# Natural Hazards Observer--July 1996

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# Mitigation from the Ground Up

## Sustainable Cities in California

### *--an invited comment*

A popular notion in land-use management is that communities should be sustainable. However, this concept frequently overlooks the importance of hazard mitigation for encouraging sustainability, often only including elements relating to environmental resource protection, energy efficiency, and economic self-sufficiency. In addition, sustainability has been reduced in the popular literature to its simplest terms, that is, "not borrowing against the future."

In this sense, the concept should be expanded to encompass predisaster hazard mitigation. By paying billions of dollars in disaster reimbursements under the Stafford Act, we are borrowing against our financial future while not mitigating hazards very well.

This realization has helped motivate FEMA's National Mitigation Strategy, which will place a new obligation on states to encourage predisaster mitigation. Some states already have effective mandates for local hazard mitigation, and mandates matter, as May and Burby have documented (see the ***Observer***, Vol. XX, No. 5, p. 1).

## Building Codes

The Hanshin-Awaji (Kobe) and Northridge earthquakes, hurricanes Andrew and Iniki, and the Oakland Hills fire provide obvious lessons that building codes are important. Following the Hanshin-Awaji earthquake, it was determined that buildings constructed under new standards adopted since 1981 performed well, while older buildings rebuilt hastily after World War II, without proper mitigation, suffered great damage.

## Beyond Codes to Community Design

Part of the long-term solution is for localities to implement disaster-resistant community design. The broad purpose of this concept is to create new communities in an overall pattern that is more resistant to the effects of natural hazards.

Disaster-resistant community design includes, but moves well beyond, code solutions to embrace site and neighborhood design approaches that take into account the more complex interaction of natural hazards with the built environment. Common examples of design practices fostering effective mitigation in flood-, earthquake-, fire-, and landslide-prone areas include:

- limiting development densities and/or requiring large lot sizes;
- transferring allowable densities to safer areas on- or off-site;
- setting buildings back from flood, landslide, and fault hazard zones;
- requiring adequate minimum paved street widths;
- limiting street grades to assure fire truck access;
- requiring second access points into each development in case primary access is blocked during an emergency;
- restricting the lengths of cul-de-sacs as well as the number of dwelling units on them;
- developing adequate water supply, maintaining adequate flow to fight fires, and providing redundant storage locations; and
- using open space easements for fire breaks, equipment staging, and evacuation areas.

Such practices are often classified in the hazards literature as "land use measures"--a catchall term tinged with skepticism shared by those social scientists, engineers, and emergency managers who perceive city planning with some distrust due to its relationship to politics. However, disaster-resistant community design practices are being used effectively in various states and cities to mitigate hazards during development. In California, such practices are grounded on local general plan safety elements mandated by state law, or they may be in response to a hazard identified in an environmental impact report under

the California Environmental Quality Act.

Now evolving within many city governments is a rather sophisticated, multidisciplinary, teamwork approach to hazard reduction. In such model circumstances, planning departments coordinate with building, fire, police, public works, parks, transportation, and other city staff to bring about a reduced level of risk in relation to recognized hazards. In many cases, effective mitigation is the product of skilled negotiation by planners with developers and property owners based on local policy commitments to build safe communities.

## Rebuilding Existing Communities

We are far from achieving uniform application of disaster-resistant design principles in new development; yet, perhaps the greatest challenge is what to do with the vast number of communities already built up without sufficient mitigation.

In some communities with serious vulnerability to hazards, there is a growing awareness that the community is living on borrowed time. Commonly recognized measures to counteract this threat include:

- geological investigations to identify the existence, severity, and location of potential hazards;
- upgrading of building codes to increase disaster resistance in new construction as the city is redeveloped;
- retrofitting existing unreinforced masonry (URM), tilt-up, non-ductile concrete, and other buildings that are especially susceptible to earthquake damage;
- widening existing roads to provide for improved emergency access and evacuation movement; and
- increasing water supply and distribution for greater fire protection.

To accomplish mitigation projects within existing communities, financial incentives are often needed. In California, this need has been addressed partly through the formation by property owners of self-taxing benefit assessment districts that support issuance by cities of bonds providing long-term, low-cost financing for mitigation. Examples include:

- formation by the city of Long Beach in 1991 of a district to underwrite $17.3 million worth of seismic upgrading for approximately 200 URM buildings, with low payments over 24 years;
- formulation by the city of Los Angeles of separate benefit assessment districts for retrofitting commercial and apartment buildings with fire sprinklers;
- creation after the Oakland Hills fire of a benefit assessment district covering the entire hillside area in the city of Oakland to minimize hazards through vegetation management and improved fire protection.

## An Investment in Safer Living

In the long run, it is much safer and cheaper to build communities right the first time. Real mitigation is much harder to achieve following a disaster in a built-up community because of the pressures to rebuild quickly and the costs of retrofitting existing structures. The problem in both newly developing and built-up communities is reluctance by localities to act on their own to force property owners and developers to pay mitigation costs in the absence of a state mandate requiring all communities to do so.

Disaster-resistant community design instead treats mitigation costs as an investment, the returns for which are reduced life and property losses and vastly less expensive recovery. Through mandates, examples, and incentives, it is possible to create inducements for newly developing communities to mitigate hazards more effectively. As savings from predisaster mitigation accrue, resources can be redirected to the tough long-term task of redeveloping existing cities in more disaster-resistant form.

At this juncture, we need to stop tiptoeing around the so-called "land use measures" issue and pursue through the National Mitigation Strategy a full-scale effort at national, state, and community levels to use proven disaster-resistant community design and financing practices both in developing and redeveloping safer communities. We owe it to our children and grandchildren.

Ken Topping, AICP, Topping Jaquess Consultants, Pasadena, California

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*The Latest from the Natural Hazards Center . . . ;*

# Of Earthquakes and Hurricanes

### Using Earthquake Maps to Chart Public Policy

Over the past 50 years, seismic code development has grown more complex and time-consuming, in large part because of the increasing difficulty of transferring and incorporating scientific and technical knowledge about earthquakes into public policy. The difficulties arise from three primary causes:

- the rapidly increasing store of scientific knowledge,
- the growing number of people and organizations who are taking part in the knowledge creation and transfer process, and
- the formal public policy processes that are slow to adapt to change.

In the Natural Hazards Center's most recent working paper, ***National Earthquake Probabilistic Hazard Mapping Program: Lessons for Knowledge Transfer*** (WP92, 1996, 84 pp.), by Elliott Mittler, Craig Taylor, and William Petak, the authors take a critical look at how maps have been used to transfer sophisticated seismic information to persons who design, build, and approve the construction of buildings. The authors asked three important questions:

- Do map preparers, building code officials, and earthquake design engineers agree on how maps should be drawn and what their content should be?
- Is the precision of hazard maps adequate for use in structural design?
- From both the map preparers' and users' points of view, how well is the transfer of knowledge working and what, if any, improvements are needed?

The authors discuss the progress of earthquake zone mapping and seismic building codes in the U.S. from the 1890s to the present, describe the controversies that often arise when organizations attempt to amend seismic building codes, analyze the knowledge transfer process in depth, and offer conclusions and recommendations for improving this process. Additionally, they provide a year-by-year chronology of seismic map and code developments in the U.S.

Copies of WP92 sell for $9.00 (plus shipping and handling) and are available from 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.* See the chart below for shipping charges.

## New Quick Response Reports

The Natural Hazards Center manages a grant program that enables social scientists to conduct research at disaster sites in the immediate aftermath. The findings from the studies are published by the center as Quick Response Reports, which are available in two formats: 1) in printed form for the cost of reproduction and mailing, and 2) from the Natural Hazards Center's home page on the World Wide Web for free.

The three most recent reports are:

- QR82: *Early Response to Hurricane Marilyn in the U.S. Virgin Islands*, by Betty Hearn Morrow and A. Kathleen Ragsdale. 1996. 10 pp.
- QR83 : *Response to a Damaging Earthquake in an Environment of Political Turmoil*, by William A. Mitchell. 1996. 19 pp.
- QR84 *: Impact of Hurricane Opal on the Florida/Alabama Coast*, by David M. Bush, Craig A. Webb, Robert S. Young, Bryan D. Johnson, and Graham M. Bates. 1996. 12 pp.

Printed copies of all Quick Response Reports cost $5.00, but shipping charges vary. See the attached chart for prices.

### Shipping Charges

| | Domestic | |
|---|---|---|
| Number of Pages | Printed Matter | FirstClass |

| | | |
|---|---|---|
| 0 - 35 | $3.00 | $3.00 |
| 36 - 80 | $3.50 | $4.00 |
| 81 - 450 | $4.00 | $5.00 |

**Canada and Mexico**

| Number of Pages | Surface Printed Matter | Air Printed Matter |
|---|---|---|
| 0 - 35 | $3.00 | $3.00 |
| 36 - 80 | $3.50 | $4.50 |
| 81 - 450 | $5.00 | $6.00 |

**International**

| Number of Pages | Surface Printed Matter | Air Printed Matter |
|---|---|---|
| 0 - 35 | $4.00 | $5.00 |
| 36 - 80 | $5.00 | $6.00 |
| 81 - 450 | $6.00 | Please call for price |


# IDNDR Secretariat Supports Hazard Awareness

## Disaster Reduction Day Activities

The theme for this year's Disaster Reduction Day, to be held October 9, is "Cities at Risk." Although the United Nations has designated the second Wednesday in October of each year as Disaster Reduction Day, the Secretariat of the International Decade for Natural Disaster Reduction (IDNDR) is encouraging participating organizations to extend public awareness activities to a week, a month, or even longer.

The secretariat is sponsoring several activities to support local, national, and international efforts and is making materials available to those interested in undertaking IDNDR activities.

## Internet Conference

In order to promote work performed by IDNDR partners on cities and disasters, the Secretariat will host a virtual conference, "Solutions for Cities at Risk," from August to mid-October 1996. The conference will take place on the World Wide Web, beginning with a "plenary" session that will present the conference agenda and an overview of key issues. Successive "workshops" will deal with topics

introduced with a paper that will provide the basis for discussion. Brief comments by experts will follow, then the "floor" will be open for questions and discussions.

Currently, conference organizers are planning to conduct sessions in English and Spanish, however, additional languages may be added. Papers will describe city experiences in dealing with planning, organization, training, early warning, health, and other issues that relate to reducing the impacts of disasters on urban areas.

The conference will be found at *http://www.quipu.net*; however, those with only e-mail capabilities can also participate. For more information, contact the *IDNDR Secretariat, U.N. Department of Humanitarian Affairs, Palais des Nations, 1211 Geneva 10, Switzerland; tel: (41 22) 798 6894; fax: (41 22) 733 8695; e-mail: idndr@dha.unicc.org;* or *Oficina Regional DIRDN, Apartado 3745-1000, San José, Costa Rica; tel: (506) 257 2141; fax: (506) 257 2139; e-mail: PEDCOR@sol.racsa.co.cr.*

### Poster Contest

The IDNDR Secretariat is also sponsoring a poster contest to improve public awareness. Winners will be selected according to their ability to portray both the theme of this year's Disaster Reduction Day, "Cities at Risk," as well as practical measures that reduce risk. Entries will also be judged on suitability of design.

Submissions are due by September 20, 1996, and may include both new and existing materials. For information, contact the IDNDR Secretariat at the above address.

### Campaign Support Materials

For those who are looking for ideas on how to participate in Disaster Reduction Day, the secretariat has three brochures available. ***Facts and Figures*** contains all sorts of statistical tidbits, such as, "by the year 2000, half the world's population will live in urban areas, crowded into 3% of the earth's land," that can serve as background information for presentations. ***Guidelines for Local Organizers*** includes a campaign checklist, tips on how to present success stories, questions to ask when identifying cities at risk, and ideas for fostering partnerships and contacts. ***Activities for Children*** presents specific projects, such as community mapping contests, art exhibits, pen pal programs, and school education programs, that can be used to increase childrens' awareness of disaster preparedness and mitigation.

The flyers are available in English and French from the IDNDR Secretariat, and the Spanish versions are available from the Oficina Regional DIRDN at the addresses above. Interested individuals may also want to contact these organizations for lists of forthcoming campaign materials.

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## Governors Get Hot about Wildfires

Many state governors believe that a comprehensive revision of fire policy regarding the wildland/urban interface is critical to preventing future loss of life, property, and natural resources. Hence, the members of the Western Governors' Association (WGA), in their recently released document, ***Wildland/Urban Interface Fire Policy Action Report*** (1996, 9 pp., free), offer a blueprint for improved management of the wildfire hazard that plagues western states.

The governors recognize that, as western populations continue to move into wildland areas, the risk increases, and that, although low-intensity fires are often beneficial to the forest environment, intense fires are destructive to plant and soil systems. Thus, to support changes in wildfire hazard management, the Western Governors' Association formed a partnership with other stakeholders and those with responsibilities for fire response, suppression, prevention, and risk reduction to assess the problem and propose improvements.

In their report, the governors identify five principle areas that require attention:

- providing leadership to ensure successful implementation;
- developing and implementing a uniform hazard/risk assessment system;
- developing and using appropriate building standards and fire codes;
- integrating appropriate insurance industry standards; and
- implementing appropriate fire protection and mutual-aid agreements among all levels of government.

The governors stress the inter-relatedness of all five areas and recommend specific actions for each. They also call for improved data on fires in the wildland/urban interface so that the actual problem can be better defined and for that data to be included in the U.S. Fire Administration's National Fire Incident Reporting System.

Copies of the report and implementation updates are free and can be obtained from the *Western Governors' Association, 600 17th Street, Suites 1705S and 1706S, Denver, CO 80202-5447; (303) 623-9378.*

## The Quito School Retrofit Project

The first phase of a project to identify schools threatened by earthquakes in Quito, Ecuador, has inspired local philanthropic organizations and businesses to gather funds to mitigate the danger. The financial support will help pay for low-cost retrofit measures designed by GeoHazards International and Ecuador's Escuela Politecnica Nacional.

Initiated in 1994, the Quito School Earthquake Safety Project had three objectives:

- to evaluate the vulnerability of the city's schools to earthquakes;
- to design affordable strengthening techniques for vulnerable schools; and
- to strengthen selected schools.

Subsequently, 15 high-risk schools were chosen, and retrofit designs were created for each. The affordable designs use local materials and construction techniques.

Significant progress has already been made in this project. Local funding has been secured to retrofit 11 of the 15 buildings, and the U.S. Agency for International Development and Ecuador's National Directorate for School Construction have agreed to sponsor the design of new, earthquake-resistant school modules to be used for future school construction throughout the country.

For a copy of a report describing this project (in both English and Spanish), contact *Geoffrey Hoefer, GeoHazards International, Stanford University, Stanford, CA 94305-2215; (415) 723-3655; fax: (415) 723-3624; e-mail: geohaz@pangea.stanford.edu* o r *Jeannette Fernandez, Escuela Politecnica Nacional, Quito, Ecuador; tel: 593-2/507-144, ext. 606; fax: 593-2/567-848; e-mail: janet@mail.epn.edu.cc.*

# The Internet Page(s)

## Web Sites for the Tornado/Hurricane Season, Plus Volcanoes, Earthquakes, Wildfire, Baseball, and Other Hazards on the Net

### All Hazards

*Home.html*

The Natural Hazards Center's Web site has several new additions, including:

The center's latest topical bibliography, ***The Socioeconomic Aspects of Flooding in the U.S.***, by John Wiener (see the ***Observer***, Vol. XX, No. 5, p. 5); the direct URL is:

*tb19.html*

Quick Response Report #78: ***Self Organization in Disaster Response: The Great Hanshin, Japan, Earthquake of January 17, 1995***, by Louis K. Comfort:

*qr/qr78.html*

Quick Response Report #82: ***Early Response to Hurricane Marilyn in the U.S. Virgin Islands***, by Betty Hearn Morrow and A. Kathleen Ragsdale:

*qr/qr82.html*

Quick Response Report #83: ***Response to a Damaging Earthquake in an Environment of Political Turmoil (Dinar, Turkey, October 1, 1995)***, by William A. Mitchell:

*qr/qr83.html*

Quick Response Report #84: ***Impact of Hurricane Opal on the Florida/Alabama Coast***, by David M. Bush, Craig A. Webb, Robert S. Young, Bryan D. Johnson, and Graham M. Bates:

*qr/qr84.html*

An updated annotated list of colleges, universities, and institutions offering emergency management courses:

*colleges.html*

An updated selection of other useful hazards/disaster sites on the Internet:

*sites.html*

*http://www.ema.gov.au/*

The home page of Emergency Management Australia (EMA)--the antipodal equivalent of the Federal Emergency Management Agency--includes information about the mission, organization, and programs of the agency, including its training arm, the Australian Emergency Management Institute. The site also offers sections on preparing for disaster, disaster response, postdisaster recovery, education and training,

seminars and conferences, the International Decade for Natural Disaster Reduction in Australia, information services, and EMA publications and reports.

*http://gcmd.gsfc.nasa.gov*

This Global Change Master Directory (GMCD) offers an on-line search and retrieval system for persons interested in identifying global change earth science data for education and research. The heart of the directory is a data base of 3,400 earth science entries. It includes references to data held at many federal agencies, universities, and foreign countries, and covers atmospheric, land, ocean, and solid earth science.

*http://www.slip.net/~earthenv/*

The "Earthweek" home page offers a world map dotted with small icons that chronicle recent (within the last week) natural events--from earthquakes to forest fires to insect infestations. Click on the icon and find out the latest on the locust infestation in Iran. Back issues are also available.

### Hurricanes

*http://www.nhc.noaa.gov*

This is the home page of the National Centers for Environmental Prediction, including the Tropical Prediction Center and the National Hurricane Center (NHC)--obviously a good place to start a search for hurricane information. It includes material about past and present tropical storms and lots of stuff about the NHC and what it does.

*http://cirrus.sprl.umich.edu/wxnet/tropical.html*

The University of Michigan's "Weathernet" site includes this "Tropical Weather Products" page, which the creators extol as providing "the most comprehensive access to hurricane-related products on the Net--National Hurricane Center advisories, recon reports, local National Weather Service statements, tracking maps . . ." well, you get the picture. The site includes both current news and historical data. Meanwhile, Weathernet itself:

*http://cirrus.sprl.umich.edu/wxnet*

is a great source of all kinds of weather information, much of it in images and other graphics.

*http://asp1.sbs.ohio-state.edu/tropicaltext.html*

Meanwhile, further south in Columbus, Ohio State University's Atmospheric Sciences Program has put

together a site that includes this page with a broad array of current weather information, tropical storm outlooks and advisories, and satellite images, mostly compiled from National Hurricane Center data. The site also includes a "Severe Weather and Natural Disaster Bulletins" page:

*http://asp1.sbs.ohio-state.edu/severetext.html*

that provides information about all sorts of recent and ongoing events. It covers thunderstorms; tornadoes; floods; adverse marine weather and coastal flooding; tropical advisories; special weather and severe weather statements; adverse winter weather; fog/wind/fire/pollution advisories; avalanche, earthquake, and tsunami reports; natural disaster bulletins; civil emergencies; and short-term forecasts.

*http://www.fema.gov/fema/trop.html*

The Federal Emergency Management Agency's "Tropical Storm Watch" page provides news and situation reports on current storms, as well as information on past hurricanes monitored by FEMA.

*http://www.fema.gov/fema/hurricaf.html*

This site offers FEMA's "Fact Sheet" on hurricanes, including information about what to do before, during, and after a hurricane and steps for long-term mitigation.

*ftp://downdry.atmos.colostate.edu/pub/TCfaqI*

*ftp://downdry.atmos.colostate.edu/pub/TCfaqII*

These two FTP sites provide the answers to just about every tropical cyclone FAQ (Frequently Asked Question) one can imagine.

*http://www.sun-sentinel.com/storm/*

This site, the ***Ft. Lauderdale Sun-Sentinel***'s "Hurricane '95 Home Page," is an excellent place to find information on preparing for and recovering from hurricanes.

*http://www.usatoday.com/weather/whur0.htm*

The ***USA Today*** "Weather Guide to Hurricane Information" includes the 1996 outlook, ***USA Today*** stories about current and recent tropical storms, an overview of the remarkable 1995 hurricane season, and various other articles covering a wide range of hurricane information, from meteorology to sociology. As you might expect from ***USA Today***, the site is replete with charts, graphs, pictures, and other gewgaws.

## Tornadoes

*http://www.fema.gov/fema/tornadof.html*

This page offers FEMA's fact sheet on personal tornado preparedness, response, and recovery.

*http://www.movies.warnerbros.com/twister*

Believe it or not, this site for the Warner Brothers blockbuster thriller ***Twister*** offers a cache of good information about tornadoes and tornado safety, as well as tornado statistics, a glossary, storm chasers' guide, and other solid information.

*http://www.st.rim.or.jp/~k_ono/tornado*

This is the "Tornado Boy" home page, with everything you ever wanted to know about Hideo "Tornado" Nomo, the Los Angeles Dodger pitching phenom and favorite son of Osaka, Japan, where he is known as "Tornado Boy" because of his unique wind-up and delivery.

## Volcanoes

*http://www.dartmouth.edu/pages/rox/volcanoes/elecvolc.html*

This Web page, the "Electronic Volcano," bills itself as "a window into the world of information on active volcanoes." The site is a source of many different kinds of information, including maps, photographs, dissertations and theses, and several rare documents. It also provides a guide to resources in libraries or on other information servers. The Electronic Volcano offers introductory material in Chinese, German, Spanish, Italian, French, and Russian, followed by guides to catalogs of active volcanoes and relevant literature, an index of journals that contain articles on active volcanoes, tables of contents of journals, visual information, maps, a list of volcanic observatories and institutions, descriptions of volcanic hazards, a section on current events and research, and a volcano name and country index.

## Earthquakes

*http://www.abag.ca.gov/bayarea/eqmaps/eqhouse.html*

The Web site of the Association of Bay Area Governments (ABAG), which we've mentioned before as an excellent source of information about earthquake hazards in the Bay Area, now includes this page with excerpts of text and images from ABAG's new publication, ***Shaken Awake! Estimates of Uninhabitable Dwelling Units and Peak Shelter Populations in Future Earthquakes Affecting the San Francisco Bay Region***.

*http://www.geophys.washington.edu/seismosurfing.html*

"Seismosurfing" is a Web page created to aid individuals who are scanning the Internet for earthquake data. It provides an index of known Internet connections where seismic data or seismic research information are available. The information is categorized under: Global or Composite Catalogs and Maps, California Institutions, Institutions in Alaska and the Pacific Northwest, Institutions in the Inter-Mountain U.S., Institutions in the Eastern U.S., North American Institutions (Outside the U.S.), Institutions Outside North America, Seismic Information Relating to Volcanic Activity, Links to More General Volcanology Information, and Other Useful References.

## Wildfire

*http://www.teleport.com/~wildfire*

The Web site for the International Association of Wildland Fire offers articles and other information from the current issue of ***Wildfire***, the association's quarterly bulletin.

*http://www.boco.co.gov/gislu/whims.html*

Boulder County, Colorado, spans several ecological zones--from prairie to alpine to subarctic--and the invasion of human structures into the forested mountain regions, where natural fires have not reduced flammable vegetation in decades, has resulted in an extreme wildland fire hazard. The Wildfire Hazard Information and Mitigation System (WHIMS) is a project undertaken by Boulder County government to mitigate that hazard. WHIMS combines expertise in hazard assessment, forest management, wildfire behavior, and fire suppression with the rapidly advancing technology of geographical information systems (GISs). It is designed to address all elements of hazard mitigation--hazard identification, risk assessment, homeowner education and motivation, pre-attack planning, emergency response, land-use planning, and disaster assessment. The project represents a partnership among almost all of the groups and individuals dealing with the problem, from local residents to federal agencies. This Web site includes a project summary describing WHIMS in detail, as well as specific information about what people can do to protect their homes. Questions about WHIMS should be directed to *Nan Johnson, Boulder County Land Use Department, P.O. Box 471, Boulder, CO 80306; (303) 441-3930; e-mail: nanlu@boco.co.gov*.

## Floods

*http://h2o.usgs.gov/*

This site is the main water resources page of the U.S. Geological Survey (USGS). Pointers on the page direct readers to reports of current floods or other hydrologic events, and many of the local sites provide

special reports on emergency activities. From this site, one can also access

*http://h2o.usgs.gov/public/realtime.html*

a page that offers current streamflow conditions for many states. All World Wide Web pages of the USGS can be reached through the USGS home page:

*http://www.usgs.gov*

## Climate and Weather

*http://www.ncdc.noaa.gov*

This Web site of the National Climate Data Center is the climate/weather researcher's Shangri-la. It includes data from thousands of weather stations around the world, as well as hundreds of images, numerous technical reports on extreme weather events, and *lots* of other climate/weather data.

## Discussion Groups

*Hazards and GIS*

The National Information Service for Earthquake Engineering (NISEE) at the University of California-Berkeley has established a discussion list for persons interested in GIS use in hazards management and research. Although the list will focus on earthquake hazard issues, the sponsors encourage other GIS/hazard researchers to sign on. The list is open and unmoderated. To subscribe, send an e-mail message to:

*majordomo@violet.berkeley.edu*

with the text "subscribe gis_group" in the body of the message. To post messages, send them to:

*gis_group@violet.berkeley.edu*

The discussion list software will then broadcast your message to all subscribed members. If you reply to a message, your reply will be sent to the entire group.

*Emergency Preparedness in Latin America*

The Pan American Health Organization (PAHO), through a joint project with the National Aeronautics and Space Administration, is promoting access to the Internet in Central America by updating software in health institutions and emergency management agencies and sponsoring workshops at the subregional

and national levels on how to make the best use of the Internet. As part of that effort, disaster managers and other interested persons with e-mail access can now subscribe to a newly created e-mail discussion list called "desastres-ca," which is maintained by PAHO's country office in Nicaragua. Communication via the list will be predominantly in Spanish. To subscribe, send an e-mail note to

*majordomo@ops.org.ni*

with the sole instruction in the body of the message "subscribe desastres-ca [your e-mail address here]." You will then automatically receive messages sent by others to desastres-ca. To send a message yourself, simply e-mail to

*desastres-ca@ops.org.ni*

*Emergency Preparedness in Canada*

The Emergency Preparedness Information Exchange (EPIX) at Simon Fraser University in Vancouver, British Columbia, has created a "Canadian Emergency Preparedness Discussion Group" on the Net. The service is intended to promote the exchange of ideas and information among members of the Canadian emergency preparedness community. To subscribe, send an e-mail message to

*listserv@hoshi.cic.sfu.ca*

with the one-line message "subscribe emercan [yourfirstname yourlastname]"

*QUAKE-L*

QUAKE-L, one of the original disaster e-mail discussion lists, has moved to a new computer at the same host site (the North Dakota Higher Education Computer Network). The QUAKE-L list is for general discussions about earthquakes and covers a wide range of topics from discussions of specific earthquakes and their aftereffects to various theories and scientific principles of earthquakes and related phenomena. To subscribe to the list, send e-mail to the new QUAKE-L server:

*listserv@listserv.nodak.edu*

with the sole command in the body of the message "sub quake-l [yourfirstname yourlastname]."

## An On-Line Conference

MCB University Press in Great Britain recently announced that "The Disaster 96 First Internet

Conference: Electronic Communication and Disaster Management" is now open for registration. Registration can be completed through the virtual conference center at the MCB University Press Web site:

*http://www.mcb.co.uk/services/conferen/jun96/disaster/conhome.htm*

Registration is free to all who wish to participate. The program for the conference, which was scheduled to commence June 1 and continue through the summer, includes papers that describe the use of the Internet in almost all aspects of hazards management, as well as pieces that ask critical questions about how the Internet can and should be used to mitigate disasters.

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## Calling All GIS/Hazards Researchers

For the past several years, the Natural Hazards Center has maintained on its Web site a list of researchers using or investigating the use of geographical information systems (GISs) in hazards/disaster management, but, frankly, that index has languished in recent months. However, the Hazards Research Laboratory (HRL) at the University of South Carolina, one of the primary centers of GIS/hazards research in the nation, has come to the rescue and offered to update and maintain this directory.

Therefore, we ask any and all GIS/hazards researchers to contact the HRL with a brief note describing who they are and what they are doing. Please be sure to include contact information--addresses, phone/fax numbers, e-mail addresses, and Web URLs, if available. Please send information to *Mike Scott, Hazards Assessment Laboratory, Department of Geography, University of South Carolina, Columbia, SC 29208; (803) 777-1699; fax: (803) 777-4972; e-mail: mscott@ecotopia.geog.sc.edu*.

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# WASHINGTON UPDATE

## FEMA Named Lead Agency in New National Earthquake Program

On May 20, John Gibbons, President Clinton's chief science advisor, announced the formation of the National Earthquake Program (NEP) and the designation of the Federal Emergency Management Agency (FEMA) as the lead agency. In making the announcement, Gibbons noted that it is likely that one or more severely damaging earthquakes, equal to or greater than the 1994 Northridge earthquake, will strike the U.S. in the next decade. This new program will focus scarce government research and development dollars on saving lives and property and limiting social and economic disruptions due to future quakes.

The White House noted that the National Earthquake Hazard Reduction Program (NEHRP), which has existed since 1977, has focused largely on basic research and the development of engineering techniques to reduce losses, while the promotion of mitigation practices by institutions outside the federal government has flagged. Following an extensive review of the NEHRP by the National Earthquake Strategy Working Group for the National Science and Technology Council, a new national earthquake strategy, the National Earthquake Program, was developed. This program is intended the strengthen and expand NEHRP, rather than replace it.

The NEP was created to enhance cooperation and coordination among the NEHRP agencies--the U.S. Geological Survey, the National Science Foundation, FEMA, and the National Institute of Standards and Technology--as well as include other federal agencies involved in earthquake-related activities. It has eight goals:

- provide leadership and coordination for federal earthquake research;
- improve technology transfer and outreach;
- improve engineering of the built environment;
- improve data for construction standards and goals;
- continue the development of seismic hazards and risk assessment tools;
- analyze seismic hazard mitigation techniques;
- develop understanding of the societal impacts and responses related to earthquake hazard mitigation;
- analyze the medical and public health consequences of earthquakes; and
- continue documentation of earthquakes and their effects.

As the lead agency, FEMA will be responsible for the management, planning, reporting, and budgetary coordination of the program, with the guidance of a federal interagency committee. FEMA will be the single point of contact within the federal government for information related to earthquake research and mitigation and will undertake various outreach activities to transfer research to state and local governments and the private sector. Specifically, FEMA will:

- advocate program policies and practices;
- coordinate interagency strategic planning;
- recommend program priorities that do not conflict with agency activities conducted in support of special or unique missions;
- manage accounting for program funds;
- encourage and offer guidance to nonfederal organizations and consortia to reduce earthquake losses;
- conduct periodic national forums and develop additional means to include the views, interests, and priorities of nonfederal communities in the program; and
- evaluate program performance and effectiveness and report findings every two years to the president and Congress.

Federal funding for the NEP consists of funds currently expended on earthquake issues by the NEHRP member agencies, and thus, has a neutral impact on the federal budget. Robert Volland, a long-time senior FEMA official, was appointed by FEMA Director James Lee Witt to direct the NEP.

The document that establishes the NEP, ***Strategy for National Earthquake Loss Reduction***, is available on the White House World Wide Web site: *http://www.whitehouse.gov/WH/EOP/OSTP/NSTC/html/NSTC_Home.html*. For more information, access the FEMA World Wide Web site: *http://www.fema.gov* or contact FEMA's *Office of Emergency Information and Public Affairs, 500 C Street, S.W., Washington, DC 20472; (202) 646-4600; fax: (202) 646-4086; e-mail: eipa@fema.gov.*

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## FEMA Offers Good Ideas

FEMA's Family Preparedness Program, a cooperative effort with the American Red Cross and the National Oceanic and Atmospheric Administration (NOAA), recently released two publications that provide resources for people who educate the public about how to prepare for, respond to, and recover from disasters.

The ***Good Ideas Book*** was created to promote disaster preparedness and contains ideas, materials, and a "how to" guide for a variety of activities, ranging from simple steps for the first-time organizer to more complex guidance for those able to develop a multifaceted outreach program. The book includes examples of activities and case studies of successful partnerships as well as ready-to-use artwork and materials that can be adapted for local use.

The ***Disaster Public Information Catalog*** lists resources to help educate the public about earthquakes, fires, floods, hurricanes, thunderstorms and lightning, tornadoes, winter storms, and hazardous chemicals. The first section of the catalog lists materials that can help individuals prepare for disaster, particularly at the household level. The second section covers materials for disaster preparedness, mitigation, and recovery program organizers, including "how to" guidelines, presentations, videos, displays, and other items. The third section lists additional resources that provide information, including catalogs, organizations, and Internet sites.

Copies of the ***Good Ideas Book*** (FEMA Publication 8-1108) and the ***Disaster Public Information Catalog*** (FEMA Publication L-164) are available free from *FEMA, P.O. Box 2012, Jessup, MD 20794-2012; (800) 480-2520; fax: (301) 497-6378.* Individual items can also be downloaded from the FEMA World Wide Web site: *http://www.fema.gov*.

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## Social Security Expands Window for Disaster Benefits

In the past several years, portions of the United States have experienced natural disasters that have had unprecedented effects on supplemental security income (SSI) recipients. In 1992, Hurricane Andrew caused over $18 billion in damage in South Florida. Because of the extent of devastation, SSI recipients in the area were unable to use insurance payments to repair or replace their damaged property within the maximum 18-month period provided by regulations. At the end of 18-months, SSI recipients were required to treat these payments as income, resulting in loss of SSI and Medicaid eligibility.

To deal with this problem, the Social Security Administration has modified its regulations, giving individuals additional time to repair or replace destroyed or damaged property following major disasters. Under the new regulations, the Social Security Administration may extend the period during which the funds may be spent to 30 months.

The final rule can be found in the ***Federal Register***, *Vol. 61, No. 32, pp. 5943-5945 (February 15, 1996).* For further information regarding this rule, contact *Henry D. Lerner, Division of Regulations and Rulings, Social Security Administration, 6401 Security Boulevard, Baltimore, MD 21235; (410) 965-1762.* For information on eligibility or benefit application, call *(800) 772-1213.*

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## FCIC to Assist the Uninsurables

The Federal Crop Insurance Corporation (FCIC) of the U.S. Department of Agriculture (USDA) recently announced its final rule for providing disaster assistance to producers of crops for which insurance is not available, meeting the requirements of the Federal Crop Insurance Reform Act of 1994. That act requires the FCIC to provide eligible producers with protection comparable to the catastrophic risk protection provided by crop insurance. It is designed to help reduce financial losses that occur when natural disasters hinder crop production or prevent planting of an eligible crop.

This coverage addresses such events as drought, hail, excessive moisture, frost and freezing, tornadoes, hurricanes, earthquakes, excessive winds, floods, volcanic eruptions, extreme heat, insect infestations, and disease. Under the new guidelines, coverage will be offered for any commercial crop grown for food, livestock consumption, or fiber (excluding wood and paper products); aquacultural species production; ornamental nursery crops, Christmas trees, turfgrass sod, industrial crops, and other crops for which coverage has not been previously available.

The program will be administered under the general supervision of the FCIC and carried out through state and county committees and offices of the Farm Service Agency or other local USDA offices. The final rule can be found in the ***Federal Register***, *Vol. 61, No. 39, pp. 7193-7206 (February 27, 1996).*

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## SBA Reviews, Offers FAQs

In response to a regulatory review directive by President Clinton, the Small Business Administration (SBA) has completed an extensive review of its regulations in order to clarify and streamline them. As a result, the agency recently published in the ***Federal Register*** a reorganization of SBA regulations covering its disaster loan program.

In language that is easy to understand, SBA lists responses to their most frequently asked questions (FAQs); for example: What are disaster loans and disaster declarations? What kinds of loans are available? What does SBA look for when considering a disaster loan application? Are there restrictions on how disaster loans can be used?

The answers to these questions and other pertinent queries can be found in the final rule, published in the ***Federal Register***, *Vol. 61, No. 21, pp. 3304-3310.* For further information, contact *Bernard Kulick, Associate Administrator for Disaster Assistance, Small Business Administration, 409 3rd Street, S.W., Washington, DC 20416; (202) 205-6734; World Wide Web: http://www.sbaonline.sba.gov (click on "Disaster Assistance").*

## NCDC Releases Weather-Related Disaster Damage Figures

The National Climatic Data Center, part of the National Oceanic and Atmospheric Administration, recently released information on 23 weather-related disasters between 1980 and 1996 that exceeded $1 billion in damage. Of particular note, 15 storms that occurred over a 42-month period from August 1992 to January 1996 caused $75 billion in losses and 750 deaths. The storms include the blizzard and flooding in January 1996 in the Appalachians, mid-Atlantic, and Northeast; Hurricane Opal; Hurricane Marilyn; flooding that occurred in the south and California in 1994 and 1995; Tropical Storm Alberto; the southeast ice storm of February 1994; the 1993 California wildfires; the Great Floods in the Midwest in 1993; Hurricane Andrew; and various other droughts, floods, and hurricanes.

The list is available from the *National Climatic Data Center, Research Customer Service Group, Asheville, NC 28801; World Wide Web: http://www.ncdc.noaa.gov/publications/billionz.html.*

# Aggies on Hazards

The Hazard Reduction and Recovery Center (HRRC), our cow-pokin' cousins at the great state of Texas' A&M University, conducts research on both natural and technological hazard mitigation, response, and recovery. The center's publications include books, monographs, reports, and articles. Recent publications

include:

- ***Flood-Hazard Problems and Programmes in Asia's Large River Basins**, by Jeffrey W. Jacobs and James L. Westcoat, Jr. No. 120A. 14 pp. $4.00.*
- ***Natural Hazard Reduction and Sustainable Development: A Global Assessment**, by Philip R. Berke. No. 121A. 14 pp. $4.00.*
- ***Enhancing Plan Quality: Evaluating the Role of State Planning Mandates for Natural Hazard Mitigation**, by Philip R. Berke, Dale J. Roenigk, and Edward J. Kaiser. No. 123A. 39 pp. $4.00.*
- ***Mekong Committee History and Lessons for River Basin Development**, by Jeffrey W. Jacobs. No. 130A. 14 pp. $4.00.*
- ***Environmental Racism or Inequity: Comparative Study of Four Ethnic Groups**, by George O. Rogers. No. 131A. 19 pp. $4.00.*
- ***Planning and Sustainability: The Elements of a New (Improved?) Paradigm**, by Timothy Beatley. No. 132A. 14 pp. $4.00.*
- ***Promoting Sustainable Land Use: Mitigating Natural Hazards Through Land Use Planning**, by Timothy Beatley. No. 133A. 6 pp. $4.00.*
- ***A Study of Household Mitigation and Recovery Following Hurricane Gilbert in Jamaica**, by Clarence Feagin. No. 12B. 118 pp. $10.00.*
- ***A White Paper on Hurricane Loss Calculations for the Caribbean Region**, by Norris Stubbs. No. 42R. 100 pp. $10.00.*
- ***Cost Effectiveness of the New Building Code for Windstorm Resistant Construction Along the Texas Coast**, by Norris Stubbs, Dale Perry, and Patricia Lombard. No. 45R. 80 pp. $10.00.*
- ***Development of Wind Speed Contour Map for Texas Coastline**, by Dale Perry and Norris Stubbs. No. 46R. 24 pp. $8.00.*
- ***Estimate of Costs to Implement the New Building Code for Windstorm Resistant Construction Along the Texas Coast**, by Patricia Lombard, Norris Stubbs, and Dale Perry. No. 47R. 178 pp. $12.00.*
- ***Sustainable Development as a Guide to Community Land Use Policy: A Conceptual Framework**, by Philip R. Berke and Jack Kartez. No. 37P. 25 pp. $7.00.*
- ***Reducing Natural Hazard Risks Through Land Use Planning and Growth Management: Federal and State Policy Experience**, by Philip R. Berke. No. 38P. 42 pp. $10.00.*

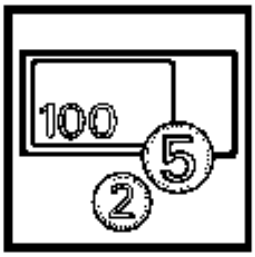
These publications can be ordered from the *Hazard Reduction and Recovery Center, College of Architecture, Texas A&M University, College Station, TX 77843-3137; (409) 845-7813; fax: (409) 845-4491; e-mail: h150hc@tamv1.tamu.edu.* Prepayment is requested and must be made in U.S. dollars. If first class mailing is desired, add $1.00 per item. Checks should be payable to the *Hazard Reduction and Recovery Center.*

## Central U.S. Earthquake Consortium Offers Earthquake Hazards Map

The Central U.S. Earthquake Consortium (CUSEC) recently published a 1:2,000,000-scale earthquake hazards map of member states. The map shows areas of potential liquefaction and ground shaking, epicenters of selected earthquakes, and features of interest to emergency management officials. The map also explains the differences between ground response maps and U.S. Geological Survey earthquake probability maps.

A limited number of the earthquake hazards maps (26" by 35") are available for the cost of shipping--$2.00-- from *CUSEC, 2630 East Holmes Road, Memphis, TN 38118-8001; (901) 345-0932; fax: (901) 345-0998.*

For further information on CUSEC's mapping project, write to *Paul B. DuMontelle, Coordinator, CUSEC State Geologists Project, Illinois State Geological Survey, 615 East Peabody Drive, Champaign, IL 61820.*




## CONTRACTS AND GRANTS

**Field Survey of the February 17, 1996, Irian Jaya Tsunami,** National Science Foundation, $13,464, 12 months. Principal Investigator: *Costas E. Synolakis, Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, CA 90007-4363; (213) 740-0613; fax: (213) 744-1426; e-mail: costas@mizar.usc.edu.*
In February, a strong earthquake shook Biak Island off Irian Jaya in East Indonesia, generating tsunami waves that reached both Japan and the U.S. This funding will support the participation of U.S. researchers in the international effort to learn from this event by gathering and studying perishable inundation data. The researchers will measure maximum runup at different locations, estimate inundation velocities, and interview eyewitnesses to determine the nature and number of waves that occurred.

**Tsunami Survey for the February 21, 1996, Peruvian Earthquake**, National Science Foundation, $12,603, 12 months. Principal Investigator: *Harry H. Yeh, Department of Civil Engineering, 167 Wilcox Hall, University of Washington, Seattle, WA 98195; (206) 685-8655; fax: (206) 685-3836; e-mail: harryeh@u.washington.edu.*
This grant will support the study by a small reconnaissance team of the earthquake and tsunami that occurred earlier this year along the northern coast of Peru. The tsunami, between three and five meters

high, swept into the port of Chimbote and destroyed fish processing plants and more than 50 houses. The team will gather information on runup, flow patterns and velocities, tide-gauge records, structural damage, scouring effects, sediment transport, ground shaking, impacts on estuaries and nearby lakes, and other secondary effects.

**The Relationship Between Snowpack and Terrain: Bridger Mountains, Montana,** National Science Foundation, $9,075, 18 months. Principal Investigator: *Melvin G. Marcus, Department of Geography, Arizona State University, P.O. Box 871603; Tempe, AZ 85287; (602) 965-7533; e-mail: aomgm@asuvm.inre.asu.edu.*
This research will contribute to understanding of avalanches by supporting sampling and modeling at a scale not previously examined. The study is based on the hypothesis that snowpack variations can be correlated to terrain. Sampling teams will collect data three times a season on snowpack stability, strength, depth, and other physical aspects, as well as location within the mountain range. In addition, weekly data will be collected to assess the evolution of the snowpack. The investigators hope to show that data from a specific area can be extrapolated to approximate the condition of nearby slopes.

**Multiple Autonomous Mobile Robots for Search and Rescue Applications**, National Science Foundation, $102,800, 24 months. Principal Investigators: *Robin Murphy, Mathematical and Computer Sciences, SH-408; Colorado School of Mines, 1500 Illinois, Golden, CO 80401-1887; (303) 273-3874; e-mail: rmurphy@mines.colorado.edu,* and *Julian Martinez, Department of Mining Engineering, Colorado School of Mines, 1500 Illinois, Golden, CO 80401-1887; (303) 273-3608; e-mail: jmartine@mines.colorado.edu.*
This project will support, over two years, 10 undergraduate students who will conduct research using two identical mobile robots for search and rescue in underground mines. During the second year, the students will transfer software developed and used in the mine-rescue robots to small robots suitable for search and rescue work in collapsed buildings. The use of two sets of robots and two variations of the same task will reinforce the development of general purpose solutions and basic software engineering skills.

**Estimating the Economic Impact of Catastrophic Urban Earthquakes,** National Science Foundation, $181,870, 24 months. Principal Investigators: *Stephanie E. Chang and Charles Scawthorn, EQE International, Inc., Yatsunami Building, 6F, 4-2, Minami Aoyama, 1-chome, Minato-ku, Tokyo 107, Japan; tel: (03) 3475-6020; fax: (03) 3475-6021; e-mail: crs@eqe.com.*
The Great Hanshin earthquake that struck Kobe, Japan, in 1995 killed over 5,000 residents and caused over $100 billion in losses. The magnitude of this disaster exceeds any in modern U.S. history and provides lessons regarding the earthquake threat in this country. This project will investigate economic impacts of the Hanshin quake in order to estimate the economic impacts of a great earthquake in the U. S. It will also compare the results with the effects of the moderate Northridge and Loma Prieta quakes in California and focus on nonlinear effects and structural changes in the economy.

**Normative Foundations in Risk Judgments,** National Science Foundation, $64,992, 12 months. Principal Investigator: *Carl F. Cranor, College of Humanities and Social Sciences, University of California-Riverside, 900 University Avenue, Riverside, CA 92521-0101; (714) 787-3572; e-mail:*

*carl@chss.cr.edu.*
This research will take a unique approach in comparing human concern about risk from toxic substances and risks from other hazards. Past discussion of comparative risk has been dominated by the scientific and technical risk assessment community, with little input from philosophers. This debate has missed some of the problems posed by the special properties of toxic substances and some of the differences between them and other risks, tending to overlook the acceptability of risks and assessing them only in terms of utilitarianism and cost-benefit analysis. This project's goal is to broaden understanding of the relevant moral paradigms used to evaluate risks.

**Earthquakes in the Utah Science Core Curriculum**, Federal Emergency Management Agency, $50,000, 12 months. Principal Investigator: *Deedee O'Brien, Earthquake Education Services, Department of Mines and Earth Sciences, University of Utah, Salt Lake City, UT 84112; (801) 581-6201; e-mail:*
*DOB@geode.umnh.utah.edu.*
This grant will help establish a cooperative effort between the Utah Division of Comprehensive Emergency Management and the University of Utah Seismograph Stations to enhance earthquake education in Utah. Project participants will adapt the FEMA curriculum ***Seismic Sleuths*** for use in secondary schools, develop Utah-specific teaching materials for the ninth grade, and present eight teacher training workshops throughout the state.

## NSF to Boost Earthquake Engineering Research

The National Science Foundation (NSF) recently announced a new competition for earthquake engineering research centers, to be funded through its Earthquake Hazard Mitigation Program in the Directorate for Engineering. NSF notes that, while the focus of this program is on geotechnical and structural engineering, earthquake hazard mitigation is a multidisciplinary problem and thus earthquake-related research in architecture, planning, and the social sciences will also be supported. Additionally, this program will also provide funds for education and information dissemination, especially the transfer of information to researchers and professionals in engineering, architecture, and planning.

Proposals must be received by October 15, 1996. For information on submitting proposals, contact *William Anderson, Clifford Astill, or S.C. Liu, Earthquake Hazard Mitigation Program, Division of Civil and Mechanical Systems, Room 545, National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230; (703) 306-1362; World Wide Web: http://www.nsf.gov.*

## Looking for American Contributors

Researchers at the Environmental Change Unit of the University of Oxford, U.K., are looking for U.S.

researchers who have conducted work on windstorms and/or sea level rise to contribute to an upcoming publication, ***Climate Change and Extreme Events: Altered Risk, Socio-Economic Impacts, and Policy Responses.*** Persons interested in contributing should contact *Thomas E. Downing, Climate Impacts and Responses, Environmental Change Unit, University of Oxford, Oxford OX1 3TB, U.K.; +44 1865 281180; fax: +44 1865 281181l; e-mail: Tom.Downing@ecu.ox.ac.uk; World Wide Web: http://info.ox.ac.uk/departments/ecu/.*

## CONFERENCES AND TRAINING

These are the latest conference announcements received by the Natural Hazards Center. A comprehensive list of all the meetings we have heard about is posted on our World Wide Web site:

*Home.html*

*25th General Assembly of the European Seismological Commission (ESC). Reykjavik, Iceland: September 9-14, 1996*. The ESC assembly will cover seismic issues pertinent to Europe, but with a heightened focus on volcanic hazards, on measures for mitigating seismic and volcanic risk, and on topics related to Iceland--in particular, current international research on the Iceland "hot spot" and on the Mid-Atlantic ridge. Several parallel meetings and field trips will complement the meeting. For detailed conference information, contact *LOC XXV ESC General Assembly, attn: Bardi Thorkelsson, Icelandic Meteorological Office, Bustadavegur 9, 150 Reykjavik, Iceland; tel: 354-560-0600; fax: 354-552-8121; e-mail: esc96@vedur.is; World Wide Web: Icelandic Meteorological Office (http://www.vedur.is), or European Seismological Commission (http://ui.nmh.ac.uk/esc.html).*

*1996 Annual Meeting of the National Association of Flood and Stormwater Management Agencies (NAFSMA): "Stormwater/Floodplain/Watershed Management: A Common Ground?" San Diego, California: October 23-26, 1996*. The 1996 NAFSMA meeting will include sessions on stormwater management, regulation, watershed management, flood control, current issues facing the Army Corps of Engineers, and the National Flood Insurance Program's Community Rating System. For details, contact *NAFSMA, 1401 Eye Street, N.W., Suite 900, Washington, DC 20005; (202) 218-4122.*

*Geological Society of America (GSA) Annual Meeting. Denver, Colorado: October 28-31, 1996.* The 1996 GSA meeting will include sessions on seismicity of North America and on numerous other geologic hazards. A wide range of pre- and post-meeting field trips are also offered. For a conference brochure, contact: *GSA, 3300 Penrose Place, Boulder, CO 80301; (303) 447-2020; (800) 472-1988; fax: (303) 447-0648; e-mail: meetings@geosociety.org; World Wide Web: http://www.geosociety.org.*

*Sixth International Conference of Disaster Medicine and Technical Exhibition of Medical and Logistic Equipment for Disaster Situations. Sponsors: International Society of Disaster Medicine, Geneva, and the Hungarian Society of Military and Disaster Medicine. Budapest, Hungary: November 3-6, 1996.* The objectives of this conference are to convey pertinent, up-to-date information concerning the management of casualties in disasters and to share new research and techniques related to mass medical care. The program will cover education and training in disaster medicine, public health and emergencies for large populations, epidemiology of disasters, and management of disaster victims. For more information, contact the *Conference Secretariat, Asszisztencia Congress Bureau Ltd., Oktober 23. u. 17.III/3, H-1117 Budapest, Hungary; tel/fax: +361 161 0149; e-mail: asszisztencia@odin.net.*

*PPR '96: Prevention, Preparedness, and Response to Major Industrial Accidents. Sponsor: Major Industrial Accidents Council of Canada (MIACC). Edmonton, Alberta, Canada: November 4-7, 1996.* PPR '96 will address the latest developments in the fields of process safety and loss management, as well as prevention of, preparedness for, and response to major industrial accidents. For conference specifics, contact *MIACC, 265 Carling Avenue, Suite 600, Ottawa, Ontario, Canada K1S 2E1; (613) 232-4435; fax: (613) 232-4915; e-mail: miacc@globalx.net.*

*Housing and Hazards: An International Workshop for Practitioners Implementing Hazard-Resistant Housing. Sponsors: Earth Resources Centre, University of Exeter, U.K., and Bangladesh University of Engineering and Technology (BUET). Dhaka, Bangladesh: December 7-10, 1996.* This workshop will explore processes through which safe building practices can be disseminated to people in developing countries. The organizers hope to attract both nongovernmental organization staff and academics from many different geographical and cultural settings. A field visit will begin the workshop and provide a less formal setting in which to discuss the factors involved in identifying and disseminating principles of hazard-resistant construction. The subsequent workshop will consist of formal presentations interspersed with discussions in smaller groups. The focus will be on the planning and implementation of housing improvements and on simple but effective strengthening techniques. Sociological and cultural factors that influence the form and function of a dwelling will also be considered. Abstracts are invited and should be sent to the workshop secretary by August 1996. For details or to register, contact *S. Seraj, Housing and Hazards Workshop Secretary, Department of Civil Engineering, Bangladesh University of Engineering and Technology, Dhaka 1000, Bangladesh; fax: +880-2-863026; e-mail: librarian.buet@driktap.tool.nl.* Alternatively, international participants may contact *R. Hodgson, The Earth Resources Centre, University of Exeter, Exeter EX4 4QE, U.K.; fax: +44-(0)1392-263907; e-mail: R.L.P.Hodgson@exeter.ac.uk.*

*Fifth U.S./Japan Workshop on Urban Earthquake Hazard Reduction. Sponsors: Earthquake*

*Engineering Research Institute (EERI) and Japan Institute of Social Safety Science (ISSS). Los Angeles, California: January 15-17, 1997*. The theme of this workshop is "Recovery and Reconstruction from Recent Earthquakes: Implications for Urban Earthquake Hazard Reduction." Its objectives are to identify recent major earthquake experiences that have broadened understanding of response, recovery, and reconstruction; to strengthen relationships between U.S. and Japanese researchers; to identify areas where understanding of repair procedures, planning, or policy is inadequate; and to generate a publication to convey the information from this workshop. Abstracts are due July 31, 1996. For details, contact *Susan Tubbesing, EERI, 499 14th Street, Suite 320, Oakland, CA 94612-1934; (510) 451-0905; fax: (510) 451-5411; e-mail: eeri@eeri.org*.

*Sixth Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst. Sponsor: Department of Geography, Geology, and Planning, Southwest Missouri State University; and P.E. LaMoreaux & Associates. Springfield, Missouri: April 6-9, 1997*. Besides keynote speakers and numerous paper presentations, this conference will feature an optional field trip to examine the environmental and engineering issues surrounding human occupation of karst terrain. Papers are invited from engineers, geologists, hydrogeologists, geographers, planners, and other professionals dealing with such problems. Presentations dealing with governmental regulations and permitting for karst terrain are particularly welcome. Abstracts are due August 22, 1996. For further information, contact *Barry F. Beck, P.E. LaMoreaux & Associates, Inc., P.O. Box 4578, Oak Ridge, TN 37831-4578; (423) 483-7483; e-mail: pelaor@use.usit.net*.

*International Symposium on Snow and Avalanches. Sponsors: International Glaciological Society and others. Chamonix, France: May 26-30, 1997*. In most mountain regions, avalanches pose a significant threat to human life and property. However, improved scientific knowledge of mountain snow and avalanche dynamics can open new and powerful prospects for reducing this threat. This symposium will focus on those aspects of snow science related to understanding the snow cover, its properties, and movements. To receive a conference circular, contact the *Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, U.K.; tel: +44 1223 355974; fax: +44 1223 336543*.

*Eighth U.S. National Conference on Wind Engineering. Baltimore, Maryland: June 5-7, 1997*. Held every four years, the National Conference on Wind Engineering provides a major forum for the discussion of recent developments in, and applications of, wind engineering. Virtually all aspects of the discipline will be addressed. A call for papers has been issued; two-page abstracts are due November 30, 1996. For a complete announcement, contact *Nicholas P. Jones, Eighth U.S. National Conference on Wind Engineering, Department of Civil Engineering, The Johns Hopkins University, Baltimore, MD 21218-2686; (410) 516-7874; fax: (410) 516-7473; e-mail: 8usncwe@jhu.edu; World Wide Web: http://www.ce.jhu.edu/~8usncwe/index.html*.

*International Symposium on Landslide Hazard Assessment. Sponsors: Japan Ministry of Education, Science, Culture and Sports; Working Group for Prediction of Rapid Landslide Motion; International Union of Forestry Organizations; and others. Xian, China: July 12-24, 1997.* This symposium will include an initial field trip to landslide sites around Xian, followed by sessions on landslide hazard

assessment, precursor phenomena, case histories, prediction, and earthquake-induced landslides. Additional field trips are planned following the conference. For more information, contact *K. Sassa, Disaster Prevention Research Institute, Kyoto University, Uji, Kyoto 611, Japan; tel: (81)-774-0789; fax: (81)-774-32-5597.*

*Coastal Zone '97: "Charting the Future of Coastal Zone Management for the Next 25 Years." Boston, Massachusetts: July 20-26, 1997.* Coastal Zone '97 will be the 10th conference in this series of biennial international meetings examining the complex, multidisciplinary problems facing the world's oceans and coastlines. CZ97 occurs at the 25th anniversary of the Coastal Zone Management Act--landmark national legislation that promotes integrated coastal zone management. The conference affords an opportunity to evaluate the course of coastal zone management in this last quarter century and to examine problems and opportunities for the future. All individuals and organizations concerned with the management of the nation's coastlines are encouraged to attend. A call for proposals for presentations, special sessions, and posters has been issued, with abstracts due September 1, 1996. For further information and a conference brochure, contact *Martin C. Miller, U.S. Army Corps of Engineers Waterways Experiment Station, Attn: CEWES-CR-O, 3909 Halls Ferry Road, Vicksburg, MS 39180.*

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## FEMA Offers Flood Awareness "Miniconferences"

The National Flood Insurance Program (NFIP) is conducting a series of one-day flood awareness miniconferences in each of the FEMA regions, focusing on the role of insurance agents and companies, lenders, appraisers, realtors, floodplain managers, disaster and emergency managers, and community officials in promoting flood insurance and flood loss reduction. The remaining conferences are tentatively scheduled as follows:

| FEMA Region | Date |
|---|---|
| V--Madison, WI | July 1996 |
| I--Braintree, MA | September 1996 |
| IV--Montgomery, AL | January, February 1997 |
| VII--Kansas City, KS | May/June 1997 |
| II--Long Island, NY | August/September 1997 |

For more information, contact your *FEMA Regional Office* or the *Federal Insurance Administration, Federal Emergency Management Agency, 500 C Street SW, Room 441, Washington, DC 20472; (202) 646-4623; fax: (202) 646-3689.*

## ON THE LINE

# Coalitions Texas Style

## Educating the Public about Emergencies and Disasters

### A Joint Effort

In 1990, the Hazard Reduction and Recovery Center (HRRC) at Texas A&M University and the Texas Agricultural Extension Service (TAEX) joined together to use the vast communication network of TAEX to improve information transfer regarding emergencies and disasters from the research community to the general public.

Since that time, the coalition has expanded to include the state coordinating chapter of the American Red Cross (ARC) represented by the coordinator of Community Disaster Education for Texas, and has received support from local Red Cross chapters. The TAEX-HRRC-ARC project has continued to expand and works in consultation with the Family Preparedness Program (FPP) of the Federal Emergency Management Agency (FEMA), under the direction of the Texas Division of Emergency Management. Including all these relevant agencies has maximized the opportunity for effective public outreach and education.

The goal of the disaster education program is to minimize property damage, injuries, and loss of life by informing and educating the public. The joint resources of the participating organizations offer a unique opportunity, with TAEX providing over 800 extension agents throughout Texas, all professionally trained, to deliver the educational programs.

### Program Foundation

The products developed by the coalition were based on the following assumptions:

- Property damage, injuries, and loss of life occur in the initial phase of a disaster, often before emergency responders arrive.
- Members of the public must assume responsibility for their own safety. Emergency personnel cannot be in all places when a disaster occurs.
- Panic is not a widespread behavior during or following a disaster; rational behavior is. Many times, incorrect behavior is labeled as panic, when in fact individuals are responding to misinformation or a lack of information.
- Education is the single most important factor in reducing the impacts of a disaster or emergency.

### The Extension Agent's Handbook

In 1992, the TAEX-HRRC-ARC program received a grant from the United States Department of Agriculture (USDA), enabling the coalition to develop ***The Extension Agent's Handbook for Emergency Preparation and Response*** (see the ***Observer***, Vol. XIX, No. 3, p. 20). This 160-page resource was created for extension service personnel to support both education about and actual response to emergencies. Currently in its fourth printing, the handbook has been adopted by several other states for use with their extension services, and every county extension office in Texas now has this information. Following a review by FEMA, the handbook was also made available through FEMA's World Wide Web site (*http://www.fema.gov*). Additionally, the Puerto Rican Extension Service has sought and received permission to translate the handbook into Spanish.

***The Extension Agent's Handbook*** includes comprehensive information on general preparedness as well as hazard-specific information; it is fully adaptable to specific locales. The section on general issues is devoted to individual preparedness and mitigation, while the second section covers preparation and response for 10 hazards: floods, fires, hurricanes, tornadoes, winter storms, earthquakes, drought, radiological accidents, hazardous materials accidents, and volcanic eruptions.

## The Workshop

During the past two years, the TAEX-HRRC-ARC program has focused on the development and pilot-testing of an "Extension Service Workshop for Conducting Community Disaster Education." This workshop is designed to:

- increase the extension agent's understanding of how the public perceives emergency- and disaster-related information; and
- help extension agents promote education about both preparedness and proper emergency response.

Topics covered in the one-day workshop include:

- using strategies and materials for conducting emergency education programs for the public;
- understanding common myths and misconceptions about emergencies and disasters;
- reaching the public before emergencies and disasters occur;
- creating and implementing disaster education programs; and;
- identifying materials and resources for disaster education efforts.

The objectives of the workshop are to enable the extension agents to:

- identify county needs for emergency education;
- devise educational strategies to meet these needs;
- identify methods and approaches to increase the public's preparedness; and
- create specific plans for disaster or emergency education activities.

The workshop takes advantage of both the extension agents' professional training and their established relationship with the public. Through education and public outreach, this program will help the public stay safe, reduce injuries and loss of life, and minimize property damage.

Additional goals for this program include offering the workshop to all extension districts in Texas by 1997 and, with the assistance of 4-H programs, developing a youth component in Texas. In addition, TAEX will work to strengthen its relationship with the Puerto Rican Extension Service, so that this information is readily available in Spanish. For the long term, the coalition hopes to firmly establish these educational programs in each of the 12 TAEX districts, emphasizing both youth programs and rural outreach.

David Bilbo, Associate Professor of Construction Science, and Coordinator of Extension Service for the Hazard Reduction and Recovery Center, Texas A&M University

## Banking on the Future

Those who work to reduce the impacts of disasters are not the only ones asking the question: How do we build and organize communities so that they survive and thrive? The Department of Energy (DOE) is asking the same question, not just in the context of disasters, but in the broader sense of overall sustainability. To pursue this issue, the DOE has created a demonstration project, the Center of Excellence for Sustainable Development--an outgrowth of DOE's work with Midwest communities devastated by the 1993 floods. DOE helped those communities rebuild, using sustainable development strategies that integrate economic development and environmental quality. With the creation of the new center, this assistance will be offered nationwide during a six-month demonstration project, which began in March.

The center's mission is to provide communities with consultation on sustainable development and to help them link to other supporting public and private programs. To accomplish this, the center offers information on sustainable activities in other communities; provides a "tool kit," including manuals, workbooks, data bases, case studies, and model codes and ordinances; and helps identify public and private sources of technical and financial assistance.

Many of the center's resources can be found on their World Wide Web site, *http://www.sustainable.doe.gov*, which includes the report ***Rebuilding the Future--A Guide to Sustainable Redevelopment for Disaster-Affected Communities*** (DOE, 1994), items from the tool kit; information on the rebuilding of Pattonsburg, Missouri; and all sorts of information on sustainability in general.

Those who prefer more traditional modes of communication can contact the *Center of Excellence for Sustainable Development, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Denver Regional Support Office, 2801 Youngfield Street, Suite 380, Golden, CO 80401; (800)*

*357-7732 or (303) 231-5750; fax: (303) 231-5757; e-mail: sustainable.development@hq.doe.gov.*

# RECENT PUBLICATIONS

## All Hazards

***Partnerships in Preparedness: A Compendium of Exemplary Practices in Emergency Management.*** *1995. 95 pp. Free. Order from the Federal Emergency Management Agency (FEMA), Distribution Facility, 8231 Stayton Drive, Jessup, MD 20794; (800) 480-2520 or (202) 646-4383; fax: (301) 497-6378.*
This report identifies well-designed, effective programs in emergency management, as selected by a panel of emergency management professionals. The entries, organized alphabetically by state, provide the name of the program, complete contact information, program type, population targeted, program setting, startup date, description, annual budget, sources of funding, and additional sources of information for each program. The information is also indexed by title, subject, location, and contact.

***Reduction and Predictability of Natural Disasters.*** *John B. Rundle, Donald L. Turcotte, and William Klein, Editors. 1996. 310 pp. $31.95. Purchase from Addison-Wesley Longman Publishing, 1 Jacob Way, Reading, MA 01867; (617) 944-3700; fax: (800) 333-3328.*
***Reduction and Predictability of Natural Disasters*** contains the proceedings of a meeting held in January 1994 to examine the applicability of computer modeling to natural disasters. Indeed, contributors feel that one of the most promising approaches to reducing the impacts of disasters is the capability to simulate these events on computers. Although fairly technical in nature, this volume includes sections on the societal impacts of natural disasters and predictions of future fatalities, the modeling of floods and landslides, and prediction and modeling of earthquake impacts.

***Acceptable Risks for Major Infrastructure.*** *P. Heinrichs and R. Fell, Editors. 1995. 203 pp. $65.00, plus $3.75 shipping. Available from Ashgate Publishing Co., Old Post Road, Brookfield, VT 05036; (802) 276-3162; fax: (802) 276-3837.*
Civil engineers and other professionals involved in the design and planning of infrastructure such as dams, water supplies, waste disposal sites, roads, airports, and harbors have long recognized the need to consider the risks posed by and to existing infrastructure and to assess whether these risks are acceptable. The Australian National Committee on Large Dams (ANCOLD) organized a symposium in Sydney in 1994 to examine these issues, and ***Acceptable Risk for Major Infrastructure*** contains the proceedings of that meeting. It includes papers on risk assessment and dam safety; legal constraints; community acceptance of risk; environmental economics and risk; public infrastructure; risk financing; risk assessment guidelines; and evaluating risks due to earthquakes, volcanoes, and floods.

***Emergency Preparedness Chair Interest Group (EPCIG) Newsletter.*** *4 pp. Free. Order from Sarah Peterson, Regional Environmental Health and Safety, Kaiser Permanente, 1800 Harrison Street, 20th*

*Floor, Oakland, CA 94612; e-mail: ehssap@ncal.kaiperm.org.*
The ***EPCIG Newsletter*** is produced by Northern California Kaiser Permanente to communicate emergency preparedness information to medical center managers, administrators, and other interested employees. Through the newsletter, the EPCIG membership shares knowledge, training, and experience, re-garding protection of staff, continuation of medical care during and after a major disaster, and protection of company assets. In the past, the newsletter, published every six months, has provided information on such topics as the incident command system, the role of various departments in Kaiser Permanente during disaster, the company postearthquake inspection program, legislation regarding workplace violence, and the organization's earthquake hazard mitigation program.

***Intelligence Support to Humanitarian-Disaster Relief Operations.*** *G. Ted Constantine. No. CSI 95-005. 1995. 27 pp. Free. To obtain a copy, contact Ted Constantine, Defense Intelligence Agency, Office of Transnational Issues, Washington, DC 20340; (202) 231-3455; fax: (202) 231-8741; e-mail: AFcongt@dia.osis.gov.*
This document presents the results of an inquiry into the role of the U.S. intelligence community in supporting U.S. humanitarian and disaster relief operations conducted abroad by U.S. military forces. It identifies the "consumers" of intelligence information for disaster relief operations, determines their information requirements, assesses the intelligence community's capability to provide such information, and offers recommendations. The inquiry focused on humanitarian emergencies caused by natural or technological disasters, and the author discovered that both policy makers and field operators need significantly greater intelligence information regarding humanitarian emergency issues. At the same time, the level of commitment from the intelligence community for providing information is uneven at best and does not meet the needs of the relief agencies.

***The Political Economy of Large Natural Disasters, With Special Reference to Developing Countries.*** *J.M. Albala-Bertrand. 1993. 275 pp. $65.00, plus $3.50 shipping. Order from Oxford University Press, 2001 Evans Road, Cary, NC, 27513; (800) 451-7556; fax: (919) 677-1303; World Wide Web: http://www.oup-usa.org.*
In ***The Political Economy of Large Natural Disasters***, Albala-Bertrand asks a number of important questions regarding the causes and meaning of disasters, for example: How reliable are current statistics and general information about disasters? What relevant patterns can be derived from existing data? To what extent do society's structure and dynamics determine people's vulnerability to disasters? and What are the overall effects of disasters on economy and society? In response, the author presents an analytical framework employed to study disaster statistics and patterns, effects on macroeconomic variables, vulnerability, indirect disaster effects, disaster-response motivations, and the effects of disasters on an economy and society in general.

## Floods and Severe Weather

***Delineation of Flooding Within the Upper Mississippi River Basin, 1993--Flood of June 18 through August 4, 1993, in Des Moines and Vicinity, Iowa.*** *Bryan D. Schaap. Hydrologic Investigations Atlas HA 735-D. 1996. Two poster-size sheets, 32" x 39" and 36" x 47". $4.00.*

***Delineation of Flood Within the Upper Mississippi River Basin--Flood of June 19-July 31, 1993, in Davenport, Iowa, and Vicinity.*** *Bryan D. Schaap. 1996. One sheet, 42" x 42". $4.00.*
***Delineation of Flooding Within the Upper Mississippi River Basin, 1993--Flood of June 29-September 18, 1993, in Iowa City and Vicinity, Iowa.*** *Bryan D. Schaap and Craig A. Harvey. One sheet, 44" x 42". $4.00.*
*A $3.50 handling fee for all orders is required, regardless of number of items ordered. All three atlases can be ordered from the U.S. Geological Survey, Books and Open-File Reports, Federal Center, Building 810, Box 25425, Denver, CO 80225-0425; (800) USA-MAPS; (800) 872-6277.*
The U.S. Geological Survey (USGS) recently released these three atlases that depict the 100-year flood boundaries, as designated by the Federal Emergency Management Agency, compared to the flooding that occurred in specific areas of Iowa during the Great Midwest Floods of 1993. Information is also included on maximum water-surface elevations and discharge rates as determined by streamflow gauging stations.

***Floodplain Management 1995: State and Local Programs.*** *1996. 146 pp. $20.00, ASFPM members; $25.00, nonmembers, plus $3.50 shipping for one copy, $2.00 for each additional copy. Order from the Association of State Floodplain Managers (ASFPM), Publications, 4233 West Beltline Highway, Madison, WI 53711; (608) 274-0123.*
Floodplain managers recognize that it takes a cooperative effort among federal, state, and local governments and the private sector to reduce flood damage in the U.S., to prevent future damage, and to protect the natural resources of floodplains. To support that goal, this report documents the capabilities of state and local floodplain management programs, covering activities undertaken from 1992 to 1994. Chapter I describes the divisions of responsibility for floodplain management, including state and local programs, as well as factors that affect these programs. Chapter II examines specific state and local floodplain management activities, including monitoring and enforcement, land-use planning, mapping, state activities in support of the National Flood Insurance Program, and state activities that foster professionalism in floodplain management. Chapter III addresses activities that modify susceptibility to floods, including regulations, development and redevelopment policies, disaster preparedness and assistance, floodproofing, and forecasting and warning. Chapters IV and V look at activities to modify flooding and its impacts, and Chapter VI discusses activities that restore and preserve the natural resources and functions of the floodplain. Chapter VII offers conclusions, and an appendix provides brief descriptions of state programs as well as contact information.

***Lightning 101: An Introduction.*** *1996. 38 pp. $5.00. Copies are available from the National Lightning Safety Institute, 891 North Hoover Avenue, P.O. Box 778, Louisville, CO 80027-0778; (303) 666-8817; fax: (303) 666-8786; e-mail: rkithil@ix.netcom.com; World Wide Web: http://www.lightningsafety.com.*
On average, lightning is the leading cause of severe weather deaths, injuries, and damage (exceeding $2 billion annually). This booklet, written for facility managers, is based on the premise that losses due to lightning can be reduced with a comprehensive and site-specific hazard-management program. It explains the physical phenomenon of lightning; theories about its causes; how to evaluate lightning risks; the effects of lightning on assets, facilities, and structures; protection of buildings; testing of protection systems; and lightning safety in general.

***July 1995 Heat Wave.*** *Natural Disaster Survey Report. 1995. 72 pp. Free. Single copies are available from the National Weather Service, Customer Service Corporation (W/OM11), 1325 East West Highway, Silver Spring, MD 20910.*

Extreme heat may be one of the more underrated and less understood deadly weather phenomenon. Unlike violent weather that causes physical destruction and clearly identifiable victims, extreme heat produces risks that are less apparent, especially at its outset. In a normal year, about 175 Americans die from summer heat; however, in 1995, more than 1,000 people died. This disaster survey by the National Oceanic and Atmospheric Administration investigates all aspects of the forecast of and response to the summer of extreme heat. It includes an executive summary that presents 49 findings, along with corresponding recommendations, as well as more detailed information on the weather system that produced the heat wave; the health impacts, particularly the heat-related deaths that occurred in Chicago, Illinois, and Milwaukee, Wisconsin; the provision of weather forecasts and other products; communications, emergency preparedness, and community response; and case studies in heat wave preparedness.

***Climatology of Hail Risk in the U.S.*** *Stanley A. Changnon. 1996. 78 pp. $85.00, plus $3.00 shipping. Copies can be obtained from Changnon Climatologist, 801 Buckthorn Circle, Mahomet, IL 61853; (217) 586-5691.*

Finding information about the climatology of damaging hail can be difficult, not because there are major unknowns about hail climate, but because much of what is known about hail in the U.S. is distributed throughout diverse resources. This report brings that information together. Information was drawn from crop-hail insurance data, National Weather Service data, and special studies of hail. The spatial information addresses the frequency, seasons of peak activity, and relative intensity of hail for a region. The temporal characteristics examined include state average hail days for each decade in the 20th century, intensity, and probability of future hail events.

## Hurricanes and Tropical Storms

***Hurricane Marilyn: September 15-16, 1995.*** *Natural Disaster Survey Report. 1996. 82 pp. Free.*
***Tropical Storm Alberto: Heavy Rains and Flooding--Georgia, Alabama, Florida, July 1994. Natural Disaster Survey Report. 1995.*** *140 pp. Free.*
*Single copies are available from the National Weather Service, Customer Service Corporation (W/OM11), 1325 East West Highway, Silver Spring, MD 20910.*

Hurricane Marilyn struck the U.S. Virgin Islands and Puerto Rico in September 1995, the first storm to hit the area since Hurricane Hugo seven years earlier. Although not as intense as Hugo, Marilyn's impacts were still dramatic--eight deaths, $2.1 billion in damage, and severe disruption of the islands' tourism industry. This assessment of the performance of the National Weather Service during the hurricane includes information on the impacts of the storm, its hydrometeorology, preparedness activities, user response, and the performance of the National Weather Service in general. Appendices provide information on the Saffir-Simpson scale, the aerial survey of damage, river gauge heights and discharges during the storm, forecast procedures and errors associated with Marilyn, and sample hurricane statements and short-term forecasts.

As Tropical Storm Alberto began to decay in July 1994, it produced torrential rainfall that caused some

of the worst flooding ever observed across portions of Georgia, Alabama, and Florida, claiming 33 lives and causing nearly $750 million in damage. The second report contains the results of a natural disaster survey team evaluation of the National Weather Service response to this event. It describes the impacts of the flooding, the storm's hydrometeorology, the performance of the National Weather Service in issuing forecasts and storm track predictions, and information dissemination activities. The report also discusses issues that were highlighted by the event, such as vulnerabilities due to recent weather service modernization, and provides a summary of findings and recommendations.

***EDA's Post-Disaster Assistance Program After Hurricane Andrew: Final Report.*** *1996. 140 pp. Free. Copies are available from Christopher Dyer, Aguirre International, 4630 Montgomery, Suite 600, Bethesda, MD 20814; (301) 654-8800; fax: (301) 654-9120,* or *John Fieser, Technical Assistance and Research Division, Economic Development Administration (EDA), U.S. Department of Commerce, Washington, DC 20230.*
Following Hurricane Andrew in south Florida in 1992, the Economic Development Administration (EDA) helped communities and organizations by providing over $50 million in planning grants and revolving loans; infrastructure projects and building renovations and improvements; and training and technical assistance programs. This report evaluates the effectiveness of these programs, asking two important questions: Can appropriate economic assistance help communities regain their former condition and even enhance their quality of life? and, Does such assistance have implications beyond the immediate disaster area? Researchers examined the effectiveness of projects in attaining specified goals, the appropriateness of each project to the needs created by the disaster, the economic impacts of the projects, and the social impacts on and benefits to target populations. They discovered that EDA projects have a regional impact, projects do stimulate economic growth, and EDA was generally effective in maintaining an ongoing relationship with local officials and potential grantees.

## Earthquakes

*"The Northridge, California, Earthquake of January 17, 1994."* ***Bulletin of the Seismological Society of America.*** *Volume 86, No. 1, part B. 368 pp. $30.00 (California residents, add 8% sales tax). To order, contact the Seismological Society of America, 201 Plaza Professional Building, El Cerrito, CA 94530; (510) 525-5474; fax: (510) 525-7204; World Wide Web: http://www.seismosoc.org/ssa/, select "Publications" to view the table of contents.*
The Northridge earthquake was almost certainly the most costly earthquake in the history of the U.S., with property damage exceeding $20 billion. This special issue of the ***Bulletin*** contains 24 articles that examine many aspects of the quake, such as fault geology, source characterization, path effect, site response, landslides, and impact on engineering works.

***The Effect of Earthquakes on Manufactured Home Installations.*** *Document No. ACCN-HUD7004. 1995. 112 pp. $5.00.*
***Minimizing Damage and Repair Costs to Manufactured Homes During an Earthquake.*** *Document No. ACCN-HUD7003. 1995. 18 pp. $5.00.*
*Both items are available from HUD USER, P.O. Box 6091, Rockville, MD 20849; (800) 245-2691; fax:*

*(301) 251-5767; TDD: (800) 877-8339. All orders must be prepaid. Credit card orders are accepted.*
The Northridge earthquake damaged numerous homes in the Los Angeles area; however, manufactured homes experienced a disproportionately high incidence of damage--more than 9,000 were severely damaged--renewing concerns about the safety of manufactured housing in the U.S. Research indicated that nearly half of these homes were damaged due to shifting and toppling from their support systems. Also, a surprisingly high number of homes were destroyed by fires fed by natural gas from ruptured supply pipes. As a result, the U.S. Department of Housing and Urban Development (HUD), Office of Policy Development and Research, developed this report and brochure to provide guidelines on installing manufactured housing in seismically active areas. ***The Effect of Earthquakes on Manufactured Home Installations*** provides engineers with information for designing quake-resistant bracing systems and technical information for building regulatory agencies to determine how to improve installation, strengthen foundations and utility connections, retrofit existing homes, and mitigate damage. ***Minimizing Damage and Repair Costs*** provides recommendations to homeowners and park operators on limiting and preventing structural damage and focuses on improving gas and utility connections.

***Rapid Visual Screening of Buildings for Potential Seismic Hazards Training Manual.*** *ATC-21-T. 1996. 120 pp. and 120 slides. $160.00 (plus $5.00 shipping for overseas orders). California residents, please add local sales tax. Order from the Applied Technology Council (ATC), 555 Twin Dolphin Drive, Suite 550, Redwood City, CA 94065; (415) 595-1542; fax: (415) 593-2320.*
In 1988, the Applied Technology Council published the ***Handbook for Rapid Visual Screening of Buildings for Potential Seismic Hazards*** (ATC-21). This companion volume was developed to aid training of individuals who undertake such screening. The ***Training Manual*** provides a narrative that can be used by a trainer and includes an overview of the rapid visual screening procedure; a list of trainer and trainee qualifications and instructions to the trainer; an explanation of earthquake behavior of buildings, building types, and typical damage; evaluation of structures and hazard mitigation factors; a list of steps for implementing the procedure; guidance on field inspection and gathering of data; and example applications. The slides provide supporting photographs, schematic drawings, and textual information.

## Wildfires

***An International Collection of Wildland-Urban Interface Resource Materials.*** *K.G. Hirsch, M.M. Pinedo, and J.M. Greenlee. Information Report NOR-X-344. 1996. 150 pp. Free. Order from Natural Resources Canada, Canadian Forest Service, Northwest Region, Northern Forestry Centre, 5320 122nd Street, Edmonton, Alberta, Canada T6H 3S5.*
***An International Collection of Wildland-Urban Interface Resource Materials*** is a bibliography of about 2,200 materials compiled by the International Association of Wildland Fire and the Canadian Forest Service, Northwest Forestry Centre. Most items in this collection were produced prior to 1993 and pertain to the U.S., Australia, and Canada. Listed alphabetically by author, they provide information on a wide spectrum of topics, including building materials, hazard reduction techniques, disaster management, politics, and social issues. Citations are also indexed by subject in three categories: general and technical materials, newspaper articles, and public education materials.

***IFCI Urban-Wildland Interface Code: First Draft.*** *1996. 60 pp. Free.*
***IFCI Fire Code Journal: Part II--1996 Annual Report of the Uniform Fire Code (U.F.C.) and Urban-Wildland Interface Code (U.W.I.C.) Code Development Committees.*** *1996. 61 pp. Free.*
*A limited number of copies of both documents is available from the International Fire Code Institute, 5360 Workman Mill Road, Whittier, CA 90601-2298; (310) 699-0124; fax: (310) 699-8031.*
The first draft of the ***Urban-Wildland Interface Code***, the result of two years of work by the Urban-Wildland Interface Code Committee, provides a model code for undertaking mitigation of wildland fire hazards. Regulations address both land use and the built environment, and much of the information was drawn from ordinances that were implemented to mitigate hazards in various jurisdictions throughout the U.S. and from data collected from tests and actual fires.
The ***Annual Report*** outlines a process for challenging the draft code and presents items that were both approved and disapproved in the code-drafting process. A ***Challenge Agenda*** will be released shortly with dissenting points of view.

For those who would like to research this topic further, the 1991 document, ***NFPA 299: Protection of Life and Property from Wildfire*** is the standard developed by the Forest and Rural Fire Protection Committee of the National Fire Protection Association to provide criteria for fire agencies, land use planners, architects, developers, and local governments for safe development in fire-prone areas. ***NFPA 299*** is available for $21.00, plus $4.50 shipping, from the *National Fire Protection Association, 11 Tracy Drive, Avon, MA 02322; (800) 344-3555; fax: (800) 593-6372.*

***International Forest Fire News.*** *Published semi-annually. Free. Copies can be requested from the Timber Section, UN-ECE Trade Division, United Nations, Palais des Nations, CH - 1211 Geneva 10, Switzerland; fax: +(41-22) 917-0041.*
***International Forest Fire News*** is a joint effort of the United Nations Team of Specialists on Forest Fire, the International Union of Forestry Research Organizations, the International Association of Wildland Fire, and other organizations. A recent sample issue contains information on activities in various countries, technological developments, research, news from the United Nations, recent publications, and upcoming meetings. The editors invite contributions from interested individuals and organizations. For more information, contact the editor, *Johann Georg Goldammer, Fire Ecology Research Group, Freiburg University, P.O. Box D-79085, Freiburg, Germany; tel: + 49-761-80 80 11; fax: + 49-761-80 80 12; telex: 41 87 674 mpch d; e-mail: jggold@sun1.ruf.uni-freiburg.de.*

## Recent Videos, Slides, and CDs

***1995 Hurricanes (DMSP).*** *1996. 22 slides. $30.00.*
***1995 Typhoons (DMSP).*** *1996. 23 slides. $30.00.*
*All non-U.S. orders must include a $10.00 handling charge. Orders should be directed to the National Geophysical Data Center, Code #/GC2, Department 979, 325 Broadway, Boulder, CO 80303-3328;*

*(303) 497-6761; fax: (303) 497-6513; e-mail: info@ngdc.noaa.gov; telex: 592811 NOAA MASC BDR; TDD: (303) 497-6958. Prepayment should be made by check or money order, drawn on a U.S. bank in U.S. dollars, and payable to "Commerce/NOAA/NGDC." Visa, MasterCard, and American Express are also accepted.*
When 11 tropical cyclones reached hurricane status--nearly double the annual average--the 1995 Atlantic hurricane season became the most active since 1933. In addition, in 1995 12 Pacific tropical cyclones became typhoons, five of which were super typhoons with winds in excess of 150 mph. Defense Meteorological Satellite Program (DMSP) satellites photographed these storms, and the National Geophysical Data Center has created two slide sets from the satellites' unique vantage point. The name of each storm and the time of the photograph are printed on each slide, and captions in the accompanying information booklet describe the magnitude and path of the storm.

***From Chaos to Confidence: A Family Prepares for a Tornado Strike.*** *1996. 14 minutes. $8.00. Copies are available from Mike Penner, City of Olathe, Office of Emergency Management, P.O. Box 768, Olathe, KS 66051; (913) 782-4500; fax: (913) 791-6370; e-mail: dmfd87a@prodigy.com.*
This video describes how families and households can prepare for and respond to tornadoes.

***Everything Weather: The Essential Guide to the Whys and Wonders of Weather.*** *CD-ROM (available in both Windows and Macintosh versions). 1996. $39.95, plus $4.95 shipping. (Georgia and Michigan residents, add appropriate sales tax.) For system requirements and ordering information, contact BVE Products, Inc., Everything Weather, P.O. Box 2249, Livonia, MI 48151-2249; domestic orders: (800) 633-2222; international orders: (800) 806-1130.*
The Weather Channel recently released this CD-ROM, an electronic guide to weather, that contains interactive weather maps; programs for creating a hurricane tracking map and accessing on-line weather forecasts; and footage of tornadoes, hurricanes, and thunderstorms. In addition, ***Everything Weather*** includes a climate data base for more than 500 U.S. cities and more than 200 international cities; articles, photos, and videos of all major weather pheonomena; a daily planner; and a glossary of 480 weather words.

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### Correction

In the May issue of the ***Observer***, the price information for the ***Water Resources Bulletin*** was incorrect. Single issues cost $19.00 for all foreign orders, including Canada and Mexico. Also, the domestic subscription rate for one year is $115.00.

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## THE NATURAL 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, and the Insurance Institute for Property Loss Reduction. Please send information of potential interest to the center or the readers of this newsletter to the address below. The deadline for the next ***Observer*** is *May 15, 1996*.

Center phone number: (303) 492-6818; Fax: (303) 492-2151; E-mail: hazctr@spot.colorado.edu

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The Hazards Center also publishes ***Disaster Research***, an electronic newsletter, and maintains a World Wide Web site: Home.html

To reach us by snail mail, send correspondence to:

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