WSSPC
WESTERN STATES SEISMIC POLICY COUNCIL

We develop seismic policies and share information to promote programs intended to reduce earthquake related losses.

A non-profit earthquake consortium for the western states

Fall 2016 e-Newsletter

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Western States Seismic Policy Council
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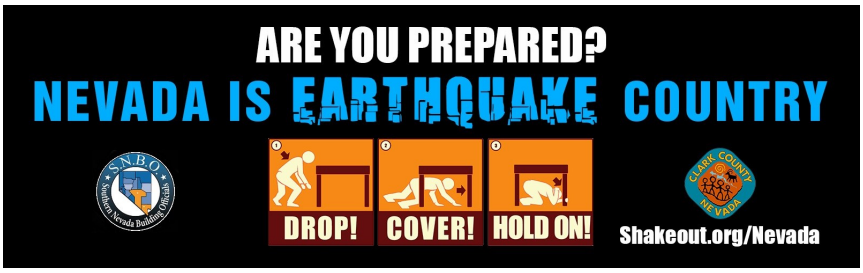
In This Issue

Call for Nominations for 2017 WSSPC Awards in Excellence

Recognize outstanding people and projects that have had an impact on seismic risk reduction with a nomination for the 2017 WSSPC Awards in Excellence, Lifetime Achievement Award, or WSSPC Leadership Award. Nomination forms can be found on the website at: *www.wsspc.org/awards/call-nominations/*

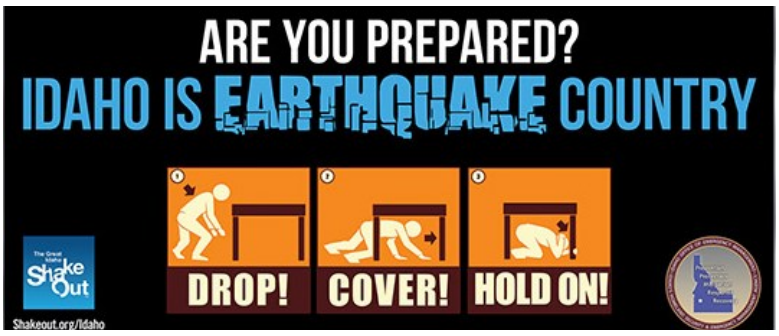
WSSPC Supports ShakeOut Billboard Projects in Idaho and Nevada

Once again, WSSPC is supporting billboards with the "Drop, Cover, Hold On" message in Nevada and Idaho with FEMA NEHRP State support funding. Clark County Department of Building and Fire Prevention and the Southern Nevada Building Officials have partnered to blanket the Las Vegas valley with 11 digital billboards, 7 posters, and 3 static billboards. They will be coordinating public outreach with the appearance of the billboards.



Idaho is initiating their billboard campaign at the same time utilizing Nevada's artwork but tailoring it to their state, providing uniformity of messaging. They are targeting southeastern Idaho to kick off their 9-month public outreach campaign culminating in an earthquake exercise next spring.

Both billboard campaigns begin October 3 and run for 4 weeks.



WSSPC Prepares Earthquake Handbook For Rural Emergency Managers

The Earthquake Handbook is designed for Emergency Managers in rural areas to refer to during their immediate response following an earthquake. The handbook was developed as a result of the M6 Wells, Nevada earthquake in 2008, and a subsequent WSSPC Policy Recommendation. While the handbook is almost complete, there is still time for comments/feedback before going to print. The deadline for submitting feedback to Patti Sutch at psutch@wsspc.org is October 6. If you would like to read/review the handbook it can be found on the website: *http://www.wsspc.org/earthquake-response-handbook/*

California Passes Budget with Funding for Earthquake Early Warning and Governor Signs Bill to Create Advisory Board

For the first time, the state of California has appropriated funding to support the expansion of its earthquake early warning system. California Governor Jerry Brown signed a state budget that allocates $10 million to earthquake early warning development. Initially research and development for the system was funded through the U.S. Geological Survey and the Gordon and Betty Moore Foundation. Now, with this additional state funding, more sensors may be added to the seismic network to enhance the reliability of ShakeAlert, an early warning prototype that provides warning of strong ground shaking from an earthquake. In addition, the funds will be used for public education and further research.

On September 29, the California Office of Emergency Services (Cal OES) held a press conference to announce that Governor Jerry Brown signed California Senate Bill 438 that establishes an 8-member California Earthquake Early Warning Advisory Board. The Board will advise the Cal OES Director on early warning system operations, research and development, finance and investments, and training and educational aspects of the program. The bill specifies a February 1, 2018 deadline for a business plan to be developed and submitted to the legislature.

SB 438 *Earthquake Safety: Statewide Earthquake Early Warning Program and System* was introduced by State Senator Jerry Hill.

References:

http://www.pasadenanow.com/main/caltech-scientists-on-board-as-governor-signs-state-budget-allocating-10-million-for-earthquake-early-warning/#.V-1ETogrKUk

http://news.berkeley.edu/2016/06/30/state-budgets-10-million-for-earthquake-early-warning/

http://www.dailycal.org/2016/07/04/california-budget-includes-10-million-for-earthquake-early-warning-system/

https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=201520160SB438

http://www.oesnews.com/9621-2/

Expedition 2016: Wiring the Abyss

In June 2016 the first of several earthquake early warning sensors were deployed and connected by Ocean Networks Canada (ONC) along the Cascadia subduction zone. The entire process lasted 40 days at sea, off the west coast of Canada, and involved 149 people aboard three ships. The 24/7 operation relied on three remotely operated vehicles (ROVs) which, in total, made 44 dives to deploy, maintain, and recover 180 instruments. While at sea 18km of steel armored, fiber-optic cables were also laid along the ocean floor.

The $5 million development investment was funded by Emergency Management British Columbia (EMBC). How the sensors will operate is simple: a 90 second (or less) warning will go out to the EMBC and they will send the message out to the public. There are talks about getting an app created to more easily inform the public; however, the alert sensors will ultimately save lives and protect infrastructure in the affected areas.

References:

http://www.oceannetworks.ca/expedition-2016-wrap-bigger-footprint-enables-better-science

http://www.oceannetworks.ca/deployed-first-spike-british-columbias-earthquake-early-warning-system

http://www.cbc.ca/news/canada/british-columbia/first-b-c-offshore-earthquake-early-warning-sensor-up-and-running-1.3689186

Major Earthquake could Crack Canada's Financial System

An analysis of the economic impacts of earthquakes in Canada contained in a Canadian think tank's report urges policymakers to act now to avert the consequences of a large earthquake. The report by C.D. Howe Institute, *Fault Lines: Earthquakes, Insurance, and Systemic Financial Risk,* suggests that the insurance industry could handle losses from an earthquake up to $35 billion, but beyond that a financial backstop is needed. The report estimates a magnitude 9 Cascadia subduction zone earthquake could cause insurance claims and losses of $95 billion.

The report suggests the Canadian government backstop could be triggered once the limits of what the insurance industry could handle are reached. It recommends that an industry-funded, non-profit organization called the Property and Casualty Insurance Compensation Corporation (PACICC), be strengthened so that it could intervene before insurance companies become insolvent, and be able to isolate earthquake losses from other insurance business. Nicholas LePan (senior fellow at the C.D. Howe Institute and report author) states, "It is important to bolster the PACICC to deal with insurance industry problems and reduce systematic impacts from severe catastrophes."

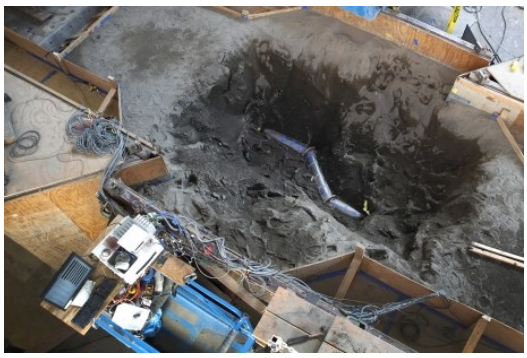
References:

http://www.ctvnews.ca/business/how-a-major-earthquake-could-put-cracks-in-canada-s-financial-system-1.3013500

http://www.canadianunderwriter.ca/insurance/c-d-howe-institute-report-calls-federal-emergency-backstop-arrangement-earthquakes-1004097714/

https://www.cdhowe.org/public-policy-research/fault-lines-earthquakes-insurance-and-systemic-financial-risk

New Earthquake-Resilient Pipes Tested



Above: Buried pipe after rupture.
Photo: Robert Barker/University Photography

Cornell University's Geotechnical Lifelines Large-Scale Testing Facility conducted an earthquake simulation of a 28-foot-section of a new earthquake-resilient pipe. The 8-inch diameter test pipe was monitored with over 120 different instruments and buried under 80 tons of soil in a hydraulically powered "split box" which imposed two feet of fault rupture at a 50 degree angle. A Cornell University researcher spoke to the simulation results stating "We took the pipe to three times its current design standard, and it continued to convey water."

The test results are important for cities who are concerned with the stability of water and sewage infrastructure during earthquakes. Los Angeles Mayor Eric Garcetti has made earthquake resiliency of the water utility system a top priority in Los Angeles, where there are 7,000 miles of water-delivery infrastructure crossing 30 different faults. Other west coast cities have also expressed interest in upgrading their pipelines with the earthquake-resilient pipe.

References:

http://www.routefifty.com/2016/07/earthquake-resilient-pipes-los-angeles/130359/

http://www.news.cornell.edu/stories/2016/07/cornell-tests-earthquake-resilient-pipeline-la

Emergency Preparedness Requirements for Hospitals and Medicare and Medicaid Programs

Hospitals and Medicare and Medicaid providers and suppliers now must meet four best practice standards, according to a Federal Rule published September 16. The rule establishes consistent ground rules for operating in disaster situations to safeguard human resources, maintain business continuity, and protect physical resources. The rule was developed as a result of the challenges faced by the health care facilities in responding to disasters over the last decade.

The four elements of the emergency plan are the following:

- Perform an all-hazards risk assessment of the most likely hazards and establish an emergency plan that considers capacities and capabilities
- Develop and implement policies and procedures that support the successful execution of the emergency plan
- Develop and maintain a communications plan that coordinates patient care across the facility, employees, healthcare providers, public health departments, and emergency management agencies
- Train and test to include annual drills, exercises, and training in policies and procedures

The effective date of the new requirements is November 15, 2016.

References:

http://www.bna.com/hospitals-adopt-disaster-n73014447438

https://www.federalregister.gov/documents/2016/09/16/2016-21404/medicare-and-medicaid-programs-emergency-preparedness-requirements-for-medicare-and-medicaid

RESEARCH

Tides Trigger Tiny Tremors

The idea that tides trigger Earth tremors called low-frequency earthquakes (LFEs) is a well known theory in which new insight has emerged. Along the San Andres fault, researchers found that seismic activity correlated with the waxing phase of the fortnightly tidal cycle. "The stress that gets built up to produce earthquakes comes from the deeper plate tectonic processes," said U.S. Geological Survey researcher Nicholas van der Elst in *The Christian Science Monitor*. "So this is where the spring is getting loaded."

References:

http://www.csmonitor.com/Science/2016/0719/How-tidal-tugs-trigger-tiny-earthquakes-on-San-Andreas-fault

http://www.sciencemag.org/news/2016/07/spring-tides-trigger-tremors-deep-california-s-san-andreas-fault

Seattle Landslide Simulations from a Magnitude 7 Earthquake

A study reported in the *Bulletin of the Seismological Society of America* simulated earthquake-triggered landslides in the Seattle area. Dividing the area into 5-meter squares, lead author Kate Allstadt and others calculated the generic landslide risk, and then subjected the model to a magnitude 7 on the Seattle fault. In addition, they looked at the same earthquake occurring during dry and wet conditions. The dry scenario, modeled after the conditions during the 2001 Nisqually earthquake, caused about 5000 landslides that potentially impacted 1000 buildings, while the wet scenario created 6 times as many landslides that would put over 16,000 buildings in harm's way, including Interstate 5 as it traverses downtown Seattle.

References:

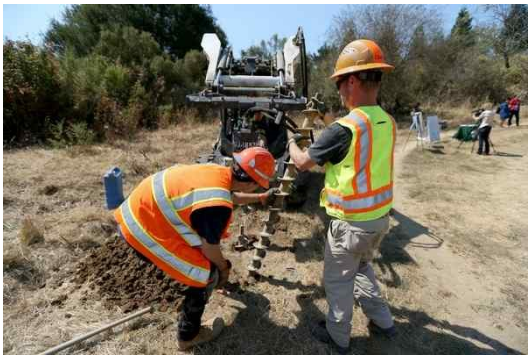
Allstadt, K., et al., 2013, A Scenario Study of Seismically Induced Landsliding in Seattle Using Broadband Synthetic Seismograms: Bulletin of the Seismological Society of America, December 2013.

Hayward Fault Stimulation

U.S. Geological Survey (USGS) scientists along with Cal State East Bay graduate students and community volunteers are installing 500 small portable seismographs along a 10-mile line that crosses the Hayward fault from San Leandro to Castro Valley in the San Francisco Bay area. A small explosive will be buried 30-feet below Lake Chabot Regional Park and around 1 a.m., sometime within the next several weeks, it will be detonated. Nearby residents won't feel a thing, but the seismic data generated by the explosion will help scientists identify the fault structure, including the poorly understood Chabot fault.

A three-dimensional image (similar to a medical MRI) will be created which will help predict how the area will respond to shaking. By studying simulation data "we can improve our 'Shake Maps,' which helps first responders", said Rufus Catchings, USGS geophysicist and co-chief of the project.

Luther Strayer, Cal State East Bay professor of geology and co-chief of the project states, "We're trying to keep people alive". Simulations and data collection like this are how they are going to accomplish that goal.



Above: Cal State East Bay graduate students drill 20 -30 feet down into the ground along a trail at Lake Chabot Regional Park in Castro Valley. Photo: Anda Chu — Bay Area News Group

References:

http://www.santacruzsentinel.com/article/NE/20160909/NEWS/160909750

ADDITIONAL RESOURCES & PUBLICATIONS

San Francisco Bay Area Earthquake Probabilities

The U.S. Geological Survey published a revised earthquake outlook for the San Francisco Bay area. Fact Sheet 2016-3020, version 1.1, revised in August 2016, reports a 72 percent probability of magnitude 6.7 or greater earthquake in the 30 year period ending in 2043. The highest probability of 33% was given to the Hayward-Rodgers Creek fault zone, followed by the Calaveras fault (26%) and the San Andreas fault (22%).
For more information: *https://pubs.er.usgs.gov/publication/fs20163020*

Fault Lines: Earthquakes, Insurance, and Systemic Financial Risk

In *Fault Lines: Earthquakes, Insurance, and Systemic Financial Risk* the C.D. Howe Institute *Commentary No. 454* analyzes the gaps in the existing Canadian insurance scheme; currently, damage caused by a catastrophic level earthquake is not an insurable risk and is not adequately
covered.

The publication brings awareness to the Property and Causality Insurance Compensation Corporation (PACCIC) and explains how they should be allowed to intervene earlier to achieve lower-cost and to enhance their ability to finance policyholder claims.
For more information: *https://www.cdhowe.org/sites/default/files/attachments/research_papers/mixed/Commentary%20454_0.pdf*

WSSPC Logo Wear

A special selection of men's and women's shirts emblazoned with the WSSPC logo is now available for order directly from Lands End: *https://business.landsend.com/store/wsspc/.*

PEOPLE & TRANSITIONS

WSSPC Welcomes New Member:
Susan Cleverley, SHMO, Idaho Office of Emergency Management

Lee Allison Passes Away
Lee Allison, State Geologist & Director of the Arizona Geological Survey, passed away unexpectedly August 16 from a head injury. See the link below for a tribute to Dr. Allison from the Arizona Geological Society.
http://www.arizonageologicalsoc.org/resources/Documents/Archived%20News%20Letters/2016/September2016newsletter.pdf

CONFERENCES, WORKSHOPS & EVENTS

California Strong Motion Instrumentation Program (CSMIP) will hold SMIP16 Seminar
October 6, 2016
University of California, Irvine
For more information: *http://www.conservation.ca.gov/cgs/smip/Pages/seminar.aspx [Seminar Program and Registration Form are available on the webpage]*

United Nations Office for Disaster Risk Reduction (UNISDR) World Tsunami Awareness Day
November 5, 2016
For more information: *https://www.unisdr.org/archive/48820*

WSSPC Board Meeting
November 8, 2016
Sacramento, California

AGU Fall Meeting
December 12-16, 2016
San Francisco, California
For more information: https://fallmeeting.agu.org/2016/

2017 NTHMP Annual Meeting
January 30 – February 3, 2017
Portland, Oregon
For more information: *http://nws.weather.gov/nthmp/2017annualmeeting/*

WSSPC
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There are so many ways to stay connected!

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Facebook- www.facebook.com/WSSPC

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If you have a newsworthy item for our e-Newsletter, please forward it to Erin Mommsen Program Manager at: *emommsen@wsspc.org*