



Western States Seismic Policy Council 2017 Policy Recommendation Implementation Survey Results

WSSPC prepared this survey to establish the status of adoption and implementation of each adopted policy recommendation in every U.S. member state and territory as of November, 2017. The survey was emailed to all 16 U.S. state and territory agency members (Emergency Management and Geological Survey Directors and Seismic Commission Liaisons) and Representatives (State Earthquake and Tsunami Program contacts).

The survey questions are based upon the facilitation and communication section of the policy recommendations, in the full policy recommendation versions that include the Facilitation and Communication, Assessment, and History sections. The survey results are summarized in this document.

We received responses from 13 U.S. states and 1 territory: Alaska, Arizona, California, Colorado, Guam, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, a response rate of 87.5%.

We received multiple responses from agencies in Alaska and Nevada. Where there were differences in answers, we attempted to reconcile those answers with the comments provided and with the matrix on page 3.

No responses were received from: American Samoa or Northern Mariana Islands.

British Columbia and Yukon were not included in the survey.

Respondents:

The following table shows which agencies responded (either individually or as a group).
EM = emergency management, GS = geologic survey, SC = seismic council or committee.

| <u>STATE/TERRITORY/ PROVINCE</u> | <u>CODE</u> | <u>GROUP</u> | <u>REPLIES</u> | <u>NOTES</u> |
|--------------------------------------|-------------|--------------|----------------|-----------------------------|
| Alaska | AK | EM | 1 | |
| Alaska | | GS | 1 | |
| Alaska | | SC | 1 | |
| American Samoa | AS | EM | 0 | |
| Arizona | AZ | EM | 0 | |
| Arizona | | GS | 1 | |
| California | CA | EM | 0 | |
| California | | GS | 1 | |
| California | | SC | 0 | |
| Colorado | CO | EM | 0 | |
| Colorado | | GS | 0 | |
| Colorado | | SC | 1 | |
| Guam | GU | EM | 1 | |
| Hawaii | HI | EM | 1 | |
| Hawaii | | SC | 0 | |
| Idaho | ID | EM | 1 | (incorporated GS responses) |
| Idaho | | GS | 0 | |
| Montana | MT | EM | 0 | |
| Montana | | GS | 1 | |
| Nevada | NV | EM | 1 | |
| Nevada | | GS | 1 | |
| Nevada | | SC | 0 | |
| New Mexico | NM | EM | 0 | |
| New Mexico | | GS | 1 | |
| Northern Mariana Islands | MP | EM | 0 | |
| Oregon | OR | EM | 1 | (incorporated GS responses) |
| Oregon | | GS | 0 | |
| Oregon | | SC | 0 | |
| Utah | UT | EM | 1 | |
| Utah | | GS | 0 | |
| Utah | | SC | 0 | |
| Washington | WA | EM | 1 | |
| Washington | | GS | 0 | |
| Wyoming | WY | EM | 1 | |
| Wyoming | | GS | 0 | |
| TOTAL | | | 17 | |

If any one of the responding member agencies has fulfilled the policy objective, the state is considered to have implemented that policy. Data has been edited so that the 2 states that provided multiple responses have been given one response using the following matrix.

| Alaska Responses | Single value |
|-------------------------|---------------------|
| yes – yes – yes | yes |
| yes – yes – unknown | |
| yes – yes – no | |
| yes – unknown – no | |
| yes – N/A – no response | |
| no – no – yes | no |
| no – no – no | |
| no – no – N/A | |
| N/A – N/A – N/A | N/A |

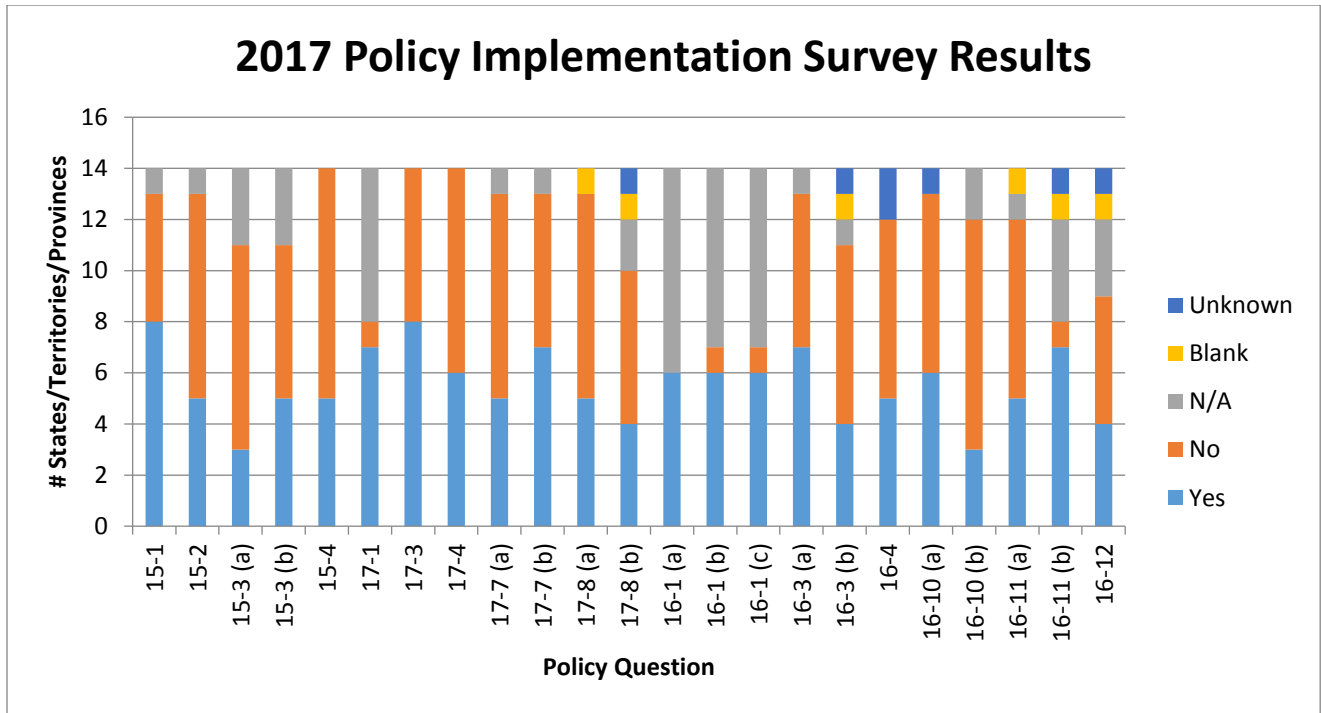
| Nevada Responses | Single value |
|-------------------------|---------------------|
| yes – yes | yes |
| yes – unknown | |
| yes – N/A | |
| no – no | no |
| no - unknown | |
| no – N/A | |
| no – no response | |

Policies:

The policies are organized by topic rather than in numerical order.

| POLICY CATEGORIES | |
|---|-----------------------------|
| <u>Category</u> | <u>Policy Number</u> |
| Risk Reduction Strategies | 15-2 |
| Hazard Identification and Assessment | 15-1, 15-3 |
| Earthquake Monitoring and Early Warning | 17-3, 17-7 |
| Building Codes | 15-4, 17-4, 16-4 |
| School Building Safety | 16-10, 17-8 |
| Lifelines | 16-11, 16-12 |
| Tsunami | 17-1, 16-1 |
| Post-Event Management | 16-3 |

The table below summarizes the responses.



The following section contains the individual policy statements organized by topic, survey questions (in italics) and responses and comments by state. Note that the total number of responses received was 17 while the number in the graph is 14. The data has been edited to give one response per state or territory as explained above.

Risk Reduction Strategies

Policy Recommendation 15-2: *Developing Earthquake and Tsunami Risk-Reduction Strategies*

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

a) *Has your agency sent this policy recommendation to all identified policy and decision makers (elected officials, heads of key department, such as emergency managers, building officials and planners, and chairs of the State Seismic Safety Commission and Boards)?*

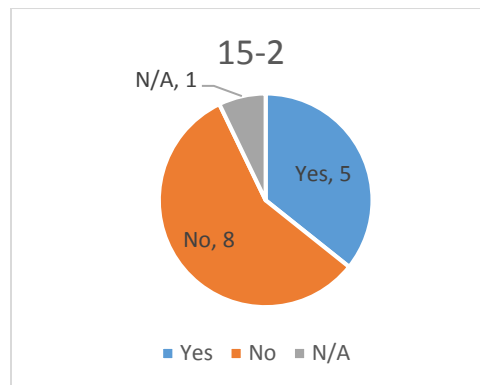
Yes (5): AK, CA, GU, NV, UT

No (8): AZ, CO, HI, ID, NM, OR, WA, WY

N/A (1): MT

Blank (0):

Unknown (0):



AK-EM: The Alaska Seismic Hazard Safety Commission (ASHSC) advises the Governor, Executive Branch, State Legislature, and public on seismic issues. The Commission holds public meetings monthly and promotes development of effective practices and policies for earthquake loss-reduction. The DHS&EM State Hazard Mitigation Officer serves as one of the eleven Commission board members appointed by the Governor.

HI: We have been undergoing major leadership changes.

NV-EM: We are in regular communication with emergency managers and deliver presentations to the Nevada organization of Building Officials. Presentations and outreach conducted through the Nevada Hazard Mitigation Planning committee enable us to meet with planners in various communities throughout the state. Note the chairman of the earthquake safety Council is a required member of the Hazard Mitigation Planning committee and a seismic presentation is a standing item on the agenda.

NV-GS: The WSSPC policy has legitimized the discussion of tsunami, even in the unfamiliar settings of a continental lake. Thus, when putting together the hazard mitigation plan of Douglas County, it was encouraged by local emergency managers to fully explore the potential for a tsunami caused by one of the lake bounding faults – a wise move given one of these faults is near the end of its seismic cycle.

UT: Utah currently promotes all of these strategies to Utah entities. Our Utah Safety Seismic Commission's (USSC) mission is to promote, educate and complete these exact goals.

WY: Staff and time limitations have impacted the effort to contact all policy and decision makers. However, efforts have been made to reach peers who we routinely interact with. This effort is ongoing.

b) Please describe your state, province, or territory's efforts forming public/private partnerships to develop earthquake and tsunami risk reduction strategies.

AK-EM: The State of Alaska's Division of Homeland Security and Emergency Management (DHS&EM) coordinates the State Tsunami and Earthquake Programs through the Division's Planning Section (Mitigation Team) in a statewide effort to eliminate loss of life, reduce damage, and educate the public about short/no notice seismic hazards.

As in previous years, DHS&EM engaged multiple state, local, and federal agencies in partnership. These partners include University of Alaska Fairbanks Geophysical Institute, Alaska Earthquake Center (UAF/GI AEC); Alaska Department of Natural Resources Division of Geological and Geophysical Survey (DNR/DGGS); Alaska Seismic Hazards Safety Commission (ASHSC); Federal Emergency Management Agency (FEMA); the National Tsunami Warning Center (NTWC); the National Oceanic and Atmospheric Administration/National Weather Service (NOAA/NWS) warning coordination meteorologists; and Alaska's local, tribal, and borough governments.

AK-GS: Earthquake and tsunami risk reduction strategies for Alaska are developed and implemented by the Alaska Seismic Hazards Safety Commission (comprising both public and private sector representatives); the University of Alaska's Alaska Earthquake Center; the Alaska Division of Geological & Geophysical Surveys; the Alaska Division of Homeland Security and Emergency Management; the State Hazard Mitigation Officer (SHMO) and State Hazards Mitigation Advisory Committee (SHMAC); and state and university partners working with the National Tsunami Hazard Mitigation Program (NTHMP).

AK-SC: Alaska generally has small, but robust, earthquake and tsunami risk reduction programs. Div. of Homeland Security and Emergency Management lead the majority of these including the successful Alaska Partnership for Infrastructure Protection program that specifically brings together private and public entities. DHS runs a variety of other in-community programs.

One challenge that Alaska faces is that most risk reduction programs (and scenario exercises) focus on either earthquakes or on tsunamis. Because Alaska's tsunami threats are near-field, history has demonstrated that many communities must deal with the both of these as part of the same disaster. The fact that different agencies have jurisdiction at the federal level for earthquakes and tsunamis propagates across most levels of planning and preparation. This bifurcation is dangerous. *One of Alaska's major risk reduction challenges is getting agencies, planners, first responders and the public to recognize that, in many coastal Alaska communities, earthquake impacts and the ensuing tsunami are different facets of the same disaster. They are not two independent natural hazards. Risk reduction needs to be considered in this context.*

AZ: We mostly work with other local, state and federal agencies, NGOs, and volunteer groups to inform people regarding earthquake hazard and risk in Arizona.

CA-GS: California has numerous programs dealing with earthquake and tsunami risk reduction strategies and programs. These programs can be found at the CGS Website:

<http://www.conservation.ca.gov/CGS/Pages/Index.aspx>

New earthquake risk reduction activities involving public and private sector entities deal with the California Earthquake Early Warning System (CEEWS), a description of which can be found at:

<http://www.caloes.ca.gov/cal-oes-divisions/earthquake-tsunami-volcano-programs/california-earthquake-early-warning-program>

GU: Guam's public/private partnerships for the development and maintenance of the jurisdiction's earthquake and tsunami risk reduction strategies has been established through the Earthquake Advisory Committee and the Tsunami Ready Committee.

ID: We reach out to multiple planning partners for participation in a seismic technical working group that provides input on projects and plan revisions.

NV-EM: Primarily committee membership is both diverse and evolving enabling the seismic safety message to be transmitted to many segments of our population. We have worked directly with the Nevada resort Association, state agencies and local school districts.

NV-GS: The Nevada Bureau of Mines and Geology has partnered with the Nevada Seismological Laboratory to sponsor a Working Group on Nevada Seismic Hazards workshop scheduled to take place in February 2018. The purpose of the workshop is to review ongoing earthquake hazard research in Nevada, discuss technical issues related to earthquake hazards in Nevada, and identify priorities for future research that will reduce uncertainties and improve the USGS Earthquake Hazard Model. The intent is to hold similar workshops every 2 years and ultimately broaden participation to other partners (i.e. emergency management).

UT: Utah has created substantial efforts and partnership strategies developing earthquake risk reduction strategies with the Utah Safety Seismic Commission (USSC), Utah Stat Hazard Mitigation Team (SHMCDT), The Utah Floodplain and Stormwater Management Association (UFSMA), Utah Chapter of AIA, the Utah LP3 Section (Private-Government relationship), Structural Engineers of Utah and the Utah Division of Emergency Management.

Utah has successfully leveraged State, Federal and private organizations to reduce earthquake risk throughout the state. Utah's Fix the Bricks program has been a direct result of these partnerships.

WA: The Washington Emergency Management Division facilitates the State/Local Coastal Tsunami workgroup and the Washington ShakeAlert Communication, Education and Outreach Committee to help foster communication and collaboration between key partners to help develop/steer earthquake and tsunami risk reduction activities in at-risk coastal communities.

WY: Wyoming continues to work to develop public/private partnerships, with the goal of developing earthquake risk reduction strategies (and risk reduction strategies related to other hazards as well). Many of our efforts toward earthquake hazard risk reduction resulted through funding provided through the National Earthquake Hazard Reduction Program (NEHRP).

We have completed several projects with NEHRP funds over the past 5-10 years. They include public education through fliers inserted in local newspapers where earthquake risk is the greatest (Western Wyoming), Earthquake Preparedness Playing Card distribution, free water-heater straps provided at public events in Western Wyoming, and an exercise with state and local government officials and first responders in Lincoln County and contiguous counties in Wyoming.

The Wyoming Office of Homeland Security PIO continues to utilize social media to inform the public and help them prepare for all kinds of disasters, including earthquakes. This effort was particularly focused during September (Preparedness Month). Social media has consistently been used to promote the Great Wyoming ShakeOut annually, and was expanded this year to include daily posts by both the Wyoming Office of Homeland Security AND the Wyoming Geological Survey. An interview with local Cheyenne TV channel news was televised the day of the ShakeOut this year and a press release was published by the Wyoming Office of Homeland Security prior to the event.

Hazard Identification and Assessment

Policy Recommendation 15-1: *Earthquake and Tsunami Planning Scenarios*

WSSPC recommends that each member state, province, and territory establish an active program to produce Earthquake and/or Tsunami Planning Scenarios for areas with high risk and vulnerability. WSSPC also recommends that state and federal agencies and potential private partners support the production of these Planning Scenarios through their funding resources and in-kind services.

a) *Has your agency developed and published any new earthquake and tsunami planning scenarios since 2015?*

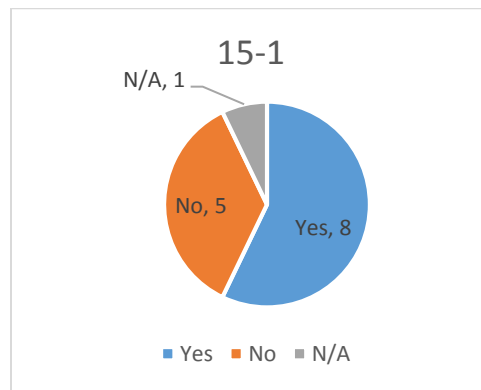
Yes (8): AK, AZ, CA, GU, ID, MT, UT, WY

No (5): HI, NV, OR, NM, WA

N/A (1): CO

Blank (0):

Unknown (0):



NV-EM: Answered by Craig dePolo through Rich Koehler's response.

NV-GS: NBMG is seeking funds to develop a tsunami inundation map for communities surrounding Lake Tahoe. We have initiated conversations with the Nevada Division of Emergency Management and are looking for research grant opportunities to address this issue. To date, funding has not been identified to support this effort.

UT: Tsunami risk is not a significant threat in Utah and isn't a priority. Utah does not have a border with any ocean and the Great Salt Lake is currently at historical lows.

WA: Efforts are being made to support the development of new HAZUS risk assessments that incorporate the tsunami modeling feature.

b) If yes, please describe.

AK-EM: Alaska's Next Big Earthquake Workshop was held May 9-11, 2017, and brought together over 100 representatives from Alaska local, state, and federal governments and agencies*; schools; financial and business sectors; health care; critical infrastructure - ports, utilities and transportation; engineers, planners, and scientists; first responders, non-profits, Department of Corrections, and other interest groups. The workshop was designed to encourage a robust discussion of the earthquake and tsunami hazard, and mitigation, preparedness, response, and recovery issues between attendees and subject matter expert panelists. The second day was devoted to two tabletop exercises with a discussion of impacts to the state. The writing group met the third morning and planned for the written report, which was printed and posted on the workshop website at <http://nextearthquake.gi.alaska.edu> as well as an attendee list and presentations.

*Federal Agencies – Alaskan Command, DOD, Army, National Guard, Air National Guard, FAA, USGS, US EPA, HUD, DOT, NOAA, National Park Service, FEMA

AK-GS: In collaboration with the University of Alaska's Alaska Earthquake Center (AEC), we have published new tsunami inundation scenarios for more than 14 Alaska communities and surrounding areas since 2015. NTHMP funding has been secured to map additional coastal communities in coming years.

AK-SC: New tsunami scenarios have been published for Juneau, Kodiak, Chignik, Chenega, Unalaska, Sand Point, King Cove, Cold Bay. No new credible earthquake scenarios have been developed during this period. FEMA did develop a few earthquake risk scenarios as part of its RiskMap program. These are still in draft form and have caused a fair degree of friction with the state. The Alaska Seismic Hazards Safety Commission raised concerns in 2017 that FEMA's treatment of earthquakes under the RiskMap program were ad hoc and without scientific rigor. The Commission has pointed out that in some cases underestimated ground shaking values used by RiskMap might prove counterproductive in community planning.

AZ: We regularly upgrade our online earthquake viewer and we have completed HAZUS analysis for 11 counties. We plan to publish the HAZUS as an Open-file report later this year.

CA-GS: New publications include seismic hazard zone maps (surface faulting, liquefaction, landsliding) as well as tsunami inundation and "Playbooks". Please refer to the CGS Website for further details: <http://www.conservation.ca.gov/CGS/Pages/Index.aspx>.

GU: Guam's earthquake and tsunami planning scenarios had been included in the whole community assessment and planning products, as follows: Threat and Hazard Identification and Risk Assessment / State Prepared Report for FY2016 and FY2017; etc.

ID: We revised earthquake scenarios for the state mitigation plan, EMAP accreditation, and exercises.

MT: The Montana Bureau of Mines and Geology provided parameters (location, length, width, depth, and slip) for 20 faults in Montana to the USGS. The USGS used these parameters to

produce scenario earthquakes (<https://earthquake.usgs.gov/scenarios/catalog/mt2016/>) that included ShakeMaps. FEMA used these ShakeMaps together with generic databases of buildings, facilities, and lifelines in HAZUS to generate estimates of casualties and damage (<http://www.nehrpsenario.org/completed/montana-earthquake-scenarios/>). These earthquake scenarios will provide realistic information for planning and mitigation efforts.

UT: The Scenario for Magnitude 7.0 Earthquake on the Wasatch front Fault—Salt Lake City Segment was published June 4, 2015. This publication has received widespread attention in 2016, 2017 and in 2018.

The Utah guide for Seismic Improvement of Unreinforced Masonry Dwellings (Second edition—Special Edition) was published in 2016. This publication was supported by FEMA, The Association of Structural Engineers, Utah Safety Seismic Commission and the Utah Division of Emergency Management. Utah shares the Earthquake Handbook that was developed by WSSPC and other States.

Utah has run Hazus scenarios for every county in the State of Utah. Utah has created Shakemaps for 25 different earthquake scenarios in the State of Utah.

WY: Wyoming worked together with OPP, utilizing NEHRP funding, to facilitate a tabletop exercise to discuss initial actions by first responders following an earthquake. Discussions included actions anticipated in the first 24, 48 and 72 hour timeframes. This was not really a new scenario, but rather an opportunity to share expected actions and provide an opportunity for open communication for responders and governmental officials in the immediate response area. The exercise was held in Lincoln County, and involved responders from three counties in the western third of Wyoming.

Hazard Identification and Assessment

Policy Recommendation 15-3: *Definitions of Recency of Surface Faulting for the Basin and Range Province*

WSSPC recommends that each state in the Basin and Range physiographic province (BRP), through consultation with state and federal geological surveys and other earthquake-hazard experts, define scientifically and societally relevant categories for recency of surface faulting (generally earthquake magnitude $\geq M 6.5$).

Examples of categories that are applicable for much of the BRP include the following:

Latest Pleistocene-Holocene fault – a fault whose movement in the past 15 ka has been large enough to break the ground surface.

Late Quaternary fault – a fault whose movement in the past 130 ka has been large enough to break the ground surface.

Quaternary fault – a fault whose movement in the past 2.6 Ma (Cohen and Gibbard, 2010) has been large enough to break the ground surface.

WSSPC further recommends that in the absence of information to the contrary, all Quaternary faults be considered Latest Pleistocene-Holocene active unless there are adequate data to confidently assign them to a Late Quaternary or Quaternary activity class.

a) *Have these definitions of surface faulting in the Basin & Range Province been communicated to policy makers?*

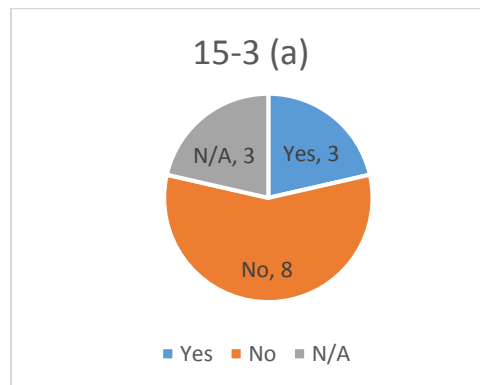
Yes (3): CA, NV, UT

No (8): AZ, HI, ID, MT, NM, OR, WA, WY

N/A (3): AK, CO, GU

Blank (0):

Unknown (0):



NV-GS: The inadequacy of a Holocene definition of an active fault is evident in some of Nevada's most famous earthquakes, in particular the 1954 Pleasant Valley earthquake. A late

Quaternary time frame is advocated in hazard mitigation plans and illustrated on the state Quaternary fault map.

UT: We defer to the Utah State Geological Survey to expand on this information.

b) Have these definitions been adopted by your state, province, or territory?

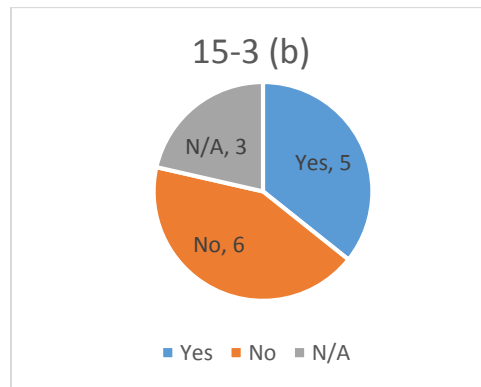
Yes (5): AZ, NV, UT, WA, WY

No (6): CA, GU, ID, MT, NM, OR

N/A (3): AK, CO, HI

Blank (0):

Unknown (0):



CA-GS: Active faulting in the State of California is defined by the California State Mining and Geology Board, with a statewide standard definition that faults displaying activity in the past 11,700 years (Holocene) are considered “active”. Refer to CGS Website:

<http://www.conservation.ca.gov/CGS/Pages/Index.aspx> .

GU: Faults on Guam and the Marianas are described in Earthquake Hazard Vulnerability of Guam – 1994, Seismic Hazard Vulnerability on Guam – 1988, General Geology of Guam – 1964, etc.

NV-EM: Primarily implemented to local jurisdictions.

NV-GS: There is not specific legislation in Nevada but there is a professional practice advocated by the Association of Engineering Geologists.

UT: We defer to the Utah State Geological Survey to expand on this information.

WY: These definitions have been adopted by and are being used by the Wyoming Geological Survey.

Earthquake Monitoring and Early Warning

Policy Recommendation 17-3: *Earthquake Monitoring Networks*

WSSPC supports the continued expansion and modernization of earthquake monitoring networks as envisioned and articulated by the Advanced National Seismic System (ANSS), with emphasis on expanded strong-motion monitoring in areas prone to large earthquakes and in urban areas, including selected engineered structures; increased regional broadband seismograph instrumentation; increased geodetic instrumentation; and earthquake early warning capabilities. The resulting data will provide better understanding of future ground shaking potential, tsunami generation potential, more rapid information for emergency response, and insights for the improved design of more earthquake and tsunami-resistant construction.

a) *Has your state, province, or territory been able to expand its seismic monitoring capabilities in partnership with the United States Geological Survey or the Geological Survey of Canada?*

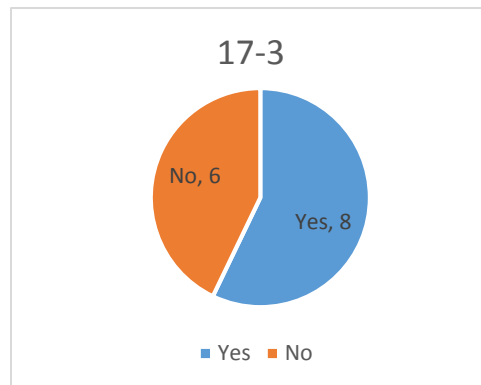
Yes (8): AK, AZ, CA, CO, ID, NV, OR, WA

No (6): GU, HI, MT, NM, UT, WY

N/A (0):

Blank (0):

Unknown (0):



GU: No expansion has been done for Guam and the Marianas on 2016 and 2017.

ID: USGS and University of Utah Seismological Stations installed temporary array of stations near Soda Springs, Idaho in Fall, 2017 in response to 9/2/2017 M 5.3 earthquake and aftershocks (Bill Phillips, Idaho Geological Survey).

MT: In fact, Montana has lost ANSS funding for operation of the Montana Regional Seismic Network and analysis and reporting of the data it collects. Upgrades, expansion, and modernization of the Montana network is a pipe dream at this point.

NV-GS: Expansion of the seismic monitoring capabilities has been conducted by the Nevada Seismological Laboratory. Over the last several years, the NSL has been installing mountain top fire watch cameras built on the backbone of the statewide earthquake network communication

system. Although these cameras focus on fire hazards, they serve to make the seismic monitoring system more robust and will contribute to evaluating fire hazards and coordinating emergency response in the event of a large earthquake.

WY: Wyoming does not have seismic monitoring capabilities and have, therefore, not been expanded.

b) If yes, how many stations and what type (for example: broadband seismograph, instrumentation of engineered structures or geodetic instrumentation) of instrumentation have you been able to install?

AK-EM: The Alaska Earthquake Center (AEC) operates a seismic network of more than 300 seismic stations distributed throughout the state (see figure to the left), receiving and archiving waveform data from all stations in near real time. Within the large regional network are subnetworks comprised of stations, which serve several purposes. One subnetwork, operated jointly with the Alaska Volcano Observatory (AVO), includes more than 100 stations that monitor 17 active volcanoes. Another evaluates tsunami hazard potential with more than 20 stations located in coastal communities, which is operated in cooperation with the Alaska Tsunami Warning Center.

As part of NOAA's National Tsunami Hazard Mitigation Program, the AEC is participating in a project that will augment the tsunami subnetwork with 21 new modern seismic stations. The goal of the project, named the Consolidated Reporting of Earthquakes and Tsunamis (CREST).

AK-GS: Our agency has not installed any of these instruments; other entities (primarily University of Alaska and Alaska Volcano Observatory) have done the installations. Also, USArray currently has approximately 280 new temporary stations installed in Alaska. Efforts are underway to secure funds for incorporating some of these into Alaska's permanent seismic network.

AK-SC: Core ANSS support to the Alaska Seismic Network has been reduced repeatedly in recent years. Core funding is current below FY11 levels. As a result of this, and other reductions, network maintenance was suspended temporarily in 2016 and the data return and quality were compromised accordingly. In 2017-8, Alaska is benefiting from a congressionally-mandated plus-up to the USGS budget to provide stop-gap support to the Alaska Earthquake Center. This is highly ephemeral, however, and not indicative of long term trends.

The state is benefitting hugely from the National Science Foundation's USArray program and the Plate Boundary Observatory. Nearly all of the state's geodetic network is operated under the PBO program. While this is an excellent resource, Alaska remains the only area of the country where most PBO data are not transmitted in real-time. As a result, the geodetic data are not part of routine earthquake monitoring. The USArray network was fully installed in Alaska in late 2017. Under the USArray program roughly 10% of the land area of the U.S. has been seismically

instrumented for the first time. This is a tremendous (and, relatively speaking, free) asset for the state while it lasts. The network is scheduled for decommissioning in 2019.

AZ: We recently added 5 additional broadband seismometers to our Arizona Broadband Seismic Network, bring the total of seismometers operated by AZGS to 13.

CA-GS: The State of California operates the largest seismic network in the United States, with CGS operating the largest strong-motion network with over 1,325 stations and 8,500 instruments. <http://www.conservation.ca.gov/CGS/Pages/Index.aspx>.

ID: 2 strong motion and 6 broadband and strong-motion. (Bill Phillips, Idaho Geological Survey).

NV-EM: One, Broadband seismograph type.

NV-GS: The NSL now has over 29 fire cameras that are co-located with seismic monitoring stations.

WA: At least 140 stations. Not sure exactly which types. PNSN could provide more detailed information as they are the ones installing them, along with the USGS.

Earthquake Monitoring and Early Warning

Policy Recommendation 17-7: *Earthquake Early Warning Systems*

WSSPC recommends the research, development, and implementation of earthquake early warning systems in those states or regions with high seismic risk and a seismic network that can, or can be enhanced to, support an early warning capability. These national and regional-specific systems should include outreach, education, training, management, and ongoing maintenance of the systems.

a) *Has your state, province or territory established a state-level working group on earthquake early warning?*

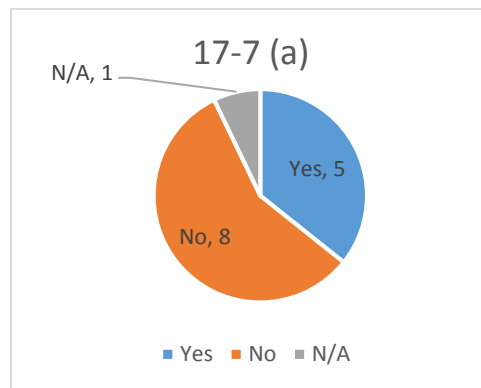
Yes (5): CA, GU, HI, OR, WA

No (8): AK, AZ, ID, MT, NV, NM, UT, WY

N/A (1): CO

Blank (0):

Unknown (0):



HI: The state of Hawaii utilizes the Hawaii Earthquake & Tsunami Advisory Committee (HETAC) to monitor and recommend new technology. And, therefore this committee has researching and monitoring the application of this new program in California.

NV-EM: Discussions have been initiated but no formal action has taken place.

NV-GS: Are involved with the EEW system in California.

UT: From a national perspective Utah was one of the States that was brought up as a suggested state for earthquake monitoring and early warning systems.

b) Is earthquake early warning being considered in your state, province, or territory?

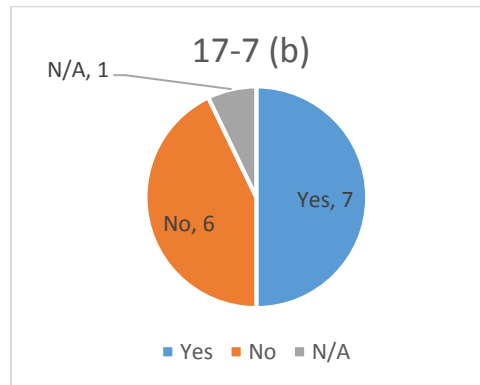
Yes (7): AK, CA, HI, NV, OR, UT, WA

No (6): AZ, CO, ID, MT, NM, WY

N/A (1): GU

Blank (0):

Unknown (0):



AK-EM: It is being looked into but we have limited capabilities and sparse populations to benefit the high costs.

AK-GS: Alaska's governor has expressed interest in earthquake early warning.

AK-SC: The topic now comes up in a wide variety of venues and is a frequent topic of conversation. To date, however, no meaningful planning has occurred at the state level. Two documents have touched on EEW in Alaska.

In 2016, the ASHSC conducted a stakeholder survey on earthquake monitoring and early warning at the request of Governor Walker. (2016, http://seismic.alaska.gov/presentations_reports.php) A small number of entries touch on the broad potential capabilities of EEW.

In 2016 the USGS included discussion of potential EEW instrumentation a benefit study addressing the USArray network. Discussion of EEW capabilities was limited, but the study did include some initial discussion of instrumentation needs.

AZ: Not at this time, but we are pursuing the establishment of an Arizona Seismic Safety Committee. Once established, the committee would likely address an early warning system.

GU: Guam is a geographically isolated island with an area 212 square miles proximate to the subducting plate in Marianas Trench, the deepest trench in the world and with potential to generate great earthquakes. Guam's concern is more on the arrival of destructive tsunamis from this source which maybe is less than 10 minutes away.

The expansion of early warning on Guam is all-hazards in its approach. Monitoring P waves travel underwater is not being tabled at this time.

HI: If it can be found to be cost effective.

NV-GS: It is being considered, however network density and cost issues have not been worked out yet.

UT: USSC supports this and is willing to promote this in the future.

Building Codes

Policy Recommendation 15-4: Identification and Mitigation of Non-Ductile Concrete Buildings

WSSPC recommends that states, provinces, territories or communities with moderate and high seismicity consider creating programs to identify non-ductile concrete buildings and develop plans and policies that will effectively reduce the risks in their jurisdictions.

a) *Has your state, province or territory identified, prioritized, or inventoried its non-ductile concrete buildings?*

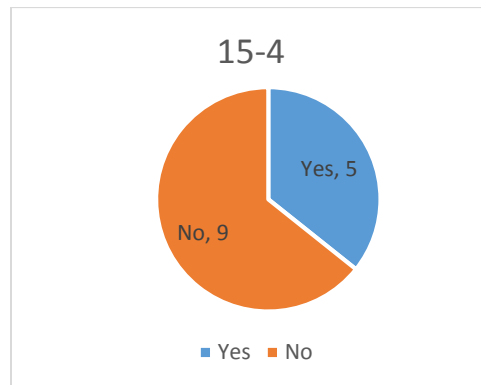
Yes (5): AK, CA, GU, UT, WY

No (9): AZ, CO, HI, ID, MT, NV, NM, OR, WA

N/A (0):

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Unknown (0):



AZ: AZGS has not. However, other state agencies may have programs in place. But if so I'm unaware of them.

GU: The inventory of Guam's building stock has been ongoing in preparation of the update of the Guam Hazard Mitigation Plan in 2019.

HI: Not much of this type of inventory.

MT: Not that I am aware. However, the Bureau of Mines and Geology does not have any programs that relate to application of building codes. A completely accurate reply would have to come from other state agencies.

NV-EM: The Nevada Earthquake Safety Council has an unreinforced masonry structure subcommittee which is undertaking a review of the issues and is charged with bringing forth recommendations.

UT: Utah voluntarily completed a partial review of Salt Lake City and also completed schools K-12 in a statewide assessment. Utah has a general idea and understanding of identification and mitigation of Non-Ductile Concrete buildings.

WY: Wyoming has, in a limited way, begun the process of rapid visual assessments of critical infrastructure buildings (governmental structures, schools, hospitals, structures housing first responder equipment, etc.). This has been accomplished through NEHRP-funded projects in a few communities. This is expected to be an on-going effort for years to come, as funding is available and as local champions are located with a will to pursue the projects.

b) If yes, please describe your state, province, or territory efforts to reduce risks from non-ductile concrete buildings.

AK-EM: Alaska continues a major effort to provide funding and technical assistance for local community hazard mitigation planning and identifying non-ductile concrete buildings and develop plans and policies that will effectively reduce the risks. In 2016-2017, seventeen Alaskan communities throughout the state developed or updated their mitigation plans. The hazard mitigation planning process includes surveys and identifying non-ductile concrete buildings and conducting community meetings in which seismic and tsunami risk and mitigation are discussed and prioritized, among other hazards. These plans result in communities that have assessed seismic and tsunami hazards and their associated risks, and developed strategies to address them. This activity is consistent with WSSPC Policy Recommendation 09-2: developing earthquake risk-reduction strategies. Each local community mitigation plan integrates with the State Hazard Mitigation Plan, enhancing Alaska's overall seismic resilience.

DHS&EM added all-hazard vulnerability assessment to the Division's Homeland Security and Vulnerability Assessment teams to provide additional information to critical facility operations around the state. These initiatives are consistent with WSSPC Policy Recommendation 06-1: promoting the development of risk-reduction strategies.

CA-GS: Non-ductile concrete buildings cannot be constructed in the State of California. Existing non-ductile concrete buildings must be seismically retrofitted at the owner's expense.

GU: Due to the stringent Building Code on Guam, homes are made (like a shell) of concrete reinforced masonry. While GovGuam ensures that building permits strictly regulates construction of substandard buildings, the culture of mitigation with the jurisdiction being in a typhoon (hurricane) alley, has inculcated in the minds of everyone that retrofits or replacement of buildings are to be borne by homeowners/property owners.

NV-GS: Well, even though this has not been specifically addressed (non-ductile concrete buildings) we keep the conversation going by including talks about these kinds of buildings in meetings, such as the joint meeting between NESC and USSC.

UT: Utah School districts have an understanding of retrofits and building replacement. The school districts individually raise bonds and replace and improve buildings. Districts are addressing seismic safety and helping to improve seismic standards in the school districts.

WY: See above. No retrofitting/structural replacement/risk disclosure projects have been pursued to date following visual assessments. These will be pursued as funding becomes available and as local champions are located with a will to pursue the projects.

Building Codes

Policy Recommendation 17-4: *Identification and Mitigation of Unreinforced Masonry Structures*

Unreinforced masonry bearing-wall structures represent one of the greatest life-safety threats and economic burdens to the public during damaging earthquakes. WSSPC recommends that 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 that will effectively address the reduction of this risk.

a) Has your *state, province, or territory* adopted a program to identify the risk from unreinforced masonry buildings?

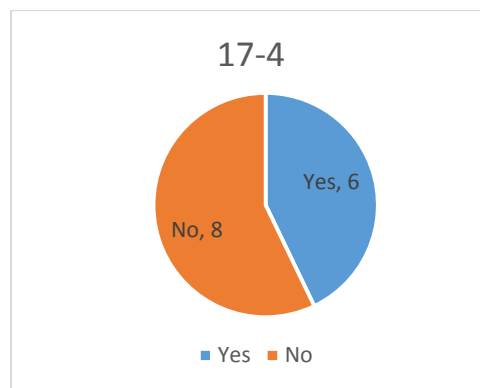
Yes (6): AZ, CA, GU, ID, NV, UT

No (8): AK, CO, HI, MT, NM, OR, WA, WY

N/A (0):

Blank (0):

Unknown (0):



AK-EM: It is only applicable to municipalities at this time to adhere to any guidelines. The Seismic commission can only make recommendations.

AZ: For the part of AZGS, this is limited to HAZUS modelling which accounts for the greater likelihood of URM collapse.

MT: Not that I am aware. However, the Bureau of Mines and Geology does not have any programs that relate to application of building codes. A completely accurate reply would have to come from other state agencies.

NV-GS: We have a committee on unreinforced masonry buildings that is exploring ways to communicate the hazard, inventory the state's URM buildings, and devising a roadmap to reduce the risk of URM buildings. We are planning a URM building summit with Utah and other partners (WSSPC? – just haven't asked yet) to raise awareness of this hazard and how to reduce this risk. Education of this risk and having some reasonable, practical ways to deal with it are the starting point we are at.

WA: Working on it.

WY: No formal program has been adopted to identify the risk from unreinforced masonry buildings. However, Wyoming has, in a limited way, begun the process of rapid visual assessments of critical infrastructure buildings (governmental structures, schools, hospitals, structures housing first responder equipment, etc.). This has been accomplished through NEHRP-funded projects in a few communities. This is expected to be an on-going effort for years to come, as funding is available and as local champions are located with a will to pursue the projects.

b) If yes, is the program voluntary or mandatory? Please describe.

CA-GS: The program is statewide mandatory. Public buildings must be seismically retrofitted at owner's expense, and notices posted to the public about the seismic instability of the structure.

GU: For new construction, in as much as all construction projects have to secure building permits, it is mandatory. Guam is more faced with substandard, not permitted, ranch houses type of homes made of light materials, such as: wood, tin, etc. Permitted masonry structures are all reinforced and are not a problem on Guam.

ID: Voluntary. Seven school districts and sixteen higher risk counties selected critical infrastructure facilities for inspections.

NV-EM: The identification of unreinforced masonry structures is being undertaken to a joint effort of the Clark County Building Department, the Nevada Earthquake Safety Council and various local jurisdictions with financial support from the Federal Emergency Management Agency.

UT: This program is voluntary.

WA: We have not gotten far enough along to answer this definitively, but the intention is to make it mandatory.

WY: Strictly voluntary.

Building Codes

Policy Recommendation 16-4: *Seismic Provisions in the 2015 International Building Codes*
WSSPC endorses the prompt adoption and enforcement of the seismic provisions of the 2015 International Existing Building Code, the 2015 International Building Code, and the 2015 International Residential Code (and the 2015 National Building Code of Canada, where applicable) as minimum standards by states, territories, provinces and/or local jurisdictions. Further, WSSPC discourages modifications or amendments that would weaken the Code or its required inspections. WSSPC also encourages Code organizations to continue the development and refinement of building codes and consensus standards to remain substantially equivalent to the National Earthquake Hazards Reduction Program (NEHRP) Recommended Seismic Provisions for New Buildings and Other Structures (FEMA 1050) and encourage authorities having jurisdictions to focus on seismic education, purpose, incentives, lifelines and the business/industry and residential sectors.

Has your state, province, or territory adopted seismic provisions that meet or exceed those provisions in the 2015 International Building Code, International Existing Building Code and International Residential Code?

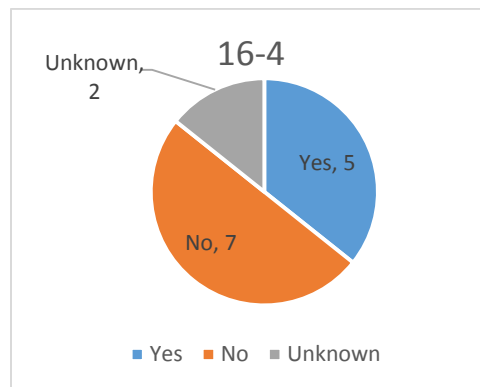
Yes (5): CA, ID, NV, OR, WY

No (7): AK, CO, GU, HI, MT, UT, WA

N/A (0):

Blank (0):

Unknown (2): AZ, NM



AK-GS: To the best of our knowledge, Alaska uses the 2012 codes (if codes are used at all).

AK-SC: Depending on jurisdiction, Alaska communities remain one or two cycles behind the 2015 IBC.

CO-SC: The State of Colorado does not enact a state-wide building code and building code enforcement is generally delegated to the local jurisdictions. For schools the IBC 2015 is adopted and local jurisdictions, if their Building Department is approved by the State, are responsible for enforcement provided they review and inspect according to the 2015 IBC regardless of what Building Code they may have in place for their community.

GU: Currently, Guam is officially adopting the IBC 2009. Efforts are currently being coordinated for the adoption of IBC 2018.

MT: I believe that all new building designed for public occupancy have to meet federal building codes. However, the Bureau of Mines and Geology does not have any programs that relate to application of building codes. A completely accurate reply would have to come from other state agencies.

NV-GS: There are many factors that play into the local adoption of building codes, including how practical it is to train everybody in the new code.

WA: [No], Due to this being a lengthy process and having limited funding for the WA SBCC.

WY: The Wyoming Fire Marshall's Office has the Building Code adoption role in the state. They review plans for only public structures over a specified square footage. Plans are reviewed for fire and life safety. Communities with a local building official must enforce, at a minimum, the codes adopted by the state. Per the Wyoming Fire Marshall's Website the 2015 IBC was adopted November 2015. The codes are reviewed and adopted on a 3-year cycle. Following is code adoption information posted on the Fire Marshall's Website:

Council on Fire Prevention and Electrical Safety

In accordance with § W.S. 35-9-106, the following codes are incorporated by reference in these rules. This incorporation by reference does not include any later amendments or editions of the incorporated codes.

- The International Building Code, 2015 Edition, promulgated by the International Code Council.
- The International Existing Building Code, 2015 Edition, promulgated by the International Code Council.
- The International Fire Code, 2015 Edition, promulgated by the International Code Council, including Appendix D, Appendix E, Appendix F & Appendix G.
- The International Mechanical Code, 2015 Edition, promulgated by the International Code Council.
- The International Fuel Gas Code, 2015 Edition, promulgated by the International Code Council.
- Provisions of the International Residential Code, the International Property Management Code, as said codes are referenced in the International Building Code, the International Fire Code, the International Mechanical Code, and the International Fuel Gas Code but only to the extent that the referenced provisions apply to fire and life safety issues.

The current codes were adopted November 30, 2015.

School Building Safety

Policy Recommendation 16-10: Joint Policy for the Evaluation and Seismic Remediation of School Buildings

The Western States Seismic Policy Council, with the support of the Earthquake Engineering Research Institute, recommends that each member state, province and territory establish as a goal that all school buildings be seismically resilient. Seismically vulnerable school buildings should be retrofitted or replaced by new earthquake resilient school buildings as an important part of a nationwide school earthquake resiliency goal.

a) *Has the policy recommendation been distributed to policy and decision makers, elected officials, school districts, parent/teacher associations, teacher unions, school administrators, building departments or elected leaders?*

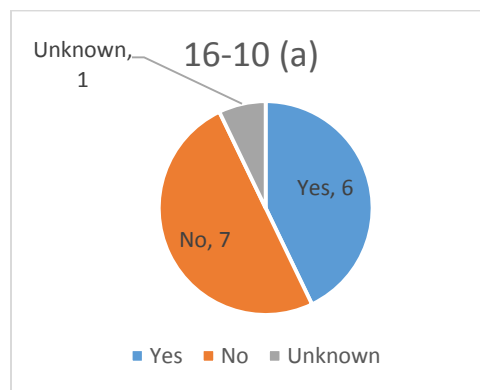
Yes (6): AK, CA, GU, OR, UT, WA

No (7): AZ, CO, HI, MT, NV, NM, WY

N/A (0):

Blank (0):

Unknown (1): ID



AZ: Not that I am aware of. It is possible that AZ Department of Emergency Management has shared this information.

CA-GS: California has strict seismic requirements for all public school buildings.

GU: In addition, through the help of NEHRP's NETAP related training courses, including Train-the-Trainer courses, have been directly delivered to Guam and were made available to key officials and decision makers of the island's public and private schools as well as to building permits team, building inspectors, engineers and designers.

MT: Not that I am aware. However, the Bureau of Mines and Geology does not have any programs that relate to application of building codes. A completely accurate reply would have to come from other state agencies.

UT: USSC and members have had discussions with school districts and completed an assessment of buildings K-12 in the state. The completed inventory has been communicated and shared with people who are in charge and understand seismic risks. The key leaders, policy leaders, schools and decision makers are aware and understand seismic risks.

WA: The need to retrofit schools has been recommended multiple times in many different ways to all types of audiences. Most recently the need was described in the Resilient Washington Subcabinet report which was briefed directly to Governor Inslee.

ID: Unsure if the policy was previously distributed; however, the policy is in practice.

b) Has your state, province, or territory or school districts within your state, province, or territory adopted a seismic retrofit plan for their school buildings?

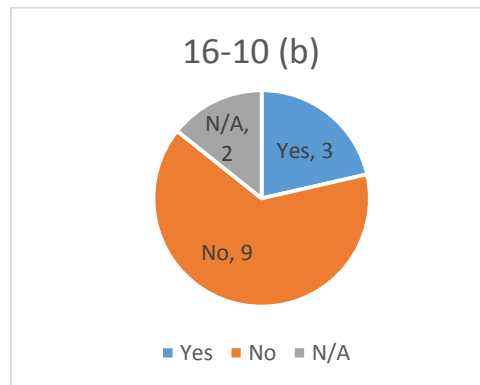
Yes (3): CA, OR, WY

No (9): AK, AZ, CO, HI, ID, MT, NV, UT, WA

N/A (2): GU, NM

Blank (0):

Unknown (0):



AK-GS: Some schools have been assessed using Rapid Visual Screening (RVS) methods, but there is no statewide or area-wide plan for retrofitting any school buildings that we are aware of.

CA-GS: All public school buildings that undergo any modifications that affect the structure of the buildings must be upgraded to the latest seismic safety requirements.

GU: No school or building official has come back and indicated that any of the school facility needs any form of retrofit.

UT: The State of Utah gives this responsibility to the individual School Districts.

WA: The governor recently submitted a budget that includes funds to begin a school seismic assessment program. The state legislature will vote on the budget in the spring.

WY: There is not a specific plan to target and retrofit seismically-vulnerable school buildings. However, if or when a building is funded for renovation the renovation scope may include structural improvements.

Statutes prescribe the long term goal that over time building conditions are brought to adequate levels. Statute 21-15-115 requires that the regular assessment of buildings include seismic rating and structural integrity. The statute for your reference can be accessed here: <http://legisweb.state.wy.us/lisoweb/statutesdownload.aspx> . Wyoming assesses school facilities every 4 years.

Wyoming has been working to improve and update its school facilities for some time. Per the Wyoming School Facilities Commission Website:

The School Facilities Commission Design Guidelines were first developed in 2003 and are updated periodically, most recently in 2010. The guidelines are intended to ensure the design and construction of adequate public school facilities... The School Facilities Commission is in the process of revising its design guidelines for educational buildings.

The Commission's current and draft guidelines reference seismic construction standards as requirements in the construction of masonry cavity walls, veneer and metal framed walls, and veneer and wood framed walls. [current construction standards- <https://docs.google.com/file/d/0ByAJz33FLoSLoSLWXBta1VoZWRkY28/edit> ; draft construction standards- <https://drive.google.com/file/d/0ByAJz33FLoSLoSLdINPdkZpOUhVdTQ/view>].

School Building Safety

Policy Recommendation 17-8: Seismic Design and Construction of New Schools

WSSPC recommends that each member state, province, and territory establish and fund an active program to improve the seismic safety of new schools by selectively increasing the current design and construction requirements for buildings and non-structural components, providing rigorous plan reviews and inspections and by establishing minimum regional seismic design categories for new schools. WSSPC also recommends that appropriate responsible local and federal entities provide dedicated financial support for the establishment of a program that improves the seismic safety of new schools.

a) *Has the policy recommendation been sent to all identified policy and decision makers, (elected officials), heads of key department such as emergency managers, building officials and planners and chairs o State Seismic Commissions and Boards?*

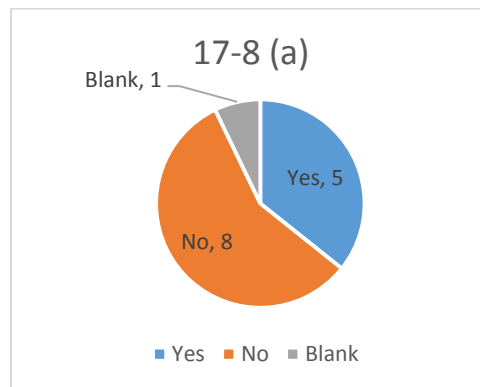
Yes (5): AK, CA, CO, GU, NV

No (8): AZ, HI, MT, NM, OR, UT, WA, WY

N/A (0):

Blank (1): ID

Unknown (0):



AK-SC: The state of Alaska does not have a dedicated program to identify or retrofit schools for seismic safety. However, The ASHSC has been rather successful in leveraging FEMA NEHRP funding to conduct rapid visual screenings of school buildings in major communities across the state. This has proven to be a fairly successful way to engage communities and to raise awareness. Funding retrofits remains a challenge. But the state has made laudable progress on identifying high priority schools.

CO-SC: The CEHMC has repeatedly sent our recommendation for the Design of New Schools to the State of Colorado for their review, discussion and ultimately, we hope, for adoption by the State. We understand that action on this recommendation will not be taken this code cycle and will likely not be considered until the IBC 2021 is available for adoption. The recommendation is actually broader than WSSPC PR 17-8.

HI: Will add these recommendation to the HETAC agenda.

MT: Not that I am aware. However, the Bureau of Mines and Geology does not have any programs that relate to application of building codes. A completely accurate reply would have to come from other state agencies.

UT: USSC understands this and has conducted outreach to many school districts. SEAU and AIA also work with school districts and are very aware.

b) Has your state adopted elevated seismically designed standards for school facilities?

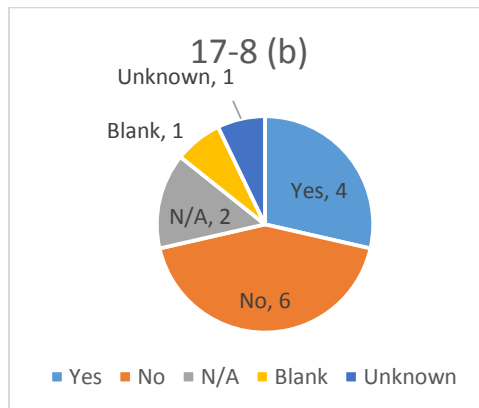
Yes (4): CA, GU, OR, WY

No (6): AK, MT, NV, NM, UT, WA

N/A (2): CO, HI

Blank (1): ID

Unknown (1): AZ



GU: This has been implemented through the building permits processes, implementation of Guam hazard mitigation strategies, and through coordination with engineers and architects.

HI: Will add these recommendation to the HETAC agenda.

OR: The State of Oregon has laws on seismic safety of schools. Also, the Oregon Seismic Safety Policy Advisory Commission has recommended to the Building Code Division that they adopt higher standards for common areas, which is in review.

WA: Most recently the need was described in the Resilient Washington Subcabinet report which was briefed directly to Governor Inslee.

WY: New schools are required to meet all applicable building codes, which would include seismic. Statutes prescribe the long term goal that over time building conditions are brought to

adequate levels. Statute 21-15-115 requires that the regular assessment of buildings include seismic rating and structural integrity. The statute for your reference can be accessed here: <http://legisweb.state.wy.us/lisoweb/statutesdownload.aspx> . Wyoming assesses school facilities every 4 years.

Wyoming has been working to improve and update its school facilities for some time. Per the Wyoming School Facilities Commission Website:

The School Facilities Commission Design Guidelines were first developed in 2003 and are updated periodically, most recently in 2010. The guidelines are intended to ensure the design and construction of adequate public school facilities... Please note, the School Facilities Commission is in the process of revising its design guidelines for educational buildings.

The Commission's current and draft guidelines reference seismic construction standards as requirements in the construction of masonry cavity walls, veneer and metal framed walls, and veneer and wood framed walls. [Current construction standards-
<https://docs.google.com/file/d/0ByAJz33FLoSLoSLWXBta1VoZWRkY28/edit> ;
Draft construction standards-
<https://drive.google.com/file/d/0ByAJz33FLoSLoSLdINPdkZpOUhVdTQ/view>].

Lifelines

Policy Recommendation 16-11: *Reliability of Lifeline Services*

WSSPC encourages utility regulatory bodies and utility service providers to implement best practices and seismic design in the construction and maintenance of their infrastructure in order to assure satisfactory performance in future earthquakes.

a) *Has your state, province, or territory encouraged agencies and regulators to develop guidelines addressing the seismic resilience of critical infrastructure?*

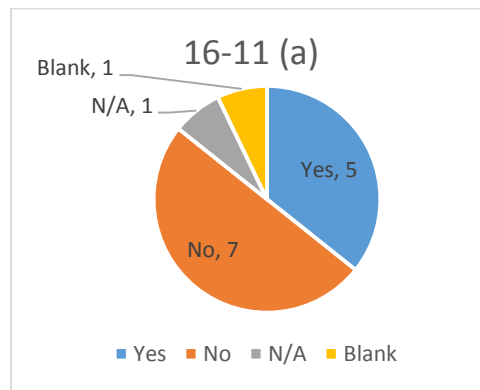
Yes (5): CA, GU, UT, WA, WY

No (7): AK, AZ, CO, MT, NV, NM, OR

N/A (1): HI

Blank (1): ID

Unknown (0):



AK-SC: This undoubtedly happens at an ad hoc level. However, there is no statewide effort to target lifeline services. The ASHSC has developed and distributed a policy on the resilience of public buildings, addressing some aspects of this need.

GU: This has been implemented through the building permits processes.

MT: Not that I am aware. However, the Bureau of Mines and Geology does not have any programs that relate to application of building codes. A completely accurate reply would have to come from other state agencies.

UT: Groups such as Salt Lake County hold annual resiliency workshops and conduct state-wide outreach to accomplish this goal.

WA: We have done a lot of “encouraging” with mixed results without funding sources to go along with it.

WY: The Wyoming Public Service Commission (PSC) regulates and supervises public utilities in accordance with Wyoming Title 37. They protect the interests of Wyoming’s public utility consumers in electric, gas, telephone and pipeline/water utilities.

Per current PSC State Administrative Rules, “Each utility shall construct, install, operate and maintain its entire plant and system ... in accordance with accepted good utility practice and in a manner that prevents injury to persons or property, promotes the safety, health, comfort and convenience of ... the general public.” Additionally, the rules require:

- (i) Electric utilities shall construct, install, operate and maintain facilities in accordance with NEC, NESC, WECC and NERC standards along with RUS standards, if applicable.
- (ii) Natural gas and pipeline utilities shall construct, install, operate and maintain facilities, including conducting leak surveys and cathodic protection of distribution and service lines, in accordance with PHMSA regulations (49 CFR e) § 40; 191- 193; 199).
- (iii) Water utilities shall construct, install, operate and maintain facilities in accordance with the requirements of DEQ and the State Engineer's Office. [<https://rules.wyo.gov/Search.aspx> **Reference Number:** 023.0002.3.03212016].

The Wyoming Department of Environmental Quality (DEQ) regulates water and sewage treatment plant capabilities and construction. Per current DEQ State Administrative Rules, structural design of these plants “shall consider the seismic zone, groundwater and soil support. Soils investigations shall be made, or ... available to develop structural design.” [<https://rules.wyo.gov/Search.aspx> , Reference Numbers 020.0011.11.03232015 and 020.0011.12.07312012].

b) Have public and private lifeline operators utilized available seismic design and performance guidelines in the construction, operation and rehabilitation of their facilities?

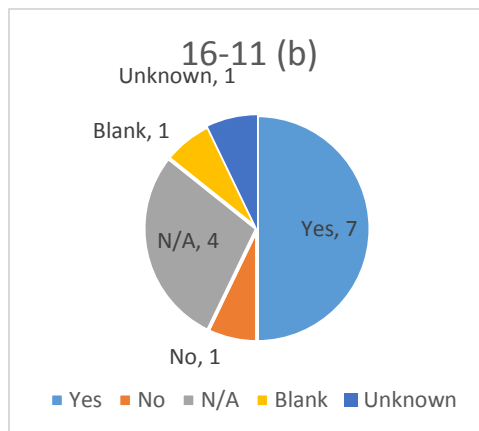
Yes (7): AK, CA, GU, OR, UT, WA, WY

No (1): NV

N/A (4): CO, HI, MT, NM

Blank (1): ID

Unknown (1): AZ



AK-EM: The Alaska Partnership for Infrastructure Protection, or APIP, works to integrate the private and public sector critical infrastructure owners into the municipal, state, and federal emergency framework, participating in all stages of the disaster cycle, from preparedness and mitigation through to response and recovery. APIP's purpose is to improve Alaska's emergency management capabilities through the following:

- Resource identification, management, and sharing.
- Information sharing and management.
- Emergency planning and response process improvement.
- Infrastructure sector characterization to understand and address vulnerabilities, dependencies, and single points of failure.
- Provide awareness of physical security, cyber security, law enforcement, and antiterrorism threats.
- Strengthen individual business's response capacity.
- Team building and collaborating for exercises.
- Make recommendations for priorities of protection, support, and recovery of critical infrastructure.
- Provide a safe partnership environment for Critical Infrastructure owners/operators to increase resiliency statewide.

AK-SC: There is no single answer to this. Some have done a very thorough job, such as the Trans Alaska Pipeline System. Many other operators undoubtedly do the minimum required by their stakeholders.

GU: An island wide re-assessment will be conducted this 2018 and 2019.

UT: This information has been shared and provided to public/private entities.

WA: Many lifeline infrastructure operators have very advanced plans and facilities. They are well aware of the risks and have ongoing efforts to be more resilient.

Lifelines

Policy Recommendation 16-12: Earthquake Actuated Automatic Gas Shutoff Devices

WSSPC recommends that each state, province or territory that is considering implementing requirements for installing earthquake-actuated automatic gas shutoff devices in industrial, commercial and/or residential applications assure that shutoff valves meet the provisions of the most currently available revision of ANSI/ASCE/SEI Standard 25 (Earthquake-Actuated Automatic Gas Shutoff Devices) and be installed in conformance with the manufacturer's installation instructions. The cost versus benefit of turning gas on after an event or the analysis of false activation is left to the authority having jurisdiction. The policy only advocates that if a decision is made to proceed with earthquake actuated automatic gas shutoff devices that the current standard be utilized.

Has your state, province, or territory considered implementing requirement for installing automatic gas shutoff devices in industrial, commercial and/or residential applications that meet the provisions of the most currently available revision of ANSI/ASCE/SEI standard 25 (Earthquake-Actuated Automatic Gas Shutoff Devices)?

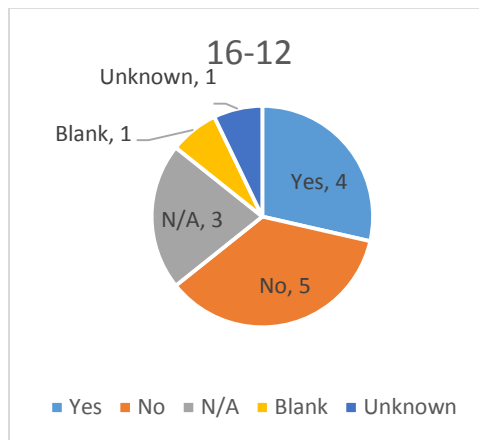
Yes (4): AK, CA, GU, NV

No (6): AZ, CO, MT, OR, UT, WA

N/A (3): HI, NM, WY

Blank (1): ID

Unknown (0):



GU: This is being implemented through the building permits processes.

MT: Not that I am aware. However, the Bureau of Mines and Geology does not have any programs that relate to application of building codes. A completely accurate reply would have to come from other state agencies.

NV-EM: The Clark County school District, one of the 10 largest in the United States, has initiated a program of installing earthquake actuated automatic gas shutoff devices. The installations are consistent with ASCE standard 25.

NV-GS: This has been done by the Clark County School District through a FEMA hazard mitigation grant – an impressive effort that I believe includes all county schools.

OR: This policy has been shared with others.

UT: We don't but it is recommended but not required.

WY: Automatic gas shutoff devices are installed in industrial/commercial applications and are triggered when lines no longer have pressure. They are not triggered by shaking.

Tsunami

Policy Recommendation 17-1: Improving Tsunami Public Education and Warning Procedures for Distant and Local Sources

WSSPC recommends expanding the efforts by NOAA, the USGS, FEMA, and WSSPC members to enhance public education programs about potential impacts from local tsunamis and the need to evacuate threatened areas immediately after strong or sustained ground shaking; prioritizing those efforts, which have an immediate and direct impact on life-safety for locally-generated tsunamis, over deep-sea tsunami detection systems that have no benefit for local warnings. WSSPC also recommends robust, effective, and fully maintained implementation of the tsunami detection system by NOAA, as long as it is not at the expense of community-level tsunami preparedness, mitigation, and recovery planning.

Has your state, province, or territory communicated to federal, state, and local stakeholders its position on support for enhanced educational efforts in communities at risk to local tsunami sources?

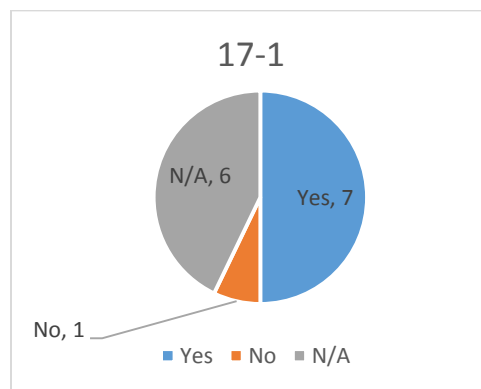
Yes (7): AK, CA, GU, HI, NV, OR, WA

No (1): UT

N/A (6): AZ, CO, ID, MT, NM, WY

Blank (0):

Unknown (0):



AK-SC: Alaska is very proactive in the National Tsunami Hazard Mitigation Program and also at the Congressional level on tsunami concerns.

GU: Currently, GHS/OCD has a robust community outreach and public education program leveraging its efforts across all available grant and funding sources and working with all relevant parallel programs. As an example, most of the funding from NOAA's NTHMP Grant is being directed to tsunami awareness and its community outreach and public education initiatives.

HI: We have a robust Earthquake and Tsunami education program here in Hawaii.

NV-GS: Local source tsunamis originating along active normal faults in Lake Tahoe has been communicated at several public talks to raise awareness.

UT: It isn't an issue right now. The Great Salt Lake is at historical low levels right now.

WA: Through the NOAA/NWS Tsunami Activities Grant the Washington state supports a wide variety of tsunami risk reduction activities. WA is the first in the nation to support the construction of a vertical evacuation structure with several more projects underway.

WY: Not applicable in Wyoming.

Tsunami

Policy Recommendation 16-1: *Rapid and Effective Tsunami Identification and Response*

WSSPC recommends that each coastal state, province, and territory emergency management agency work with coastal jurisdictions to develop evacuation plans for both near- and distant-source tsunamis, and supplement these emergency plans with a preparedness education campaign focusing on instructions to evacuate based on ground shaking, that ensures all populated coastal areas in the WSSPC coastal states, territories and provinces are guided by at least one type of system, appropriate to local conditions. Strong coordination should also occur between and among federal partners, such as the U.S. Geological Survey, National Oceanic and Atmospheric Administration, etc. and state/academic institutions developing earthquake early warning system technologies, expanding upon the WSSPC Policy Recommendation on Earthquake Early Warning, to ensure appropriate community response to both earthquake and tsunami alerts.

(a) Has your state, province, or territory continued to support increased tsunami mitigation, preparedness, and response activities through improved planning, drills, and exercises?

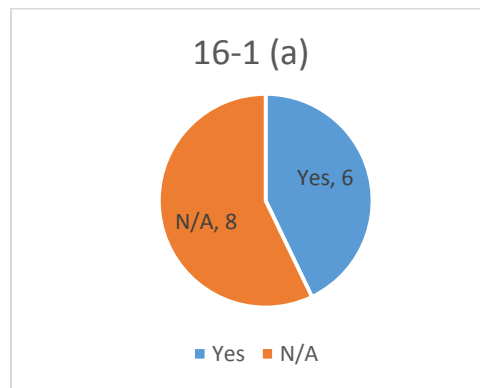
Yes (6): AK, CA, GU, HI, OR, WA

No (0):

N/A (8): AZ, CO, ID, MT, NV, NM, UT, WY

Blank (0):

Unknown (0):



UT: This is not a priority for Utah. The Great Salt Lake is at historically low levels and it isn't a priority right now.

WA: WA is in the middle of planning a tsunami communications tabletop exercise in the spring. Efforts are being made to have a least one tsunami exercise a year in preparation for the Cascadia Rising 2.0 earthquake/tsunami functional exercise tentatively scheduled for 2022. 1.26 million Washington residents registered for The Great Washington ShakeOut which the states supports/promotes every year. Plans to increase 2018 participation are already being planned.

WY: Not applicable in Wyoming.

(b) Has your state, province or territory worked with NTHMP to support development of guidance on rapid identification and notification systems?

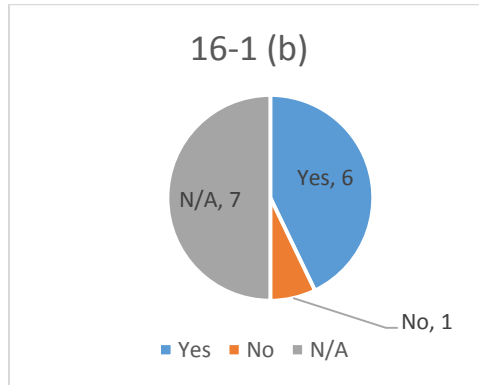
Yes (6): AK, CA, GU, HI, OR, WA

No (1): UT

N/A (7): AZ, CO, ID, MT, NV, NM, WY

Blank (0):

Unknown (0):



AK-SC: These efforts continue to focus on ‘traditional’ tsunami warning via sirens and public messaging. To date, so-called early warning, has not been a major component of this effort.

WA: WA state has two NTHMP coordinating committee members, one from Washington State Emergency Management Division and another from the Department of Natural Resources.

WY: Not applicable in Wyoming.

(c) Has your state, province, or territory communicated this WSSPC adopted policy or forwarded Policy Recommendation 16-1 to NOAA, USGS, FEMA, state or local decision makers other organizations for budgetary and technical support?

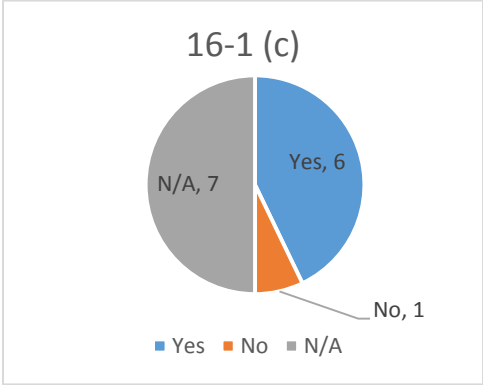
Yes (6): AK, CA, GU, HI, OR, WA

No (1): UT

N/A (7): AZ, CO, ID, MT, NV, NM, WY

Blank (0):

Unknown (0):



WA: Several members of NTHMP are also WSSPC members.

WY: Not applicable in Wyoming.

Post-Event Management

Policy Recommendation 16-3: *Post-Earthquake Technical Clearinghouses*

WSSPC recommends that each member state, province, and territory establish a plan for a post-earthquake technical clearinghouse to be activated if possible within 24 hours after each major earthquake within its jurisdiction. WSSPC also recommends that multijurisdictional agreements between and among WSSPC members and Federal agencies be in place that would allow for the establishment of a single comprehensive technical clearinghouse in the event of a large earthquake.

a) *Has your state, province, or territory established a plan for a post-earthquake clearinghouse?*

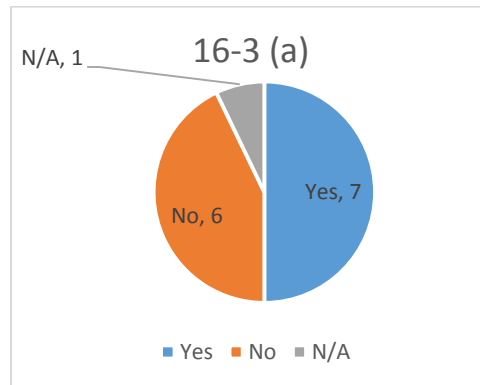
Yes (7): AK, AZ, CA, GU, HI, ID, UT

No (6): MT, NV, NM, OR, WA, WY

N/A (1): CO

Blank (0):

Unknown (0):



AK-SC: This planning is still in the works. However it was spurred entirely by the WSSPC recommendation.

AZ: DEMA may have such a plan in place.

HI: Still under development.

ID: currently under development through NEHRP funding to WSSPC.

NV-GS: We have had discussions on following protocols described by EERI and the Utah Geological Survey for establishing a post-earthquake technical clearinghouse. As of this date, funding has not been established to design a Nevada specific technical clearinghouse.

UT: Utah Geologic survey is in charge of establishing a clearinghouse. Additionally, our clearinghouse website was used and provided to Nevada during the Wells Earthquake.

WY: No plan has been established. However, Wyoming would be willing to accommodate the activation of a technical clearinghouse as soon as possible following a major earthquake in our jurisdiction and would be pleased to allow a single comprehensive technical clearinghouse.

b) *Has your state, province, or territory established MOA's with state and federal agencies or others?*

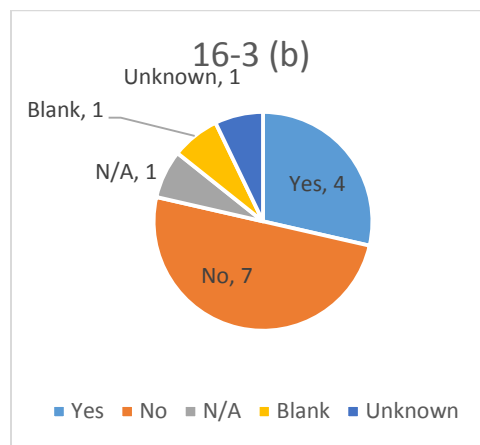
Yes (4): AK, GU, NV, UT

No (7): CA, HI, MT, NM, OR, WA, WY

N/A (1): CO

Blank (1): ID

Unknown (1): AZ



AK-SC: Note that no advance MOA is necessary to activate the EERI clearinghouse mechanism. This is the most likely clearinghouse house to be activated for a major Alaska earthquake.

GU: The Governor of Guam and the Governor of CNMI have recently entered into a mutual aid agreement. Likewise, Guam is a member of EMAC.

ID: Agreement regarding earthquakes associated with volcanic eruptions at the Yellowstone Volcano are in place with Yellowstone Volcano Observatory (Bill Phillips, Idaho Geological Survey).

MT: Response from Montana Disaster and Emergency Services Division may have accurate information about this item.

NV-EM: We participate in EMAC and NEMAC.

NV-GS: We are not aware of any specific MOA's.

UT: We are not aware of any official agreement; however, we support Nevada and would use our warehouse if called up or asked.

WY: Not specific to an earthquake event.