



E-Newsletter Fall 2011 Edition October 25, 2011

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HEADLINE NEWS

2012 EERI Annual Meeting & National Earthquake Conference

"Learning from the Past to Protect the Future"
Save the Date: April 10-14, 2012, Memphis, Tennessee

Join us at the anchoring event of the New Madrid Bicentennial — engineers, scientists, emergency managers, social scientists, and policy makers.

- Learn the many lessons from recent and historic earthquakes and how to apply them to reduce future impacts and build resiliency.
- Look into the vulnerability of aging large infrastructure.
- Exchange key information on tools for earthquake risk reduction.
- Learn from successful earthquake mitigation and response programs in the public and private sectors.
- Get the latest information on seismic safety improvements for our schools.
- And much more!

Co-organizers:



WSSPC Releases Tsunami Report

WSSPC has released WSSPC Report 2011-01: *Tsunami Hazard Mitigation and Preparedness: A Perspective from State and Territory Tsunami Programs in the High Tsunami Risk Pacific Region*. With contributions from Alaska, American Samoa, California, Guam, Hawaii, Northern Mariana Islands, Oregon, and Washington, the Report documents the importance and effectiveness of the state and territorial tsunami programs to prepare local communities at high risk for future damaging tsunamis.

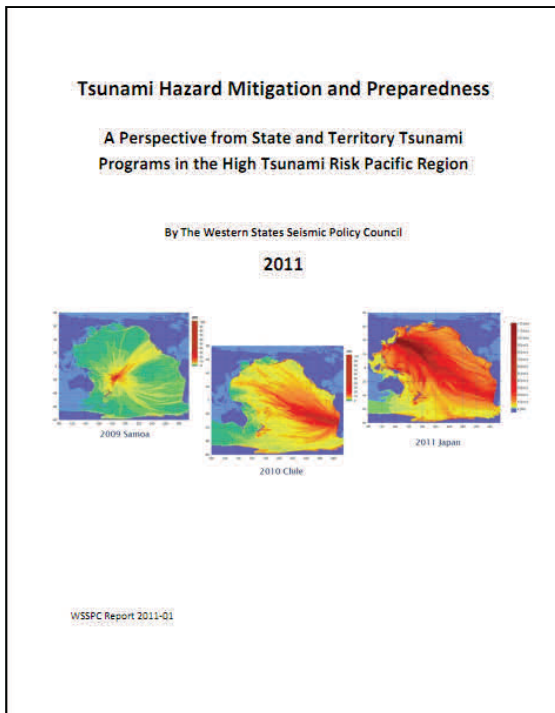
"The Report was prepared to provide a regional perspective of states and territories that share a high probability of tsunami risk to their coastlines", said John G. Parrish, WSSPC Board Chair and Chair of the WSSPC Tsunami Hazard Mitigation Committee. "The states' roles are critical in educating and preparing the public for tsunamis so as to reduce losses to life and property".

Continued on Page 2—See "WSSPC Report 2011-01"

Nominations Now Accepted for the 2012 National Awards in Excellence and WSSPC Lifetime Achievement Awards

Nominations are now being accepted for the 2012 National Awards in Excellence and the WSSPC Lifetime Achievement Awards. The 2012 National Awards in Excellence will be awarded for exemplary programs, projects, and products that have significantly contributed to addressing earthquake risk reduction through demonstrated achievements in earthquake mitigation, preparedness, response and recovery. *Continued on Page 2—See "Nominations"*

Continued from Page 1: WSSPC Report 2011-01



The Pacific Rim states and territories have a history of damaging tsunamis caused by both distant and local earthquakes. Since 1946, tsunamis have cost the Pacific U.S. states and territories 392 lives and over \$1.6 billion in damages. Distant earthquakes provide time for warning and evacuation of vulnerable populations from a tsunami, whereas local earthquakes may not. In the event of a large local earthquake that could generate a local tsunami, individuals and communities must be educated to respond appropriately, a role that the states and territories implement through their state tsunami programs requiring sustained community-based preparedness activities.

The recent tragic Japanese tsunami on March 11th highlights the necessity of continuing to have strong state and territory tsunami programs. The Report notes that currently the state tsunami programs are funded through the National Tsunami Hazard Mitigation Program (NTHMP) authorized by the Tsunami Warning and Education Act of 2006. The Act is due to sunset in September of 2012. The Pacific Rim states and territories support the reauthorization of the Act and clearly affirm the original intent of the Act to provide these partners with 27% of the Act's funding. Local program representatives are unanimous in their belief that the states and territories are in the best position to implement national policies at a community level.

The Report's other Recommendations urge a balanced benefit-cost approach to the proposal to expand the DART buoy system and the creation of a third warning center with the existing needs of the state tsunami programs. Expanding an already extensive system of buoys should not come at the expense of the community-based preparedness activities, especially for local tsunami events, because official warnings through the DART system cannot be implemented. Maintaining a strong partnership among the state and federal organizations in the NTHMP will strengthen and improve tsunami preparedness in the U.S. and its Pacific territories and enable all levels of government to work towards the common goal of saving lives of those at risk from tsunamis along our coastlines.

Bound copies of WSSPC Report 2011-01 are available from the WSSPC office. To download a copy, visit the WSSPC website at:

http://wsspc.org/Reports/WSSPC_Report_2011-01.pdf.

Continued on From Page 1: Nominations

The Awards recognize new and creative approaches to earthquake risk reduction, and facilitate the transfer of those successful experiences to others.

WSSPC's 2012 Lifetime Achievement Award will be given to recognize an outstanding leader in earthquake risk reduction who is still practicing in his or her profession. The recipient will have demonstrated throughout his or her career an extraordinary commitment, level of service, and contribution to earthquake risk reduction.

If you know of a deserving person or program, submit a nomination to the WSSPC office by December 30, 2011. The awards will be given at the 2012 National Earthquake Conference in Memphis, Tennessee April 10-14, 2012.

The National Awards in Excellence Nomination Form is available at <http://wsspc.org/awards/2012/2012NationalAwardsNomForm.doc>

The WSSPC Lifetime Achievement Nomination Form is available at <http://wsspc.org/awards/2012/2012LifetimeAchievementNomForm.doc>

Special Report

The Role of Social Media in Disaster Preparedness and Response

By Amy Lewis, Program Manager, WSSPC

Social media has emerged as an important tool for gathering and disseminating information before, during, and after a disaster strikes. Social media allows for rapid communication directly with large numbers of people in affected areas; with other disaster and emergency organizations; and with both new and conventional media outlets. Since information is made readily available to almost anyone at any time, the key is to be the source that provides accurate information. Establishing a social media presence before disaster strikes allows organizations to provide their communities with preparedness information while simultaneously developing their procedures behind the scenes so logistically they're prepared to respond. A case study of the Queensland (Australia) Police Service confirms the success of this pre-disaster approach. *Continued on page 4.*

Queensland, Australia: Governmental Use of Social Media

The Queensland Police Service's (QPS) use of social media for public engagement and emergency disaster response to December 2010's Tropical Cyclone and January 2011's flash flooding is a great success story for use of social media by a government agency during a disaster.

QPS social media accounts were established as a trial run in May 2010 with the intent of claiming a social media presence, conversing with the public, and developing a community of online followers before a disaster occurred. Police Media let their following grow by word of mouth while they developed their procedures for Social Media information sharing behind the scenes. By November 2010 the agency had 8000 Facebook "Likes" and 1000 "Followers" on Twitter.

As December's Tropical Cyclone moved in, QPS took to conventional and new media methods to deliver public safety information about the weather. Within a two-week period the number of people following the QPS through social media doubled. Flash flooding began January 10, 2011 and in the 24 hours following, the number of Facebook "likes" rose from approximately 17,000 to 100,000 and posts were viewed at a rate of 450 per second.

The QPS incorporated the social network sites into their routine in the seven months prior to the cyclone and flooding, so once the disaster hit it was natural for them to take to the social media sites with public service information. The Police Media team eliminated the necessity of having each piece of information cleared before it could be posted and was instead directed to use their best judgment when sending out information. This streamlined their information dissemination to the public as well as other emergency and disaster relief organizations.

Television and radio outlets began to broadcast information obtained directly from the QPS Facebook and Twitter pages. They also directed citizens to visit those social media channels allowing for more accurate, real-time information to be spread more quickly and to a larger audience than previously possible. The interactive nature of Twitter and Facebook allowed the Police Media team to quickly correct misinformation in the media and community. The pages were monitored 24/7 and inquiries from the public were addressed when possible.

The success of the QPS social media sites came from the benefit of a pre-disaster seven-month trial run by Police Media and the abundance of support the team had from within the QPS organization. The team was able to embed the QPS social media sites as a part of its daily routine prior to the disaster occurring, and was therefore comfortable and familiar with the process once disaster struck.

As of September 27, 2011 the QPS Facebook page has 222,126 "likes", and the QPS Twitter page (QPSmedia) has 16, 570 Followers.

Queensland Police Service: Disaster Management and Social Media – a case study, is available for download at www.police.qld.gov.au/Resources/Internet/services/reportsPublications/documents/QPSSocialMediaCaseStudy.pdf

Preparedness

Social media outlets can be valuable tools for conveying preparedness information instantly to large groups of people. Facebook and Twitter accounts may serve as preparedness clearinghouses that both house and distribute information. Statistics from research conducted by the Red Cross show that people are less likely to look to social media for preparedness information than they are for post-disaster information; however, followers of Facebook and Twitter accounts will be exposed regularly to an organization's posts and tweets, even though they not be actively seeking out preparedness information. Evacuation maps, preparedness brochures, and other informational materials can now be passed out to thousands of people and organizations instantly without paying for postage or worrying about spam filters.

It is also important to note that while people may not be actively seeking out preparedness information, a quick Twitter search shows that thousands of people are looking to social media for natural disaster information in their area before the next event. The "Quakeprediction" Twitter account is the first search result that appears when one searches for "California Earthquake" in Twitter. It is the second result of a search for "California Seismic Safety" in Twitter and fifth in Google. There are currently over 19,100 people following the "Quakeprediction" Twitter feed and another 734 have it "listed", meaning that while it is not a part of their real-time stream, they can easily access the Tweets when they choose to. In contrast, the California Emergency Management Agency Twitter (CalEMA) has 5337 followers and 460 listed followers. This is important because "Quakeprediction" is not affiliated with any local, state, or government agency, nor is it affiliated with any reputable non-profit organization or educational institution. The page claims to provide earthquake forecast information for San Diego, San Francisco, and Los Angeles, California, and Japan, and regularly Tweets inaccurate information.



Assuring communities receive accurate information about the risk in their area is an essential first step to disaster preparedness. Inaccurate information can be easily corrected through Twitter by simply Tweeting an @ symbol with the Twitter name to whom the comment is directed (ex:

@Quakeprediction) and supplying the correct information. Anyone following the targeted (inaccurate) Twitter account will see the corrected Tweet.

Apart from dissemination of preparedness information, social media may also provide the perfect forum to find out what communities believe preparedness means; what steps people are taking to be prepared; and what they believe they need from your organization to help them prepare. It allows for the "non-survey" survey—simple questions put out there requiring simple answers that may actually provide an organization with important data on the preparedness levels of communities.

Disaster Response and Recovery

As we've seen recently with the March 11, 2011 earthquake and tsunami in Japan and the May 22, 2011 Joplin, Missouri tornado, immediately following a disaster (and sometimes in the middle of one), those in the affected areas use their mobile devices to login to social media outlets to report what they are experiencing and let family and friends know they are safe. Emergency and aid organizations are now instantly given a real-time account of conditions on the ground through Facebook and Twitter. In these moments an organization can simultaneously push personal safety and survival information out, while taking in the situation on the ground first hand from those affected. With information flowing freely between emergency organizations and disaster victims, all parties stay better informed of everything from emergency room wait times and road closures, to power and telephone outages. This type of exchange also allows for "mythbusting", the debunking of misinformation and rumors circulated by members of the community and media, which could be vital in a disaster situation.

In order for an organization to connect with its community through social media, its social media accounts should be easy to find and immediately distinguishable. This could be especially important during and immediately following a disaster. Generally, people will seek out emergency organizations through topical searches (ex: "Oregon

Emergency”), or by searching for an organization’s name, so the more specific information included in the social media page, the better. It should be noted that the general public may not be familiar with an organization’s acronym; therefore, using an acronym as an organization’s only identifying label on social media pages should be avoided.

The open communication lines social media outlets were designed for also add a human dimension to disaster situations. Text messaging does not require active phone lines, and both Facebook and Twitter can be updated through text, so when the power is out and the phone lines down, there is comfort in knowing that help is probably still in the palm of your hand. A simple Facebook post or Tweet can let an entire network of family, friends and colleagues know a person has survived. A text message sent from someone trapped under rubble can save a life. A Facebook conversation with emergency management or disaster relief organization offers feelings of security and empowerment to someone who would otherwise be just another email in the inbox. Communities are able to organize themselves and rally together to match resources with needs and begin rebuilding. When used properly, social media can provide safety, security and aid resilience to disaster stricken communities.

Joplin, Missouri: Community Resilience through Social Media

On May 22, 2011 Joplin, Missouri was hit by a category EF5 tornado, devastating the town. Within hours of the tornado, Joplin native Brent Beshore, set up the *Joplin, MO Tornado Recovery* Facebook page (<http://www.facebook.com/joplinmo>) to help connect him and others with their friends and family in the affected area. Within 24 hours of its creation, the Joplin, MO Tornado Recovery Facebook page had more than 40,000 “Likes” and just days later that number had risen to more than 100,000.

The *Joplin, MO Tornado Recovery* Facebook page became a significant source of information for those people in and out of the affected area. Joplin residents began using the page as a “community bulletin board”, posting what services and supplies were needed and what resources they had to offer. Posts began pointing people to the locations of newly opened food distribution centers, mobile hospital units, and housing options, often before the mainstream media had announced the locations. The page was also used to direct people to disaster relief organizations, including the Federal Emergency Management Agency, American Red Cross, Habitat for Humanity, and United Way.

The Joplin case study has been highlighted as a shining example of how social media can be used to bring together a disaster-stricken community at the community level to foster resilience and aid in recovery; however, it did leave the information dissemination in the hands of the general public instead of emergency and disaster management. Thankfully, it worked out in the best interests of the people affected, but it should be noted that inaccurate information spreads just as quickly through social media as accurate information. The easiest and most efficient way to ensure that misinformation doesn’t become “fact” is by covering the disaster through an emergency management’s social media outlets.

As of October 5, 2011, the *Joplin, MO Tornado Recovery* Facebook page has 171,918 “likes” and is still being updated regularly; there were no verifiable Facebook pages found for Jasper County, Missouri Emergency Services or the Missouri State Emergency Management Agency.



L'Aquila, Italy: Risk Communication may lead to Prison Time

Six Italian scientists and one government official are now being charged with manslaughter for dozens of deaths caused by the M6.3 earthquake that struck the medieval Italian city of L'Aquila on April 6, 2009. The quake struck after months of low magnitude tremors and caused massive damage, killing 309 in L'Aquila and surrounding towns, injuring more than 1,500, and displacing 65,000 others. The prosecution and the people of L'Aquila argue that the defendants were negligent in providing the residents of L'Aquila with what they consider to be sparse and incorrect information regarding the earthquake risk to the area in the days before the M6.3 struck. This negligence, they argue, led to the deaths that occurred as a result of the April 2009 earthquake.

The scientists indicted were members of the National Commission for Forecasting and Predicting Great Risks, which held a meeting in L'Aquila just a week before the M6.3 quake. In a televised press conference conducted immediately following the meeting, it was communicated by commission member Bernardo De Bernardinis that the people of L'Aquila were not in danger, particularly because of the frequent tremors. "More tremors, less danger" became a common phrase around the city. L'Aquila residents argue that had they been given more accurate information about the earthquake potential in the area and provided with preparedness information, lives may have been saved.

Traditionally in L'Aquila, when an earthquake was felt, the people would leave their homes and go to the piazza or take cover in another area outdoors. The evening before the M6.3 quake occurred, there was a foreshock. The elder folks in the town stuck with tradition and evacuated their buildings, staying outside all night. The younger generations stayed inside, believing that a larger earthquake would not follow the tremor. This proved to be a fatal mistake.

These scientists are not on trial for failing to predict an earthquake; they are on trial for failing to adequately communicate earthquake risk and preparedness measures, a trial that has captured the attention of scientists and governments worldwide.

For a detailed report on the L'Aquila indictment, visit www.nature.com/news/2011/110914/full/477264a.html

MEMBER NEWS

WSSPC Members ShakeOut!

On October 20, 2011 at 10:20 a.m., millions of people in several WSSPC states participated in ShakeOut and practiced drop, cover, and hold during statewide earthquake drills. The number of participants for each state is listed below. Please note, these are estimates as the final tallies are not yet available.

- California with Yuma, AZ: 8.7 Million
- British Columbia with Yukon: 530,000
- Nevada: 190,000
- Idaho: 86,000
- Guam: 58,000
- Oregon: 22,400*
- American Samoa: No information available.

*Oregon held its first ShakeOut in January 2011. Over 39,000 people participated.

For more information on the ShakeOut program, visit <http://shakeout.org/>

Multimedia Seismic Hazard Kiosks in Alaskan Coastal Communities

Submitted by Mark Roberts, State Hazard Mitigation Officer, Alaska DHS&EM

This summer Alaska Division of Homeland Security and Emergency Management (DHS&EM), in a cooperative effort using NEHRP Earthquake Hazards Reduction State Assistance Program funds, installed seismic-safety multimedia outreach kiosks in three coastal Alaskan communities that suffered casualties in the 1964 Alaskan earthquake and tsunami. The interactive displays, located in tourist venues, include powerful first person 1964 survivor interviews, science animations of earthquakes and tsunamis, preparedness information, and explanation of emergency operations. The kiosks emphasize the importance of "being ready", for both residents and visitors, in the seismically active State of Alaska.



Humboldt's Ready

Humboldt's Ready Disaster Preparedness Fair was held on October 15, 2011 in McKinleyville, California. Humboldt's Ready originally started in 2010 by a group of local businesses looking to promote their services while protecting their communities and customers by providing disaster preparedness information. Humboldt's Ready grew in 2011 to include several business, disaster, and emergency preparedness and response organizations. The California Emergency Management Agency provided a two hour class on earthquake and tsunami education and preparedness; the Redwood Coast Tsunami Working Group gave a talk on the difference between distant and near source tsunamis, and if and when one should evacuate; and Pacific Watershed Associates discussed why earthquakes occur on the North Coast and what to expect from future earthquakes, placing emphasis on the "Great California ShakeOut", which was held October 20, 2011.

For more information on the Humboldt's Ready Disaster Preparedness Fair, visit <http://humboldtsready.yolasite.com/>

October is Earthquake Awareness Month in Idaho

Governor C.L. "Butch" Otter has proclaimed October as Earthquake Awareness Month. Throughout October, the Idaho Bureau of Homeland Security (BHS) is working to educate Idahoans about the fact that earthquakes occur in Idaho, and there are simple things that can be done to prepare for them.

Twenty-eight years ago, on October 28, 1983, the 6.9 Borah Peak Earthquake struck central Idaho, causing widespread damage and taking two lives. Large, damaging earthquakes are most likely in the mountainous regions of eastern and central Idaho, but all parts of Idaho are under at least a moderate threat.

For the full press release, visit www.bhs.idaho.gov/Pages/PressRoom/Releases/2011EQ%20Month%20Release.pdf.

OSSPAC Adopts Recommendations Inspired by Great Japan Earthquake

The Oregon Seismic Safety Policy Advisory Committee (OSSPAC) has adopted a set of policy recommendations developed by the Oregon Department of Geology and Mineral Industries (DOGAMI) in the wake of the March 11, 2011 Tohoku, Japan earthquake and tsunami. With these new policies, OSSPAC will further explore how to manage Oregon's significant earthquake risk, which includes ensuring schools, emergency facilities and critical facilities meet the most modern building codes and can withstand strong earthquakes; mitigate damage to existing structures and major lifelines; review

resiliency plan options; and develop sister-states/prefectures to facilitate information exchange and help Oregon prepare for Cascadia earthquakes.

For more information, visit www.oregon.gov/OMD/OEM/ossprac/docs/Earthquake_Resilience_presentation.pdf

Be Ready Utah

Be Ready Utah is the State of Utah's official emergency preparedness campaign managed by the Division of Emergency Management. It's designed as a bottom-up approach for preparedness with the focus on every individual's personal responsibility in preparedness first.

In observance of National Preparedness Month, the Be Ready Utah preparedness guide was mailed to over 500,000 homes across Utah. Private sector partners began receiving monthly employee/family preparedness messages in September. Be Ready Utah also hosted an emergency preparedness exhibit at the Utah State Fair with the theme "Pledge to participate in the Great Utah ShakeOut". The exhibit featured a life-size "disaster house" and two earthquake simulators.

For more information on the Be Ready Utah campaign, visit their website at www.BeReadyUtah.gov.

Washington's Quileute Tribe Seeks Higher Ground

The Quileute Tribal School in La Push, Washington is located next to First Beach, just 80 miles from the Cascadia Subduction Zone, which is capable of producing a M9.0 megathrust earthquake and subsequent tsunami. Moving the school to higher ground is a top priority of the tribe. Under the tribe's long range plan, the 400 families who live at sea level in the lower village, the tribal headquarters and the elder center also in harm's way would be moved to higher ground. While tragic events in Japan are still fresh in everyone's mind, the tribe has stepped up its lobbying effort for an ambitious village relocation project that would designate 800 acres of Olympic National Park for the tribe's use.

Computer models of the Cascadia subduction zone suggest that Quileute Tribe members would have about 20 to 30 minutes after such an earthquake to flee to higher ground in advance of a tsunami, Washington Department of Natural Resources geologist Tim Walsh said. But the energy generated by the earthquake could first tear the village apart and wipe out the only road leading out of La Push, Walsh continued.

For the full article, visit http://seattletimes.nwsourc.com/html/localnews/2014805126_apwatsunamiquileute1stldwritethru.html

People

New WSSPC Contacts

American Samoa

Danny Langkilde is the Territorial Emergency Management Coordinating Office National Tsunami Hazard Mitigation Program (NTHMP) Manager

Cinta Brown is the Territorial Emergency Management Coordinating Office Deputy Director

Vinnie Atofau is the Territorial Emergency Management Coordinating Office Manager

Idaho

Dave Jackson is the new Idaho Bureau of Homeland Security Critical Infrastructure Protection Program Manager

Mark Stephensen is the new Idaho State Hazard Mitigation Officer.

Oregon

Kent Yu is the new Oregon Seismic Safety Policy Advisory Council chair and liaison to WSSPC.

Moving On

New Mexico

Sophia Beym is no longer with the New Mexico Department of Homeland Security and Emergency Management. Susan Walker is the interim contact.

Dates and Deadlines

November 15, 2011

- WSSPC Board meeting, Sacramento, California

November 16, 2011

- WSSPC Strategic Directions Meeting, Sacramento, California

December 30, 2011

- National Awards in Excellence and WSSPC Lifetime Achievement Award Nominations Due to WSSPC Office

April 10, 2012

- WSSPC Annual Meeting, Peabody Hotel, Memphis Tennessee

April 11-14, 2012

- National Earthquake Conference, Peabody Hotel, Memphis, Tennessee

NATIONAL NEWS

NSF Expo on Capitol Hill for National Preparedness Month

In light of National Preparedness month and the recent Hurricane Irene and Mineral, Virginia earthquake, the National Science Foundation (NSF) hosted an expo on Capitol Hill September 7, 2011. More than 30 research exhibitor teams demonstrated how their NSF-supported work impacts and enables policymakers and disaster responders to better predict, prepare for, mitigate and respond to significant hazards that affect life, property, societal infrastructure and natural assets.

The exhibits displayed research relating to tornados, earthquakes, tsunamis, volcanoes, oil spills and hurricanes, as well as the human response to these events. Walk-through exhibits included: an earthquake simulator, tornado pods, search-and-rescue robots, a flood flume, 3-D IMAX clips from *Tornado Alley*, unmanned aerial vehicles for rescue, and more.

For the full article, visit www.nsf.gov/news/news_summ.jsp?cntn_id=121618

Senator Jeff Bingaman Honored with USGS Coalition Leadership Award

Senator Jeff Bingaman (D-N.M.) has received the U.S. Geological Survey (USGS) Coalition's Leadership Award. The award recognizes Senator Bingaman for his long-term support of the USGS and for his leadership on legislation and policies on natural resources, public lands, and energy for current and future generations.

For the full press release, visit www.usgscoalition.org/?q=node/6

Indigenous Knowledge and Disaster Risk Reduction

On August 9, 2011 the United Nations commemorated the 17th International Day of the World's Indigenous Peoples with the theme of "Indigenous designs: celebrating stories and cultures, crafting our own future". The United Nations International Strategy for Disaster Reduction (UNISDR) used this as an opportunity to highlight the importance of indigenous knowledge to disaster risk reduction. They noted the Moken people of the Andaman Sea survived the 2004 Indonesian tsunami because of a legend their people tell about the Laboon, "the wave that eats people". According to ancient lore, before the wave arrives the water recedes and the loud cicadas stop singing, which happened before the 2004 tsunami hit. A member of the tribe noticed the silence and warned everyone. The community moved to higher ground before the first wave struck and was saved.

According to the United Nations Environmental Programme (UNEP), traditional communities rely on indigenous knowledge to conserve the environment and deal with disasters. These communities, particularly those in hazard-prone areas, have generated a vast body of indigenous knowledge on disaster prevention and mitigation that they have passed down through generations. Because this knowledge is not well documented, it is in danger of being lost as its custodians pass away. Preserving this knowledge and integrating it into modern disaster risk reduction efforts may be crucial to hazard reduction.

For the full article, visit www.unisdr.org/archive/21236

PERI Restructure

The Public Entity Risk Institute (PERI) has restructured so that it may provide direct resources to public risk management. PERI is developing an operational model to directly expend funds to support local, institutional and educational risk management efforts.

For more information, visit www.riskinstitute.org/peri/component/option,com_deepockets/task,catContShow/cat,28/id,1151/Itemid,84/

MITIGATION & RESILIENCE

New Approach Gives School Officials Affordable and Accurate Ways to Judge Earthquake Risks to Buildings

Submitted by John Schelling, Earthquake/Tsunami/Volcano Program Manager, Washington Emergency Management Division

A federally funded pilot project examining earthquake hazards to school buildings in Washington State has produced a model process that could help the state and cash-strapped school districts target hazard mitigation funds to the buildings most in need.

Funded by the Federal Emergency Management Agency (FEMA) at no cost to the schools involved, the project report, *Providing Safe Schools for Our Students*, concludes that the proposed process is cost-effective enough to make it possible to assess and rank the earthquake vulnerability of school buildings in Washington State. The undertaking could be done for a total cost of \$10 million to \$13 million over an 8- to 10-year period. Ultimately, the new process would expedite efforts to reduce the risk to students, teachers, and administrative personnel from earthquakes.

“In these tough budget times when trust revenues are stretched thin, we now have a cost-effective and scientifically sound process to move ahead to find out how

prepared Washington school buildings are to withstand an earthquake,” said Peter Goldmark, Commissioner of Public Lands.

“The process that’s been identified is the result of great and thoughtful work by many agencies,” said Randy Dorn, Superintendent of Public Instruction. “Having this in place now will help prepare our schools and our students sooner, rather than later, in case there is a natural disaster.”

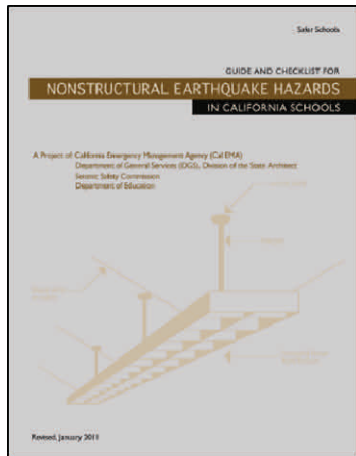
Rather than use the Rapid Visual Screening (RVS) method, a more detailed methodology called *ASCE 31-03 Seismic Evaluation of Existing Buildings* was used to capitalize on the availability of original school design documents, full building access, and volunteer support from the Structural Engineers Association of Washington. Site Class for each school site was determined by conducting seismic refraction studies to obtain the site-specific seismic velocity in the top 100 feet of the subsurface, and all probabilistic seismic sources were considered to obtain the design ground shaking values. Building type, building condition, and potential nonstructural hazards were noted in each building inspection. Building and seismic inputs were combined into HAZUS-MH to estimate the potential damage to school buildings. This new process would take less than a day per school site without disrupting classes or other indoor activities and involve highly-trained professionals, such as structural engineers and geologists.

The multi-agency Washington State Seismic Safety Committee, which authored the report, says the increased speed and accuracy of the new process would make it possible to assess every public school building in the state at a cost of \$3,500 to \$4,500 each. By avoiding multiple inspection visits sometimes required under the currently used Rapid Visual Screening method, the new approach would save money but not sacrifice accuracy. Assessments using the new process would be more cost effective and provide more valuable information.

Conducted during 2010, the School Seismic Safety Pilot Project assessed the seismic vulnerability of several buildings in the Walla Walla and Aberdeen school districts – two areas with known earthquake faults. Partners in the pilot project included the Washington State Military Department’s Emergency Management Division, Washington State Department of Natural Resources (DNR)–Division of Geology and Earth Resources, Office of Superintendent of Public Instruction, Washington State Seismic Safety Committee, the Structural Engineers Association of Washington, and the Washington Association of Building Officials.

The report is available at: www.dnr.wa.gov/Publications/ger_ofr2011-7_school_pilot_project.pdf

Cal EMA Launches Updated Guide for Earthquake Safety in Schools



On September 30, 2011, Mike Dayton, Acting Secretary of the California Emergency Management Agency (Cal EMA), launched the updated *Guide and Checklist for Nonstructural Earthquake Hazards in California Schools*. Originally released in 2003 by order of the California Emergency Services Act, the revised *Guide and*

Checklist provides further direction for creating safer educational facilities in a non-technical, easy-to-follow format. It gives school district officials concrete examples and recommendations to reduce the potential of seismically related hazards associated with nonstructural components in schools, including mechanical systems, ceiling systems, light fixtures and furnishings, and incorporates newer equipment more commonly used in schools, such as flat screen televisions. The guide also makes recommendations to maintain safe and clear exits for evacuation and access for first responders, and to prevent chemical spills, fires and gas leaks.

In addition to Cal EMA, the guide was created in partnership with Department of General Services (DGS), Division of the State Architect, the Alfred E. Alquist Seismic Safety Commission and the California Department of Education.

For more information, visit www.calema.ca.gov/NewsandMedia/layouts/DispItem.aspx?List=f1e85c6a%2Dfa43%2D4225%2D9050%2D2b846c19cb73&ID=17&RootFolder=%2FNewsandMedia%2FLists%2FLatest%20News&Source=http%3A%2F%2Fwww%2Ecalema%2Eca%2Egov%2FPages%2Fdefault%2Easpx&Web=9ce220de%2D6375%2D45c8%2D9565%2Df1a49b0cad7f

The document is available for download at www.calema.ca.gov/PlanningandPreparedness/Documents/Earthquake%20Program/7.28.11Revised%20Nonstructural%20EQ%20Hazards%20for%20Schools%202011.pdf

Oregon Parents for Quake-Resistant Schools

Submitted by Edward Wolf, Co-Founder, OPQRS



Oregon Parents for Quake-Resistant Schools (OPQRS) is a statewide initiative co-founded by Edward Wolf and Amanda Gersh, two parents of children attending Portland Public Schools (PPS). As the largest school district in Oregon, PPS exemplifies the structural challenges common in many school districts around the state. Its 85 schools average more than sixty years in age, and only two (both are elementary schools) have been constructed since Oregon first adopted seismic building codes in 1994. Throughout the state, Oregon children attend classes in a built environment not designed or constructed with a modern understanding of the seismic risks these buildings face. Repairs and retrofits have been piecemeal at best.

The effort to create OPQRS started several months ago when the co-founders discovered a common concern for the seismic safety of the school buildings their daughters attended. Using social media (an on-line petition plus Facebook page) gave parents a platform to express their concern to Oregon Governor John Kitzhaber, and to ask him to accelerate state investment in seismic safety on behalf of Oregon's children and to face up to its obligation to make every school earthquake-safe.

Oregon PTA's Board of Directors has formally endorsed the petition, and many school-based PTAs are sharing it with their members and signing on. Oregon PTA helped set the stage for the petition and for OPQRS by adopting a Resolution to Make Oregon Schools Earthquake-Safe at their statewide convention in April 2011. Oregon PTA's credibility with parents and their leadership on this issue are both real assets for this initiative.

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"California fears its Big One. But we have an even Bigger One coming to Oregon and more than two thirds of the public school buildings have seismic deficiencies that need to be addressed. K-12 school is mandated by the state of Oregon so at the very least, the state must provide a minimum level of life safety for our kids. But it's not happening. Right now, Oregon is gambling with our children's lives. Parents need to know that." – Amanda Gersh, Co-Founder, OPQRS.

For more information on the OPQRS petition, visit the petition page at www.change.org/petitions/oregon-governor-make-oregon-schools-quake-safe, or the Facebook page at www.facebook.com/quakesafeschools

Buildings Hold Key to Disaster-Proof Schools

An article co-written by Nancy Bailey, Barry Welliver, and Edward Wolf underscores the importance of building safety in protecting our children from earthquakes. They highlight the public's willingness to participate in earthquake preparedness drills, such as the ShakeOut, but point out that practicing preparedness activities is not enough to save the lives of those children who attend school in unreinforced masonry structures - buildings that are not built to withstand the earthquakes that the Wasatch Front, and the Pacific Northwest are capable of producing.

As noted in the Spring 2011 WSSPC eNewsletter, Utah has taken the first step to gauge the risk, using Federal Emergency Management Agency funds to survey 128 school buildings along the Wasatch Front with a "rapid visual screening" method designed to help prioritize safety investments. The survey turned up 77 buildings that needed a closer look, and of those, 46 are believed to be at high or very high risk of collapse. Utah's Seismic Safety Commission urges expanding the survey to all of the state's 1,085 K-12 school buildings. But state lawmakers, even in family-friendly Utah, have yet to take up the cause.

Oregon has gone further, completing a statewide survey of 2,186 school buildings, along with fire stations, police stations, and hospitals. The results raised eyebrows: The survey found that 1,018 school buildings, or 47 percent of all K-12 buildings examined, rated high or very high for risk of collapse in a strong earthquake. But efforts to fix risky schools have scarcely begun: A state grant program launched in 2009 and subsequently cut by 25 percent received \$7.5 million in life support from legislators in 2011. A couple dozen schools will be fixed, but hundreds remain dangerous.

For the full article, visit www.edweek.org/ew/articles/2011/07/18/37bailey.h30.html?tkn=LWQFgu2gCvv0Ud4TprnKm3JR3vF0IONc3do4

Vertical Evacuation Plans Could Save Thousands from Tsunamis, Studies Say

From the Washington Emergency Management Website

Two new federally-funded studies say vertical evacuation structures could save thousands of Washington coastal residents from deadly tsunami waves.

A series of specially constructed berms, towers, and buildings could save an estimated 24,750 residents and visitors in Pacific and Grays Harbor counties which have more than 120 miles of Pacific Ocean coastline lying only a short distance from the Cascadia Subduction Zone. Geologic studies have shown that the low-lying coastal zones of these counties have experienced Magnitude 9+ Cascadia earthquakes and tsunamis about

every 300 to 500 years over the past 3,500 years.

"These reports are the product of the nation's first community-based project to help low-lying areas that are vulnerable to devastating earthquakes and tsunamis like those from the Cascadia Subduction Zone off of the Washington coast. Vertical evacuation is the only viable evacuation strategy for some Washington communities" said John Schelling, manager of the Washington Emergency Management Division's earthquake program.

Schelling was the state lead for a project - called Project Safe Haven -- which began in early 2010 to address vertical evacuation proposals for the Washington coastal counties, beginning in four Pacific County areas. Work started in three Grays Harbor County areas in early 2011. Additional work is scheduled in 2011 and 2012 in Jefferson and Clallam counties.

Using a National Tsunami Hazard Mitigation Program grant, Schelling tapped the University of Washington's College of Built Environments Department of Urban Design and Planning, the state Department of Natural Resources Geology and Earth Resources Division, the Pacific County Emergency Management Agency, and Grays Harbor County Emergency Management to conduct a series of public meetings aimed at helping residents develop plans for integrating tsunami vertical evacuation into their communities. Additional technical assistance was provided by the National Oceanic and Atmospheric Administration, the U.S. Geological Survey, Federal Emergency Management Agency, and Dengkolb Engineers.

Stephanie Fritts, Pacific County emergency manager, said the key to the program was to emphasize the community's role in identifying potential vertical evacuation locations. "Community members were listened to and consulted in each phase of the project," she said. "The result is a Pacific County vertical evacuation project list that has wide-spread community support."

"Coastal residents found the vertical evacuation to areas of safety offered a much better way to address tsunami evacuation than our existing plans," said Charles Wallace, Grays Harbor County emergency manager. "Our Project Safe Haven project list reflects a solid consensus of opinion about how and where the vertical evacuation structures should be built."

Pacific County vertical evacuation recommendations are as follows:

- 20 facilities, including 13 berms, five towers, and two buildings.
- Estimated cost: \$ 11 million.
- Project areas: Long Beach, Ilwaco/Seaview, Ocean Park, Tokeland/North Cove.
- Affected population: 6,300.

Grays Harbor vertical evacuation recommendations are as follows:

- 32 facilities, including three berms, 18 towers, eight tower/berms, and three buildings.
- Estimated cost: \$40 million.
- Project areas: South Beach, Ocean Shores, and Taholah.
- Affected population: 18,450.

More detailed information about Project Safe Haven is available at <http://www.facebook.com/ProjectSafeHaven>

Cannon Beach, Oregon Tsunami Mitigation

The community of Cannon Beach, Oregon has been a leader in earthquake and tsunami preparedness, but in the wake of the March 11, 2011 M9.0 earthquake and subsequent tsunami that struck Japan, city leaders are realizing they are not as prepared as they thought. A major earthquake off the Oregon coast would collapse Cannon Beach City Hall and the Ecola Creek Bridge. The community now has to figure out how to mitigate these disasters, and how to pay for it.

The community agrees that City Hall must be moved to higher ground; the debate is what to do about the bridge. Several possible options have been proposed, including leaving the bridge and building a vertical evacuation tower, though once the town decides on what structure they want built they have to find the funds to build it. City Manager Rich Mays is hoping for state and federal funding to aid the builds.

For the full article, visit www.oregonlive.com/pacific-northwest-news/index.ssf/2011/08/Japan_tsunami_fuels_sense_of_urgency_in_cannon_beach_to_better_prepare_for_big_quake_wave.html

NSF Program Supports Innovation in Emergency Response

From the NSF website.

Rochester Institute of Technology (RIT) and the University at Buffalo (UB) have joined together in a NSF Partnership for Innovation (PFI) program (award number 0917839) dedicated to innovation in disaster management. They created the Information Products Laboratory for Emergency Response (IPLER) as a technology, policy and business development incubator to facilitate interaction and innovation among university researchers, private sector service and product providers, and public sector emergency response decision makers.

One of IPLER's major accomplishments is its emergency response role following the January 2010 earthquake in Haiti. Supported by additional funding from the World Bank, IPLER collaborated with several industry partners to collect imagery and topography data for more 250 square miles in and around Port-au-Prince.

Data from this response effort are in the public domain for response and research purposes. More than 100 terabytes of data have been downloaded by groups ranging from the National Geospatial Intelligence Agency, the U.S. Army, U.S. Geological Survey, Google, and the United Nations, to Purdue University and Massachusetts Institute of Technology. The data, which traditionally have not been available at the field level for operating agencies immediately after a disaster, have been shared by many international organizations as well. RIT and UB also received a NSF Rapid Response Research, or "RAPID", grant (award number 1034639) to build a target detection tool for post-earthquake Haiti disaster management as well as future earthquakes and tsunamis.

IPLER scientists also participated in image-processing of the Fukushima nuclear power plant following the March 2011 earthquake and tsunami that devastated Japan. Other activities include flood plain mapping in partnership with the Seneca Nation, a collaboration with the U.N. Foundation on broadening international emergency response efforts, and the development of a masters-level training program in environmental forecasting and disaster preparedness and response.

For more information about IPLER, read a special report from RIT at www.rit.edu/research/imaging_story.php?id=55

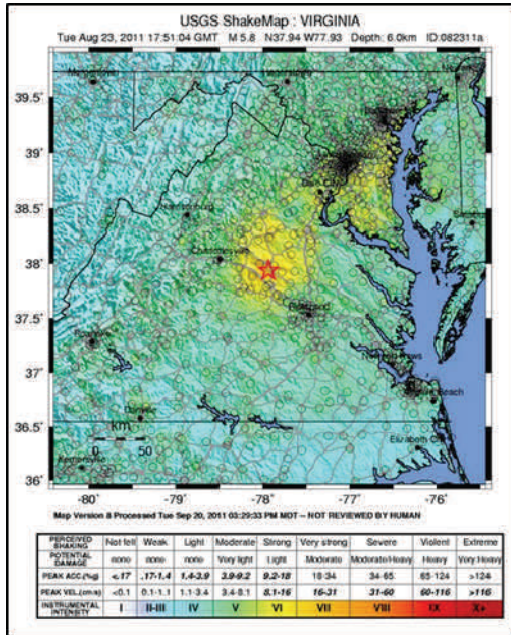
Engineering & Building Codes

Building Safety Congressional Briefing

On October 5, 2011, the High-Performance Building Congressional Caucus Coalition (HPBCCC) and the Congressional Hazards Caucus Alliance sponsored a congressional briefing: "Building Safety in the Face of Natural Disasters". The briefing focused on the critical role of building codes in community resilience following disasters. Speakers included HPBCCC Co-chair Rep. Russ Carnahan (D-MO-3), Insurance Institute for Business and Home Safety President and CEO Julie Rochman, National Institute of Building Sciences President Henry Green, and Fairfax County building official and International Code Council Board member Guy Tomberlin.

Presentations are available at www.ashrae.org/advocacy/page/1394

Virginia



M5.8 Earthquake Strikes National Capital Area

From the USGS website

A shallow M5.8 earthquake struck the greater Washington D.C. area on Tuesday, August 23, at 1:51p.m. (EDT), causing moderate shaking and potentially significant damage, and was felt throughout Northern Virginia and neighboring areas. The earthquake occurred near Louisa and Mineral, Va., approximately 100 miles southwest of Washington, DC. Shaking was recorded all along the Appalachians, from Georgia to New England. There have been several aftershocks.

The earthquake occurred in the Central Virginia Seismic Zone, which has produced earthquakes in the past. The most notable was an earthquake that occurred in 1875 that scientists believe was about a M4.5. This earthquake is almost as strong as the strongest recorded earthquake in Virginia, a M5.9, which occurred in May 1897 in Giles County, Va. The strongest recorded earthquake to strike the East Coast was the 1886 Charleston, S.C., earthquake, which was about a M7.3.

For the full write-up, visit www.usgs.gov/newsroom/article.asp?ID=2898.

Several videos of the earthquake occurring and the aftermath are available at www.wdbj7.com/news/wtvr-nrc-north-anna-nuclear-plant-shook-hard-20110908,0,105782.story

Virginia Nuclear Plant Shaken in Earthquake

From the Washington Post

On September 8, 2011, officials from Dominion Virginia Power told the Nuclear Regulatory Commission (NRC) that the August 23, 2011 M5.8 earthquake that struck near Louisa, Virginia shook the North Anna nuclear power plant harder than it was designed to withstand. Fortunately, Dominion also reports that there has been no damage to any “safety related” structures or systems at the plant, which is located just 12 miles from the quake’s epicenter.

North Anna is the first nuclear reactor to shut down after an earthquake in the 53-year history of commercial nuclear power in the United States.

The dual-reactor at the North Anna facility experienced “strong” ground motion in the north-south direction for about three seconds during the August quake, said Eric Hendrixson, director of nuclear engineering for Dominion.

The company’s analysis of data from seismographs at the plant showed that the facility experienced “cumulative absolute velocity” — a measure of the total amount of shaking over time — in excess of the so-called “design basis” for the plant, Hendrixson said.

The company’s analysis confirms the NRC’s.

For the full article, visit www.washingtonpost.com/national/health-science/va-nuclear-plant-experienced-strong-shaking-in-aug-23-quake/2011/09/08/gIQAuGOuCK_story.html

Virginia Earthquake Damage to Schools

More than 100 schools throughout Virginia and Maryland suffered structural and non-structural damage from the August 23, 2011 M5.8 earthquake. Three Louisa County, Virginia schools near the epicenter of the earthquake were the most severely damaged. Louisa High School and Thomas Jefferson Elementary will be closed through the end of the school year. Trevilians Elementary has added 25 mobile classes to accommodate all 550 students from Thomas Jefferson. High School students will attend class at the middle school on a Monday, Wednesday, Friday schedule and the middle school students will now attend on a Tuesday, Thursday, Saturday schedule.

For articles on the condition of the Louisa County schools, visit www.nbc29.com/story/15326702/extensive-earthquake-damage-to-3-louisa-schools and www.nbc12.com/story/15342950/two-schools-will-not-reopen-this-year

FEMA Denies Aid to Louisa, County

From the Los Angeles Times

The Federal Emergency Management Agency (FEMA) has denied aid to Louisa County, Virginia. About 1,000 homes in Louisa County were damaged in the M5.8 earthquake that struck on August 23, including a number that are uninhabitable, according to state officials, who estimate the damage at more than \$80 million.

FEMA has determined that the damage to dwellings "was not of such severity and magnitude as to be beyond the capabilities of the commonwealth, affected local governments and voluntary agencies," the agency's director, W. Craig Fugate, said in a letter to Virginia Gov. Robert McDonnell.

McDonnell is seeking assistance such as low-interest loans for homeowners, renters and businesses, unemployment assistance, disaster housing assistance and crisis counseling.

For the full article, visit <http://latimesblogs.latimes.com/nationnow/2011/10/quake-aid-virginia-denied-political.html>

EERI Virginia Earthquake Clearinghouse

The Earthquake Engineering Research Institute (EERI) has launched the Virginia Earthquake Clearinghouse website. The Clearinghouse contains detailed information on the impact of the M5.8 August 23, 2011 event, including structural and non-structural damage, social and economic impacts, and geotechnical information. The website is available at www.eqclearinghouse.org/2011-08-23-virginia/.

Tohoku, Japan

Japan Primary School Evacuated into Tsunami

Nearly 70 percent of the students enrolled in the Okawa Primary School in Ishinomaki, Miyagi, Japan died or remain missing in the wake of the March 11, 2011 tsunami. School students and staff remained assembled in the school playground for 40 minutes before finally evacuating along a route toward the Kitakamigawa River. The students were lined up oldest to youngest as they walked to an area of higher ground called "sankaku chitai" at the foot of the Shin-Kitakami Ohashi bridge. The tsunami surged toward them as they approached. The older children at the front of the line turn and ran in the direction from which they had come while the youngest looked on in confusion. One boy managed to save himself by first using his safety helmet as a flotation device, then climbing into a door-less refrigerator that floated toward the hill behind the school. He helped save the life of a fellow classmate who became stuck in the mud while trying to run away.

The local board interviewed 28 people about the events that transpired in the moments leading up to the inundation of the site. The interviews revealed considerable confusion about where to evacuate to in the minutes leading before the tsunami hit. The school and residents eventually settled on "sankaku chitai" because it was on higher ground, and some believed the tsunami couldn't travel that far inland.

For the full write-up, visit www.yomiuri.co.jp/dy/national/T110823005568.htm

Video: Car in Japanese Tsunami Wave

The video linked below was taken from a camera mounted to the dash of car when the March 11, 2011 earthquake and tsunami struck Japan. The video serves as a chilling example of why evacuation by car during a tsunami is not advised. The driver, Yu Muroga, was at work making deliveries when the earthquake hit. He was unaware of how far inland the Tsunami would travel and continued to drive and do his job. The HD camera mounted on his dashboard captured not only the earthquake, but also the moment he and several other drivers were suddenly engulfed in the Tsunami. **He escaped from the vehicle seconds before it was crushed by other debris and sunk underwater.** His car and the camera have only recently been recovered by the police. The camera was heavily damaged but a video expert was able to retrieve this footage.

The video is available at www.flixxy.com/japanese-tsunami-viewed-from-a-car.htm

Radiation found in Japan Rice

Government officials in Japan are ordering more tests on rice growing near the Fukushima Dai-ichi nuclear power plant, which released radioactive cesium after it was damaged in the March 11, 2011 earthquake and tsunami. A sampling taken of unharvested rice contained 500 becquerels of cesium per kilogram, which is the highest consumable level under Japanese regulations. Previously, the highest level of cesium found in rice tested from more than 400 spots in Fukushima prefecture was 136 becquerels per kilogram. Elevated radiation levels have also been found in rice from Nihonmatsu, a city located 35 miles west of the Fukushima plant.

For the full write-up, visit www.usatoday.com/news/world/story/2011-09-24/japan-rice-radiation/50535820/1

Japan Tsunami Debris Headed for Hawaii

Researchers from the University of Hawaii are estimating that the 5-20 million tons of debris swept out to sea by the March 11, 2011 Japan tsunami will reach Hawaii within two years and the U.S. West Coast within three years. Debris, including furniture, appliances, and a fishing boat, was spotted in September by a Russian training vessel after passing the Midway Islands. Researchers say the debris was found closer to Midway than modeling programs predicted, and is therefore moving faster than expected.

For the full story, visit <http://news.yahoo.com/blogs/envoy/20-million-tons-debris-japan-tsunami-moving-toward-143640503.html>



Debris from the Japan tsunami heading toward HI. Credit: Yahoo News and KITV/ABC

Surviving the Tsunami NOVA Special

From the NOVA website

The earthquake that hit the northern coast of Japan on March 11, 2011 was recorded at M9.0—the worst ever recorded in Japan. It generated an unprecedented tsunami, obliterating coastal villages and towns in a matter of minutes. In some areas, the tsunami climbed over 100 feet in height and traveled miles inland. Amazingly, amateur and professional photographers captured it all on video, including remarkable tales of human survival, as ordinary citizens became heroes in a drama they never could have imagined.

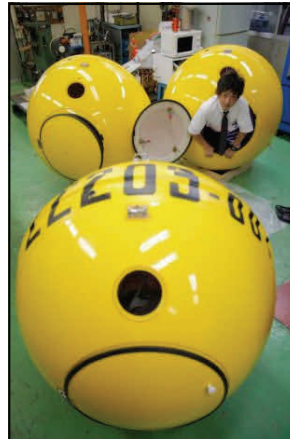
As the waves rush in, a daughter struggles to help her elderly mother ascend their rooftop to safety; a man climbs onto an overpass just as the wave overtakes his car. These never-before-seen stories are captured in video and retold after-the-fact by the survivors who reveal what they were thinking as they made their life-saving decisions. Their stories provide lessons on how we should all act in the face of life-threatening disasters. This unique program was originally produced and broadcast in Japan by NHK, Japan's public broadcaster.

The film is available for viewing at www.pbs.org/wgbh/nova/earth/surviving-tsunami.html

EERI Learning From Earthquakes Series

The Earthquake Engineering Research Institute (EERI) has completed and released three of six planned Learning From Earthquakes Special Reports on the March 11, 2011 Tohoku, Japan earthquake and tsunami. To download the reports, visit www.eeri.org/2011/09/next-report-in-eeri-lfe-series-on-japan-earthquake-tsunami-effect-of-tsunami-on-structures/

Japanese Company Designs Tsunami Survival Ball



"Noah" Survival Ball. Photo: Itsuo Inouye / AP

Cosmo Power, a small company in Japan, is reporting a huge spike in orders of its "Noah", a bright yellow, fiberglass ball it claims "is the only shelter that guarantees protection from any natural disaster". Noah is designed to hold four adults, withstand impact and float. It comes with ventilation and a lookout window, and the yellow color is intended to make rescue easier. The product was completed over four years ago, but none sold until after the March 11, 2011 Tohoku earthquake and tsunami. The company has since received 600 orders for the \$4000 ball.

For the full article, visit <http://abcnews.go.com/blogs/technology/2011/09/japanese-build-escape-pod-noah/>

Canterbury, New Zealand

Report on URM Building Performance in the 2010-2011 Canterbury Earthquake Swarm

A technical report prepared by Associate Professor Jason Ingham of the University of Auckland and Professor Michael Griffith of the University of Adelaide on the performance of unreinforced masonry buildings was prepared for the Canterbury Earthquakes Royal Commission in Christchurch. The report, *The Performance of Unreinforced Masonry Buildings in the 2010-2011 Canterbury Earthquake Swarm*, discusses the architectural characteristics and seismic vulnerability of unreinforced masonry buildings in New Zealand, makes observations about the performance of such buildings in the Canterbury earthquakes and available techniques for seismic upgrading. It recommends certain structural elements of all unreinforced masonry buildings be improved to meet the requirements for such structural elements in new buildings, and other elements be improved to meet at least 67% of the standard required for new buildings. The authors recommend that there be one

national standard instead of policies being set by individual territorial authorities.

The report was peer reviewed separately by structural engineer Fred Turner of California's Seismic Safety Commission and Bret Lizundia of San Francisco-based structural engineering and geotechnical firm Rutherford and Chekene. Both peer reviews have been published on the Commission's website.

The report will be presented at a public hearing to be held at St Teresa Hall in Riccarton, Christchurch November 7, 2011.

To download the report, visit <http://canterbury.royalcommission.govt.nz/Technical-Report--The-Performance-of-Unreinforced-Masonry-Buildings-in-the-2010-2011-Canterbury-Earthquake-Swarm>

L'Aquila, Italy

New L'Aquila Earthquake Commission Report



Following the 2009 L'Aquila earthquake, the Dipartimento della Protezione Civile Italiana (DPC), appointed an International Commission on Earthquake Forecasting for Civil Protection (ICEF) to report on the current state of knowledge of short-term prediction and forecasting of tectonic earthquakes and indicate guidelines for utilization

of possible forerunners of large earthquakes to drive civil protection actions, including the use of probabilistic seismic hazard analysis in the wake of a large earthquake. The Commission's report, *Operational Earthquake Forecasting: State of Knowledge and Guidelines for Utilization*, focuses on operational earthquake forecasting as the principle means for gathering and disseminating authoritative information about time-dependent seismic hazards to help communities prepare for potentially destructive earthquakes.

To read the full abstract and to download the report, visit www.annalsofgeophysics.eu/index.php/annals/article/view/5350

RESEARCH

Regional Earthquake Likelihood Models

From Scientific American

Scientists have bandied about a number of different earthquake forecasting methods over the years. For instance, one technique might look at the magnitude and timing of small quakes to predict when larger ones might occur; another might examine geological evidence of ancient temblors to forecast when future ones might happen; still another might estimate how much stress is built up in faults to guess when they might rupture from the pressure.

To see which technique might work best, researchers were invited to submit forecasts of future quakes to the Regional Earthquake Likelihood Models (RELM) test, the first competitive analysis of such methods. The project was supported by the Southern California Earthquake Center, a consortium of 600 researchers funded by the U.S. Geological Survey and the National Science Foundation.

Seven research groups submitted forecasts. The aim was to estimate the chances that earthquakes of magnitude 4.95 or higher would occur in more than 7,600 grids in and around California encompassing about 360,000 square miles (930,000 square kilometers) between 2006 and 2011. During this time, 31 earthquakes of the given magnitudes struck this area.

Of the seven techniques, a method known as "pattern informatics" scored as most reliable. This approach looks for anomalous increases and decreases in seismic activity, and if the number or intensity of these changes exceed a threshold based on past events, a given area gets flagged as a hot spot.

Of the 22 grids stricken by quakes, the pattern informatics model flagged 17 as potential hot spots. For eight of these 17 this model had the highest certainty of an earthquake hitting of all the forecasting techniques, said researcher Donald Turcotte, a geophysicist at the University of California, Davis, who helped develop the model. "We are not predicting the occurrence of a specific earthquake," Turcotte cautioned. "We are giving the relative risk of occurrence of earthquakes."

For the full article, visit www.scientificamerican.com/article.cfm?id=test-pits-earthquake-forecasts. To read the report from the Proceedings of the National Academies of Sciences, visit www.pnas.org/content/early/2011/09/19/1113481108.abstract

RESOURCES & PUBLICATIONS

California

CGS Special Report 220

The California Geological Survey (CGS) and U.S. Geological Survey (USGS) have released CGS Special Report 220/ USGS Open File Report 2011-1071: *Liquefaction and Other Ground Failures in Imperial County, California, from the April 4, 2010 El Mayor-Cucapah Earthquake*. The earthquake ruptured approximated 120 kilometers along several known faults in Baja California. Liquefaction and its related effects damaged infrastructure throughout the southwestern third of Imperial County.

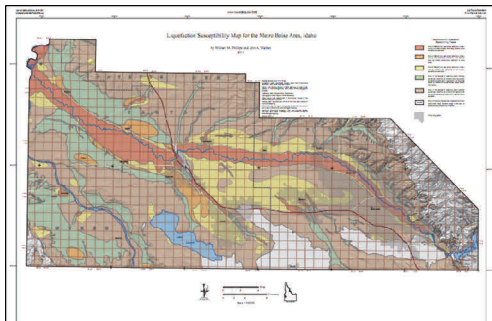
This jointly published report documents observed ground failures in the irrigated portion of the southern Imperial Valley, the majority of which are attributed to soil liquefaction. The observations were made by teams of geologists and engineers from the USGS, CGS, and the University of California, Los Angeles within the first week following the earthquake. The increased understanding of the spatial distribution of liquefaction-related ground failures holds the potential to improve infrastructure resiliency to future earthquakes in Imperial County and other tectonically active areas of the state.

The report is available as a free download at: www.consrv.ca.gov/cgs/information/publications/Pages/recent.aspx

Idaho

New Idaho Maps Released

The Idaho Geological Survey has released *National Earthquake Hazards Reduction Program (NEHRP) Site Class and Liquefaction Susceptibility Maps for the Boise Metro Area, Idaho* and seventeen geologic maps for various areas throughout the state. To view these maps, visit www.idahogeology.org/Products/reverselook.asp?switch=new



Cascadia Region

Film Examines Cascadia's Megathrust Earthquake Risk



Screen Shot from "Megathrust Earthquake", Brian Atwater and Dave Yamaguchi

Inspired by the March 11, 2011 Tohoku, Japan earthquake and tsunami, the 10.5 minute documentary film "Megathrust Earthquakes" examines the megathrust earthquake risk along the Cascadia subduction zone. It highlights the work of geologist Brian Atwater and tree ring scientist Dave Yamaguchi in dating the last megathrust earthquake and resulting tsunami to occur in the Cascadia zone back to January 1700, and geophysicist Ken Creager in monitoring slow-slip events in the Olympic Peninsula. The information collected by these scientists is being used to determine the risk of a future megathrust earthquake to the Cascadia region with the hope of mitigating disaster before it strikes.

To view the video, visit <http://science.kqed.org/quest/video/megathrust-earthquakes/>

Other Regions and Organizations

FEMA National Disaster Recovery Framework

From the FEMA Website

The *National Disaster Recovery Framework* is a guide that enables effective recovery support to disaster-impacted States, Tribes, Territories and local jurisdictions. It provides a flexible structure that enables disaster recovery managers to operate in a unified and collaborative manner. It also focuses on how best to restore, redevelop and revitalize the health, social, economic, natural and environmental fabric of the community and build a more resilient Nation.

The *National Disaster Recovery Framework* is consistent with the vision set forth in the Presidential Policy Directive (PPD)-8, National Preparedness, which directs the Federal Emergency Management Agency (FEMA)

to work with interagency partners to publish a recovery framework. It is the first framework published under the Presidential Policy Directive reflecting the core recovery capabilities by supporting operational plans as an integral element of a National Preparedness System. It is a first step toward the PPD-8 objective to achieve a shared understanding and a common, integrated perspective across all mission areas—Prevention, Protection, Mitigation, Response, and Recovery—in order to achieve unity of effort and make the most effective use of the Nation’s limited resources.

For the full write-up and to download your copy of the *National Disaster Recovery Framework*, visit www.fema.gov/recoveryframework/

FEMA National Preparedness Goal

From the FEMA website

The National Preparedness Goal is the first deliverable required under Presidential Policy Directive (PPD) 8: National Preparedness. The National Preparedness Goal sets the vision for preparedness nationwide and identifies the core capabilities and capability targets necessary to achieve that vision across the five mission areas: prevention, protection, mitigation, response and recovery.

The first edition of the National Preparedness Goal builds extensively on prior work of various stakeholder groups from around the nation, draws upon lessons learned from past large-scale and catastrophic events and represents input from preparedness partners from all levels of government, non-profit organizations, the private sector and individuals.

For more information or to download the National Preparedness Goal, visit www.fema.gov/prepared/ppd8.shtm

New NTHMP Tsunami Evacuation Mapping Guidelines

The National Tsunami Hazard Mitigation Program (NTHMP) has released *Guidelines and Best Practices for Tsunami Evacuation Mapping Guidelines*. Groups and agencies producing tsunami evacuation maps with NTHMP funds are required to adopt these guidelines for maps produced after January 1, 2012; all other organizations are strongly encouraged to adopt these guidelines as well.

The objectives of the guidelines are to promote a consistent look and feel to tsunami evacuation maps; facilitate emergency management planning activities; depict the area(s) affected by a tsunami; and create viable maps incorporating a thorough assessment of local risks.

For more information and to download your copy of the guidelines, visit <http://nthmp.tsunami.gov/>.

Guidelines and Best Practices to Establish Areas of Tsunami Inundation for Non-modeled or Low-hazard Regions

Finalized: August 2011

Developed by the National Tsunami Hazard Mitigation Program (NTHMP) Mapping & Modeling Subcommittee, *Guidelines and Best Practices to Establish Areas of Tsunami Inundation for Non-modeled or Low-hazard Regions* specifies a set of guidelines and recommended practices to guide the determination of tsunami inundation zones in areas where there is a low hazard – based on historical occurrence of tsunami, a low risk – due to a low population and infrastructure vulnerability, or that may not have modeled inundation and evacuation maps in the near future and wish to initiate planning and preparedness efforts.

For more information and to download the guidelines, visit http://nthmp.tsunami.gov/modeling_guidelines.html

NIST Launches Disaster and Failure Study Data Website

The National Institute of Standards and Technology (NIST) Engineering Laboratory has launched the Disaster and Failure Events Data Repository, a new website housing a compilation of images, videos and documents collected by NIST during and after failure events, and generated from researching those events. The repository will ensure that data are organized and maintained to enable study, analysis and comparison with future severe disaster events. It also will serve as a national archival database where other organizations can store the research, findings and outcomes of their disaster and failure studies.

The site is being established in two phases: 1) Data from NIST’s investigation into the collapses of World Trade Center buildings 1,2, and 7 in New York City as a result of the September 11, 2001 terrorist attacks. This phase has been completed and the data are available. 2) This phase includes a larger collection of information on hazard events such as earthquakes, tsunamis, structure fires, tornadoes, man-made hazards, etc...

More details on NIST’s Disaster and Failure Events Data Repository are available on page 3 of the September 2011 Engineering Laboratory newsletter, available at www.nist.gov/el/upload/elnewslettersept11.pdf. The repository is accessible at <http://wtcdata.nist.gov/>.

New PEER Report Published

The Pacific Earthquake Engineering Research Center (PEER) has just released “Seismic Risk Management in Urban Areas”. It contains the proceedings of a U.S.-Iran-Turkey Seismic Workshop on December 14-16, 2010 in Istanbul, Turkey. The workshop was supported by the U.S. National Academy of Sciences in collabo-

ration with the Bogazici University–Kandilli Observatory and Earthquake Research Institute, Turkey; Sharif University of Technology, Iran; and the Pacific Earthquake Engineering Research Center, University of California Berkeley, USA. The report is available as a free download at http://peer.berkeley.edu/publications/peer_reports/reports_2011/webPEER-2011-07-Turkey-Proceedings.pdf

CONFERENCES, WORKSHOPS AND EVENTS

COSMOS Technical Session

Date: November 14, 2011
Location: Emeryville, California

The Consortium of Organizations for Strong Motion Observation Systems (COSMOS) will be holding its Annual Meeting and Technical Session at the Hilton Garden Inn in Emeryville, California, on Friday, November 4, 2011 co-sponsored by the Pacific Earthquake Engineering Research Center (PEER) and the California Geological Survey (CGS). The day-long session will focus on “Recent Major Earthquakes and their Influence on Strong Ground Motion Determinations and Design.”

For complete program and registration details, visit www.cosmos-eq.org.

2012 IRIS Workshop

Dates: June 13-15, 2012
Location: Boise, Idaho

The next Incorporated Research Institute for Seismology (IRIS) workshop will be held June 13-15, 2012 in Boise, Idaho. Sessions are being organized around the theme: “*Seismology and Geophysics during the next 25 years*”. This Workshop will be an opportunity to explore links between exciting new scientific opportunities and facilities to enable exploration and discovery. For more information, visit www.iris.edu/hq/news/story/2012_iris_workshop_-_boise_idaho_-_june_13-15_-_save_the_dates

2012 SSA Annual Meeting

Dates: April 17-19, 2012
Location: San Diego, California

The 2012 SSA Annual Meeting will be held in San Diego, California on April 17-19, 2012. The upcoming meeting will focus on seismotectonics and hazards in continental margins with regional emphasis on Plate boundary processes. Topics of interest may include recent large earthquakes, tsunamigenic earthquakes, earthquake forecasting, urban earthquake hazards, issues related to siting nuclear or other critical facilities, and emergency management issues associated with large

earthquakes. Visit them online for upcoming submission and registration deadlines at www.seismosoc.org/meetings/2011/specialsessions.php.

Mark Your Calendars!!

October 27, 2011

Earthquake Engineering Research Institute Technical Seminar: Seismic Design and Performance of Nonstructural Elements, San Francisco, California
www.eeri.org/2011/08/technical-seminar-seismic-design-and-performance-of-nonstructural-elements/

October 28, 2011

Earthquake Engineering Research Institute Technical Seminar: Seismic Design and Performance of Nonstructural Elements, Seattle, Washington
www.eeri.org/2011/08/technical-seminar-seismic-design-and-performance-of-nonstructural-elements/

November 3, 2011

Earthquake Engineering Research Institute Technical Seminar: Seismic Design and Performance of Nonstructural Elements, Los Angeles, California
www.eeri.org/2011/08/technical-seminar-seismic-design-and-performance-of-nonstructural-elements/

November 4, 2011

Earthquake Engineering Research Institute Technical Seminar: Seismic Design and Performance of Nonstructural Elements, San Diego, California
www.eeri.org/2011/08/technical-seminar-seismic-design-and-performance-of-nonstructural-elements/

November 4, 2011

Consortium of Organizations for Strong Motion Observation Systems (COSMOS) Technical Session: Ground Motions from Subduction Earthquakes and Issues for Seismic Design, Emeryville, California, www.cosmos-eq.org/

November 11-17, 2011

International Association of Emergency Management Annual Conference and EMEX 2011
Rio All-Suites Hotel, Las Vegas, Nevada
www.iaem.com/events/annual/intro.htm

November 14-16, 2011

WSSPC-Supported Basin & Range Province Earthquake Working Group II, Salt Lake City, Utah (Invitation Only)

November 15, 2011

WSSPC Board Meeting, Citizen Hotel, Sacramento, California

November 16, 2011

WSSPC Strategic Planning Session, Citizen Hotel, Sacramento, California

2012

January 17-19, 2012

International Disaster Conference & Expo, New Orleans, Louisiana
www.internationaldisasterconference.com/

March 25-30, 2012

National Emergency Management Association Mid Year Emergency Management Policy Leadership Forum, Hilton Alexandria Mark Center, Alexandria, VA
<http://www.nemaweb.org/>

April 9-11, 2012

Partners in Emergency Preparedness Annual Conference
<http://conferences.wsu.edu/emergencyprep>

April 10, 2012

WSSPC Annual Meeting, Peabody Hotel, Memphis, Tennessee, 1:00pm-6:00pm

April 11, 2012

Seismic Councils and Commissions Meeting, Peabody Hotel, Memphis, Tennessee, 6:30pm-9:00pm

April 11-14, 2012

National Earthquake Conference, Peabody Hotel, Memphis Tennessee

April 17-19, 2012

Seismological Society of America Annual Meeting, San Diego, California
www.seismosoc.org/

May 9-11, 2012

Geological Society of America Rocky Mountain Section Meeting, Albuquerque, New Mexico
<http://www.geosociety.org/Sections/rm/2012mtg/>

June 13-15, 2012

Incorporated Research Institutions for Seismology (IRIS) Workshop, Boise, Idaho
www.iris.edu/hq/news/story/2012_iris_workshop_-_boise_idaho_-_june_13-15_-_save_the_dates

June 20-22, 2012

Golden Gate Bridge, Highway and Transportation District "Public Works For Public Learning" International Conference, San Francisco, California

June 26-29, 2012

45th Rock Mechanics/ Geomechanics Symposium, San Francisco, California
www.armasymposium.org/docs/sponsorship_ops.pdf

October 5-10, 2012

National Emergency Management Association Emergency Management Policy Leadership Forum, <http://www.nemaweb.org/>

November 4-7, 2012

Geological Society of America Annual Meeting, Charlotte, North Carolina
www.geosociety.org/meetings/2012/

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Request for Newsletter Submissions

If you have a newsworthy item for the next eNewsletter, please forward it to Amy Lewis, Program Manager by **January 1, 2012** at: alewis@wsppc.org