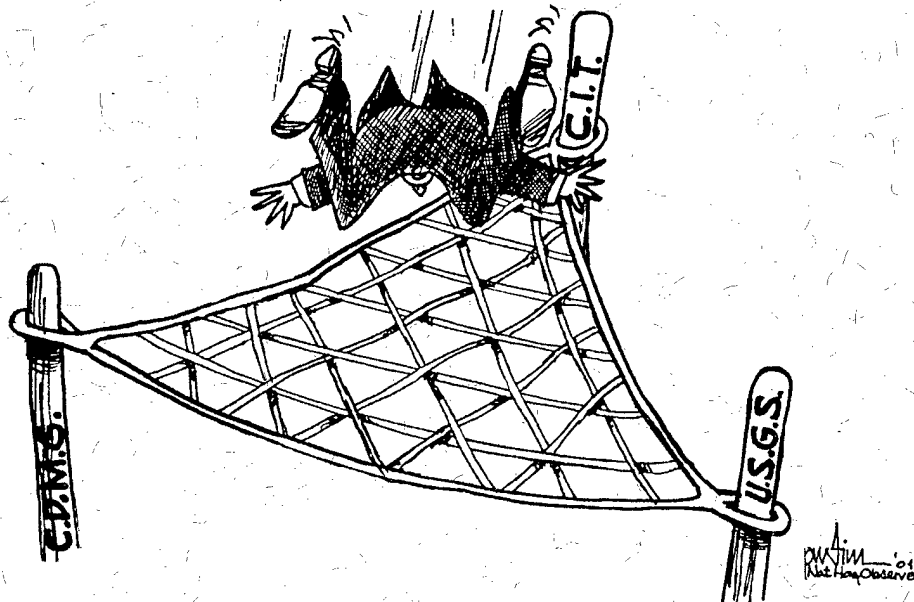


NATURAL HAZARDS

Observer

VOLUME XXV NUMBER 6

JULY 2001



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TriNet New Tools for Rapid Earthquake Response Through Interdisciplinary Research

—an invited comment

Immediately following a damaging earthquake, emergency managers must quickly assess the situation and make response decisions. Where are the major incidents? What resources must be mobilized and in what quantities? What areas have sustained damage and what areas are relatively free of damage? Will mutual aid be needed?

Typically, first response organizations learn the answers to these questions through reconnaissance, police and fire services reports from the stricken areas, and information gathered from other agencies. Reconnaissance requires hours and sometimes days to complete; however, decisions regarding search and rescue, medical emergency response, mass care and shelter, and other critical response needs must be made quickly on the basis of available information. Often, this information is inadequate.

Historically, California's seismic networks have contributed to reconnaissance efforts after major earthquakes and provided, within the limits of available technology, rapid information on seismic activity. The information generated by the networks has, since the 1980s, included the magnitude, location, and identification of the ruptured fault, and, more recently, the probability of damaging aftershocks. While useful, this information was not sufficient to support

critical postearthquake emergency management decisions. With the implementation of TriNet in 1997, this situation has changed in southern California.

In an assessment of seismic network performance conducted following the 1994 Northridge earthquake, scientists concluded that use of new digital equipment, modern data communications methods, and advanced computing could greatly improve the accuracy and timeliness of seismic information and provide useful decision support tools for emergency responders. In the months that followed Northridge, seismologists responsible for network operations assembled a proposal for a state-of-the-art seismic and strong motion network that would serve the needs of emergency management while also supporting scientific investigation and building code development. In 1997, the Federal Emergency Management Agency (FEMA), the California Governor's Office of Emergency Services (OES), the U.S. Geological Survey (USGS), and other partners agreed to provide funding for the network.

The TriNet project is named for the three organizations that have collaborated to build this network: the California Institute of Technology, the State of California Division of Mines and Geology (CDMG), and the USGS. This five-year

project will be completed at the end of 2001. The TriNet budget of approximately \$21 million, including matching funds, has been invested in hardware, software development, data communications, and an outreach program that seeks to move technology from the laboratory to the emergency operations center. The real-time information products from TriNet are direct results of the new digital seismic and strong motion networks and include the rapid broadcast and web posting of accurate and reliable information on magnitude, location, fault configuration, and ground shaking for all earthquakes in the region; maps showing the distribution of ground motion expressed as intensity, peak acceleration, and velocity; and a prototype earthquake early warning system.

TriNet also provides ground shaking data for regional loss estimation software, including FEMA's HAZUS program and the Early Post-Earthquake Damage Assessment Tool (EPEDAT) developed by EQE International, Inc. EPEDAT and HAZUS employ similar methodologies and provide similar outputs. However, they differ in that HAZUS is nationally applicable while EPEDAT is customized with detailed building inventories for five southern California counties. EPEDAT was developed for, and is used by, California OES and shared with Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties.

In addition, TriNet fulfills the other goals outlined above, providing data to support seismological and earthquake engineering research and improvements in building codes—efforts led by CDMG.

The maps, which display ground motion, are particularly important for emergency management. Known as ShakeMap and available on the web at www.trinet.org/shake, these maps offer important information beyond magnitude and location of an earthquake's epicenter. Because they can see the geographic distribution of ground shaking within five minutes of an earthquake, emergency responders can rapidly determine what areas have been severely impacted and begin responding based on an accurate overall assessment of the scope of the disaster. In Northridge, as in the 1989 Loma Prieta earthquake, some areas of heavy damage were quickly identified through ground and aerial reconnaissance, but there were also relatively hidden pockets of severe damage that were belatedly discovered. These areas included Santa Cruz and Watsonville in 1989 and Santa Monica in 1994. In future quakes, ShakeMap will identify these areas quickly and help minimize delays in response. Since March 1997, these maps have been generated automatically within five minutes for earthquakes as small as magnitude 3.5 and as large as the magnitude 7.1 Hector Mine earthquake that occurred on October 16, 1999.

The rapid loss estimation software programs used by local, state, and federal agencies to calculate damage and population impacts in an earthquake now utilize ground motion data from TriNet. HAZUS and EPEDAT calculate estimates of economic loss as both total dollar loss and losses to structures and contents; damage in terms of the number of red- (unsafe to reoccupy) and yellow- (restricted access) tagged buildings (both residential and commercial); damage to water, power, and natural gas infrastructure; and population impacts, including the number of casualties and persons

displaced from their homes. Prior to the advent of TriNet, these loss estimation systems attempted to estimate ground motion based on quake magnitude and location. Using actual ground motion data will reduce the number of assumptions necessary for modeling damage and should improve the accuracy of loss estimates.

Perhaps the most intriguing of the new technologies being developed through the TriNet project is a prototype earthquake early warning capability that will, for some earthquakes, provide a few seconds warning prior to the arrival of strong ground motion. Early warnings may provide the opportunity to take life safety measures and mitigate hazards, albeit in a very short period of time. The earthquake early warning component of the TriNet project was approached as a multidisciplinary effort that involved the Disaster Research Center (DRC) at the University of Delaware (see p. 23 of this *Observer*), the Center for Public Health and Disaster Relief at the University of California—Los Angeles (UCLA), EQE International, Inc., and several TriNet working groups.

The DRC first conducted a comprehensive assessment of the social science literature regarding both warning systems for other hazards and behavioral response to warnings. Building on these insights, the UCLA center conducted a survey of 200 organizations to assess the acceptability and feasibility of introducing earthquake early warning among four sectors of the community: education, health care, emergency management, and utilities and transportation lifelines. With both of these studies in hand, EQE International addressed the salient public policy issues raised by the introduction of earthquake early warning in California, including potential legal liabilities, costs and benefits, and the organization and management of a warning system. These studies will set the stage for the selection of early warning pilot project partners with whom TriNet will test this emerging technology.

The TriNet products hold great promise for improving emergency response after the next major earthquake in southern California. As it has proceeded, the project has benefited from the reservoir of experience held by the emergency services community, and it is through the cooperative efforts of many disciplines that earthquakes will be better understood and response will be more rapid and efficient. Based on the success of TriNet, a committee of scientists and emergency managers from northern and southern California is seeking state funding to implement the California Integrated Seismic Network. On an even larger scale, Congress has authorized and provided initial seed funding for the Advanced National Seismic System (ANSS), a USGS project that would develop a TriNet-like system for the entire nation.

James D. Goltz and Egill Hauksson
Seismological Laboratory
California Institute of Technology

For additional information about TriNet, see the project web site: www.trinet.org; or contact the authors at the *Seismological Laboratory, Office of Earthquake Programs, MC 252-21, California Institute of Technology, Pasadena, CA 91125*, e-mail: jgoltz@gps.caltech.edu or hauksson@gps.caltech.edu.

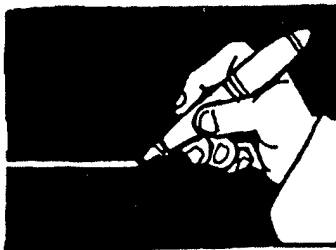
The Gilbert F. White Natural Hazards Mitigation Chair

The University of Colorado and the Natural Hazards Research and Applications Information Center have launched a major fundraising effort to establish an endowed faculty position dedicated to understanding and reducing loss caused by disasters.

Named after the center's founder and long-time mentor, the Gilbert F. White Natural Hazards Mitigation Chair will honor White by reflecting his life-long dedication to furthering knowledge and research regarding ways to alleviate human suffering caused by natural hazards. The post will ensure that hazards mitigation remains at the forefront of scholarship in social science. The chair will be open to any relevant discipline and will reside at the Natural Hazards Center, which is part of the university's Institute of Behavioral Science.

On May 2 of this year, in a ceremony at the Natural Hazards Center, Becky Turner, a representative of the State Farm Fire and Casualty Insurance Company and State Farm General Insurance Company, presented a check for \$100,000 toward the position. The donation represents the initial step in a University of Colorado Foundation campaign to raise \$3 million to endow the chair by White's 90th birthday on November 26.

Persons interested in learning more about or donating toward the Gilbert F. White endowed chair should contact *Linda Bachrach, C.U. Foundation, P.O. Box 1140, Boulder, CO 80306-1140; (303) 492-5689; e-mail: Linda.Bachrach@cufund.colorado.edu.*



ON THE LINE

Effective Disaster Warnings A National Tragedy

How many Americans know what to do when a tornado touches down in their county? How should they respond when the main highway is closed because of a chemical spill or terrorists have poisoned the local water system? How can local officials warn them that a flash flood has been spotted near where they live or work?

Accurate information delivered in a timely way can determine whether individuals take appropriate actions that protect themselves and their families, or dither about what to do, or even take steps that increase their risk.

Current news broadcast systems work well for long-term warnings such as those for hurricanes. Many days before a storm reaches the coast, network and local news channels

can provide reasonable estimates of landfall and intensity. On a shorter scale, although the exact track of a tornado is difficult to predict, if an effective communication system is available, the tornado's progress can be monitored and communities in its path can be alerted minutes before it arrives. Warnings for chemical spills, terrorist acts, flash floods, or earthquakes, however, are rarely available before they occur, but accurate information immediately following the incident can often be used very effectively to reduce losses.

Scientists are improving the accuracy of and increasing the lead time for warnings. At the same time, emergency responders are improving their information gathering and

response systems. Yet, there is still a problem delivering critical information over the last mile—that is, to the people at risk no matter where they are and what they are doing. Experience shows that when people are showered with warnings that do not apply directly to them, they tend to tune out all subsequent advisories. To overcome this problem and improve individual response, warnings need to focus only on those at risk. In this technological age, numerous systems can accomplish this task, yet none have been implemented in the United States.

The underlying issues in this country are widespread confusion over the appropriate roles of government and industry, a substantial lack of coordination among government agencies and private sector groups, and a lack of resources devoted to the problem. The poor state of warning systems in the U.S. is indeed a national tragedy.

A recent report, *Effective Disaster Warnings*, released by the National Science and Technology Council (NSTC), describes existing warning systems, the basic issues involved in providing effective warnings, and the many technologies that could be used to issue timely warnings. The report's primary conclusion is that a public-private partnership is needed to bring the appropriate groups together to implement effective warning systems. The council points out that most warnings are currently issued by federal, state, and local government authorities, but most current or potential warning delivery systems are owned and operated by private industry. The inadequate coordination among them is the result of historical approaches to warnings, unclear signals from several different branches of government, fears of government mandate, and the difficulties of finding private investors for "government-related" ventures.

Our current national warning system is the Emergency Alert System (EAS), managed by the Federal Communications Commission and implemented by private broadcasters under government mandate. This system, originally designed to allow the president to address the nation in times of national crisis, interrupts local programming. Most broadcasters and advertisers are not excited about increasing the number of regional and local warnings their stations already provide, and, as stated before, the EAS reaches many more people than those at risk from most hazards. Although digital coding technology can focus a warning on a small area and transmit it to that location, few individuals have receivers that can decode these messages.

The National Oceanic and Atmospheric Administration's NOAA Weather Radio (NWR), another national system, can be transmitted to over 95% of the population. It provides regular weather forecasts for the region surrounding each transmitter and issues warnings in both audio and digital formats. Unfortunately, this system uses a federal radio frequency far away from the AM/FM bands assigned to

commercial broadcasters and thus requires a special receiver. Imagine how much more effective NWR would be if it could transmit to built-in circuitry in every radio and television in the U.S. This circuitry would be able to detect local warnings and interrupt programming or even turn on a receiver, increase the volume, and issue a warning only to those to whom it applies. The Radio Data System (RDS) does this in the FM band and is in widespread use in Europe, but is not available in the U.S.

Cellular telephones are becoming an American fixture; 111 million are currently in use, and rapid growth is anticipated in this market. The technology is available to broadcast to or dial up all telephones within a cell.

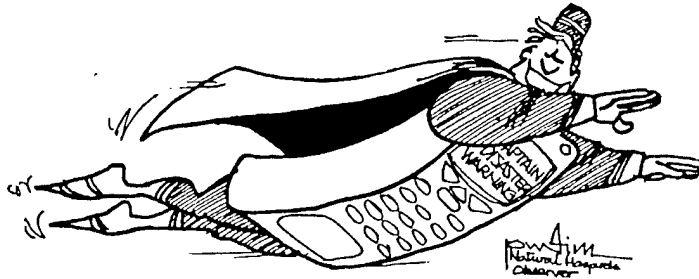
Imagine how many lives could be saved issuing warnings to cell phone users as a tornado weaves across the countryside! Despite the determined effort of several citizens to promote such a system, providers have been slow to respond because they fear a government mandate similar to the requirements for the EAS. Furthermore, the confused roles of public and private groups make it difficult for industry to evaluate the business consequences of adopting this system.

Many entrepreneurs are developing systems to broadcast warnings only to people at risk. Some have found limited application around nuclear reactors and oil refineries, but market potential is limited by government programs and officials who favor outdated existing systems, by liabilities associated with issuing warnings, by the unclear delineations between public and private roles, by the reticence of investors to be associated with disasters or to be involved with government programs, and generally by the fog that obscures who is responsible for what and where the business opportunities lie.

It is time to bring the people on all sides of these issues together to set some clear goals, agree on roles, and deliver to the American people the effective warnings they deserve. We do not need more government. We need an effective public-private partnership.

Peter L. Ward
Chair
Working Group on Natural Disaster
Information Systems

The report *Effective Disaster Warnings* (2001, 56 pp.) is available on the World Wide Web at www.nnic.noaa.gov/CENR/NDIS_rev_Oct27.pdf. This report was the result of a year-long study by 19 federal employees from a dozen federal agencies who specialize in disaster warnings. This Working Group on Natural Disaster Information Systems (NDIS) was appointed by the Subcommittee on Natural Disaster Reduction under the NSTC's Committee on Environment and Natural Resources. For additional information about the working group, e-mail the author at peward@wyoming.com.



On Hurricanes and Politics in Central America and the Caribbean

A year ago, researchers Richard Olson, Juan Pablo Sarmiento Prieto, Robert Olson, Vincent Gawronski, and Amelia Estrada published *The Marginalization of Disaster Response Institutions: The 1997-1998 El Niño Experience in Peru, Bolivia, and Ecuador* (Natural Hazards Center Special Publication #36—see the *Observer*, Vol. XXIV, No. 5, p. 4, and www.colorado.edu/hazards/sp/sp.html). In their critical analysis of the organized response to El Niño, they show that most lessons from the earlier 1982-83 El Niño were lost—primarily because of a lack of prior planning and the political exigencies that emerged when the 1997-98 event became a major “catastrophe” that received national and global attention. Their principal finding is that, while at the outset the civil defense organizations in the respective countries were the nominal “national emergency organizations,” each was rapidly pushed aside and replaced by one or more ad hoc governmental organizations, with resulting confusion, duplication of effort, weakened morale, and loss of credibility in each country’s civil defense organization.

Would the same debilitating political process unfold following a high impact disaster such as a hurricane?

Well, in at least three cases, it did.

The Storms of '98: Hurricanes Georges and Mitch — Impacts, Institutional Response, and Disaster Politics in Three Countries, by Richard Olson, Ricardo Alvarez, Bruce Baird, Amelia Estrada, Vincent Gawronski, and Juan Pablo Sarmiento Prieto (Natural Hazards Center Special Publication #38, 2001, 68 pp.) examines the response and “disaster politics” (including media attention) associated with Hurricane Georges in the Dominican Republic and Hurricane Mitch in Honduras and Nicaragua. Again, a particular focus is the marginalization of agencies that were supposed to be the official response organizations. The authors conclude that

despite some successes during the United Nations International Decade for Natural Disaster Reduction, it was sadly ironic that even as this much-publicized event was coming to a close, Hurricane Georges and especially Hurricane Mitch would devastate three countries. . . With this in mind, we need to step back and look at the entire situation for the Dominican Republic, Honduras, and Nicaragua (and many other countries, for that matter). A relatively simple equation can outline why disaster losses are going up, not down:

Population Growth + Urbanization + Mass Poverty-High Inequality + Deforestation and Other Environmental Degradation + Lack of Mitigation (Land Use and Building Standards) + Institutional (National Emergency Organization/Civil Defense) Weakness = Increasing Vulnerability and Eventual Catastrophe



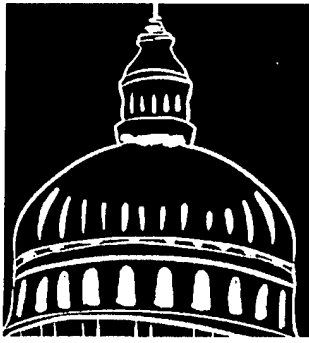
As a list, this is hardly novel, but the combination of the first three variables sets the stage for Mitch-type catastrophes.

The authors go on to state that “disasters must be understood as innately political events . . . creating a variety of opportunities and constraints,” and that institutional readiness is the direct result of political and policy decision making. Being political, such institution building is extremely difficult—particularly in countries with very limited resources and particularly when disasters are not salient problems.

To deal with the difficulty of establishing a strong, permanent emergency response institution, Olson and his colleagues offer their “accordion option.” Under this approach, a national emergency organization recognizes its probable marginalization in a major disaster and therefore prepares a plan to be presented to the head of state if such an event should ensue. In that plan, the organization outlines how national-level disaster response can be expanded to include other ministries and organizations, while the emergency management office itself retains an organizing and coordinating role. The authors conclude by outlining the advantages of this approach.¹

The Storms of '98: Hurricanes Georges and Mitch — Impacts, Institutional Response, and Disaster Politics in Three Countries can be purchased for \$20.00, plus shipping (\$5.00 for the U.S., Canada, and Mexico; \$8.00 for international mail beyond North America). Orders should be directed to the *Publications Administrator, Natural Hazards Research and Applications Information Center, University of Colorado, 482 UCB, Boulder, CO 80309-0482; (303) 492-6819; fax: (303) 492-2151; e-mail: janet.kroeckel@colorado.edu.*

1. At least one of the authors (Olson) intends to continue his research into the apparently universal problem of the marginalization of disaster response institutions in large catastrophes (an issue not just in poorer countries)—see the *Grants* section of this *Observer*.



WASHINGTON UPDATE

FEMA Issues Interim Rule on Public Assistance and Disaster Loan Programs

In an effort to reduce the growing demand for federal disaster assistance, Congress passed the Disaster Mitigation Act of 2000 (see the *Observer* Vol. XXV, No. 3, p. 8). Recently, the Federal Emergency Management Agency (FEMA) issued an interim final rule to implement portions of that legislation that affect various aspects of both the agency's Public Assistance Program and its Community Disaster Loan Program.



Specifically, the Disaster Mitigation Act amended the federal contribution for "alternate projects" under the Robert T. Stafford Disaster Relief and Emergency Assistance Act—repairing, restoring, reconstructing, or replacing a public facility—from 90% to 75% of the cost. However, the legislation allowed an exception; where unstable soil at the site of a damaged facility makes repair or restoration unfeasible, the federal contribution remains 90%.

Nonprofit organizations are no longer required to first apply for a disaster loan from the Small Business Administration for restoration work of critical facilities and services. The act defines critical services as water, sewer, and wastewater treatment; communications; and emergency medical care. All other private, nonprofit organizations are still required to apply to the SBA before receiving funding from the Disaster Assistance Program. FEMA proposes adding fire services, emergency rescue, and nursing homes to the list of critical facilities that may qualify for assistance under the Stafford Act.

The Disaster Mitigation Act of 2000 also capped the amount of any loan made by FEMA under the Community Disaster Loan program at \$5 million and states that a local government will not be eligible for future disaster loans if the community is behind in payments on a previous community disaster loan. For a community to be eligible to receive such a loan, it must show that it may suffer or has suffered a substantial loss of tax and other revenues as a result of a major disaster or emergency and must demonstrate a need for financial assistance in order to perform its government functions.

The interim final rule was published in the May 4, 2001, *Federal Register* (Vol. 66, No. 87, pp. 22443-22445). For further information, contact Margaret Earman, Response and Recovery Directorate, FEMA, 500 C Street, S.W., Washington, DC 20472; (202) 646-4172; e-mail: margie.earman@fema.gov.

For specific information on program policies, additional publications have been posted to the FEMA web site:

- *Coordination Requirements for PA and FMA Assistance:* www.fema.gov/r-n-r/pa/9510_1.htm.
- *Project Supervision and Management Costs of Subgrantees:* www.fema.gov/r-n-r/pa/9525_6.html.
- *Payment of Contractors for Grant Management Tasks:* www.fema.gov/r-n-r/pa/9525_11.htm, and
- *Updated Policy Manual:* www.fema.gov/r-n-r/pa/9500toc.htm.

Interior Asks NAPA to Study Wildfire Management

The Department of the Interior has asked the National Academy of Public Administration (NAPA) to study the procedures used by federal land management agencies to plan for and respond to wildland fires. Previously, NAPA was asked to study the issue as it relates to the National Park Service and recommended further study of implementation and accountability systems for wildfire management, the use of program evaluations to enhance operations, improvements in risk management methods, and options for meeting workforce challenges.

NAPA will also look at issues raised in the recently completed evaluation and update of the Federal Wildland Fire Management Policy (see the *Observer*, Vol. XXV, No. 5, p. 10). The new study will examine ways all five federal agencies that deal with wildfires—the National Park Service, the Bureau of Indian Affairs, the Bureau of Land Management, the Fish and Wildlife Service, and the U.S. Forest Service—can effectively implement the policy.

An eight-member panel has been convened by NAPA to oversee the study and will use literature and document reviews, interviews, expert papers, a “best practices” conference, option papers, and panel meetings to develop recommendations for improving federal wildland fire practices.

For more information, contact NAPA, 1120 G Street, N.W., Suite 850, Washington, DC 20005; (202) 347-3190; fax: (202) 393-0993; WWW: www.napawash.org.

Fannie Mae Expands Project Impact Prevention Loan Program

Protecting a home from future natural disasters just got a little easier for homeowners in several states. Recently, Fannie Mae, the national home ownership financial institution, joined with FEMA’s Project Impact and several states to offer consumer installment loans at competitive interest rates to homeowners for making disaster prevention improvements. The Prevention Loan Program began in Florida in June 2000, and Fannie Mae expects to make it available throughout the U.S. Additional programs have already been launched in the San Francisco Bay area, Georgia, Kansas, and Oklahoma.

The Prevention Loan Program, which includes a quick approval process, requires work be performed by certified contractors who are qualified to make disaster-resistant improvements to residences. Unsecured, fixed-rate loans of up to \$20,000 are available with repayment terms of up to 10 years. Interest rates are based upon market conditions for the terms of the loan, and there are no income limitations for borrowers. Projects that may be covered under this program include strengthening a home’s roofing system, installing hurricane shutters, constructing an in-home safe room, elevating a structure above base flood elevation, and bracing a chimney.

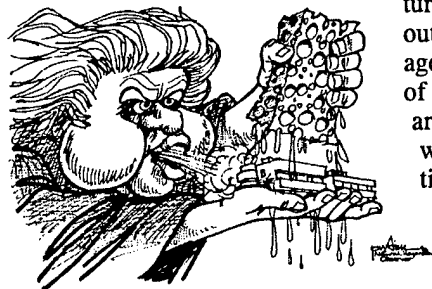
For more information about the Prevention Loan Program, contact *Fannie Mae*; (800) 732-6643. Additional information can be obtained from *FEMA’s Project Impact*; (202) 646-4117; WWW: www.fema.gov/impact/partners/fanniema.htm.

[Adapted from *Watermark*, the National Flood Insurance Program’s newsletter (Fall 2000/Winter 2001).]

FEMA Establishes Hurricane Evacuation Liaison Team

In 1999, Hurricane Floyd threatened the southeastern United States, resulting in the largest evacuation in U.S. history. Because of large populations in this coastal region, many problems arose, such as jammed freeways and confusion about where and how to evacuate. Officials

realized that, in future disasters, without effective management, the volume of people leaving an area could overwhelm transportation systems and delay sheltering. As a result, FEMA and the U.S.



Department of Transportation are working with state and local officials to improve coordination and communication during major evacuations.

On April 11, 2001, FEMA Director Joe Allbaugh announced that an evacuation liaison team would be established at the agency’s Atlanta regional office, and that additional teams will be created in other regions of the U.S. The Atlanta team will be staffed by FEMA and operated from the National Hurricane Center in Miami to assist emergency managers in making decisions and recommendations when hurricanes threaten. It will provide emergency managers with forecast updates issued by the center and answer questions regarding those forecasts.

Additionally, FEMA hopes to release a hurricane evacuation travel demand forecasting model by December 2002 that will allow states to obtain via the Internet information for individual counties regarding storm intensity, expected evacuation compliance, current tourist occupancy, and probable destinations. The system will also provide the number of vehicles expected to cross state lines, comparisons of traffic to forecast conditions, the number of vehicles generated by each county traveling to specific inland locations, and information regarding types and characteristics (e.g., number of lanes) of routes available.

For more information about the evacuation liaison team and model, contact *FEMA Region IV*, 3003 Chamblee Tucker Road, Atlanta, GA 30341; (770) 220-5200; fax: (770) 220-5230; WWW: www.fema.gov/reg-iv. Information on the National Hurricane Program can be found on the *FEMA web site*: www.fema.gov/mit/nhp.htm.

President Creates New FEMA Office of National Preparedness

In order to assess national capability to deter terrorism and to coordinate response to terrorist attacks, including those involving biological, chemical, or nuclear weapons, in May, President Bush announced that he was establishing the Office of National Preparedness within FEMA. In addition, a federal working group will assess these threats and report its findings to Congress by October 1, following review by the National Security Council. FEMA Director Joe Allbaugh testified before Congress that the new office will serve only as an organizer to make sure local and state agencies are prepared for terrorism. Vice President Cheney will lead the working group and oversee the creation of a national terrorism response plan.

President Bush's announcement of the new office can be found on the FEMA web site at www.fema.gov/nwz01/nwz01_33.htm. FEMA Director Allbaugh's prepared testimony before the Joint Hearing of the Committees on Appropriations, Armed Services and Intelligence, which describes the new office, can be found at www.fema.gov/nwz01/nwz01_34.htm.

FEMA Changes Procedure for LOMRs

Under the National Flood Insurance Program (NFIP), overseen by FEMA's Federal Insurance Administration, flood maps designate special flood hazard areas (SFHAs). Under the Flood Disaster Protection Act of 1973, regulated lending institutions, federal agency lenders, and government sponsored enterprises for housing must determine whether a property for which such an agency is contemplating making, extending, or renewing a loan is located within an SFHA. If so, they must require flood insurance coverage on the property before completing the loan transaction.

Letters of Map Revision (LOMRs) are issued when a property owner either undertakes work that removes the property from the flood risk or provides information that indicates the property in question is not located in an area at risk due to flooding. Recently, FEMA issued a final rule that changes its procedures for issuing LOMRs and Letters of Map Revision Based on Fill (also known as LOMR-Fs).

Specifically, the rule states that FEMA will not review any request for a LOMR or LOMR-F without community assurances that minimum floodplain management criteria under the NFIP are met. If the community cannot assure FEMA that it has complied with the appropriate requirements, the map revision request will be deferred until all violations are remedied to the maximum extent possible. Once the community assures FEMA the land and structures are "reasonably safe from flooding," FEMA will process a revision to the SFHA. A revision of floodplain delineations based on fill must demonstrate that any such fill does not result in floodplain encroachment. Likewise, a community may also request a map revision when no physical changes

have occurred in an SFHA if more accurate topographic information becomes available.

The new guidelines for requesting Letters of Map Revision can be found in the May 4 *Federal Register* (Vol. 66, No. 87, pp. 22438-22443). Copies can be obtained from any federal repository library or on-line at www.access.gpo.gov.

GAO Looks at Measurements of NFIP Effectiveness

In the U.S., floods cause the greatest economic losses of any natural disaster. According to FEMA, from fiscal year 1992 to 1999, 20 major floods caused over \$97 billion in damage. The nation's principle nonstructural program to address this problem is FEMA's National Flood Insurance Program (NFIP). The General Accounting Office recently presented the preliminary results to Congress of its ongoing



review of the NFIP, which seeks to minimize human suffering and flood-related property losses by providing flood insurance and encouraging its purchase—particularly by those living in Special Flood Hazard Areas (see the previous article). The NFIP also promotes building and land-use standards aimed at minimizing flood losses.

In testimony before the Senate Subcommittee on VA, HUD, and Independent Agencies, Committee on Appropriations, JayEtta Hecker, GAO Director of Physical Infrastructure Issues, described problems associated with measuring the performance of the NFIP. Hecker noted that, although FEMA has increased the number of insurance policies in force and reduced flood-related losses, it has not yet implemented methods for gauging participation rates for all residents living in SFHAs. These rates could help determine whether the financial risk to the federal government from floods is increasing and guide marketing and compliance activities to maximize program participation.

Hecker asserted that key data, provided by private insurance companies that have agreements to sell NFIP

policies, as well as local governments participating in the NFIP, are incomplete and inaccurate. Although new technologies can improve the accuracy of the data, updating flood maps over the next six fiscal years would cost approximately \$773 million above expected program funding. To decrease costs, FEMA has also entered into partnerships with other agencies to fund cooperative mapping efforts.

Hecker's testimony, contained in the report *Flood Insurance: Emerging Opportunities to Better Measure Certain Results of the National Flood Insurance Program* (GAO-01-736T, 2000, 17 pp., free) is available from the General Accounting Office, P.O. Box 37050, Washington, DC 20013; e-mail: info@www.gao.gov; WWW: www.gao.gov.

FEMA Issues New Earthquake Policy Guide for High Rise Buildings

Following the Northridge earthquake in the Los Angeles area in 1994, building damage inspectors discovered cracks in the welded connections between horizontal beams and vertical columns in newer steel-frame buildings that designers and building code officials believed would bend under the stress of earthquakes. A few of the structures sustained significant damage, leading experts to conclude that modern steel-frame buildings were not as safe in earthquakes as previously thought. Recently, FEMA announced the findings and recommendations of a six-year, \$12 million project examining the problem.

Damage sustained by steel-frame buildings was caused by several factors, including construction defects such as welds that were not bonded well with steel columns, changes in the material properties of weld metal and structural steel,

and building code requirements that were problematic when applied to large beams and columns. Thousands of welded steel-frame buildings have been built throughout the U.S. in the last 30 years, and most high-rise buildings erected since 1970 use this type of construction. The results of FEMA's study, conducted jointly by the Structural Engineers Association of California, the Applied Technology Council, and the California Universities for Research in Earthquake Engineering, are outlined in *A Policy Guide to Steel Moment Frame Construction* (FEMA 354, 2000, free), which explains in lay terms how the study was conducted and what is being recommended as a result. The guide is available on-line at www.fema.gov/library/fema354.htm.

FEMA also issued four technical documents to assist the building code, design, and construction industries:

- *Recommended Seismic Design Criteria for New Steel Moment-Frame Buildings* (FEMA 350): www.fema.gov/library/fema350.htm.
- *Recommended Seismic Evaluation and Upgrade Criteria for Existing Welded Steel Moment-Frame Buildings* (FEMA 351): www.fema.gov/library/fema351.htm.
- *Recommended Post-Earthquake Evaluation and Repair Criteria for Welded Steel Moment-Frame Buildings* (FEMA 352): www.fema.gov/library/fema352.htm.
- *Recommended Specifications and Quality Assurance Guidelines for Steel Moment-Frame Construction for Seismic Applications* (FEMA 353): www.fema.gov/library/fema353.htm.

Printed versions of all five publications are free and can be requested from the *FEMA Publications Center*, (800) 480-2520.

ASCE Updates and Converts NEHRP Rehabilitation Guidelines to Preliminary Standard

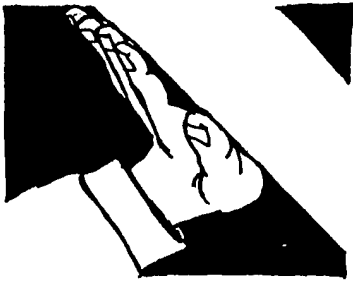
The American Society of Civil Engineers (ASCE), through a cooperative agreement with the Federal Emergency Management Agency (FEMA), has completed a project to update and convert the *NEHRP* [National Earthquake Hazards Reduction Program] *Guidelines for the Seismic Rehabilitation of Buildings* (FEMA 273) and the related *NEHRP Commentary* (FEMA 274) into a mandatory language *Pre-standard and Commentary for the Seismic Rehabilitation of Buildings* (FEMA 356). This pre-standard is now available for use. In addition, *Global Topics Report on the Pre-standard and Commentary for the Seismic Rehabilitation of Buildings* (FEMA 357), which documents the nature of and rationale for the technical changes made in the conversion of the guidelines into the pre-standard, is also now available.

The completion of the pre-standard is the first step in turning FEMA 356 into an ASCE/American National Standards Institute (ANSI) approved national consensus standard. In this process, recent research results and technical advance-

ments are incorporated into the pre-standard if deemed appropriate by the project team and approved by the ASCE Standards Committee on Seismic Rehabilitation.

The ASCE Standards Committee on Seismic Rehabilitation of Buildings has unanimously voted to accept FEMA 356 as the basis of a voluntary consensus standard, which, upon its completion, will be suitable for reference by building codes and inclusion in contracts. In 2001, the Standards Committee is balloting members and pursuing the formal standard development process. For more information, contact ASCE's Standards Coordinator, *Kim Brubaker, ASCE, 1801 Alexander Bell Drive, Reston, VA 20191; e-mail: kbrubaker@asce.org*. Free copies of both FEMA 356 and FEMA 357 are available from the *FEMA Document Distribution Center* at the phone number above.

[Adapted from the *MCEER Information Service News: mceer.buffalo.edu/infoService/enews/default.asp*]



SUSTAINABILITY AND NATURAL HAZARDS

This article is the second in a series on ways in which hazards management and sustainability could be linked for the betterment of both fields. The series grew out of a Natural Hazards Center project, funded by the Public Entity Risk Institute, to develop information on sustainable local recovery and conduct training to develop expertise on this topic throughout the U.S.

Taking Stock of Quality of Life During Post-Disaster Recovery

Quality of Life remains an ill-defined, subjective concept, often equated with social well-being. Some factors determining quality of life include housing, education, transportation alternatives, health care services, employment, environment, recreation, and public safety. The level of importance and relevance placed on these different elements remains highly variable at different geographic scales, among different socioeconomic groups, and at different stages in an individual's life. Disaster recovery provides an opportunity to take a closer look at the broader community and to enhance at least some of these elements.

Communities can be described in many ways, but communities seeking to identify their assets and frame a vision of their future typically express their qualities in concrete terms that reflect notions of community: "lovely old homes," "good place to send your children to school," "lots of cultural opportunities," "good housing available," "friendly people."

The Impact of Disasters on Quality of Life

All of these attributes notwithstanding, communities with a good quality of life must also be sustainable, disaster-resistant communities (Geis, 2000). Disasters create sudden changes in the social networks, lifelines, environment, housing, and economy of communities and have dramatic effects on the social well-being and quality of life of their citizens. Indeed, changes in one aspect of a locality often lead to negative effects in others.

To take just one example, schools and institutions of higher learning clearly demonstrate how the effect of a disaster on one element of a community can spread to many others. Schools serve multiple functions—as centers of learning and recreation, centers of community and child care, and centers of employment. Some schools also serve as shelters immediately following a disaster. Clearly, damage to or loss of schools can affect many aspects of community life beyond just education. Similarly, colleges and universities within communities provide employment, business opportunities, and rental income for property owners. Damage to these institutions can also mean hardship throughout a community.

Disasters can also have far-reaching effects beyond the area of immediate impact. Depending on the type and severity of the disaster, other communities in the county and state, or even further afield, can experience disruptions in their quality of life. For example, when Hurricane Floyd flooded the basement of one Bell Atlantic building in New Jersey, telephone service was cut to about a million local customers and to 8,000 automated teller machines throughout the country.

Enhancing Quality of Life Through Recovery Strategies: Opportunities and Caveats

Again, the long-term recovery and reconstruction period can be used to (re)build a more sustainable community and enhance its quality of life. Communities have used this

window of opportunity to build disaster-resistant, affordable housing or to revive failing downtown areas. Others have used the period to replace aging, damaged buildings and infrastructure.

Such programs have proven to work best when combined with other programs not meant for disaster recovery but having similar objectives. Indeed, quality of life serves as a guiding principle in planning and decision making for many ongoing local, state, and federal initiatives related to land use and environmental protection, smart growth, economic development, housing, and transportation. By integrating holistic disaster management and hazard mitigation with these other concerns, quality of life can be enhanced even further.

Perhaps on a more fundamental level, in a recent analysis of failed large-scale reconstruction projects, Eve Passerini (2001) suggests that we must look beyond the social and built environment to structural and cultural explanations for and barriers to sustainable disaster recovery. This includes recognizing such basic factors as energy and automobile subsidies, market forces, and institutional pressures. Her work further implies that plans for sustainability need to be developed collaboratively, with broad participation and partnerships, while avoiding funding that might jeopardize the viability of long-term, holistic recovery from disasters.

Whose Quality of Life? Keeping It Community-Specific and Community-Defined

When recovering from disaster, some communities have literally had to start from scratch—both in rebuilding and in creating community consensus and support. For example, Rhineland, Missouri, a community of 157 people, was relocated to a 49-acre plot adjacent to its previous location after being flooded four times in 1993. In a recent conversation, Steve Etcher, executive director of the Boonslick Regional Planning Commission, confirmed that quality of life factors such as the preservation of the history and heritage of this community were among the main driving forces behind this effort, which boasts a 96% participation rate. Etcher credits this success to the residents who worked hard to convince their neighbors that relocation was a viable option. Rhineland has since grown and survived major floods in 1995 and 1998.

In planning and conducting sustainable recovery projects, one must keep an open mind regarding the meaning of "community." Many of the successful Federal Emergency Management Agency (FEMA) Project Impact communities are built on partnerships that involve residents, local officials, the public sector, the private sector, nonprofit organizations, and state and federal agencies (see, for example, the *Observer*, Vol XXV, No. 5, p. 1). Some go beyond town boundaries to encompass entire watersheds, while others even cross state lines (such as the Waverly Project Impact bi-state initiative among several towns, villages, and boroughs in New York and Pennsylvania). Sociologist Dennis Mileti (1999) reminds us that "for the purposes of sustainability, the full range of stakeholders in

local communities (e.g., government, business, and individuals) should begin to consciously define and plan for the quality of life they want and believe they can achieve for themselves and for future generations." Clearly, these stakeholders can compose a group much larger than just the local citizenry.

Five Factors to Consider for Sustainable Disaster Recovery

There are at least five major perspectives that any community should keep in mind when addressing recovery from disaster:

- 1) **The long-term horizon in decision making processes.** How does immediate short-term reconstruction affect overall long-term efforts to maintain and enhance a community's quality of life?
- 2) **Consistency with other local planning and development efforts.** Do the quality of life reconstruction projects envisioned by the community complement other locally driven planning and development initiatives?
- 3) **Multiple objective management.** Does the reconstruction process meet several goals, such as improved housing, recreation, education, employment, or transportation?
- 4) **Shared vision by community residents.** Does this process promote public participation by all (rich and poor, employed and unemployed, young and old, homeowners and renters, business owners and consumers)?
- 5) **Quality of life for current and future residents.** Does the redevelopment process contribute to an improved quality of life for current and future generations? Who should define success?

If a community struck by disaster keeps these questions in mind, it can go a long way toward reconstituting itself as a sustainable community.

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- Geis, D.E. 2000. "By Design: The Disaster Resistant and Quality of Life Community." *Natural Hazards Review* 1 (3): 151-160.
- Mileti, D. 1999. *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Washington, D.C.: Joseph Henry Press.
- Passerini, E. 2001. "Who is to Blame for the Failure of Sustainable Reconstruction Projects." *Natural Hazards Review* 2 (2): 45-53.



CONTRACTS AND GRANTS

Below are descriptions of recently awarded contracts and grants for the study of hazards and disasters. An inventory of contracts and grants awarded from 1995 to the present (primarily those funded by the National Science Foundation) is available on the Natural Hazards Center's web site: www.colorado.edu/hazards/grants.html.

Collaborative Research and Volcanic Hazard Mitigation in Guatemala and El Salvador. Funding: National Science Foundation, \$60,000, 36 months. Principal Investigators: *William I. Rose and James W. Vallance, Michigan Technological University, 1400 Townsend Drive, Houghton, MI 49931-1295; e-mail: raman@mtu.edu.*

This award will support collaboration with institutions in Guatemala and El Salvador to study volcanic hazard mitigation efforts. The two countries are part of one of the most consistently active volcano zones in the world, and many of their volcanoes are close to population centers. The researchers plan to use satellite remote sensing, global positioning survey techniques, digital topography, field mapping, and laboratory simulation of volcanic processes to develop a model of current and prospective hazards.

Field Survey of Easter Island. Funding: National Science Foundation, \$25,693, 12 months. Principal Investigator: *Costas E. Synolakis, University of Southern California, Los Angeles, CA 90089-1147; e-mail: costas@usc.edu.*

This grant will fund a field survey of Easter Island and the Juan Fernandez Islands off the coast of Chile to examine the effects of the 1946 Aleutian tsunami. Generated by a relatively moderate earthquake, the Unimak Island tsunami, as it is now called, produced the highest waves throughout the Pacific recorded in historical times and killed 159 people in Hawaii. To understand this event, scientists are collecting inundation data from around the Pacific. During a field survey of a tsunami in the islands off South America, researchers discovered large rocks that were moved inland as far as 300 meters about the time of the 1946 event, dispelling the commonly held belief that the Aleutian tsunami had little impact south of Hawaii. Findings also indicated the waves may have been caused by a previously unidentified landslide. Inundation maps for Hawaii are being re-evaluated, and inundation maps for the Pacific states on the U.S. mainland are currently being developed for the first time. The potential landslide trigger of tsunamis from the Aleutians needs to be carefully reassessed so that new

inundation and evacuation maps can be developed with the best information available.

Coastal Effects of Tsunamis. Funding: National Science Foundation, \$195,579, 36 months. Principal Investigator: *Costas E. Synolakis, University of Southern California, Los Angeles, CA 90089-1147; e-mail: costas@usc.edu.*

This group research project will focus on specific aspects of tsunami hazards mitigation. Recently, the National Oceanic and Atmospheric Administration (NOAA) established a program to improve identification of tsunami inundation zones along the western coastal areas of the U.S. (see www.pmel.noaa.gov/tsunami/time). The next step is to evaluate tsunami run-up in more detail, and this project will research flow patterns, induced forces, the impact of debris and floating objects, and their implications for improved design of waterfront structures and decisions concerning land use. The project involves researchers from Cornell University, Southern Methodist University, the University of Southern California, the University of Washington, Japan's Public Works Research Institute, GeoEngineers, Inc., and others.



Emergency Planning for Small Business and Nonprofit Organizations. Funding: Public Entity Risk Institute, 12 months. For information, contact: *Diane M. Dunleavy, Health and Safety Services, American Red Cross, Greater Cleveland Chapter, 3747 Euclid Avenue, Cleveland, OH 44115-2597; (216) 431-3010; fax: (216) 431-3025.*

The Business and Industry Council for Emergency Planning and Preparedness (BICEPP) is a local project in southern California that provides training to small companies in business interruption recovery and emergency preparedness. This project will make BICEPP's three-day course available in a distance learning format and develop a "train-the-trainer" program as well as self-directed materials. The project is being conducted by the American Red Cross and the Maxine Goodman Levin College of Urban Affairs at Cleveland State University.

The Impact of Occupational Stress and Burnout on Attrition in Deployed and Non-Deployed Army Medical Personnel. Funding: Center for Disaster Management and Humanitarian Assistance (CDMHA), \$90,570, 12 months. Principal Investigator: *Candace Burns, College of Nursing, University of South Florida, 12901 Bruce B. Downs Boulevard, MDC 22, Tampa, FL 33612-4766; (813) 974-9160; e-mail: cburns@hsc.usf.edu.*

This study explores the relationship among occupational stress, compassion fatigue, burnout, and coping in U.S. military medical personnel who leave the service after a "mission other than war" deployment (i.e., disaster/humanitarian/peacekeeping operations) versus those who stay.



Retention of highly qualified, skilled health care providers in the military is a major challenge today. This research hypothesizes that: 1) deployment status and military grade of medical personnel will directly affect the degree of burnout, compassion fatigue, and occupational stress; 2) burnout, compassion fatigue, and occupational stress will directly affect the decision to stay or leave the service; and 3) coping strategies, both positive and negative, will moderate the relationships hypothesized above. To test these theories, the

investigator will survey deployed and nondeployed personnel who have stayed or left the service.

In the Shadow of the Volcano: Human Health and Community Resilience Following Forced Evacuation. Funding: CDMHA, \$139,050, 12 months. Principal Investigators: *Graham Tobin, Department of Geography, and Linda Whiteford, Department of Anthropology, University of South Florida, 4202 East Fowler Avenue, SOC 107, Tampa, FL 33620-8100; (813) 974-4932; e-mail: gtobin@chuma1.cas.usf.edu or lindaw@chuma1.cas.usf.edu.*

This research looks at both the impacts of disasters on people's lives—particularly on their health—and the longer-term effects on community stability following a disaster. The focus is community recovery following disaster. Based on continuing research near Tungurahua Volcano in Ecuador, the investigators will test the effects of evacuation on infectious disease patterns, exposure to volcanic ash, and community resilience.

Choosing a Paradigm for Disaster Recovery. Funding: CDMHA, \$128,054, 12 months. Principal Investigator: *William J. Siembieda, Department of City and Regional Planning, California Polytechnic State University—San Luis Obispo, San Luis Obispo, CA 93407; (805) 756-1315; e-mail: wsiembie@calpoly.edu.*

This project examines how community groups choose between a "return to normalcy path" or a "transformative path" wherein they transform their relations with society (donors, government, employers, social groups) in ways that are sustainable. A multinational team of researchers will study nine communities in four countries (Mexico, El Salvador, Honduras, and Nicaragua) in order to develop a comparative view of community-based decision making under conditions of stress and to help inform the emerging international strategy to include mitigation plans in development programs.

Disaster Learning, "Poder Convocatorio," and Coordination in Six Latin American Countries. Funding: CDMHA, \$122,586, 12 months. Principal Investigator: *Richard S. Olson, Department of Political Science, Florida International University, University Park, DM 480, Miami, FL 33199; (305) 348-6398; e-mail: olsonr@fiu.edu.*

One key to effective national-level disaster response in Latin America and the Caribbean is the ability to coordinate efforts among an increasingly wide variety of organizations: government ministries, external donors, militaries, non-governmental organizations, and civil society. Few, if any, national governments in the region can maintain an emergency management organization capable of responding to a major disaster. Therefore, "poder convocatorio" (convoking authority) is critical if multiorganization and multisector responses to major disasters are to be improved. This project examines changes (or lack thereof) in the "poder convocatorio" of national emergency organizations in six countries struck by disasters in recent years: Peru, Bolivia, and Ecuador (the El Niño of 1997-98), the Dominican Republic (Hurricane Georges in 1998), and Honduras and Nicaragua (Hurricane Mitch in 1998).

Assessing Disaster Vulnerability at the Community Level: A Pilot Research Project with Low-Income Women's Groups in the Dominican Republic and St. Lucia. Funding: CDMHA, \$119,918, 12 months. Principal Investigators: *Betty Morrow, International Hurricane Center, Florida International University, University Park, Miami, FL 33199; (305) 348-1607; e-mail: morrowb@fiu.edu; and Elaine Enarson, Institute for Women's Studies and Services, Metropolitan State College, Denver, CO [contact: 33174 Bergen Mountain Road, Evergreen, CO 80439; (303) 670-1834; fax: (303) 679-0938; e-mail: enarson@uswest.net].*

This project investigates how development patterns affect disaster vulnerability of women and men in the Caribbean, with a special focus on low-income women and women maintaining households. Responding to the call for more participatory, community-based, and gender-focused disaster social science, the investigators will build on local community knowledge. The project forges a partnership between outside researchers knowledgeable about gender, development, and disasters and local women knowledgeable about specific political, economic, and social conditions affecting women's vulnerability and the utilization of this knowledge to effect social change. The investigators will work with consultants in the Dominican Republic and St. Lucia and involve four grassroots women's organizations in the actual conduct of research and the development of guidelines for engaging low-income women in the assessment of local disaster vulnerability and response capacity.

CDMHA Soliciting Proposals for Research on Disasters in the Americas

The Center for Disaster Management and Humanitarian Assistance (CDMHA) anticipates issuing its next "Request for Proposals [RFP] Related to Research on Disasters in the Americas" in the fall of 2001. The aim of the CDMHA research program is to facilitate the discovery and application of scientific knowledge related to disaster preparedness and mitigation in the Americas. The scope of the program includes medical, environmental, sociocultural, and engineering issues. The CDMHA competitive grant program is funded by the U.S. Department of Defense through the Office of Naval Research.

Proposals will be considered in three areas: 1) public health issues in disasters; 2) social science, disasters, and development; and 3) information technology and decision science applied to disaster management. Priority areas for funding will be identified in the RFP, and letters of intent will be due November 1, 2001.

The CDMHA was founded in 1998 as a partnership between the University of South Florida and Tulane University. Offices of the CDMHA are located in Tampa, Florida, within the College of Public Health at the University of South Florida, as well as at the Payson Center for International Development at Tulane University in New Orleans,

Louisiana, and Washington, D.C. The mission of the CDMHA is to facilitate collaborative education, training, research, and information and communication services among disaster response and humanitarian assistance agencies (for example, the military, nongovernmental organizations, private voluntary organizations, and others) primarily throughout the Western Hemisphere.

For more information, please contact *Jeannine Coreil, CDMHA, College of Public Health, University of South Florida, 13201 Bruce B. Downs Boulevard, MCD 56, Tampa, FL 33612; (813) 974-6698; e-mail: jcoreil@hsc.usf.edu; or Nick Colmenares, address as above, (813) 835-8289; e-mail: carmaworld@aol.com.* For general information on the CDMHA see the center's web site: www.cdmha.org; or contact the center at the address above; (813) 974-2907; fax: (813) 974-9980; e-mail: cdmha@hsc.usf.edu.

PERI Grant and Research Program Seeks Proposals

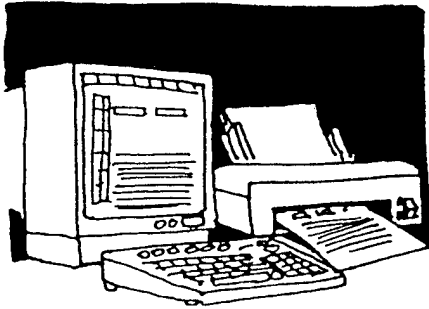
Through its Grant and Research Program, the Public Entity Risk Institute (PERI) seeks to fund projects, programs, research, and innovations that advance the practice of risk management in public, nonprofit, and private organizations.

The PERI grant program is aimed at broad areas of need identified on an annual basis by the institute's board of directors. Targeted areas for this year include employee occupational safety and health, workers compensation, general liability, employment practices liability, and land-use planning. However, PERI is willing to consider proposals in other areas that address one or more of the organization's three fundamental goals:

- Facilitate the development and delivery of education and training on all aspects of risk management for public and private entities (particularly small nonprofit organizations and businesses);
- Serve as a usable, easily accessible resource center and clearinghouse for information relating to risk management, environmental impairment liability, and disaster management issues; and
- Stimulate through its grants program the development and delivery of innovative programs that advance the fields of risk management, environmental impairment liability management, and disaster management.

Any organization or individual is eligible to receive PERI grant funding. Eligibility is not restricted to public or nonprofit entities.

PERI is actively seeking letters of interest for projects that address the areas listed above. For more information, see the PERI web site: www.riskinstitute.org; or call *Claire Reiss, Grant and Research Programs, Public Entity Risk Institute, 11350 Random Hills Road, Suite 210, Fairfax, VA 22030; (703) 352-1846; fax: (703) 352-6339.*



INTERNET PAGES

Below are new or updated Internet resources the Hazards Center staff has found informative and/or useful. For a more complete list of some of the better sites dealing with hazards and disasters, see www.colorado.edu/hazards/sites/sites.html.

All Hazards

www.redcross.org (Disaster Section)
www.redcross.org/services/disaster/

The American Red Cross web site has been redesigned and reorganized and now offers both a cleaner look and a more user-friendly navigation system. Disaster information is only one or two clicks away from the home page (rather than three or four), and the content is organized clearly and intuitively to meet the needs of the general public.

www.sba.gov/disaster

To support its disaster assistance program, the U.S. Small Business Administration (SBA) has established this web site that not only offers information about the agency and its disaster loan programs, but also provides general information about disaster preparedness, current disasters in which the SBA is involved, and other aid programs available from the federal government.

www.ci.tampa.fl.us/dept_Planning/planning_section/LMS

This City of Tampa, Florida, "Local Hazard Mitigation" web site is intended to educate citizens regarding the city's efforts to minimize future impacts of natural or human-caused disasters. The site could well serve as a model for other localities that want to use the web to inform and be informed about reducing disaster losses. It includes a brief introduction regarding the nature and benefits of local mitigation, as well as four mitigation strategy documents covering local hazards, critical facilities, mitigation projects, and background reports.

www.bghrc.com

The Benfield Greig Hazard Research Centre in London has recently added two new publications to the center's web site. The first is *Guidance Notes on Participation and Accountability in Disaster Reduction*, intended to help practitioners in disaster mitigation and preparedness. The notes cover principles and practice and contain a number of case studies. Because they are still in draft form, comments and additional case studies are welcome. A copy can be downloaded by going to the "Disaster Management" pages of the Benfield Greig site and looking under "Other Publications."

The second publication, *Sustainable Livelihoods and Vulnerability to Disasters*, summarizes recent thinking on this topic. In particular, it looks at a sustainable livelihoods framework currently being developed and includes a list of selected references and sources of information. It also comments on issues arising from current theories on livelihood options for disaster risk reduction. Copies are also available from the "Disaster Management" page's "Working Papers" section.

The Benfield Greig Centre has also recently published the first issue of its newsletter, *BGHRC ALERT*, via this web site. *BGHRC ALERT* is intended to disseminate information about the work of the center—one of Europe's leading academic hazard research centers—and to help stimulate dialogue and understanding related to contemporary issues in risk science and disaster management. It will be published and available to all, free of charge, four times a year.

The BGRHC site includes much other information resulting from the center's work; topics range from Atlantic tsunami risks, to other geological and meteorological hazards, to NGO initiatives in disaster reduction. In short, the center's interests span the whole range of hazards issues.

www.iadb.org/sds/env/site_2493_e.htm
www.iadb.org/sds/env/publication_2530_e.htm
www.iadb.org/idbamerica/english/mar01e/mar01e8.html

The Inter-American Development Bank (IDB) has made a major commitment to addressing natural disasters as an integral part of its overall mission to promote development in the Americas. The IDB Natural Disaster Management web site at

the first URL describes the bank's mission, strategy, and work program in this area and, at the second address, offers three publications for download from the site:

- *A Matter of Development: How to Reduce Vulnerability in the Face of Natural Disasters*. Economic Commission for Latin America and the Caribbean and IDB. 2000. 45 pp.
- *Facing the Challenge of Natural Disasters in Latin America and the Caribbean: An IDB Action Plan*. IDB. 2000. 34 pp.
- *Natural Disasters in Latin America and the Caribbean: An Overview of Risk*. Céline Charvériat. 2000. 104 pp.

These publications can also be obtained by sending an e-mail to env@iadb.org, or by contacting the *Environment Division, Stop W-500, Inter-American Development Bank, 1300 New York Avenue, Washington, DC 20577*; WWW: www.iadb.org/exr/pub/index.asp.

At the third URL, the bank recently announced the publication of a new volume—*Social Protection for Equity and Growth* (2000, 238 pp., \$22.50, plus shipping), edited by Ann Moline. The book focuses on the extreme vulnerability of the poor in Latin America and discusses how governments in the region can plan for (rather than simply respond to) disasters and severe economic fluctuations. The authors argue that the impact of disasters in Latin America can be mitigated by instituting financial and land-use reforms, developing social systems, encouraging entrepreneurship, and creating disaster reserve funds. They hold that a coherent social protection strategy will improve a nation's overall economic status after a crisis by reducing the exposure of the poor to risk and boosting their participation in economic activities with higher returns, thus ultimately preparing a country to deal with inevitable future disasters. More information, excerpts, and an order form are available from the site. Orders should be directed to the *IDB Bookstore, 1300 New York Avenue, N. W., Washington, DC 20577*; WWW: www.iadb.org/exr/pub/pages/Order.asp.



www.eriskcenter.org

The goal of the Risk Management Resource Center is to provide information that can help local governments, nonprofit organizations, and small businesses manage risks effectively. The center is a collaborative effort of the Public Risk Management Association (PRIMA), the Nonprofit Risk Management Center (NRMC), and the Public Entity Risk Institute (PERI). The materials available include conference papers, reports, and publications; databases of information resources; and hundreds of links to other useful Internet sites. Specifically, among its many resources, the site provides the "PRIMAFile" On-line Library—abstracts of materials contained in PRIMA's reference library (complete copies can be ordered on-line); NRMC *Risk Management Briefs*—25 free, downloadable papers summarizing knowledge about various aspects of risk management; papers and presentations from PRIMA, PERI, and NRMC conferences and symposia; PERI's Risk Management Clearinghouse—a database of resources on risk management; as well as numerous other publications, web links, and resources.

www.emaponline.org

www.nemaweb.org

The National Emergency Management Association (NEMA) has launched a new web site at the first URL to support its Emergency Management Accreditation (EMAP) program (see the *Observer*, Vol. XXV, No. 3, p. 7). In addition, individuals who want to be regularly updated on EMAP activities can request such information by e-mailing edemers@csg.org.

aic.stanford.edu/disaster/

The American Institute for Conservation (AIC) site offers an entire section on disaster recovery. It includes tips for the care of water-damaged objects of all kinds—from family heirlooms to books, textiles, and photographs—as well as links to other resources and information on the protection and conservation of valuable and/or historic artifacts.

www.eventbasedscience.com

This set of classroom resources prepared by the Montgomery County, Maryland, school system for middle and high school students includes disaster preparedness curricula on such hazards as asteroids, earthquakes, floods, hurricanes, oil spills,

tornadoes, toxic leaks, volcanoes, and disease outbreaks. Each module involves students adopting different roles dealing with the specific hazard—from architect or planner to emergency responder. The site links to multiple resources for each module and also encourages students to consider careers in relevant fields.

groups.yahoo.com/group/emlegislation

A new Yahoo Internet discussion group has been established to disseminate legislation, regulatory notices, and other federal government news (such as *Federal Register* documents, GAO reports, and texts of bills) that might affect emergency management professionals. Additionally, this e-mail list will serve as a forum for discussion of emergency management policy issues. To subscribe, send an e-mail to emlegislation-subscribe@yahoogroups.com, or visit the group's web page above. The group moderator would like to establish partnerships with others who can provide information for the group. If you are interested, contact *Mary Ann Marrocolo*, e-mail: mmarrocco@oem.nyc.gov or mmarrocolo@aol.com.

risk-com@listserv.itd.umich.edu

risk-com-request@umich.edu

A new information and discussion list has been established to promote discussion among persons interested in risk communication. Persons wishing to subscribe should send an e-mail message to the second address above with the word "subscribe" as the subject of the message.

Earthquakes

greenwood.cr.usgs.gov/pub/i-maps/i-2737/

greenwood.cr.usgs.gov/pub/fact-sheets/fs-0006-01/

More than 1,000 earthquakes have hit the Northeast over the last 360 years—some of them causing significant damage. These events are documented in a new earthquake map and fact sheet entitled *Earthquakes In and Near the Northeastern United States, 1638-1998* recently released by the U.S. Geological Survey and the Northeast States Emergency Consortium. Both can be downloaded from the URLs above.

www.es.ucsc.edu/~jsr/EART10/Trips/FT3/index.html

This site, prepared by the Earth Sciences Department at the University of California-Santa Cruz, offers a virtual field trip of the Santa Cruz region following the 1989 Loma Prieta earthquake. Intended for an introductory earth science class, it provides basic information about seismic phenomena as well as specific details about the October 17, 1989, event that was responsible for 62 deaths, 3,757 injuries, and over \$6 billion in damage. Besides an overview, the self-guided field trip includes illustrated sections on tectonics, building damage, liquefaction, surface cracking, and landslides.

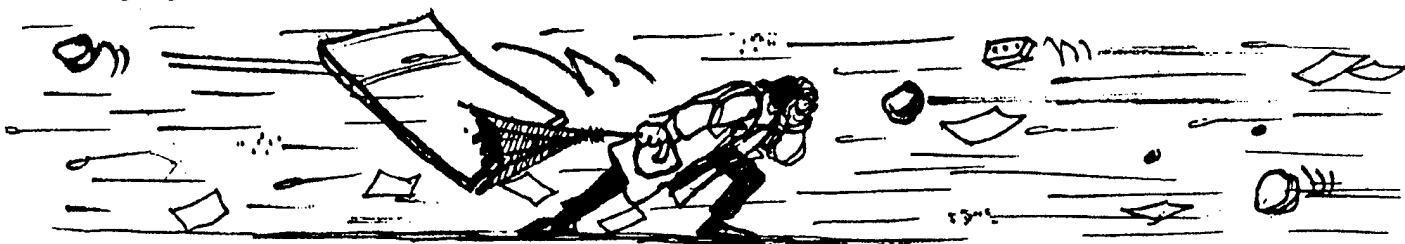
MCEER Offers Webcasts of Earthquake Engineering Seminars

Earlier this year the University at Buffalo of the State University of New York, home of the Multi-disciplinary Center for Earthquake Engineering Research (MCEER), "webcast" seminars featuring Tom D. O'Rourke of Cornell University, who spoke on "Seismic Evaluation and Retrofit of Water Supply Lifelines," and William J. Petak of the University of Southern California, who discussed "Mitigation: A Framework for Analysis." These seminars were simultaneously broadcast live and on the World Wide Web at civil.eng.buffalo.edu/webcast/. These and other archived presentations are now available at this site, as is information about upcoming webcasts. Suggestions for future presentations and speakers are welcome and should be directed to *Andrea Dargush, MCEER, University at Buffalo, Red Jacket Quadrangle, Buffalo, NY 14261-0025; (716) 645-3391; fax: (716) 645-3399; e-mail: dargush@acsu.buffalo.edu*.

Severe Weather

uswrp.mmm.ucar.edu/uswrp/

The U.S. Weather Research Program (USWRP) is a cooperative effort of four federal agencies: the National Oceanic and Atmospheric Administration (NOAA), National Science Foundation (NSF), Department of Defense (DOD), and National Aeronautics and Space Administration (NASA). Together, these agencies support research into many aspects of weather, including meteorologic hazards. Indeed, a priority goal is the improvement of forecasts of hurricane landfall and heavy (potentially flood-inducing) precipitation. This web site provides an overview and details about program structure and ongoing research, as well as an index of upcoming meetings and program reports.



www.comet.ucar.edu/resources/cases

The Cooperative Program for Operational Meteorology Education and Training (COMET—see the *Observer*, Vol. XXIII, No. 1, p. 13; Vol. XXIV, No. 6, p. 16) provides materials, including numerous web-based case studies, for the education of meteorologists and other hazards professionals. The program has recently added studies of several tornado outbreaks, a cold front that exacerbated forest fires in Montana, two snowstorms, two additional examples of severe weather, and an incident involving terrain-locked convection that caused flooding in New Jersey last August. Over 30 studies are now available. Interested persons can stay informed of the latest developments in the COMET case study project by subscribing to the COMET mailing list via www.joss.ucar.edu/cometCases/mailList.htm.

Climate Change and El Niño

iri.ldeo.columbia.edu/

iripred.ldeo.columbia.edu/

iripred.ldeo.columbia.edu/research/ENSO/enso.html

The International Research Institute (IRI) for Climate Prediction was established through a cooperative agreement between the NOAA Office of Global Programs and Columbia University. The IRI web site posts the institute's news, upcoming events, and recently released products and publications. It also includes three principal sections:

- Climate Information System (with pages entitled "Digest," "Forecasts," "Monitoring," "Regional Impacts," "Data Library," and "Research");
- Applications ("Sectors," "Regions," and "Cross-Cutting Issues"); and
- Outreach ("Training Program," "Climate Dictionary," "IRI Publications," and "Meeting Archives").

The Climate Information System Forecasts page, at the second URL above, provides a seasonal climate forecast distilled from a variety of climate prediction tools, and, at the third URL, a series of global maps that illustrate the probabilities of seasonal temperature and precipitation anomalies associated with El Niño and La Niña. The user who wants to know the potential effects of El Niño (or La Niña) can go to this page, enter a season, a location, and other information and receive a map that illustrates the probabilities of seasonal temperature and precipitation outcomes associated with the specified weather pattern. An in-depth explanation of the maps is included.

Three (Four) Other Sites Dealing with Climate Prediction and Human Aspects of Climate Change

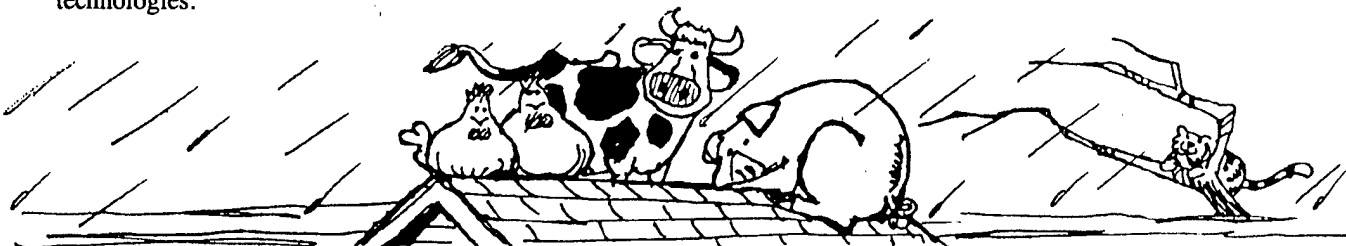
- www.iges.org — the site for the Institute of Global Environment and Society, Center for Ocean-Land-Atmosphere Studies
- ecpc.ucsd.edu — the homepage of the Experimental Climate Prediction Center, Climate Research Division, Scripps Institution of Oceanography
- www.wcc.nrcs.usda.gov — the web site for the National Water and Climate Center, Natural Resources Conservation Service, U.S. Department of Agriculture

We discovered these sites in a recent issue of *Weatherzine* (www.esig.ucar.edu/socasp/zine/index.html), a newsletter available on-line from the Environmental and Societal Impacts Group at the National Center for Atmospheric Research (www.esig.ucar.edu and www.esig.ucar.edu/socasp)—another excellent web site on this topic. Besides *Weatherzine* and an abundance of data and information on the societal aspects of climate and weather, the ESIG site offers other periodicals including their *Network Newsletter*, for people involved in climate impact assessment, and *ENSO Signal*, for persons interested in the El Niño-Southern Oscillation (ENSO) cycle and its impacts on society and the environment. For either newsletter, see www.esig.ucar.edu/pubs.html.

Floods

www.fema.gov/mit/tsd/WN_main.htm

The Federal Emergency Management Agency (FEMA) Flood Hazard Mapping "What's New" page describes several new features that the FEMA mapping folks have added to their Web site. In particular, the site offers numerous new on-line tutorials and e-mail lists to which interested persons can subscribe. The lists include a general newsletter for updates on flood mapping activities, a coastal hazard mailing list, and several other e-mail missives regarding mapping programs and technologies.



Hurricanes and Other Coastal Hazards

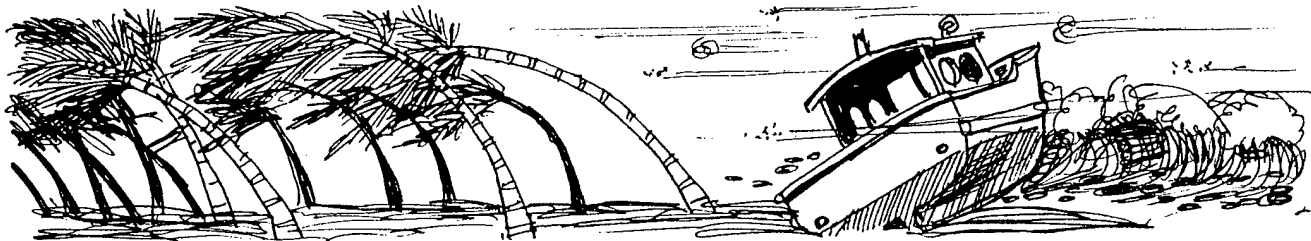
www.csc.noaa.gov/

www.csc.noaa.gov/products/nchaz/startup.htm

The web site of NOAA's Coastal Services Center (CSC) is entitled "Living on the Coast: Smart Growth Tools on the Internet." One of those tools is the CSC's "Community Vulnerability Assessment Methodology" (CVAM) (see the *Observer*, Vol. XXIV, No. 4, p. 23). Provided on CD-ROM, this tool is designed to aid federal, state, and local coastal resource managers in conducting community- and state-level hazard risk and vulnerability assessments to mitigate potential damage. Having developed the methodology, the CSC is now preparing related training material and programs (see, for example, the *Observer*, Vol. XXV, No. 5, p. 19). To obtain background information, to see an example of how this tool is being used in one location (New Hanover County, North Carolina), or to request the CVAM CD-ROM, see the second URL above. Additional information about the project is also available from the *NOAA Coastal Services Center, 2234 South Hobson Avenue, Charleston, SC 29405-2413; (843) 740-1200; fax: (843) 740-1224; e-mail: clearinghouse@csc.noaa.gov.*

coastalhazards.wcu.edu

The "Coastal Hazards Information Clearinghouse" is a joint project of Western Carolina University and the State University of West Georgia. With support from the Public Entity Risk Institute and Federal Emergency Management Agency, these two schools have created a web site that contains a 10-chapter monograph on coastal hazards, detailed coastal hazard maps for all coastal states, photos of property damage from several recent hurricanes, and a list of coastal hazard links for each state.



coastal.er.usgs.gov/hurricanes/mappingchange/

U.S. Geological Survey scientists, in partnership with NASA, have developed a new extreme-storm hazards map. Created using data gathered by a high-tech, airplane-mounted laser, the map shows critical elevations of the southern Atlantic coast that indicate relative vulnerabilities of the coast to storm surge and inundation by hurricanes and severe storms. The new data provided by the map are intended to help local emergency managers and natural resource officials prepare for storms. The scientists have also developed a new scale that categorizes expected coastal change (erosion and accretion) that will occur during storms. The map and scale are now available on the web site above. In the future, similar maps will be prepared for the Gulf of Mexico and northeast U.S. coastlines.

www.disaster.info.desastres.net/saludca/desastresCR

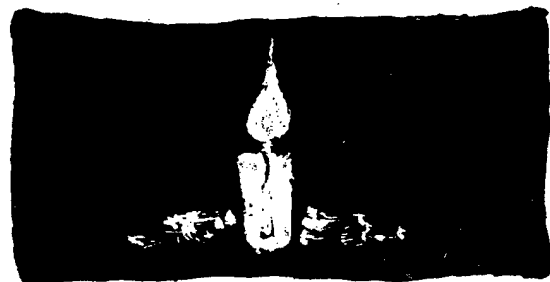
www.paho.org/English/PED/ped401e.pdf

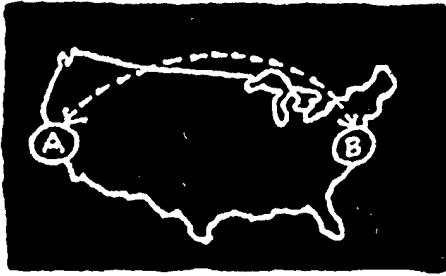
The Emergency Preparedness and Disaster Relief Program (PED) of the Pan American Health Organization (PAHO), in collaboration with the Regional Disaster Information Center (CRID) for Latin America and the Caribbean and the Costa Rican nongovernmental organization FUNDESUMA, has undertaken a major project on "Vulnerability Reduction and Disaster Preparedness in Countries Affected by Hurricane Mitch." Background information in Spanish is available from the first web page listed above, and an article about the program appears in the latest issue of the PAHO newsletter *Disasters: Preparedness and Mitigation in the Americas*, available at the second address. More information is also available from PAHO, *Emergency Preparedness and Disaster Relief Program, 525 23rd Street, N.W., Washington, DC 20037; (202) 974-3520; fax: (202) 775-4578; e-mail: disaster@paho.org; WWW: www.paho.org/disasters/.*

A Not-So-Natural Hazard of Our Times

www.redcross.org/services/disaster/keepsafe/blackout.html

The American Red Cross (ARC) recently developed a fact sheet on rolling energy blackouts that is posted on the ARC web site at the address above. This information was created using input from the electric utility community and Red Cross public educators primarily located in California.





CONFERENCES AND TRAINING

Below are the most recent conference announcements received by the Natural Hazards Center. A comprehensive list of hazard/disaster meetings is posted on our World Wide Web site: www.colorado.edu/hazards/conf.html.

Disaster Mental Health Institute (DMHI) Fourth Annual Conference: "International Psychosocial Responses to Disaster and Humanitarian Emergencies." Rapid City, South Dakota: August 19-21, 2001. This conference will bring together an international group of responders and researchers with experience in disasters, refugee situations, and other humanitarian emergencies. The focus will be psychosocial issues following recent major international emergencies, including the floods that struck Venezuela in 1999-2000 and the earthquake that occurred in India early this year. The conference is intended for mental health professionals interested in the development of better cooperative multinational partnerships among governments, nongovernmental organizations, and other stakeholders. Details are available from the *Disaster Mental Health Institute, University of South Dakota—SDU 116, 414 East Clark Street, Vermillion, SD 57069-2390; (800) 522-9684 or (605) 677-6575; fax: (605) 677-6604; e-mail: dmhi@usd.edu; WWW: www.usd.edu/dmhi/conf01/index.html.*

Critical Incident Stress Management Suite of Workshops. Offered by: *International Critical Incident Stress Foundation (ICISF).*

- Columbia, Maryland: August 16-19, 2001
 - Edmonton, Alberta, Canada: August 23-26, 2001
 - Phoenix, Arizona: September 5-8, 2001
 - Birmingham, Alabama: September 20-23, 2001
 - Olathe, Kansas: October 18-21, 2001
 - Houston, Texas: November 1-4, 2001
 - San Diego, California: November 29-December 2, 2001
- For conference brochures or details about the various workshops offered, contact *ICISF, 10176 Baltimore National Pike, Unit 201, Ellicott City, MD 21042; (410) 750-9600; fax: (410) 750-9601; WWW: www.icisf.org.*

2001 American Public Works Association (APWA) International Congress and Exposition. Philadelphia, Pennsylvania: September 9-12, 2001. Because almost every city, county, and state must deal with a storm, flood, landslide, or other hazard at some time or other, the APWA annual congress always includes several sessions on disaster

preparedness, response, and recovery. For details about this year's program, contact *APWA, 2345 Grand Boulevard, Suite 500, Kansas City, MO 64108-2641; (816) 472-6100; fax: (816) 472-1610; e-mail: congress@apwa.net; WWW: www.apwa.net/Meetings/Congress/2001.*

First International Conference on River Basin Management. Organizer: *Wessex Institute of Technology, Cardiff, Wales, U.K.; September 11-13, 2001.* This meeting will focus on the planning, design, and management of river basin systems. It will examine the ecology and environmental management of rivers, floodplains, wetlands, and mangrove forests. The conference will feature recent advances in the management of riverine systems, including progress in hydraulic and hydrologic modeling, environmental protection, and floodplain mapping. More information is available from *Susan Hanley, Conference Secretariat, River Basin Management 2001, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO40 7AA, U.K; fax: 44 (0) 238 029 2853; e-mail: shanley@wessex.ac.uk; WWW: www.wessex.ac.uk/conferences/2001.*

Seminar: Developing, Writing, Implementing, Testing, Managing, Maintaining Your Recovery Plan. Offered by: *DisasterRecovery.com, Inc.*

- Orlando, Florida: September 15-16, 2001
- Las Vegas, Nevada: October 22-24, 2001
- Los Angeles, California: November 5-7, 2001
- Washington, D.C.: November, 26-28, 2001

This seminar will show those who must manage business recovery how to recognize the threats faced by modern corporations and how to prepare, test, maintain, and implement a plan to deal with those risks. For more information, contact *DisasterRecovery.com, Inc., 812 Proctor Avenue, Ogdensburg, NY 13669; (800) 361-8398; fax: (520) 441-4170; e-mail: phoenix@binomial.com.*

13th International Disaster Recovery Symposium and Exhibition. Host: *Disaster Recovery Journal (DRJ).* Orlando, Florida: September 16-19, 2001. The Disaster Recovery Symposium is one of the nation's largest meetings for

business and industry disaster preparedness, response, and recovery specialists and business continuity professionals. It comprises dozens of workshops and educational sessions, including a mock disaster drill. Complete details and a registration form are available from the *DRJ Registrar*, P.O. Box 510110, St. Louis, MO 63151; (314) 894-0276; WWW: www.drj.com.

Disaster Management Workshops. Offered by: University of Wisconsin-Madison, Department of Engineering Professional Development, Disaster Management Center. Madison, Wisconsin: September 17-21, 2001. This annual seminar series is intended for emergency managers in business, industry, government, and community organizations. It addresses emergency information management; disaster communications; response planning; damage, needs, and resources assessment; and monitoring, evaluation, and reporting. More information is available from *Amy Lensing, Department of Engineering Professional Development, University of Wisconsin-Madison, 432 North Lake Street, Madison, WI 53706; (800) 462-0876; fax: (608) 263-3160; e-mail: custserv@epd.engr.wisc.edu; WWW: epdweb.engr.wisc.edu/*.

International Exhibition for Disaster Control and Emergency Treatment Services. Organizer: Shanghai Municipal Civil Defense Office. Co-sponsors: Disaster Preparedness and Emergency Response Association, International Association of Emergency Managers, and others. Shanghai, China: September 18-20, 2001. This event will feature a disaster control and emergency treatment forum, technical seminars, business presentations, and new product appraisals. For additional information, contact *Education Network and Exhibition Services Ltd., 14E Cindic Tower, 128 Gloucester Road, Wanchai, Hong Kong; tel: 852 2598 7556; fax: 852 2598 0302; e-mail: enesjonathan@ctimail3.com*.

National Conference on Disaster and Crisis Management: Prepare, Prevent, Prevail. Host: Center for Disaster and Crisis Management, State University of New York Maritime College. Throggs Neck, New York: September 30-October 3, 2001. This meeting will provide an overview of natural and human-caused disasters and specifically address risk assessment and vulnerability analysis, emergency operations plan development, business continuity, crisis communication, legal implications of disasters, hazard mitigation, and public relations and disasters. Additional information is available from the *Center for Disaster and Crisis Management, State University of New York Maritime College, 6 Pennyfield Avenue, Fort Schuyler, NY 10465; (718) 409-7459; WWW: www.sunymaritime.edu/ACADEMICS/undergraduate/cdcm.asp*.

Earthscope Workshop. Host: Southern California Earthquake Center (SCEC). Snowbird, Utah: October 10-12, 2001. Earthscope is a major research initiative proposed by the National Science Foundation Earth Sciences Division. It will examine in detail the structure and tectonics of North America, including volcano and earthquake hazards. For details, see: www.scec.org/instanet/01news/earthscope.html, or contact *SCEC, Department of Earth Sciences, University*

Park, Los Angeles, CA 90089-0742; (213) 740-5843; fax: (213) 740-0011; e-mail: scec@usc.edu.

14th Annual Emergency Preparedness Conference. Hosts: British Columbia Ministry for Children and Families, City of Vancouver, Insurance Bureau of Canada, and others. Vancouver, British Columbia, Canada: October 16-18, 2001. The purpose of this annual event is to "raise the level of emergency preparedness and make the world a better, safer place by: promoting awareness; providing information, tools, and solutions to problems; sharing experiences; showcasing technologies; and creating networking opportunities." The conference includes tours, plenary talks, workshops, exhibits, and dozens of concurrent sessions covering everything from dealing with children in disasters to community emergency management planning, disaster education, warning systems, and much more. For the complete program and registration information, contact *Emergency Preparedness Conference, 700 West 57th Avenue, Vancouver, British Columbia, Canada V6P 1S1: (604) 322-8365; fax: (604) 322-8359; e-mail: mrogan@vanhosp.bc.ca; WWW: www.epma.bc.ca/epc/*.

Natural Disasters Roundtable: "Climate Variability and Natural Disasters." Host: National Academy of Sciences. Washington, D.C.: October 25, 2001. The mission of the Natural Disasters Roundtable is to facilitate and enhance communication and the exchange of ideas among scientists, practitioners, and policy makers in order to identify important issues related to the understanding and mitigation of natural disasters. Roundtable meetings are held three times a year in Washington, D.C., and each meeting is an open forum focusing on a specific topic or issue. More information is available from *Patricia Jones Kershaw, Natural Disasters Roundtable, National Academies, 2101 Constitution Avenue, N.W., Washington, DC 20418; (202) 334-1964; fax: (202) 334-1961; e-mail: pkershaw@nas.edu; WWW: national-academies.org/naturaldisasters*.

Stream Corridor Restoration for Floodplain Management. Sponsors: Association of State Floodplain Managers (ASFPM) and U.S. Environmental Protection Agency. Tampa, Florida: October 29-30, 2001. Details are available from *ASFPM, 2809 Fish Hatchery Road, Suite 204, Madison, WI 53713; (608) 274-0123; e-mail: asfpm@floods.org; WWW: www.floods.org*.

Annual Voluntary Organizations Active in Disaster (VOAD) Conference: "A 2001 Collaborative Odyssey." Oklahoma City, Oklahoma: November 2-5, 2001. Voluntary organizations are not only key responders to disasters and other emergencies, but also important groups that can help educate community members about disaster preparedness and mitigation. To promote interorganizational cooperation and planning, VOAD encourages state and local emergency managers as well as representatives from voluntary agencies to attend this annual meeting. For details, see www.okvod.org; or contact *Linda Soos-Davis, Oklahoma Department of Emergency Management, P.O. Box 53365, Oklahoma City, OK 73152-3365; (405) 521-2481; fax: (405) 522-0851; e-mail: mail@okvod.org*.

Second Asian Symposium on Risk Assessment and Management. Host: Society for Risk Analysis-Japan. Kobe, Japan: November 23-25, 2001. A special topic at this conference will be "Natural Disaster and Risk Management." For more information see ecopolis.sk.tsukuba.ac.jp/~sra-japan; or contact Saburo Ikeda, Secretary General, SRA-Japan, c/o Institute of Policy and Planning Sciences, University of Tsukuba, Tsukuba 305-8573, Japan; tel: +81-298-53-5380; fax: +81-298-55-3849; e-mail: sra-japan@ecopolis.sk.tsukuba.ac.jp.

Disaster 2002. Sponsor: Florida Emergency Medicine Foundation, in collaboration with the Florida College of Emergency Physicians. Orlando, Florida: January 31-February 3, 2002. The organizers of this annual conference on disaster response are currently seeking presentation proposals. Details and a proposal form are available from www.fcep.org and www.fcep.org/callforpreframe.htm. Information can also be obtained from John Todaro, Florida Emergency Medicine Foundation, Florida College of Emergency Physicians, 3717 South Conway Road, Orlando, FL 32812-7607; (800) 766-6335 or (407) 281-7396; fax: (407) 281-4407; e-mail: jtodaro@fcep.org.



North American Snow Conference. Host: American Public Works Association (APWA). Columbus, Ohio: April 14-16, 2002. APWA's annual snow conference showcases the latest ideas, practices, and equipment available for dealing with the problems posed for public works departments by winter weather. The organizers are currently soliciting session proposals; the deadline for submissions is September 6, 2001. For details, on

the World Wide Web see www.apwa.net/Meetings/snow/2002; or contact Karen Wilson, APWA, 2345 Grand Boulevard, Suite 500, Kansas City, MO 64108-2641; (816) 472-6100; fax: (816) 472-1610; e-mail: kwilson@apwa.net.

International Conference on Slope Instability—Planning and Management. Sponsor: Centre for the Coastal Environment. Isle of Wight, U.K.: May 20-23, 2002. This conference is an opportunity for engineers, planners, academic researchers, practitioners, and insurers to discuss the practical aspects of slope instability assessment, management, and mitigation. The goal is to translate theory and policy into coordinated practice in land-use planning and the management of ground instability. The meeting will focus on identifying and understanding the nature of this hazard, determining methods for guiding development toward suitable locations, and similarly ensuring that development does not increase risks. Participants will survey such disparate factors as global warming and climate change, new technologies for determining and mitigating slope failure, and local government involvement in hazard planning and mitigation. A conference brochure is available from the Conference Office, *Instability—Planning and Management*

2002, Centre for the Coastal Environment, Dudley Road, Ventnor, Isle of Wight PO38 1EJ, U.K.; tel: +44 (0) 1983 856896; fax: +44 (0) 1983 855859; e-mail: conference@iwight.gov.uk; WWW: www.coastalwight.gov.uk.

Hurricane Andrew 10-Year Anniversary Conference. Host: International Hurricane Center, Florida International University. Miami, Florida: May 30-31, 2002. This conference will include six tracks—science and technology, government, engineering and design, human impact, vulnerability and mitigation, and education and outreach—and examine four key questions in each area: What was the status in 1992? What is the status in 2002 (what has changed)? What are the consequences of this change? and, Where must we go in the next 10 years? For further information, contact Ricardo Alvarez, International Hurricane Center, Florida International University—CEAS 2710; Miami, FL 33199; (305) 348-1607; fax: (305) 348-1605; e-mail: alvarez@fiu.edu or hurrican@fiu.edu; WWW: www.ihc.fiu.edu.

Third International Conference on Landslides, Slope Stability, and the Safety of Infrastructure. Host: CI-Premier Ltd. Singapore: July 10-12, 2002. (Preceded by a one-day workshop: *Landslide Causes and Landslide Remediation*.) The aim of this conference is to provide an opportunity for engineers and scientists working in the field of slope instability and remediation to meet; present new ideas, achievements, and experiences; and develop closer relationships. The conference organizers have identified 14 themes for presentations and technical papers, ranging from landslide investigation to climatic and geological factors influencing landslides, monitoring, hazard analysis, effects on structures, remediation, disaster management, and other topics. Abstracts are due December 15, 2001. Additional information is available from CI-Premier Ltd, 150 Orchard Road #07-14, Orchard Plaza, Singapore 238841; tel: 065-7332922; fax: 065-2353530; e-mail: cipremie@singnet.com.sg; WWW: www.cipremier.com.

European Conference on Severe Storms (ECSS) 2002. Sponsor: Czech Meteorological Society; local organizer: Czech Hydrometeorological Institute. Prague, Czech Republic: August 26-30, 2002. This conference will build on the Conference on European Tornadoes and Severe Storms, which was held February 2000 in Toulouse, France. The main topics of ECSS 2002 will be:

- Types and conceptual models of severe convective storms;
- Terminology of severe convective weather;
- Climatology of severe convective storms and related weather phenomena in Europe;
- Detection, monitoring, and research by remote sensing;
- Ground and airborne surveys of damage;
- Numerical modeling and forecasting; and
- Synoptic and mesoscale processes associated with deep convection.

A first announcement, call for papers, on-line registration, conference details, and travel and accommodation information are posted on the conference web site: www.chmi.cz/ECSS2002/.

IBHS Offers Tips for Homeowners

The Institute for Business and Home Safety (IBHS) is an insurance industry initiative to reduce deaths, injuries, property damage, economic losses, and human suffering caused by natural disasters. In an effort to inform homeowners about ways to reduce losses from natural disasters, IBHS has created a number of brochures and guides that offer tips for protecting residences. They include:

- *Glue Your Roof On*. 2001. 2 pp. Free.
- *Protect Your Home Against Hurricane Damage*. 2001. 2 pp. Free.
- *Is Your Home Protected from Hurricane Disaster? A Homeowner's Guide to Hurricane Retrofit*. 1998. 36 pp. Single copies, free; multiple copies, \$10.00 each.
- *¿Está Protegido Su Hogar Contra Huracanes? Guía de Refacciones en el Hogar Para Prevenir los Daños Causados por Huracanes*. 2000. 36 pp. (Available on IBHS web site only.)
- *Protect Your Home Against Hurricane Damage*. 2001. 2 pp. Free.
- *Protect Your Home Against Flood Damage*. 2001. 2 pp. Free.
- *Protect Your Home Against Earthquake Damage*. 2001. 2 pp. Free.
- *Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit*. 1999. 42 pp. Single copies, free; multiple copies, \$10.00 each.
- *Protect Your Home Against Hail Damage*. 2001. 2 pp. Free.
- *Is Your Home Protected from Hail Damage? A Homeowner's Guide to Roofing and Hail*. 1999. 14 pp. Single copies, free; multiple copies, \$10.00.
- *Protect Your Home Against Wildfire Damage*. 2001. 2 pp. Free.
- *Protect Your Home Against Damage from Freezing Weather*. 2001. 2 pp. Free.

Each document is available at the IBHS web site: www.ibhs.org/ibhs2/html/publications/Default.htm. Printed copies are available for purchase on-line or by contacting IBHS, 1408 North Westshore Boulevard, Suite 208, Tampa, FL 33607; (813) 286-3400; fax: (813) 286-9960. Quantity discounts are available.

The Latest From the Fightin' Blue Hens

Every year, the Natural Hazards Center receives a stack of the latest article reprints, preliminary reports, and other publications produced by the Disaster Research Center, the first social science research center in the world devoted to the study of disasters. Located at the University of Delaware (home of the Fightin' Blue Hens), this enduring and energetic center conducts field and survey research on a broad range of disasters, including hurricanes, floods, earthquakes, tornadoes, hazardous chemical incidents, and plane crashes.

Some of its newest products examine disasters and popular culture, public support for seismic rehabilitation, the history of organized efforts to plan for and respond to disasters, disaster mental health research, and disaster resistant communities. Nearly all of the DRC's Preliminary Papers are available free on its web site. The center also publishes books, reports, historical and comparative studies, articles, dissertations, and other publications, many of which are also on-line. To obtain a catalog, contact the DRC, Publications, University of Delaware, Newark, DE 19716; (302) 831-6618; WWW: www.udel.edu/DRC/publications.html.

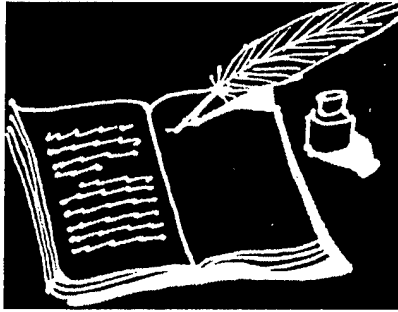
ASFPM Offers Advanced Certification

The Association of State Floodplain Managers (ASFPM) has announced a new professional certification, the Advanced Certified Floodplain Manager (ACFM), which will be granted exclusively by the association to individuals who assist communities in addressing their flooding problems through comprehensive approaches and who encourage development of national flood policies and programs that promote thorough, well-conceived, sustainable local efforts. In short, individuals receiving ACFM certification will be leaders who have gone beyond their paid duties to further the profession and promote better floodplain management understanding and practice at all levels.

The ACFM designation will be awarded to individuals who are an ASFPM recognized Certified Floodplain Manager, have at least four years experience in floodplain management, and receive at least a 75% passing grade on the ACFM exam.

Application forms and other details are available from ASFPM, 2809 Fish Hatchery Road, Suite 204, Madison, WI 53713; (608) 274-0123; e-mail: asfpm@floods.org; WWW: www.floods.org.

[Adapted from the April issue of the ASFPM newsletter, *News and Views*]



RECENT PUBLICATIONS

Below are summaries of some of the recent, more useful publications on hazards and disasters received by the Natural Hazards Center. Due to space limitations, we have provided descriptions of only a few key publications or those with a title that may not indicate content. All items contain information on how to obtain a copy. A complete bibliography of publications received from 1995 through 2001 is posted on our web site: www.colorado.edu/hazards/bib/bib.html.

All Hazards

Topics: Annual Review of Natural Catastrophes 2000. 2001. 56 pp. Free. English version order number: 302-02909. Copies are available from Münchener Rückversicherungs-Gesellschaft (Munich Re), Research and Development Geoscience Research Group, Königstrasse 107, D-80791, Munich, Germany; tel: +49 (0) 89/3891-52 91; fax: +49 (0) 89/3891-56 96; e-mail: info@munichre.com. The complete report is also available from the Munich Re web site: www.munichre.com.

Every year, Munich Re assembles a resplendent report about the natural catastrophes that have occurred around the world. Noting that 2000 "was a year of floods and a year that was by and large lacking in major earthquakes and storms," this report provides a statistical analysis of the major natural events of that year and includes, for the first time, information on technical catastrophes such as air crashes and major fires. Although an extremely large number of catastrophes occurred throughout the world, there were no instances of heavily populated regions being struck (although the Gujarat quake in India would follow early in 2001), and thus monetary losses were comparatively low. In addition to providing detailed disaster data, the report cautions that losses are destined to increase due to increasing global populations and that increases in weather and climate-related catastrophes should be expected due to global climate change. The report also presents "The Year in Pictures"; a section on major engineering and fire catastrophes; background information on Munich Re's 25-year-old NatCatSERVICE database; and articles on damaging windstorms in Europe, flooding and landslides in the Alps, floods in Great Britain, the climate summit in the Hague, and the growing loss potential of megacities.

Foreign Assistance: Implementing Disaster Recovery Assistance in Latin America. Testimony Before the Subcommittee on Foreign Operations, Export Financing, and Related Programs, Committee on Appropriations, House of Representatives. Statement of Jess T. Ford, Director, International Affairs and Trade. GAO-01-541T.

2001. 20 pp. Free. Copies can be obtained from the U.S. General Accounting Office, P.O. Box 37050, Washington, DC 20013; (202) 512-6000; fax: (202) 512-6061; e-mail: info@www.gao.gov; WWW: www.gao.gov.

Data Book on Asian Natural Disasters in the 20th Century. 2000. 220 pp. Free. The complete text of this report is on-line from the Asian Disaster Reduction Center in Japan: www.adrc.or.jp.

"Human and Pet-Related Risk Factors for Household Evacuation Failure During a Natural Disaster." Sebastian E. Heath, Philip H. Kass, Alan M. Beck, and Larry T. Glickman. *Journal of Epidemiology*, Vol. 153, No. 7 (April 2001). Reprints are available for \$5.00 from Sebastian Heath, 1650 Harvard Street, N.W., Washington, DC 20009-3727; fax: (202) 332-2739; e-mail: heath@animaldisasters.com; WWW: www.animaldisasters.com.

This article presents the results of a study that characterized risk factors for household evacuation failure. It determined that pet owners had a substantially lower evacuation rate than others, including households with children. Impediments to evacuation included owning multiple pets, owning outdoor dogs, and not possessing a cat carrier. The authors recommend that predisaster planning place a high priority on facilitating pet evacuation.

Risk Preparedness: A Management Manual for World Cultural Heritage. Herb Stovel. 1998. 145 pp. \$16.00. To order a copy, contact the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), Via di San Michele 13, I-00153, Rome, Italy; tel: +39-0658553 1; fax: +39-068553 349; e-mail: iccrom@iccrom.org; WWW: www.iccrom.com.

This manual discusses the principles and benefits of risk preparedness for world cultural heritage sites. It focuses on developing property-specific strategies for risks such as fire, earthquake, flood, armed conflict, tsunami, avalanche, mudslide, and tropical storm. It also includes a list of technical and planning sources.

Governor's Guide to Emergency Management—Volume One: Natural Disasters. 2000. 62 pp. \$18.00. Copies are available from the National Governors' Association (NGA), Publications, P.O. Box 421, Annapolis Junction, MD 20701; (301) 498-3738; fax: (301) 206-9789; e-mail: opa@nga.org; WWW: www.nga.org. The guide can be downloaded free from www.nga.org/cda/files/reportemerguide2001.pdf.

This guide provides state governors and their staffs with an outline of the major issues they must contend with in an emergency. It lists sources of additional, more detailed information on assembling an emergency response team and assessing a state's resources and capabilities for dealing with a flood, earthquake, hurricane, or other crisis. Contact information and web sites are also included.

"Managing Disaster: What the United Nations is Doing, What it Can Do." *United Nations Chronicle*, Vol. XXXVII, No. 4 (December 2000-February 2001). Annual subscription: \$25.00, plus \$10.00 shipping. To subscribe, contact United Nations Publications, Room DC2-0853, New York, NY 10017; (800) 253-9646; fax: (212) 963-3489; e-mail: publications@un.org.

United Nations Secretary-General Kofi Annan introduces this special issue of the *U.N. Chronicle* by stating, "the number of lives lost in disasters is rising steadily. The economic cost of disasters is rising even faster. Yet we, as a community of nations, remain relatively passive." In the first article, "Disasters: What the United Nations and Its World Can Do," hazards researcher Ben Wisner outlines his recommendations for improving the way the world responds to disasters. Subsequent articles examine the roles of United Nations agencies in responding to disasters and reducing vulnerability, our understanding of the Chernobyl nuclear disaster 15 years after the event, and disasters and social development.

Emotional Recovery After Natural Disasters: How to Get Back to Normal Life. Ilana Singer. 2001. 188 pp. \$14.00. Copies can be ordered through any bookstore or on-line bookseller.

According to Singer, disaster survivors need more than simple advice from a grief counselor; they need a mental mechanism to cope with their emotional trauma, and in this book she provides six tactics to help those dealing with emotional trauma. In lay terms, she discusses causes of and methods for coping with disorientation, pressure to "get better," forgetfulness, "ordeal fatigue," depression, and anxiety. She also includes sections devoted to the special needs of children, teenagers, and the elderly.

Acute Traumatic Stress Management: Addressing Emergent Psychological Needs During Traumatic Events. Mark D. Lerner and Raymond D. Shelton. 2001. 190 pp. \$19.95, plus \$5.00 shipping. Copies can be obtained from the American Academy of Experts in Traumatic Stress, 368 Veterans Memorial Highway, Commack, NY 11725; (631) 543-2217; fax: (631) 543-6977; WWW: www.atism.org.

This volume outlines a pragmatic process developed to enable all emergency responders to address the emergent psychological needs of individuals exposed to traumatic events. In recent years, effective interventions have been developed for helping those involved in a traumatic experience—including emergency responders—immediately following an event; yet, there is little guidance for helping people *during* an event. The authors believe that early intervention may ultimately prevent acute traumatic stress reactions from becoming chronic stress disorders. Their book offers techniques for connecting with emotionally distraught individuals, supporting those who are grieving, and managing responder reactions to traumatic events.

Instructors Manual Available for Business and Industry Emergency Management Course

The Capital Area Chapter of the American Red Cross is making the *Instructors Manual* for its very successful Emergency Management Planning Workshop for Business, Industry and Government available so that others can offer this course within their communities. The workshop uses the FEMA/American Red Cross *Emergency Management Guide for Business and Industry* (see the *Observer*, Vol. XXIII, No. 4, p. 19) as its participant workbook. The *Instructors Manual*, a Power Point workshop presentation on CD, and the workshop video are available for \$125.00 from the Disaster Services Office, Capital Area Chapter, American Red Cross, 187 Office Plaza Drive, Tallahassee, FL 32301.

The Capital Area Chapter has been offering its Emergency Management Planning Workshop for Business, Industry and Government since 1997 and has provided training to over 300 organizations. For additional information on the workshop, see: www.tallytown.com/redcross.

2001 Disaster Resource Guide. 2001. 160 pp. \$6.00. To obtain a copy, contact the Disaster Resource Guide, P.O. Box 15243, Santa Ana, CA 92735; (714) 558-8940; fax: (714) 558-8901; WWW: www.disaster-resource.com.

This year's *Disaster Resource Guide* catalogs numerous products, services, and sources of information related to disaster planning and management, information technology and telecommunications, facility management, and crisis communications and response.

Stress Management in Disasters. Pan American Health Organization (PAHO). 2001. 138 pp.

Insight into the Concepts of Stress. PAHO. 2001. 80 pp.

Establishing a Mass Casualty Management System. PAHO. 2001. 65 pp.

All three publications can be downloaded free from the PAHO web site: www.paho.org/disasters/. A limited number of printed copies are also available. For information on acquiring copies, contact the Editor, *Disasters: Preparedness and Mitigation in the Americas*, PAHO, 525 Twenty-third Street, N.W., Washington, DC 20037-2895; (202) 974-3522; fax: (202) 775-4578; e-mail: disaster-newsletter@paho.org.

Climate

The Science of Regional and Global Change: Putting Knowledge to Work. Committee on Global Change Research, National Research Council. 2000. 32 pp. \$23.00 (\$18.40 if purchased online). Copies are available from the National Academy Press, 2101 Constitution Avenue, N.W., Lockbox 285, Washington, DC 20055; (800) 624-6242 or (202) 334-3313; WWW: www.nap.edu.

A central challenge facing the United States and other countries in the 21st century will be to enhance human well-being in a world where growing population and the drive to improve living standards place potentially huge demands on natural resources and the environment. To make vital, informed decisions, substantial improvements in observations of the atmosphere, surface and ground water, oceans, and ecosystems, as well as relevant eco-

conomic and societal data, will be required. This report is intended to promote a dialogue between the scientific community and government officials regarding global change. It provides a brief description of the challenges and proposed responses needed from the highest levels of government, a more detailed discussion of the issues directed to agency-level officials, and a detailed bibliography that lists many of the specific documents upon which the views in this report are based.

Weatherwise, Vol. 54, No. 2 (March/April 2001). Annual subscriptions: \$32.00, individual; \$68.00, institution. Add \$15.00 postage for destinations beyond the U.S. To subscribe, contact Heldref Publications, 1319 Eighteenth Street, N.W., Washington, DC 20036-1802; (800) 365-9753 or (202) 296-6267; fax: (202) 293-6130. *Weatherwise* is also available free on-line: www.weatherwise.org.

This special issue of *Weatherwise* is devoted to weather occurrences in the year 2000. It includes articles and data on weather in the U.S. and around the world, Atlantic hurricanes, eastern Pacific hurricanes, the 1999-2000 snow season, tornadoes, and temperature extremes.

Floods

Stormwater Collection Systems Design Handbook. Larry W. May, editor. 2001. 1,035 pp. \$125.00. Available from McGraw-Hill, (800) 262-4729; fax: (614) 759-3641; e-mail: pbg.ecommerce_custserv@mcgraw-hill.com; WWW: www.books.mcgraw-hill.com.

This handbook presents comprehensive, state-of-the-art information on the design of facilities that convey, store, and dispose of stormwater. Among its many topics, the volume presents authored chapters on the regulation of stormwater systems in the U.S., hydraulics, hydrology, detention, wetlands, distributed stormwater control and re-use systems (by Leonard T. Wright and James P. Heaney), flood control, erosion and sediment control, and litter removal.

Dams and Development: A New Framework for Decision-Making. 2000. 404 pp. £55, hard cover; £20, paperback. To purchase a copy, contact Earthscan Publications, Ltd., 120 Pentonville Road, London N1 9JN, U.K.; tel: +44 (0)20 7278 0433; fax: +44 (0)20 7278 1142; WWW: www.earthscan.co.uk.

This report, prepared by the World Commission on Dams, is intended to inform governments, the private sector, and nonprofit organizations regarding the complex global issues surrounding development and dams. The world has built more than 45,000 large dams to irrigate crops, generate power, control floods, and store water. Yet, in the last century, large dams also disrupted the ecology of half the world's rivers, displaced millions of people from their homes, and left many nations burdened with debt. Their impacts have generated growing controversy and conflict, and resolving the role of dams in meeting water and energy needs is vital. This volume provides a comprehensive review of the performance and impacts of dams worldwide, presents a new framework for water and energy resource development, and recommends seven strategic priorities, along with corresponding criteria and guidelines, for future decision making.

Tornadoes

The Tornadoes of Oklahoma City of May 3, 1999. 2000. 40 pp. Free. To obtain a copy, contact the Wind Engineering Research Center, Texas Tech University, Box 41023, Lubbock, TX 79409-1023; (806) 742-3479; fax: (806) 742-3446; e-mail: webmaster@wind.ttu.edu; WWW: www.wind.ttu.edu/index.html.

Hurricanes

Galveston and the 1900 Storm. Patricia Bellis Bixel and Elizabeth Hayes Turner. 2000. 190 pp. \$60.00, hardcover; \$27.95, paperback. To purchase a copy, contact the University of Texas Press, P.O. Box 7819, Austin, TX 78713; (800) 252-3206; fax: (800) 687-6046; WWW: www.utexas.edu/utpress.

Global Hazards and Catastrophic Risk: Assessments, Practitioners, and Decision Making in Reinsurance. Mojdeh Keykhah. 2000. 37 pp. Free. Available on-line from the Global Environmental Assessment Project, John F. Kennedy School of Government, Harvard University web site: environment.harvard.edu/gea/pubs/2000%2D22.pdf.

Over the last decade, catastrophic events have caused unprecedented losses for the insurance industry. In particular, Hurricane Andrew in 1992 convinced the industry that losses could be devastating. This paper investigates the saliency, credibility, and legitimacy of two types of catastrophe assessments for Atlantic hurricane risk and evaluates their effectiveness in reinsurance decision making.

Earthquakes

Seattle (Nisqually), Washington Earthquake of February 28, 2001 (Magnitude 6.8): An EQE Briefing. 2001. 8 pp. \$10.00. Available from Publications, EQE International, 1111 Broadway, 10th Floor, Oakland, CA 94607. Also available free on-line: www.eqe.com/revamp/SeattleEQ.htm.

This document summarizes the effects of the recent Seattle quake on structures, utility lifelines, and transportation. It also describes potential damage from future larger earthquakes, implications for the structural design community, estimated insured losses, impacts on real estate, and lessons to be learned from the quake.

The Nisqually, Washington, Earthquake: February 28, 2001. Preliminary Reconnaissance Report. 2001. 30 pp. \$15.00, plus \$5.00 shipping. California residents add 8% sales tax. Also available free on-line. To obtain a copy, contact the Earthquake Engineering Research Institute (EERI), 499 14th Street, Suite 320, Oakland, CA 94612-1934; (510) 451-0905; fax: (510) 451-5411; e-mail: eeri@eeri.org; WWW: www.eeri.org.

This report presents the preliminary findings of EERI's earthquake reconnaissance team that examined the impacts of the Seattle earthquake. It contains sections on seismology, geotechnical considerations, buildings, bridges, lifelines, governmental response and socioeconomic aspects, and conclusions and recommendations.

California Earthquakes: Science, Risk, and the Politics of Hazard Mitigation. Carl-Henry Geschwind. 2001. 352 pp. \$45.00. Available from Johns Hopkins University Press, 2715 North Charles Street, Baltimore, MD 21218-4363; (410) 516-6900; fax: (410) 516-6998; WWW: www.press.jhu.edu.

In 1906, after an earthquake wiped out much of San Francisco, leading California officials and scientists described the disaster as a one-time occurrence and assured the public that it had nothing to worry about. *California Earthquakes* explains how, over time, this attitude changed, and Californians came to accept earthquakes as a significant threat, as well as to understand how science and technology could reduce this threat. Geschwind tells the story of the small group of scientists and engineers who—in tension with real estate speculators and other pro-growth forces, private and public—developed the scientific and political infrastructure necessary to implement greater earthquake awareness. Through

their political connections, these reformers succeeded in building a state apparatus in which regulators could work together with scientists and engineers to reduce earthquake hazards. Geschwind details the conflicts throughout the 20th century among scientists, engineers, politicians, and other powerful groups as well as the dramatic advances in our understanding of earthquakes—their causes and how we can try to prepare for them.

Volcanoes

No Apparent Danger: The True Story of Volcanic Disaster at Galeras and Nevado del Ruiz. Victoria Bruce. 2001. 250 pp. \$26.00. Copies can be purchased on-line: www.noapparentdanger.com.

On January 14, 1993, a group of volcanologists entered the crater of the Galeras Volcano in southern Colombia. Several hours later, the volcano erupted, killing six scientists and three tourists instantly when they were caught inside the caldera. This eruption was Colombia's second volcanic disaster in less than a decade, following the eruption of Nevado del Ruiz in 1985, in which more than 23,000 people were killed. *No Apparent Danger* links the events surrounding these catastrophes through the experiences of Marta Calvache, a Colombian volcanologist who dealt with both disasters. Calvache was a member of a group of scientists that had been studying volcanic activity at Nevado del Ruiz and who warned the government that there would be a dangerous eruption.

Wildfires

U.S. Department of Energy Response to the 24 Command Wildland Fire on the Hanford Site—June 27-July 1, 2000. 2000. Report #DOE/RL-2000-63. Free. The report is available on-line from the U.S. Department of Energy's Hanford Site web site: www.hanford.gov/docs/rl-2000-63.

Electronic Fare

The El Niño CD-ROM. 1998. \$29.95, home version; \$39.95, school version with guide; plus \$5.00 shipping. To purchase, contact REMedia, Inc. 13523 Midland Road, Poway, CA 92064; WWW: www.remedia.com/ENpromo.html.

This CD-ROM contains information on the causes and effects of El Niño as well as how it is modeled and predicted.

1999 Kocaeli, Turkey, Earthquake Reconnaissance Report. CD-ROM. 2001. \$6.00, EERI members; \$80.00, nonmembers.

Annotated Images from the Bhuj, India Earthquake of January 26, 2001. CD-ROM. 2001. \$40.00, EERI members; \$50.00, nonmembers.

Both items can be obtained from the Earthquake Engineering Research Institute (EERI), 499 14th Street, Suite 320, Oakland, CA 94612-1934; (510) 451-0905; fax: (510) 451-5411; e-mail: eeri@eeri.org; WWW: www.eeri.org. Add \$5.00 shipping for each item. California residents add 8% sales tax.

The first CD contains the full text of EERI's 457-page reconnaissance report on the Kocaeli, Turkey, quake, including expert conclusions emerging a year after the quake. It includes color photographs; figures; and observations on seismicity, fault rupture, tsunamis, strong motion, ground failure, geotechnical effects, structures and industrial facilities, building code enforcement, lifelines, and societal impacts and emergency response.

The second CD contains over 300 images illustrating geotechnical damage; liquefaction effects; and damage to structures, bridges, lifelines, historic monuments, industrial facilities, dams, railways, and ports.

Virtual Health Library for Disasters. 2001 edition. Available as a CD-ROM and on the World Wide Web: www.who.int/eha/disasters/ or www.paho.org/disasters. To order the CD-ROM, contact the Pan American Health Organization (PAHO), Disaster Publications, 525 Twenty-third Street, N.W., Washington, DC 20037; e-mail: disaster-publications@paho.org; or the World Health Organization (WHO); e-mail: eha@who.ch.

Two years ago PAHO produced the first edition of its *Virtual Disaster Library* on CD-ROM. Now several other national and international organizations have teamed up with WHO and PAHO to produce the expanded 2001 edition. The *Virtual Library* incorporates the most important new works published by the many cooperating agencies and consequently offers a broad variety of information on disaster preparedness, mitigation, management, and response. The *Virtual Health Library for Disasters* is now truly a global collection, containing more than 300 full-text scientific and technical documents and incorporating a new, more powerful search engine.

The Hazards Center On-Line

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