



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 2018 e-Newsletter

Western States Seismic Policy Council

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WSSPC NEWS

WSSPC Executive Director Position

After nearly 20 years as Executive Director, Patti Sutch has announced her retirement at the end of 2018. The Western States Seismic Policy Council (WSSPC) is currently seeking qualified applicants to fill the position of Executive Director. The deadline to apply is October 15, 2018, and interviews will be conducted in Sacramento November 15-16, 2018.

The Executive Director is the key management leader of WSSPC. The Executive Director is responsible for overseeing the administration, programs and strategic plan of the organization. Other key duties include grant writing, conference planning, and public outreach. The position reports directly to the Board of Directors.

WSSPC is a federally funded nonprofit consortium comprising 13 states, 3 U.S. territories 1 Canadian territory and 1 Canadian province. It seeks to promote regional cooperation and interaction between members and the public in the formation of, and advocacy for, seismic policy.

Details of the position and how to apply are available at www.wsspc.org/wp-content/uploads/2018/08/2018_WSSPC-EX-DIR-JOB-DESCRIPTION_FINAL.pdf.

Welcome to the New WSSPC Program Manager



Lara Brodetsky is the new Program Manager at WSSPC. She earned her B.A from the University of California Santa Cruz with a double major in both Environmental Studies combined with Economics and Political Science, graduating with highest major honors as well as Magna Cum Laude university honors.

Lara brings an interdisciplinary approach to WSSPC. Her academic background allows for the ability to not only analyze science articles and data, but also to work on outreach, policy, and education pertaining to earthquake and tsunami safety. Before coming to WSSPC, Lara worked as a K-12 school teacher and has volunteered with many groups focusing on community outreach and environmental education such as SproutUp!, The Homeless Garden Project, and Rotaract.

It's Awards Nomination Time Again!

Nominations for 2019 WSSPC Awards are now open. Recognize outstanding colleagues and projects that have had an impact on seismic risk reduction with a nomination for the WSSPC Awards in Excellence, Lifetime Achievement Award, or WSSPC Leadership Award. The nomination deadline is January 4, 2019. Nomination forms and eligibility guidelines can be found on the website at: www.wsspc.org/awards/call-nominations/

WSSPC Presents CSG-West Legislators with Earthquake Information

WSSPC was invited by the Council of State Governments (CSG)-West to make an hour-long presentation and participate in their committee round table discussion at their annual meeting September 14 in Snowbird, Utah. The CSG-West Transportation and Infrastructure Committee, led by Representatives Rick Youngblood (Idaho) and Jake Fey (Washington), held a 3-hour meeting in part to learn about and discuss earthquake issues in the western states. Approximately 30 legislators attended the meeting.

Peter McDonough, WSSPC Board Chair and member of the Utah Seismic Safety Commission, focused his talk on transportation infrastructure. He was followed by Bob Carey, Utah Division of Emergency Management, who gave an overview of seismic risk in the western states, and Barry Welliver, of Barry H. Welliver Consulting Engineers, who spoke on seismic safety of schools.

Before WSSPC was incorporated, it worked under the umbrella of CSG-West and shared an office in San Francisco. WSSPC membership of the 13 western states is identical to CSG-West. CSG-West members number over 1300 state legislators.

Reference:

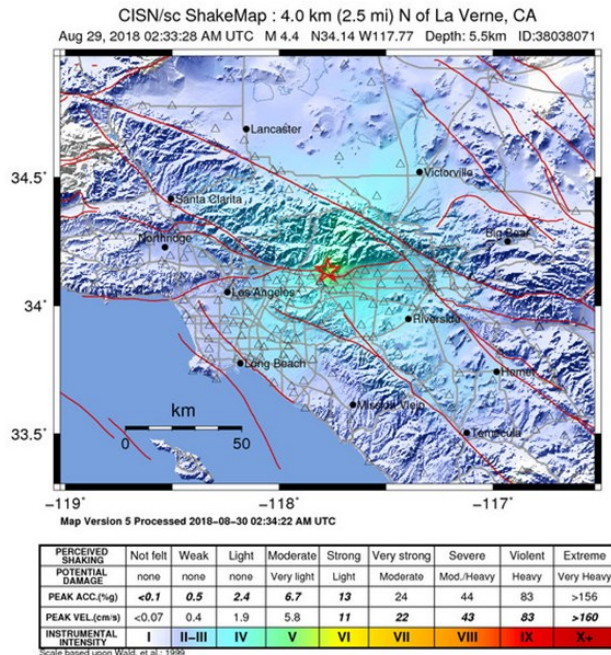
<https://www.csghost.org/annualmeeting/Schedule2018.aspx>

NEWS

California Earthquake Early Warning System Provides Three Second Warning

ShakeAlert, the West Coast’s Earthquake Early Warning (EEW) System, had another successful test when a magnitude 4.4 earthquake with epicenter 2 miles north of the city of La Verne in southern California shook residents on the evening of Tuesday, August 28th. Beta testers at the California Institute of Technology (CalTech) in Pasadena received 3 seconds of warning prior to feeling shaking from the quake which was centered approximately 20 miles away. Shaking was widely felt in the region but no major damage was reported.

The EEW system has provided a number of successful alerts prior to this event. Distance from the epicenter is the main determinant of warning time prior to the arrival of shaking. ShakeAlert currently accesses data from more than 850 earthquake stations, but for complete west coast coverage, it is estimated that another 800 stations would be required. Limited public notifications from the USGS are planned for sometime this year.



*Above: ShakeMap from August 28, 2018, 7:33 p.m. PST La Verne, CA earthquake
 Image: <https://earthquake.usgs.gov/earthquakes/eventpage/ci38038071#shakemap>*

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In addition, for the first time in California, earthquake sensors were part of the original design of the bridge, rather than being added after construction. About 75 accelerometers will be incorporated into the bridge during construction. The instruments will be part of the California Strong Motion Instrumentation Program (CSMIP) which has sensors on "structures such as buildings, hospitals, bridges, dams, utilities and industrial facilities" currently including 60 bridges.

The bridge construction is scheduled for completion by the end of 2019. The existing bridge is slated for demolition once the replacement is completed.

References:

<https://abcnews.go.com/Technology/wireStory/sensors-california-bridge-record-earthquake-data-57585180>
www.conservation.ca.gov/cgs/smip/Pages/about.aspx
<https://newgdbridge.com/about-the-bridge/>
www.presstelegram.com/2018/09/04/new-bridge-at-long-beach-port-will-be-a-giant-seismograph-recording-quake-data/

NTHMP FY18 Tsunami Activities Grants Announced

The National Oceanic and Atmospheric Administration/National Weather Service (NOAA/NWS) National Tsunami Hazard Mitigation Program (NTHMP) has announced financial assistance grants totaling \$5,982,670 "for projects and support to make coastal communities throughout the United States and its territories safer from tsunamis." Funded projects include research, outreach, workshops, exercises, tsunami warning signs and sirens, and more. The grant performance period is from September 1, 2018 – August 31, 2019. WSSPC Members receiving grants include Alaska, American Samoa, California, Commonwealth of Northern Mariana Islands, Guam, Hawaii, Oregon, and Washington.

Reference:

<https://nws.weather.gov/nthmp/grants/2018grants/index.html>

There are so many ways to stay connected!

Online- www.wsspc.org

Twitter- [@WSSPC](https://twitter.com/WSSPC)

Facebook- www.facebook.com/WSSPC

HAZARD MITIGATION & PREPAREDNESS

Pew Report Recommends Standardized Data Collection by States for Natural Disasters

A recent Pew Charitable Trusts (Pew) report *What We Don't Know About State Spending on Natural Disasters Could Cost Us*, suggests that while federal spending on natural disasters continues to increase, changes in federal funding are being considered without understanding the widely varying levels of state and local government contributions to these events. "Making policy decisions without all the relevant information could result in changes that simply shift spending from one level of government to another or miss opportunities to encourage investment at all levels that could help manage growth in the nation's total costs."

In a 10-year period from 2005-2014, "all 50 states and the District of Columbia experienced disasters severe enough to trigger a federal emergency or major disaster declaration ..."

Pew collected data on state spending for natural disasters for the fiscal years 2012-2016. Only 23 states provided the requested information for: state program spending, federally related spending, reimbursements received, and details on spending. The resulting Pew report found that "most states do not comprehensively track natural disaster spending" and "state spending is highly variable."

Some of the challenges to tracking state spending included the number of different federal agencies offering disaster assistance programs ("more than 300 federal programs across 17 departments") with different requirements for matching (cost sharing or other "matches" to the federal funds), state and local programs not using federal monies, difficulties and differences in requirements for tracking expenditures during disasters, the number of agencies at all governmental levels involved in disasters, and programs specific to different phases of the disaster cycle: mitigation, preparedness, response, and recovery.

The report strongly recommends that standardized, detailed data collection of disaster-related spending be a priority at all levels of government. The recommendations specifically include data collection

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on mitigation expenditures as these activities have been shown to reduce costs in future disasters, with estimates of savings as high as \$6 in response and recovery savings for every \$1 spent on mitigation. In addition, "collecting this information would ensure a better understanding of federal, state, and local capacity to respond to emergencies and could help identify targeted cost-saving incentives." As natural disaster costs continue to rise, "a commitment from state and federal policymakers to collect and share comprehensive data is critical."

References:

www.pewtrusts.org/research-and-analysis/reports/2018/06/19/what-we-dont-know-about-state-spending-on-natural-disasters-could-cost-us
www.pewtrusts.org/en/research-and-analysis/issue-briefs/2018/09/natural-disaster-mitigation-spending--not-comprehensively-tracked
www.govtech.com/em/preparedness/States-Arent-Spending-Enough-on-Mitigation-Before-Disasters-Occur.html?utm_term=READ%20MORE&utm_campaign=States%20Aren%27t%20Spending%20Enough%20on%20Mitigation&utm_content=email&utm_source=Act-On+Software&utm_medium=email

Bay Area Exercise Focuses on Mass Care and Shelter

The Bay Area Urban Areas Security Initiative (UASI) held the Urban Shield Yellow Command exercise September 6-10. The exercise focused on care and shelter needs following a magnitude 7.9 earthquake on the San Andreas Fault as described in the Bay Area Earthquake Plan.

Improving coordination between the many participating entities was one of many exercise goals. The hundreds of participants included city, county, state and federal employees, as well as non-profit organizations and volunteers. Participating communities included Oakland, San Francisco, Fremont, Dublin, Castro Valley, Livermore, and Santa Clara and Sonoma counties.

The Yellow Command exercise "tests one aspect of the Bay Area's Regional Catastrophic Planning efforts" each year.

References:

www.bayareauasi.org
[www.caloes.ca.gov/PlanningPreparednessSite/Documents/BayAreaEQConops\(Pub_Version\)](http://www.caloes.ca.gov/PlanningPreparednessSite/Documents/BayAreaEQConops(Pub_Version))

2016.pdf

www.nbcbayarea.com/news/local/Prep-For-the-Big-One-Urban-Shield-Drills-For-Major-Earthquake-in-the-Bay-Area-492658611.html
<https://sf.curbed.com/2018/9/6/17824452/bay-area-emergency-shelter-drill-earthquake-sf-berkeleyurbanshield.org/bay-area-uasi.html>

Earthquake Brace & Bolt Program Registration to Open October 9

The California Residential Mitigation Program (CRMP), a joint powers authority created by the California Earthquake Authority (CEA) and the Governor's Office of Emergency Services (OES), announced that registration for the 2019 Brace & Bolt residential retrofit program will be open October 9 through November 13, 2018. Eligibility is based initially on zip code. In addition there are residence and structure requirements including that the home was built before 1980, has a raised continuous perimeter concrete foundation, sits on level ground or a low-slope, and, has wood-framed walls (called cripple walls) in the crawl space under the first floor.

More than 60 zip codes in northern California and 20 in the southern part of the state have been added to the program, bringing the total to approximately 275 zip codes in 70 cities.

A typical retrofit costs between \$3,000-7,000. Incentives of up to \$3,000 are available through the program. New in 2019 is that contractors must be selected from the EBB Contractor Directory.

References:

www.earthquakebracebolt.com/
https://crmpebbstorage.blob.core.windows.net/mediaprd/1405/ebb_one-sheet_final-2019.pdf

Resilient Business Challenge Provides Resources for Bay Area Businesses

Recognizing that the ability of businesses to function after a disaster plays a major role in a community's resiliency after a disaster, the HayWired scenario project partners, including the California Alfred E. Alquist Seismic Safety Commission, have initiated the "Resilient Business Challenge" as part of the "Outsmart Disaster" campaign.

"The Outsmart Disaster campaign and Resilient Business Challenge are designed to make it easy for local government leaders to communicate to local businesses. The commission will collect information

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on companies registering for and completing the Resilient Business Challenge, including location and industry sector, and report back to city leaders on the progress their local businesses are making in the challenge. The state will also promote and recognize cities that have adopted the local resolution to thank them for their leadership in this space.”

References:

<http://www.cacities.org/Top/News/News-Articles/2018/July/Help-Your-City-s-Businesses-Prepare-to-Outsmart-Di#sthash.3UFz22DK.nvH5TP6z.dpuf>
<https://outsmartdisaster.com>

RESEARCH

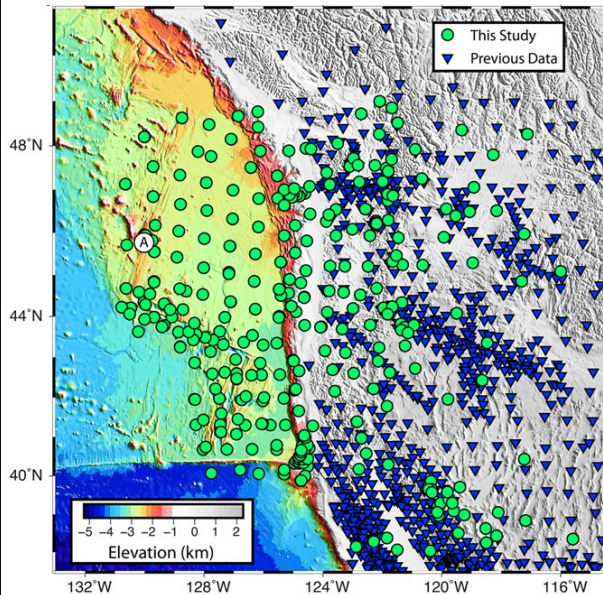
Researchers Identify Likely Source Areas for Next Large Cascadia Earthquake

Researchers at the University of Oregon are trying to understand the likely future behavior of the more than 600-mile long Cascadia Subduction Zone. The fault zone runs from northern California to Vancouver Island in Canada and is considered capable of producing a M9 earthquake which would cause widespread catastrophic damage.

Seismic records show more activity on the northern and southern sections of the fault zone than the relatively seismically quiet central area. The researchers are interested in why this is and what bearing it may have on future earthquakes, particularly because they believe we are currently within the 300-500 year return interval for large quakes in the region.

In order to construct a full picture of what is going on underground, the National Science Foundation (NSF) supported the Cascadia Initiative project, begun in 2011, to deploy a temporary amphibious array of hundreds of seismometers on the ocean floor off the western U.S. over the span of four years. The array was the first to “cover an entire tectonic plate with instruments at a spacing of roughly 50 kilometers.” This array, along with existing and new land based instruments in the seismic network, allowed scientists to create a better

model of what is going on at depths of more than 100 kilometers in the study region.



Left: Green dots and blue triangles show locations of seismic monitoring stations.

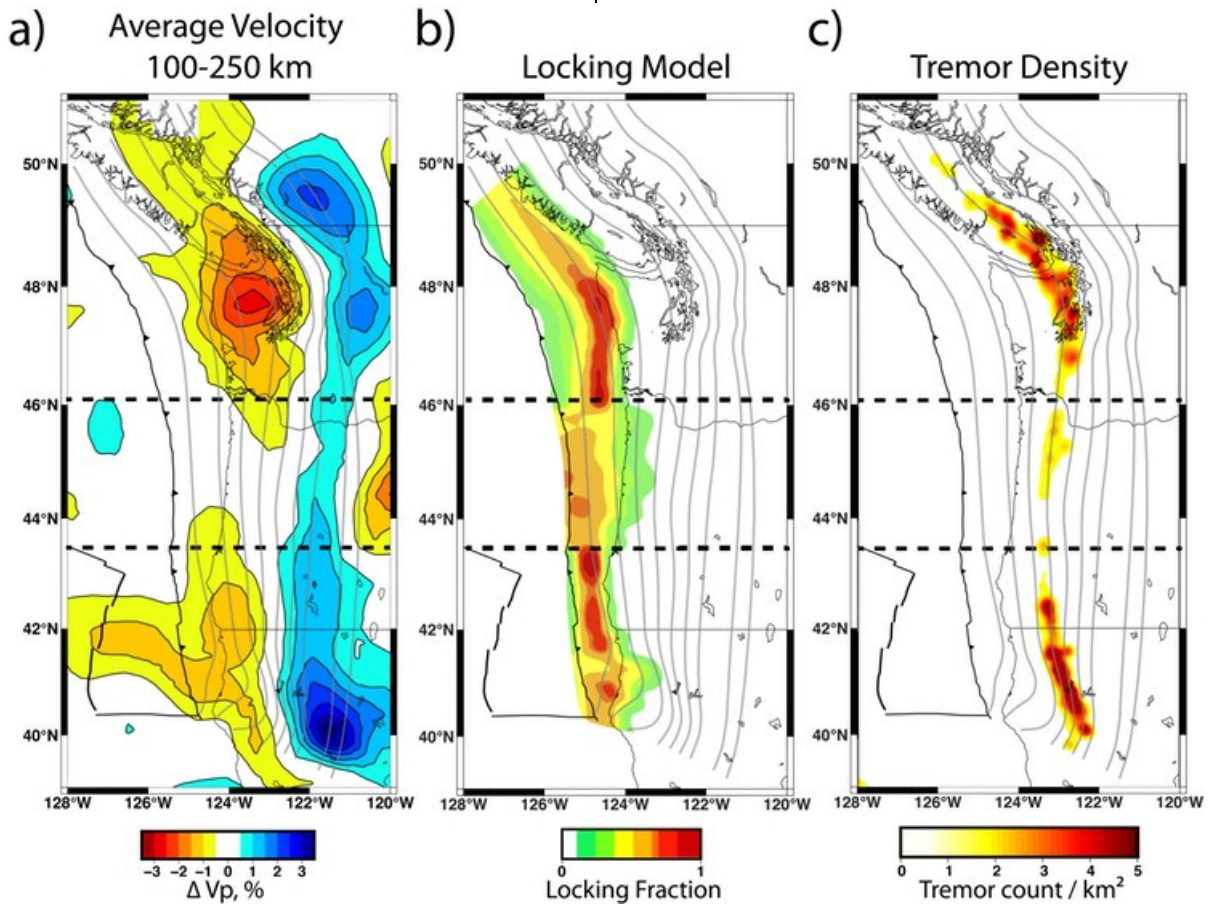
Source: Bodmer et al., 2018, *Geophysical Research Letters*, CC BY-ND

The researchers found two large regions, one in the north and one in the south, where seismic waves traveled more slowly than expected. The scientists interpreted these results as suggesting that in these areas the Earth’s mantle is rising and slightly melting; “These physical changes cause the anomalous regions to be more buoyant – melted hot rock is less dense than solid cooler rock. ... The hot, partially molten region pushes upwards on what’s above, similar to how a helium balloon might rise up against a sheet draped over it. We believe this increases the forces between the two plates, causing them to be more strongly coupled and thus more fully locked.” The more strongly locked areas are more likely to release their energy in a sudden large event than in the central area of the fault zone.

While the research suggests the likely source location of the next large earthquake, it doesn’t tell us when or whether part or all of one or more of the three sections will rupture in the next big quake. One posited scenario is frighteningly named the “decade of terror” where “different segments rupture independently, years apart.” The authors suggest that a permanently deployed augmented array of

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Above: Regions where seismic waves moved more slowly, on average, are redder, while the areas where they moved more quickly are bluer. The slower anomalous areas 150 km beneath the Earth's surface corresponded to where the colliding plates are more locked and where tremor is more common.

Source: Bodmer et al., 2018, *Geophysical Research Letters*, CC BY-ND

sensors would provide additional useful data as well as serving as part of the west coast's ShakeAlert Earthquake Early Warning system.

References:

<https://cascadia.uoregon.edu/>
<https://theconversation.com/parts-of-the-pacific-northwests-cascadia-fault-are-more-seismically-active-than-others-new-imaging-data-suggests-why-100631>
www.king5.com/article/news/local/new-earthquake-research-shows-where-big-one-could-strike/281-587140152

Artificial Intelligence Improves Earthquake Aftershock Location Forecasting

Aftershocks, the “triggered” earthquakes that follow a mainshock, can cause significant damage and safety concerns for people living and working in areas that have already been affected by the initial quake. Seismologists currently use “stress-failure” analyses to provide forecasts of aftershock probability; “While scientists have developed empirical laws to describe the likely size and timing of those aftershocks, such as Bath’s Law and Ohmori’s Law, forecasting their location has been harder.”

Researchers at Harvard University, with support from Google, are using machine-learning to discover relationships between mainshocks and aftershocks to better determine locations of these secondary, but often dangerous, events. Data from thousands of events were used to train a neural network to “learn” and find correlations related to aftershock location. “The researchers used these data to train a neural network that modelled a grid of cells, 5 kilometres to

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a side, surrounding each main shock. They told the network that an earthquake had occurred, and fed it data on how the stress changed at the centre of each grid cell. Then the scientists asked it to provide the probability that each grid cell would generate one or more aftershocks. The network treated each cell as its own little isolated problem to solve, rather than calculating how stress rippled sequentially through the rocks.”

The researchers then ran the Artificial Intelligence (AI) system on a data set of 30,000 quakes including mainshocks and aftershocks. The “trained” AI system provided more accurate aftershock location predictions than the stress-failure analysis method. In addition, the system showed that the parameter known as the “second invariant of the deviatoric stress tensor,” or “J2,” may be an important factor in the analyses. The J2 parameter is used to “describe stress changes in materials such as metals” and has previously not been widely used in the study of earthquakes.

The researchers note that this system can be used in areas with different types of fault geometries. At this time, the system is not able to provide real-time forecasts and doesn’t model all the possible types of earthquake caused changes in stress within the earth. However, the research provides a new model for aftershock generation and may improve our understanding and preparedness following future earthquakes.

References:

www.nature.com/articles/d41586-018-06091-z
<https://news.harvard.edu/gazette/story/2018/09/harvard-scientists-probe-aftershocks-with-ai/>

Scientists Posit Creep at Depth for Southern California Faults Considered “Locked”

The San Jacinto and San Andreas Faults in the San Bernardino Basin in Southern California have long been considered “locked” faults by scientists. Both faults are strike-slip, with horizontal motion along the fault during a rupture. However, about a third of the small earthquakes recorded below a depth of 10 km (6 mi) in the region in the last 36 years have shown unexpected vertical motion.

Scientists using 3D modeling to explain this behavior suggest that at depth, the northern San Jacinto fault is not locked, and is in fact creeping. Normally, GPS analysis is used to measure creep, but in this instance, the San Jacinto and San Andreas Faults are too close together to use this method.

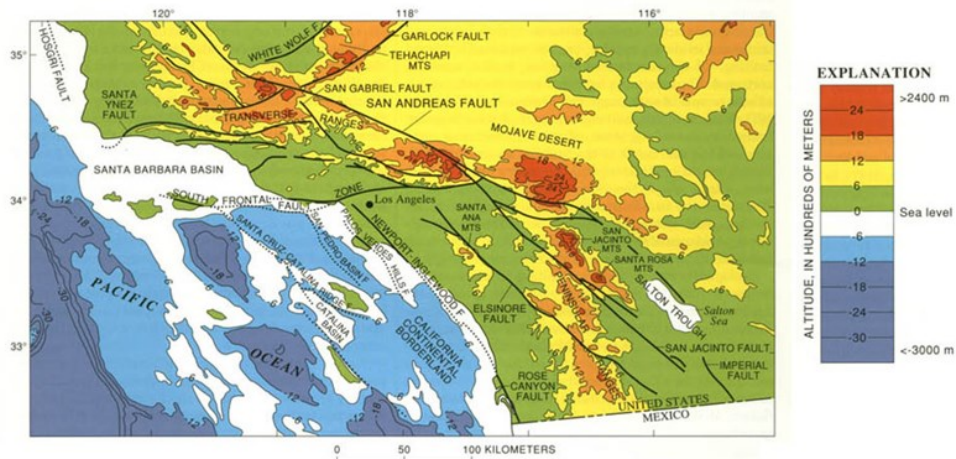
The results of this study suggest that these small quakes and associated creep may affect our current understanding of energy build up and interactions between faults in the region.

Below: Generalized topographic map of southern California, showing major faults with Quaternary activity in the San Andreas fault system. Faults dotted where concealed by water; hachures on contours indicate area of closed low.

Source: <https://geologycafe.com/california/pp1515/chapter4.html>

References:

<https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2018GL078932>
www.newsweek.com/san-andreas-fault-unexpected-underground-deep-creep-could-explain-mystery-1127780



A Physics-Based Method to Estimate Seismic Hazard for California

A new physics-based method to estimate seismic hazard for California provides results in close agreement with the existing statistical model, the Uniform California Earthquake Rupture Forecast, version 3 (UCERF3).

The authors note that current Probabilistic Seismic Hazard Analysis (PSHA) models are complex, difficult to test and calibrate, and have led to questions about the veracity of the results.

Using the physics-based RSQSim earthquake simulator, researchers were able to reduce some of the uncertainty and assumptions present in the PSHA method. After running simulations on a supercomputer for 500,000 years of California earthquakes, the resulting hazard estimates matched with the results from the state's statistical model which uses data collected from seismic events over the last 100 years. Based on these results, the RSQSim method can be used to validate PSHA region-specific analyses and hazard estimates.

Regional hazard estimates are of great importance in supporting local building code requirements as well as for earthquake mitigation and preparedness efforts. Having two different analyses that independently agree will increase confidence in decision making based on these results.

Additional improvements to the analyses such as "earthquakes in unexpected places, the evolution of earthquake faults over geological time, and the viscous flow deep under the tectonic plates" are under consideration to be added to the model. Future studies areas include aftershocks and expanding the model for use on other fault systems.

References:

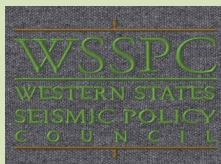
<http://advances.sciencemag.org/content/advances/4/8/eaau0688.full.pdf>
<https://blogs.ei.columbia.edu/2018/08/22/milestone-forecasting-earthquake-hazards/>

What Every Wardrobe Needs:

A special selection of men's and women's shirts emblazoned with the WSSPC logo is available for order directly from

Lands End:

<https://business.landsend.com/store/wsspc/>



Sea Level Rise May Lead to More Frequent Coastal Flooding from Tsunamis

A recently published article in *Science Advances* details what is believed to be the first study of its kind modeling probabilistic tsunami inundation scenarios when sea level was increased by 0.5 (1.5 ft.) and 1 meter (3 ft.). The authors note that "While some assessments of tsunami hazard exist, how the future tsunami hazard evolves with a rising sea level has not been studied." The sea level rises (SLRs) were chosen to represent realistic scenarios for the years 2060 and 2100.

The study area of Macau is a densely populated region in the Pearl River Delta area of South China. Based on the researchers' models, at the present sea level, for large areas of the study area to have inundation of greater than 1 meter, an earthquake of magnitude 8.8 or greater is required. When the models were run with the 0.5- and 1.0-meter SLRs, inundation occurred from tsunamis generated by smaller magnitude earthquakes. Frequency of inundation was also significantly affected by SLR; "The sea-level rise dramatically increased the frequency of tsunami-induced flooding by 1.2 to 2.4 times for the 1.5-foot increase and from 1.5 to 4.7 times for the 3-foot increase." As sea level rises, small tsunamis that under current conditions don't cause inundation may become damaging events.

One of the study's authors, Robert Weiss from the Virginia Tech Department of Geosciences, stated: "Our research shows that sea-level rise can significantly increase the tsunami hazard, which means that smaller tsunamis in the future can have the same adverse impacts as big tsunamis would today." The results of this study show the need for additional studies for other coastal and island communities at risk from the combined effects of SLR and tsunamis.

References:

<http://advances.sciencemag.org/content/4/8/eaat1180>
www.wvtf.org/post/sea-level-rise-earthquakes-tsunamis-more-coastal-flooding-ahead
https://vtnews.vt.edu/articles/2018/08/Science-tsunamis_increase_climate_change.html

RESILIENCE AND RECOVERY

New York Times Story Highlights Low Earthquake Insurance Uptake by Californians

An August 31, 2018 article in the New York Times reports that only 13% of homeowners and fewer than 10% of commercial buildings in California are insured for earthquake losses. The California State Insurance Commissioner, Dave Jones, said that “From an insurance perspective, Californians are simply not prepared.” According to Alex Kaplan, from the insurance company Swiss Re, earthquakes are the “largest uninsured exposure from a natural disaster in the U.S.”

A primary reason suggested for the low participation by Ray Lehmann in Insurance Journal is that “unlike other insurance for floods, fires and windstorms, the government-sponsored enterprises Fannie Mae and Freddie Mac don’t require it.” Other reasons cited include high cost and “a chronic problem of denial and underestimation of the risk” says Dave Jones.

After the Northridge Earthquake in 1994 caused great costs to insurers, many companies stopped writing policies in the state. This prompted the creation of the California Earthquake Authority (CEA), “a not-for-profit, publicly managed, privately funded entity,” in 1996. Insurance companies can offer their own earthquake policies or CEA policies.

References:

www.earthquakeauthority.com/About-CEA/CEA-History

www.insurancejournal.com/blogs/right-street/2018/09/04/500044.htm

www.nytimes.com/2018/08/31/us/california-earthquake-insurance.html

Washington Holds “Fractured Grid” Tabletop Exercise Focusing on Power Outages

A tabletop exercise held in August brought federal, state, and public and private utility representatives together to discuss response and recovery for power grid failures resulting from a Cascadia Subduction Zone earthquake. Subjects of discussion included interagency coordination, restoration prioritization, pre-event stockpiling of supplies, challenges due to failures of other systems such as transportation

corridors and communications during and following a major earthquake.

Reference:

www.mil.wa.gov/blog/news/post/fractured-grid-tabletop-focuses-on-recovery-after-the-big-one

ADDITIONAL RESOURCES & PUBLICATIONS

Lessons from Mexico’s Earthquake Early Warning System

<https://eos.org/features/lessons-from-mexicos-earthquake-early-warning-system>

Tsunami Evacuation Analysis of Florence and Reedsport, Lane and Douglas Counties, Oregon, Open-File Report O-18-05

www.oregongeology.org/pubs/ofr/p-O-18-05.htm

PEOPLE & TRANSITIONS

WSSPC Welcomes three new State Hazard Mitigation Officers who have joined our WSSPC member states:

- ◆ Lucrecia “Lu” Hernandez, Arizona Department of Emergency and Military Affairs Division of Emergency Management
- ◆ Steven Board, Disaster Recovery Manager, Colorado Division of Homeland Security and Emergency Management
- ◆ Vickie Villagomez, CNMI Emergency Management Office

We are looking forward to working with our new members.

Wendy Smith-Reeve, Deputy Director, Arizona Department of Emergency and Military Affairs, and the Director, Division of Emergency Management, was one of 8 new members sworn in to the Homeland Security Advisory Council (HSAC) September 18. The HSAC is a Department of Homeland Security federal advisory committee that provides Secretary Nielsen with independent, informed recommendations, and advice on a variety

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of homeland security issues. The HSAC is comprised of national policy makers, representatives from state, local, and tribal governments, emergency, and first responder communities, academia, and the private sector.

For more information on the Council, go to:
www.dhs.gov/homeland-security-advisory-council
<https://www.dhs.gov/news/2018/09/18/secretary-nielsen-swears-new-homeland-security-advisory-council-members>

CONFERENCES, WORKSHOPS & EVENTS

National Emergency Management Association (NEMA) Annual Forum

October 1-4, 2018
Savannah, GA
www.nemaweb.org/index.php/forums-meetings/save-the-date

QuakeSmart Preparedness Workshops

October 3, Jackson, WY
October 18, Albuquerque, NM
<http://flash.org/readybusiness/workshop.php>

Earth Science Week

October 14-20, 2018
www.earthsciweek.org/about-esw

Great ShakeOut Earthquake Drills

October 18, 2018
Alaska, American Samoa, Arizona, British Columbia, California, Colorado, Guam, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Washington, Wyoming, Yukon
www.shakeout.org/index.html

Geological Society of America (GSA) Annual Meeting

November 4-7, 2018
Indianapolis, IN
<https://community.geosociety.org/gsa2018/home>

National Disaster Resilience Conference

November 7-9, 2018
Clearwater Beach, FL
<http://flash.org/nationaldisasterresilienceconference/>

WSSPC Board Meeting and Executive Director Interviews

November 15-16, 2018
Sacramento, CA
www.wsspc.org/



The poster features a solid orange background. At the top, the text "Get Ready to Shake Out." is written in large, bold, blue and white letters. Below this, there are three small icons in a row: a person dropping, a person covering their head, and a person holding on. Each icon is accompanied by a label: "DROP!", "COVER!", and "HOLD ON!". Below the icons, the text "October 18, 10:18 a.m." is written in white. To the right of the icons, the "Shake Out" logo is displayed in blue and white. At the bottom right, the text "Register at www.ShakeOut.org" is written in white.

**Publication of this e-Newsletter was funded through
FEMA Cooperative Agreement EMW-2018-CA-00001.**

If you have a newsworthy item for our e-Newsletter, please forward it to
Lara Brodetsky, Program Manager at: lbrodetsky@wsspc.org