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# Natural Hazards OBSERVER

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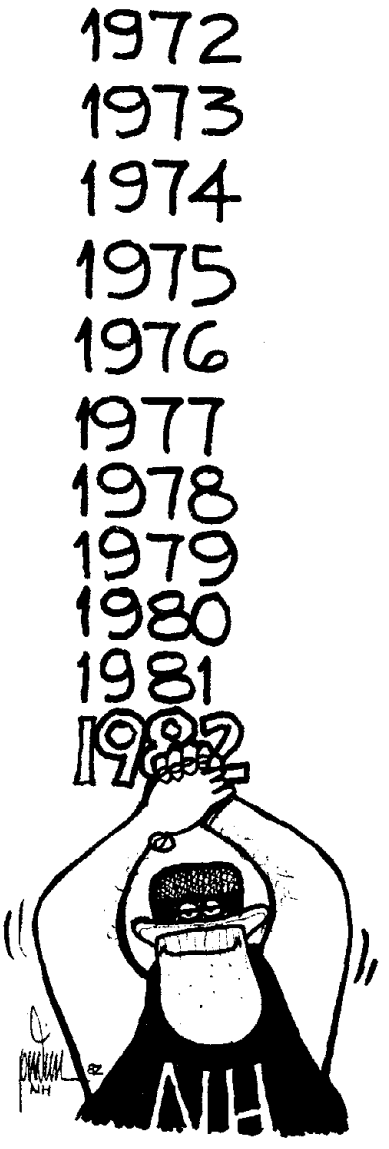
## REMEMBERING THINGS PAST
—an invited comment

The year 1982 marks a noteworthy anniversary for members of the natural hazards community. It was ten years ago that the seminal ***Disaster Preparedness: Report to the Congress*** was published and the even more influential ***Assessment of Research on Natural Hazards*** was begun. Each in its own way focused on what the hazards were, how they affected people and their works, what was being done at the time to adjust to them and lessen their impacts, and what could and should be done to make the country less vulnerable.

Prepared by a mixed group of experts and neophytes under the lead of the late Robert E. Schnabel at the Office of Emergency Preparedness, ***Disaster Preparedness*** identified a national agenda that has weathered the test of time remarkably well—in spite of some enormous blind spots, such as discounting the possibility of predicting earthquakes. Similarly, the ***Assessment,*** a major initiative undertaken by a group of researchers and graduate students at the University of Colorado, illuminated significant national policy and research problems, some of which are still with us, though perhaps in not as acute a form as they were then.

All in all, however, both efforts pointed the direction of much-needed progress, some of which has been achieved in the intervening decade. A number of laws have been passed and executive orders issued that have provided the underpinning of, and the funding for, far-reaching hazards management programs (the Flood Disaster Protection Act, the Disaster Relief Act, the Earthquake Hazards Reduction Act, and Executive Orders 11988, 11990, and 12148, for example). Substantial strides have been made in our knowledge about the physical occurrence and characteristics of the major hazards, and extensive research projects in engineering and the social sciences have increased our capacity to mitigate and cope with their effects. The attention that had been given to finding technological solutions to risks from hazards has been balanced somewhat with at-

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INFORMATION RESOURCES
NATIONAL SCIENCE FOUNDATION

tention to social measures that can also be effective, for instance, warning systems, land use management, and insurance. Measures taken by intergovernmental bodies, especially challenging in our federal system, have also expanded from mere responses to unusual events to preparing for them in coordinated fashion. There undoubtedly have been other less visible but equally significant advances.

The unfinished agenda, however, appears to be at least as long as the list of what has been accomplished. The challenge that faces the hazards community now is to redefine specifically what it is that we still do not know. This task is especially significant in view of reduced public spending, new federalism, and increased private sector roles. The epigraph of the original preparedness report described disaster preparedness as ". . . a task never completed. It represents an unbroken chain stretching from prevention through ultimate recovery and requires continuous effort. . . ." Perhaps a revised ***Preparedness Report*** and a new ***Research Assessment*** are in order.

Ugo Morelli
Natural Hazards Division
Federal Emergency Management Agency

Editor's note: Mr. Morelli's views are his own and do not necessarily reflect those of FEMA.

## EMERGENCY MANAGEMENT SERVICE

The first volume of the ***Comprehensive Emergency Management Bulletin*** was released by the National Governors' Association last spring. Part of a comprehensive service inaugurated by NGA's Emergency Management Project with funds from FEMA, the ***Bulletin*** will be issued from time to time, and is intended for the use of executive aides and others who coordinate emergency management matters on behalf of a governor.

Comprehensive emergency management (CEM) is a concept, and slowly growing system, advanced to help federal, state and local governments and the private sector to mitigate, prepare for, respond to, and recover from all types of disasters—natural and not so. The guiding assumption is that CEM will result in more efficient and less costly emergency management systems that will reduce life and property loss better than the currently fragmented systems can.

The NGA has for some years been analyzing state emergency programs, funding, and organization in order to recommend improved standards and strategies. The April, 1982, ***Bulletin*** summarizes findings from data on 43 states, and offers commentary on current practices—both good and bad—found in many state operations. Practices addressed include 1) location of the state emergency office (SEO) in the state's organizational structure, 2) SEO staffing and funding, 3) SEO coordination of all risks, 4) state emergency councils, 5) inadequate data gathering, 6) emergency operations centers, and 7) SEOs' tendencies to let the federal government plan their programs.

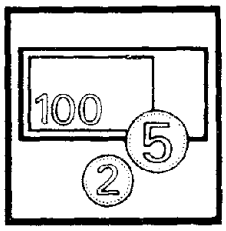
Future issues will discuss these concerns at greater length, as well as describe and interpret additional data collected by the NGA. For more information, or to obtain a copy of the ***Bulletin,*** contact *Hilary Whittaker, Emergency Management Project, Office of State Services, National Governors' Association, 444 North Capitol Street, Washington, DC 20001.*

## EROSION CONTROL FOR A SAVINGS

The old cry, "Surf's up!" may strike joy into the heart of someone with a surfboard, but anyone with shoreline property thinks bleakly of the inches wearing away and being washed off into the blue yonder. To spare the property owner undue anxiety, the U.S. Army Corps of Engineers has just published a helpful book, ***Low Cost Shore Protection.*** Of interest also to local governments, contractors, and engineers, the book describes methods of protection applicable especially to all protected and inland shores where wave height does not normally exceed six feet and hurricanes are not annual events.

With excellent photographs and illustrations helping to explain the text, the book describes the natural processes that affect shores, and presents the fundamentals of erosion control. It then details types of low-cost methods—for instance, breakwaters, groins, revetments, and seawalls—and discusses the shoreforms and situations where each can be used to maximum efficacy. The book presents a number of general considerations that should be made before a course of action is decided upon, the most practical one being whether the owner intends to construct the control alone or in cooperation with neighboring property owners.

The 36-page book is completed with a directory of sources of further information and assistance, and a glossary of frequently used terms that may, unfortunately, not be in the working vocabularies of many beach owners. ***Low Cost Shore Protection*** is available at no cost from *John G. Housley, Section 54 Program, U.S. Army Corps of Engineers, DAEN-CWP-F, Washington, DC 20314.*




# GRANTS

*State program evaluation.* "Evaluation of State Programs for Flood Hazard Mitigation," National Science Foundation, $88,520, 12 months. Principal Investigators: *Raymond J. Burby, Beverly A. Cigler, David R. Godschalk, and Edward J. Kaiser, Center for Urban and Regional Studies, University of North Carolina at Chapel Hill, Hickerson House 067A, Chapel Hill, NC 27514, (919) 962-3074.*

This project will provide a systematic assessment of the effectiveness of flood hazard mitigation measures and procedures currently being used by state governments, and will develop guidelines for formulating effective mitigation strategies and programs for the future. Original data will be collected from all 50 state governments using a combination of telephone and mail surveys, examinations of government documents, and case studies of four particularly effective state programs. The study will generate a comprehensive description of state flood hazard mitigation programs, a taxonomy of state practices, matrices of organizational arrangements and their interrelationships, measurements of program impact, guidelines for choosing among alternative mitigation approaches, and recommendations for federal and state policy.

*Emergency response.* "Emergent Groups During the Disaster Period," Federal Emergency Management Agency, $50,000, 12 months. Principal Investigator: *E.L. Quarantelli, Disaster Research Center, 128 Derby Hall, The Ohio State University, Columbus, OH 43210, (614) 422-5916.*

The project will examine the circumstances and conditions that generate the emergence of ad hoc groups in the crisis period of a disaster. The nature and function of such groups will be studied, and those which appear to be most important to the disaster operations will be identified. Data will be gathered by field teams which will be dispatched to the disaster sites immediately after the emergency occurs.

*Earthquake losses.* "Development of a Rational Methodology for Predicting Earthquake Losses in Urban Areas," U.S. Geological Survey, $124,064, 12 months. Co-Principal Investigators: *Onder Kustu and Roger E. Scholl, URS/John A. Blume and Associates, Engineers, 130 Jessie Street, San Francisco, CA 94105, (415) 397-2525.*

In the second year of this proposed three-year project, the researchers will specify their method for assessing potential earthquake damages in a city, and develop a computer program to make the method accessible to others. The first year of the study was given over primarily to a thorough literature search of every technique heretofore proposed to inventory possible losses from earthquakes. In light of their findings from that exercise, the researchers will refine their method, and incorporate motion/damage relationships for different types of structures into the program. In the third year of the study, it is proposed to test the method on a specific city on an active fault zone.

*Flood plain management.* "The Role of Regional Governments in Managing Metropolitan Flood Plains," National Science Foundation, $192,252, 24 months. Principal Investigator: *Rutherford H. Platt, Department of Geology and Geography, University of Massachusetts, Amherst, MA 01003, (413) 545-2296.*

Flood losses and the potential for them are increasing rapidly as storm drainage and sewer systems are extended to previously undeveloped sectors of urbanizing watersheds, and natural surfaces are replaced with pavement and buildings. Unfortunately, metropolitan flood plain and stormwater management is often assigned to governmental authorities that are inappropriate in geographic scale and/or legal authority. Federal and state governments are hampered by inadequate resources, their remoteness from the local situation, and the fact that their efforts are sometimes politically unwelcome. Local municipalities, on the other hand, are too small and too numerous to achieve a coordinated, effective approach to flooding and watershed management. However, counties, regional special districts, and regional institutions have achieved significant success in certain metropolitan areas, although their collective experience is not well known or documented. This study will inventory the state of the art of regional response to flood problems, and analyze and compare several of the leading examples.

## BARRIER ISLANDS BILL

Congress passed and the President signed into law last month the Coastal Barrier Resources Act restricting future federal expenditures and financial assistance for development on barrier islands (see ***Observer,*** Vol. VI, No. 6, p. 4). Recognizing that coastal barriers serve as natural buffers to storms and that they are vulnerable to hurricane damage as well as gradual shoreline erosion processes, the Act establishes a Coastal Barrier Islands Resource System consisting of all the undeveloped and not otherwise protected coastal barriers along the Atlantic and Gulf Coasts—about 13% of the nation's coastal barriers for a total of 700 miles of shoreline.

The Act halts such development subsidies to property owners as those for construction or purchase of buildings or facilities, roads, sewers, causeways, bridges and some shoreline stabilization projects. Federally subsidized flood insurance will not be available for new construction or for substantial improvements to existing construction on lands within the System on or after October 1, 1983. Some exceptions are provided for in the Act: federal aid may be available for the maintenance of certain existing roads and facilities, the exploration and extraction of energy resources, and military or Coast Guard activities, but only after consultation with the Secretary of the Interior. Certain other activities will be eligible for federal aid subject not only to consultation with Interior but also to a determination that such expenditures are consistent with the purposes of the Act. Included in the latter category are emergency disaster relief actions performed pursuant to §§ 305 and 306 of the Disaster Relief Act of 1974 and § 1362 of the National Flood Insurance Act of 1968.

## DISASTER ASSISTANCE DELIVERY

The $700 million in disaster assistance provided by FEMA to state and local governments in FY1979-1981 was in many cases inappropriate federal expenditure, according to a recent report by the General Accounting Office. ***Improved Administration of Federal Public Disaster Assistance Can Reduce Costs and Increase Effectiveness*** finds that, although federal funds are intended to *supplement* state and local governments' resources, FEMA was actually reimbursing them for certain expenditures in disaster recovery, for instance, costs of using their own employees and equipment. GAO holds that these costs should not be met by the federal government because they would have been incurred anyway.

Additionally, GAO notes that the delivery system for disaster assistance is cumbersome and inconsistent. State and local governments complain rightfully that funds come in fits and starts with no apparent coherence. GAO recommends that Congress amend the Disaster Relief Act of 1974 to provide that state and local governments assume disaster relief costs that they are capable of meeting. GAO also suggests that FEMA perfect a more streamlined system for getting disaster assistance to governments who do need it.

Copies of the report, #GAO/CED-82-98, are available at no cost from the *U.S. General Accounting Office, Document Handling and Information Services Facility, P.O. Box 6015, Gaithersburg, MD 20877.*

## EARTHQUAKE RESPONSE PLANNING

An Interagency Coordinating Committee has been formed to facilitate the management of the National Earthquake Hazards Reduction Program in accordance with the Earthquake Hazards Reduction Act of 1977, as amended. As a step toward fulfilling its responsibility for coordinating federal planning, the Federal Emergency Management Agency has organized a Subcommittee on Federal Earthquake Response Planning. Its duties will be to expand current federal and state programs and to develop a comprehensive national framework for response to a catastrophic earthquake anywhere in the country.

The Subcommittee's first meeting in August, 1982, was attended by more than 30 representatives of ten agencies. Participants were briefed on the development of plans to cope with the several phases of emergency operations—prediction, rescue, and short and long-term recovery.

Planning guidelines, developed by FEMA with the assistance of the Subcommittee, will be published in the ***Federal Register*** so that agencies may make use of them in formulating their own response plans. A schedule for the development of the plans and subsequent exercises will also be made public.

For further information, contact *Edward Sergent, FEMA, Office of Emergency Coordination, Washington, DC 20472, (202) 287-0515.*

## HURRICANE EVACUATION EXERCISE

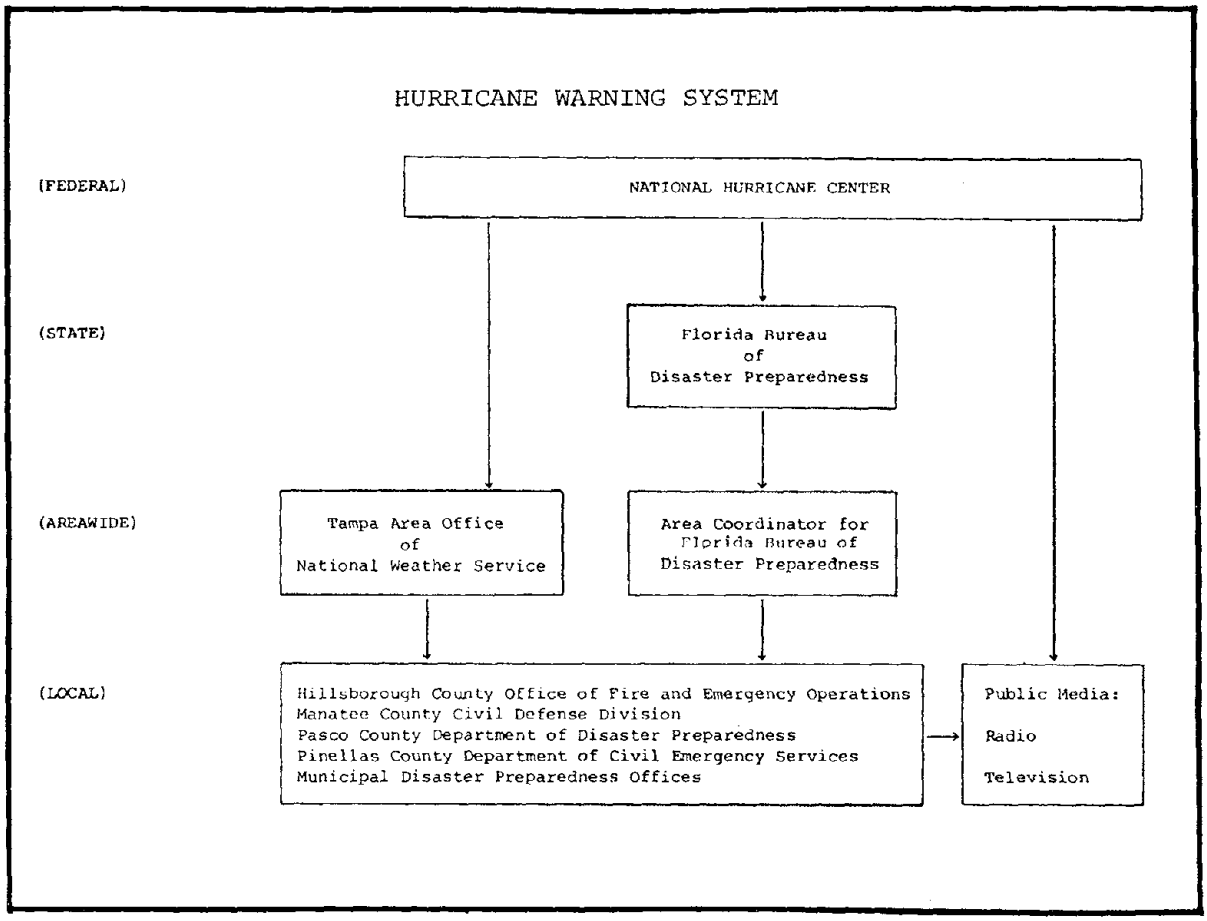
On May 6, 1982, the Tampa Bay Regional Planning Council (TBRPC) administered a full-scale regional hurricane evacuation exercise, simulating the approach and landfall of a major tropical storm, the evacuation decision-making process, and the emergency operations required by the Tampa Bay Region Hurricane Evacuation Plan (see ***Observer,*** Vol. IV, No. 4, p. 3). Four counties and about 20 municipalities participated, and six agencies took part both in the eight-hour exercise and the extended 72-hour hurricane approach scenario.

Short of the actual relocation of all vulnerable residents, the activity tapped all local elements of the hurricane evacuation plan. The fact that only seven persons—one in each participating agency—knew about the scenario in advance allowed for spontaneous response by most emergency personnel. Several components of the plan were tested for the first time ever: the activation of the emergency operating centers of three counties; the comprehensive test of the area's emergency broadcast system; and the region-wide test of television broadcasts of maps of risk zones, evacuation routes, and shelters.

A committee of 20 involved local officials evaluated the exercise and issued recommendations for improved hurricane evacuation preparedness, decision making, and operations by all levels of government and the local broadcast media. The comments incorporated in their critique ranged from very specific suggestions, to proposals for future activities:

- The terms "executive order" and "evacuation order" were sometimes misinterpreted in oral communications. The terminology should be more clearly distinguishable.
- The Pasco County Emergency Operating Center should be relocated inland to a site free from storm surge.
- A system for county-wide "conference telephone calls" would greatly reduce the amount of time needed to disseminate essential information to officials during the approach of a hurricane.
- In spite of the difficulties, the exercise significantly improved the hurricane preparedness of the local governments in the region.

For further information about the Tampa Bay Region's evacuation exercise, ***Hurricane!,*** contact *David Griffith, Tampa Bay Regional Planning Council, 9455 Koger Boulevard, St. Petersburg, FL 33702, (813) 577-5151.*



## COMING THROUGH THE BIG ONE

If you don't survive the next earthquake in an exemplary fashion, it won't be for lack of information on how to do so. Three new books on earthquake preparedness and survival have just hit the stands, all addressed to the lay person sitting down to an evening of TV watching when he or she should really be locating the gas shutoff valve and readying a good first aid kit instead.

***Safety and Survival in an Earthquake,*** just released by the Los Angeles Chapter of the American Red Cross, is part of an earthquake preparedness course developed originally for Los Angeles' Earthquake Awareness Week in 1980. The 42-page booklet addresses all the considerations a person anywhere near a fault should make, sooner rather than later: storage of emergency supplies, earthquake dynamics, what to do immediately after the quake, first aid principles, coping with children's reactions, and developing a family disaster plan, to mention but a few. It explains home construction methods and the chances they each have for surviving damage, presents a quiz to check up on working knowledge, and provides a bibliography of additional information. ***Safety and Survival*** can be gotten for $3.00 from *"Earthquake Book," American Red Cross, 2700 Wilshire Boulevard, Los Angeles, CA 90057.*


Virginia Kimball survived the 1971 San Fernando earthquake, but her immense feelings of helplessness and hopelessness afterwards impelled her to research and write ***Earthquake Ready*** ten years later in an attempt to aid others in lessening their losses and levels of victimization. The first chapter is a well-documented look at what happens during an earthquake, and why; the next chapter discusses what can happen to humans in a quake and what they can do about it. Subsequently, there are precise directions for preparing an earthquake kit, making a house earthquake-ready, what to do during and after the disaster, and what to expect from public and private relief efforts. A final chapter on the science of prediction is informative and helpful. A bibliography and index complete this excellent book. ***Earthquake Ready*** is published by *Peace Press, 3828 Willat Avenue, Culver City, CA 90230;* it costs $5.95 and is 154 pages long.

***Earthquake: Are You Prepared?,*** by Pauline Jue-Obermeyer and William Obermeyer, covers much the same territory as the Red Cross booklet but in a bit more detail. The book explains earthquake dynamics, analyzes home construction and its risks, prescribes preparedness measures, discusses what actions to take in various settings during a quake, alerts the reader to the sort of attendant hazards to expect afterwards, and discusses at some length coping with children in the aftermath. There are brief appendices on first aid techniques and water purification methods. The 68-page book is available from *The California Earthquake Readiness Association, P.O. Box 18103, San Francisco, CA 94118, for $2.95, 40% off for 25 copies or more.*

## THE HANDWRITING ON THE WALL

There is little doubt in the scientific community that the effects of an R8.3 earthquake on the south-central San Andreas Fault will be catastrophic, but until now there has been only a very imprecise understanding of the forms the catastrophe will take. A report recently published by the California Division of Mines and Geology forecasts the impacts the ground shaking and ground motion associated with such an earthquake will have on the vital lifelines in the Los Angeles Basin and environs. ***Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in Southern California*** makes it clear that most of the lifelines will be significantly damaged and that—combined with the anticipated 3,000-14,000 dead and possibly 55,000 injured—will place an unprecedented strain on the ability of our institutions and society in general to cope with the havoc.

In response to a report commissioned by the President on the consequences of, and preparation for, a large earthquake in California, published by FEMA in 1981 (see the ***Observer,*** Vol. V, No. 3, p. 7), the Governor of California established a Taskforce on Earthquake Preparedness. A subcommittee of this group, the Threat Assessment Committee, was charged with the job of characterizing the outcomes of large earthquakes in northern and southern California. Their analysis and findings are presented in ***Earthquake Planning Scenario*** in hopes that they will aid in better preparations for the disaster by making it more clear to all concerned what may actually happen.

After first furnishing a seismic intensity distribution map for the Los Angeles area, based on best estimates for potential ground failure and liquefaction, the report

hypothesizes the nature and extent of damages to the following lifelines: highways, airports, railroads, marine facilities, communications, water supply and waste disposal, electrical power, natural gas, and petroleum fuels. Following each scenario, recommendations are made for further work to anticipate and deal with the damages described.

Among the insights offered by the report are:

- Two of the three major aqueduct systems that cross the San Andreas Fault will be ruptured and supplies will not be restored for a three- to six-month period.
- Los Angeles imports nearly a third of its electrical power, and most of that will be lost. Additionally, some power generated within the Basin will be lost, reducing the power availability to about half of its normal level.
- Imported crude oil from the San Joaquin Valley will be lost from pipelines that cross the San Andreas Fault; petroleum product lines exporting from the Basin will also be disrupted. The potential for fires will be great.
- Telephone communications will be severely hampered by both equipment damage and by incoming calls saturating the systems still operating. Radio systems will be 40-75% effective; microwave systems only 30% effective, or less.

***Earthquake Planning Scenario*** is available for $6.00 from the *District Office, California Division of Mines and Geology, 2815 O Street, Sacramento, CA 95816.* Make checks payable to the California Division of Mines and Geology.

## MANAGING FLOOD PLAIN MANAGEMENT

The closely trimmed budgets of recent years have made effective resource allocation by federal and state flood plain managers critical. As a result, agencies are seeking more objective criteria and more accurate information to assist in the allocation of the various services and means of support they provide. During FY1982, the U.S. Water Resources Council's Floodplain Management Task Force undertook three projects to help meet these needs. The first was the identification of those activities considered to be most important to strengthening flood plain management in the 1980s. The second task was an analysis of the potential for using computerized information on flood-prone communities to determine optimal allocations of resources. Third, the perceived needs of local officials for flood plain management assistance from federal and state agencies were determined.

The expertise of the federal and state personnel comprising the Task Force and its work groups was supplemented by the contributions of local flood plain managers and nationally recognized experts on flood problems. Their views are summarized in the Task Force's recently released report.

- Emphasis should be placed during the next decade on marketing innovative flood plain management programs and motivating potential users, finding ways to finance nonstructural approaches besides using federal funds, and applying such advanced technology as remote sensing and automated cartography to flood loss reduction. More detailed recommendations along these lines will be released this winter, the results of two National Science Foundation studies.
- There is a need for a single, centralized data management system for the storage and use of data on flood-prone communities. Since the Federal Emergency Management Agency holds most of this data and has the computer hardware to support such an effort, it should develop this system along with the capability to answer requests for the data.
- It is believed that local officials most need assistance in obtaining and using flood plain maps, administering and enforcing regulations, and meeting the requirements of the National Flood Insurance Program. Direct technical assistance through in-person visits or telephone calls is the most effective delivery technique. To meet with success, the assistance requested by the local officials should be provided by the next highest level of government having the capability to do so.

Single copies of the Task Force report, ***Floodplain Management Work Program: FY 82,*** are available free from the *Natural Hazards Research and Applications Information Center.*

## 'TIS THE MONTH BEFORE CHRISTMAS

In keeping with its tradition of providing one-of-a-kind gifts for the person who has nearly everything, the Information Center has outdone itself this year with the publication of two new working papers and one special publication.

***Floodplain Regulations and the Courts, 1970-1981,*** Special Publication #5, was prepared by Jon Kusler for the U.S. Water Resources Council as one chapter of ***Regulation of Flood Hazard Areas to Reduce Flood Losses, Volume 3.*** We bring it out now as a separate volume for attorneys, government officials, researchers, and others with an interest in the legal ramifications of flood plain management. The publication reviews conclusions from the 1970 and 1971 reports on judicial response to flood plain regulations, examines the types of cases litigated during the 1970s, and analyzes judicial treatment given to specific claims and issues. Additionally, the report provides descriptions of the rulings handed down during the decade by both federal and state courts in over 50 cases on flood plain and wetland regulations, flood insurance, and Section 404 permits. Complete with a bibliography, Special Publication #5 runs 51 pages and costs $5.00.

Working Paper #45, ***Trends and Developments in Global Natural Disasters, 1947 to 1981,*** was written by Stephen A. Thompson to update global data last collected by Judith Dworkin in 1974 (Working Paper #26). The paper notes that floods remain the single most frequent disaster by type, followed by earthquakes and then tornadoes; the three together comprise over 67% of all disasters. The single most deadly hazard is hurricanes. Among the tabloid statistics presented are loss of life from various kinds of disasters, number of large-area disasters per year, and disaster occurrence by type. The paper costs $4.50 and is 25 pages long.

***Emergency Planning Implications of Local Governments' Adaptive Responses to Mount St. Helens,*** by Jack D. Kartez, analyzes the experiences of local governments as they coped with the ash from the May 18th, 1980, eruption of Mount St. Helens. Information is presented on the actual strategies governments adopted to organize their resources, seek outside assistance, and work with citizens to get the mess cleaned up and the city functioning again. In most of the localities studied, existing functional lines of organization were used first, for instance, those available to public works, and safety and management staffs. Around 50% of the 26 jurisdictions surveyed reported no use at all of a county-wide emergency preparedness plan, the usual centerpiece of planning funded by state and federal governments. Working Paper #46 is 33 pages long and costs $4.50.

All of the above can be ordered from the Information Center.

## SBA REORGANIZES

The U.S. Small Business Administration has recently reorganized its disaster assistance division. The program now consists of a staff of trained disaster professionals working out of four area offices. Readers are encouraged to add these names and addresses to the list of information sources originally published in the March, 1982 ***Observer.***

### SMALL BUSINESS ADMINISTRATION DISASTER ASSISTANCE DIVISION

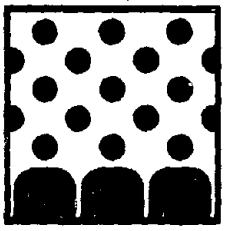
National Office—*Bernard Kulik, Deputy Associate Administrator, 1441 L Street, N.W., Room 820, Washington, DC 20416, (202) 653-6879.*

Area 1 (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Puerto Rico, Rhode Island, Vermont, Virgin Islands)—*Gino Uccellini, Director, c/o SBA District Office, 970 Broad Street, Room 1435-D, Newark, NJ 07102, (201) 645-3920.*

Area 2 (Alabama, Delaware, District of Columbia, Florida, Georgia, Illinois, Indiana, Kentucky, Maryland, Michigan, Minnesota, Mississippi, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, Wisconsin)—*Richard J. Nash, Sr., Director, 75 Spring Street, S.W., Suite 822, Atlanta, GA 30303, (404) 221-5822.*

Area 3 (Arkansas, Iowa, Kansas, Louisiana, Missouri, Nebraska, New Mexico, Oklahoma, Texas)—*George Darby, Director, 2306 Oak Lane, Suite 110, Grand Prairie, TX 75051, (214) 767-7571.*

Area 4 (Alaska, Arizona, California, Colorado, Guam, Hawaii, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming)—*Robert L. Belloni, Director, 660 J Street, Suite 215, Sacramento, CA 95814, (916) 440-3178.*



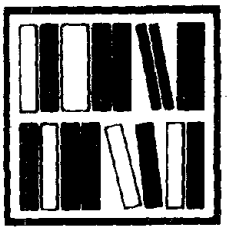
# CONFERENCES

*Civil Emergency Management—Earthquake. California Specialized Training Institute. San Luis Obispo, CA: November 15-19, 1982; January 24-28, 1983; March 7-11, 1983; May 9-13, 1983.* This is one of many courses offered in emergency management by the CSTI, a training institute within California State Government. In its twelfth year of operation, CSTI designed the "Earthquake" course to assist government and private sector managers in planning for a catastrophic event. The management of a great earthquake is beyond the scope of most local plans, but much can be gained by identifying potential risk and anticipating all the problems that may result in the disaster. Life support and search and rescue are stressed for the immediate postdisaster period; subsequent concerns covered by the course include damage assessment, resources accounting, and coordination of local, regional, state, and federal agencies. Business and industry integration into management and planning is emphasized. Eligible to take the course are persons in the public and private sectors whose job responsibilities cover emergency response. Additional information can be gotten from the *California Specialized Training Institute, P.O. Box G, San Luis Obispo, CA 93406, (805) 544-7101.*

*Third International Symposium on Land Subsidence. International Association of Hydrological Sciences. Venice, Italy: March 19-24, 1984.* The symposium will bring together international interdisciplinary specialists on the problems of land subsidence caused by continuing human use of ground water, oil, and gas. The heavy development of these resources is changing the natural fluid regime and giving birth to more and more subsidence areas in the world. Of special interest will be legal, socioeconomic, and environmental effects of land subsidence; attention will also be given to engineering theory and analysis, karst "sink-hole" subsidence, and subsidence caused by the application of water. It is expected that simultaneous translation into English, French, and Italian will be available at all sessions. Notice of intent to offer a paper or attend the symposium should be given as soon as possible to the *Program Chairman, A. Ivan Johnson, Woodward-Clyde Consultants, 7600 East Orchard Road, Englewood, CO 80111, (303) 694-2270.*

*Disaster Management and Preparedness. Oxford Polytechnic Faculty of Architecture, Planning and Estate Management. Oxford: March 7-May 14, 1983.* Part of the annual Oxford Programme of Development Workshops, these sessions will focus on ways of alleviating distress, maximizing available resources and reducing subsequent risks from such diverse disasters as floods, earthquakes, high winds, and droughts. The workshops are intended for experienced professionals from public and voluntary agencies and professional groups active in the various aspects of disaster management, and make use of case studies, disaster simulation exercises, and group discussions. Participants may attend any or all of the courses that comprise the workshop. Part 1 is a two-week session on disaster preparedness; Part 2 also lasts two weeks and deals with relief management for quick-onset disasters; Part 3 is a three-week segment on relief and refugee management for slow-onset or human-caused disasters; Part 4 is an opportunity for participants to engage in individual study for three weeks under the supervision of the faculty. Some financial support is available. Applications and more information are available from *Oxford Programme of Development Workshops, c/o Department of Town Planning, Oxford Polytechnic, Headington, Oxford OX3 OBP, United Kingdom.*

*Nineteenth Annual Conference and Symposium. American Water Resources Association. San Antonio, Texas: October 9-13, 1983.* The title of next year's conference is "Analysis and Management of Land Drainage and Flood Waters." Contributed and invited papers will be presented at sessions dealing with a wide variety of issues: stormwater management, planning and design; erosion and sediment problems; flood plain management considerations; stormwater law, ordinances and legal issues; flood hazard mitigation; hydrology of controlled watersheds; land use impacts on flooding; and environmental issues in land drainage. The symposium, to be held on the 12th and 13th of October, will address "Regional and State Water Resources Planning." Topics to be discussed include water importation or interbasin transfer issues; the role of state natural resources departments in water planning; state and regional groundwater management issues; technological advances to aid in large-scale water resources management; and federal versus state versus regional responsibilities. Deadline for submission of paper abstracts for either convocation is January 15, 1983. For information on the Conference, contact *Max Spindler, Civil Engineering Department, University of Texas at Arlington, P.O. Box 19308, Arlington, TX 76019, (817) 273-2207.* Symposium Program Committee Chair is *Randall Charbeneau, Civil Engineering Department, University of Texas at Austin, ECJ 8.6, Austin, TX 78712, (512) 471-5602.*



# RECENT PUBLICATIONS

*A Guide to ABAG's Earthquake Hazard Mapping Capability. Association of Bay Area Governments, Hotel Claremont, Berkeley, CA 94705, (415) 841-9730. 1982. 53 pp. $4.00.*

The latest revision of ABAG's guidebook contains a general introduction to the project's capabilities, and describes each of the basic data map files, the hazard map files, and applications for both.

Since 1979, ABAG has been developing computer-based map files to provide information that can be used by local governments to improve their seismic safety programs. Recent additions to ABAG's working paper series include: ***Detailed Map Information for Selected Existing Urbanized Areas and Landslide Susceptibility Hazard Map Refinement. Working Paper #16. 1982. 21 pp. $1.50. Using Earthquake Intensity and Related Damage to Estimate Risk of Ground Shaking Damage. Working Paper #17. 1982. 62 pp. $12.00. Using Earthquake Hazard Maps to Analyze the Vulnerability of Lifeline System Locations. Working Paper #18. 1982. 51 pp. $3.50. (Add $1 for each publication to defer handling costs.)***

*Disaster Prevention and Mitigation: A Compendium of Current Knowledge, Volume 8—Sanitation Aspects. United Nations Disaster Relief Coordinator. 1982. 75 pp. Single copies are free. Available from R.M. Zoubeidi, UNDRO Liaison Director, Room 2535, United Nations, New York, NY 10017.*

Prepared in cooperation with the World Health Organization, this monograph deals mainly with disaster conditions developing nations are likely to experience. Part "A" addresses problems associated with water supply and waste disposal, such as water storage and treatment in emergency camps, and organizational procedures to ensure adequate sanitary relief measures. Part "B" considers postdisaster control of diseases transmitted by arthropod or rodent vectors. The selection of appropriate insecticides and rodenticides is discussed, together with an examination of equipment and techniques for applying these chemicals. The monograph points out that the opportunity in the disaster health field is to prevent or reduce the risk of damage to the sanitary infrastructure of communities exposed to extreme natural hazards.

*"Forecasting Southern California Earthquakes." C.B. Raleigh, K. Sieh, L.R. Sykes, and D.L. Anderson. Science 217 (September 17, 1982): 1097-1104.*

Since 1978 and 1979, California has had a significantly higher frequency of moderate to large earthquakes than in the preceding 25 years. In the past such periods have been associated with major destructive earthquakes (R7 or greater), and the annual probability of occurrence of such an event is now 13% in the state. The increase in seismicity is associated with a marked deviation in the strain accumulation pattern, a correlation that is physically plausible. Although earthquakes of magnitude R7.5 or greater are too infrequent to have clear associations with any pattern of seismicity that is now observed, the San Andreas fault in southern California has accumulated sufficient potential displacement since the last rupture in 1857 to generate a great earthquake along part or all of its length. The authors conclude that an extensive network for closely monitoring and analyzing strain and seismicity data is imperative.

*Goals and Tasks of the Landslide Part of a Ground-Failure Hazards Reduction Program. Geological Survey Circular #880. 1982. 49 pp. Available free on request to Branch of Distribution, U.S. Geological Survey, 604 South Pickett Street, Alexandria, VA 22304.*

Authored by the 53 experts in attendance at a Workshop on Ground-Failure Hazards in January of 1981, this report summarizes the workshop and discusses 1) the scope of the landslide problem in the U.S., 2) potential benefits of a hazards-reduction program with specific examples, and 3) a list of approaches and tasks for each of the three major program elements—process and prediction studies, landslide hazard mapping and risk evaluation, and information transfer and use. Since ground failure in the form of landslides causes more than $1 billion in damages annually, the U.S. Geological Survey understandably has proposed this program to acquire the necessary technical data, and to promote utilization of available information. Data collection given the highest priority is for processes causing the greatest damage or posing the highest threat to human life; areas of highest priority, both for investigations and utilization of information, are the West Coast, the Rocky Mountain region, and Appalachia.

*Post-Earthquake Transit Operations Analysis. Southern California Association of Governments. 1981. 63 pp. Limited numbers of copies are available at no cost from SCAG, 600 South Commonwealth Avenue, Suite 1000, Los Angeles, CA 90005, (213) 385-1000.*

This study explores the possible uses of special transit services after a major earthquake. The study grew out of interest by the Urban Mass Transportation Administration in whether, and how, a regional transit system could serve mobility needs in emergency conditions. The main objectives of the research were to identify potential transportation impacts from a big earthquake, decide on a strategy for operating the transit system after a quake, and identify policies needed for implementation of the plan. A major finding was that an emergency transit system can not work without full participation of regional governments, businesses, and transit operators. Additionally, emergency transit routes would have to be established quickly in the wake of the disaster and receive priority in debris removal. In spite of all complications, however, the report concludes that transit systems could play a major role in increasing mobility after an earthquake.

*Problems in Formulating Disaster Relief. Leonard D. Goodisman and Peter J. May. Graduate School of Public Affairs, DP-30, University of Washington, Seattle, WA 98195. 1982. 149 pp. Single copies are available for the cost of copying ($7.50) from the above address.*

Conceived as a more abstract analysis of political-organizational influences on the formulation of disaster relief, this study takes as its primary focus the Mount St. Helens disaster and the factors that shaped federal and state-level relief and recovery efforts. A comparison of this case with those of other natural disasters elucidates some of the more general problems of disaster relief formulation: budgeting and control in federal relief policy, estimating relief needs before they're known, and controversy over federal-state relations and fair shares. Among the findings of the study are 1) the current funding pool mechanism for disaster relief is good in that it lessens the need to base levels of appropriations on early estimates of damages and needs, and 2) too much can not be said about the need for federal and state governments to have on-going, coordinated relationships and plans before a disaster (between disasters) for there to be much chance of a coherent response when one does happen.

*Inventory of Disaster Field Studies in the Social and Behavioral Sciences: 1919-1979. E. L. Quarantelli. 1982. Approximately 400 pp. $25.00 (prepaid), plus $5.00 postage for orders from outside the U.S. or Canada. Order from the Disaster Research Center, 128 Derby Hall, 154 North Oval Mall, The Ohio State University, Columbus, OH 43210.*

Based upon a similar National Academy of Sciences volume published in 1961, the inventory lists 353 events studied during the years 1919-1979. A few field studies also are included for 1980-1982, but coverage necessarily is incomplete for these years. In addition to various categories of human-caused disasters, the inventory contains seven natural disaster subject areas: earthquakes, floods, snowstorms and blizzards, tornadoes, tsunamis, volcanoes, and hurricanes and severe storms. A brief narrative on damages and casualties is provided for each event, together with a listing of all known reports and publications emanating from the field study. This handy reference tool should prove useful to social science researchers investigating disaster-related topics.

*Earth-Covered Buildings: An Exploratory Analysis for Hazard and Energy Performance. Frank L. Moreland, et al. Prepared for the Federal Emergency Management Agency, Division of Mitigation and Research, Washington, DC 20472. 1981. 302 pp. Available in paper and microfiche from the National Technical Information Service, Springfield, VA 22161 (Stock #PB-82 189564), or in paper only from Moreland Associates, 908 Boland, Fort Worth, TX 76107, (817) 335-2883.*

One section of the publication examines the capabilities of earth-covered buildings to resist damage from earthquakes, severe storms, floods, fire, and nuclear blast and radiation. These buildings also offer some degree of protection from hail, wind, and severe heat, and a considerable degree of protection from hurricanes, provided that care is taken when selecting the site. The ability of earth-covered buildings to withstand flood and earthquake forces is less clear-cut, and fire can pose a significantly greater threat than in some conventional buildings. Earth-covered buildings are particularly resistant to tornadoes because of their minimal exposure, structural toughness, and resistance to flying debris. A high degree of storm protection for institutional buildings is offered by such structures, witness the 27 earth-sheltered schools and 15 schools with earth berming that have been constructed in Oklahoma.

*Thunderstorms: A Social, Scientific, and Technological Documentary, Volume 2—Thunderstorm Morphology and Dynamics. Edwin Kessler, editor. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Environmental Research Laboratories. 1982. $13.00. 603 pp. For sale by the Superintendent of Documents, Government Printing Office, Washington, DC 20402. Sales #003-017-00498-8.*

The second of NOAA's three-volume series on thunderstorms consists of a collection of technical articles on the current status of knowledge about the meteorological and physical phenomena that produce these storms and their hazardous offspring: tornadoes, lightning, wind, and hail. Topics range from thunderstorm energetics and the mesoscale environment to tropical convection patterns and tornado dynamics. The chapter on thunderstorm climatology contains information most relevant to disaster researchers: data concerning the distribution, timing, and effects of thunderstorm activity both in the U.S. and abroad. Specific U.S. data is given for items as diverse as the hour of maximum thunderstorm activity and the average annual number of acres burned by lightning-ignited wildfires. Many of the articles provide extensive references.

*An Economic Comparison of Different Flood Mitigation Strategies in Australia: A Case Study. R.J. Higgins and D.J. Robinson. Australian Water Resources Council Technical Paper #65. 1981. 385 pp. Available from Mail Order Sales, Australian Government Publishing Service, P.O. Box 84, Canberra ACT 2600 Australia.*

This volume reports the results of a major field survey that was conducted to compile flood damage estimates for the residential, business, rural, and service sectors of the economy. Estimation procedures were developed to enable a comparison of damages between regions. The principal product of the study was a set of procedures for evaluating the various alternatives available to mitigate the economic impacts of flooding, and for combining these approaches into those strategies preferred for a particular area. The process allows flood plain management decisions to be made in a manner consistent from place to place, but in recognition of individual characteristics of particular flood plains and their occupants.

*The Great San Francisco Earthquake and Fire, 1906. Eric Saul and Don Denevi. Available from Celestial Arts, 231 Adrian Road, Millbrae, CA 94030. 1981. 168 pp. $25.00.*

An excellent collection of old photographs of San Francisco before, during, and after the great earthquake is presented in this book. The text accompanying the photos is concise and illuminating, and is supplemented with eyewitness reports drawn from old letters, diaries, and memoirs. Five chapters capture San Francisco as it was in 1906, show the extent and types of damage caused by the quake, preserve the immensity of the fires that broke out, show life as it was in the survivor camps and makeshift shelters, and provide valuable images of the clean-up and first reconstruction tasks. Before and after pictures of same streets and perspectives are especially instructive. This book has something for everyone, from those who are interested in earthquakes, or in buildings, or in people, to those who are taken with San Francisco.

*Storm. A.B.C. Whipple. The fourth volume in Time-Life Books' Planet Earth series. Available from Time-Life Books, 541 North Fairbanks Court, Chicago, IL 60611. 1982. 176 pp. $12.95 plus shipping and handling costs.*

The phenomena which produce such weather-related hazards as hurricanes, tornadoes, hailstorms, lightning, and blizzards are explored. The volume traces human society's gradual comprehension of the forces which generate these storms, describes some of its disastrous encounters with them, and examines recent attempts to control the storms themselves or mitigate their effects. Anecdotal accounts and informative graphics are used to illustrate the enormous energy which such storms can generate. The book is indexed and contains over 125 references to further reading.

*Tornado Awareness. Wayne P. Speigel. Kansas Division of Emergency Preparedness, Natural Disaster Planning Section. 1982. 19 pp. Copies may be obtained free from the Kansas Division of Emergency Preparedness, 2800 South Topeka Avenue, P.O. Box C-300, Topeka, KS 66601. Attention: James Van Sickel or Brian Logan.*

The booklet is a concise review of emergency information about the tornado hazard. Written in a straightforward style, it acquaints the reader with the general characteristics of tornadoes, the weather terminology associated with severe storms, and the precautions that should be taken to protect oneself during a tornado watch or warning. Additional sections deal with emergency supplies, mobile home safety, and how to protect life and property after a tornado. The locations and frequencies of eight Kansas radio stations served by NOAA's FM weather radio are listed.

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 Federal Emergency Management Agency, the National Oceanic and Atmospheric Administration, the U.S Geological Survey, and the Corps of Engineers, acting through the National Science Foundation.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