Last Chance to Nominate Someone for our Awards Program!

Nominations for 2019 WSSPC Awards are coming to a close and it’s the last chance to nominate someone! 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: https://www.wsspc.org/awards/call-nominations/

Welcome New WSSPC Executive Director: Matthew Wall

WSSPC is happy to welcome Matthew Wall as its new Executive Director. Matthew is experienced in all aspects of emergency management and response. From 2007 until 2018, he served in the Commonwealth of Virginia, Department of Emergency Management as the Virginia Emergency Support Team (VEST) Coordinator, the State Hazard Mitigation Officer, and the Hazard Mitigation Project Coordinator. He was responsible for developing the state earthquake program after the Mineral, Virginia earthquake in 2011.

Matthew also dedicated a large part of his career to the City of Richmond, Department of Fire and Emergency Services, as a Firefighter, Fire Lieutenant, and Fire Captain from 1980 to 2006.

As Captain, he was in command of personnel at his stations, developed work plans, trained personnel, and provided immediate emergency response for a city of over 200,000.

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Matthew has served as Chairman of the National Earthquake Program Managers (NEPM) and is currently a member of the National Earthquake Resiliency Coalition (NERC). He has previously served as a member of the Executive Board for the Virginia Floodplain Managers Association (VFMA), the Executive Board for the Virginia State Animal Response Team (VASART), and as a member of the Virginia Chapter of the Silver Jackets.

His colleagues say "Matthew is a consensus seeker and innovator, engenders confidence, and is a dedicated, performance oriented person, balanced as to what he does and puts a human touch to it.” Such qualities will be welcomed at WSSPC and we look forward to welcoming him to California and our consortia.

Matthew will start mid-January and he and Patti Sutch will transition through the end of February.

Save the Date!

**WSSPC Annual Meeting and National Earthquake Program Managers Meeting**

The WSSPC Annual Meeting and National Earthquake Program Manager's (NEPM) Meeting will be held in Salt Lake City, Utah during the week of April 22nd-26th, 2019 at the Salt Lake City Marriott University Park.

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**Thank You 2018 WSSPC Affiliate Members!**

WSSPC welcomes all members of the professional community who share the common goal of reducing losses from earthquakes. Thanks one more time to our 2018 Affiliate Members:

**Corporate**

- California Earthquake Authority
- Degenkolb Engineers, Inc.
- Saunders Construction, Inc.

**Government**

- City of Las Vegas Building and Safety
- Clark County Building and Fire Prevention

**Non-Profit**

- Applied Technology Council
- Earthquake Engineering Research Institute (EERI)

**Individual**

- Dominic Sims

**Join as an Affiliate Member for 2019 and get the following benefits:**

- Recognition of support with a link on the WSSPC website to your organization
- Participation on WSSPC Committees providing input to policy recommendations
- Quarterly E-Newsletters and Monthly Bulletins
- Opportunities to exhibit and sponsor activities

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There are so many ways to stay connected!

Online- [www.wsspc.org](http://www.wsspc.org)
Twitter- [@WSSPC](https://twitter.com/WSSPC)
Facebook- [www.facebook.com/WSSPC](http://www.facebook.com/WSSPC)
NEHRP Reauthorization Act of 2018

On December 11th, 2018 President Trump signed into law Public Law 115-307, officially reauthorizing the National Earthquake Hazards Reduction Program (NEHRP). The Reauthorization Act, in the works since September 2017 when it was introduced by Senator Dianne Feinstein as S. 1768, more heavily emphasizes activities to promote greater resilience to earthquakes.

NEHRP, originally established in 1977, was last reauthorized in 2004, and authorization for appropriations expired in 2009, although Congress continued to appropriate funds for it. The Act authorizes appropriations for NEHRP activities for the four federal agencies through FY2023.

The new Act adds to the NEHRP purpose of reducing risks to life and property by “increasing the resilience of communities to future earthquakes” and defines community resilience as “the ability of a community to prepare and plan for, absorb, recover from, and more successfully adapt to seismic events”. Included in this concept of resilience is the idea that buildings should be designed and constructed to be able to continue functioning and be re-occupied after an earthquake.

The Act also incorporates changes in federal agencies' responsibilities to allow "federal agencies to create clearer distinctions on emergency management responsibilities, fund the continued development of earthquake early warning systems, and fund the production of maps showing active faults and folds, liquefaction susceptibility, and other hazards such as landslides that can be induced by an earthquake."

To identify how NEHRP activities have reduced earthquake risks and losses from earthquakes, the Comptroller General is now required to review federal earthquake hazard risk reduction efforts and report by 2021 its findings to Senate and House Committees.

Such a reauthorization is especially significant in the wake of the recent M7.0 earthquake in Anchorage, Alaska. Communities are now looking towards mitigation practices such as adopting and enforcing stricter building codes in an effort to protect themselves against earthquake damage.

References:
https://fas.org/sgp/crs/misc/R43141.pdf

San Francisco Incorporates Earthquake Preparedness into Science Curriculum

Beginning this year, San Francisco Unified School District is updating its science curriculum to include earthquake safety and preparedness for all 7th graders. Partnering with the San Francisco Department of Emergency Management, the district was able to create a program that not only satisfied state science requirements, but also educated students and families on the dangers of earthquakes and how to be prepared. This is especially pressing in a city that is at a high risk for a major earthquake in the coming years.

The new program targets all 7th graders and their families, requiring the students to take the information learned from the project and share it with their families. An estimated 800,000 people would be exposed to this information over 20 years.

The curriculum focuses on giving students a real-world challenge and having them give recommendations based on the soil type and rock strata for different parts of the Bay Area. Students then must gather information based on real locations to determine the proper procedure for tackling the problem they are given.

San Francisco Unified School District and the San Francisco Department of Emergency Management's collaboration on this project should not only help 7th graders learn about the mechanics and science behind earthquakes, but also spread important information about earthquake safety to both the students and their families.

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Unknown Origin of Indonesia's Tsunami
Surprises Scientists

On September 28th a 7.5 magnitude earthquake hit the city of Palu, Indonesia, causing a tsunami and a series of devastating effects on human lives, city infrastructure, and Palu's economy. The estimated total deaths caused by the earthquake and tsunami have surpassed 1400, with many more people still unaccounted for. Questions about what caused such a calamitous tsunami are being asked as this destructive tsunami's origin is largely unknown.

Often, catastrophic tsunamis are the result of megathrust earthquakes, a type of dip-slip fault that moves Earth's crust vertically along a fault. However, this was not the case in Palu where the fault that ruptured was along a strike-slip fault, producing horizontal displacements. This type of movement is not usually associated with generating a tsunami.

A number of theories have circulated regarding the tsunami's origin. One focuses on the possibility that it was not necessarily the strike-slip fault that caused the tsunami, but the possibility that the fault's 70 mile long rupture zone passed through an area where the seafloor changed elevation. This would theoretically cause a vertical motion that would displace the seawater, causing a tsunami.

Another theory about the tsunami's origin is that the shaking from the earthquake caused an undersea landslide that displaced water under the surface, creating waves and the eventual tsunami that followed. Undersea landslides have caused tsunamis in the past and we know of several that occurred during the 1964 Alaska quake.

The third possibility focuses on Palu's geographical location. As the city is situated at the end of a narrow bay, "the coastline and the contours of the bottom of the bay could have focused the wave energy and guided it up the bay, increasing the wave height as it approached shore." Such effects have been observed in other tsunami cases.

These theories draw upon logical assumptions and previous observations. However, studies of the seafloor are needed in order to have a more complete understanding of the case of this tsunami. Until scientists have better understanding, emergency management and humanitarian groups are helping Palu recover.

References:
https://www.theguardian.com/world/2018/oct/02/what-caused-palu-indonesia-tsunami-and-could-lives-have-been-saved

Portland Passes Ordinance for Unreinforced Masonry Buildings

On October 10th, 2018, the Portland City Council voted to require placards on Unreinforced Masonry (URM) buildings and requires landlords to notify tenants if their building is unreinforced and may be unsafe in the case of a major earthquake.

Portland, a city with an estimated 1600 URM buildings, has been working hard to ensure earthquake preparedness despite the city's surplus of buildings that are not retrofitted.
This ordinance was passed after a long four years and three different committees worked on it, making it a highly anticipated ordinance for the city.

The ordinance will require a placard on all URM buildings that have not been retrofitted to prevent collapse in the event of a major earthquake, require URM building owners to notify tenants in their rental agreements that the building is an URM and that it may be unsafe in the event of a major earthquake, and strengthen existing triggers in Title 24.85 that require retrofits of URM buildings. The placard required must be 8" x 10" with 50-point bold font, posted in an obvious location at the exterior of the main entrance of the building. Both the placard and the notification to tenants in the rental agreement must have the following message: "This Building is an Unreinforced Masonry Building. Unreinforced Masonry Buildings may be unsafe in an event of a Major Earthquake."

These new requirements take action at different times for different categories of businesses and buildings. Publicly-owned buildings must be in alignment with the ordinance by January 1, 2019, non-profit buildings by November 1, 2020, and all other buildings by March 1, 2019. After 4 years of deliberating and negotiating, it seems that Portland will move forward in its goal of earthquake preparedness in the coming years.

References:
https://www.portlandoregon.gov/pbem/66306
https://www.portlandoregon.gov/bds/article/696915

Salt Lake City receives $1.9 million from FEMA to retrofit homes

Fix the Bricks is a Salt Lake City program that uses federal grants to retrofit Unreinforced Masonry Buildings. They cover up to 75% of the homeowners retrofitting costs and now have a new goal to retrofit 100 Unreinforced Masonry homes along the Wasatch fault within the next several years due to being granted a large grant from FEMA. The program to retrofit these homes, estimated to cost $2.55 million, has been given $1.9 million from FEMA's Pre-Disaster Mitigation Grant Program, a generous portion of the project's budget. This grant allows Utah to better prepare its citizens, renters, and homeowners for the possibility of an earthquake.

The U.S Geological Survey and Utah Geological Survey found that there is a 57% chance of a M6.0 earthquake and a 43% chance of a M6.75 earthquake in Salt Lake City within the next 50 years. Currently, one-third of Salt Lake County homes are at risk of getting destroyed during a magnitude 7.0 or higher earthquake.

As exemplified on a city-sponsored interactive map that shows which homes are most at risk in the event of a major quake, the northeastern and southeastern portions of the county have the highest risk for earthquake damage. With this increased outreach towards Salt Lake City's residents about earthquake safety and Utah's effort to retrofit homes, FEMA's $1.9 million grant is going towards new efforts to increase earthquake preparedness.

References:
https://www.slc.gov/em/fix-the-bricks/

7.0 Magnitude Quake Strikes Alaska

A 7.0 magnitude earthquake struck Alaska seven miles from Anchorage on Friday, November 30th. The quake was followed by more than 1,400 aftershocks in the four days following the earthquake, including one with a magnitude of 5.7. The Alaska oil pipeline was shut down for hours and roads didn't fare well with about 50 sites reporting damage, including eight that were considered major.

Image: #121 Vine Road near Wasilla, AK.
Source: EERI Anchorage, Alaska Clearinghouse

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Although the earthquake resulted in cracked city roads and collapsed highway ramps, there were no reports of serious injuries or collapsed buildings. This is largely thanks to Alaska’s strict building codes that were born out of the M9.2 1964 earthquake, the second most powerful recorded earthquake in world history.

EERI has set up a virtual clearinghouse for this event at:
http://www.learningfromearthquakes.org/2018-11-30-anchorage-alaska/

References:
https://www.pbs.org/newshour/nation/strict-building-codes-helped-anchorage-withstand-quake
#4f0c417e3a98
https://seismosoc.secure-platform.com/a/solicitations/5/sessiongallery/129

Gov. Jerry Brown Vetoes two Bills Creating Stricter Earthquake Safety Construction Codes

Two bills, AB 1857 and AB 2681, meant to protect against damage from earthquakes, were vetoed by California Governor Jerry Brown in late September. Currently, California's minimum requirement for construction does not take into account the building's resilience after an earthquake, but only “life-safety” which, although important, is not the only priority when preparing for an earthquake. Earthquake safety activists fought for these bills to identify already weak buildings that need to be renovated and create buildings that are stronger from the beginning, thus allowing for repairs to happen more quickly after an earthquake and for residents to get back to their normal routine faster.

Bill AB 1857 called to create an advisory group to "explore and make recommendations on updating the performance standard of the California Building Code from life-safety to functional recovery.” This translates to fighting for stricter building codes to change them from the current platform of basic survival to one also focused on the importance of recovery. Supporters of the bill claimed that as the world's 5th largest economy, it is vital that California will be able to recover quickly after a large earthquake so business as usual will be minimally disrupted.

Bill AB 2681 required all vulnerable buildings in California to be inventoried and for this list to be maintained periodically. This would require the "building department of a city or county that meets specified requirements to create an inventory of potentially vulnerable buildings, as defined, within its jurisdiction,

based on age and other publicly available information, and submit that inventory to the office, as specified." This state-mandated local program would allow the state and its local communities to identify potentially hazardous buildings with the hopes of updating them in the future.

Despite the potential benefits of these bills, Brown wrote in his veto message that “Instead of duplicating this federal process at the state level, it would be wise to allow the… [National Institute of Standards and Technology]…to finish its work."

This outcome was supported by The League of California Cities and California Building Officials, who claimed that the legislation would be too much of a burden on small building departments.

Although many earthquake activists are disappointed with the outcome, they want to continue working on increasing earthquake preparedness in California. Many people agree with Assemblyman Adrin Nazarian (D-North Hollywood) when he claimed that he “will continue to work with my colleagues and our scientific community to develop building standards that save lives, protect property and allow our economy to remain strong.”

References:
National Institute of Standards and Technology Presents Building Code Report to Congress

The National Institute of Standards and Technology (NIST) delivered a new report to Congress that asks for stricter building codes to prepare cities for natural hazard events. The goal of the report is to point out how the current building code is not enough for a city to economically bounce back after the devastating effects of an earthquake and how to get the nation on track to implement codes that keep structures operational after an earthquake as to limit the economic damage of natural disasters.

Currently, building codes focus on preserving lives by limiting significant structural collapse from hazards but do not emphasize the building’s functionality after the earthquake strikes. The prioritization of preserving lives above all else is of course critical, but current codes ignore the economic wellbeing of a city after the earthquake, which can cause reduced quality of life, social disruptions, and long term shifts in the city’s economic trajectory.

The new NIST report, Research Needs to Support Immediate Occupancy Building Performance Objective Following Natural Hazard Events, emphasizes what it would take to require all buildings to have immediate occupancy performance codes, or codes that value the structural integrity of buildings after natural hazards. The publication presents a number of research and implementation procedure that would enhance the longevity of buildings in the case of a natural disaster.

The research paper also identifies the main challenges facing the effort to increasing the functionality of buildings after an earthquake. These include the difficulty in motivating communities and cities to make the investment for safer buildings and managing how the costs are allocated.

The NIST report acknowledges the difficulties that are associated with such a large change in the building codes, but also concludes that the "advantages may be substantial" and that, through a difficult and major change to the current system, it is possible to achieve such goals.

References:

Disaster Recovery Reform Act Signed Into Law

On October 5th, 2018 the Disaster Recovery Reform Act (DRRA) was signed into law as a part of the Federal Aviation Administration Reauthorization Act of 2018. This bill amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act and has the ultimate goals of providing greater investments in mitigation before a disaster, reducing risk from future disasters, increasing state capacity to manage disaster recovery with higher rates of reimbursement, providing the assistance available to survivors with disabilities, and retaining long term and skilled personnel at FEMA.

The reforms that the DRRA proposed acknowledge the shared responsibility between the federal government, state governments, and local and tribal governments to promote disaster response and recovery, specifically through increasing state capacity to manage disaster recovery. This will be done by implementing public assistance and hazard mitigation projects. It also increases flexibility for states and local governments to administer their own mitigation and recovery programs through increasing federal funding for administrative costs.

The Disaster Recovery Reform Act focuses on more heavily investing in mitigation strategies to better prepare states for natural disasters before a disaster hits. This will be done through authorizing the National Public Infrastructure Pre-Disaster Hazard Mitigation Grant Program, which will fund projects that increase pre-disaster community resilience. This mitigation funding no longer requires congressional appropriations that vary annually, but rather now have a more reliable stream of funding to promote and execute mitigation programs.

This bill also provides greater flexibility to survivors of natural disasters with disabilities. It does this by increasing assistance available to those with disabilities and providing accessibility repairs without it counting against their maximum disaster assistance grant award.
By providing a greater amount of funding for mitigation efforts, the DRRA will not only save lives and protect infrastructure, it will also save the nation six dollars in future disaster costs for every one dollar invested in mitigation projects.

References:

**New Online Tool Helps Bay Area Residents Assess Earthquake Risk**

The Association of Bay Area Governments created an online tool to help residents and homeowners identify the types of threats to their homes related to earthquakes. It was released on the same day as the 10th Annual Great California ShakeOut on October 18th, 2018.

The new tool includes both an Earthquake Home Quiz that assesses homes within the Bay Area and a PDF of the Earthquake Field guide, which helps to identify housing types and their vulnerabilities. The website's data differentiates between single family, multifamily, and manufactured homes, giving the specific strengths, weaknesses, and the unique needs for each type. It looks at the type of construction, the existence of and type of chimneys, the water and gas lines, and the potential flooding and fire risk for each time of home. Both the quiz and the PDF are available at the Association of Bay Area Governments' Resilience Program's website at homequakequiz.org.

References:

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**RESILIENCE AND RECOVERY**

**Parks as a Center for Disaster Recovery**

In an effort to provide greater resilience in Portland in the case of a disaster, Portland State University's Institute for Sustainable Solutions (ISS) is funding resilience planning to come up with solutions for recovery from disasters. ISS and their partner Portland Parks and Recreation are focusing on the role parks play after disasters as meeting points, community spaces, and places to distribute supplies.

In the reports done by student researchers at Portland State University, they have found that parks have played a crucial role in past disaster recovery and that the Portland parks will play a key role in future disaster recovery, regardless of whether they plan for it.

Beth Gilden, project manager at ISS, said “resilience and recovery planning requires cross-departmental work and creates the opportunity to come up with solutions that might not otherwise be identified.” The project is entering its third year of supporting the City’s resilience planning effort.

References:

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**Image: Parks as a space for basic needs,**
Source: Portland State University

...continued from page 7
Oregon Updates Playbook for Earthquake Response

Oregon’s Office of Emergency Management updated their Cascadia Playbook, a 100-page plan that addresses their response within two weeks after a Cascadia Subduction Zone earthquake occurs.

The revisions to the Cascadia Playbook come from its new take on responding and recovering times. The plan is laid out in steps based on intervals of time. The first "play" is based on responding within the first hour of the earthquake, then the first 6 hours, then the first 12, 24, and 48 hours, and then moving on to what to do after shaking has stopped for 4, 7, 10, and 14 days.

These new revisions came after the Cascadia Rising exercise in 2016. This four-day regional drill looked to see how prepared the Pacific Northwest is for an earthquake and/or tsunami. The plays are based on prioritizing the most critical duties first and efficiently including other, less immediately critical, actions with time. For example, within the first hour the steps are to "contact the governor and determine what staff are available to start notifying agencies."

Within six hours, the Cascadia Playbook highlights priorities that include having the governor declare a state of emergency, assessing roads and bridges for damages, working to get emergency supplies, establishing communications with local government and sending information to the public.

The playbook also serves as a reminder to those in emergency management that multiple agencies will all be involved with different duties, and the playbook highlights this importance by arranging "agency actions side-by-side" throughout its procedures.

Report Finds Many San Francisco Buildings Not Earthquake Safe

A recent study by the Applied Technology Council, dubbed the Tall Buildings Safety Strategy, researched the earthquake readiness of many buildings in San Francisco. The study found that San Francisco, a city with a booming economy and a quickly growing downtown, has a shocking number of buildings and high rises that are ill equipped for an inevitable earthquake.

City-wide building inspections for earthquake readiness last occurred in San Francisco after the Loma Prieta earthquake in 1989. However, in the wake of the Northridge earthquake five years later, engineers saw the damage done to certain types of welds in steel-framed buildings that we now know may not withstand another similarly strong earthquake. Because San Francisco had been inspected before this knowledge about the drawbacks to these welding techniques were discovered, many buildings in San Francisco may still have this structural vulnerability.
The fact that San Francisco is also home to a large amount of high rises, mostly compacted into the northeastern neighborhoods, makes it at a higher risk for large losses in the event of an earthquake. Out of San Francisco’s 156 tallest buildings, or those taller than 240 feet, about 100, or 64%, were built before modern seismic codes were put in for their building type after Northridge. In the study, experts from the Applied Technology Council recommend intensive structural inspections to examine the welds on the steel frames and see if they need to be replaced.

Additionally, current San Francisco laws have not yet been effective in forcing the owners of tall buildings to evaluate them for earthquake safety or retrofit them. Because the current law "requires a seismic retrofit when two-thirds of a building's floors are renovated," most high rise buildings are left untouched as they only contract on a small fraction of the building at a time. The report suggests different ways to require seismic evaluations, such as when buildings are purchased, leased, or renewed, and expanding the current rules for high rises to apply to any building taller than 75 feet.

References:

Mid-Century Earthquakes Likely Triggered by Oil Extraction

A recent study in AGU’s Journal of Geophysical Research: Solid Earth proposed that the World War II era oil pumping under Los Angeles, California likely triggered "a rash of mid-sized earthquakes in the 1930s and 1940s." The researchers think these earthquakes led seismologists to overestimate the earthquake potential in the region due to the inflated amount of earthquakes from oil extractions.

The authors found that the small earthquakes that happened in the 1930s in Los Angeles from oil production made the already seismically active area of Southern California look more active than it is in reality. Unlike the earthquakes associated with hydraulic fracturing in places like Oklahoma, these events in California were not caused by deep fluid re-injection, but rather taking the oil out of the ground. This likely pushed some faults that were already over the edge, causing earthquakes to happen more frequently than they would have otherwise during that time period.

These findings suggest that our understanding of seismology in the LA region may be skewed due to the overly active period in the 1930s and 1940s. Such findings help further research in Southern California seismology and the role oil extraction has on seismic activity.

References:

British Columbia Leech River Fault May Be Active

The Leech River fault, which starts a few kilometers from downtown Victoria and extends across to Vancouver Island, may be capable of producing large-magnitude earthquakes. Thought to have been an inactive fault, a recent study shows it "produced three surface-rupturing earthquakes in the last 10,000 years with a magnitude greater than 6.5" and may still be capable of producing such large quakes. This discovery suggests that British Columbia may have an even higher chance of experiencing a damaging earthquake than thought previously.
The Leech River fault is a crustal fault and part of the Cascadia Subduction Zone. The fact that the Leech River fault now seems to be active suggests that there may be other active faults that scientists either think are inactive or are unaware of.

The research was conducted by creating a rupture history of the Leech River fault using Light Detection and Ranging (LiDAR) and trenching. The study not only showed that the fault is active, it also revealed that rocks on either side of the fault moved vertically, counter to other evidence that suggested the movement should be strike slip.

Such research opens the door for other faults to be more deeply examined to better inform seismologists and policy makers about the possibilities of seismic hazards in a given location.

References:

Active Faults Discovered in Oregon near Mt. Hood

A new study done by researchers from Portland State University and the Oregon Department of Geology and Mineral Industries discovered an "extensive network of active geological faults" near Mt. Hood, Oregon that have the possibility of triggering up to a 7.2 magnitude earthquake.

New Milestone in Earthquake Forecasting

A team of researchers from Columbia University's Lamont-Doherty Earth Observatory, University of Southern California, University of California at Riverside, and the U.S. Geological Survey have developed a computer model that forecasts earthquakes using a physics-based system. The researchers report that this model of California's earthquake hazards is able to match the estimates found by UCERF 3, California's leading statistical model.

The supercomputer simulated nearly half a million years’ worth of California earthquakes using a physics-based model to find California's earthquake hazard estimates. The data matched that of UCERF 3, based on 100 years of instrumental data, validating the data that supports California's current hazard projections.

"If you can get similar results with different techniques, that builds confidence you’re doing something right,” says study co-author Tom Jordan, University of Southern California Professor.

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RSQSim, the earthquake simulator that was used for the study, “simplifies California's statistical model by eliminating many of the assumptions that go into estimating the likelihood of an earthquake of certain size hitting a specific region.” Seismologists can now use the simulator to confidently test regional hazard estimates. These estimates are used as input into the current building codes so having a second tool that confirms the hazard estimates gives credibility to those numbers.

Study Says That Seattle Would Lose Water Pressure Within 24 Hours of Large Earthquake

A new study done by Seattle Public Utilities (SPU) states Seattle would lose all water pressure within 24 hours of a catastrophic earthquake. SPU claimed that restoring water to Seattle and some of its surrounding suburbs could take anywhere from two months to years in the case of earthquakes on par with those in Christchurch, New Zealand, and Tohoku, Japan. Currently, SPU provides drinking water to 1.4 million people, all of whom would have no water supply in the case of a large earthquake. The study examines two possible scenarios: a magnitude 7 earthquake on the Seattle Fault and a magnitude 9 quake on the Cascadia Subduction Zone. In both of these cases between 1,400 and 2,000 pipeline breaks, give or take 50%, are expected, especially in areas with ground displacement. Losing water supply would make every Seattle neighborhood lose its ability to use tap water for drinking, showering, flushing, and firefighting.

Seattle is facing 15 to 20 percent odds of a Cascadia earthquake in the next 50 years, leading the study to recommend that the city should spend $850 million through 2075 to mitigate risk to their water system. Some, like University of Washington disaster risk-reduction expert Scott Miles, warns that these cost estimates are too low and that such projects are a costly, but critical, priority. The study claims that if all necessary changes are made by 2075, service to 70% of direct-service customers could be restored in 11 days, and the rest within 45 days.

References:
http://advances.sciencemag.org/content/advances/4/8/eaau0688.full.pdf
A recent publication evaluates the minimum walking times necessary to escape a tsunami generated by an earthquake on the Cascadia Subduction Zone in Reedsport, Florence, Douglas, and Lane, Oregon. By assuming a 4 feet per second walking speed and analyzing the least-cost distance (LCD) routes using roads, trails, and pedestrian pathways that have been designated by local government, the researchers estimated whether pedestrians could escape a tsunami using evacuation routes.

The primary scenario used the "existing road network and included a 10-minute delay from start of the earthquake before beginning evacuation." Additionally, the model assumed that existing roads and bridges will not be severely damaged and evacuation paths will not have to change based on such infrastructure damage.

Given these constraints, the study found that, in all cases, "evacuation of the entire region is achievable" at four feet per second, even for those with mobility limitations. However, constraints on the study include the assumptions that the "identified minimum speeds must be maintained for the entire time it takes to evacuate from the inundation zone" and that the existing "road and bridge network is not compromised."

The researchers offer possible mitigation options in the case of a tsunami such as increasing the number of routes, building or remodeling bridges and roads to ensure that they can endure a major earthquake, and installing a vertical evacuation structure as a possible refuge.

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

WSSPC is happy to welcome some of its newest members!

- Kyle Sturgil-Simon: Montana State Hazard Mitigation Officer and Earthquake Program Manager
- Andrea Chatman: Chair of the Hawaii Earthquake and Tsunami Advisory Committee and WSSPC Liaison
- Bill Short: Acting California State Geologist
- Caleb Cage: Nevada Chief of the Division of Emergency Management and Homeland Security Advisor

We are looking forward to working with our new members.
CONFERENCES, WORKSHOPS & EVENTS

NTHMP Annual Meeting
January 28-February 1, 2019
San Diego, CA

Guam Seismic Mitigation Workshop
February 5-6, 2019
Tumon, Guam

WSSPC Executive Director Patti Sutch’s Last Day
February 28, 2019

EERI Annual Meeting
March 5-8, 2019
Vancouver, B.C, Canada

Deadline to Return Policy Recommendation Changes to the WSSPC Office
March 15, 2019
wsspc@wsspc.org

NEMA Mid-Year Forum
March 29-April 2, 2019
Alexandria, VA
https://www.nemaweb.org/index.php/forums-meetings/save-the-date

Above Photo: Luke Meyers, Hawaii Emergency Management Agency Executive Officer, presents Patti Sutch, WSSPC Executive Director, with a Certificate of Appreciation for providing state support, while Kevin Richards Hawaii Natural Hazards Planner assists.

Conferences, Workshops & Events continued

National Earthquake Program Managers Meeting and WSSPC Annual Meeting
April 22-26, 2019
Salt Lake City, Utah

Seismological Society of America Annual Meeting
April 23-26, 2019
Seattle, Washington
https://www.seismosoc.org/annual-meeting/

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