



TsuInfo Alert

prepared on behalf of the

National Tsunami Hazard Mitigation Program

by the Washington State Department of Natural Resources

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TSUNAMI PROGRAM NEWS

Newest TsunamiReady Community

The Quinault Indian Nation became the first Native American community to achieve the TsunamiReady Community designation. A ceremony was held May 30, 2002, in Taholah, Washington. (Photos and details will be included in the August *TsuInfo Alert*.)

Oregon Tsunami Warning Publication is Online!

Tsunami Warning Systems and Procedures (Oregon Department of Geology and Mineral Industries' Special Paper 35) was announced in the April issue. It's now available online; the correct URL is http://www.wa.gov/dnr/htdocs/ger/pdf/or_sp35.pdf (The URL we gave before was incorrect.)

TsuInfo Alert Links

TsuInfo Alert has made the Big Time! A growing number of other webpages are linking directly to our online version (at <http://www.wa.gov/dnr/htdocs/ger/tsuinfo/index.html>). To date, we're linked from--

- NOAA's Tsunami Links page (www.pmel.noaa.gov/tsunami-hazard/links.html)
- Access Washington (access.wa.gov/emergency/tsunami.asp)

- ITIC (http://www.prh.noaa.gov/itic/lib_links.htm)
- Northwest Geological Society (http://www.scn.org/tech/nwgs/joust/geology_links.htm)
- Pacific County (WA.) Emergency Management (<http://www.co.pacific.wa.us/pcema/hazards.html>).
- The Neptune Project (see page 10, and at www.neptune.washington.edu/pub/whats_neptune/whats_neptune.html) has requested and been granted permission to link to *TsuInfo Alert*, effective this month.

Enhanced Backup Capabilities

The Pacific Tsunami Warning Center (PTWC) and the West Coast/Alaska Tsunami Warning Center (WC/ATWC) have focused efforts over the past few months to improve backup capabilities between the Centers. The two Centers have exchanged and implemented each other's messaging software and have also been issuing monthly communications tests over the various messaging circuits to each other's area of responsibility. These efforts help ensure that tsunami warnings and other bulletins can be issued normally if either Center is partially or completely disabled.

from: Tsunami Newsletter, v. 34, no. 2.

New Pacific Seismic Data

Contractors representing the Incorporated Research Institutes for Seismology (IRIS) and its Global Seismic Network spent a week at the Pacific Tsunami Warning Center (PTWC) in early February 2002. They worked with PTWC and other U.S. National Weather Service staff to activate a satellite link for receiving high quality real-time broadband seismic data from a new station at Pitcairn Island in the southeast Pacific. These data are now being utilized in PTWC operations as well as forwarded to IRIS. The satellite link will also be used for up to an additional nine Pacific stations, most of which are on remote island sites without any other feasible communications means. When the project is completed it will provide both U.S. Tsunami Warning Centers (PTWC and WC/ATWC) with an independent non-land-line data set sufficient for locating and evaluating potentially tsunamigenic earthquakes in the Pacific.

from: Tsunami Newsletter, v. 34, no. 2

(continued, p. 3)

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

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The views expressed herein are those of the authors and not necessarily those of the Washington Department of Natural Resources or of the sponsors of *TsuInfo Alert*.



WASHINGTON STATE DEPARTMENT OF
Natural Resources

Doug Sutherland - Commissioner of Public Lands

(continued, from p. 1)

Earthquake Triggers DART Buoy

The 10 January 2001 M6.9 Alaskan earthquake was an excellent example of the value of DART data to quickly confirm potentially destructive tsunamis and reduce false alarms. The earthquake occurred at 07:03 local time about 70 miles southwest of Kodiak, Alaska, and an information bulletin was issued at 07:08 by the warning center. At 07:11, a DART system at 51 deg N and 157 deg W picked up the earthquake waves that induced an apparent sea level change of approximately six cm and triggered the buoy to start transmitting 1-minute data. By 07:13 these data were plotted on the web site, and showed no tsunami present. Charles McCreery, Geophysicist-in-Charge of the National Weather Service's Pacific Tsunami Warning Center, said, "While the earthquake was too small to automatically trigger a tsunami warning, the Pacific Tsunami Warning Center closely monitored the Kodiak buoy data to quickly confirm

that potentially destructive tsunami waves were not propagating towards Hawaii or the rest of the Pacific."

from: Tsunami Newsletter, v. 34, no. 2

GSA Cordilleran Section - 98th Annual Meeting May 13-15, 2002

The 2002 Cordilleran Section meeting of the Geological Society of America has held in Corvallis, OR, May 13-15. About 500 presentations were given (as either posters or talks), in 50 separate sessions. Session T23, "Natural Hazard Monitoring and Warning Systems" was hosted by Mark Darienzo and Steve B. Taylor.

The abstracts for all the presentations are available online at http://gsa.confex.com/gsa/2002CD/finalprogram/session_1999.htm and at http://gsa.confex.com/gsa/2002CD/finalprogram/session_3089.htm (One of the abstracts, "The CREST Project: Consolidated Reporting of Earthquakes and Tsunamis," by D. Oppenheimer and others is reprinted on page 11).

HAZARD MITIGATION NEWS

Report Assesses FEMA's Safe Construction Networks

A new report documents how the Federal Emergency Management Agency (FEMA) successfully created and used partnerships to reach its goals of preventing and reducing hazards and their impacts by implementing mitigation methods. The Agency's transition from just responding to disasters to mitigating hazards is documented. In "Leveraging Networks to Meet National Goals: FEMA and the Safe Construction Networks" (William L. Waugh, Jr., 2002, 44 p.), the author analyzes, assesses, and compares FEMA's efforts to execute these new mitigation goals via public-private partnerships that promote safe construction. To reach its goals of reducing property losses and protecting lives, FEMA focused on promoting safer construction, stronger building standards and codes, and more disaster-resistant construction methods. The Agency's success in implementing mitigation strategies through indirect and more time-consuming partnership networks shows that these methods are effective, even in a large-scale organization like the federal government. To make it work, though, the lead agencies must, among other things, be flexible, devote time to relationship building, and be more open to working with non-traditional partners. FEMA's large community, all government executives who must partner with other sectors to implement national goals, and professors teaching emergency management courses will find this evaluation of the Project Impact Program relevant. The report is part of the PricewaterhouseCoopers Endowment for the Business of Government, New Ways to Manage Series, and is available in PDF format.

from PricewaterhouseCoopers' Web site at
http://endowment.pwcglobal.com/publications_GrantDetails.asp?GID=114
from: Disaster Research 364, April 11, 2002

Introducing CARDIN

The Caribbean Disaster Information Network (CARDIN) was established in June 1999 to link Caribbean disaster organizations, to develop a broad collection of disaster-related information, and to ensure improved access to such material

The project was initially funded by the European Community Humanitarian Office (ECHO), and the Library of the University of the West Indies at Mona was selected as the network focal point.

CARDIN is intended to strengthen capacity for the collection, indexing, dissemination, and use of disaster-related information in the English-, Spanish-, Dutch-, and French-speaking Caribbean. The network's major goals are to:

- provide wider access and coverage of disaster information in the region;
- create a database of disaster-related information available on the Internet, CDs, and in print format as a resource for policy makers, practitioners, researchers, and the general public;
- facilitate the dissemination of disaster-related information to the general Caribbean public on the World Wide Web and through a newsletter and document delivery services;
- create full text documents and scanned images on disaster-related information making them available on the Internet;
- establish and maintain relationships with other agencies for effective coordination of disaster information activities within the region.

For more information, contact CARDIN, Science Library, University of the West Indies, P.O. Box 104, Mona, Kingston 7 Jamaica, W.I.; tel: (876) 927-1068/935-8202-3; fax: (876) 970-1758; e-mail: cardin@uwimona.edu.jm.

from: Disaster Research 366, May 8, 2002

FEMA Creates One-stop Shopping for Disaster Relief

The September 11 terrorist attacks underscored the need for the federal government to provide fast and easy disaster-related information to citizens. To better aid victims of disaster, the Federal Emergency Management Agency (FEMA) recently established *Disasterhelp.gov*, a web site designed to be a one-stop portal for citizens looking for disaster-relief information and assistance. The site will consolidate federal and other disaster-relief programs on a single site as well as provide links to state and local emergency management groups.

Eventually the site will provide a secure link for an automated transaction-processing system for disaster assistance. In the meantime, FEMA's Eligibility Assistance Online, the site that provided aid for citizen disaster benefits, will be moved to the Labor Department. *Disasterhelp.gov* began in April.

For more information about *Disasterhelp.gov*, go to the web site or contact FEMA, 500 Street S.W., Washington, DC 20472; e-mail: eipa@fema.gov; <http://www.fema.gov>
from: Natural Hazards Observer, v. XXVI, no. 5, May 2002, p. 7

NASA Funds Project to Test Use of Remote Sensing in Emergency Management

On October 5, 2001, the Washington State Emergency Management Division was awarded funding under NASA's Earth Science Applications Program for a new project, the "Strategic and Practical Use of Remotely Sensed Data in Emergency Management" (SPURS-EM). The Western Disaster Center, a nonprofit organization that researches the use of advanced computer, information, and communication technologies, and the University of Washington are partners with the state in this research initiative.

SPURS-EM will integrate products from satellite remote sensing into the operational structure of Washington's Emergency Management Division. The data will be applied to hazard preparedness, response, recovery, and mitigation. As a result, decision makers will have better information regarding the application of resources to reducing the damaging effects of natural hazards, emergencies, and disasters.

The Western Disaster Center will provide outreach and promote the use of remote sensing, and the Emergency Management Division will promote the use of SPURS-EM with the Washington State Emergency Management Association (WSEMA), which represents emergency managers from Washington's local jurisdictions.

A brief description of the project can be found on the Western Disaster Center's web site, under the "Announcements" section: <http://www.wdc.ndin.net>. For further details about the project, contact Terry Egan, Washington Military Department, Emergency Management Division, Mitigation, Analysis, and Plans Unit, Building 20, M/S: TA 20, Camp Murray, WA 98430-5122; (253) 512-7041; e-mail: t.egan@emd.wa.gov; WWW: <http://www.wa.gov/wsem>.

from: Natural Hazards Observer, v. XXVI, no. 5, May 2002, p. 16

Input Sought for Developing a National Strategic Plan for Public Warning

The Partnership for Public Warning needs your help in formulating a Public Warning Plan for the nation. Public warning systems and procedures have significantly reduced the casualties and other consequences of disasters. But the effectiveness of these systems and procedures can be improved further. The continuing threat of terrorism now makes this effort a national imperative.

The Partnership for Public Warning was formed as a nonprofit public/private partnership to develop consensus among representatives of all warning stakeholders regarding standards and best practices. The National Emergency Management Association (NEMA) has endorsed this effort.

The partnership is preparing to draft the first ever National Strategic Plan for Public Warning. The first step in this process is to collect all relevant information and experience from people and organizations with public safety and homeland security missions and interests. We are looking for input from representatives of the many different stakeholders in warning systems.

Please download the Request for Information from <http://www.PartnershipForPublicWarning.org> and return whatever information you feel is appropriate by June 30, 2002. Thank you very much for helping us address this very important national problem. Partnership for Public Warning, 7515 Colshire Drive, Mail Stop NO22, McLean, VA 22102-7508; (703) 883-2745; fax: (703) 883-3689
E-mail: stratplan@PartnershipForPublicWarning.org

from: Disaster Research 367, May 23, 2002

FEMA's Higher Education Project Seeking Contributions for "Practitioner's Corner"

The Federal Emergency Management Agency's Higher Education Project is interested in establishing a "Practitioner's Corner" on its web site, <http://www.training.fema.gov/EMIWeb/edu>. This section is intended to provide another means for emergency management professionals to communicate their thoughts and ideas concerning college-level hazard, disaster, and emergency management courses and programs to the educators responsible for those programs.

The organizers envision short papers on subjects like:

- types of competencies to be emphasized in such courses
- ways to examine or approach emergency management
- lessons learned in disasters
- lessons learned in bureaucratic politics
- success stories/failures
- public policy issues

Submissions and questions should be sent to the Higher Education Project Manager, Wayne Blanchard, e-mail: wayne.blanchard@fema.gov. Selected papers will be posted on the Higher Education web site; the project reserves the right to edit content.

Adapted from the "IAEM Bulletin" - the newsletter of the International Association of Emergency Managers.
reprinted from: Disaster Research 367, May 23, 2002

COLLEGES ENTER EMERGENCY FIELD

by Tan Vinh: tvinh@seattletimes.com, Seattle Times staff reporter
from: The Seattle Times, January 22, 2002, Local News, p. B1
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TsuInfo Editors' note: The *Seattle Times* graciously gave us permission to reprint their article in the print version of *TsuInfo Alert*. However, they asked that we not include the article in the online version, but instead to refer users to their website. We are grateful for their help in sharing this article with the TsuInfo community, and so are happy to comply with their needs.

To access the article, go to <http://seattletimes.nwsourc.com/html/home/> and search the archives by the article's title.

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WEBSITE OF THE MONTH AWARD

http://www.prh.noaa.gov/itic/lib_links.htm

Check out the *New!! and Improved!!* ITIC Library website! The site provides a general reading list, links to brochures, newsletters, research tools, factsheets-- and more, including a very useful and complete 20-page tsunami glossary (at <http://www.shoa.cl/oceano/itic/pdf-docs/glossary.pdf>). They'll soon have their library database up as a searchable file, and will even have full-text for selected materials. Wow!

REVIEW OF THE 1994 SKAGWAY, ALASKA TSUNAMI AND FUTURE PLANS

by

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Reprinted with permission from *Science of Tsunami Hazards*, v. 20, no. 1, p. 42-47.

Abstract-- On November 3, 1994 a nine meter amplitude submarine landslide-created tsunami with a resonate wave train lasting about 30 minutes struck the Skagway, Alaska, waterfront causing extensive damage and loss of one life.

Numerous scientists and engineers have studied the 1994 tsunami and at a workshop on the subject in Seattle, Washington, on October 30-31, 2001, have generally concluded that large down inlet submarine landslide(s) created the tsunami. A general plan under the National Tsunami Hazard Mitigation Program was developed to start a study, which could lead to mitigation measures at Skagway with possible adaptability to other parts of the world with similar problems.

This paper briefly overviews the events preceding the tsunami, reviews findings following the event and outlines plans relating to similar future expected tsunamis.

Introduction

The City of Skagway, Alaska is located at the head of a fjord in northern Southeast Alaska (the panhandle) and situated on a river delta landform resulting from Skagway River sedimentation (Figure 1). Founded in 1897 by miners heading for the Klondike gold fields, Skagway soon experienced river flooding problems necessitating river training dike construction, which has continued sporadically to the present. This dike construction causes river sediment bed loads to deposit in an unnatural and concentrated fashion on the river's submarine delta.

Mining is no longer a major economic factor for Skagway, but tourism via large tour ships primarily, brings many people to the city. Presently up to five large tour ships, the state ferry and other vessels can be in port at one time, thus any hazard involving the waterfront becomes much more important than in the past. Thousands of tourists can be scattered along the waterfront and throughout the city during the time ships are in port.

In 1972, the U.S. Geological Survey issued an open-file report (Yehle and Lemke, 1972) addressing tsunami hazard potential at Skagway, Alaska. They predicted the possibility of up to an 18-meter amplitude event as a result of submarine landslides. Subject to tide stage they predicted such an event could pose a major hazard to the Skagway waterfront and other parts of the city. They further recommended that the area be studied in detail to better understand the Skagway River delta front stability and tsunami hazard potential.

Response time for local tsunamis can be a matter of minutes or less; thus responsible officials apparently concluded that nothing could be done in the way of warning, thus nothing has been done, including the recommended studies. The 1972 USGS report was apparently filed with no attempt being made to mitigate the problem or to educate the people of Skagway, visitors, workers or others about the tsunami hazard.

During the first week in October, 1994 the Skagway River experienced a violent flood, nearly reaching top of dike levels and serious consideration was given by officials

to evacuate some areas of the city. A large bed load was carried by the Skagway River as evidenced by resident reports of noise and high water velocity on the 0.8 percent river gradient.

On the evening of November 3, 1994 during one of the lowest tides of the year (extreme tide range at Skagway is El. +23 to El. -6 or 29 feet) a submarine landslide occurred producing a tsunami with an estimated amplitude of nine meters. Extensive waterfront damage resulted and one life was lost.

Following the tsunami, various legal teams presented arguments supporting each client's position, many without technical merit (Nottingham 2000). Visible ongoing dock construction was the main litigation target as a triggering mechanism for the submarine landslide and ensuing tsunami. This legal activity delayed the important task of identifying and mitigating the continuing tsunami hazard identified as early as 1972.

In 2001, Alaska Congressman Don Young recognized the government's responsibility in this matter and working with the National Tsunami Hazard Mitigation Program organized a workshop on October 30-31, 2001 in Seattle. Interested scientists, engineers and officials were invited to discuss the 1994 Skagway tsunami and other related issues. The workshop resulted in an initial one year work plan and budget basically similar to that recommended in 1972 by the U.S. Geological Survey.

Summary of Workshop Proceedings

Dr. Frank Gonzalez (NOAA/PMEL) acting as workshop chairman provided an opening welcome and outlined the workshop schedule and expected work products. Attendees were given the opportunity to present their interests, affiliations, findings or other information relating to the subject.

Technical summary notes taken at the workshop are as follows:

-- Dr. Costas Synolakis (USC) presented a series of case histories of various past tsunamis world wide including

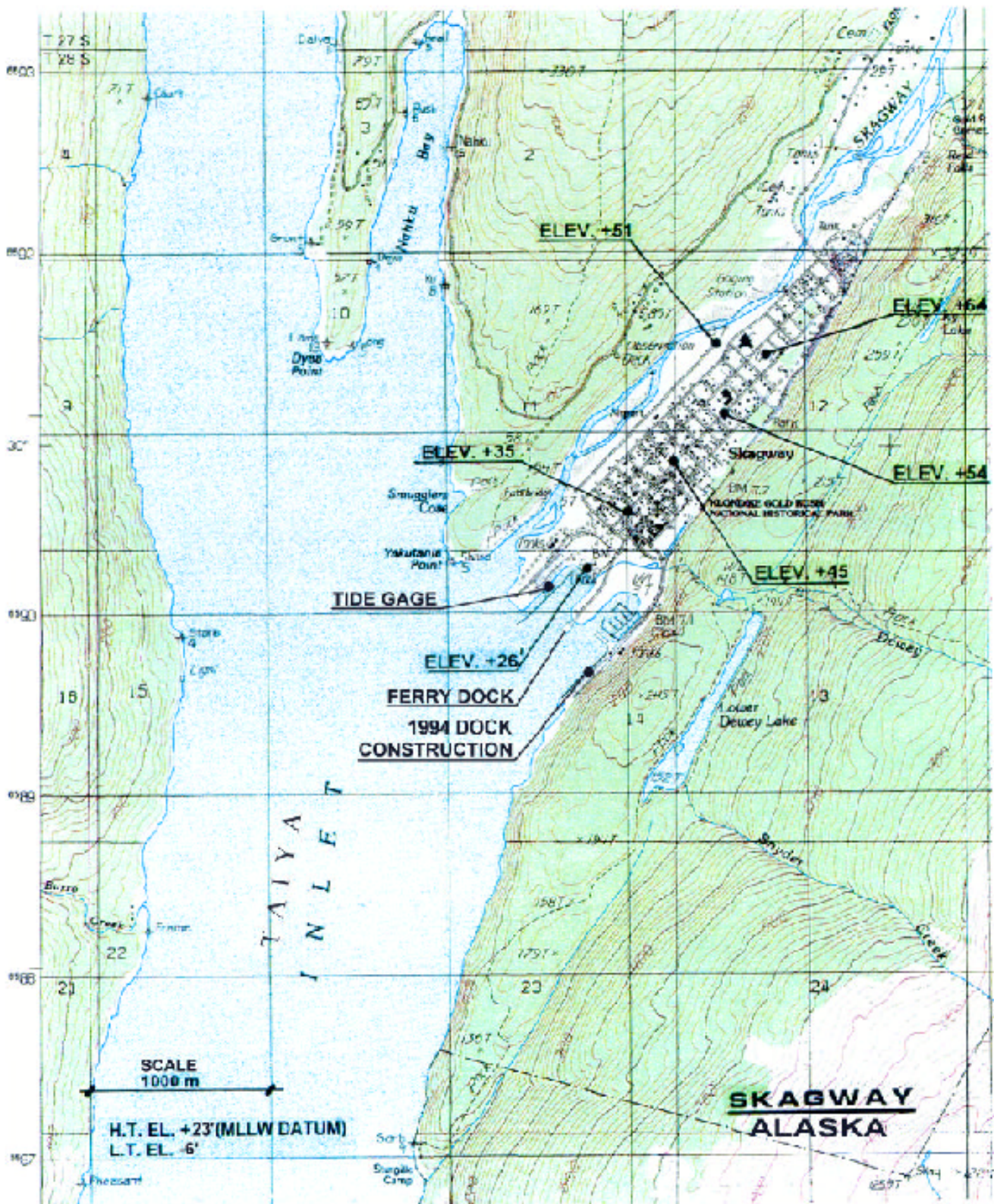
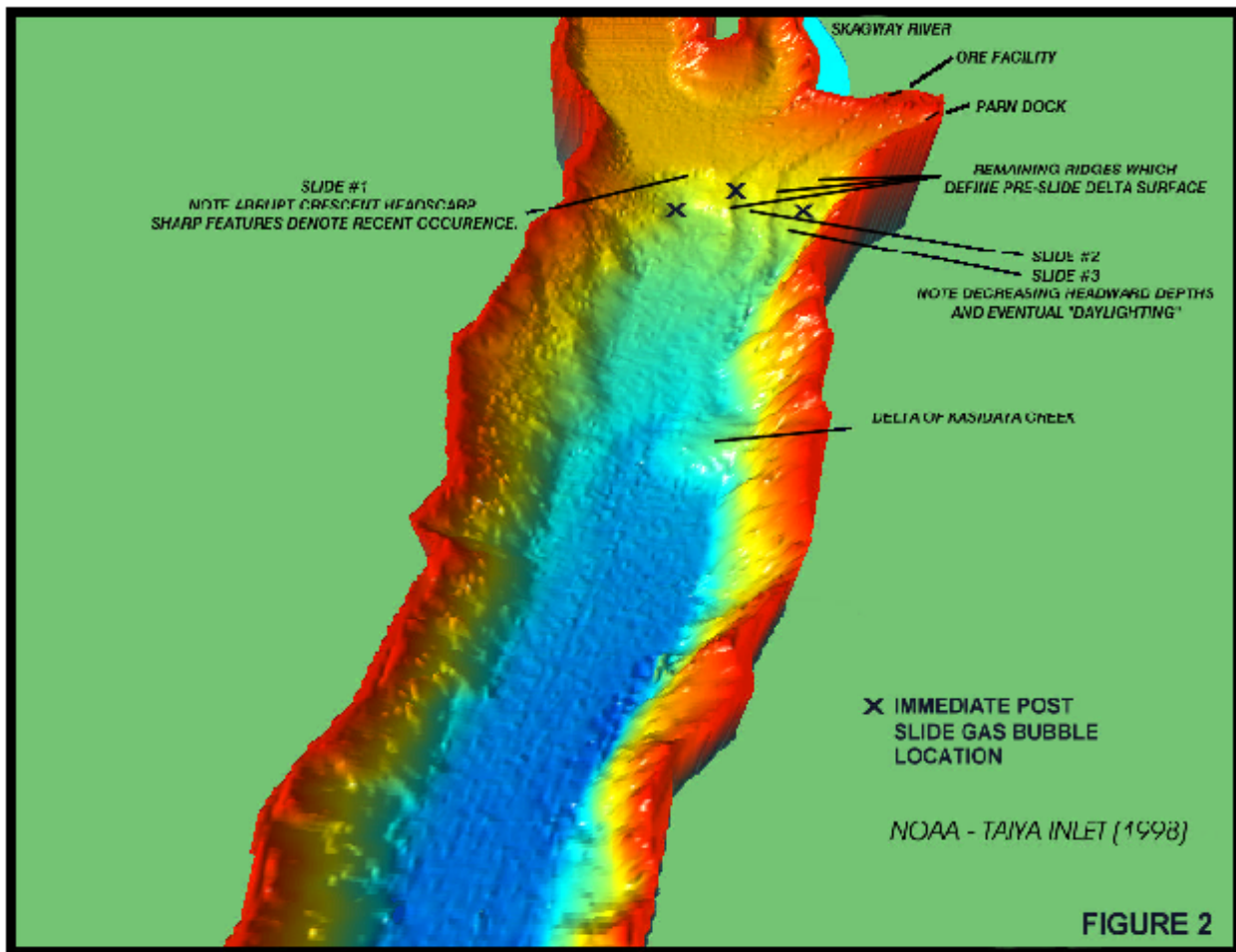


FIGURE 1



landslide created events. This presentation helped to outline potential serious risks of tsunamis, many of which had some relationship to Skagway.

--A general discussion of past historical tsunamis at Skagway disclosed three large events probably creating waves with amplitudes from three to nine meters plus numerous potential smaller events. Detailed information was contained in a 1972 USGS report on Skagway where significant space was dedicated to discussing tsunamis and tsunami potential relating to submarine landslides at Skagway. Potential submarine landslides along the east shoreline, and off the Skagway River delta were mentioned. A technical discussion primarily related to the 1994 tsunami centered on potential locations of submarine landslide frequency and impact of these events.

--Bruce Campbell (Consultant) discussed the need to utilize and explain every shred of evidence in arriving at forensic conclusions about the 1994 event or any event. He located three primary potential submarine landslides using available survey information and discussed slide cross-sections and volumes (Figure 2). He also spent time discussing eyewitness reports and tide gage action with the conclusion that effects from offshore slides directed down the inlet could

only fit all the evidence. He showed that Skagway River diversion was concentrating river sediments in an area with future landslide potential. Sediment thickness increases of over 30 meters had been found for about a 50-year time interval.

--Dr. George Plafker (USGS) verified Mr. Campbell's findings of potential past landslide locations. He chose to investigate the easterly shoreline slide south of the rail dock because of recent slide evidence found during submarine dives. This slide was so large in volume that he concluded the small volume of material involved with dock construction was inconsequential and thus not a factor. In fact, the slide retrogressively ended at dock construction instead of starting at dock construction.

--Dr. Synolakis presented modeling results of the east shoreline slide identified by Dr. Plafker with results closely matching most evidence including eyewitness reports, except time length of the measured wave train was not discussed. An exceptional video animation clearly demonstrated the event.

--Dr. Zygmunt Kowalik (UAF) discussed the unusual nature of the tsunami and exceptional time length of the wave train. He found it necessary to nearly simultaneously use the

three slides found by Campbell to reproduce all the evidence. These included the east shoreline slide (about three million cubic meters), a central delta slide (about four million cubic meters) and a westerly delta slide (in excess of eight million cubic meters). Note that large areas of surface gas bubbles verifying submarine slide locations were seen by engineers immediately after the November, 1994 event at the location of the easterly and westerly slides and about a week later near the center of the inlet (Figure 2).

--Dr. Kowalik also investigated known movement of the floating Alaska Marine Highway System Ferry Terminal under various slide scenarios but found the three slide down inlet modeling most nearly produced results consistent with the evidence. His work also identified tsunami related inlet current activity most important to moored ship response.

--Dr. Charles Mader (Consultant) was unable to attend the workshop, but provided information that supported the conclusion that a very large submarine slide volume progressing down inlet would have been required to produce the observed and recorded (tide gage) tsunami on November 3, 1994.

Investigators generally concluded that one or more down inlet submarine landslides must have been involved to create actions consistent with the evidence. The slide(s) were very large and produced initial drawdown at the rail dock probably creating slope instability. The returning crest wave was nearly coincident with the progressing slope failure near dock construction.

Discussions centered around potential for future tsunamis and need for additional investigation. General conclusions based on documented recurrence of tsunami activity at Skagway were that there is a need for more investigation and potentially some form of mitigation.

The USGS, in their 1972 report, provided in part to the workshop, recommended future study involving site investigation, seismic evaluation, bathymetry, sediment analysis and Skagway River delta front stability analysis. These recommendations were essentially followed by the workshop in drafting a future work scope with a first-year budget.

Before conclusion of the workshop, participating State and Federal representatives and City of Skagway officials discussed how they might participate and presented their general impressions. The consensus was that a much better understanding had been gained during the workshop and that a pilot tsunami investigative project for Skagway would be an important step for Skagway and the other parts of the world.

The following workshop summary statement was issued following completion of the workshop.

Workshop Summary Statement

Skagway, Alaska has a history of deadly and damaging tsunamis caused by landslides. The most recent, on November 3, 1994, killed one person and caused an estimated \$21 million in damage. The risk increases each year with the

arrival of cruise vessels that dock at Skagway; this seasonal tourism can swell the Skagway annual population by 800,000 – many of whom live on-board dockside vessels during visits.

There is no question that future landslides and tsunamis will occur – they are expected, even inevitable. This is because the causative physical processes that generated past events will continue to be active in the future – earthquakes, sedimentation, extremely low tide levels, delta accretion and failure, coastal slope failures. The appropriate questions are: -- What is the level of the hazard (Hazard Assessment)? -- What could/ should be done to reduce or eliminate this hazard (Hazard Mitigation)?

An Action Plan for Hazard Assessment to address the first of these questions was developed at the “Workshop Relating to Potential Tsunami Hazards at Skagway, Alaska.” This workshop brought together Skagway elected officials and twenty state, federal and private scientists and engineers. The working sessions were held in Seattle, Washington on 30-31 October 2001 at the Pacific Marine Environmental Laboratory of the National Oceanic and Atmospheric Administration, the lead Federal agency for the U.S. National Tsunami Hazard Mitigation Program.

Essential components of the Action Plan were identified, and preliminary budget estimate was drawn up for the proposed work in Year 1. The Year 1 Action Plan proposes both the exploitation of existing data and new data acquisition to estimate fundamental indicators of risk – background delta accretion rates; flood history and its influence on sedimentation rates and delta loading; landslide history from paleosedimentology; assessment of coastal slope stability; ship response hazardous scenarios; tide, seiche and wave measurements; acoustic detection and characterization of landslides; measurement and characterization of the earthquake environment. We expect that lessons learned and technologies developed by this effort will be exportable to other Alaskan and U.S. sites.

NOAA’s Pacific Marine Environmental Laboratory (NOAA/ PMEL) under Dr. Eddie Bernard, Director will provide overall management and administration of the Skagway project.

References

- Nottingham, Dennis, 2000, Investigating the Skagway, Alaska 1994 tsunami. *In* Rens, K. L.; Bosela, P. A.; Rendon-Herrero, Oswald, editors, Forensic engineering--Proceedings of the Second Congress: American Society of Civil Engineers.
- Workshop Relating to Potential Tsunami Hazards at Skagway, Alaska, Pacific Marine Environmental Laboratory of the National Oceanic and Atmospheric Administration, Seattle, Washington, October, 2001. (Video and DVD disk documenting the 2001 workshop produced by In Progress Media Productions, 1319 Cornwall Ave. #200 Bellingham, WA 98225, (206) 752-1384.)
- Yehle, L. A.; Lemke, R. W., 1972, Reconnaissance engineering geology of the Skagway area, Alaska, with emphasis on evaluation of earthquake and other geologic hazards: U.S. Geological Survey Open-File Report 72-454, 108 p., 2 plates.

WHAT IS NEPTUNE?

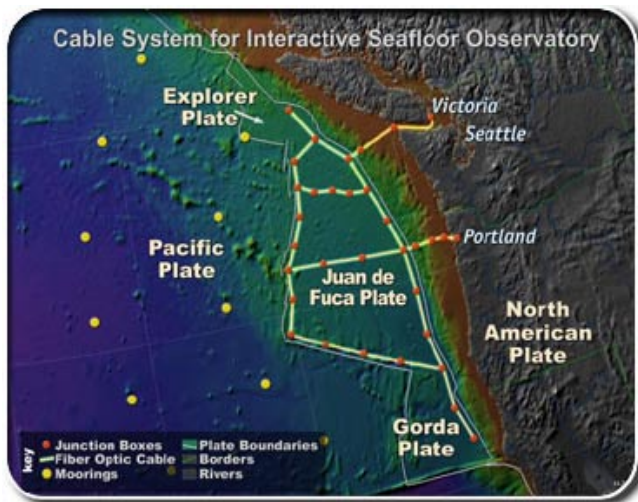
webpage: http://www.neptune.washington.edu/pub/whats_neptune/whats_neptune.html
University of Washington, School of Oceanography, NEPTUNE Project; reprinted with permission

The Goal

The goal of the NEPTUNE project is to establish a network of underwater observatories within the depths of the northeastern Pacific Ocean. NEPTUNE's 3000 kilometers of fiber-optic/power cable will provide communications and power to scientific instruments. For the first time, researchers, as well as shore-based learners of all ages, will participate in detailed studies and experiments on a wide area of seafloor and ocean for decades rather than just hours or days.

Leadership/Project Management

An Executive Team, made up of representatives from each of the NEPTUNE partners, oversees the project. NEPTUNE is a U.S./Canada partnership. The project office is located at the University of Washington in Seattle.



NEPTUNE will be located in the northeastern Pacific and will be spatially associated with the Juan de Fuca tectonic plate. The NEPTUNE network will provide a coherent system of high-speed, submarine communication-control links using fiber-optic/power cables. Remote, interactive experimental sites will be connected with land-based research laboratories and classrooms. The system will provide real-time flow of data and imagery to shore-based Internet sites. It will permit interactive control over robotic vehicles on site and will provide power to the instruments and vehicles. NEPTUNE may also serve as a unique testbed for sensor and robotic systems designed to explore other oceans in the solar system.

A Shift in the Sciences

The earth, ocean, and planetary sciences are shifting from an intermittent expeditionary mode of identifying

"what's out there" to a sustained, in situ experimental mode of exploring well-defined natural systems in the time domain. The shift arises in part from the rapidly expanding developments in the computational, robotic, communications, and sensor industries and in part from a maturation of the natural sciences that involves a growing awareness of process complexity and interactive dynamics in many systems.

These new approaches require an extensive, remote, continual, interactive "sensor presence" within a particular system of interest, whether a full instrumented fault system on land, a remotely wired oceanic plate, or a robotic colony on Mars.

The Network

NEPTUNE will provide a coherent system of high-speed, submarine communication-control links using fiber-optic/power cables that will connect remote, interactive experimental sites with land-based research laboratories and classrooms. The system will provide real-time flow of data and imagery to shore-based Internet sites. It will permit interactive control over robotic vehicles on site and will provide power to the instruments and vehicles. NEPTUNE may also serve as a unique testbed for sensor and robotic systems designed to explore other oceans in the solar system.

The Plate-Scale Observatory Concept

NEPTUNE's plate-scale observatory concept is underlain by the following premises:

- Many globally significant planetary phenomena, involving both oceanographic and solid earth processes, operate at or below the scale of a tectonic plate;
- Thorough four-dimensional examination of at least one plate/mesoscale system will generate major new insights into all such systems, and
- Understanding the interactions among the myriad processes operative at such scales will require decadal commitment to the studies.

Scientific Studies

NEPTUNE's capabilities will allow many basic oceanographic and geophysical systems to be explored with entirely new investigative strategies. Extended characterization of complex, interactive processes will provide a powerful complement to the traditional focus on spatial characterization achieved by mapping and sampling. The spectrum of scientific studies currently envisioned for the NEPTUNE facility will cover a broad range. Two proof-of-concept sites for cabled observatories such as NEPTUNE are planned (VENUS and MARS) and will include scientific experiments.

Schedule/Cost

The NEPTUNE network is expected to be operational by 2006 and will cost approximately \$250 million to develop, install, and operate through the first five years.

Environmental Considerations and Permits

Because some portions of the NEPTUNE cable will be laid on public submerged lands, the program will be subject to several legal and regulatory requirements of state and

federal agencies. Other entities with vested interests in NEPTUNE are the U.S. Navy, Native American tribes, fishing organizations, environmental groups, coastal communities near NEPTUNE shore landings, and telecommunication companies. Several meetings involving stakeholder groups have already been held and more are planned. A white paper report is available on this topic (via a link on the webpage).

Abstract of a presentation at the May 13-15, 2002 GSA Cordilleran Section Meeting, Corvallis, OR. (Other abstracts from the Meeting are available: http://gsa.confex.com/gsa/2002CD/finalprogram/session_1999.htm and http://gsa.confex.com/gsa/2002CD/finalprogram/session_3089.htm)

THE CREST PROJECT: CONSOLIDATED REPORTING OF EARTHQUAKES AND TSUNAMIS

Oppenheimer, D.¹, Bittenbinder, A.², Bogaert, B.², Buland, R.², Dietz, L.¹, Hansen, R.³, Malone, S.⁴, McCreery, C.⁵, Sokolowski, T.⁶, and Weaver, c.⁷, (1) USGS, 345 Middlefield Rd - MS 977, Menlo Park, CA 94025, oppen@usgs.gov, (2) USGS, P.O. Box 25046, Lakewood, CO 80225, (3) Univ of Alaska, Geophysical Inst, POB 757320, Fairbanks, AK 99775, (4) Earth and Space Sciences, University of Washington, Johnson Hall 63, Seattle, WA 98195, (5) Pacific Tsunami Warning Ctr, 91-270 Fort Weaver Rd, Ewa Beach, HI 96706, (6) WC/Alaska Tsunami Warning Ctr, 910 S. Felton Street, Palmer, AK 99645, (7) USGS, Univ of Washington, Johnson Hall 63, Seattle, WA 98195

In 1997 the U.S. Geological Survey, National Oceanographic and Atmospheric Agency, and the five western states joined in a partnership to enhance the quality and quantity of seismic data provided to the NOAA tsunami-warning centers in Alaska and Hawaii. The project, named the Consolidated Reporting of Earthquakes and Tsunamis (CREST), now provides the warning centers with real-time seismic data over dedicated communication links and the Internet from regional seismic networks monitoring earthquakes in the 5 western states, the US National Seismic Network in Colorado, and from domestic and global seismic stations operated by other agencies. The goal of the project is to reduce the time needed to issue a tsunami warning by providing the warning centers with high-dynamic range, broadband waveforms in near real-time. An additional goal is to reduce the likelihood of issuing false tsunami warnings by rapidly providing to the warning centers parametric information on earthquakes that could indicate their tsunamigenic potential, such as hypocenters, magnitudes, moment tensors, and shake distribution maps. At the end of the five-year project new or upgraded field instrumentation will be installed at about 56 seismic stations in the 5 western states. Data from these instruments has been integrated into the CREST network utilizing Earthworm software. The CREST system has significantly reduced the time needed to respond to teleseismic and regional earthquakes. Notably, the West Coast/Alaska Tsunami Warning Center responded to the 2/28/2001 Mw 6.8 Nisqually earthquake beneath Olympia, WA within 2 minutes compared to an average response time of over 10 minutes for the previous 18 years.

ASSOCIATIONS AND ORGANIZATIONS

compiled by
Lee Walkling

Email *TsuInfo Alert* if your favorite group was not included. Also forward any corrections.
We'll print an addendum later in the year, as necessary.

State Emergency Management Associations

California Emergency Services Association--"Dedicated to the protection of life and property through aggressive planning and emergency management." Networking emergency managers and contingency planners. <http://www.cesa.net/>

Oregon Emergency Management Association--OEMA is a statewide organization committed to fostering emergency planning efforts to enhance the safety of Oregon's citizens and visitors. OEMA promotes efforts of communities to create and improve mitigation, preparedness, response and recovery capabilities to deal with a range of natural and technological hazards. email: oema@oregonemergency.com
<http://www.oregonemergency.com/index.htm>

Washington State Emergency Management Association--WSEMA is the professional association of local, county, state and federal emergency management individuals from the private and public sectors committed to:
-- Providing state leadership and expertise in comprehensive emergency management
-- Serving as a vital information and assistance resource for local, county and state managers and directors
-- Forging strategic partnerships to advance continuous improvement in emergency management. <http://www.wsema.org/>

Organizations for Emergency Managers and Mitigation Planners

American Civil Defense Association (TACDA)

The American Civil Defense Association (TACDA) is a non-profit, non-political organization dedicated to providing strategic civil defense, disaster preparedness and disaster mitigation solutions to all sectors of American society and abroad, and to promoting reasonable disaster preparedness activities and sanctity of life for all.

TACDA's member base is comprised of a diverse group of individuals, organizations, institutions and agencies all sharing the same fundamental goal of preserving life and property through the promotion of proven reasonable civil defense, disaster preparedness and emergency management strategies and techniques. <http://www.tacda.org/>

American Planning Association

122 South Michigan Avenue, Suite 1600, Chicago, IL 60603. William Klein, Director of Research; (312) 431-9100; fax: (312) 431-9985; e-mail: research@planning.org;
<http://www.planning.org>.

American Public Works Association and APWA Emergency Management Committee

2345 Grand Boulevard, Suite 500, Kansas City, MO 64108-2641; (816) 472-6100; fax: (816) 472-1610. Washington, D.C., office: 1401 K Street, N.W., 11th Floor, Washington, DC 20005; (202) 408-9541; fax: (202) 408-9542; <http://www.apwa.net> and <http://www.apwa.net/About/PET/EmergencyMgmt/>.

American Society for Public Administration (Aspa), Section on Emergency and Crisis Management

Department of Public Administration and Urban Studies, Georgia State University, Atlanta, GA 30303. William Waugh, Section Head; (404) 651-4592; fax: (404) 651-1378; email: wwaugh@gsu.edu; <http://www.aspanet.org>.

American Society of Professional Emergency Planners

"The American Society of Professional Emergency Planners (ASPEP), founded in 1972, is a professional organization of certified emergency managers dedicated to the advancement of knowledge about disasters and to the improvement of the practice of emergency management. ASPEP works toward these goals through continuing education, through professional development and exchange, and through the publication of an annual Journal." (703) 538-1795 or (703) 241-5603 (fax) or by e-mail at iaem@aol.com;
<http://www.iaem.com>.

from: <http://www.iprimus.ca/~tmheath/ASPEP.HTM>

Association of Contingency Planners

The Association of Contingency Planners (ACP) is a non-profit trade association dedicated to fostering continued professional growth and development in effective Contingency & Business Resumption Planning. ACP is the recognized premier international networking and information exchange organization in the business continuity industry. Technical Enterprises, Inc (TEI), 7044 S. 13th Street, Oak Creek, WI 53154; Phone: 1-800-445-4ACP or (801) 553-1010; Inquiries -- (800) 445-4227 ext. 116; e-mail: rpassey@utdk.com; <http://www.acp-international.com>.

Board on Natural Disasters (National Research Council)

The Board on Natural Disasters (BOND), which was organized in 1992, coordinates the NRC's discussions with the federal government and others on disaster reduction issues of domestic and international importance. The board's actions reflect the NRC's long-standing and continuing obligation to focus scientific, technical, and public policy expertise on efforts to mitigate the human suffering, disruption,

destruction, and economic burdens of natural disasters.
2101 Constitution Avenue, NW, Room HA 486E, Washington, DC 20418; (202) 334-1964; Fax: (202) 334-1961; Email: news@nas.edu; <http://www2.nas.edu/bond/>

Building Seismic Safety Council

1090 Vermont Avenue, N.W. Suite 700, Washington, DC 20005-4905. James R. Smith; (202) 289-7800; fax: (202) 289-1092; e-mail: thollenbach@nibs.org; <http://www.bssconline.org>.

Business Continuity Planners Association

P.O. Box 75930, . Paul, MN 55175-0930; voice mail: (651) 223-9801 <http://www.bcpa.org/>

Business and Industry Council for Emergency Planning and Preparedness

P.O. Box 7942, Van Nuys, CA 91409-7942. (213) 386-4524; fax: (818) 893-0169; <http://www.bicepp.org>.

Business Emergency Preparedness Council

c/o Emergency Management Agency, 125 North Main, Room 2B49, Memphis, TN 38103. Clinton L. Buchanan, Interim Director; (901) 528-2780; fax: (901) 576-6547 or 528-3711.

Canadian Centre for Emergency Preparedness

77 James Street North, Suite 325, Hamilton, Ontario L8R 2K3 Canada; (800) 965-4608; (905) 546-3911; fax (905) 546-2629. <http://www.ccep.ca/>

The Canadian Centre for Emergency Preparedness (CCEP) is a Canadian not-for-profit organization devoted to the promotion of disaster management to individuals, communities and organizations, in both government and the private sector, with the aim of reducing the risk, impact and cost of natural, human-induced and technological disasters.

Cascadia Region Earthquake Workgroup

(CREW) is a not-for-profit corporation of private and public representatives working together to improve the ability of Cascadia Region communities to reduce the effects of earthquake events. The goals are to:

- Promote efforts to reduce the loss of life and property.
- Conduct education efforts to motivate key decision makers to reduce risks associated with earthquakes.
- Foster productive linkages between scientists, critical infrastructure providers, businesses and governmental agencies in order to improve the viability of communities after an earthquake event. <http://www.crew.org/>

Center for the Study of Emergency Management

112 N. Harvard Avenue, Suite 30, Claremont, CA 91711. Wesley D. Balda; (909) 626-1399; fax: (909) 593-5604; e-mail: wbalda@xc.org.

Center of Excellence in Disaster Management and Humanitarian Assistance

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-dmha.org>.

Disaster Preparedness & Emergency Response Association (DERA)

P.O. Box 797, Longmont, CO 80502 (USA); (970) 532-3362; fax: (970) 532-2979; e-mail: dera@disasters.org; <http://www.disasters.org/dera/dera.htm>

Disaster Recovery Information Exchange

The Disaster Recovery Information Exchange (DRIE) is a Canada-wide organization with chapters in Toronto, South-Western Ontario, Ottawa, Montreal and western Canada. The mandate of DRIE is to promote professionalism and to facilitate the exchange of ideas and information amongst its members. DRIE WEST, PO Box 1557, Station M, Calgary Alberta; <http://www.drie.org/welcome.html>

Disaster Recovery Institute CANADA

2175 Sheppard Avenue East, Suite 310, Toronto, Ontario, M2J 1W8, Canada; (416) 491-5335; (416) 491-1670 fax toll free 1-888-728-3742. DRI Canada provides valuable services, certification and international standards for contingency planning and business continuity professionals.

Disaster Recovery Institute International

111 Park Place, Falls Church, VA 22046-4513; (703) 538-1792; fax: (703) 241-5603; <http://www.drii.org>.

Disaster Relief Org

<http://www.disasterrelief.org/> The Disaster Relief website is a cooperative effort between the American Red Cross, CNN Interactive and IBM. Our mission is to help disaster victims and the disaster relief community worldwide by facilitating the exchange of information on the Internet.

Emergency Information Infrastructure Partnership

A voluntary association of organizations and individuals, seeking to enhance their effectiveness in coping with disasters and emergency situations, by exploring the opportunity for sharing information and ideas made possible by electronic technology. <http://www.emforum.org/>

Emergency Net

Emergency Net News... a 24hour News, Information, Analysis and Coverage of Disasters and Major Emergency Events <http://www.emergency.com/>

Institute for Business and Home Safety

1408 North Westshore Boulevard, Suite 208, Tampa

FL 33607;. (813) 286-3400; fax: (813) 286-9960; e-mail: info@ibhs.org; <http://www.ibhs.org>.

International Association of Emergency Managers (IAEM) (formerly National Coordinating Council on Emergency Management)

111 Park Place, Falls Church, VA 22046-4513. Elizabeth Armstrong, Executive Director; (703) 538-1795; fax: (703) 241-5603; e-mail: iaem@aol.com; <http://www.iaem.com>.

International City/county Management Association (ICMA)
777 North Capitol Street, N.E., Suite 500, Washington, DC 20002-4201. (202) 962-3680; fax: (202) 962-3500; <http://www.icma.org>.

International Critical Incident Stress Foundation

10176 Baltimore National Pike, Unit 201, Ellicott City, MD 21042. Donald Howell, Director of Operations, ICISF, Inc.; (410) 750-9600; fax: (410) 750-9601; email: dhowell@icisf.org; <http://www.icisf.org>; Emergency Debriefing Team Coordination Center: (410) 313-2473.

International Disaster Recovery Association

IDRA is a group originally comprised of those having a special interest in the voice, data, image, and sensory telecommunications aspects of Disaster Recovery Planning (DRP), Contingency Planning and Business Continuation. <http://www.idra.com/>

International Society for the Prevention and Mitigation of Natural Hazards

P.O. Box 49511, 80 Glen Shields Avenue, Concord, Ontario, Canada L4K 4P6 <http://www.es.mq.edu.au/NHRC/NHS>

The International Society for the Prevention and Mitigation of Natural Hazards--The Natural Hazards Society, NHS, founded in 1988, is a professional society espousing the following goals:

- 1) Promotion of research in all aspects of natural hazards;
- 2) Distribution of preparedness and emergency response plans for all countries; and
- 3) Formulation and implementation of educational programs concerning hazard prevention and mitigation.

National Association of State EMS Directors

NASEMSD MISSION: "Providing leadership and support to develop effective EMS systems throughout the nation and formulate national EMS policy, and to foster communication and sharing among state EMS directors." <http://www.nasemsd.org/>

National Coordinating Council on Emergency Management, *see* International Association of Emergency Managers

National Emergency Management Association

P.O. Box 11910, Lexington, KY 40578-1910. Trina Hembree; (606) 244-8000; fax: (606) 244-8239; e-mail: thembree@csg.com; <http://www.nemaweb.org>.

National Emergency Number Association

491 Cheshire Road, P.O. Box 527, Sunbury, OH 43074. W. Mark Adams, Executive Director; (800) 332-3911; fax: (740) 622-2090.

National Governors Association, Natural Resources Group

444 North Capitol Street, Washington, DC 20001. Tom Curtis, Director; (202) 624-5389; fax: (202) 624-5313.

Natural Hazards Center at the University of Colorado, Boulder

University of Colorado, 482 UCB, Boulder, CO 80309-0482; t: (303) 492-6818; Fax: (303) 492-2151; hazctr@colorado.edu; <http://www.colorado.edu/hazards/infosource1/domestic.html>

The Natural Hazards Center, located at the University of Colorado, Boulder, Colorado, USA, is a national and international clearinghouse for information on natural hazards and human adjustments to hazards and disasters. The Natural Hazards Center carries out its mission in four principal areas: information dissemination, an annual workshop, research, and library services. The Center's prime goal is to increase communication among hazard/disaster researchers and those individuals, agencies, and organizations that are actively working to reduce disaster damage and suffering.

Pacific Disaster Center

590 Lipoa Parkway, Suite 259, Kihei, Maui, HI 96753. Kara L. Yoshina; e-mail: kyoshina@pdc.org; <http://www.pdc.org/> The PDC is a federal information processing facility that supports emergency managers in the Pacific and Indian Ocean Regions..

Public Risk Management Association (PRIMA)

1815 North Fort Myer Drive, Suite 1020, Arlington, VA 22209. James F. Coyle, Executive Director; (703) 528-7701; fax: (703) 528-7966; e-mail: info@primacentral.org; <http://www.primacentral.org>.

Society for Risk Analysis (SRA)

1313 Dolley Madison Boulevard, Suite 402, McLean, VA 22101. Richard J. Burk, Jr., Executive Secretary; (703) 790-1745; fax: (703) 790-2672; e-mail: sra@burkinc.com.

State and Local Emergency Management Data Users Group (SALEMDUG)

P.O. Box 74590, Baton Rouge, LA 70894. Mike McNeill, Specialized Disaster Systems International; (504) 774-7372 or (800) 521-5912; e-mail: mmcneill@advertisnet.com; <http://www.geocities.com/Area51/>

Rampart/4818/.

Tsunami Society

P.O. Box 25218, Honolulu, HI 96825; <http://www.ccalmr.ogi.edu/STH/society.html>

Urban and Regional Information Systems Association (URISA)

1460 Renaissance Dr. #305, Park Ridge, IL 60068. (847) 824-6300; fax: (847) 824-6363; e-mail: members@urisa.org; <http://www.urisa.org>. U.S. Geological Survey, Denver Federal Center, Box 25046, MS-516, Denver, CO 80225; (303) 236-5838

Volunteers in Technical Assistance (VITA), Disaster Information Center

1600 Wilson Boulevard, Suite 500, Arlington, VA 22209. Richard Muffley, Director, Domestic Disaster Information Center; (703) 276-1800; fax: (703) 243-1865; e-mail: muffley@vita.org. Suzanne Brooks, Director, International Disaster Information Center; (703) 276-1914; fax: (703) 243-1865; e-mail: sbrooks@vita.org; <http://www.vita.org>.

Western States Seismic Policy Council

The mission of the Western States Seismic Policy Council is to help reduce future earthquake losses by providing a forum to advance earthquake programs throughout the Western Region and by developing and facilitating the implementation of seismic policies and programs through information exchange, research application, and education. <http://www.wsspc.org/aboutwssp.html>

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See also ...

<http://www.colorado.edu/hazards/infosource1/infosource1.html> for *Disaster-related Organizations and Other Sources of Hazards/disaster Information*. Links to Domestic Organizations; Academic Institutions; State and Territorial Agencies and Organizations; U.S. Government Agencies; and International and Overseas Organizations.

New Partnership Formed for Medical First Responders

Organizations representing medical emergency responders recently announced the formation of a new coalition to strengthen community readiness for biological, chemical, and nuclear terrorism and other disasters. The Partnership for Community Safety: Strengthening America's Readiness was formed by several organizations, including the American Ambulance Association, the American College of Emergency Physicians, the American Hospital Association, the American Organization of Nurse Executives, the American Public Health Association, the Association of American Medical Colleges, the National Association of County and City Health Officials, the International Association of Fire Chiefs, and the National Association of State EMS Directors.

The new alliance will promote collaboration among its members to improve disaster plans and increase the ability of emergency responders to prepare for the new challenges of terrorism. In addition, members will work to reduce duplication of effort, exchange ideas, and highlight model programs. The new organization will also educate the public about local readiness issues.

The coalition believes that there is a need to:

- Improve communications infrastructure to avoid disruption to public safety communications from cellular and wireless systems during disaster.
- Increase community capacity to address the health care needs of large numbers of casualties.
- Improve disease surveillance, disease reporting, and field laboratory identification systems.
- Provide responders with equipment to protect them from the effects of weapons of mass destruction.
- Enhance training, education, and exercises for mass casualty incidents.

For more information about this new organization, contact the American Health Association, (312) 422-3000; <http://www.aha.org/Emergency/Resources/PartnershipForSafety.asp>.

from: <http://www.colorado.edu/hazards/o/maro02/maro02i.htm#medical>
Natural Hazards Observer, v. XXVI, no. 4, March 2002

TSUNAMI INFORMATION WEBSITES

Los Alamos National Laboratory
<http://t14web.lanl.gov/Staff/clm/tsunami.mve/tsunami.htm>

Tsunami Society Journal and Symposium
<http://www.sthjourn.org/>
<http://www.mccohi.com>

National Tsunami Hazard Mitigation Program
<http://www.pmel.noaa.gov/tsunami-hazard/>

PUBLICATIONS

PAHO presents a new disaster publications catalog

"In recent years the growing number of publications, videos, CD-ROMs and slides published by the Pan American Health Organization (PAHO) on emergencies and disasters has complicated the task of compiling a complete list of what is available. For the time being, however, the challenge has been met with a new catalog of disaster publications, now available in a print or electronic version.

This catalog is a clear demonstration that the production of publications and training materials continues to be a core function of PAHO's Program on Emergency Preparedness and Disaster Relief. The content of many publications has been revised and many new titles have been added.

Without neglecting the traditional print medium, this catalog highlights the value added of electronic publications as complements to this body of material. All books are available in full text on the Internet, in HTML or PDF format. CD-ROMs, with their ease of use, low distribution cost and high storage capacity, are also featured. In 2001 alone, four new CDs were produced.

In order to consolidate PAHO's disaster information resources in one location, the catalog has special sections devoted to information products that make use of technology, including SUMA (The Humanitarian Supply Management System), the CRID (Regional Disaster Information Center), and the Virtual Health Library for Disasters. Also included is a description of many web sites PAHO maintains, sponsors or contributes to.

There are different ways to order and receive this material. The catalog provides the addresses (postal and e-mail) of all PAHO Disaster Offices (Washington, Barbados, Costa Rica and Ecuador) and all PAHO/WHO Country Offices in the Americas, and the PAHO's Publications Program. To request a print copy of this catalog, contact disaster-publications@paho.org or write to the Editor, Disasters: Preparedness and Mitigation in the Americas Newsletter, PAHO, 525 Twenty-third Street NW, Washington, DC 20037, USA. Consult the catalog online at www.paho.org/disasters."

from: Disasters—Preparedness and Mitigation in the Americas, Issue 86, January 2002, p.6.

New, 2002 Edition of The Disaster Recovery Yellow Pages (Tm)

The updated, "New Century" 2002, edition of the Disaster Recovery Yellow Pages™, by The Systems Audit Group, Inc. has begun shipping, coincidentally during one of the most disastrous seasons in recent history.

Based on nearly two decades of disaster planning experience, the Disaster Recovery Yellow Pages™ is a 350-page, comprehensive sourcebook designed to help users locate scores of crucial but hard-to-find recovery services throughout the United States and Canada. It contains over

3000 vendors and covers over 270 categories such as drying and dehumidification of paper and microfilm records, smoke odor counteracting services, trauma counselors, salvage, emergency rental of POS and other computer equipment, etc.

The volume is an essential reference for facility managers, computer operations managers, emergency personnel, risk managers, security managers, librarians, record managers, systems executives, and business recovery coordinators, as well as claims adjusters, insurance agents, and any others responsible for putting organizations "back to normal" after a crisis.

This reference contains five comprehensive sections, covering restoration services, mobile buildings, computer and emergency equipment, planning and data recovery software, as well as training publications and videos. In addition, The Disaster Recovery Yellow Pages™ also includes an alphabetical listing of companies for ease in locating a vendor without knowing an address.

The Disaster Recovery Yellow Pages™ also includes a tutorial on areas which are frequently overlooked—even by experienced users—when preparing their disaster recovery plans, as well as hints on "getting started" and preparing a disaster plan.

The Systems Audit Group, Inc., has worked with leaders in the disaster recovery field to develop this comprehensive sourcebook, as well as using the experiences gained in working with over 100 organizations and institutions to prepare comprehensive recovery plans for the resumption of their operations following a disaster. These organizations have ranged from banks and insurance companies to manufacturers, retailers, colleges, and other organizations.

The Disaster Recovery Yellow Pages™ comes in a three-ring binder, for ease in adding sources which individual users have gathered that are unique to their own circumstances. The price is US\$98. per copy, plus US\$3 for shipping and handling. Regular updates are available.

To obtain a free brochure, or to order The Disaster Recovery Yellow Pages™, contact The Systems Audit Group, Inc., 25 Ellison Road, Newton, Mass. 02459, 617-332-3496, fax: 617-332-4358, E-mail: DRYP@Disaster-Help.com, or go to the web site at: <http://www.DISASTER-HELP.com>.

More Quick Response Reports

Five new quick response reports are now on-line on the Natural Hazards Web site. Three of the documents explore more aspects of the September 11 terrorist attacks while the other two evaluate post-disaster communication and emergency support efforts. The Natural Hazards Center sponsors "Quick Response" investigations that allow researchers to visit the site of a disaster immediately after impact in order to assess response and recovery. In turn, the researchers

publish summaries of their findings on the Hazards Center's Web site. The two newest reports of interest to *TsuInfo Alert* readers:

QR149: "Oregon Emergency Management: Evaluating Interagency Communication in the Post-Disaster Environment" by Robert Parker, Andre LeDuc, and Kathy Lynn, 2002. This report examines the perception of the communication and coordination roles of the Oregon Emergency Response System (OERS) by Oregon state government agencies participating in disaster response following the September 11 attacks. Survey results from 22 OERS members conclude that Oregon Emergency Management is effectively communicating its communication and assistance coordination role; the up-to-date and accurate post-disaster information provided by the system helps agencies provide services and communicate to the public; the participating agencies prefer external communication systems (phones, e-mail, Internet); and the complex interagency communication is essential in all phases of disasters. <http://www.colorado.edu/hazards/qr/qr149/qr149.html>

QR152: "Marginalized Groups in Times of Crisis: Identity, Needs, and Response" by Marci Eads, 2002. The unmet needs and ultimate effects of the terrorist attacks on the lesbian, gay, bisexual, and trans-gender (LGBT) community is examined in this report. The report concludes that this group's special needs were not and still are not being met by mainstream relief organizations. LGBT community leaders are assessing these needs in an effort to coordinate and provide assistance and referrals. The problems met by the community include same-sex partners of victims or injured who were denied service, information, or assistance; others were afraid to seek assistance because of their sexual orientation; and others who attempted to seek services were retraumatized because of difficult experiences with relief organizations.

<http://www.colorado.edu/hazards/qr/qr152/qr152.html> from: Disaster Research 365, April 30, 2002, and, Disaster Research 366, May 8, 2002

Report Outlines Ten Ways to Reduce Recurring Losses

A report published by the Institute for Business and Home Safety (IBHS) outlines 10 of the most important solutions to decrease recurring losses from natural disasters. The 29-page report is the outcome of a June 2000 workshop convened by the American Society of Civil Engineers and the IBHS. The document addresses why losses from natural disasters are increasing and offers recommendations and priorities for future research and development of cost-effective solutions to reduce the losses. Participants identified research areas for residential and commercial buildings and prioritized mitigation methods that would offer the biggest loss reductions in the shortest time for damages from hurricanes/ windstorms, earthquakes, floods, hail, wildfire, and winter storms. Incorporating holistic measures that integrate research, development, and education with profession-

al practices and public policies garnered consensus. Some specific steps needed to reduce losses include reducing well-known vulnerabilities in roofs, envelopes, and structural/foundation systems of existing buildings and preventing them in new construction. The full report can be downloaded as a PDF file from the IBHS Web site at http://www.ibhs.org/research_library/downloads/292.pdf.

from: Disaster Research 365, April 30, 2002

Crisis and Emergency Management Newsletter

The George Washington University, Volume 2, Number 3 <http://www.seas.gwu.edu/~emse232/emse232apr> April 1, 2002

The EMGT 232 Disaster Newsletter is produced by the students in the spring 2002 class EMSE 232: Crisis and Emergency Management at The George Washington University in Washington, DC. The student authors include Stan Adler, Jennifer Chang, Harold Gillens, Lydia Castro, Frank Comer, Ted Blackburn, Kurt Ettenger, Ken Marsala, Stephen Fields, Alfredo Lagos, Vic Bird, Mariella Cacho and Michael Angiolillo.

The purpose of The EMSE 232 Disaster Newsletter is to provide its readers with a current perspective of activities in the disaster management field in the United States and around the world. The Newsletter includes information on current disaster management trends in the areas of research, funding, technology, legislation and consulting. This information is provided in brief summaries of current activities accompanied by a computer link or reference to more detailed information.

Contents:

- The Necessity of a Long Term, Multi-Sectoral Perspective for Success in Disaster Mitigation, by C. M. Herridge
- Interview with Josh Green--Volunteer at the Red Cross National Capital Chapter in Washington, D.C., by Jennifer Chang
- Update on the Disaster Prevention Home and Business Loan Program, by Harold Gillens
- FEMA's New Strategic Plan & Direction: An Interview with Patricia Stahlschmidt, by S.T. Fields
- SBA Regulations Modified to Assist September 11th Small Business Victims, by Michael Angiolillo
- The Latest Facts and Figures Six Months After 9/11, by Alfredo Lagos
- Actions Taken by the City of Tulsa, OK to Adopt New Ideas for Natural Hazard Reduction and Methods to the War on Terrorism, by Lydia Castro
- September 11 Influences Major Changes at the Maryland Fire and Rescue Institute, by Ken Marsala
- Support for Domestic Anti-Terrorism Programs, by Victor Bird
- Where Do our Leaders Stand on Homeland Security?, by Frank Comer
- Conferences, Symposiums, Trainings, and Workshops
- Legislative Update on the War Against Terrorism, by Stan

Adler

- Update on Request for Proposals (RFPs), by Kurt Ettenger

Disclaimer: The EMGT 232 Disaster Newsletter is produced and distributed as an information tool to its readers. Should you wish to remove your name from the distribution list please contact George Haddow at george_haddow@hotmail.com or at (301) 270-5554. Back issues are archived on the website.

Please forward any comments, inquiries or contributions to George Haddow at george_haddow@hotmail.com.

Ogmius Newsletter

A new newsletter published by the Center for Science and Technology Policy Research highlights ideas, events, and research from the world of science and technology policy. The Ogmius newsletter, named after the Gallic god of Eloquence, is published three times a year and contains information of interest to the science policy and hazards communities. Included are topical exchanges from leading policy professionals; news; educational and research opportunities; meetings; updates on the center's projects, web sites, and publications; and media resources. Ogmius is available online at <http://sciencepolicy.colorado.edu/ogmius>. To be added to the e-mail notification list, use the on-line form at <http://sciencepolicy.colorado.edu/ogmius/>

subscriptions.html or send an e-mail message to ogmius-admin@sciencepolicy.colorado.edu with your name, organization, e-mail address, interests and needs, and how you heard about the newsletter.

from: Natural Hazards Observer, v. XXVI, no. 5, May 2002, p.8

Chapel Hill Announces Five Case Studies of Citizen Participation in Hazard Mitigation Planning

The following papers are now available from the Center for Urban and Regional Studies, University of North Carolina at Chapel Hill. Each document can be downloaded free from <http://www.unc.edu/depts/curs>. E-mail requests for copies should be directed to carolyn_jones@unc.edu.

--Public Participation in the City of Fort Lauderdale Comprehensive Plan: A Constituency Model of Plan Making. Samuel Brody. 2001.

--Pinellas County: The Role of Focussed Participation in the Comprehensive Planning Process. Samuel Brody. 2001.

--The City of Sarasota, Florida 1998 Comprehensive Plan: The Role of Communicative Culture and Informal Participation in Plan Making. Samuel Brody. 2001.

--Bottom-up Comprehensive Planning: A Case Study of Pierce County, Washington. Dave Robison. 2001.

--Citizen-Driven Visioning in Comprehensive Planning: A Case Study of Issaquah, Washington. Dave Robison. 2001

from: Natural Hazards Observer, v. XXVI, no. 5, May 2002, p. 21

CONFERENCES AND TRAINING

June 24-25, 2002

Emergency Operations Centers: Develop and Maintain Command Structures that Save Lives, Prevent Damage, and Ensure Continuity of Operation.

Sponsors: National Institute for Government Innovation (NIGI), International Terrorism Response Association, Memorial Institute for the Prevention of Terrorism, National Terrorism Preparedness Institute, and the International Association of Emergency Managers.

The seminar will explore how to develop an emergency operation center and enhance understanding of the management process in terms of mitigation, preparedness, response, and recovery planning.

San Jose, CA (also New York, NY on July 15-16, 2002) Contact: NIGI, 708 Third Avenue, 4th Floor, New York, NY 10017-4103; (888) 670-8200; fax (941) 951-7885; e-mail: registration@nigi.org; Internet: www.nigi.org
from: Disaster Research 363, March 27, 2002

June 25-27, 2002

Disaster Mitigation Workshop Series. Presented by the Conservation Center for Art and Historic Artifacts (CCAHA). The workshops, intended for staff involved in cultural collections care activities, will provide tools for assessing a cultural institution's vulnerability to disaster, evaluating fire prevention and suppression strategies, determining security risks, and assessing health and safety factors related to disaster. New York, New York: Contact: Preservation Services Office, CCAHA, 264 South 23rd Street, Philadelphia, PA 19103; (215) 545-0613; fax: (215) 735-9313; e-mail: ccaaha@ccaaha.org; WWW: <http://www.ccaha.org/>.

from: Disaster Research 365, April 30, 2002

July 7-10, 2002

12th World Conference On Disaster Management, "The Changing Face Of Disaster Management"

NEW TSUNAMI MITIGATION MATERIALS

(see page 2 for ordering instructions)

Native Peoples and Oral Histories

- Hutchinson, Ian; Crowell, Aron, 2002, Archaeological evidence of great earthquakes and associated tsunamis, Alaska subduction zone. *In* U.S. Geological Survey, External research program--Annual project summaries, Volume 43, FY 2001, Pacific Northwest: U.S. Geological Survey, 2 p.
- McMillan, A. D.; Hutchinson, Ian, 2002, When the mountain dwarfs danced--Aboriginal traditions of paleoseismic events along the Cascadia subduction zone of western North America: *Ethnohistory*, v. 49, no. 1, p. 41-68.

Popular or General Materials

- Chang, Kenneth, 2002, Experts find clues to cause of deadly Pacific tsunami: *New York Times*, Apr. 23, 2002, Late edition--Final, Section F, p. 3, column 2.
- International Tsunami Information Center, 2001, Tsunami glossary: International Tsunami Information Center, 19 p. (Accessed May 3, 2002 at <http://www.shoa.cl/oceano/itic/frontpage.html>)
- Smith, D. L., 2000, Of landslides, couch potatoes, and pocket tsunamis: *Engineering & Science*, v. 63, no. 1, p. 26-36.

Technical Reports

- Ballerini, Mark; Michalik, Alexandra, 2002, A comparison of physical model results for tsunami inundation around a conical island with a photogrammetric survey of the 1992 Babi Island tsunami [abstract]: *Eos (American Geophysical Union Transactions)*, v. 83, no. 19, Supplement, p. S206.
- Geist, E. L., 1999, Tsunami record from the Great 1906 San Francisco earthquake: U.S. Geological Survey, 7 p.
- Geist, E. L., 2002, Complex earthquake rupture and local tsunamis: *Journal of Geophysical Research*, v. 107, no. B5, 10.1029/2000JB000139, paper ESE 2, 16 p.
- Grilli, S. T.; Vogelmann, Sylvia; Watts, Philip, 2002, Development of a 3D numerical wave tank for modeling tsunami generation by underwater landslides: *Engineering Analysis with Boundary Elements*, v. 26, no. 4, p. 301-313.
- Grilli, S. T.; Vogelmann, Sylvia; Watts, Philip, 2002, Landslide tsunami amplitude prediction in a numerical wave tank. *In* Edge, B. L.; Hemsley, J. M., editors, *Ocean wave measurement and analysis; Proceedings of the fourth international symposium, WAVES 2001*: American Society of Civil Engineers, p. 1495-1514.
- Grilli, S. T.; Watts, Philip, 2001, Modeling of tsunami generation by an underwater landslide in a 3D-NWT. *In* Eleventh (2001) international offshore and polar engineering conference, June 17-22, Stavanger, Norway: International Society of Offshore and Polar Engineers [conference reprint], 8 p.
- Malone, S. D., 2002, The Pacific Northwest Seismograph Network--A multi-hazard data and information system [abstract]: *Geological Society of America Abstracts with Programs*, v. 34, no. 5, p. A-11.
- Ollerhead, Jeff; Huntley, D. J.; Nelson, A.R.; Kelsey, H. M., 2001, Optical dating of tsunami-laid sand from an Oregon coastal lake: *Quaternary Science Reviews*, v. 20, no. 18, p.

1915-1926.

- Oppenheimer, D. H.; Bittenbinder, Alex; Bogaert, Barbara; Buland, Raymond; Dietz, Lynn; Hansen, R. A.; Malone, S. D.; McCreery, C. S.; Sokolowski, T. J.; Weaver, C. S., 2002, The CREST project--Consolidated Reporting of Earthquakes and Tsunamis [abstract]: *Geological Society of America Abstracts with Programs*, v. 34, no. 5, p. A-11.
- Science of Tsunami Hazards*, v. 20, no. 1. 2002

Includes:

- Hubbard, J. R.; Duncan, S.A., Tsunami hazard mitigation and the NOAA National Water Level Observation Network. p. 19-25.
- Loomis, Ha. G., The momentum of tsunami waves. p. 38-41.
- Nottingham, Dennis, Review of the 1994 Skagway, Alaska tsunami and future plans. p. 42-49.
- Paine, M. P., Tsunami book gives a better understanding of ancient floods on Mars p. 50-56.
- Scheffers, A. M., Paleotsunami evidences from boulder deposits on Aruba, Curacao and Bonaire. p. 26-37.
- Whelan, Franziska; Kelletat, Dieter, Geomorphic evidence and relative and absolute dating results for tsunami events on Cyprus., p. 3-18.
- Science of Tsunami Hazards*, v. 20, no. 2. 2002.

Includes:

- Abe, Kuniaki, Observations of selective amplification of tsunamis to azimuth of the source. p. 102-117.
- Lander, J. F.; Whiteside, L. S.; Lockridge, P. A., A brief history of tsunamis in the Caribbean Sea. p. 57-94.
- Watts, Philip, The need for underwater landslide hazards prediction. p. 95-101.
- Sokolowski, T. J., 2002, Automatic earthquake processing at the U.S. West Coast/Alaska Tsunami Warning Center [abstract]: *Geological Society of America Abstracts with Programs*, v. 34, no. 5, p. A-23.
- Synolakis, C. E.; Borrero, J. C.; Eisner, R. K., 2002, Developing inundation maps for southern California. *In* Ewing, Lesley; Wallendorf, Louise, editors, *Solutions to coastal disasters 2002*: American Society of Civil Engineers, p. 848-862.
- Tinti, Stefano; Pelinovsky, E. N., editors, 2001, Special issue--Tsunamis: *Natural Hazards and Earth System Sciences*, v. 1, no. 4, [92 p.]. (Accessed Apr. 10, 2002 at <http://copernicus.org/EGS/nhess/1/contents.htm>)

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- Gianfreda, F.; Mastronuzzi, G.; Sanso, P., Impact of historical tsunamis on a sandy coastal barrier--An example from the northern Gargano coast, southern Italy. p. 213-219.
- Hebert, Helene; Schindele, F.; Heinrich, Philippe, Tsunami risk assessment in the Marquesas Islands (French Polynesia) through numerical modeling of generic far-field events. p. 233-242.
- Matsumoto, T.; Kimura, M.; Nakamura, M.; Ono, T., Large-scale slope failure and active erosion occurring in the southwest Ryukyu fore-arc area. p. 203-211.
- Nosov, M. A.; Skachko, S. N., Nonlinear tsunami generation mechanism. p. 251-253.
- Pelinovsky, E. N.; Kharif, Christian; Riabov, Igor; Francius, Marc, Study of tsunami propagation in the Ligurian

- Sea. p. 195-201.
- Pelinovsky, E. N.; Talipova, T.; Kurkin, A.; Kharif, Christian, Nonlinear mechanism of tsunami wave generation by atmospheric disturbances. p. 243-250.
- Piatanesi, Alessio; Tinti, Stefano; Pagnoni, G., Tsunami waveform inversion by numerical finite-elements Green's functions. p. 187-194.
- Pinegina, T. K.; Bourgeois, Joanne, Historical and paleo-tsunami deposits on Kamchatka, Russia--Long-term chronologies and long-distance correlations. p. 177-185.
- Tanioka, Yuichiro; Seno, T., Detailed analysis of tsunami waveforms generated by the 1946 Aleutian tsunami earthquake. p. 171-175.
- Tinti, Stefano; Maramai, Alessandra; Graziani, L., A new version of the European tsunami catalogue--Updating and revision. p. 255-262.
- Zahibo, N.; Pelinovsky, E. N., Evaluation of tsunami risk in the Lesser Antilles. p. 221-231.
- Tsunami Society, 2002, Second tsunami symposium, May 28-30, 2002, Honolulu, Hawaii--Program, abstracts, CD-ROM contents: Tsunami Society, 1 v. (*Available at:* <http://www.sthjourn.org/stap.htm>)
Includes abstracts for:
- Bernard, E. N.; Gonzalez, F. I.; Meinig, Christian; Milburn, H. B., Early detection and real-time reporting of deep ocean tsunamis.
- Clague, J. J.; Munro, Adam; Murty, T. S., Tsunami hazard in Canada.
- Dominey-Howes, D. T. M., The late Minoan tsunami in the eastern Mediterranean--A re-examination.
- Fritz, H. M.; Mader, C. L., The Lituya Bay mega-tsunami.
- Fryer, G. J., The landslide origin of the Aleutian tsunami of 1946--Implications for tsunami warning.
- Goldfinger, Chris; Johnson, J. F.; Nelson, C. H., Is there a connection between subduction zone earthquakes, submarine landslides, and the destabilization of gas hydrates on the central Oregon margin.
- Gonzalez, F. I.; Titov, V. V.; Mofjeld, H. O.; Venturato, A. J., The NTHMP inundation mapping program.
- Hansen, R. A.; Suleimani, Elena; Combellick, R. A., Tsunami hazard maps of Alaska communities.
- Helsley, C. E., Gas hydrates on the Chatham Rise, New Zealand, and their potential of tsunami generation.
- Hubbard, J. R.; Duncan, S. A., Tsunami hazard mitigation and the NOAA National Water Level Observation Network.
- Jaffe, B. E.; Rubin, D. M.; Peters, Robert; Gelfenbaum, Guy; Anima, R. J.; Swensson, Matt; Olcese, Daniel; Anticono, L. B.; Gomez, J. C.; Riega, P. C., Using tsunami deposits to improve understanding of the June 23, 2001 Peru tsunami.
- Keating, B. H., Queens Beach tsunami deposit baseline study.
- Keating, B. H.; Helsley, C. E., Elevated strandlines--Not tsunami deposits on Lanai, Hawaii.
- Kowalik, Zygmunt, Relations between tsunami calculations and their physics.
- Loomis, H. G., The momentum of tsunami waves.
- Mader, C. L.; Gittings, Michael, Dynamics of water cavity generation by projectiles.
- Max, M. D., Mass flow in marine sediment--Physical causes and possible examples from the geological record.
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- Milkov, A. V., Global distribution and significance of natural gas hydrate.
- Noormets, Riko; Crook, K. A. W.; Felton, E. A., Hydrodynamics of megaclast emplacement and transport on a shore platform, Oahu, Hawaii.
- Nottingham, Dennis, Review of the 1994 Skagway, Alaska tsunami and future plans.
- Pararas-Carayannis, George, Tsunamigenic efficiency of magma-induced kinematic crustal changes, associated with "silent" volcanic earthquakes and massive slope failures of oceanic island stratovolcanoes.
- Pararas-Carayannis, George, Volcanically-generated tsunamis.
- Rynn, Jack, An assessment of tsunami hazard and risk in the Indonesian region.
- Scheffers, A. M., Evidences of tsunamis on Curacao, Bonair, and Aruba.
- Sewell, R. T., Probabilistic tsunami hazard and risk assessment.
- Shigihara, Yoshinori; Imamura, Fumihiko, Numerical simulation with two-layer model for a landslide-induced tsunami.
- Walker, D. A.; Cessaro, R. K., Locally generated tsunamis in Hawaii--A low cost, real time warning system with world-wide applications.
- Watts, Philip, Probability distributions and sensitivity analysis of gas hydrate induced landslides and tsunamis.
- Watts, Philip.; Grilli, S. T.; Kirby, J. T.; Fryer, G. J.; Tappin, D. R., Validation of topics and case studies with Geowave.
- Weaver, Robert; Giesler, Galen; Gittings, Michael, Asteroid generated tsunamis.
- Whelan, Franziska; Kelletat, Dieter, Geomorphic evidence and C14 dating results for tsunamis in Cyprus.

Infrequently Asked Questions

COMPILED BY LEE WALKLING

WHAT GEOLOGIC EVENT WAS REPORTED 100 YEARS AGO?

As reported in the **May 15, 1902** issue of *Nature*:

"News of the terrible volcanic eruption in Martinique reached this country on Thursday last, and the details which have since become known have shown that an appalling disaster has occurred. St. Pierre, the chief commercial centre of the island, has been totally destroyed, and about thirty thousand people have perished. The eruption of Mont Pelee began on the night of Saturday, May 3, when large quantities of scoriae and volcanic ash were thrown into the surrounding country. On Monday, May 5, a stream of lava is reported to have rushed down the side of Mont Pelee, following the dry bed of a torrent, and reaching the sea, five miles from the mountain, in three minutes. When the stream met the sea the water receded 300 feet on the west coast, returning with greater strength in a large wave. Two days later, on May 8, a similar torrent of incandescent lava engulfed the town of St. Pierre."

from: Nature, v. 417, p. 231, 16 May 2002

CAN YOU NAME ANOTHER WAY IN WHICH TSUNAMIS CAN BE TRIGGERED, BESIDES BY EARTHQUAKES, VOLCANOES, UNDERWATER LANDSLIDES AND METEOR IMPACTS?

In the April issue, *TsuInfo Alert* quoted J. H. Latter's 1981 list of eight mechanisms for the generation of tsunamis during volcanic eruptions. *TsuInfo Alert* has discovered another mechanism for the generation of tsunamis by some subduction zone earthquakes. So add this to the list of ways tsunamis can be created:

"The breakdown of the [methane] hydrates, triggered by changes in water pressure and temperature, is also thought to be responsible for seafloor landslides and large water wave (tsunamis)."

from: Nature, v. 415, no. 6870, p. 355, 24 January 2002

"Hydrates on continental margins may be major factors in large-scale slope instabilities producing submarine gravity currents and abyssal turbidity deposits and may even play roles in the larger-than-expected tsunamis produced by some subduction-zone earthquakes."

from: <http://geology.usgs.gov/postdoc/opp7.html>

For more information on methane hydrates, go to <http://marine.usgs.gov/fact-sheets/gas-hydrates/title.html>
<http://woodshole.er.usgs.gov/project-pages/hydrates/>
<http://cnie.org/NLE/CRSreports/energy/eng-46.cfm>

ARE THERE ANYMORE TSUNAMI ACRONYMS THAT NEED TO BE DEFINED?

Well, yes, there seems to be no end to the acronyms. Here's the latest batch:

CENS = (Community Emergency Notification System), a system that gives public safety officials the ability to send an outgoing telephone message to every phone number within a specified warning area or evacuation zone.

CREST = (Consolidated Reporting of Earthquakes and Tsunamis) is a project funded through the National Tsunami Hazard Program to upgrade regional seismic networks in Alaska, Washington, Oregon, California, and Hawaii and provide real-time seismic information from these networks to the tsunami warning centers. (*Editors' note: see the abstract, p. 11*)

SAWS = (Simultaneous Announcement Wireless System) is a dedicated system of transmitters and receivers installed by local authorities for all types of messages.

THRUST = (Tsunami Hazard Reduction Using System Technology) is a comprehensive program to mitigate tsunami hazards in developing countries, sponsored by the Office for U.S. Foreign Disaster Assistance/Agency for International Development.

from: Oregon Emergency Management; Oregon Department of Geology and Mineral Industries, 2001, Tsunami warning systems and procedures--Guidance for local officials: Oregon Department of Geology and Mineral Industries Special Paper 35, p. 30-31.

ARE THERE OTHER NEW TERMS THAT NEED TO BE DEFINED?

Holistic disaster recovery is a new term that is being used to denote a new approach "which integrates what is known about the process of recovering and reconstruction after a disaster with the principles of sustainability."

To learn more about this, request the two free publications from the Natural Hazards Center:
-- *Holistic Recovery: Ideas for Building Local Sustainability after a Natural Disaster* (2001, 234 p.) Available from: Public Entity Risk Institute, 11350 Random Hills Road, Fairfax, VA 22030; 703 352-1846; fax 703 352-6339; dkouba@riskinstitute.org. Available online at: www.colorado.edu/hazards/holistic_recovery
-- *Building Better Back: Creating a Sustainable Community After Disaster*, by Jacquelyn L. Monday. Available online at: www.colorado.edu/hazards/informer (Issue #3)

from: Natural Hazards Observer, March 2002, p. 5

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

- ___ **Cascadia: The Hidden Fire - An Earthquake Survival Guide**; Global Net Productions, 2001. 9.5 minutes. A promo for a documentary about the Cascadia subduction zone and the preparedness its existence demands of Alaska, Oregon and Washington states. Includes mention of tsunamis. (The full documentary is scheduled for broadcasting on a PBS station in April 2002.)
- ___ **Not Business as Usual: Emergency Planning for Small Businesses**, sponsored by CREW (Cascadia Regional Earthquake Workgroup), 2001. 10 min. Discusses disaster preparedness and business continuity. Although it was made for Utah, the multi-hazard issues remain valid for everyone. Web-sites are included at the end of the video for further information and for the source of a manual for emergency preparedness for businesses.
- ___ **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.
- ___ **Disaster Mitigation Campaign** (15 min.) American Red Cross; 2000 TV spots. Hurricanes, high winds, floods, earthquakes
- ___ **Forum: Earthquakes & Tsunamis** (2 hrs.) CTV-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.
- ___ **Mitigation: Making Families and Communities Safer** (13 min.) American Red Cross
- ___ **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
- ___ **Protecting Our Kids from Disasters** (15 min.) Gives good instructions to help parents and volunteers make effective but low-cost, non-structural changes to child care facilities, in preparation for natural disasters. The Institute provides a booklet to use with the video. Does NOT address problems specifically caused by tsunamis.
- ___ **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 Oku-shiri 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.
- ___ **USGS Earthquake Videotapes "Pacific Northwest"** USGS Open-File Report 94-179-E
- ___ **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.) Washington Military Department/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.) Produced by the Ocean Shores (Washington) 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:

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(360) 902-1432; Fax (360) 902-1785
email: tim.walsh@wadnr.gov

STATE EMERGENCY MANAGEMENT OFFICES For general emergency management information, contact:

Alaska Division of Emergency Services
Department of Military & Veterans Affairs
P.O. Box 5750
Fort Richardson, Alaska 99505-5750
(907) 428-7039; Fax (907) 428-7009
<http://www.ak-prepared.com/>

California Office of Emergency Services
2800 Meadowview Road
Sacramento, California 95832
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<http://www.oes.ca.gov/>

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<http://www.osp.state.or.us/oem/oem.htm>

Washington State Military Department
Emergency Management Division
Camp Murray, WA 98430-5122
(253) 512-7067, Fax (253) 512-7207
<http://www.wa.gov/mil/wsem/>

Provincial Emergency Program
455 Boleskin Road
Victoria, BC V8Z 1E7
British Columbia, Canada
(250) 952-4913
Fax (250) 952-4888 <http://www.pep.bc.ca>

TSUNAMI ANNIVERSARIES

May 22, 1960 Chile earthquake

largest earthquake in the world since 1900, mag. 9.5
http://neic.usgs.gov/neis/eqlists/10maps_world.html

June 7, 1692 Port Royal, Jamaica earthquake/tsunami

refer to *TsuInfo Alert*, volume 3, no. 4, August 2001

June 28, 1992 Landers, CA earthquake

June 28, 1992 Big Bear, CA earthquake

<http://www.coutant.com/earth/quake0.html> (photo tour)

<http://www.scecdc.scec.org/landersq.html>

<http://www.eqe.com/publications/bigbear/bigbear.htm>

<http://www.scecdc.scec.org/bigbear.html>

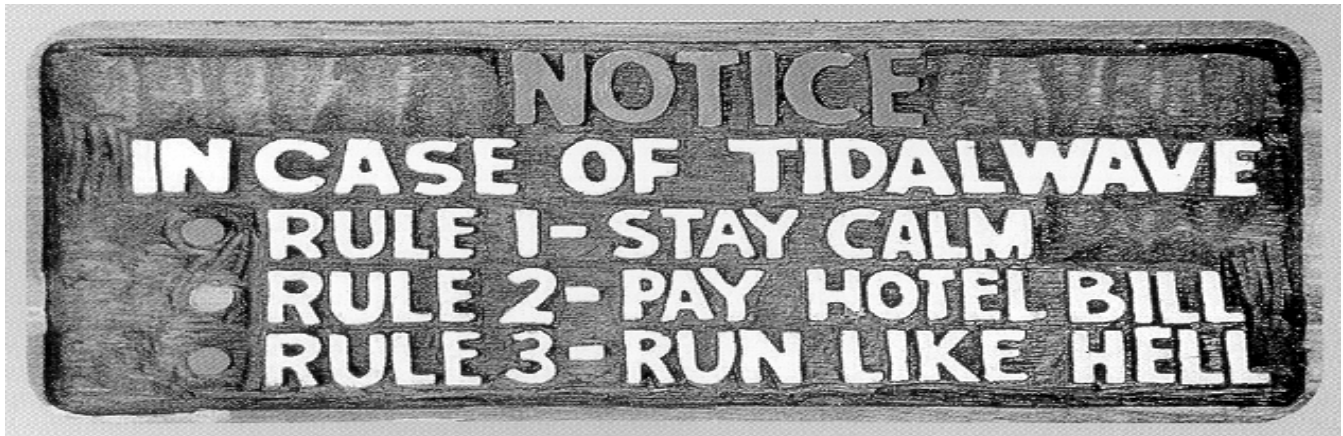
July 10, 1958 Lituya Bay, AK earthquake/tsunami

<http://www.gi.alaska.edu/ScienceForum/ASF7/763.html>

<http://www.usc.edu/dept/tsunamis/alaska/1958/webpages/> (includes map of area)

<http://www.geocities.com/CapeCanaveral/Lab/1029/Tsunami1958LituyaB.html> (aerial photos)

July 21, 365 BC Knossos, Crete earthquake (M 8.5)



This sign reportedly hangs over the bar at the Waikiki Yacht Club.....



Library
Department of Natural Resources
Division of Geology and Earth Resources
P.O. Box 47007
Olympia, WA 98504-7007