



TsuInfo Alert

prepared on behalf of the

National Tsunami Hazard Mitigation Program

by the Washington Department of Natural Resources

Contents

Volume 2, number 2, March-April, 2000

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TSUNAMI PROGRAM NEWS

Congratulations to DOGAMI!

The Oregon Department of Geology and Mineral Industries (DOGAMI) was awarded one of the 1999 WSSPC Awards in Excellence for their program, *Outreach to Schools --Tsunami Education Strategy*. The major purpose of the Oregon Department of Geology and Mineral Industries' Tsunami Education Strategy is to save the lives of Oregon coastal residents and visitors from the rapid arrival of devastating tsunami waves from Cascadia off-shore earthquakes.

The specific activities and operations of the program are:

- A school curriculum, including a video, designed for tsunami education programs for grades K-12.
- Educational Podiums, placed on frequently visited beaches along the Oregon coast to explain the tsunami hazard and provide instructions regarding evacuation when required.
- Brochures and other materials provided as information pieces and as takeaway educational items for visitors to coastal hotels and motels.

Most of the program was designed in Oregon and is currently being adopted or considered in other Pacific states. Public polling shows an increase in awareness of the tsunami hazard--especially in the schools--as a result of the program. Further, the components of this program could well serve as a model for educational efforts for other perils affecting a state or geographical area.

(from: WSSPC Awards in Excellence, 1999, p. 8.)

NEWS AND ANNOUNCEMENTS

from: *Disaster Research*,

Natural Hazard Center <hazctr@spot.Colorado.EDU>

FEMA Adjusts Grant Amounts

FEMA has increased the amount of money available for Individual and Family Grants, grants to state and local governments, and grants to private nonprofit facilities for disasters declared on or after October 1, 1999, by 2.3% over the prior year. As of that date, the maximum amount of any grant made to an individual or family for disaster-related needs and expenses is increased to \$13,900. States, local governments, and owners of private nonprofit facilities are eligible to receive up to \$48,900. For more information, contact Madge Dale, FEMA, Response and Recovery Directorate, 500 C Street, S.W., Washington, DC 20472; (202) 646-3772.

Congress Authorizes Monument to Civil Defense and Emergency Management

On November 13, 1999, President Clinton signed Public Law 106-13, which authorizes the United States National Civil Defense Monument Commission to construct a monument "to honor those who have served the Nation's civil defense and emergency management programs." The monument is to be constructed on Federal Emergency Management Agency land in Emmitsburg, Maryland, and is subject to the approval of the agency director. The monument is to be paid for through contributions to the commission, which is nonprofit. Copies of Public Law 106-13 can be found at any federal repository library or on-line at <http://thomas.loc.gov>.

(continued, p. 3)

The 1999 issues of *TsuInfo Alert* are now on the Internet, at <http://www.wa.gov/dnr/htdocs/ger/tsindex/html>

TsuInfo Alert

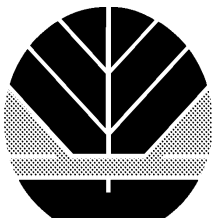
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Participants in the TsuInfo program can request copies of reports listed in this issue from:

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

(continued from p. 1)

Seeking Ideas/Participants for Pacific Rim Summit on Natural Hazards

Stanford University, the U.S. Geological Survey, and the Circum-Pacific Council, along with other public and private organizations, are sponsoring a three-day summit to address the socioeconomic consequences of natural hazards on countries that rim the Pacific Ocean. The summit is scheduled for August 2001 at Stanford University, Palo Alto, California.

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 as the interconnectivity of the 21st century grows. The meeting is designed to explore these large-scale regional teleconnections and initiate planning to mitigate the global implications of disastrous events on the changing populations and increasingly interdependent economic infrastructures of Pacific rim countries.

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 policy recommendations to political leaders for risk reduction, and 3) conducting a series of post-summit educational workshops throughout the Pacific rim for decisionmakers, business and industry, and citizens to communicate the issues and motivate community-based action.

The organizers currently seek 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, Tel: (650) 329-5430, Fax: (650) 329-4999, e-mail: dhowell@usgs.gov

IG Issues FEMA Top 10 List

In its 21st "Semi-Annual Report to Congress" (April 1, 1999 -September 30, 1999), the FEMA's Inspector General's (IG) Office reviewed, among other items, the 10 most serious management challenges facing the agency. They are: 1) containing disaster costs, 2) clarifying disaster declaration criteria, 3) sustaining the national mitigation program, 4) assessing state and local preparedness for emergencies, 5) enhancing the financial soundness and equity of the National Flood Insurance Program (NFIP), 6) updating flood maps, 7) developing reliable procedures for complying with the Government Performance and Results Act of 1993, 8) enhancing financial management operations, 9) developing a viable grants management program, and 10) implementing and maintaining information management systems.

Further, the Inspector General assessed the effectiveness of FEMA's Substantial Damage Rule as a mitigation tool. The rule requires communities participating in the NFIP to ensure that flood-prone structures damaged equal to or greater than 50% of their value be replaced with flood-resistant structures and (usually) elevated. After an examination of insurance claim data, the Inspector General found that many communities are not implementing mitigation under this rule, resulting in higher insurance premiums for the owners. The office recommends that FEMA centralize management of substantially damaged structures; notify policyholders prior to payment that their homes may be substantially damaged and eligible for mitigation funding; re-rate flood policies based on a structure's flood risk; require communities to use market value capped at replacement cost to calculate substantial damage; increase training regarding this rule; and visit communities to monitor compliance.

The "Semi-Annual Report" (1999, 40 p., free) also describes numerous investigations regarding attempted fraud, inappropriate grant awards, and bribery of government employees. It describes the agency's Fraud Hotline, the Disaster Fraud Training course currently being developed, the IG's participation in other FEMA activities, and reviews of legislative and regulatory activities.

Copies of the "Semi-Annual Report" are free and can be obtained from Rita Rios, FEMA, Office of Inspector General, 500 C Street, S.W., Room 506, Washington, DC 20472; (202) 646-4166; fax: (202) 646-3901; e-mail: Rita.Rios@fema.gov; WWW: <http://www.fema.gov/ig>.

Introducing DRM

Although developed countries have substantially increased local capabilities to reduce disasters, in many cases developing countries have not been able to adapt such capabilities for their own localities. To address this problem, the Board of the Swiss Federal Institutes of Technology and Virginia Tech University recently created the World Institute for Disaster Risk Management (DRM) in Alexandria, Virginia, to develop disaster risk reduction approaches that promote both public safety and sustainable development.

The DRM program is interdisciplinary, addressing prevention strategies, implementation activities, education, and knowledge dissemination in relation to both human-caused technological risks and natural disasters. The DRM will also play an active role in the ProVention Consortium on Natural and Technological Catastrophes of the World Bank (see the DR #313).

The Swiss Federal Institutes of Technology (ETH) represents numerous research centers that study a broad range of hazard-related issues, from risk management to engineering to public policy. Virginia Tech has multidisciplinary capabilities and experience in natural and technological disaster management, including in the areas of

seismology, water resource management, environmental and hazardous materials studies, transportation research, and public policy.

Several affiliated universities from around the world are also part of the DRM network. Basically, DRM will provide services to aid the private sector, governments, and community groups in defining and dealing with hazards and risks.

To obtain further information about this effort, contact DRM, World Institute for Disaster Management, Alexandria Research Institute, 206 North Washington Street, Suite 400, Alexandria, VA 22314; (703) 518- 8080; fax: (703) 518-8085; e-mail: widrm@vt.edu; or DRM, c/o ETH Board, Haldelwig 15, ETH Centre, CH-8092 Zurich, Switzerland; tel: +41 1 632 20 02; fax: + 41 1 632 11 90; e-mail: DRM@ethrat.ch.

A Certificate Program in Disaster Management and Humanitarian Assistance

On January 13, the Center of Excellence in Disaster Management and Humanitarian Assistance (CEDMHA) and the University of Hawaii-Manoa introduced the foundation course for a new multidisciplinary training and research program leading to a Certificate in Disaster Management and Humanitarian Assistance. The initial seminar, and, indeed, the entire new program, will draw on the Asia-Pacific expertise of the university faculty and the extensive field experience of CEDMHA staff. In addition, the course developers plan to invite experts from various international response and relief agencies and other universities to contribute to the program. Participants will include both civilian and military students. For additional information about the new certificate program, contact the Center of Excellence in Disaster Management and Humanitarian Assistance, c/o Tripler Army Medical Center, 1 Jarrett White road (MCPA-DM), Tripler AMC, HI 96859-5000; (808) 433-7035; fax: (808) 433-1757; WWW: <http://coe.tamc.amedd.army.mil> or <http://coe-dmha.org>. Interested persons can also contact the program coordinator, James. D. White, (808) 956-3265; e-mail: jwhite@hawaii.edu.

New Courses and Other Resources Available from FEMA's Higher Education Project

One of the goals of the Federal Emergency Management Agency is to encourage and support the spread of emergency-management-related education in colleges and universities across the United States. To further this end, FEMA's Emergency Management Institute (EMI), which focuses on providing skills-based training to existing emergency management personnel, has undertaken several initiatives promoting college-based emergency management education for future emergency managers.

First the project has compiled an annotated list of colleges, universities, and other institutions offering

emergency management courses, certificates, and degrees. This catalog is available on-line at <http://www.fema.gov/emi/edu/higher.htm>. To obtain background and course materials, see <http://www.fema.gov/emi/edu/higher.htm> or contact the project director, Wayne Blanchard, FEMA Higher Education Project, Emergency Management Institute, 16825 South Seton Avenue, Emmitsburg, MD 21727; (301) 447-1262; fax: (301) 447-1598; e-mail: wayne.blanchard@fema.gov.

"Electronic Journal of Emergency Management" Seeking Articles

The "Electronic Journal of Emergency Management" is a peer-reviewed on-line journal that specializes in articles dealing with emergency management, business continuity, and disaster science. The editors are currently seeking contributions from students, faculty, researchers, and emergency management and business continuity practitioners. Disaster case studies and historical analyses are particularly welcome, as are summaries of both qualitative and quantitative research. The editors are also interested in papers on new or emerging topics that would normally not be examined in other publications. Articles should be less than ten pages, doubled spaced. For more information about the journal, submission requirements, and the peer review process, or to view the current issue, see: http://members.tripod.com/~Richmond_ESM/index.html; or contact Walter Green, Assistant Professor of Emergency Services Management, School of Continuing Studies, University of Richmond, Richmond, VA 23173; (804) 287-1246; e-mail: wgreen@richmond.edu.

Meetings and training schedule

A comprehensive list of upcoming hazards-related meetings and training is available from our [Natural Hazards Center] World Wide Web site: <http://www.colorado.edu/hazards/conf.html>

* * * *

Tsunami Quiz

Can you name eight standard tsunami mitigation measures?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

(answers are on page 7)

THE HAZARDS FROM TSUNAMIS

by

Terry C. Wallace, University of Arizona, Department of Geosciences

(reprinted with permission from <http://www.geo.arizona.edu/geo2xx/geo218/UNIT4/lecture14.html>)

History contains many accounts of tsunamis destroying coastal cities. A famous example is the great Lisbon earthquake of November 1, 1755. The earthquake associated with this tsunami occurred a considerable distance off the west coast of Portugal. However, the tsunami that reached Lisbon had a wave height that reached 5 meters and traveled up the large river that runs through Lisbon. After the earthquake and tsunami were over more than 60,000 people had died and Portugal was no longer a world naval power.

Measuring Tsunami

Tsunami become dangerous during run-up and landfall. There is usually a series of waves in which there is flooding and then wave retreat. The fourth or fifth wave of flooding may be the largest; the interval between the arrival of each wave is usually some fraction of an hour. The size of the tsunami depends on the amplitude of the waves -- and this amplitude depends on many different things. These factors include: (1) the size of the original wave, the distance the wave has traveled, the shape of the seafloor near the beach, and the shape of the coast line. Tsunami magnitude (similar to earthquake intensity) is a measure of the local size of a tsunami, and is measured with the formula: $M = 3.32 \log h$.

The US danger from tsunamis

| State | Cities susceptible to tsunami | Population susceptible | Population endangered by a 50 foot tsunami |
|------------|-------------------------------|------------------------|--|
| Washington | 102 | 1,510,000 | 96,000 |
| Oregon | 60 | 95,000 | 31,500 |
| California | 152 | 8,700,000 | 589,500 |
| Hawaii | 123 | 750,000 | 131,000 |
| Alaska | 52 | 170,000 | 47,000 |

Generating Tsunami

Tsunami are generated when there is a significant displacement of sea water by a sudden event. There are three basic ways to do this: earthquakes, volcanic eruptions and landslides. By far, the most common way to generate tsunami is by the offset of the sea floor by earthquakes (earthquakes that generate tsunami are called tsunamigenic earthquakes). The size of the tsunami is related to the magnitude of the earthquake, although the damage from a tsunami also strongly depends on the sea floor and shore conditions. Volcanic eruptions can also be efficient generators of tsunami -- explosive eruptions can displace enormous volumes of rock that is partially submerged, and the rapid influx of water can create a tremendous wave.

Table summarizing the tsunami magnitude scale:

| Intensity | Height (m) | Description | Frequency in Pacific Ocean |
|-----------|------------|--|----------------------------|
| 4 | 16 | Disastrous. Near complete destruction of manmade structures | 1 in 10 years |
| 3 | 8 | Very large. General flooding, heavy damage to shoreline structures | 1 in 3 years |
| 2 | 4 | Large. Flooding of shore, light damage to structures | 1 per year |
| 1 | 2 | Moderate. Flooding of gently sloping coasts, slight damage | 1 per 8 months |

The Coastal Natural Hazards Geographic Information System

by

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from: http://www.czconference.org/Final%20Abstracts/J_Marra-824.html (12-23-99)

The Coastal Natural Hazards Geographic Information System (CNHGIS) is a database, decision support and tracking system intended to assist city and county planners, state agency representatives, and others involved in the management of chronic coastal natural hazards (e.g. dune erosion, bluff retreat, landsliding). The CNHGIS is focused on individual littoral cells. Currently it covers a 20+ kilometer segment of shoreline along the central Oregon coast. Plans are underway to extend its coverage to 60+ kilometers.

The ArcInfo/ArcView compatible GIS consists of a series of base, cultural, physical, biological, and risk zone map/attribute layers. Base layers include a rectified orthophoto with a resolution of just over 1 foot per pixel. The Statutory Vegetation Line, tax lots, zoning, and shore protection structures are included among the cultural layers. Assessor's map number, tax lot number, zoning classification, jurisdiction, ownership, building and if so the year built, as well as city or county permit type and number are examples of attributes included within the tax lot layer. Attributes within the shore protection structures layer include: permit number and type; applicant name, address, and phone number; structure type, length, width, height, and volume; and permit status. Dune or bluff characteristics (e.g. toe and crest elevation, percent vegetation cover, presence of seeps or springs), average annual recession rates, SCS soil type designations, and FIRM flood zone designations are included among the physical layers. The

USFW National Wetlands Inventory is included among the biological layers.

The Risk Zone layers are a key element of the CNHGIS. Attributes within this layer include: risk zone type (i.e. dune, bluff, slide, or inlet); risk zone classification (i.e. extreme, high, and low); and the average, minimum, and maximum risk zone width (i.e. the distance landward from a reference feature) associated with each risk zone type and class. Risk zones are delineated through the application of a process-based methodology for assessing relative risk. Simple formulas are applied to four shoreline settings common to the Oregon coast: dune-backed; bluff-backed; slide-backed; and inlet-affected shorelines. These formulas express factors affecting shoreline stability as a combination of short term events and long term trends unique to the given shoreline setting. For example, along dune-backed shorelines wave attack during storm events is the primary control on shoreline stability and is thus an individual term in the hazard assessment formula for this setting. The long term trend of shoreline change attributable to relative sea level rise is also represented as a term in the formula for this setting. Using a range of actual values for the individual terms in the formulas provides a basis for establishing areas with different degrees of relative risk.

The map/attribute layers that constitute the Coastal Natural Hazards Geographic Information System (CNHGIS) form the basis for politically acceptable as well as scientifically defensible decision-making.

APRIL IS TSUNAMI
MITIGATION MONTH!

Ocean and Coastal Law Center Collection

John E. Jaqua Law Library
1221 University of Oregon
(1515 Agate Street)
Eugene, OR 97403-1221
541 346-1567
541 346-1564 fax

<http://oceanlaw.uoregon.edu/library/library.html>

This collection is funded in part by the Oregon State University Sea Grant College Program, as part of the law school's Ocean and Coastal Law Center. The collection's holdings emphasize marine resources (fisheries, marine mammals, oil and gas, and seabed minerals), coastal zone management, marine pollution, ocean policy, maritime boundaries, and the international Law of the Sea. Also included are materials on the socioeconomic, environmental, and scientific aspects of using the oceans.

This type of collection, found in only a few other law libraries across the country, is valuable, foremost, because it brings together in a single location specialized legal publications and broadly related materials in a field that is necessarily interdisciplinary. The collection has about 5,800 cataloged books, reports, and government documents; 260 reprints; and 200 maps. It currently receives 168 journals and newsletters.

This special collection is open to the public for on-site use. Materials are to be checked out at the law library circulation desk, where borrowing privileges are extended to attorneys, all Oregon college students, and holders of a UO "Public Borrower Card." Other users may borrow items with the permission of the ocean and coastal law librarian. The loan period is two weeks, with renewals upon request. Certain reference works do not circulate. The ocean and coastal law librarian provides reference service to anyone needing information. Bibliographies and literature searching are done in response to specific requests, as time allows.

The periodicals holdings list is available online at <http://oceanlaw.uoregon.edu/library/periodicals.html>

Review:

Natural Hazards Review
Vol. 1, No. 1, February 2000

A new quarterly journal, *Natural Hazards Review*, a joint project of the American Society of Civil Engineers and the Natural Hazards and Research Applications Information Center, made its debut in February, with an issue devoted to the International Decade for Natural Disaster Reduction (IDNDR). The editors, James E. Beavers (Mid-America Earthquake Center) and Dennis S. Mileti (Natural Hazards Research and Application Information Center), want the journal to be international in scope.

"*Natural Hazards Review* stands on the realization that natural disaster losses result from interactions between the physical world, the constructed environment, and the character of the societies and people who occupy them. The journal is dedicated to bring together the physical, social, and behavioral sciences; engineering; and the regulatory and policy environments to provide a forum for cutting edge, holistic, and cross-disciplinary approaches to natural hazard loss and cost reduction. The journal offers a means for researchers and practitioners working together to publish the results of truly interdisciplinary and partnered approaches to loss reduction and long-term disaster resiliency." (p. ii)

The journal is available in print, on CD ROM, or online. More information is available at <http://www.pubs.asce.org/journals/nhnews.html>, or by email: marketing@asce.org.

* * * *

Tsunami Quiz Answers (in no particular order):

- determine at-risk areas
- establish a warning system
- relocate buildings from low-lying land (at-risk areas) to safe areas
- construct and/or identify escape routes
- conduct evacuation training
- leave open spaces along shorelines for absorbing the tsunami energy
- plant and cultivate forests along the shoreline in order to reduce the tsunami attack
- educate the coastal citizenry about earthquakes as possible tsunami warnings

New Tsunami Mitigation Materials

Added to the Division of Geology and Earth Resources Library

compiled by

Connie J. Manson

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

GENERAL WORKS

- Hays, W. W., editor, 1981, Facing geologic and hydrologic hazards--Earth-science considerations: U.S. Geological Survey Professional Paper 1240-B, 108 p.
- Hughes, John, 2000, Do we really need another wake-up call?: Washington Geology, v. 27, no. 2/3/4, p. 29.
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TECHNICAL REPORTS

Hawaii

- Moore, Andrew L., 2000, Landward fining in onshore gravel as evidence for a late Pleistocene tsunami on Molokai, Hawaii: Geology, v. 28, no. 3, p. 247-250.

Oregon and Washington (the central Cascadia region)

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- Yamaguchi, David K.; Jacoby, Gordon C.; Atwater, Brian F.; Bunker, Daniel E.; Benson, Boyd E.; Reid, Marion S.; Woodhouse, Connie A., 1997, Tree-ring dating of an earthquake at the Cascadia subduction zone to within several months of January, 1700. *In* Dieterich, J. H.; Nonomura, Kunio, chairmen, Proceedings of the First Joint Meeting of the U.S.-Japan Conference on Natural Resources (UJNR) Panel on Earthquake Research: U.S. Geological Survey Open-File Report 97-467, p. 143-150.

Warning centers and warning systems

- Bernard, E. N., 1980, U.S. tsunami warning system, December 1979: Tsunami Newsletter, v. 13, no. 1, p. 39-40.
- Foster, Harold D.; Wuorinen, Vilho, 1980, British Columbia's tsunami warning system--An evaluation [abstract]: Tsunami Newsletter, v. 13, no. 1, p. 52.
- Maramai, Alessandra; Tinti, Stefano, 1996, Study for a pilot

Europe

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Japan and the Far East

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**April 22, 2000 is
Earth Day.**

VIDEO RESERVATIONS

Place a check mark () 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.walking@wadnr.gov 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:

___ **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.

___ **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

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 earth- quakes, 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 version...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.

___ **The Wild Sea: Enjoy It...Safely** (7 min.)

Produced by the Ocean Shores (Washington) Interpretive Center, this video deals with beach safety, including mention of tsunamis.

WEB SITES

From: Disaster Research 311, January 12, 2000.

<http://omzg.sccc.ru/tsulab/>

Tsunami Laboratory, Institute of Computational Mathematics and Mathematical Geophysics (Computing Center) Siberian Division. Russian Academy of Sciences. Head of the Laboratory: Dr. Viacheslav K. Gusiakov
Tel: (3832) 34-20-70 Fax: (3832) 32-42-59 Email: gvk@omzg.sccc.ru.

Includes the *On-line Pacific Tsunami Catalog, 47B.C.-1998A.D.* at <http://tsun.sccc.ru/htdbpac>, which includes almost 1,500 historical tsunamigenic events and nearly 8,000 coastal run-up and tide-gauge observations of wave heights. The site also links to other of their research projects, including the July 17, 1998 Papua New Guinea Tsunami, tsunamis in the Caribbean, the Mediterranean, Australia, and other areas.

<http://www.oep.ndms.dhhs.gov>

The U.S. Department of Health and Human Services (HHS) Office of Emergency Preparedness (OEP) has responsibility for managing and coordinating federal health, medical, and health-related social services and recovery to major emergencies and federally declared disasters. Working in partnership with the Federal Emergency Management Agency (FEMA) and other federal agencies, OEP serves as the lead agency for health and medical services within the Federal Response Plan. OEP also directs and manages the National Disaster Medical System (NDMS) - a cooperative asset-sharing partnership among HHS, the Department of Defense, the Department of Veterans Affairs, FEMA, state and local governments, private businesses, and civilian volunteers. The OEP Web site provides background information about the office and the NDMS system, as well as contacts, links, and information about the annual NDMS conference.

<http://members.spree.com/education/helpu>

The members of HELPU are all disabled citizens residing within the Commonwealth of Virginia. The organization provides information and services to all members of the disabled community, their care-givers, attendants, fire and rescue personnel, and emergency services departments. The HELPU Web site offers *numerous* pages on various aspects of fire and disaster safety and mitigation for disabled persons. For more information about this organization, contact HELPU Fire and Life Safety, 1409B North Mt. Vernon Avenue, Williamsburg, VA 23185-2819; (757) 221-0542; fax: (757) 221-8377; e-mail: helpu@visi.net.

<http://www.wsspc.org>

The Western States Seismic Policy Council (WSSPC) has created a Web-based forum for the discussion of earthquake and other disaster costs, and strategies and policy options to ameliorate those losses. The group is open to anyone from any discipline interested in this issue. Potential topics for discussion range from methods for increasing public awareness, to public risk perception, to loss estimation models and improved data collection methods, to the identification of realistic public and private policies to deal with the quantifiable costs of future damaging events. WSSPC anticipates publishing summaries of these discussions in its newsletter, "EQ: Earthquake Quarterly," and, based on these summaries, posing new questions to be addressed by participants. For more information about this discussion group, see the Web site above, or contact WSSPC, 121 Second Street, 4th Floor, San Francisco, CA 94105; (415) 974-6435; fax: (415) 974-1747; e-mail: wsspc@wsspc.org.

<http://www.iaem.com>

iaem-list@asmii.com

Following the relatively quiet rollover of the millennial clock (time to take the planet in for its 2,000-year tune up???), the members of the *International Association of Emergency Managers (IAEM) Y2K* e-mail list voted not to abandon their discussions, but rather to continue correspondence and expand discussion to *all hazards and all aspects of emergency management*. Hence, the list will transmogrify and continue via the second (e-mail) address above. Interested persons can subscribe by going to the first (Web) address and filling out a form.

<http://www.esri.com/hazards>

As part of its contribution to the Federal Emergency Management Agency's Project Impact, Environmental Systems Research Institute (ESRI) has established this nifty Web site that offers on-line multihazard maps and information for U.S. citizens, business owners, community groups, and local governments. Users can enter a location and receive a map portraying various hazards affecting that area. The Web site also offers other information on disasters and hazards mitigation.

<http://www.iii.org>

<http://www.iii.org/media/issues/catastrophes>

<http://www.iii.org/media/catastrophes>

The Web site of the Insurance Information Institute (III) offers considerable information about insurance issues related to disasters, a wealth of statistics on disaster losses

(including data on overall losses, and losses due to earthquakes, hurricanes, floods, and tornadoes), and information on hazards mitigation measures.

<http://www.oas.org/usde/publicaciones.htm>

The Organization of American States has made the complete text of its 1991 publication "Primer on Natural Hazard Management in Integrated Regional Development Planning" available on the Web. The primer covers most of the major natural hazards and many of the current tools (including GIS and remote sensing) available to assess and deal with these risks. Other on-line hazards-related publications include, "Disaster, Planning and Development: Managing Natural Hazards to Reduce Loss" and "Reduction of Vulnerability to Floods in River Basins." Many other documents on sustainable development are available. Spanish versions of some of these publications and other useful documents in Spanish are available from the second URL.

http://www.disastercenter.com/email/e_list.mv

The Disaster Center, a sizable resource of Internet disaster information, is now maintaining a USA disaster situation report mailing list. The situation report, which is sent at least once daily, provides information related to tornado, hurricane, flood, and fire risk, as well as current weather warnings, and earthquake, flood, fire, tornado, volcano, hurricane and other disaster-related reports. It also provides links to articles and to imagery. The list also provides for individuals to send personal reports, and the list managers are interested in links to and information about research and technical developments as well. Interested persons can join through the Web page above. Questions or suggestions should be e-mailed to host@disastercenter.com.

<http://www.usc.edu/sppd/ijmed>

The official Web site of the "International Journal of Mass Emergencies and Disasters" (IJMED) was recently updated with the addition of a temporary version of a cumulative index for the journal. The site also offers background information about the journal, the contents of recent issues, information on how to submit articles, a list of upcoming articles, and information on how to subscribe.

The Worst Natural Disasters Ever

by Piero Scaruffi

from:<http://www.scaruffi.com/politics/disaster.html>

Athens, 430 B.C.: Typhus epidemic
Pompeii, 79: Volcanic eruption
Constantinopol, 542: Bubonic plague
Genoa, 1347-49: Bubonic plague or "black death" (one third of the European population dead plus millions in Asia and North Africa)
Havana, 1648: Yellow fever epidemic
Sevilla, Spain, 1649: Plague (80,000 dead)
Lisbon, 1755: Earthquake and **tsunami** (30,000 dead)
Philadelphia, 1793: Yellow fever epidemic (5,000 dead)
Cairo, 1831: Cholera epidemic, which spreads to London
Indonesia, 1883: **Tsunami** (36,000 dead)
Japan, 1896: **Tsunami** (27,000 dead)
Galveston, 1900: Hurricane (8000 dead)
San Francisco, 1906: Earthquake and fire
Messina, Italy, 1908: 7.5 Earthquake (70,000 dead)
Mexico City, 1911: Earthquake
Worldwide, 1918: Influenza pandemic (25 million dead)
Gansu, China, 1920: 8.6 Earthquake (200,000 dead), strongest earthquake ever
Yokohama, 1923: 8.3 Earthquake (143,000 dead)
Nanshan, China, 1927: 8.3 Earthquake (200,000 dead)
Florida, 1928: Hurricane (1800 dead)
Gansu, China, 1932: 7.6 Earthquake (70,000 dead)
Quetta, Pakistan, 1935: 7.5 Earthquake (30,000 dead)
New York, 1938: Rains (600 dead)
Turkey, 1939: Earthquake (33,000 dead)
Louisiana, 1957: Hurricane (400 dead)
North Peru, 1970: 7.8 Earthquake (66,000 dead)
Tangshan, China, 1976: 8.0 Earthquake (255,000 dead)
Andhra Pradesh, India, 1977: cyclone (10,000 dead)
Ciudad de Mexico, 1985: 8.1 Earthquake (8,000 dead)
Armenia, 1988: Earthquake (55,000 dead)
Gilan and Zanzan, Iran, 1990: 7.7 Earthquake (35,000 dead)
Latur, India, 1993: Earthquake (22,000 dead)
Kobe, Japan, 1995: Earthquake (6,500 dead)
Papua New Guinea, 1998: **Tsunami** (3,000 dead)
Yangtze Kiang, China, 1998: flooding (3,600 dead)
Central America, 1998: Hurricane Mitch and floods (12,000 dead)
Turkey, 1999: Earthquake (17,000 dead)
Taiwan, 1999: 7.6 Earthquake (1,800 dead)
Orissa, India, 1999: Cyclone (7,600 dead)
Venezuela, 1999: Floods (15,000 dead)

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Alaska Division of Emergency Services
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(907) 428-7039
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<http://www.ak-prepared.com/>

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<http://www.oes.ca.gov/>

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The Decade Lives On...

On November 24, the Second Committee of the General Assembly of the United Nations adopted Resolution A/C.2/54/L.44, which endorses proposals made by the Secretary General for implementing institutions, programs, and other arrangements to succeed the International Decade for Natural Disaster Reduction (IDNDR). The proposals promote a global, interdisciplinary approach to disaster management -- to be known as the International Strategy for Disaster Reduction (ISDR) -- that recognizes the interrelationship of social and physical factors in producing disasters. The resolution also calls on the international community to provide the necessary financial support to effect international action. The primary objectives of the strategy are to help communities become more resilient to hazard events and to promote risk prevention strategies as part of sustainable development.

The resolution calls for the composition of an interagency task force and the establishment of a small secretariat to succeed the IDNDR office in Geneva, and, as of January 2000, the IDNDR Secretariat was replaced by the ISDR Secretariat, OCHA, United Nations, Palais Wilson, 51, Rue des Paquis, CH-1201 Geneva, Switzerland; tel: (41-22) 917-9000; fax: (41-22) 917-9098 or 917-9099; email: isdr@un.org.

More information about the resolution is available from the United Nations Web site at <http://www.un.org/Depts/dhl/resguide/r54c2.htm>.

*(from: Natural Hazards Observer, March 2000,
volume XXIV, no. 4, p. 9.)*

INFREQUENTLY ASKED QUESTIONS

compiled by
Lee Walkling

Which of the Pacific U.S. states has the most coastline?

Alaska has the most coastline, while California has the most coastal residents.

| State | Miles of coastline | Coastal population |
|------------|--------------------|--------------------|
| Alaska | 33,904 | 466,410 |
| California | 3,427 | 21,859,530 |
| Washington | 3,026 | 3,389,033 |
| Oregon | 1,410 | 1,085,935 |
| Hawaii | 1,052 | 1,159,600 |

from: <http://www.coastalcoalition.org/facts/statistics/stats.cstate.html> (Nov. 12, 1999) American Coastal Coalition , statistics compiled by NOAA).

Which Pacific coast states have the largest and the smallest populations at risk from a 50-foot tsunami?

California has the highest (at 589,500) and Oregon the lowest (at 31,500). See how all five states rank, on p. 5.

According to the American Coastal Coalition, what percentage of the U.S. Population lives within 50 miles of the coast?

Fact: 53% of the U.S. population lives within 50 miles of the coast. And the U.S. coastal population increases by over 3,000 people a day!

Population per square mile, 1995
(from: <http://www.coastalcoalition.org/facts/statistics/53Percent.htm>)



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

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