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Volume 12, Number 5 October 2010

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REPORT FROM ALABAMA

The key to response and recovery in the state of Alabama is citizen preparedness. The Alabama Emergency Management Agency (AEMA) is constantly updating our Website to give residents of the state information they need to be more prepared. This information helps them know their risks, develop a communication/action plan and build a family emergency supply kit.

The Development Team at the Alabama Emergency Management Agency (AEMA) has created a Risk Analysis Tool to be used by the general public and has posted it to the Agency’s website. The tool allows users to view multiple data layers that house a variety of information ranging from live weather feeds such as the radar and watches and warnings distributed by the National Weather Service to historical data including hurricane tracks and tornado touchdown locations. The tool also has several statewide point data sets with critical facilities including fire stations, police departments, hospitals, universities, and emergency operation centers. One of the most recent layers added is river gauge information that will give additional information to residents of communities near rivers and streams.

Users can search for their home by entering an address and then turning on layers of interest to see how their area has been or may be impacted by natural hazards. For instance, a user could locate their home and then turn on the storm surge layer to determine which surge zone they fall into. To access the Risk Analysis Tool, go to www.ema.alabama.gov and click on the link in the upper right portion of the page.

Auburn University at Montgomery presented its 2009 Innovative Alabama Governments Awards on December 4, 2009. The IT Development Team won in Digital Government Innovation: State/Regional Category. This honor is awarded to an Alabama state/regional government that implemented an innovative digital government solution (technology-driven) to increase efficiency and responsiveness in government service delivery.

The direct link to the Risk Analysis tool is <http://gis.ema.alabama.gov/mapping/introduction.html>.

The AEMA Website also has information to assist residents as they prepare their families and businesses for disasters that could impact them. This includes downloadable risk-specific publications such as hurricane, severe weather, winter weather and earthquake guides.

All disasters are ultimately local. We encourage those who visit our Website to know who their local emergency management director is and how to contact them. Complete contact information for each county EMA is available at www.ema.alabama.gov.

AEMA uses Twitter as one tool to distribute current information. The AEMA home page holds a link to follow us on twitter (@AlabamaEMA) for emergency information and preparedness tips.

Submitted by Charles Williams, Alabama EMA, <http://ema.alabama.gov/> ♦

(continued on page 3)

TsuInfo Alert

is 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).

It is assembled by
Lee Walkling, Librarian,
and is published bi-monthly by the
Washington Department of Natural Resources, Division of Geology and Earth Resources.

This publication is free upon request and is available in print (by surface mail), and at
<http://www.dnr.wa.gov/ResearchScience/Topics/GeologyPublicationsLibrary/Pages/tsuinfo.aspx>
Participants in the TsuInfo program can request copies of reports listed in this issue from:

Washington Geology Library
Washington Department of Natural Resources
Division of Geology and Earth Resources
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The views expressed herein are those of the authors and not necessarily those of
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TsuInfo Alert.

ISSN 1938-5064



REGIONAL REPORTS

ALABAMA (continued)



Brock Long was appointed by Governor Bob Riley to serve as director of the Alabama Emergency Management Agency.

Always reach out to your local emergency management director for information on your community. You can find out how to contact them on our Web site (Alabama) at the County EMA tab.

The key to response and recovery in the state of Alabama is citizen preparedness. Plan how you will communicate with and protect your family before a disaster strikes. Please visit our Web site to help you determine how to prepare for the specific hazards you face in your community. Go to www.ema.alabama.gov and click on the Risk Analysis Tool link. You can put your address into the application and find out about the risks and emergency responders in your area.

Follow us on twitter (@AlabamaEMA) for emergency information and preparedness tips. ♦

ALASKA

Tsunami sensor testing and development at the West Coast/Alaska Tsunami Warning Center

By Michael Burgy, Senior Technician, West Coast/Alaska Tsunami Warning Center

Sea level monitoring systems, and techniques have been developed and occasionally pioneered at NOAA's West Coast and Alaska Tsunami Warning Center (WC/ATWC). Until recently there were no realistic environments to test and evaluate these developments. A dedicated station for testing of sea level monitoring systems and techniques has been established at Port MacKenzie which is near WC/ATWC.

The Port MacKenzie station (NWS SID is PKZA2) provides multiple environments that can be encountered for many tsunami-centric sea level gauging applications. The conditions can be very harsh and difficult to overcome. Acceptable performance for a gauge at PKZA2 is a clear indicator that the gauge will perform well elsewhere. Conditions at PKZA2 are as follows; Daily tidal fluctuation is nearly 40 ft. Mud flats are at PKZA2, as well as grade 5 rip-rap boulders, and a vertical sea wall. Sea ice and freezing sea spray are additional challenges in the winter. The large tidal fluctuation causes swift currents that more resemble river current. PKZA2 can support multiple telemetry solutions, such as cellular, radio, and Ethernet. NOS has a tide gauge across Cook Inlet, at Anchorage that is used for comparison.

The current system test being conducted is for the evaluation of a standard pressure sensor that is deployed in an unconventional manner. The sensor utilizes a soft enclosure that was developed in the TsSMART system at WC/ATWC in 2005. TsSMART system is intended for rapid deployment in places where there is little, or no existing infrastructure, such as docks or piers. It is for temporary monitoring. The TsSMART sensor may not be completely submerged during the low tide cycle, because of deployment constrictions at the site. The soft enclosure prevents the pressure orifice from clogging with debris and icing when it is exposed at low tide.

For the current PKZA2 test the soft enclosure is housed within a weighted tube that is resting on the sea floor. The weighted tube is a 5 ft X 6 inch PVC pipe. It is merely tethered to the shore using steel cable attached to a guy-line anchor. The pressure sensor cable is a weak link and is usually intended to be housed in a stilling well tube and conduit. For this test no protection for the cable is employed, so the cable has been replaced with mil-spec armored cable called Spiral-4. The Spiral-4 cable has strength that approaches that of the steel cable used as the tether. There is a trade-off using the Spiral-4 cable and that is it is not vented. The original pressure sensor cable had an air tube that ran the length of the cable and vented the backside of the pressure diaphragm to the atmosphere. Without the air tube there is no distinction between water pressure changes and atmospheric changes. The impact of atmospheric changes for Tsunami Warning Center operations is to be evaluated in this test.

Future tests will involve TsSMART sensor deployment among the rocks and mud flats as well as tests of the permanent sea level gauges to be deployed. One test to be evaluated is the installation of the WC/ATWC "radar" gauge where the sensor is mounted at an angle incident to the water surface. Development of tsunami gauging standards and criteria is being coordinated with PTWC and NOS. Such criteria will be evaluated at the PKZA2 station as well as other new methods and hardware. ♦

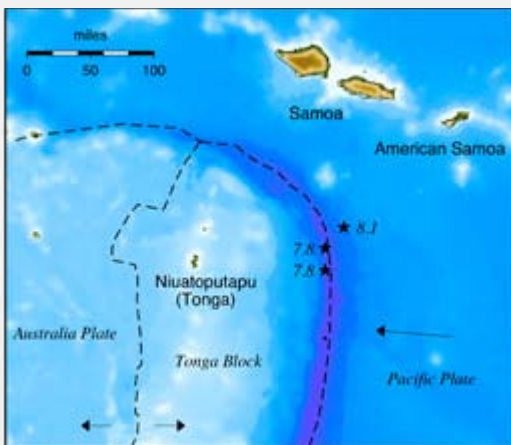
Seismicity of the Earth 1900-2007, Aleutian arc and vicinity

This new map was compiled by Susan Rhea, Arthur C. Tarr, Gavin Hayes, Antonio Villasenor, Kevin P. Furlong, and Harley Benz for the U.S. Geological Survey Open-File Report 2010-1083-B. The pdf, online version is available at <http://pubs.usgs.gov/of/2010/1083/b/> ♦

AMERICAN SAMOA / TONGA

Deadly Tonga earthquake revealed as three big quakes

Press Release 10-144 August 18, 2010



The Sept. 29, 2009, quake in Samoa, American Samoa and Tonga was in fact a triple-quake.

A magnitude-8.1 earthquake and tsunami that killed 192 people last year in Samoa, American Samoa and Tonga was in fact a triple-whammy.

The 8.1 "great earthquake" concealed and triggered two major quakes of magnitude 7.8, seismologists report in this week's issue of the journal *Nature*.

The National Science Foundation (NSF) and the U.S. Geological Survey funded the research, which was led by seismologist Thorne Lay of the University of California at Santa Cruz.

"At first, we thought it was one earthquake," says paper co-author Keith Koper, director of the University of Utah Seismograph Stations.

"When we looked at the data, it turned out it wasn't just one great earthquake, but three large earthquakes that happened within two minutes of one another. The two quakes that were hidden were responsible for some of the damage and tsunami waves."

The two magnitude-7.8 quakes combined "represent the energy release of another magnitude-8 quake," says Koper.

The quake on September 29, 2009, generated tsunami waves that varied in height depending upon where they struck. In some places the water reached more than 49 feet above sea level.

The disaster killed at least 149 people in Samoa, 34 people in American Samoa and nine on Niuaotupapu, an island in the northern part of Tonga.

It is the first known case of a large "normal" fault earthquake (the 8.1 quake) occurring on a sea-floor tectonic plate, then triggering major "thrust" quakes (the 7.8 quakes) in the "subduction zone" where the oceanic plate is diving or "subducting" beneath a continental plate of Earth's crust.

"Detailed analyses of the seismic waves showed that this was an unusual set of events," says Benjamin Phillips, program director in NSF's Division of Earth Sciences, which funded the research.

Usually, big 'megathrust' quakes that happen on the subduction zone boundary between two plates trigger other quakes on the oceanic plate that is diving or 'subducting' under the continental plate.

Thrust quakes are those in which ground is pushed together along a fault, forcing the ground on one side of the fault either under or over ground on the other side.

In the southwest Pacific Ocean, the Pacific Plate is moving westward and is being thrust under the Tonga block, a "microplate" on the northeast edge of the Australian plate.

During normal quakes, ground is pulled apart along a fault. The magnitude-8.1 quake occurred when the Pacific plate broke apart at the "outer rise" where it begins to dive westward beneath the Tonga block.

"This is the first time a large normal-faulting quake has been shown to trigger large thrust-faulting earthquakes," says Koper.

"This study will affect the way earthquake and tsunami hazards are calculated, not just in this region but potentially in other places around the world."

All three quakes began at depths from 9 to 12 miles beneath the surface.

The magnitude-8.1 quake lasted 60 seconds. The first magnitude-7.8 quake started sometime between 49 and 89 seconds after the 8.1 quake. The second 7.8 began 90 to 130 seconds after the first quake started.

Scientists know of only three previous cases of great earthquakes--those measuring magnitude 8 or more--that happened due to pull-apart or normal faulting within a diving seafloor plate.

They were the 1933 Sanriku, Japan, quake (about magnitude 8.4), which killed more than 3,000 people; the 1977 Sumba, Indonesia quake (8.3), which claimed 189 lives; and the 2007 Kuril Islands, Russia quake (magnitude 8.1).

"We've had seismometers only 100 years and good observations only the last 50 years, so not enough earthquake cycles have been observed to see this before."

In addition to Utah's Koper, other co-authors of the *Nature* paper are seismologists Charles Ammon of Pennsylvania State University, Hiroo Kanamori of the California Institute of Technology, Luis Rivera of the University of Strasbourg in France and Alexander Hutko of the Incorporated Research Institutions for Seismology's Seattle data center.

From: The National Science Foundation
http://www.nsf.gov/news/news_summ.jsp?cntn_id=117514&WT.mc_id=USNSF_51&WT.mc_ev=click
Media Contacts: Cheryl Dybas, NSF cdybas@nsf.gov
Lee Siegel, leesiegel@ucomm.utah.edu, University of Utah ♦

AUSTRALIA

Hanging on the line – on the need to assess the risk to global submarine telecommunications infrastructure - an example of the Hawaiian "bottleneck" and Australia

By Dale Dominey-Howes and James Goff

<http://www.nhrl.unsw.edu.au/articles/hangingontheline.html>

National economies are becoming increasingly dependent on the global telecommunications system – and in particular, its submarine cable infrastructure. Any disruption or damage to major submarine cables can have serious consequences by dramatically reducing the flow of information between users.

A sustained outage would cause data loss, significant delay and severe financial loss not only to cable owners but also to users relying on communication with the rest of the world.

Natural hazard processes, such as tsunami, earthquakes and submarine sediment slides, are a significant threat to this infrastructure as they are capable of damaging or even destroying it, both in deep water and at the coast.

Some places within the global telecommunications system are already known to be bottlenecks or “choke points”. Clearly, any damage to the fibre optic cables that pass through one of these choke points, resulting in interruptions to data flow would represent a major threat to the [global] eEconomy. The longer the interruption – the greater the consequence would be for any economies dependent upon the flow of traffic via that location.

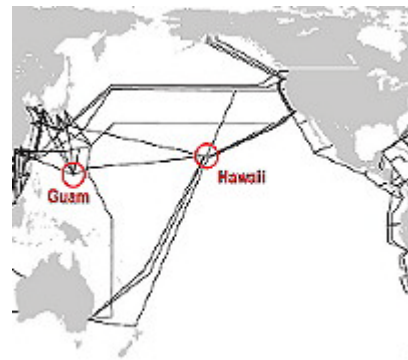
Hawaii is just such a choke point and interestingly, Hawaii is also affected by numerous large magnitude natural hazard processes. Any damage to cable coming out of Hawaii would have a direct effect on Australia as well as other countries in the southwest Pacific.

Because of this, the ATRC is conducting research in Hawaii to assess the risk of potential cable damage or breakage due to natural hazards. The two big questions

this research aims to answer is: how often do tsunami impact Hawaii and how big can they be?

This type of research is vital as part of a full risk assessment of this type of critical infrastructure, to ensure that national economies (such as Australia's) are not left “hanging on the line”.

For more information contact Professor James Goff or Associate Professor Dale Dominey-Howes.
Source: Dominey-Howes, D. and Goff, J.R. (2009), “Hanging on the line” - On the need to assess the tsunami risk to Australia's critical submarine telecommunications infrastructure at the Hawaiian bottleneck. *Natural Hazards and Earth Systems Sciences*, 9: 605-607.



Located in the central Pacific, Hawaii is an internationally recognised bottleneck or “choke point” in the global telecommunications network (after Dominey-Howes and Goff, 2009) ♦

Email from James Goff, Co-Director, Australian Tsunami Research Centre

Sept. 5, 2010

Due to a growing interest in our (Australian Tsunami Research Centre) research and the desire from individuals and organisations to contribute to our efforts we have set up a charitable donation fund.

This is solely for donations for tsunami-related work – any contributions made from the US will go through our US foundation called “UNSW and Study Abroad - Friends and US Alumni Inc.”, - a not-for-profit charitable entity with 501 (c) (3) status that is based in New York, NY.

Donations are fully tax deductible against US income. All donations will be tagged for tsunami research and disbursed through to the UNSW Foundation for credit to the “Australian Tsunami Research Fund”, which is part of the Australian Tsunami Research Centre (ATRC). On the UNSW website the information about this fund states:

The ATRC carries out research into all aspects of tsunamis, from responding to immediate post-tsunami assessments, to the search for evidence of prehistoric events, and public education and awareness. The work of the ATRC is globally relevant as research is being used to inform new emergency risk management policy in

Australia, Australasia, the Asia-Pacific region, Europe and the Americas. Senior staff are recognised global leaders in their fields of expertise. This fund has been established to support the ATRC in their research efforts. Donations will be used to support people and research costs associated with tsunami related projects around the world and to allow ATRC staff to participate in immediate post-tsunami disaster situations.

For non-US citizens there is a direct link at the bottom of our homepage for donations:
www.nhrl.unsw.edu.au.

We welcome donations and 100% of funds donated will be spent on tsunami research. The UNSW Foundation is the charitable arm of the university and manages and monitors all expenditure.

Hopefully this initiative is of interest to the wider tsunami community. The work we do involves many nations and is invariably carried out in multi-disciplinary, multinational teams. We welcome support from all US and non-US citizens and will happily answer any queries related to this exciting development.

For further information or questions, or to make a donation, please feel free to contact me or one of my colleagues below:

James Goff, Co-Director, ATRC - j.goff@unsw.edu.au
Xanthe Chapman, Senior Development Officer, UNSW Foundation - x.chapman@unsw.edu.au
Ben Phillips, US Representative (Development) - ben.phillips@unsw.edu.au or telephone (202) 396 8151
Australian Tsunami Research Centre website
<http://www.nhrl.unsw.edu.au> ♦

CARIBBEAN REGION

VITEMA held territory-wide tsunami workshop, with community participation

The Virgin Islands Territorial Emergency Management Agency (VITEMA) held its first-ever Tsunami Workshops in July, to educate residents and businesses about the threat and risks of tsunamis in the Virgin Islands and how to become a TsunamiReady community. The daylong Tsunami Workshops were held on July 21 on St. Croix at Carambola Resort and, on July 23 on St. Thomas at the Marriott's Frenchman Reef & Morning Star Beach Resort.

"The purpose of these workshops was to inform and educate our community about the threat and risks we face in the territory, and also throughout the Caribbean, for tsunamis," said Mark A. Walters, VITEMA Director. "A tsunami is a rare but extremely high impact event that can totally devastate a community. Our first line of defense is the residents and businesses themselves. The better educated we are about threat and risks of tsunamis, the better prepared we are to respond and recover as a community."

Bill Proenza, NOAA's National Weather Service Southern Region Director, was the keynote speaker at both the St. Croix and St. Thomas workshops. Mr. Proenza, a 40-year NOAA veteran, has been serving as the Southern Region Director since September 2007. He was formerly the director of the National Hurricane Center.

The ranking NOAA official in the region, Mr. Proenza also serves as the head of the U.S. Delegation to the Caribbean and western Atlantic Basin's tsunami meetings conducted by the United Nations Education, Science and Cultural Organization (UNESCO).

The Southern Region — one of the National Weather Service's six designated regions — encompasses a quarter of the continental United States from New Mexico, Texas and Oklahoma through the coastal gulf and southern states, including Georgia, Florida and in the Caribbean, Puerto Rico and the Virgin Islands. It includes any area of the United States that is vulnerable to severe weather such as flash floods, lightning and hail, tornadoes, droughts, fire weather, and land-falling hurricanes.

During his presentation he emphasized the very high risk to life in the Virgin Islands based on the hazard and the very high concentration of residents, businesses and cruise ships with its thousands of passengers in tsunami threatened areas.

Other guest speakers included: Paul Whitmore, Director of NOAA's West Coast/Alaska Tsunami Warning Center who focused on the interim tsunami warning services currently provided to the region by the NWS of NOAA; Christa von Hillebrandt-Andrade, Manager of the Caribbean Tsunami Warning Program briefed on the newly established program and the requirements for a community to be recognized by the NWS as Tsunami Ready; Roy Watlington, oceanographer and retired University of the Virgin Islands professor dissertated on the 1867 tsunami and the tsunami hazard in the USVI; and Jennifer Rhoades, Manager of the National Tsunami Hazard Mitigation Program explained the funding and support that NOAA NWS is providing to the Territory.

"The panel reflected some of the nation's most knowledgeable and ranking officials in the area of tsunami risk and education," said Jacqueline Heyliger, VITEMA Assistant Director, who organized the workshop. "We're extremely encouraged by the great attendance, especially those who live or work near the coastline, who took full advantage of this opportunity to hear first-hand what we need to know to become a Tsunami-Ready community."

For more information about the workshop call Assistant Director Heyliger at 340-773-2244. ♦



NOAA National Weather Service recognizes Aguada and Añasco as TsunamiReady™ communities

Officials from the NOAA National Weather Service and the Puerto Rico Seismic Network held Tsunami-Ready™ recognition ceremonies for the Aguada and Añasco municipalities of the Commonwealth of Puerto Rico. These two municipalities are located on the western coast of the island and are part of the first ten municipalities in Puerto Rico to be recognized as TsunamiReady™.

“While no community can be tsunami proof, Aguada and Añasco now have the means to minimize the loss of life from any future tsunami,” said Bill Proenza, regional director of the National Weather Service Southern Region, who was on hand at the May 10, 2010 joint ceremony. “A tsunami may not strike for many generations, but then again, it could happen tomorrow – as evidenced by the recent earthquakes and deadly tsunamis in Haiti and Chile. We continue to look forward to expanding the program to include all Puerto Rico coastal communities and eventually – all of our Caribbean neighbors.”

Located along the western coast, Aguada has a population of just over 42,000 with almost 5,000 living in the tsunami danger zone. Working closely with the National Weather Service forecast office in San Juan, as well as the Puerto Rico Seismic Network and the recently established NWS Caribbean Tsunami Warning Program, Aguada completed a rigorous set of warning and evacuation criteria to meet the guidelines for TsunamiReady™ recognition on March 5, 2010.

Añasco is also located along the western coast. It has a population of almost 30,000 of which over 2,300 live in the tsunami inundation zone, this number does not include the floating tourist population. Working with the NWS San Juan Weather Forecast Office and the Puerto Rico Seismic Network, Añasco had completed the requirements in 2009, but had not been officially recognized until the May 10th ceremony.

To be recognized as TsunamiReady™, a community must establish a 24 hour warning point, develop multiple ways to receive tsunami warnings and alert the public, develop a formal tsunami hazard plan, conduct emergency exercises and promote public readiness through community education.

City officials were presented with a recognition letter and special TsunamiReady™ signs in a ceremony at the TsunamiReady Summit held in Mayaguez on May 10. The TsunamiReady™ process is ongoing and the municipalities will be up for renewed recognition in three years.

Additional information is available at <http://www.tsunamiready.noaa.gov/> ♦

Government of Puerto Rico and FEMA provide funds to mitigate risks

Release date: August 11, 2010

Release number: 1919-09

SAN JUAN, PR—Federal Emergency Management Agency (FEMA) officials and Puerto Rico Governor’s Authorized Representative (GAR) staff held an Applicants’ Briefing meeting related to FEMA’s Hazard Mitigation Grants Program (HMGP) for the 10 designated municipalities, state agencies and some private non-profit organizations. The meeting was held on Friday August 13, 2010, at 10:00 am, at the Puerto Rico State Emergency Management Agency facilities.

“We are reaching local governments and non-profit organizations to make sure they know how to apply for this assistance,” said FEMA Federal Coordinating Officer, Justo Hernandez. “With this meeting they will know all the requirements to submit proposals for hazard mitigation projects in the Island.”

In the Applicants’ Briefing meeting, FEMA will provide detailed information regarding the Hazard Mitigation Grants Program procedures. Through this program, FEMA provides funds to reimburse local, state and some private nonprofit organizations for the eligible projects to implement hazard mitigation measures. FEMA will reimburse up to 75 percent of the costs.

On June 24, 2010, President Obama granted federal assistance under the Public Assistance for ten municipalities, and under the HMGP for all municipalities in the Commonwealth of Puerto Rico. ♦

Seismicity of the Earth 1900-2007, Caribbean Plate and vicinity

This map was compiled by Arthur C. Tarr, Susan Rhea, Gavin Hayes, Antonio Villasenor, Kevin P. Furlong, and Harley Benz, for U.S. Geological Survey Open-File Report 2010-1083-A. The map is available online at <http://pubs.usgs.gov/of/2010/1083/a/> ♦

HAWAII

Professor leads team to study impacts of tsunami-borne debris--Advances civil engineering knowledge

C.S. Papacostas

University of Hawaii at Mānoa

Prof & Chair, Civil and Environmental Engineering

Posted: Sep. 9, 2010

An international team of researchers led by H. Ronald Riggs, professor in the Department of Civil and Environmental Engineering at the University of Hawai’i at Mānoa, was awarded a \$965,000 grant by the National Science Foundation for a three-year study to improve our understanding of the effects of tsunami-driven debris, such as logs, utility poles and steel shipping containers on

buildings and other structures. The team includes Marcello Kobayashi, professor of mechanical engineering at UH Mānoa, and collaborators from Oregon State University, Lehigh University, Nagoya University and the Port and Airport Research Institute in Japan.

The impact forces imparted by debris on structures during tsunamis are not well known. At the same time, a vulnerable community's potential "resilience" to tsunamis depends on the design of effective countermeasures based on scientific knowledge of these forces and updated building codes. This is especially important for "vertical" tsunami evacuation shelters, fuel and chemical storage tanks, and port and industrial facilities often located within tsunami inundation zones.

The UH Mānoa-led research team will carry out experiments at the Network for Earthquake Engineering Simulation (NEES) facility at Lehigh to understand the impact of full-scale shipping containers on structural elements. At the Oregon State NEES Tsunami Research Facility, the knowledge gained at Lehigh will be applied to develop and test a 1:5 scale physical model of containers directed by laboratory-generated tsunami waves against a test structure. Similar tests will use debris such as logs and utility poles.

The project is expected to obtain a rich set of experimental data to develop and validate 2 numerical models. The first is a simplified model that can be immediately used in structural design and a more complex fluid-structure interaction model based on computational fluid dynamics theories. The second is an extended model that will allow the researchers to explore complex factors not included in the simple model and to consider scenarios that cannot be covered by the planned experimental observations.

Data from this National Earthquake Hazards Reduction Program (NEHRP) project will be archived and made available to other researchers and to the public.

A side benefit of the research is to include a significant involvement of Native Hawaiian undergraduate students who would be exposed to advanced educational opportunities here and on the U.S. mainland.

"Successful large-scale research these days often involves the collaboration of major research institutions," said C. S. Papacostas, professor and chair of the Department of Civil and Environmental Engineering. "Professor Riggs' accomplishments place our department in that category."

<http://www.hawaii.edu/news/article.php?aId=3848> ♦

***How to prepare your business for the next tsunami—
A guide for businesses in the Hawaiian Islands***

<http://www.tsunami.org/>

The Pacific Tsunami Museum partnered with the Hawaiian County Planning Dept. to produce this guide for Hawaiian businesses. Available online. ♦

New tsunami evacuation maps take effect for Oahu

Honolulu—Friday, August 27, 2010, the city finalized the newest tsunami evacuation maps. They replace the previous maps, developed in 1991.

At a news conference, acting Honolulu mayor Kirk Caldwell urged residents to review the new evacuation zones because they have increased and expanded.

From: <http://www.kitv.com/news/24792361/detail.html> ♦

OREGON

Uniform tsunami warning signal adopted in Oregon

Press release, September 1, 2010

Years of hard work have paid off for tsunami response on the Oregon coast. The uniform tsunami warning signal is now in place and local communities have up to five years to transition to the new standard signal. Risk to lives will be reduced by applying a uniform siren signal to inform the public of an approaching tsunami on the Oregon coast.

"Due to the recent earthquake events around the world, it has been clear the general public is uncertain how our alerting systems will work," said Althea Rizzo, Oregon Emergency Management Tsunami and Earthquake specialist.

Taking lessons learned from the States Amber Plan and working with local broadcast mediums, a work group, together since 2006, has worked toward the goal of creating a standardized warning system.

Under the direction of Oregon Emergency Management (OEM), a team of specialists has reviewed existing research and best practices on tsunami warning systems and decided on a uniform state signal that provides the necessary consistency to reduce potential conflicts and confusion. The new standard signal is the up-and-down wail that lasts for three minutes.

The siren test time is designed to roughly coincide with the weekly National Oceanic and Atmospheric Administration (NOAA) Weather Radio tests. Tsunami warning sirens will be tested on the first Wednesday of each month at 11:00 a.m.

Based on Oregon Senate Bill 557, Section 2, the uniform tsunami warning signal administrative rules must specify type of signal, duration of signal, volume of signal and location of delivery device.

Contact Info: Jennifer Bailey, OEM Public Affairs Coordinator, 503-750-8308, 503-378-2911 Ext. 22294
<http://www.oregon.gov/OMD/PressRelease/2010/09-01-10Press.shtml> ♦

Central Oregon coast plans 17-mile tsunami drill

Lincoln County will hold the largest tsunami drill ever conducted in Oregon on Sept. 29 at 11 a.m.

http://www.beachconnection.net/news/tsunam092710_154.php ♦

WASHINGTON

Tsunami vertical evacuation strategy under development along the Washington coast

By Christopher Scott, Jeana Wiser, and John Schelling¹

When most of us think about tsunami evacuation, we envision those blue and white signs strategically placed along coastal roads, directing motorists to high ground. Those signs are a good method of informing people where to go in order to escape a tsunami and educating the public about the threat that we face along the coast. But what happens if the tsunami is the direct result of a local subduction zone earthquake that has damaged or blocked roadways to such an extent that evacuation on that route is impossible? What happens if high ground is too far away for people to get to on foot before the tsunami arrives?

Over the past several months, it has been the job of students and faculty of the University of Washington, in cooperation with the Washington State Departments of Emergency Management and Natural Resources, Pacific County, the United States Geological Survey, and the National Oceanic and Atmospheric Administration, to develop strategies designed to address these types of questions. This effort is based on the principles outlined in the new FEMA Publication 646 "*Guidelines for Design of Structures for Vertical Evacuation from Tsunamis.*" [see page 20]

Working under a grant from the National Tsunami Hazard Mitigation Program, Robert Freitag of the University of Washington's Hazard Mitigation Institute and Dr. Omar El-Anwar from the College of Built Environments have been leading a group of graduate students in developing vertical evacuation strategies for coastal areas of Pacific County. The project is aimed at developing viable, publically acceptable, and effective evacuation strategies through a strongly inclusive 'bottom up' approach to the public process. These strategies will then allow the state and counties to be ahead of the curve in terms of public buy-in when funds become available to construct tsunami vertical evacuation safe havens. The project team and coastal residents are currently looking at three basic types of vertical evacuation structures, which include earthen berms similar to those seen in various locations in Japan, evacuation towers, and large public elevated buildings such as parking structures.

The modeled tsunami created by the scenario earthquake is assumed to reach the western shore of the Long Beach peninsula within 40 minutes after cessation of shaking. Although the modeling predicts a 40-minute window of time between cessation of ground shaking and the tsunami's arrival, the project team is developing strategies using a window of 25 minutes. This duration was selected in order to allow time needed for post-event orientation and to increase the margin of safety.

Additionally, the team utilized walking speed research by Dr. Harry Yeh of Oregon State University, which allowed the development of travel times representing distances that different age groups would likely be able to cover in the short timeframe.

In addition to the hazard model, a preliminary community profile is developed in order to begin understanding the demographics, urban form, and the strengths, weaknesses, opportunities, and threats stemming from the area's human population and built environment. Once the preliminary profiles are created, a six-phased, public strategy process follows. To date, this process has been used in four at-risk communities along the Pacific County coast; Ilwaco, Long Beach, Ocean Park (and other areas of the north peninsula), and Tokeland. The results from all four communities are currently being compiled into a single document and will be presented during a county-wide public meeting later this year. Following production of this report, the project will continue in Grays Harbor County and beyond over the next three years.

Throughout this entire project, feedback from the public has been overwhelmingly positive. Residents of the affected communities have been extraordinarily receptive to the concepts of vertical evacuation and each community meeting has been exceptionally productive. In fact, many residents expressed the feeling that this new evacuation strategy gave them a sense of hope; the feeling that there was something practical that they could do instead of just accepting the risk with a sense of despair. It is just this kind of public excitement and buy-in that makes great projects happen as well as helps save lives.

¹ Christopher Scott and Jeana Wiser are University of Washington Master of Urban Planning graduate students and were research assistances involved with this Tsunami Safe Haven Project. Other students include Amanda, Engstfeld, Katherine Killebrew and Patricia Linn DeMarco. John Schelling is the Earthquake/Volcano/Tsunami Program Manager for the State of Washington Emergency Management Division.♦

Washington State "Train-the-Trainer" program

The Train-the-Trainer program aims to develop an educational curriculum to train qualified Tsunami Public Education Instructors. The Train-the-Trainer program is a joint effort of the NOAA Center for Tsunami Research (NCTR) and the Washington State Emergency Management Division (WA EMD). As of January 2010, Train-the-Trainer graduates have conducted at least 12 community workshops for a minimum of 339 participants.

On 9 June 2009, WA EMD hosted a pilot Train-the-Trainer Workshop. The workshop objective was to conduct a pilot project to initiate, test, and refine a curriculum for a Trainer program that will be developed and taught by the NCTR in collaboration with WA EMD to



Classroom snapshot at pilot Train-the-Trainer workshop held on June 9, 2009.

graduate qualified Tsunami Public Education Instructors as identified by WA EMD. This objective is a critical component essential to the [National Tsunami Hazard Mitigation Program](#) (NTHMP) [Educational Plan](#).

The Workshop was a joint effort of the WA EMD and the NCTR. A total of 31 participants from various coastal Washington jurisdictions took part in the Workshop. Attendees included personnel from county and community organizations such as Emergency Management and Community Emergency Response Team (CERT).

From: <http://nctr.pmel.noaa.gov/education/train-trainer.html> ♦

Lessons from the reconstruction of houses in Aceh after the tsunami of December 26, 2004

By Teddy Boen, Senior Advisor, World Seismic Safety Initiative

Note: This is an excerpt of a paper written 4 years after the December 26, 2004 tsunami; this paper is part of a series of papers written earlier as indicated in the references. It is thought that maybe what was written could prevent similar mistakes during the reconstruction of houses in other earthquake stricken areas.

From: Asian Disaster Management News, v. 16, no. 1, 2010, p. 22-24.
http://www.adpc.net/v2007/Downloads/2010/Jun/Newsletter_V16No1_2010.pdf
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Almost 4 years after the December 26, 2004 tsunami in Aceh, it can be said that the quality of constructed houses is still poor. The reasons which caused poor reconstruction, among others, are:

1. Needs assessment and site specific information

Needs assessment is a statement of what needs to be done. It is a prerequisite for the success of any reconstruction. There must be appropriate and timely information about what has happened, what needs to be done, and what resources are available. One of the important components in the needs assessment for reconstruction is an in-depth study of the site-specific information, local wisdom and expertise. The reconstruction strategy should be localized and site-specific as far as possible.

Economic, environmental, social and cultural factors must all be taken into account when developing disaster risk mitigation strategies and solutions must be anchored in the prevailing circumstances of local situations. A detailed and accurate disaster assessment is a very important factor for a successful planning and execution of the rehabilitation and reconstruction. Such assessment is expected to produce reliable data of beneficiaries of houses such as: to which target group they belong; numbers of IDPs eligible for the program at the transition stage as well as the long term; number of persons who do not possess land and are permanent evacuees; the suitability and availability of site for relocation; the availability of the resources (human, material and funds) necessary to carry out such a huge undertaking, namely building thousands of houses within a very short time span. All those data are vital prior to commencing the actual reconstruction. In Aceh, within six months after the tsunami, many foreign “experts” introduced all sorts of house types which are not the prevailing practice and many are culturally unacceptable.

2. Directives from the authority

Any successful reconstruction needs a capable authority with strong leadership that can provide clear directions and requirements concerning the type of buildings and the standards to be followed from the onset. The approval/permit system must be strictly enforced and all parties (government, NGOs, and other organizations) involved in the reconstruction of houses should provide continuous qualified technical assistance and inspect their respective works on a constant basis.

In developing countries, if earthquake resistant design codes exist, they have been adopted by some larger cities only and very few have been adopted and enforced for smaller cities and rural areas. Also most codes are incomplete; almost no standards have been developed for non-engineered buildings. Past experience showed that in developing countries, unfortunately, most earthquake disasters occurred in rural areas, thus affecting non-engineered buildings. Codes are also designed to regulate new developments and not the repair, retrofitting, and strengthening of existing and/or damaged buildings. In other words, the minimum standards contained in the codes are meant to build new buildings or to rebuild totally damaged ones and don't address the issue of repair

and strengthening, the most common situation with most buildings after an earthquake disaster. This is one of the main reasons why no provisions to prevent future losses are taken into account after an earthquake disaster since people have no understanding and are not aware of repair, retrofitting, and strengthening methods.

3. Differentiation between emergency shelters, transition, and permanent houses

Reconstruction of houses after a disaster must be planned within the overall context of phases---from emergency shelters to durable solutions. Immediately after the disaster, displaced people move to emergency shelters provided by the government and NGOs. They then are shifted to transition houses until permanent housing can be built. Differentiation between emergency shelters, transition houses, and permanent houses should be made.

In Aceh, in the early stage of reconstruction, several NGOs did not differentiate between immediate shelter needs (which were already built by the government), medium term/transition houses, and permanent houses.

Therefore, in the early stage, many of the houses already built were of the transition type but built on permanent former lands belonging to recipients. Many of those “temporary/transition” houses became permanent and the final reconstruction stage failed to materialize. The need for “permanent” housing was, in part, reflected by the large amount of funding available and was articulated in terms of reconstruction rather than recovery. This leads to a focus on physical construction rather than studying and understanding how the process of rebuilding can lead to economic activity and the role that shelter plays in meeting needs and allowing families to return home and carry out their livelihoods.

Also, no construction phase allowed phasing of occupancy to be observed. Usually the construction phase is chosen to construct transition houses on the site and allow early occupation while the permanent houses are being constructed. Programs to provide semi-permanent shelter sought to provide this assistance quickly and economically, but were superseded by the pressure for “permanent” housing and were affected by poor quality timber.

4. Influx of local and foreign “experts”

In major disasters, developing countries are often offered and accept large amounts of technical assistance as foreign aid; most of the time such assistance may not be linked with the actual needs of the disaster victims.

In Aceh, the lack of immediately available site-specific information was coupled with the influx of many so-called “experts” (local and foreign) offering an endless number of earthquake resistant building type “so-

lutions” causing unsatisfactory results. Most of those “experts” lack technical capacity and a clear understanding of the local building culture and the social order of the community as well as the ability to adapt disaster resistant techniques to local styles and situations. Many NGOs ended up trying to “re-invent the wheel” by introducing house types which defied the local culture. It is not advisable for experts to try to “teach” local people, but instead they must try to absorb and understand the local wisdom regarding why it was done the way it is. Having understood the local way of thinking, experts must try to help locals to make their house earthquake resistant but without introducing abrupt changes or use new “alien” materials. The experts need to draw upon the past knowledge and practice of an area and try to incorporate their expertise and latest developments in a way that will create appropriate, useful reconstruction plans acceptable to the local communities.

5. Alien type of construction, culturally inappropriate and NOT sustainable

The trouble with most of the imported solutions is that the buildings last only as long as the fund is still available. The village people learn how to fit up the alien buildings, but as soon as the free materials stop arriving, the village people are as badly off as ever—except, of course, for the buildings they already have. The point is that they cannot employ the skills they have learned because they cannot afford the materials. “Alien methods,” in fact, merely succeed in giving the village people an illusory feeling of progress and superiority while tempting them into the most frustrating blind alleys, giving them a sophisticated solution that will inevitably be shut to them a short time later. In Indonesia, disaster victims rely more upon family, neighborhood, friends, and other local coping mechanisms. These mechanisms must be encouraged and supported.

6. Main target is numbers and not quality

At the onset of the reconstruction of houses in Aceh and Nias, one of the missions of Indonesia’s Reconstruction and Rehabilitation Agency (BRR) was community-driven or community-based reconstruction. Basically, community-based construction is a bottom up model: beneficiaries are involved, jointly with the professionals, in planning and implementation. They are engaged in decisions about the project through discussions among themselves and the professionals. Within the community and the beneficiaries, there will be a range of experiences, skills and resources. The ideal is for each to participate according to his or her special abilities. In reality, however, not all will contribute, and, in most communities, the collaboration with professionals will be largely left in the hands of the representatives or local leaders.

One year after the tsunami, I have suggested to look beyond numbers for the reconstruction of houses and to

concentrate on the technical as well as the quality of the houses. However, to date (almost 4 years after), the main target is still numbers and not quality.

7. Site development and infrastructure

The other important aspect in the reconstruction of houses is the planning of site engineering design and infrastructure such as the drainage, the arrangement of access roads and foot paths, provision for sanitary facilities, provision of water supply and utilities. It must run parallel to the planning of the site layout and must be constructed during the site preparation stage. However, in Aceh, almost four years after, the engineering design still was left out.

8. Mis-interpretation of community-based reconstruction

Local communities need to be actively involved in the planning, decision-making and implementation in most sectors if reconstruction is to be successful. Experience with disaster reconstruction all over the world has shown that community participation is a fundamental requirement that helps reduce trauma, ensuring appropriate solutions, equity, community ownership, transparency, and accountability. It will also be essential to set up a fair and accessible grievance redress system. Basic safety regulations must be developed within the context of community-based construction; this is a challenge for technicians: safe structural methods are a priority. Only thereafter can one expect to build a safe but affordable building. Participation stimulates self reliance, because people who participate in their own house building will be confident about problems and less dependent on outside agencies.

9. Core housing, building completion and further extension

Core houses are frequently introduced but seldom really understood. Many architects working for NGOs as well as World organizations were suggesting that the 36 m² house should be considered as a core house that can be extended by the beneficiaries at a later date.

Such opinions became very common in Aceh and Nias, while, in fact, in earthquake prone countries like Indonesia, it is not advisable to encourage beneficiaries to extend their houses unless the extension is pre-designed and all the connections for the extension are already in place.

Extensions are not advisable without engineering assistance. Unless already pre-designed, earthquake engineers will not recommend the idea of extending core houses for the following reasons: seismic resistance depends upon wholeness of building, in which the building acts as one integrated unit and not as a loose assembly of pieces. Therefore, the continuity and rigidity of construction that is so required is difficult to

ensure when the completion of core structures and their physical expansion over a larger plan area is undertaken without technical supervision. Extension and the original core house must be united structurally to act as one integral unit when shaken by earthquakes.

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[NOTE: the online version of this article includes photographs to illustrate points made in the report.]♦

"Exercise 24" aims to be first ever tsunami and earthquake drill online

By Alex Priest

Sept. 24, 2010, at 11:08 AM

<http://technorati.com/blogging/article/exercise-24-aims-to-be-first>

Social media consultancy firm BuzzMgr kicked off a two-day tsunami and earthquake drill September 24. It is the first such drill to ever take place entirely online, relying on the power of social media and word of mouth to see just how fast news of the "disaster" can spread.

Dubbed "Exercise 24", the project is described on the BuzzMgr website as:

This virtual exercise is intended to test in part, the willingness & ability of disaster relief organizations to use social media to speed response & recovery. You can help. Exercise 24 begins virtually with a major earthquake in Southern California and extends into Mexico.

Read more about the project on the Exercise 24 website: <https://sites.google.com/a/inrelief.org/24/> ♦

Global database to link missing persons and disaster victims in development by INTERPOL and European partners

30 July 2010 © Interpol

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From:

<http://www.interpol.int/Public/ICPO/PressReleases/PR2010/PR062.asp>

LYON, France – A project to assist in the faster identification of multiple victims or missing persons following a man-made or natural disaster and in day-to-day policing is being spearheaded by INTERPOL in collaboration with five European partners.

The FAST and efficient international disaster victim IDentification (FASTID) project is being developed with experts from the German Federal Criminal Police Bundeskriminalamt (BKA), the IOSB and IGD Institutes of the Fraunhofer-Gesellschaft in Germany, Danish company PlassData, the University of Dundee and Crabbe Consulting Ltd, with co-funding from the European Union's seventh framework programme.

Following the Asian tsunami in 2004, the INTERPOL General Assembly adopted a resolution in 2005, recognizing the need to establish a centralized database to identify and link missing persons and/or unidentified bodies.

Based on INTERPOL's tools, including its globally recognized Disaster Victim Identification (DVI) protocols combined with its Yellow Notices, for missing persons, and Black Notices, to seek information on unidentified bodies, the FASTID project is aimed at providing a 'one stop shop' for teams in the field either responding to a disaster or national police trying to locate a missing person.

"After a major tragedy, such as the Asian tsunami, it is vital that with so many countries involved either in terms of victims or first responders, that there are standardized and recognized procedures to ensure the fast and efficient identification of victims so that they can be repatriated as quickly as possible," said Peter Ambs, INTERPOL's FASTID project leader.

"The combined elements of this database and its accessibility to law enforcement across the world via INTERPOL's global network will help meet the needs of both day-to-day policing and for those responding to disasters, where and when required," added Mr Ambs.

As part of the FASTID project, research is also being carried out into image retrieval methods, including a computerized system to browse and identify potential matches to help forensic identification in relation to faces, tattoos, body jewellery and clothing.

In addition to commonly used identifying methods, such as fingerprints, dental and DNA information, craniofacial reconstruction, 3D morphing and superimposi-

tion will also be examined by the project team to establish if these techniques can also be implemented and integrated into the system.♦

OPINION

Talk, Talk: Communication never stops being key

From: Disaster Research 550, July 22, 2010

Put 400 big thinkers in one room and there's bound to be talk. Gabbing and nattering, to be sure, but also dialogue, parleys, and powwows. Definitely some hearty discourse and discussion. Probably even a little bombast and braggadocio. So what's with the reticence beyond those walls?

Every year at the Natural Hazards Workshop [University of Colorado], one issue arises again and again—the need to break ideas free of the academic, political, or industry silos holding them incommunicado. The 35th Annual Natural Hazards Research and Applications Workshop was no exception.

While calls for increased communication usually work their way into sessions on various topics in numerous ways, the matter was brought front and center early in the Workshop by our first keynote speaker, *New York Times* journalist Andrew Revkin.

A day earlier, Revkin had posted an article on his Dot Earth blog detailing outrageous advice given to members of the Intergovernmental Panel on Climate Change by its chairman—keep a distance from the media. That, along with a backgrounder listing words to avoid using if a scientist were to speak to the media (including uncertainty and risk), provided a good jumping off point for discussions about the need to share information, how we now communicate, and who ultimately has the authority—and responsibility—to speak.

"This is the 21st Century" Revkin said. "Anyone trying to shrink away from the media; that's not the right reflex." But for many, keeping quiet is a reflex, often out of fear of being misrepresented. The problem is that we live in an age of a constant information hum, so refusal to speak doesn't mean there will be silence, it only means there will be conversation with one less learned voice. Revkin likened the phenomenon to a buffet of choices where consumers hungry for information gorged themselves on whatever noshes looked tasty versus the "information comfort food" dished out in the past.

When it comes to such smorgasbords, many don't stop to think who's bringing the food to the table—and sometimes it's hard to tell. One such instance that Revkin highlighted was the Deepwater Horizon Response site, introduced within days of the first oil spilled in the Gulf. While the site showed the government's ability to provide the type of information flow that the public demands, it

blurred the line between information provided by federal sources and that from BP.

On its face, the new information free-for-all seems to provide more reasons to shy away from communicating than it does for participation, but it also provides opportunities. For those that want to speak their piece, there are blogs, Twitter, personal Web sites, on-demand publishing and a number of other ways to speak directly to the public. And as Revkin pointed out (via the Global Warming's Six Americas 2009 report), the public is more likely to trust expert voices than the media—at least on the topic of climate change.

Whether the topic is climate change, or community preparedness, or any of the hundreds of others linked to hazards or disaster, perhaps the top reason to be communicative is because it's why we do the work. Like the proverbial tree falling in the forest, knowledge that isn't communicated doesn't make a sound.♦



Robinson Crusoe Island, off the coast of Chile

Hometown of 'real' Robinson Crusoe to aid stricken Pacific Island--Largo area is twinned with Robinson Crusoe Island - which was devastated by a recent earthquake and tsunami.

27 July 2010 10:52 GMT

From: <http://news.stv.tv/scotland/188634-hometown-of-real-robinson-crusoe-to-aid-strick-pacific-island/>
Reprinted with permission from stv.tv, based in Glasgow, Scotland, part of STV, the national Scottish TV station.

The Scottish hometown of the "real" Robinson Crusoe has launched an appeal to help the tiny Pacific island where he was marooned for over four years rebuilding its only school after it was swept away by a devastating tsunami.

Daniel Defoe based his book, *Robinson Crusoe*, on the life of Scottish sailor Alexander Selkirk, who was born in Lower Largo, in Fife. The Largo area was twinned with Robinson Crusoe Island, formerly Mas a Tierra, in 2004 to celebrate the 300th anniversary of the village's famous son Selkirk being marooned there.

Now the two disparate communities have come together after the tropical island 400 miles off the coast of Chile was left devastated by a recent earthquake - which caused a five-metre high tsunami to sweep over the island. It destroyed many buildings on the island, populated by around 650 people, including its only school that served 120 children.

Largo Area Community Council has set up an appeal to help the Gabriela Mistral Foundation in trying to raise \$500,000 to rebuild the islanders' school.

Momentum

Community council chairman Peter Aitken said the appeal has already gathered momentum, with almost £5000 already being raised.

He said: "The island school has been destroyed and requires to be rebuilt with the British Ambassador to Chile becoming patron of the project to rebuild the island school. We hope to involve both Lundin Mill and Kirkton of Largo primary schools in the project to rebuild the school on the island.

"At a public meeting I asked the audience to imagine the situation if the disaster had befallen Largo how grateful we as a community would be to have the support of the islanders of Robinson Crusoe Island, in the rebuilding of our community." MEP Struan Stevenson hopes that the people of Largo will help contribute with the rebuilding effort after the tsunami struck in February.

He added: "Jon Benjamin, the British Ambassador to Chile recently agreed to a suggestion by the Mayor of Isla Robinson Crusoe to become Patron of the project to rebuild the school.

"The ambassador says that he is closely in touch with Peter Aitken, chairman of the Largo Area Community Council, about next steps, including involving the two primary schools there."

Voyage

The seventh son of a Lower Largo cobbler, Selkirk, born in 1676, went to sea as a young teenager. In 1704, during a privateering voyage on the Cinque Ports, Selkirk fell out with the commander over the ship's seaworthiness and he decided to remain behind on island, where they had landed to overhaul the worm-infested vessel. He cannot have known that it would be four years and four months in isolation before he was picked up by a passing English ship.

Published in 1719, Defoe's book *Robinson Crusoe* is one of the oldest and most famous adventure stories in English literature. Newspaper reports of Selkirk's exploits made him a well-known figure, though it is unclear whether Defoe ever met him. He died of yellow fever in 1721. A bronze statue commemorating him stands outside his former home on Lower Largo's Main Street.♦

The need for regional resilience and restoration strategies

By Brandon Hardenbrook

From: *Disaster Recovery Journal*, v. 23, no. 2, p. 43-45, Spring 2010

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The infrastructure of the United States is the foundation of our security, economy and citizens' way of life. This complex system of interdependent structures, services and goods serves our needs in a seemingly seamless and perpetual manner. The economy and our infrastructures are interwoven together and share unique interdependencies. According to the Department of Homeland Security, more than half of the nation's gross domestic product is directly represented by our infrastructures and the overwhelming majority of the nation's infrastructures are owned and controlled by the private sector. These two facts alone illustrate the important tie between economic and infrastructure protection policy and the need to examine the entire system (public and private) when making restoration decisions.

After a disaster or major incident impacting a region's critical services, our elected officials and emergency managers must make crucial decisions regarding restoration of critical infrastructures on a prioritized basis. Very few, if any, have the knowledge or capability to fully understand the economic and regional impacts of their decisions. It is fairly easy to understand that infrastructures and our economy are directly tied to one another, with business and government depending on critical assets and service to keep the economy running. It is also important to point out that all infrastructures are directly and indirectly linked in many of the same ways and none respect jurisdictional boundaries. Whether it is agriculture, energy or transportation, all are dependent on one another and all experience cascading impacts resulting from disruptions or uninformed restoration decisions. With this in mind, the task of making decisions to determine the criticality of an infrastructure is a daunting task.

Restoration strategy

When examining restoration priorities, one must understand the immediate needs of the community or region. Life safety, public health and protection issues generally are listed as top priorities immediately after an event, usually during the response and initial recovery. When examining a disaster that has a long term impact such as a major earthquake or widespread biological or radiological event, longer term priorities must be considered in conjunction with these immediate priorities. These could include: reducing environmental impacts, restoring the economy and re-establishing livable communities. Most decision makers are well aware of the need to consider longer term priorities but

when examining the system as a whole it is difficult to understand how the pieces fit together.

Many regions have strategies to rapidly restore lifeline infrastructures which include: electric and gas utilities, water, sewer, communication and other critical services we depend on for life safety and protection. These strategies focus mainly on rapid restoration and generally do not address long term economic, interdependencies and resilience issues. They also mainly focus on point of failure disruptions which often makes restoration more straightforward. The problem with this approach is that interdependencies are not always factored into the decision making process.

Most interdependencies remain undiscovered and very few organizations have an idea of the interdependent relationships their business or infrastructure shares with the rest of the region. Because all infrastructures and sectors are linked physically, virtually or economically, all experience disruptions due to no fault of their own. The success of a business often depends on the reliability of the electrical grid or the assurance of IT systems. Supply chains depend on just-in-time delivery of goods with very little room for error. Any hiccup in the system causes delays or damage, lost revenue and lost jobs. Many organizations have taken great pains to develop continuity plans and redundant systems, however, often this is not enough. A disruption caused by a disaster, human error or economic slowdown is beyond any one organization's control. Businesses and governments are at the mercy of each other whether they recognize it or not. They must actively work together to develop a sound understanding of how a region truly functions; this does not happen overnight or by accident.

Building relationships and establishing trust is the key to understanding interdependencies. Establishing trusted relationships that are cross sector and public-private will ultimately shed light on the dependent nature of a business, sector and region. Key service providers must have trusted relationships with governments and other infrastructures they depend on. Supply chains must be analyzed and key partners must work together to improve the efficiency of the system. Relationships must be cross sector and cross jurisdictional in order to truly understand the interdependent relationships of a region. It is through these relationships that information will be provided and shared to benefit the region as a whole. A good example of how relationships improve resilience comes from a major grocery distributor in the Pacific Northwest. The director of loss prevention has developed a policy of providing of any items requested to assist in disaster planning or response based solely on a phone or email request, without any contracts, memorandums of understanding or prior paperwork in place. The only caveat to this is that he will only honor a request if he knows the person asking. In all the years of dealing with these types of information ad hoc requests, this major distributor has always been

able to collect payment after the disaster has ended. This type of resilience only happened because of personal relationships and trust.

Regional partnerships

The National Infrastructure Protection Plan (NIPP) calls for the development of sector coordination councils as well as the development of regional partnerships to address critical infrastructure/key resource (CI/KR) issues such as identifying interdependencies and developing information sharing strategies. On a regional level there are very little resources available for these activities, and no clear guidance on how to develop regional efforts as described in the NIPP. The reality is that most sector coordination has occurred on a national level and often overlooks the unique needs of individual regions. Some states have attempted to develop sector coordination councils as described in the NIPP, but most do not have the resources or expertise to handle this task. In the end, national sector coordination overlooks the clear need for cross sector collaboration and dialogue on important regional priorities. This type of regional collaboration will help regions develop clear restoration and resilience strategies.

An example of a regional effort aimed at building trust and encouraging information sharing can be found in the northwest. In 2006 the Pacific Northwest Economic Region (PNWER) set up the Critical Infrastructure Protection (CIP) Taskforce with the goal of improving information sharing between the five northwest states and 3 western Canadian provinces and federal agencies on CIP issues. At the time very few states/provinces had defined CIP programs and dedicated CIP managers. Jurisdictions participated in quarterly conference calls and several in person meetings to share best practices, explore regional interdependencies and build relationships. Now, after three years, every state and province in the region has a CIP program in place and all but one has a dedicated CIP manager. The CIP Taskforce continues to meet quarterly and members routinely call one another with questions or to share information. This is a good example of how jurisdictions can work together to build relationships and trust to begin to develop resiliency on a regional level.

When developing a structure for building resilience and making decisions that impact the restoration of the economy and critical services, the need for continuous ongoing information sharing is paramount. As mentioned earlier this can only work if trusted relationships have been established. Through dialogue, stakeholders can work together to mitigate vulnerabilities and address shortfalls in a consistent framework. They can also work together to determine the criticality of a service and prioritize the restoration process. This cannot be done solely by the government, or the private sector

alone, but only in a trusted partnership based on the understanding of interdependencies.

One of the primary reasons for the need for this ongoing cross sector dialogue is the fact that the majority of our infrastructures are owned and controlled by the private sector. The private sector is extremely adept at what it does. The government should not try to step in during a disaster and try to duplicate or improve areas outside of its area of expertise. A good example of this comes from King County, Washington. During the H1N1 pandemic in May 2009, Seattle/King County Public Health began to distribute anti-viral medications. The agency is not a pharmacy and does not have experience dispensing massive quantities of medication. Instead of attempting to take on this incredible duty, the agency simply contracted with the three largest pharmacy chains in the area to distribute the medication. Most involved felt it made sense to have the private sector do what it does best. It also allowed the county public health agency to focus on their areas of expertise and better serve the region.

Many emergency management agencies do not have programs to actively include the private sector in planning or exercises. Ultimately, however, the private sector does not always want to help a government test their plan if private companies were not at the table during the development process. The private sector and critical infrastructures must be included in all phases of the process. This will help create a shared sense of ownership and ultimately speed recovery and restoration. Failure to work together will result in stove-piped decisions resulting in long term physical and economic distress.

What is needed?

In order to develop a regional process to build resilience and intelligently restore infrastructure, a structure must be created to bring together the disparate public and private groups who keep our economy, critical services and infrastructure running. While the NIPP and several state and local plans call for developing regional partnerships, none layout a clear strategy that encourages the development of grassroots partnerships of key stakeholder organizations working with state and federal partners to identify vulnerabilities, impacts, and undertake actions to prevent and mitigate preparedness and resilience shortfalls. The key component to this process is to create opportunities to build trust and dialogue. This simply cannot take place solely on a national level with the largest employers and national infrastructure sector councils. Resilience must be developed from the bottom up, mainly because regional stakeholders rely on one another for survival. Regional economies are driven by regional businesses and infrastructures. Businesses, government, emergency responders and infrastructures are all dependent on regional services and assets. Regions are used to working together on a daily basis to do business and provide services, therefore local perspectives are

crucial in determining the criticality of an asset. Because of this, regions must include a cross sector representation of the regional economy in order to make informed decisions regarding restoration of services and infrastructure.

Many regions have trusted third parties who could assist in this process. Several non-profits and non-governmental councils exist that are made up of both public and private sector members. Cross sector regional coordination councils could be developed with the help of these trusted organizations. One of the best ways to begin this process is to work to develop cross sector seminars and workshops to explore interdependencies. This will help develop trust and encourage information sharing between sectors. Stakeholders will begin to understand the value of collaborating and will in turn work to assist in following projects and activities related to recommendations from these workshops and exercises. Once organizations begin to understand how their survival depends on other regional players, they will more readily collaborate, communicate and trust one another.

Brandon Harden brook is the chief operating officer of the Pacific Northwest Economic Region (PNWER), a statutory cross border public/private partnership consisting of five northwest states and five Canadian jurisdictions. PNWER's core mission is to address issues that impact the Pacific Northwest's regional economy. In 2001 PNWER created the Partnership for Regional Infrastructure Security and in 2006 developed the Center for Regional Disaster Resilience. ♦

More states complete disaster planning for children

by Corey McKenna, on August 20, 2010

<http://www.emergencymgmt.com/disaster/Disaster-Planning-Children.html>

Reprinted with permission from *Emergency Management* journal

More than one-third of parents reported that their children have experienced physical or mental distress as a result of the recent Gulf of Mexico oil spill, according to a survey of residents living within 10 miles of the Gulf. The survey was conducted by Columbia University's Mailman School of Public Health after the Deepwater Horizon well was capped in July. It also found that one-quarter of the 1,200 respondents thought they might have to move away from the coast, and children of those parents were three times more likely to be experiencing stress. More than one-fifth of respondents said their children spent less time playing outdoors after the oil spill.

The survey follows a 2009 report by nonprofit Save the Children that examined the major disasters of the last 10 years and their impacts on children. The

report also outlined four recommendations states could adopt to improve child welfare during disasters including: written evacuation and relocation plans; reunification plans and plans for special needs children at child-care facilities; and written multihazard plans at schools. Seven states met all four recommendations in 2009. Since then, five additional states — Mississippi, California, Wisconsin, New Mexico and Washington — have incorporated the group's recommendations into their emergency planning.

Planning for everyday disasters

Officials in Mississippi began addressing the needs of children in disasters following the devastation caused by Hurricane Katrina. In May 2006, Mississippi State University's Early Childhood Institute conducted an assessment of the state's child-care infrastructure in Katrina's wake. "As a result of that, there were things that emerged, such as there were no licensing regulations in the state for when an emergency occurs and you have no building in town to house a facility for the care of kids," said Cathy Grace, the institute's director.

Building on planning efforts for disasters where there's a degree of warning, such as hurricanes and tornadoes, Mississippi is developing plans to improve the resiliency of child-care facilities following sudden emergencies like chemical spills and broken water mains. "A lot of times we've found a lot of the child-care directors don't necessarily plan for those types of disasters," said Jill Dent, the director of the Office for Children and Youth at the Mississippi Department of Human Services. "So we're going to offer that as a training to be able to give them specific documents that would tell them exactly what they needed when they walked out the door if they were never to come back again." Dent hoped to begin the training this fall.

The Office for Children and Youth also is encouraging an estimated 5,000 to 7,000 unlicensed in-home child-care providers to register for inclusion in a statewide database, which would help officials notify them if an evacuation is necessary. She estimated that the state has registered 600 such providers so far.

States more prepared than they appear?

At least one state believes it was closer to meeting recommendations than Save the Children reported in 2009. According Amy Blondin, communications manager for the Washington State Department of Early Learning (DEL), the agency had met the nonprofit's recommendations in 2009, but that was not reflected in the group's report until 2010.

Bob McClellan, DEL's assistant director for licensing oversight, said the state's administrative code has contained requirements for evacuation and reunification of children in disasters since 2009.

Save the Children spokeswoman Erika Viltz said via e-mail that the company that conducted the survey drew its conclusions from a review of the state's administrative law. That review showed Washington's regulations governing child-care centers met the group's recommendations in 2009, while family home day-care facility regulations did not. The 2010 review showed regulations for both sets of facilities were in line with the group's recommendations, she said.

Any of the 38 states that have not met each of the group's recommendations may be in a similar situation.♦

2011 submission deadlines for *TsuInfo Alert*

January 20
March 21
May 20
July 21
September 19
November 18

The deadline for Alaska Emergency Management's submission of material for the December 2010 issue is December 3, 2010. Please submit material as WORD documents.

The Hazards Data Distribution System is updated

After a major disaster, a satellite image or a collection of aerial photographs of the event is frequently the fastest, most effective way to determine its scope and severity. The U.S. Geological Survey (USGS) Emergency Operations Portal provides emergency first responders and support personnel with easy access to imagery and geospatial data, geospatial Web services, and a digital library focused on emergency operations. Imagery and geospatial data are accessed through the Hazards Data Distribution System (HDDS). HDDS historically provided data access and delivery services through nongraphical interfaces that allow emergency response personnel to select and obtain pre-event baseline data and (or) event/ disaster response data. First responders are able to access full-resolution GeoTIFF images or JPED images at medium- and low-quality compressions through ftp downloads.

USGS HDDS home page: <http://hdds.usgs.gov/hdds2/>

From: U.S. Geological Survey Fact Sheet 2010-3053, <http://pubs.usgs.gov/fs/2010/3053/> ♦

The December 2010 issue will arrive in late December.
(The Editor will be in Sydney, Australia for the month of November)

NEWS

Congratulations to new TsunamiReady communities

Florence, Oregon; Big Lagoon Community and Rancheria Indian Tribe, California; Redwood National and State Park, California; Aguadaa, Puerto Rico; Aguadilla, Puerto Rico; Ponce, Puerto Rico; Ilwaco, Washington; Shoalwater Bay Tribe, Washington are now TsunamiReady.

National Tsunami Hazard Mitigation Program, Warning Coordination Subcommittee meeting notes

from the January 26, 2010 meeting in Pasadena, California:

http://nthmp.tsunami.gov/Minutes/2010_01_26_Pasadena-img-615085105-0001.pdf

Tsunamis leave ionosphere all shook up.

"The signals of GPS satellites could be used to monitor tsunamis as they sweep across the ocean. In the most detailed study to date of the effect, scientists have shown that even though open ocean tsunami waves are only a few centimetres high, they are powerful enough to create atmospheric vibrations extending all the way to the ionosphere, 300 kilometres up in the atmosphere. The finding, the researchers hope, could hugely improve tsunami early-warning systems."

To read the full report by Richard Lovett visit:

(<http://www.nature.com/news/2010/100914/full/news.2010.467.html>)

USFA and the International Association of Fire Fighters develop best practices for emergency vehicle and roadway operations safety

Press release: August 24, 2010

USFA Media Contact: (301) 447-1853

Emmitsburg, MD – The United States Fire Administration (USFA), in partnership with the International Association of Fire Fighters (IAFF), announces the release of *Best Practices for Emergency Vehicle and Roadway Operations Safety* which highlights the results of a U.S. Department of Justice, National Institute of Justice (NIJ) supported initiative to enhance emergency vehicle and roadway operations safety for firefighters and law enforcement officers.

"With vehicle crashes and emergency responders being struck on the roadway being a major cause of on-duty fatalities, it is important for all first responders to avail themselves of these programs to reduce this tragic cause of death," said Acting U.S. Fire Administrator Glenn A. Gaines. "We are grateful for the U.S. Department of Justice's support of this emergency vehicle and roadway safety initiative which benefits the fire service and law enforcement alike."

"The number of law enforcement officers and firefighters killed in vehicle crashes and as the result of being

struck by vehicles as they work at the roadside is disturbing and unacceptable,” said IAFF General President Harold A. Schaitberger. “The purpose of this program is to provide information to all emergency responders that will make their jobs safer.”

The goal of this project is to provide a basic guide for all law enforcement officers and firefighters to improve their level of safety at work. The document discusses training, policy development, education, and technology to enhance emergency vehicle and roadway safety operations.

Best Practices for Emergency Vehicle and Roadway Operations Safety is available on the IAFF’s website: <http://www.iaff.org/hs/EVSP/guides.html>

Further information on USFA’s emergency vehicle and roadway operations safety projects may be found on the USFA’s website: <http://www.usfa.dhs.gov/fireservice/research/safety/vehicle-roadway.shtm>

The new 911: Social media seen as emergency option, ready or not

Love it or hate it, social media is changing the way we communicate, even in emergencies. And according to a recent Red Cross Poll, emergency responders better start loving it. The poll, which surveyed more than a 1,000 people, found one in five would turn to social media for help if they weren’t able to reach 911—and 74 percent of those would expect a response in less than an hour.

Social media has been both extolled and vilified as an emergency management tool for some time now, but no clear victor has emerged. The Red Cross poll may indicate the public has moved beyond that debate. They simply expect emergency agencies to be down with the latest technology.

“The social web is creating a fundamental shift in disaster response—one that will ask emergency managers, government agencies and aid organizations to mix time-honored expertise with real-time input from the public,” American Red Cross President Gail McGovern stated in a press release. “We need to work together to better respond to that shift.”

So far, much of the conversation around social media and emergency management has focused either on how agencies can leverage the communication capacity of applications such as Facebook and Twitter or how they can use the aggregated information from those sites to better respond to emergencies.

In general, social media, paired with traditional communication channels, are seen as an acceptable way to get the word out. Many agencies have Twitter accounts where they post alerts and there are many campus and citywide systems, such as AlertDC, set up to text users in emergencies. The burgeoning mediums can also be used to receive information. The U.S. Geolo-

gical Survey and the National Weather Service both have programs where user reports on events such as earthquakes and tornadoes are analyzed by scientists to recreate an “on-the-ground” perspective.

What’s missing—and what the survey indicates is needed—is a direct connection to responders during any emergency. Despite the fact that many emergency social media sites **specifically state** that visitors should not report emergencies via that medium, the Red Cross poll showed 69 percent of respondents thought agencies should be monitoring their social streams for calls for help.

“The first and best choice for anyone in an emergency situation is to call 911,” McGovern stated. “But when phone lines are down or the 911 system is overwhelmed, we know that people will be persistent in their quest for help and use social media for that purpose.”

The Red Cross commissioned the online poll—which includes information about respondents’ social media familiarity and use and across age groups—in preparation for its Emergency Social Data Summit today. The summit will include discussions on the handling of emergency calls made via social media. Those interested can follow up online by a variety of methods.

From: Disaster Research 551, August 12, 2010

Statim Tsunami Shelter System

Here’s a new plan for tsunami survival (and storm or tornado use, too)..interconnected modules. <http://www.slideshare.net/dbcorp/statim-tsunami-shelter-system>

The 5-minute YouTube video: <http://www.youtube.com/watch?v=cmVOna-v98M>

Massive glacier triggers ‘tsunami’ in lake [Peru]

Yes, readers, the author of this news item meant seiche, not tsunami. If you’re curious about this April 11, 2010 event, check out <http://www.foxnews.com/scitech/2010/04/13/massive-glacier-triggers-tsunami-lake/>.

How tsunami warnings fail, and how to fix them

An analysis by Michael Reilly, from May 6, 2010, explaining why tsunami warnings are confusing.

From: <http://news.discovery.com/earth/how-tsunami-warnings-fail-and-how-to-fix-them.html>

PUBLICATIONS

Asian Disaster Management News

TsuInfo Alert mentioned this publication in volume 2, no. 3, page 11, 2000. It merits another mention to alert new NTHMP members to its existence and value. “Each issue presents a theme article on common issues that emerge in design and management of reconstruction

programs, features brief case studies from Asia, and provides information resources, both on the Web and in print.” All the issues are online, back to 1997, at <http://www.adpc.net/v2007/IKM/ASIAN%20DISASTER%20MANAGEMENT%20NEWS/Default-NEWS.asp>

Science of Tsunami Hazards

Volume 29 Issue No. 2, Aug/Sep., 2010

<http://tsunamisociety.org/STHV029N2Y2010.pdf>
(17 MB)

In compressed format:

<http://tsunamisociety.org/STHV029N2Y2010c.pdf>
(5.2 MB)

Individual Abstracts of Volume 29 No 2 (Aug/Sep., 2010) can be seen at:

<http://tsunamisociety.org/292Abstracts.html>

Individual Papers and entire journal can be seen or downloaded in pdf format from:

<http://tsunamisociety.org/OnlineJournals10.html>

Tsunami preparedness along the U.S. West Coast (video)

U.S. Geological Survey General Information Publication 105, filmed and edited by Kurt Loeffler and Justine Gesell in 2010, in cooperation with the California Emergency Management Agency, Oregon Department of Geology and Mineral Industries, Washington Emergency Management Division, Marin Office of Emergency Services and Pacific Gas and Electric Company. <http://pubs.er.usgs.gov/publication/gip105>

Tsunami preparedness in California (video)

U.S. Geological Survey General Information Publication 91, filmed and edited by Kurt Loeffler and Justine Gesell in 2010, in cooperation with the California Emergency Management Agency and Pacific Gas and Electric Company.
<http://pubs.er.usgs.gov/publication/gip105>

Guidelines for design of structures for vertical evacuation from tsunamis

FEMA publication P646,
<http://www.fema.gov/library/viewRecord.do?id=3463>

Vertical evacuation from tsunamis: A guide for community officials

FEMA publication P646a,
<http://www.fema.gov/library/viewRecord.do?id=3808>

Tsunami Evacuation Building Workshop, September 28-29, 2009, Cannon Beach, Seaside, and Portland, Oregon

Oregon Open-File Report O-10-02, released February 16, 2010.

On September 28th and 29th, 2009, the Cascadia Region Earthquake Workgroup held the first ever regional workshop that addressed tsunami vertical evac-

uation as a new means to protect people and improve community recovery. This two-day workshop included participants from the Pacific Northwest, California, Hawaii and British Columbia.

WEBSITES

http://www.pdc.org/PDCNewsWebArticles/2010/iTunes/disaster_alert.htm

Pacific Disaster Center Disaster Alerts

If you have an iPhone or iPad, you have a direct line to minute-by-minute disaster information from around the world, including maps, disaster status, and links to more information. The Pacific Disaster Center has created a free app that uses the DisasterAWARE system to keep you informed. Visit the PDC Web site for screenshots and downloads.

From: Disaster Research 551, August 12, 2010

<http://www.ready.gov/america/getakit/index.html>

You may need to survive on your own after an emergency. This means having your own food, water, and other supplies in sufficient quantity to last for at least 3 days. Local officials and relief workers will be on the scene after a disaster, but they cannot reach everyone immediately. You could get help in hours, or it might take days. In addition, basic services such as electricity, gas, water, sewage treatment, and telephones may be cut off for days, or even a week or longer.

<http://www.ready.gov/america/makeaplan/index.html>

Your family may not be together when disaster strikes, so it is important to plan in advance: how you will contact one another; how you will get back together; and what you will do in different situations.

<http://www.ready.gov/america/getakit/kit-print.html>

Emergency kit supply list, which emphasizes the basics of survival: fresh water, food, clean air and warmth.

<http://www.1105newsletters.com/t.do?id=5840314:10445340>

5 ways to use social media for better emergency response

More people now use social media tools to report emergencies or call for help, and they expect government response agencies to be actively engaged in using the technology, too.

From: State and Local IT Update, Sept. 9, 2010

<http://www.nhrl.unsw.edu.au/>

The homepage of the Australian Tsunami Research Centre, Natural Hazards Research Laboratory “The Australian Tsunami Research Centre and Natural Hazards Research Laboratory (ATRC-NHRL) is a global leader in tsunami research and natural hazards. The centre com-

prises 18 senior researchers and PhD students examining hazard processes such as earthquakes, tsunamis, volcanic eruptions, landslides, climate change and tropical cyclones and storms.

The ATRC-NHRL uses an innovative coupled human-environment systems' framework to explore the mechanics of hazard processes, their frequency-magnitudes and distributions and the impacts of natural hazard processes on biophysical and human socio-economic systems. This centre is unique in the Australasian region in that it utilises the combined skills of geologists, geographers, engineers, sociologists, policy scientists and ecologists to gain a holistic understanding of the hazards phenomena.

The work of the ATRC-NHRL is globally relevant as research is being used to inform new emergency risk management policy in Australia, Australasia, NW Europe and the USA. Senior staff are recognised global leaders in their fields of expertise. Significant opportunity exists to build further collaboration with research scientists and centres of excellence around the world."

<http://www.geoplatform.gov/>

The Geospatial Platform is an effort by the Federal Geographic Data Committee to provide applications and information to the public (and "geo-enable the business of government") by compiling data from multiple agencies. Early results of the project, which launched in April, can be seen in an interactive tool for the Gulf Oil Spill that maps spill trajectory, research ship location, shipping closures, and other data.

From: Disaster Research 550, July 22, 2010

<http://allhazards.blogspot.com/>

All Hazards Blog

From fires to earthquakes to how to pick the right weather radio, the All Hazards Blog has a wide range of entries that will come in handy to anyone interested to keeping up with hazards—or out of their way. Created by Indiana University Informatics Professor and EMT David Wild, the blog taps his interest in how to best use technology and information in disasters, while pointing to preparedness tactics useful for everyday folks.

From: Disaster Research 552, Sept. 9, 2010

<http://www.phe.gov/preparedness/pages/default.aspx>

Public Health Emergency

The U.S. Department of Health and Human Services has aggregated a vast array resources that apply to public health emergencies and preparedness—chances are if you're an emergency responder, medical worker, government official, nonprofit organizer, emergency manager, or anyone else who might be working for the public during a health emergency, you'll find a treasure trove of information for your particular niche.

From: Disaster Research 552, Sept. 9, 2010

<http://ch16.org/>

Ch16.Org

Channel 16—a name taken from the frequency of an international distress signal—is a collaboration aimed at delivering humanitarian and crisis news on the ground. Billing itself as a frontline for response, the site has a variety of tools for reporting eyewitness accounts of events and resources on how to take action.

From: Disaster Research 551, August 12, 2010

[http://ioc-](http://ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=3354)

[unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=3354](http://ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=3354)

Tsunami signage reports are included in these 2 documents:

- 1) Fifth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-V) March 15-17, 2010
- 2) Fourth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions June 2-4, 2009

EXERCISES

December 7-8, 2010

U.S. Federal and Puerto Rico Commonwealth Agencies Continuity of Operations Plan (COOP) exercise.

The scenario of MAREMOTO I will be based on a tsunami generated by the partial collapse of the Cumbre La Vieja volcano in the Canary Islands. This exercise is being coordinated by FEMA Caribbean Area Division Office.

E-mail from Christa von Hillebrandt-Andrade, Sept. 21, 2010

March 23, 2011

CARIBE WAVE11/ LANTEX11

The annual (2011) NTHMP tsunami exercise in the Atlantic is being combined with the first-ever international Caribbean tsunami exercise.

The exercise roughly parallels the 1867 Virgin Islands tsunami and will take place on March 23, 2011.

A draft Handbook is being circulated and will be finalized after Sept. 30, 2010. Thanks to Christa von Hillebrandt, Bill Knight, and James Waddell (WCATWC) for putting the exercise together.

E-mail from Paul Whitmore, Sept. 7, 2010

The 28 states and territories are invited to participate. The organizing agencies include the UNESCO IOC Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and adjacent regions, the U.S. National Tsunami Haz-

ard Mitigation Program, and the NOAA NWS Caribbean Tsunami Warning Program.

E-mail from Christa von Hillebrandt-Andrade,
Sept. 21, 2010

CONFERENCES/TRAINING

October 27, 2010

26th annual Disaster Preparedness Academy of the Orange County Red Cross. "Prepare for Impact—Trained. Empowered. Prepared." Anaheim Convention Center, 7:30 AM to 4:30 PM. The program includes a tabletop exercise, 22 workshops, and keynote speakers. <http://www.oc-redcross.org/show.aspx?mi=4614>.

October 29 to November 4, 2010

IAEM 58th Annual Conference 2010, International Association of Emergency Managers; San Antonio, TX

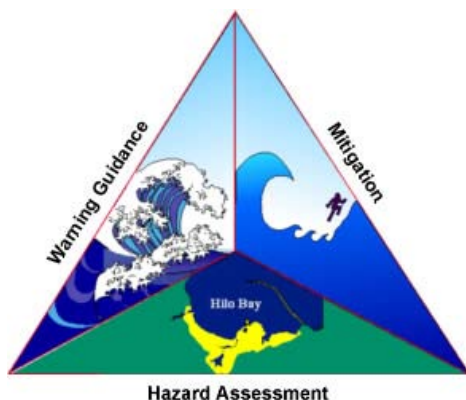
This conference will be a forum for ideas on current trends, topics, and the latest emergency management tools and technology.

From: Disaster Research 551, August 12, 2010

July 9-12, 2011

Plan now on joining us (University of Colorado, Boulder, Natural Hazards Center) for the 36th Annual Natural Hazards Research and Applications Workshop from Saturday, July 9, through Tuesday, July 12, 2011. The Workshop will again be held at the Omni Interlocken Resort in Broomfield, Colorado, and will be immediately followed by the IRCD Researchers and NHMA add-on meetings, both of which will run through Wednesday, July 13.

The Workshop is still an invitation-only event, so if you're not already on the list and think you've got something to contribute, please request an invitation by emailing Diane Smith. Also, keep an eye on *DR [Disaster Research]*—we'll be opening our suggestion page for next year's Workshop before you know it. ♦



Material added to the NTHMP Library

September – October 2010

Note: These, and all our tsunami materials, are included in the online (searchable) catalog at <http://www.dnr.wa.gov/ResearchScience/Topics/Geology/PublicationsLibrary/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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STATE EMERGENCY MANAGEMENT OFFICES
updated 3-31-2006

Alaska Dept of Military & Veteran Affairs
Division of Homeland Security & Emergency
Mgmt.
PO Box 5750
Fort Richardson, AK 99505-5750
(907) 428-7000; toll-free 800-478-2337
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
<http://emd.wa.gov>

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

ALSO:

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.cnmieo.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
Kolonias, 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

<i>Prepare in a Year</i>	
Don't forget... Choose one hour each month to complete the designated activity and write it on your planning calendar.	
Month #1 Activity: Develop an Action Plan	Month #2 Activity: Out of Area Contact Card
Month #3 Activity: Storing Water	Month #4 Activity: 72-hour Comfort Kit
Month #5 Activity: Important Documents	Month #6 Activity: Extended Events
Month #7 Activity: Under the Bed Items	Month #8 Activity: Utility Safety
Month #9 Activity: Drop, Cover, Hold	
From Washington Emergency Management Division http://www.emd.wa.gov/preparedness/prep_infocus.shtml	

Alert the masses—The evolution of mass notification

By Frank Mahdavi

Disaster Recovery Journal, v. 23, no. 2, p. 41-42.

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Part 1: Events that heralded the need

The Cold War. Electronic mass notification gained prominence in 1963 when the U.S. government implemented the Emergency Broadcast System (EBS) to quickly warn the entire population of any emergency. In that era, school children routinely participated in nuclear bomb safety drills, and many of us recall a voice declaring over the television or radio, “This is a test of the Emergency Broadcast System. For the next 60 seconds...this is only a test,” followed by a loud, one-minute tone.

That system was replaced in 1997 by the Emergency Alert System (EAS), designed to enable the President of the United States to speak to the entire country within minutes. The EAS also relies on TV and radio, but includes analog, digital, terrestrial, and satellite broadcast. EAS is effective for reaching a very large geographical area, but it isn’t flexible enough to target a specific area such as a county, city, or neighborhood.

Localized catastrophes during the past two decades and the adoption of many additional communication modes have increased the need for a new class of mass notification systems that can effectively warn many people at once in a specific affected area using the latest communication channels. For most of the world, Sept. 11, 2001, was the wake-up call. But for the Department of Defense, the wake-up call came a few years earlier in the form of a truck bomb.

1996: DOD’s wakeup call in Saudi Arabia. On the evening of June 25, 1996, a fuel truck drove up to a U.S. Air Force base in Saudi Arabia, parking near Khobar towers, a housing complex on the base. A few men got out of the truck and escaped in a getaway car. Sentries on the roof quickly identified the truck as a bomb, reported the threat to Central Security Control (CSC), and started evacuating the building, knocking on doors and calling out warnings. Meanwhile, CSC started the process of activating the base’s “Giant Voice,” a loudspeaker system used to issue voice or siren alerts across the entire base. Unfortunately, the process was so awkward and complicated that Giant Voice could not be turned on in time. The sentries could only evacuate three floors before the bomb went off, ripping through the building with a force estimated at nearly 20,000 pounds of TNT. While the sentries saved many lives with their efforts, 20 men were killed and nearly 400 were injured.

In his analysis of the incident, published in July 2007, Secretary of Defense William S. Cohen coined the phrase “mass notification,” noting that measure such as knocking on doors and word-of-mouth were “...not a substitute for an automated mass notification system.” This incident was the impetus for the Department of Defense authoring its pioneering document in 2002, “DOD Minimum Antiterrorism Standards for Buildings,” which defines mass notification as “...the capability to provide real-time information and instructions to people, in a building, area, site, or installation using intelligible voice communications including visible signals, text, and graphics, and possibly including other tactile or other communication methods.” The DOD realized that the old way of doing things—manual phone trees, manual one-way e-mail blasts, paging, and word-of-mouth—were woefully inadequate to the task of emergency notification, and that an automated solution using a wide variety of communication modes was needed. Soon the rest of the world would realize the same.

2000-2009: One catastrophe after another. The past decade has had more than its fair share of terrorist bombings and natural disasters that underscore the need for automated mass notification:

- Sept. 11, 2001—Terrorists attack the World Trade Center in New York City and government buildings in Washington, DC
- 2004—Madrid train bombings
- 2004—Tsunami in Southeast Asia
- 2005—Hurricane Katrina
- 2005—London Underground public transport bombing
- 2007—Virginia Tech campus shootings
- 2008—Deadliest tornado and hurricane outbreak in 23 years
- 2009—H1N1 influenza global pandemic outbreak
- 2010—Haiti earthquake

In every case, an automated, rapid, two-way mass notification system able to reach many people at once on multiple communication modes—such as cell phone, landline, e-mail, text message, page, fax, TTY for the hearing impaired and BlackBerry PIN-to-PIN—could have helped save lives and reduce confusion in the midst of these calamities. In particular, two of these events changed the way we think about public safety and business continuity. During the 9/11 attack on the World Trade Center, a mass notification system would have been instrumental in guiding people to safety and coordinating the efforts of public safety personnel before and after the towers collapsed. It also would have helped those

companies with offices in the towers to better communicate with their employees to monitor their status, provide support, assess their business situation, and activate recovery plans.

The Virginia Tech campus shootings, in which a lone shooter killed 32 people and injured many more, was also a major catalyst, serving as the clarion call to educational institutions nationwide to immediately implement mass notification systems to keep students safe and parents informed during critical, fast-moving situations.

Part 2: Technological path to mass notification

1980s and 1990s. In the 1980s, notification consisted of point-to-point, one-way e-mails and pages, with e-mail only working within closed corporate networks. The early 1990s saw the introduction of e-mail for the masses, but only with subscription services such as Prodigy, CompuServe, and AOL, at dial-up speeds. Meanwhile, computer-generated text-to-speech was so primitive as to be completely impractical except for the most cryptic alerts, used primarily by corporate IT personnel for network maintenance issues. And standards for handling voice dialogues between humans and computers didn't yet exist, making it difficult to develop notification systems that could interact directly with people using speech. At the same time, telephony infrastructure was expensive and bandwidth was limited, meaning, one could only make a few outgoing calls at a time.

The 1990s saw significant advances in Integrated Services Digital Network (ISDN) and T1 technology, dramatically decreasing the cost of telephony ports while increasing the capacity of trunk lines. By the year 2000, costs and capacities were at a point that sending an urgent message with thousands of simultaneous phone calls became practical and cost effective. E-mail had also advanced to become a universal communication medium, making it practical for reaching many people quickly.

2000s: The confluence of enabling technologies. As the need for effective mass communication intensified throughout the last decade, technologies have emerged that make such solutions possible. Chief among them are VXML, improved text-to-speech, SMS, and Web 2.0.

VoiceXML (or VXML)—Introduced in 1999, the Voice Extensible Markup Language is an XML format for adding tags to voice data so that a computer will know how to present and process this data. Just as HTML allows you to view and interact with documents using a Web browser, keyboard, and mouse, VXML lets you use a voice browser to listen to a pre-recorded or computer-synthesized voice, and to provide input through your spoken voice or with DTMF (Dial Tone Multi Frequency) tones from a telephone keypad. VXML paved the way for mass notification systems to take any message and accurately convey it as speech to human recipients and to correctly interpret and play back audio inputs received from people—all instantly, and all without special custom programming to enable it.

Improved Text-to-Speech—Speech synthesis in 2000 was primitive, choppy, and alien sounding. Since then, speech synthesis has improved so much that many people actually find the synthesized voice easier to understand than a recorded human voice. Combined with VXML, it is now practical to type messages and transmit them as voice using a mass notification system.

SMS—Short Message Service, or text messaging became available for common use in 2000. Over the course of the past decade, SMS usage has grown to billions of messages sent daily. With global cell phone adoption now in the billions, SMS has become a critical “unobtrusive” mode for quickly reaching people. Schools in particular rely on SMS since the majority of students use cell phones and SMS almost exclusively. (As of this writing, SMS should still be used in tandem with other communication modes, because the wireless infrastructure is not yet optimized to guarantee immediate delivery of SMS messages.)

Web 2.0—The shift from the so-called Web 1.0 of the 1990s and early 2000s to Web 2.0 was a game changer. Web 1.0 was static; early Web pages contained text and graphics, links to more pages, and simple forms for inputting. Web 2.0 is a paradigm shift, replicating the desktop application user experience online and providing rich interactivity to users worldwide. Web 2.0 enables mass notification systems to be hosted online as Software as a Service (SaaS), or “cloud computing,” meaning they can be accessed via any Internet-connected device. SaaS also makes mass notification technology cost-effective, as the cost of the infrastructure can be spread among a near-infinite number of users. Web 2.0's interactivity makes it easy for administrators to configure and use their mass notification systems and for registered recipients to keep their contact data current by simply logging in. People can also use a Web 2.0-enabled mass notification system to report their status to their employers or the authorities by logging in through any Internet browser. In addition, Web 2.0 technology allows Web-hosted mass notification systems to provide real-time reporting of communications in progress, including who's received notification, when, on what communication devices, and how they responded—all vital information during a critical event.

Part 3: New uses of mass notification technology

The events of the 1990s and 2000s have made clear the need for automated, rapid, two-way mass notification systems, and subsequently, many government agencies, municipal public safety departments, and educational institutions worldwide have implemented such systems.

At the same time, enterprise risk management and business continuity have matured as core corporate disciplines, with mass notification playing a key role in ensuring employee safety and carrying out continuity and recovery plans. Companies large and small, global and regional, have started using mass notification systems, representing numerous industries including manufacturing, retail, financial services, transportation, energy, food service, and healthcare. This trend will continue to grow as more and more companies implement risk and emergency management as vital parts of their businesses.

Mass notification systems also play a critical role in helping IT departments maintain network uptime, instantly alerting IT staff when there is a network outage or urgent help desk issue. The important of this cannot be overstated, as much of the world depends on IT uptime, and every minute of downtime can result in significant lost revenue and interruption of important services.

In addition, many organizations have realized that their mass notification systems can provide real productivity gains in their daily operations, greatly increasing the return on their investment. Examples include:

Supply chain logistics—inventory levels, shipment schedules and delays, routing of shipments

Transportation—staffing, scheduling, and coordination of drivers and pilots

Employee communications—staffing and scheduling, updates to benefits and HR policies, news and events, executive messages, facilities management

Retail—pricing and product updates to distributors and outlets

Marketing—marketing promotions, ad hoc customer surveys

CRM—billing and late payment notices, product and services updates

Sales management—updates to offerings, pricing and promotions, polling and real-time reports from sales people in the field

Event management—coordination of staff, venue and scheduling changes, attendee polling, and event announcements.

The uses for mass notification will only continue to expand in the coming years for public safety, risk and emergency management, as well as daily operations. What began as a tool to keep people safe in a localized area can provide myriad benefits to people and organizations worldwide.

Author Frank Mahdavi, chief strategy officer for MIR3, Inc., has fulfilled strategic roles in the software engineering and telecommunications industries for nearly three decades. For the past eight years at MIR3, Mahdavi has been responsible for tracking and analyzing mass communication technology and market trends. ♦

INFREQUENTLY ASKED QUESTIONS

What are vertical evacuation buildings?

A vertical evacuation structure is a building or earth mound that is specially designed to resist earthquake and tsunami forces, and its height allows people to evacuate above the level of tsunami inundation. The main purpose of vertical evacuation structures is to provide protection during a tsunami. These buildings are especially important where high ground does not exist or where local earthquake sources do not allow people enough time to evacuate, between the moment when an earthquake strikes and the time when the first tsunami wave reaches the shore. Vertical evacuation structures are a fairly new concept that has proven effective; some survivors of the 2004 Indian Ocean tsunami were saved because they evacuated to multi-story reinforced concrete buildings.

From: <http://www.geohaz.org/projects/sumatra.html>

What is the estimated rupture length of a Cascadia subduction zone 9.1 earthquake; and is there a tsunami animation simulating this type of event?

The earthquake scenario depicted in these animations is a magnitude (Mw) 9.1 Cascadia Subduction Zone event (Priest et al., 1997 and Myers et al. 1999). This event's primary features are a rupture length of approximately 1050 km, average rupture width of 70 km, and slip of 17.5 m. More information and animations at <http://nctr.pmel.noaa.gov/animate.html> ♦

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.

NEW Tsunami preparedness in Washington; version 1.0. 32-min. DVD.

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 Folk tale (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. ♦

