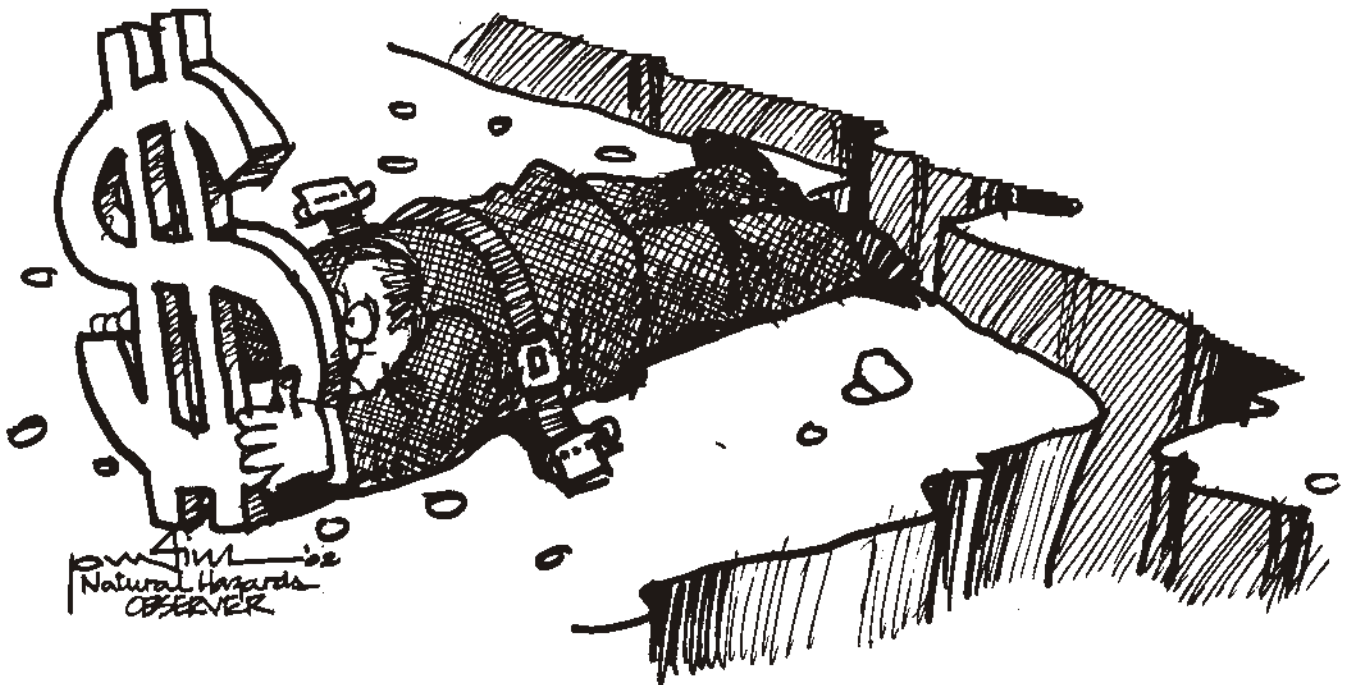


NATURAL HAZARDS Observer

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Securing Society Against Catastrophic Earthquake Losses

—an invited comment

The Earthquake Engineering Research Institute (EERI) has been deeply concerned about the eroding levels of funding for earthquake engineering research. Unless effective technologies are developed and implemented to reduce existing risks and encourage the development of less vulnerable new construction, the costs of future earthquakes and other natural and technological disasters will continue to escalate.

It is with this in mind that EERI is proposing an integrated science and engineering plan to guard this country against the staggering losses that could result from a major U.S. urban earthquake—a single incident could result in up to 10 times the number of people killed at the World

Trade Center (WTC) and economic losses of \$100 billion. This plan consists of basic and applied research in all related disciplines that can substantially reduce losses from earthquakes and help protect the built and human environments from the devastating effects of other major disasters caused by wind, flood, fire, and terrorist attacks.

This plan presents a new vision from the earthquake engineering community for the rapid development and deployment of leading edge research to create safer, more resilient communities. At a time when the nation is faced with multiple natural and human-caused hazards, federally supported efforts to harden the built environment and strengthen communities against the effects of earthquakes

can offer important new technological advances and practices for a safer nation.

Our proposed budget of \$379 million per year over 20 years amounts to just one-tenth of the estimated annualized U.S. earthquake risk (\$4.4 billion) and one-fifteenth of the potential cost of a single catastrophic earthquake. The plan identifies new areas of basic and applied science and engineering research that must be investigated over the next two decades to protect life, property, and economic stability in the event of a moderate or major earthquake anywhere in the country. It also includes a call for extensive social science research that will influence the development of appropriate design and construction standards for multiple hazards.

In 1977, Congress approved the National Earthquake Hazard Reduction Program (NEHRP), the nation's first long-term funding commitment to advance the sciences of hazard prediction and earthquake engineering. The objective was clear: to reduce earthquake losses, especially the loss of life. With support from the U.S. Geological Survey, the Federal Emergency Management Agency (FEMA), the National Science Foundation, and the National Institute of Standards and Technology, NEHRP provided a unifying vision and a roadmap for critical research. After 25 years and an investment of approximately \$2.5 billion, much has been accomplished.

The first generation of mitigation tools generated by NEHRP agencies and partners are giving local officials and first responders more of the information they need *both before and after an earthquake* to make life-saving, cost-effective decisions for their communities. These tools include:

- Improved seismic hazard maps showing earthquake fault locations, including the first regional maps, and the software program HAZUS—a loss-probability database that provides nearly instantaneous maps of damage.
- Ground motion sensing systems using wireless sensors and newly developed software to identify areas of strongest ground shaking after an earthquake to enable local fire, police, and emergency managers to send rescue and recovery teams where they are most needed.

- Improved building codes, construction practices, materials, and systems for earthquake resistant construction and seismic strengthening for homes, high rises, factories, bridges, roads, transportation systems, utilities, schools, and historic sites. The same resilient design principles and construction materials that delayed the collapse of the World Trade Center—allowing tens of thousands of workers to safely escape its towers—have saved lives in earthquakes throughout this country.
- Improved emergency response communication and planning.

In spite of these advances, economic losses from natural disasters, especially earthquakes of moderate magnitudes, are skyrocketing. In Northridge, California, a magnitude 6.7 earthquake caused \$40 billion in losses, and a magnitude 6.9 in Kobe, Japan, cost that country \$100 billion.

Increasing populations, widespread development in high-risk areas, stretched emergency response resources, and aging building stock and infrastructure all contribute to increasing risk. Building codes—though substantially improved over decades past—still focus on preventing collapse and not on managing economic losses. In addition, many jurisdictions still do not adopt building codes or require design by certified professionals. The next goal of the NEHRP program must be to reduce economic and societal losses.

Unfortunately, insufficient knowledge in several key research areas hampers the development of tools needed to secure society against catastrophic earthquake losses. EERI's proposal includes major research and technology transfer plans for predicting earthquake hazards, assessing and reducing impacts, enhancing community resilience, and improving education and outreach. These programs take advantage of several new technological capabilities such as ANSS¹, Earthscope, and NEES² that have created breakthrough opportunities to improve the resilience of communities, systems, and structures.

Society stands to benefit from these advances through:

- More comprehensive and systematic approaches to earthquake risk mitigation by building owners, the financial community, and government officials;



- A better understanding of societal vulnerability and the ways in which it can be reduced;
- Improved emergency response and recovery from earthquakes and other catastrophic events; and
- A more scientific and credible basis for developing and testing codes and other guidelines for improving seismic safety.

Last September, many of the lessons learned from the study of earthquakes were applied in the immediate aftermath of the World Trade Center (WTC) attacks. Under the direction of FEMA, structural and civil engineers used protocols from post-earthquake safety inspections to evaluate the suitability for occupancy of some 400 structures immediately surrounding the WTC. Because it had been done so often in earthquake disasters, a team of 16 experienced engineers was able to accomplish this task in just four days. Similarly, emergency response and recovery procedures in the aftermath of the WTC benefited from years of research by social and policy scientists who studied search and rescue, emergency communications, business recovery, and other cross-cutting issues.

Nevertheless, the proposed research and technology transfer program is not limited to earthquake risks. It provides a framework for developing advanced materials; sensors; and simulation, design, and planning tools and will advance information technology for emergency operations, laboratory testing, etc. The envisioned program will also provide substantial benefits for homeland security and other efforts to build the resilience of communities. Through advances in building design, land-use planning measures, and technologies addressing emergency management and recovery, the initiative proposed by EERI complements and enhances programs to reduce the threat of terrorist attack and destruction from other extreme events such as blast, wind, flood, and fire.

In addition, EERI strongly advocates the continuation of earthquake engineering research through a renewal and

expansion of NEHRP funding. Repeated requests to expand funding have failed to capture sufficient attention. It is clear that this critical need is largely being ignored because there has been neither national vision nor organized advocacy to reduce the increasing vulnerability we face as a technologically dependent nation.

The proposed EERI plan is just one piece of a larger agenda for research and development for all hazards fields. The challenges we face were clearly articulated in Mileti's publication, *Disasters by Design* (1999). Now is the time for action. EERI proposes a formal affiliation with the Natural Hazards Center to bring together social and policy scientists, building designers, planners, and responders from all fields to develop a strategic plan of collaboration and advocacy. EERI pledges to work closely with the Center to promote critically important research and implement policies to secure society against catastrophic losses in a manner that allows the hazards community to speak with a common voice.

Susan Tubbesing
Earthquake Engineering Research Institute
Oakland, California

To obtain more information about this effort, contact the author at EERI, 499 14th Street, Suite 320, Oakland, CA 94612-1928; e-mail: skt@eeri.org; <http://www.eeri.org>.

1. ANSS: Advanced National Seismic System (see page 22 of this *Observer*).
2. NEES: George E. Brown Network for Earthquake Engineering Simulation.

References

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

FEMA Awards Firefighter Grants

In mid-July, the Federal Emergency Management Agency (FEMA) and its U.S. Fire Administration (USFA) announced the first round of "Assistance to Firefighters" grant awards totaling almost \$4 million. By the end of July, the agencies had released another round of grant monies, bringing the total of recipients to 353. The program was designed to allow Congress to work with FEMA and improve basic fire delivery service, protect the health and safety of the public and firefighting personnel against fire and fire-related hazards, as well as provide assistance for fire prevention programs. The money is used in a variety of ways, including training and purchase of fire apparatus.

The grant program has distributed \$360 million through approximately 5,500 grants. Funds are awarded by a peer review panel of more than 300 fire service personnel and will assist rural, urban, and suburban fire departments throughout the country. Grant award announcements and updates about this annual program may be seen at <http://www.usfa.fema.gov/dhtml/inside-usfa/grants.cfm>.

Workshop Notebook Now On-Line

In the September issue of the *Natural Hazards Observer*, we mentioned that our Hazards Research and Applications Workshop notebook was available for purchase. Participants at our workshop (held in Boulder, Colorado, in July) focused on cutting-edge hazards issues, ranging from the shifting concerns and cross-cutting lessons of September 11 to the impacts of Hurricane Andrew 10 years later. Other topics included wildfire mitigation, coordinating research, higher education, El Niño, tsunami hazards, mapping risk, and land-use mitigation, to name but a few.

To ensure that the ideas and discussions generated from this gathering are shared with those who did not attend, the Natural Hazards Center publishes its Workshop notebook, which includes the session summaries and abstracts of poster sessions, current research, and programs and projects relating to natural hazards. In the past, we have only posted the session summaries on our web site, but now, for the very first time, we have included the abstracts at the same URL. To peruse the *2002 Hazards Research and Applications Workshop Notebook* (216 pp.), go to <http://www.colorado.edu/hazards/ss/ss02.html>. Individuals can view specific sections or download the entire document.

For those who prefer, printed copies can be purchased from the Natural Hazards Center for \$25.00, plus \$5.00 shipping. To buy a copy of the complete notebook, which includes the meeting agenda, session summaries, abstracts, and participant list (not included in web version), contact the *Publications Administrator, Natural Hazards Research and Applications Information Center, 482 UCB, University of Colorado, Boulder, CO 80309-0482; (303) 492-6819; fax: (303) 492-2151; e-mail: janet.kroeckel@colorado.edu; http://www.colorado.edu/hazards*. Checks should be in U.S. dollars and written on a U.S. bank. Visa, Mastercard, American Express, and Diner's Club cards are also accepted.



Land Use Planning as a Mitigation Tool State Law Summary Publication Revised and Reissued

The Institute for Business and Home Safety (IBHS) has updated its *Summary of State Land Use Planning Laws* and released an updated and expanded 2002 edition. The publication will help promote the premise that no planning is truly comprehensive until mitigation of natural hazards where development occurs is addressed, and a plan for recovery from major natural disasters is in place where appropriate. The first edition was issued in 1998 (see the *Observer*, Vol. XXII, No. 6, p. 24), and since then IBHS has been looking at ways to heighten the priority of hazard mitigation in state planning legislation. This edition focuses more directly on natural hazards and benefits from input from the American Planning Association. The new edition was written by Jim Schwab of the American Planning Association for IBHS. Ordering information can be obtained from *IBHS, 4775 East Fowler Avenue, Tampa, FL 33617; (813) 286-3400; fax: (813) 286-9960; e-mail: info@ibhs.org*. A brief overview of the document, along with an on-line form to request a copy, can be found at http://www.ibhs.org/research_library/view.asp?id=302.

Help Wanted

Delaware Disaster Research Center Director

The Department of Sociology and Criminal Justice at the University of Delaware invites applications for the position of director of the Disaster Research Center (DRC) and associate/full professor of sociology and criminal justice. Candidates should have a record of scholarly accomplishments in the study of disasters, risk, or natural and technological hazards; administrative and grants-management experience; and a demonstrated ability to obtain extramural funding.

Founded at Ohio State University in 1963 and moved to the University of Delaware in 1985, the DRC is central to the international network of research on the social aspects of disasters and crises. DRC receives funding from various governmental and private agencies, including the National Science Foundation and the Federal Emergency Management Agency. The director manages center operations, supervises a staff that includes graduate research assistants and undergraduates, and represents DRC to funding agencies and other constituencies. The appointment also includes opportunities for teaching undergraduate and graduate courses related to disasters.

The University of Delaware is an equal opportunity employer that encourages applications from minority group members and women. The committee will begin reviewing applications on November 15, 2002. Applicants should send a statement of interest, curriculum vitae, reprints of recent publications, and three letters of reference to: *Chair, Disaster Research Search Committee, Department of Sociology and Criminal Justice, University of Delaware, Newark, DE 19716*. For more information about DRC, visit <http://www.udel.edu/DRC/index.html>.



Natural Disaster Health Research Network Seeks You!

In 1998, the Institute for Catastrophic Loss Reduction (ICLR) was established by the Canadian insurance community and the University of Western Ontario to reduce the loss of life and property caused by severe weather, earthquakes, and other natural phenomena. ICLR's mandate is to improve Canada's capacity to adapt to, anticipate, mitigate, withstand, and recover from natural disasters.

ICLR is committed to conducting multidisciplinary research to understand natural disasters as well as finding effective ways to reduce the social, economic, and cultural impacts of such events. ICLR has supported research activities in the following areas:

- Reducing wind and earthquake damage to housing, buildings, and infrastructure;
- Understanding disaster risk management and prevention;
- Examining the role of government science related to natural disasters; and
- Improving community actions for disaster mitigation.

The social and health effects of extreme weather and weather-related events are important to Canadians. However, knowledge of the full health and social impacts of these disasters is limited.

To help remedy this, ICLR announced the creation of a "Natural Disaster Health Research Network" to develop a foundation of scientific evidence concerning the health and social impacts of extreme weather-related events. The network's objective is to address issues related to mental health, physical injury, preparedness, population displacement, public health infrastructure, and occupational health hazards affected by extreme weather events. Network participants will identify critical research needs and work to collaboratively build effective strategies to help communities across Canada successfully adapt to a changing climate.

The network is seeking members from multidisciplinary backgrounds. If you are interested in receiving additional information, e-mail info@iclr.org; or visit <http://www.iclr.org>.



WASHINGTON UPDATE

National Construction Safety Team Act Becomes Law

On October 2, President Bush signed into law legislation passed by Congress “to provide for the establishment of investigative teams to assess building performance and emergency response and evacuation procedures in the wake of any building failure that has resulted in substantial loss of life or that posed significant potential of substantial loss of life.”

The National Construction Safety Team Act (Public Law 107-231) authorizes the director of the National Institute for Standards and Technology (NIST) to deploy teams after building failures that cause substantial damage and/or loss of life. In consultation with the U.S. Fire Administration (USFA), the director is to develop procedures for team deployment within three months of the enactment of the new

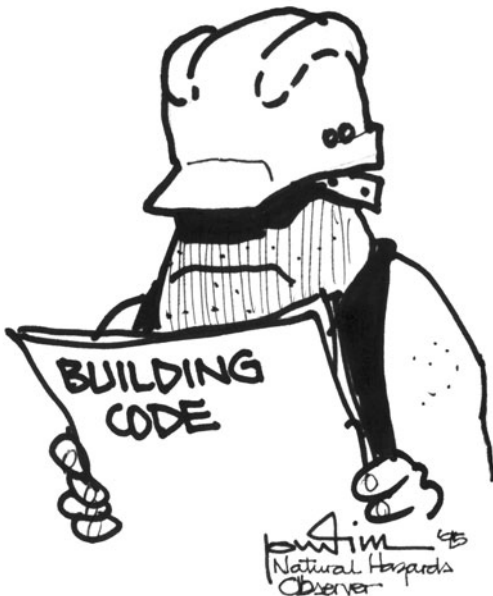
law. Each team, which should be deployed within 48 hours of an event whenever possible, will be lead by a NIST employee and include others chosen by the director from among private sector experts; university experts; representatives of professional organizations with appropriate expertise; and federal, state, and/or local officials.

The Act allows team members to enter property where a building failure has occurred or where building components, materials, and artifacts with respect to failure are located, and take “necessary action” to carry out the duties of the team. They may also inspect any “record, . . . process, or facility” related to the investigation and test building components. When a failure has been caused by a criminal act, the team must relinquish investigative priority to the appropriate law enforcement agency.

The NIST director may also conduct hearings, provide regular public briefings, produce witnesses, and issue subpoenas in the course of an investigation. Most of the items and information gathered through an investigation will, however, be made available to the public on request. The director must also appoint an advisory committee to review procedures and team reports.

Additionally, a team must issue a public report 90 days after completing its investigation. Information must include an analysis of likely causes of failure as well as recommendations for changes to or the establishment of evacuation and emergency response procedures, improvement of building codes and construction practices, and research and other actions that will help to prevent future building failures. NIST is then to work with USFA and other federal agencies to conduct or enable others to conduct research recommended by the team and promote adoption of recommendations by the team.

The text of the National Construction Safety Team Act and summaries, as well as additional information on the subject, are available at <http://www.house.gov/science>. Click on the link, “Lessons Learned from Ground Zero.” The complete text of the legislation can also be found at any *federal repository library* or on the Library of Congress web site: <http://thomas.loc.gov>.



FEMA Consolidates Programs That Provide Disaster Assistance

When Congress passed the Disaster Mitigation Act of 2000 (Public Law 106-390), legislators required that the "Temporary Housing Assistance" provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act be combined with the "Individual and Family Grant" programs (see the *Observer*, Vol. XXV, No. 3, p. 8). Recently, the Federal Emergency Management Agency (FEMA) published an interim final rule in the *Federal Register* to implement that provision (see Vol. 67, No. 189, pp. 61445-61460). The new program is called the "Federal Assistance to Individuals and Households" and was implemented on September 30, 2002.

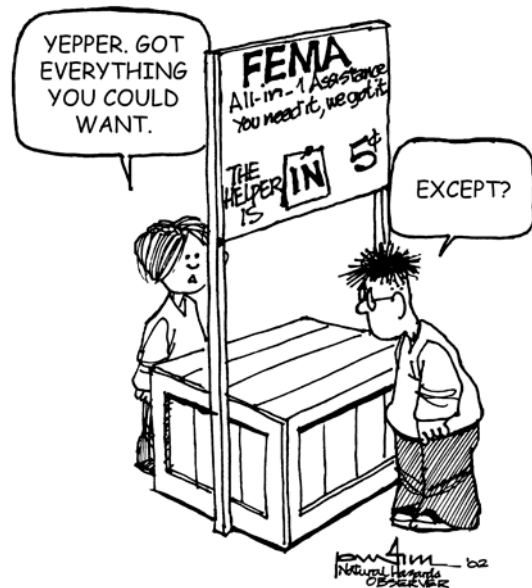
This new program provides financial assistance and/or other types of assistance to eligible individuals and households that, as a direct result of a major disaster or emergency, have uninsured or under-insured basic living expenses that they are unable to meet through other means. Recipients may receive up to \$25,000 for a disaster or emergency. One or more types of housing assistance may be made available, and FEMA shall determine the appropriate type of assistance based on considerations of cost effectiveness, convenience to individuals and households, and suitability and availability of types of assistance. Temporary housing and repair assistance "shall be utilized to the fullest extent practicable before other types of housing assistance" are provided.

FEMA may provide this type of assistance for no longer than 18 months following a presidential disaster declaration. Additionally, this assistance will not be counted as income or a resource to determine eligibility for welfare assistance, income assistance, or income-tested benefits programs from the federal government. These assistance rules also apply to those who are insured under the National Flood Insurance Program (NFIP), and policy holders who have suffered flood losses and received disaster assistance are required to maintain flood insurance for at least the assistance amount.

In general, FEMA may provide assistance to those who qualify under the Stafford Act (e.g. those who have incurred disaster-related expenses in a state that has received a presidential disaster declaration), when the individual's insurance coverage has been denied, and when insurance proceeds have been significantly delayed or are insufficient to cover necessary expenses. FEMA may also cover medical, dental, and funeral expenses; replacement of clothing and household items; cleaning or sanitizing of personal property; transportation needs; and moving and storage expenses.

Under the new rule, a state may either request that FEMA administer the assistance or apply for a grant from FEMA to administer the grant through the state. If a state chooses to administer its own program, it must submit a State Administrative Plan (SAP) to its FEMA regional director by November 30 of each year. A SAP will be effective for at least one year and must be resubmitted in full every three years.

The interim final rule contained in the *Federal Register* can be found in any federal repository library or on-line at



<http://www.access.gpo.gov>. Further information about this new rule can be obtained from the *FEMA Readiness, Response and Recovery Directorate*, 500 C Street, S.W., Washington, DC 20472; (202) 646-3487; e-mail: eipa@fema.gov; <http://www.fema.gov>.

The notice of the Interim Final Rule for revision of the Group Flood Insurance Policy under the NFIP, which addresses the requirement for certain recipients of disaster aid to purchase flood insurance as a condition of their assistance, can also be found in the same issue of the *Federal Register* from page 61460 to 61462.

USFA Releases Guidance for Local Infrastructure Protection

First it was Y2K, then it was terrorism. In fact, any type of catastrophic event can cause major interruptions in a community's critical infrastructure, including disruptions to major transportation routes, utilities, electrical transmission, telecommunications, and the computers that control critical systems. Community leaders, including emergency first responders, have the responsibility to decide what infrastructures must be protected from attacks by people, nature, or hazardous materials accidents. The reality of scarce resources (i.e., time, money, personnel, and material) tremendously complicates decision-making.

Recently, FEMA's U.S. Fire Administration (USFA) recognized the need for emergency responders to take stock of critical systems and plan for potential disruptions. In order to assist local governments, USFA's Critical Infrastructure Protection Information Center (CIPIC) recently published the *Critical Infrastructure Protection Process Job Aid* (2002, 18 pp., free) for local jurisdictions.

The Critical Infrastructure Protection Process is an analytical model to guide communities in establishing the systematic protection of critical infrastructures. Essentially,

it is a reliable decision sequence that helps leaders identify which infrastructure elements require protection. This process enhances efficiency because it prioritizes infrastructure according to survivability and mission success and assists public officials in determining which structures should be protected first.

The document can be downloaded from the CIPIC web site: <http://www.usfa.fema.gov/dhtml/fire-service/cipc-jobaid.cfm>.

CDC Restructures Epidemiology and Surveillance Division

In an effort to more effectively deal with the changing needs of public health surveillance and immunization to address the threat of bioterrorism, the Bush Administration recently announced the restructuring of the Centers for

Disease Control and Prevention (CDC), Epidemiology and Surveillance Division, National Immunization Program.

In a September 23, 2002, notice in the *Federal Register*, (Vol. 67, No. 184, pp. 59526-59528), the CDC outlined the new program functions, designating the National Immunization Program as the agency that directs all program activities regarding epidemiology; national surveillance; research and technical consultation for pertussis, diphtheria, tetanus, polio, measles, mumps, rubella, varicella, smallpox, and the vaccines and toxoids to prevent these diseases; and immunization safety. The agency will also have a role in creating immunization policy and vaccine development in the U.S. It will provide epidemic aid in collaboration with other CDC agencies and direct epidemiological research.

Copies of the *Federal Register* can be found in any federal repository library or on-line at <http://www.access.gpo.gov>.



A Letter to the Editor

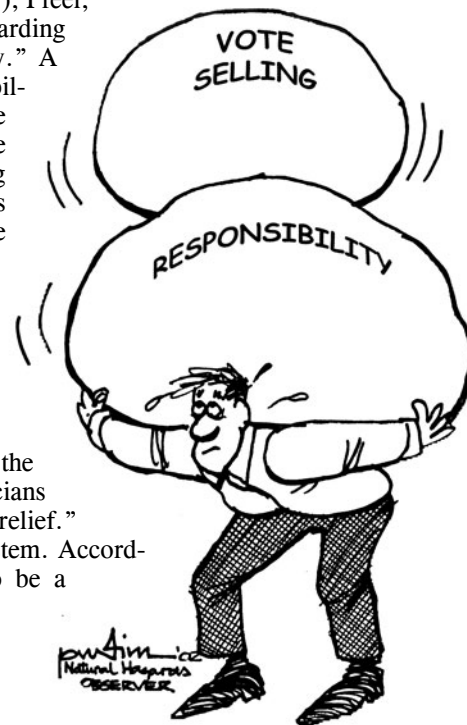
Of Personal Responsibility and Politics

A Response to Last Month's Invited Comment

Although much of Ellis Stanley's comment regarding vulnerability to natural hazards is undeniably correct and appropriate (see the *Observer*, Vol. XXVII, No. 1, p. 1), I feel, however, that explicit mention must be made of two critical unstated issues regarding vulnerability. First, it is not "we" who must "protect citizens and property." A primary factor in risk mitigation is for individual citizens to accept the responsibility for their own actions—it is "they" who must protect themselves. We in the hazard mitigation community can empower them, but they must choose to use that power. Many of the traditional paternalistic approaches, such as drawing sharp zoning boundaries, answer legal needs, but do not relate to the actualities of the hazards themselves—a flood will not necessarily stop at the edge of the mapped 100-year floodplain! The second issue is even more pernicious: natural disasters are the incumbent politician's best friend. They offer one of the very few opportunities for a politician to "buy" votes with someone else's money—the government's, thus ultimately ours. The partnership Stanley urges cannot and will not work when one of the more powerful members of that partnership, local and regional politicians, have a powerful disincentive to participate effectively.

All of the measures Stanley proposes will fail unless the responsibility (i.e., the cost) is placed directly on those who make unwise decisions, and unless politicians are enjoined from after-the-fact profiteering in the guise of "humanitarian relief." Neither of those eventualities are likely, or perhaps even possible, in our system. Accordingly, investment in many of the measures Stanley advocates is likely to be a continued waste of money.

William W. Locke
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Worldwide Emergency Services Initiative from Down Under

Over the past decade, a global team of academics and emergency professionals has researched the needs of emergency service agencies and emergency medical service providers in a variety of countries around the world. Largely based on findings generated during this survey period, an international advisory team came together to launch the International Combined Emergency Services initiative (ICES). The goal of ICES is to provide a center of global excellence in emergency services education, training, and response. ICES is being organized in recognition of the growing severity and magnitude of disasters worldwide, as well as the disparity of resources, training, and services among emergency responders around the world. A degree program in Public Safety is being developed, along with on-site and Internet course options in fire and rescue, medical response, environmental and humanitarian assistance, and law enforcement and security.

Located in Queensland, Australia, the ICES Center will eventually be able to meet the needs of up to 15,000 international students and staff. ICES' focus on training and operations will help developing countries meet specific needs to train and administer their own emergency service agencies, thus ensuring that more vulnerable communities are better able to cope with disasters. ICES will establish and maintain a variety of capabilities ranging from an operations center to an airborne response task force capable of responding globally to a fully staffed mobile field hospital.

For more information contact John Sturrock, ICES, P.O. Box 1227, Crows Nest N.S.W. 1585, Australia; tel: 61-2-9929-6179; e-mail: johns@icesproject.com; <http://www.icesproject.com>.



Earthshaking New Program Will Lead to Better Forecasting

The Southern California Earthquake Center (SCEC) has been awarded \$10 million from the National Science Foundation (NSF) to develop computing capabilities that will lead to better forecasts of when and where earthquakes are likely to occur in southern California and how the ground will shake as a result. The project team includes collaborating researchers from SCEC, the Information Sciences Institute (ISI) at the University of Southern California, the San Diego Supercomputing Center (SDSC), the Incorporated Research Institutions for Seismology (IRIS), and the U.S. Geological Survey (USGS).

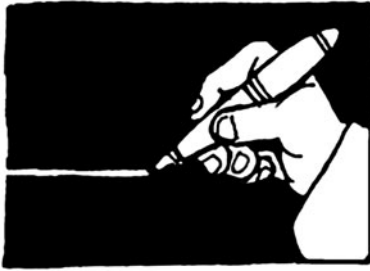
These earth and computer scientists will create an on-line collaborative laboratory—a collaboratory—to allow scientists from across the country to work together more effectively than is currently possible.

SCEC, headquartered at the University of Southern California, was founded in 1991 to gather new information about earthquakes; integrate existing knowledge into a comprehensive and predictive understanding of earthquake phenomena; and communicate this understanding to

end-users and the general public to increase earthquake awareness, reduce economic losses, and save lives. Funding for SCEC activities is also provided by the NSF and the USGS.

A community of outstanding scientists from over 40 institutions throughout the country participate in SCEC. The SCEC Communication, Education, and Outreach Program offers student research experiences, web-based education tools, classroom curricula, museum displays, public information brochures, on-line newsletters, and technical workshops and publications.

For more information, contact the Southern California Earthquake Center, University of Southern California, 3651 Trousdale Parkway, Suite 169, Los Angeles, California, 90089-0742; (213) 740-5843; e-mail: sceinfo@usc.edu; <http://www.scec.org>.



ON THE LINE

FEMA's Multihazard Mapping Initiative On-Line Access to Natural Hazards and Supporting Data

Geographic information systems (GIS) are an important tool in land-use planning, hazard mitigation, preparedness, and response to natural hazards events. In growing recognition of their importance in efforts to reduce the impacts of natural hazards, amendments to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) in 2000 required the Federal Emergency Management Agency (FEMA), in consultation with states, local governments, and appropriate federal agencies, to develop multihazard advisory maps accessible to at least five states (see the *Observer*, Vol. XXV, No. 3, p. 8).

A multihazard advisory map is a map "on which hazard data concerning each type of natural disaster is identified simultaneously for the purpose of showing areas of hazard overlap." The Stafford Act mandated that the map system be practicable, cost-effective, and use the most efficient technology available. The maps are to be made available to appropriate state and local governments to inform the general public about hazards and to support mitigation activities and a range of public uses. For instance, a local official may need to plan countywide evacuation routes or develop land-use zoning maps. Knowing the historical overlap of events such as floods, hurricanes, earthquakes, and severe winds, for example, would be an important factor in the public policy process.

From this concept, FEMA's Federal Insurance and Mitigation Administration (FIMA) developed the Multihazard Mapping Initiative (MMI) to:

- Foster the exchange of geospatial hazards data;
- Increase hazards awareness;
- Encourage data providers to establish standards-based services that facilitate distribution of data for the creation of multihazard maps;

- Promote the concept of "E-government" and coordinate with such projects as the Geospatial One-Stop, which provides standards and models for geospatial framework data, and the U.S. Geological Survey's National Map Geologic Database;
- Make FEMA spatial data holdings available as a web map service; and



- Allow FEMA easy access to outside spatial data critical to its daily operations.

To achieve these goals, the MMI included the development of a public map server and an internal FEMA MMI development site.

The Public Site

The public access site at <http://www.HazardMaps.gov> is a web-based collection of natural hazards maps and supporting data. It was created to provide organizations and agencies access to comprehensive natural hazards data.

There are three main components to the MMI:

- **Web Atlas.** This on-line, interactive mapping system enables users to turn multiple hazards and base map layers on and off, zoom to street level, and navigate around the U.S. with an easy-to-use interface. Users can create and save custom map views. Use of the atlas requires no plug-ins or downloads.
- **Data Exchange.** This feature provides an on-line center for hazards and other data exchange, including free data and complete descriptions of the content, quality, condition, and other characteristics of nearly every database in the system.
- **Data Upload.** Users can upload data to the MMI central multi-hazard data repository for access by others. In addition, uploaded data can be nominated for display on the Web Atlas.

The public access site establishes a framework of interoperable services that illustrates the advantages of using products and standards with Open GIS Consortium (OGC)¹ interfaces to access, merge, and visualize spatial information across federal, state, and local agencies and with other organizations supporting mitigation efforts. For instance, a user can access the site from an office desktop through a web browser and display multiple datasets from numerous locations on a single map.

In the first three months of operation, the site received over 250,000 hits from 65,000 visitors. FEMA plans to extend the interoperable capabilities and data holdings of the site in the near future.

MMI Development Site

The MMI also established a parallel development site for continuing development and testing with full interoperability. This site grew out of a multi-participant demonstration project in conjunction with the OGC. The project was designed to establish a standards-based framework of interoperable services to illustrate the advantages of using products with OGC interfaces to access, integrate, and depict critical spatial information in support of FEMA multi-hazard mitigation, response, and recovery functions. By implementing these services, we demonstrated their value to federal, state, and local agencies as well as other organizations supporting mitigation efforts.

The MMI is based on shared agreements governing essential geospatial concepts implemented through communications and message protocols, information models,

software interfaces, data formats, and policy. Built on open source technology and open GIS standards, the web map server allows the user to access and share any type of spatial data located worldwide. The MMI also established FEMA's node on the Federal Geographic Data Committee Clearinghouse.

Conclusions

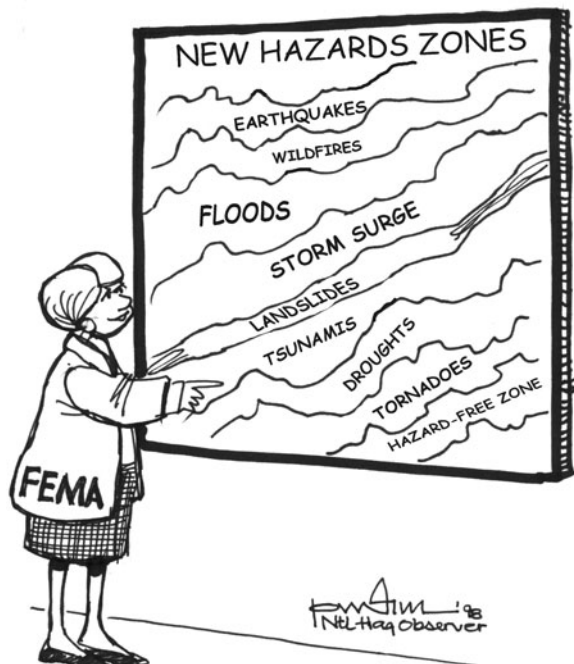
FEMA is planning additional work to increase interoperability on the public access site. Also, we would like to work with other federal, state, and local agencies to implement a system for data exchange in which the information resides on an agency's own server, but is accessible through interoperable standards and technology.

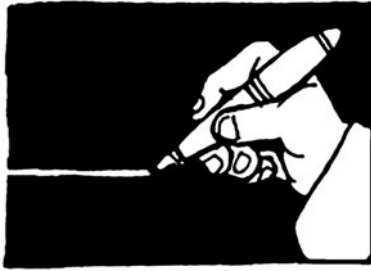
Many within FEMA see the MMI as an impetus to coordinate web offerings within the agency and to streamline many of the day-to-day mapping needs of FEMA and the larger hazards community. The goal is to make sure that FEMA initiatives are not simply warehoused and do not become isolated information repositories unable to integrate or communicate with one another. We are now one step closer to providing a fully interoperable platform that can extend the bounds of data and accessibility.

Michael Buckley
Federal Insurance and Mitigation Administration
Federal Emergency Management Agency

1. See <http://www.opengis.org> for more information.

For more information on the Multihazard Mapping Initiative, contact Scott McAfee, FEMA, 500 C Street, S.W., Washington, DC 20472; (202) 646-3317; e-mail: scott.mcafee@fema.gov; or Anne Flowers, FEMA, (202) 646-2748; anne.flowers@fema.gov. FEMA invites comments on the site; they can be e-mailed to mmi@hdm.com.





ON THE LINE II

California's Seismic Hazards Mapping Act Sustainable Hazard Mitigation

In 1996, the National Science and Technology Council's Subcommittee on Natural Disaster Reduction called for an emphasis on pre-disaster mitigation as a component of sustainable development (1996; see the *Observer*, Vol. XXII, No. 1, p.12). Simply put, this heralded a shift toward being proactive, instead of reactive, when confronting natural hazards.

Since then, with support from the Federal Emergency Management Agency (FEMA), the California Geological Survey has been implementing an earthquake hazard mitigation program that is already showing signs of success. Much of this achievement can be attributed to a statewide policy, the Seismic Hazards Mapping Act (SHMA), that embraces the concept of sustainable development through a broad combination of hazards zoning, mapping, disclosure policies, and economic incentives (see the *Observer* Vol. XVI, No. 3, pp. 14-15). Since its inception in 1990, over 150 California communities have been zoned using SHMA, and potential hazards at development sites are now being more effectively recognized and addressed.

SHMA was initiated following a feasibility study of the seismic hazard information needs of the insurance industry, local governments, and property owners. Although completed before the concept of sustainable development was widely established, the feasibility study recognized the importance of considering the sociological, economic, and political environments within which a program could operate.

Fortify Building Codes

SHMA was enacted to strengthen building codes targeted at ground failures such as liquefaction and landslides. Building codes are typically the minimum safety level to which buildings are designed, although such codes may

provide inadequate provisions for earthquake-triggered ground failure. SHMA supplements California's building standards code to require more rigorous analyses of hazards that results in a greater emphasis on appropriate mitigation.

The uniform and detailed regional assessment of potential seismic hazards that is codified within SHMA meets a variety of stakeholder needs because both the developer and the local permitting agency agree to address geotechnical hazards identified at the site.

Policy That Evokes Action

SHMA relies on a mechanism of hazards disclosure that begins with the state's issuance of official seismic hazard zone maps and continues through local planning and building departments, to property owners and developers, and ultimately to buyers. SHMA mandates a transfer of liability (and associated potential for litigation should damage occur) to induce mitigation at steps throughout the planning, construction, and sale processes.

Hazard awareness does change behavior as well as lead to cost-effective mitigation at appropriate levels. This type of comprehensive approach to mitigation can be considered "diagnostic," and is a significant improvement over a "prescriptive" solution in which potential hazards are not well determined, resulting in mitigation that is either inadequate or needlessly expensive.

Successful implementation of diagnostic policies requires natural hazards disclosure laws, along with registration and certification of qualified engineers and geologists who will conduct evaluations and propose mitigation actions. In California, implementing SHMA involves a modest modification of the existing construction permitting process in larger jurisdictions, and smaller communities are allowed to contract for technical oversight and review.

Economic Viability

The costs of hazards mapping and information dissemination are funded through general tax revenues, a FEMA Hazard Mitigation grant, and a levy on local building permit fees. At the project site, the cost of geotechnical hazard investigations is borne by the owner or developer—the primary beneficiary. Because hazards have been identified at the site, the added cost of mitigation is incorporated into the market value of the property. Disclosure protects the property buyer's right to know about potential hazards and what has been done to address them.

Because it emphasizes planning and mitigation, SHMA has a distinct benefit over building codes. Seismic hazard zones identify where adverse geologic conditions are most likely to occur. SHMA requires local agencies to consider seismic hazard zones when updating the safety element of their general plan and when making land-use decisions.



Seismic hazard zones also link the cost of construction, insurance, and lending to a statutorily established zone that helps support land-use loss reduction strategies, and in some cases, preserves environmental quality. For example, limiting development in floodplains that are prone to liquefaction helps manage flood risks while preserving the floodplain ecosystem.

Flexible Implementation

Under SHMA, local agencies are responsible for establishing the process and standard under which required site

investigations are conducted, reviewed, and approved. The jurisdictions are provided the flexibility and authority to establish standards based on individual community objectives and perceptions of acceptable risk.

In response to SHMA, the City and County of Los Angeles assembled an expert advisory committee under the auspices of the Southern California Earthquake Center, local chapters of the Association of Engineering Geologists, and the American Society of Civil Engineers. This committee helped define the methods, procedures, and standards for site investigations and review.

An Eye Toward the Future

The state provides technical guidelines to help define the scope of geotechnical site investigations. In addition, implementing SHMA has required extensive outreach to local governments and the geotechnical community. Workshops, short courses, in-service training, media events, and focused meetings within affected jurisdictions are on-going. Partnerships, cooperative research, and technology transfer projects provide insights from recent earthquakes from around the world.

Managing natural hazards can help maintain a community's quality of life and perhaps even the quality of the environment. However, sustainable mitigation includes promoting social and intergenerational equity and maintaining a healthy local economy. It should continue to improve public safety and reduce future losses throughout a community's lifespan. Further, mitigation must evolve with new findings in science, engineering, and technology to improve quality and lower the cost of implementation.

SHMA was designed to facilitate this type of mitigation. When implemented by a community, seismic hazard zone maps impact all future building construction. The Seismic Hazards Mapping Act installs a permanent mechanism that continues to improve earthquake safety for future generations. The real test, however, will come next year, when supporting FEMA grant funds expire. With only half the job completed in California, the future of SHMA lies in the hands of our government decision-makers.

Charles R. Real
California Geological Survey
Sacramento, California

Seismic Hazard Zone Maps and other information regarding the Act can be downloaded from <http://www.consrv.ca.gov>. For more information on the Seismic Hazard Mapping Program, contact the California Geological Survey, 801 K Street, MS 12-31, Sacramento, CA 95814; (916) 323-1886.

References

National Science and Technology Council, 1996. *Natural Disaster Reduction: A Plan for the Nation*. Committee on the Environment and Natural Resources, Subcommittee on Natural Disaster Reduction. Washington, D.C.





CONTRACTS AND GRANTS

The Implementation of Disaster Assistance in New York in the Aftermath of September 11: The Dynamics of Multiorganizational Response. Funding: National Science Foundation, \$80,389, 12 months. Principal Investigator: *Steven Stehr, Department of Political Science, Johnson 816, Washington State University, Pullman, WA 99164-4880; e-mail: stehr@wsu.edu.*

The principal objective of this research is to develop a more comprehensive and systematic understanding of the disaster assistance process, particularly as it relates to programs that benefit individuals and households. Data will be obtained from representatives of the more than 200 agencies and organizations that were involved in the disaster relief effort following the terrorist attacks on the World Trade Center. From that information, the researchers will identify the types of assistance offered, the number of victims who sought assistance, the number of victims who received aid, and the costs associated with providing this assistance. They hope to provide a more detailed understanding of the inter-organizational dynamics associated with disaster recovery and the political and organizational aspects of large-scale victim assistance following a disaster.

Terrorism and Corporate Crisis Management: The Strategic Effect of the September 11 Attacks. Funding: National Science Foundation, \$339,997, 24 months. Principal Investigators: *John R. Harrald, Julie Ryan, and Louise K. Comfort, Institute for Crisis, Disaster, and Risk Management, George Washington University, 1776 G Street, N.W., Washington, DC 20047; e-mail: harrald@seas.gwu.edu.*

The September 11 attacks on the World Trade Center were also an attack on corporate America. Of the almost 3,000 persons killed, most were employees of private corporations, and most of the direct economic losses were sustained by the private sector. Corporate America is in the midst of a strategic change as the issues of crisis preparedness, physical and information security, and continuity of operations have become central and immediate concerns. Objectives for this project include creating a method for quantifying the organizational and economic impacts of

extreme events on businesses, creating a framework for evaluating corporate preparedness, and defining the common body of knowledge for executive-level crisis managers. In addition, the researchers will examine the inter-organizational coordination between private sector businesses and among businesses, government, and nonprofit organizations.

R4: Rescue Robots for Research and Response. Funding: National Science Foundation, \$823,269, 36 months. Principal Investigator: *Robin R. Murphy, College of Engineering, ENB 311, University of South Florida, Tampa, FL 33620; e-mail: murphy@csee.usf.edu.*

This project, which will undertake the development and maintenance of robotics kits for nationwide research, aims to facilitate research into robot-assisted urban search and rescue (USAR). This funding supports the expansion of existing caches of robots suitable for USAR research in two separate regions, training on these robots, data collection, access to the robots and data sets via the Internet, field research exercises with fire rescue professionals at USAR sites, and loan of robots to individual researchers. In addition to integrating existing technologies and eliciting cooperation among response professionals and researchers, the project provides education in robotics for emergency response and homeland defense as well as the potential to safeguard the lives of rescue workers and locate victims more readily.

Adaptive Shoring for Robot-Assisted Search and Rescue. Funding: National Science Foundation, \$96,146, 12 months. Principal Investigator: *Robin R. Murphy, College of Engineering, ENB 311, University of South Florida, Tampa, FL 33520; e-mail: murphy@csee.usf.edu.*

This exploratory project will contribute to the development of a network of distributed shoring mobile robots to help brace collapsed structures (see the item above). Each robot would be able to position itself in a rubble pile where humans and other tools cannot go, adapt the pressure in its airbags to shift collapsed structures, and identify positions to improve support. Each unit would work in concert with other robots to maintain stability in a rescue area. This type

of system has been identified by the Federal Emergency Management Agency and regional response teams as an important tool for urban search and rescue teams. This project will investigate the use of sensors for local adaptive shoring and for placement of such robots.

Enabling the Next Generation of Hazards Researchers: An Education and Training Proposal. Funding: National Science Foundation, \$370,000, 24 months. Principal Investigator: *Raymond J. Burby, Department of City and Regional Planning, Campus Box 3140, New East Hall, University of North Carolina-Chapel Hill, Chapel Hill, NC 27599-3140; e-mail: burby@email.unc.edu.*

A serious issue in research on societal aspects of extreme events is the lack of junior faculty to sustain scholarship into the future. This initiative will develop a comprehensive mentoring program for recently appointed junior faculty at research universities. Objectives include identifying and recruiting a cohort of well-trained social scientists to undertake research into the societal aspects of extreme events, engaging these scholars in research discussions, enabling new faculty to undertake sustained research in the



field, and fostering an expanded network of social scientists interested in hazards and disasters. To accomplish these goals, the principal investigator will bring newly appointed faculty together with seasoned researchers in decision sciences, economics, geography, political science, psychology, public health, sociology, and urban planning. Sixteen junior faculty will be competitively selected as project fellows who will participate in two workshops and research and writing activities.

Intelligent Joint Evolution of Data and Information: An Integrated Framework for Drought Monitoring and

Mitigation. Funding: National Science Foundation, \$200,000, 24 months. Principal Investigators: *Ashok K. Samal, Leen-Kiat Soh, Donald A. Wilhite, Kenneth G. Hubbard, and William J. Waltman, Department of Computer Science and Engineering, University of Nebraska-Lincoln, Lincoln, NE 68588; e-mail: samal@cse.unl.edu.*

Water is a strategic resource in the U.S. that impacts the sustainability and livability of both rural and urban communities. It is therefore critical to build monitoring and early warning systems for hydrologic events that inventory water resources and accurately model water usage and impacts on communities across multiple scales. Notably, drought involves complex processes that contain hydrological, agricultural, and socioeconomic components. Researchers in this project will work to develop an integrated framework that views drought through various windows that can better detect emergency situations and understand their spatial and temporal aspects.

Shaping Science and Technology to Serve National Security. Funding: National Science Foundation, \$50,000, 12 months. Principal Investigator: *James J. Richardson, Potomac Institute for Policy Studies, 901 North Stuart Avenue, Suite 200, Arlington, VA 22204-1821; (703) 525-0770.*

The investigators in this study will define and document potential science and technology trends and their impacts on national security over the next 20 years. Specifically, they will examine which trends are most likely to yield products to benefit national security, which trends are likely to pose dangers to our society, how the trends are likely to evolve, where new and significant capabilities or threats will emerge, who will be the most likely producers of these capabilities and threats, and whether there are roadblocks to scientific or technological progress that may deter these developments. The six scientific areas to be examined include advanced materials; life sciences; social, behavioral, and economic sciences; energy; nanotechnology; and information technology.

A High-Frequency Beam-Steered Electromagnetic Impulse Radar to Locate Human Targets Through Opaque Media. Funding: National Science Foundation, \$500,000, 24 months. Principal Investigator: *Scott R. Thompson, RealTronics, P.O. Box 228, Hermosa, SD 57744-0228; e-mail: scott@realtronics.com.*

This work will develop an imaging system to locate humans through opaque media and provide wide-area subsurface sensing for ground-probing applications. Initial testing demonstrated that the system could detect human beings on the opposite sides of building walls and walls of granite over 10 meters in thickness. The second phase of the research will develop hardware and software to classify, track, and count living beings. Some of the primary applications for this technology will be for use in homeland security, search and rescue operations, and military operations. The technology could also be used for geophysical exploration, utility detection and location, road-bed and bridge scans for cracks and voids, and ground sensing to predict earth or structural failure.

Designing for Earthquakes. Funding: National Science Foundation, \$100,000, 24 months. Principal Investigators: *Susan Tubbesing, Christopher Arnold, and Christine Theodoropoulos, Earthquake Engineering Research Institute, 499 14th Street, Suite 320, Oakland, CA 94612-1928; e-mail: skt@eeri.org.*

This project will carry out the research needed to update a classic publication, *Designing for Earthquakes*, originally published in 1978. One of the few technical documents that deals with seismic design for members of the architecture profession, this publication is now out of print. The new book will improve vastly on the earlier publication by incorporating advances that have been made in engineering knowledge and the development of the concept of "Performance Based Seismic Design." The absence of technical seismic design information for architects has ignored the pivotal role they play in communicating seismic resistant strategies to building owners and community leaders. EERI will examine the current status and limitations of seismic design education in university architecture and continuing education programs, identify the kinds of information and training architects need to better understand and design for seismic risk, update the information in the 1978 edition, and add several new chapters that reflect current engineering knowledge.

Condition and Security Indicators for Interdependent Infrastructure Systems. Funding: National Science Foundation, \$246,284, 36 months. Principal Investigators: *Neil S. Grigg and Evan C. Vlachos, Department of Civil Engineering, A205G Engineering, Colorado State University, Fort Collins, CO 80523; e-mail: neilg@engr.colostate.edu.*

The goal of this research is to define multi-attribute performance indicators for infrastructure condition and security. The indicators will enable identification of inefficiencies and vulnerabilities of three types of infrastructure: roads, electricity delivery systems, and water supply systems. As government- or investor-owned monopolies, roads, electrical supply structures, and water utilities support basic societal functions, but even large, well-managed organizations reveal little data about their condition and security. Indicators will be selected from past failures and a case study of infrastructure systems in the Northern Colorado region. A workshop will be conducted in which agency managers will learn how to use the indicators and will provide insights on why indicators are not used more often. Indicators will then be constructed that will be tested on stakeholders and the public at a second workshop. The researchers seek to determine whether the public judges the information to be relevant for decision making and whether the management of public infrastructure can be improved if the public has more relevant and easily understood information about condition and security.

NIST Receives \$16 Million to Study Trade Center Collapse



On August 21, 2002, the Commerce Department's National Institute of Standards and Technology (NIST) announced details of its \$16 million, 24-month federal building and fire safety investigation to study the structural failure and subsequent progressive collapse of several World Trade Center (WTC) buildings following the terrorist attacks in 2001. The study of WTC Buildings 1 and 2 (the Twin Towers) and WTC Building 7 will focus on building construction, materials used, and technical conditions that contributed to the disaster.

NIST already has completed much of the planning work for the investigation and has consulted extensively with the public concerning its scope. The investigation

will involve the participation of technical experts from industry, academia, and other laboratories to complement the agency's in-house expertise. NIST also will draw from a private-sector coalition that includes professionals from the Structural Engineering Institute of the American Society of Civil Engineers (SEI/ASCE), the Society of Fire Protection Engineers (SFPE), the National Fire Protection Association (NFPA), the American Institute of Steel Construction (AISC), the Council on Tall Buildings and Urban Habitat (CTBUH), and the Structural Engineers Association of New York (SEAoNY).

Additionally, NIST will work with other industry organizations, standards and code bodies, and the insurance industry during its investigation, as well as the families of building occupants, first responders, and organizations representing families of victims such as the Skyscraper Safety Campaign.

NIST expects to complete its investigation and issue a final report in 24 months. Further details about this project can be obtained from the *NIST World Trade Center Investigation Team, 100 Bureau Drive, Stop 8610, Gaithersburg, MD 20899-8610; e-mail: wtc@nist.gov; http://wtc.nist.gov.*

HHS Awards \$11.4 Million Contract to Assess Health of Workers, Volunteers at WTC Disaster Site

On August 5, 2002, the Department of Health and Human Services (HHS) announced an \$11.4 million contract with the Mt. Sinai School of Medicine to determine whether rescue and recovery workers and volunteers who worked at the World Trade Center disaster site are experiencing related illnesses or injuries.

The contract will fund free standardized clinical examinations to workers and volunteers involved in on-site rescue and cleanup efforts. The goal of the project is to create a system to help employers and public health professionals identify symptoms, injuries, or conditions that may indicate long-term illness as a result of site conditions at WTC. The contract will also pay for Mt. Sinai to compile a database of the findings, allowing researchers to assess potential occupational illness and injury patterns among the workers and provide data for future studies where health changes over time can be addressed.

The examinations will focus on identifying health problems most likely to occur as a result of work at or near the World Trade Center site. These include respiratory effects, musculoskeletal disorders, chronic effects from injuries at the site, and mental health conditions.

The contract will be administered by the National Institute for Occupational Safety and Health (NIOSH), the part of the Centers for Disease Control and Prevention

(CDC) that conducts research and makes recommendations for preventing job-related injuries and illnesses.

It is estimated that the program will provide screenings to at least 8,500 workers and volunteers, who will receive a report about their test results. General information about the screenings will be shared with industry, labor, and government to help identify potential trends in health effects.

Mt. Sinai's Irving J. Selikoff Center for Occupational and Environmental Medicine will lead the examinations. The other participating occupational health clinical centers are the Bellevue/New York University Occupational and Environmental Medicine Clinic; the State University of New York's Stony Brook/Long Island Occupational and Environmental Health Center; the Center for the Biology of Natural Systems at Queens College in New York; and the Clinical Center of the Environmental and Occupational Health Sciences Institute at the University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School. Referrals for participants who live outside the New York area will be coordinated with the Association of Occupational and Environmental Clinics.

For information about the screening program, contact the Mt. Sinai School of Medicine, One Gustave L. Levy Place, New York, NY 10029; (888) 702-0630; <http://www.mssm.edu/theshool>.

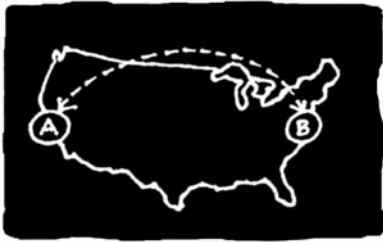
Universities Form Bio-Research Consortium

Six southwestern universities have formed a consortium to combat biological threats, including bioterrorism. The Southeastern Center for Emerging Biologic Threats (SECEBT) partnership includes Emory University's Robert W. Woodruff Health Sciences Center, the Georgia Institute of Technology, the Medical College of Georgia, Morehouse School of Medicine, the University of Florida, the University of Georgia, and the University of Mississippi Medical Center. Other partners are expected to come on board over the next few months. The center will also work in close collaboration with state and federal agencies.

The SECEBT will develop new means of detecting, combating, and preventing biologic threats, whether purposefully caused, as from terrorism, or arising from naturally occurring phenomena. Among the many projects to be undertaken, the consortium will conduct work regarding:

- early detection and warning of biologic threats;
- communication approaches, including best methods to convey risk and create structures to disseminate information to public health agencies, government officials, hospitals, medical and veterinary personnel, and the general public; and
- hospital (including trauma and emergency departments) and community response to threats, including detailed plans to address access to facilities, emergency transportation, availability of medical supplies, chain of command, emergency power, rapid communication with staff and public health agencies, disease surveillance, and other issues.

For more information about this new cooperative effort, contact *Holly Korschun*, Robert H. Woodruff Health Sciences Center, Emory University, Atlanta, GA 30322; (404) 727-3990; e-mail: hkorsch@emory.edu. A brief description of the program can be found on-line at <http://www.secenterbiothreats.org>.



CONFERENCES AND TRAINING

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

Business Continuity Plan (BCP) Development: A Five-Day Workshop. Sponsored by the Institute for Business Continuity Planning. Offered in two locations on the same date: Washington, D.C. and Atlanta, Georgia: November 18-22, 2002. BCP is concerned with protecting the vital business processes of companies so that in the event of a critical incident, essential business components will continue to function. This intensive workshop provides the approach and methodology for developing a business continuity plan to ensure organizational survival. For more information e-mail: info@ibct.com; <http://www.ibct.com/index.html>.

HazMat Explo 6. Hosts: Federal Emergency Management Agency, U.S. Environmental Protection Agency and Department of Transportation, Nevada League of Cities, and Association of Counties. Las Vegas, Nevada: December 2-6, 2002. This hazardous materials training conference includes course tracks in industry, medicine, radiology, emergency planning, and first response. The conference was organized following State Emergency Response Commission (SERC) and Local Emergency Response Committee (LEPC) member requests for a conference to provide training regarding solutions to problems hazardous materials pose. For more information, write to *HazMat Explo 6, Clark County Local Emergency Planning Committee, Post Office Box 551713, Las Vegas, NV 89155-1713; (702) 768-0887; http://www.hazmatexplo.org*.

Fencing Floods in South Asia: Disaster Preparedness through Risk Communication—A Regional Media and Policy Workshop. Hosts: Rural Development Policy Institute, Journalists Resource Center, Meteorology Department of Pakistan, and Asian Disaster Preparedness Center (ADPC). Islamabad, Pakistan: December 16-19, 2002. The workshop is designed to highlight perspectives and experiences in flood preparedness in South Asia through sharing, discussing, and debating options for planning effective flood management via a process of risk communication in the region. Participants will include media representatives, South Asian

country government representatives, international donors, universities and research institutes, and regional organizations working on disasters. For more information, contact: *Iftikhar Haider, Rural Development Policy Institute, Number 270, Suite 37, G-9/1, Islamabad, Pakistan; tel: 0092-51-285 3616; e-mail: eeftiqar@hotmail.com.*

Weapons of Mass Destruction Conference 2003: Preparedness Through Partnership. Sponsors: University of South Florida College of Medicine, Veterans Health Administration, Emergency Management Strategic Healthcare Group, Florida Department of Health—Emergency Operations, Brooke Army Medical Center, Pinellas County Emergency Management, and the Federal Emergency Management Agency. St. Petersburg, Florida: January 24-28, 2003. Although the threat from incidents involving Weapons of Mass Destruction (WMD) is perceived as critical, only recently have there been efforts to address both crisis and consequence management at the local, state, and federal levels. The civilian response part that has received the least amount of attention is the health care system. This vital component of the response system is the final common destination for victims of a WMD event and, yet, health care facilities in a community remain less involved and under less scrutiny than other response entities. For more detailed information, contact *Gregory Watts: (727) 398-9482; e-mail: Gregory.Watts2@med.va.gov; http://www.va.gov/wmd*.

7th World Congress on Stress, Trauma and Coping: Crisis Intervention in a Changing World. Host: International Critical Incident Stress Foundation (ICISF). Baltimore, Maryland: February 12-16, 2003. Sessions during this congress are designed to provoke critical thinking, challenge convention, and offer ideas and insight into the broad field of crisis intervention. Participants will identify the tools needed to solve current problems as well as discuss challenges and opportunities for the future. One- and two-day pre-congress workshops will be offered February 12-13,

2002. For complete conference information, contact *Shelly Cohen, ICISF, 10176 Baltimore National Pike, Unit 201, Ellicott City, MD 21042; (410) 750-9600; e-mail: scohen@icisf.org; http://www.icisf.org/cfp.pdf.*

International Disaster Recovery Association (IDRA) Annual Meeting. Providence, Rhode Island: February 23-26, 2003. The theme for the 13th annual conference is "readiness, resilience, recovery, and reassessment," and all topics focus on telecommunications contingency planning. For more information, contact *IDRA, c/o BWT Associates, P.O. No. 4515, Shrewsbury, MA 01545; (508) 845-6000; e-mail: 2003@idra.com; http://www.idra.com.*

Dissertations Initiative for the Advancement of Climate Change Research (DISCCRS) Symposium. Sponsors: American Geophysical Union, American Meteorological Society, American Society of Limnology and Oceanography, Ecological Society of America, and Whitman College. Puerto Rico: March 10-15, 2003. The symposium will allow graduate students to present their research, discuss emerging professional and societal issues, meet with funding agency representatives, and build a professional network. To register with DISCCRS, or receive complete symposia information including eligibility, deadlines, and how to apply, contact *C. Susan Weiler; (509) 527-5948; e-mail: weiler@whitman.edu; http://aslo.org/discrcr/discrcrposter.pdf.*

The 11th Annual Conference on Traumatic Stress. Host: Association of Traumatic Stress Specialists (ATSS). League City, Texas: April 2-6, 2003. ATSS prepares and equips individuals who work in trauma services, response, treatment, and pastoral care. This year's conference will focus on self-care for the trauma work provider as well as traditional workshops that cover a variety of trauma-related topics. The conference is geared toward people that provide counseling, therapy, crisis intervention, and debriefing to trauma populations. For more information, contact *Jo Halligan, ATSS, Post Office Box 2747, Georgetown, TX 78627; (512) 868-3677; http://www.atss-hq.com/conference/index.cfm.*

First World Forum on Children in Complex Emergencies. Host: Union of Pediatricians of Russia and International Charitable Fund for Children in Disasters and Wars, with the support of the Government of Russia and other organizations. Moscow, Russia: April 26-29, 2003. The forum will discuss and adopt a model for national and regional plans to assist children in emergencies through 2010 as requested by the 27th United Nations Special Session Resolution, "A World Fit for Children." For more information, contact: *World Forum Organizing Committee, Children's Hospital #20, B. Polyanka str. 20, Moscow, Russia 119180; e-mail: roshal@lamport.ru; http://www.childrendisasters.org.*

Seismological Society of America (SSA) 98th Annual Meeting. Host: University of Puerto Rico. San Juan, Puerto Rico: April 30-May 2, 2003. The objectives of this conference

include demonstrating to the scientific community that seismologists and engineers can work together; bridging exposure gaps between the scientific communities of the Americas; and encouraging scientists in related areas to work more closely together. Presentation themes include earthquake predication, seismic safety, topographic effects of earthquakes, near source ground motion, and seismic imaging of fault lines to name just a few. For more conference information, contact *SSMA at 201 Plaza Professional Building, El Cerrito, CA 94530; e-mail: christa@rmsismo.uprm.edu; http://ce.uprm.edu/SSA-2003.*

Strategies for Performance in the Aftermath of the World Trade Center. Sponsors: International Council for Research and Innovation in Building and Construction (CIB) and the Council on Tall Buildings and Urban Habitat (CTBUH). Kuala Lumpur, Malaysia: May 8-10, 2003. The collapse of the World Trade Center prompted immediate actions by the design and construction industry to examine critical issues concerning tall buildings and strongly suggests the need to enhance building performance for future construction. While recognizing the impossibility of designing for complete resistance to extreme impacts, the performance of buildings could be improved by examining various technical aspects. This international conference will provide the opportunity for authorities and stakeholders to discuss and exchange information on performance issues and strategies for enhancing the performance of tall buildings during emergencies. For more information, contact *Faridah Shafii, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia; (607) 550-3435; e-mail cibkl@cibklutm.com; http://www.cibklutm.com.*

VIII European Conference on Traumatic Stress (ECOTS). Host: Catholic University of Applied Sciences, Berlin, and the German-Speaking Society for Psychotraumatology. Berlin, Germany: May 22-25, 2003. The themes of this conference include progress in medical and psychological treatment; biological processes involved in post-traumatic stress disorder; natural and technological disasters; refugees and trauma; and clinical social work with trauma survivors. The intended audience is all scientists and mental health workers involved with trauma. For conference information contact *Andreas Maercker, University of Zürich, Department of Clinical Psychology II, Zürichbergstrasse 43, 8044 Zürich, Switzerland; tel. (41) 1-634-4452; e-mail: maercker@klipsy.unizh.ch; http://www.trauma-conference-berlin.de.*

2003 Structures Congress and Exhibition: "Engineering Smarter." Host: American Society of Civil Engineers (ASCE). Seattle, Washington: May 29-June 1, 2003. This congress will engage engineers and researchers in discussions on how to make better use of existing materials and structural concepts as well as developing new methods and materials. For more information, contact *Charles W. Roeder, Structures Congress 2003, University of Washington, 233B More Hall, Seattle, WA 98195-2700; (206) 543-6199; e-mail: croeder@u.washington.edu; http://www.asce.org/conferences/structures2003.*

13th World Conference on Disaster Management (WCDM). Sponsors: Canadian Centre for Emergency Preparedness. Toronto, Canada: June 22-25, 2003. The theme for this conference is "The Changing Face of Disaster Management: New Threats, New Approaches," and it is designed to bring together professionals from the fields of emergency response, management, and health care; business continuity planning; risk management; and security and information technology. Abstracts for one of the following themes—real events/real lessons learned; emerging trends in disaster management; the human element in disaster management; and technical disaster management principles and practices—are due by December 16, 2002. For complete conference information, contact *Adrian Gordon, Canadian Centre for Emergency Preparedness, 1005 Skyview Drive, Suite 202, Burlington, ON L7P 5B1, Canada; (905) 319-4034; e-mail: agordon@ccep.ca; http://www.wcdm.org.*

Cities on Volcanoes 3 Conference. Host: County and State of Hawaii and the International Association of Volcanology and Chemistry of the Earth's Interior. Hilo, Hawaii: July 13-18, 2003. This is the third international meeting to bring together emergency managers, volcanologists, educators, sociologists, psychologists, economists, and city planners to re-evaluate volcanic crisis preparedness and management in cities and densely populated areas. For more information contact *Cities on Volcanoes 3, University of Hawaii Hilo Conference Center, 200 West Kawili Street, Hilo, HI 96720; e-mail: cov3@hawaii.edu; http://www.uhh.hawaii.edu/~cov3; or call Andrea Furuli: (808) 974-7555.*

Sixth U.S. Conference and Workshop on Lifeline Earthquake Engineering. Host: Technical Council on Lifeline Earthquake Engineering (TCLEE). Long Beach, California: August 10-13, 2003. The conference theme is advancing mitigation technologies and disaster response, and the workshop is designed to provide the opportunity to bring together engineers, seismologists, geologists, social scientists, and managers to exchange information about earthquakes and lifeline performance. For more information, contact the *American Society of Civil Engineers 1801 Alexander Bell Drive, Reston, VA 20191-4400; (800) 548-2723; http://www.asce.org/conferences/tclee2003/index.html.*

Fifth International Conference on Case Histories on Geotechnical Engineering. Sponsor: University of Missouri-Rolla, Civil Engineering Department. New York, New York: April 13-17, 2004. This meeting will provide a forum for geotechnical professionals from around the world to present their research findings. Topics include soil structure, geotechnical case studies of natural disasters, forensic engineering, and retrofit issues, among others. For more information, contact *Wanda Furniss, University of Missouri-Rolla, 1870 Miner Circle, Rolla, MO 65409-1060; (573) 341-4442; fax: (573) 341-4992; e-mail: eqconf@umr.edu; http://web.umar.edu/~eqconf/5thCHConf.*

Emergency Response Improvements in the Big Apple

The World Trade Center tragedy on September 11, 2001, was unparalleled in nature and magnitude. The actions of the New York City Fire Department (FDNY) and the New York City Police Department (NYPD) facilitated the safe evacuation of more than 25,000 people, the most successful urban emergency evacuation in modern history. Earlier this year, the City of New York enlisted McKinsey and Company to identify both the effective and ineffective aspects of the response to the attack on the World Trade Center. The reviews are based on extensive interviews, surveys, and documentary records from within both agencies and were commissioned to help the city be better prepared for large-scale emergencies in the future.

Recommendations for improvements in the emergency response capability for both the NYPD and FDNY include: clearly defining roles and responsibilities, enhancing mobilization procedures, establishing comprehensive preparedness and scenario-based training, improving inter-departmental communication and equipment distribution, creating specialized incident management teams, improving staging procedures, and providing flexible family and member support services.

Both city agencies have already enacted a number of initiatives and procedures based on report recommendations. The fire department report can be found at: http://www.nyc.gov/html/fdny/html/mck_report/toc.html, and the police department report is available at http://www.mipt.org/pdf/nypd_lessonslearned9-1-1.pdf.





INTERNET PAGES

Below are new or updated Internet resources that the Natural Hazards Center staff have 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.sustainable.doe.gov>

<http://www.ncat.org>

For the last six years, the National Center for Appropriate Technology (NCAT) has maintained the Center of Excellence for Sustainable Development web site for the Department of Energy (DOE). Although the URL remains the same, the site was recently re-named the “Smart Communities Network” to reflect the DOE’s emphasis on creating communities that incorporate energy efficiency as part of sustainable development. The site contains a wealth of information and links about sustainability and is worth a look. The NCAT site, home of the people who maintain the DOE site, contains a lot of interesting information, too, including information about upcoming workshops on “non-traditional risk management outreach.”

<http://www.nlm.nih.gov/medlineplus/disastersandemergencypreparedness.html#generaloverviews>

The U.S. National Library of Medicine (NLM) has created a new Internet section on disasters and emergency preparedness. The web site section includes articles on disaster planning, natural disasters, relief work, and emergency medicine. The site is part of NLM’s MEDLINEplus web site.

<http://www.goinginternational.org>

This web site, which calls itself the “information platform in medicine and public health,” contains a new on-line section; a “course catalog” of more than 2,500 programs, courses, and international meetings; as well as course content information and contact information for all course organizers. Topics range from disaster management and emergency medicine to humanitarian assistance. Printed copies are also available for \$29.00. Please see <http://www.goinginternational.org/english/b2.htm> for complete ordering information or contact *Going International, Fasangasse 28/27, A-1030 Vienna, Austria; tel. and fax: +43-(0)1-798 25 27.*

<http://www.all-hands.net/pn/index.php>

All-Hands.net is a new virtual community of emergency managers and business continuity professionals. It is designed as a user-supported community, and all of the site’s content is provided by members and participants. Users can easily post articles, share files, and communicate with others. To register, submit the membership request form at the URL above.

Terrorism

<http://www.stanfordhospital.com/forPhysiciansOthers/bioterrorism/bioterrorism.html>

This web site from the Stanford University School of Medicine has a number of electronic resources concerning bioterrorism and emergency preparedness for physicians and health care providers. In particular, the site includes a variety of clinical checklists and worksheets for handling smallpox and anthrax cases, as well as information from a number of different agencies and organizations.

http://www.nlc.org/nlc_org/site/newsroom/terrorism_response/index.cfm

The National League of Cities (NLC) has a section on its web site titled “Strengthening Hometown Security” that includes NLC programs and activities and profiled programs in select cities. The web site section is designed to help city officials in carrying out their new roles as the front line of hometown defense. NLC documents include practical tools for local governments; available federal resources; city events that commemorated September 11, 2001; and more.

<http://www.epa.gov/wtc/stories/yearreview.htm>

"Oh My God, Look at That Plane!" begins an on-line overview of EPA Region 2 actions and reactions during the events of September 11, 2001. Web sections include emergency operations, environmental monitoring, sampling, and contaminant issues; communicating the response to the public, and personnel narratives about work at the Fresh Kills Landfill as well as the general agency response.

<http://ksgnotes1.harvard.edu/BCSIA/ESDP.nsf/www/Home>

The Executive Session on Domestic Preparedness (ESDP) is a standing task force of practitioners and academic specialists concerned with terrorism and emergency management. Sponsored by the John F. Kennedy School of Government, Harvard University, and the U.S. Department of Justice, the ESDP brings together experts with operational experience in emergency management, law enforcement, fire protection, public health, emergency medicine, national security and defense, and elected office. The ESDP is a resource for federal, state, and local government officials, congressional committees, and others interested in reducing the threat of terrorism and minimizing the vulnerability of democratic societies to its effects. There are a number of new discussion papers listed on the site that may be of interest to *Observer* readers.

<http://www.slu.edu/colleges/sph/csbei/bioterrorism/index.html>

The St. Louis University School of Public Health, Center for the Study of Bioterrorism, has a comprehensive web site that presents a variety of information, links, and research about bioterrorism issues. The site includes upcoming training and conferences and a section on emergency response.

Earthquakes

<http://earthquake.usgs.gov>

The Earthquake Hazards Program with the U.S. Geological Survey has upgraded its web site to feature near-real-time Advanced National Seismic System (ANSS) recent earthquake maps. The site has been extensively reorganized to provide more accessible information that is usually posted within minutes after an earthquake.

Floods and Drought

<http://www.es.mq.edu.au/nhrc/web/floodAUS/floodausbrochure.htm>

This site contains a geographic information systems-based model for estimating mainstream flood risk in urban areas on a per address basis in specific areas of Australia. The first application of this model was completed in March 2002.

<http://water.usgs.gov/waterwatch>

The U.S. Geological Survey (USGS) unveiled its new, on-line Water Watch web site that gives visitors an instantaneous picture of water conditions nationwide in near-real-time. Through the use of USGS Water Watch maps, the country's current streamflow conditions, including high flood-flows and low drought-flows, are depicted on maps with color-coded dots that represent conditions at about 3,000 stream gages.





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

"Responding to Energy-Related Emergencies," Oak Ridge National Laboratory Review, Vol. 25, No. 2, 2002. Free on-line newsletter. For subscription information write to Oak Ridge National Laboratory Review, 4500-S, MS 6149, Oak Ridge, TN 37831-2008; e-mail: zhk@ornl.gov or see <http://www.ornl.gov/ORNLReview/front/subscribe.shtml>.

Oak Ridge National Laboratory (ORNL) has developed a computer-based system, the Oak Ridge Evacuation Modeling System (OREMS), to help emergency responders develop plans for moving people quickly and safely away from the site of almost any disastrous event. This article describes various hazards scenarios (both natural and human-caused) to which the model has been applied. The system is based on data from actual events. OREMS is currently used by planners and municipal agencies from a variety of states. OREMS has the capability to adapt to a wide variety of scenarios and situations, including plume predictions; forecast evacuation traffic flow; and provide guidance for an overall coordinated response to a chemical or natural disaster.

Avoiding Disaster: How to Keep Your Business Going When Catastrophe Strikes. John Laye. 2002. 272 pp. \$24.95. To obtain a copy, contact Wiley Publishers, Customer Care Center, Consumer Accounts, 10475 Crosspoint Boulevard, Indianapolis, IN 46256; (877) 762-2974; fax: (800) 597-3299; e-mail: customer@wiley.com; <http://www.wiley.com>.

Avoiding Disaster provides contingency planning methods for managers in both the public and private sectors to cope with catastrophes such as natural disasters, human-caused events, or technological calamities. The author notes that in the event of a disaster, managers must engage policy directives that are clear, unequivocal, and directed for maximum benefit. As case studies in the book illustrate, decisive and well-reasoned management is the single most important ingredient for an organization's survival in a crisis. He provides guidance for undertaking contingency planning, initiating a crisis management plan, assessing risk, analyzing business impacts, understanding business continuity strategies, managing emergency response, training emergency response teams, establishing a crisis management team, exercising emergency plans, involving senior management, communicating a disaster avoidance program, restoring operations and implementing recovery activities, and enhancing interaction between companies and government agencies.

Blindsided: A Manager's Guide to Catastrophic Incidents in the Workplace. Bruce T. Blythe. 2002. \$24.95. 224 pp. To obtain a copy,

contact Penguin Putnam, Inc.: (800) 788-6262; fax: (800) 227-9604 or (201) 256-0017; <http://www.penguinputnam.com>.

Blindsided is a manual for managers on how to prepare themselves and their companies for workplace catastrophes—natural disasters, kidnappings, aviation and industrial accidents, terrorism, and armed attack. It is intended as a step-by-step process that can help any company deal with customers, employees, and the media after a crisis. It addresses such topics as: what to do in the immediate aftermath of a crisis; how to address the human side of crisis response, recovery, and preparedness; how to quickly reduce a company's vulnerability to disaster; how to increase the effectiveness of communications; how to analyze foreseeable risks and create a master plan for crisis response; how to manage employee stress in the aftermath of a crisis; and how to accelerate recovery. It also outlines the critical components of crisis preparedness and recommends ways companies can prepare for future terrorism.

Hazard Mitigation Planning. Emergency Management Series Number 3. William D. Wagoner. 2002. 11 pp. \$5.00. Copies can be obtained from the Michigan Municipal Risk Management Authority (MMRMA), 14001 Merriman Road, Livonia, MI 48154; Attention: Cara; (517) 513-0300. Checks should be payable to MMRMA.

This report, designed for county-level hazard mitigation planning, outlines planning requirements, the planning process, and potential strategies for multiple hazards preparedness. It offers practical guidelines for determining hazard mitigation activities and discusses the issues involved in developing a local hazard mitigation process and strategy.

How to Create a HAZUS User Group. FEMA 404. 2002. 45 pp. Free. Printed copies can be requested from the FEMA Publications Distribution Center, P.O. Box 2012, Jessup, MD 20794-2012; (800) 480-2520. The complete report is available on the HAZUS web site: http://www.fema.gov/hazus/li_user.pdf.

HAZUS, a natural hazards loss estimation methodology developed by the Federal Emergency Management Agency (FEMA) in partnership with the National Institute of Building Sciences, uses geographic information systems (GIS) technology to compute estimates of damage and losses that could result from an earthquake. To support FEMA's mitigation and emergency preparedness efforts, HAZUS is being expanded into a multi-hazard methodology with new modules for estimating potential losses from wind (hurricanes, thunderstorms, tornadoes, tropical cyclones, and hail) and flood (riverine and coastal) hazards. This manual provides guidance for creating a user group. In particular, it provides tips for a user group to assess and mitigate natural

disaster risks and losses. Templates and the experiences of existing groups help new users in gaining support from member organizations, sustaining the initial impetus, arranging HAZUS training, and maintaining group motivation. It also contains an index of resources.

The Journal of the American Society of Professional Emergency Planners (ASPEP). Bruce Binder, editor. 2002. 114 pp. \$19.00. Order from ASPEP, c/o International Association of Emergency Managers, 111 Park Place, Falls Church, VA 22046-4513. Checks should be payable to ASPEP.

The American Society of Professional Emergency Planners (ASPEP) is an organization of certified emergency managers dedicated to the advancement of knowledge of disasters and the improvement of the practice of emergency management. ASPEP works toward these goals through continuing education, professional development, and the annual publication of this journal. The 2002 journal includes papers on the ramification of the immediate impacts of September 11, 2001; local government planning in the event of first contact with extraterrestrials; hot zone rescues; professionalism of the field of emergency management; how emergency management supports local economic development; and many other subjects.

Sharing the Front Line and the Back Hills: Peacekeepers, Humanitarian Aid Workers and the Media in the Midst of Crisis. Yael Danieli, editor. 2002. 448 pp. \$59.00. For purchasing information, contact Baywood Publishing Company, 26 Austin Avenue, P.O. Box 337, Amityville, NY 11701; (800) 638-7819; e-mail: info@baywood.com; <http://www.baywood.com/search/PreviewBook.asp?qsRecord=201>.

This book tells the stories of individuals working around the world with the United Nations, nongovernmental organizations, media, and other private voluntary organizations to alleviate suffering during crisis situations. The chapters evaluate international intervention and action in the context of protecting crisis workers who often deal with stress and reactions themselves. The book portrays the experience of those who are on the front line.

Homeland Security

Homeland Protection Professional. July/August 2002. Monthly subscriptions are free. To subscribe, go to <http://www.hppmag.com>.

This electronic magazine was created to assist the American emergency response community in preparing for and responding to acts of domestic terrorism. Espousing cross-discipline approaches to emergency preparedness, the magazine will regularly present information on training exercises, public health, technology, bioterrorism, international perspectives, private sector issues, media relations, and interagency coordination.

Understanding September 11. Craig Calhoun, Paul Price, and Ashley Timmer, editors. 2002. 454 pp. \$19.95. Copies can be obtained from The New Press, 450 West 41st Street, New York, NY 10036; (212) 629-8081; fax (212) 629-8617; <http://www.thenewpress.com>.

The year since the World Trade Center bombings has produced countless predictions and analyses of America's relationship with the world. This book is an effort to provide the context and perspective of a difficult subject from some of the country's leading social scientists. Its multidisciplinary approach covers topics such as past and present perceptions of Islam, homeland defense and civil liberties, and the presentation of personal and scholarly narratives to provide a perspective on what transpired in 2001.

New Challenges: A Look at Campus Security after Sept. 11. 2002. \$40.00, Emergency Preparedness News subscribers; \$55.00, non-subscribers. To purchase a copy, contact Business Publishers, Inc., 8737 Colesville Road, Suite 1100, Silver Spring, MD 20910-3928; (800) 274-6737 or (301) 589-5103; fax: (301) 589-8493; e-mail: custserv@bpinews.com.

Since the events of September 11, college campuses have been faced with the increasing need to protect students from danger. This report contains an analysis of the various terrorism-related threats facing campuses. It describes what schools are doing to counteract

these threats and discusses the need for increased funding. It also contains a section on the mental health repercussions of campus security and terrorism.

Emergency Responder Guidelines. 2002. 82 pp. Free. The Guidelines can be found on the U.S. Department of Justice's Office for Domestic Preparedness web site: <http://www.homelandsecurity.org/bulletin/emergencyresponderguidelines.pdf>.

The Office for Domestic Preparedness (ODP) is responsible for enhancing the capabilities of state and local jurisdictions to prepare for and respond to incidents of domestic terrorism involving chemical and biological agents as well as radioactive and other explosive devices. ODP assistance to states includes training of emergency response personnel, supporting state and local emergency response exercises, and providing technical assistance to these agencies. These Guidelines contain the advice of terrorism experts from both the public and private sectors and are intended to be a tool for first responders seeking to improve their skills. Information is presented for three levels of responder skills and knowledge: awareness, performance, and planning and management. An appendix includes an outline regarding skilled support and specialist employees, a glossary, and training courses offered by federal agencies.

September 11, 2001: Unprecedented Events, Unprecedented Response—A Review of the American Red Cross' Response in the Past Year. 2002. 23 pp. Free. The complete report can be found on the American Red Cross web site: http://www.redcross.org/press/disaster/ds_pr/pdfs/arcwhitepaper.pdf.

One Year Later: The Fiscal Impacts of 9/11 on New York City. William C. Thompson, Jr. 2002. 64 pp. Free. The Comptroller's Office of the City of New York has made the report available on-line at <http://www.comptroller.nyc.gov>.

This report examines the financial toll exacted by the attacks on New York City's economy, budget, and cash flow. It also contains an overview of the level of federal support earmarked for the city. Among the report's findings:

- The economic cost to the city from the attacks will total between \$83 and \$95 billion. The final figure will depend, in part, on the number of jobs that are eventually relocated out of the city.
- It will cost \$22 billion to replace the buildings, infrastructure, and tenant assets destroyed. In all, the attacks destroyed 13 million square feet of prime office space—equal to the entire office space inventory in the central business districts of Atlanta or Miami.
- Job losses have already cost the city more than \$17 billion in lost wages. New York City has lost 146,000 jobs as result of the attacks and has not gained a projected 63,000 jobs that would have resulted from its recovery from recession.
- The attacks have cost the city nearly \$3 billion in lost taxes and nearly \$500 million in unreimbursed expenses.
- Federal officials have pledged \$21 billion in total federal assistance to the city, but less than \$3 billion has been released to date.

Mental Health and Mass Violence: Evidence-Based Early Psychological Intervention for Victims/Survivors of Mass Violence. A Workshop to Reach Consensus on Best Practices. 2002. 123 pp. Free. Printed copies can be requested from the National Institute of Mental Health (NIMH), Office of Communications and Public Liaison, 6001 Executive Boulevard, Room 8184, Bethesda, MD 20892-9663; (301) 443-4513. The report is also available from the NIMH web site: <http://www.nimh.nih.gov/research/massviolence.pdf>.

Americans have been exposed to increased violence over the past decade, including school shootings, workplace murders, and terrorist acts. This report addresses the urgent need to evaluate the various psychological interventions that are increasingly among the first responses to traumatic events. This publication contains the results of a workshop held in late 2001 to address the impacts of early intervention.

The meeting was sponsored by the U.S. Department of Health and Human Services, the Department of Defense, the Department of Veterans Affairs, the Department of Justice, and the American Red Cross. The document contains conclusions and recommendations regarding effective early interventions, key operating principles, timing of interventions, appropriate screening, victim follow-up, skills and training for those conducting early intervention, the roles of research and evaluation, ethical issues, and future research requirements.

Bioterrorism Preparedness and Response: Use of Information Technologies and Decision Support Systems. Evidence Report/Technology Assessment: Number 59, July 2002. Free. 9 pp. Copies are available from the Agency for Healthcare Research and Quality, Suite 501, Executive Office Center, 2101 East Jefferson Street, Rockville, MD 20852; (800) 358-9295; <http://www.ahrq.gov/clinic/epcsums/bioitsum.htm>.

The Agency for Healthcare Research and Quality (AHRQ) is charged with developing scientific information on which agencies and organizations may base clinical guidelines and performance measures. This report focuses on the national capability of clinicians and health care workers to detect, manage, and communicate during a bioterrorism event. Based upon a comprehensive search of existing published materials and exploration of four key questions designated by the study team, the report provides an overview of information technologies and decision support systems that have the potential to aid clinicians and public health officials in their emergency response.

Secure Virginia Initiative Progress Report: July 30, 2002. 2002. 14 pp. Free.

Secure Virginia Panel Summary of Recommendations: September 5, 2002. 2002. 11 pp. Free.

Both reports are available from the Virginia Office of the Assistant to the Governor for Commonwealth Preparedness web site: <http://www.commonwealthpreparedness.state.va.us>.

In January 2002, Governor Mark Warner of Virginia established the Secure Virginia Initiative to "improve the Commonwealth's preparedness and response and recovery capability for natural disasters and emergencies of all kinds, including terrorist attacks." These two reports present the recommendations of the panel of experts appointed to examine these issues. The first report describes the Secure Virginia Initiative and presents recommendations for policies relating to background checks of state employees, emergency alert system enhancements, communicating with the public during emergencies via the Internet, enhancing technology, and improving the public health response to emergencies. The second report examines government operations and funding, technology and critical infrastructure protection, industry and commerce issues, enhancing first responder capabilities, addressing transportation issues, and improving health and medical coordination during emergencies.

Floods

No Adverse Impact Status Report: Helping Communities Implement NAI. 2002. 16 pp. \$2.00 each for 100 copies or less; \$1.75 each for orders of more than 100 copies. To obtain, contact the Association of State Floodplain Managers (ASFPM), 2809 Fish Hatchery Road, Madison, WI 53713; (608) 274-0123; fax: (608) 274-0696; e-mail: asfpm@floods.org; <http://www.floods.org>.

In 2001, the Association of State Floodplain Managers (ASFPM) introduced the concept of "No Adverse Impacts" (NAI) (see the *Observer*, Vol. XXVI, No. 1, p. 11). NAI urges decision makers to rethink methods of flood mitigation from reducing flood impacts on a particular development site to examining the cumulative and sometimes secondary impacts to other properties of current and future development. In other words, projects that transfer or worsen flooding in other areas are inappropriate. In this status report, ASFPM highlights five communities that have changed their approach to floodplain management and outlines approaches communities can take to incorporate the NAI concept into their activities. Complete contact information for each of the highlighted projects is also included.

MMWR Looks at Health Impacts of September 11

Morbidity and Mortality Weekly contains data on specific diseases as reported by state and territorial health departments and reports on infectious and chronic diseases, environmental hazards, natural or human-generated disasters, occupational diseases and injuries, and intentional and unintentional injuries. Also included are reports on international topics and notices of public health events. Two recent issues contained articles of interest to those in the hazards community. They are listed below, along with the URL at which they may be found.

The *Morbidity and Mortality Weekly Report (MMWR)* is prepared by the Centers for Disease Control and Prevention (CDC). Subscriptions are free and be obtained on-line at <http://www.cdc.gov/mmwr>. Copies of the articles below can also be found at any federal repository library.

From Volume 51, Special Issue (September 11, 2002):

- "Community Needs Assessment of Lower Manhattan Residents Following the World Trade Center Attacks—Manhattan, New York City, 2001." <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm51SPa4.htm>.
- "Injuries and Illnesses Among New York City Fire Department Rescue Workers After Responding to the World Trade Center Attacks." <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm51SPa1.htm>.
- "Syndromic Surveillance for Bioterrorism Following the Attacks on the World Trade Center—New York City, 2001." <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm51SPa5.htm>.
- "Deaths in World Trade Center Terrorist Attacks—New York City, 2001." <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm51SPa6.htm>.
- "Use of Respiratory Protection Among Responders at the World Trade Center Site—New York City, September 2001." <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm51SPa2.htm>.
- "Impact of September 11 Attacks on Workers in the Vicinity of the World Trade Center—New York City." <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm51SPa3.htm>.

From Volume 51, No. 35 (September 6) issue:

- "Self-Reported Increase in Asthma Severity After the September 11 Attacks on the World Trade Center—Manhattan, New York, 2001." <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5135a1.htm>.
- "Psychological and Emotional Effects of the September 11 Attacks on the World Trade Center—Connecticut, New Jersey, and New York, 2001." <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5135a2.htm>.

Hot Off the Federal Presses

The General Accounting Office (GAO) is the investigative arm of Congress. GAO exists to support legislators in meeting their constitutional responsibilities and to help improve the performance and ensure the accountability of the federal government for the American people. Since the terrorist attacks on New York and Washington, D.C., Congress has been heavily concerned with issues of homeland security and emergency preparedness. The following is a list of recent GAO publications that may be of interest to *Observer* readers.

- **Foreign Assistance: Disaster Recovery Program Addressed Intended Purposes, but USAID Needs Greater Flexibility to Improve Its Response Capability.** GAO-02-787. 2002. 54 pp.
- **Chemical Safety: Emergency Response Community Views on the Adequacy of Federally Required Chemical Information.** GAO-02-799. 2002. 23 pp.
- **Critical Infrastructure Protection: Significant Homeland Security Challenges Need to Be Addressed.** Testimony before the House Subcommittee on Oversight and Investigations, Committee on Energy and Commerce. GAO-02-918T. 2002. 44 pp.
- **Homeland Security: New Department Could Improve Coordination but Transferring Control of Certain Public Health Programs Raises Concerns.** Testimony before the Senate Committee on Health, Education, Labor, and Pensions. GAO-02-954T. 2002. 21 pp.
- **Homeland Security: Critical Design and Implementation Issues.** Testimony before the House Select Committee on Homeland Security. GAO-02-957T. 2002. 30 pp.
- **September 11: Interim Report on the Response of Charities.** GAO-02-1037. 2002. 41 pp.
- **National Preparedness: Technology and Information Sharing Challenges.** GAO-02-1048. 2002. 7 pp.
- **Public Health: Maintaining an Adequate Blood Supply is Key to Emergency Preparedness.** GAO-02-1095T. 2002. 13 pp.
- **Mass Transit: Challenges in Securing Transit Systems.** GAO-02-1075T. Testimony Before the Subcommittee on Housing and Transportation, Committee on Banking, Housing, and Urban Affairs, U.S. Senate. 2002. 29 pp.

GAO reports are free and can be requested from the U.S. General Accounting Office (GAO), 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>.

The History and Future of State and Regional Floodplain Management Associations. Leslie Bond. 2002. 37 pp. Free. The complete report can be downloaded from the ASFPM web site: <http://www.floods.org>.

Application of Geographic Information Systems and Remote Sensing in River Studies. R.S.E.W. Leuven, I. Poudevigne, and R.M. Teeuw, editors. 2002. 247 pp. For availability, contact Backhuys Publishers, Postbus 321, 2300 AH Leiden, the Netherlands; tel. + 31 (0)71 517 09 27; e-mail: backhuys@euronet.nl; <http://www-milieukunde.sci.kun.nl/research/gisrbook.html>.

Geographic information systems (GIS) and remote sensing are emerging tools for river research and management (e.g., assessments of flooding and sedimentation processes, vegetation dynamics,

landscape changes and ecological risks, as well as the integrated multi-disciplinary studies required for river management). The book describes the background, goals, and results of an international workshop on the application of geographic information systems and remote sensing in river studies, organised by the universities of Nijmegen, Rouen, and Hertfordshire. It is not designed to be a textbook on the technical aspects of GIS and remote sensing, but it fills a niche in novel applications of these tools in river science.

Sustainable Water Use in Europe—Part 3: Extreme Hydrological Events: Floods and Droughts. Teodoro Estrela, Manuel Menedez, Mirta Dimas and Concepcion Marcuello. 2001. 84 pp. Free. The report is available on-line at http://reports.eea.eu.int/Environmental_Issues_No_21/en/enviissue21.pdf.

This is the third report in a series undertaken by the European Environment Agency to assess sustainable water use in Europe. The publication presents an overview of the main natural and artificial causes and impacts of floods and droughts in western and central European countries, along with a variety of policy responses. Part 3 considers the importance and impact of extreme hydrologic events such as floods and droughts in relation to Europe's water resources. The report aims to help policy- and decision-makers in their work preparing for and preventing such extreme events.

Severe Weather

The Tornado: Nature's Ultimate Windstorm. Thomas P. Grazulis. 2001. 352 pp. \$29.95. Copies can be purchased from the University of Oklahoma Press, 4100 28th Avenue, N.W., Norman, OK 73069-8218; (800) 627-7377 or (405) 325-2000; fax: (405) 364-5798; <http://www.ou.edu/oupress>.

Tornadoes occur in every state in the U.S., and each region has a unique tornado season. The most intense tornadoes can carry automobiles over half a mile and level a well-constructed building. Some tornadoes have crossed mountains. Some have lasted more than an hour, scouring the earth with wind speeds of 250 miles per hour. In *The Tornado*, Grazulis describes the history of tornadoes, the tornado life cycle, how these storms are formed, tornado forecasting and warnings, wind speeds, the Fujita scale of tornado intensity, myths surrounding tornadic storms, effective safety measures, tornado numbers and records, tornado data by decade, tornadoes outside the U.S., and risk from these storms. He also provides data on the deadliest U.S. tornadoes and suggests items for further reading.

Protect Your Commercial Property from Water Damage. 2002. 2 pp. Free. This brochure is available from the Institute for Business and Home Safety web site: http://www.ibhs.org/research_library/view.asp?id=318.

The Rough Guide to Weather. Robert Henson. 2002. 416 pp. \$17.95. Penguin Putnam, Inc., Penguin Putnam, Inc.; (800) 788-6262; fax: (800) 227-9604 or (201) 256-0017; <http://www.penguinputnam.com>.

This guide to understanding weather is written for the general public and provides an explanation of worldwide weather patterns, profiles of extreme weather systems and how they develop, a behind-the-scenes look at weather forecasting, and a basic primer on global climate change.

How the Weather Affects Your Health. Manfred Kaiser. 2002. \$19.95. 180 pp. To purchase a copy, contact Michelle Anderson Publishing PTY Ltd., 86 Bourke Street, Melbourne, Australia 3000; tel: (03) 9662 2282; fax: (03) 9662 2527; e-mail: hocpub@collinsbooks.com.au; <http://hillofcontent.bizland.com>.

How the Weather Affects Your Health addresses today's weather and health concerns and offers information about the effects of global warming. The book guides readers to prepare for weather events and avoid circumstances that may lead to the many health problems associated with weather and pollution: asthma, skin cancer, arthritis, eye disorders, electromagnetic radiation, premature aging due to sunlight, high blood pressure, heart and circulatory diseases, seasonal affective disorder, and many more. The book presents information on how the human body regulates its temperature and adapts to outside temperature

changes, how temperature extremes cause high mortality rates, how ultra-violet radiation burns the skin and causes skin cancer, how sunlight can cause illnesses or other problems such as loss of eyesight and an inhibited immune system, and how lack of sunlight can create mood swings and depressions.

Climate Change

Climate Change Policy: A Survey. Stephen H. Schneider, Armin Rosencranz, and John O. Niles, editors. 2002. 540 pp. \$60.00, clothbound; \$29.50, paperback. Copies are available from Island Press, 7631 Commercial Street, P.O. Box 7, Covelo, CA 95428; (707) 983-6432; fax: (707) 983-6414; e-mail: service@islandpress.org; <http://www.islandpress.org>.

Climate Change Policy addresses the confusion surrounding climate change by bringing together leading experts in the field who examine the many dimensions of the topics most important in understanding climate change and the policies needed to deal with it. Contributors consider climate science in historical perspective, uncertainties in climate science and policy, the economics of climate policy, North-South and intergenerational equity issues, policy mechanisms, and the roles of business and industry in climate solutions.

Gender, Development, and Climate Change. Rachel Masika, editor. 2002. 120 pp. \$12.95. Copies are available from Stylus Publishing, LLC, P.O. Box 605, Herndon, VA 20172-0605; (800) 232-0223 or (703) 661-1581; fax: (703) 661-1501; <http://www.styluspub.com>.

In the face of extreme weather events, desertification, and a rise in sea levels, governments and communities around the world increasingly recognize the urgent need to mitigate and adapt to climate change. This book considers the gendered dimensions of climate change. Ranging from high-level global decision making to local communities, the contributors examine the potential impacts of environmental degradation and change on vulnerable groups. They highlight the different vulnerabilities, coping strategies, and risks faced by men and women, and the socio-economic implications of changing livelihoods and insecurity. Examples of mitigation projects that have successfully integrated gender concerns are explored, as well as initiatives that have overlooked gender considerations and resulted in different outcomes for women and men.

Coastal and Marine Ecosystems and Global Climate Change: Potential Effects on U.S. Resources. Victor S. Kennedy, Robert R. Twilley, Joan A. Kleypas, James H. Cowan, Jr., and Steven R. Hare. 2002. 54 pp. Free. Copies can be found at the Pew Center for Global Climate Change web site: <http://www.pewclimate.org/projects/marine.cfm>.

Hurricanes

Nature's Revenge: Hurricanes, Floods and Climate Change. Tony Gilland, Mike Hulme, Peter Sammonds, Charles Secrett, and Julian Morris. 2002. 88 pp. £5.99 Available from Hodder and Stoughton, Hodder Headline Group, 338 Euston Road, London NW1 3BH, U.K.; <http://www.instituteofideas.com/Publications/DM/docs/nature.html>.

This volume contains commentaries regarding whether climate change will result in increasing numbers of unusual weather events. Contributors discuss climate change in general; extreme climates; science, politics, and economics for the 21st century; and coping with climate change.

In the Eye of Hurricane Andrew. Eugene F. Provenzo, Jr., and Asterie Baker Provenzo. 2002. \$24.95. 204 pp. Copies are available for purchase from the University Press of Florida, 15 N.W. 15th Street, Gainesville, FL 32611-2079; (352) 392-1351; fax: (352) 392-7302; <http://www.upf.com>.

Although Florida has been struck by more hurricanes than any other state in the U.S., most people living in south Florida in 1992 had never experienced a hurricane. In a matter of hours, hurricane Andrew caused \$30 billion in damages and left 250,000 people homeless. In this volume, nearly 100 people share their experiences about evacuation decisions, preparations and experiences during the storm,

clean-up activities, ways they coped with price gouging, and how they rebuilt and recovered from the disaster. The authors draw on newspaper accounts and related reports to put the interviews in context. They also provide a bibliography of nearly 300 documents and recordings related to the hurricane, including books; pamphlets; conference proceedings; local, state, and federal reports; maps; videos; dissertations; and novels.

Earthquakes and Other Geologic Hazards

Bhuj, India, Earthquake of January 26, 2001 Reconnaissance Report. Sudhir K. Jain, William R. Lettis, C.V.R. Murty, and Jean-Pierre Barde, editors. 2002-01 Supplement A to *Earthquake Spectra* 18, July 2002. 398 pp. \$40.00, plus \$7.00 shipping. California residents, add 8.25% sales tax. To purchase a copy, contact the Earthquake Engineering Research Institute (EERI), 499 14th Street, Suite 320, Oakland, CA 94612-1934; <http://www.eeri.org>.

Improving Loss Estimation for Woodframe Buildings. Volume 1 (Report). Keith A. Porter, James L. Beck, Hope A. Seligson, Charles A. Scawthorn, Thomas L. Tobin, Ray Young, and Tom Boyd. 2002. 135 pp.

Improving Loss Estimation for Woodframe Buildings. Volume 2 (Appendices). 2002. 304 pp.

The report can be found on the Earthquake Engineering Research Library, California Institute of Technology; web site at <http://caltecheerl.library.caltech.edu/documents/disk0/00/00/03/33/index.html>. The appendices are located at <http://caltecheerl.library.caltech.edu/documents/disk0/00/00/03/34/index.html>.

Tephra: Earth Movements, Vol. 19, June 2002. For subscription information, contact Chandrika Kumaran, P.O. Box 5010, Wellington New Zealand; tel: (64) 4-473-7368; e-mail: chandrika.kumaran@dia.govt.nz.

Published once a year by the Ministry of Civil Defense and Emergency Management in New Zealand, this edition is noteworthy for its focus on mitigation and land-use issues. It contains an overview on earth movements in New Zealand and articles on the Abbotsford Landslide, planning for a lahar event, evaluating risks and coordinating planning, disaster resilience, protecting the national power infrastructure, the sinkhole and Waihi and the response to it, websites that contain information on landslides and emergency management, the next great earthquake to hit the west coast of New Zealand, landslide research, monitoring hazards in the new century, and earth movement preparedness.

Electronic Fare

Crisis and Consequence Response Files Version 1. CD-ROMs. 2002. Free. To request a copy, contact Unconventional Concepts, Inc., 425 E Hollywood Boulevard, Suite A, Mary Esther, FL 32569; (850) 243-4411; e-mail: compilations@unconventional-inc.com; <http://www.unconventional-inc.com>.

These CDs contain information gleaned from numerous web sites that support those working in public safety and homeland security. Unconventional Concepts, Inc. (UCI) created the CDs to provide key pieces of information that are consolidated and cross-referenced in one searchable database. Among the topics and items contained on the disks that might be of interest to *Observer* readers are: Army environmental medicine documents, counter-terrorism plans, disease fact sheets, emergency management documents, Federal Emergency Management Agency guides, hospital incident planning information, discussions of the incident command system, information on public health, search and rescue documents, local emergency plans, and incident reports. UCI also requests that interested individuals send their suggestions for files, web sites, and other information sources to the company to be included in future editions. Send your suggestions to compilations@unconventional-inc.com.



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 (FEMA), 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, the Public Entity Risk Institute, and the FEMA Region X office. Please send information of potential interest to the center or the readers of this newsletter to the address below. The deadline for the next *Observer* is *November 15, 2002*.

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