

NATURAL HAZARDS Observer

Vol. XXVI No. 6

July 2002



Are We Planning Safer Communities? Results of a National Survey of Community Planners

—an invited comment

Property-casualty insurance companies in the United States paid more than \$90 billion to cover catastrophe losses during the 1990s, and local, state, and federal governments paid tens of billions of dollars more. If catastrophe trends continue, as they are projected to do, that decade's enormous losses could eventually become small in comparison. However, with land-use planning that takes into account an area's potential disaster risks, many losses could be avoided or reduced. Unfortunately, few communities have fully embraced this approach.

Are We Planning Safer Communities?, a study completed recently by the Institute for Business and Home Safety (IBHS), shows that few communities—including those that recently experienced a catastrophic loss—have

comprehensive land-use plans that consider natural hazards risks.

IBHS is a national nonprofit organization funded by the insurance industry to reduce deaths, injuries, property damage, economic losses, and human suffering caused by natural disasters. Insurers have long supported efforts to prevent and reduce losses from natural catastrophes through improved building materials and construction techniques, stronger building codes, and other means. Comprehensive land-use plans that consider natural catastrophe risks could also do a great deal to mitigate future disasters.

A study completed last year at the University of North Carolina estimates that appropriate land-use measures could reduce expected property losses by one-third over the next

50 years (Burby, 2001). The greatest savings come from reducing the effects of landslides and floods. In all cases, maximum savings can be realized only if local comprehensive plans contribute to the effort.

Findings of the National Survey

To learn whether plans incorporate safety elements that could help lower catastrophe risks, IBHS and its Land Use Planning Committee worked with the American Planning Association and the American Institute of Certified Planners to survey municipal land-use planners throughout the U.S. Planners in 505 cities and counties in nearly every state responded. IBHS then weighted the data according to geographic distribution of the U.S. population.

To answer the survey, respondents received a booklet compiled by IBHS called *Community Land Use Evaluation for Natural Hazards*. They were asked a series of questions, and they provided information about their community, including size, disaster history, and factors they thought might help them to incorporate information about natural hazards into their local plans.

IBHS determined that the ideal local comprehensive plan would address eight elements:

- **Plan basics** — a general or comprehensive plan supported by a professional planning staff;
- **Quality data** — factual data and maps;
- **Identification of issues** — natural hazards and other community issues;
- **Community support and involvement;**
- **Policies that specifically address hazards;**
- **Coordination** — consistency with federal, state, regional, and internal community plans.
- **Implementation** — goals linked to specific actions; and
- **Organization** — a plan that is readable, comprehensible, and easy to use.

To produce a planning safety rating, IBHS used these elements to create a checklist of 71 items that planners could use. The typical community scored 48%, which earned a B minus on the IBHS safety report card. A surprisingly high percentage—8%—scored zero. On average, plans scored well above 50% on four of the eight elements—basics, citizen involvement, consistency, and organization. This is encouraging, because it means that local comprehensive plans provide a good basis for future growth and development. Overall, though, plans fell short in the areas that are most important for safe growth. They contained 40% or fewer of the items related to vulnerability, identification of issues, new policies and programs, and ways to implement these measures.

Most survey participants said they would be willing to use the information in the booklet to include safety considerations in their plans. However, they also said hazards planning elements would be difficult to implement without public demand as well as additional funding, support from elected officials, and technical assistance to do this type of

Average Scores

Overall Plan Quality = 48%

Plan Basics	66%
Quality of Data	30%
Issues Identified	39%
Community Support	62%
Policies	34%
Coordination	57%
Implementation	39%
Organization	57%

planning. Other needed support included better mapping and data, state mandates for planning, additional staff, and legislative changes.

States and Hazard Planning

The importance of interest at the state level was borne out by the sharply higher scores in the six states that require local planning that takes into account natural hazards risks. This indicates that one key to better performance is state-mandated local comprehensive plans.

Are We Planning Safer Communities? found that a typical municipal land-use plan addresses only half the elements that contribute to a safe, hazard-resistant community. Communities in six states scored highest in planning for safety—Florida (statewide), Nevada (large cities and counties only), North Carolina (coastal region communities only), Oregon (statewide), South Carolina (coastal communities only), and Washington (growth management act jurisdictions). These states required local planning, specified that plans must attend to safety from natural hazards, and required that local plans be consistent with state policy. Scores in these six states averaged 55% higher than localities in states that did none of these things.

Where states did not mandate planning but had established specific requirements for intergovernmental consistency and a hazards element in local plans, community scores were nearly 30% higher. Two states—Georgia and Nevada (for smaller cities and counties)—fell into this category.

There was also a significant trend toward higher average scores for communities in states that mandate local comprehensive plans with hazard elements. In states with planning mandates but no requirements for consistency or hazard safety elements, scores dipped closer to the overall average.

Why Be Concerned?

The need for land-use planning with hazards elements is increasing, particularly where the U.S. population is growing, because the greatest growth is occurring on the east and west coasts, along the Gulf of Mexico, and in and around forests and wildlands. These areas are at highest risk for major catastrophes such as hurricanes, earthquakes, landslides, and wildfires.

The United States is already seeing the effects of this growth in high-risk areas. Since 1989, the nation has frequently entered periods in which losses from catastrophic natural disasters averaged about \$1 billion per week. And these losses are expected to continue to rise (Mileti, 1999). This is a disturbing trend for the private and public entities that bear much of the financial risk associated with these losses.

Further, social and economic disruptions and environmental damage caused by natural disasters can affect entire states and regions as well as the nation. Proper land-use planning would help ensure that development and redevelopment occurs outside high-risk areas and/or employs mitigation measures to minimize the potential impacts of natural disasters. For instance, in low-lying areas where hurricanes can cause flooding, homes and businesses either would not be allowed or would be built (in conjunction with local building codes) in a manner that mitigates risk.

Hazards safety policies within community plans can make it easier to implement necessary zoning ordinances

and building code requirements. Such policies can also help inform municipal departments, real estate developers, and the public about the extent and magnitude of natural hazards risks in a community.

Diana L. McClure, Consultant, and
Members, Land Use Planning Committee
Institute for Business and Home Safety

Burby, Raymond J., Editor

2001 *Delphi Survey of the Impacts of Hazard Adjustments on Property Losses from Selected Natural Hazards, 2000-2050: Summary of Findings*. Chapel Hill: University of North Carolina-Chapel Hill, Department of City and Regional Planning.

Mileti, Dennis S.

1999 *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Washington, D.C.: Joseph Henry Press.

Are We Planning Safer Communities? Results of a National Survey of Community Planners and Natural Disasters (2002, 24 pp., free) is available from the IBHS web site: http://www.ibhs.org/research_library/view.asp?id=289. Click on "Appendix B" for the survey booklet. *The IBHS Showcase State Model for Natural Disaster Resistance and Resilience*, which includes state and local planning concepts, is also available at http://www.ibhs.org/research_library.

Storms of '98 Now Available in Spanish

Last year, we announced the availability of the Hazard Center's Special Publication 38, *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 (see the *Observer*, Vol. XXV, No. 6, p. 5). That work examines the response and "disaster politics" (including media coverage) associated with Hurricane Georges in the Dominican Republic and Hurricane Mitch in Honduras and Nicaragua. The focus is the "marginalization" of national emergency response agencies. These organizations—typically small national civil defense offices—were quickly shouldered aside when the disasters became major catastrophes demanding international attention and aid. New, temporary offices were established, with consequent duplication of effort, lack of coordination, and poor response.

To deal with this difficulty in the future, Olson and his colleagues offer their "accordion option" under which a national emergency organization recognizes its probable marginalization and therefore prepares a plan for the head of state that 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.

To make this important work available as widely as possible, *The Storms of '98* has been translated into Spanish and is now available free from the web site of the Regional Disaster Information Center (CRID) in San José, Costa Rica, at <http://www.crid.or.cr/crid/ENG/NEWS/Noticia15.htm>. In English it remains available from <http://www.colorado.edu/hazards/sp/sp.html>.

Persons desiring a printed copy can still purchase *The Storms of '98* for \$20.00, plus shipping (\$5.00, U.S.; \$8.00, Canada; \$12.00, Mexico; \$18.00, beyond North America) from 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*.

Even More Quick Response Reports from the Hazards Center

Wildfire

In the summer of 2000, numerous firestorms raged across the western United States. Several areas in Montana, especially the Bitter Root Valley, were severely impacted. To better understand human response to these events, Sarah J. Halvorson, a geographer at the University of Montana, examined the effects in several communities severely affected by the fires. She collected data on the extent of damage, perceptions of fire, local strategies for coping with fire impacts, and the various roles of community-based organizations in the response and recovery process. The results indicate that, on the whole, the communities were quite resilient during and after the firestorms, but that some mountain settlements were more vulnerable to fire risks than others. At the same time, everyone living in the valley had to endure the smoke and the trauma associated with this event. Halvorson's report—*The Fires of 2000:*

Community Response and Recovery in the Bitter Root Valley, Western Montana

(Natural Hazards Center Quick Response Research Report #151, 17 pp.)—concludes by highlighting both practical and policy-oriented lessons regarding recovery in the wildland-urban interface. *The Fires of 2000* is available free from the Natural Hazards Center web site: <http://www.colorado.edu/hazards/qr/qr151/qr151.html>.



A Tornado

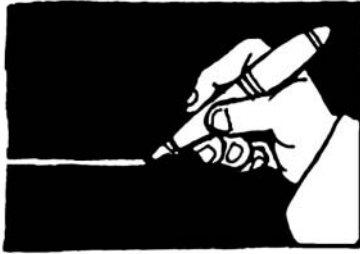
On April 21, 2001, a category F-4 tornado struck the small central Kansas town of Hoisington, leaving one person dead, dozens injured, and millions of dollars in damage. Based primarily on a survey of those that endured this disaster, Quick Response Report #154—*Emergency Support Satisfaction Among 2001 Hoisington, Kansas, Tornado Victims* (26 pp.)—examines respondent overall satisfaction with disaster relief as well as satisfaction with each of four major sources of support—government agencies, private insurance companies, volunteer organizations, and business communities. Despite general satisfaction, respondents indicated that they faced difficulties in obtaining support from these sources, and they offered suggestions regarding how these sources might improve future emergency assistance efforts. *Emergency Support Satisfaction* was prepared by Bimal Kanti Paul and Jeanenne Leven of the Geography Department at Kansas State University. It is also available from the Natural Hazards Center web site: <http://www.colorado.edu/hazards/qr/qr154/qr154.html>.

9/11 x 2

In their quick response study—*Public/Private Collaboration in Disaster: Implications from the World Trade Center Terrorist Attacks* (Quick Response Report #155, 18 pp.)—Richard Weber, David McEntire, and Robie Robinson of the University of North Texas examined the interaction of businesses and government agencies following the World Trade Center disaster. They found that the private sector clearly played vital and varied roles in emergency response—indeed, that the contributions of businesses in all aspects of emergency management were significantly underestimated. Moreover, they found that the roles of the two sectors were so entwined that the distinction between the two was not always clear. Still, coordination issues did emerge, and these are documented with recommendations for their amelioration and for needed additional research. *Public/Private Collaboration in Disaster* is available at: <http://www.colorado.edu/hazards/qr/qr155/qr155.html>.

Following September 11, hazards researcher Lori Peek went to New York to “explore the response of and reaction toward Muslim students on college and university campuses in the . . . region.” She explains, “Given the unique nature and magnitude of the events of September 11, it was important to document and analyze what was happening to one of the primary groups being targeted for blame.” Her report, peppered with numerous quotations from those she interviewed, clearly indicates that Muslim students feared for their own safety following September 11 and that many of them had been directly or indirectly confronted regarding the terrorist attacks, but also that most realized the people who directed anger toward them represented only a small fraction of the American population. Peek concludes that longer-term research is not only necessary to understand the consequences of these attacks for the entire Muslim population in the U.S., but that such research could inform national policy regarding the safety and well-being of all Americans. *Religious and Ethnic Issues After September 11, 2001: Examining Muslim University Student Experiences* (15 pp.) is available at <http://www.colorado.edu/hazards/qr/qr156/qr156.html>.

These reports are the result of the Natural Hazards Center's Quick Response Program, which allows researchers to examine the effects of disasters immediately after they happen. Besides being available free on the web, the reports can be purchased for \$5.00, plus \$4.50 shipping, from the *Publications Administrator, Natural Hazards Center, University of Colorado, 482 UCB, Boulder, CO 80309-0482; (303) 492-6819; fax: (303) 492-2151; e-mail: janet.kroeckel@colorado.edu*.



ON THE LINE

Making Cities Safer . . . Before Disasters Strike

Rapid urbanization is a global phenomenon, and as populations concentrate in growing cities, they become increasingly vulnerable to natural and technological disasters. The Asian Disaster Preparedness Center (ADPC) recently launched the “Safer Cities” case study series to present useful strategies for urban disaster mitigation derived from analyses of real-life experiences, successful practices, and lessons learned in Asian cities.

Cities of Asia are changing the way they think about disasters. In the past, there was a tendency to respond to disasters as they occurred, with actions focusing primarily on response and relief. In recent years, a more comprehensive approach has emerged that focuses on actions taken prior to disaster to reduce human suffering, economic losses, and institutional collapse. This approach integrates disaster risk reduction with sustainable economic, social, and environmental development.

Asia is the most disaster-affected region of the world. In the last decade, nearly 60,000 people were killed and 190 million more were affected by disasters in Asia. This represents nearly 80% of fatalities and 90% of the total global population impacted by disasters. Exacerbating this problem, Asia is the fastest urbanizing region in the world, and nearly half of Asia’s population is expected to live in urban areas by 2015.

Recognizing the challenges of urbanization and responding to the need for safer cities, ADPC implemented the Asian Urban Disaster Mitigation Program (AUDMP) in 1995 (see the *Observer*, Vol. XXI, No. 2, p. 8), and the program has resulted in a range of strategies and mechanisms for urban disaster mitigation.

The AUDMP works to build the capacity of local authorities, national governments, nongovernmental organizations, businesses, and other groups responsible for disaster mitigation. It also facilitates information sharing and dialog among key stakeholders to promote successful approaches in other cities and countries. The AUDMP currently has programs in Bangladesh, Cambodia, India, Indonesia, Lao PDR, Nepal, Philippines, Sri Lanka, Thailand, and Vietnam.

The program’s Safer Cities publication series highlights the experiences of Asian cities. It is designed to provide decision makers, planners, city and community leaders, and others with ideas, tools, policy options, and strategies for urban disaster mitigation. Key principles include broad-based participation, partnerships, sustainability, and replication of success stories.

The first three case studies in this series have been published. They include:

- *Safer Cities 1: Community Based Initiatives in Kathmandu Valley, January 2002.* This study highlights lessons from a project in Kathmandu to establish a community-based disaster management process and implement a school earthquake safety program.
- *Safer Cities 2: Coping with Flood in Cambodian Communities, February 2002.* This study features the development of an organizational framework for flood vulnerability reduction in 23 Cambodian communities.
- *Safer Cities 3: Mitigating Flood Risk in Cambodian Communities, March 2002.* This research focuses on resource mobilization and proposal development, implementation of mitigation measures, and preparedness planning.

Three more case studies will be published this year dealing with public awareness and school earthquake safety programs in Indonesia and Nepal.

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Persons interested in receiving copies of the Safer Cities case studies should contact the ADPC, P.O. Box 4, Klong Luang, Pathumthani 12120, Thailand; fax: (662) 524-5350; e-mail: ccapikul@ait.ac.th; WWW: <http://www.adpc.ait.ac.th>.



WASHINGTON UPDATE

FEMA Releases World Trade Center Building Performance Study

The collapse of the twin towers in New York resulted in the largest loss of life from any single building collapse in U.S. history. Of the 58,000 people estimated to be at the World Trade Center complex that day, nearly 3,000 lost their lives. Structural damage combined with the ensuing fires resulted in the total collapse of each building, and, as the towers fell, massive debris clouds fell onto and blew into surrounding structures, causing extensive collateral damage and, in some cases, igniting fires and causing additional collapses. In total, 10 major buildings experienced partial or total collapse and nearly 30 million square feet of commercial office space was rendered unusable.

Following disasters, FEMA and other organizations send teams of experts to study the impacts—in this case, why the buildings failed—and to obtain knowledge that may prevent similar disasters. Immediately after the collapse of the towers, FEMA, the American Society of Civil Engineers (ASCE), and other organizations deployed a team to study the performance of the buildings. The results of their initial observations are now available in the report, *World Trade Center Building*

Performance Study: Data Collection, Preliminary Observations, and Recommendations (2001, 256 pp., free).

The report describes the World Trade Center site, the affected buildings, emergency egress, emergency power, management procedures for emergencies, the response of each tower to the impacts of the planes, and the buildings' substructures. One conclusion is that the remarkable ability of the structures to remain standing for an extended period despite massive damage allowed most building occupants to evacuate safely. The report also recommends that resources be directed toward aviation safety and other security measures rather than hardening buildings against airplane impacts. Other recommendations address design issues and fire, the need for greater interaction among various professions involved in building design and fire protection, the importance of building evacuation research, the protection of emergency responders, the education of stakeholders, and the need to archive the information regarding this tragedy.

The complete study can be found on the U.S. House of Representatives Committee on Science web site: <http://www.house.gov/science/hot/wtc/wtcreport.htm>. A seven-page executive summary is available from the FEMA web site: http://www.fema.gov/diz01/wtc_exsm.pdf.



Administration Creates Interagency Wildland Fire Leadership Council

On April 10, Agriculture Secretary Ann M. Veneman and Interior Secretary Gale Norton announced the creation of a new Interagency Wildland Fire Leadership Council to provide cabinet-level coordination of wildland firefighting and to further implement the National Fire Plan (see the *Observer*, Vol. XXVI, No. 4, p. 8). The new council is comprised of departmental and land management officials from both departments who are responsible for wildland fire management. Staffing of the council will be coordinated by the Department of Agriculture's Office of Fire Aviation Management and Interior's Office of Wildland Fire Coordination.

The council will work with elected state, local, and tribal officials and other federal partners on wildland fire management policies. Among its activities, the council will work

with state partners and local communities to help restore landscapes, rebuild communities, conduct projects to reduce fire risk, and assess the economic needs of areas damaged by fire.

The new council will identify and prioritize projects to aid communities most at risk, reduce hazardous fuels, improve forest health, and monitor and evaluate project results. It will oversee interagency performance and ensure common procedures regarding natural fuels reduction.

Further information regarding the new council and the National Fire Plan can be found on-line at <http://www.fireplan.gov>.

GAO Issues Report Critical of Wildland Fire Agencies

The General Accounting Office (GAO) recently issued a sharp criticism of federal agencies responsible for managing wildland fires on federal lands. *Severe Wildland Fires: Leadership and Accountability Needed to Reduce Risks to Communities and Resources* (Report No. GAO-02-259, 46 pp., free) details a series of concerns with the overall federal response to fire management. The GAO concluded that:

- The federal effort to reduce hazardous fuels lacked clearly defined and effective leadership;
- Little progress has been made in implementing a sound performance accountability framework to spend the millions of dollars appropriated by Congress and President Clinton in 2000 for reducing hazardous fuels;
- High risk communities have not been identified and prioritized; and
- Multiple strategies for reducing fuels have been developed with different goals and objectives.



In written responses that are included in the report, the secretaries of the Departments of Agriculture and Interior refuted many of the findings and offered examples of agency progress in meeting the requirements of the legislation. Copies of the report can be obtained from the *U.S. General Accounting Office, P.O. Box 37050, Washington, DC 20013; (202) 512-6000; fax: (202) 512-6061; http://www.gao.gov*.

USGS Creates Earthquake Research Committee

The U.S. Geological Survey (USGS) recently announced the establishment of the Scientific Earthquake Studies Advisory Committee to advise the director of the USGS on matters relating to that agency's participation in the National Earthquake Hazards Reduction Program (NEHRP).



At the committee's first meeting in May, the group reviewed the program's current status and USGS' five-year NEHRP plan. Congress created the committee through Public Law 106-503, passed in November 2000, to advise the director on the survey's roles and objectives within the NEHRP, and establish and measure performance goals. The committee is required to issue an annual report to the director before September 30 of each year that describes the committee's activities and addresses policy issues.

To obtain more information about the committee, contact *John Filson, USGS, 12201 Sunrise Valley Drive, Reston, VA 20192; (703) 648-6785*.

Corporation Expands Allowable Activities to Include Homeland Security

The Corporation for National and Community Service, a federal agency that provides grants for volunteer programs to meet community needs, recently announced that recipients may redirect their program activities to homeland security. The corporation defines homeland security to include programs that support public safety, public health, and disaster preparedness and relief.

In his State of the Union Address in January, President Bush announced the creation of the USA Freedom Corps that will work with key service agencies in government and the nonprofit sector to provide opportunities for volunteers to

serve at home and abroad. The corporation and its programs—the National Senior Service Corps, AmeriCorps, and Learn and Serve America—are included in these efforts.

For public safety, the corporation will support volunteers that aid police and fire departments, rescue teams, emergency response agencies, and land management agencies. Activities could include organizing neighborhood watch groups, community policing, providing victim assistance, and undertaking other tasks.

Public health activities include assisting with immunization, distributing public health information, and providing health screenings.

Disaster Preparedness and Relief volunteers have a long history of working with the Federal Emergency Management Agency (FEMA) and other agencies, helping communities respond to disasters.

The organizations that currently receive program grants or any type of federal assistance from the corporation are encouraged to refocus activities to support homeland security.

The corporation's announcement of this policy appeared in the March 8 *Federal Register* (Vol. 67, No. 46, pp. 10689-10690), which can be found in any *federal repository library* or on-line at <http://www.access.gpo.gov>.

FEMA Creates Local Government "Write Your Own" Pilot Project

Many local and state governments contribute funds to an insurance "pool" in order to obtain lower-cost coverage for liability, property damage, and other types of risk. FEMA's Federal Insurance and Mitigation Administration (FIMA) recently launched a three-year pilot project that will permit six governmental risk-sharing pools to sell flood insurance to



public entities under the National Flood Insurance Program's Write Your Own (WYO) effort. The WYO Program allows participating property and casualty insurance companies to write and service the Standard Flood Insurance Policy in their own names. The companies receive an expense allowance for policies written and claims processed, while the federal government retains responsibility for underwriting losses. The WYO Program operates within the National Flood Insurance Program (NFIP) and is subject to its rules and regulations.

To determine program participants, FEMA will accept two nominations each from the National League of Cities, the National Association of Counties, and the Association of Governmental Risk Pools. Officials at FEMA will then

choose up to six organizations that meet its criteria. Nominations may include a public entity risk-sharing organization, an association of state and local governments, a state association of political subdivisions, a state-sponsored municipal league, or any other intergovernmental risk-sharing pool. The program will end September 30, 2004.

The final rule for this pilot program can be found in the March 22 *Federal Register* (Vol. 67, No. 56, pp. 13540-13551). Information about FIMA and the NFIP can be found on the FEMA web site: <http://www.fema.gov/fima>.

President Creates Homeland Security Advisory Council

On March 21, President Bush issued an executive order that established the President's Homeland Security Advisory Council (PHSAC) along with senior advisory committees for homeland security. The council will have 21 members that are appointed by the president and that represent the private sector, academia, professional service organizations, federally funded research and development centers, non-governmental organizations, state and local governments, and other groups. The executive order also requires that the chair and vice chair of the National Infrastructure Advisory Council, the chair of the President's National Security Telecommunications Advisory Council, the chair of the President's National Security Telecommunications Advisory Committee, and the chair of the Panel on the Science and Technology of Combating Terrorism from the president's Council of Advisors on Science and Technology also serve as members.

The PHSAC will provide advice to the White House on a national strategy to secure the United States from terrorist attacks; recommend ways to improve coordination, cooperation, and communication among federal, state, and local officials and private and nonprofit entities; and provide a means to collect scholarly research, technological advice, and information concerning homeland security. The council will also advise the president regarding implementation of measures to prepare for, prevent, protect against, respond to, and recover from terrorist threats and attacks.

The complete text of Executive Order 13260 can be found on the White House web site: <http://www.whitehouse.gov/news/releases/2002/03/print/20020321-9.html>.

FEMA Funds Largest Crisis Counseling Grant in Agency History

As part of its continuing response to 9/11, FEMA recently approved a \$132 million Regular Services Crisis Counseling Grant to provide additional emotional support to New York State's Project Liberty outreach program.

The program helps victims to address grief, reduce stress, review their options, and ultimately move forward with their lives. It encourages victims to link with others in their community and helps identify and refer people who may need

services outside the scope of the crisis counseling program. Project Liberty uses trained counselors from within respective communities. The \$132 million approved by FEMA for the World Trade Center disaster is the largest Regular Services Grant in the agency's history, coming close to the total amount of \$147.9 million awarded for this type of grant in declared disasters since 1974.

For more information about Project Liberty, call (800) 543-3638 or view their web site at <http://www.projectliberty.state.ny.us>.

President Signs Bioterrorism Preparedness Act

In June, President Bush inked his approval of the Bioterrorism Preparedness Act of 2001, which was created to improve the federal response to bioterrorism. The bill provides new authorities and responsibilities for the secretary of Health and Human Services (HHS) concerning bioterrorism preparedness and response to public health emergencies. Specifically, it requires the secretary to develop and implement a plan that includes criteria for measuring the progress made at national, state, and local levels toward preparedness for such an attack.

The legislation requires the maintenance of an "adequate national strategic pharmaceutical stockpile of vaccines, therapies, and medical supplies" for use at the secretary's discretion in the event of a biological threat, attack, or other public health emergency. It further expands the role of the Centers for Disease Control and Prevention and requires the creation of a coordinated network of public health laboratories to assist with the detection of and response to such risks.

Congress also required the appointment of an Assistant Secretary for Emergency Preparedness to head the Office of Emergency Preparedness in HHS. The legislation directs the National Disaster Medical System to provide appropriate health and social services in response to a health emergency if the HHS Secretary activates the system. In turn, the secretary is required to provide, within 48 hours, a written declaration to Congress indicating that an emergency under this provision occurred.

In addition, Congress directed HHS, in coordination with the Department of Defense; FEMA; the U.S. Attorney General; the secretaries of Veterans Affairs, Labor, and Agriculture; and other agencies to establish a joint interdepartmental working group to address prevention of, preparedness for, and response to a biological threat or attack on the civilian population.

Two new advisory committees are to be established—the National Task Force on Children and Terrorism and the Emergency Public Information Communications Task Force, and Congress recommended the creation of an official federal web site on bioterrorism. Legislators increased appropriations of FY2002 funds to improve state and local public health capacities to detect, monitor, and respond to threats to public health, and enhanced regulatory

control of biological agents and toxins.

Additionally, the State Bioterrorism Preparedness and Response Block Grant Program was created and appropriations were authorized. The new program amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by requiring emergency preparedness plans to include guidance on how to provide information to the public. It also amends the Public Health Service Act to require the development of bioterrorism countermeasure educational programs for health care professionals, particularly regarding the special needs of children and other vulnerable populations. The National Institute for Occupational Safety and Health will expand research on the health and safety of workers who are at risk for biological threats and attacks in the workplace.

Additional measures address the need to increase the development of smallpox and other vaccines, develop the genome sequencing of pathogens, and provide research funding for improving our defenses against bioterrorism.

The safety of the U.S. food supply will be increased as well. The President's Council on Food Safety is required by the new legislation to develop a crisis communication and education strategy regarding terrorism. The Secretary of Agriculture is directed to enhance and expand food safety inspections; the secretary of HHS is required to expand the Food and Drug Administration to ensure the safety of food; and both departments will provide research funds to improve food safety. Other provisions address the importation of food, inspection of food manufacturers, and labeling; they provide funding to state and local governments for food inspections and investigations.

The complete text of this new law can be found at *any federal repository library* or on the Library of Congress web site: <http://thomas.loc.gov>.



LSU Announces New Center to Study Health Impacts of Hurricanes and Floods

Disease risk in Louisiana due to hurricanes is high. Forty percent of the state lies in a coastal zone where 70% of residents dwell. Ninety percent of this coastal zone is at or below sea level, and major population areas in that region, such as New Orleans, rank among the highest risks in the nation regarding societal, mortality, and economic impacts from hurricanes. To address these problems, the Louisiana State University Board of Regents, through its Health Excellence Fund (HEF), recently awarded a five-year contract to the university's Hurricane Center to establish the HEF Center for the Study of Public Health Impacts from Hurricanes and Floods.

Using New Orleans as a test case, the center will develop detailed models for the assessment and amelioration of public health problems due to hurricanes and major floods. To conduct this work, a multi-campus, multidisciplinary team was formed of representatives from the natural science, social science, engineering, mental health, and public health communities. Recent research indicates that even a category 3 hurricane could cause levy over-topping in the region, resulting in widespread and long-term flooding that would create biological and chemical contamination.

Using computer models, team members will calculate storm surges and rainfall flooding and use government databases and geographic information system technology to identify at-risk areas, determine probable chemical and sewage site releases, and simulate air and water movement of contaminants. The researchers will identify the impacts of these events and test various management scenarios.

For further information about this project, contact the *LSU Hurricane Center, Suite 3513 CEBA Building, Louisiana State University, Baton Rouge, LA 70803; (225) 578-4813; fax: (225) 578-7646; WWW: <http://www.hurricane.lsu.edu>.*



Transportation Research Board Creates Committee on Evacuation

The Transportation Research Board (TRB) Technical Committee on Transportation Safety Management, part of the National Academies of Science, has created a new Subcommittee on Emergency Evacuations. The first formal meeting of the subcommittee was held in January in Washington, D.C.

The subcommittee will explore:

- Operational and safety guidelines for interstates and other major roadways during evacuations, including design standards for interstate and other major highways that could be used “contra-flow” for evacuations;
- Applications of technology and remote sensing for evacuations, including the collection, processing, and communication of roadway and weather data to decision makers, evacuees, businesses, and commercial carriers;
- Evacuation travel demand forecasting and operation planning;
- Human behavior and related issues in evacuations; and
- Traffic enforcement issues.

The subcommittee comprises a diverse cross-section of professionals with a range of transportation related expertise. Interested persons should contact *Brian Wolshon, LSU Hurricane Center, 3513 CEBA Building, Louisiana State University, Baton Rouge, LA 70803; (225) 578-5247; fax: (225) 578-5263.*

Announcing CIRI and TISP

In all disasters, natural or human-caused, maintaining the integrity of the built environment is critical to reducing damage and loss of life. Recently, two groups were formed that will work separately and together to make our critical systems more disaster resilient.

CIRI

The American Society of Civil Engineers (ASCE) launched the Critical Infrastructure Response Initiative (CIRI) to address infrastructure vulnerability and develop strategies for mitigating the effects of natural and human-caused disasters on critical elements of the nation's transportation, water, power, communication, and other important systems. As part of that effort, CIRI assembled two building performance study teams that are gathering data on the effects of the September 11 terrorist attacks in New York and Washington, D.C. (see the Washington Update section of this *Observer*).

CIRI will hold a series of "summits" wherein participants will share information and expertise needed to make the various components of the nation's infrastructure more secure. Summit topics include "The Critical Water Infrastructure Dialog," building systems security, and security for transportation systems.

TISP

In an effort to further their work, CIRI joined with construction industry groups and federal agencies to form an additional organization, The Infrastructure Security Partnership (TISP).

Spearheaded by the U.S. Army Corps of Engineers, TISP was established so that the collective technical expertise of professionals within both the design and construction industries and the government sector could collectively improve security. Other founding members include the American Institute of Architects, the Society of American Military Engineers, the American Council of Engineering Companies, the Federal Emergency Management Agency, the National Institute for Standards and Technology, and others.

The goals of TISP will be to assess infrastructure vulnerability; prioritize needed infrastructure renovation based on the results of vulnerability assessment; and determine research and development that will help protect critical elements, develop retrofit designs to mitigate disaster damage, formulate new design procedures, and improve disaster preparedness and response.

Other objectives of TISP include promoting efforts to improve antiterrorism and asset protection, disseminating infrastructure knowledge, transferring knowledge of effective security measures, and encouraging protocols related to the sensitivity of information generated by the new partnerships.

To obtain more information about CIRI, contact *Marla Dalton, Critical Infrastructure Response Initiative, American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191; (800) 548-2723*. To learn more about TISP, contact *Larry Delaney, U.S. Army Corps of Engineers, Engineering and Construction Division, (202) 761-4945*. Interested persons can also view the TISP web site: <http://www.tisp.org>.



WMO and Others Launch Associate Program on Flood Management

The World Meteorological Organization (WMO), the Global Water Partnership, and the Japanese government have established the Associate Program on Flood Management (APFM) to promote adoption of flexible structural and nonstructural solutions for flood-prone regions of the world. One of the main purposes of the project is to establish and encourage close cooperation among agencies and institutions concerned with flood management. The United Nation's International Strategy for Disaster Reduction is also involved with this initiative and will provide assistance in identifying international, regional, and national agencies relevant to this project.

To obtain further information or to become involved in the APFM, contact the *Hydrology and Water Resource Department, WMO, Case postale 2300, CH-1211, Geneva 2, Switzerland; e-mail: miyake_k@gateway.wmo.ch*.



INTERNET PAGES

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

All Hazards

<http://www.colorado.edu/hazards>

<http://www.colorado.edu/hazards/litbase/ask.htm>

To be honest, we're rather proud of the many resources and services available from the Natural Hazards Center web site; a lot of time and energy has gone into creating and, especially, maintaining the information there. However, if all those resources prove insufficient to answer your questions about hazards and disasters, the Hazards Center has now added another service to respond to specific requests for information. Just go to the second URL above and send us a question.

Besides the information made possible through our site, the Natural Hazards Center maintains an in-house library and databases of people, programs, organizations, and other sources of hazards/disaster information—including a new database, funded by the Public Entity Risk Institute, of professionals in sustainable disaster recovery. Thus, we should be able to answer your questions or point you in the right direction quickly . . . and at no cost to you. However, if your question requires an extensive database or bibliographic search or lengthy investigation, it would be necessary to charge a fee. Rest assured, however, we will contact you before undertaking such work.

<http://www.hazardmaps.gov/>

This is the web site of the Federal Emergency Management Agency's Multi-Hazard Mapping Initiative (MMI), which includes an on-line "Multi-Hazard Atlas." Users can scan a map of the U.S. and zoom in or out to determine the hazards of a particular location. They can also specify a state, zip code, or congressional district, as well as specific hazards.

<http://www.swissre.com>

The Swiss Reinsurance Company (SwissRe) issues several "Sigma Insurance Research Studies" each year. Study #1 for 2002, entitled *Natural Catastrophes and Man-made Disasters in 2001: Man-made Losses Take on a New Dimension*, is available from the SwissRe web site. In that report, the company notes that human-caused and natural catastrophes claimed more than 33,000 lives worldwide in 2001 and that the burden on property insurance due to catastrophe losses was extremely high (approximately \$34.4 billion), with an estimated \$19 billion incurred by property and business interruption losses arising from the events of September 11. Furthermore, the insurance industry must also cover liability and life insurance losses related to the attack, and those are estimated between \$16.5 and \$39 billion. Meanwhile, the estimated death toll for the earthquake in Gujarat, India, alone was 15,000, while about 3,000 people lost their lives in the terrorist attacks of September 11.

According to the study, 2001 would have gone down as an average loss year had it not been for September 11. However, this event confronted the insurance industry with an entirely new loss dimension. Until 2001 only natural catastrophes such as Hurricane Andrew, which resulted in losses of \$20.2 billion, or the Northridge earthquake, which resulted in losses of \$16.7 billion (at 2001 prices) had caused losses of this magnitude. The terrorist attack has exposed a new dimension of threat to the insurance industry, bringing up a number of questions regarding terrorism coverage.

To read the entire report, available in several different languages, see the web site above, click on "Research," then on "Sigma Insurance Research." Several other reports on natural hazard risks are available.

<http://www.heritagepreservation.org/>

Heritage Preservation is an organization that works to ensure the perpetuation of America's collective history and culture. One of its programs is the Heritage Emergency National Task Force, which helps individuals and institutions protect their collections in times of disaster. Its "Emergency Response and Salvage Wheel," an informational tool used by archives,

museums, and libraries across the country, is now available in Spanish. For details about the work of the task force or about obtaining a wheel, see the web site above, or contact *Heritage Preservation, 1730 K Street, N.W., Suite 566, Washington, DC 20006-3836; (202) 634-1422; fax: (202) 634-1435.*

<http://www.cidi.org>

The Center for International Disaster Information (CIDI), operated by Volunteers in Technical Assistance (VITA), disseminates information and guidance regarding appropriate international disaster relief. The CIDI web site offers guidelines, situation reports, a register through which commodities and technical assistance can be offered, general information about international disaster response, and current news about CIDI and its activities.

http://www.usaid.gov/procurement_bus_opp/procurement/annual_pstatements/sadp_aps_draft_042302k2.html

http://www.usaid.gov/procurement_bus_opp/procurement/annual_pstatements/apsforcfa.html

At these URLs, the U.S. Agency for International Development (USAID) has posted two Annual Program Statements that will be of interest to the larger hazards community: ***Enhanced Disaster Preparedness in South Asia: Through Community-Based and Regional Approaches*** and ***Climate Forecast Applications for Disaster Mitigation in Asia***.

<http://www.getcited.org>

This web site allows scholars to enter the details of any publications, papers, or presentations they might want others to know about, particularly works that are not indexed elsewhere, such as book chapters and conference papers. In its one year of existence, scholars from a wide variety of disciplines have added a great deal of content, including information about many publications on hazards and disasters. The result is an extremely powerful—and growing—academic search engine that also functions as an academic directory.

<http://www.apu.ac.uk/geography/d&scrn/>

The purpose of the Disaster & Social Crisis Research Network (D&SCRN) is to promote the study, research, and analysis of natural, technological, and social disasters “with a view to contributing to the development of disaster-resilient European communities and preventing or mitigating the human, economic, social, cultural, and psychological effects of disasters.” The network intends to achieve its scientific and social policy goals through the organization of sessions during the biannual conferences of the European Sociological Association, the convening of interim conferences and sessions at other meetings, the publication of an electronic newsletter, and the establishment of this web page. For more information, a list of members, and a copy of the network’s latest newsletter, see the URL above.

Earthquakes

<http://www.quake06.org>

In preparation for the 100th anniversary of the Great 1906 San Francisco Earthquake, the Earthquake Engineering Research Institute (EERI) Northern California Chapter has launched “Quake ’06”—a four-year campaign to reduce earthquake risk in the San Francisco Bay area intended for professionals, the media, and the general public (see the previous *Observer*, Vol. XXVI, No. 5, p. 9). Co-sponsored by many concerned California public and private organizations, and involving 150 volunteer earthquake professionals, Quake ’06 will be the largest citizen-based campaign ever launched in the U.S. to mitigate seismic risks. The primary message of the campaign is that most potential earthquake losses are manageable or avoidable, and a key strategy will be to spotlight how specific communities and other entities have successfully taken steps to reduce their risk. The campaign will then work with a broad range of groups to implement “best practices” on a wider scale. For more information about Quake ’06 see the new web site above.

<http://quake.abag.ca.gov>

<http://quake.abag.ca.gov/traffic/index.html>

As we’ve noted before, the Association of Bay Area Governments (ABAG) in California maintains an excellent web site with information regarding the many hazards affecting the Bay Area. The site focuses on earthquakes, of course, and includes a facility for generating ground shaking maps for a given location and quake magnitude. However, the site also covers other natural hazards. For an example of a new addition to the earthquake section, see the second URL above—a page on traffic and automobile problems that could arise during and following a quake. It includes a PDF file, available in English, Spanish, and Chinese, that can be used as a template for a guide regarding automobile earthquake preparedness.

Wildfire

<http://www.iawfonline.org>

This new web site of the International Association of Wildland Fire (IAWF), an organization of global wildland fire professionals, provides membership information, lists of upcoming events (see the Conferences and Training section of this *Observer*), and full-text reports and other documents, including *Wildfire* magazine and the *Journal of Wildland Fire*.

Floods and Drought

<http://www.worldwaterforum.org>

In preparation for the Third World Water Forum to be held next March in Japan (see the Conferences section of this *Observer*), the organizers have established a “Virtual Water Forum” at the above URL to initiate preliminary discussions about the numerous topics that will be covered at the meeting. Many issues are addressed, including flood, drought, and the effects of climate change on these two hazards. To join the discussion, see the web site above.

<http://www.hpc.ncep.noaa.gov/nationalfloodoutlook>

<http://www.hpc.ncep.noaa.gov/qpf/6hrqpfall.html>

The National Weather Service’s Hydrometeorological Prediction Center (HPC) produces a map that shows flood potential for the contiguous 48 states. Updated daily at 4 p.m., this five-day outlook provides an entry point for users seeking more detailed hydrologic information provided by the NWS’s regional River Forecast Centers and Weather Forecast Offices (WFOs). Official flood forecasts and warnings will continue to be issued by WFOs. At the second URL above, the HPC issues an excessive rainfall potential outlook. Areas identified on this map indicate locations where rainfall rates are forecast to exceed flash flood rates.

El Niño and Climate Change

<http://www.eird.org/homeing.htm>

The World Meteorological Organization (WMO) and Columbia University’s International Research Institute for Climate Prediction (IRI) are now issuing regular “El Niño Outlooks” for the United Nations Interagency Task Force on Natural Disaster Reduction. See the U.N. ISDR regional site above for the latest outlook.

That site also offers several new documents including the ISDR’s recently published *Review of Disaster Reduction Trends in the Americas, Natural Disasters and Sustainable Development: Understanding the Links Between Development, Environment and Natural Disasters*, the latest issue of *ISDR Informs—Latin America and the Caribbean, Guidelines for Producing a Community Risk Map*, and *Lessons Learned from the 2001 El Salvador Earthquakes, Education and Human Settlements*.



Terrorism

<http://www.ssrc.org/sept11>

The Social Science Research Council (SSRC) is an independent, nongovernmental, nonprofit, international organization that supports social science research, education, and scholarly exchange. The council has established this web site, entitled “Perspectives from the Social Sciences,” to disseminate a still-expanding collection of essays by leading social scientists from around the world regarding the events of September 11, their precursors, and subsequent terrorist attacks. These essays represent efforts by social scientists to bring theoretical and empirical knowledge to bear on those tragic events. The pieces are intended as resources for teachers—especially college and university instructors—who want to address the unfolding events in their courses. But they are also intended “for all of us who seek deeper understanding in these troubling times.”

<http://www.ojp.usdoj.gov/odp/docs/cip.pdf>

The U.S. Department of Justice’s Office of Domestic Preparedness (ODP) now offers several publications via <http://www.ojp.usdoj.gov/odp/docs>, including *Critical Incident Protocol: A Public and Private Partnership*, developed by Michigan State University’s School of Criminal Justice for the ODP. The document discusses how public and private institutions can (indeed, *must*) work together to assess risks, plan, and practice for emergencies, as well as develop mitigation measures to reduce impacts.

<http://www.engr.psu.edu/ae/wtc/wctragedy.html>

Professor Louis Geschwindner of Pennsylvania State University assembled this site in order to bring together many of the web articles that deal with the World Trade Center (WTC) and Pentagon tragedies. Although the articles focus on physical aspects of the WTC before, during, and after collapse, the site also includes sections covering Building Conditions Around

the WTC Site; WTC Site Clean-up; Occupancy of the WTC; Structural Investigation Teams; the Pentagon Site; Insurance Industry Response; General Political Information; as well as firsthand reports, numerous images, and other information.

<http://www.homelandsecurity.org/>

The September 11 terrorist attacks spurred interest in many national security issues. One place to find more information on the subject is the newly updated ANSER Institute for Homeland Security's Internet home page. The nonprofit research organization has added a "What's New?" column highlighting the institute's activities and publications, as well as new, interactive opinion polls. The home page directs readers to sections offering current news articles, library materials, and other resource pages.

<http://www.twotigersonline.com/resources.html>

The Two Tigers Radiological company has compiled this "definitive homeland security information resource," which includes sections entitled:

- Homeland Security Quick Links (links to relevant federal and state organizations and other resources)
- Nuclear/Radiological Emergencies
- Biological Emergencies
- Chemical Emergencies
- Hazardous Devices, Bombs and Explosive Ordnance Emergencies
- Natural Disasters (with "Instant Answers" to several natural disaster questions)

FEMA's Higher Education Project Seeking Contributions for "Practitioner's Corner"

The Federal Emergency Management Agency's Higher Education Project is interested in establishing a "Practitioner's Corner" on its web site, <http://www.training.fema.gov/EMIWeb/edu>. The purpose of this section is to create another means for emergency management professionals to communicate their thoughts and ideas concerning college-level hazard, disaster, and emergency management classes and programs to the educators responsible for those programs. The organizers envision short papers on such subjects as:

- types of competencies that should be emphasized in such courses,
- perspectives on different ways to examine or approach emergency management,
- case studies of disasters,
- lessons learned in bureaucratic politics,
- success stories/failures, and
- public policy issues.

Submissions and questions should be sent to the *Higher Education Project Manager, Wayne Blanchard*, e-mail: wayne.blanchard@fema.gov. Selected papers will be posted on the Higher Education web site; the project reserves the right to edit content.

[Adapted from the *IAEM Bulletin*—the newsletter of the International Association of Emergency Managers]





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 from the Natural Hazards Center's web site: <http://www.colorado.edu/hazards/grants.html>.

Urban Stream Corridor Management in the United States: The Interaction of Ecology and Policy. Funding: National Science Foundation, \$208,820, 24 months. Principal Investigators: *Rutherford Platt, Center for Public Policy and Administration, Ecological Cities Project, Department of Geosciences, University of Massachusetts, Amherst, MA 01003; (413) 545-2499; fax: (413) 545-1200; WWW: <http://www.umass.edu/ecologicalcities>; and Timothy Beatley, School of Architecture, Campbell Hall, University of Virginia, Charlottesville, VA 22903; (804) 982-2196; e-mail: tb6dtombboy6dog@virginia.edu.*

This award will be used to investigate current practice regarding the incorporation of ecological knowledge into public policies concerning urban stream corridors, wetlands, and estuaries. The researchers will undertake a survey of recent experiences in selected U.S. metropolitan areas, conduct regional workshops, and examine case studies related to the approaches identified from the survey and workshops. They hope to show the relative contributions of ecological and political factors in managing urban land-water resources. The study will incorporate elements of physical and natural sciences, urban geography, law, economics, and public policy research.

Turning to Digital Government in a Crisis: Coordinating Government, Business, and Nonprofit Services in Response to the World Trade Center Attacks of September 11, 2001. Funding: National Science Foundation, \$100,931, 12 months. Principal Investigator: *Sharon S. Dawes, Center for Technology in Government, 1535 Western Avenue, State University of New York-Albany, Albany, NY 12204; (518) 442-3027; e-mail: sdawes@ctg.albany.edu.*

Through interviews with key participants, this project will examine what government agencies did in the midst of and immediately after the attacks on the World Trade Center as well as how information technologies were used. Starting at Pier 92, where New York City's Emergency Operations Center was re-established after being demolished in the

collapse of the Trade Center towers, this study will document the relationships, information flows, and actions in response to this tragedy.

An Integrated Transportation Network Reliability Analysis Framework. Funding: National Science Foundation, \$375,000, 48 months. Principal Investigator: *Anthony Chen, Department of Civil Engineering, Utah State University, Logan, UT 84322; (435) 797-7109; e-mail: achen@cc.usu.edu.*

Resilient transportation infrastructure is critical to restoration normalcy following earthquakes and other natural or human-caused disasters. Nonetheless, reliability analysis has received very little attention in transportation research. The investigator in this project will develop a reliability analysis framework that will include estimating maximum capacity of a transportation network and route choice models that account for both traveler perception error as well as the uncertainty of network travel times.



Earthquake Center Announces New Research Program

Thanks to a grant from the National Science Foundation and the U.S. Geological Survey, the Southern California Earthquake Center (SCEC) has established the Information Technology Research Program to create an on-line collaborative system to organize information about earthquakes and allow scientists to conduct their research interactively and more efficiently. The \$2 million grant is part of the SCEC base funding of \$36 million per year for the next five years.

Founded in 1991, SCEC was created as a research partnership between the state of California and the earthquake scientific community. The center's membership consists of 14 core academic institutions that contribute to SCEC's research objectives. The center has worked both to understand earthquakes in southern California and to improve public awareness and preparedness for quakes.

For more information about SCEC and its recent funding, contact the center at the *University of Southern California, 3651 Trousdale Parkway, Suite 119, Los Angeles, CA 90089-0742; (213) 740-5842; fax: (213) 740-0011; e-mail: SCECinfo@usc.edu; WWW: <http://www.scec.org>.*

NATO to Fund Catastrophe Research

A program of scientific and technological cooperation between NATO and Russia has recently been developed under the NATO-Russia Joint Science Technological Cooperation agreement. Funding has been made available for research in three areas, one of which is "Forecast and Prevention of Catastrophes: Safety in Natural and Industrial Aspects."

The goal of NATO and the Ministry of Industry, Science and Technology of the Russian Federation is to develop tools and knowledge that will:

- Decrease vulnerability and impacts of catastrophic events on natural, social, economical, and technical systems; and
- Improve forecasting and enhance management of risks for these complex systems.

Specific opportunities include research and new applications in hazard identification, risk analysis, and risk reduction.

Further information about this new program can be found on-line at <http://www.nato.int/science/e/russia/info.html>. To apply for support, an application form should be submitted jointly by scientists from Russia and one or more NATO countries. The deadline for receipt of applications is September 15, 2002.

EERI Expands Its Learning from Earthquakes Program

The Earthquake Engineering Research Institute (EERI) recently received a \$3.1 million grant from the National Science Foundation to expand its Learning from Earthquakes program (see the *Observer*, Vol. XXIII, No. 5, p. 1), which supports postearthquake investigations to understand the effectiveness and failures of earthquake engineering. Following a recent one-day training session regarding postearthquake investigation skills and an invitational workshop to develop damage data collection protocols, four research projects were selected for funding. They are:

- **2001 Nisqually, Washington, Earthquake: Business Recovery and Reconstruction.** Principal Investigator: *Kurt McMullin, San Jose State University, California.*
- **2001 El Salvador Earthquakes: Appropriateness of the Rehabilitation and Reconstruction Response.** Principal Investigator: *Dominic Dolwing, University of Technology, Newcastle, New South Wales, Australia.*
- **1999 Kocaeli, Turkey, Earthquake: Evaluation of Earthquake Performance of Highway Bridges and Viaducts, Immediate Post-EQ Actions and Retrofit Applications.** Principal Investigator: *Mustafa Erdik, Kandilli Observatory and Earthquake Research Institute, Bogazici University, Istanbul, Turkey.*
- **1994 Northridge, California, Earthquake: Re-assessing Earthquake Losses in Woodframe Houses.** Principal Investigator: *David Bonowitz, Consultant, San Francisco, California.*

Further information about this expanded research effort can be obtained from *Marjorie Green, EERI, 499 14th Street, Suite 320, Oakland, CA 94612-1934; e-mail: mgreene@eeri.org.*

NASA Launches Six-Year Study of Earth's Water

On May 4, NASA launched its Aqua satellite to study the many ways that water affects the climate and how that relationship may be changing. The satellite is designed to follow the cycle of the earth's water in its many forms to determine whether the cycle is being affected by climate change.

The Aqua Project is a multi-disciplinary study of the earth's interrelated processes (atmosphere, oceans, and land surface) and their relationship to earth system changes. Specifically, Aqua instruments will contribute to global change research in the areas of



atmospheric temperature and humidity profiles, clouds, precipitation and radiative balance; terrestrial snow and sea ice; sea surface temperature and ocean productivity; soil moisture; and the improvement of numerical weather prediction. The \$952 million program, planned to last six years, should also improve understanding of biological systems dependent upon water, enhance long-term weather and climate forecasting, and further knowledge regarding severe storms.

For additional information about the Aqua satellite program, see <http://aqua.gsfc.nasa.gov/>.

New Version of HAZUS Earthquake Loss Estimation Software Released

Hazards U.S. (HAZUS) is a software program developed by the Federal Emergency Management Agency (FEMA) in partnership with the National Institute of Building Sciences (NIBS) to estimate losses from potential earthquakes. The agencies have recently released a new, updated version. HAZUS99-SR2 has several new features:

- An "Advanced Engineering Building Module" for analyzing damage and loss in individual buildings,
- An outdoor casualty estimation capability, and
- Metadata for the inventory databases.

In addition, many other improvements and fixes have been made in the areas of inventory, hazard characterization, damage and loss modules, report writing, and operating software.

An article describing the new features of the software is available from <http://www.scec.org/resources/020502hazus.html>. To order CD-ROM sets of the new version of HAZUS, print out and fax the order form available from http://www.fema.gov/hazus/re_form.htm, or call the *FEMA Distribution Center*, (800) 480-2520.

For more information about HAZUS, training opportunities, and future developments (including flood and wind modules), see <http://www.fema.gov/hazus>.

[Adapted from *SCEC News*—an e-mail newsletter of the Southern California Earthquake Center]





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 web site: <http://www.colorado.edu/hazards/conf.html>.

National Emergency Management Association (NEMA) Annual Conference. Asheville, North Carolina: September 1-5, 2002. NEMA is the professional association of state, Pacific, and Caribbean state emergency management directors. The association's annual meeting not only offers opportunities to learn about the latest issues and innovations in emergency management, but also a chance to meet with federal elected and nonelected officials who determine and manage national programs dealing with hazards and disasters. For more information and registration materials, contact NEMA, c/o Council of State Governments, P.O. Box 11910, Lexington, KY 40578; (859) 244-8162; e-mail: nema_admin@csg.org; WWW: <http://www.nemaweb.org/index.cfm>.

Fall World 2002: 14th International Disaster Recovery Symposium and Exhibition. Sponsor: Disaster Recovery Journal (DRJ). Orlando, Florida: September 8-11, 2002. Details about this expansive biannual exposition are available from DRJ, P.O. Box 510110, St. Louis, MO 63151; (314) 894-0276; fax: (314) 894-7474; WWW: <http://www.drj.com/conferences/orl2002/8pg/>.

Disaster Management Workshops. Offered by: University of Wisconsin-Madison, Department of Engineering Professional Development. Madison, Wisconsin: September 23-27, 2002, and March 12-21, 2003. This program is intended for emergency managers in business, industry, government service, and community organizations, and covers emergency information management; disaster communications; response planning; damage, needs, and resources assessment; monitoring; evaluation; and reporting. For details, contact Don Schramm, e-mail: schramm@epd.engr.wisc.edu; or see <http://epdweb.engr.wisc.edu/courses> (click on "Disaster Management"). Interested persons can also contact Jennifer Oster, Department of Engineering Professional Development, University of Wisconsin-Madison, 432

Lake Street, Madison, WI 53706; (800) 462-0876; fax: (608) 263-3160; e-mail: oster@epd.engr.wisc.edu.

Regional Workshop on Best Practices in Urban Disaster Mitigation: Lessons Learned from the Asian Urban Disaster Mitigation Program (AUDMP) and Other Initiatives. Host: Asian Disaster Preparedness Center (ADPC). Bali, Indonesia: September 24-26, 2002. ADPC, with support from the U.S. Agency for International Development, Office of Foreign Disaster Assistance, is holding this regional workshop so that the center can share the insights gained from its seven-year AUDMP program and other urban disaster mitigation initiatives in Asia. The meeting will showcase how communities, city governments, and civil society groups have been able to introduce and sustain measures to reduce vulnerability to natural and technological hazards, and it will provide a forum for knowledge sharing so that the most effective urban disaster mitigation practices can be replicated worldwide.

Eight themes fundamental to urban disaster mitigation will be addressed:

- Hazard Mapping and Risk Assessment
- Mitigation Planning and Implementation
- Policy, Legal, and Institutional Arrangements
- Public Awareness and Education
- Capacity Building
- Safer Building Construction
- Community Based Approaches to Disaster Mitigation
- Climate Applications and Preparedness

A mailing list for the workshop has been established; for further information and updates, sign up by sending a blank e-mail to adpc-wkshp-subscribe@yahoogroups.com. Interested persons can also contact the Asian Disaster Preparedness Center (ADPC), Asian Institute of Technology, P.O. Box 4, Klong Luang, Pathumthani 12120, Thailand; tel: (66-2) 524-5354; fax: (66-2) 524-5360; e-mail: adpc@ait.th; WWW: <http://www.adpc.ait.ac.th>

AEG/AIPG Annual Meeting: "Gambling with Geologic Hazards." Sponsor: Association of Engineering Geologists (AEG) and the American Institute of Professional Geologists (AIPG). Reno, Nevada: September 24-27, 2002. Participants at this meeting will address such issues as environmental hazards, expansive soils, slope stability, liquefaction, landslides, and Great Basin fault hazards. For more information and registration materials, contact *Jonathan Price*; (775) 784-6691; e-mail: jprice@unr.edu; WWW: <http://www.aegweb.org>; or write to the AEG, Department of Geology and Geophysics, Texas A&M University, TAMU 3115, College Station, TX 77843-3115.

International Meeting of Mountain Cities: "World Heritage Mountain Cities and Natural Hazards." Sponsors: City of Chambéry in collaboration with UNESCO's Division of Earth Sciences and the UNESCO World Heritage Centre. Chambéry, France: September 25-27, 2002. This conference is part of France's larger effort to bring attention to the fate and importance of mountains during the United Nation's International Year of the Mountain (see the *Observer*, Vol. XXVI, No. 4, p. 20). Conference topics include: revising heritage site management plans relative to preventing natural disasters, protecting society from natural disasters, traditional knowledge and natural hazards, and scientific knowledge and disaster risk management. More information is available from *Wolfgang Eder*, UNESCO Division of Earth Sciences; e-mail: w.eder@unesco.org; WWW: <http://www.unesco.org/science/earthsciences>.

First International Training Course on Earthquake Disasters and Disaster Mitigation for Developing Countries. Sponsors: Chinese Ministry of Science and Technology (MOST), Commission on Earthquake Hazard, Risk and Strong Ground Motion (SHR); Asian Seismological Committee (ASC); and others. Beijing, China: October 6-20, 2002. During a training session, participants in this course will present papers, while a seminar will address the development of national seismic observation systems, countermeasures, and experiences in seismic hazard mitigation. Qualified papers will be published in English in a special volume of the peer-reviewed, regional journal *Earthquake Research*. For more information, contact *Su Xiao-Lan*, 5 Minzudaxuenan Road, IGCSB, Beijing 100081, China; tel: 86-10-6846-7978 or 86-10-6841-7859; fax: 86-10-6841-5372; e-mail: suxl@eq-igp.ac.cn; WWW: <http://www.icce.ac.cn/most/workshop.htm>.

Women and Disaster Management. Organizer: Indian Environmental Society. New Delhi, India: October 10-11, 2002. The recent earthquakes in Gujarat and the Orissa cyclone have demonstrated India's extreme vulnerability to natural hazards, while creating a growing understanding in the region that predisaster management is essential to reduce the impacts of such events and that the effects of these disasters differ among women, men, children, the elderly, and other subsets of society. This meeting is being convened in order to better understand and improve the socioeconomic condition of women before and after disasters. For more information, contact the *Indian Environmental Society*, U-112, Vidhata House, Third Floor, Shakar Pur, Vikas

Marg, Delhi-110092, India: tel: (911) 2046823/24; fax: (911) 2223311; e-mail: iesenro@del2.vsnl.net.in; WWW: <http://iesglobal.org>.

COSTO 2002. Sponsor: Council of Security and Strategic Technology Organizations (COSTO). Washington, D.C.: October 14-17, 2002. This conference is intended to accelerate the development and application of safety and security technologies; it will cover security, homeland defense, business continuity, disaster communications, and several other topics. For more information, contact *COSTO*, 421 Hudson Street, #320, New York, NY 10014; (212) 352-9720; e-mail: info@COSTO.info; WWW: <http://www.costo.info>.

Earthquake Loss Estimation and Risk Reduction. Bucharest, Romania: October 24-26, 2002. Topics to be addressed include seismic instrumentation and real time earthquake information, seismic hazards and site effects, ground motion input for building design, fragility analysis and seismic control techniques for buildings and structures, retrofitting and strengthening techniques for damaged structures, damage and risk modeling, disaster prevention, and earthquake insurance. For registration information, contact the *Conference Secretariat, INCERC, National Institute for Building Research*, 266 Pantelimon, Bucharest, 73559 Romania; tel: 40-1-255-7866; fax: 40-1-255-0062; e-mail: eler2002@hidro.utcb.ro; WWW: <http://www.utcb.ro/conferin/conference.html>.

- *Local- and Community-Level Disaster Risk Management.* October 14-25, 2002, and September 15-26, 2003.
- *Conflict Prevention, Resolution, and Reconstruction.* November 18-29, 2002, and May 19-30, 2003.
- *International Disaster Risk Management Course.* March 3-14, 2003.
- *Executive and Leadership Development Program for Emergency Managers.* July 14-25, 2003.
- *Management of Risk Due to Climate Change and Extreme Climatic Events.* November 17-28, 2003.

These and many other courses are offered by the International Institute for Disaster Risk Management (IDRM), with training taking place in Manila, Philippines. For more information, see <http://www.idrmhome.org>; or contact *IDRM*, P. O. Box 1005 Makati Central Post Office, Makati City 1250, Metro Manila, Philippines; tel: (63 2) 817 1434 or (63 2) 813 1668; fax: (63 2) 817 0894; e-mail: info@idrmhome.org.

Sixth International Conference on Corporate Earthquake Programs. Osaka, Japan: October 28-30, 2002. The objective of this meeting is to improve corporate earthquake preparedness programs by bringing together risk managers, earthquake hazard reduction practitioners, and researchers from both public and private sectors. Session topics include corporate and societal earthquake hazard mitigation, unique characteristics of recent disasters, emergency preparedness training in corporations, business continuity planning for public- and private-sector organizations, damage estimation and insurance, regional cooperation for disaster reduction,

and economic impacts of the New York September 11 attack. Additional information is available from *Guna Selvaduray, San Jose State University, Chemical and Materials Engineering Department, One Washington Square, San Jose, CA 95192-0082; (408) 924-3874; fax: (408) 924-4057; e-mail: gunas@email.sjsu.edu.*

Attacks and Encounters: Wildlife as Hazard. Sponsors: The James and Marilyn Lovell Center for Environmental Geography and Hazards Research and the Department of Geography, Southwest Texas State University. San Marcos, Texas: November 1-3, 2002. The presentations and papers at this conference will address aspects of unexpected human encounters with wildlife in their natural settings (on land; at sea; and in urban, suburban, and rural contexts). Details are available from *John Tiefenbacher, Associate Director for Research and Publications, The James and Marilyn Lovell Center for Environmental Geography and Hazards Research, Department of Geography, Southwest Texas State University, San Marcos, TX 78666; (512) 245-8327; fax: (512) 245-8353; e-mail: jt04@swt.edu; WWW: http://www.geo.swt.edu/centers/lovell/conference.html.*

American Water Resources Association (AWRA) 2002 Annual Water Resources Conference. Philadelphia, Pennsylvania: November 3-7, 2002. Session topics include the effects of climate change; flood forecasting, warning, and preparedness; flooding and floodplain management; and drought management. For more information, contact *Janet L. Bowers, Conference Chair, Chester County Water Resources Authority, West Chester, PA; (610) 344-5400; fax: (610) 344-5401; e-mail: jbowers@chesco.org; WWW: http://www.awra.org/meetings/Philadelphia2002.*

2002 Wildland Fire Safety Summit. Coimbra, Portugal: November 18-23, 2002. Complete information is available from the *International Association of Wildland Fire, 4025 Fair Ridge Drive, Suite 300, Fairfax, VA 22033-2868; (804) 833-2955; fax: (804) 326-0838; e-mail: meetingplanner@ichiefs.org; WWW: http://www.iawfonline.org.*

Interface 2002: Surviving the Danger Zone—A Conference Focusing on Wildland Urban Interface Fire. Kansas City, Missouri: December 4-6, 2002. Details are available from the *International Association of Wildland Fire, 4025 Fair Ridge Drive, Suite 300, Fairfax, VA 22033-2868; (804) 833-2955; fax: (804) 326-0838; e-mail: meetingplanner@ichiefs.org; WWW: http://www.iawfonline.org.*

22nd Annual Meeting of the Society for Risk Analysis (SRA). New Orleans, Louisiana: December 8-11, 2002. Although the SRA focuses on environmental risks, toxicology, technological hazards, and such things, its annual meeting often includes sessions on natural hazards and disasters. For more information about this year's meeting, contact the *Society for Risk Analysis, 1313 Dolley Madison Boulevard, Suite 402, McLean, VA 22101; (703) 790-1745; e-mail: sra@burkinc.com; WWW: http://www.sra.org.*

12th Symposium on Earthquake Engineering. Host: India Institute of Technology-Roorkee. Roorkee, India: December

16-18, 2002. This symposium will allow researchers, professionals, planners, and policy makers to share the latest knowledge and techniques regarding the mitigation of earthquake hazards. Abstracts of 250 words or less are due August 1. For details, e-mail the conference organizers at *l2see@rurkiu.ernet.in.*

Earthquake Engineering Research Institute (EERI) Annual Meeting. Portland, Oregon: February 5-8, 2003. For their 2003 annual meeting, EERI members will repair up the coast to view the beautiful Cascade Mountains, feast on fresh salmon, and discuss current problems and the cutting edge information and technology available to alleviate seismic hazards. For details, contact *EERI, 499 14th Street, Suite 320, Oakland, CA 94612-1934; (510) 451-0905; fax: (510) 451-5411; e-mail: eeri@eeri.org; WWW: http://www.eeri.org.*

2003 International Disaster Management Conference: "Disaster 2003." Sponsor: Florida Emergency Medicine Foundation. Orlando, Florida: February 6-9, 2003. The organizers have issued a call for presentations. For details, contact *John Todaro, Director of Education, Florida Emergency Medicine Foundation, Florida College of Emergency Physicians, 3717 South Conway Road, Orlando, FL 32812-7607; (407) 281-7396, ext. 17; fax: (407) 281-4407; e-mail: jtodaro@femf.org.*

Third World Water Forum. Host: World Water Council. Kyoto, Shiga, and Osaka, Japan: March 16-23, 2003. See the Internet Pages of this **Observer** for information about the preparatory on-line discussions and the many aquatic hazards that will be addressed at this forum. More information is also available from the *Secretariat of the Third World Water Forum, Fifth Floor 2-2-4 Kojimachi Chiyodaku, Tokyo 102-0083, Japan; tel: +81-3-5212-1645; fax: +81-3-5212-1649; WWW: http://www.worldwaterforum.org.*

Pacific Public Safety and Risk Management Conference, 2003. Host: South Pacific Applied Geoscience Commission (SOPAC). Outrigger Reef Resort, Fiji: May 5-7, 2003. The primary aim of this conference is to expand multi-disciplinary and inter-sectoral partnerships to strengthen existing community safety and sustainability in Pacific island nations. It will promote disaster-reduction policies, legislation, research, and training for all types of hazards. Abstracts are due September 30, 2002. For submission details and conference themes see: *http://www.sopac.org/Secretariat/Units/Dmu/Conference.htm*; or contact *Vive Vuruya, Disaster Management Unit, SOPAC Secretariat, Private Mail Bag, GPO, Suva, Fiji; tel: +679 338 1377; fax: +679 337 0040; e-mail: vive@sopac.org.*

International Conference on "Community Safety and Sustainability in the Pacific." Sponsors: South Pacific Applied Geoscience Commission and others. Nandi, Fiji: May 6-7, 2003. For more information about this meeting, contact *Jack Rynn, e-mail: sally.brown@uq.net.au; or Atu Kaloumaira, e-mail: atu@sopac.org.fj.*

Fourth International Conference on Seismology and Earthquake Engineering (SEE4). Organizer: International Institute of Earthquake Engineering and Seismology. Tehran, Iran: May 12-14, 2003. This conference will promote international cooperation in the advancement of earthquake knowledge and mitigation expertise. Topics to be addressed include everything from seismicity to building design, socioeconomic issues, and disaster planning. For details see <http://www.iiees.ac.ir> and <http://www.iiees.ac.ir/test/abs.html>; or contact *Mohsen Ghafory-Ashtiany, International Institute of Earthquake Engineering and Seismology; tel: 98-21-229-4932; fax: 98-21-229-9479; e-mail: ashtiany@dena.iiees.ac.ir.*

Training Available from NOAA's Coastal Services Center

The National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center (CSC) offers a number of training programs for coastal resource managers. Some classes are taught at the center's Charleston, South Carolina, training facility; others are offered off-site; and a few are available via the Internet.

Specifically, the CSC offers a course entitled "Hazards Training"—a region-specific workshop that focuses on risk and vulnerability assessments to be used by local and state managers. Other programs fall into one of three tracks: coastal management, geospatial technology, and building process skills.

For more information see <http://www.csc.noaa.gov/training>, or (for the hazards course) contact *Lynne Hinkey, CSC, 2234 South Hobson Avenue, Charleston, SC 29405-2413; (843) 740-1200; e-mail: lynne.hinkey@noaa.gov.*

Fundamentals of Disaster Communications. Offered by: University of Wisconsin-Madison, Department of Engineering Professional Development. Madison, Wisconsin: May 14-16, 2003. For details, contact *Don Schramm, e-mail: schramm@epd.engr.wisc.edu; or see http://epdweb.engr.wisc.edu/courses (click on "Disaster Management").*

Association of State Floodplain Managers (ASFPM) Annual Conference. St Louis, Missouri: May 11-16, 2003. The ASFPM conference covers everything from alluvial fan flooding to zoning for floodplain development, with a lot in between. Indeed, the ASFPM annual meeting is the premier venue for learning the latest about floods, floodplain management, and the many other aspects of community development relative to wet areas. For more information, contact *Diane Brown, ASFPM, 2809 Fish Hatchery Road, Suite 204, Madison, WI 53713; (608) 274-0123; fax: (608)*

274-0696; e-mail: asfpm@floods.org; WWW: http://www.floods.org.

36th World Congress of the International Institute of Sociology. Beijing, China: July 7-11, 2003. A session is currently being organized on "The Sociology of Disasters: Theory and Research." One-page abstracts are due December 31, 2002, and should be sent to *Henry Quarantelli, Disaster Research Center, University of Delaware, Newark, DE 19716; e-mail: elqdr@udel.edu; fax: (302) 831-2091.* For conference information, see: <http://www.IIS2003beijing.com.cn>.

Dam Safety 2003. Host: Association of State Dam Safety Officials (ASDSO). Minneapolis, Minnesota: September 7-10, 2003. So that Johnstown never happens again. Details are available from *ASDSO, 450 Old Vine Street, Second Floor, Lexington, KY 40507; (859) 257-5140; fax: (859) 323-1958; e-mail: info@damsafety.org; WWW: http://www.damsafety.org/conferences.cfm?content=annual.*

32nd International Geological Congress (IGC). Florence, Italy: August 15-22, 2004. For a conference circular, e-mail 32igc@32igc.org; or contact *Chiara Manetti, Università degli Studi di Firenze, Dipartimento di Scienze della Terra, Via La Pira, 4 50121 Firenze, Italy; tel/fax: +39 055 2382146; e-mail: cmanetti@geo.unifi.it; WWW: http://www.iugs.org/iugs/news/igc32-02.htm.* Note: The 32nd IGC includes a Topical Symposium on "Natural Hazards and Mitigation of Geological Risks"; for more information, contact *Tina Nunziata, e-mail: conunzia@unina.it, or Attia El-Sayed, e-mail: elsayedat@mans.edu.eg.* It will also include a session on "Geological Data and Seismic Hazard Maps"; for details, see <http://www.bghrc.com.Geolhaz/Syposium/info.htm> (sic), or contact *Ioannis Papanikolaou, e-mail: i.papanikolaou@ucl.ac.uk.*

Training Available from CEPC

The Canadian Emergency Preparedness College (CEPC) recently published its *Training and Education Program 2002-2003* calendar. These programs, delivered by Canada's Office of Critical Infrastructure Protection and Emergency Preparedness (OC�PEP), focus on the management of multi-service/agency response to an emergency, as well as other aspects of emergency planning and management. The programs include courses, seminars, and workshops.

The course calendar is available on-line at http://www.ocipep-bpiepc.gc.ca/publicinfo/college/cepc_e.html. It can also be ordered by contacting *OC�PEP Communications; (613) 991-7035 or (800) 830-3118; e-mail: communications@ocipep-bpiepc.gc.ca.*

[Adapted from *Emergency Preparedness Digest*, January-March 2002]

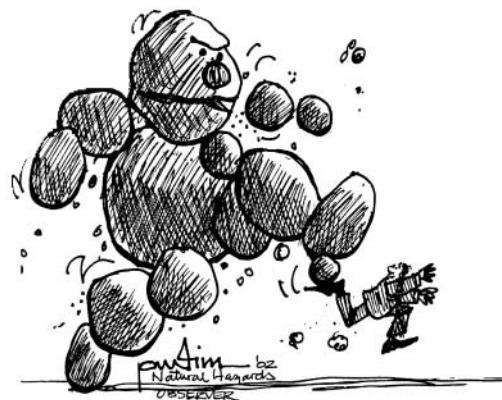
Introducing the International Consortium on Landslides

A new international organization focused on landslides was recently created at the 2002 Kyoto International Symposium on "Landslide Risk Mitigation and Protection of Cultural and Natural Heritage." There, experts from international, national, scientific, governmental, nongovernmental, and academic organizations unanimously agreed to launch the International Consortium on Landslides (ICL).

The consortium will promote landslide research, mitigation, education, and international coordination, and will support the exchange of information on landslides for the benefit of both society and the environment. Any organization that supports the objectives of the consortium—intellectually, practically, and/or financially—is invited to become a member of ICL.

For additional information on ICL membership and other details, contact the *Secretariat of the International Consortium on Landslides, Landslide Section, Disaster Prevention Research Institute, Kyoto University, Uji 611-0011, Kyoto, Japan; tel: +81-774-384110; fax: +81-774-325597; e-mail: ICL@landslide.dpri.kyoto-u.ac.jp; WWW: http://landslide.dpri.kyoto-u.ac.jp/ICL.htm.*

[Adapted from the *Multidisciplinary Center for Earthquake Engineering Research (MCEER) Information Services Newsletter*—see <http://mceer.buffalo.edu/infoService/enews/default.asp>]



Introducing CARDIN

The Caribbean Disaster Information Network (CARDIN) was established in June 1999 to link Caribbean disaster organizations, to establish a broad collection of disaster-related information, and to ensure improved access to such material. The project was initially funded by the European Community Humanitarian Office (ECHO), and the Library of the University of the West Indies at Mona, Jamaica, was selected as the network focal point.

CARDIN is working to strengthen local, national, and regional capacity for the collection, indexing, dissemina-

tion, and use of disaster-related information in the English-, Spanish-, Dutch-, and French-speaking Caribbean. The network's major goals are to:

- provide wider access to and coverage of disaster information in the region;
- create a database of disaster-related information available on the Internet, CDs, and in print format as a resource for policy makers, practitioners, researchers, and the general public;
- facilitate the dissemination of disaster-related information to the general Caribbean public on the World Wide Web and through a newsletter and document delivery services;
- put full-text documents on the Internet;
- establish and maintain relationships with other agencies to ensure coordination of disaster information activities within the region.

For more information, contact *CARDIN, Science Library, University of the West Indies, P.O. Box 104, Mona, Kingston 7 Jamaica, W.I.; tel: (876) 927-1068/935-8202-3; fax: (876) 970-1758; e-mail: cardin@uwimona.edu.jm.*



[Adapted from *ISDR Informs*—the United Nations International Strategy for Disaster Reduction's newsletter for Latin America and the Caribbean]



RECENT PUBLICATIONS

Below are summaries of some of the recent, most 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 to the present can be found on our web site: <http://www.colorado.edu/hazards/bib/bib.html>.

All Hazards

The Socioeconomic Benefits of Earth Science and Applications Research: Reducing the Risks and Costs of Natural Disasters in the United States. Ray A. Williamson, Henry R. Hertzfeld, Joseph Cordes, and John M. Logsdon. 2001. 24 pp. Free. The report can be found on the web site of the Space Policy Institute of the Elliott School of International Affairs, The George Washington University: <http://www.gwu.edu/~spi>.

Within the United States and its territories between 1980 and 2001, major weather and climate disasters resulted in more than \$248 billion in losses and killed 690 people. In that same period, earthquakes and volcanoes cost the U.S. an additional \$541 billion and 193 lives. The federal investment in earth science research from space, funded primarily through the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA), has led to an improved understanding of weather, climate, earth movement, and other terrestrial phenomena. The authors of this report examine losses caused by Hurricane Floyd in 1999, the western wildfires in 2000, flooding in the northern plains in 1997, and the Northridge earthquake in 1994. They also discuss the economic value of better information and issues related to obtaining it. Tables present data that compare the losses for various types of disasters

Establishing a Mass Casualty Management System. 2001. 58 pp. \$12.00. Order Code: OP 139, English; OT 139, Spanish. This document can be downloaded for free from: <http://www.paho.org/english/ped/masscs.pdf>.

Humanitarian Supply Management and Logistics in the Health Sector. 2001. 176 pp. \$20.00. Order Code: OP 145, English; OT 145, Spanish. Copies of this publication are also available free on-line from: <http://www.paho.org/english/ped/HumanitarianSupply.pdf>. Printed copies of both documents may be obtained by contacting the Pan American Health Organizations (PAHO); (800) 472-3046; e-mail: disaster-publications@paho.org. WWW: <http://publications.paho.org>.

The Ten Most Wanted: A Search for Solutions to Reduce Recurring Losses from Natural Hazards. 2002. 29 pp. Free. The full report can be downloaded as a PDF file from the IBHS Web site: http://www.ibhs.org/research_library/downloads/292.pdf.

The ***Ten Most Wanted***, published by the Institute for Business and Home Safety (IBHS), outlines 10 of the most important solutions to decrease recurring losses from natural disasters. The 29-page report is the result of a June 2000 workshop convened by the American Society of Civil Engineers and IBHS. It addresses why losses from natural disasters are increasing and offers recommendations and priorities for future research and development of cost-effective solutions to reduce these losses. Participants identified research needed regarding both

residential and commercial buildings and prioritized mitigation methods that would offer the biggest loss reductions in the shortest time for damage from hurricanes/windstorms, earthquakes, floods, hail, wildfire, and winter storms. They concurred on incorporating holistic measures that integrate research, development, and education with professional practices and public policies.

Vital Signs: Anticipating, Preventing and Surviving a Crisis in a Nonprofit. Melanie L. Herman and Barbara B. Oliver. 2001. 94 pp. \$20.00. Copies can be obtained by contacting the Nonprofit Risk Management Center, 1001 Connecticut Avenue, N.W., Washington, DC 20036; (202) 785-3891; fax: (202) 296-0349; e-mail: info@nonprofitrisk.org; WWW: <http://www.nonprofitrisk.org>.

Rapid Environmental Impact Assessment: A Framework for Best Practices in Emergency Response. Charles Kelly. 2001. 22 pp. Free. The report of the field test and lessons learned is online at the Benfield Greig Hazard Research Centre's web site: <http://www.bghrc.com> (go to the "Disaster Studies" page and click on "projects.")

It's a Disaster!... And What are You Gonna Do About It?: A Basic First Aid and Disaster Preparedness Manual from Fedhealth. Second edition. Bill and Janet Liebsch. 2001. 212 pp. \$19.95, plus \$2.75 shipping. Copies can be obtained from Fedhealth, (888) 999-4325; <http://www.fedhealth.net>.

This is a manual for emergencies ranging from sunburn to building explosions. It focuses on how to prepare for any situation through mitigation and planning and what to do if you are a victim of a disaster. It includes basic first aid and CPR tips as well as ideas on fireproofing a home.

2002 Environmental Sustainability Index. 2002. 301 pp. Free.

Pilot Environmental Performance Index. 2002. 31 pp. Free.

Copies of both documents can be downloaded from Columbia University's Center for International Earth Science Information Network (CIESIN) web site: <http://www.ciesin.org/indicators/ESI>.

The Environmental Sustainability Index consists of 20 indicators for 142 countries that track the relative success of five components: environmental systems, the reduction of environmental stresses, the reduction of human vulnerability, social and institutional capacities, and global stewardship. It evaluates current conditions, pressures on those conditions, human impacts, and social responses to those conditions in order to gauge the long-term prospects for sustainability. The first report presents data enabling cross-national comparisons, identifies areas in which national performance is above or below expectations, outlines priority policy areas within countries and regions, tracks environmental trends, provides quantitative assessment of the success of policies and programs, and provides data to support

investigations into interactions between environmental and economic performances and the factors that influence environmental sustainability.

The *Pilot Environmental Performance Index* measures data in four main areas: air quality, water quality, greenhouse gas emissions, and land protection at a national scale.

Terrorism

Rebuilding the World Trade Center: A Report by the Construction Institute-American Society of Civil Engineers. A report from ASCE's Committee on Social and Environmental Concerns in Construction. 2002. 32 pp. Free. The complete text is available on-line at: <http://www.ConstructionInst.org>.

Intended as a starting point for planning the rebuilding of the World Trade Center, this report examines issues from New York City traffic patterns to future security issues. Among two dozen discussed trends in this volume are: the decrease in New York office leases since September 11, green building designs, and decentralization of Manhattan's financial district. The report also explains how shorter building designs could address emergency evacuation, traffic congestion, and security.

Assessment of Federal Terrorism Preparedness Training for State and Local Audiences. 2002. 62 pp. Free. The report can be found on FEMA's web site at <http://www.fema.gov/emweb/ctr.htm>.

The current federal terrorism training effort is frequently fractionalized, redundant, and wasteful and leaves many of the needs of states and local communities unmet, according to this report prepared by FEMA at the request of Congress. The report includes a comprehensive accounting of federal terrorism preparedness training, an assessment of the effectiveness of the training, and recommendations on how to improve the system. Its conclusions focus primarily on emergency response aspects of federal terrorism preparedness training.

Communities involved in the assessment indicated that training is needed that focuses on interoperability among various response communities. Local officials said there is considerable confusion regarding operations requirements for dealing with a terrorist incident. City officials that participated in the study also said there is a need for large-scale disaster training focusing on command and logistics, special training for command personnel, and training courses on public information outreach in emergency and crisis situations.

High-Impact Terrorism: Proceedings of a Russian-American Workshop. 2002. 296 pp. \$47.00; \$37.60 if purchased on-line. Copies are available from the National Academy Press, 2101 Constitution Avenue, N.W., Lockbox 285, Washington, DC 20055; (888) 624-8373 or (202) 334-3313; WWW: <http://www.nap.edu>.

This proceedings volume contains papers that address terrorism and the law; biological, chemical, nuclear, explosives, agricultural, and cyber terrorism; and future trends and international cooperation to combat terrorism. Appendices include an outline of the goals of the Russian program on "Problems of Natural and Technological Security."

Preparing for Terrorism: What Governors and Mayors Should Do. John F. Kennedy School of Government, Harvard University. 2001. 9 pp. Free. Available on-line at <http://www.homelandsecurity.org/bulletin/ESDPMemoMayorsGov.pdf>.

This memorandum contains the recommendations of a working group of domestic preparedness specialists, elected officials, federal agency representatives, and academics that convenes semi-annually at the Kennedy School of Government. It addresses initial issues that elected officials should consider regarding domestic preparedness. Specifically, it highlights components of a comprehensive preparedness strategy and outlines state and local government priorities for change.

Community Response to the Threat of Terrorism. Issues and Ideas Papers Presented During a Public Entity Risk Institute (PERI) Internet Symposium. 2001. 59 pp. Free. Copies can be downloaded or ordered from the PERI web site: <http://www.riskinstitute.org>.

Floods

An Evaluation of the Boulder Creek Local Flood Warning System. Eve Gruntfest, Kim Carsell, and Tom Plush. 2002. 100 pp. Copies of this report are available from the Department of Geography and Environmental Studies, University of Colorado at Colorado Springs, P.O. Box 7150, Colorado Springs, CO 80933; e-mail: ecg@uccs.edu.

Boulder Creek in Boulder, Colorado, poses a high flash flood danger not only because of its physical characteristics, but because so many people work and live along its floodplain. Even if all aspects of the warning system set up to protect citizens worked perfectly, a flash flood might take many lives. This study, conducted to improve flood warnings, reviews the flood warning literature, provides a brief overview of the nationally recognized flash flood warning system in Boulder, reviews detection and warning practices in other communities with innovative flash flood warning operations, presents a survey of local emergency planning officials, describes an in-depth survey of floodplain residents along Boulder Creek, and reviews flash flood plans for several non-residential Boulder floodplain occupants. Recommendations from those conducting the study relate to public education, use of new technologies and education techniques, and the involvement of local businesses and schools in the warning system.

A Slew of Reports from GAO

As usual, the General Accounting Office has been hard at work, cranking out reports that examine issues of national importance. In order to include all titles, rather than describe each report, we simply list them below.

Copies of these reports are free and can be obtained from the U.S. General Accounting Office, P.O. Box 37050, Washington, DC 20013; (202) 512-6000; fax: (202) 512-6061; TDD (202) 512-2537; e-mail: info@www.gao.gov. The complete text of each report is also available on-line at: <http://www.gao.gov>.

Combating Terrorism: Intergovernmental Cooperation in the Development of a National Strategy to Enhance State and Local Preparedness. Patricia A. Dalton. Report No. GAO-02-550T. 2002. 23 pp.

Combating Terrorism: Intergovernmental Partnership in a National Strategy to Enhance State and Local Preparedness. Paul L. Posner. Report No. GAO-02-547T. 2002. 22 pp.

Combating Terrorism: Key Aspects of a National Strategy to Enhance State and Local Preparedness. Jayetta Z. Hecker. Report No. GAO-02-473T. 2002. 23 pp.

Combating Terrorism: Critical Components of a National Strategy to Enhance State and Local Preparedness. Randall A. Yim. Report No. GOA-02-548T. 2002. 22 pp.

Combating Terrorism: Enhancing Partnerships Through a National Preparedness Strategy. Patricia A. Dalton. Report No. GAO-02-549T. 2002. 22 pp.

Homeland Security: Progress Made; More Direction and Partnership Sought. Henry L. Hinton, Jr. Report No. GAO-02-490T. 2002. 18 pp.

Homeland Security: Responsibility and Accountability for Achieving National Goals. David M. Walker. 2002. 11 pp.

National Preparedness: Integration of Federal, State, Local, and Private Sector Efforts is Critical to an Effective National Strategy for Homeland Security. Randall A. Yim. Report No. GAO-02-621T. 2002. 28 pp.

Mitigation Success Stories in the United States. Fourth Edition. 2002. 102 pp. Free. Copies can be downloaded from the Association of State Floodplain Managers (ASFPM) web site: <http://www.floods.org>.

Since the 1980s, mitigation activities have been implemented throughout the U. S. to save lives and reduce property damage. In many cases, mitigation success has been achieved following devastating disasters, when local officials and the general public have realized the need to effect change in their community. Major recent efforts to reduce flood damage include programs such as the Federal Emergency Management Agency's Hazard Mitigation Grant Program and Flood Mitigation Assistance Program. *Mitigation Success Stories IV*, a joint effort between FEMA and the ASFPM, showcases mitigation activities, demonstrating the benefits of mitigation in 39 communities in 24 states. The examples presented in this document can be used by other communities and can provide decision makers with valuable information about how to achieve natural hazard reduction. Topics include flood control projects, elevation issues, acquisition efforts, floodproofing, and watershed management.

Dam Safety

Dam Removal: Science and Decision Making. 2002. 224 pp. Free. Single copies of the report can be requested from the Heinz Center, 1001 Pennsylvania Avenue, N.W., Suite 735 South, Washington, DC 20004; (202) 737-6307; fax: (202) 737-6410; e-mail: sdavid@heinzctr.org.

Widespread interest in dam removal has been spurred by the aging of many dams, by evolving societal values, and by new scientific understanding of the changes brought by dams. Property owners, public utilities, state and local governments, and private citizens are faced with complex and difficult decisions, and they need guidance as they attempt to incorporate scientific information into the decision-making process regarding whether or not to remove dams. This report, the result of 18 months of research and deliberation by a panel of experts, outlines the current state of research on and experience with dam removal. It contains sections on the federal legal context, informed decisions, environmental outcomes, economic issues, and the social aspects of dam removal.

Success and Challenges: National Dam Safety Program 2002. Association of State Dam Safety Officials (ASDSO). 2002. 96 pp. Free. A limited number of copies are available by contacting the ASDSO, 450 Old Vine Street, Second Floor, Lexington, KY 40507-1544; fax: (859) 323-1958; e-mail: Info@damsafety.org.

Success and Challenges highlights achievements realized as a result of the National Dam Safety Program Act of 1996, which expires in FY 2002. The National Dam Safety Program, administered by the Federal Emergency Management Agency, has fostered significant improvements in state dam safety programs and cooperation between state and federal programs. However, as the report points out, there is still much to be done to increase dam security, improve dam failure flood inundation maps, and develop more and better emergency action plans.

Dam Removal Success Stories: Restoring Rivers Through Selective Removal of Dams that Do Not Make Sense. Trout Unlimited and the National Park Service. 1999. 125 pp. Free. Hard copies can be ordered on-line at: <http://www.amrivers.org/damremovaltoolkit/successstoriesreport.htm>.

Dam Removal: A Citizen's Guide to Restoring Rivers. Wisconsin River Alliance and Trout Unlimited. 2000. 130 pp. \$15.00, non-River Alliance members; \$10.00, members. An order form is available online at: <http://www.wisconsinrivers.org/SmallDams/toolkit-order-info.html>.

Ecology of Dam Removal: Summary of Benefits and Impacts. American Rivers. 2002. 17 pp. Free. Copies are available on-line at: <http://www.americanrivers.org/damremovaltoolkit/ecologyofdamremoval.htm>.

Hurricanes

National Review of Hurricane Evacuation Plans and Policies. Brian Wolshon, Elba Urbina, and Marc Levitan. 2001. 32 pp. Free. The complete text is available on-line at: <http://www.hurricane.lsu.edu/>

&EvacuationReview.pdf. For additional information contact The Hurricane Center, 3513 CEBA Building, Louisiana State University, Baton Rouge, LA 70803; (225) 578-4813; fax: (225) 578-7646; e-mail: info@hurricane.lsu.edu.

Extreme Weather and Climate Change

"Damaging Thunderstorm Activity in the United States," Bulletin of the American Meteorological Society, Vol. 82, No 4, pp. 597-608. Stanley Changnon. Free. Abstracts for all AMS articles are available to everyone. Subscribers have access to full-text HTML and PDF articles. For information on how to obtain copies and to join the American Meteorological Society, contact AMS, 45 Beacon Street, Boston, MA 02108-3693; (617) 227-2425; fax: (617) 742-8718; e-mail: amsinfo@ametsoc.org; WWW: <http://www.ametsoc.org/AMS> (click on "Browse" to get the article).

Long-Term Fluctuations in Hail Incidences in the United States. Stanley Changnon and David Changnon. *Journal of Climate*, Vol 13. Free. 6 pp. Copies may be obtained from the American Meteorological Society, 45 Beacon Street, Boston, MA 02108-3693; (617) 227-2425; fax: (617) 742-8718; e-mail: amsinfo@ametsoc.org; WWW: <http://www.ametsoc.org/AMS>.

Data and Approaches for Determining Hail Risk in the Contiguous United States. Stanley Changnon. *Journal of Applied Meteorology*, Vol 38. 2000. 9 pp. Copies may be obtained from the American Meteorological Society, 45 Beacon Street, Boston, MA 02108-3693; (617) 227-2425; fax: (617) 742-8718; e-mail: amsinfo@ametsoc.org; WWW: <http://www.ametsoc.org/AMS>.

Losses Caused by Weather and Climate Extremes: A National Index for the United States. Stanley Changnon, Joyce Changnon, and Geoffrey Hewings. *Physical Geography*, Vol 11, No. 1. 2001. 28 pp. Subscriptions: \$58.00, individual; \$309.00, institution. To subscribe, contact *Physical Geography*, Bellwether Publishing Ltd., 8640 Guilford Road, Suite 200, Columbia, MD 21046-2612; (410) 290-3870; fax: (410) 290-8726; e-mail: subs@bellpub.com.

Wildlife Responses to Climate Change: North American Case Studies. Stephen H. Schneider and Terry L. Root, editors. 2002. 437 pp. \$60.00. Copies can be purchased from Island Press, 58440 Main Street, P.O. Box 7, Covelo, CA 95428; (800) 828-1302; fax: (707) 983-6414; e-mail: service@islandpress.org.

In 1997, the National Wildlife Federation provided fellowships to eight graduate students to conduct research on global climate change. This volume presents the results of their work. The eight case studies provide information about how biotic systems respond to climate change. They also examine the complex problems likely to arise from changes in climate and demonstrate the types of scientific questions that need to be explored in order to improve our understanding of how these changes and other human impacts affect wildlife and ecosystems.

Natural Hazards and Environmental Change. Bill McGuire, Ian Mason and Christopher Kilburn. 2002. 187 pp. \$29.95, paperback; \$72.00, clothbound; plus \$4.75 shipping. Copies can be ordered from Oxford University Press, Inc., on-line at: <http://www.oup-usa.org>.

Analysis of Costs and Loss Reduction Benefits of Windborne Debris Protection: North Carolina. 2002. Free.

Analysis of Costs and Loss Reduction Benefits of Windborne Debris Protection: South Carolina. 2002. Free.

Copies of each report can be downloaded from the Institute for Business and Home Safety's web site: <http://www.ibhs.org>.

These recent studies point to the importance of windborne debris protection during hurricanes and other severe weather. Average losses from hurricanes in the coastal Carolinas could be reduced by up to 36% with proper protection. IBHS, which helped fund and develop the studies, is presenting these findings to the states' building code councils to inform their decisions regarding structural techniques that reduce losses from strong winds and hurricanes.

El Niño in History: Storming Through the Ages. César N. Caviedes. 279 pp. \$24.95. Available from the University Press of Florida, 15 N.W. 15th Street, Gainesville, FL 32611; (800) 226-3822; fax: (352) 302-7302; WWW: <http://www.upf.com/Fall2001/caviedes.html>.

Earthquakes

Earthquake Culture and Corporate Action. Dennis S. Mileti, Daniel M. Cress, and JoAnne DeRouen Darlington. *Sociological Forum*, Vol. 17, No. 1 (NEED PAGE #s AND DATE). 2002. Subscriptions: \$79.00, individual; \$385.00, institution. To subscribe, contact the *Sociological Forum*, New York University, Sociology Department, 269 Mercer Street, Fourth Floor, New York, NY 10003; (212) 992-9513; fax: 443-0451; e-mail: sociological.forum@nyu.edu; WWW: <http://www.nyu.edu/pubs/sociological.forum>.

Arresting the Growth of Earthquake Vulnerability: Needs and Opportunities for Earthquake Engineering. Earthquake Engineering Research Institute. 2002. 55 pp. Free. Copies can be obtained on-line from: <http://www.eeri.org/research.html>.

Wildfire

Burning Questions: A Social Science Research Plan for Federal Wildland Fire Management. Report to the National Wildfire Coordinating Group. 2002. 260 pp. For a copy, contact Sheila Williams, National Interagency Fire Center; (208)-387-5203; e-mail: Sheila_Williams@nps.gov.

Understanding the relationship between people and wildland fire is crucial to how federal agencies respond, and, according to this research, an expanded program of social science research is needed for an accurate and comprehensive understanding. *Burning Questions* presents an interagency social science research plan for wildland fire management, commissioned by the National Wildfire Coordinating Group, which includes representatives from the Bureau of Land Management, the Bureau of Indian Affairs, the U.S. Fish and Wildlife Service, the U.S. Forest Service, and the National Park Service. The plan covers evaluation of the harmful and beneficial effects of fire;

social science research in the fields of anthropology, economics, geography, psychology, political science, and sociology; and interdisciplinary research. The three key elements of the plan are policy analysis, literature review, and needs assessment.

Mapping Wildfire Hazards and Risks. R. Neil Sampson, R. Dwight Atkinson, and Joe W. Lewis. *Journal of Sustainable Forestry*, Vol. 11. \$59.95 hardbound; \$39.95, paperback. Copies can be ordered from Haworth Press Inc., 10 Alice Street, Binghamton, NY 13904; (800) 429-6784; e-mail: getinfo@haworthpressinc.com; WWW: <http://www.HaworthPressInc.com/store>.

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A Fond Farewell

Dave Butler, the Natural Hazards Center's long-time senior editor, web wizard, and notorious name-changer, has finally decided to hang up his hard drive and retire.

Dave began working at the center when the *Natural Hazards Observer* was still produced with a typewriter and rubber cement. He ushered our Information Dissemination Program into the 21st century by designing and constructing the Hazards Center's web site; writing and distributing *Disaster Research*, our electronic newsletter (which was a pioneering effort); contributing a substantial portion of the material found in each *Natural Hazards Observer*; and editing countless books, working papers, quick response reports, special publications, and whatever else required his erudite wit.

In addition, Dave has been a delight to work with, always willing to go the extra mile to increase the quality of the Hazards Center's products. He also served as a mentor, friend, and confidante to the many graduate students who have passed through the Hazards Center over the years.

Dave did it all with good humor and considerable editorial talent, and he will be greatly missed. We wish him good luck and best wishes for the future.



THE HAZARDS CENTER

The NATURAL HAZARDS RESEARCH AND APPLICATIONS INFORMATION CENTER was founded to strengthen communication among researchers and the individuals and organizations concerned with mitigating natural disasters. The center is funded by the National Science Foundation, the Federal Emergency Management Agency, the National Oceanic and Atmospheric Administration, the U.S. Geological Survey, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Department of Transportation, the U.S. Bureau of Reclamation, the U.S. Forest Service, the National Aeronautics and Space Administration, the Centers for Disease Control and Prevention, the Institute for Business and Home Safety, and the Public Entity Risk Institute. Please send information of potential interest to the readers of this newsletter to the address below. The deadline for the next *Observer* is July 19, 2002.

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Cartoons for the *Observer* are drawn by Rob Pudim.

NATURAL HAZARDS OBSERVER

ISSN 0737-5425

Printed in the USA.

Published bimonthly. Reproduction with acknowledgment is permitted and encouraged.

The *Observer* is free to subscribers within the U.S. Subscriptions beyond the U.S. cost \$24.00 per year. Back issues of the *Observer* are available for \$4.00 each, plus shipping and handling. Orders must be prepaid. Checks should be payable to the University of Colorado.

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