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The Impact of the 1997 El Niño on Winter Precipitation in the West

—an invited comment

Initial newspaper, television, and radio reports in the summer of 1997 on the issue of El Niño and its impact on rainfall in the West in many cases were misleading. For example, early predictions of a spectacularly wet winter for extreme southern California (by meteorologists and oceanographers in the southern portion of the state) were reported widely as applying to the whole state, and other quotes, such as "Californians should build an ark," garnered much attention.

The impact of such statements on the public was astonishing. By late summer, it was evident that overreaction were spreading across the West, particularly in California, with overstatement and alarm evident in the tone of many newspaper articles. All of this led to poorly drawn conclusions.

Brief Definition of El Niño

The term El Niño refers to a rapid warming of sea-surface temperature (SST) in the eastern tropical Pacific, chiefly along the north-central coast of South America and westward. El Niño events are characterized by a rather dramatic onset of large positive temperature deviations (on the order of 2° C, or about 4° F, or greater), usually peaking in December (hence the name, which refers to Christmas, El Niño, or the Christ Child).

Warmings occur rather frequently (on the order of once every four years or so) as part of the Southern Oscillation, a cyclical change in the pressure and temperature distribution along the equator. In the current El Niño Southern Oscillation (ENSO) event, ocean temperatures are over 5° C (almost 11° F) warmer than the long-term normal in that area.

It is important to note that the term El Niño does not refer to a series of catastrophic, flood-producing weather events in California or elsewhere, a hurricane or series of hurricanes, or even a period of drought in the West, although any of these can and do occur as an impact of El Niño conditions along the South American coastline.

Not All El Niño Events Are Alike

The present El Niño is a so-called Type 1 El Niño (Fu et. al, 1986). Type 1 events involve the strongest SST anomaly (>2.0° C) and extend from approximately 160° E to 80° W. From 1949 to 1993, there were eight Type 1 ENSO events; however, the present event is dissimilar to other Type 1 events in that it grew and matured much more rapidly than previous events.

This unprecedented early development raised speculation that the present El Niño would peak and dissipate too soon to impact the winter precipitation systems that affect the West. As of early December, this did not seem likely. A recent series of forecasts of SST anomalies by three-month period through next spring from the National Centers for Environmental Prediction (NCEP) shows

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that, although the temperature anomalies associated with El Niño are forecast to decrease slightly by March 1998, apparently they will persist through the spring.

How Will This El Niño Event Affect the Pacific Storm Track?

The unusually warm pattern in the eastern tropical and subtropical Pacific is expected to create a southern branch of the storm track, as depicted schematically in Figure 1. This southern branch, often referred to as a subtropical storm track, should extend from the latitude of Hawaii (approximately 20° N) to the southern or central coast of California, and then along the southern tier of states.

Storms moving along this path carry warm and very moist subtropical air to the West Coast and are associated with heavy precipitation and high snowlines in California. Warm temperatures at high elevations often exacerbate the situation by creating massive snowmelt, adding to runoff and contributing substantially to local flooding along stream margins. The position of the subtropical

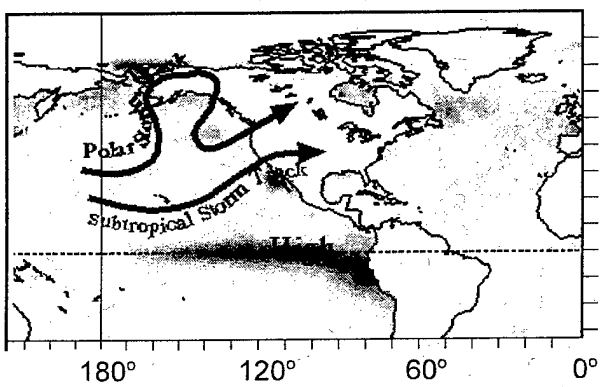

Figure 1. Schematic Diagram Showing Midwinter Position of Storm Tracks During Type 1 El Niño Events.

branch determines which portion of California and/or the West receives the heaviest precipitation.

Further east, in regions where upper tropospheric ridging is more typical in a normal winter, the surface cyclones moving in the southern branch are associated with greater cloudiness than usual and, north of the surface lows, anomalously strong surface northerlies. Thus, in these regions, cooler and wetter than normal conditions are typical with Type 1 El Niño events.

How Have Type 1 El Niño Events Historically Affected Precipitation Patterns Over the West?

Type 1 events have a very strong signal in the precipitation record of California (Schonher and Nicholson, 1989) and the West. Figure 2 shows the composite precipitation anomalies (in inches) by climatic division across the coterminous United States for eight Type 1 events since 1950. Generally speaking, the southwestern

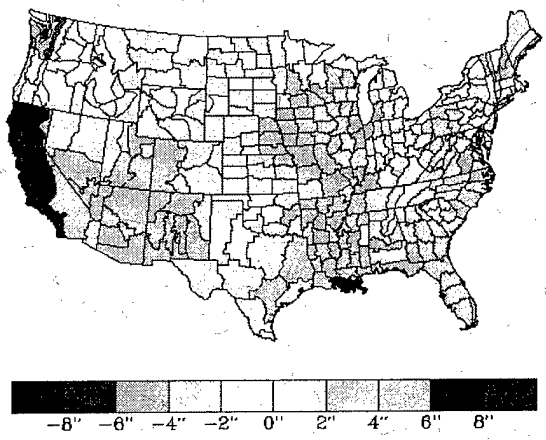

Figure 2. Composite Precipitation Anomaly for Type 1 El Niño Events (1951, 1957, 1965, 1968, 1972, 1977, 1982, and 1991).

portion of the United States, Gulf Coast, and the Mississippi River Valley have experienced wetter than normal conditions, with the strongest positive departures in California, and negative departures in coastal and Cascade Range portions of Washington State.

The absolute values of the anomalies do not tell the whole story. Figures 3a, 3b, and 3c, show the precipitation history in California, Colorado, and Washington for the eight Type 1 El Niño events listed above. The information plotted on these maps was obtained by the authors by dividing the anomalies shown in figure 2 by the mean rainfall for each climatic division.

In coastal California, the greatest departures from normal have occurred from San Francisco south and in the desert southeastern portions of the state. The western and southwestern regions of Colorado have experienced between 110% and 120% of normal precipitation, whereas coastal Washington incurred only 90-95% of the long-term normal precipitation.

How Remarkable Has the Precipitation Been in the West with Type 1 El Niño Events?

Given these historical anomalies, the question is "How remarkable or unremarkable has the precipitation been that has historically occurred with Type 1 events?" Figure 4 shows the precipitation anomalies shown in Figure 2 as a fraction of the standard deviation of precipitation. Generally speaking, a departure of one standard deviation or more can be considered significant, since it means that the given precipitation is greater than about 70% of the totals in the period of record.

Note that the information shown is consistent with the observation that there is enough data to support the concern for above-normal precipitation in the southwestern portions of the United States, with departure between +1.0 and +1.5 standard deviations for large areas of California and Nevada and small portions of Utah and

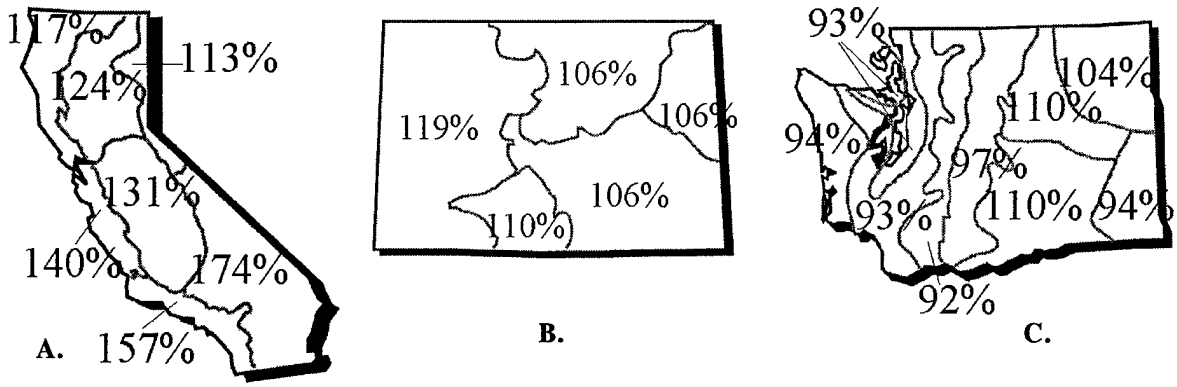

Figure 3. State Precipitation History for Type 1 El Niño Events for a) California, b) Colorado, and c) Washington.

Arizona. However, nothing in Figures 2, 3, or 4 suggests that the early concerns that hugely above normal precipitation, on the order of 300-400% (two to four standard deviations) should be expected in any area of the West this upcoming winter.

It is also important to keep in mind that while both predictions based upon computerized models of the linked physics of the oceans and the atmosphere (not shown here) and statistical analyses of the past rainfall record (summarized above) suggest wetter than normal conditions for most of the Southwest, two of the eight recent Type 1 El Niños were associated with below average precipitation in certain areas, including north-central California. The greatest positive anomalies occurred for the El Niños of 1982-83 (180-200% in California) and 1957-58 (170-190% in California).

Not all cool season flooding events in the West occur during El Niño years, and not all El Niño years produce widespread flooding. It is true that more frequent storms and heavier precipitation are more typical in the Southwest, particularly in California, during Type 1 El Niños. However, the potential for flooding or mudslides also strongly relates to the phasing of precipitation events (even a day or two break between weather systems can make a large difference in the flood potential), as well as to the saturation of soils, and, for coastal flooding, the state of the tides.

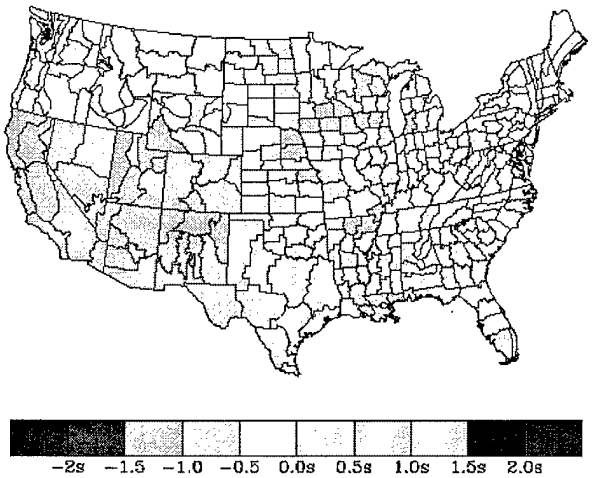

Figure 4. Composite Standardized Precipitation Anomalies Versus 1950-1995 Long-Term Average.

Conclusions

The present El Niño is one of the strongest (if not the strongest) of the 20th century. There is no reason, however, for panic, nor is there any evidence to support the overreactions stimulated by early news reports this past summer. On the other hand, there is evidence to support a reasonable concern for a wetter-than-normal winter for most of the Southwest and even a much wetter-than-normal cool season in southern California.

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References

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Schonher, T. and S.E. Nicholson
1989 "The Relationship between California Rainfall and ENSO Events," *Journal of Climate* 2: pp. 1258-1269.

A more detailed explanation of El Niño, also written by the authors, can be found on their departmental Web site: *http://tornado.sfsu.edu/geosciences/elnino.html.*

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Decade for Natural Disaster Reduction

The Latest News from the Secretariat . . .

An IDNDR Update

IDNDR Regional Activities

The government of Kazakhstan, the United Nations International Decade for Natural Disaster Reduction (IDNDR) Secretariat, and the United Nations Development Program will cooperate on a project to strengthen the monitoring capacities of the Seismological Centre of Almaty and to ensure regional cooperation and exchange of seismic information. Also, in 1999 the IDNDR Secretariat will cosponsor with the Kazakh government an International Conference on the Prevention and Mitigation of Mudflows, to be held in Kazakhstan.

At the same time, the government of Italy has approved an IDNDR project to improve seismic disaster prevention and management in Albania. The project, developed in collaboration with the Italian and Albanian IDNDR National Committees, will restore the Albanian seismic surveillance system and strengthen national institutions for disaster prevention.

The IDNDR Secretariat is also helping to plan the Fifth Conference on Cooperation of the Central, Eastern, and Southeastern European Countries on Protection Against Natural and Other Disasters, to be held in Armenia in September 1998. One main goal of the conference will be to create a set of recommendations or guidelines for disaster reduction, regionally and globally, in the 21st century.

IDNDR and the El Niño Task Force

In November 1997, Mr. Yasushi Akashi, United Nations Emergency Relief Coordinator and Under-Secretary-General for Humanitarian Affairs, established a task force for cooperative work on the prevention and mitigation of and preparedness for natural disasters related to the El Niño phenomenon. The task force is composed of organizations from both within and outside the United Nations, each of whom deals with either the scientific aspects of El Niño hazards, or socioeconomic, vulnerability, and risk management issues.

The task force meetings are being convened by the IDNDR Secretariat. At its first meeting, held in Geneva in November, the committee addressed both scientific and social aspects of the El Niño problem. It agreed that presently there is significant difficulty in translating scientific knowledge into prevention-oriented, capacity-building economic and social activities at the local level. Participants also agreed that gathering historical data is necessary to support the mapping of possible effects of El Niño in various regions and countries.

Focusing on cooperation through information exchange and policy formulation, the task force agreed that it will: act as a forum for information exchange and coordination of follow-up actions through its meetings and an Internet discussion forum; produce joint press kits and a joint publications series; explore options for longer-term research; and undertake joint actions, including national and regional workshops.

Follow-up meetings are currently being organized. In addition, the U.N.'s ReliefWeb home page—*www.reliefweb.int*—now offers a special page on El Niño actions and background information. For additional information, contact *Natalie Domeisen, United Nations IDNDR Secretariat, Palais des Nations, CH-1211 Geneva 10, Switzerland; (41 22) 798 68 94; fax: (41 22) 733 3141; e-mail: natalie.domeisen@dha.unicc.org.*

IDNDR and the General Assembly

The director of the IDNDR Secretariat introduced two reports of the Secretary General to the General Assembly in November. The first report (A/52/560) highlighted the status of the implementation of Decade activities and elaborated on the action plan for the period 1998-1999. The second report (A/52/561) was a discussion on the improved effectiveness of early-warning systems with regard to natural and other disasters. This report identifies established and developing capabilities for early warning, and recommends increased local utilization of warnings and related aspects of disaster management in order to minimize the risks of disasters.

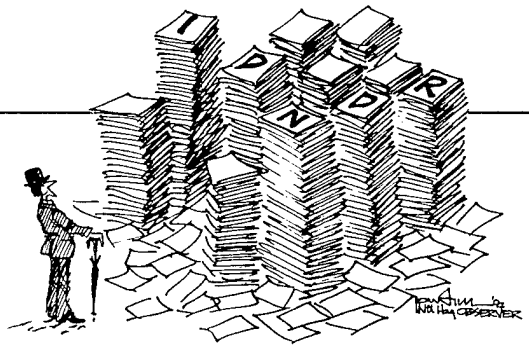
Promotion and Public Awareness

The IDNDR Secretariat recently completed a detailed analysis of the conference survey for the 1996 IDNDR Internet Conference on "Solutions for Cities at Risk." The survey provided useful feedback on issues related to Internet conferencing and will be used to design future IDNDR Internet conferences.

Public-Private Partnerships

In November, the IDNDR Secretariat met with representatives of Anite Systems Inc., a British group engaged in the organization of the 1998 World Conference on Earth Observation Data in Forecasting, Managing and Recovering from Natural and Man Made Disasters. The conference will take place in London, June 3-5, 1998.

For more information about any of these projects, or to obtain copies of the reports mentioned, contact *Natalie Domeisen, Promotion Officer, IDNDR Secretariat, United Nations, at the address on the previous page.*



Looking for a few good stories . . .

Decade Volume to Be Published

In May 1999, Natural Disaster Management Limited will publish a commemorative volume celebrating the achievements of the IDNDR and encouraging the continuation of the goals and ideals of the Decade into the next century.

Titled ***Natural Disaster Management***, the book will document the united effort of the countries of the world to reduce damage and suffering caused by natural disasters. The volume will be divided into sections covering each element of the disaster cycle. It will be reviewed and approved by a select editorial advisory board and will be written exclusively by disaster prevention professionals in order to share possible solutions to international disaster prevention, reduction, and mitigation problems.

The publishers are currently seeking contributors, editorial advisors, sponsors, co-publishers, and other individuals and organizations interested in contributing to this effort. In addition, they are publishing a quarterly newsletter, ***NDM News***, to inform authors, subscribers, sponsors, advertisers, and other interested parties about progress in the publication of ***Natural Disaster Management***. To subscribe, or to obtain more information about this concluding Decade activity, contact *Natural Disaster Management Limited, Tudor House, 70a Harwood Road, London, SW6 4PZ, U.K.; tel: +44 171 731 7635; fax: +44 171 731 7645; e-mail: ndm@dial.pipex.com.*

The Internet Pages

Below are some of the useful Internet sites we've discovered recently. A comprehensive list of these resources is posted on the Hazard Center's Web page: *http://www.colorado.edu/hazards/sites/sites.html.*

http://www.colorado.edu/hazards

The Natural Hazards Center home page now includes a search engine for locating information on our Web site: *http://www.colorado.edu/hazards/query2.html.*

In addition, the center has added yet another full-text Quick Response report to the Web site at *http://www.colorado.edu/hazards/qr/qr101.html*: **QR101**: ***Repeat Response to Hurricane Evacuation Orders***, by Kirstin Dow and Susan L. Cutter.

Quick Response reports offer the observations and findings of researchers who travel to a disaster site soon after impact to study immediate disaster effects. The entire list of quick response reports is available at *http://www.colorado.edu/hazards/qr/qr.html.* In addition, printed copies of these reports can be purchased for $5.00 each, plus shipping charges: $3.00 for the U.S., Canada, and Mexico; $4.00 for international surface mail; and $5.00 for international air printed matter. To order copies, contact the *Publications Clerk, Natural Hazards Research and Applications Information Center, Campus Box 482, University of Colorado, Boulder, CO 80309-0482, (303) 492-6819; fax: (303) 492-2151; e-mail: jclark@spot.colorado.edu.*

http://www.iris.edu

The Incorporated Research Institutions for Seismology (IRIS) is a university research consortium dedicated to exploring the earth's interior through the collection and distribution of seismographic data. IRIS programs contribute to scholarly research, education, earthquake hazard mitigation, and the verification of the Comprehensive Test Ban Treaty. Besides abundant information about IRIS, its projects and publications, this Web site provides a full-color "Seismic Monitor Map" that displays seismic activity around the globe. Users can click on the map to obtain information from any of 40 world seismic stations, as well as details about earthquakes that have occurred in the last five years (or last 30 minutes).

http://www.scecdc.scec.org/

Speaking of seismic data, the Southern California Earthquake Center has *a lot*, focusing (not surprisingly) on Southern California. The Web site above also includes publications about and seismic hazard maps of the region. The center itself hosts a Web site at *http://www.scec.org* that contains their publication list, descriptions of their research activities, and much more earthquake information.

http://www-sfb461.physik.uni-karlsruhe.de/

This is the Web site for the new Cooperative Research Center entitled "Strong Earthquakes—A Challenge for Geoscientists and Civil Engineers," funded by the German Research Foundation but regionally focusing on Romanian earthquakes. The information is provided in English. For details about the center, see the Web site or contact *Friedemann Wenzel, Geophysical Institute, Karlsruhe University, Hertzstraße 16, 76187 Karlsruhe, Germany; tel: 49-721-608 4431; fax; 49-721-71173; e-mail: fwenzel@gpiwap1.physik.uni-karlsruhe.de.*

http://www.theadvocate.com/news/

The Advocate, a Baton Rouge, Louisiana newspaper, recently ran a series of articles on the National Flood Insurance Program entitled, "Flood Insurance: The Money Drain." Its three parts, now available on the Web, include:

Part I: The Disaster the National Flood Insurance Program Can't Seem to Fix—Homes That Flood Year After Year;
Part II: Treading Water, Floods as a Way of Life for Some Louisianians;
Part III: How Tulsa, Oklahoma, Stemmed Its Growing Tide of Flood Claims, and Other Ways to Fight Back.

http:/www.sacbee.com/news/projects/gathering_storm/index.html

Another newspaper, the ***Sacramento Bee***, recently ran a similar series of articles, entitled "The Gathering Storm," on the flood problem in the West. The articles take a critical look at the issues and the inadequacy of the entire range of current solutions, from dams and other structural measures, to flood insurance, disaster relief, and land-use planning. The authors, Tom Knudson and Nancy Vogel, conclude with a review of possible reforms, combining it with a sobering recognition of the political realities of floodplain management." "It's easy to get money when something breaks because Washington . . . responds to the high visibility and publicity," they quote one flood expert as saying. "But that's a scary way to operate a ship."

http://www.dir.ucar.edu/esig/HP_roger/hurr_norm.html

Roger Pielke, Jr. of the Environmental and Societal Impacts Group, National Center for Atmospheric Research, and Christopher W. Landsea of the Hurricane Research Division, National Oceanic and Atmospheric Administration, recently drafted a paper entitled "Normalized Hurricane Damages in the United States: 1925-1995," which is available from the Web address above. For persons interested in the costs associated with natural hazards, the paper provides interesting reading. The authors found that

when inflation and two additional factors—coastal population changes and changes in wealth—are taken into account, the trend of increasing damage in recent decades disappears. However, over the long-term, the average annual damage in the United States is about $4.8 billion (in 1995 dollars)—substantially more than previous estimates. Of this damage, over 83% is accounted for by intense hurricanes (3, 4, and 5 on the Saffir-Simpson scale), yet these storms make up only 21% of U.S.-landfalling tropical cyclones. The entire text, tables, and figures are on-line and the authors welcome any comments, since the paper is being revised for final publication.

http://www.dir.ucar.edu/esig/prediction

This site provides a project overview and reports results from the NSF-funded project examining "Prediction in the Earth Sciences: Use and Misuse in Policy Making" (see the ***Observer***, Vol. XXII, No. 2, p. 18). The study covers a number of hazards, including earthquakes, climate change, floods, asteroid impacts, and extreme weather.

http://www.civil.buffalo.edu/wind/windneeds.html

Here's another report-on-the-web—"Wind Engineering: New Opportunities to Reduce Wind Hazard Losses and Improve the Quality of Life in the USA," prepared by the American Association for Wind Engineering. The report addresses both "The Current State of Affairs" and "Establishing Our Future Direction," and includes a list of 11 recommendations for improving wind hazard mitigation in the U.S.

http://www.cdc.gov/epo/mmwr/mmwr_wk.html

The November 14, 1997, issue of the ***Morbidity and Mortality Weekly Report*** (***MMWR***—Vol. 46, No. 45) of the Centers for Disease Control and Prevention (CDC) includes an article entitled "Tornado Disaster—Texas, May 1997." From time to time, the ***MMWR*** contains analyses of deaths and injuries due to recent disasters. Current and back issues can be found on the World Wide Web at the address above.

http://www.airs.org/nerin/

A growing number of people have become especially vulnerable to disasters because of poverty, disability, lack of English language skills, or other risk factors, and more and more these individuals are being crowded into inner cities in the most disaster-prone areas of the United States. Beginning with the Loma Prieta earthquake in 1989, it has become clear that traditional disaster response agencies, both public and private, are not prepared to deal with the many long-range recovery needs of these groups. Increasingly, local human service agencies have been called on to fill the gap.

Recognizing these changes, the Alliance of Information and Referral Systems (AIRS), through an 18-month planning grant from the National Telecommunications and Information Administration, developed a model of a national Internet-based human services information system for disaster recovery—the National Emergency Resource Information Network (NERIN).

The key elements of the NERIN model are:

- An active site on the World Wide Web, containing all material developed by NERIN, linked to national agencies by hotlinks, and structured to receive event-specific information from local agencies;
- Comprehensive training for information and referral agencies;
- The Disaster Service Taxonomy, a national standard for disaster database development, access, and reporting;
- A guide for local information and referral agencies in building and strengthening local disaster preparedness recovery coalitions;
- A framework for a national mutual aid agreement among information and referral agencies; and
- Protocols for the collection, maintenance, storage, and dissemination of disaster resource information.

The NERIN home page provides detailed information on each of these elements, as well as a means to comment on the model. With the completion of model design, NERIN is entering Phase II of the project—implementation. For more information about how this vision will be realized, consult the NERIN Web site or contact *AIRS, P.O. Box 31668, Seattle, WA 98103; (206) 632-2477.*

http://www.es.mq.edu.au/NHRC
http://www.es.mq.edu.au/NHRC/ema.html

The Natural Hazards Research Centre (NHRC) at Macquarie University in New South Wales, Australia, has put together a directory of natural hazards research in the South Pacific region. Information about the NHRC and the directory are available from the URLs above. Researchers not included are invited to submit information about their projects via an on-line form.

http://www.ehc.arch.vuw.ac.nz

This is the Web site of the recently established Earthquake Hazard Centre in New Zealand—a nonprofit organization dedicated to promoting earthquake resistant construction in developing countries (see the ***Observer***, Vol. XXII, No 2, p. 9).

http://www.jcu.edu.au/dept/CTURP/cdsweb.htm

The home page of the Centre for Disaster Studies at James Cook University, Queensland, Australia, provides an overview of the center, its goals and functions, numerous links to other Web sites relevant to Australian hazards, and summaries of current center research.

http://hoshi.cic.sfu.ca/epc/pub/en_publist.html

The Emergency Preparedness Canada Web site now includes a Canadian National Electronic Disaster Database, including a browser program, via the publications page listed above. The site also offers numerous other on-line disaster management materials.

http://www.nas.net/~ccep/ccepnews/index.html

Also up north, the Canadian Centre for Emergency Preparedness recently began providing its quarterly news magazine, ***CCEP NEWS***, on-line at the address above.

http://www.paho.org/english/disaster.htm
http://www.paho.org/spanish/disaster.htm

In mid-November, in Bogota, Colombia, the Pan American Health Organization (PAHO) held a major international conference on using the Internet to manage disasters and epidemics. About 300 health and communication experts from over 40 countries collaborated to produce an extensive conference document that calls for a major effort to help developing nations harness the Internet to deal with natural disasters and outbreaks of disease. The complete conclusions and recommendations from the meeting are now available from the PAHO Web sites above.

http://www.PPBI.org

This is the home page of a new not-for-profit corporation—Private & Public Businesses, Inc. (PPBI)—established to act as a clearinghouse for the exchange of information between emergency managers, public agencies, and private businesses through communication, training, and standards setting. The site includes a section on education and training from PPBI, a glossary of emergency management/disaster recovery terms, a list of participating individuals and agencies, and numerous links to partners. PPBI can also be reached at *P.O. Box 510229, St. Louis, MO 63151-0110; (314) 894-2052.*

http://pangea.stanford.edu/~tucker/geohaz.html

GeoHazards International is an organization dedicated to improving urban earthquake risk management through collaboration among community leaders, planners, earthquake engineers, and local concerned citizens. It creates, teaches, and applies methods of urban earthquake risk management that are appropriate for use in developing countries, with local community leaders setting the priorities of GeoHazards projects, and GeoHazards staff and consultants performing technical analyses with local experts. These projects help produce safer public schools, better prepared communities, well-trained researchers and public servants, and risk management methods tailored to the needs of developing countries. This Web site covers the motivation, approach, and organization of Geohazards International, lists its publications, and describes the projects GeoHazards has undertaken.

http://www.millersv.edu/~srg

The mission of the Social Research Group (SRG) at Pennsylvania's Millersville University is to study and assess behavioral and organizational response to disasters; the impact of the media on response; emergency preparedness; and disaster mitigation activities. In the broadest sense, it endeavors to contribute to the dissemination of knowledge regarding disasters, response, preparedness, and mitigation. The SRG home page offers background information about the group, as well as its publications list and summaries of current research. A disaster newsletter and an on-line journal are also in the works.

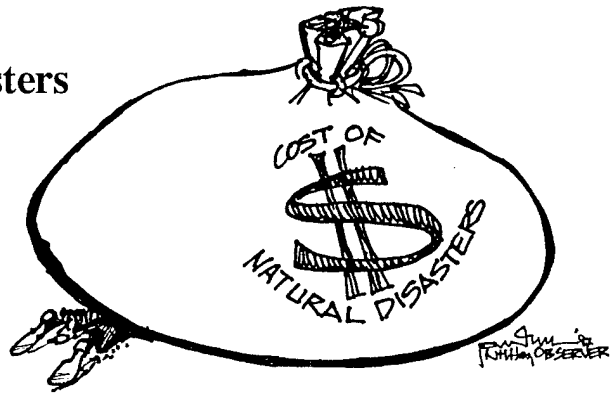
USGS Launches News Listserves

To promote faster news dissemination, the U.S. Geological Survey (USGS) has established several e-mail lists that will automatically provide subscribers with the latest news releases, bulletins, and other information about USGS activities as issued by the survey's Office of Outreach. The listserves are organized by topic:

- water-pr
- geologic-hazards-pr
- biological-pr
- mapping-pr
- products-pr
- lecture-pr

To subscribe to any of these lists, send an e-mail message to *listproc@listserver.usgs.gov*. In the body of the message type: *subscribe [name of list] [your name]* (for example, *subscribe geologic-hazards-pr James Lee Witt*). General comments or questions about this new service can be directed to *Karen Wood; (703) 648-4447; e-mail: kwood@usgs.gov.*

A New NRC Project: Assessing the Costs of Natural Disasters



The losses from natural disasters are far reaching; they include direct damage to buildings, infrastructure, nonstructural elements and contents, and natural resources, and indirect costs due to lost productivity and wages. While the severity of these losses is generally appreciated and there is interest in mitigating them, the actual scope and magnitude of such costs remains poorly understood. Recognizing that a more complete understanding is needed before effective action can begin, the Board on Natural Disasters of the National Research Council has appointed a new Committee on Assessing the Costs of Natural Disasters—a multidisciplinary group of experts who will work to determine expenses associated with such events. The committee's report, to be published in two years, will help FEMA, the study's sponsor, to develop successful mitigation policies for natural disasters. For more information, contact the *National Research Council, Board on Natural Disasters, 2101 Constitution Avenue, N.W., HA 370, Washington, DC 20418; (202) 334-1964; fax: (303) 334-1377.*

Western Governors Plan for Floods

In the past 18 months, major flooding has afflicted many states in the West and the northern Great Plains, with an estimated $5 billion in federal, state, and local funds having been spent on recovery. As the number and cost of disasters continues to rise, improving the management of floodplains has become increasingly critical. These losses and associated issues have gained the attention of the Western Governors' Association, which recently created ***An Action Plan for Reducing Flood Risk in the West*** (1997, 8 pp., free).

Noting that far too often, in the rush to restore victims' lives, structures are rebuilt in the same hazardous locations, the governors affirm that professionals at all levels of government must now work to reduce future flood risks and costs.

The ***Action Plan*** contains 25 recommendations for achieving safer communities. It calls for gubernatorial leadership, including organizing public/private summits to focus on ways to reduce risk; establishing a cabinet-level office to develop and implement state plans to reduce flood risk; and issuing executive orders or using other means to support the National Flood Insurance Program and flood mitigation in general. The plan also includes recommendations for implementing other policies and programs to address the flood risk, outlines steps for states to reduce their share of disaster costs and implement mitigation funding, and suggests ways to improve the communication of flood issues.

Copies of the ***Action Plan*** can be obtained from *Bruce Flinn, Western Governors' Association, 600 17th Street, Suite 1705 South Tower, Denver, CO 80202; (303) 623-9378; fax: (303) 534-7309; WWW: http://www.westgov.org.*

A Footnote on Flood Insurance: A Survey of Red River Flood Victims

Following the Red River Valley floods in North Dakota and Minnesota last spring, the University of North Dakota's Bureau of Government Affairs and the Institute for Business and Home Safety sent out 3,300 surveys to flood victims and received 1,200 responses. Some preliminary findings include:

Flood Insurance:
- 95% of the respondents knew that flood insurance existed.
- 20% purchased flood insurance.

Top Three Reasons for Buying Flood Insurance:
- 45.7% lived near the Red River or English Coulee.
- 53.3% believed that grants and loans would not be sufficient.
- 89.3% were concerned over record snowfall.

Top Three Reasons for Not Buying Flood Insurance:
- 51.1% saw maps and concluded that they did not need insurance.
- 74.5% did not think the flood would damage their house.
- 79.6% relied on National Weather Service forecasts, which underestimated the river crest.

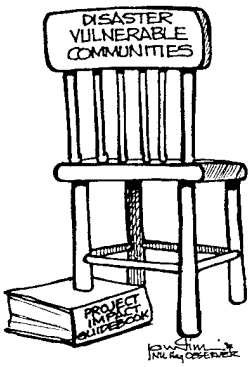
[Taken from the Newsletter of the National Lenders' Insurance Council]

WASHINGTON UPDATE

FEMA Announces Project Impact

The Federal Emergency Management Agency (FEMA) is taking a new tack in the fight against natural disasters, focusing on building disaster-resistant communities, thus reducing the need to rebuild following disasters. On October 14, during the El Niño Community Preparedness Summit in Santa Monica, California, FEMA Director James Lee Witt announced Project Impact, a new approach to emergency management that involves moving from the current reliance on response and recovery to an emphasis on preparedness and disaster management. On November 6, FEMA designated Deerfield Beach, Florida, as its first pilot disaster-resistant community.

Project Impact includes a national awareness campaign and the participation of seven pilot communities around the U.S. that will demonstrate the benefits of disaster mitigation. The remaining pilot communities include Allegheny County, Maryland; Oakland, California; Pascagoula, Mississippi; Seattle, Washington; Tucker and Randolph counties, West Virginia; and Wilmington, North Carolina. Under the terms of the memorandum of understanding between FEMA and Deerfield Beach, FEMA will provide up to $1 million in seed money to make the community more disaster-resistant. For example, the community will use $150,000 to improve the hurricane resistance of the local high school. Local and national businesses have pledged to join the effort as well.



At the same time, FEMA has launched an outreach effort to businesses and communities using a new ***Project Impact Guidebook***, which offers a formula communities can follow to become disaster resistant. It contains four chapters that address building partnerships, recognizing hazards and vulnerability, identifying and prioritizing risk reduction activities, and communicating the goals of Project Impact and keeping the initiative moving forward. The guidebook also contains lists and worksheets for identifying community partners; recognizing possible risks; using institutions as resources, including government agencies, employers, and nonprofit organizations; undertaking mitigation measures for wildfire, wind, seismic, and flood risks for both residences and businesses; working with news media and planning events; and creating a personalized media contact list.

Copies of the ***Project Impact Guidebook*** (1997, 48 pp., free) can be obtained from the *FEMA Publications Distribution Center, 8231 Stayton Driver, Jessup, MD 20794; (800) 480-2520 or (202) 646-3484; fax: (301) 497-6378.* For more information on Project Impact, contact the *Federal Emergency Management Agency, Office of Emergency Information and Media Affairs, 500 C Street, S.W., Washington, DC. 20472; (202) 646-4600; e-mail: eipa@fema.gov; WWW: http://www.fema.gov/about/impact.htm.*

FEMA Issues Guide for Risk Assessment

To support its Disaster Resistant Community initiative (see the article above), FEMA just released the new publication, ***Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy*** (1997, 418 pp., free). FEMA initiated a research project to clarify and document previous efforts to identify natural and technological hazards and to assess associated risks. This report summarizes those findings.

The report provides detailed descriptions of atmospheric hazards; landslides, subsidence, and expansive soils; floods and storm surges; droughts; coastal erosion; seismic hazards; volcanic hazards; and wildfires. It also describes technological hazards related to dam failures, fires, hazardous materials, and nuclear materials.

For specific natural and technological hazards, the report summarizes the state of scientific and technical knowledge regarding the associated risks. It introduces FEMA's recently developed risk assessment methodology, HAZUS (for Hazards United States) (see the ***Observer***, Vol. XXI, No. 2, p. 11). It also summarizes FEMA's National Mitigation Strategy and highlights recent successes in each of the five major elements of this strategy: 1) hazard identification; 2) applied research and technology transfer; 3) public awareness, training, and education; 4) incentives and resources; and 5) leadership and coordination.

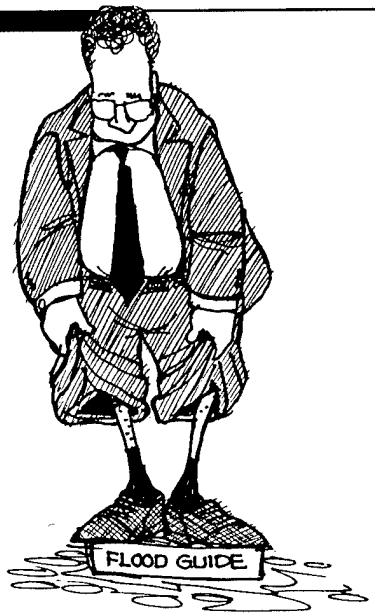
Copies of ***Multi-Hazard Identification and Risk Assessment*** are free and can be obtained from the *FEMA Publications Distribution Center* at the address above.

FEMA Issues Flood Guide for Elected Officials

FEMA has issued a new guide to educate public officials about their community's flood risks. Don Barnett, former mayor of Rapid City, South Dakota, introduces the guide by saying:

> Elected public officials must give the same attention and priority to their flood problems as they give to their police and fire problems. In the history of Rapid City, perhaps 35 people have died in fires and another 35 have been killed during the commission of crimes. But in just two hours, 238 died in the [June 1972] flood.

Addressing Your Community's Flood Problems: A Guide for Elected Officials (1997, 40 pp., free) is a manual for reducing local flood risks. It describes how floods can affect communities as well as the role of local officials in dealing with the risk. It then outlines steps to take for understanding the flood problem, learning what the community has already done to reduce risk, coordinating mitigation with other activities and programs, building support by promoting floodplain management, and carrying out a successful flood risk reduction program. The guide also includes several local success stories.



Addressing Your Community's Flood Problems explains situations local officials face after a flood occurs and includes a list of resources available to local communities to cope with flooding. Appendices list outside sources of assistance and measures that can be employed at the local level to reduce flood losses.

Copies of the guide are free and can be obtained from the *FEMA Publications Distribution Center* at the address on the previous page.

Florida Creates Showcase Communities

To highlight the multiple programs in the state designed to make its communities more disaster resistant, Florida has initiated the Florida Showcase Community Project through its Department of Community Affairs. Besides supporting and highlighting local efforts to strengthen disaster resistance, the project functions like a magnifying glass to focus the efforts of all existing state initiatives in the host community. In addition, the program helps to create partnerships between communities and other organizations to make additional resources available, and the state is currently working with FEMA and the Institute for Business and Home Safety to strengthen this effort (see the article on the previous page and the ***Observer***, Vol. XXII, No. 2, p. 4).

Currently projects are underway in Broward County and the city of Deerfield Beach. Once tested, the programs and projects will be replicated throughout the state. The program's effectiveness will be monitored and evaluated by researchers from the state's university system.

To support this project and assist local governments in reducing their risks from natural hazards, the state's Department of Community Affairs developed ***The Local Mitigation Strategy: A Guidebook for Florida Cities and Counties*** (1997, 46 pp.). Further, to address the threat of hurricane-force winds, the state is implementing a Residential Construction Mitigation Program to provide structural mitigation inspections to homeowners, along with advice and guidance on retrofitting their homes. Grants will also be offered to selected homeowners to make needed improvements.

Finally, Florida is also taking advantage of the new Flood Mitigation Assistance Program from FEMA to target structures that have been repeatedly flooded for mitigation activities.

For more information on these Florida efforts, contact *Dennis Smith, State of Florida, Department of Community Affairs, 2555 Shumard Oak Boulevard, Tallahassee, FL 32399-2100; e-mail: dennis.smith@dca.state.fl.us.* Printed copies of the guidebook are no longer available; however, the hypertext version is available via the Internet at *http://www.state.fl.us/comaff/DEM.*

GAO Evaluates FEMA's Fast Track

FEMA distributed housing assistance to victims of the 1994 Northridge, California, earthquake through an expedited process the agency calls "Fast Track," which differed from regular temporary housing assistance provisions because applications from certain areas, identified by zip code, received checks before FEMA conducted physical inspections of applicants' residences to verify their eligibility. Fast Track recipients were advised that in cashing the check, they were confirming that their application was correct and that they would use the money only for disaster-related emergency housing needs, rent for alternative housing, or repairs. The agency distributed $143 million to about 400,000 households under this program.

In its report ***Disaster Assistance: Guidance Needed for FEMA's "Fast Track" Housing Assistance Process*** (GAO/RCED-98-1, 1997, 25 pp., free), the General Accounting Office (GAO) examined several issues pertaining to the use of Fast Track, including the authority and rationale for the Fast Track process, FEMA's experience with it in Northridge, whether the process was influenced by the Office of the Inspector General's recommendations for improving disaster assistance distribution, and the program's advantages and disadvantages.

GAO concluded that, although the Robert T. Stafford Disaster Relief and Assistance Act does not explicitly provide for such a process, it does gives the agency wide latitude in providing expeditious assistance for disaster victims, thereby authorizing FEMA to use the process. GAO notes that the principle advantage of Fast Track is that it provides assistance more quickly than a regular process, and to officials involved in the Northridge earthquake response, Fast Track demonstrated to victims and the general public that help was actually on the way. However, a principle disadvantage is the relative loss of control over the disbursement of funds and the subsequent need to recover ineligible payments. FEMA designated $9.6 million for recovery due to overpayment, of which about $4 million has already been recaptured, and recovery efforts are underway for the remainder. GAO also recommended that FEMA create thorough guidance to help the agency avoid future difficulties and avoid ineligible payments.

Copies of the report are available from the *GAO, Document Distribution Division, P.O. Box 6015, Gaithersburg, MD 20884-6015; (202) 512-6000; fax: (301) 258-4006; e-mail: info@www.gao.gov; WWW: http://www.gao.gov*. The complete text of the report is also available via the Internet: *http://www.access.gpo.gov*.

FEMA Issues Seismic Guidelines

Following a five-year effort involving hundreds of experts, FEMA recently released its ***National Earthquake Hazards Reduction Program Guidelines for Seismic Rehabilitation of Buildings*** (Publication No. 273, 1997, 400 pp., free), along with its companion ***Commentary*** (Publication No. 274, 1997, 400 pp., free). Using these guidelines, design professionals, building officials, and others concerned about the safety of buildings in earthquakes will have standards to evaluate seismic rehabilitation designs.

The National Earthquake Hazards Reduction Program (NEHRP) was created by Congress to reduce the threat of earthquakes in the U.S. FEMA serves as the lead agency of the program, which is a joint effort of FEMA, the U.S. Geological Survey, the National Institute of Standards and Technology, and the National Science Foundation.

Copies of these two documents can be obtained from the *FEMA Publications Distribution Center* at the address on page 10.

EMI Offers Independent Study Course on Seismic Construction

In an effort to provide information and guidance tools for those affected by Executive Order 12699, *The Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction* (issued by President Bush in 1990), FEMA's Emergency Management Institute has created an independent study course, ***Building for the Earthquake of Tomorrow: Complying with Executive Order 12699*** (1997, 174 pp., free).

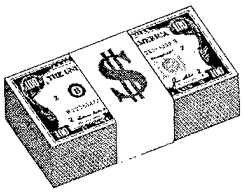
While this course was created to explain the requirements and issues surrounding implementation of E.O. 12699, the publication also serves as an introduction to the causes and effects of earthquakes and the construction of earthquake-resistant buildings. In addition, it provides information on the evaluation of community seismic safety, seismic hazard mitigation, the rationale behind seismic provisions in building codes, liquefaction, land-

slides, faults, damping, ductility and strength, building configuration, and stiffness. Intended for state and local government officials, individual or group enrollment in this course is available for qualified persons at no charge.

To obtain more information about this course, submit written requests to the *FEMA Independent Study Program, Emergency Management Institute, 16825 South Seton Avenue, Emmitsburg, MD 21727-9986.*

Congress Funds FEMA for Another Year

On October 29, 1997, Congress approved funding for the Federal Emergency Management Agency (FEMA) for fiscal year 1998 (FY 98), allotting $320 million for disaster relief expenses, $171 million for salaries and expenses, $4.8 million for the FEMA Office of the Inspector General, and $100 million for emergency food and shelter. Congress also provided $244 million for Emergency Management and Planning Assistance (EMPA), of which $30 million is to be used for "pre-disaster mitigation." EMPA funds were earmarked for completion of a comprehensive analysis and plan for evacuation alternatives for the New Orleans metropolitan area ($.5 million), state and local assistance ($3 million), the newly restructured Dam Safety Program ($2.9 million), and replacing and upgrading FEMA emergency equipment and vehicles ($5 million).



In addition, while holding flood insurance rates at the same rate set under the National Flood Insurance Reform Act of 1994, Congress provided funding for the National Flood Insurance Program, including operating expenses of $47 million, $373 million for agents' commissions and taxes, and $50 million for interest on Treasury borrowings—all to be taken from the National Flood Insurance Fund.

To obtain copies of this legislation, Public Law 105-65, "An Act Making appropriations for the Departments of Veterans Affairs and Housing and Urban Development, and for sundry independent agencies, commissions, corporations, and offices for the fiscal year ending September 30, 1998, and for other purposes," contact your *Congressional Representative or Senator* or your local *federal depository library*. Also, the complete text and history of the legislation can be found on the Library of Congress Web site: *http://thomas.loc.gov.*

FEMA Seeks Exemplary Practices

In keeping with its goal of building a strong and effective emergency management system across the nation, the Federal Emergency Management Agency (FEMA) continues to search for creative ways and means of using the resources available at all levels of government and in the private and volunteer sectors to improve emergency management.

For the past two years, FEMA has published a ***Compendium of Exemplary Practices in Emergency Management***, which pays tribute to model policies, procedures, projects, or programs, and provides a means for forging new cooperative efforts by encouraging the replication of exemplary practices in other communities. The compendium both describes novel and effective public- and private-sector emergency management initiatives and refers users to knowledgeable individuals for further information on any practice described.

The compendium is distributed throughout the emergency management community. It is available on FEMA's Web site at *http://www.fema.gov/library/lib07.htm* or *http://www.fema.gov/pte/partner01.htm*. Moreover, 42,000 printed copies of volume II of the compendium have been distributed, and FEMA continues to receive requests for the publication. Volumes I and II are available at no cost by calling the FEMA publications warehouse at *(800) 480-2520.*

FEMA's search for exemplary practices in emergency management is an ongoing effort. Possible contributors include state and local governments, nonprofit organizations, public interest groups, first responders, large and small private businesses, industries, volunteer organizations, and private citizens. Nominations are welcome at any time, and nominations for volume III of the compendium are currently being solicited and will be accepted through January 1998. For more information or to receive a nomination form, contact *Compendium of Exemplary Practices in Emergency Management, Federal Emergency Management Agency, PT-SL Room 614, 500 C Street, S.W., Washington, DC 20472*, or see *http://www.fema.gov/pte/partner01.htm.* An independent screening panel consisting of representatives from several national emergency management organizations will review all submissions and make final recommendations.

And one correction . . .

In our November issue, we announced that the Institute for Business and Home Safety (IBHS) had created a program to encourage disaster resistant communities (see the ***Observer***, Vol. XXII, No. 3, p. 4). However, we neglected to mention the name of this program, which is the IBHS Showcase Communities Program.

CONTRACTS AND GRANTS

Disaster Research for Civil Defense, 1951-1962, National Science Foundation, $4,730, 12 months. Principal Investigator: *Sharon Ghamari-Tabrizi, Carnegie-Mellon University, 5000 Forbes Avenue, 215 Smith Hall, Pittsburgh, PA 15213-3815; (412) 268-2000.*

This project involves the collection of archival material and oral histories from behavioral scientists who were central in the creation of "disasters research" for the Civil Defense Administration during the years 1951-1962. At that time, behavioral scientists viewed disasters as opportunities for studying social processes (such as leadership, role behavior, and social perception) in extreme circumstances. The rise and development of disaster research offers insight into the state of U.S. behavioral science during the Cold War.

Hydrometeorological Analysis of the Spring Creek Flood 1997: Fort Collins, National Science Foundation, $16,660, 12 months. Principal Investigators: *Jerry R. Richardson, University of Missouri–Columbia, 305 Jesse Hall, Columbia, MO 65211; (314) 882-2121; Fred L. Ogden, University of Connecticut, Storrs, CT 06269; (203) 486-2000; e-mail: ogden@eng2.uconn.edu; and James A. Smith, Princeton University, Princeton, NJ 08544; (609) 452-3000.*

This grant will support the use of state-of-the-art remote sensing and rainfall/runoff modeling to examine the catastrophic Colorado flood that occurred in Fort Collins on July 28, 1997. This flood caused an estimated $100 million damage on the campus of Colorado State University alone, devastated two mobile home parks, flooded numerous homes, and caused five deaths.

Dissertation Enhancement: Extreme Floods, Typhoon Occurrences, and Climate Change in the Ara River Basin, Japan, National Science Foundation, $27,550, 12 months. Principal Investigator: *James C. Knox, University of Wisconsin–Madison, 750 University Avenue, Madison, WI 53706-1490; (608) 262-1234.*

Current theories suggest that extreme floods in the Ara River Basin of Japan may be a direct result of human-induced global climate change and not a continuation of previous patterns. This research will test global change theories by comparing past and present fluvial system data in order to determine if apparent changes in fluvial regimes are the result of global climate change. The project will provide empirical rationale for similar research in other regions of the world.

Beyond the Flood: Participatory Action Research with Non-Profit Orgnaizations in Grand Forks, Otto Bremer and Bush Foundations, $120,000, 36 months. Principal Investigator: *Clifford L. Staples, Department of Sociology, Box 7136, University of North Dakota, Grand Forks, ND 58202; (701) 777-4417; fax: (701) 777-2468; e-mail: staples@badlands.nodak.edu.*

This grant will support research addressing long-term recovery needs and social problems in the Grand Forks community following the flooding in the spring of 1997. One project will focus on the role of child care in the recovery of households and redevelopment of businesses. The goal of the project is to increase the supply of and demand for quality child care in the community and to demonstrate the need for a quality child care system in long-term recovery from disasters. Future projects will focus on social and economic justice issues within the context of disaster recovery and community redevelopment.

Monitoring Business Recovery in Grand Forks, Center for Entrepreneurial Leadership, Ewing Marion Kauffman Foundation, $23,000, 12 months. Principal Investigator: *James W. Bronson, Department of Management, Box 8377, University of North Dakota, Grand Forks, ND 58202; (701) 777-4148; fax: (701) 777-4092; e-mail: jbronson@badlands.nodak.edu.*

This study builds upon a census of all businesses and employers located within the city of Grand Forks, North Dakota, that was conducted following the April 1997 flooding. Questionnaires will be administered and on-site interviews will be conducted one year after the flood with the owners and managers of a representative sample of organizations included in the census in order to study the process of business recovery during the first year following the disaster.

Introducing the Flash Flood Laboratory

Following the extensive flooding that occurred on the Colorado State University campus and in the surrounding community in July 1997, the university created a Flash Flood Laboratory, devoted exclusively to the study of this phenomenon. Resources have been contributed to the lab by the Cooperative Institute for Research in the Atmosphere, the Water Center, the Department of Atmospheric Sciences, the Department of Hydrology, and other parts of the university. Support is also provided by the National Oceanic and Atmospheric Administration and the U.S. Geological Survey.

The Flash Flood Laboratory will facilitate collaborative work among hydrology, meteorology, geology, and the social science researchers. It will address flash flood issues critical to urban planning and emergency management, promote partnerships with federal and local governments, and create a flash flood model to assist planners and managers in addressing regional flooding problems. The Flash Flood Laboratory welcomes contributions from research professionals interested in reducing the losses associated with these dangerous phenomena.

For more information, contact *Ken Eis, Cooperative Institute for Research in the Atmosphere, Colorado State University, Fort Collins, CO 80523-1375; (970) 491-8397; fax: (970) 491-8241; e-mail: eis@cira.colostate.edu;* or *Chris Adams; at the address above; (970) 491-3899; e-mail: adams@cira.colostate.edu; WWW: http://www.cira.colostate.*

CONFERENCES AND TRAINING

Below are recent 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/conf.html

Executive Military Support to Civil Authorities Course (MSCAC). Offered by: The National Interagency Counterdrug Institute. San Luis Obispo, California: February 1-4, 1998. The mission of the National Interagency Counterdrug Institute (NICI) is to improve the efficiency and effectiveness of joint civilian-military initiatives that address critical national problems; one focus is military support to civil authorities in response to natural and human-caused disasters. NICI offers unique, tuition-free courses to federal, state, and local emergency responders and military personnel involved in emergency management. Most courses are conducted at NICI in San Luis Obispo, California, although some are offered elsewhere. The organization also offers several free publications (in print or from the NICI Web site) to qualified individuals or organizations. For more information, contact *NICI, P.O. Box 4209, San Luis Obispo, CA 93403-4209; (805) 782-6780; WWW: http://www.nici.org.*

International Symposium on Information Technology Tools for Natural Disaster Risk Management. Sponsors: International Center for Disaster-Mitigation Engineering (INCEDE) and the United Nations University (UNU). Bangkok, Thailand: February 4-6, 1998. Recognizing the importance of information tools for managing natural disaster risk, INCEDE and UNU are jointly organizing this symposium on the use and applications of remote sensing, geographic information systems, global positioning systems, communication technologies, and databases for researchers working on the problems of the Asia-Pacific region. For more information, contact *Srikantha Herath, ISITT for NDRM, INCEDE, Institute of Industrial Science, University of Tokyo, 7-22-1 Roppongi, Minato-ku, Tokyo 106, Japan; tel: (+81-3) 3402-6231 ext. 2661-3; fax: (+81-3) 3402-4165: e-mail: herath@incede.iis.u-tokyo.ac.jp; WWW: http://incede.iis.u-tokyo.ac.jp/symposium98.html.*

Public Risk Management Association (PRIMA) 1998 Government Risk Management Seminar—East. Orlando, Florida: February 9-13, 1998. This program is intended for new risk managers and others interested in learning more about the discipline. It will provide a basic understanding of the principles of risk management, including the five steps of risk management that apply to every risk and how those steps can be applied to the four principal exposures of any organization: liability, property, worker's compensation, and employee benefits. The seminar will also examine the larger question of how risk management fits into public administration and government. For a seminar brochure, contact *PRIMA, 1815 North Fort Myer Drive, Suite 1020, Arlington, VA 22209; (703) 528-7701; fax: (703) 528-7966; e-mail: info@primacentral.org.*

Public Risk Management Association (PRIMA) 1998 Government Risk Management Seminar—West (includes sessions on "Identifying and Mitigating Natural Catastrophe Exposures"). San Diego, California: February 23-27, 1998. See the description of the eastern seminar above.

Floodplain Management Association of California Spring Conference. San Diego, California: March 1998. The theme of this conference is "Winter 97-98: Year of the Great El Niño?" and it will focus on the unusual weather patterns and flooding associated with El Niño events, as well as effects on engineering design, flood management plans, and the economics of flood control projects. Presentations are solicited in four major areas: computer modeling and emerging technologies, funding of flood control projects, floodplain regulation and management, and flood control engineering design and application. Abstracts are due January 23, 1998, and should be sent to *Lisa Vomero Inouye, Technical Program and Conference Chair, A&M Engineering Consultants of California, 11440 West Bernardo Court, Suite 300, San Diego, CA 92127-1644; (619) 674-6930; fax: (619) 674-6931.*

Seismological Society of America (SSA) Annual Meeting. Boulder, Colorado: March 16-18, 1998. At its annual conference, the SSA examines almost all aspects of things seismic—from the geophysics of earthquakes to disaster response and mitigation. For more information on this year's agenda, contact *SSA, 201 Plaza Professional Building, El Cerrito, CA 94530; (510) 525-5474; fax; (510) 525-7204; WWW: http://www.seismosoc.org/ssa/.*

7th International Conference on Emergency Medicine. Vancouver, British Columbia, Canada; March 25-29, 1998. Under the theme "Defining Acute Care Medicine for the 21st Century," this conference will offer 15 separate tracks covering the latest and most critical topics in emergency medicine. It will examine emerging trends and controversies, as well as

compare the practice of acute care in different countries and settings. The program includes sessions on international emergency medicine and disaster medicine. For a complete description, contact *International Conference Services, Ltd, 604-850 West Hasting Street, Vancouver, BC, Canada V6C 1E1; (604) 681-2153; fax: (604) 681-1049; e-mail: 74161.347@compuserve.com.*

Spring and Summer 1998 Emergency Preparedness Planning and Management Courses from UC–Berkeley

The University of California–Berkeley Extension has recently issued the 1998 spring and summer schedule of courses for its Emergency Preparedness Planning and Management Program. Upcoming courses include: Introduction to Emergency Management; Emergency Operations Center Course; Strategic Planning and Implementation in Emergency Management; Business Recovery for Your Organization; Integrating Emergency Management Structures into Your Organization; Emergency Preparedness on the Internet; Financial Support for Emergency Preparedness, Recovery, and Business Continuity Planning; Designing Emergency Plan Exercises; and Corporate/Public Agency Coordination and Interdependence.

For information on these classes and the emergency management education and training program, contact *Diane Wolcott, Emergency Preparedness Planning and Management Program, Environmental Management, UC–Berkeley Extension, 1995 University Avenue #7012, Berkeley, CA 94720-7012; (510) 642-7537; fax: (510) 643-8290; e-mail: dlw@unx.berkeley.edu.*

National Disaster Medical System (NDMS) Conference on Lifesaving Intervention. Denver, Colorado: March 29-April 1, 1998. This fully accredited education program, designed for physicians, nurses, social workers, psychologists, pharmacists, EMS professionals, sanitarians, health care executives, emergency managers, and agency officials, will be a multidisciplinary forum focusing on reducing the health effects of disasters. It will examine the interrelatedness of the health and medical requirements of any disaster; the integration of local, state, and federal emergency health and medical services; and the further integration of medical and health services into disaster response and recovery. For a registration packet, call *(800) 872-6367 and press the "star" key*; or see *http://www.oep_ndms.dhhs.gov* on the World Wide Web.

Retrofitting Flood-Prone Residential Buildings Course (E-279). Offered by: Federal Emergency Management Agency Mitigation Directorate and Emergency Management Institute (EMI). Emmitsburg, Maryland: March 30-April 3, 1998, and September 28-October 2, 1998. Because of the many major flood disasters that have occurred in the U.S. recently, design professionals and government officials are increasingly being called upon to provide technical assistance to reduce or eliminate future flood damage. This course will present current engineering principles and practices for retrofitting flood-prone residential buildings and will cover floodproofing, the regulatory framework, design parameters and practices, and benefit/cost/feasibility analysis. Before applying for the course, participants must complete a prerequisite independent study course. More information is available from *EMI, National Emergency Training Center Admissions Office, 16825 South Seton Avenue, Emmitsburg, MD 21727; (301) 447-1525; fax: (301) 447-1441.*

Conference on Current Earthquake Engineering Research in the Central United States (CEERICUS '98). Sponsor: Earthquake Engineering Research Institute (EERI) Student Chapter at the University of Illinois. Urbana, Illinois: April 4, 1998. CEERICUS '98 is intended to provide graduate students an opportunity to present recent findings in earthquake engineering. Papers reflecting all disciplines and research in progress are encouraged. The goal is to promote interaction among students in related fields from schools in the central U.S. For more information, contact *Pat Arnett, 3139 Newmark Lab, 205 North Matthews, Urbana, IL 61801; fax: (217) 333-9264; e-mail: jarnett@uiuc.edu.*

14th International Meeting on Prevention, Preparedness, and Response to Hazardous Material Spills: "Risk Management: Closing the Loop." Sponsor: U.S. Environmental Protection Agency. Chicago, Illinois: April 5-9. 1998. The conference planning committee is currently seeking suggestions for topics, presentations, and training. For details, on the Internet, see *http://www.nrt.org/nrt/hazmat98.nst*, or *http://epa.gov/ceppo/pubs/postcard.html*; or e-mail: *hazmat98@icfkaiser.com.*

20th Annual National Hurricane Conference. Sponsors: Florida Shore and Beach Preservation Association, Federal Emergency Management Agency (FEMA), and many others. Norfolk, Virginia: April 6-10, 1998. General session topics will include the 1997 hurricane season, El Niño effects, 1998 hurricane forecasts, cost-effective ways to mitigate hurricane damage, rapid response to hurricane disasters, and new technology to improve hurricane forecasting. In addition, the conference will offer 32 workshops covering major aspects of hurricane preparedness, response, and recovery. FEMA's Emergency Management Institute and the American Red Cross will each offer several training courses during the conference. A conference brochure is available from the *Florida Shore and Beach Preservation Association, 2952 Wellington Circle, Tallahassee, FL 32308; (850) 906-9224; fax: (850) 906-9228; WWW: http://www.nettally.com/nhc.*

European Geophysical Society (EGS) 23rd General Assembly (includes sessions on "Landslide Hazards in Seismically Active Regions" and "Scaling, Multifractals, and Natural/Man-Made Hazards"). Nice, France: April 20-24, 1998. For details on the landslide hazards session, contact *Janusz Wasowski, CNR-CERIST (Italian National Research Council), c/o Istituto Geologia Applicata e Geotecnica, Politecnico di Bari, via Orabona, 4-70125 Bari, Italy; tel: +39-80-5428111; fax: +39-80-5567944; e-mail: wasowski@area.ba.cnr.it; WWW: http://www.copernicus.org/EGS/egsga/nh3-5.htm.* For more information about the scaling/fractals session, contact *Bruce D. Malamud, Department of Geological Sciences; Cornell University, Snee Hall, Ithaca, NY 14853-1504; (607) 255-3432; fax: (607) 254-4780; e-mail: malamud@geology.cornell.edu;* also see *http://www.multifractal.jussieu.fr.* For general infor-

mation about the assembly, see *http://www.copernicus.org/EGS/EGS.html*.

13th Annual Conference on Emergency Management Technology. Sponsor: State and Local Emergency Management Data Users Group (SALEMDUG). Virginia Beach, Virginia: April 21-24, 1998. Conference topics will include new weather technologies, satellites and remote sensing, vulnerability of information systems to terrorism, and global positioning systems. To be added to the conference mailing list, contact *Mark Pennington, Conference Coordinator, Virginia Department of Emergency Services; (804) 674-2432; e-mail: mpennington.des@state.va.us; WWW: http://www.salemdug.dis.anl.gov*; or *SALEMDUG, c/o Florida Division of Emergency Management, 2555 Shumard Oak Boulevard, Suite 120, Tallahassee, FL 32399-2100.*

Fire Information for the 21st Century. Sponsors: International Network for Fire Information and Reference Exchange (inFire), and others. Melbourne, Australia: May 4-8, 1998. This international gathering will offer the most recent information from several areas affecting fire information and fire services, including: Internet and intranet developments; planning and legislation; the changing role of the library and librarian; advances in fire education; impacts of fire on the environment, including bushfires, the urban/wildland interface, and standards and codes; privatization; new technologies, and risk management. For details, contact *Nina McPherson, Metropolitan Fire Brigade Training Complex Library, 619 Victoria Street, Abbotsford, VIC 3067, Australia: tel: +61 3 9420 3820; fax: +61 3 9420 3857; e-mail: nmcpers@mfbb.vic.gov.au.*

Summit '98—Conducting Business with Confidence. Offered by: IBM Global Services. San Francisco, California: May 17-20, 1998. Summit '98 will focus on the latest techniques in business recovery and information security, with topics such as data protection in a complex environment, network computing, Internet security and recovery, multivendor recovery, electronic commerce, information intrusion, and management and year 2000 issues. For details, contact *IBM Global Services, Business Recovery Services, P.O. Box 1715, Minneapolis, MN 55440-1715; (800) 981-9816 or (612) 550-4661; fax: (612) 550-6391; WWW: http://www.brs.ibm.com.*

1998 National Flood Conference. Sponsor: Federal Insurance Administration. Atlanta, Georgia: May 31-June 4, 1998. This annual event is intended for insurance brokers and underwriters, lending officials, and all other persons involved in seeing that the goals of the National Flood Insurance Program are achieved. For details, contact *Rebecca Reardon, National Flood Conference, National Flood Insurance Program, 10115 Senate Drive, Lanham, MD 20706; (301) 918-1439; fax: (301) 918-1471; e-mail: becky.reardon@fema.gov.*

14th Technical Conference on Irrigation, Drainage, and Flood Control: Contemporary Challenges for Irrigation and Drainage. Sponsor: U.S. Committee on Irrigation and Drainage (USCID). Phoenix, Arizona: June 3-6, 1998. This multidisciplinary forum will provide an opportunity for irrigation and drainage specialists to share problems and solutions, including those related to flood control. For details, contact *USCID, 1616 Seventeenth Street, Suite 483, Denver, CO 80202; (303) 628-5430; fax: (303) 628-5431; e-mail: stephens@uscid; WWW: http://www.uscid.org/~uscid.*

Water: A Looming Crisis?—International Conference on World Water Resources at the Beginning of the 21st Century. Convened by: United Nations Educational, Scientific, and Cultural Organization (UNESCO); International Association of Hydrological Sciences; and World Water Council. Paris, France: June 3-6, 1998. At the end of the century, concern about the availability of water resources to meet the needs of future economic and social development is increasing. Countries in arid and semi-arid regions will face water crises in the years to come, and sharing transboundary rivers or groundwater may bring about conflict in other regions. This conference will examine both the present availability of water and the problems we will face in the near future. The goal is to recommend strategies that can be pursued by the international scientific community to deal with these challenges. To be included on the conference mailing list, contact *UNESCO, Division of Water Resources, 1 rue Miollis, 75732 Paris Cedex 15, France; fax: 33 1 45 68 58 11.*

Upcoming from *DRJ*

The ***Disaster Recovery Journal*** and Disaster Recovery Institute are hosting the following seminars, symposia, and exhibitions:

- *Ninth Annual Corporate Contingency Planning Seminar and Exhibition.* San Diego, California: March 13-16, 1998.
- *Tenth International Disaster Recovery Symposium and Exhibition.* Orlando, Florida; September 13-16, 1998.
- *Tenth Annual Corporate Contingency Planning Seminar and Exhibition.* San Diego, California; March 21-24, 1999.
- *Eleventh International Disaster Recovery Symposium and Exhibition.* Orlando, Florida: September 12-15, 1999.

For details about any of these meetings, contact *Mercedes Knese, Conference Registrar,* ***Disaster Recovery Journal****; (314) 894-0276; fax: (314) 894-7474: e-mail: drj@drj.com: WWW: http://www.drj.com.*

Okushiri Tsunami Workshop. Sapporo and Okushiri, Japan: July 9-14, 1998. 1998 marks the fifth anniversary of the Hokkaido Nansei-oki tsunami, which caused severe damage and human suffering on Okushiri Island, Japan. This workshop, the third in an international series that began in the U.S. in 1990, will examine the Okushiri event, as well as the more general topics of tsunamis around islands, tsunamis generated by landslides and tectonic movement, local tsunami runup, and disaster and reconstruction. More information is available from *Fumuhiko Imamura, Disaster Control Research Center, School of Engineering, Tohoku University, Aoba, Sendai 980-77, Japan; fax: 81-22-217-7514; e-mail: imamura@tsunami2.civil.tohoku.ac.jp.*

Disaster and After: An International Conference on the Practicalities of Information Service in Times of War and Other Catastrophes. Sponsor: International Group of the Library Association. Bristol, U.K.: September 4-6, 1998. The aim of this conference is "to bring together experience of running and

reinstating information services in war-torn areas and the scenes of disasters" and to publish the proceedings so that those facing similar problems can benefit from the assembled knowledge. For further information, contact *Mark Perkins, RRMG Librarian, ODI Library, Portland House, Stag Place, London SW1E 5DP, U.K.; tel: +44 (0)171-393-1650; fax: +44 (0)171-393-1699; e-mail: library@odi.org.uk.*

Post-Emergency Response Issues Conference. Sponsor: U.S. Environmental Protection Agency. Washington, D.C.: September 9-11, 1998. This conference will be an international forum focusing on issues that emerge following a significant radiological release affecting public health, welfare, and the environment—particularly in the post-emergency phase of the response. Brief abstracts of proposed papers are due by February 28. Submissions and requests for additional information should be directed to *Sarah Wallis, EPA Post-Emergency Response Conference, SciComm, Inc., 7735 Old Georgetown Road, Fifth Floor, Bethesda, MD 20814; (301) 652-1900; fax: (301) 652-7001; e-mail: EPAConference@scicomm.com.*

National Emergency Management Association (NEMA) 1998 Annual Conference. Charleston, South Carolina: September 9-12, 1998. NEMA is the national association of state emergency managers. Its annual conferences cover virtually all aspects of the profession and often include sessions or meetings with policy developers at the national level. For more information, contact *Marcia Hensley, NEMA, P.O. Box 11910, Lexington, KY 40578-1910; (606) 244-8162.*

19th Conference on Severe Local Storms. Sponsor: American Meteorological Society. Minneapolis, Minnesota: September 14-18, 1998. The organizers of this conference are soliciting papers on all aspects of severe thunderstorms, particularly synoptic and mesoscale processes associated with convection; severe thunderstorm phenomena (tornadoes, hail, high winds, heavy precipitation); forecasting and numerical modeling; and electrification of severe storms. A panel discussion on "Communicating Information About Hazardous Weather" is also planned. Abstracts must be submitted by March 16. Proposals should be sent to *Harold E. Brooks, Program Chairperson, NOAA/National Severe Storms Laboratory, 1313 Halley Circle, Norman, OK 73069; (405) 366-0499, fax: (405) 366-0472; e-mail: brooks@nssl.noaa.gov*; they can also be submitted via the conference Web site: *http://www.nssl.noaa.gov/sls19/.*

Disaster Management: Crisis and Opportunity. Sponsor: Center for Disaster Studies, James Cook University. Cairns, Australia: September 27-30, 1998. Detailed information is available from the *Center for Disaster Studies, P.O. Box 6811, James Cook University, Cairns, Queensland 4870, Australia; tel: +(61 70) 42 1215; fax: +(61 70) 42 1214; e-mail: linda.berry@jcu.edu.au; http://www.jcu.edu.au/dept/CTURP/cdsweb.htm.*

1998 International Snow Science Workshop. Bend, Oregon: September 27-October 1, 1998. This workshop provides an opportunity for the exchange of ideas among those who work with snow in hazard management, recreation, and research. Topics will include mountain weather, mountain snowpack, avalanche processes, avalanche risk management, and instrumentation. In addition there will be a special session on teaching about avalanches. To be put on the workshop mailing list, contact the *ISSW Registration Committee, ISSW '98, Stevens Pass, Inc., P.O. Box 98, Skykomish, WA 98288.*

Southern California Earthquake Center (SCEC) 1998 Annual Meeting. Palm Springs, California: October 17-20, 1998. Besides covering the business of the center, the SCEC annual meeting includes invited presentations on the state of the art in seismic studies. For more information, contact *SCEC, University of Southern California, University Park, Los Angeles, CA 90089-0740; (213) 740-5842; fax: (213) 740-0011; e-mail: mcraney@terra.usc.edu; WWW: http://www.usc.edu/go/scec.*

Third International Conference on Forest Fire Research and 14th Fire and Forest Meteorology Conference. Luso, Coimbra, Portugal: November 16-20, 1998. The aim of these concurrent meetings is to bring together scientists from various parts of the world working on different aspects of forest fires, encourage the presentation of the latest advances in research, promote the discussion of methodologies and results, and increase international cooperation. For further information, contact *ADAI, Universidade de Coimbra, Apartado 3131, 3000 Coimbra, Portugal.*

10th Japan Earthquake Engineering Symposium (JEES). Sponsors: Architectural Institute of Japan and others. Yokohama, Japan: November 25-27, 1998. The 10th JEES will be an opportunity both to present and hear about the most recent research results from the 1995 Hyogo-ken Nanbu (Kobe) earthquake and other recent seismic events. It will also be an opportunity to learn about the latest techniques in earthquake response, planning, and mitigation. For a conference flyer, contact the *10th JEES, c/o Architectural Institute of Japan, 26-20, Shiba 5-chome, Minato-ku, Tokyo 108, Japan; tel: +81-3-3456-2051; fax: +81-3-3456-2058; WWW: http://www.aij.or.jp/jees/index.html.*

GWU's ICDM Offers On- and Off-Campus EM Courses

The Institute for Crisis and Disaster Management at George Washington University offers both graduate-level courses and short (two- to four-day) courses on various aspects of disaster management. Current graduate-level courses include "Information Technology in Crisis and Emergency Management," and "Disaster Recovery and Organizational Continuity." The short courses are available on a contractual basis and can be taught either at the GWU Virginia campus or on-site elsewhere. These courses include "The Threat from Within: Violence and Sabotage in the Workplace," "Crisis Management and Crisis Decision Making," and "Organizing and Managing a Multi-Organization Response." For complete information, contact *Greg Shaw, George Washington University, Institute for Crisis and Disaster Management, GWU Virginia Campus, 20101 Academic Way, Room 220, Ashburn, VA 22011; (703) 729-8271; e-mail: glshaw@gwisw.gwu.edu.*

RECENT PUBLICATIONS

All Hazards

Ethical Dilemmas in Hazard Mitigation. *Timothy Beatley. Natural Hazard Working Paper Number 8. 1996. 57 pp. $10.00. Purchase from the Center for Urban and Regional Studies, Campus Box 3410, Hickerson House, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3410; (919) 962-3074; WWW: http://www.unc.edu/depts/curs. Checks should be payable to the "Center for Urban and Regional Studies."*

Decisions about planning for, responding to, and recovering from natural disasters are ultimately questions of ethics, choices among societal values. Noting that there is too little attention focused on the ethical dimensions of natural hazards and disasters, Beatley and his associate David Brower examined the ethical aspects of mitigation in a National Science Foundation funded research effort. They conducted interviews with public officials and others involved in hazard mitigation, examined mitigation case studies, and identified a number of broad categories of ethical issues. Beatley and Brower found many instances in which there was considerable personal and institutional judgment exercised, then categorized the ethical issues that emerged. They found that responsibility for hazard mitigation is morally diffuse, that is, everyone is responsible for mitigation and no one is. In addition, different values compete for attention and priority in mitigation, including protection of public health and safety, protection of private property, environmental values, personal freedom, historic preservation, and social equity. In this paper, Beatley also discusses procedural fairness, the cost of mitigation, distributive equity, acceptable risk, the moral community, culpability, entitlements, issues of uncertainty, and property rights and the taking issue.

Hazard and Disaster Management Learning and Failure in the London Megacity. *Dennis J. Parker and Sue Tapsell. Geography and Environment Paper No. 29. 1997. 83 pp. £3.50, plus £8.45 shipping. Available from the Flood Hazard Research Centre, Middlesex University, Queensway, Enfield, Middlesex EN3 4SF, U.K.; tel: 0181 362 5359; fax: 0181-362-5403; e-mail: fhrc1@mdx.ac.uk; WWW: http://www.mdx.ac.uk/www/gem/fhrc.htm.*

Around 1790, London became the world's first post-industrial city to reach a population of one million, making it the first megacity; its population is now around 13 million. London's history is punctuated by disasters, including the Black Plague, the London Fire, and the air raids of World War II. In this volume, the authors examine that history in order to better understand hazard response. They describe the physical setting and historical evolution of London; the urbanization of this megacity and its relationship to environmental hazards; hazard-related issues that exist today; natural and "hybrid" hazards, that is, hazards that result from a combination of factors; public perceptions, hazard, information, and hazard and disaster reporting; disruption of urban infrastructure; changes in natural, technological, and social hazard factors; complex emergencies; and opportunities for intervention.

Reconstruction After Disaster: Issues and Practices. *Adenrele Awotona, Editor. 1997. 200 pp. £35.00. Order from Ashgate Distribution Services, Gower House, Croft Road, Aldershot, hants., GU11 3HR, U.K.; tel: +44-1252-331551; fax: +44-1252-344405.*

Disasters are particularly devastating in developing countries, where the impacts are exacerbated by the lack of adequate relief and emergency plans, lack of resources, and by inappropriate reconstruction programs. What can be done to alleviate the suffering of victims in such regions? How can tragedy turn into an opportunity for development? ***Reconstruction After Disaster*** tackles these questions by providing information about the different phases of disaster management and planning, including preparedness, rehabilitation, mitigation, and reconstruction. Its papers address urbanization, poverty, and disasters; the planning process; reducing flood vulnerability; Bangladesh cyclone shelter projects; a fieldwork approach in war-damaged villages in Lebanon; reconstruction following the 1963 Skopje earthquake; housing and resettlement in post-war Liberia; typhoon housing for the poor in the Philippines; and building bridges to reduce risk.

Managing Environmental Risk Through Insurance. *Paul K. Freeman and Howard Kunreuther. 1997. 108 pp. $59.95. Order from Kluwer Academic Publishers, Orders Department, P.O. Box 358, Accord Station, Hingham, MA 02018-0358; WWW: http://www.wkap.nl.*

Managing Environmental Risk Through Insurance explains how insurance can be employed to cope with risks that, in the modern environment, otherwise typically are controlled through government regulation. The authors demonstrate the effectiveness of dealing with various risks through the mechanism of private insurance rather than direct government regulation, and they explain the nature and mechanics of how this approach works. They begin with an overview of risk and attempts to manage it through government regulation, the legal system, and insurance. They then examine environmental risk management and the role of insurance, contrast insurance with other societal tools for addressing risk, and discuss government benefit programs and the imposition of involuntary liability through the court system.

Room for Improvement: The Management and Support of Relief and Development Workers. *Rebecca MacNair. Network Paper 10. 1995. 110 pp. £5.00, plus £1.25 postage and handling. Obtain from the Relief and Rehabilitation Network, Overseas Development Institute, Portland Place, Stag Place, London SW1E 5DP, U.K.; tel: +44 171 393 1674; fax: +44 171 393 1699.*

This report presents the findings and recommendations from an investigation into the support and management provided to relief and development workers. The survey found that selection

processes of relief workers are often casual, there are considerable unmet needs in terms of predeparture preparation, problems and dissatisfaction with management at the relief site are major complaints, poor security is a major stressor for workers, time and space need to be set aside for workers on their return to discuss the emotional impact of an assignment, and short-term contracts can be problematic for field workers. The author recommends that agencies reach general agreement on a code of practice for supporting human resources and establish a professional body or association to implement this code.

Reducing the Impact of Natural Disasters: Governors' Advisors Talk about Mitigation. *Eric Brenner. 1997. 23 pp. $5.00, U.S.: $10.00, overseas. To obtain a copy, send check or money order to Eric Brenner, 1610 Stanford Road, Silver Spring, MD 20902; (301) 754-0437; e-mail: brennere@erols.com..*

This is a final report of the Council of Governors' Policy Advisors (CGPA), a nonprofit, nonpartisan organization whose members were the top four advisors to each of the nations governors, and whose duties were recently absorbed by the National Governors Association. Following a series of conversations between GCPA staff and the Federal Emergency Management Agency, GCPA surveyed states to determine the level of knowledge that exists in governors' offices regarding disaster mitigation. The results of that survey are included in this paper, as well as a history of federal hazard mitigation activity and a description of the basic theories behind natural hazard mitigation. A section entitled "Issue Analysis" examines hazard mitigation from the standpoint of a general policy maker in a governor's office rather than that of an expert on the subject. Among the findings, GCPA members felt there was a lack of political and public support for mitigation, although respondents thought their governors would be open to a stronger leadership role if it was possible to clearly measure the benefits of increased mitigation and if these benefits were significantly greater than the costs of conducting the work.

Economic Assessment of Disaster Mitigation: An Australian Guide. *Paul Thompson and John Handmer. 1996. 90 pp. Free. To request a copy, contact the Australian IDNDR Office, Emergency Management Australia, P.O. Box 1020, Dickson, ACT 2602, Australia; tel: +61 6 266 5408; fax: +61 6 257 1490.*

Major investments to reduce natural hazard risks in Australia, as in other countries, are in part justified by assessing the likely economic benefits compared with the costs. However, there is a lack of understanding regarding how to assess the benefits as well as what may be counted as a benefit. This document provides such guidance, covering why there is a need for guidelines and standardization of loss assessment methods, benefits of formal economic project appraisal, benefits of disaster mitigation, key principles for economic assessments, differences in potential benefits and assessment methods between disaster types, outstanding issues, and key references and recommendations for further reading.

Safer Hospitals for the 21st Century. *Published three times a year. Available in either Spanish or English. Free subscriptions are available from the Pan American Health Organization, Regional Office of the World Health Organization, Emergency Preparedness and Disaster Relief Coordination Program, 525 23rd Street, N.W., Washington, DC 20037; (202) 974-3527; fax: (202) 775-4578; e-mail: disaster@paho.org; WWW: http://www.paho.org/english/disaster.htm.*

This new newsletter from the Pan American Health Organization (PAHO) was created to strengthen disaster preparedness among hospitals of the Americas. It contains articles that describe natural disaster vulnerability assessment and mitigation programs among several hospitals in Latin America. It also contains a "Forum" section for individuals to present issues related to making medical facilities more disaster-resistant, announcements of courses and upcoming meetings, and announcements of PAHO publications of interest.

Animals and Disaster

The Humane Society of the United States is concerned about the impacts of disasters on animals and has created several items on the subject, including:

- ***Protecting Your Pet in Case of Disasters.*** *Brochure.*
- ***Survey of Large Animal Evacuations.*** *R.D. Linnabary and J.C. New, Jr. and* ***Evacuation of Animals in the Event of Man-Made or Natural Disaster.*** *Robert D. Linnabary and John C. New, Jr. 18 pp.*
- ***Disaster Plan Worksheet.*** *2 pp.*
- ***Statement of Understanding Between the Humane Society of the United States and the American National Red Cross.*** *4 pp.*
- ***Preparing the Farm and Farm Animals for Disasters.*** *Jacob Casper, Sebastian E. Heath, and Robert D. Linnabary. 4 pp.*
- ***Disaster Planning in Shelter Design.*** *Cindy Ferguson. 5 pp.*
- ***Through Hell and High Water: Disasters and the Human-Animal Bond.*** *Randall Lockwood. 7 pp.*
- ***Saving Animals from the Flood.*** *Article reprint. 6 pp.*
- ***Struggle and Triumph in Andrew's Wake.*** *Article reprint. 6 pp.*
- ***Rescue, Reunion, and Tragedy: The Flood of '94.*** *Article reprint. 6 pp.*
- ***The Humane Society of the United States Offers Disaster Planning Tips for Pets, Livestock, and Wildlife.*** *3 pp.*
- ***Guidelines for Developing a Community Animal Disaster Plan for People with Special Needs.*** *6 pp.*
- ***Guidelines for Developing an Animal Disaster Plan for Your Community.*** *19 pp.*
- ***Guidelines for Pet Friendly Public Evacuation Shelters.*** *13 pp.*
- ***The Maryland Pet-Sheltering Plan.*** *3 pp.*

To obtain copies of any single item or all of the materials listed above, contact *Jorge Ortega, Humane Society of the U.S., 2100 L Street, N.W., Washington, DC 20037; (301) 258-3103; fax: (301) 258-3107; WWW: http://www.hsus.org.* Be sure to enclose a self-addressed, stamped envelope with your request.

Floods

Floods: People at Risk, Strategies for Prevention. *Publication No. DHA/97/107. 1997. 104 pp. $32.00, plus $5.00 shipping. Order from the United Nations, Publications, Sales, and Marketing Section, Room DC2-853, Department 1004, New York, NY 10017; (212) 963-8302 or (800) 253-9646; fax: (212) 963-3489; WWW: http://www.un.org/Pubs. Checks should be payable to "United Nations Publications."*

The 1997 theme for the U.N.'s International Decade for Natural Disaster Reduction was "Water: Too much ...Too little: The Leading Cause of Disaster." This publication was created to support that program; it describes the extent and nature of floods throughout the world, explains the causes of floods, describes basic concepts of floodplain management, examines various structural measures used to control water, depicts various methods of nonstructural flood mitigation, discusses dam safety, and explains emergency response issues related to floods.

Emergency Management Issues in the California Floods of 1997: Lessons Learned or Lessons Lost? *Bruce P. Baird and Richard R. Robles. 1997. 50 pp. $9.95. Prepayment is required. Available from the California Specialized Training Institute, P.O. Box 8123, San Luis Obispo, CA 93403-8123; (805) 549-3005 or 549-3536; fax: (805) 544-7103; e-mail: Chris_Shaeffer@oes.ca.gov; WWW: http://www.csti.org.*

The New Year's flood of 1997 in California caused nearly $2 billion in property damage and forced over 100,000 people from their homes, making it the most destructive flood in the state's history. Following the presidential disaster declaration in January, a field research team from the California Specialized Training Institute (CSTI), the training branch of the Governor's Office of Emergency Services, conducted a special study to identify the major emergency management issues in the floods and to suggest improvements in training for future flood disasters. This document is the final report from this effort; it describes the causes and impacts of the floods; discusses issues in hazard analysis, mitigation, preparedness, response, and recovery that arose as a result of the floods; and identifies lessons for local and state officials. The report also includes a summary of the ranking of relative risk of 10 types of flood hazards by public officials who attended a newly developed training course on flood preparedness and response at CSTI in October.

Flood Warning: Issues and Practice in Total System Design. *John Handmer, Editor. 1997. 200 pp. For price and availability, contact the Flood Hazard Research Centre, Middlesex University, Queensway, Enfield, Middlesex EN3 4SF, U.K.; tel: 0181-362-5359; fax: 0181-362-5403; e-mail: fhrc1@mdx.ac.uk; WWW: http://www.mdx.ac.uk/www/gem/fhrc.htm.*

In the forward to this volume, Edmund Penning-Rowsell notes that effective flood warnings save lives, although flood warning does not just mean effective flood forecasting or the identification of flood levels, but rather accurate forecasting, an appropriate warning message, and an efficient mode of dissemination of that message to those most likely to suffer from the flood. In addition, effective flood warning systems involve an efficient feedback mechanism from potential victims to those issuing the warning so that information can be tailored to the threats victims face, particularly their need for information with which to plan actions to minimize the effects of a flood. In ***Flood Warning***, contributors to this volume explore these concepts in depth by examining flood warning practices in various countries. Part 1 addresses current issues in system design, Part 2 looks at flood warning practices in the United Kingdom, Part 3 examines international practices, and Part 4 discusses the relationship between system design and operation.

River Voices, *Vol. 8, No. 2 (Summer 1997). $35.00, annual subscription. Single issues: $3.00, members; $6.00, nonmembers. Available from the River Network, P.O. Box 8787, Portland, OR 97207-8787; (503) 241-3506; e-mail: rivernet@igc.apc.org.*

This issue of ***River Voices*** is dedicated to floods and floodplain management. Articles include: "Flood Policy and Management: A Post-Galloway Progress Report," by Scott Faber; "Tools for Reducing Flood Losses in Your Watershed"; "Friends of the River Responding to the 1997 California Floods," by Charlie Casey and Rita Haberman; "Principles of California Flood Management and Floodplain Restoration"; "Countering the 'Quick Fix' and Developing Long-Term Solutions: West Virginia Rivers Coalition's Response to Floods," by Roger Harrison; and "Restoring the Floodplain of Oregon's Willamette River," by Phil Wallin.

Lightning

Lightning: Understanding It and Protecting Systems from Its Effects, *R.T. Hasbrouck. 44 pp. $20.00.*
Lightning Safety: An Introduction. *1997. 89 pp. $20.00.*
Both publications are available from the National Lightning Safety Institute, Box 778, Louisville, CO 80027; (303) 666-8817; fax: (303) 666-8786; e-mail: rkithil@ix.netcom.com; WWW: http://www.lightningsafety.com.

Lightning: Understanding It and Protecting Systems from Its Effects was prepared originally as a tutorial and presented at the 35th International Instrumentation Symposium in Orlando, Florida, in May 1989. It reviews the atmospheric electrification process; discusses the development and characteristics of lightning discharge; presents techniques and instrumentation for lightning threat warning, detection, and tracking; and discusses various principles and practices for providing protection from lightning.

Lightning Safety: An Introduction presents a risk management approach to protecting facilities and organizations from the effects of lightning. It discusses lightning safety in general, safety for outdoor athletic events, safety at swimming pools, the effects of electrical current on the human body, symptoms of lightning strike, lightning detection monitoring equipment, lightning behavior, lightning protection for structures and facilities, recommended grounding guidelines, and lightning and surge protection.

Hurricanes

Is Your Home Protected from Hurricane Disaster? A Homeowner's Guide to Hurricane Retrofit. *1997. 25 pp. $6.00. Purchase from the Institute for Business and Home Safety (IBHS), 73 Tremont Street, Suite 510, Boston, MA 02108-3910; (617) 722-0200, ext. 205; fax: (617) 722-0202.*

This brochure was created to inform individual homeowners of the steps they can take to make their homes more resistant to hurricane-force winds. It discusses the environment surrounding a building (open or dense), home inspection, roofs, improving the structure of a roof to resist winds, wall openings, wall to foundation connections, home improvement projects, and costs. The brochure also includes a list of additional sources of information and a checklist for identifying potential problem areas.

Hurricane Andrew: Ethnicity, Gender, and the Sociology of Disasters. *Walter Gillis Peacock, Betty Hearn Morrow, and Hugh Gladwin. 1997. 304 pp. $100.00. Purchase from Routledge Publishing, 7625 Empire Drive, Florence, KY 41042; (800) 634-7064, fax: (800) 248-4724; e-mail: fastline@kdc.com; WWW: http://www.routledge.com.*

Hurricane Andrew was the most costly natural disaster in U.S. history. This book explores how social, economic, and political factors affected the impact of Hurricane Andrew by influencing who was prepared, who was hit the hardest, and who was most likely to recover. Employing data they collected over three years using qualitative and quantitative techniques, the authors analyze the consequences of conflict and competition—especially associated with race, ethnicity, and gender—on preparation, response, and recovery.

Drought

Drought: Selected Bibliography. *Matt Hildner. 1997. 14 pp. Free. Available from the Colorado Water Resources Research Institute, 601 Howes Street #410, Colorado State University, Fort Collins, CO 80523; (970) 491-6308; fax: (970) 491-2293; e-mail: cwrri@colostate.edu.*

This bibliography is the product of the first phase of a study, conducted with the Colorado Drought Response Organization, examining a drought that struck Colorado in the early and mid-1950s, although the entries in the bibliography are not limited to

that era. It contains listings for books; articles; pamphlets; reports; government publications; and descriptions of and contact information for manuscript and records collections from the Colorado Agricultural Archives, the Denver Water Board, Colorado State Archives, Greeley Municipal Archives, University of Colorado Archives, and the University of Denver Special Collections.

Drought Conciliation and Water Rights: Japanese Experience. *IDI Water Series No. 1. 1997. 107 pp. Free. Request from Toshikatsu Oomachi, Infrastructure Development Institute–Japan, New Kojimachi Building, 5-3-23 Kojimachi Chiyoda-ku, Tokyo 102 Japan; tel: +81-3-3263-4821; fax; +81-3-3230-4030; e-mail: idi01@idi.or.jp; WWW: http://www.iijnet.or.jp/idi/contentse.htm.*

In recent years, precipitation has declined while demand for water has increased in Japan, resulting in more frequent droughts. This document describes that country's experience and its history of water use and water resources development. It provides a definition of drought, describes drought processes, details the need for "conciliation," that is, a system that resolves problems between water rights holders using natural streamflow as their water source (such as irrigators) and hydropower operators. It also covers changes in drought conciliation practice; regional differences in conciliation procedures; principles of drought conciliation in major river basins; and methods for ensuring harmony in drought conciliation, such as disclosing information, clearly outlining the role of a Drought Conciliation Council, and simplifying procedures.

Earthquakes

Seismic Rehabilitation of Existing Buildings in Oregon: Report to the Sixty-Ninth Oregon Legislative Assembly. *1996. 134 pp. $7.00. Copies can be purchased from the Nature of the Northwest Information Center, Suite 177, 800 N.E. Oregon Street, No. 5, Portland, OR 97232; (503) 872-2750; fax: (503) 731-4066.*

In 1995, Oregon legislators passed Senate Bill 1057, which directed the governor and state geologist to appoint a Seismic Rehabilitation Task Force to address issues related to the rehabilitation of existing buildings for protection against earthquakes. This report contains the recommendations of that task force, which include urging the state to adopt a long-term goal of achieving rehabilitation of unreinforced masonry buildings within 30 years and all other buildings within 70 years. The group also recommended that a statewide inventory of buildings be conducted in order to determine the scope of the problem. The report details the proposed program for seismic rehabilitation of existing buildings in Oregon and the associated costs and provides proposed legislation for implementing these recommendations.

Economic and Fiscal Impacts of Proposed Seismic Retrofit Incentives. *1997. 70 pp. Free. Available from Angie Karel, Oregon Seismic Rehabilitation Task Force, 800 N.E. Oregon Street, No. 28, Portland, OR 97232; (503) 731-4100.*

This study provides an analysis and estimate of the fiscal and economic impacts on state and local governments of implementing proposed seismic rehabilitation incentives (see the above publication). It describes the likely effects of such incentives on redevelopment activity and on tax revenues for state and local governments in Oregon. It also outlines the likely long-term property tax, investment, employment, and other benefits resulting from rehabilitation work, as well as the economic impacts of rehabilitation on the value of the actual buildings.

Performance Based Strategy Evaluation Methodology for Earthquake Risk Management. *Anju Gupta. Report No. 122. 1997. 257 pp. $25.00.*

An Urban Earthquake Disaster Risk Index. *Rachel A. Davidson. Report No. 121. 1997. 281 pp. $27.00. Available from Carol Strovers, John A. Blume Earthquake Engineering Center, Department of Civil Engineering, Stanford University, Stanford, CA 94305-4020; (415) 723-4150; fax: (415) 725-9755; e-mail: strovers@ce.stanford.edu; WWW: http://blume.stanford.edu.*

Perceptions of the utility of earthquake risk management activities vary. Researchers may believe that each dollar invested saves multiple dollars in reduced damage, while the public may believe that mitigation is too expensive. ***Performance Based Strategy Evaluation Methodology*** presents a comprehensive method for identifying optimal strategies. It presents Strategy Effectiveness Charts that contain loss and recovery data for a range of earthquake scenarios in a region and describes evaluation of pre-mitigation performance using scenario data and socioeconomic characteristics. It also discusses postmitigation performance based on scenario data and likelihood of implementation. The charts address residential, commercial, lifeline, and government sectors in Los Angeles County and the San Francisco Bay area.

An Urban Earthquake Disaster Risk Index is a composite index that allows direct comparison of the overall earthquake disaster risk of cities worldwide and describes the relative contributions of various factors to that overall risk.

U.S. Japan Workshop on Cooperative Research for Mitigation of Urban Earthquake Disasters: Learning from Kobe and Northridge—Recommendations and Resolutions. *Stephen Mahin, Tsuneo Okada, Masanobu Shinozuka, and Kenzo Toki. 1997. 66 pp. $21.40, paper; $10.00, microfiche. Order from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; (703) 487-4650; fax: (703) 321-8547; e-mail: orders@ntis.fedworld.gov; WWW: http://www.ntis.gov. Specify Product ID: PB97-172431INF.*

In December 1995, representatives from the U.S. and Japan met in Hawaii to share knowledge about the seismic behavior of the built environment based on insights gained following the Kobe and Northridge earthquakes. The participants identified a research agenda related to urban earthquake loss reduction that includes identification of high priority investigation needs, realization of opportunities for cooperative research between the two countries, sharing of unique experimental and analytical research facilities and data, development of requirements for new research facilities and resources, and creation of mechanisms for improved international cooperation and communication.

The report for the second U.S.-Japan workshop, the ***Proceedings of the Second U.S.-Japan Workshop on Cooperative Research for Mitigation of Urban Earthquake Disasters, Tokyo, Japan, February 27-March 1, 1997*** is now available via the Internet at *http://www-rcf.usc.edu/~shino*, and can be downloaded in MSWord™ format.

Earthquake Quarterly. *Fall 1997. Free to qualified subscribers; $20.00/year, all others in the U.S. and Canada; $50.00/year, all other countries; $5.00, single copies in the U.S.; $10.00, single copies, all other countries. Subscriptions are available from the Western States Seismic Policy Council (WSSPC),* ***EQ Quarterly****, 121 Second Street, 4th Floor, San Francisco, CA 94105; (415) 974-6435; fax: (415) 974-1747; e-mail: eq@wsspc.org; WWW: http://www.wsspc.org.*

This is the premiere issue of ***Earthquake Quarterly***, a publication of the Western States Seismic Policy Council addressing earthquake and seismic hazard reduction issues. This issue contains WSSPC member agency updates; an Earthquake Information Providers Group update; articles on proposed legislation, earthquake and tsunami statistics, FEMA's Disaster Resistant Community program, Project Impact (see p. 10 of this ***Observer***), the Institute for Business and Home Safety's Showcase Communities effort, and WSSPC awards for excellence; a calendar of events, and other news.

Other Geological Hazards

Mudflows: Experience and Lessons Learned from the Management of Major Disasters. *1997. 150 pp. $60.00, plus $5.00 shipping. Sales Number E.96.III.M.I. Order from the United Nations, Publications, Sales, and Marketing Section, Room DC2-853, Department 1004, New York, NY 10017; (212) 963-8302 or (800) 253-9646; fax: (212) 963-3489; WWW: http://www.un.or/Pubs. Checks should be payable to "United Nations Publications."*

As much as 20% of the world's population lives and works in areas prone to frequent mudflows, including slides caused by earthquakes, heavy rains, or volcanic eruptions. The United Nations Department of Humanitarian Affairs (DHA) believes that the losses and suffering inflicted by these and other hazardous phenomena can be reduced. With this in mind, the DHA has initiated a new series of publications focusing on experiences and lessons learned by governmental authorities, international organizations, nongovernmental organizations, and technical groups regarding the management of natural disasters. This volume on mudflows is the first in the series. It focuses on the causes and mechanisms of mudflows, the assessment of mudflow hazards, prevention planning to reduce mudflow consequences, precautionary measures and mitigation planning, and organizational and management issues. The report also includes case histories of several major mudflow disasters.

Volcanoes

Volcanoes: Crucibles of Change. *Richard V. Fisher, Grant Heiken, and Jeffrey B. Hulen. 1997. 344 pp. $35.00. Available from Princeton University Press, Fulfillment Services, 1445 Lower Ferry Road, Ewing, NJ 08618; (800) 777-4726 ; fax: (800) 999-1958; e-mail: orders@cpfs.pupress.princeton.edu; WWW: http://www.pupress.princeton.edu.*

Volcanoes: Crucibles of Change chronicles the geologic behavior of these phenomena as well as their profound effect on human life. The authors begin with a discussion of the May 1980 eruption of Mount St. Helens in the U.S., an explanation of how safety officials and scientists tried to predict events, and a description of how unsuspecting campers and loggers miles away struggled with the blasts of ash, stone, and heat. They then discuss why volcanoes erupt; types of volcanoes and types of eruptions; water and volcanoes; the hazards created by volcanoes, such as mudflows, lava flows, volcanic gases, and eruption clouds; the myths about and benefits of volcanoes; and mitigation and survival for those who live near them. The book concludes with a tourist guide to volcanoes, covering over 40 sites throughout the world.

Sedimentology, Behavior, and Hazards of Debris Flows at Mount Rainier, Washington. *USGS Professional Paper 1547. 1995. 56 pp. $8.50, plus $3.50 shipping. Order from the U.S. Geological Survey, Customer Service, Box 25286, Denver, CO 80225; (800) 435-7627.*

Mount Rainier is potentially the most dangerous volcano in the Cascade Range due to its great height, frequent earthquakes, active hydrothermal system, and extensive glacier mantle. Many debris flows have inundated areas far from the volcano in postglacial time. This report covers the origins, magnitude, and frequency of debris flows and other associated flows, particularly those related to volcanic hazards. It also provides three case histories that can be used for risk planning and for the design of structures, such as dams and power plants, in the vicinity of a volcano.

Interplanetary Hazards

Rain of Iron and Ice: The Very Real Threat of Comet and Asteroid Bombardment. *John S. Lewis. 1996. 254 pp. $13.00, paperback; $25.00, hardcover. Order from Addison-Wesley Longman Publishing Company, attn: Order Services, One Jacob Way, Reading, MA 01867; (800) 358-4566; fax; (800) 367-7198; WWW: http://www.awl.com.*

According to the author, earth, like other planets, experiences an erratic, unceasing rain of comets and asteroids that exposes its inhabitants to a continuous risk of disaster. From time to time, enormous impact explosions affect the entire surface of our planet, excavating huge craters and making the biosphere briefly unstable and hostile to many forms of life. More frequently, small impacts have a devastating local effect similar to that of a multimegaton nuclear blast. In ***Rain of Iron and Ice***, Lewis discusses ancient impacts; research relating to the meteor crater in Arizona, which lead scientists to conclude that not all craters were caused by volcanoes; the Tunguska fireball in Russia in 1908; the influence of the nuclear age on understanding this phenomenon; the space program's discovery of heavy cratering on the moon, Mars, and Mercury; the use of modern technologies to search for threatening bodies; the concept of nuclear winter; the end of the Cretaceous era, which scientists believe was caused by a large impact on the earth's surface; the discoveries of the Magellan space mission regarding the final disintegration of comets and asteroids during high-speed entry into planetary atmospheres; the impacts of water-rich asteroids on Mercury, which has two polar ice caps despite its proximity to the sun; the Shoemaker-Levy 9 impact on Jupiter; the potential for a devastating tsunami generated by an impact in one of earth's oceans; computer modeled effects on urban areas of blast waves, fire storms, and tsunamis; and the advantages and disadvantages of several collision avoidance schemes.

First PPP 2000 Forum Report Available

Public Private Partnership 2000 (PPP 2000—see the ***Observer***, Vol. XXII, No. 1, p. 12) is a unique alliance of federal, private-sector, and nonprofit agencies committed to reducing deaths, injuries, property damage, economic loss, human suffering, and environmental damage due to disasters by redefining society's approach to handling natural hazards.

On September 10, 1997, PPP 2000 held the first forum in a series dedicated to exploring new approaches to natural disaster mitigation. The meeting, cosponsored by the U.S. Subcommittee on Natural Disaster Reduction (SNDR) and the Institute for Business and Home Safety (IBHS), focused on initiatives of the insurance sector. The primary goals of the forum were to bring the many stakeholders together and to break through traditional patterns of thinking.

A report from this initial forum is now available. It covers past inadequacies of disaster reduction programs, but also offers a list of six "proposed actions" to improve hazard mitigation in the U.S. Copies are available from the USGS EarthFax fax-on-demand system at *(703) 648-4888* (press 1, then press 2, then request document number 1800). Additionally, e-mail copies can also be requested from *Tim Cohn, tacohn@usgs.gov; Matt Gentile, mgentile@ibhs.org; or Kathleen Gohn, kgohn@usgs.gov.*

Over the next year, PPP 2000 will sponsor more than a dozen forums on topics such as cities and megacities at risk (January 1998) and reducing losses from floods (March 1998). For more information about the PPP 2000 project, contact the *Institute for Business and Home Safety, 73 Tremont Street, Suite 510, Boston, MA 02108-3910; (617) 722-0200; fax: (617) 722-0202; WWW: http://www.ibhs.org.*

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, National Aeronautics and Space Administration, and the Institute for Business and Home Safety. 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 21, 1997.*

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