



## E-Newsletter Summer 2010 Edition July 20, 2010

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## WSSPC HEADLINE NEWS

### 2010 WSSPC Annual Meeting

The 2010 WSSPC Annual Meeting was held July 9-10, 2010 at the Omni Interlocken Resort in Broomfield, Colorado alongside the Natural Hazards Workshop. The Committee, Board and Annual Business Meetings were held on Friday, July 9. An Earthquake Early Warning Bridge Session, and an invitation-only Seismic Councils/Commissions Meeting were held on Saturday, July 10.

Information on the Committee and Seismic Councils/Commissions Meetings will be posted to the WSSPC website as it becomes available. [www.wsspc.org](http://www.wsspc.org)

### Annual Business Meeting



Thirty-six attendees were present at the this year's Annual Business Meeting, including WSSPC Members, Affiliate Members and representatives from FEMA and the USGS. The following 2010 WSSPC Policy Recommendations were approved and are available at the WSSPC website at <http://wsspc.org/policy/recommendations.shtml> :

#### Policy Recommendation 10-1 & 10-2

Rapid Tsunami Identification and Evacuation Notification

#### Policy Recommendation 10-3

Post-Earthquake Technical Clearinghouses

#### Policy Recommendation 10-4

Seismic Provisions in the 2009 International Building Code

#### Policy Recommendation 10-5

Basin and Range Province Earthquake Working Group(s)

#### Policy Recommendation 10-6

Post-Earthquake Information Management System

#### Policy Recommendation 10-7

Seismic Design of New Schools

#### Policy Recommendation 10-8

Identification and Potential Mitigation of Seismically Vulnerable School Buildings

#### Policy Recommendation 10-9

Earthquake Early Warning Systems

Headlines continued on Page 2.

## HEADLINES CONTINUED



### **Awards in Excellence Banquet**

The 2010 WSSPC Awards in Excellence banquet was held Friday, July 9, 2010 at the Omni Interlocken Resort in Broomfield, Colorado. This year's Overall Award in Excellence was presented to the Humboldt County Chapter of the American Red Cross, and Judy Warren, Humboldt County Chapter volunteer, for Outreach to General Public and Non-Profit Agency Efforts, for their "Living on the Faultline and Along the Coast" class. Judy was present to accept the award.

A letter from Oregon Senate President Peter Courtney was read by WSSPC Board Member Vicki McConnell of the Oregon Department of Geology and Mineral Industries, who accepted the Legislation award on his behalf.

Craig DePolo of the Nevada Bureau of Mines and Geology accepted their award for Research.

Congratulations to the 2010 WSSPC Awards in Excellence winners!

For a full list of the 2010 Awards in Excellence winners, visit our website at <http://wsspc.org/awards/current.shtml>

### **Earthquake Early Warning Bridge Session**

Dr. Jim Goltz, Earthquake and Tsunami Program Manager at the California Emergency Management Agency (CalEMA) moderated the Saturday, July 10 session. Speakers included Dr. David Applegate, Senior Advisor for Earthquakes and Geologic Hazards, USGS; Dr. Dennis Mileti, Former Director of the Natural Hazards Center and Professor of Sociology (Emeritus) at the University of Colorado, Boulder; David Zocchetti, J.D., Chief Counsel and Director of Legislative Affairs, CalEMA; and Dr. Yukio Fujinawa, Senior Managing Director, Real-Time Earthquake Information Consortium, Japan.

## WSSPC NEWS

### **2011 WSSPC Awards in Excellence**

We are now accepting nominations for the 2011 WSSPC Awards in Excellence. All submissions are due to the WSSPC Office by October 15, 2010. Information on the WSSPC Awards in Excellence program and nomination forms are available at the WSSPC Website at

<http://wsspc.org/awards/nominations.shtml>

### **2010 State Earthquake Program Reports**

Member agency State Earthquake Program Reports are due to the WSSPC office by October 15, 2010.

To view the 2009 reports, visit the WSSPC website at <http://wsspc.org/resources/state.shtml>

### **WSSPC Board Member Ken Murphy Appointed Administrator of FEMA Region X**

From the FEMA Website

Federal Emergency Management Agency (FEMA) Administrator Craig Fugate today applauded President Obama's appointment of Kenneth Dean Murphy as FEMA Regional Administrator for Region X, which encompasses Alaska, Idaho, Oregon and Washington.

"Regional Administrators are crucial to our ability to respond effectively to emergencies based on the needs of the communities we serve," said Fugate. "Kenneth Murphy is an experienced emergency manager who knows the Northwest well and is uniquely qualified to lead our efforts there."

Murphy has served with Oregon Emergency Management since 1999, most recently as the agency's Director. In that role, he was responsible for coordinating preparedness, response, recovery, and mitigation activities with state and local emergency services agencies. He also served on the Oregon Homeland Security Council, Oregon's State Interoperability Executive Council, the Governor's Search and Rescue Policy Commission, and the

Governor's Recovery Cabinet, as well as FEMA's National Advisory Council.

For the full press release visit:

<http://www.fema.gov/news/newsrelease.fema?id=51884>

### **WSSPC Members Selected for Preparedness Task Force**

WSSPC Board Member John Madden, Director, Alaska Division of Homeland Security and Emergency Management, and WSSPC Members Charles Ada, Administrator, Guam Office of Civil Defense, and Hans Kallam, Director, Colorado Division of Emergency Management have been selected to participate in the local, state, tribal and federal Preparedness Task Force.

The Task Force is a council of 35 experts from local, state, and tribal governments charged with assessing the state of the nation's disaster preparedness and making recommendations to Secretary Napolitano about ways to build resiliency in communities across America.

For more information on the Task Force and a full list of members, visit

[www.dhs.gov/ynews/releases/pr\\_1270649859370.shtm](http://www.dhs.gov/ynews/releases/pr_1270649859370.shtm)

### **Walter Arabasz Scholarship Fund**

Dr. Walter Arabasz has retired as Director of the University of Utah Seismograph Stations after a 37-year career at the University of Utah. Dr. Arabasz was the 2008 winner of the WSSPC Lifetime Achievement Award for his work in earthquake risk reduction. The Walter Arabasz Scholarship Fund has been established in his honor. You can help organizers reach their goal of \$25,000 by sending donations to:

University of Utah Seismograph Stations  
The University of Utah  
115 South 1460 East, Room 211(FASB)  
Salt Lake City, Utah 84112

Please make checks payable to the University of Utah, and designate "Walter Arabasz Scholarship Fund" on the memo line.

### **Wallace Ulrich Wyoming Acting State Geologist**

Wallace Ulrich was named Acting State Geologist by Wyoming Governor Dave Freudenthal on July 6, 2010. Ulrich is a past chairman and present member of the Wyoming State Geological Survey Advisory Board, a trustee of the American Geological Institute Foundation, the chairman of the board of the National Foundation for the Geosciences, and the secretary and one of the founders of the Geologists of Jackson Hole.

Ulrich succeeds Ron Surdam, who is now directing the Carbon Management Institute at the University of Wyoming's School of Energy Resources.

For the full press release, visit

[www.wsgs.uwyo.edu/NewsCenter/PressReleases/July7\\_2010.aspx](http://www.wsgs.uwyo.edu/NewsCenter/PressReleases/July7_2010.aspx)

### **WSSPC Members Featured in "On Shaky Ground" Series**

KUOW 94.9 FM, Puget Sound Public Radio in Washington, ran a four-part series June 8-11, 2010 entitled "On Shaky Ground: Waiting for the Big One in the Pacific Northwest." The series highlights faults, building codes, school safety and preparedness in the Puget Sound region of Washington. WSSPC Members Yumei Wang, geohazards section leader, Oregon Department of Geology & Mineral Industries, and John Schelling, earthquake program manager, Washington Military Department, Emergency Management Division, are featured in the July 10, 2010 "How Safe Are Schools?" segment.

To listen to the broadcasts, visit

[www.kuow.org/specials/earthquakes.php](http://www.kuow.org/specials/earthquakes.php)

### **Dr. Rick Astor Receives 2010 Distinguished Research Award**

The New Mexico Institute of Mining and Technology (New Mexico Tech) 2010 Distinguished Research Award was given to Dr. Rick Aster, the chairman of the Earth and Environmental Science Department at New Mexico Tech. The award was announced at the 2010 Commencement on Saturday, May 15.

For the full press release, visit

<http://www.nmt.edu/news/3827-aster-arendt-take-top-faculty-honors>

## **Member News**

### **Moving On**

WSSPC Board Member Ken Murphy has been appointed FEMA Region X Administrator and is no longer with Oregon Emergency Management.

Mai Claire Bolton has left the British Columbia Provincial Emergency Program for a position with RMS, San Francisco.

### **New Faces**

Wallace Ulrich has been appointed Acting State Geologist for Wyoming, replacing Ronald Surdam who is directing the Carbon Management Institute at the University of Wyoming's School of Energy Resources.

Dr. Jeri Young has joined the Arizona Geological Survey as a Research Geologist.

## Updated Contact Information

Oregon Emergency Management has changed the email addresses for its staff. For a list of updated addresses, visit [www.oregon.gov/OMD/OEM/contact\\_us\\_directory.shtml](http://www.oregon.gov/OMD/OEM/contact_us_directory.shtml)

## NATIONAL NEWS

### 2014 Provisions Committee Approved

The Building Seismic Safety Council (BSSC) Board of Direction has approved the membership of the 2014 Provisions Update Committee (PUC). The PUC is the hands-on group responsible for developing the next edition of the *NEHRP Recommended Seismic Provisions for New Buildings and Other Structures*. David Bonneville, PE, SE, Senior Principal of Degenkolb Engineers of San Francisco, Calif., will chair the 24-member committee.

For the full write-up, visit [www.nibs.org/index.php/bssc/news/Entry/2014pucaproved](http://www.nibs.org/index.php/bssc/news/Entry/2014pucaproved)

### \$7 Million Awarded for Earthquake Monitoring

From the USGS Website

More than \$7 million in cooperative agreements will be awarded for earthquake monitoring by the U.S. Geological Survey (USGS) in 2010. This funding will contribute to the development and operation of the USGS Advanced National Seismic System (ANSS).

As part of the National Earthquake Hazards Reduction Program (NEHRP), the ANSS provides continuous, real-time monitoring of earthquake activity and collects critical information about how earthquake shaking affects buildings and structures. Funds are also being provided for the operation of geodetic monitoring networks, which detect minute changes in the earth's crust caused by faulting in earthquake-prone regions.

Institutions receiving funding for monitoring through seismic and geodetic networks include the California Institute of Technology; University of Washington; University of Utah; University of California, Berkeley; University of Memphis; University of Alaska, Fairbanks; University of Nevada, Reno; Columbia University; St. Louis University; Boston College; University of California, San Diego; University of South Carolina; Montana Bureau of Mines and Geology (Montana Tech of the University of Montana); University of Oregon; Central Washington University; University of Colorado; and San Francisco State University.

For the full press release, visit [www.usgs.gov/newsroom/article.asp?ID=2453](http://www.usgs.gov/newsroom/article.asp?ID=2453)

## USGS to Award \$4M in Earthquake Research Grants

From the USGS Website

Earthquake research will receive approximately \$4 million in grants from the U.S. Geological Survey (USGS) in 2010, with support going to 47 universities, state geological surveys and private firms.

Examples of grant recipients include the following: In the Pacific Northwest, John Vidale of the University of Washington will develop computer simulations of ground shaking during earthquakes in the Seattle area. This study will provide a better understanding of the influence of large sedimentary basins (such as the sediment-filled basin underlying Seattle), on ground shaking and will provide more accurate estimates of ground shaking in the region.

In Alaska, researchers will continue developing a chronology of past earthquakes along the southern coast of Alaska. This will allow Ian Shennan and colleagues from the University of Durham in the United Kingdom to provide better estimates of recurrence times for large earthquakes, both in Alaska and in similar subduction-zone settings such as Chile.

For potential applicability both nationally and internationally, Jonathan Bray and colleagues at the University of California at Berkeley will investigate the possible use of smart phones and similar personal devices to rapidly deliver earthquake shaking information. Such information would then be used to more quickly and accurately quantify and locate earthquakes as they occur.

Roland Burgmann of the University of California at Berkeley and Brendan Meade of Harvard University will develop integrated models of northern California faults using GPS, InSAR and seismicity data. The inclusion of recent geodetic data into the revision and update of the this model of the San Francisco Bay Area is critical for estimates of seismic risk in the East Bay and in the Sacramento-San Joaquin River Delta.

In southern California, Peter Shearer at the University of California at San Diego and Egill Hauksson of the California Institute of Technology will investigate mechanisms and patterns of earthquakes. Shuo Ma of San Diego State University will simulate likely earthquakes for the fault system that borders Los Angeles to the north. Lisa Grant Ludwig at the University of California at Irvine will pursue a better record of prehistoric earthquakes on the San Andreas Fault. Don Helmberger at the California Institute of Technology will investigate earthquake source processes and improve methods for rapidly estimating earthquake source properties.

A complete list of funded projects and reports can be found on the USGS Earthquake Hazards Program website. The application period is now closed.

For the full press release, visit <http://www.usgs.gov/newsroom/article.asp?ID=2446>

### **USGS Awards \$2.7 Million in Stimulus Funding to Improve the Detection of Changes in the Earth's Crust**

From the USGS Website

The U.S. Geological Survey has awarded \$2.7 million in cooperative agreements under the American Recovery and Reinvestment Act to the University of California, Berkeley; Central Washington University; University of California, San Diego; and UNAVCO, Inc., to improve networks that detect minute changes in the earth's crust caused by faulting in earthquake-prone regions.

Monitoring these small changes (undetectable except through the methods of advanced geodesy) is an integral part of assessing the likely rate of large earthquakes. For optimal performance in real time, many existing monitoring stations need modern sensors and improved communication systems. Funds provided through six cooperative agreements will improve monitoring capabilities by replacing obsolete sensors that may be more than 10 years old and by upgrading communications so that real-time data streams are more reliable or possible for the first time. These funds will create or preserve jobs relating to contract work and equipment manufacturing.

For the full press release, visit <http://www.usgs.gov/newsroom/article.asp?ID=2443>

### **Italian Seismologists Indicted for Failing to Predict Earthquake**

The Seismological Society of America (SSA) and other professional associations are highlighting the indictment of Italian seismologists by the Prosecutor's Office in L'Aquila, Italy for failing to issue a short-term alarm prior to the April 6, 2009 L'Aquila Earthquake. Information on this case and how to respond can be found at the SSA website at [www.seismosoc.org/news/newsitem.php?id=i2010066109](http://www.seismosoc.org/news/newsitem.php?id=i2010066109)

### **SSA Calls for Nominations for the Bruce Bolt Medal**

The Bruce Bolt Medal is awarded jointly by the Consortium of Organizations for Strong Motion Observation Systems (COSMOS), the Earthquake Engineering Research Institute (EERI), and SSA to recognize individuals worldwide whose accomplishments involve the promotion and use of strong-motion earthquake data, and whose leadership in the transfer of scientific and engineering knowledge into practice or policy has led to

improved seismic safety. Members of COSMOS, EERI and SSA are encouraged to submit their nominations by August 31, 2010.

For more information, visit [www.seismosoc.org/news/#i2010076239](http://www.seismosoc.org/news/#i2010076239)

### **AGU Announces 2010-2012 Officers**

The American Geophysical Union (AGU) has announced their new officers. Each will serve a two-year term in these volunteer leadership positions. The new officers are President Michael J. McPhaden, senior scientist with the National Oceanic and Atmospheric Administration Pacific Marine Environmental Laboratory and affiliate professor of oceanography at the University of Washington; President-Elect Carol A. Finn, research geophysicist with the U.S. Geological Survey and affiliate of the Institute of Arctic and Alpine Research, University of Colorado; General Secretary Lisa Tauxe, distinguished professor of geophysics at the Scripps Institution of Oceanography; International Secretary Francis Albarède, professor of geochemistry at Ecole Normale Supérieure de Lyon; Past President Timothy L. Grove, professor of geology at the Massachusetts Institute of Technology.

## **EARTHQUAKE & TSUNAMI NEWS**

### **Seismic Events**

#### **M4.9 Utah Quake**

The University of Utah Seismograph Stations reports that a light M4.9 earthquake occurred on April 15, 2010. The epicenter of the shock was located 5 mi NE of Randolph, Utah. In Utah, the event was reported by more than 280 residents, from cities such as Logan, Morgan, Ogden, and Salt Lake City.

The quake was also felt in much of southwestern Wyoming in Wyoming's Uinta, Sweetwater and Lincoln counties.

There were no immediate reports of injuries or damage associated with the event.

For the full press release, visit [www.usgs.gov/newsroom/article.asp?ID=2443](http://www.usgs.gov/newsroom/article.asp?ID=2443)

#### **M5.0 Southern Alaska Quake**

On July 7, 2010 at 7:15pm local time, a M5.0 earthquake struck in the Cook Inlet region of Alaska, 50 miles north-northwest of Anchorage. Felt reports came in from Anchorage, Chugiak, Wasilla, Palmer, Fort Richardson, and Elmendorf AFB.

For more information, see the Alaska Earthquake Information Center at [www.aeic.alaska.edu/html\\_docs/information\\_releases.html](http://www.aeic.alaska.edu/html_docs/information_releases.html)

#### **M5.4 Southern California Quake**

On July 7, 2010 a M5.4 earthquake occurred 30 miles south of Palm Springs in the San Jacinto fault zone — one of two fault lines where researchers have noticed increased pressure since April's magnitude-7.2 quake that killed two people in Baja California. More than 5,000 aftershocks have rattled the border region since then.

“The July 7 quake is considered a ‘triggered quake’ and not an aftershock of the Baja shaker because it struck north of where scientists would expect aftershocks to occur,” said seismologist Kate Hutton of the California Institute of Technology.

The quake rattled buildings 100 miles away in Los Angeles and was felt in Arizona and Nevada, but no injuries were reported.

For the full article, visit [http://news.yahoo.com/s/ap/us\\_california\\_earthquake](http://news.yahoo.com/s/ap/us_california_earthquake)

To view the ShakeMap of this event, visit <http://earthquake.usgs.gov/earthquakes/dyfi/events/ci/10736069/us/index.html>

For the Center for Engineering Strong Motion Data report, visit [http://strongmotioncenter.org/cgi-bin/ncesmd/iqr\\_dist\\_DM2.pl?iqrID=BorregoSprings\\_07Jul2010&SFlag=0&Flag=1](http://strongmotioncenter.org/cgi-bin/ncesmd/iqr_dist_DM2.pl?iqrID=BorregoSprings_07Jul2010&SFlag=0&Flag=1)

#### **M7.1 Yushu, China Earthquake**

On Wednesday April 14, 2010, at 7:49 a.m. local time, a M7.1 earthquake struck the Yushu county of Qinghai Province, China, affecting an area about 4,000 square km in the central part of the Qingzang high plateau with a population of about 100,000 people. It was followed by a sequence of aftershocks felt during the entire time of the search and rescue effort. As of April 22, the earthquake had caused 2,187 deaths (including 207 students), 80 missing, and 12,135 injuries, as well as significant damage to the local residential and public buildings and infrastructure. Damage and casualties were mainly focused in the capital town of Jiegu, through which the fault rupture passed directly.

For more information, see page 3 of the May 2010 EERI Newsletter at [www.eeri.org/site/images/eeri\\_newsletter/2010\\_pdf/May10.pdf](http://www.eeri.org/site/images/eeri_newsletter/2010_pdf/May10.pdf)

#### **M3.4 Potomac Area Quake**

A M3.4 earthquake struck the Potomac/Washington D.C. Area on July 16, 2010. Felt reports were recorded from Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Virginia, and Maryland. For further details, visit the USGS website at

<http://earthquake.usgs.gov/earthquakes/dyfi/events/us/2010yua6/us/index.html>

### **Updates on Earlier Events**

#### **Haiti**

##### **EERI Haiti Earthquake Workshop**

Several EERI members, including Executive Director Jay Berger, participated in a workshop convened by the U.S. National Science and Technology Council's Subcommittee on Disaster Reduction (SDR), focusing on the role of science and engineering in Haiti's reconstruction in the aftermath of the January 12, 2010 quake. The key findings from this workshop are available at [www.state.gov/p/io/rls/fs/139155.htm](http://www.state.gov/p/io/rls/fs/139155.htm).

##### **EERI Haiti Earthquake Report #2**

EERI has released their second report on the January 12, 2010 M7.0 Haitian Earthquake. Topics include: remote sensing data, performance of historic structures, engineered buildings, low-rise buildings and homes, hospitals, water/wastewater, ports, social impacts, recovery efforts and significant recovery issues.

To download the report, visit [www.eeri.org/site/images/eeri\\_newsletter/2010\\_pdf/Haiti\\_Rpt\\_2.pdf](http://www.eeri.org/site/images/eeri_newsletter/2010_pdf/Haiti_Rpt_2.pdf)

##### **MCEER Signs Haiti Training MOU**

MCEER, together with the University at Buffalo (UB) Office of International Education, has signed a memorandum of understanding with the University of Quisqueya (UniQ) in Port-au-Prince.

The MOU provides for the immediate training in ATC-20 rapid building assessment procedures and earthquake engineering fundamentals. The group will also develop longer-term educational programs on seismic design of buildings with a focus on adapted techniques for reconstruction, and will promote academic exchange and cooperation over the next three years.

For more information, visit <http://mceer.buffalo.edu>.

##### **PAHO: Learning From Haiti**

The Pan American Health Organization, a regional office of the World Health Organization (WHO), dedicated much of their May 2010 issue of *Disasters: Preparedness and Mitigation in the*

Americas to the January 12, 2010 M7.0 Haiti Earthquake. The journal asks "What can we really learn from the earthquake in Haiti?" and focuses on preparedness and response of medical and humanitarian organizations.

To view this publication, visit [www.disaster-info.net/newsletter/113/NL113e.pdf](http://www.disaster-info.net/newsletter/113/NL113e.pdf).

## Chile

### **M8.8 Chile Earthquake Report**

The EERI Chilean Earthquake Report is now available for download. Topics include tectonic setting and geological aspects, strong motion, geotechnical effects, the tsunami, buildings, nonstructural components and systems, hospitals and healthcare, lifelines, transportation systems, industrial facilities, social impacts, and response and recovery.

To download this report, visit [www.eeri.org/site/images/eeri\\_newsletter/2010\\_pdf/Chile10\\_insert.pdf](http://www.eeri.org/site/images/eeri_newsletter/2010_pdf/Chile10_insert.pdf)

## El Mayor, Mexico (Baja)

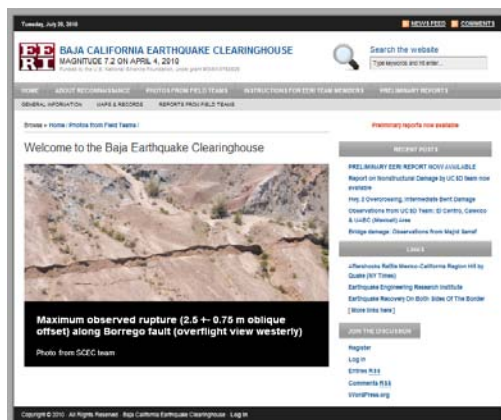
### **M7.2 El Mayor (Baja) Earthquake Report**

EERI has released a report on the April 4, 2010 El Mayor Cucupah (Baja California) Earthquake. The report highlights surface faulting, ground motions, liquefaction, north and south of the border structures, non-structural components and systems, bridges, water and waste water systems, and economic losses.

To review the report, visit [www.eeri.org/site/images/eeri\\_newsletter/2010\\_pdf/Baja\\_CA\\_EQRpt.pdf](http://www.eeri.org/site/images/eeri_newsletter/2010_pdf/Baja_CA_EQRpt.pdf)

### **EERI El Mayor Earthquake Clearinghouse**

EERI has established an Earthquake Clearinghouse for the April 4, 2010 M7.2 El Mayor Earthquake at <http://www.eqclearinghouse.org/20100404-baja/>



## Research

### **Baja Quake Sheds Light on Liquefaction**

Mary Caperton Morton, Contributing Writer, Earth Magazine

Data collected by a unique array of instruments located near the epicenter of the magnitude-7.2 earthquake that struck Baja California April 4 are providing scientists with new insight into the phenomenon of liquefaction.

Jamison Steidl, a seismologist at the University of California at Santa Barbara, says the data collected by the network of accelerometers and underground pressure sensors located just south of the California-Mexico border show the start of the liquefaction process, when excess pore water pressure in underlying sandy soils reduces the shear strength of the sand.

For the full article, visit <http://www.earthmagazine.org/earth/article/35f-7da-7-9>

### **Predicting the next Northwest Mega Quake**

The Northwest is due for another devastating mega-quake. Precise predictions are impossible, but by reconstructing the history of mega-quakes in the Northwest, scientists have found a possible pattern that could help improve forecasts of the next big one. Findings suggest that the largest, most damaging quakes may strike in clusters, appearing every 260 years. Those clusters are separated by gaps of 1,000-year periods of inactivity.

"The critical question is, are we in a cluster, or are we in a gap?" says Ivan Wong, a seismologist with URS Corp. in Oakland, Calif. "We think there is a high probability that we are still in a cluster, that we have at least one more big earthquake in this cluster."

"Hundreds of buildings that aren't designed to withstand ground-shaking are going to fail," says Yumei Wang, a geotechnical engineer with the Oregon Department of Geology and Mineral Industries, who spent time in Chile in March studying how buildings withstood a subduction zone quake. For the full article, visit [www.oregonlive.com/news/index.ssf/2010/04/predicting\\_the\\_next\\_northwest.html](http://www.oregonlive.com/news/index.ssf/2010/04/predicting_the_next_northwest.html)

### **Tiny Clays Curb Big Earthquakes**

When Ben van der Pluijm and colleagues at the University of Michigan and Germany's Ernst-Moritz-Arndt Universität Institut für Geographie und Geologie report in the July issue of *Geology* analyzed samples of rock from an actively creeping segment of the San Andreas Fault that was brought up from a depth of two miles below the surface as part of the San Andreas Fault Observatory at Depth (SAFOD) project, they found that fractured rock surfaces were

coated with a thin layer of smectitic clay, less than 100 nanometers thick, that acts something like grease on ball bearings.

"For a long time, people thought you needed a lot of lubricant for creep to occur," said van der Pluijm, "What we can show is that you don't really need a lot; it just needs to be in the right place. It's a bit like real estate: location, location, location." The nanocoatings occur on the interfaces of broken-up bits of rock in exactly the places where they affect the fault's "weakness"—how easily it moves.

Although the samples obtained through SAFOD are from a depth of only about two miles, van der Pluijm and colleagues think it's likely the clay nanocoatings also are forming and driving fault behavior at greater depths. What's more, analyses of older, inactive strands suggest that the coatings have been facilitating creep for the millions of years of fault activity.

The SAFOD project, which is establishing the world's first underground earthquake observatory, is a major research component of EarthScope, an ambitious, \$197-million federal program to investigate the forces that shaped the North American continent and the processes controlling earthquakes, volcanoes and other geological activity.

For the full article, visit [www.ns.umich.edu/htdocs/releases/plainstory.php?id=7854](http://www.ns.umich.edu/htdocs/releases/plainstory.php?id=7854)

### **NSF Research Grants: Chilean Earthquake**

From the NSF Website

In response to the February 27, 2010 M8.8 Chilean earthquake, the National Science Foundation (NSF) has awarded three major Rapid Response Research (RAPID) grants to study how the quake happened, and learn from those findings for the future.

Two NSF RAPID awards--made to a consortium of institutions including Ohio State University, California Institute of Technology, University of Hawaii, University of Memphis, and UNAVCO Inc., in Boulder, Colo.--provide for installation of 25 continuously operating global positioning system (CGPS) stations, as well as state-of-the-art satellite communications for data delivery.

A preliminary analysis of the CGPS data by the University of Hawaii has shown that between one-quarter and one-third of the entire South American continent experienced measurable motion due to the earthquake, with maximum motions exceeding three meters in southern Chile.

Through another Chile quake RAPID award, 60 seismic stations arrived in Santiago, Chile, from the NSF-supported Incorporated Research Institutions for Seismology (IRIS) Program for Array Seismic

Studies of the Continental Lithosphere (PASSCAL) Instrument Center in Socorro, New Mexico.

With data from the instruments, scientists will obtain high-resolution locations of aftershocks, carry out research on Earth structure in and around the Chilean subduction zone, and study major cities for a detailed analysis of local response.

All data collected as part of the U.S. deployments will be open and freely available immediately after collection.

For the full write-up, visit [www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=116870](http://www.nsf.gov/news/news_summ.jsp?cntn_id=116870)

### **Sediment Composition Affected Strength of Sumatran Earthquake**

From the NSF Website

With support from the National Science Foundation (NSF), Sean Gulick, a geophysicist from the University of Texas at Austin, joined an international research team to try to figure out why there were two strong quakes in Sumatra in 2004 and 2005, and what made them so different.

The researchers found that the fault surface where the two tectonic plates meet, called a décollement, has different properties in the two earthquake rupture regions. In the southern part of the 2004 area, the décollement imaging results show a bright reflection, while the décollement in the 2005 area does not. This difference in the images suggests changes in the composition of the rocks--or the fault itself--between the rupture areas. These characteristics may partially explain why the areas did not rupture together and may also contribute to differences in the tsunamis produced by both events.

Scientists believe this difference in composition, combined with several other factors, resulted in the fault slipping over a much wider part of the margin and farther seaward in the 2004 event.

For the full article, visit [www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=117261](http://www.nsf.gov/news/news_summ.jsp?cntn_id=117261)

### **Aseismic Slip as a Barrier to Earthquake Propagation**

From the California Institute of Technology (CalTech) Website

On August 15, 2007, a magnitude 8.0 earthquake struck in Central Peru, killing more than 500 people—primarily in the town of Pisco, which was heavily damaged by the temblor—and triggering a tsunami that flooded Pisco's shore and parts of Lima's Costa Verde highway. An array of GPS stations used to measure the postseismic deformation – the deformation that occurred in the first year after the earthquake – was then deployed in southern Peru.

"After the earthquake, the plate interface slipped quite a bit," says Jean-Philippe Avouac, director of the Tectonics Observatory and professor of geology at Caltech. "But the aftershocks were tiny compared to the displacement. In other words, there was a lot of deformation, but most of it was aseismic." (Aseismic slippage, or aseismic creep, is movement along a fault that occurs without any accompanying seismic waves.)

This was contrary to what had long been assumed about plate movement in the area. "We used to think the plate interface at a subduction zone—which extends in this case from the surface to a depth of about 40 kilometers—was only slipping during large earthquakes," Avouac explains. "In Peru, 50 percent of the slippage within this range of depth is actually aseismic."

When the team mapped this aseismicity, they found that it occurred in a sort of "patchwork" pattern, says Avouac, with areas that "mostly slip aseismically and areas that mostly slip during earthquakes." As it turns out, some of these areas are always aseismic, "creeping continuously," he notes—and therefore act as a sort of permanent barrier to the propagation of an earthquake. Since seismic stress cannot build up in these particular aseismic areas, there is no stress to be released in an earthquake; any seismic rupture traveling through such an area would stop dead in its tracks.

What was perhaps most surprising, Avouac adds, is that one of the largest aseismic areas the researchers found "corresponds with where the Nazca ridge comes into the trench."

"This large area of aseismic slip is good news," he says. "It lowers the seismic hazard in that region, and allows us to be a little bit predictive. We cannot tell you when there will be an earthquake, but we can tell you where there is stress buildup, and where there is no stress buildup. Where there is no stress buildup, there will be no seismic rupture. That is where the earthquakes are going to stop."

The lessons learned in Peru, Avouac says, should be generalizable to just about any subduction zone—Sumatra, for instance, or Chile—and probably to any other kind of fault as well.

For the full press release, visit [http://media.caltech.edu/press\\_releases/13344](http://media.caltech.edu/press_releases/13344)

## Simulations

### **110-Foot Concrete Bridge Withstand 8.0 Earthquake Simulation**

After a succession of eight separate earthquake simulations, a 110-foot long, 200-ton concrete bridge model at the University of Nevada, Reno (UNR) withstood a powerful jolting, three times the acceleration of the disastrous 1994 magnitude 6.9 Northridge, Calif. earthquake, and survived in good condition.

Of the test, Saïd Saïdi, principal investigator for the project and University of Nevada civil engineering professor said "We estimated bridge failure at 8 inches of deflection, which is a lot, but we had 10 inches of deflection in the support columns and the bridge remained standing and usable, even with considerable internal stresses.

"What is extraordinary about the construction techniques tested with this bridge is the use of glass and carbon fibers to support the bridge, precast columns, segmental columns and special steel pipe-pin connections in a high seismic setting."



The 200-ton, four-span bridge was built over several months atop the 14-foot-square shake tables at the large-structures lab. The innovative bridge was hit with nine increasingly more powerful earthquakes over several days, and survived. – CREDIT:UNR

For the full write-up, visit <http://www.unr.edu/nevadanews/templates/details.aspx?articleid=5469&zoneid=8>

### **UCB Shake Table Presentation**

On May 26, 2010 over 100 engineers, researchers, media representatives and members of the public were on hand to witness the demonstration of a new isolated bridge system at the PEER Earthquake Simulator Laboratory at UC Berkeley's Richmond Field Station. The bridge was subjected to various ground motion records and varying intensity levels including the 1985 Liollo Chile record, the 1995 Kobe Japan JMA record, the 1978 Tobas Iran record and the 1994 Sylmar Northridge record. The bridge performed as expected without damage and the train that had been placed on the bridge deck was still fully operational after the earthquake and was able to slide easily on its rails.

For more information and to watch a video of the simulation, visit

[http://peer.berkeley.edu/events/2010/5-26-10\\_bridge\\_test/bridge\\_test\\_ucb.html](http://peer.berkeley.edu/events/2010/5-26-10_bridge_test/bridge_test_ucb.html)

## **Tsunamis**

### **NTHMP 2009-2013 Strategic Plan Released**

The National Tsunami Hazard Mitigation Plan (NTHMP) 2009-2013 has been released and is available in Microsoft Word format at:

<http://nthmp.tsunami.gov/documents/NTHMPStrategicPlanvf-062110.doc>

### **Alaskan Communities Receive All Hazards Warning Sirens**

The cities of King Cove and Saint Paul, Alaska finished installation of state-of-the art all-hazards emergency warning sirens this May. The siren system's primary function is to issue community activated tsunami evacuation orders. The digital sirens can also alert residents of imminent hazards including fires, chemical spills, volcanic eruptions and other emergency events.

For the full press release, visit [www.ak-prepared.com/documents/Press%20Release%20-%20All-Hazard%20Emergency%20Warning%20Sirens%20Installed.pdf](http://www.ak-prepared.com/documents/Press%20Release%20-%20All-Hazard%20Emergency%20Warning%20Sirens%20Installed.pdf)

### **NGDC Develops New Tsunami Inundation Digital Elevation Model of Atka, Alaska**

The National Geophysical Data Center (NGDC) has developed a high-resolution coastal DEM of Atka, Alaska for PMEL. This integrated bathymetric-topographic DEM is part of an on-going collaboration across NOAA to support the tsunami forecast and warning system being developed by PMEL for the Tsunami Warning Centers. The new DEM covers a small community in the Aleutian Islands of Alaska. It was compiled from the best available digital data obtained from U.S. federal

agencies, and will increase the accuracy with which NOAA's tsunami modeling efforts will forecast inundation in the region.

For more information, visit

[http://www.ngdc.noaa.gov/nndc/struts/results?eq\\_1=2010/05&op\\_3=eq&v\\_3=N&t=102750&s=3&d=10,6,11](http://www.ngdc.noaa.gov/nndc/struts/results?eq_1=2010/05&op_3=eq&v_3=N&t=102750&s=3&d=10,6,11)

### **NGDC Develops New Tsunami Inundation Digital Elevation Models of Santa Monica, California**

The National Geophysical Data Center (NGDC) has developed a high-resolution coastal digital elevation model (DEM) of Santa Monica for the Pacific Marine Environmental Laboratory (PMEL). The integrated bathymetric-topographic DEM is part of an on-going collaboration across NOAA to support the tsunami forecast and warning system being developed by PMEL for the Tsunami Warning Centers. The mean high water DEM is centered on Santa Monica and includes the cities of Los Angeles, Marina del Rey, Huntington Beach, and Malibu. The one-third arc-second DEM was compiled from the best available digital data obtained from U.S. federal, state and local agencies, and will increase the accuracy with which NOAA's tsunami modeling efforts will forecast inundation in the region. In addition, NGDC provided a mean low water Santa Monica DEM to the State of California in support of the National Tsunami Hazard Mitigation Program. The State plans to utilize the DEM in modeling tsunami currents and inundation resulting from the February 27, 2010, earthquake in Chile.

For more information, visit

[http://www.ngdc.noaa.gov/nndc/struts/results?eq\\_1=2010/05&op\\_3=eq&v\\_3=N&t=102750&s=3&d=10,6,11](http://www.ngdc.noaa.gov/nndc/struts/results?eq_1=2010/05&op_3=eq&v_3=N&t=102750&s=3&d=10,6,11)

### **Oregon May Build Nation's First Tsunami Evacuation Structure**

From the Oregon State University Website.

Working closely with experts from Oregon State University, the Oregon Department of Geology and Mineral Industries, and local residents, the small town of Cannon Beach wants to build a new city hall that could serve a dual purpose – public business all of its life, and a life-saving shelter on the one day that the water sweeps ashore.

A conceptual design for the 9,800-square-foot structure has been completed, a cost of \$4 million estimated, public hearings held and funding support is being sought from the federal government. Engineers at OSU are now testing a model of the proposed structure in their Tsunami Wave Basin, the most sophisticated facility of its type in the world.

In Washington State's Long Beach peninsula, officials are considering building a series of berms,

essentially artificial hills that would be high enough to get above the water. If structures are built, they could be designed to serve various purposes, such as ocean viewing platforms or picnic areas.

To read the full write-up, visit <http://oregonstate.edu/ua/ncs/archives/2010/may/oregon-may-build-nation%E2%80%99s-first-tsunami-evacuation-structure>

### **Mangrove Forests Could Combat Tsunamis**

A study of an Indonesian coastline ravaged by the December 2004 tsunami has estimated the buffering capacity of intact mangrove forests, which could protect homes and buildings.

Shunichi Koshimura, a civil engineer at Tohoku University in Sendai, Japan, and his colleagues estimate that a 500-yard-wide forest of 10-year-old mangroves would reduce the force of flowing water in a 10-foot tsunami by 70 percent.

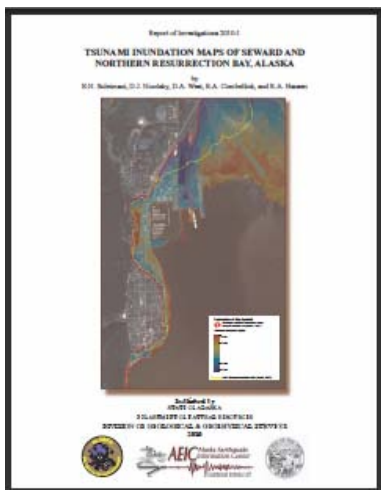
An abstract of the article is available at <http://europa.agu.org/?view=article&uri=/journals/jc/jc1006/2009JC005587/2009JC005587.xml&t=jc,Koshimura>

The full article is available to American Geophysical Union members.

## **RESOURCES & PUBLICATIONS**

### **Alaska Inundation Mapping**

Tsunami inundation maps of Seward and northern Resurrection Bay, Alaska have been released. For more information and to order these maps, visit [www.dggs.alaska.gov/pubs/pubs?reqtype=citation&ID=21001&utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed%3ADggsNews+%28DGGs+News%29](http://www.dggs.alaska.gov/pubs/pubs?reqtype=citation&ID=21001&utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3ADggsNews+%28DGGs+News%29)



### **Online Guide to Hazards in Alaska**

The Alaska Department of Natural Resources Division of Geological and Geophysical Surveys (DGGS) online *Guide to Geologic Hazards in Alaska* provides a wealth of information about geologic hazards known to occur in Alaska. The guide includes a glossary of hazards-related terms, illustrative photos, links to pertinent websites, and links to relevant scanned maps and documents published by DGGS and the USGS. DGGS was recently awarded funding to update the guide and make it more user-friendly to coastal district planners, Alaska Coastal Management Project, and project applicants.

To view the guide, visit [www.dggs.alaska.gov/index.php?menu\\_link=engineering&link=geohazards&sub\\_link=hazards](http://www.dggs.alaska.gov/index.php?menu_link=engineering&link=geohazards&sub_link=hazards)

### **Bathymetric Map for Tsunami Buoy Deployment**

Deep-Ocean Assessment and Reporting of Tsunamis (DART) buoys allow monitoring of sea-surface height useful for many ocean studies and critical for confirming or cancelling tsunami messages through NOAA's Tsunami Warning System. NOAA National Geophysical Data Center (NGDC) produces custom bathymetric maps to assist the National Data Buoy Center in the deployment of DART buoys. May 14, 2010, NGDC delivered the latest custom map for station 46411 off the coast of Northern California. DART buoy placement is a key NOAA effort to reduce the loss of life from tsunami in U.S. coastal communities and minimize false alarms, which result in high economic costs for unnecessary evacuations.

For more information, visit [http://www.ngdc.noaa.gov/nndc/struts/results?eq\\_1=2010/05&op\\_3=eq&v\\_3=N&t=102750&s=3&d=10,6,11](http://www.ngdc.noaa.gov/nndc/struts/results?eq_1=2010/05&op_3=eq&v_3=N&t=102750&s=3&d=10,6,11)

### **2010 State Geologic Map of California**

The 2010 Geologic Map of California includes modifications to the fault traces for consistency with the 2010 edition of the Fault Activity Map of California. Several faults that have been mapped since the compilation of the original geologic map were also identified and added, and traces no longer believed to be faults were removed.

In general, the Quaternary faults shown in the onshore region of this map are intended to be a simplified representation of the faults depicted on the Fault Activity Map.

For more information and to download a copy of the Geologic Map, visit [www.consrv.ca.gov/cgs/cgs\\_history/Pages/2010\\_geologicmap.aspx](http://www.consrv.ca.gov/cgs/cgs_history/Pages/2010_geologicmap.aspx)

### 2010 Fault Activity Map of California

The 2010 Fault Activity Map of California presents a much more detailed depiction of faults in California than previous versions. Faults active in the Quaternary (2.6 Ma) were digitized from their original sources in order to preserve as much of the original detail as possible. Similar to the 1994 Fault Activity Map, the new map is accompanied by an extensive listing of the sources of fault maps and age determinations. In the 2010 Fault Activity Map, the faults are depicted in as much detail as possible at the scale of the map.

For more information and to download a copy of the Fault Activity Map, visit [www.consrv.ca.gov/cgs/cgs\\_history/Pages/2010\\_faultmap.aspx](http://www.consrv.ca.gov/cgs/cgs_history/Pages/2010_faultmap.aspx)



### New Tsunami Evacuation Maps for Oahu's North Shore

For the next several weeks, city officials and tsunami experts from the University of Hawaii will be meeting with the public as they take the new tsunami evacuation maps on the road. The maps hadn't been updated in nearly 20 years. While some stretches along the highway have been reduced, some residents in the Kahuku area and Turtle Bay Golf Course are now in the evacuation zone.

For the full article, visit [www.kitv.com/news/24237541/detail.html](http://www.kitv.com/news/24237541/detail.html)

### Grays Harbor County All Hazards Guide

The 2009-2010 *All Hazards Guide* for Grays Harbor County, Washington has been released. The guide provides general and preparedness information on the potential hazards to the region, including earthquakes and tsunamis.

To download a copy of the *Guide*, visit <http://nthmp.tsunami.gov/documents/FINAL-GHCAIHHazardsGuide.pdf>

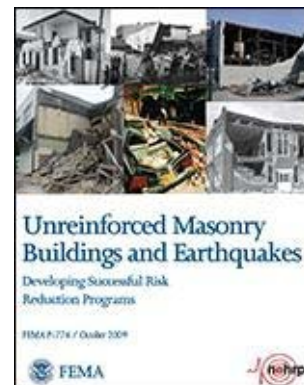
### FEMA P-750/ 2009 Edition Now Available

FEMA P-750/ 2009 Edition, *NEHRP Recommended Seismic Provisions for New Buildings and Structures*, is now available. This new edition adopts ASCE/SEI 7-05 by reference, which allows the Provisions to resume its role as the resource for introducing new knowledge, innovative concepts, and design methods to improve the national seismic standards and codes. FEMA P-750 CD contains the Provisions, design maps, and other supporting materials.

For more information and to download your copy, visit [www.fema.gov/library/viewRecord.do?id=4103](http://www.fema.gov/library/viewRecord.do?id=4103)

### FEMA P-774 – URM

This publication provides guidance on reducing the risks faced by those who own, occupy, or use unreinforced masonry (URM) buildings in seismically active areas. FEMA P-774 discusses policy and regulatory issues that often must be considered in efforts to reduce URM risks, such as retrofit costs, the economic viability of older buildings, numbers of occupants and types of use, and historic or architectural values. Rather than prescribing a rigid sequence of steps for URM risk reduction, FEMA P-774 documents a wide variety of successful approaches that have been developed across the United States.



To download your copy, visit <http://www.fema.gov/library/viewRecord.do?id=4067>

### PEER Report 2010/106

PEER Report 2010/106, *Verification of Probabilistic Seismic Hazard Analysis Computer Programs* by Patricia Thomas and Ivan Wong of URS Corporation's Seismic Hazards Group, and Norman Abrahamson of the Pacific Gas & Electric Company's Geosciences Department, has been released and is available on the Pacific Earthquake Engineering Research Center website.

This report describes a project to test and verify the numerical approaches and software used in Probabilistic seismic hazard analysis. The project was sponsored by the PEER's Lifelines Program.

To download your copy, visit  
[http://peer.berkeley.edu/publications/peer\\_reports/reports\\_2010/web\\_PEER\\_10106\\_THOMASetal.pdf](http://peer.berkeley.edu/publications/peer_reports/reports_2010/web_PEER_10106_THOMASetal.pdf)

### **Call for Papers: Haiti Special Edition of EERI's Earthquake Spectra**

The journal Earthquake Spectra will be publishing a special issue on the January 2010 Haiti Earthquake. Papers are invited on the earth science, engineering, and social and economic sciences aspects of the earthquake and its aftermath. All papers should be submitted online through the Earthquake Spectra manuscript submission web page: <http://eqs.peerxpress.org>. When the manuscript is uploaded, authors must select "Haiti Earthquake" from the drop-down list for special issues. All papers to be reviewed must be received by September 15, 2010.

For more information, visit  
[www.eeri.org/site/news/latest-news/933-call-for-papers-haiti-earthquake-special-issue](http://www.eeri.org/site/news/latest-news/933-call-for-papers-haiti-earthquake-special-issue)

### **Earthquake Debates**

The Earthquake Debates session at the SSA Annual Meeting has been captured and is available for viewing at the SSA website. Debates were titled as follows:

Debate #1: A Discussion of Elastic Rebound, Earthquake Recurrence and Characteristic Earthquakes

Debate #2: The Case for Gutenberg-Richter Scaling on Faults vs. Do Large Earthquakes on Faults Follow a Gutenberg-Richter or Characteristic Distribution?: A Characteristic View

Debate #3: Applications of Earthquake Simulators to Assessments of Earthquake Probabilities vs. Barriers to the Use of Physics-Based Seismicity Simulators in Seismic Hazards Assessments

For more information on the debates and links to the presentations, visit  
[www.seismosoc.org/meetings/2010/eqdebates/index.php](http://www.seismosoc.org/meetings/2010/eqdebates/index.php)

### **Earthquakes and Structures**

The inaugural issue of the new quarterly journal *Earthquakes & Structures* has been released. The scope of topics for the journal are the following: characterization of strong ground motion; quantification of earthquake demand and structural capacity; design of earthquake-resistant structures and foundations; experimental and computational methods; seismic regulations and building codes;

seismic hazard assessment; seismic risk mitigation; site effects and soilstructure interaction; assessment, repair and strengthening of existing structures, including historic structures and monuments; and emerging technologies, including passive control technologies, structural monitoring systems, cyberinfrastructure tools for seismic data management, experimental applications, and early warning and response.

The journal can be ordered from  
<http://technopress.kaist.ac.kr>

### **Virtual Journey through a Safe Hospital**

From the May 2010 Disasters: Preparedness and Mitigation in the Americas

The multimedia training program, *Virtual journey through a safe hospital* is now available on DVD in its English version. The program combines video, animation, three-dimensional images, and sound, and includes technical presentations and publications to create a virtual learning environment about safe hospitals.

This virtual library includes supporting material, text, videos, PowerPoint presentations, etc. For more information, please contact Ricardo Perez:  
[perezric@pan.ops-oms.org](mailto:perezric@pan.ops-oms.org).

### **Handbook for Reconstruction after Natural Disasters**

From the May 2010 Disasters: Preparedness and Mitigation in the Americas

The World Bank and the Global Facility for Disaster Reduction and Recovery have launched the manual *Safer Homes, Stronger Communities: A Handbook for Reconstructing after Natural Disasters*. The manual was prepared to assist policy makers and project managers responsible for rebuilding homes and communities after major disasters.

The book argues that reconstruction after a disaster begins with a series of decisions that must be made immediately and emphasizes the importance of establishing policy that will guide an effective process. The handbook gives guidelines on developing the content of reconstruction policies, mechanisms for communicating effectively with partners, and adapting and monitoring the implementation of policies. The manual can be downloaded at:

[www.housingreconstruction.org/housing/toc](http://www.housingreconstruction.org/housing/toc).

### **IFRC 2009 World Disasters Report**

The *World Disasters Report, 2009*, produced by the International Federation of Red Cross and Red Crescent (IFRC), argues that early warning systems are not enough without early action; early action can do more to reduce deaths and protect livelihoods than can be achieved through emergency response alone. The report emphasizes that this challenge must be

taken by national governments, donors, and other stakeholders.

The report features an introduction to early warning systems for different hazards and early action; people-centered early warning and early action; early action and bridging timescales; climate change – the early warning; and food insecurity: what actions should follow early warning?

The document is available in English and Spanish and can be downloaded at:

[www.ifrc.org/publicat/wdr2009](http://www.ifrc.org/publicat/wdr2009)

## CONFERENCES, WORKSHOPS AND EVENTS

### **An Earth Dynamics Workshop: Experiments with Portable Ocean Bottom Seismographs (EPOBS)**

Location: Snowbird Resort, Utah

Dates: September 26-28, 2010

This workshop will examine the future of ocean bottom seismology using portable instrumentation to study problems in Earth structure and dynamics. The overarching objectives of the community-based workshop and resultant report are to: Identify the long-term goals and scientific opportunities for research in Earth's oceans using portable, seafloor seismological instrumentation; identify the science and user requirements to be met by facilities and infrastructure that would support experiments addressing these goals; explore new technologies that shall have significant impacts on seafloor seismology and the ability to support a broad range of science; identify strategies for maximizing the scientific return and efficient use of facilities, including the development of open, community initiatives; and increase the size and vigor of the research community that routinely uses marine seismic data.

For more information and to register for this event, visit [http://www.iris.edu/hq/obs\\_workshop/](http://www.iris.edu/hq/obs_workshop/)

### **Fourth International Tsunami Symposium**

Location: Toronto, Canada

Dates: July 25 - 29, 2010

Tsunami Society International will hold its Fourth International Tsunami Symposium July 25 - 29, 2010, in Toronto, Canada, in conjunction and mutual co-sponsorship with the 9th US National & 10th Canadian Conference on Earthquake Engineering.

For more information on this event, visit <http://tsunamisociety.org/SymposiumFuture.html>

## Mark Your Calendar!!

### **2010**

#### **July 25-29, 2010**

9<sup>th</sup> US National & 10<sup>th</sup> Canadian Conference on Earthquake Engineering: Reaching Beyond Borders, Westin Harbour Castle Hotel, Toronto, Canada  
<http://2010eqconf.org/>

#### **August 25, 2010**

Nevada Earthquake Safety Council Meeting, Reno, Nevada

#### **September 9, 2010**

California Seismic Safety Commission  
Teleconference

#### **September 14-17, 2010**

California Emergency Services Association Annual Conference and Training, Monterey, California  
[www.cesa2010.org/](http://www.cesa2010.org/)

#### **September 19-23, 2010**

American Association of State Geologists Fall Liaison

#### **September 20-26, 2010**

Association of Environmental & Engineering Geologists Annual Meeting, Francis Marion Hotel, Charleston, South Carolina  
<http://aegweb.org/i4a/pages/index.cfm?pageID=4565>

#### **October 4-5, 2010**

USGS Workshop on the Applications of Precarious Rocks and Related Fragile Geological Features to US National Hazard Maps, University of Nevada, Reno

#### **October 8-9, 2010**

George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) and Pacific Earthquake Engineering Research Center (PEER) Joint Annual Conference: Quake Summit 2010, San Francisco Marriott Union Square, San Francisco, California  
<http://quakesummit2010.org/>

#### **October 17-21, 2010**

National Emergency Management Association Annual Conference, Peabody Hotel Little Rock, Little Rock, Arkansas  
<http://www.nemaweb.org/?2068>

#### **October 21, 2010**

California ShakeOut, State-wide Event  
[www.shakeout.org/](http://www.shakeout.org/)

#### **October 23, 2010**

Applied Technology Council Meeting, New York, New York

**October 30-November 4, 2010**

International Association of Emergency Managers  
58<sup>th</sup> Annual Conference & EMEX 2010, Hilton  
Palacio del Rio & Henry B. Gonzalez Convention  
Center, San Antonio, Texas  
<http://www.iaem.com/events/annual/intro.htm>

**October 31-November 3, 2010**

Geological Society of America Annual Meeting,  
Denver, Colorado  
<http://www.geosociety.org/meetings/2010/index.htm>

**November 17, 2010**

WSSPC Board of Directors Meeting  
Sacramento, California

**November 17, 2010**

Nevada Earthquake Safety Council Meeting, Las  
Vegas, Nevada

**December 9, 2010**

California Seismic Safety Commission Meeting,  
Sacramento, California

**December 13-17, 2010**

American Geophysical Union Fall Meeting, Moscone  
Convention Center, San Francisco, California  
[www.agu.org/meetings/fm10/](http://www.agu.org/meetings/fm10/)

**2011**

**TBD**

Association of American State Geologists Annual  
Meeting, Iowa  
[http://www.stategeologists.org/upcoming\\_meetings.php?id=38](http://www.stategeologists.org/upcoming_meetings.php?id=38)

**February 9-12, 2011**

Earthquake Engineering Research Institute 63<sup>rd</sup>  
Annual Meeting, Hyatt Regency La Jolla at Aventine,  
San Diego, California  
[www.eeri.org/site/meetings/2011-annual-meeting](http://www.eeri.org/site/meetings/2011-annual-meeting)

**March 2011 (TBD)**

WSSPC Board of Directors Meeting  
Washington, D.C.

**March 2011**

National Emergency Management Association Mid  
Year Conference, Hilton Alexandria Mark Center,  
Alexandria, Virginia  
[www.nemaweb.org/?2068](http://www.nemaweb.org/?2068)

**March 13-17, 2011**

American Association of State Geologists Spring  
Liaison

**April 2011 (TBD)**

National Earthquake Program Managers Meeting

**April 11-13, 2011**

American Society of Civil Engineers International  
Conference on Risk Analysis and Management and

ISUMA 2011 Fifth International Symposium on  
Uncertainty Modeling and Analysis, University  
College Inn & Conference Center, University of  
Maryland, Hyattsville, Maryland  
<http://content.asce.org/conferences/icvram2011/index.html>

**April 13-15, 2011**

Seismological Society of America Annual Meeting,  
Memphis, Tennessee  
[http://www.seismosoc.org/meetings/meeting\\_cal.php](http://www.seismosoc.org/meetings/meeting_cal.php)

**August 23-26, 2011**

4<sup>th</sup> Annual International Association of Seismology  
and Physics of the Earth's Interior (IASPEI)  
International Symposium: Effects of Surface Geology  
on Seismic Motion, University of California, Santa  
Barbara, California

**2012**

**TBD**

Association of American State Geologists Annual  
Meeting, Texas  
[www.stategeologists.org/upcoming\\_meetings.php?id=39](http://www.stategeologists.org/upcoming_meetings.php?id=39)

**March 2012**

National Emergency Management Association Mid  
Year Conference, Hilton Alexandria Mark Center,  
Alexandria, VA  
[www.nemaweb.org/?2068](http://www.nemaweb.org/?2068)

**March 26-30, 2012 (Tentative)**

National Earthquake Conference, Memphis,  
Tennessee

**November 4-7, 2012**

Geological Society of America Annual Meeting,  
Charlotte, North Carolina  
[http://www.stategeologists.org/upcoming\\_meetings.php?id=39](http://www.stategeologists.org/upcoming_meetings.php?id=39)

**Request for Newsletter Submissions**

If you have a newsworthy item for the next  
eNewsletter, please forward it to Amy  
Lewis, Program Manager at:  
[alewis@wsspc.org](mailto:alewis@wsspc.org)