TsuInfo Alert

prepared by the Washington State Department of Natural Resources on behalf of the
National Tsunami Hazard Mitigation Program
a state/federal partnership funded through the National Oceanic and Atmospheric Administration (NOAA)

Contents **Volume 11, Number 1 February 2009**

Social media and the Democratic Convention

What happens when Web 2.0 meets the "official version?"

by Jeannette Sutton, Natural Hazards Center, University of Colorado

from: *Natural Hazards Observer*, v. 33, no. 2, p.7-9
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The world has gone a-Twitter. And a-Flickr. And you-Tube'n.

Micromedia, new social media, Web 2.0--call it what you like. Peer-to-peer information and communication technologies are changing the way information is shared in a disaster. These new technologies, both online and mobile, include such things as social networks like Facebook and MySpace, photo sharing through Flickr, video sharing through YouTube, and microblogging with Twitter. In this article, we discuss how new social media have been used in recent crises and disasters, and the ways that the public information officers monitored information online during the Democratic National Convention in Denver.

Social media are a new phenomenon, but their growth has been extraordinary. Twitter (twitter.com), for instance, was founded in March 2006, emerging in only a couple of years to become one of the most popular sites on the Internet (the number of Twitter users isn't published officially, but could be as high as 15 million). Facebook (www.facebook.com) was founded in February 2004 as a network for college students, but has grown into a favorite online destination of multigenerational Web surfers. It has 110 million users, making it the fourth most-trafficked Web site in the world. Other sites such as YouTube, Flickr, and MySpace, have entered the daily vocabulary of the Web-savvy entertainment seeker, news hound, and office-bound procrastinator.

The relevance of these new media to emergency management is their ability to support real-time reporting of events happening on the ground. Recent research on the uses of peer-to-peer communication in disaster has revealed striking patterns of collective behavior that are becoming important for the practice of emergency management, especially the functions of information gathering, retrieval and dissemination of risk information, and situational awareness.

The school shooting at Virginia Tech in April 2007 was a community-wide tragedy that provoked international interest. As members of the public converged online to offer their prayers and condolences, the students used their trusted online social networks on Facebook to conduct health and welfare checks. Within days of the disaster, researchers began to collect data on the channels and flow of information during the event, revealing examples of concentrated and earnest collective intelligence enabled by new social media. For example, students and other volunteers participated in a coordinated online effort using Facebook to correctly identify the names of all the deceased victims before the university released that information (Palen *et al*. 2007).

Investigation into the sources and uses of information and communication technology during the 2007 Southern

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California wildfires also revealed important patterns of public involvement. Individuals with local knowledge monitored news activity online, often providing corrections to misinformation (Sutton *et al*. 2008). During this same disaster, one local news and information website, rimoftheworld.net (www.rimoftheworld.net), became the go-to-source of information for local residents, as well as emergency responders and local public officials. Rimoftheworld founder Scott Straley says that the site went from an average of 300,000 page views a week to nine million during the weeklong evacuation of the area affected by the fires.

Using a small staff of employees and many volunteers, they monitored back-channel* communications such as scanners and "word-of-mouth" social networks. Combined with their pre-established online presence, rimoftheworld.net was able to keep people up to date about the fires (Shklovski *et al*. 2008). "We developed a system that could keep residents informed in near real-time with the progress of the fire fight," say Straley.

Unfortunately, even as peer-to-peer communication technology enables information exchange in times of disaster, back-channel communications are suspect in the eyes of emergency managers. To some, information sharing through online social networks and other social media is viewed as uncontrolled and uncoordinated. For those reasons, some emergency managers believe that some unconfirmed information is likely to be rumor-driven and rife with inaccuracies. Misinformation could lead to misunderstandings about the situation, confusion about official orders for public protection, misdirected resources, and in the direst circumstances, may exacerbate the situation and lead to loss of life or property.

Empirical studies on peer-to-peer communications in disaster, such as those cited above, show that these concerns, while valid, may be overstated. For instance, during the Virginia Tech tragedy, communications between members of Facebook groups was found to be extremely well coordinated. Individuals took turns monitoring and verifying one another's postings. Not one name posted by this distributed group was inaccurate. (Vieweg *et al.* 2008). During the 2007 Southern California wildfires, many of the people who participated in back-channel communications did so because of a perceived dearth of information from official sources; information which was necessary for making key life-safety decisions. They also contributed their local knowledge to correct the misinformation disseminated by public officials and network news (Sutton *et al*. 2008). Instead of generating rumor and misinformation, these online volunteers, enabled by technology, offer a viable fact-checking service that can be harnessed in future events to strengthen situational awareness.

Some emergency managers are eager to learn more about the potential applications of new social media in disaster and crisis situations and are working with local policy makers and information technology departments to remove the filters from some social media Web sites that are traditionally blocked to government employees. Just this past August, in preparation for the Democratic National Convention, the Office of Emergency Management for the City of Denver recognized the potential benefits that might come from accessing new social media and put into place plans to monitor public sentiment online. Public information officers (PIO) served as the test case for using Web 2.0 technologies.

Stationed in a newly remodeled Joint Information Center (JIC), PIOs developed a consistent message across all agencies, answered media inquiries, and investigated and corrected instances of information inaccuracies. This third task largely consisted of online monitoring of news and commentary about protest groups, public demonstrations, police activity, arrests, and the activities of city officials. PIOs engaged in regular communications with their counterparts in the Emergency Operations Center, various city departments, and federal officials located at the Multi-Agency Communication Center nearby.

During the week of the Convention, a team of researchers led by the Natural Hazards Center was embedded in the JIC to observe the information retrieval and sharing activities of PIOs. A second team of researchers from the University of Colorado Department of Computer Science observed patterns of user traffic on a number of online sites.[1]

Throughout the event, there was a significant increase in traffic through mobile communications devices and online. For instance, Verizon Wireless reported a 16-fold increase in wireless calls, text messages, picture and video messages, Internet connections, and other wireless traffic on cell sites serving the Denver area on the night Barack Obama accepted his party's presidential nomination. In addition, thousands of videos and photos were posted to YouTube and Flickr, and there was an increase in activity on Twitter and Facebook during the week of the DNC. In spite of this, researchers observed a lack of focused attention to new social media in the JIC during the week-long event. While PIOs were regularly engaged in online searches for news reports about the convention and the city's involvement in public safety activities, they mainly did so by viewing official online news sites produced by local news stations and some political blogs; other social media were rarely accessed.[2]

Given the efforts required to enable access to traditionally restricted sites, such as those designed for social networking or video and picture exchange, one might consider the JIC media-monitoring activities to have been too narrowly focused. The city plans for the external affairs function during the DNC detailed the PIO tasks for information retrieval and dissemination with little instruction on how to utilize new social media beyond the most basic activities, such as scanning for event-related infor-

mation on the more widely read official news sites. Providing access to these new resources does not necessarily mean that those responsible for public safety will monitor or use it as part of their daily operations.

Many questions remain, however, about how PIOs could have routinely engaged in Twitter monitoring, Facebook browsing, or citizen blog reading during their downtime in the JIC. For instance, how might PIOs have sorted through the overwhelming amount of information available to them on the Internet? How would they have determined what was useful in the midst of chatter and "static"? Once potentially valuable information was recognized, how would they have verified its accuracy and where would the information have been channeled within the coordinated efforts of the Emergency Operations Center? And in the end, would members of the public who engaged in discussions on Facebook groups, posted videos, or produced Twitter streams argue that government monitoring was an invasion of their privacy? These are questions yet to be answered as government officials ponder the use of social media for disaster response and recovery.

[1] These projects are ongoing. Full reports will be made available at the conclusion of the research.
[2] FEMA external affairs officers conducted their own media monitoring and provided twice daily updates to the JIC. The sources and content of these updates are not known at the time of this writing.

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*Jeannette Sutton emailed me her definition of backchannel communications:

The term "backchannel" is used in several disciplines and thus has several definitions. In this paper, we use "backchannel" as understood in the areas of public policy, politics and law to mean a secret, unofficial, or irregular means of communications (McCarthy & Boyd, 2005). So defined, backchannel or peer-to-peer communications are positioned in contrast with the official or "formal" communications to the public. Public officials often view backchannel communications as having strong potential to spread misinformation and rumor, thereby compromising public safety. Nevertheless, with each new disaster, peer-to-peer communications through social media such as social networking sites, text and instant messaging applications, blogs, wikis and other web forums, are growing as a means for supporting additional, often critical and accurate, dissemination of information within the public sphere. Furthermore, backchannel communication tools provide the opportunity for the public to actively engage in the creation of information rather than be passive consumers (McCarthy & boyd, 2005).

From: Sutton, Jeannette; Palen, Leysia; Shklovski, Irina, 2007, Backchannels on the front lines—Emergent uses of social media in the 2007 Southern California wildfires: Proceedings of the 5th International ISCRAM Conference, Washington, DC, USA, May 2008. F. Fiedrich and B. Van de Walle, editors. ♦

See also: "Gen Y and emergency management," p. 7-10, Dec. 2008 issue of *TsuInfo Alert* and p. 17 this issue.

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http://www.ak-prepared.com/

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Mather, CA 95655
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http://www.oes.ca.gov/

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http://www.scd.state.hi.us

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http://www.oregon.gov/OOHS/OEM/

Washington State Military Dept.
Emergency Management Division
Camp Murray, WA 98430-5122
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http://emd.wa.gov/ (continued on page 5)

The NOAA Shoreline Data Website

A new resource showcases practical guidance on shoreline data and easy access to multiple data sets.

December 2008/January 2009 *Coastal Connections*

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The year was 1807, and President Thomas Jefferson saw a pressing need to map the nation's coasts. The president, who was also an experienced land surveyor, knew that coastal charts were vital to security and essential for the growth of commercial shipping. At his urging, Congress passed an act to establish a survey of the coast, an initiative that marks the birth of what later became the National Oceanic and Atmospheric Administration (NOAA).

In the two centuries since that act was passed, NOAA's leadership and a steady stream of technological improvements have enhanced the precision of shoreline maps. And accurate, accessible shoreline information and data have never been more important, as sea level rise in the coming decades is expected to bring unprecedented environmental, economic, and residential challenges to coastal communities. This realization is not lost on the nation's coastal resource managers—and in fact, a top customer request of the NOAA Coastal Services Center is for shoreline data and information.

However, shoreline data can easily be misunderstood and misinterpreted by coastal professionals new to the task. To lessen confusion and increase effective use of shoreline data, NOAA and other agencies have come together to produce a website that for the first time provides access to all NOAA shoreline information, plus data from other federal agencies.

The NOAA Shoreline Website (*http://shoreline.noaa.gov*) was developed and designed by the NOAA Coastal Services Center in cooperation with NOAA's National Geodetic Survey, Office of Coast Survey, and Office of Ocean and Coastal Resource Management, in addition to the U.S. Geological Survey and the National Geospatial-Intelligence Agency.

The website provides links to seven sources of federal shoreline data, with supporting segments devoted to frequently asked questions, common uses of shoreline data, and shoreline references and terms.

Shoreline Data: Studying the Terrain

"There are several reasons why coastal stakeholders and professionals do not always know how to apply or compare shoreline data sets," says Tara Miller, a coastal hazards specialist with the Center.

- Not every shoreline map is appropriate for every purpose. For instance, old paper-charting methods were accurate for their era, but these maps cannot pinpoint coordinates with the precision of today's technologies. The inconsistencies in maps obtained by different methods can cause confusion among users.
- The shoreline is not static. The tide is ephemeral, and coastal erosion or changes in sea level can alter the shoreline.
- The scale of a map will determine the shoreline data included. For instance, a "bird's-eye view" captured through aerial photography will record fewer shoreline miles than a map developed by walking along all the shoreline's estuaries and creeks, measuring every nook and cranny.
- Most shoreline charts contain "cartographic bias"—that is, they are developed with the end product in mind. For example, if the chart is developed for a mariner, it will be focused primarily on safe navigation.

Improving Data Access, Providing Context

To bring potential shoreline data users up to speed, the NOAA Shoreline Website features an interactive shoreline mapping time line that has received praise from a nationally recognized expert in the history of cartography.

"The site is a fantastic resource, because it introduces users to mapping technologies and sources while also placing them within a historical context," says Mark Monmonier, a distinguished professor of geography at Syracuse University and the author of *Coast Lines: How Mapmakers Frame the World and Chart Environmental Change*. "For instance, the website provides background on NOAA T-Sheets, coastal topographic maps that were compiled beginning in the 19th century and continuing on through the 1950s. The website and other efforts by the Center have improved the collection of coastal imagery and data," he adds.

Besides the federal shoreline data sources featured, "the site explains the factors that have gone into collecting federal data—the tidal element, the scale, the coverage area, the data format, and other considerations," says Miller.

Users can locate data sources by application or scale, and they can also learn about nautical chart production, shoreline change analysis, boundary determination, and other applications. "With the data and guidance on the site, we're confident that coastal professionals will find shoreline data easier to use and to apply to their agencies' needs," says Miller.

Provincial Emergency Program (continued from p. 4)
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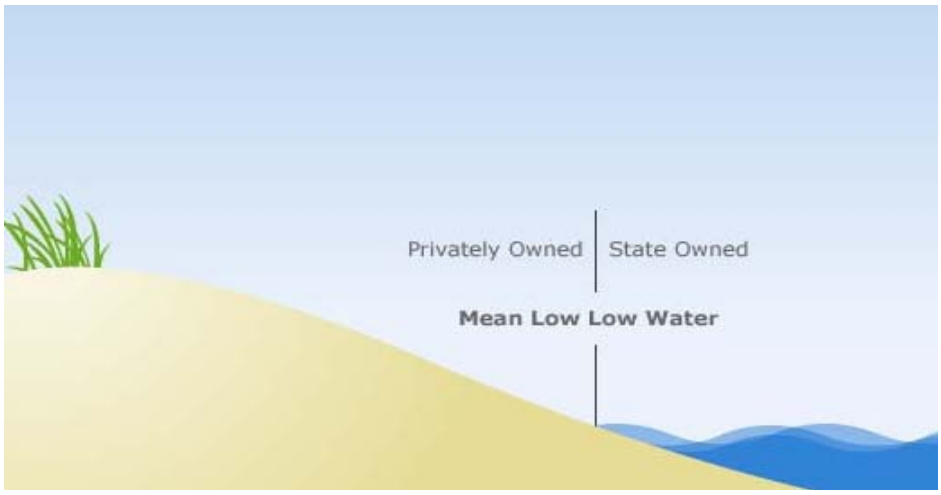
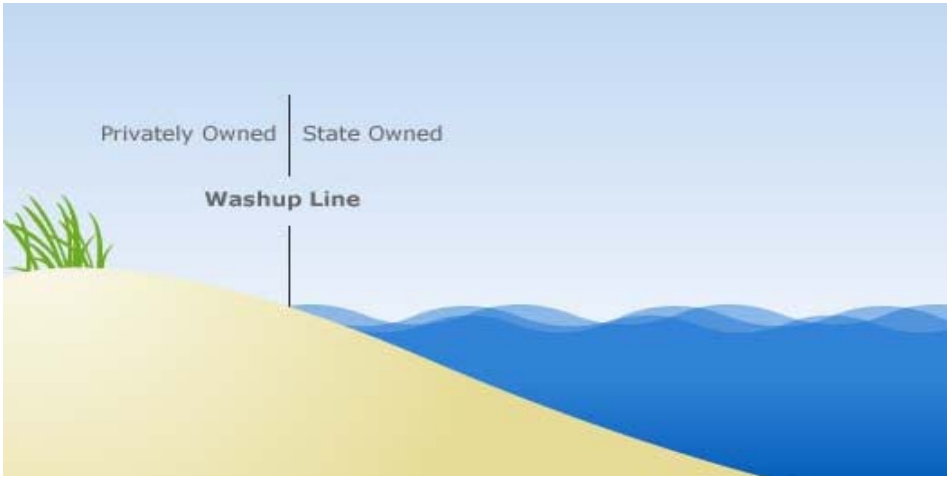
http://www.pep.bc.ca/



Delaware



Hawaii

The boundary between private uplands and state submerged lands varies from state to state, as shown in the Delaware chart (at top) and Hawaii chart (beneath). Viewers of the NOAA Shoreline Website can consult the drop-down menu in the "boundary determination" section to view the boundary for each state.

Shoreline Data Policy and Management Resources

The NOAA Shoreline Website lists a variety of planning, policy, and regulatory resources that can help coastal professionals in the management of shoreline areas:

The Public Trust Doctrine – The Public Trust Doctrine is a common-law doctrine of property law, customized by each state, which establishes public rights in navigable waters and on the shore. To learn more, visit *www.csc.noaa.gov/ptd/*.

Technical Assistance Toolbox – NOAA's Office of Ocean and Coastal Resource Management (OCRM) created the Shoreline Management Technical Assistance Toolbox as an on-line guide for state coastal managers. It provides centralized access to resources and tools to address shoreline erosion and management. View *http://coastalmanagement.noaa.gov/shoreline.html*.

Living Shorelines Portal – This clearinghouse section outlines implementation procedures for living shorelines, describes case studies, and includes many other resources and contacts. Go to *www.habitat.noaa.gov/restorationtechniques/public/shoreline_tab1.cfm*.

Marine Managed Areas: Best Practices for Boundary Making – This publication provides a short, useful "best practices" guide to writing boundary descriptions for federal, state, or local marine managed areas within U.S. waters and for developing those boundaries within a geographic information system environment. Visit *www.csc.noaa.gov/products/mb_handbook/*. ♦

EOC design consideration
By Eric Holdeman

13th Annual Disaster Resource Guide, p. 138-139
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An Emergency Operations Center (EOC) is a complex facility that serves as a nerve center during both small emergencies and large disasters. There are five primary considerations for the design and construction of a new Emergency Operations Center: Survivability, Redundancy, Communications, Flexibility and Open Architecture, and Security. These design considerations are important even if you are remodeling a building to become your EOC, or modifying and improving an existing EOC.

Survivability. It is critical that your EOC remains operational during an emergency. If you must relocate your operations to another facility without the same capacity and technology as your EOC, it can put you and your response operation at a severe disadvantage, and fighting to regain control of an event. The New York City Office of Emergency Management (OEM) experienced just such a scenario when their EOC was impacted by the attacks on the World Trade Center buildings and they had to relocate to another site.

The EOC should be located away from high hazard areas and in a survivable building. In our modern culture this may be difficult, since there are hazards—natural or technological—almost everywhere. There should be separation from highways, railroads, pipelines, hazardous materials sites, and the like. Your facility should not be in a flood plains, in an area subject to liquefaction in an earthquake, or subject to ocean storm surge from hurricanes. [Editor's note: or tsunamis].

Location of the facility is driven by many factors including space availability, political decisions, accessibility, and proximity to potential hazards. You may not have a choice of locations. You are assigned a building and space based on its availability. In this case you must take every action possible to harden the facility to survive a disaster. Examine all mitigation measures available to you. If your region is at risk from earthquakes, consider seismic retrofits to the structure. If your building is in a flood zone, store sandbags, and have high capacity water pumps on site to remove water from basements and other critical areas. Consider measures to protect staff from airborne vapor hazards by having systems in place to either filter air intakes, or to shut air handling systems down to allow for sheltering in place.

King County, Washington had their EOC in a liquefaction area. It was only because the facility had a seismic retrofit to the building that it remained functional following the Nisqually earthquake of 2001. It is an excellent example of $250K in mitigation funding paying big dividends to protect an EOC and allow for disaster response because of what "didn't" happen.

Redundancy. Redundancy is closely allied with survivability. Your facility survivability is linked to the number of redundant systems that support it. The challenge is that when designing, building and modifying a facility, redundancy is not valued. In this era of tight budgets, you can expect considerable opposition to having multiple systems backing up existing systems. It is not that hard to convince a budget person that a generator is needed for an EOC. Convincing the budget office that you need a second generator to back up the emergency generator can be another issue. Experience tells us that one thing you can count on in a power outage is that generators will fail.

Other redundant systems to consider include heating, cooling, and water supplies. We have become more technology dependent in our need to keep electronic systems cooled and functioning. In 1994, Washington state had an extremely destructive fire season. With outside temperatures over 90 degrees, the air conditioning unit in the EOC failed, causing uncomfortable working conditions for those inside. Worse than human discomfort, communications systems were almost lost, even though a new air conditioning unit was installed within 24 hours. What would have happened today with the heavier technology loads?

How much fuel and other supplies do you need on site in order to be self-contained and functional following a disaster? The national level message of three days for individuals and families is not adequate for EOCs. With a catastrophic event that includes transportation challenges it would be appropriate to plan for 7-10 days of fuel and other supplies.

Communications. The EOC exists to gain and maintain situational awareness and to coordinate the use of resources to restore operations and to recover from the impact of a disaster. To do this requires multiple communications system.

Having communications system redundancy is extremely important. Hard line phones, cellular communications, satellite phones, and multiple radio systems are all necessary to ensure continuous operations and linkage with the rest of the world. Amateur radio groups have provided communications links for decades during disasters and are still used today as backup communications to highly sophisticated radio systems. Every EOC should have amateur radio equipment and operators available to help during times when other methods of communications fail or need augmentation.

Consider having multiple communication paths for your T1 lines and other ground cable based systems. You don't want one errant backhoe to take out your entire operation. The move toVoice over Internet Protocol (VoIP) phone systems are wonderful for generating day to day cost savings. However, it exposes you to another vulnerability of having an internet outage. And, in this era of Private Branch Exchange (PBX) phone systems, it is still a good idea to have a few POTs (Plain Old Telephone) lines that run from your facility straight to the telephone company's main switch.

Even the President of the United States will turn on the television to find out what is happening. A functioning

television can help you obtain and maintain situational awareness. Television systems can be made redundant. The King County EOC has cable television, backed up by a satellite system and then an antenna on the roof if the other higher technology systems fail.

[Editor's note: The accuracy and timeliness of television information falls off in proportion to the distance the disaster event is from the producing station. In recent Lewis County flooding, the Seattle television stations dispensed a great deal of inaccurate information that was corectly reported on local radio, 100 miles south of Seattle.]

Flexibility and Open Architecture. What are the new technology systems that will be employed in the next 20-40 years? If you are building a new EOC, flexibility is one of the things that you need to consider. Design flexibility for scalable operations and also for new technology and mission requirements.

During this author's tours of many EOCs, several issues of flexibility occur frequently. Examples are:

*Space needs already exceed space availability by the time the facility is construction and occupied.

*Not planning for adequate space for technology systems and pathwasy has limited improvements in this area.

As much as possilbe, factor in future growth in staffing and technology in your design. You will need to make your case to budget staff whose only role is keeping a lid on your expenditures for the facility.

While technology systems of today are much smaller than their ancestors of 20 years ago, they still require space and cabling. No matter where the computer room is, wires must run from that location to your various work locations. Always plan for expansion when determining the diameter of your communications pipes running from the server room to administrative and operational areas.

Raised flooring is another consideration for allowing the maximum flexibility for the routing and distribution of your various communications and IT systems. The balancing aspect will once again be the cost of raised flooring over other less expensive alternatives that don't provide the same level of flexibility.

You should plan ahead for the use of all available spaces. For instance, you might have an area designated as storage. During the design phase have this space configured with systems such as electrical power and communications so that it can serve as future office space. This will allow for additional staff growth even when you are not able to get dedicated funding for it in your existing administrative spaces. Many times EOCs are not dedicated spaces, but serve as conference or training rooms during non-emergency times. Consider the use of flexible wall systems so that you can configure your space based upon needs. In some cases you will have minor emergencies and in others you may need to "grow" the facility to h andle a catastrophe.

Wide hallways allow for the movement of people quickly and efficiently. It also allows for the natural ad hoc meetings to occur as people walk through the building without blocking the operations of the facility as a whole.

Security. If you had asked people about the threat of terrorism here in the United States before the 9/11 attacks, most would have rated it significantly lower than it would be rated today. You should be considering what types of threats are emerging worldwide and not discount the fact that those types of attacks might be employed here in North America during the lifetime of the facility.

Layered levels of security are always a good route to take. You might have one level for day to day operations when the threat is lower and then increasing measures as the threat escalates.

Access control in the form of card readers, fencing, gates, security checkpoints and biometric devices might be appropriate. Cameras are cost effective measures for access control and as a deterrent to surveillance operations against your facility.

Designing the driving approach to your facility is easily done for new construction. Eliminating "running starts" and having barriers in place to stop cars and trucks from getting close to your facility are appropriate measures. EOCs located in urban areas may not have this luxury.

Protecting staff by putting blast film over windows is another consideration. Just remember that these films, while minimizing glass shattering, also block radio waves from entering your building, so some form of repeater system may be needed for your communications systems.

EOS are probably not primary targets for terrorists, but they would make excellent secondary targets for follow-on attacks, since they will be activated and full of people responding to the situation

Summary. EOCs are complex facilities that now rival hospitals in the complexity of systems that need support and the diversity of the functions that occur within their walls. When it comes to designing a facility it would be wise to use an architectural firm that is experienced specifically in EOC design. There are many pitfalls that can be eliminated by having a team of experts working to advise you and also help you make the case for survivability, redundancy, communications, flexibility and security.

About the author: Eric Holdeman, former director of the King County Office of Emergency Management, is a principal with ICF International Consulting. ♦

NWS Southern Region Director Bill Proenza (left) congratulates Lajas Mayor Marcos Arturo Irizarry Pagan during TsunamiReady recognition ceremony (Photo: Melinda Bailey, NWS)

Lajas, Puerto Rico recognized as a TsunamiReady™ community

(December 30, 2008)—Officials from the National Weather Service recognized the Municipality of Lajas, Puerto Rico as a TsunamiReady™ community. Lajas is one of only three TsunamiReady communities in the Commonwealth of Puerto Rico and the Caribbean. Located on the southwest corner of the island with a population of approximately 30,000, Lajas shares the designation with the Municipalities of Mayagüez and Dorado.

Although less than one thousand residents of Lajas live in the Tsunami Hazard zone, Lajas and its community of Parguera receive thousands of visitors from Puerto Rico and the mainland who are attracted by the many cays, fabulous snorkeling and diving, and the world famous Bioluminescent Bay. Of particular concern is the Puerto Rico Trench to the northwest. Highly susceptible to seismic activity, the Trench is the boundary between the Caribbean, North American and South American plates. Since 1848, eight tsunamis have originated there, causing more than 2,500 deaths. In 1918, a 7.5 magnitude earthquake in the Trench resulted in a tsunami that killed 140 people in Puerto Rico.

Working closely with the National Weather Service forecast office in San Juan, Lajas completed a rigorous set of warning and evacuation criteria to meet the guidelines for TsunamiReady recognition.

"While no community can be tsunami-proof, Lajas now has the means to minimize the loss of life from any future tsunami," said Bill Proenza, regional director of the National Weather Service Southern Region. "A tsunami may not strike for many generations, but it could happen next week. We now look forward to continued expansion of the program to include all Puerto Rico coastal communities and eventually all of our Caribbean neighbors."

From: http://www.srh.noaa.gov/srh/srnews/stories/2008/lajas.htm

Additional notes supplied by Christa G. von Hillebrandt:

In Puerto Rico, 44 of 78 municipalities are threatened by tsunamis. Tsunami inundation maps exist for the whole island since 2003 and Tsunami evacuation maps have been developed for four of the municipalities.

In addition to the San Juan Forecast Office of the NWS and the local emergency management office and government, the TsunamiReady activities are carried out in partnership with the Puerto Rico Seismic Network of the University of Puerto Rico and the Puerto Rico State Emergency Agency. The Puerto Rico Seismic Network is responsible for coordinating, executing and administering the funding and activities of the TsunamiReady and National Tsunami Hazard Mitigation Program activities in Puerto Rico. ♦

An Early Warning System for the Caribbean

27 August 2008

EDITORIAL – The following is an editorial reflecting the views of the US Government (Voice of America News)

It's peak hurricane season in the Caribbean Basin, a threat that is all too familiar to the millions of people living in the low-lying coastal region. Unknown to many, though, another potential hazard threatens the Caribbean, one that the United States is working hard to better understand.

Deep under the sea, cracks in the earth's crust pose an earthquake risk that could unleash massive waves, or tsunami, with devastating results, particularly for island nations such as Cuba, Haiti, the Dominican Republic and Jamaica. Little can be done to prevent such a catastrophe, but a broad monitoring system is being developed to provide an early warning and to help Caribbean nations be better prepared.

For over 40 years, an office of UNESCO, the United Nations science agency, has encouraged Caribbean states to invest in an integrated system of ocean observations to ensure sustainable coastal development and to reduce the risk of natural hazards. In 2004, the need to do more in the region was highlighted by the massive underwater earthquake in Indonesia that caused a tsunami devastating areas of Thailand, Burma and other nations around the Indian Ocean. More than 230,000 people died and hundreds of thousands more were injured or displaced.

While such disasters aren't common in the Caribbean, they aren't unique either. A tsunami struck the Dominican

Republic in 1946, killing 1,790, and a similar disaster hit Puerto Rico in 1918.

The U.S. is contributing to the establishment of a regional warning system through the transfer of technology to analyze seismic, sea level, and other information relevant to the propagation of tsunami and other coastal hazards. As part of this effort, the U.S. will deliver a tide station to facilitate training of technicians on station operation and maintenance, interpretation of the resulting data, dissemination of warnings, and ensuring appropriate community response. The International Oceanographic Commission is helping the U.S. to leverage its many contributions with that of other donors such as the World Bank, which has pledged to deliver 11 stations to the region.

From: http://www.voanews.com/uspolicy/2008-08-27-voa4.cfm ♦

Western States Seismic Policy Council (WSSPC) names 2009 Awards in Excellence winners; Kodiak Island Borough wins 2009 Overall Award in Excellence

Sacramento, CA—The Western States Seismic Policy Council Board of Directors is pleased to announce (Dec. 19, 2008) the winners of the 2009 WSSPC Awards in Excellence. The Overall Award in Excellence in Mitigation went to Kodiak Island Borough, Alaska, for their School Seismic Hazard Mitigation Program. The program is a community-wide effort of the Kodiak Island Borough of Alaska to assess the seismic risk to the Borough's public schools and then perform the needed retrofit construction. The community was recognized for their sustained commitment to take action on public school structural seismic safety, and being a model for other communities to follow to provide seismically safe schools and enhanced knowledge of seismic risks.

"Kodiak Island Borough is honored, proud, and excited to have been chosen for the 2009 WSSPC Overall Award in Excellence for Mitigation,' said Rick Gifford, Manager of Kodiak Island Borough. "We thank our community, the school district, world class consultants, elected and appointed boards and commissions, dedicated staff and state agencies who are our partners in accepting this prestigious award."

Also selected for a 2009 WSSPC Award in Excellence in other areas were the following; *Innovations*: Redwood Coast Tsunami Work Group, operating from Humboldt State University Earthquake Education Center; *Outreach to General Public*: City of Santa Rosa, California Emergency Preparedness Program called COPE (Citizens Organized to Prepare for Emergency; *Outreach to Business/Government*: Washington State Department of Natural Resources, Division of Geology and Earth Resources, Geologic Hazards Program for their Washington Decision Makers Field Conference and guidebook; and *Research*: Wasatch and Sevier Faults Paleoseismic Research conducted by the Utah Geological Survey.

The WSSPC Awards in Excellence Program was started in 1996 to recognize achievement in different areas of earthquake mitigation, preparedness and response. "The Awards have been an effective methods for sharing model programs and products throughout the western United States, western Canada, and the far Pacific region, and in recognizing the hard-working, creative and innovative efforts within the earthquake hazards reduction community," said WSSPC Chairman John Parrish.

The Awards will be given at the joint WSSPC-Earthquake Engineering Research Institute annual conference at the Hilton Salt Lake City Center in Salt Lake City, Utah at a banquet Friday February 13, 2009. Summaries of the 2009 winning programs and projects are posted on the Western States Seismic Policy Council's website at www.wsspc.org

The mission of the Western States Seismic Policy Council (WSSPC) is to develop seismic policies and disseminate information about programs intended to reduce earthquake-related losses.

From: WSSPC press release, December 18, 2008; www.wsspc.org/Awards/2009/PR_awards09_Final.pdf

Contact: Patti Sutch, WSSPC Executive Director, 916 444-6816 ♦

Unraveling the source of large erratic boulders on Tonga: Implications for geohazards and mega-tsunamis [abstract]
By Matthew J. Hornbach, Cliff Frohlich, and Frederick W. Taylor
Geological Society of America Abstracts with Programs, v. 40, no. 6, p. 161

Large erratic boulders located near shorelines are sometimes linked with paleo tsunamis and associated geohazards. Perhaps the finest modern examples of tsunami-derived erratic boulders are the coral boulders deposited by the great 1883 Krakatau eruption, which generated a >40 m high near-field tsunami that devastated the Sunda Strait. Geophysical analysis of tsunami-derived erratic boulders offers insight into the size, energy, frequency, and trigger-mechanism of past mega-tsunamis. In the wake of the 2004 Sumatra earthquake and tsunami, there has been a significant effort to find, document, and analyze large erratic boulders that may represent paleo mega-tsunami deposits in order to constrain the size, frequency, and location of these events.

With this goal in mind, a team of geophysicists at the University of Texas traveled to Tonga last November in search of rumored reports of large out-of-place erratic boulders located along the western flank of Tongatapu. During their expedition, the researchers found a 3 km

chain of massive coral boulders that had been deposited 100-400 m inland. Our analysis suggests these boulders may represent the largest known tsunami deposits on Earth. Radiometric dating and structural/sedimentary interpretation indicates these boulders may have been emplaced recently (Holocene). Preliminary results from wave modeling also suggest an unconventional wave-triggering mechanism. In particular, our analysis adds credence to the concept that submarine slides and volcanic eruptions may trigger Earth's largest tsunamis. ♦

↕ **Participants in the Tsunami! Coast Challenge camp (Saturday Academy). See article in October issue of *TsuInfo Alert*, p. 14**

Project Impact - Briefing Paper – Abstract
Dale Furrow

Project Impact was an initiative of the Federal Emergency Management Agency (FEMA) which began in 1997 during the Clinton Administration. The program had four major goals: 1) identify and recruit partners in the community such as local government leaders, civic and volunteer groups, businesses, and individual citizens; 2) determine the community's risk for falling victim to natural disasters; 3) set priorities and target resources to reduce impact of future disasters; and 4) keep the community informed and focused to reduce damage and costs of future disasters. The program was one aspect of a multi-faceted effort to redefine the role of FEMA as a focused and effective organization aimed at improving coordination with state and local emergency offices and directing attention and resources to the benefits of disaster mitigation.

The program was the realization of a novel concept, because it was designed to be different from other federal disaster related initiatives by making it possible for communities to receive funding to mitigate future losses, before an event occurred. The other main source of funding which was available at the time was the Hazard Mitigation Grant Program (HMGP), which also provided grants to both state and local entities for the purpose of implementing mitigation efforts. However, the HMGP could only provide these funds once a major disaster declaration had been made by the president. Originally enacted in 1988 as part of the Robert T. Stafford Act, the HMGP utilized a cost-sharing of disaster recovery funding, where the state or local government had to match the funds according to an established ratio. Though the ratio has changed over time to make participation more feasible, the essential concept of post-disaster assistance remained the same.

When established, Project Impact was designed as a pilot program reaching out to seven communities. To each community, FEMA provided expertise and technical assistance at both the national and regional level and guided the communities through a complete risk assessment. In the years to follow, the communities which participated in Project Impact were able to utilize the seed money provided by FEMA to develop mitigation programs which worked for their communities. As seen through the successes of Seattle, Washington from the development of earthquake hazard mitigation programs and Tulsa, Oklahoma with the tornado casualty mitigation efforts, the program was working.

By early 2001, the pilot program had expanded to nearly 250 communities throughout the nation and the network of partners had extended to over 2,500 businesses. According to sources within the agency, Project Impact was on the verge of tripling its outreach efforts by adding another 700 communities. However, in February

of 2001, the Bush Administration released its 2002 Budget, also revealing to the public the decision to no longer fund Project Impact. According to the budget summary, the program had "not been effective," and the administration indicated that there may be faster methods of implementing mitigation programs.

There is much to be learned from the success of Project Impact, as well as from the Pre-Disaster Mitigation Program (PDM) which replaced it and utilizes a competitive grant process where funding is managed by the state. It is evident that the concepts which were successful in the disaster preparedness function of the program, and FEMA, were lost in the transition and have not been replaced. There is no longer a community based pre-disaster mitigation effort which focuses on reducing losses to locally identified risks and puts the power to reduce the hazards in the hands of the community. Any future administration which does not consider renewal of such a program would be doing the public a great disservice.

From: Institute for Crisis, Disaster, and Risk Management; *Crisis and Emergency Management Newsletter* Website, v. 15, no. 3, December 2008 ♦ http://www.seas.gwu.edu/%7Eemse232/december2008_2.html ♦

The media machine making disaster mythology

Response to disaster:Fact versus fiction and its perpetuation. By Henry W. Fischer, III. 2008. ISBN: 978-0-7618-4117-3. 240 pp. $34.95 (paper). University Press of America. www.univpress.com

It is the iconic network news hurricane footage: the intrepid reporter leans ten degrees into the wind and water, long-tailed raincoast streaming behind, the loosened debris of other people's lives spinning past in the background. He shouts into his microphone, even then barely audible above the furious blast of the storm.

Who among us hasn't wished our intrepid reporter would get clocked by a haphazard hunk of billboard?

This method of gathering the news is symptomatic of the ways mythology about people's behavior in disasters is propagated. Henry Fischer writes that nations—as opposed to local—news organizations "are more engaged in a ratings battle, hence the quest for a good, picturesque story. A good *story* and good *news* is not the same product." (Emphasis in original.)

The prevailing media environment, Fischer says, helps to perpetuate disaster myths—the things that many people believe happen in crises, but seldom do. These include panic, price gouging, looting, irrational behavior, and other popular legends. These behaviors rarely occur in disasters, Fischer says, amply documenting his claims from his own research and that of others.

Even in the most hazardous conditions, he says, people usually behave in normative ways. In the September 11, 2001, attacks on the World Trade Center, those evacuating the buildings "helped one another down steps and they proceeded as according to previous evacuation plans. They were calm and followed directions."

These same conclusions are reached, though more anecdotally, and with more literary flair, by Amanda Ripley in her book, *The unthinkable: Who survives when disaster strikes and why* (Crown Publishers, 2008, $24.95 hardcover). She writes of one 9/11 survivor, Elia Zedeño, who now conducts tours at Ground Zero. "The number one question Zedeño gets asked is, How did people behave in the stairwell?" Ripley writes. "No one expects the answer they get. 'Everybody was very calm, very calm.'" Only one woman got hysterical, she said.

"In sharp contrast to the image usually perceived," Fischer writes, "survivors are not apathetic; they begin search and rescue activities themselves; they are very calm and do not panic. Looting behaviour is extremely rare following a disaster."

But the dogged persistence of these myths can be laid at the door—at least partially—of the news media, he says, especially the national television networks. Local electronic media and newspapers do a better job of producing accurate chronicles, he says.

From: *Natural Hazards Observer*, v. 33, no. 3, p. 15. Natural Hazards Center, University of Colorado at Boulder ♦

Typical Tsunami Wave vs. Typical Wind-generated Wave

Wave Feature	Wind-generated Wave	Tsunami Wave
Wave Speed	5-60 mph (8-100 kph)	500-600 mph (800-1,000 kph)
Wave Period (time required for two waves to pass a single point in space)	5 to 20 seconds apart	10 minutes to 2 hours apart
Wave Length (horizontal distance between two waves)	300-600 feet apart (100-200 meters apart)	60-300 miles apart (100-500 km apart)

From: http://science.howstuffworks.com/tsunami1.htm

Material added to the NTHMP Library,
January - February 2009

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

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NEWS

Tsunami timelines

The last time a tsunami the size of the 2004 Indian Ocean wave hit the Asian coast was at least 600 years ago, according to new research. Kent State University's Katrin Monecke and colleagues found that the most recent 35 meter (114 feet) tsunami in the region prior to 2004 occurred sometime between AD 1290 and AD 1400.

Monecke's team studied sand deposition on land near Aceh in northern Sumatra. The largest tsunami prior to 2004 that residents collectively remember was in 1904, devastating the west coast of Simeulue Island. The authors said the "paleotsunami record for northern Sumatra suggests that damage-causing tsunamis in Aceh recur infrequently enough for entire human lifetimes to typically elapse between them."

This poses a dilemma for balancing the risks of a tsunami against the advantages of living along the coast. Recollections of the 1904 Simeulue Island event led the island's residents to flee to higher ground and escape the 2004 event, But because of the infrequency of the events on the mainland, this information wasn't available. The U.S. Geological Survey says these issues are relevant in the United States, especially on the Pacific Coast: "In North America these finding are most relevant in the Cascadia region, which extends along the 700 miles of Pacific coast from southern British Columbia to northern California."

"Like Thailand and Aceh, this coast has a geologic history of catastrophic tsunamis hundreds of years apart. The 2004 tsunami offers lessons on how to save lives from these Cascadia tsunamis—in particular, knowing a tsunami's natural warning signs and how to reach safety in time."

From: *Natural Hazards Observer*, v. 33, no. 3, p. 3. Natural Hazards Center, University of Colorado at Boulder

What we have here is a failure to communicate

Twenty-two states were unable to provide a state-level emergency plan when asked for one by a George Mason University researcher.

GMU Communications Professor Carl Botan says that despite federal laws requiring an emergency operations plan (EOP), 22 states couldn't provide one, withheld it on security grounds or made it difficult even for trained researchers to gain access.

Botan says that two-way communication between the public and government is essential, since residents must know what to do in emergency situations. Only 13 states—out of the 51, including the District of Columbia—surveyed, had specific strategies for communicating with vulnerable citizens in their plans. Only two EOPs—New Mexico and D.C.—received perfect scores.

The Web site *Emergencity* noted, "Professor Botan hits the nail on the head—emergency planning and communication services frequently do not embrace two-way communications with the public, nor do they ultimately empower the public with the actionable intelligence that allows our citizens to make smart decisions."

From: *Natural Hazards Observer*, v. 33, no. 3, p. 4. Natural Hazards Center, University of Colorado at Boulder

Wahlstrom named to UN post

Margareta Wahlstrom has been named to serve as United Nations assistant secretary general for Disaster Risk Reduction, a new appointment meant to increase international disaster action and cooperation. She'll also be the special representative for Secretary General Ban Kimoon in implementing the Hyogo Framework.

Sweden's Wahlstrom has 25 years of experience in disaster management preparedness. She has held leadership positions in the U.N. Office for the Coordination of Humanitarian Affairs and the International Federation of the Red Cross and Red Crescent Societies and is a member of the Swedish Commission on Climate Change and Development.

From: *Natural Hazards Observer*, v. 33, no. 3, p. 4. Natural Hazards Center, University of Colorado at Boulder

Wash. State Indian village moves to higher ground to escape flood, tsunami danger

To read the full news report on the Hoh Indian Reservation, go to http://www.startribune.com/nation/36968764.html or http://article.wn.com/view/2009/01/01/Wash_state_Indian_village_moves_to_higher_ground_to_escape_f/

Is it possible to make oil rigs 'disappear' from tsunami's path?

London, Sep 26, 2008 (IANS), by *Sindh Today*. Why build stronger ocean-based structures to withstand Tsunamis, when it might be much easier to make them disappear.

Physicists at the Centre National de la Recherche Scientifique (CNRS) and Aix-Marseille Universite in France and the University of Liverpool in England have conducted lab experiments showing that it's possible to make a type of dike that acts as a cloak hiding off-shore platforms from water waves.

The principle is analogous to the optical invisibility cloaks that are currently a hot area of physics research, according to a release of the American Physical Society.

Tsunami invisibility cloaks wouldn't make structures disappear from sight, but they could manipulate ocean waves in ways that makes off-shore platforms, and

possibly even coastlines and small islands, effectively invisible to tsunamis.

If the scheme works as well in the real world as the lab-scale experiments suggest, a tsunami should be able to pass right by with little or no effect on anything hidden behind the cloak.

This study will be published in a forthcoming issue of Physical Review Letters of the American Physical Society.

From: http://www.sindhtoday.net/world/23708.htm

Scientists carry out international tsunami research in Germany

Researchers from 11 Indian Ocean littoral states have begun training tsunami detection techniques in the northern port city of Bremerhaven… On board the research vessel Uthoern, the scientists from Thailand, Sri Lanka, Madagascar, the Maldives, and other states are spending two weeks to learn ways of charting the ocean floor's structure using modern sonar equipment…the data is to be used to map the seabed and predict the course of giant waves caused by earthquakes.

Full article: http://www.topnews.in/scientists-carry-out-international-tsunami-research-germany-269824

New exhibit at the Pacific Tsunami Museum

The Pacific Tsunami Museum opened a new exhibit in December documenting the Indian Ocean tsunami of 2004. Deemed the deadliest tsunami on record, the exhibit contains survivor stories from Thailand, India, Indonesia and Sri Lanka which are featured on touch-screen computer kiosks. The exhibit also features wall displays about the earthquake, the tsunami impact, amazing stories of survival and the recovery effort.

The team who gathered and assembled the display was headed by the museum's outreach coordinator Genevieve Robison and included: Dr. Dudley, John Coney and Barbara Muffler.

The exhibit was made possible through contributions from The O'Neil Foundation and the Change Happens Foundation. The U.S. National Oceanic and Atmospheric Administration and the United States Agency for International Development helped defray costs for the on-site interviews with tsunami survivors in Indonesia, Thailand, Sri Lanka, and India

From: December 31, 2008 press release.

PUBLICATIONS

***Natural Hazards Observer* and *Research Digest* available online**

The latest editions of two of the Natural Hazards Center's popular publications--*Natural Hazards Observer* and *Research Digest*—are available online. Featured articles from the January 2009 *Observer* include: Toward a National Disaster Recovery Act of 2009; Misuse of cash donations after disaster is overstated; A letter from Davos: Searching for 100 new ideas; The un-merry winds of Windsor: Q & A with emergency manager Steve Blois.

Visit the Natural Hazards Center Web site at http://www.colorado.edu/hazards/o/index.html to read the January and past *Observers*. *Research Digest,* the quarterly compilation of research abstracts, can be accessed at http://www.colorado.edu/hazards/rd/

From: Disaster Research 517, January 15, 2009. Natural Hazards Center, University of Colorado at Boulder.

The role of transit in emergency evacuation

Transportation Research Board of the National Academies Special Report 294. 2008. ISBN: 978-0-309-11333-5. 214 pp. E-mail: TRBsales@nas.edu Free download: www.trb.org

Transit can play a major role in emergency evacuations, this report finds: "In 2005, transit could have played an important role in New Orleans in advance of Hurricane Katrina but failed to do so when few drivers reported to work, transit equipment proved inadequate and was left unprotected, and communication and incident command were nonexistent."

Few localities have considered disasters that involve multiple jurisdictions or multiple states in a region—even those that have emergency plans in place. The report urges the Department of Homeland Security, the Federal Emergency Management Agency and the U.S. Department of Transportation to provide guidance on including public transit providers in emergency plans.

People who don't own cars, the disabled, elderly and medically homebound may especially benefit from the careful integration of transit facilities in planning.

From: *Natural Hazards Observer*, v. 33, no. 3, p. 16. Natural Hazards Center, University of Colorado at Boulder

Prehistoric Cascadia tsunami inundation and runup at Cannon Beach, Clatsop County, Oregon

The Oregon Department of Geology and Mineral Industries (DOGAMI) has released Open-File O-08-12, *Prehistoric Cascadia tsunami inundation and runup at Cannon Beach, Clatsop County, Oregon*, by Robert C. Witter.

One of the most important tasks for the Oregon Department of Geology is helping coastal communities understand and mitigate for the risk of possible tsunamis. Communities located in exposed, low-lying areas along the Oregon coast face the risk of inundation by tsunamis produced by earthquakes around the Pacific Rim far from Oregon, as well as local earthquakes on the Cascadia subduction zone.

As part of this important effort, DOGAMI is re-mapping the state's entire 362-mile long coastline for

tsunami inundation using state-of-the-art computer models, coupled with laser based terrain mapping and field based geologic investigations. This report by Dr. Robert C. Witter of DOGAMI discusses field investigations conducted over the past 2 years that detail the landward extent of sand deposits left by Cascadia tsunamis that inundated the lower Ecola Creek valley in Cannon Beach over the last 2,000 years.

The open-file report is available on CD-ROM for $10. (503) 872-2750. Or order online: http://www.naturenw.org There is no map associated with the report, however, an evacuation map for Cannon Beach is available in the brochure at http://www.oregongeology.org/pubs/tsubrochures/CannonEvac.pdf

From: DOGAMI press release, December 17, 2008

WEBSITES

www.lrc.fema.gov/rss_em.html

FEMA Learning Resource Center emergency management RSS and e-mail updates.

The Federal Emergency Management Agency is compiling a library of links to RSS feeds, e-mail lists, and other electronic notification that promises to keep users in the know about emergency management, natural hazards, and homeland security.

From: *Natural Hazards Observer*, v. 33, no. 3, p. 19. Natural Hazards Center, University of Colorado at Boulder

monitter.com

Those familiar with Twitter know that the brief chirps of information during an emergency can paint a sonar-like picture of what's happening on the ground. Monittor.com allows you to enter keywords for instant and personalized monitoring of the Twitter stream.

From: *Natural Hazards Observer*, v. 33, no. 3, p. 19. Natural Hazards Center, University of Colorado at Boulder

www.femarecovery.gov/

This recently-completed second phase of the Federal Emergency Management Agency's Recovery Transparency Initiative allows residents to monitor the status of rebuilding in their neighborhoods. Detailed maps, reports, and expected completion dates are included.

From: *Natural Hazards Observer*, v. 33, no. 3, p. 19. Natural Hazards Center, University of Colorado at Boulder

www.dhs.gov/xnews/releases/pr_1225900531284.shtm

DHS 2009 grant guide. The Department of Homeland Security this month (January 2009) announced $3 billion in federal grants would be available for state and local government preparedness efforts. The money will be awarded through 14 programs such as the Urban Areas Security Initiative and the Transit Security Grant program.

Emergencymanagementnetwork.ning.com

Emergency preparedness junkies might soon be able to leave MySpace and LinkedIn behind, now that there's a social networking site devoted to them. The Emergency Management Network community is just getting off the ground, but the site has areas for news, discussion forums, sharing photos and videos, blogging, and live chat.

From: *Natural Hazards Observer*, v. 33, no. 3, p. 19. Natural Hazards Center, University of Colorado at Boulder.

http://trb.org/news/blurb_detail.asp?id=9264

The role of transit in emergency evacuation. The final version of this Transportation Research Board special report is now available online. The report committee's finding, first released in July 2008, indicate not enough is being done to involve transit providers in emergency evacuation plans. Recommendations for partnering with transit organizations in emergency planning and an addendum detailing transit's role in 33 urban-area plans are included.

From: *Disaster Research 517*, January 15, 2009. Natural Hazards Center, University of Colorado at Boulder.

CONFERENCES, SYMPOSIA

March 4-6, 2009

Third National Emergency Management Summit. International Association of Emergency Managers, Washington, DC. The Summit will assess risk and awareness of natural disasters, epidemics, and terrorism in the United States and set out practical approaches to planning, response, and recovery. The goal is to increase disaster preparedness knowledge, learn to use scarce resources, and implement responses. www.emergencymanagementsummit.com

March 5-6, 2009

The Law and Catastrophic Disasters: Legal issues in the aftermath. Hosts: The National Legal Preparedness Program, Institute for Public Safety and Justice, and others. Alexandria, VA. This program for attorneys and disaster management officials will cover major catastrophe scenarios, legal requirements, restrictions, liabilities, and risks. Sessions are designed to stimulate discussion of legal issues that arise in the first year following a disaster and identify best practices. http://www.cailaw.org/ilgs/Details_09/DisasterMang.html From: *Disaster Research 517*, January 15, 2009. Natural Hazards Center, University of Colorado at Boulder.♦

EMERGENCY MANAGEMENT OFFICES
(added November 30, 2007)

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

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

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

CNMI Emergency Management Office
Office of the Governor
Commonwealth of the Northern Mariana Islands
P.O. Box 10007
Saipan, Mariana Islands 96950
(670) 322-9529; (670) 322-7743 FAX
www.cnmiemo.gov.mp

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

National Disaster Control Officer
Federated States of Micronesia
P.O. Box PS-53
Kolonia, Pohnpei - Micronesia 96941
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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
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Untapped potential—Evaluating state emergency management agency web sites 2008
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http://people.ku.edu/~dguth/EMAreport.html
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(Lawrence, Kan.) - Despite post-Hurricane Katrina calls for improved communication, a University of Kansas study has concluded that state emergency management agencies (EMAs) across the United States have been slow to adopt Internet-based resources to reach out to the public during emergencies.

According to *Untapped Potential: Evaluating State Emergency Management Web Sites 2008*, state EMA Web sites appear to place a greater emphasis on reaching first responders than they do the citizens of their state or the news reporters who reach them. The study urges state emergency planners to recognize that Internet and emerging social media are important public outreach tools. Funded by the University of Kansas Transportation Research Institute, the study analyzed 51 state EMA Web sites (including the District of Columbia) and the results of an online survey of state EMA public information officers. The 48-page report outlined 13 findings of the research and made six recommendations to the nation's emergency managers.

"I hope this report will spark serious discussions nationwide about the role of Internet communication before, during and following crisis situations," said Associate Professor David W. Guth, the author of the study. "The purpose of this research is not so much to criticize state EMA officials as it is to shed light upon practices that can help them fulfill the public safety mission to which they have dedicated themselves."

While 80 percent of online survey respondents indicated that residents of their state were primary audiences of EMA Web sites, the most-frequently found feature on their Internet sites was first responder/emergency manager training information. According to *Untapped Potential*, less than half of the Web sites provided the identity of the agency's public information officer, his/her direct telephone number, and a direct e-mail address. The report said that Web site technicians appear to have more influence on their content than do the emergency managers who supervise them. While survey respondents said they see moderate value in using the Internet during emergencies, they also said they do not see the Internet as the equal to more traditional communications media, such as radio and television. ♦

VIDEO-CD-DVD RESERVATIONS

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

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

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

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

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

Cascadia: The Hidden Fire–An Earthquake Survival Guide (10 min.). Global Net Productions, 2001. A promo for a documentary about the Cascadia subduction zone and the preparedness its existence demands of Alaska, Oregon and Washington states. Includes mention of tsunamis.

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

Disaster Mitigation Campaign (15 min.). American Red Cross; 2000 TV spots. Hurricanes, high winds, floods, earthquakes.

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

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

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

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

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

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

Numerical Model Aonae Tsunami–7-12-93 (animation by Dr. Vasily Titov) and Tsunami Early Warning by Glenn Farley, KING 5 News (The Glenn Farley portion cannot be rebroadcast.)

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

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

Protecting Our Kids from Disasters (15 min.) Gives good instructions to help parents and volunteers make effective but low-cost, non-structural changes to child care facilities, in preparation for natural disasters. Accompanying booklet. Does NOT address problems specifically caused by tsunamis.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Infrequently Asked Questions

October 2008

Statistically, are you more apt to be killed in a plane crash or a tsunami?

Statisticians say your odds of dying in a plane crash are 1 in 11 million; you are 22 times more likely to be killed by a tsunami. (Internet, Jan. 20, 2009)

According to WIRED magazine (October 20, 2008), what are the five most dangerous U.S. earthquake hotspots besides California?

Pacific Northwest
New Madrid
Salt Lake City
Hawaii
Alaska

After China, which area has the longest records of tsunamis>

"The Mediterranean Sea has one of the longest records of tsunami. Over three hundred events have been recorded since 1300 B.C. Large tsunami originate in the Eastern Mediterranean, the Straits of Messina of southern Italy, or southwest of Portugal. About 7% of known earthquakes in this region have produced damaging or disastrous tsunami. Around Greece, 30% of all earthquakes produce a measurable seismic wave, and seventy major tsunami have been recorded. Around Italy, there have been sixty-seven reliably reported tsunami over the past 2,000 years. The majority of these have occurred in the last 500 years, as records have become more complete. Of these, forty-six was caused by earthquakes and twelve by volcanoes. By far the most destructive tsunami followed an earthquake on 28 December 1908 in the Messina Strait region. A small proportion of the 60,000 people killed during this event were drowned by the tsunami, which flooded numerous coastal villages and reached a maximum run-up exceeding 10 m in elevation."

(Kuran and Yalciner, 1993; Tinti and Maramai, 1999)

From: Bryant, Edward, 2001, Tsunami—The underrated hazard: Cambridge University Press, p. 16.

What is a meteorological tsunami?

"Meteorological phenomenon can generate long period waves in the tsunami window. These waves have been referred to as meteorological tsunami. They take on various local names: *rissaga* in the Balearic Islands in the Eastern Mediterranean, *abiki* or *yota* in bays in Japan, *marubbio* along the coast of Sicily, *stigazzi* in the Gulf of Fiume, and *Seebär* in the Baltic Sea. They also occur in the Adiatic Sea, the South Kuril Islands, Korea, China, the Great Lakes of North America, and numerous other lakes that can come under the influence of atmospheric activity. Meteorological tsunami can be significant recurrent phenomena…

Meteorological tsunami are distinct from storm surges, although in some cases both consist of a single wave…However, isolated occurrences and single waves are rare because meteorological tsunami tend to recur at specific locations and travel in wave trains. The periodicities of meterological tsunami appear constant at many locations—a fact indicating that resonance controls the phenomenon due to the geometry and topography of a specific section of coastline. It is often noted that the phenomenon only affects a particular inlet or bay along a coast. Certainly meteorological tsunami appear restricted to harbours and bays rather than being prevalent along open coastlines."

(Wiegel, 1964; Bryant, 1991; Rabinovich and Monserrat, 1996; Hamer, 1999)

From: Bryant, Edward, 2001, Tsunami—The underrated hazard: Cambridge University Press, p. 46-47.♦

U.S. Coastline Tsunami Hazard Assessment for the Nuclear Regulatory Commission

Introduction:

Applications to build and operate up to 26 new nuclear power reactors are expected over the next few years, increasing the current level of 104 nuclear power reactors licensed to operate in the U.S. at 65 sites in 31 states. Some candidate Nuclear Power Plant (NPP) sites may be located on coasts subject to tsunamis hazard. The devastation to coastal infrastructure caused by the Indian Ocean tsunami of 24 December 2004 has changed the perception of a tsunami as a low-risk hazard. Tsunamis are now viewed as a hazard of medium probability and potentially high risk for world coastlines. 6 destructive tsunamis that have occurred since 2005 are convincing arguments for such assessment. The December 2004 catastrophe focused attention to sources with under-estimated tsunami potential convincing researchers to broaden list of possible danger areas (Geist *et al*., 2005). The Indian Ocean tsunami has also increased awareness of this hazard to the NPPs.

Methodology:

The tsunami science has produced a variety of research tools for tsunami hazard assessment. In particular, the tsunami modeling technology has evolved tremendously during the last 20 years, when crucial field observation and laboratory data have become available for model verifications and testing. The numerical modeling of tsunami dynamics has become a standard research tool in tsunami studies. Modeling methods have matured into a robust technology that has proven to be capable of accurate simulations of historical tsunamis, after careful consideration of field and instrumental historical data. Recently developed standards and criteria for tsunami model use in operations (Synolakis *et al*., 2007) provided solid ground for practical model applications. At the same time, the Sumatra tsunami of 26 December 2004 reminded that most of the world coastal communities and infrastructures are unaware and unprepared for the hazard from coastal flooding by multiple tsunami waves. This event also highlighted research challenges and triggered accelerated efforts to fill the gaps in the tsunami science.

Tsunamis generated by landslides *:* The first research focus area is development of a computer model to simulate landslide generated tsunamis, with arbitrary parameters and arbitrary scales, including full coupling with water column. The model will be tested comprehensively against field and laboratory data.

Tsunamis from seismic sources*:* The second research focus is regional and local tsunami hazard assessment from seismic sources, utilizing tools for tsunami hazard assessment studies in NOAA's SIFT tsunami forecast system. SIFT includes a model database of tsunami propagation scenarios which can provide detailed analysis of the tsunami potential for a coastal region or a coastal community and pinpoint high-impact sources for a given coastal location. A very comprehensive analysis is feasible because more than a thousand propagation scenarios for all major seismic tsunami source areas are readily available from the database. The scenario database will be updated with the latest findings from the U.S. Geological Survey (USGS) analysis of tsunami sources.

Case study for Probable Maximum Tsunami (PMT) analysis from seismic, landslide and impact sources: The PMT analysis will include model assessment of tsunami impact from several types of tsunami sources identified from the regional and/or local tsunami hazard assessment. The case study will use the high-resolution inundation model to assess the tsunami impact at the chosen site. The study will use the experience and recommendation from the FEMA pilot study (Tsunami Pilot Study Working Group, 2006). PMT analysis will not only provide tsunami assessment for a selected community but will have a regional tsunami hazard assessment value.

References:

Geist, E.L., V.V. Titov, and C.E. Synolakis (2006): Tsunami: Wave of change. *Scientific American, 294*(1), 56–63. Text of article from the Scientific American website.

Tsunami Pilot Study Working Group (2006): Seaside, Oregon Tsunami Pilot Study—Modernization of FEMA flood hazard maps. *NOAA OAR Special Report*, NOAA/OAR/PMEL, Seattle, WA, 83 pp. + 7 appendices.

Synolakis, C.E., E.N. Bernard, V.V. Titov, U. Kânoğlu, and F.I. González (2007): Standards, criteria, and procedures for NOAA evaluation of tsunami numerical models. NOAA Tech. Memo. OAR PMEL-135, NOAA/Pacific Marine Environmental Laboratory, Seattle, WA, 55 pp. [PDF Version]

Links:

The Nuclear Regulatory Commission

From: http://nctr.pmel.noaa.gov/state/nrc/index.html (includes 2 illustrations not copied here) ♦