TsuInfo Alert

prepared on behalf of the
National Tsunami Hazard Mitigation Program
by the Washington Department of Natural Resources

Contents

Volume 2, Number 5, October, 2000

TSUNAMI NEWS

Washington's coastal counties now receive weather and emergency alert and warning information from a new radio transmitter site on Mount Octopus that officials dedicated September 11 at a ceremony at the Quinault Beach Resort.

Officials from federal, state, local, and tribal organizations participated in the ceremony to formally dedicate the radio transmitter that now covers the coastline from Cape Flattery to Long Beach from Mt. Octopus in western Jefferson County.

"The weather radio site at Mt. Octopus will help us save lives and protect the property, citizens, and tourists in Grays Harbor, Pacific, and western Clallam and Jefferson counties. Now, they can get up-to-the-minute weather information on wind, wave and storm conditions," said Sheriff Mike Whelan, director of Grays harbor County Emergency Management. "Previously, many areas of the western Olympic Peninsula were out of range of weather radio transmissions."

"The Mt. Octopus transmitter also greatly expands the Olympic Peninsula network for emergency alert and warning information about such hazards as storms, floods, earthquakes, or tsunamis," said Glen Woodbury, director, Washington Emergency Management Division, Washington Military Department.

Chris Hill, meteorologist-in-charge, national Weather Service, Seattle, said the agreement of federal, state, county, and private sector organizations to install the Mt. Octopus transmitter was the first of its kind in the nation. "This partnership is the first to establish a system of weather and emergency alert and warning information for the coastline of an entire state," Hill said.

Dr. Eddie Bernard, chairman, national Tsunami Hazard Mitigation Program, National Oceanic and Atmospheric Administration/Pacific Marine Environmental Laboratory, said the radio transmitter would be another important link in a tsunami warning system that encompasses the entire Pacific Rim. "The transmitter at Mt. Octopus can give residents in Washington's coastal counties critical warning time of a tsunami generated by distant earthquakes in the Pacific area."

Carl Cook, mitigation director, FEMA Region 10, said the new transmitter will provide weather radio coverage and alert and warning to five coastal Indian nationals-- the Quinault, Makah, Quillayute, Hoh and Ozette nations. "This important service will help Indian nations better protect themselves and their property from damage from storms and other hazards."

With installation of the Mt. Octopus transmitter, hundreds of Quinault National members and other residents of northern Grays Harbor County have their first reliable emergency alert and warning system," said Lisa Hall, chief, Taholah Fire Department.

from: Washington Emergency Management Division news release, Sept. 11, 2000

October 14th is the United Nations' Day for Natural Disaster Reduction

TsuInfo Alert

is published monthly by the Washington Department of Natural Resources, Division of Geology and Earth Resources. This publication is free upon request and is available in print (by surface mail) and electronically (by e-mail). The 1999 issues are also available at http://www.wa.gov/dnr/htdocs/ger/tsunami.htm

TsuInfo Alert **and the TsuInfo document delivery program are made possible by a grant from the Federal Emergency Management Agency via the Washington Military Department, Division of Emergency Management.**

Participants in the TsuInfo program can request copies of reports listed in this issue from:

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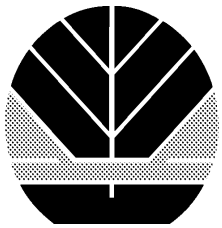

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Jennifer M. Belcher - Commissioner of Public Lands

ESTABLISHING A CONGRESSIONAL NATURAL HAZARDS CAUCUS

by David Applegate
American Geological Institute

The primary goal of establishing a congressional natural hazards caucus is to develop a wider understanding within Congress that reducing the risks and costs of natural disasters is a public value. That requires educating Members and staff about the costs of natural disasters to their districts and states and the benefits their constituents will realize through greater efforts to understand, prevent, and mitigate natural disasters. The caucus would provide Members with an opportunity to demonstrate their concern and commitment to reducing hazard losses.

Jurisdiction for natural hazards programs is spread among many committees in Congress. Each committee only handles a piece of the overall efforts to prevent and mitigate natural disasters. A caucus can provide the "big picture" to interested lawmakers and their staff, and give them the opportunity to see how the issues that fall within individual committee jurisdictions fit within a larger national effort. Typical caucus events include Capitol Hill luncheon briefings, roundtable discussions, special forums, receptions, and events targeted to a subgroup of the caucus. Events can also be structured so that they also provide a forum for raising the visibility of a hazards-related topic with the media and American public.

A successful caucus reflects a strong partnership between its congressional members and groups outside Congress that share similar interests. A working group of organizations has come together with a common desire to reduce the toll--both human and financial--of natural hazards and to enhance the nation's ability to recover from those events. We plan to work together to help our nation become more resilient to natural hazards.

Shared objectives for the caucus include:

1. Focus great attention in Congress on the natural and manmade hazards facing the nation and improve understanding of the need to mitigate against the impacts of floods, earthquakes, hurricanes, landslides and land subsidence, tornadoes, volcanoes, wind storms, drought, fire, and tsunamis.

2. Foster better land-use planning and optimize building codes.

3. Strengthen public and private support for science and engineering research by deonstrating how application of advances in science and engineering research can contribute to saving lives and money.

4. Support the implementation of new technologies, such as geographic information systems, to address societal challenges faced by state and local government and the private sector.

5. Identify additional areas of consensus and common interests related to natural hazards.

The working group is currently seeking charter members of this caucus. We would be happy to discuss this proposal further or provide additional information. Please contact David Applegate at the American Geological Institute (703) 379-2480, ext. 228; applegate@agiwe.org or Peter Folger at the American Geophysical Union (202) 777-7509; pfolger@agu.org.

Natural Hazards Facts

The cost of natural disasters is rising. During the past two decades, natural disaster damage costs have exceeded the $500 billion mark. Only 17 percent of that figure was covered by insurance. (Dennis S. Mileti, Disasters by Design).

Almost 135 million people, which accounts for almost half of the U.S. population, are now living on or near the nation's coastline. (Amanda Levin, The National Underwriter Company). Noted hurricane forecaster William Gray, Colorado State University professor, predicts hurricanes will be the nation's greatest threat during the next 20 to 30 years.

From 1976 to 1998, the U.S. experienced almost 800 declared major disasters (Federal Emergency Management Agency statistics). From FY1990 to FY 1997, damage from U.S. flooding alone topped $33 billion (FEMA statistics). One of the nation's most expensive disasters, the 1994 Northridge Earthquake, cost FEMA more than $5.5 billion in relief funds alone (FEMA statistics). 1998 was one of the costliest years for the U.S. The U.S. sustained seven disasters, each costing more than $1 billion (The National Oceanic and Atmospheric Administration).

Not only did the eastern drought and heat wave of the summer of 1999 result in more than $1 billion in agriculture losses, but 256 people lost their lives. Just one year before, the Southern drought and heat wave resulted in almost $9 billion in agriculture and ranching damage. Two hundred people perished that summer (NOAA).

The Congressional Natural Hazards Caucus Work Group

American Geological Institute * American Geophysical Union * American Meteorological Society * American Red Cross * American Society of Civil Engineers * Association of American State Geologists * Association of State Flood Plain Managers * Geo-Institute of ASCE * Institute for Business and Home Safety * IRIS Consortium * National Emergency Management Association * Reinsurance Association of America & Seismological Society of America * Structural Engineering Institute of ASCE * University Corporation for Atmospheric Research * USAA

from: EQ (Earthquake Quarterly) Spring 2000, p. 18

UPDATE!

On August 18, 2000, David Applegate reported that the Caucus had been formed by Senators Ted Stevens (R-AK) and John Edwards (D-NC), with a current membership of 18 senators. A full report of the June 21 meeting (http://www.agiweb.org/gap/legis106/caucus_alert0600.html) includes the request for more members. To help build this caucus, you are asked to contact your senators and encourage them to join. This website provides sample letters to use.

Caucus Roster:

Senator Ted Stevens (R-AK), Co-Chair
Senator John Edwards (D-NC), Co-Chair
Senator Daniel Akaka (D-HI)
Senator Barbara Boxer (D-CA)
Senator John Breaux (D-LA)
Senator Robert C. Byrd (D-WV)
Senator Max Cleland (D-GA)
Senator Thad Cochran (R-MS)
Senator Kent Conrad (D-ND)
Senator Byron Dorgan (D-ND)
Senator Dianne Feinstein (D-CA)
Senator Bob Graham (D-FL)
Senator Daniel Inouye (D-HI)
Senator Frank Murkowski (R-AK)
Senator Chuck Robb (D-VA)
Senator Charles Schumer (D-NY)
Senator Robert Torricelli (D-NJ)
Senator Ron Wyden (D-OR)

New work group members include American Iron and Steel, Applied Technology Council, Disaster Recovery Business Alliance, Earthquake Engineering Research Institute, Emergency Information Infrastructure Project, Geological Society of America, International Association of Emergency Managers International Code Council, Manufactured Housing Institute, Multihazard Mitigation Council of the National Institute of Building Sciences, National Association of Contingency Planners, State Farm, Telcordia, and Western Disaster Center.

There is additional information about the Caucus on Senator Edwards website:
http://www.senate.gov/~edwards/cnhc/index.html

The Natural Hazards Caucus Work Group's website: http://www.agiweb.org/workgroup/

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U.S. CONSUMER PRODUCT SAFETY COMMISSION RECALLS TWO KINDS OF WEATHER RADIOS

PRODUCT: Oregon Scientific, Inc. All Hazards Weather Radio model WR-122. A recall is underway in Oregon for 10,000 weather radios. The Consumer Product Safety Commission reports that the radios fail to decode certain National Weather Service signals and provide incorrect severe weather warnings.

The radios were produced by Oregon Scientific, Inc., which says it has received 12 reports from consumers who did not receive an emergency signal broadcast from the "All Hazards Weather Radios."

The recalled radios also function as AM/FM clock radios, and have model number "WR-122" printed on the bottom. Retail outlets, catalogs and Web sites across the country sold the radios from December 1999 through July 2000 for about $70.

Oregon Scientific, Inc. says consumers should not rely on the affected radios for emergency information, and should contact the company toll free at 1-800-869-7779 for information about replacing the radios.

from: Pacific Marine Environmental Laboratory, Aug. 30, 2000

PRODUCT: Midland Weather Radios - Midland Consumer Radio Inc., of Kansas City, Mo., is recalling 9,000 weather radios. **Only model 74-200 radios that have a serial number beginning with 904 or 905 are being recalled**. The model and serial numbers are found on the bottom of the unit. The digital radio measures about 7.75 inches long, 5 inches wide and 2 inches high, and is made of black plastic. "MIDLAND SAME DIGITAL WEATHER/HAZARD ALERT MONITOR" is written on the top of the radio. This radio has a specific area message encoder (SAME) to sound alerts for an entire weather service broadcast area or for up to 15 selected areas. The radio has a battery backup, antenna, built-in alarm clock, digital message display for 56 types of watches or warnings, and alert status lights for statement, watch, or warning. Electronic, hardware, mass merchandise stores and truck stops nationwide sold the radios from May 1999 through August 1999 for about $70. Other Midland weather radios are not involved in this recall.
PROBLEM: The radio contains a programming error, which can cause the device to fail to recognize certain signals broadcast by the National Weather Service. Consumers could fail to receive some National Weather Service notices advising of a severe weather threat putting lives and property at risk.
INCIDENTS/INJURIES: None reported.
WHAT TO DO: Immediately return the recalled radio to the store where purchased to receive a new model 74-200 radio that has been programmed correctly. Consumers also can return the radio directly to Midland Consumer Radio, 1670 North Topping Ave., Kansas City, MO 64120 for replacement. For more information, call the company toll-free at (877) 302-1904 between 8 a.m. and 4:30 p.m. CT Monday through Friday.

from: NEWS from CPSC, U.S. Consumer Product Safety Commission

TSUNAMI FEAR SPREADS ON EAST COAST!

In the May issue of *Geology* (v. 28, no. 5, p. 407-410), Driscoll, Weissel, and Goff discussed the "Potential for large-scale submarine slope failure and tsunami generation along the U.S. mid-Atlantic coast, " particularly southern Virginia and North Carolina, after discovering a system of cracks on the outer continental shelf. That report set off a frenzy when the local papers picked up the story. A second geologic study reported in July only added to the concern. Here's what happened:

Tsunami News Floods East Coast,
by
Laura Wright
(Reprinted with permission from *Geotimes*, July 2000, the American Geological Institute)

Terror. Threat. Speeding waves. Tsunami. These words hit news headlines like the Sunday paper hits your doorstep. Whump.

All you wanted was the midweek paper, coffee and 15 minutes of early morning peace.

You swallowed a little more than French Roast if you picked up *USA Today* on May 2 or *The Washington Post* or *The New York Times* on May 3. Tidings of impending destruction from a possible East Coast tsunami swept the headlines. The fear of a killer wave striking the Mid-Atlantic coast crossed the gap between the usual not-in-my-backyard dismissal and the mind-blowing notion that the Washington Monument might be bobbing down the Potomac River like a drifting buoy sometime in the near future.

Neal Driscoll of the Woods Hole Oceanographic Institution, and fellow researchers John Goff of the University of Texas and Jeffrey Weissel of the Lamont-Doherty Earth Observatory, discovered inexplicable crack-like features on the continental shelf off the coast of southern Virginia and North Carolina. They published their findings in the May issue of *Geology*.

From sidescan images and bathymetric profiling the scientists identified what they described as en echelon cracks spanning 40 kilometers in water depths of 100 to 200 meters. Directly to the south of the cracks was a sediment slump that formed after the Ablemarle-Currituck slide during the Pleistocene. They drew attention to the juxtaposition of the two features as evidence for potential slope failure in the vicinity of the newly discovered cracks. In their *Geology* article they concluded that, 'Given the risk to the coastal community, it seems wise to invest effort to determine whether the en echelon cracks...are fossil features or are active and likely to produce a potentially disastrous, large submarine slide in the near future.'

On May 6, Driscoll and fellow researchers left for a two-week research cruise to further investigate the sea-floor cracks. What at first appeared to be cracks now seem to be craters that formed as a result of massive gas blowouts. Sonar studies of the geometry of the subsurface did not reveal fault lines as the team had expected, but rather large pockets of gas trapped in the sediment.

Instead of answering questions related to sediment slumping along cracks, Driscoll and his team opened an entirely different can of worms. 'We found areas of sediment that are bowed up from gas charging in the sediments,' he says. In light of these new discoveries, Driscoll questions whether or not the Ablemarle-Currituck slide 40 kilometers to the south could have been generated by a gas blowout and plans to investigate the area further before making any definite conclusions.

Driscoll does not discount the possibility that this area still poses a tsunami threat. 'There is a slight potential for slope failure,' he says. If gas blowouts are related to the sediment slumping at Ablemarle-Currituck, then there is reason to believe that it could happen again, he says.

Goff agrees. 'There are physical features that could lead to a major event such as a tsunami, but the chances of that happening are slim,' he says. 'We are not worried about it taking place in our lifetime.'

How did the report published in *Geology* become a feeding-frenzy for newspapers across the East Coast?

As they do with every issue, the editorial staff of *Geology* sent out an e-mail summarizing the contents of the May issue a few days before May 1. *Geology* didn't provide a press release, but Woods Hole, Lamont-Doherty and the University of Texas did. All three releases highlighted the potential for a damaging tsunami to strike the Mid-Atlantic region of the United States in the near future.

The story was covered in *The New York Times*, *The Seattle Times*, *Chicago Tribune* and *Los Angeles Times*--- just to name a few. 'Ocean crack could spawn tidal waves,' headlined *USA Today*. The front page of *The Washington Post* on May 3 read: 'Wave of concern: Atlantic tsunami? Fissures found off Va. Coast may be precursor, experts say.'

The news washed into the evening broadcasts of MSNBC and Comedy Central's *The Daily Show*, according to Ann Cairns, director of communications and marketing for the Geological Society of America, which publishes *Geology*. 'We knew it would get a lot of attention, but we were taken aback by how much attention it received,' Cairns says.

'The media jumped the gun,' says Costas Synolakis, director of the Tsunami Research Group at the University of Southern California. Although he agrees there is indeed cause for investigation, his initial reaction was that the report had been sensationalized by a whirlwind of media coverage. As Driscoll and his team have realized, 'if it does have potential, there are many other factors to be considered, including dating other slides in the area.'

However, Synolakis does not claim that the coverage was unnecessary. 'I agree that the issue does need coverage. Offshore hazards were not recognized before the Papua New Guinea project,' he adds. 'This has been a wake-up call. There is something out there that could pose a hazard to populated areas.'"

Again in August, *Geotimes* summarized the situation: "The East Coast tsunami lookout continued this summer with a report in the July 14 *Science*. Peter Flemings of Pennsylvania State University took sediment cores from the continental slope off the coast of New Jersey that have revealed subsurface zones of undercompacted sediment with high fluid pressure. Flemings believes these pressures may lead to sediment failure--and possibly a tsunami. Earlier this summer, Neal Driscoll of the Woods Hole Oceanographic Institution and his colleagues drew attention to submarine features off the East Coast as potential tsunami threats, but they concluded that high-pressure gas is the most likely explanation. Flemings sampled sediment in 1997 at Ocean Drilling Program site 1073 from the JOIDES Resolution. Like Driscoll, who discovered large zones of disturbed sediment off the coast of Virginia and the Carolinas (Geotimes, July 2000), Flemings claims that the sediments could violently release their pressurized contents if disturbed. Such a sediment collapse could cause a tsunami. However, the probability of a tsunami striking the New Jersey shore has not been determined and the scientists plan to continue their research."

The title of the July *Science* article was "Overpressure and fluid flow in the New Jersey continental slope: Implications for slope failure and cold seeps," which the July 14, 2000 issue of a New Jersey paper, the Star-Ledger translated to the headline: "Trapped water raises tidal-wave worries."

Trapped Water Raises Tidal-Wave Worries--
Penn State researchers say a quick release of the deep-sea trouble could imperil Jersey
by
Wayne Woolley

Researchers have discovered water trapped at extremely high pressure under the ocean floor 100 miles off the coast of Atlantic City, a condition they say could trigger an underwater landslide and send a devastating tidal wave straight for the Jersey Coast.

The water, trapped under the continental shelf for the past million years, could set off a landslide if it were to break through the ocean floor, according a study to be published today in the journal Science.

"The water there is severely over-pressured--it's like a big water balloon that's being squeezed," said Brandon Dugan, a Penn State geologist who conducted the study with Peter B. Fleming, a faculty member at the University.

Dugan and Fleming used data collected by an expedition of the Washington, D.C.-based Ocean Drilling Program, which found a water pocket trapped 300 feet under the rocky ocean floor in an area where the sea is about 1,800 feet deep. The researchers used a computer model to calculate the pressure of the trapped water.

"These pockets of water down there are supporting tremendous weight," Dugan said.

The study stopped short of trying to predict the likelihood of a tidal wave.

"We aren't saying an event is imminent and we can't predict when one will occur," Fleming said.

The study's authors concede that the trapped water, which was deposited in the sediment by runoff from the Hudson River in an age when the Atlantic Ocean was far smaller than it is today, could seep slowly and harmlessly back up through the ocean floor without causing a tidal wave.

"What we're saying is that this is something that definitely warrants further study," Dugan said.

No tidal wave has ever hit the East Coast, at least in recorded history. But the Penn State study isn't the first to raise the possibility.

In May, a team of researchers from the Woods Hole Oceanographic Institute in Massachusetts discovered tears in the ocean floor off the Virginia coast that they believe were caused by trapped gas trying to force its way free. They concluded the phenomenon could trigger a landslide and tidal wave if enough gas were to escape suddenly.

Unlike the wind-driven waves caused by hurricanes and other storms, tidal waves are caused by any sudden shift of the ocean floor. The amount of water displaced by the movement is forced to the surface, where it becomes a massive wave.

Although tidal waves can be caused by underwater landslides, they occur much more frequently in the aftermath of earthquakes and underwater volcanic eruptions.

Preparedness for a tidal wave is included in New Jersey's emergency operations program, said John Hagerty, a State Police spokesman.

"It's the same evacuation strategy we would use for a hurricane," Hagerty said. "The only difference is that this would come upon us much quicker."

Editor's note: Woolley should have used the term *tsunami* rather than tidal wave. His description of how tsunamis are generated should have said that ocean floor movement creates massive *waves* (plural). One hopes this tsunami panic will educate the East Coast emergency managers that tsunami mitigation and emergency planning require different strategies from hurricanes.

Our thanks to *TsuInfo Alert* East Coast correspondent, Joe DaRold, for bringing this information to our attention.

HISTORICAL TSUNAMI DATABASE REGIONAL COORDINATORS

An effort is being made to increase the availability and quality of the Historical Tsunami Database for the Pacific (HTDB/PAC). Regional coordinators are checking the inclusiveness and quality of the historical data. Contact information for the designated regions are listed below. Note that the Regional Coordinator for the Philippines is yet to be designated.

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from: Tsunami Newsletter, v.32, no. 1, p. 7 (ITIC) and personal communication (Linda Sjogren).

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NEWS BRIEFS

Legislation

President Clinton signed the Oceans Act of 2000 August 12th, establishing a special commission to protect and sustain America's coastal resources and oceans. The act, passed by Congress earlier this year, calls for record funding to protect U.S. beaches and coasts, rebuild fisheries and marine mammal populations, strengthen coastal economies, and expand undersea exploration. A number of Research Council reports deal with coastal water issues.

from: http://www.nationalacademies.org/headlines/#0808a, Aug. 12, 2000

Recently awarded research grants

"Increasing the State of Washington State Emergency Management Division's GIS/Remote Sensing." Funding: Washington State Emergency Management Division, $80,000, 12 months. Principal investigators: Robert Freitag, Frank Westerlund, and Earl Bell, Institute for Hazard Mitigation Planning and Research, Box 355740, University of Washington, Seattle, WA 98195-5740; (206) 616-2395; fax (206) 685-9597; email: bfreitag@u.washington.edu; website: http://depts.washington.edu/mitigate

from: Disaster Research #327, August 24, 2000

Conferences

Tribal Emergency Management Conference: "Honoring our Partnerships, A Vision for Emergency Management in Indian Country." Sponsor: Federal Emergency Management Agency. Rapid City, South Dakota: September 26-28, 2000. For complete information, see http://www.fema.gov/Reg-VIII/tribal/conf.htm.

from: Disaster Research #327, August 24, 2000

Pacific Rim Summit on Natural Hazards. Sponsors: Stanford University, U.S. Geological Survey, Circum-Pacific Council, and other public and private organizations. Palo Alto, California: August 2001.

This three-day meeting will address the socioeconomic consequences of natural hazards for the countries that rim the Pacific Ocean. The "Crowding the Rim Summit" will bring together natural and social scientists, demographers, economists, risk managers, and mitigation experts to address how local natural hazards in the Pacific Rim are becoming regional problems. The meeting is designed to initiate planning to mitigate the global effects of disastrous events among the changing population and increasingly interdependent economic infrastructures of the region. The summit will combine on-site professional exchanges, game simulations, and disaster-resistance strategy development with real-time interactive Internet conferencing among educational institutions throughout the region. Three objectives of the summit include 1) developing an educational curriculum for those most at risk; 2) crafting risk reduction policy recommendations to be delivered to political leaders; and 3) conducting a series of post-summit educational workshops throughout the Pacific Rim for decision makers, business and industry leaders, and citizens in order to communicate the issues identified at this meeting and motivate community action. The organizers are currently seeking program ideas, participants, and funding sources. For more information, contact David Howell, U.S. Geological Survey, M/S 975, 345 Middlefield Road, Menlo Park, CA 94025; (650) 329-5430; fax: (650) 329-4999; e-mail: dhowell@usgs.gov.

from: Natural Hazards Observer, May 2000, p. 19

Websites

Three new sections have been added to this site. Go to http://www.usc.edu/dept/tsunamis then click on the "world map" button to find:

Chile - A description of some local effects along the Chilean coast resulting from the 1960 earthquake by intern Daniel Rousseau.

Marquesas 1999 - A report of the trip to investigate the aseismic, landslide-generated tsunami of September 1999 on Fatu Hiva Island in the Marquesas.

Marquesas 1946 - A not yet completed summary of the effects of the 1946 tsunami in the Marquesas Islands. Photos and data were taken this past August (2000).

from: email from Jose Borrero, USC Tsunami Research Group. jborrero@usc.edu

http://www.epa.gov/region03/greenkit/q5_disas.htm

EPA's Region III Green Communities Web page includes a "Green Communities Assistance Kit" designed as a comprehensive reference guide for identifying and resolving needs, interests, and problems of a range of communities - urban, suburban, and rural. Included is this "Tools for Natural Disasters" page offering a lengthy list of Internet resources divided into Policy and Planning Tools, Regulatory Tools, Technical Tools, and Financial Tools. This Web resource covers everything from hurricane preparedness training and guidelines to disaster response and recovery programs.

http://www.coastalmanagement.com

This not-for-profit site catalogs other informative sites on coastal management and research. It outlines new research and provides links to over 1,000 coastal management sites world-wide, including a broad range of coastal hazard sites. It also lists coastal conferences and events. In addition, the site provides access to a free e-mail coastal management newsletter called "icoast" - an efficient means for interested persons to keep up with recent coastal management developments on the Internet. To subscribe to "icoast" send an e-mail to icoast_news-subscribe@egroups.com or visit the Web site.

http://www.Egroups.com/group/DisasterSurvivorSupport

The "Disaster Survivor Support" group is a peer support network for anyone who has endured a disaster, including families who have lost loved ones. The list is open to the public and intended to be a "survivor helping survivor" network; however, research professionals may find it of interest and are welcome.

The October EIIP Virtual Forum Schedule

The following is a list of Emergency Information Infrastructure Partnership (EIIP) on-line events offered in October. All sessions take place Wednesdays at 12:00 noon, Eastern time. To eavesdrop or participate, log in to the EIIP Virtual Forum Web site: http://www.emforum.org and click on "Chat Login" under "Quick Picks."

October 11 - "World Disaster Reduction Day" - Nicole Appel, Awareness and Promotion Officer, International Strategy for Disaster Reduction (ISDR) Secretariat

October 18 - "Masters of Disasters Curriculum" - Rocky Lopes, American Red Cross

October 25 - "Community Alert Network (CAN)" - Ken Baechel, President

The October-December 2000 EENET Schedule

Below is a list of satellite broadcasts scheduled by the Federal Emergency Management Agency's Emergency Education Network (EENET) (all programs begin at 2:00 pm Eastern time, except where noted):

October 4 - Around the Table at Emmitsburg. Featuring students from FEMA's Emergency Management Institute "Multi-Hazards Planning for Schools" course.

October 11 - Fires in Small Communities - Impact and Prevention (Repeated October 25, 8:00-11:00 p.m.)

October 18 - National Alert Broadcast - FEMA's monthly video magazine on emergency management

October 25 - Consequence Management News, Equipment, and Training (CoMNET) Magazine

November 1 - Emergency Responders and Infectious Disease: Part 1 - An Overview

November 8 - New Hazardous Materials Curriculum Programs - An Overview for Training Managers

November 15 - National Alert Broadcast

November 22 - Critical Incident Stress Management (CISM) for Schools - Part I

November 29 - Virginia Beach Fire Department Special - featuring videos on a response accident and on community flood recovery

December 6 - Schools, Violence, and Lessons Learned

December 13 - Critical Incident Stress Management (CISM) for Schools - Part II

December 20 - National Alert Broadcast

December 27 - Unified Command: Practical Issues - Part I

Additional broadcasts are often added. For up-to-date information, a description of each of these programs, and satellite broadcast information, visit the EENet Web site: http://www.fema.gov/home/emi/eenet.htm.

VIDEO RESERVATIONS

Place a check mark (T) beside the video(s) you want to reserve; write the date of the program behind the title.
Mail to TsuInfo Alert Video Reservations, Lee Walkling, Division of Geology and Earth Resources Library, PO Box 47007, Olympia, WA 98504-7007; or email lee.walkling@wadnr.gov

___**Adventures of Disaster Dudes** (14 min.)
Preparedness for pre-teens

___**The Alaska Earthquake, 1964** (20 min.)
Includes data on the tsunamis generated by that event

___**Cannon Beach Fire District Community Warning System** (COWS) (21 min.)
Explains why Cannon Beach chose their particular system

___**Disasters are Preventable** (22 min.)
Ways to reduce losses from various kinds of disasters through preparedness and prevention.

___**Forum: Earthquakes & Tsunamis** (2 hrs.)
CVTV-23, Vancouver, WA (January 24, 2000)
2 lectures: Brian Atwater describes the detective work and sources of information about the Jan. 1700 Cascadia earthquake and tsunami; Walter C. Dudley talks about Hawaiian tsunamis and the development of warning systems.

___**Killer Wave: Power of the Tsunami** (60 min.)
National Geographic video.

___**Numerical Model Aonae Tsunami - 7-12-93**
(animation by Dr. Vasily Titov) and

___**Tsunami Early Warning** by Glenn Farley, KING 5 News (***note:*** The Glenn Farley portion cannot be rebroadcast.

___**The Prediction Problem** (58 min.)
Episode 3 of the PBS series "Fire on the Rim." Explores earthquakes and tsunamis around the Pacific Rim.

___**The Quake Hunters** (45 min.)
A good mystery story, explaining how a 300-year old Cascadia earthquake was finally dated by finding records in Japan about a rogue tsunami in January 1700.

__**Raging Planet; Tidal Wave** (50 min.)
Produced for the Discovery Channel in 1997, this video shows a Japanese city that builds walls against tsunamis, talks with scientists about tsunami prediction, and has incredible survival stories.

___**Raging Sea: KGMB-TV Tsunami Special**. (23.5 min.)
Aired 4-17-99, discussing tsunami preparedness in Hawaii.

___**The Restless Planet** (60 min.)
An episode of "Savage Earth" series. About earthquakes, with examples from Japan, Mexico, and the 1989 Loma Prieta earthquake in California.

___**Tsunami and Earthquake Video** (60 min.)
Includes "Tsunami: How Occur, How Protect," "Learning from Earthquakes," and "Computer modeling of alternative source scenarios."

___ **Tsunami: Killer Wave, Born of Fire** (10 min.)
NOAA/PMEL. Features tsunami destruction and fires on Okushiri Island, Japan; good graphics, explanations, and safety information. Narrated by Dr. Eddie Bernard, (with Japanese subtitles).

___**Tsunami: Surviving the Killer Waves** (13 min.)
Two versions, one with breaks inserted for discussion time.

___**Tsunami Warning** (17 min.)
San Mateo (California) Operational Area Office of Emergency Services. This is a good public service program, specifically made for San Mateo County. Citizens are told what to do in cases of tsunami watches or tsunami warnings, with specific inundation zones identified for the expected 20-foot tall tsunami. An evacuation checklist is provided, as well as locations of safe evacuation sites. This video gives the impression that all tsunamis are teletsunamis (generated at a source more than 1000 km from the coastline) which therefore provide time for warnings. Locally-generated tsunamis are not discussed.

___**Understanding Volcanic Hazards** (25 min.)
Includes information about volcano-induced tsunamis and landslides.

___**The Wave: a Japanese Folktale** (9 min.)
Animated film to help start discussions of tsunami preparedness for children.

___**Waves of Destruction** (60 min.)
An episode of the "Savage Earth" series. Tsunamis around the Pacific Rim.

___**Who Wants to be Disaster Smart?** (9 min.) ***new!***
Washington Emergency Management Division. 2000
A game show format, along the lines of *Who Wants to be a Millionaire*?, for teens. Questions cover a range of different hazards.

___**The Wild Sea: Enjoy It...Safely** (7 min.)
Ocean Shores, Wash. Interpretive Center, this video deals with beach safety, including tsunamis.

Check the title(s) you would like and indicate the date of your program. The video(s) will be mailed one week before the program date. You will be responsible for return postage.

Name: _____
Organization: _____
Mailing address: _____
City, State, Zip:_____
email: _____

NEW TSUNAMI MITIGATION MATERIALS ADDED TO THE DGER LIBRARY, AUGUST AND SEPTEMBER, 2000

compiled by

Connie J. Manson

Note: **Free reprints of these materials are available**. (See page 2 for ordering information)

Archaeological and Societal Considerations

Bahk, C. M.; Neuwirth, Kurt, 2000, Impact of movie depictions of volcanic disaster on risk perception and judgments: International Journal of Mass Emergencies and Disasters, v. 18, no. 1, p. 63-84.

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Prager, E. J.; and others, 2000, Furious earth--The science and nature of earthquakes, volcanoes, and tsunamis: McGraw-Hill, 235 p.

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Geist, E. L.; Dmowska, Renata, 1999, Local tsunamis and distributed slip at the source: Pure and Applied Geophysics, v. 154, no. 3-4, p. 485-512.

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Priest, G. R.; and others, 2000, Tsunami hazard map of the Gold Beach area, Curry County, Oregon: Oregon Department of Geology and Mineral Industries Interpretive Map Series IMS-13, 1 sheet, scale 1:12,000, with 5 p. text.

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Couchman, Elizabeth, 2000, A seismic risk assessment of Seattle, Washington using a geographical information system: University of Edinburgh Masters of Research [thesis], 130 p.

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"There is agreement within the tsunami and emergency response communities that technology alone cannot protect coast habitats in the immediate area of a near-source tsunami. When a large subduction zone earthquake occurs nearby, the first tsunami waves may reach coastal communities within a few minutes of the event. Local populations at risk must be able to recognize the signs of impending tsunami hazards and seek higher ground immediately. Communities need to be aware of what areas are likely to be flooded. Local decision-makers need to understand the risk and be provided with mitigation tools in order to make informed planning decisions. Planners, emergency responders, and residents need to understand the multi-hazard ramifications of a very large local earthquake and its disruption to the community."

from: California Governor's Office of Emergency Services, 2000, Local planning guidance on tsunami response--A supplement to the emergency planning guidance for local governments; 2nd ed.: California Governor's Office of Emergency Services, 195 p.

Penrose Conference Abstracts

The Penrose Conferences were established in 1969 by the Geological Society as forums where the best scientists in a specific discipline can meet to exchange ideas. The "Great Cascadia Earthquake Tricentennial," held in Seaside, Oregon in June was one of only three Penrose Conferences held in 2000. Nearly 100 eminent researchers on Cascadia subduction zone earthquakes gathered for that "by invitation only" five-day meeting. The program description and conference abstracts have just been published by the Oregon Department of Geology and Mineral Industries.

Clague, J. J.; Atwater, B. F.; and others, compilers, 2000, Penrose Conference, "Great Cascadia Earthquake Tricentennial"--Program summary and abstracts: Oregon Department of Geology and Mineral Industries Special Paper 33.

Includes:

Aalto, K. R., Sculpturing of wave-cut platforms by tsunami--Perspective from Crescent City, California. p. 19.

Adams, John; Halchuk, Stephen; Weichert, D. H., Seismic hazard from great earthquakes on the Cascadia subduction zone. p. 20-21.

Ament, Jim, Earthquake threat in the Pacific Northwest--Financial perspective. p. 22.

Atwater, B. F., Questions about using liquefaction features to estimate strength of shaking in the 1700 Cascadia earthquake. p. 23-24.

Aya, A. A., Jr., Emergency evacuation of tsunami inundation zones--Alerting and instructing area crowds of primarily visitors unfamiliar with ocean hazards. p. 25.

Ballantyne, D. B., Cascadia subduction earthquake affects on buried pipelines--A comparison to crustal events. p. 26-27.

Beaulieu, J. D., New geology and seismic risk reduction. p. 28.

Bela, J. L., The dilemma of great subduction--Or, How I learned to love politics and stop worrying about the earthquake. p. 29-30.

Brocher, T. M.; Trehu, A. M., Crustal structure of the Cascadia subduction zone from seismic reflection and refraction profiling--Relation to earthquakes on the megathrust. p. 31-32.

Campbell, K. W.; Thenhaus, P. C.; Hampson, D.; Barnhard, T. P., The impact of uncertainty on probabilistic and deterministic ground-shaking hazard from great earthquakes on the Cascadia subduction zone. p. 35-37.

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Hughes, J. F., Botanical evidence from northern Cascadia for coseismic subsidence and post-seismic rebound associated with the AD 1700 subduction zone earthquake. p. 59-60.

Hutchinson, Ian; Clague, J. J.; Bobrowsky, P. T.; Williams, H. F. L., Investigations of Cascadia paleoseismicity in southwestern BC and northern most Washington State. p. 61.

Kayen, R. E.; Barnhardt, W. A.; Monahan, P. A.; Clague, J. J.; Christian, H. A., Potential impacts of Cascadia-margin earthquakes on the Fraser River (Vancouver) and Duwamish River deltas (Seattle). p. 66.

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Losey, R. J., Assessing the impact of the AD 1700 Cascadia subduction zone earthquake on Native American coastal peoples--Archaeological evidence from the northern Oregon coast. p. 70-71.

McNeill, L. C.; Goldfinger, Chris; Yeats, R. S.; Kulm, L. D., The effects of upper plate deformation on records of prehistoric Cascadia subduction zone earthquakes. p. 76-76.

Monahan, P. A.; Levson, V. M.; McQuarrie, E. J.; Bean, S. M.; Henderson, P. W.; Sy, Alex, Seismic microzonation maps of greater Victoria, British Columbia, Canada. p. 84-85.

Myers, E. P., III; Baptista, A. M., Assessment of future Cascadia tsunami hazards using a finite element model--Tools and approaches. p. 81.

Nelson, A. R.; Kelsey, H. M.; Hemphill-Haley, Eileen; Witter, R. C., Oxcal analyses and varve-based sedimentation rates constrain the times of 14C-dated tsunamis in southern Oregon. p. 87-88.

Nelson, C. H.; Goldfinger, Chris; Johnson, J. E., Turbidite event stratigraphy and implications for Cascadia basin paleoseismicity. p. 89-90.

Perkins, D. M., Probability distributions for recurrence of USGS hazard map characteristic earthquake sources in the Pacific Northwest. p. 93.

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Plafker, George; Carver, G. A.; Clarke, S. H., Jr., Seismotectonics of the 1964 Alaska earthquake as an analogue for future tsunamigenic southern Cascadia subduction earthquakes. p. 96-97.

Priest, G. R., Estimating the Cascadia tsunami threat--Important issues. p. 98-99.

Pringle, P. T.; Logan, R. L.; Schuster, R. L., Rock slide-debris avalanches as records of prehistoric earthquakes in western Washington State. p. 100-101.

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Ruff, L. J., Great earthquakes in subduction zones. p. 106-107.

Satake, Kenji; Wang, Kelin, Coseismic fault slip and seismic moment of the 1700 Cascadia earthquake estimated from Japanese tsunami observations [abstract] p. 110-111.

Schlichting, Robert; Peterson, C. D., Down to earth tsunami hazard mitigation--Progress toward elucidating prehistoric tsunami dynamics from the geologic record at open coastal sites along the central Cascadia margin. p. 113.

Shuto, Nobuo, Tsunami disasters and mitigation. p. 118-119.

Thorson, R. M., Shoreline stratigraphy of Lake Washington--Implications for Holocene crustal strain and earthquak recurrence in the Cascadia forearc. p. 120-121.

Tucker, Christopher; Koshida, Grace, NHEMATIS--Progress on a Canadian natural hazard risk assessment model. p. 122.

Tuttle, M. P.; Sims, J. D., Uncertainties related to estimating the timing, source areas, and magnitudes of paleoearthquakes from liquifaction features. p. 123-124.

Walsh, T. J.; Caruthers, C. G.; Heinitz, A. C.; Myers, E. P., III; Baptista, A. M.; Erdakos, Garnet; Kamphaus, R. A., Tsunami hazard map of the southern Washington coast--Modeled tsunami inundation from a Cascadia subduction zone earthquake. p. 125-126.

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Wang, Yumei; Vogt, B. F., Predicted Cascadia losses. p. 129-130.

Wang, Zhenming, Earthquake risk assessment in Tillamook County, Oregon. p. 133-134.

Windeler, D. S., Jr.; Williams, C. R.; Rahnama, Mohsen; Rodriguez, Agustin, Pacific Northwest EQ risk--Sensitivity to Cascadia rupture behavior. p. 138-139.

Witter, R. C.; Kelsey, H. M.; Hemphill-Haley, Eileen, Stratigraphic evidence for twelve Cascadia earthquakes in the last 6600 years from the Coquille River estuary, Oregon. p. 140.

Wong, I. G.; Silva, W. J., Predicting great earthquake ground shaking in the Pacific Northwest from the Cascadia subduction zone. p. 141-143.

Youngs, R. R., Important issues in characterizing ground shaking hazards along the Cascadia subduction zone. p. 145.

BOOK ANNOUNCEMENTS AND REVIEWS

by Lee Walkling

Mitigating Geologic Hazards in Oregon: A Technical Reference Manual, by John D. Beaulieu and Dennis L. Olmstead, Special Paper 31, 60 p., $20

Geologic Hazards: Reducing Oregon's Losses, by John D. Beaulieu and Dennis L. Olmstead, Special Paper 32, 27 p., $10

Future Oregon earthquakes and tsunamis are expected to take thousands of lives and cost billions of dollars. Landslides cause an average one to two deaths per year and cost $1-$10 million. Flooding causes millions of dollars of damage and some deaths. Coastal erosion threatens property nearly every year.

The two new publications are designed to give policy makers and the general public better tools to reduce the toll of geologic processes on people and property.

Special Paper 31 includes information on Oregon's past disasters, potential for future problems, issues to address when more than one hazard is present (for example, flooding and landslides), and a wide variety of strategies to mitigate hazards. It is primarily designed for planners, emergency managers, and policy makers.

Special Paper 32 is an illustrated summary of this technical manual and is designed for nontechnical users.

They can be purchased through:

Nature of the Northwest Information Center
800 NE Oregon Street #5, Suite 177
Portland OR 97232
(503) 872-2750; info@naturenw.org
www.naturenw.org

from: March 13, 2000 news release, Oregon Department of Geology & Mineral Industries

Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas , by FEMA

To mitigate losses from natural hazards in coastal areas, FEMA has published an updated coastal construction manual that presents a comprehensive approach for managing risk. The publication, *Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas,* (2000, **free**), provides technical guidance on the best practices for building along shorelines.

For the first time, the revised manual emphasizes land-use planning methods, including approaches that reduce the impacts of long-ter erosion. Careful land-use planning and site design are cited as critical predecessors to any development and building project. Rather than attempting to conquer the natural features of the coast, developers, the Coastal Construction Manual suggests, should consider options that incorporate the natural features of the land to reduce risk. The manual evaluates numerous practices for improving construction and reducing economic losses associated with coastal disasters and provides detailed guidance for implementing them.

The three-volume manual will also be available on CD-ROM (FEMA-55,Third Edition), and free copies of both the print and CD-ROM editions can be ordered from the FEMA Publications Center, PO Box 2012, Jessup, MD 20794-2012; (800) 480-2520.

from: Natural Hazards Observer, Sept. 2000, p. 10.

Coasts in Crisis--Public Issues in Earth Science, by S. Jeffress Williams, Kurt Dodd, and Kathleen Krafft Gohn. U.S. Geological Survey Circular 1075, 1990, 32 p. (**free** from Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225)

"In this book, the authors describe our Nation's varied coastal environments and the natural processes and human actions that are constantly modifying them. Ignorance of these processes exacerbates the tragic collisions between people and nature--such as Hurricane Hugo last year in South Carolina, which left thousands homeless and destroyed billions of dollars of property. We are still learning the lesson that Francis Bacon expounded almost four centuries ago: "Nature to be commanded must be obeyed." To obey and command nature, however, we must improve our scientific understanding of its forces and processes; only then can we address the crisis now facing coastal communities." (Dallas L. Peck, Director, p. iii)

The Introduction goes on to say: "Our coasts are reaching a crisis. Threats to coasts and to coastal communities are growing as development, recreation, and waste disposal activities increase, often in conflict with long-term natural processes. Other threats to our coasts, such as sea-level rise and reduction in sediment supply, result from global warming and the damming of rivers.

The impending crisis of our coasts stems from misconceptions about what coasts are--and from actions based on those misconceptions. Differences between our perceptions and the reality of coasts intensify the conflicts between people and nature. These conflicts will worsen as the coastal population expands and competing uses of the recreational, wildlife, shipping, and mineral resources of coasts increase." (p. 1)

Coasts in Crisis provides a useful overview: a short, easy-to-read report which makes good use of photographs, charts and maps to explain the variety of U.S. coastlines, their formation, structure, maintenance, and current problems. Besides tsunamis, there are other threats to the coasts. Coastal populations must deal with the everyday processes as well as being prepared for the catastrophic events.

The Great Waves, by Douglas Myles, McGraw-Hill Book Co., 1985

Dr. George Pararas-Carayannis, then Director of the International Tsunami Information Center in Hawaii, wrote in his foreword for *The Great Waves*, "It has been thoroughly and comprehensively researched, and compiles diverse materials on tsunami. The author has organized these materials into a very readable format and has produced a fine book which should appeal to scientists and laymen alike. The book provides the necessary background on the earth's structure, the underwater topography of the oceans, and the earth's violent events, then proceeds to the explanation of the tsunami itself, which is a geophysical as well as an oceanographic phenomenon.

Mr. Myles has done a fine job in documenting, in very explicit narrative form, important destructive historic tsunamis throughout the world from the beginning of recorded history to the present time. Many of these descriptive materials are based on eyewitness accounts of the different disastrous tsunami and have been painstakingly collected, organized, and presented in this book, providing not only descriptions of the tsunami disasters themselves, but also giving us an inside glimpse of the history of each particular era, and the ever-interesting personal accounts of people who were affected by these events." (p. xiii) Although the coverage is worldwide, the book focuses on the Pacific.

The author aims at "lessening the worldwide ignorance of this subject" (p. 194) and increasing awareness in order to decrease the number of deaths caused by tsunamis. His overview of the tsunami hazard is thorough but non-technical and should be a standard source of tsunami data for the public. The dramatic eyewitness accounts (historical as well as current) help illustrate the threat tsunamis pose to coastal communities. Hearing another human's description of an actual tsunami makes the scientific explanations easier to visualize and understand.

Mr. Myles includes discussions about the Santorini eruption/tsunami, which some researchers believe to be the event that gave rise to the Atlantis myth, and the parting of the waters of the Red Sea, possibly caused by the Santorini tsunami. The scientific research is fascinating 'detective' work which, as yet, only provides clues and not solutions.

There are two problems with this book. The chapter on the development of the tsunami warning system is accurate, historically, but needs to be updated. There have been major technological advances and more study since 1985. And the book is no longer in print. The only way to get a copy is through Interlibrary Loan at your local library.

Media, Emergency Warnings, and Citizen Response, by Ford N. Burkhart, Westview Press, 1991, 152 p.

"Citizen compliance with *any* warning message is not automatic." (p. 2) This book presents a study about the varied citizen response to news and warnings about imminent danger, repeated warnings, false alarms, and the actual disaster; and discusses the roles of the media in disasters, because "information about the functioning of human communication networks within a social system is vital for officials concerned with the accomplishment of such organizational tasks as the dissemination of warnings." (p.12)

Burkhart suggests members of the media should be part of the preparedness team, going on to say that "effective personal relationships between journalists and public officials can greatly facilitate the dissemination of disaster warnings." (p. 20) The media already handles disaster *response*, but they should also be involved in planning efforts and educational programs held by emergency managers to enlist their help with disaster *preparedness*, *recovery*, and *mitigation* as well.

Besides discussing the interface between emergency managers and the media, Burkhart includes a study of media and response in two emergencies to illustrate media/emergency management interactions and public perception. This study makes up the bulk of the book.

Burkhart asked, "What are the sources reported by citizens as their means of getting personal preparedness information about local hazards that may affect their communities?"(p. 44) "Technical sources of risk data simply are not the usual places to which citizens look for such information (Davies et al., 1987). A parallel might be found in the finding that almost two-thirds of the U.S. population obtain information about cancer prevention from the media, while fewer than one in five obtain it from physicians (Nelkin, 1987, p. 77). There is no reason to expect that emergency managers would be more effective -- or the media less dominant -- in the area of local disaster preparedness information. The media are in general not well equipped to present technical data that are part of the background to a hazard preparedness plan, but they will make use of officially prepared materials and otherwise attempt to cope with the challenge of presenting hazard related materials and disaster planning information. Drabek, recognizing the need for the media to play an increasingly important part in disseminating emergency related information, lists involvement of the media in the 'overall emergency management system' as a key tactic for officials (Drabek, 1987, p. 241)." (p.44)

A second question points out where emergency managers can be the most effective. "What do people identify as preferred sources for their own search for additional preparedness information." (p. 45) "This question looks at the citizen who may be pursuing detailed information about local hazard, evacuation routes, or other possible protective measures that might be employed. It is likely that citizens may perceive the best communication channels for this activity as involving alternatives to the mass media channels discussed above. Detailed information about preparedness plans is not something that

the mass media would normally possess, nor would it necessarily be information that citizens might expect to find by turning to their social networks. The full range of local official agency resources may be perceived as better able to satisfy such demands."(p. 45)

Burkhart writes a good description of current emergency management: "Government has a responsibility to protect citizens in disasters. This responsibility for citizens justifies a broad range of efforts included within the concept of disaster management. In this way, officials concern themselves with planning for and responding to emergencies that disrupt lives of large numbers of people and strain a community's ability to cope (Barton, 1969). Disaster management cuts across areas of social science and has a technical dimension as well. At times, the field seems to defy definition (Quarantelli, 1986). It involves both individual responses and emergency organizations that mobilize to take action (Drabek, 1988; Dynes, 1970). Emergency management agencies range from federal to state, county, and local units, and from private to volunteer to public organizations. When all of the resources that are brought to bear on large scale disasters are included in the picture, the result reflects the complexity, contradictions and compromises of federalism itself.

Since the 1950s, the field of emergency management has been undergoing change in a number of ways. The emphasis upon response preparedness and civil defense has been replaced by notions of comprehensive emergency management and integrated emergency management (Drabek, 1988; Perry, 1985). The trend has been toward mitigation efforts, and way from a national defense-oriented preparedness perspective that acknowledged the 'inevitability' of disasters and war. This has altered the strategies of reliance upon citizen altruism and cooperation in the response phase, and has increased pressure on managers (both public and private sector) at all levels to use management techniques to manipulate the causes of disasters and thereby limit their negative consequences for citizens. This latter strategy demands unprecedented cooperation among government organizations, private organizations and citizens. In many ways, the mass media have become the glue that connects these three sectors in a communication context." (p. 13).

Unfortunately, this book is out of print. A copy can be obtained via Interlibrary Loan from your local library. Copies are held at the following libraries:

Alaska: Univ of Alaska, Anchorage
California: California Polytechnic State Univ
California State Univ, Dominguez Hills
California State Univ, Fresno
California State Univ, Hayward
California State Univ, Long Beach
Claremont College
Occidental College Library
San Diego State Univ
San Francisco State Univ Library
San Jose State Univ
Santa Clara Univ
Stanford Univ Library
Univ of California, Berkeley
Univ of California, Davis, Shields Library
Univ of California, Irvine
Univ of California, LA
Univ of California, Riverside
Univ of California, Santa Cruz
Univ of San Diego, J S Copley Library
Univ of Southern California
Hawaii: Univ of Hawaii at Manoa
Oregon: Oregon State Univ
Washington: Univ of Washington
BC: Simon Fraser Univ

References

Barton, A. H., 1969, Communities in disasters--A sociological analysis of collective stress situations: Doubleday, 352 p..

Davies, J. C.; Covello, V. T.; Allen, F. W., editors, 1987, Risk communication--Proceedings of the National Conference on Risk Communication: Conservation Foundation, 143 p..

Drabek, T. E., 1988, Strategies used by local emergency management agency directors to maintain organizational integrity: Western Social Science Association conference presentation.

Drabek, T. E., 1987, The professional emergency manager--Structures and strategies for success: University of Colorado Institute of Behavioral Sciences Monograph 44, 274 p..

Dynes, R. R., 1970, Organized behavior in disaster: Heath Lexington Books, 235 p..

Nelkin, Dorothy, 1987, Selling science--How the press covers science and technology: W. H. Freeman, 224 p.

Perry, R. W., 1985, Comprehensive emergency management--Evacuating threatened populations. JAI Press, 203 p.

Quarantelli, E. L., 1986, Disaster studies--An historical analysis of the influences of basic sociology and applied use on the research done in the last 35 years: University of Delaware Disaster Research Center.

Expanded Infrequently Asked Questions

compiled by

Lee Walkling

Why is it so difficult to predict tsunami magnitudes?

"Although predictions of arrival times for first waves of tsunami are satisfyingly accurate, predictions of tsunami magnitude are not. In fact, scientists say, because of the bewildering number of local effects that can cause variations in tsunami, it is not now possible even to tell if a known tsunami will have any significant effect at all on shore. Consequently, there is an inescapable amount of overwarning."

from: Tsunami Newsletter, volume XII, no. 2, June 1979, p. 3.

What is the difference between magnitude and intensity?

According to the dictionary:

MAGNITUDE = a number assigned to a quantity by means of which the quantity may be compared with other quantities of the same class.

INTENSITY = extreme strength, force or energy.

"The Intensity Scale differs from the Richter Magnitude Scale in that the effects of any one earthquake vary greatly from place to place, so there may be many Intensity values... measured from one earthquake. Each earthquake, on the other hand, should have just one Magnitude although the several methods of estimating it will yield slightly different values."

from: http://www.seismo.unr.edu/ftp/pub/louie/class/100/mercalli.html, downloaded 6-9-2000

For example, the 1994 Northridge earthquake (6.8 on the Richter scale...its magnitude) would have registered a large Mercalli number (its intensity) near Northridge, a smaller number in Orange County, and one of the smallest numbers (least intensity) in Palm Springs.

Earthquakes have the Richter Scale to rate their magnitudes; is there a tsunami magnitude scale?

Several, although there is an ongoing debate about the difference between magnitude scales and intensity scales.

The traditional scale, established in 1942 by Imamura and modified in 1958 by Iida, is the **Imamura-Iida** tsunami magnitude scale (Imamura-Iida Grade Scale):

[-1]: Minor tsunami observed by tide-gauges with wave heights less than 50 cm. No damage.

[0]: The maximum height is about one meter. Ships and marine products suffer lightly. The tsunami height is 50-80 cm within the area of 100 km.

[1]: The maximum height is 2-3 m. Houses on low ground are inundated and ships are washed ashore. The tsunami height is about one meter within the area of 200 km.

[2]: The maximum height is 4-6 m. Many houses are destroyed and some persons are killed. The tsunami height is about 1.5 m within the area of 300 km.

[3]: The maximum height is about 10 m and locally reaches 15-20 m. The tsunami height is about 2.5 m within the area of 400 km and this region suffers heavy damage.

[4]: The maximum height is about 20 m and locally reaches 30 m. The tsunami height is about four meters within the area of 500 km and this region suffers very heavy damage.

from: Hatori, T., 1986, Classification of tsunami magnitude scale: Bulletin of Earthquake Research Institute, v. 61, p. 515.

According to Abe, this scale "has long been used in Japan...to grade tsunamis in terms of both the maximum local height and the geographical extent of the tsunami hazard."

from: Abe, Katsuyuki, 1983, A new scale of tsunami magnitude, M_t. *In* Iida, K.; Iwasaki, T, editors, Tsunamis---Their science and engineering: Terra Scientific Publishing Company, p. 95.

"A new scale of tsunami magnitude, M_t, was recently established on the basis of the logarithm of the maximum amplitude of tsunami waves that were recorded by tide gauges." (p. 91). This is the **Abe** tsunami magnitude scale, described in Abe, K., 1983, A new scale of tsunami magnitude, M[subscript t]. IN Iida, K.; Iwasaki, T, editors, Tsunamis---Their science and engineering: Terra Scientific Publishing Company, p. 91-101; and in Blackford, M.E., 1984, Use of the Abe magnitude scale by the Tsunami Warning System: Science of Tsunami Hazards, v. 2, no. 1, p. 27-30.

Also in 1980, **Murty and Loomis** proposed a new objective tsunami magnitude scale (to do for tsunamis what the Richter scale does for earthquakes), based on total tsunami energy, to "provide an adequate representation of the whole spectrum of tsunamis, starting from the negligible ones and including those that have devastated whole coastlines." They believe the Imamura-

Iida scale and the Abe scale are intensity scales, equivalent, not to the Richter scale, but to the Modified Mercalli Scale for earthquakes.

from: Murty, T. S.; Loomis, H. G., 1980, A new objective tsunami magnitude scale: Marine Geodesy, v. 4, no. 3, p. 267-282.

Note: The ITIC Tsunami Glossary (http://www.shoa.cl /oceano/itic/glossary-01.html) defines a **Sieberg** tsunami intensity scale as a descriptive tsunami intensity scale which was later modified into the **Sieberg-Ambraseys** tsunami intensity scale. Thanks to Linda Sjogren, ITIC Library, an explanation of that scale was found in the October 1962 issue of the Bulletin of the Seismological Society of America, page 905:

Modified Sieberg Seismic Sea-Wave Intensity Scale
i. Very light. Wave so weak as to be perceptible only on tide-gauge records.
ii. Light. Wave noticed by those living along the shore and familiar with the sea. On very flat shores generally noticed.
iii. Rather strong. Generally noticed. Flooding of gently sloping coasts. Light sailing vessels carried away on shore. Slight damage to light structures situated near the coast. In estuaries reversal of the river flow for some distance upstream.
iv. Strong. Flooding of the shore to some depth. Light scouring on man-made ground. Embankments and dikes damaged. Light structures near the coast damaged. Solid structures on the coast injured. Big sailing vessels and small ships drifted inland or carried out to sea. Coasts littered with floating debris.
v. Very strong. General flooding of the shore to some depth. Quay-walls and solid structures near the sea damaged. Light structures destroyed. Severe scouring of cultivated land and littering of the coast with floating items and sea animals. With the exception of big ships all other types of vessels carried inland or out to sea. Big bores in estuary rivers. Harbour works damaged. People drowned. Wave accompanied by strong roar.
vi. Disastrous. Partial or complete destruction of man-made structures for some distance from the shore. Flooding of coasts to great depths. Big ships severely damaged. Trees uprooted or broken. Many casualties.

OK, so what are the Modified Mercalli Intensity Scale and the Richter Scale? How does the U.S. Postal Service help? Which scale is more meaningful to the layperson?

Modified Mercalli Intensity Scale (for earthquakes)

The Modified Mercalli Scale, developed in 1931 by American seismologists Harry Wood and Frank Neumann, describes the effects of earthquakes. "The Modified Mercalli Intensity value assigned to a specific site after an earthquake has a more meaningful measure of severity to the nonscientist than the magnitude because intensity refers to the effects actually experienced at that place. After the occurrence of widely-felt earthquakes, the Geological Survey mails questionnaires to postmasters in the disturbed area requesting the information so that intensity values can be assigned. The results of this postal canvass and information furnished by other sources are used to assign an intensity within the felt area. The maximum observed intensity generally occurs near the epicenter.

The *lower* numbers of the intensity scale generally deal with the manner in which the earthquake is felt by people. The *higher* numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above.

The following is an abbreviated description of the 12 levels of Modified Mercalli intensity.
I. Not felt except by a very few under especially favorable conditions.
II. Felt only by a few persons at rest, especially on upper floors of buildings.
III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly.

Vibrations similar to the passing of a truck. Duration estimated.
IV. Felt indoors by many, outdoors by few during the day. At night, some awakened.

Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air."

Abridged from: The Severity of an Earthquake, a U. S. Geological Survey General Interest Publication. (http://wwwneic.cr.usgs.gov/neis/general/handouts/mercalli.html) 6-21-2000

The Richter Magnitude Scale (for earthquakes)

Developed in 1935 by Charles F. Richter of the California Institute of Technology, this mathematical scale compares the size of earthquakes. " The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value."

A good description of the Richter Scale can be found at http://www.seismo.unr.edu/ftp/pub/louie/class/100/magnitude.html, with charts and diagrams, formulas and a cartoon.

from: http://wwwneic.cr.usgs.gov/neis/general/handouts/richter.html (6-21-2000).

What is being done to detect and measure tsunamis?

"Some of these problems, particularly those related to false alarms and the unreliability of tide gauges, are presently being addressed:

1) Deepwater buoy and pressure sensor systems are being installed, most notably off the west coast of the USA, Hawaii and Japan. The American system is described at http://www.pmel.noaa.gov/tsunami-hazard/warning.html. These are designed to detect the very small pressure changes on timescales of tens of minutes that are produced on the ocean floor by the passage of tsunami waves. Since they are not affected by the near shore phenomena that affect tide gauges, and because they can be positioned at will on the routes that tsunamis from major sources follow to impact major population sensors, these offer the potential for much more accurate upgrading of tsunami watches to tsunami warnings. Furthermore, the data collected from them on tsunami amplitudes and wave forms in the deep ocean will greatly aid the process of tsunami modeling.

2) Rapid modeling of the tsunami generation process by
interpolation. Computer simulations of tsunami generation involve very large amounts of computational power and considerable time, even on the most powerful machines. However, efforts by the Japan Meteorological Agency (Tatehata, 1997) and the Pacific Marine Engineering Laboratory, amongst others, are now producing large sets of model tsunamis, produced by earthquakes of different magnitudes, focal plane mechanisms, focal depths and epicentral locations on a regular grid. The PMEL program, the Method Of Splitting Tsunamis, is described at http://www.pmel.noaa.gov/pubs/PDF/tito1927/tito1927.pdf . It is a relatively simple matter to interpolate between these precomputed model tsunamis to produce a rapid estimate of the likely magnitude of a tsunami event, as well as wave arrival times. Future work along these lines may allow tsunami alerts to contain estimates of wave runups at key locations as wellas times of arrival for the first wave. At present, however, the simulations commonly under-or over- estimate runup values.

TSUNAMI Initiative, a British Antarctic Survey project, supported by the United Kingdom DTI and seven insurance companies. The information on this site is ongoing research and carries no warranty of any kind and should not be used operationally.

from: http://www.nerc-bas.ac.uk/tsunami-risks/html/Mitig1Improv.htm

What is the average height of a tsunami wave?

"Normally these waves do not reach more than twenty-five feet in height, but there are exceptions. Sometimes wave trains that have originated in different centers will combine, and within any train there will always be some waves that are bigger than the rest. It has been calculated that one wave in 23 will be twice the average height, one in 1,715 will be three times the average, and one in 300,000 will be four times higher than the average."

from: Tsunami Newsletter, volume XII, no. 2, June 1979, p. 4.

PERIODICALS FOR DISASTER MITIGATION AND TSUNAMI INFORMATION

This information was gathered from Hazard/Disaster Periodicals (http://www.wsspc.org/resources/periodcl.html), the Ocean and Coastal Law Center Collection (http://oceanlaw.uoregon.edu/library/library.html), and other online sources. Journal titles that are starred (*) have been found informative and useful by Colorado's Natural Hazards Center (hazctr@spot.colorado.edu). The **bold** titles are held in the Geology Library.

AEDR Newsletter *

Jim Cohen, American Engineers for Disaster Relief, PO Box 684, Princeton, NJ 08550-0684, (201) 678-1960, ext. 706; (609) 737-3714; published irregularly; **free**

Bridges: Emergency Management Connections *

National Coordinating Council on Emergency Management, 7297 Lee Highway, Suite N, Falls Church, VA 22042; (703) 533-7672; fax: (703) 241-5603 Annual; single copies are **free**; additional copies are $5.00 each..

Coastal Management

(formerly, Coastal Zone Management Journal) An International Journal of Marine Environment, Resources, Law and Society,
www.taylorandfrancis.com/JNLS/cmg.htm

Coastal Management is a peer-reviewed, applied research journal dedicated to exploring the technical, legal, political, social, and policy issues relating to the use of coastal resources and environments on a global scale. The journal presents timely information on management tools and techniques as well as recent findings from research and analysis that bear directly on management and policy. Current areas of focus include coastal tourism, biodiversity in the coastal environment, seaport and waterfront management and planning, coastal hazards management and sea level rise, ocean policy and coastal state planning, coastal law and administration, water quality in the coastal environment, and international coastal management.

The Connection

available at: http://www.naem.com/connection.html

This newsletter "comprises articles written by people from around the country involved in local preparation for an mitigation of emergencies. It includes profiles of specific local organizations and activities, particularly showcasing Community Emergency Response Teams (CERTs). The editors of "The Connection" welcome article submissions. The deadline for the next issue is February 15, 2001, and guidelines are available from the newsletter's Web site. In addition, the editors are assembling a list of CERT-type community programs with contact information for program coordinators. A submission form for such information is also available from the site. For more information about CERTs, see the FEMA website:http://www.fema.gov/emi/cert/.

from: Disaster Research #327, August 24, 2000

Contingency Planning and Management *

Witter Publishing Corporation, 84 Park Avenue, Flemington, NJ 08822; (908) 788-0343; fax: (908) 788-3782; e-mail: WitterPub@aol.com. Monthly - **free** to qualified subscribers; otherwise, $99/year, U.S. and Canada; $150/year, elsewhere. (Library's subscription starts with vol. 5, no. 4, July/Aug 2000)

Disaster Management *

UNISAF Publications, Division of FMJ International Publications, Ltd., Queensway House, 2 Queensway, Redhill, Surrey RH1 1QS, U.K.; tel: (0737) 768611; fax: (0737) 761685; telex: 948669 TOPJNL G. Quarterly - ú213.10/year, U.K.; ú256.15, overseas; $397, U.S.

Disaster Prevention and Management: An International Journal *

For subscriptions within the U.S., contact MCB University Press Limited, P.O. Box 10812, Birmingham, AL 35201-0812; (800) 633-4931; fax: (205) 995-1588. Outside the U.S., contact Customer Services, MCB University Press Limited, 62 Toller Lane, Bradford BD8 9BY, U.K.; fax: (0274) 547143. Quarterly - $299.95/year.

Disaster Recovery Journal *

P.O. Box 510110, St. Louis, MO 63151; (314) 894-0276. Quarterly - **free** to all qualified personnel involved in managing, preparing, or supervising contingency planning; otherwise $10/year, U.S.; $24, Canada and Mexico; $47, elsewhere.

Disaster Response Network *

Kelly Kennai, American Psychological Association, Practice Directorate, 750 First Street, N.E., Washington, DC 20002-4242; (202) 336-5898. Three times per year - **free**.

DisasterCom *

Disaster Emergency Response Association, P.O. Box 37324, Milwaukee, WI 53237-0324. Quarterly - subscription part of membership fee ($15/year).

Disasters: Preparedness and Mitigation in the Americas *

Pan American Health Organization, 525 23rd Street, N.W., Washington, DC 20037; (202) 861-6096; fax: (202) 775-4578; e-mail: disaster@paho.org. (Available in English and Spanish.) Quarterly - **free**.

Disasters: The Journal of Disaster Studies, Policy and Management *

(formerly the *Journal of Disaster Studies and Management* and also formerly *Journal of Disaster Studies, Policy and Management*

Blackwell Publishers, 238 Main Street, Cambridge, MA 02142; or, 108 Cowley Road, Oxford OX4 1JF, U.K. Quarterly - Institutions: ú97.50/year, Europe/U.K.; $151/year, North America; ú97.50/year, elsewhere. Individuals: ú50/year, Europe/U.K.; $90/year, North America; ú58/year, elsewhere.

A major, peer-reviewed quarterly journal reporting on all aspects of disaster studies, policy and management. It provides a forum for academics, policy-makers and practitioners reporting on high quality research and practice related to natural disasters and complex political emergencies around the world. The journal maintains a balance between academic papers, field reports from relief workers, case studies, and articles of general interest. Includes book reviews.

Emergency Preparedness Digest (Canada) *

Canada Communications Group-Publishing, Ottawa, Canada K1A 0S9; (819) 956-4802. Quarterly - $20 (Canadian)/year, Canada; $26 (U.S.)/year, U.S.

Emergency Preparedness News *

BPI, 951 Pershing Drive, Silver Spring, MD 20910-4464; (301) 587-6300 or (800) 274-6737; fax (301) 587-1081. Biweekly - $299/year, add $13 for airmail postage outside the U.S.

Emergency Responder

Emergency Management Division of the Washington Military Department, Camp Murray, WA 98430-5122 available in alternative formats upon request: Rob Harper (800) 562-6108, ext. 7005; (253) 512-7298 TDD; or r.harper@emd.wa.gov

Hazard (formerly Hazard Monthly) *

EIS International, 1401 Rockville Pike, Suite 500, Rockville, MD 20852; (800) 999-5009 or (301) 738-6900; fax: (301) 738-1026. Quarterly - **free** within the U.S.; call for pricing information outside U.S.

HELPU Newsletter (online only)

http://members.spree.com/education/helpu/maynews2000.html (for May issue)

Serves the disabled community, their care-givers, attendants, fire & rescue personnel, and emergency services departments. Numerous pages with tips on emergency/disaster preparedness for various hazards.

INCEDE Newsletter *

International Center for Disaster-Mitigation Engineering (INCEDE), Institute of Industrial Science, University of Tokyo, 7-22-1 Roppongi, Minato-ku, Tokyo 106, Japan; tel: 81-3-3402-6231, ext. 2660-2663

International Journal of Mass Emergencies and Disasters *

(formerly Mass Emergencies)

www.usc.edu/dept/puad/ijmed/about.html

David Neal, Institute of Emergency Administration and Planning, P.O. Box 13438, University of North Texas, Denton, TX 76203. Three times per year - $48, institutions; $20, individuals.

The International Journal of Mass Emergencies and Disasters is published triannually during the months of March, August, and November. It is concerned with the social and behavioral aspects of relatively sudden collective stress situations typically referred to as disasters or mass emergencies. All aspects of the life history of such events, both actual and threatened, are examined including mitigation, preparedness, response, and recovery activities. These situations often are created by natural disaster agents, technological accidents, violent intergroup conflicts, shortages of vital resources, acute and chronic environmental threats, and other kinds of major hazards to life, health, property, well-being, and everyday routines. While the focus of the Journal is on work dealing with the human and organizational aspects of mass emergencies, contributions concerning medical, biological, physical engineering, or other technical matters are acceptable if social and behavioral features of disasters are also prominently discussed. (Library's subscription was submitted July 2000)

Journal of American Planning Association

American Planning Association, 122 S. Michigan Avenue, Suite 1600, Chicago, IL 60603, (312) 431-9100 (312) 431-9985 fax. Quarterly

Journal of American Society of Professional Emergency Planners

www.aspep.org/journal.htm

Committed to the sharing of ideas, research, lessons, practice, and opinion, as well as serving as a forum for all disciplines involved in emergency management. Annual publication. ASPEP, c/o IAEM, 111 Park Place, Falls Church, VA 22046-4513

Journal of Contingencies and Crisis Management *

Blackwell Publishers, 108 Cowley Road, Oxford OX4 1JF, U.K.; or, Journals Marketing Manager, Blackwell Publishers, 238 Main Street, Suite 501, Cambridge, MA 02142. available online: http://www.blackwellpublishers.co.uk/journals/JCCM/descript.htm Quarterly - ú95/year, Europe; $140, North America; ú95, elsewhere.

Source of information on all aspects of contingency planning, scenario analysis, and crisis managment in both

corporate and public sectors.

The Liaison (online)
http://coe-dmha.org
Published by the Center of Excellence in Disaster Management and Humanitarian Assistance, Hawaii.

Natural Disaster Loss Reduction Update*
Insurance Institute for Property Loss Reduction, 73 Tremont Street, Suite 510, Boston, MA 02110-1273, attn: Karen Gahagan; (617) 722-0200; fax: (617) 722-0202. Quarterly - **free.**

Natural Hazards: International Journal of the International Society for the Prevention and Mitigation of Natural Hazards *
Journal of the International Society for the Prevention and Mitigation of Natural Hazards. Kluwer Academic Publishers, P.O. Box 322, 3300 AH Dordrecht, the Netherlands, or P.O. Box 358, Accord Station, Hingham, MA 02018-0358. Bimonthly - $289/year. Website: http://www.es.mq.edu.au/NHRC/NHS

Natural Hazards Observer
Publications Clerk, Natural Hazards Research and Applications Information Center, IBS #6, Campus Box 482, University of Colorado, Boulder, CO 80309-0482; (303) 492-6819; fax: (303) 492-2151; e-mail: jclark@colorado.edu.Bimonthly - **free** within the U.S.; $15/year, elsewhere.

Natural Hazards Review
American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400, online: www.pubs.asce.org Quarterly, $38 ASCE members; $175 US institutions. Cosponsored by Natural Hazards and Research Applications Information Center, University of Colorado

Ocean Science News
ISSN:0029-8069, Nautilus, 1201 National Press Building , Washington, DC 20045, Phone: (202) 347-6643

Oregon Coastal Notes
Oregon Coastal Zone Management Association, Newport, OR, Note: Issues for Feb. and Mar. 1995 have title: Coastal Notes

Science of Tsunami Hazards *
The Tsunami Society, Box 25218, Honolulu, HI 96825. Biannually - subscription part of membership fee ($25, individuals; $100, institutions; $5, students).

Shore and Beach
Journal of the American Shore and Beach Preservation Association, http://www.ncsu.edu/asbpa U.S. Army Engineer Waterways Experiment Station, Coastal and Hydraulic Laboratory, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199

Stop Disasters*
United Nations Secretariat for the International Decade for Natural Disaster Reduction, Palais des Nations, CH-1211, Geneva 10, Switzerland; tel: (41) 22 798 8400; fax: (41) 22 733 8695; or, Osservatorio Vesuviano, via A. Manzoni, 249 - 80123 Naples, Italy; tel: 39-81 575 5904; fax: 39-81 575 4239. Bimonthly - **free.**

TsuInfo Alert
http://www.wa.gov/dnr/htdocs/ger/tsindex.html
DNR, Division of Geology and Earth Resources, PO Box 47007, Olympia, WA 98504-7007, (360) 902-1472; (360) 902-1785 fax, Bimonthly - **free.**

Tsunami Newsletter *
(formerly, the ITIC Newsletter)
http://www.shoa.cl/oceano/itic/frontpage.html
International Tsunami Information Center, Box 50027, Honolulu, HI 96850; fax: (808) 541-1678; e-mail: itic@ptwc.noaa.gov. Semiannual - **free** to scientists, engineers, educators, community protection agencies, and governments worldwide.

What's New---Mitigation and Preparedness Activities Across the Country (online; PDF format)
Published by the American Red Cross, in support of FEMA's Project Impact and disaster reduction generally.

QUESTIONS TO OUR READERS

Do you know of any emergency management or tsunami journals we've missed? If so, please mail, email or fax us the information: title, publisher, mailing address, email or website.

Are there any professional emergency management or mitigation planning journals you would subscribe to if money was available?

If *TsuInfo* subscribed to tsunami, mitigation or emergency management journals, and you could receive copies of their Tables of Contents from which to request articles of particular interest, which journals would you select?

(NOTE: based on the response, TsuInfo could subscribe to the top five requested journals, and do a Table of Contents service, with the bi-monthly mailing).

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