

Natural Hazards Observer

VOLUME XX, NUMBER 3--January 1997

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Building a Public/Private Partnership in Emergency Management

--an invited comment

For too long, our nation's emergency management system has relied almost exclusively on government and volunteer groups to assist communities in preparing for, responding to, and recovering from disasters.

The time has come for the business community to become a full partner in our nation's emergency management system. The health and safety of our citizens and the vitality and future of our communities depend on it. That is why the Federal Emergency Management Agency (FEMA) is actively exploring opportunities to establish a Public/Private Partnership for Emergency Management.

FEMA Strategic Goal

One of FEMA's principal strategic goals to "create an emergency management partnership with other

Federal agencies, State and local governments, volunteer organizations, and *the private sector* to better serve our customers."

In the past three and one-half years, with the leadership and support of President Clinton, FEMA has strengthened its working relationships with the 28 federal agencies and volunteer organizations that comprise the Federal Response Plan.

Additionally, FEMA has increased funding to state and local emergency management operations in each of the past three fiscal years and instituted new Performance Partnership Agreements with each state that provide emergency officials with the flexibility they need to manage the risks they face.

As a result, from the 1993 Midwest floods to the Northridge earthquake to Hurricanes Opal, Marilyn, and Fran to floods in the Northeast and the Northwest, FEMA and its partners have responded quickly, efficiently, and effectively to deliver disaster relief to millions of Americans.

Just as FEMA has worked to strengthen its partnership with other government and volunteer agencies, we are also seeking partnership opportunities with the private sector. While the business community has been generous in the past in supporting disaster relief efforts with donated goods and services, until now there has never been a coordinated effort to include the business community in the U.S. emergency management system.

Why Business Involvement?

Why should the private sector enter a partnership for emergency management? What possible benefits could be derived from such a partnership? These are the two most commonly asked questions I get from members of the business community.

First and foremost, the business community has a clear stake in the health and personal and economic security of their community. The people who live there comprise the employee and customer base for most businesses.

When a disaster strikes, individual businesses may survive and recover operations quickly. But the recovery is not complete if employees cannot get to work because they can't travel on the roads or electricity and water aren't available and if customers can't buy products and services because debris hasn't been removed or order and safety have not been restored.

Conversely, individuals and communities have a stake in the health and security of the business community, because it provides jobs and taxes that have a direct impact on the quality of life in any given city.

When disaster strikes, individuals and communities may survive and recover quickly. But the recovery will not be complete if the business community is destroyed or unable to recover. Jobs will be lost, the

tax base will be decimated, and the general community may never recover.

Clearly, the business community and the community at large are interdependent. It is just common sense and mutually beneficial for any emergency management activities to be cooperatively coordinated and implemented. The bottom line is that a public/private partnership in emergency management will increase the likelihood that communities and businesses will survive and recover from disasters.

FEMA Partnership Activities

In recent years, FEMA has been involved in several public/private partnership activities. In the Pacific Northwest, FEMA Region X staff have worked closely with business, lifeline, engineering, and government organizations, and area universities to form the Cascadia Region Earthquake Workgroup (CREW) ([see the article in this *Observer*](#)). CREW was formed to develop and promote cost-effective, all-hazard mitigation in response to the threat of a great Cascadia Subduction Zone quake.

As FEMA director, I have sponsored a series of roundtable discussions with public and private groups to discuss their potential involvement in emergency management. Additionally, FEMA has formed several task forces with members of the insurance community to explore partnership opportunities.

In October, FEMA's Response and Recovery Directorate sponsored a workshop with business representatives from the Agility Forum, an industry-sponsored research organization that regularly works with government and academia to explore partnership opportunities in all four phases of emergency management: mitigation, preparedness, response, and recovery.

FEMA's goal is to develop a structure for a public/private emergency management partnership that facilitates communication and coordination between government and the business community, not only during a disaster, but also in shaping and implementing preparedness and mitigation.

The possibilities for public/private partnerships in emergency management are limitless. That is why I encourage *Observer* readers to share their ideas and suggestions with us. Please contact FEMA's Business Liaison, *George Haddow*, FEMA, 500 C Street, S.W., Room 832, Washington, DC 20472; (202) 646-3291; e-mail: ghaddow@fema.gov.

Conclusion

FEMA's mission is "to reduce the loss of life and property and protect our institutions from all hazards by leading and supporting the nation in a comprehensive risk-based emergency management program of mitigation, preparedness, response and recovery." To successfully fulfill this mission, the business community must become a full partner in our nation's emergency management system.

A public/private partnership for emergency management will ensure that we build the strongest possible emergency management system to protect and serve our communities. It is in the best interest of our

people and the business community, and we at FEMA are committed to making it a reality.

James L. Witt, Director, Federal Emergency Management Agency

Hazards Assessment Update

With the help of dozens of experts, the Natural Hazards Research and Applications Information Center is currently undertaking an assessment of knowledge and research needs regarding natural hazards in the United States (see the *Observer*, Vol. XX, No. 2, p. 6). **This column has been instituted to inform readers of the *Observer* of the efforts of the many contributors to the project.**

Confronting Hazards: Land-Use Planning for Sustainable Communities

The Land-Use Subgroup's contribution to the Assessment Project is a new book about natural disasters and sustainability.¹ In that work, we show that by planning for and managing land use to create sustainable communities, the scale and adverse effects of disasters can be reduced significantly. Land-use plans enable local governments to gather and analyze information about the suitability of land for development, so that the limitations of hazard-prone areas are understood by policy makers, potential investors, and community residents.

In the process of preparing plans, local governments engage in a problem-solving process, ensuring that all stakeholders understand the issues the community faces and that they reach some degree of consensus about how those issues will be addressed. Plans involve the systematic generation and evaluation of alternative courses of action, and, in this way, also help insure that the approach chosen to reduce vulnerability is an optimal one, given a community's present circumstances, future prospects, and the goals and aspirations of its residents. Once adopted, plans guide the choice of development management measures by establishing rules to ensure that urban growth occurs in locations and with design characteristics that reduce vulnerability to natural disasters.

In *Confronting Hazards: Land-Use Planning for Sustainable Communities*, we highlight the promise of land-use planning and development management for reducing societal vulnerability to natural hazards and for bringing about more sustainable communities. Our goal is to foster better understanding of why inappropriate land-use patterns have occurred in the past and to lay out land-use planning procedures, a vision of sustainability, and concrete suggestions for policy reform.

The book has three parts. Part I, "The Choices of the Past," describes and analyzes the land-use choices of governments and individuals that have put millions at risk from natural hazards. Part II, "The Land-Use Planning Alternative," sets forth and elaborates the four key

components of sustainable planning for hazards--plans, information, development management, and partnerships with nongovernmental organizations. Finally, Part III, "A Vision of the Future," lays out a conception of sustainability as a goal for planning and land-use management and then examines what governments at all levels can do to move society toward more sustainable urban development.

This is the first comprehensive examination of land-use planning and development management as ways to reduce societal vulnerability to natural hazards. It is founded on and synthesizes more than two decades of scholarly research supported by the U.S. National Science Foundation, the U. S. Geological Survey, the Federal Emergency Management Agency, the National Oceanic and Atmospheric Administration, and other federal agencies. For the first time, the wealth of information generated by literally dozens of academic studies, government reports, and experiences of planning professionals is presented in a way that is accessible to a broad audience of policy makers at all levels of government and to interested citizens.

***Confronting Hazards* sets forth five principles as a foundation for future planning and public policy:**

- 1) Government must limit the practice of subsidizing the risks involved in using hazardous areas.**
- 2) Governments must build and share a base of knowledge about the nature of risks and sustainable ways of living with hazards.**
- 3) Governments themselves must develop commitment and capacity to change the way they manage the use of hazardous areas.**
- 4) Governments must do a better job of coordinating and integrating policies to manage exposure to hazards with policies to accomplish economic, social, and environmental objectives in community development.**
- 5) Governments must foster innovation in governance and land management to better match institutional systems and tools with the problems posed by natural hazards.**

Using these principles, our book dissects current government policy and planning practice to identify why hazards continue to plague society, sets forth practical planning and development management procedures that have proven effective in dealing with natural hazards, and advocates policy reforms that will reduce vulnerability and foster sustainability.

Members of the Land-Use Subgroup and authors of this book are: Raymond J. Burby (subgroup leader), Timothy Beatley, Philip R. Berke, Robert E. Deyle, Steven P. French, David R. Godschalk, Edward J. Kaiser, Jack D. Kartez, Peter J. May, Robert B. Olshansky, Robert G. Paterson, and Rutherford H. Platt. The group has been assisted by comments and reviews

received from George Mader, Martha Tyler, French Wetmore, and participants in the past two Hazards Research and Applications Summer Workshops.

1. *Confronting Natural Hazards: Land-Use Planning for Sustainable Communities* will be available in 1997 and will be announced in an upcoming *Observer*.

Adoption and Implementation of Hazard Adjustments

The Adoption and Implementation Subgroups's goal was to survey research that investigated the processes by which all hazard adjustments, defined as actions that reduce risk due to extreme events in the natural environment, are adopted, implemented, and evaluated. Our report examines the interrelationships among different stakeholders (i.e., households; businesses; social, economic, and government influentials; and hazards professionals). These stakeholders vary in their bases of power and the means at their disposal to influence others--reward, coercion, legitimation, referral, expertise, and information--they can employ. The interactions among these groups include formal and informal social, organizational, economic, governmental, and legal processes.

The subgroup's review of informal social processes examined literature on persuasion; selective exposure; and attention to information, innovation, and culture. The committee also looked at the role of complex organizations, especially the extent to which their structural forms and other factors affect innovation and change. Economic processes were examined in terms of market defects, especially erroneous assumptions about individual decision making and social interaction. Governmental processes were examined from the perspective of conflicting problem definitions across levels--contrasting complaints about "unfunded federal mandates" with those about "irresponsible localism." Alternative strategies, such as limited regulation, mobilization, collaboration, and general regulation, were identified. Finally, the legal processes defined by tort law were analyzed with respect to their bases (e.g., intentional torts, negligence, and strict liability), as well as their current status.

The committee's findings can be summarized as follows:

- Existing hazard awareness and education programs lack a coherent and comprehensive theoretical framework, and the research on natural hazard adjustment that should guide these programs has failed to use adequately relevant theoretical perspectives inside and outside hazards research.
- Informal social processes play a significant role in disaster response, but their effects on the adoption and implementation of pre-impact hazard adjustments has largely been neglected. In particular, the degree to which models of hazard adjustment can be generalized to racial and ethnic minority populations within the United States and to other cultures has not been determined.
- Little research has been conducted on processes by which hazard adjustments are adopted

and implemented in private-sector organizations.

- There has been a significant amount of research on the economics of disaster impact and recovery, as well as on the economics of insurance purchase, but little research on economic processes affecting the adoption and implementation of other hazard adjustments.
- A significant amount of research has been conducted on governmental processes of hazard adjustment, but it has focused primarily on intergovernmental relations in hazard mitigation, and to a lesser degree, interorganizational relations in emergency preparedness.
- The relative influence of voluntary (informational) and involuntary (regulatory) approaches to hazard adjustment has not been adequately addressed.
- The mechanisms by which legal action can influence hazard adjustment are understood, but the extent to which these mechanisms are actually used has not been determined.
- Finally, processes guiding the development and transmission of new knowledge among hazards professionals (researchers and practitioners) are poorly understood.

The subgroup's report will be published in 1997 as a special issue of the *International Journal of Mass Emergencies and Disasters*. For further information, contact *Michael K. Lindell, The George Washington University, Administrative Sciences Program, 2136 Pennsylvania Avenue, N.W., Suite 301, Washington, DC 20052; (202) 994-4452; e-mail: mlindell@gwis2.circ.gwu.edu*.

CREW: Crossing Barriers and Reducing Risk

The private sector and government often have difficulty working together, coming as they do from the contrasting worlds of the entrepreneurialism and the scientific and regulatory realm. In an effort that transcends these differences and recognizes the need for regional hazard mitigation, public and private organizations in the Pacific Northwest recently formed the Cascadia Region Earthquake Workgroup (CREW) to reduce the impacts of earthquakes in that region. The group's goals are to:

- promote efforts to reduce the loss of life and property,
- develop mitigation initiatives to sustain a viable post-disaster economy,
- motivate key decision makers to undertake mitigation, and
- foster links among key utility and transportation providers and the businesses and industries they support.

CREW has formed project teams to promote mitigation objectives in the Cascadia region. Currently, teams are working on lifeline performance, interregional recovery issues, and Japan-U.S. cooperative studies. In addition, various CREW committees handle tasks related to organization administration.

CREW members represent a broad range of interests, including government, corporate, medical, financial, manufacturing, utility, and transportation groups. The workgroup's efforts address

region-wide concerns as well as activities specific to British Columbia, Washington, Oregon, Northern California, and the coastal area. CREW is funded by the Federal Emergency Management Agency, the U.S. Geological Survey, the University of Washington Geophysics Program, and the National Science Foundation.

For more information on this workgroup, contact *Bill Steele, University of Washington Seismology Laboratory, Pacific Northwest Seismic Network, Box 351650, Seattle, WA 98195-1650*, or access the CREW home page: <http://www.geophys.washington.edu/CREW/index.html>.



Reducing the Threat of Natural Hazards in Latin American Schools

Apart from their primary function of providing a place for the education of children during a large part of the day, school buildings also often provide civic leaders and the public with meeting places, activity centers, and emergency shelters. In addition, they often contain valuable libraries and communications equipment. Thus, when a school building is vulnerable to natural hazards, a large part of the community is at risk.

To mitigate this danger, the Natural Hazard Vulnerability Reduction Program for the Education Sector (NHVRPES) was instituted by the Organization of American States (OAS), Unit of Sustainable Development and Environment (USDE), through financial support from the European Community Humanitarian Office (ECHO). The program assists the ministries of education in Central and South American countries in incorporating hazard mitigation into school construction, reconstruction, maintenance, and repair.

Specifically, the project is aiding the

- development of appropriate designs for new and remodeled schools in high risk areas;
- implementation at the local level of a vulnerability reduction program in a pilot area of each participating country, and
- preparation of training materials for school planning and construction personnel in the ministries of education, staff of nongovernmental organizations, and officials of local communities.

In 1992 and 1993, the USDE and the former Department of Educational Affairs of OAS organized

regional workshops in both Latin America and the Caribbean to discuss vulnerability reduction programs. In 1994, with financial support from ECHO, the OAS-ECHO program began pilot activities in El Salvador and Nicaragua. In 1995, this program was expanded to include Belize, Costa Rica, Guatemala, Honduras, and Panama. In 1996, workshops were held in Costa Rica and Belize.

The program has been linked to the four groups that can best integrate its goals: each country's ministry of education, national agencies in charge of public building projects, regional organizations, and international organizations that provide financial and technical assistance.

To ensure their effectiveness, these programs are based on an evaluation of the natural hazards in an area, an analysis of vulnerability to those hazards, and the design of appropriate structural and nonstructural mitigation measures. The USDE is currently developing geographic information system software for participating countries to use when preparing natural hazard vulnerability profiles of their schools.

The USDE supports these programs with documents and other training materials to help define national programs, determine design strategies, prepare technical documents, and implement actions. The unit has prepared an information packet covering the importance of reducing the vulnerability of school buildings, the NHVRPES program, and case studies of vulnerability reduction, and including an annotated technical bibliography. In addition, the agency has developed both English and Spanish language stickers to identify school buildings that have been evaluated by the project; a poster/brochure that describes the program; a video on the vulnerability of school buildings to natural hazards as well as steps to take to reduce the risk; and a working paper, *The Role of International Organizations that Provide Financial and Technical Assistance in Natural Hazard Vulnerability Reduction for the Education Sector in Central America*.

To request the free information packet or obtain further details, contact the *Unit of Sustainable Development and Environment, Organization of American States, 1889 F Street, N.W., Washington, DC 20006; (202) 458-6295; fax: (202) 458-3560.*

An IDNDR Secretariat/UNESCO Project . . .

Developing Institutional Networks for Disaster Reduction

With the impact of natural disasters on the rise, social and economic development will be eroded if countries do not make disaster reduction part of their development planning, and humanitarian assistance will be ineffective if it is not linked to development. Clearly, the application of the results of scientific research through education and training has an important role in disaster reduction.

In order to strengthen concerted action for natural disaster reduction, the United Nations International Decade for Natural Disaster Reduction (IDNDR) Secretariat and the U.N. Educational, Scientific, and Cultural Organization (UNESCO) have initiated a project called "Development of Institutional Networks for Disaster Reduction." The project fosters and strengthens cooperative efforts among universities, scientific institutions, and existing networks in disaster preparedness, prevention, and mitigation.

As the first step towards strengthening such networks, the U.N. agencies have developed a questionnaire to inventory capacities in universities and scientific institutions. Following the inventory, on a regional basis, the project organizers will promote exchange of information, collaboration, and support for appropriate research, training, and disaster reduction at the local level.

The IDNDR Secretariat invites all interested universities and scientific institutions to participate in this project. In order to receive the questionnaire, please contact *Christine V. Schneider, IDNDR Secretariat, Palais des Nations, CH-1211 Geneva 10; tel: 41 22 798 6894; fax; 41 22 733 8695; e-mail: christine.schneider@dha.unicc.org.*

Center for Disaster Management Opens in Maharashtra

A Center for Disaster Management has been established at the Yeshwantrao Chavan Academy of Development Administration (YASHADA), Pune, Maharashtra, India. The center will conduct research; coordinate activities relating to disaster management in Maharashtra, both at the state and district levels; develop a set of training modules and case studies on disaster management; and promote disaster preparedness and capability building through the preparation of district disaster management plans, the hosting of workshops, the administration of training programs, and the preparation of other practical disaster management materials.

This center has been created with financial support from the Natural Disaster Management Division of the Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India, as well as from the United Nations Development Programme.

The center looks forward to cooperating with other interested groups and individuals around the world. For more information, contact *N. Vinod Chandra Menon, Centre for Disaster Management, YASHADA, Raj Bhavan Complex, Baner Road, Pune, India 411007 ; tel: +91-212-350869; fax: +91-212-359135; e-mail: cendis@giaspn01.vsnl.net.in.*



The Internet Page(s)

Hazards Working Papers Now Available Via the Web

These are some of the more interesting sites we've stumbled across recently on the World Wide Web. A complete, annotated list of hazard/disaster Web venues is posted on the Hazard Center's World Wide Web page: <http://www.colorado.edu/hazards/>

Since its formation in 1975, the Natural Hazards Center has published hazards/disaster research working papers. The series was initiated to aid the rapid distribution of research findings and other information to both scholars directly involved in hazards research and to the larger circle of interested persons. The first 93 working papers were published in print and can be purchased from the Natural Hazards Center. For a complete list and ordering information, consult the Hazards Center World Wide Web site and look under "Hazard Center Publications." Alternatively, contact the *Publications Clerk, Natural Hazards Research and Applications Information Center, IBS #6, Campus Box 482, University of Colorado, Boulder, CO 80309-0482, (303) 492-6819; fax: (303) 492-2151; e-mail: jclark@spot.colorado.edu.*

Beginning with Working Paper #94, these papers are now published via the World Wide Web. The initial paper, *Hurricane Damage to Residential Structures: Risk and Mitigation*, by Jon K. Ayscue, examines the damage to residential structures inflicted by hurricanes Hugo, Andrew, and Iniki. The author offers numerous recommendations for improving building practice to enhance structural performance in future hurricanes. The direct URL for Working Paper #94 is: <http://www.colorado.edu/hazards/wp/wp94/wp94.html>

The Natural Hazards Center site also includes some new full-text quick response reports resulting from recent disaster research. The latest additions include:

- **Quick Response Report #88: *Response to Severe Winter and Blizzard Conditions in Grundy and Buchanan County, Virginia in 1996: A Focus Group Analysis***, by Joseph B. Perry, Duane Dukes, and Randall Norris
- **Quick Response Report #90: *Tornadoes in the Districts of Jamalpur and Tangail in Bangladesh***, by Thomas Schmidlin and Yuichi Ono

The entire list of quick response reports can be accessed directly at: <http://www.colorado.edu/hazards/qr/qr.html>

The Web site of the [National Emergency Management Association](#) includes information on NEMA's history, publications, committees, and membership, as well as lists of upcoming conferences, information on regional communications, updates on current legislation and other federal issues, and state contact information. Of particular interest is NEMA's extensive Hazard Mitigation Grant Program (HMGP) data base. This index tracks all federally funded Hazard Mitigation Grant Program projects. Currently, it includes over 600 projects in 32 states. The data base is intended to help state hazard mitigation officers share ideas and design practicable hazard mitigation projects.

The latest edition of the [U.S. Geological Survey Yearbook](#) is available electronically for the first time on the World Wide Web at the above address. Traditionally a compilation of brief articles on the progress of major research of the USGS, the yearbook also includes contact information for key Survey personnel and partner organizations. The on-line version provides all of this information to users around the world, as well as a gateway to thousands of pages of data and information that the USGS already has available on the World Wide Web. Highlights include essays about flooding and debris flows in Madison County, Virginia; the Kobe earthquake; the USGS role in hurricane response; the use of GIS in disaster management; and other natural hazards issues.

The Virginia Cooperative Extension's Web site offers this ["After a Disaster Series of Publications"](#)--a wide range of useful material on postdisaster recovery based on earlier publications developed by the Clemson Cooperative Extension. The collection encompasses 30 brief documents, grouped into seven categories: safety, food and water, coping with stress, cleaning, insurance and contracts, landscape and agriculture, and roof repairs.

[The Flood Hazard Research Centre](#) is an interdisciplinary research center based in the School of Geography and Environmental Management at Middlesex University in Britain. The center studies the interaction between people and the environment, analyzes environmental policy, and provides teaching and training in these areas. As one might suspect from its name, much of the center's research focuses on the management of water. The center now provides this Web site describing the courses, research, publications, and other activities of the center.

[This earthquake education site](#) includes an earthquake quiz, a rotating globe showing earthquake locations, famous accounts of earthquakes, an animated portrayal of how earthquakes occur, a history of early seismology, and, of course, links to numerous additional earthquake Web sites.

The [MedicCom](#) bulletin board system (BBS), which bills itself as the largest disaster medicine, management, and mitigation BBS in the nation, is now accessible via the Web at the above URL.

This Web site provides access not only to the messages exchanged through the BBS, but also to numerous downloadable files on disaster management archived at the site.

In our last issue we mentioned the flood and hurricane help information available from http://www.housenet.com/articles/Saf_Sec/STORM.HTM. What we failed to mention is that the information provided on flood repair is taken from the booklet *Repairing Your Flooded Home*, prepared by the Federal Emergency Management Agency and the Red Cross. That booklet is available free by calling FEMA at (800) 480-2520 or by contacting *your local Red Cross chapter*. In addition, it is posted on the Red Cross Web site at the address above. Indeed, a large collection of individual and community disaster preparedness and recovery information is available from the Red Cross via the net.

In the November 1996 *Observer* we also mentioned [the home page of EPA's Chemical Emergency Preparedness and Prevention Office \(CEPPO\)](#), an excellent site for tracking down information about chemical emergency information. Here are two additional sites with information about accidents involving toxic substances.

The National Oil and Hazardous Substances Response System is the federal government's mechanism for emergency response to discharges of oil into navigable waters of the United States, and releases of chemicals into the environment. National Response Team membership consists of 16 federal agencies with interests and expertise in emergency response to pollution incidents. [The NRT Web site](#) is designed for "all members of the HAZMAT and oil community," and includes "information about prevention, preparedness, response, and recovery."

[The Right-to-Know Network site](#) features a host of sources of public information, including databases and text files on environmental issues and toxic substances.

WSSPC-L: An Internet Discussion Group for Seismophiles

The Western States Seismic Policy Council (WSSPC) has created a new discussion list for persons interested in seismic hazard preparedness, mitigation, and response. This is an open, unmoderated list and non-WSSPC members are invited to join. To subscribe, send an e-mail message to: majordomo@nisee.ce.berkeley.edu

with the message: subscribe wsspc-l [your e-mail address here]

Messages for the list should be sent to: wsspc-l@nisee.ce.berkeley.edu

For more information, contact WSSPC, 121 Second Street, 4th Floor, San Francisco, CA 94105;

(415) 974-6422; (415) 974-1747; e-mail: wsspc@wsspc.org.

On The Line

The Role of Universities in Disaster Reduction

Refining and maximizing the role of universities in disaster reduction in cities throughout the world strikes me as setting a goal that is (like the moon) brilliant, but not out of reach.

Universities are the stewards of science and technology, an enterprise that has accounted for half the economic growth in the world over the past 50 years. Research at colleges, universities, medical schools, and other academic centers has been and remains a high priority in leading countries such as the U.S.

Yet, the number of natural disasters has risen by a factor of four since 1960. The economic losses from disasters grew by a factor of six and the insured losses by a factor of 14 over the same period. Mortality from earthquakes reached an all-time low between 1950 and 1960 and is now again at the level of 1920.

These numbers in themselves are an indictment of our strategy of disaster prevention. As Richard Feynman used to say, they are a sure sign that we are not using science correctly. Disaster research is to a considerable extent pseudo-science or "Cargo-Cult Science." Going through the motions of scientific research is not enough. To guarantee results we must sit down and *rethink* our approach to disasters. This, I think, is the real role of universities.

Three cities at risk (Mexico City, San Francisco, and Kobe) have a lot in common in terms of earthquake hazard. All three are urban settlements in a bayshore or lakeshore environment. Soil types are similar. Historical patterns of landfill (extending the urban area into waterlogged areas) are similar. It is hardly surprising to find that the patterns of damage from the 1985, 1989, and 1995 disastrous earthquakes in these cities are also similar. The common evolution of these cities gives rise to the question: Should disasters be viewed as emergent properties of complex nature-society systems that have a *history*?

Take a disaster such as the Kobe earthquake of January 17, 1995. How far back into the past do we have to go in order to understand how this disaster was generated? Landfill in the area began in 1868. The city was razed by air raids in 1945. Artificial islands were built after 1960. The original layer of bay mud is now covered by a layer of crushed granite that was believed to be resistant to liquefaction in earthquakes and which nevertheless liquefied on an unprecedented scale. What kind of a concerted interdisciplinary effort will it take to investigate these contributing factors and provide an answer that will actually help prevent similar disasters in the

future?

In Mexico City, building codes have been revised and toughened every few years since the 1957 earthquake. Each time we are told that the codes are now tough enough to prevent structural damage in earthquakes. Yet every earthquake is worse than the preceding one. The public concludes that we are now prepared for the 1985 earthquake. The question is, are we ready for the 1997 event?

I wonder how useful the dissemination of past knowledge about disasters really is. I have been in quite a few earthquake disasters over the years. What strikes me is that every quake was unexpected. Valuable engineering structures end up taking a punishment they apparently were never designed or tested to actually withstand. At the same time, the nature-society system does not stand still. Patterns of urban settlement that have already changed a lot may change even faster. Should not emergency administrators and academic researchers take another look at the knowledge being generated by universities and how relevant it actually is? And, if knowledge is inadequate, is it worth disseminating?

Cinna Lomnitz, Instituto de Geofisica, Universita Nacional Autonoma de Mexico (UNAM), Mexico

Readers can e-mail Dr. Lomnitz at cinna@ollin.igeofcu.unam.mx.

Adapted from the United Nations International Decade for Natural Disaster Reduction Internet Conference, "Solutions for Cities at Risk," August 26 to October 25, 1996.



A Letter to the Editor

Editor:

Your article "Losses Due to Natural Hazards" in the September 1996 *Natural Hazards Observer* [Vol. XXI, No. 1, p. 16] made interesting reading and calls attention to how elusive loss figures are in this setting.

We would like to describe some lightning costs, deaths, and injuries as our own research has uncovered them. Here, too, accuracy and consistency are difficult to confirm.

1. Numbers of Deaths, Natural Hazards, 1940-1981 (after Kessler, 1988)

Lightning	Tornado	Flood	Hurricane
7,741	5,268	4,481	1,923

2. Annual Costs Associated with Lightning

(after Kithil, 1995)

Storm Data--\$27 million

National Fire Protection Association/Fire Chiefs--\$137.8 million

Holle, et al.--\$332 million

Insurance Information Institute (homeowners only)--\$1 billion

3. Lightning Frequency vs. Insurance Claims

(after Holle, 1995)

Average annual number of lightning strikes in the U.S.--17,600,000

Average annual national lightning-related insurance claims--307,000

Ratio of insurance claims to lightning strikes--one in 57

Lightning's damaging nature is that single accidents are the norm, unlike hurricanes, earthquakes, tornadoes, etc., in which scores of injuries and deaths and much damage may occur all at once. For these and other reasons, lightning's dangers are understated by many. We hope the *Natural Hazards Observer* will devote more coverage to this threat.

Rich Kithill, President, National Lightning Safety Institute

Editor's note: The National Lightning Safety Institute can be contacted at P.O. Box 778, Louisville, CO 80027-0778; (303) 666-8817; fax: (303) 666-8786; e-mail: rkithil@ix.netcom.com; WWW: <http://www.lightningsafety.com>.

NCCEM Seeks Articles, Advertising

The National Coordinating Council on Emergency Management (NCCEM) is expanding its monthly newsletter, the *NCCEM Bulletin*. The newsletter is now soliciting advertising to support the expanded format and is also seeking articles on emergency management and related topics from practitioners and researchers. Possible contributions include:

- **a paragraph or two updating activities in a reader's given area, or a note about a useful resource;**
- **a longer article (up to 1,500 words) on some aspect of emergency management;**
- **a letter to the editor or opinion piece;**
- **a request for information and/or ideas.**

The editors would also appreciate phone calls or e-mail indicating possible contacts for articles.

The staff is particularly looking for stories providing "lessons learned" or good, practical ideas for local emergency managers, as well as summaries of current research that highlight the effective use of results.

To contribute or place advertising, contact the *NCCEM Bulletin* editor: phone/fax: (301) 588-4279; e-mail: skayec@aol.com; or *NCCEM Headquarters*, 7297 Lee Highway, Suite N, Falls Church, VA 22042; (703) 538-1795; fax: (703) 241-5603; e-mail: nccem@aol.com.

Washington Update

Water Resources Development Act Passes Congress

On October 12, 1996, President Clinton signed the Water Resources Development Act (Public Law 104-303), a complicated and lengthy bill that includes several provisions modifying the flood control program of the U.S. Army Corps of Engineers. In the new legislation, the House and Senate urge the Corps to continue to consider nonstructural alternatives as required by existing law, but also to go further and improve Corps efforts to determine nonstructural options in both project study and formulation. Such options should include watershed management, wetlands restoration, elevation, and relocation. The Corps is also encouraged to explore alternatives that may be implemented by others, beyond the authority of the Corps, including changes in local zoning or development patterns.

The legislation directs the Secretary of the Army to conduct a review of policies, procedures, and techniques relating to the evaluation and development of flood control measures in order to identify impediments to justifying nonstructural flood control measures as alternatives to flood

control structures. This report must be transmitted to Congress within one year and must include recommendations for modifying existing law.

In addition, Congress increased the nonfederal share of project costs, established earlier in the Water Resources Development Act of 1986, from 25% to 35%, allowing some flexibility to reduce that amount based on the ability of the nonfederal interest to pay.

The legislation requires that before construction of any local flood protection or hurricane or storm damage reduction project, the nonfederal interest must agree to participate in and comply with federal floodplain management and flood insurance programs. Within one year of signing an agreement for construction of a project, the nonfederal interest must prepare a floodplain management plan for the project area that must be implemented no later than one year following completion of the project.

In the same bill, Congress also established the National Dam Safety Program "to reduce the risks to life and property from dam failure in the United States through the establishment and maintenance of an effective national dam safety program to bring together the expertise and resources of the Federal and non-Federal communities in achieving national dam safety hazard reduction." The law establishes an Interagency Committee on Dam Safety (ICODS) composed of representatives of the Department of Agriculture, the Department of Defense, the Department of Energy, the Department of the Interior, the Department of Labor, the Federal Emergency Management Agency, the Federal Energy Regulatory Commission, the Nuclear Regulatory Commission, the Tennessee Valley Authority, and the United States Section of the International Boundary Commission. ICODS will "encourage the establishment and maintenance of effective Federal and State programs, policies, and guidelines to enhance dam safety." The program will be administered by FEMA, and the director is required to develop an implementation plan, to be approved by Congress, and to implement the program within one year. In addition, ICODS must provide a report to Congress on the availability of dam insurance and make recommendations for encouraging greater availability.

The bill authorizes funding for FEMA to implement the program, providing \$1 million in 1998, \$2 million for 1999, and \$4 million each for 2000, 2001, and 2002. The funds can then be allocated to states to provide up to 50% of the cost of implementing state dam safety programs. However, appropriations have yet to be made.

Copies of P.L. 104-303 can be obtained from your *Senator or Congressional Representative*, your local *government depository library*, or from the Library of Congress World Wide Web site:

<http://thomas.loc.gov>.

GAO Looks at Cypress Viaduct Reconstruction

On October 17, 1989, when the Loma Prieta earthquake struck northern California, a portion of Oakland's two-tiered Cypress Viaduct collapsed, killing 42 of the 67 people who died in the quake. Although this structure was an integral component of the area's transportation system, it has not yet been replaced, despite severe traffic congestion, transportation problems, and financial losses. Members of Congress asked the General Accounting Office (GAO) to investigate the reconstruction project, and the results are contained in the GAO report *Emergency Relief: Status of the Replacement of the Cypress Viaduct* (GAO/RCED-96-136, 1996, 14 pp.).

The GAO was asked to investigate the status of construction, the expected project completion date and reasons for any delays, the estimated costs of the project and reasons for any increases in costs, and the Federal Highway Administration's use of emergency relief funds. The agency concluded that the California Department of Transportation (Caltrans) was unable to begin construction until early 1994 due to public opposition to replacing the structure in its original location, the time required to complete an environmental impact assessment for its new site, and the need to negotiate with and compensate railroads for building the new structure on railroad property. Although the project is only one-third complete, it has progressed on schedule since these hurdles were overcome.

Caltrans estimates that the project's total cost will be \$1.13 billion. Of this, 90% will come from the emergency relief program. The report also discusses the Federal Highway Administration regulations and issues that arose because emergency assistance funding was used for the project.

Single copies of the report are free and can be ordered from the GAO, P.O. Box 6015, Gaithersburg, MD 20884-6015; (202) 512-6000; fax: (301) 258-4066; TDD: (301) 413-0006; e-mail: info@www.gao.gov. The complete text of the report is also available from the U.S. Government Printing Office World Wide Web site:

<http://www.access.gpo.gov>.

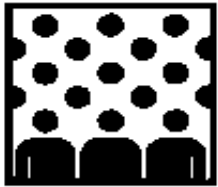
Interstate Emergency Management Compact Approved by Congress

Before adjourning this fall, Congress approved an interstate Emergency Management Assistance Compact (EMAC) that had already been entered into by 13 states and Puerto Rico. Initiated in 1993 as the Southern Regional Compact (see the *Observer*, Vol. XIX, No. 4, p. 7), the agreement was the first "all-purpose" emergency management assistance agreement among states. The EMAC quickly evolved into a national effort and can now expand to additional states.

The compact establishes legal and practical mechanisms for states to share resources during disasters by providing parameters for reimbursement and outlining limits on liability. States that agree to participate receive a manual that includes background information, guidance on how to request aid, a synopsis of each state's legal authority to participate as well as information about each state's strengths and weaknesses in emergency management, and forms for requesting assistance and maintaining records.

For more information on the EMAC, contact the *Southern Governors Association, Hall of the States, 444 North Capitol Street, N.W., Washington, DC 20001; (202) 624-5897; fax: (202) 624-7797.*

Adapted from the *NCCEM Bulletin* - the newsletter of the National Coordinating Council on Emergency Management.



Conferences And Training

These are the latest conference announcements received by the Hazards Center. A comprehensive list of hazard/disaster meetings is posted on our World Wide Web site:

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

International Symposium on Earthquakes and People's Health: Vulnerability Reduction, Preparedness, and Rehabilitation. Sponsor: World Health Organization, Center for Health Development. Kobe, Japan: January 27-30, 1997. This conference will be an opportunity to bring together international, multidisciplinary experience on a global environmental issue with major implications for short-term and long-term health and development. The objective is to develop a holistic view of earthquakes and people's health. The symposium will synthesize the present state of knowledge and provide important information to health policy makers, emergency planners, and decision makers regarding preventive and mitigative measures. The conference will be held in English. For details, contact the *World Health Organization Center for Health Development, Kobe Chamber of Commerce and Industry Building, 6-1, Minatojima-Nakamachi, Chuo-ku, Kobe 650, Japan; tel: +81 78 303 1200; fax: +81 78 303 1306; e-mail: wck@who.or.jp; WWW: <http://www.who.or.jp>.*

Engineering for Extreme Winds. Sponsor: Wind Engineering Research Center, Texas Tech

University. Lubbock, Texas: February 5-7, 1997. This short course is designed for engineers, building officials, architects, and other professionals involved in the design of buildings to resist extreme winds--including tornadoes and hurricanes. The course covers assessment of wind loads, wind effects on structures, wind load standards, dynamics and effects of extreme winds; and performance of buildings in severe storms. For a course brochure, contact *Birgit Rahman, Division of Continuing Education, Texas Tech University, Box 41006, Lubbock, TX 79409-1006; (806) 742-2352, ext. 272; fax: (806) 742-2318.*

Great Plains Symposium 1997: The Ogallala Aquifer: "Managing for Drought and Climate Change." Lincoln, Nebraska: March 10-12, 1997. This symposium will involve four sessions: 1) management influences--understanding the Ogallala aquifer and regional drought and climate change impacts and their economic and social implications; 2) management responses--presentations and discussion on the aquifer's physical response and on private and public preparation for and management of drought and climate change; 3) sustainable management--sessions in which management policies and research needs will be identified; and 4) management perspectives--presentations on regional sustainability. For further information, contact *Robert Kuzelka, 103 Natural Resources Hall, University of Nebraska, Lincoln, NE 68583-0844; (402) 472-7527; fax; (402) 472-3574; e-mail: rkuzelka@unlinfo.unl.edu.*

Arid Regions Conference: "Development in the Floodplains--The Good, The Bad, and The Ugly." Combined Meeting of the Association of State Floodplain Managers Arid West Committee, the Floodplain Management Association, and the Arizona Flood plain Management Association. Laughlin, Nevada: March 19-21, 1997. Rather than minimizing flood hazards, sparse precipitation in the arid West only changes the nature of the problem, which can be as threatening to life and property in that region as it can anywhere else in the U.S. Flash flooding, alluvial fan flooding, and other hydrological problems of the arid West will be examined in depth at this meeting. For more information contact *Clark E. Farr, Arid Regions Conference, Kern County Engineering and Survey Services, 2700 M Street, Suite 570, Bakersfield, CA 93301; (805) 862-5094; or Peggy Bowker, Arid Regions Conference, Nimbus Engineers, 3710 Grant Drive, Suite A, Reno, NV 89509; (702) 689-8630.*

Fourth World Congress on Stress, Trauma and Coping in the Emergency Services Professions: Research and Practice. Sponsor: International Critical Incident Stress Foundation (ICISF), Inc. Baltimore, Maryland: April 2-6, 1997. This congress is a major international forum for the review and dissemination of newly developed research and practical information on workplace stress, trauma, and coping. The meeting is intended to enhance participants' knowledge and skills in intervening against stress and trauma; it will include sessions on family issues, workplace trauma, and recent major disasters. Additional presentations will cover community services and unusual applications of critical incident stress management services. For a program or additional information, contact *ICISF, 4785 Dorsey Hall Drive, Suite 102, Ellicott City, MD 21042; (410) 730-4311; fax: (410) 730-4313.*

1997 National Radiological Emergency Preparedness Conference. Kansas City, Missouri: April 21-

23, 1997. This conference will address nuclear power plant offsite emergency preparedness and provide a forum for professionals involved in planning for such emergencies to share insight and experience. Questions should be directed to *Pebble Holland, Iowa Emergency Management Division, Hoover State Office Building, Level A, Des Moines, IA 50319; (515) 281-3231; fax: (515) 281-7539; e-mail: dmiller@max.state.ia.us.*

19th Annual National Hurricane Conference. *Sponsors: American Meteorological Society and many others. Houston, Texas: April 22-25, 1997.* The 1997 Hurricane Conference will focus on mitigation--practical and feasible ways to reduce future storm damage. In 1995, Hurricane Opal demonstrated the value of sound mitigation; not a single coastal structure approved under Florida's coastal construction control line program was destroyed or seriously damaged. The conference will include 12 in-depth training sessions, 32 workshops, and general sessions focusing on recent hurricanes, the upcoming season, and Federal Emergency Management Agency mitigation initiatives. To obtain more information, contact the *Florida Shore and Beach Preservation Association, National Hurricane Conference, 864 East Park Avenue, Tallahassee, FL 32301; (904) 561-1163; fax: (904) 561-1172; WWW: <http://www.nettally.com/nhc>.*

Symposium to Honor Haresh Shah: "Risk Management and Mitigation for Natural Hazards." *Sponsor: Stanford University Department of Civil Engineering. Stanford, California: April 25-26, 1997.* Besides honoring Professor Shah, this symposium will feature invited speakers from around the world who will address various dimensions of natural hazards risk management. To be added to the conference mailing list, contact the *Blume Earthquake Engineering Center, Department of Civil Engineering, Stanford University, Stanford, CA 94305-4020; (415) 723-4150; fax: (415) 725-9755; e-mail: ShahSymp@ce.stanford.edu.*

National Disaster Medical System (NDMS) 1997 Annual Conference. *Tampa, Florida: May 5-7, 1997.* The 1997 NDMS conference will feature tracks focusing on public health; planning, management, and coordination; clinical medicine; field response; and health care facilities. In addition several parallel training courses will be offered prior to and during the meeting. For additional information, contact *NDMS, Parklawn Building, Room 4-81, 5600 Fishers Lane, Rockville, MD 20857; (301) 443-1167; (800) or 872-6367, ext. 444.*

First American Wetlands Conference: "Communities Working for Wetlands." *Sponsors: Terrene Institute and others. Alexandria, Virginia: May 7-9, 1997.* "Communities Working for Wetlands" will bring together people interested in community-based wetlands conservation to share their experiences and thus expand their wetlands knowledge. To receive a conference announcement, contact *Stacey Satagaj, Terrene Institute, 4 Herbert Street, Alexandria, VA 22305; (703) 548-5473; e-mail: terrene@gnn.com.*

Fourth Conference on Tall Buildings in Seismic Regions: "Tall Buildings for the 21st Century." *Sponsor: Los Angeles Tall Buildings Structural Design Council. Los Angeles, California: May 9-10, 1997.* This conference will address the effects of recent earthquakes around the world on the

performance of all structures, including tall buildings, and examine measures taken to limit seismic damage to such structures. The goal is to improve planning, design, construction, and rehabilitation of tall buildings so that they will service society into the 21st century. For further information, contact the *Los Angeles Tall Buildings Structural Design Council, 800 Wilshire Boulevard, Suite 510, Los Angeles, CA 90017; (213) 362-0707; fax: (213) 688-3018.*

Geological Association of Canada/Mineralogical Association of Canada (GAC/MAC) Annual Joint Meeting. Ottawa, Canada: May 19-21, 1997. This conference includes the symposium "Geoenvironmental Mapping: Applying Geoscience to Hazards and Land-Use Issues in the 21st Century," which will bring together individuals with wide experience in the development and use of geoscience data for environmental management. For more information, contact *Steve Sibbick, British Columbia Geological Survey, 5-1810 Blanshard Street, Victoria, BC, Canada V8V 1X4; (604) 952-0399; fax: (604) 952-0381; e-mail: ssibbick@galaxy.gov.bc.ca.*

The International Emergency Management Society (TIEMS) 1997 Conference. Copenhagen, Denmark: June 10-13, 1997. TIEMS is dedicated to the study of emergency management from a multidisciplinary perspective. Conference topics will include natural disasters, human factors, crisis response communications, emergency health services, technological disasters, risk analysis and simulation, training, and disaster recovery. For additional information, contact *Verner Andersen, Riso National Laboratory, P.O. Box 49, DK-4000 Roskilde, Denmark; tel: +45 46 77 46 77; fax: +45 46 75 51 70; telex: 43116; e-mail: tiems@risoe.dk; WWW: <http://www.risoe.dk/news/tiems97.html>* .

Seventh World Conference on Disaster Management. Sponsor: Canadian Centre for Emergency Preparedness. Hamilton, Ontario, Canada: June 22-25, 1997. This event will focus on emergency response, major accidents, domestic terrorism, risk and crisis management, natural disasters, business recovery, and health care disaster management. For details, contact the Canadian Centre for Emergency Preparedness, P.O. Box 2911, Hamilton, Ontario, Canada L8N 3R5; (905) 546-3911 or (800) 965-4608; fax: (905) 546-2340; e-mail: ccep@netaccess.on.ca.

Third International Conference on Coastal Engineering (COASTAL 97). Sponsors: Wessex Institute of Technology and Universidad de La Coruna. La Coruna, Spain: June 23-25, 1997. COASTAL 97 will bring together coastal, civil, and hydraulic engineers and other scientists to discuss computer modeling of seas and coastal regions, focusing on practical applications. The organizers seek papers on such topics as coastal erosion, tsunamis, pollutant dispersion, and atmospheric effects. For details, contact *S. Owen, COASTAL 97 Conference Secretariat, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, U.K. SO40 7AA; tel: 44-1703-293-223; fax: 44-1703-292-853; e-mail: sue@wessex.ac.uk; WWW: <http://www.wessex.ac.uk/conferences/coastal/>.*

Second National Seismic Conference on Bridges and Highways: "Meeting the Challenge, Research and Practice." Sponsors: Federal Highway Administration and California Department of Transportation. Sacramento, California: July 8-11, 1997. This meeting will focus on national

problems and solutions of interest to bridge, geotechnical, and highway engineers in all seismic hazard zones. Bridge owners and federal, state, and local agency representatives are also encouraged to attend. For more information, contact *James H. Gates, California Department of Transportation, P.O. Box 942874, Sacramento, CA 94274-0001; (916) 227-8773; fax: (916) 227-8898; e-mail: jgates@trmx3.dot.ca.gov.*

Eighth International Conference on Soil Dynamics and Earthquake Engineering (SDEE '97). Organized by Bogazici University, Istanbul; Princeton University, Princeton, New Jersey. Sponsors: United Nations Educational, Scientific, and Cultural Organization (UNESCO), and United Nations International Decade for Natural Disaster Reduction (IDNDR) Secretariat. Istanbul, Turkey: July 20-24, 1997. Abstracts due January 30, 1997. The organizers of this conference have issued a call for papers covering a broad spectrum of themes concerning earthquakes, including "earthquake insurance and other socioeconomic issues," "experience derived from recent earthquakes," and "historical structures." More information is available from Ahmet S. Cakmak, Conference Chair, Princeton University, Department of Civil Engineering and Operations Research, Princeton, NJ 08544-5263; (609) 258-4601; fax: (609) 258-1309 or (609) 258-2685; e-mail: ahmet@tremor.princeton.edu; WWW: <http://www.ceor.princeton.edu/sdee.html>; or Mustafa Erdik, Conference Co-Chair, Bogazici University, Kandilli Observatory and Earthquake Research Institute, Cengelkoy, Istanbul 81220, Turkey; tel: +90.216.332.6560; fax: +90.216.308.0163 or 216.332.1711; e-mail: erdik@hamlin.cc.boun.edu.tr; WWW: <http://www.boun.edu.tr/sdee.html>.

SR/DR '97: Search and Rescue/Disaster Response Conference and Exposition. Nashville, Tennessee: July 25-27, 1997. SR/DR '97 will bring together vendors and end users from both the search and rescue and disaster/emergency response communities. The meeting is intended for county and municipal emergency management workers, FEMA officials, search and rescue personnel, fire responders, EMS providers, public safety officials, and all others involved in emergency response and/or search and rescue. The meeting will include over fifty educational sessions and workshops, as well as demonstrations and trade exhibits. For a conference brochure, contact SR/DR '97, 2413 West Algonquin Road, Suite 411, Algonquin, IL 60102; (847) 458-0420; fax: (847) 458-0421; WWW: <http://www.emergency.com/srdr97/index.htm>.

1997 Association of State Dam Safety Officials (ASDSO) Annual Conference. Pittsburgh, Pennsylvania: September 7-10, 1997. Abstracts due March 1, 1997. Since its formation in 1984, the ASDSO has served as the leading professional organization for individuals committed to ensuring the safety of dams in the U.S. The annual conference features technical sessions presented by experts in such areas as dam rehabilitation, computer applications, hydrology and hydraulics, seismic design, and risk analysis/risk management. For details, contact Susan Sorrell, Conference Coordinator, ASDSO, 450 Old East Vine, Second Floor, Lexington, KY 40507; (606) 257-5146; fax: (606) 258-1958.

Civil Emergency Preparedness: Risk, Crisis, Security and Vulnerability in Society. Sponsor: National Board of Civil Preparedness in Sweden. Umea, Sweden: September 9-10, 1997. Abstracts due March

1, 1997. This annual research meeting attracts researchers from a wide range of disciplines within the social and natural sciences, as well as the humanities. For a conference brochure, contact *Carola Lofstrand, Department of Social and Economic Geography, Umea University, S-901 87 Umea, Sweden; t el: +46-90-167918; fax: +46-90-166359; e-mail: carola.lofstrand@geography.umu.se.*

Thirteenth Semiannual Meeting of the Floodplain Management Association. Sacramento, California: September 10-12, 1997. The Floodplain Management Association was formed to "promote the common interest in reducing flood losses and to encourage the protection and enhancement of natural floodplain values." Semiannual conferences are one of the principle means through which the association achieves these goals. The meetings update members on state-of-the-art tools and techniques in floodplain management. For more information, contact *James Owen, 4145 Maybell Way, Palo Alto, CA 94306-3820; (415) 493-7198; e-mail: hjowen@aol.com; WWW: <http://home.navisoft.com/fldplnma>.*

National Coordinating Council on Emergency Management (NCCEM) 1997 Annual Conference. Phoenix, Arizona: September 13-16, 1997. The NCCEM annual conference is one of the premier venues for the education, training, and exchange of experience and information among local, state, and national emergency managers. For conference details, contact *NCCEM, 7297 Lee Highway, Suite N, Falls Church, VA 22042; (703) 533-7672; fax: (703) 241-5603; e-mail: pmann@silverlink.net.*

Volcanism and Volcanic Hazards in Immature Intraplate Oceanic Islands. Sponsors: Estacion Volcanologica de Canarias, Geological Society of London, and others. La Palma, Canary Islands, Spain: September 15-18, 1997. Abstracts due March 1, 1997. This conference will include sessions on land-use planning and risk mitigation, as well as on the hard sciences of island volcanism. For specifics, contact *W.J. McGuire, Department of Geological Sciences, University College London, Gower Street, London WC1E 6BT, U.K.; e-mail: w.mcguire@ucl.ac.uk.*

Tenth World Congress on Emergency and Disaster Medicine (WCEDM). Mainz, Germany: September 24-27, 1997. For a copy of the scientific agenda, write the *WCEDM Congress Office, Klinik fur Anasthesiologie, Langenbeckstrasse 1, D-55131 Mainz, Germany; fax: 49-6131-17-6649.*

Seventh Chilean Conference on Seismology and Earthquake Engineering. Santiago, Chile: November 1997. Abstracts due January 15, 1997. This conference will incorporate the Ninth Latin-American Seminar on Earthquake Engineering, the First Ibero-American Seminar on Earthquake Engineering, and the World Seismic Safety Initiative Regional Seminar. The meeting will cover virtually all aspects of earthquakes--geologic, structural, and social. For details, contact the *Conference Secretariat, Blanco Encalada 2120 Piso 4, Casilla 228/3, Santiago, Chile; tel: (56-2) 6784372; fax: (56-2) 6892833.*

Twelfth International Conference and Workshops on Applied Geologic Remote Sensing. Sponsors: Environmental Research Institute of Michigan (ERIM) and others. Denver, Colorado: November 17-

19, 1997. This meeting will include sessions on geologic hazards. For further information contact **Robert Rogers, ERIM, P.O Box 134001, Ann Arbor, MI 48113-4001; (313) 994-1200, ext. 3234; fax: (313) 994-5123; e-mail: raeder@erim.org; WWW: <http://www.erim.org/CONF/conf.html>.**

Fourth International Conference on Case Histories in Geotechnical Engineering. Sponsors: University of Missouri-Rolla and others. St. Louis, Missouri: March 8-15, 1998. This conference will provide a forum for geotechnical, civil, and structural engineers, engineering geologists, and consulting engineers to talk with and learn from leaders in geotechnical engineering from around the world. For a conference brochure, contact **Buddy Poe, Conference Coordinator, 103 ME Annex, University of Missouri-Rolla, Rolla, MO 65409-1560; (573) 341-6061; fax: (573) 341-4992; e-mail: buddyp@shuttle.cc.umar.edu; WWW: <http://www.umar.edu/~conted/conf8926.html>.**

Local Authorities Confronting Disasters and Emergencies. Sponsors: Emergency Preparedness Canada and others. Edmonton, Alberta, Canada: June 26-July 1, 1998. This third local authorities conference will be a multidisciplinary forum intended to enhance partnerships and create solutions to mitigate disasters that affect the people, property, and environment in communities around the world. It is directed toward elected officials; administrators of local or regional government; emergency responders; provincial, state, or federal officials; educators; and all others with an interest in disaster preparedness and response. For further details, contact **Herb Presley, preslh@censsw.gov.ab.ca; or Dave Noble, nobled@censsw.gov.ab.ca; Disaster Services Branch, Alberta Transportation and Utilities, Second Floor, 4999 - 98 Avenue, Edmonton, Alberta, Canada T6B 2X3; (403) 422-9000; fax: (403) 422-1549; e-mail: disaster@freenet.edmonton.ab.ca; WWW: <http://www.freenet.edmonton.ab.ca/disaster>.**

Upcoming Courses in UC-Berkeley's Emergency Management Program

The University of California-Berkeley Extension offers an eight-course program leading to a Certificate in Emergency Preparedness Planning and Management. Individuals who would like to earn the certificate are encouraged to begin with the course, "Strategic Planning and Implementation in Emergency Management," offered March 4-7, 1997. Persons with little background in emergency management should take the two-day workshop, "Introduction to Emergency Management," February 27-28, 1997. The courses are taught in downtown San Francisco. For more information, contact **John Laye, Program Director, University of California Extension, 346 Rheem Boulevard, Suite 202, Moraga, CA 94556-1588; (510) 631-0400; fax: (510) 631-0403; e-mail: <[A HREF="mailto:johnlaye@violet.berkeley.edu">johnlaye@violet.berkeley.edu](mailto:johnlaye@violet.berkeley.edu).**

ASCE Offers Course in Seismic Design

In 1997, the American Society of Civil Engineers (ASCE) is offering the course, "Seismic Design and Performance of Building Structures" in two locations: Atlanta, Georgia: January 30-31; and New York City, New York: March 6-7. For more course information, contact **ASCE, 1015 15th Street, N.W., Suite 600, Washington, DC 20005-2605; (800) 548-2723 or (202) 789-2200; fax: (202)**

289-6797.

Upcoming Courses at ADPC

The Asian Disaster Preparedness Center, Bangkok, Thailand, has announced the following training classes for 1997:

Basic Course in Disaster Management--January 20 - February 7
Community Based Approaches to Disaster Management--March 10-21
Training of Trainers in Disaster Management--March 31 - April 11
Basic Course on Urban Disaster Mitigation--May 4-23
Management of Technological Hazards--June 2-13
GIS and Technology Application to Mitigation--June 1-15
Crisis Management Course--June 23 - July 4

For details or an application form, contact *Sanny Jegillos, Senior Manager, Learning and Professional Development, Asian Disaster Preparedness Center, Asian Institute of Technology, P.O. Box 2754, Bangkok 10501, Thailand; tel: (66-2) 524-5391; fax: (66-2) 524-5360; e-mail: adpc@ait.ac.th.*

Recent Publications

All Hazards

Disaster Management in the U.S. and Canada: The Politics, Policymaking, Administration, and Analysis of Emergency Management. Second Edition. Richard T. Sylves and William L. Waugh, Jr. 1996. 420 pp. \$78.95, clothbound; \$49.95, paperback. Order from Charles C. Thomas, Publisher, 2600 South First Street, Springfield, IL 62794-9265.

Disaster Management builds upon its first edition, *Cities and Disaster: North American Studies in Emergency Management* (1990), by examining advances in the literature and profession of emergency management as well as recent disaster experiences to offer lessons to local, state, and provincial governments and organizations. Its central theme is the need for all levels of government to develop a cooperative plan for and response to emergencies. *Disaster Management* includes chapters on the evolving role of federal emergency management, California's emergency management efforts, emergency management and the Midwest floods of 1993, local emergency planning committees, building regulation, "Managing Major Emergencies in 'Gotham City,'" the role of Canadian mayors in emergency management, training and education for public administrators, all-hazards information systems, and the future of disaster management.

Before Disaster Strikes: Developing an Emergency Procedures Manual. 1996. 200 pp. \$49.95, plus

\$6.00 shipping.

Before Disaster Strikes. VHS. 10 minutes. \$25.00. Both items are available from the Institute of Real Estate Management, 430 North Michigan Avenue, Chicago, IL 60611; (312) 329-6000; fax: (312) 329-6039.

***Before Disaster Strikes* was developed by the Emergency Procedures Task Force of the Institute of Real Estate Management to guide property owners and managers in planning and preparing for emergencies and disasters. The first section outlines the steps in developing an emergency procedures plan, including establishing an emergency management team, creating a procedures manual, and other aspects. The second section discusses emergency planning for specific types of real estate, including residential properties, office buildings, medical buildings, shopping centers and other retail properties, and industrial sites. The third section describes types of emergencies that may be encountered, including bombs and bomb threats, natural hazards, medical emergencies, crime, and nuclear accidents. The appendix includes sample emergency procedures forms and outlines management issues associated with bomb threats, risk management, and the incident command system.**

"Challenges in Risk Assessment and Risk Management." The Annals of the American Academy of Political and Social Science 545 (May 1996). Howard Kunreuther and Paul Slovic, Special Editors. \$18.00, softcover; \$28.00, hardcover. Order from Sage Publications, Inc., P.O. Box 5084, Thousand Oaks, CA 91359; (805) 499-9774; fax: (805) 499-0871.

In the past two decades, during which our society has grown healthier and safer on average, the public has become more, rather than less, concerned about risk. The papers in this volume recognize the uncertainties associated with assessing risk as well as the value differences between interested parties; they are based on the premise that one must first understand the decision processes and cultural norms that affect behavior before prescribing a set of policies for managing risk. Topics include: identifying and assessing risks, government regulations, scientific uncertainty and the political environment, risks and the environment, valuation of risks, hazard and risk communication, risk management, and risk and the legal system.

Codes and Standards: An Introduction. 1996. 16 pp. Free. For copies, contact the Insurance Institute for Property Loss Reduction (IIPLR), 73 Tremont Street, Suite 510, Boston, MA 02108-3910; (617) 722-0200; fax: (617) 722-0202.

Recognizing that one of the most important tools for reducing loss of life and property from natural disasters is enforcement of sound building codes, IIPLR prepared this document on effective building code regulation. It explains the authority for creating building codes, model codes, and local and state codes; describes model code organizations and their structure; explains the enforcement process; and discusses building standards and the standards development process.

International Perspectives on Teaching about Hazards and Disasters. John Lidstone, Editor. 1996. 140 pp. £18.95. Available from Plymbridge Distributors Limited, Estover, Plymouth PL6 7PZ, UK; tel: +44 (0) 1752 202301; fax: +44 (0) 1752 202331.

This volume examines the issues and difficulties surrounding the teaching of hazards, particularly in the field of geography. Ten authors describe the ways in which natural disasters are currently

handled in the national curriculum and comment on the appropriateness of the approaches in light of both the hazard vulnerability of their countries and education theory. Chapters include: "Disaster Education: Where We Are and Where We Should Be," by John Lidstone, and "Natural Hazards Education: A Question of Implementation Strategies," by Paul Whitehead. Subsequent chapters examine teaching about natural hazards and disasters in Germany, France, Bulgaria, South Africa, Hong Kong, Finland, Nigeria, and New Zealand.

The Public Health Consequences of Disasters. Eric Noji, Editor. 1997. 468 pp. \$59.95, plus \$3.50 shipping. California and North Carolina residents must add sales tax. Purchase from the Order Department, Oxford University Press, 200 1 Evans Road, Cary, NC 27513; (800) 451-7556 (credit card orders only).

In the past 20 years, natural and human-caused disasters have claimed more than 3 million lives, affected at least 800 million people, and caused more than \$50 billion in property damage. In fact, a major disaster occurs almost daily in some part of the world. *The Public Health Consequences of Disasters* examines numerous aspects of public health and such events as well as concerns specific to geophysical, weather-related, and human-caused disasters. It includes discussions of epidemiology, sanitation, water, shelter, mental health, and media relations, while paying particular attention to prevention and control of disease.

"Disasters, the Environment, and Public Health: Improving Our Response." James N. Logue. American Journal of Public Health, Vol. 86, #9 (September 1996). Subscriptions: \$100/year, U.S.; \$140/year, international. Single copies: \$13.00, U.S.; \$14, international (surface delivery); \$22.00, International (Air Delivery). Prepaid orders can be sent to the American Public Health Association, 1015 15th Street, N.W., Washington, DC 20005; (202) 789-5600; TDD: (202) 789-5673.

This article considers public health response to disasters, highlighting environmental health issues and approaches and reviewing developments relating to capacity building, training, and collaboration. The author notes that although improvements have occurred in the public health response to disasters, a comprehensive federal or academic approach is not evident in the U.S. and a proper link to environmental health is lacking.

Developing a Comprehensive Disaster and Crisis Response Program for Mental Health: Guidelines and Procedures. Elizabeth K. Carll, Editor. 1996. 75 pp. \$6.95. Order from the New York State Psychological Association, Executive Park East, Albany, NY 12203; (800) 732-3933

.When disasters occur, there is a need for effective, on-site mental health services to assist victims. This publication was developed in response to numerous requests to the New York State Psychological Association over the years for practical information on and guidelines for developing a mental health disaster response program. It includes sections on defining services, organizing a response team and network, developing procedures for on-site response, developing procedures for pro bono follow-up referrals, working with community agencies and programs, training and continuing education, and communicating with the news media.

Guide for All-Hazard Emergency Operations Planning. State and Local Guide 101. 1996. 274 pp. Free. Available from the Federal Emergency Management Agency, Publications Distribution

Facility, 8231 Stayton Drive, Jessup MD 20794; (800) 480-2520; (202) 646-3484; fax: (301) 497-6378.

This guide was created to aid state and local emergency management professionals in developing and maintaining a viable all-hazards emergency management plan. Chapter 1 discusses the preliminary considerations that must take place before a plan can be developed. Chapter 2 outlines a recommended planning process that incorporates research, development, validation, and maintenance of a plan. Chapter 3 offers tips on how to format a plan. Chapter 4 outlines the basic content of plan, and Chapter 5 suggests some functional attachments or appendices. Chapter 6 outlines hazard-unique planning considerations, and Chapter 7 discusses linking federal and state emergency response operations.

Disaster Debris Management. Gabriela Y. Solis, Henry C. Hightower, Jim Sussez, and June Kawaguchi. 1996. 28 pp. Free. Printed copies can be obtained from Emergency Preparedness Canada, 122 Bank Street, 2nd Floor, Jackson Building, Ottawa, Ontario, Canada K1A 0W6; (613) 991-7034. The complete text will soon be available on the Internet: <http://hoshi.cic.sfu.ca/~anderson/index.html>.

Major disasters in the U.S. and abroad in the past 10 years have created serious solid waste management problems due to the substantial debris created from damaged structures. This paper looks at issues and options relating to post-disaster debris management, including the allocation of responsibilities, policy definition and implementation, worker and public safety, communications, collection, transportation, disposal, hazardous waste, environmental concerns, reuse and recycling, and program administration. The report includes suggestions for further reading.

The ASPEP Journal 1996. 1996. 90 pp. \$15.00, plus \$3.00 shipping. A limited number of copies are available from Rosemary Chisholm-Cohen, 340 Weeward Avenue, Beachwood, NJ 08722; (980) 341-3451; e-mail: nccem@aol.com.

The American Society of Professional Emergency Planners (ASPEP), founded in 1972, comprises only certified emergency management professionals in the U.S. In an effort to provide a medium for research and opinion from the global emergency management community, including both practitioners and academics, the society publishes the annual *ASPEP Journal* annually. This year's issue includes papers on the efficient use of workplace telephones after a disaster, computer-mediated communications in hazards management and research, responding to floods, California's Standardized Emergency Management System, information technology, emergency management conferences on the internet, emergency response and public health, professional exchange, training, terrorism, disaster planning, racial issues, and pets and evacuation in disasters.

Catastrophes: Insurance Issues Surrounding the Northridge Earthquake and Other Natural Disasters. 1994. 42 pp. \$40.00.

The Impact of Catastrophes on Property Insurance. 1994. 50 pp. \$40.00.

Both items can be purchased from Industry Relations-Customer Service, Insurance Services Office, Inc., 7 World Trade Center, 14th Floor, New York, NY 10048-1199; (800) 888-4476; fax: (212) 898-5554.

The Northridge earthquake was the second costliest disaster in U.S. history, exceeded only by Hurricane Andrew. The increasing costs of such major catastrophes point to a need to re-evaluate the way society deals with disasters and their aftermath. The report *Catastrophes* examines how these events affect various segments of society, including both uninsured and insured victims; federal, state, and local governments; and particularly the insurance industry. It also discusses the various methods government and insurers are proposing to mitigate losses and to control and distribute the costs of disasters equitably.

The Impact of Catastrophes on Property Insurance discusses recent catastrophic events and the stresses they have placed on the insurance industry; the potential financial problems insurers, reinsurers, and other risk-bearers would face if a major catastrophe were to hit a heavily populated urban area; steps to prepare for future catastrophic losses; and recommendations for reducing financial losses through better building code enforcement, geographic diversification, changes in coverage, and improvements in catastrophe forecasting and rate setting.

Land-Based and Marine Hazards: Scientific and Management Issues. M.I. El-Sabh, S. Venkatesh, H. Denis, and T.S. Murty, Editors. 1996. 311 pp. \$140.00. Available from Kluwer Academic Publishers, 101 Philip Drive, Assinippi Park, Norwell, MA 02061; (617) 871-6600; fax: (617) 871-6528.

This volume contains peer-reviewed papers that were presented at the international symposium, HAZARDS '93, held in Qingdao, China, in August 1993. The meeting was a contribution to the International Decade for Natural Disaster Reduction (IDNDR), and as such, sessions covered a broad range of topics, including climatic and atmospheric hazards; marine hazards such as tsunamis, storm surges, sea level variations, water pollution, coastal erosion, and river floods; geological hazards; and wildfires. Papers were presented on both the scientific aspects of these phenomena as well as the mitigation, management, and socioeconomic aspects of disasters. Papers include: "Natural and Technological Disaster Management," by H. Denis; "Governmental Measures to Mitigate Earthquake Impacts in Algeria," by Djillali Benouar; "Unified Natural Hazard Management: Lessons from Flooding," by Frank H. Thomas; "On the Natural Disaster Reduction Policy and Management System in China," by Huating Yang; and "Managing Forest Fires: An Automatic Fire Weather Station Network in China," by Cheng Bang Yu and Jin Xiao Zhong.

"Special Issue: The Stanford University Conference on Social Treatment of Catastrophic Risk." *Journal of Risk and Uncertainty*, Vol. 12, #2/3 (May 1996). Individual subscription: \$140.00. To subscribe, contact Kluwer Academic Publishers, 101 Philip Drive, Assinippi Park, Norwell, MA 02061; (617) 871-6600; fax: (617) 871-6528.

This issue of the *Journal of Risk and Uncertainty* contains selected papers from a conference held in October 1994 at Stanford University to examine both common elements and disparities in the handling of risks, incentives, and losses across different hazards and programs. Topics include: the theory of risk-bearing; the economics of catastrophes; the complex politics of catastrophic economics; mitigating disaster losses through insurance; pricing of catastrophic insurance; government involvement in risk-bearing; global risk management; the Bhopal disaster; global financial markets and risk; and catastrophic responses to catastrophic risks.

National Media Guide for Emergency and Disaster Incidents. Bob Riha, Jr. and David Handschuh. 1995. 81 pp. \$12.00. Copies can be obtained from the National Press Photographers Association, 3500 Croasdaile Drive, Suite 306, Durham, NC 27705; (800) 289-6772.

Throughout U.S. history, members of the news media have experienced First Amendment conflicts with law enforcement and other government agencies regarding access to the scene of an emergency or disaster. This document provides advice for journalists and public safety representatives and discusses news media identification, barrier tape guidelines, media information centers, private property considerations, guidance for specific types of emergencies, and media pools. The *National Media Guide* also addresses federal media policies and procedures for the U.S. Coast Guard, the Department of Justice, the military, the Federal Emergency Management Agency, Indian lands, and nuclear emergencies.

Severe Weather

Safety Review: General Aviation Weather Accidents--An Analysis and Preventive Strategies. 1996. 382 pp. \$24.95. Copies can be ordered from the Aircraft Owners and Pilots Association (AOPA), Air Safety Foundation, 421 Aviation Way, Frederick, MD 21701-4798; (301) 695-2000. Telephone orders can be made to Sporty's Pilot Shop: (800) 543-8633.

Weather is a leading factor in light aircraft accidents. Concerned over the safety issues involved, the Flying Physicians Association funded this study of weather-related accidents. The review examines accidents that occurred from 1982 to 1993, identifies typical characteristics and experience of pilots involved in adverse-weather events, the classes of airplanes flown, and the phases of flight that presented weather challenges. The information is also arranged according to weather phenomenon, time of day, and flight conditions. The raw data, taken from actual reports and findings from the National Transportation Safety Board, indicate that 27% of small aircraft accidents occur during adverse weather, 30% cause fatalities, and winds are the most common cause. The study also revealed that, when pilots fly solely by instrument reference, they are safer and that many of these accidents involved pilot error as well as poor weather. Sections of the report include principal conclusions, recommendations, "quick look" summaries by weather conditions, a statistical overview, a compilation of accidents in brief, an educational supplement with training guidelines and recommendations, a glossary, and an index.

The Snow Booklet: A Guide to the Science, Climatology, and Measurement of Snow in the United States. Nolan J. Doesken and Arthur Judson. 1996. 85 pp. \$10.00, plus \$5.00 shipping. Copies can be purchased from the Colorado Climate Center, Atmospheric Science Department, Colorado State University, Fort Collins, CO 80523-1371; (970) 491-8545; fax: (970) 491-8449. Advanced payment is required and checks should be payable to Colorado State University.

This book was written to inform climatological observers, those who must cope with the impacts of snow, urban planners and managers, and winter recreationists about snow and its characteristics. The authors explain the physical differences between fresh fallen snow, snow on the ground, and melting snow, and present a brief primer on avalanches. They follow with a discussion of the climatological aspects of snow in the U.S., including storm tracks and

frequencies, duration and intensity, national snowfall patterns, and snow hydrology and snowloads. They also present an in-depth discussion of the problems and challenges in measuring snow as well as tips for dealing with blizzards.

Floods

A Primer for Hosting Buyout Workshops: A "How To" Manual for Developing and Managing Buyout Workshops to Encourage and Facilitate the Acquisition and/or Relocation of Flood-Damaged Structures. 1996. 107 pp. For cost and ordering information, contact the Association of State Floodplain Managers, 4233 West Beltline Highway, Madison, WI 53711; (608) 274-0123; fax: (608) 274-0696; e-mail: asfpm@execpc.com.

Following the extensive flooding in the Midwest in 1993, the Federal Emergency Management Agency and the state of Iowa hosted the "Flood Recovery Workshop: Buyouts and Relocation, A "How To" Workshop for Iowa Communities" in January 1994. Based on that experience, this *Primer* was created to guide future buyout workshops. Section I describes initial planning decisions, covering the need for a workshop, state funding commitments, and creation of a workshop development team. Section II offers guidance on establishing a workshop framework and setting an agenda. Section III presents the Davenport Workshop Agenda, and Section IV offers tips for managing the workshop while in progress. The last two sections provide recommendations for both administration and workshop evaluation. Appendices include lists of additional resources, a sample workshop agenda, articles on floodplain management, sample buyout programs, and sample workshop forms.

Alluvial Fan Flooding. 1996. 172 pp. \$39.00, U.S.; \$47.00, international. Available from the National Academy Press, 2101 Constitution Avenue, N.W., Box 285, Washington, DC 20055; (800) 624-6242; WWW: <http://www.nap.edu>.

In the Western United States, many major land use conflicts revolve around development on alluvial fans, which can be susceptible to catastrophic flooding. These controversies prompted the Federal Emergency Management Agency to ask the National Research Council for help in revising the existing definition of alluvial fan flooding and in developing criteria for determining whether an area is susceptible to this risk. This report contains the results of that effort; it discusses flooding processes, indicators for characterizing alluvial fans and associated flooding, the application of these indicators, and conclusions and recommendations.

Midwest Flood of 1993: Weather, Climate, and Societal Impacts. Roger A. Pielke, Jr. 1996. 159 pp. \$9.00. Available from the National Center for Atmospheric Research, Environmental and Societal Impacts Group, P.O. Box 3000, Boulder, CO 80308-3000; (303) 491-8111; fax: (303) 497-8125; e-mail: rogerp@ucar.edu. Prepayment is required and checks should be payable to the National Center for Atmospheric Research.

Midwest Flood of 1993 reviews U.S. social vulnerability to flood, focusing on large-scale events. It provides an overview of the various processes that society has developed to cope with floods and distills lessons from various assessments and analyses of the extensive flooding that occurred in

the Midwest in 1993. The report discusses "nine fallacies of floods"; policy, science, and floods; problem definition; social and decision processes to reduce vulnerability; and assessments of flood forecasting, impacts, and responses in 1993. Appendices provide information on estimated annual deaths and damages due to floods, the recommended goals for a Unified National Floodplain Management Program; and bibliographic and World Wide Web resources on floods.

Rivertech 96: Proceedings of the 1st International Conference on New/Emerging Concepts for Rivers. Two volume set. 1996. 474 pp., Vol. 1; 457 pp., Vol. 2. \$75.00 per set. To obtain, contact Donna Herriott, Conferences and Institutes, University of Illinois-Urbana-Champaign, 302 E. John Street, Suite 202, Champaign, IL 61820; (217) 333-2881; fax: (217) 333-9561; e-mail: dherriot@uiuc.edu.

Mastercard, Visa, American Express, and Discover cards are accepted for prepayment.

These proceedings document a meeting held in Chicago in September 1996 to honor the 25th anniversary of the International Water Resources Association (IWRA). Volume 1 contains papers on open channel flow hydraulics, the ecological importance of floods, river quality, river structures, conservation and restoration of rivers and floodplains, the integrated management of large rivers, river quality, floodplain management, the Mississippi River, diversion systems and hydropower, technical analysis, modeling, and watershed management. Volume 2 includes papers on sediment transport; the Chicago and Birmingham, U.K., sister cities project; hydrology and hydraulics; vegetated and natural systems; floodplain management; public participation; flood control; and ecological economics.

On Borrowed Land: Public Policies for Floodplains. Scott Faber. 1996. 32 pp. \$14.00, plus \$3.50 shipping. Copies can be purchased from the Lincoln Institute of Land Policy, Publications Orders, 113 Brattle Street, Cambridge, MA 02138-3400; (617) 661-3016; fax: (617) 661-7235; e-mail: lincolnpubs@lincolninst.edu.

This report summarizes key points from a conference of policy experts and local elected officials that draw lessons from the disastrous Midwest flooding in 1993. The participants concluded that human uses of land increase flood risks in two ways: 1) human development anywhere increases the speed and force with which rainfall flows across land and into rivers, and 2) intensive use of floodplains by humans exposes more and more property to potential damage. This report includes discussions on what local communities, states, and the federal government can do to mitigate flood damage, including educating themselves and their constituents about the hazards, initiating changes to public programs in order to eliminate incentives to build and rebuild in the floodplain, and working to inform those who may have a false sense of security from structural protection that they may still be at risk from floods.

Hurricanes and Tropical Storms

Hurricanes. Peter Chaston. 1996. 182 pp. \$29.00. Copies can be obtained from Chaston Scientific, Inc., P.O. Box 758, Kearny, MO 64060; (816) 628-4770; fax: (816) 628-9975; e-mail: chaston111@aol.com.

This book is written in lay terms to explain the way hurricanes develop and impact the U.S. It

provides a brief history of these storms and their impacts on the United States, Canada, and elsewhere; explains the structure and life-cycle of a hurricane; discusses how the storms are named; and describes weather satellite imagery, storm movement, hurricane-force winds, rainfall and storm surge, and tornadoes and downbursts in a hurricane. A technical section provides additional information for meteorologists and others desiring more in-depth material.

Wildfires

Introduction to Wildland Fire. Second Edition. Stephen J. Pyne, Patricia L. Andrews, and Richard D. Laven. 1996. 780 pp. \$89.95, plus shipping. Copies can be purchased from John Wiley and Son, Inc., One Wiley Drive, Somerset, NJ 08875; (800) 225-5945, ext. 2497; fax: (908) 302-2300. Credit cards, checks, or invoices accepted.

This second edition of *Introduction to Wildfire* expands and updates information on the scientific, technical, and social aspects of this hazard. It discusses the fundamental physics and chemistry of fire, fire behavior, wildland fuels, the interaction of fires and weather, the ecological effects of fires, fire management programs, planning, suppression, prescribed fires, and global fire management. The new edition also examines current problems such as the burning of the Amazon rain forest and the implications of recent drought-related fires that have plagued urban areas bordering wilderness lands.

Urban Wildfires. Natural Hazard Mitigation Insights 5 (September 1996). Free. Copies can be requested from the Insurance Institute for Property Loss Reduction, 73 Tremont Place, Suite 510, Boston, MA 02108-3910; (617) 722-0200; fax : (617) 722-0202.

The problem of providing fire protection in the urban/wildland interface continues to grow as many communities in the U.S. expand into wildlands. Because fire is a fact of life in wildland ecosystems, homeowners need to be aware of steps they can take to ensure the safety of their home and family. This brochure describes measures that can reduce the risk of wildfire damage, including landscaping, creating an emergency water supply, establishing safe access and exit routes, preparing for emergencies, and installing smoke alarms and fire extinguishers.

The Ecological Implications of Fire in Greater Yellowstone. Proceedings of the Second Biennial Conference on the Greater Yellowstone Ecosystem. Jason Greenlee, Editor. 1996. 242 pp. \$25.00, U.S.; \$30.00, international. Copies can be obtained from the International Association of Wildland Fire, P.O. Box 328, Fairfield, WA 99012; (509) 283-2397; fax: (509) 283-2264; e-mail: jgreenlee@igc.apc.org; WWW: <http://www.teleport.com/~wildfire>.

In 1988, intense and uncontrollable wildfires burned through much of Yellowstone National Park, creating a unique opportunity for scientists to study how natural landscapes respond to fire. This volume, the proceedings of a meeting held in 1993 to further the scientific dialogue, includes papers on fuel manipulations; simulation of fire effects; tourism in Montana following the fires; media coverage of fire ecology; fire impacts on snow melt, streamflow, and sediment transport; large mammal mortality in the fires; migration and habitat use following the fires; effects of the fires on Yellowstone's lakes; the National Fire Danger Rating System; and the ecological

implications of fire in Yellowstone.

Earthquakes and Other Geologic Hazards

Home Buyers' Guide to Geologic Hazards. Wilgus B. Creath. 1996. 32 pp. \$6.00, AIPG members; \$9.00, nonmembers. Order from the American Institute of Professional Geologists (AIPG), 7828 Vance Drive, Suite 103, Arvada, CO 80003; (303) 431-0831; fax: (303) 431-1332; e-mail: aipg@aipg.com; WWW: <http://www.nbmg.unr.edu/aipg>. Prepayment required.

The AIPG prepared this booklet to educate potential home buyers about damages that can occur to structures due to geologic hazards. It offers tips on finding information regarding geologic hazards; obtaining professional consultations; ensuring proper siting, construction, and drainage; and understanding risks posed by expansive soils and heaving bedrock, flooding, subsidence, landslides, rockfalls, avalanches, earthquakes, coastal erosion, and radon. The *Home Buyer's Guide* also includes a geologic checklist for home buyers, a guide to sources of public geological information, and a list of sources of insurance information.

Scenario for a Magnitude 7.0 Earthquake on the Hayward Fault. 1996. 110 pp. \$15.00. California residents add 8¼% sales tax; international orders, add \$2.50 shipping. Prepaid orders can be submitted to the Earthquake Engineering Research Institute (EERI), 499 14th Street, Suite 320, Oakland, CA 94612-1934; (510) 451-0905; fax: (510) 451-5411; e-mail: eeri@eeri.org; WWW: <http://www.eeri.org>.

At the 1995 annual meeting of EERI, a special day-long symposium was held on the multidisciplinary challenges posed by a major urban earthquake, using the northern Hayward fault as an example. This volume contains the presentations that were given during that symposium. Topics include the socioeconomic setting of the Hayward Fault; the geology and seismology of the fault; ground failure; water and sewer delivery systems; buildings and transportation systems affected by ground failure; power, telecommunications, and fuel delivery systems; critical facilities; commercial and residential buildings; emergency response and relief; regional response; housing and social recovery; regional transportation response; and economic recovery.

"Residential Earthquake Recovery: Improving California's Post-Disaster Rebuilding Policies and Programs." Mary D. Comerio, John D. Landis, and Catherine J. Firpo, with Juan Pablo Monzon. CPS Brief Vol. 8, #7 (September 1996). Free. The complete report is also available for \$30.00 from the California Policy Seminar, 2020 Milvia Street, Suite 412, Berkeley, CA 94704; (510) 643-9328; WWW: <http://www.ucop.edu/cps>. The complete text of the report is also available free on the Internet at <http://www.ucop.edu/cps/lancome.html>.

Between 1989 and 1994, earthquakes, hurricanes, and floods took a heavy toll on America's housing stock; more than 200,000 housing units were completely destroyed or substantially damaged, and 600,000 units required significant repairs. During that period, California suffered 13 presidentially declared disasters, including the Loma Prieta and Northridge earthquakes, leading to major concerns about the disaster recovery process. This report examines the current state of earthquake recovery practice in California, particularly as it relates to housing. The

authors examine the complementary and overlapping roles of different federal, state, private, and nonprofit recovery and rebuilding institutions, as well as the distribution of post-Northridge rebuilding funds. They conclude that relatively little preparation has gone into coordinating and paying for postdisaster rebuilding, and that victims cannot expect private insurers or the federal government to compensate them at a level of assistance comparable to that following the Northridge quake. In particular, the authors conclude that linking earthquake mitigation, particularly residential retrofitting, to assistance holds significant potential for reducing rebuilding costs.

Second National Workshop on Modelling Earthquake Casualties for Planning and Response: Summary of Proceedings. 1996. 188 pp. \$22.50. Available from Robert Olson Associates, 4164 Los Coches Way, Sacramento, CA 95864; (916) 978-7300; fax: (916) 978-7301; e-mail: robtatroa@aol.com.

This volume contains the proceedings of a workshop that was held in Los Altos, California, in February 1996 to examine issues and difficulties related to modeling earthquake casualties. Papers examine the HAZUS loss estimation method (see the *Observer*, [Vol. XXI, No. 2](#), p. 11), user needs, seismic risk assessment, the health effects of earthquakes, the Kobe quake, research prospects and problems, and the Northridge earthquake.

Enhancing the Transfer of U.S. Geological Survey Research Results into Engineering Practice. ATC-35. 110 pp. \$25.00. California residents, add local sales tax. For overseas orders, contact ATC for shipping charges. Copies can be purchased from the Applied Technology Council (ATC), 555 Twin Dolphin Drive, Suite 550, Redwood City, CA 94065; (415) 595-1542; fax: (415) 593-2320; e-mail: atc@atcouncil.org.

Despite significant advances in knowledge about earthquakes and earthquake engineering, incorporation of this understanding into seismic design has been slow, in part because of the separation of earth sciences researchers and practicing engineers. This report contains a recommended program for the transfer of U.S. Geological Survey (USGS) research results into practice. It discusses management actions that enhance information transfer; communications, such as newsletters, briefs, seminars, and workshops; and research activities into information vital to engineering. The report also discusses a ground motion initiative, planning studies, regional earthquake assessments, and improved information collection and dissemination.

Pumice and Ash: An Account of the 1994 Rabaul Volcanic Eruptions. Sue Lauer. 1995. 80 pp. \$23.95 (Australian). A CD-ROM of 60 images is also available for \$85.00 (Australian), as are six slide sets (\$25.00 each, 10 slides each): 1. Tavurvur in Eruption; 2. Vulcan in Eruption, 3. Rabaul Town Destruction (aerial); 4. Rabaul Town Damage; 5. Simpson Harbour and Surrounds; and 6. General Views. All six slide sets can be purchased for \$125.00 (Australian). To order, contact CPD Resources, P.O. Box 4037, Goonellabah, New South Wales 2480, Australia; tel: +61 66 24 5655; fax: +61 66 24 5656; e-mail: cpdres@nor.com.au; WWW: <http://www.nor.com.au/media/cpdres>.

In September 1994, the volcanic caldera in Northeastern New Britain began to rumble and finally erupt, spewing volcanic ash and burying the town of Rabaul, Papua New Guinea. This book

provides a personal account of the volcanic eruptions. It is well-illustrated with numerous photographs of damage and eruptive activity.

Terrorism

Final Report: Alfred P. Murrah Federal Building Bombing, April 19, 1995. 1996. 400 pp. \$25.00. Available from Fire Protection Publications, Oklahoma State University, 930 North Willis, Stillwater, OK 74078-8043.

This document describes the rescue and recovery efforts of the City of Oklahoma City following the bombing of the Alfred P. Murrah federal building in 1995. Because the blast collapsed a nine-story office building, severely damaged or destroyed 25 other buildings, and damaged another 300, this tragedy offers lessons for others who must deal with similar impacts caused by natural hazards. Descriptions of the city's response are broken into five categories: "Shock and Response," "Taking Control," "Resource Escalation," "Sustaining the Effort," and "Recovery, Healing, and Remembrance." After-action reports are also provided describing the overall actions of city personnel; the fire, police, and emergency medical departments; urban search and rescue teams; Murrah building federal agencies; the state health department; and relief organizations. In addition, the report provides an evaluation of communications, a history of the Murrah building, and a detailed discussion of lessons learned.

Videos, Slides, and Other Electronic Media

IDNDR Video Catalogue. 1996. 37 pp. Free. Order from the Secretariat of the International Decade for Natural Disaster Reduction (IDNDR), United Nations, Palais des Nations, CH-1211 Geneva 10, Switzerland; (41-22) 7986894; fax: (41-22) 7338695; e-mail: idndr@dha.unicc.org.

This booklet contains a list of videos received by the IDNDR Secretariat between 1990 and 1995. It represents an initial step by the Secretariat to act as a clearinghouse on natural disaster videos, and the IDNDR Secretariat requests that persons or organizations with videos send a copy and a summary so that the video can be mentioned in future editions of this catalog. At some point in the near future, this information will be placed on the IDNDR World Wide Web Home Page: <http://hoshi.cic.sfu.ca/~anderson/hazard/idndr.html>.

Avalanche Rescue Beacons: A Race Against Time. 1996. VHS. 38 minutes. \$24.95, plus \$4.00 shipping. Prepayment is required. Copies can be purchased from People Productions, 1630 North 63rd Street, Suite 7, Boulder, CO 80301; (303) 449-6086; fax: (303) 449-9526.

This video was created by the Colorado Avalanche Information Center to teach winter recreationists how to effectively search for and rescue an avalanche victim. It provides information on the use of avalanche rescue beacons and basic search techniques for people with and without rescue beacons.

Mitigation of Disasters in Health Facilities. 1996. VHS. 15 minutes. \$25.00. Available in English or Spanish from the Emergency Preparedness Program, Pan American Health Organization (PAHO), 525 Twenty-third Street, N.W., Washington, DC 20037; fax: (202) 775-4578; e-mail: webmaster@paho.org; WWW: <http://www.paho.org>.

Mitigation of Disasters in Health Facilities focuses on facility maintenance, retrofitting existing buildings, and hazard mitigation in new hospital design and construction. It highlights what is being done in some Latin American and Caribbean countries to reduce the effects of earthquakes and hurricanes on hospitals.

Who We Are

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, Federal Emergency Management Agency, National Oceanic and Atmospheric Administration, U.S. Geological Survey, U.S. Army Corps of Engineers, U.S. Forest Service, Environmental Protection Agency, U.S. Department of Transportation, the National Atmospheric and Space Administration, and the Insurance Institute for Property Loss Reduction. 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 *January 15, 1997*.

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

NATURAL HAZARDS OBSERVER

ISSN 0737-5425

Printed in the USA.

Published bimonthly. Reproduction with acknowledgment is permitted and encouraged.

The *Observer* is free to subscribers within the U.S. Subscriptions beyond the U.S. cost \$15.00 per year. Back issues of the *Observer* are available for \$2.00 each, plus shipping and handling. Orders must be prepaid. Checks should be payable to the University of Colorado.

Copies of the *Observer* and the Hazards Center's electronic newsletter, *Disaster Research*, are also available from the Natural Hazards Center's World Wide Web site: www.colorado.edu/hazards

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December 19, 1996

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