



2009 Policy Recommendation Adoption Follow-up Survey

Policy Recommendation 09-1 Earthquake Planning Scenarios

WSSPC recommends that each member state, province, and territory establish an active program to produce Earthquake Planning Scenarios for areas with high risk of earthquake losses. WSSPC also recommends that FEMA support the production of these Earthquake Planning Scenarios through its funding resources.

1. Has your state, province or territory produced or begun to produce an earthquake scenario in the past year?

Yes, begun:

[EMBC](#)

[Hawaii](#)

[Idaho](#)

[Oregon DOGAMI](#)

[Utah Seismic Safety Commission \(UGS, UUSS, Homeland Security\)](#)

[Wyoming](#)

[Washington EMD](#): In 2009, Washington with support from the USGS and FEMA began the process of completing a comprehensive Earthquake Scenario Catalog for faults across the state. Previously, other nationally recognized scenarios like the EERI-EMD Seattle Fault scenario have been published. The objective of the Earthquake Scenario Catalog project is to use scenario ground motion hazard maps produced in a ShakeMap format to provide much more accurate input into FEMA's risk analysis software HAZUS-MH. The USGS developed 15 scenario maps for use in this project. The scenario ShakeMaps can provide emergency personnel information on the distribution of strong ground shaking to facilitate informed and effective emergency response in the event of a catastrophic earthquake.

The addition of estimates of potential impacts including injuries, search and rescue, shelter, and building inspection needs, and essential facility and lifeline functionality after a large earthquake, will allow emergency personnel to respond more appropriately to the areas that are in immediate need. Additionally, these tools will provide emergency planners and responder with the tools necessary to develop scientifically-grounded mitigation strategies as well as exercise earthquake response plans.

Yes, published:

[CalEMA](#): In FY08-09 California received a \$90,000 EMPG Grant from FEMA with which we developed HAZUS loss estimates for all 56 existing ShakeMap scenarios for earthquakes in California and established an archive of scenarios for use by local government for planning, hazard mitigation and exercises. In addition, a well-researched scenario for a M7.8 earthquake on the San Andreas fault was developed by a large number of agency, university and private sector representatives and was the basis for the November 2008 Golden Guardian exercise and drove the ShakeOut earthquake preparedness campaigns of 2008 and 2009.



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California GS: The California Geological Survey published 8 Earthquake Planning Scenarios in the late 1980's and early 1990's; a couple with FEMA support. FEMA has not supported additional Scenario developments on the supposed grounds that these scenarios were neither preparations nor mitigations for earthquakes. In 2008 CGS was a partner with the USGS in the publication of a major Earthquake Scenario for Southern California – the Great Southern California ShakeOut.

Am Sam: Conduct periodic evacuation drills with schools to practice their emergency evacuation plans and basic instructions (“drop, cover and hold”) in the event of an earthquake.

Montana: Yes, the State of Montana recently planned, conducted and completed an extensive Earthquake Exercise (Vigilant Guard 2009) that tested the response capabilities of the State of Montana, involving local governments, elected officials, National Guard, Air National Guard, federal partners, private industry partners, emergency management, Search and Rescue, volunteer agencies, citizens, schools & universities, media, Joint Information Centers, local hospitals, CERTs, etc. The exercise efforts took nearly two years to plan and resulted in a successful, week-long event. Many aspects of emergency management, loss-analysis, and recovery were evaluated providing extremely useful information and data that will be used to improve mitigation, preparedness, response and recovery efforts throughout the State of Montana.

Nevada: Yes, published (NBMG Open-File Report 09-8, Estimated Losses from Earthquakes near Nevada Communities)

Oregon EM

No:

Arizona

CSSC

New Mexico

Alaska: The Alaska State Seismic Safety Hazards Commission, in collaboration with Alaska Division of Homeland Security and Emergency Management, has established an earthquake scenario committee which has scenario development as a goal. The Commission has supported applications to NEHERP and other groups but has not yet been successful. The committee continues to meet regularly to discuss the various scenario possibilities and to address the challenge of limited voluntary scenario technical staff available in Alaska.

Colorado: CEHMC has not been involved in these as yet. We would be willing to assist and participate. I assume this would be led by DEM.

2. Have loss-reduction actions or policies been identified as a result of the published scenario?

Yes:



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Am Sam

Utah Seismic Safety Commission (UGS, UUSS, Homeland Security)

WA EMD

CalEMA

California GS: Loss reduction analyses have been performed, which include the targeting of vulnerable facilities and infrastructure, and modified HAZUS program analysis by CGS has been done for CalEMA.

Montana: The After Action Report, now finalized, will be used extensively as a reference for future loss-reduction efforts.

No:

Alaska

Arizona

EMBC: No (not within the objectives of the scenario project)

California SSC

Colorado: N/A

Hawaii

Idaho: No – not yet. Need more data for scenario to draw conclusions. We have started with general discussions as part of Idaho Seismic Advisory Committee listening meetings. We are not aware of loss-reduction actions or policies identified.

New Mexico

Nevada: Not yet, although the scenarios are being integrated into the Nevada Hazard Mitigation Plan.

Oregon DOGAMI: No Answer

Oregon EM

Wyoming



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Policy Recommendation 09-2

Developing Earthquake Risk-Reduction Strategies

WSSPC strongly encourages states and local governments to develop and continually update long term, comprehensive statewide and community-level earthquake risk-reduction strategies as part of an all-hazards plan to reduce injury, loss of life, property damage and economic disruption from earthquakes.

3. Has your state included earthquake risk reduction strategies in your state hazards plan?

Yes:

Alaska: Yes – the Alaska State Hazard Mitigation Plan includes several sections on seismic hazards and specific seismic loss reduction goals and strategies. The plan is currently under revision for the 2010 update and will include additional seismic hazard data and updated mitigation actions.

Am Sam: The Territorial All Hazards Mitigation Plan which is approved by FEMA Region IX is updated every 5 years and reviewed annually as needed in terms of grant project preparations and emergency events that occur from time to time that may have impact on priorities published within this Plan.

Arizona

CalEMA

California GS: California just completed updating its State Hazard Mitigation Plan and incorporated geological and earthquake hazards provided by CGS.

California SSC

Hawaii

Idaho

Montana: Only generically.

New Mexico

Nevada

Oregon DOGAMI

Oregon EM

Utah Seismic Safety Commission (UGS, UUSS, Homeland Security)

Washington EMD

Wyoming

No:

Colorado: In regard to a “state hazards plan,” this is best answered by Colorado CGS and DEM.

N/A:

EMBC: N/A . We do not have a Provincial All Hazards Plan, however, HRVA is part of our Provincial legislation.



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4. The policy recommendation defines successes in policy implementation as occasions when mitigation actions or requirements are incorporated into public policies and decisions, and subsequently integrated into important public or private projects.

Please provide examples within the past year of mitigation successes in your state.

Alaska: One challenge of seismic mitigation projects is that they are designed to mitigate against low-frequency, high consequence events. True “success” is only verified when a damaging seismic event occurs and the project is subsequently inspected and found “successful”. Alaska has not experienced a seismic event this year that would enable such investigation. As a result, we have listed several seismic mitigation projects that were completed this year.

- Kodiak Island Borough structural and non-structural seismic mitigation on public school buildings also used as community shelters. Structural work included shear walls and bracings, non-structural work included sprinkler piping supports and securing large objects.
- Municipality of Anchorage structural and non-structural seismic mitigation on community buildings used as disaster shelters. Structural work included shear walls, bracings, girder connections, glulam reinforcement, and roof diaphragm reinforcement. Non-structural work included sprinkler piping supports.
- Municipality of Anchorage, non-structural seismic safety retrofit on natural gas supply valves on fire stations.

Anchorage School District non-structural seismic safety retrofit on natural gas supply valves on public schools that are also used as disaster shelters.

Am Sam: Local building codes include design to earthquake zone 3 and the two three-story buildings completed in the past years suffered no damage in the September 29, 2009 earthquake.

Arizona: Arizona has developed and distributed a multi-hazards brochure statewide to include earthquakes. This brochure has been very successful, not only in Arizona, but has been requested by other states. Also, the Arizona Geological Survey is the primary contact for the Arizona Shake Campaign whose goal is to provide outreach and education to the public on earthquake risks. Lastly, in 2008, the Arizona Geological Survey applied for and was awarded a Pre-Disaster Mitigation Grant for seismic monitors in order to gather, interpret, analyze, and model seismic data that result from local and out-of-state earthquakes, and yield a more accurate assessment of Arizona's true seismic risk.

EMBC: In 2005, the Province of British Columbia announced a \$1.5 billion, 15-year program to seismically upgrade B.C. schools.

- To date, 118 schools are complete, under construction or approved to proceed to construction: 45 school seismic upgrades have been completed, 39 more are under construction and an additional 34 schools have received approval to proceed to construction.



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- From 2001 to 2008, more than \$412 million was spent on seismic upgrading of schools in 37 school districts in B.C.
- Over the past 5 years, the Province has provided a total of \$25 million to districts in seismic-designated zones to complete non-structural seismic mitigation, including attaching cabinets to walls, covering some windows with protective film, and securing lights.
- Since 2001, the Province has spent more than \$1.5 billion to complete 75 new and replacement schools, 147 additions, 26 renovation projects and 20 site acquisitions across British Columbia. Each of these new and replacement schools built since 2001 are modern, safe, seismically-sound buildings.

CalEMA: Completed in 2008 and introduced in 2009, a new interactive web portal called “My Hazards” provides members of the public an opportunity to type in the address of his/her home, business or vacation site in California and determine the relevant hazards for these locations as well as the means and contacts to mitigate these hazards.

California GS: (What is a “mitigation success” – California is always mitigating through its seismic retrofit mandates under the Alquist-Priolo Act, and Seismic Hazards Zonation Maps, and building stringent codes).

California SSC: Retrofitted URMs in Eureka and homes in Ferndale and several retrofitted bridges in the vicinity performed well in the 2010-01-09 M6.5 Eureka off coast of Ferndale earthquake. In the case of URM buildings, the retrofitted ones performed noticeably better than nearby unretrofitted ones. For more information consult the SEAOC Earthquake Performance Evaluation Program, The Pacific Earthquake Engineering Research Center, and EERI’s Reconnaissance Team.

Colorado: CEHMC has presented a policy recommendation to the State of Colorado for increased seismic safety of schools. The recommendation precludes the use of the IBC Seismic Design Category A for schools and requires the use of Seismic Design Category C where Seismic Design Category B would otherwise be required. The exemptions for non-structural attachments are also excluded. The implementation of this recommendation is still in progress.

Hawaii: Implementation of a State Building Code Council and progress toward a State-wide building code that complies with current IBC standards. Previously, each county individually enforced building codes based on UBC requirements that were updated only sporadically.

Idaho:

- A. Idaho produced a state specific Earthquake Public Education “ Putting Down Roots in Earthquake Country: Your handbook for Earthquakes in Idaho”.
- B. Idaho completed a non-structural seismic retrofit for the Computer Servers at the State Controller’s Office and the Idaho Emergency Operations Center.
- C. Agreement with USGS-ANSS to maintain and operate seismic network station near Boise.
- D. Installation of new seismic network station near McCall, ID by USGS-ANSS.



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Montana: No Answer

New Mexico: N/A

Nevada: The Roman Catholic Diocese of Reno seismically retrofitted the Saint Thomas Aquinas Cathedral in downtown Reno.
St. Mary's in the Mountains Church in Virginia City recently underwent a structural and architectural retrofit.
Base-isolated warehouse shelving was installed in the warehouse area in the new Nevada Bureau of Mines and Geology's Great Basin Science Sample and Records Library Building.



Oregon DOGAMI: Using a documented and vetted process, Oregon quantified the relative vulnerability to earthquake hazards of all public schools and emergency response facilities in the state. These data were used to develop a Governmental Obligation Bond funded grant program to assist with rehabilitation of the most vulnerable buildings (OR State Seismic Needs Grant Program).

The grants program is presently assessing the first grant proposals for funding awards.

Oregon EM:

- Compiling interviews and observations for the 1964 Alaska tele-tsunami to incorporate into a documentary project.
- Oregon unified tsunami warning signal standards.
- Developing an online interactive geographic interface to display tsunami evacuation maps and online educational material.
- Finalizing the tsunami inundation hazard maps developed for Cannon Beach.
- Designing a public education sign that presents the results of the Cannon Beach assessment and depicts the derivative tsunami evacuation zone, evacuation routes and assembly areas.
- Working with local officials to design and field check a new tsunami evacuation map for Cannon Beach.
- April 2009 Earthquake and Tsunami exercise, Cascadia Peril.

Utah Seismic Safety Commission (UGS, UUSS, Homeland Security): **Bob Carey to provide list**

Washington EMD:



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- In 2009, Washington State Emergency Management enlisted Western Washington University's Resilience Institute to complete a gap analysis of existing seismic legislation in Washington State.

This project will examine current seismic risk reduction legislation across the country and provide a list of polices that have been effective in other states. The results of this project will enable the Washington State Seismic Safety Committee and emergency managers at the state and local level to identify legislative policy areas in which Washington may need to be more proactive.

- The Washington State Seismic Safety Committee (SSC) reviewed a report that was developed the by San Francisco Urban Planning and Research Association (SPUR), entitled "The Resilient City". This report examines the current state of resilience to a scenario quake in San Francisco and the series will ultimately consist of three (3) reports: Before the Disaster, Disaster Response, and After the Disaster.

The SSC intends to adapt this community-level guidance to a macro-level that will target a broader audience in Washington State. The "Resilient State Initiative" will provide a lasting foundation for future seismic policy implementation for Washington State.

- Washington State Emergency Management has partnered with the Washington State Department of Natural Resources and the Office of Superintendent of Public to develop a methodology that builds upon FEMA's Rapid Visual Screening of Buildings for Potential Seismic Hazards, which will be used to evaluate the seismic risk of all public school buildings within the state.

This will allow for the prioritization of structures in need of seismic retrofitting across the state and permit a strategic, targeted approach for mitigation rather than a less efficient method. This pilot project will test the assessment methodology in mid-2010 and a final report will be produced with recommendations on how to proceed with statewide assessment.

- The University of Washington's Institute for Hazards Mitigation Planning and Research, Washington State Emergency Management, and Pacific County, WA have begun a project to implement FEMA P646 "Guidelines for Design of Structures for Vertical Evacuation" in at-risk Pacific County communities, including the City of Long Beach. This initial project will focus on identifying the potential number of vertical evacuation sites that are necessary within Pacific County, proposing locations that will provide safe haven for the population during a tsunami event, and preliminary design and construction costs. The outcome of this assessment project will enable the State and County to move forward with a more firm understanding of the scale and potential cost to implement this mitigation strategy within the county.
- The Washington Emergency Management Division routinely solicits seismic retrofit projects for the FEMA-funded mitigation grant programs it administers in the state. Funded projects that are ongoing or recently completed include the following:
 - Padelford Garage and pedestrian walkways at the University of Washington (completed fall of 2009)



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- Non-structural retrofit at Burke Museum, University of Washington
- Retrofits of two dormitories at Pacific Lutheran University (completed for fall 2009 classes)
- Retrofit of the Carnegie Library in Port Townsend.
- Retrofit of the Cotton Building (home of police department) in Port Townsend
- Retrofit of sidewalks/tunnel lids in Port Townsend and Seattle
- Retrofit of Library Clock Tower at The Evergreen State College
- Retrofit of the Queen Anne Community Center in Seattle
- Retrofit of Roy Elementary School near Tacoma
- Retrofit of McLean Road Fire Station near Mount Vernon
- Installation of seismically activated gas shut off valves at 40 essential facilities of the City of Seattle
- Installation of seismically activated water shutoff valve for Salmonberry water reservoir near Port Orchard
- Retrofit of the Sumner Springs water reservoir in Sumner
- Retrofit of historic Old Fire Station #2 and Everett Fire Department administrative building (project approved, grant award pending)
- Several other seismic safety projects have been recommended by State Emergency Management Division for funding or are being considered for funding under the state's two open Hazard Mitigation Grant Programs.
- WA State Dept. of Transportation has continued to aggressively retrofit bridges and other transportation infrastructure along the I-5 corridor between McChord Air Force Base north of Olympia to Paine Field in Everett. Hardening of this vitally important corridor prior to an earthquake event will improve response by federal, state, and local agencies during the event as well as speed economic recovery after the event.

Wyoming: Wyoming Dept. of Homeland Security encouraged IBC adoption, retrofitting of existing structures, evacuation plans, and public outreach in the current mitigation plan. To their knowledge there have been no mitigation measures taken because of the recommendations.



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[Policy Recommendation 08-1](#)

Improving Tsunami Public Education, Mitigation, and Warning Procedures for Distant and Local Sources

WSSPC supports strong, immediate and positive action from federal and state agencies to reduce the potential loss of life caused by tsunamis. Specifically, WSSPC recommends robust, effective, and fully maintained implementation of the deep-sea tsunami detection system by NOAA, and expanding the efforts by NOAA and the USGS and WSSPC members to enhance public education programs about the potential for local tsunami impacts and the need to evacuate threatened areas immediately after strong or sustained ground shaking. WSSPC recommends full and timely appropriation of specified funds to the National Tsunami Hazard Mitigation Program (NTHMP) as described in the Tsunami Warning and Education Act of 2006.

5. What actions has your state taken to enhance tsunami public education?

Not Applicable:

[Arizona](#)

[Colorado](#)

[Idaho](#) (Idaho does not have a tsunami hazard)

[Montana](#)

[New Mexico](#)

[Nevada](#)

[Utah Seismic Safety Commission \(UGS, UUSS, Homeland Security\)](#)

[Wyoming](#)

Please list...

[Alaska:](#)

- Community visits to tsunami hazard communities supporting tsunami outreach including public meetings, school meetings, training, exercises and certification in the TsunamiReady program.
- Funding and support of tsunami evacuation, hazard and shelter signage.
- Funding and support of tsunami warning siren systems equipment purchases, installation and training.
- Statewide, Governor declared, tsunami awareness week each year including a “real code” test of the tsunami warning system, statewide exercise and outreach events.
- Public presentations at the State Fair and community fairs and events of seismic hazards, an “earthquake simulator” and tsunami education materials.
- Regular distribution statewide of tsunami education materials including pamphlets, DVD’s, booklets and instructional tools.
- Production of tsunami hazard maps for at-risk communities
- Participation in statewide tsunami education curriculum development



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- Participation in emergency management training for members NOAA, National Weather Service and the West Coast / Alaska Tsunami Warning Center
- Participation in the NTHMP mitigation and outreach committee.

Am Sam: Through continuous outreach/awareness campaigns at the village level, government agencies and public and private schools. Television and radio talk shows are also utilized to deliver messages to the general public and provide opportunities for question and answer sessions in a call-in mode.

EMBC:

Since 2004, the Province, under the Tsunami Integrated Preparedness (TIP) project, has taken many steps to improve B.C.'s level of tsunami preparedness:

- \$1 million in provincial funding to coastal communities for local government preparedness initiatives;
- signage in at risk coastal areas denoting tsunami hazard zones;
- evacuation routes and safe zones;
- modeling and mapping to identify risk areas;
- a web-based tsunami education program on the Provincial Emergency Program website;
- the Provincial Emergency Notification System that is capable of rapidly sending phone, fax and email tsunami notifications to local governments, the media, emergency personnel, police and fire departments; and
- ongoing public outreach to at risk communities about the hazard and preparedness.

CalEMA: California has developed several new tsunami public education products including a newly revised state tsunami preparedness brochure, a prize-winning animated children's tsunami safety video entitled "Tsunamis: Know What to Do!", a general-purpose tsunami safety video entitled "Tsunami Preparedness in California", and plans to sponsor a public information campaign in March of 2010 during "Tsunami Awareness and Preparedness Week" March 22-28.

California in late 2009 completed tsunami inundation maps for the entire coast of California, a total of 130 maps. These maps are a fundamental prerequisite for tsunami response and evacuation planning.

California fully supports NOAA's TsunamiReady Program and has a comprehensive program to promote tsunami planning and hazard mitigation, provide planning and technical assistance to local coastal jurisdictions in developing tsunami plans, provide public education on the tsunami hazard and has improved state level protocols and procedures for rapid notification of tsunami warnings, advisories and watches. In addition, California has taken the lead among states in the NTHMP in promoting and conducting tests of the Emergency Alert System (EAS), including activation of live tsunami event codes to assure that the equipment and procedures to activate these codes will function properly in an actual tsunami emergency.

California GS: California, through a mutual cooperative project with CalEMA, has initiated tsunami awareness programs throughout coastal communities. CGS, in partnership with CalEMA, has published 135 tsunami inundation maps covering 50 percent of the State's coastline between Del Norte and San



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Diego counties (1,100 miles). These maps are available free of charge on the CGS website, along with the local community's tsunami plans. These maps are based on the largest anticipated tsunami events from a suite of distant and local sources, plus a high tide factor to give a worst-case scenario for inundation conditions. CGS has recently published Note 55, Tsunamis, which is distributed free of charge to communities and schools.

California SSC: Added tsunami preparedness and response advice to the October 2009 Statewide Shakeout Drill

Completed some tsunami evacuation maps and installed tsunami evacuation signs in several local jurisdictions.

Hawaii: We have an ongoing public outreach program that includes: road signs showing where tsunami evacuation areas are located; tsunami drills for schools located in tsunami evacuation zones; public symposia and teacher training workshops on tsunami hazards; ongoing tsunami awareness "spots" on broadcast and cable TV stations; classroom visits detailing all hazards along with tsunami hazards; public distribution of surfing video warning that tsunamis are common and dangerous phenomena that occur along our shorelines.

Oregon DOGAMI:

- Develop tsunami and tsunami hazard curriculum for middle schools
- Develop outreach programs for grass root tsunami response awareness at the community level
- Install signs along the coastal highways to indicate when you enter a tsunami inundation zone
- Install signs in communities and state parks to indicate tsunami evacuation routes
- Develop and distribute outreach and education packets to hotels for employee orientation and use in hotel room info
- Develop official tsunami evacuation maps for coastal communities based on detailed modeling of tsunami inundation
- Coordinate with OEM to standardize tsunami warning signals and install warning lights and signals

Oregon EM:

- Developing an online interactive geographic interface to display tsunami evacuation maps and online educational material.
- Finalizing the tsunami inundation hazard maps developed for Cannon Beach.
- Designing a public education sign that presents the results of the Cannon Beach assessment and depicts the derivative tsunami evacuation zone, evacuation routes and assembly areas.
- Working with local officials to design and field check a new tsunami evacuation map for Cannon Beach.
- April Tsunami Road Show
- Numerous meetings with public officials

Washington EMD:



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- Washington State became the first NTHMP member to institute a Train-the-Trainer (T-3) course to provide Tsunami Public Education Instructors for at-risk communities. The purpose of the T-3 Program is to train a cadre of professionals that are qualified to serve as Tsunami Public Education Instructors at the community level and have undergone training in Tsunami Science, Tsunami Warning, Tsunami Risk Reduction, and Conducting community-level Tsunami Public Education. The inaugural T-3 course included 20 participants from 9 cities, counties and tribes. To date, T-3 graduates have conducted at least 8 community workshops for 239 participants.
- Pacific County Emergency Mgt., Shoalwater Bay Tribe, and WA EMD implemented a pilot program to distribute NOAA Weather Radios to low-income families on the Tokeland Peninsula in September 2009. A total of 63 NOAA Weather Radios were distributed. [Additional events](#) were held in January 2010 in South Bend, Ocean Park, and Ilwaco with 56 additional radios presented.
- During the week of November 22nd, Grays Harbor County, Washington residents received a new publication jointly developed by Washington State Emergency Management's Earthquake/Tsunami Program and Grays Harbor Emergency Management entitled "Grays Harbor County All Hazards Guide". The All Hazards Guide was distributed in the Sunday edition of The Daily World newspaper as well as the once-weekly local editions that are targeted towards specific neighborhoods. The Guide is intended to serve as a compendium of resources that can be easily be used by county residents and businesses to mitigate, prepare for, and respond to the hazards they are most likely to face. Further, the All Hazards Guide seeks to provide a 'one-stop shop' for federal, state, and local emergency management contact information. This resource document was patterned after the hurricane preparedness guides that have been successfully used in the southeast for the past decade.

In addition to being easy to distribute on a large scale with relatively little cost via newspaper media, the Guide was intentionally designed as a template that can readily be modified by other coastal and inland counties to provide a similar resource document without the expense of hiring a graphic artist. Continuing support for annual reprints of the publication can be provided by local businesses through advertisements. While the focus of the Guide is on the most frequently occurring hazards, earthquake/tsunami preparedness and response are the primary components. The center pages include color tsunami evacuation maps that are applicable to the County as well as large section on Tsunami preparedness. The project was completed using funding from NOAA's National Tsunami Hazard Mitigation Program.

The Guide can be accessed at the following site:

<http://www.co.grays-harbor.wa.us/info/DEM/Docs/AllHazDocs/GHCAIAllHazardsGuide.pdf>



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- In partnership with WA DNR and local jurisdictions, WA EMD continued to provide training on the Disaster Response Guidebook for Hotels and Motels on the Washington Coast. Six (6) hotels in Ocean Shores, WA and twenty (20) hotels in Long Beach, WA participated in the training during 2008-2009.
- The Broadcasters Tsunami Emergency Guidebook was updated and distributed throughout all of Seattle and to 100% of coastal broadcasters. (Developed in 2006 and Updated annually).

6. Has your state written to NOAA in support of the National Tsunami Hazard Mitigation Program?

Yes:

[Alaska](#)

[Am Sam](#): The Territory of American Samoa through its Department of Homeland Security is an active participant in the National Tsunami Hazard Mitigation Program and has a strong partnership with NOAA in its tsunami training/outreach programs and early warning systems.

[CalEMA](#): California has been a leader in calling for reform in the NTHMP program and is pleased to report that many improvements in NTHMP policies and procedures have been implemented by NOAA over the past 12-18 months.

[California GS](#)

[CSSC](#)

[Hawaii](#)

[Oregon DOGAMI](#)

[Washington EMD](#)

No:

[Arizona](#)

[EMBC](#): No (but BC sits on the NTHMP committee)

[Colorado](#)

[Idaho](#)

[Montana](#)

[New Mexico](#)

[Nevada](#)

[Oregon EM](#)

[Utah Seismic Safety Commission \(UGS, UUSS, Homeland Security\)](#)

[Wyoming](#)



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Policy Recommendation 08-2

Definitions of Fault Activity for the Basin and Range Province

WSSPC recommends that the following definitions of fault activity be used to categorize potentially hazardous faults in the Basin and Range physiographic province:

- Holocene fault – a fault whose movement in the past 10,000 years (11,500 cal yr B.P.) has been large enough to break the ground surface.
- Late Quaternary fault – a fault whose movement in the past 130,000 years has been large enough to break the ground surface.
- Quaternary fault – a fault whose movement in the past 1,800,000 years has been large enough to break the ground surface.

It should be emphasized that some historical magnitude 6.5 or greater earthquakes that produced surface faulting in the Basin and Range Province occurred on faults that have not been active in the Holocene; furthermore, earthquakes in the Province may occur on faults in all three categories. It is the responsibility of the user to decide what level of earthquake hazard (surface fault rupture and ground shaking) is acceptable for a specific structure or application.

7. Has your state adopted these definitions of fault activity?

Not Applicable:

[Alaska](#)

[EMBC](#)

[CalEMA](#)

[California GS](#): California is not considered in the Basin & Range Province; however, some of the Provinces tectonic characteristics “spill” into California. California acknowledges the age categories of faults used by those neighboring states in the B&R Province.

[Hawaii](#)

[Oregon EM](#)

[Washington EMD](#)

Yes:

[Colorado](#): The fault activity definitions listed in this policy recommendation are similar to but not exactly coincident with the narrative descriptions of faults as written in the CEHMC “Colorado Earthquake Hazards” publication.

[Nevada](#)

[Utah Seismic Safety Commission \(UGS, UUSS, Homeland Security\)](#): But not in state code, simply as UGS standard

No:

[Am Sam](#)

[Arizona](#)



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CSSC

Idaho

Oregon DOGAMI

Wyoming

Montana: Recognized, not formally adopted.

New Mexico: Dave W. Love, Principal Senior Environmental Geologist, Bureau of Geology and Mineral Resources, New Mexico Tech, Socorro NM comments:

1) The geological community is debating whether the 1.8 million year older limit on "Pleistocene" should be moved to 2.6 million years (Europeans favor that, US geologists do not).

2) I don't think New Mexico has any formal procedures to "adopt" these recommendations. I think the few geologists in New Mexico who worry about Quaternary faults readily accept this recommendation. Most of the geologists who work on Quaternary faults in New Mexico come from California.

8. To the best of your knowledge, what federal, state, and local entities are using these guidelines and regulations?

Arizona: Arizona has not formally adopted these guidelines, but use terminology when publishing earthquake materials, according to AZGS.

Idaho: We do not know of any.

Comment: The definition of "Quaternary" was changed by the international geological science community in 2009 (Nature, v 459 no 4, p. 624). The former definition of the base of the Quaternary of 1,800,000 years was revised to 2,600,000 years. WSSPC should revise its policy to reflect this in order to concur with mainstream scientific usage. Although the change was somewhat controversial, it reflects well-documented worldwide cooling and is unlikely to be revised back to 1.8 Ma. The effect of this on Basin and Range seismic hazard science is likely to be small because little attention is paid to structures with last movements >130,000 years.

Montana: These fault definitions were considered and used by the Montana Bureau of Mines and Geology in a geologic hazards study of Silver Bow County.

Nevada: Nevada Division of Emergency Management
Nevada Earthquake Safety Council
Private Consultants

Oregon DOGAMI: Not sure

Utah Seismic Safety Commission (UGS, UUSS, Homeland Security): The UGS publications recommend the fault activity guidelines.

No Answer:

Alaska



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Am Sam

EMBC: (N/A)

CalEMA

California SSC: None

Colorado

Hawaii

New Mexico: N/A

Oregon EM

Washington EMD: (Not Applicable)

Wyoming



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Policy Recommendation 08-3

Earthquake Monitoring Networks

WSSPC advocates the continuation and expansion of earthquake monitoring networks as envisioned and supported by the Advanced National Seismic System (ANSS). ANSS emphasizes strong-motion instrumentation of urban ground-motion monitoring sites and selected engineered structures as well as increased broadband seismograph instrumentation. The resulting data provide better understanding of future ground shaking potential, provides rapid information for emergency response, and insights for the design of more earthquake-resistant new and retrofitted construction.

WSSPC calls upon all parties committed to earthquake loss reduction to advocate greater support of the U.S. Geological Survey's efforts to expand ANSS monitoring and to standardize data collection, processing, and storage. WSSPC encourages the USGS to strengthen partnerships to further these efforts with emergency managers, engineers, and corporate response and business interruption planners, as well as State and local agencies.

9. What activities has your state undertaken to support ANSS? (Letters, advocacy, partnerships, etc.)

Alaska: The Alaska Division of Homeland Security and Emergency Management (DHS&EM) has partnered with the University of Fairbanks Geophysical Institute Alaska Earthquake Information Center (UAF/GI AEIC) to improve Alaska's near real-time seismic network, seismic instrument distribution, and modernization of seismic instrumentation and the rapid production of "shake maps" for Alaska.

In addition, DHS&EM coordinated with UAF /GI – AEIC for the installation of seven "near real time" seismic display systems in critical emergency operations centers around the State. The displays provide both the ANSS and UAF/GI – AEIC data immediately and simultaneously. The displays also provide the "shake maps" produced by AEIC following seismic events. This display system allows the State's emergency management leadership a common operating picture during a seismic event and subsequent aftershocks. This allows a coordinated, informed statewide response based upon incoming seismic data and "shake map" computations.

Am Sam: While the territory has no direct involvement with ANSS, American Samoa support the work and stay in the loop via involvement in the Mapping and Modeling subcommittee of the NTHMP and through the regional efforts of its main tsunami partner ITIC.

Arizona: In 2008, the Arizona Geological Survey applied for and was awarded a Pre-Disaster Mitigation Grant to gather, interpret, analyze, and model seismic data in Arizona that result from both local and out-of-state earthquakes, and yield a more accurate assessment of Arizona's true seismic risk.

EMBC: N/A. We support the Canadian National Seismic Network (Natural Resources Canada).



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CalEMA: California has a strong partnership between the institutions that carry out seismic monitoring and those engaged emergency management. The California Integrated Seismic Network (CISN) is a regional network of the Advanced National Seismic System and receives significant support from the California Emergency Management Agency. In addition to letters of support for ANSS and advocacy for expansion of seismic monitoring in California, the state, through the California Emergency Management Agency has conducted workshops for local government to promote the use of the CISN Display, a real-time earthquake and tsunami notification system for earthquakes and tsunamis, and fostered an understanding of the products of seismic monitoring as they contribute to emergency response. In response to financial and programmatic support from the state emergency management agency, seismic network operators have developed products and services that assist emergency managers in understanding and effectively responding to earthquakes in California.

Colorado: The CEHMC has supported ANSS and we have written a letter to support the acquisition of EarthScope instruments for Colorado.

California GS: CGS, in cooperation with ANSS, operates the largest strong motion instrument network in the U. S. CGS, also, in equal partnership with the USGS operates the Center for Engineering Strong Motion Data, which is a national and international repository of strong motion records.

California SSC: Financial support of the California Integrated Seismic Network (CISN.org) and the Strong Motion Instrumentation Program.

Hawaii: State has supported USGS efforts in deploying a comprehensive network of seismic stations statewide. State has communicated support for the program to our congressional delegation.

Idaho: In August 2009, IGS sent a staff member to assist with installation of new ANSS station in Idaho. The Idaho Bureau of Homeland Security sent a letter to USGS emphasizing the importance of the Boise network station and encouraging USGS to extend the maintenance agreement for this location.

Montana: Dr. Edmund Deal serves on the regional advisory committee of ANSS Intermountain West region. The Montana Regional Seismic Network is partly supported with ANSS funding.

New Mexico: None

Nevada: Nevada partners with ANSS by providing salary support for seismologist and technical efforts to operate the state-wide seismic network.

A basic support of ANSS in Nevada is to operate the network well, and to respond rapidly to earthquakes of public interest. These recently have included the Wells and Mogul earthquake sequences.

Nevada Earthquake Safety Council supported ANSS efforts in Nevada with a letter of support and advocacy in connection with the American Recovery and Reinvestment Act work.



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Oregon DOGAMI: Oregon state agencies and organizations sit on the Pacific Northwest ANSS Advisory Committee and Cascade Region Earthquake Workgroup. DOGAMI has been a strong advocate for increased funding for ANSS including support letter to Congressional Delegates and the USGS.

OEM: Worked with CREW and ANSS on locating sensors in the Portland Metro area.

Utah Seismic Safety Commission (UGS, UUSS, Homeland Security): Utah agencies with earthquake interests have strongly supported ANSS; The Utah Seismic Safety Commission has regularly advocated support for ANSS, both as a facilitator for the formation and functioning of a stakeholder group in the state of Utah, and to be a partner with the U.S. Geological Survey in advancing the goals of an ANSS.

Washington EMD: Washington State provides financial support to the regional ANSS seismic monitoring network, the Pacific Northwest Seismic Network (PNSN). Additionally, Washington State Emergency Management has provided letters of support and has developed a strong partnership with the PNSN.

Wyoming: None.



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10. What is your estimate of the number of strong motion instruments in your state? _____
Has the number of instruments increased in 2009?

Increased -Yes:

Alaska: 116

Arizona: 8, There are 12 other motion instruments in northern Arizona, but it is unknown if they are "strong" motion instruments.

California SSC: 900 total: 650 free field stations, 170 buildings, 20 dams, and 60 bridges

Oregon EM: Unsure.

Utah Seismic Safety Commission (UGS, UUSS, Homeland Security): ? UUSS, 106 accelerographs; NSMP, free-field 24; NSMP instrumented 4 bldgs, 1 dam, 1 bridge

Washington EMD: 142

No Increase:

Am Sam: N/A - There are no strong motion instruments in the Territory.

EMBC: ~100

California GS: CGS operates over 5,000 instruments in its own network; the USGS, UC Berkeley and Caltech operate a few hundred strong motion instruments.

Colorado: There is no organized Strong Motion program in Colorado. Any instruments that have been installed were done independently. For example, the Trinidad dam has strong motion instruments. There are probably more but the older ones have not been maintained or if they have, the CEHMC has not been involved with the work. Acquisition of Strong Motion instruments for Colorado has been desired by the CEHMC. As I recall, the annualized earthquake damage numbers for Colorado had been too low to obtain approval for federal funds for them.

Hawaii: >40

Idaho: Unknown. We do not monitor this. Unknown – Doubtful.

Montana: 15. We anticipate adding 10 new seismograph stations that will include strong motion sensors in the coming year and we are upgrading three existing stations to include strong motion instruments by September 30, 2010 using ARRA funding.

New Mexico: 0

Nevada: 65 (45 associated with urban and ANSS monitoring). Nevada's seismic network is currently diminished in coverage and capacity with the movement of NSF's EarthScope instruments out of the state and with some stations not functioning.

Oregon DOGAMI: There are several dozen strong motion instruments in the state but most are not being maintained. For example ODOT instrumented several of their bridges on the west side of OR several years ago but are not keeping them in working condition, certain buildings are required to install strong motion instruments in order to obtain a building permit but no one tracks the condition of the instrument once installed, a few older USGS sites are still in working condition and DOGAMI has arranged for about 5 instruments to be installed on Oregon university campuses and these instruments are telemetered to PNSN.

Wyoming: 12



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No Answer: [CalEMA](#)



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[Policy Recommendation 08-4](#)

Identification and Mitigation of Unreinforced Masonry Structures

Unreinforced masonry bearing wall structures represent one of the greatest life safety hazards and economic burdens to the public during a seismic event. WSSPC recommends each state, province or territory adopt a program to identify the extent of risk that unreinforced masonry structures represent in their communities and develop recommendations which will effectively address the reduction of this hazard.

11. Has your state, or communities in your state, adopted a plan to identify URM structures?

Yes:

[Am Sam:](#) The American Samoa Government Departments of Commerce and Public Works in conjunction with the PNRS oversee and enforce policy requirements with regard to building codes compliance issues including inspections, issuing of land use and building permits and to ensure full compliance with the overall permitting process.

[CalEMA](#)

[California GS](#)

[California SSC](#)

[Nevada](#)

[Oregon DOGAMI](#)

[Utah Seismic Safety Commission \(UGS, UUSS, Homeland Security\)](#)

[Washington EMD](#)

No:

[Alaska:](#) URM's are listed in the State Hazard Mitigation Plan for hazard awareness but this type is not prominent in the state's buildings. Further work is needed to implement a full URM identification program in the state.

[Arizona](#)

[EMBC](#)

[Colorado:](#) There is no program in place for this to my knowledge. Evaluation of these structures could be a pertinent exercise for school buildings.

[Hawaii:](#) There are a very small number of unreinforced masonry structures in Hawaii and probably would not justify a statewide program to determine their locations. Many are historic, some are churches.

[Idaho:](#) No. The State of Idaho All-Hazard Mitigation Plan identifies the vulnerability of these structures, and encourages local governments to take actions to identify these structures. We are in the process of developing a plan to build a geo-database for this inventory.

[Montana](#)

[New Mexico](#)

[Oregon EM:](#) No-But we are exploring different methods on how to accomplish this.

[Wyoming](#)



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12. Please provide WSSPC with state, province, territory and/or community programs which have identified their URM hazard.

State, Province, or Territory-wide Program _____

Community Programs _____

California GS: URM’s that are open for public use must carry signage that clearly states the structure is a URM building and is unsafe during an earthquake.

California SSC:

State, Province, or Territory-wide Program ___ No _____

Community Programs ___ Yes _____

Refer to <http://www.seismic.ca.gov/pub/CSSC%202006%20URM%20Report%20Final.pdf>

A number of state-owned buildings have also been identified and in some cases retrofitted or demolished.

Nevada: The Nevada Earthquake Safety Council, Nevada Bureau of Mines and Geology, and the Nevada Public Agency Insurance Pool, are in the process of compiling a state database of URMs, using county tax assessors databases.

Oregon DOGAMI: State, Province, or Territory-wide Program__See answer #4.

Utah Seismic Safety Commission (UGS, UUSS, Homeland Security): The USSC considers the URM issue to be a priority.

Washington EMD: The City of Seattle has identified URM structures and is currently working on an ordinance that may require mandatory retrofitting of hazardous URM structures.

No Answer:

- Arizona
EMBC
CalEMA
Hawaii

Additional Comments:

EMBC: British Columbia is committed to participating as an active member of WSSPC. We feel it is essential for this province to have a voice on the council and subcommittees, however, many of the FEMA based policy recommendations are not applicable to Canadian provinces. We recommend adding Public Safety Canada (PS) as a member of WSSPC to encourage parallel support and collaboration between the American and Canadian public safety organizations.