TsuInfo Alert

prepared by the Washington State Department of Natural Resources on behalf of the

National Tsunami Hazard Mitigation Program

a state/federal partnership funded through the National Oceanic and Atmospheric Administration (NOAA)

Contents **Volume 10, Number 4 August 2008**

Latest oceanic fiber-optic cable detects undersea quakes

By Martyn Williams , IDG News Service , 07/07/2008

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The Japan Meteorological Agency (JMA) began laying a fiber-optic cable under the Pacific Ocean on Sunday but it won't be used for telecommunications. The cable is part of an advanced monitoring and alert system that could provide warning should a destructive earthquake occur close to Japan.

Undersea earthquakes are particularly dangerous because they can start tsunami, or tidal waves -- destructive waves that possess much more energy that normal waves. Japan has been hit by killer tsunami waves in the past but the most famous series of tsunami waves are those that occurred in December 2004 following an earthquake off Indonesia. More than 225,000 people are estimated to have been killed in their wake.

The new fiber cable extends 220 kilometers off the south coast of Japan near Shizuoka prefecture -- an area that has long been viewed by seismologists as having a significant chance of a major earthquake. Along the cable are nine large pods, each about 2 meters long and 26 centimeters wide. The pods were developed by NEC as part of the project.

In five of the pods are earthquake sensors, in three are tsunami sensors and the final one handles signal relay from the far end of the cable back to shore. From the shore the signals are sent to data processing centers in Tokyo and Osaka. The two cities are several hundred kilometers apart so should one be affected by an earthquake, the other should keep running.

Data from the pods will be used to help better determine the location and size of undersea earthquakes and the chances of a tidal wave.

Japan is one of the most seismically active nations in the world and is hit by several earthquakes per day that are strong enough to be felt. As a result it has a highly sophisticated earthquake reporting system, and typically the size and intensity of a quake is announced by the JMA and flashed over TV screens within 2 or 3 minutes of it occurring. An integral part of this reporting system is whether danger of a tsunami exists.

A more recent innovation is an early-warning system that seeks to provide notice seconds in advance of strong quakes. The system monitors the fast moving but weak primary waves to quickly determine the approximate location and intensity of a quake and attempts to get out a warning in advance of the more destructive secondary waves.

Recently the warning system provided about 13 seconds warning of a strong quake to the 1 million residents of Sendai city in northern Japan. The warning system can't yet provide alerts fast enough to those very close to the epicenter but it's still in its early days having started operation last October.

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(*Continued from page 1*)

The new cable is being laid by the Subaru, a ship owned by Japanese telecom carrier NTT that is especially built for the job. It set sail from Yokohama port on Thursday last week. Before the journey reporters were allowed on-board to see how the ship works.

Cable sits in a large circular storage area that is several stories high in the center of the ship. On Thursday it contained just the 220 kilometers for the new cable system but can store up to 5,000 kilometers. Just like pulling a piece of string from the center of a ball, the cable is pulled up to the deck level of the ship and then through a series of pulleys and wheels before disappearing over the back of the boat and into the ocean.

In the deep ocean it sits on the seabed but closer to land a trench needs to be dug so it lays under the surface for protection. A simple digger sits on the back of the ship and can be dropped into the water to create the trench when required.

The Subaru will be at sea for a few weeks laying the cable.

From: http://www.networkworld.com/news/2008/070708-latest-oceanic-fiber-optic-cable-detects.html?hpg1=bn ♦

Firing up your geospatial technology skills—Forge a step-by-step approach to find the right training, data, and tools.

From: *Coastal Connections,* v. 6, issue 3, p. 1-3, June/July 2008.

Reprinted with permission from NOAA Coastal Services Center

By now, nearly every coastal professional has attended a presentation or two where the terms "GPS," "GIS," and "remote sensing" are bandied about. More than likely, the presenters extol the benefits of these geospatial technologies in mapping habitat or land cover, evaluating storm impacts, or crafting large-scale conservation plans.

Participants listening to such presentations are impressed—unfortunately, many of them still don't have a clue how to start using these tools once they return to their workplaces.

The use of geospatial technology tools in coastal resource management has grown significantly in the past decade—but even seasoned users do not always take maximum advantage, a point illustrated by 2007 survey results from the National Association of Counties (NACo).

The survey was given to NACo members in all major coastal regions. Targeted respondents were likely to have more exposure to these technologies than the general population. Several were members of NACo's technology committees, and professional affiliations ranged from geospatial specialists and coastal managers to county employeees in environmental engineering and science.

The survey revealed that 45 percent of the 79 respondents do not take full advantage of the geospatial data and tools that are available. Another eight percent would like to use geospatial data and tools to a greater degree but do not know what is available. And nine percent do not know what sorts of geospatial data and tools are in use at their workplace.

Get acquainted with the terminology

How do you start reaping the benefits of geospatial technology when you know little about the topic? First, thumbnail definitions are in order. The three technology systems mentioned below operate independently but can also be used in combination:

*Geographic information system (GIS)

This system captures, analyzes, manages, or stores data and information that has spatial references to the earth's surface. GIS can help users locate and manage assets and resources, calculate emergency response times, assess environmental impacts, complete scientific studies, and analyze large amounts of map-based data.

*Remote sensing

These tools collect information about land and water areas from a distance—for instance, from aircraft, spacecraft, satellites, buoys, or ships. Remote sensing can aid the analysis of land and the marine floor, fisheries habitats, and shoreline erosion.

*Global positioning system (GPS)

This hardware uses satellites and devices to compute various positions on the earth's surface. GPS devices help users determine the locations of specific items in the field, such as protected resources, and can export those features to a GIS analysis.

Investigate training and product features

Next, check out available training courses. The National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center offers eight courses in geospatial technology, which range from an introductory GIS course for nontechnologists to an advanced, hands-on training in coastal inundation mapping.

Technology novices can become intimidated by the different training and product choices, not knowing which ones will yield the best results for their coastal circumstances. If this is the case with you, consider taking one of the Center courses flagged as "basic," where you can receive guidance on the matter.

"We don't advocate one software package over another, but we can provide information to help organizations weigh their needs against the advantages of different GIS products," says Steve Walker, A GIS training coordinator with the Center.

Some Center courses can be brought to your area. [To learn more: www.csc.noaa.gov/training/.] "We've found that it makes sense to teach courses 'on the road,'" explains Walker. "Traveling to teach our students makes training affordable for agencies whose travel budgets have been cut in recent years. Also, it's easier for us to be

mobile than in the past because quite a few training labs aroung the country are set up to handle GIS."

An organization seeking to upgrade its geospatial capacity need not purchase every tool, service, and data set. According to Pedro Flores, the GIS outreach director for NACo, organizations often find valuable uses for pre-existing data.

"Some coastal counties have been using GIS for 20 years, so they can take the raw NOAA data and perform high-level analysis," says Flores. "However, counties that are just beginning to use GIS for planning and management purposes usually prefer preprocessed data that isn't too cumbersome to use."

One data resource is the Coastal Change Analysis Program (C-CAP), a Center-led initiative that provides standardized, accurate land cover data for all U.S. coastal areas. A number of programs analyzing land cover issues have used C-CAP data sets rather than starting from scratch, thereby saving hundreds of thousands of dollars.

Another cost-cutting alternative is to seek grant monies for tools and training. "There are several possibilities," notes Walker. "For example, a program established by the software maker ESRI donates millions of dollars in software, data, books, conference passes, and training to U.S. nonprofits involved in conservation and geospatial issues. Also, NACo awards annual geospatial technology grants to counties involved in coastal restoration projects," says Walker.

Finally, it is wise to forge a relationship with an agency or organization that is more experienced in geospatial applications. "When a county agency is starting out on a GIS mapping project for the first time," says Flores, "I try to hook them up with a county that has already completed a mapping project. That way, the less experienced agency can get good advice and learn which steps to avoid before they begin."

Geospatial technology training opportunities:
The basics

GIS for Managers…..This four-hour course covers geographic information system (GIS) basics through hands-on computer training. Participants will gain a better understanding of the power, and limitations, of this technology.

Assessing GIS for Your Organization….Not for the technologist, this lecture-driven course is designed for the coastal manager interested in an overview of GIS fundamentals, including software, hardward, data, required expertise, and applied uses.

Conservation Data Documentation….This three-hour, hands-on workshop gives conservation practitioners the information and tools needed to document spatial data in a GIS environment.

Beginners

Introductions to ArcGIS I…..
This course will introduce the student to GIS basics and applications to coastal resource management issues. Topics covered are basic GIS theory and concepts, spatial data creation and management, and analysis and geoprocessing, as well as cartography.

Intermediate

Coastal Applications Using ArcGIS…..This course provides students with opportunities to address a variety of coastal issues using ArcView 9x technology. Students will become familiar with metadata, map scale issues, and data formats, applying this technology to real-world coastal issues.

Remote Sensing for Spatial Analysts…..Students will use remote sensing to investigate issues such as land use, shoreline erosion, and fisheries and benthic habitat assessment. Students should gain a mastery of basic GIS skills before attending this class. All hands-on GIS exercises will utilize ArcGIS software.

Advanced

GIS Tools for Strategic Conservation Planning ….. Participants will use ArcView 9x and Spatial Analyst software, with data sets from coastal areas, to apply principles of green infrastructure network design and address realistic conservation scenarios using GIS.

Coastal Inundation Mapping…..Course participants will learn to apply inundation data for state and local planning efforts. In the GIS portion of the course, participants will use topographic and water-level data to perform vertical and horizontal transformations, create digital elevation models, map inundation areas, and compare inundation mapping methods.

Some Center courses can be brought to your area. To learn more about training opportunities, visit www.csc.noaa.gov/training/.

From:
http://www.csc.noaa.gov/newsletter/2008/issue03.pdf ♦

Simplifying coastal digital elevation models

From: *Coastal Services*, v. 11, issue 3, p. 1, May/June 2008
Reprinted with permission

A high-accuracy, seamless elevation model is essential to understanding where water will flow during events such as sea level rise, hurricane flooding, tsunami inundation, and inland flooding. A topobathy digital elevation model combines land elevation with seafloor data to make one continuous surface.

The National Oceanic and Atmospheric Administration developed "A Roadmap to a Seamless Topobathy Surface," an online resource for constructing digital elevation models. The website provides online maps of

existing data, documents to assist in data manipulation, and soon, application examples.

Resources within the website include the following:

Data inventory

The first data inventory available on the website is topography and bathymetry for the Gulf of Mexico. The location, collection date, owner, and other information about each data set are provided through maps, resulting in a data "snapshot" as of November 15, 2007. New inventories will be added as they become available, with the next data coming from the southeastern region of the U.S. (Florida to Maryland).

Process considerations

This portion of the site strives to improve and streamline the process of creating digital elevation models by providing an overview of datum conversion and integration techniques. The section stresses the importance of establishing a uniform reference for multiple data sets and describes techniques for manipulating and joining these sets.

Topobathy applications

The third part of the website is nearing completion. This section will highlight coastal applications that can benefit from the use of digital elevation models.

To view "A Roadmap to a Seamless Topobathy Surface," visit http://www.csc.noaa.gov/topobathy/. ♦

Clallam Bay tsunami tower getting a new home

By Jim Casey, Peninsula Daily News

Reprinted with permission

CLALLAM BAY — Clallam Bay's tsunami warning tower may be down, but it's not out. It's actually in the Fire District No. 5 engine house waiting for a new home. Here's how it got there.

The state Emergency Management Division erected the All Hazard Alert Broadcast System last summer atop a 60-foot-tall tower at Slip Point on Clallam Bay's east shore. Site of a lighthouse built in 1905 but long since torn down, the property has been surplused and promised to Clallam County.

The County even leases the lighthouse keeper's quarters for a West End sheriff's deputy — which may be why a former sheriff and a former emergency director thought it belonged to Clallam County.

But the deal hasn't gone through yet, and Slip Point still belongs to the Coast Guard, and the Coast Guard said the land likely overlies Native American artifacts, perhaps remains.

"They were concerned because the entire site is historical and archaeological," said Bob Martin, the current head of Clallam County's Emergency Management Division.

Down comes the tower

So in March [2008], down came the tower.

Tentative plans call for it to be set up at a small county park across State Highway 112, pending acoustic tests by the state, a state Environmental Policy Act review and an archaeological/cultural survey.

Until then, Martin said Monday, Clallam Bay and Sekiu residents can count on several other warnings of a tsunami, including:

- "Reverse telephone" notification to every household in an inundation zone.
- Notices on local radio and Canadian radio stations across the Strait of Juan de Fuca.
- Break-in announcements on cable TV systems.
- Sheriff's deputies visiting low-lying areas, parks and beaches.

Residents in any low-lying area, Martin said, also should know that if they feel a large earthquake, a tsunami almost surely will follow.

Will broadcast instructions

Once the tower is re-erected, he said, it will provide not just a warning tone but a verbal explanation of what is happening, plus instructions of what to do.

Martin said should a tsunami be generated in Alaska or around the Pacific Rim, pressure-detecting buoys will measure the wave and transmit information on it to the West Coast and Alaska Tsunami Warning Center in Palmer, Alaska. The center, in turn, will issue warnings or advisories about the tsunami's predicted arrival and its height.

At that point, the state will activate every All Hazard Alert Broadcast System on the outer coast and the Strait if appropriate.

The system, Martin said, also could be activated to warn of other dangers, such as an escape from the Clallam Bay Corrections Center or a forest fire.

Reporter Jim Casey can be reached at 360-417-3538 or at *jim.casey@peninsuladailynews.com*.

Last modified: June 09. 2008 9:00PM

From:

http://www.peninsuladailynews.com/article/20080610/NEWS/806100303 ♦

TsuInfo Alert welcomes Jolie Breeden, the new editor of *Disaster Research*, e-newsletter. We also congratulate Dan Whipple on becoming the editor of the *Natural Hazards Observer*. Both are publications par excellence and we couldn't do our work without them.

NEWS

Springy sediments may amplify tsunamis
01 July 2008
Special Report Asian Tsunami Disaster
From *New Scientist* Print Edition; www.newscientist.com
Reprinted with permission

The devastating Indian Ocean tsunami of 2004 may have been made worse by springy sediment on the seabed.

Sediment is more elastic than the hard bedrock of the Andaman Sea, where the quake occurred. As a result it can act like a spring during an earthquake: if a piece of bedrock slips downwards, for example, the sediment is briefly stretched out vertically before collapsing and compressing. The effect is to amplify the movement of bedrock, generating a larger wave than would otherwise occur.

This could explain why the 2004 tsunami was far stronger than predicted by computer models of the quake that produced it. "If you take into account the sediment, a much smaller slip along the fault will give you the same wave size," says Denys Dutykh of the École Normale Supérieure in Cachan, France.

This effect is strongest if the thickness of the sediment layer is about 12 per cent of the depth of the fault, according to calculations by Dutykh and colleague Frédéric Dias (www.arxiv.org/abs/0806.2929). The Indonesian earthquake was close to that worst-case ratio, with about 3 kilometres of sediment and a fault 25 kilometres deep. Another possible danger zone is the eastern Mediterranean, but the risk there is still uncertain, says Dutykh, as estimates of sediment depth vary wildly.

Asian Tsunami Disaster - Learn more about the greatest natural disaster in living memory in our comprehensive *special report*.

From issue 2662 of *New Scientist* magazine, 01 July 2008, page 20. Online at:
http://environment.newscientist.com/channel/earth/tsunami/mg19826625.200-springy-sediments-may-amplify-tsunamis.html

New USGs unmanned aircraft program could improve hazards response

The U.S. Geological Survey (USGS) is establishing a new program for earth observation using Unmanned Aircraft Systems (UAS). In dangerous and remote areas, such as polar regions, volcanic islands, and deserts, remote-controlled unmanned aircraft can provide detailed and timely data about the status of natural resources and environmental conditions. In many cases, UAS technology is the most cost effective way to gather earth observation data for a variety of applications such as managing federal lands, investigating climate change, mapping and charting, conducting environmental risk assessments, and responding to natural and human-induced disasters. Even in less remote areas, manned aircraft flights may not always be feasible and satellite-based observations can be hindered by course image resolution, limited sensor capabilities, or long periods between orbiting cycles. Data collection by UAS can be tailored to the required resolution and radiometric parameters of individual investigations. Offices for the new program will be located at the USGS facility in Lakewood, Colorado. Visit the USGS Land Remote Sensing Program at http://remotesensing.usgs.gov.

From: *Natural Hazards Observer*, v. 32, no. 6, p. 9-10.

NOAA bolsters tsunami early warning system

The National Oceanic and Atmospheric Administration (NOAA) recently installed the final two DART (deep-ocean assessment and reporting of tsunami) stations off the Solomon Islands, which completed the buoy network that includes 39 stations in the Pacific, Atlantic, Caribbean, and Gulf of Mexico. Tsunami sensors are now positioned between Hawaii and every seismic zone that could generate a tsunami that would impact the state and beyond, including the U.S. West Coast. Though the DART stations increase the ability to disseminate accurate tsunami information, state and local coastal communities are encouraged to increase awareness and improve resiliency to tsunamis by participating in the TsunamiReady Program (www.tsunamiready.noaa.gov), a public preparedness and education program. To read the NOAA press release, visit www.noaanews.noaa.gov/stories2008/20080310_buoy.html.

From: *Natural Hazards Observer*, v. 32, no. 6, p. 9.

FEMA Announces $48 million in interoperable communication grants

The Federal Emergency Management Agency (FEMA) in June announced the availability of $48 million in grant money to improve interoperable emergency communications capabilities across states, territories, local governments, and tribal areas.

States and territories can apply for the Interoperable Emergency Communications Grant Program (IECGP) funds through their State Administrative Agency by visiting http://www.grants.gov.

Grants awarded this fiscal year will provide funding that focuses on establishing formal governance for interoperable emergency communications and common planning and operation protocols, as well as enhancing emergency responder skills through training and exercises. All 50 states; Washington, D.C.; and Puerto Rico will receive a minimum allocation of 0.50 percent of the total allocated funds. American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and the U.S. Virgin Islands will receive a minimum allocation of 0.08 percent. FEMA expects to award funds by September 2008. For more information on IECGP, please visit http://www.fema.gov/grants.

From: *Disaster Research 505*, July 3, 2008. Hazctr@ColoradoEDU

Homeland Security Committee bills aim to enhance national preparedness and response

Rep. Bennie G. Thompson (D-MS), chairman of the Committee on Homeland Security, announced the June introduction of the following three bills, aimed at enhancing national preparedness and response capabilities.

H.R. 6425—The Homeland Security Relief Corps Act of 2008. This bill establishes a Relief Corps within the Department of Homeland Security to respond to disasters whether natural or human-induced.

H.R. 6392—The Alerting Lives Through Effective and Reliable Technological Systems Act of 2008 (or the ALERTS Act of 2008). This bill expands the emergency alert and warning system within the Federal Emergency Management Agency (FEMA) to provide Americans information before and during critical emergencies.

H.R. 6395—The Department of Homeland Security Preparedness, Research, and Education Program Act of 2008 (or the DHS PREP Act of 2008). This bill establishes a DHS fellowship program to conduct research and subsequently develop best practices for disaster response and recovery.

For more information on the introduction of these bills, visit http://homeland.house.gov/press/index.asp?ID=392.

From: *Disaster Research 505*, July 3, 2008. Hazctr@ColoradoEDU

FEMA earmarks $27 million to develop preparedness and protection training

The Federal Emergency Management Agency has $27.2 million in grants available to develop training programs that target information sharing, regional collaboration, citizen preparedness, evacuations, infrastructure protection, and other national homeland security needs.

The money will be awarded to state, local, tribal and territorial governments; national associations, non-profits, higher education institutions, and the private sector through FEMA's Competitive Training Grant Program. Those interested in applying for a grant must submit a proposal to www.grants.gov before 8 p.m. EST on June 9. (This item was received June 5! Make a note on next year's calendar.)

For more information on the grant program, including last year's proposals, visit the DHS Web site at www.dhs.gov.

From: *Disaster Research 503*, June 5, 2008. Hazctr@ColoradoEDU

Research assistance for natural hazards planning, GNS Science, New Zealand

The Hazards Planning research team at GNS Science in Wellington, New Zealand is seeking assistance with a research project on effective public notification systems for natural hazard events, including tsunami. The research is being conducted on behalf of the New Zealand Ministry of Civil Defense and Emergency Management.

The team is assessing warning systems technologies available in New Zealand, along with several not available, against a variety of criteria. They are interested in hearing from colleagues who have conducted similar research—as well as feedback on any possible omission of warning—and observations on specific technology effectiveness.

The team also would appreciate information on the proportion of the population that must be reached by an official warning message before it is assumed to be sufficient to filter to 100 percent of the at-risk population by word of mouth, etc. Research papers or anecdotal accounts relating to these topics would be acceptable.

The following is a list of alert systems being evaluated: aircraft hailers/banners, amateur radio, billboards, call-in phone lines, cell broadcast, e-mails, pagers, police/fire mobile public address systems, power line messaging (e.g., ripple control), radio announcements, Data Systems Route alert (door-to-door), SMS text messaging, telephone, auto-dialer, telephone trees, television, tourist radio, Web sites, GPS receiver messaging, fixed PA loud-speakers, flares, explosives, mobile PA loud-speakers, sirens, and tone-activated alert radio (e.g., NOAA weather radio).

Those who would like to share information, contact:
Kim Wright, Hazards Planning Scientist
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1 Fairway Drive, P.O. Box 30368
Lower Hutt, New Zealand
E-mail: k.wright@gns.cri.nz.

For more information on GNS Science's Natural Hazards Planning, visit http://www.gns.cri.nz/services/hazardsplanning/.

From: *Disaster Research 504*, June 19, 2008. Hazctr@Colorado.EDU

Nuclear test ban data to help in tsunami warning

"The Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) said that, by providing fast and reliable seismic and hydroacoustic data, it could help Pacific Rim nations "issue timely and reliable tsunami alerts".

"Agreements for tsunami warning purposes will shortly be concluded between the preparatory commission for the CTBTO and several organizations in Australia, Indonesia, Japan, the Philippines, the United States, Thailand and Malaysia," it said in a statement."

Read the full article from June 25, 2008, at http://www.terradaily.com/reports/Nuclear_test_ban_data_to_help_in_tsunami_warning_999.html

PUBLICATIONS

Guidelines for design of structures for vertical evacuation from tsunamis

Prepared by Applied Technology Council for the Federal Emergency Management Agency and the National Oceanic and Atmospheric Administration, by Steven Baldridge, Frank Gonzalez, John Hooper, Ian N. Robertson, Timothy J. Walsh, and Harry Yeh. 2008. FEMA P646 and ATC-64. A pdf copy can be downloaded from: http://www.atcouncil.org/atc64.shtml.

"Vertical evacuation is a programmatic issue central to the National Tsunami Hazard Mitigation Program, driven by the fact that there are several coastal communities along the West Coast of the United States that are vulnerable to tsunamis that could be generated within minutes of an earthquake on the Cascadia subduction zone. Given that many coastal communities are located in areas that would be impossible to evacuate quickly, a large tsunami with very little warning could result in a significant loss of life. Vertical evacuation structures provide a means to create areas of refuge within the tsunami inundation zone for communities in which evacuation out of the inundation zone is not feasible.

The developmental process involved a variety of activities including review of relevant research and state-of-the-practice documentation and literature, preparation of technical guidance and approaches for tsunami-resistant design, identification of relevant tsunami loads and applicable design criteria, development of methods to calculate tsunami loading, and identification of desired architectural and structural system attributes for vertical evacuation facilities. A list of project participants and their affiliations can be downloaded here. This effort has led to the ATC-64 Project final report, FEMA P646 *Guidelines for Design of Structures for Vertical Evacuation from Tsunamis*." [see p. 20 for cover design]

From: http://www.atcouncil.org/atc64.shtml.

Tsunami 'strikes WA every decade'

In this case, WA is Western Australia. To read the full article from *The West Australian*, July 14, 2008, visit thewest.com.au website: (http://www.thewest.com.au/default.aspx?MenuID=77&ContentID=84596)

How resilient is your coastal community? A guide for evaluating coastal community resilience to tsunamis and other hazards

U.S. Indian Ocean Tsunami Warning System Program, supported by the United States Agency for International Development and partners, Bangkok, Thailand. 144 p. January 2008. www.iotws.org

It has become apparent, this guide says, that "even without a major catastrophe such as a large tsunami, most coastal communities are not resilient to normally recurring hazards."

This guide attemps to build on the lessons of the 2004 Indian Ocean tsunami to reduce risk to vulnerable communities. Coastal communities are vulnerable because of increasing populations along the coasts and the associated impacts from human activities. Resilient communities have governance that provides involvement and leadership; manage their coastal resources; optimize land use and structural design; are aware of hazards; have a warning and evacuation plan; provide emergency response; and have a disaster recovery plan. The report offers benchmarks and guidance for each core element it identifies to aid in improving community recovery from coastal hazards.

From: *Natural Hazards Observer,* v. 32, no. 6, p. 18.

Older people in emergencies—Considerations for action and policy development

By David Hutton, World Health Organization. 2008. $15 ($10.50 in developing countries). 44 p. ISBN 978-92-4-154739-0. bookorders@who.int.

Of the 14,800 deaths in the French heat wave, 70 percent were older than 75. Of the 1,330 people who died in the wake of Hurricane Katrina, 71 percent were over the age of 60. In developed countries, 40 percent of people 65 and older suffer from chronic illness or disability. Worldwide about 20 percent of the population is disabled, 80 percent of those living in developing countries. "Old people have often been overlooked in disasters and conflicts," the WHO report says, "and their concerns have rarely been addressed by emergency programmes or planners." The report offers objectives for dealing with the needs of the elderly in the preparedness, response and operations, and recovery and transition phases of emergencies. Available in English and French.

From: *Natural Hazards Observer,* v. 32, no. 6, p. 17.

How to survive a disaster

Time magazine, June 9, 2008, article by Amanda Ripley, p. 40-45. "Disasters are becoming more frequent and more costly. But there are steps all of us can take—right now—to improve our chances of survival." Back issues of Time should be available in every public library.

Disaster Research

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From: *Disaster Research 505*, July 3, 2008. Hazctr@ColoradoEDU

Natural Hazards Observer

The July 2008 *Natural Hazards Observer* is now available online at www.colorado.edu/hazards/o/. This issue's featured articles are--New Developments and Shifting Focus in Mass Evacuation --From "Problem" to "Opportunity" in Water Management and Flood Mitigation --Texas Hurricane Evacuees Must Prove Citizenship --New Madrid Seismic Zone Alive and Shaking.

From: *Disaster Research 505*, July 3, 2008. Hazctr@Colorado.EDU

Disaster Advances

Disaster Advances is a quarterly journal now being published from Indore, India. Research papers and memberships are currently being sought. All papers received will be sent to two experts for comments and if approved by both experts, the paper will be published. All the authors should be members of the Journal. Eminent Professors and Researchers in the field of disasters are requested to send their C.V. for appointment as a Member of Editorial Board, as it is desired that members of the board be Fellow of Life members.

For additional information, please visit: www.managein.org.

From *UnScheduled Events*, v. 27, no. 1, p. 2.

PERI book highlights lessons of FEMA conference

The Public Risk Entity Institute (PERI) has gathered presentations made by 20 experts at the Federal Emergency Management Agency (FEMA) 2007 Annual Emergency Management in Higher Education Conference into an easily referenced book.

The book, released at the 2008 conference, includes topics such as Hurricane Katrina, homeland security, special-needs populations, development of emergency management programs in higher education, and the role of technology in disaster response.

For more details, including a list of included papers, visit http://www.riskinstitute.org/bookstore.

From: *Disaster Research 504*, June 19, 2008. Hazctr@Colorado.EDU

WEBSITES

http://assets.panda.org/downloads/natural_security_final.pdf

"Natural Security: Protected Areas and Hazard Mitigation" is the fifth volume in a series of reports developed as part of the "Arguments for Protection" project, which aims to widen and strengthen support for park creation by presenting evidence on the social and economic benefits of protected areas. The report explores the increasing number and severity of natural disasters, reviews how environmental degradation is contributing to this trend, looks at how conservation through protection is mitigating the impacts of hazards and disasters, and discusses options for further developing the role of protected areas in disaster prevention and mitigation strategies. The World Wildlife Fund for Nature and the UK-based consulting firm Equilibrium created this report.

From: *Disaster Research 505*, July 3, 2008. Hazctr@ColoradoEDU

http://www.csc.noaa.gov/hazards/

Coastal hazards—A toolkit of services: data and information, data analysis, and visualization tools.

http://www.interragate.info/home

inTERRAgate

This site aggregates natural hazard information and risk data both by country and by hazard. Information, including text and graphics, is uploaded by users in a wiki-type format. Blogs, links and disaster-related news also are included.

From: *Disaster Research 503*, June 5, 2008.

http://www.disability911.com

Disaster Preparedness for People with Disabilities was created to help ensure those with disabilities are ready for disaster. The site includes links to webcasts, books and newsletters, training materials, and other resources aimed at helping centers for independent living, public officials, emergency preparedness officials, and people with disabilities stay prepared.

From: *Disaster Research 504*, June 19, 2008. Hazctr@Colorado.EDU

http://edu4drr.ning.com/

Edu4drr is a just-launched social networking site for "teachers who want to make a difference in disaster prevention." Forums, shared resources and videos, event listings, and fun gadgets are now on the site and Edu4drr developers aim to make the site more robust through content contributions from educators and other interested members.

From: *Disaster Research 504*, June 19, 2008. Hazctr@Colorado.EDU

http://ricktobin.com/roadtoready/index.html

"Road to Ready Radio," an Internet radio show by Rick Tobin of TAO Emergency Management Consulting, covers hazards topics that range from pandemics to earthquake safety to pet evacuation during disasters. Listen to shows live at 3 p.m. EST on Fridays, or download MP3s to listen to at your leisure. A list of links related to programs also is included.

From: *Disaster Research 504*, June 19, 2008. Hazctr@Colorado.EDU

http://zombiehunters.org/index.php

Those that find typical disaster preparedness sites a little too strait-laced will enjoy a foray in the Zombie Squad forum. The Zombie Squad mixes public emergency

education and disaster response support with a sense of humor and, of course, zombies. Because, as they put it, "if you are prepared for a scenario where the walking corpses of your family and neighbors are trying to eat you alive, you will be prepared for almost anything."

From: *Disaster Research 504*, June 19, 2008. Hazctr@Colorado.EDU

http://www.diversitypreparedness.org

The National Resource Center on Advancing Emergency Preparedness for Culturally Diverse Communities aggregates information and provides a means of communication for culturally diverse communities in public health emergencies. A joint project of U.S. Department of Health and Human Services Office of Minority Health and Drexel University, the site includes publications, courses and training curriculum, research and evaluation tools, and translated materials.

From: *Disaster Research 504*, June 19, 2008. Hazctr@Colorado.EDU

http://www.tsunami.org/storyfestwaiakea14.html

The sixth annual tsunami story festival was sponsored by the Pacific Tsunami Museum in Hilo.

On Sunday, May 18, the Pacific Tsunami Museum's 6th Annual Story Festival took place at the Honpa Hongwanji Hilo Betsuin Sangha Hall. The program featured the lives of ten individuals who lived in Waiākea Town before the 1960 tsunami. The storytellers were Kathy "Tita" Collins and Chris Harrison.

http://www.livescience.com/technology/ap_050527_tsunami_house.html

Engineers design tsunami-resistant home

http://www.un.org/Depts/dhl/disaster/

International Day for Disaster Reduction, Oct. 8th

SYMPOSIUMS, CONFERENCES

September 8-11, 2008

National Emergency Management Association 2008 Annual Conference—Portland, Oregon. This conference provides a forum to discuss national and regional emergency management strategies with emergency management professionals and other experts in the field. The conference focuses on policy development, emergency management concerns, legislative issues, and federal relations. Attendees can hear the latest on issues that affect their agency's programs. Representatives of federal agencies, members of congress, and others attend the meetings to discuss policy and program matters and receive input from state directors. nemaadmin@csg.org or http://www.nemaweb.org/?2068/

From: *Disaster Research 504*, June 19, 2008. Hazctr@Colorado.EDU

November 17-20, 2008

Coastal Cities Summit 2008: Values and Vulnerabilities—St. Petersburg, Florida. The International Ocean Institute's Coastal Cities Summit aims to bring together public officials, nongovernmental organizations, citizens, and natural and social scientists to consider the values and vulnerabilities of coastal regions around the globe. This summit will discuss environmental, social, economic, and public policy challenges faced by coastal communities. Topics include climate change, sea level rise, maritime security needs, and extreme events such as tropical storms and tsunamis.

mara@ioiusa.usf.edu or http://www.coastalcities.org

From: *Disaster Research 504*, June 19, 2008. Hazctr@Colorado.EDU

MOVIES

Dasavatharam (not rated, probably PG-13), 150 min.

Not a typical Bollywood product, this movie is purported to be an epic science fiction adventure spanning centuries and continents. It stars Kamal Hassan who portrays 10 characters, from a 12th century priest to the U.S. president. According to Steve Persall, film critic for the *St. Petersburg Times* [Florida], this is the most expensive Indian film ever made. The plot concerns a catastrophic tsunami generated by the "chaos theory of domino disaster."

http://www.dasavatharammovie.com/

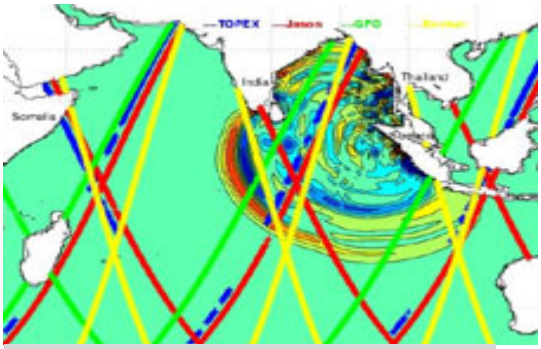
The Third Wave

In May 2008 at the Cannes Film Festival, Alison Thompson's film *The Third Wave* was championed by Sean Penn, the Film Festival's Jury President.

The Australian-born New York documentary filmmaker made the film in the Sri Lanka refuge camp she ran after the deadly 2004 Indian Ocean tsunami. The film was sent to Penn, who arranged to have it screened at Cannes. He is quoted as saying it is the best film he's seen in his life…"It inspires the very best in us." The movie follows a group of volunteers in the aftermath of the tsunami.

Wonderful Town

"When terrible tragedy strikes the most impoverished and vulnerable around, the media cameras are certain to show up quickly to sensationalize and exploit their suffering. But nearly as indifferent as the receding natural disaster that leaves its quite forgotten victims stunned and stranded in its wake, the press departs with hardly a second thought for the traumatized and their fracturedlives left behind." This is the concept behind director Aditya Assarat's *Wonderful Town*, set in Thailand. From the film review by Prairie Miller at http://newsblaze.com/story/20080719060446mill.nb/topstory.html ♦



Satellites passed over the Indian Ocean tsunami of December 2004. Two of those satellites--Jason 1 and Topex/Poseidon—were equipped with altimeters that for the first time measured the height of a tsunami in the open ocean. Image credit: NASA/JPL
Larger view

Ocean surface topography mission/Jason-2—Surveying Earth's oceans

From:
http://www.nasa.gov/mission_pages/ostm/news/ostmf-20080716.html
Media contact: Alan Buis/JPL
818-354-0474

For humans in the path of destructive hurricanes and tsunamis, an accurate warning of the pending event is critical for damage control and survival. Such warnings, however, require a solid base of scientific observations, and a new satellite is ready for the job.

The Ocean Surface Topography Mission (OSTM)/ Jason 2 adds to the number of eyes in the sky measuring sea surface and wave heights across Earth's oceans. The increased coverage will help researchers improve current models for practical use in predicting hurricane intensity, while providing valuable data that can be used to improve tsunami warning models.

"When it comes to predicting hurricane intensity, the curve in the last 40 years has been somewhat flat, with little advance in how to reduce error in predicted intensity," said Gustavo Goni, of the National Oceanic and Atmospheric Administration (NOAA) in Miami. Maps of sea surface height created from satellites, however, could help change the curve.

Satellites that measure sea surface height have been running operationally nonstop since November 1992. But more than one is needed to fly at the same time in order to identify all the features that could be responsible for intensification of tropical cyclones all over Earth. The OSTM/ Jason 2 mission will help make additional coverage possible.

NASA, university and NOAA investigators, including Goni, work to transform sea surface height information obtained from satellites, such as OSTM/ Jason 2, into maps of ocean heat content. Forecasters can use the maps to develop models to predict how hurricanes will strengthen.

Determining heat content from sea surface height is possible because warm water is less dense and hence sits higher than cooler water. In some regions, such as inside and outside the Gulf Stream current, the temperature differences result in more than a one-meter (three-foot) difference in sea surface height. Goni and colleagues use this established concept to estimate from sea level variations how much heat is stored in the upper ocean in areas where hurricanes typically develop and intensify.

While sea surface height may not necessarily be the most significant parameter for hurricane intensity forecasts, researchers now know that if sea surface height is accounted for in current forecast models, errors in forecasts for the most intense storms are reduced. For weak storms, the reduction in error is not very significant. However, for storms in the strongest category 5 range, the heat content in the upper ocean derived from sea surface height becomes increasingly important. "This is a good thing, because these are the storms that produce the most damage," Goni said.

"OSTM/Jason 2 will help us to keep the necessary coverage that we need to identify ocean features that can be linked to tropical cyclone intensification, because with only one satellite we may miss some of them," Goni said.

Upper ocean heat content derived from sea surface height is now used in operational and experimental forecast models in all seven ocean basins where tropical cyclones exist.

In December 2004, two satellites happened to be in the right place at the right time, capturing the first space-based look at a major tsunami in the open ocean. Within two hours of a magnitude 9 earthquake in the Indian Ocean southwest of Sumatra, the Jason 1 and Topex/Poseidon satellites fortuitously passed over the path of the resulting tsunami as it traveled across the ocean. It measured the leading wave, traveling hundreds of miles per hour in the open ocean, at about 0.5 meters (1.6 feet) tall.

Wave height measurements like those of the Indian Ocean tsunami do not provide an early warning because the information is not relayed to ground stations in real time. That's the job of early warning systems operated by NOAA and other global organizations that currently employ a network of open-ocean buoys and coastal tide gauges. Sea surface height measurements of tsunamis can, however, help scientists test and improve ground-based models used for early warning. One such system developed at NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., and undergoing tests at NOAA's Pacific Tsunami Warning Center, Ewa Beach, Hawaii, could become operational within about three years.

Most tsunamis are caused by undersea earthquakes. Using the JPL-developed system, when seismometers first identify and locate a large earthquake, scientists can use GPS measurements to search around the earthquake's source to see if land has shifted, potentially spurring a tsunami. Scientists can then immediately compile the earthquake's size, location, and land movement into a computer program that generates a model tsunami to determine the risk of a dangerous wave. After the wave passes, scientists can search through wave height data from satellites and verify what the model predicted.

"Satellite data play the crucial role of verifying tsunami models by testing real tsunami events," said JPL research scientist Tony Song. "If an earthquake generates a tsunami, does the satellite data match observations on the ground and model predictions?"

"One of the unique pieces of satellite observations is the large-scale perspective," said JPL research scientist Philip Callahan. Tsunamis can have waves more than 161 kilometers (100 miles) long. Such a wave would likely go unnoticed by an observer in a boat on the ocean's surface. But satellite altimeters like OSTM/Jason 2 can see this very long wave and measure its height to an accuracy of about 2.5 centimeters (one inch).

Scientists' ability to test tsunami warning models will be aided by OSTM/Jason 2. With the Topex/Poseidon mission now ended, the currently orbiting Jason 1 has now been joined by and will eventually be replaced by OSTM/Jason 2. This will help ensure that future tsunamis will also be observed by satellites as well as by buoys and tide gauges.

"The biggest value in satellite measurements of sea surface height is not in direct warning capability, but in improving models so when an earthquake is detected, you can make reliable predictions and reduce damage to property and people," Callahan said.

For more information on OSTM/Jason 2, visit: http://www.nasa.gov/ostm .

For more information on JPL's climate change research programs, visit: http://climate.jpl.nasa.gov .

From: http://www.nasa.gov/mission_pages/ostm/news/ostmf-20080716.html

For companion article "NASA launches ocean satellite to keep a weather, climate eye open," visit http://www.nasa.gov/mission_pages/ostm/news/ostm-20080620.html ♦

STATE EMERGENCY MANAGEMENT OFFICES
updated 3-31-2006

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PO Box 5750
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Fax (907) 428-7009
http://www.ak-prepared.com/

California Office of Emergency Services
3650 Schriever Ave.
Mather, CA 95655
(916) 845-8510; Fax (916) 845-8910
http://www.oes.ca.gov/

Hawaii State Civil Defense, Dept. of Defense
3949 Diamond Head Road
Honolulu, HI 96816-4495
(808) 733-4300; Fax (808) 733-4287
http://www.scd.state.hi.us

Oregon Division of Emergency Management
PO Box 14370
Salem, OR 97309-50620
(503) 378-2911; Fax (503) 373-7833
http://www.oregon.gov/OOHS/OEM/

Washington State Military Dept.
Emergency Management Division
Camp Murray, WA 98430-5122
(253) 512-7067; Fax (253) 512-7207

ALSO: (added November 30, 2007)

American Samoa Territorial Emergency Management Coordination (TEMCO); American Samoa Government
P.O. Box 1086
Pago Pago, American Samoa 96799
(011)(684) 699-6415; (011)(684) 699-6414 FAX

Office of Civil Defense, Government of Guam
P.O. Box 2877
Hagatna, Guam 96932
(011)(671) 475-9600; (011)(671) 477-3727 FAX
http://ns.gov.gu/

Guam Homeland Security/Office of Civil Defense
221B Chalan Palasyo
Agana Heights, Guam 96910
Tel:(671)475-9600; Fax:(671)477-3727
www.guamhs.org

CNMI Emergency Management Office
Office of the Governor
Commonwealth of the Northern Mariana Islands
P.O. Box 10007

Saipan, Mariana Islands 96950
(670) 322-9529; (670) 322-7743 FAX
www.cnmiemo.gov.mp

National Disaster Management Office
Office of the Chief Secretary
P.O. Box 15
Majuro, Republic of the Marshall Islands 96960-0015
(011)(692) 625-5181; (011)(692) 625-6896 FAX

National Disaster Control Officer
Federated States of Micronesia
P.O. Box PS-53
Kolonia, Pohnpei - Micronesia 96941
(011)(691) 320-8815; (001)(691) 320-2785 FAX

Palau NEMO Coordinator, Office of the President
P.O. Box 100
Koror, Republic of Palau 96940
(011)(680) 488-2422; (011)(680) 488-3312

Puerto Rico Emergency Management Agency
P.O. Box 966597
San Juan, Puerto Rico 00906-6597
(787) 724-0124; (787) 725-4244 FAX

Virgin Islands Territorial Emergency Management - VITEMA
2-C Contant, A-Q Building,
Virgin Islands 00820
(340) 774-2244; (340) 774-1491 ♦

Material added to the NTHMP Library,
July-August 2008

Note: These, and all our tsunami materials, are included in the online (searchable) catalog at http://www.dnr.wa.gov/ResearchScience/Topics/GeologyPublicationsLibrary/Pages/washbib.aspx. Click on SEARCH DATABASE, then type 'tsunamis' in the Subject field to get a full listing of all the tsunami reports and maps in the collection.

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Reprinted with changes from *TsuInfo Alert*, v. 2, no. 4, August 2000

SUMMER VACATION ASSIGNMENT FOR ALL AGES

1) Learn the height (elevation) of your street/road above sea-level. (City engineer, local library, topographical map, legal description of the property) _____

2) Know the distance of your street/road from the coast and other high-risk waters. (Surveyor, topographical map, MapQuest) _____

3) Find the tsunami evacuation route signs in your community and see where they lead. _____

4) Find the closest locations to your house, school and workplace that are 100 feet above sea level, as far inland as you can walk in 15 minutes. Every foot upland or inland can make a difference. Mark the different routes and destinations on a local street map. _____

5) Locate the name and contact information of your emergency manager. (Library, phone book, Internet, local newspaper…) _____

6) Listen to the NOAA weather radio station serving your area; their broadcasts will tell you when it's safe to return home after a tsunami. _____

7) Get a copy of USGS Circular 1187 "Surviving a Tsunami—Lessons from Chile, Hawaii, and Japan." http://pubs.er.usgs.gov/usgspubs/cir/cir1187. _____

8) Visit two tsunami websites (at home or at your local library). _____

9) Has there been a tsunami in your county within the last 100 years? If so, when? How much damage did it do? (Local library, State geological survey, emergency manager) _____

10) How many miles is your house from the Cascadia Subduction Zone? _____

This assignment is due before the next tsunami hits.

VIDEO-CD-DVD RESERVATIONS

To reserve tsunami videos, CDs or DVDs, contact *TsuInfo Alert* Video Reservations, Lee Walkling, Division of Geology and Earth Resources Library, 1111 Washington St. SE, MS 47007, Olympia, WA 98504-7007; or e-mail lee.walkling@dnr.wa.gov

Adventures of Disaster Dudes (14 min.). Preparedness for preteens. American Red Cross.

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

Business Survival Kit for Earthquakes & Other Disasters; What every business should know before disaster strikes (27 min.). Global Net Productions for the Cascadia Regional Earthquake Workgroup, 2003. With CD disaster planning toolkit & other data.

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

Cascadia: The Hidden Fire–An Earthquake Survival Guide (10 min.). Global Net Productions, 2001. 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.

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.

Earthquake…Drop, Cover & Hold (5 min.). Washington Emergency Management Division. 1998.

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

International Tsunami Information Centre, 2004, Tsunami warning evacuation news clips and video footage, UNESCO /IOC International Tsunami Information Centre, 1 **DVD**, 12 min.

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

Mitigation: Making Families and Communities Safer (13 min.) American Red Cross.

Not Business as Usual: Emergency Planning for Small Businesses, sponsored by CREW (Cascadia Regional Earthquake Workgroup) (10 min.), 2001. Discusses disaster preparedness and business continuity. Although it was made for Utah, the multi- hazard issues remain valid for everyone. Websites are included at the end of the video for further information and for the source of a manual for emergency preparedness for businesses.

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.)

Ocean Fury--Tsunamis in Alaska (25 min.) VHS and **DVD**. Produced by Moving Images for NOAA Sea Grant College Program, 2004.

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. Accompanying booklet. 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, 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.

Run to High Ground (14 min.). Produced by Global Net Productions for Washington Emergency Management Division and Provincial Emergency Program of British Columbia, 2004. Features storyteller Viola Riebe, Hoh Tribe. For K-6 grade levels. Have video and **DVD** versions.

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

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

Tsunami: Surviving the Killer Waves (13 min.). 2 versions, one with breaks inserted for discussion time.

Tsunami Chasers (52 min.). Costas Synolakis leads a research team to Papua New Guinea to study submarine landslide-induced tsunamis. Beyond Productions for the Discovery Channel.

Tsunami Evacuation PSA (30 sec.). DIS Interactive Technologies for WA Emergency Management Division. 2000.

TsunamiReady Education CD, 2005, American Geological Institute Earth Science Week kit.

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

UNESCO/IOC International Tsunami Information Centre, 2005, U.S. National Tsunami Hazard Mitigation Program public information products—B-roll footage, tsunami science, warnings, and preparedness: UNESCO/IOC International Tsunami Information Centre, 1 **DVD,** 57 min.

The Wave: a Japanese Folktale (9 min.) Animated film to 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 Wash. Interpretive Center, this video deals with beach safety, including tsunamis. ♦

Australia's tsunami risk unveiled

2008 Australian Earth Sciences Convention, Perth
Media release, July 23, 2008
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Information relating to tsunamis and other geological hazards, which only two decades ago took scientists days to accrue, is now being gathered in minutes and Australians are much safer as a result. This is the message that Dr. Barry Drummond delivered in his keynote address to the 2008 Australian Earth Sciences Convention.

Dr. Drummond, Head of the Earth Monitoring Group of projects at Geoscience Australia, told the conference delegates how science is providing new tools to determine the likelihood of Australia being affected by tsunami, and to assess which parts of the Australian coastline are most likely to be affected and what infrastructure is most likely to be exposed.

Dr. Drummond also detailed the workings of the more than 100 seismograph stations which now report in real time and form the basis of an Australian tsunami warning system, which has recently been brought online in response to the 2004 Boxing Day tsunami which killed more than 250,00 people.

"The science with which we are working is developing very quickly and it is allowing us to answer many of Australia's more difficult geo-hazard questions," said Dr. Drummond.

"If a tsunami-causing earthquake occurred in the region to the north or east of Australia, we would know about it and where it occurred within 6 minutes. Within 10 minutes we would know how big it is, and from that we would have an idea of the size of the tsunami we could be dealing with. We now access information in a minute or two which just 20 years ago would have taken hours or even days to generate, and this means Emergency Management Australia will now receive a warning at least 90 minutes before any tsunami reaches Australia."

Dr. Drummond was appointed Head of the Earth Monitoring Group of projects at Geoscience Australia after the devastating Indian Ocean tsunami of 26 December 2004 saw the Australia Government move to establish an Australian Tsunami Warning System.

The Australian Earth Sciences Convention, hosted by the Geological Society of Australia and the Australian Institute of Geoscientists, is Australia's premier geosciences conference and a major conference on the international geosciences calendar.

For more details, visit the ABC Science "News in Science" report on Australian tsunami detection at http://www.abc.net.au/science/articles/2008/07/23/2311955.htm?site=science ♦

New Zealand's tsunami signs

Currently tsunami warning signs are being placed along the New Zealand coastline.

"The signs should also be familiar to overseas tourists, as they are based on international best practice," said Civil Defence Minister Rick Barker.

According to the *Technical Standard—National Tsunami Signage* guide issued this year by the Ministry of Civil Defence & Emergency Management (http://www.civildefence.govt.nz/memwebsite.nsf/Files/Tsunami-national-signage/$file/tsunami-signage-standard-web.pdf), there five categories of signs: Evacuation zones; Information Boards; Evacuation Routes; Evacuation Safe-Locations; and Previous Event (impact/elevation) signs.

Examples:

Tsunami evacuation walking route sign

In-place vertical tsunami evacuation route sign

Safe location for walking evacuation routes sign

Safe location for in-place vertical evacuation sign ♦

ADDITIONAL NEWS

September is National Preparedness Month

Toolkits and hand-outs are available at http://ready.adcouncil.org/PreparednessToolKit.asp

National Preparedness Month is sponsored by the Department of Homeland Security and promoted around the nation through its *Ready* Campaign and FEMA's Community Preparedness Division, as well as through thousands of partners.

This year's theme is "Prepare. Plan. Stay Informed."

National Preparedness Month is a nationwide effort held each September to encourage Americans to take simple steps to prepare for emergencies in their homes, businesses and schools.

DHS sets up emergency satellite communications service

The Department of Homeland Security's Nation Communications System is launching a three-year project that could give both key government facilities and industry access to advanced satellite communication technologies during emergencies.

In an article on the Government Computer News website, William Jackson says the service, known as the Satellite Priority Service, will provide interoperable, nationwide push-to-talk radio and satellite phone service designed to be unaffected by local terrestrial conditions.

"Push-to-talk is incredibly spectrally effective," Jim Corry, vice president of government solutions for Mobile Satellite Ventures, the company contracted to implement the technology, told Jackson. "It requires very little satellite resources to talk to a lot of people. Most important to NCS, the push-to-talk never touches the PSTN [the Public Switched Telephone network that carries terrestrial telephone traffic.]"

According to Jackson, the satellite will act much like a repeater for a traditional radio in push-to-talk mode. "The signal is sent from a ground set to one of two MSV satellites in geosynchronous orbit over North America, which relays it to the ground station. There the network identifies the radio and the talk group being used, looks for other talk group members who are on the air, summons their radios to a common frequency, then sends the signal back up to a satellite and down to the radios of the talk group," Jackson says.

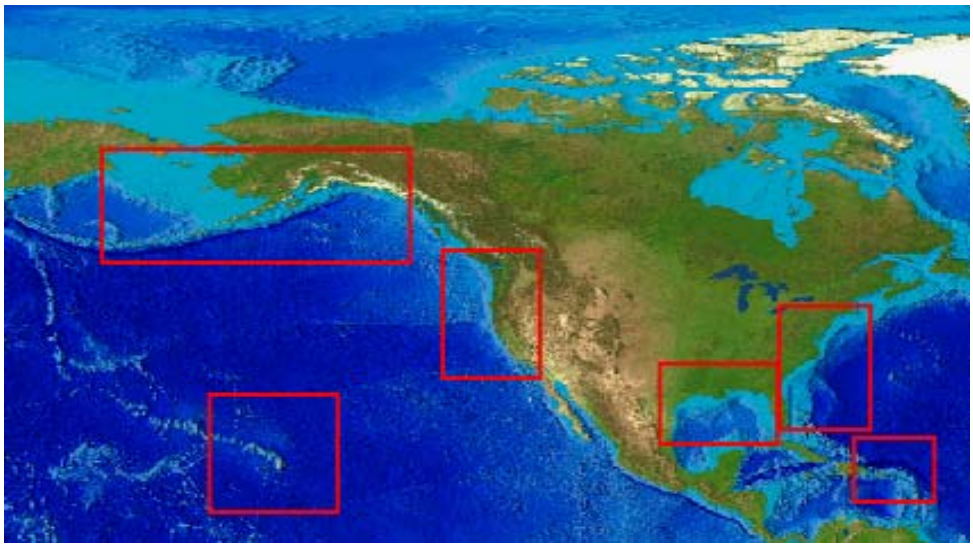
The DHS will fund the pilot program, which will provide one ground set each to 65 critical facilities with three years of service. Participating facilities now are being identified by NCS and probably will include emergency operations centers for federal, state and local government agencies as well as critical infrastructure providers.

To read the full article, visit http://www.gcn.com/online/vol1_no1/46309-1.html?topic=state-local

From: Continuity e-Guide #236—A Wednesday Update by Disaster Resource guide ♦

NGDC TSUNAMI INUNDATION GRIDDING PROJECT

http://www.ngdc.noaa.gov/mgg/inundation/



click area on map above to view the DEM regions

NOAA's National Geophysical Data Center (NGDC) is building high-resolution digital elevation models (DEMs) for select U.S. coastal regions. These combined bathymetric-topographic DEMs are used to support tsunami forecasting and modeling efforts at the NOAA Center for Tsunami Research, Pacific Marine Environmental Laboratory (PMEL). The DEMs are part of the tsunami forecast system SIFT (Short-term Inundation Forecasting for Tsunamis) currently being developed by PMEL for the NOAA Tsunami Warning Centers, and are used in the MOST (Method of Splitting Tsunami) model developed by PMEL to simulate tsunami generation, propagation, and inundation.

Bathymetric, topographic, and shoreline data used in DEM compilation are obtained from various sources, including NGDC, the U.S. National Ocean Service (NOS), the U.S. Geological Survey (USGS), the U.S. Army Corps of Engineers (USACE), the Federal Emergency Management Agency (FEMA), and other federal, state, and local government agencies, academic institutions, and private companies. DEMs are referenced to the vertical tidal datum of Mean High Water (MHW) and horizontal datum of World Geodetic System 1984 (WGS84). Grid spacings for the DEMs range from 1/3 arc-second (~10 meters) to 3 arc-seconds (~90 meters).

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Other links on this website:
Search DEMs
Tsunami DEM Development
'DEM Discovery Portal'
NOAA Center for Tsunami Research
Tsunami Data at NGDC
NOAA Tsunami Theme Page ♦

Infrequently Asked Questions

Compiled by Lee Walkling

What percentage of tsunami fatalities happen within the first hour after the source event?

80% "Time distributions of mortality during a variety of well documented historical tsunamis show that with one exception (the 1946 Aleutians tsunami) at least 80 percent of tsunami mortality occurs within the first hour after the source event, even in the case of transoceanic tsunamis.

This usually leaves less than 30 minutes for the warning systems to function if they are to prevent these 80 percent of deaths in tsunamis."

From: Eos (American Geophysical Union Transactions), v. 88, no. 52, pt. 2. *Mortality distributions in time and space during tsunamis*, by Rachel Ranger and Simon J. Day.

Have you found, in this issue, the zombies and the actor who plays 10 roles in a movie about a catastrophic tsunami?

Zombies, p. 9-10

Kamal Hassan, p. 10

We DO try to have something for everyone.

Underwater acoustics are being studied with regard to tsunamis, but what is known about above-water tsunami sounds?

"Many old documents in Japan report abnormal sounds before the arrival of tsunamis. [A monument was built in Aomori Prefecture, Japan] after the 1933 Showa Great Sanriku tsunami in order to continue public attention to tsunamis in the future generations. It advises evacuation if abnormal sounds are heard after an earthquake."

The report goes on to say " types of sounds generated by tsunamis can be classified and correlated with the types of wave profile and tsunami height…The sounds caused by a strong ebb, an impact on cliffs, and continuous spilling-breaking may be used as the natural warning of a coming tsunami."

From: Shuto, N., 1997, A natural warning of tsunami arrival. IN Hebenstreit, Gerald, editor, Perspective on tsunami hazard reduction—Observations, theory and planning: Kluwer Academic Publishers, p. 157-173. ♦

(Article about this publication is on page 8):