2015 Annual Report

WSSPC

WESTERN STATES SEISMIC POLICY COUNCIL

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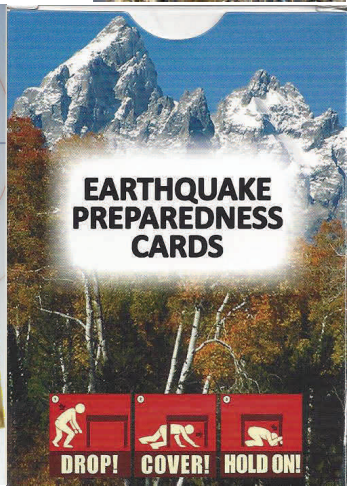

DISCLAIMER

The views and conclusions contained in this report are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government; by the Western States Seismic Policy Council (WSSPC), or by WSSPC members, agencies and affiliates.

Cover images from upper left, clockwise: *Flyer announcing Alaska's Next Big Earthquake Workshop; Alaska Workshop participants; Tlingit totem pole, University of Alaska Fairbanks; Wyoming's Earthquake Preparedness Playing Cards; Arizona is Earthquake Country Booklet; Nevada's Billboard campaign; Napa Strong outreach, (L-R) Cynthia Pridmore, California Geological Survey, Johanna Fenton, WSSPC, Adena Reed, California Governor's Office of Emergency Services; Clark County, Nevada Building Department banner for ShakeOut month in conjunction with the billboard campaign.*

2015 WSSPC ANNUAL REPORT
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ACKNOWLEDGMENTS

The 2015 Annual Report summarizes seismic policy development and earthquake/tsunami hazard reduction activities conducted by the Western States Seismic Policy Council and its member agencies for the fiscal year that runs from December 1, 2014 through November 30, 2015. Funding for the WSSPC Annual Report and all activities were provided through FEMA Cooperative Agreement EMW-2015-CA-00213-S01. We are thankful for FEMA's support.

We are also grateful to our 10 WSSPC affiliate members who help us defray operating costs not covered by FEMA. The 2015 WSSPC Affiliate members were:

Private Corporation:

California Earthquake Authority, Sacramento, California

Degenkolb Engineers, Inc., San Francisco, California

Saunders Construction, Inc.

State Farm® Insurance Companies, Bloomington, Illinois

Local Government:

City and County of San Francisco, California - Earthquake Safety Implementation Program (ESIP)

City of Las Vegas, Nevada - Building and Safety Department

Clark County, Nevada - Building Department

Individual:

Dominic Sims, Chief Executive Officer, International Code Council

Non-Profit Organization:

Applied Technology Council, Redwood City, California

Earthquake Engineering Research Institute (EERI)

SECTION 1

WSSPC Organization

MISSION AND GOALS

The Western States Seismic Policy Council (WSSPC) is a regional earthquake consortium representing thirteen states, four territories, and one province in the western United States and Canada. Organized as a 501(c)(3) non-profit organization – and funded by the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) – WSSPC is an important component of the U.S. National Earthquake Hazards Reduction Program (NEHRP), serving as an efficient and effective clearinghouse for earthquake mitigation information and ideas.

WSSPC's primary mission is to develop seismic policies and share information to promote programs intended to reduce earthquake-related losses. Our goals are to:

- Promote regional cooperation and the interaction of the State Emergency Management, State Geological Surveys, and State Seismic Councils and Commissions in the formation of seismic policy.
- Improve the overall awareness of earthquake hazards and methods to mitigate the associated risks; develop strategies to enhance earthquake preparedness; and support earthquake studies and earthquake preparedness activities that will reduce or eliminate deaths, injuries and property damage.
- Serve as a resource for earthquake and tsunami-related information, training programs and workshops, in coordination with other regional and national earthquake organizations.

Members consist of the directors of the state, provincial or territorial emergency management agencies and geological surveys in the WSSPC region, as well as a designated representative for their seismic safety commission, board or council. Members represent diverse constituencies geographically, demographically, and culturally – bringing broad expertise and perspective to the policy table.

Total population of the region served by WSSPC is over 22% of the U.S. and Canada's combined 342 million population, demonstrating the potential reach of policies developed by WSSPC members.

Population Statistics for WSSPC Region

WSSPC Region	Population
USA	**72,214,313.00**
Alaska	710,231.00
American Samoa	55,519.00
Arizona	6,392,017.00
California	37,253,956.00
Colorado	5,029,196.00
Guam	159,358.00
Hawaii	1,360,301.00
Idaho	1,567,582.00
Montana	989,415.00
Nevada	2,700,551.00
New Mexico	2,059,179.00
Northern Mariana Islands	53,883.00
Oregon	3,831,074.00
Utah	2,763,885.00
Washington	6,724,540.00
Wyoming	563,626.00
Canada	**4,433,954.00**
British Columbia	4,400,057.00
Yukon	33,897.00
Grand Total	**76,648,267.00**

Source: 2010 US Census (www.census.gov) and 2011 Canadian census (www12.statcan.gc.ca)

WSSPC BOARD AND STAFF

Chair - John G. Parrish, State Geologist (GS, 2013-2015)
California Geological Survey
801 K Street, Suite 1200, Sacramento, California 95814-3531
john.parrish@conservation.ca.gov

Mark Ghilarducci, Secretary (EM, 2015-2017)
California Governor's Office of Emergency Services
3650 Schriever Ave, Mather, California 95655
mark.ghilarducci@calema.ca.gov

Peter McDonough, WSSPC Liaison (AL, 2015-2017)
Utah Seismic Safety Commission
1140 West 200 South/P.O. Box 45360, Salt Lake City, Utah 84145
pete.mcdonough@questar.com

John Metesh, State Geologist (GS, 2014-2016)
Montana Bureau of Mines and Geology
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Mike O'Hare, Director (EM, 2014-2016)
Alaska Division of Homeland Security and Emergency Management
PO Box 5750, Fort Richardson, Alaska 99505-5750
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Idaho Bureau of Homeland Security
4040 Guard Street, Bldg. 600, Boise, Idaho 83705-5044
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WSSPC MEMBERS, EARTHQUAKE/TSUNAMI PROGRAM MANAGERS & STATE HAZARD MITIGATION OFFICERS

As of November 30, 2015

Area	**Geological Survey Director/ Representative**	**Emergency Management Director**	**Seismic Council Liaison**	**EQ Program Manager/Tsunami Program Manager**	**State Hazard Mitigation Officer**
Alaska	Steve Masterman	Mike O'Hare	Buzz Scher	Dan Belanger/ Dan Belanger	Ann Gravier
Arizona	Lee Allison Philip Pearthree	Wendy Smith-Reeve		Michael Conway Anthony Cox	LaMar Brown
California	John Parrish	Mark Ghilarducci	Dick McCarthy	Kate Long/ Kevin Miller	Linda Fong
Colorado	Karen Berry	Dave Hard	Rob Jackson	Scott Baldwin	Marilyn Gally
Hawaii	----------	Arthur "Joe" Logan	Paul Okubo	Kevin Richards/ Kevin Richards	Havinne Okamura
Idaho	Michael “Ed” Ratchford Bill Phillips	William “Brad” Richy		Mark Stephensen	Mark Stephensen
Montana	John Metesh Mike Stickney	Brad Livingston		J. Lee Okeson	Kent Atwood
Nevada	Jim Faulds Craig dePolo	Caleb Cage	Ron Lynn	Rick Martin	Karen Johnson
New Mexico	L. Greer Price Dave Love, Dan Koning	M. Jay Mitchell		Wendy Blackwell	Wendy Blackwell
Oregon	Brad Avy Yumei Wang	Andrew Phelps	Jay Wilson	Althea Rizzo/ Althea Rizzo	Dennis Sigrist
Utah	Rick Allis	Kris Hamlet	Pete McDonough	Bob Carey	Brad Bartholomew
Washington	Dave Norman Tim Walsh	Robert Ezelle		John Schelling/ John Schelling	
Wyoming	Tom Drean Seth Wittke, Martin Larsen	Guy Cameron		Melinda Gibson	Melinda Gibson
American Samoa	----------	Iuniasolua T. Savusa		Jacinta Brown/ Theodora Meredith	Vinnie Atofau
Guam	----------	James McDonald		Pilar Carbullido	Leo Rustum Espia
CNMI	----------				
British Columbia	Stephen Rowins	Pat Quealey		Robert White	
Yukon	Carolyn Relf	Michael Templeton			

WSSPC MEMBER AGENCIES

Area	Agency
Alaska	Alaska Division of Homeland Security and Emergency Management Alaska Division of Geological and Geophysical Surveys Alaska Seismic Hazards Safety Commission
American Samoa	American Samoa Department of Homeland Security
Arizona	Arizona Division of Emergency Management Arizona Geological Survey
British Columbia	Emergency Management British Columbia British Columbia Geological Survey
California	California Governor's Office of Emergency Services California Geological Survey Alfred E. Alquist Seismic Safety Commission
Colorado	Colorado Division of Homeland Security & Emergency Management Colorado Geological Survey Colorado Earthquake Hazard Mitigation Council
Guam	Guam Homeland Security & Office of Civil Defense
Hawaii	Hawaii Emergency Management Agency Hawaii Earthquake & Tsunami Advisory Committee
Idaho	Idaho Bureau of Homeland Security Idaho Geological Survey
Montana	Montana Disaster and Emergency Services Division Montana Bureau of Mines and Geology
Nevada	Nevada Division of Emergency Management Nevada Bureau of Mines and Geology Nevada Earthquake Safety Council
New Mexico	New Mexico Department of Homeland Security & Emergency Management New Mexico Bureau of Geology and Mineral Resources
Northern Mariana Islands	CNMI Office of Homeland Security & Emergency Management
Oregon	Oregon Office of Emergency Management Oregon Department of Geology & Mineral Industries Oregon Seismic Safety Policy Advisory Commission
Utah	Utah Division of Emergency Management Utah Geological Survey Utah Seismic Safety Commission
Washington	Washington Emergency Management Division Washington Geology and Earth Resources Division
Wyoming	Wyoming Office of Homeland Security Wyoming State Geological Survey
Yukon	Yukon Emergency Measures Organization Yukon Geological Survey

AFFILIATE MEMBERS

As of November 30, 2015

WSSPC welcomes members of the professional community who share our goal of reducing losses from earthquakes and tsunamis. Corporations, local governments or their departments, non-profit organizations, universities, and individuals can join WSSPC as affiliate members; membership fees are used to support program activities not eligible for reimbursement by the federal government.

Corporate	California Earthquake Authority 801 K Street, Suite 1000, Sacramento, CA 95814 *www.earthquakeauthority.com*
	Degenkolb Engineers, Inc. 235 Montgomery, Suite 500, San Francisco, CA 94104 *degenkolb.com*
	Saunders Construction, Inc. 1760 Monrovia, Unit #A-1, Costa Mesa, CA 92627 *www.saundersseismic.com/index.php*
	State Farm Insurance Companies One State Farm Plaza, Bloomington, IL 61710 *www.statefarm.com*
Local Government	City of Las Vegas Building and Safety 333 N. Rancho Drive, Las Vegas, NV 89106 *lasvegasnevada.gov/Government/buildingandsafety.htm*
	City and County of San Francisco, Earthquake Safety Implementation Program 1 Dr. Carlton B. Goodlett Place, Room 362, San Francisco, CA 94102 *www.sfgov.org/esip/*
	Clark County Building Department 4701 W. Russell Rd., Las Vegas, NV 89118-2231 *www.clarkcountynv.gov/depts/development_services*
Non-Profit	Applied Technology Council 201 Redwood Shores Parkway, Ste 240, Redwood City, CA 94065 *www.atcouncil.org*
	Earthquake Engineering Research Institute (EERI) 499 14th Street, Suite 220, Oakland, CA 94612-1934 *www.eeri.org*
Individual	Dominic Sims, International Code Council

SECTION 2

Financial

Explanation of Financial Documents

2-1. WSSPC Independent Accountant's Review and Financial Statements Report

The financial statements were prepared by an accountant for the WSSPC Fiscal Year ending November 30, resulting in a net decrease of $1009 (page 3 of financial statements). This differs slightly from the Quickbooks net Income ($-1010.30) due to rounding.

WSSPC had 10 Affiliate members in FY 14-15 who contributed $3875, a decrease of $600 from FY 13-14. Affiliate members help to offset expenses not covered by the FEMA cooperative agreements.

2-2. WSSPC FY 2014-2015 Income and Expense

This document shows how income and expenses were proportioned among the FEMA cooperative agreements during the WSSPC fiscal year and how WSSPC funds are entered into Quickbooks software, before allocating the expenses to tasks in the FEMA Work Plan. The left column records the totals.

Explanation of WSSPC Expense column numbers:
Benefits – Other, $760: This represents the liability for accrued but unused PTO (Paid Time Off).
Office Supplies, $638: This corrects an incorrect categorization from last year.
Staff Meals, $861.67: Not covered by the FEMA Grants.
Staff Hotel, $953.85: This reflects an amount that was partially reimbursed in the next fiscal year.
Executive Committee Meals, $751.35: Meals not covered by FEMA Grants.
State Support – NV, $200.47: Meals not covered by FEMA Grants.
2015 Annual Conference, $925.63: Annual Meeting Catering not covered by FEMA Grants.
Insurance Other, $-110.98: Rebate from previous insured years.
Licenses & Permits, $-10.00: Overpayment of filing costs, refunded to WSSPC.
Depreciation Expense, $130: Depreciation of equipment; supplied by the accountant.

2-3. FEMA Grant 2014 August 1, 2014 – July 31, 2015

This document shows the allocation of expenses to the tasks in the Work Plan of the FEMA Cooperative Agreement ending July 31, 2015, including the State Support projects.

Subsection 2-1

Independent Accountant's Review Report
and Financial Statements
November 30, 2015 and 2014

COOK CPA Group

WESTERN STATES SEISMIC POLICY COUNCIL

INDEPENDENT ACCOUNTANT'S REVIEW REPORT
and
FINANCIAL STATEMENTS

NOVEMBER 30, 2015 AND 2014

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INDEPENDENT ACCOUNTANT'S REVIEW REPORT

Board of Directors
Western States Seismic Policy Council

We have reviewed the accompanying financial statements of Western States Seismic Policy Council (a nonprofit organization), which comprise the statements of financial position as of November 30, 2015 and 2014, and the related statements of activities and cash flows for the year then ended, and notes to the financial statements. A review includes primarily applying analytical procedures to management's financial data and making inquiries of management. A review is substantially less in scope than an audit, the objective of which is the expression of an opinion regarding the financial statements as a whole. Accordingly, we do not express such an opinion.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement whether due to fraud or error.

Accountant's Responsibility

Our responsibility is to conduct the review engagement in accordance with Statements on Standards for Accounting and Review Services promulgated by the Accounting and Review Services Committee of the AICPA. Those standards require us to perform procedures to obtain limited assurance as a basis for reporting whether we are aware of any material modifications that should be made to the financial statements for them to be in accordance with accounting principles generally accepted in the United States of America. We believe that the results of our procedures provide a reasonable basis for our conclusion.

Accountant's Conclusion

Based on our review, we are not aware of any material modifications that should be made to the accompanying financial statements in order for them to be in accordance with accounting principles generally accepted in the United States of America.

Cook CPA Group

Roseville, California
February 9, 2016

WESTERN STATES SEISMIC POLICY COUNCIL
STATEMENTS OF FINANCIAL POSITION
NOVEMBER 30, 2015 AND 2014

	2015	2014
Assets:		
Cash	129,107	154,848
Grants receivables (Note 2)	59,437	19,211
Books and periodicals	500	500
Office equipment at cost (Less accumulated depreciation of $7,165 and $7,035) (Note 3)	979	1,109
Total Assets	$ 190,023	$ 175,668
Liabilities:		
Accrued expenses and accounts payable	16,675	$ 2,708
Accrued vacation	5,148	3,751
Total Liabilities	21,823	6,459
Net Assets:		
Unrestricted	168,200	169,209
Total Net Assets	168,200	169,209
Total Liabilities and Net Assets	$ 190,023	$ 175,668

See accompanying notes and independent accountant's review report.

WESTERN STATES SEISMIC POLICY COUNCIL
STATEMENTS OF ACTIVITIES
FOR THE YEARS ENDED NOVEMBER 30, 2015 AND 2014

	Unrestricted	
	2015	**2014**
Revenues and Support:		
Membership dues and registration	3,875	$ 4,475
FEMA cooperative agreements	281,488	232,199
Interest income	214	201
Total Revenues and Support	285,577	236,875
Expenses:		
Program services	249,049	197,123
Management and general	37,537	36,635
Total Expenses	286,586	233,758
Change in Net Assets	(1,009)	3,117
Net Assets at Beginning of Year	169,209	166,092
Net Assets at End of Year	$ 168,200	$ 169,209

See accompanying notes and independent accountant's review report.

WESTERN STATES SEISMIC POLICY COUNCIL
STATEMENT OF FUNCTIONAL EXPENSES
YEAR ENDED NOVEMBER 30, 2015

	Program Services	Management and General	Total
Salaries and fringe benefits	$ 113,100	$ 20,679	$ 133,779
Payroll taxes	8,078	1,426	9,504
Professional fees - accounting	1,345	5,380	6,725
Professional fees - other	1,004	177	1,181
Rent	15,830	2,794	18,624
Insurance	911	304	1,215
Telephone	2,349	784	3,133
Office supplies and miscellaneous	7,180	2,394	9,574
Internet services	1,145	-	1,145
Staff expenses	10,878	-	10,878
Conference expenses	5,529	-	5,529
State assistance	71,357	-	71,357
Executive committee	9,540	1,061	10,601
Bank and payroll charges	803	2,408	3,211
Depreciation and amortization	-	130	130
Total Expenses	$ 249,049	$ 37,537	$ 286,586

See accompanying notes and independent accountant's review report.

WESTERN STATES SEISMIC POLICY COUNCIL
STATEMENT OF FUNCTIONAL EXPENSES
YEAR ENDED NOVEMBER 30, 2014

	Program Services	Management and General	Total
Salaries and fringe benefits	$ 115,822	$ 21,468	$ 137,290
Payroll taxes	6,835	1,207	8,042
Professional fees - accounting	1,262	5,047	6,309
Professional fees - other	3,756	663	4,419
Rent	15,830	2,794	18,624
Insurance	772	257	1,029
Telephone	2,078	694	2,772
Office supplies and miscellaneous	2,733	911	3,644
Internet services	1,401	-	1,401
Staff expenses	5,445	-	5,445
Conference expenses	8,391	-	8,391
State assistance	22,822	-	22,822
Executive committee	9,209	1,024	10,233
Bank and payroll charges	767	2,302	3,069
Depreciation and amortization	-	268	268
Total Expenses	$ 197,123	$ 36,635	$ 233,758

See accompanying notes and independent accountant's review report.

WESTERN STATES SEISMIC POLICY COUNCIL
STATEMENT OF CASH FLOWS
NOVEMBER 30, 2015 AND 2014

	2015	2014
RECONCILIATION OF NET INCOME FROM OPERATIONS TO NET CASH PROVIDED BY OPERATING ACTIVITIES:		
Change in net assets	$ (1,009)	$ 3,117
Change in operating assets and liabilities:		
Depreciation	130	268
(Increase) Decrease in:		
Grants receivable	(40,226)	12,437
Increase (Decrease) in:		
Accounts payable	13,967	(6,988)
Accrued vacation	1,397	(318)
Cash provided by operating activities	(25,741)	8,516
NET (DECREASE) INCREASE IN CASH	(25,741)	8,516
Cash, Beginning of the year	154,848	146,332
Cash, End of the year	$ 129,107	$ 154,848

See independent accountant's review report.

NOTE 1 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Description of Organization

The Western States Seismic Policy Council (the Council) was founded in 1979 and incorporated in 1996 as a 501 (c)(3) non-profit organization. The Council provides a forum to develop seismic policies and share information to promote programs to reduce earthquake losses throughout the western region of the United States, three U.S. territories, a Canadian territory, and a Canadian province. It is funded primarily by the Department of Homeland Security's Federal Emergency Management Agency (FEMA).

Basis of Accounting

The Council prepares its financial statements in accordance with accounting principles generally accepted in the United States of America, which involves the application of accrual accounting; consequently, revenue and support are recognized when earned, and expenses are recognized when incurred.

Financial Statement Presentation

Financial statement presents information regarding its financial position and activities according to three classes of net assets: unrestricted net assets, temporarily restricted net assets, and permanently restricted net assets. The Council has no temporarily and permanently restricted net assets during 2015 and 2014.

Allowance for Uncollectible Accounts

No allowance for uncollectible accounts has been provided since management considers all accounts to be collectible as the grants receivable have historically been received in full.

Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management makes estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Cash and Cash Equivalents

For the purposes of reporting cash flows, the Council considers all unrestricted highly liquid investments with an initial maturity of three months or less to be cash equivalents.

NOTE 1 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

Functional Allocation of Expenses

The costs of providing the Council's programs and supporting services have been summarized on a functional basis. Accordingly, certain costs have been allocated among the programs and supporting services.

Grants and Cooperative Agreements

The grants and cooperative agreements are cost reimbursement type agreements; therefore, the Council records income when expenditures are made in compliance with the terms of the agreements.

Income Taxes

The Council under preliminary determination is a not-for-profit organization that is exempt from income taxed under Section 501(c)(3) of the Internal Revenue Code and Section 23701(d) of the California Revenue and Taxation Code.

Property and Equipment

Property and equipment are recorded at cost when acquisition costs are greater than $5,000. Depreciation is provided on the straight-line basis over five years.

Subsequent Event

The Council has evaluated subsequent events for potential recognition and/or disclosure through February 9, 2016, the date the financial statements were issued.

NOTE 2 – GRANTS AND COOPERATIVE AGREEMENT RECEIVABLES

The Council has a receivable from FEMA in the following amounts as of November 30:

	2015	2014
FEMA	59,437	$ 19,211
	$ 59,437	$ 19,211

NOTE 3 – OFFICE EQUIPMENT

Property and equipment consist of the following as of November 30:

	2015	2014
Computer equipment	3,321	$ 3,321
Office equipment	4,823	4,823
Total	8,144	8,144
Less accumulated depreciation	(7,165)	(7,035)
Capital assets, net	$ 979	$ 1,109

Depreciation expense for the year ending November 30, 2015 and 2014 totaled $130 and $268, respectively.

NOTE 4 – FEMA REVENUE

FEMA revenue consists of the following for the year ended November 30:

	2015	2014
2012 FEMA	$ -	$ 4,707
2013 FEMA	-	172,229
2014 FEMA	192,113	55,263
2015 FEMA	89,375	-
Total	$ 281,488	$ 232,199

NOTE 5 – LEASE AGREEMENT

The Council leases office space in Sacramento, California on a month to month lease, in arrears, in the amount of $1,552.

NOTE 6 – DEFINED CONTRIBUTION PLAN

The Council sponsors a defined contribution plan (a SIMPLE IRA plan) covering regular employees who meet certain eligibility requirements. The Council matches an employee's contribution dollar for dollar up to 3% per year. Employees who qualify under Internal Revenue Service rules may make catch up contributions to this plan. The contributions made during the years ended November 30, 2015 and 2014 were $2,522 and $2,460, respectively.

NOTE 7 – COMMITMENTS AND CONTINGENCIES

The Council received a grant from FEMA for an amount of $275,500 for the time period from August 1, 2014 to July 31, 2015. As of November 30, 2015, there was a total remaining of $28,124, which was forfeited. The Council received a grant from FEMA for an amount of $350,000 for the time period from August 1, 2015 to July 31, 2016, $225,000 for basic operations and $125,000 for supporting projects designated by FEMA. As of November 30, 2015, there was a total of $260,625 remaining to be used by the Council for performance of various services in accordance with the terms of the grant.

Subsection 2-2

WSSPC FY 14-15 Income and Expenses
December 2014 through November 2015

Western States Seismic Policy Council
FY 14-15 Income Expense
December 2014 through November 2015

	TOTALS	FEMA 2014	FEMA 2015	WSSPC
Income				
401.0 · Interest Inc				
401.1 · Money Mkt Interest Income	200.24	0.00	0.00	200.24
401.2 · CD Interest Income	14.45	0.00	0.00	14.45
Total 401.0 · Interest Inc	214.69	0.00	0.00	214.69
410.0 · Membership Dues	3,875.00	0.00	0.00	3,875.00
450.0 · Grants Earned				
460.0 · FEMA Grants Earned				
460.10 · 2014 FEMA Grants Earned	192,113.05	192,113.05	0.00	0.00
460.11 · 2015 FEMA Grants Earned	89,375.05	0.00	89,375.05	0.00
Total 460.0 · FEMA Grants Earned	281,488.10	192,113.05	89,375.05	0.00
Total 450.0 · Grants Earned	281,488.10	192,113.05	89,375.05	0.00
Total Income	285,577.79	192,113.05	89,375.05	4,089.69
Expense				
500.0 · P/R Expenses				
500.1 · Salary	116,583.32	76,064.96	40,518.36	0.00
500.2 · Benefits				
500.7 · Employee IRA Contribution				
500.701 · Employer IRA Contrib-forSutch	2,522.16	1,681.44	840.72	0.00
500.7 · Employee IRA Contribution - Other	0.00	0.00	0.00	0.00
Total 500.7 · Employee IRA Contribution	2,522.16	1,681.44	840.72	0.00
500.2 · Benefits - Other	13,585.04	8,986.42	3,838.62	760.00
Total 500.2 · Benefits	16,107.20	10,667.86	4,679.34	760.00
500.3 · Employer Contrib/Taxes	9,504.38	6,254.71	3,249.67	0.00
500.4 · Workers' Comp	1,088.65	818.97	269.68	0.00
500.5 · Payroll Service	2,614.17	1,909.29	704.88	0.00
Total 500.0 · P/R Expenses	145,897.72	95,715.79	49,421.93	760.00
506.0 · Prof Fees Accounting	6,725.00	6,725.00	0.00	0.00
507.0 · Prof Fees Consulting	1,166.25	846.25	320.00	0.00
509.0 · Prof Fees Other	15.00	15.00	0.00	0.00
510.0 · Office Supplies	5,343.00	4,527.60	177.40	638.00
515.0 · Telephone	3,132.70	2,249.42	883.28	0.00
520.0 · Printing	2,484.51	2,484.51	0.00	0.00
522.0 · Postage and Delivery	139.25	66.13	73.12	0.00
525.0 · Internet Services	1,145.45	829.45	316.00	0.00
530.0 · Staff Expenses				
530.1 · Staff Meals	861.67	0.00	0.00	861.67
530.2 · Staff Mileage	687.51	408.63	278.88	0.00
530.3 · Staff Transportation	2,307.98	2,265.98	42.00	0.00
530.4 · Staff Hotel	5,240.06	3,614.73	671.48	953.85
530.6 · Staff Meetings	1,780.00	0.00	1,780.00	0.00
Total 530.0 · Staff Expenses	10,877.22	6,289.34	2,772.36	1,815.52
535.0 · Executive Committee Expense				

Western States Seismic Policy Council
FY 14-15 Income Expense
December 2014 through November 2015

	TOTALS	FEMA 2014	FEMA 2015	WSSPC
535.1 · Meals Exec Comm	1,208.46	0.00	457.11	751.35
535.2 · Mileage Exec Comm	517.30	459.80	57.50	0.00
535.3 · Transportation Exec Comm	4,955.44	2,930.78	2,024.66	0.00
535.4 · Hotel Exec Comm	3,905.15	1,843.15	2,062.00	0.00
535.5 · Meetings Exec Comm	15.95	0.00	15.95	0.00
Total 535.0 · Executive Committee Expense	10,602.30	5,233.73	4,617.22	751.35
550.0 · Workshops/Projects				
550.10 · State Support - NV	18,485.98	8,150.08	10,135.43	200.47
550.11 · State Support-Alaska	13,778.39	0.00	13,778.39	0.00
550.2 · EQ Program Managers Meeting	22,930.88	22,930.88	0.00	0.00
550.3 · Basin & Range Prov	150.49	0.00	150.49	0.00
550.8 · State Support - AZ	4,696.22	4,696.22	0.00	0.00
550.9 · State Support - WY	11,316.16	11,316.16	0.00	0.00
Total 550.0 · Workshops/Projects	71,358.12	47,093.34	24,064.31	200.47
554.0 · Conferences				
554.8 · 2015Annual Conference	5,449.88	4,524.25	0.00	925.63
554.9 · 2016 NEC	78.71	0.00	78.71	0.00
Total 554.0 · Conferences	5,528.59	4,524.25	78.71	925.63
570.0 · Insurance				
570.1 · Liability Insurance	1,054.00	1,054.00	0.00	0.00
570.3 · Insurance Other	161.02	272.00	0.00	-110.98
Total 570.0 · Insurance	1,215.02	1,326.00	0.00	-110.98
575.0 · Rent	18,624.00	12,416.00	6,208.00	0.00
580.0 · Bank Service Charges	596.54	243.99	352.55	0.00
581.0 · Equipment Rental				
581.3 · Postage meter	137.04	90.07	46.97	0.00
Total 581.0 · Equipment Rental	137.04	90.07	46.97	0.00
583.0 · Miscellaneous Expenses	1,430.38	1,387.18	43.20	0.00
591.0 · Licenses and Permits	40.00	50.00	0.00	-10.00
595.0 · Depreciation Expense	130.00	0.00	0.00	130.00
Total Expense	286,588.09	192,113.05	89,375.05	5,099.99
Net Income	-1,010.30	0.00	0.00	-1,010.30

Subsection 2-3

FEMA Grant 2014
August 2014 through July 2015

Western States Seismic Policy Council
FEMA 2014 Cooperative Agreement EMW-2014-CA-00189
August 1, 2014 - July 31, 2015

TASKS / EXPENSES	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015
SUMMARY												
Total Cooperative Agreement Amount	275,500.00											
Amt Budgeted Per Month	16,637.02	16,875.05	17,262.79	21,013.88	16,363.05	16,957.75	18,846.97	18,006.34	17,232.47	28,435.08	20,462.56	16,907.04
Cumulative Amount Budgeted	16,637.02	33,512.07	50,774.86	71,788.74	88,151.79	105,109.54	123,956.51	141,962.85	159,195.32	187,630.40	208,092.96	225,000.00
Cumulative Budget Remaining	258,862.98	241,987.93	224,725.14	203,711.26	187,348.21	170,390.46	151,543.49	133,537.15	116,304.68	87,869.60	67,407.04	50,500.00
Amt Expended Per Month	8,960.45	12,536.99	14,554.80	19,210.69	13,923.55	18,906.80	14,255.14	21,495.60	19,733.07	52,000.65	23,905.51	27,892.73
Amount Expended to Date	8,960.45	21,497.44	36,052.24	55,262.93	69,186.48	88,093.28	102,348.42	123,844.02	143,577.09	195,577.74	219,483.25	247,375.98
Cumulative Funds Remaining	266,539.55	254,002.56	239,447.76	220,237.07	206,313.52	187,406.72	173,151.58	151,655.98	131,922.91	79,922.26	56,016.75	28,124.02
PLANNED MONTHLY COST	**16,637.02**	**16,875.05**	**17,262.79**	**21,013.88**	**16,363.05**	**16,957.75**	**18,846.97**	**18,006.34**	**17,232.47**	**28,435.08**	**20,462.56**	**16,907.04**
TASK 1.0 DEVELOP SEISMIC POLICIES	**244.81**	**754.58**	**2,169.74**	**6,589.26**	**973.61**	**203.14**	**1,346.38**	**3,753.89**	**1,331.10**	**9,251.26**	**2,071.56**	**3,610.80**
1.1 Develop Seismic Policies												
1.2 Hold Committees Meetings & Annual Meeting												
1.3 Hold Board Meetings												
TASK 2.0 PROVIDE FORUMS	**392.71**	**454.75**	**663.04**	**997.08**	**1,459.58**	**2,484.39**	**3,067.90**	**1,275.48**	**5,085.86**	**7,190.21**	**3,457.00**	**472.00**
2.1 Conduct WSSPC Awards in Excellence												
2.2 Organize National EQ Program Managers Meeting												
2.3 Support Earthquake Early Warning												
TASK 3.0 PROVIDE OUTREACH/PUBLIC EDUCATI	**7,827.53**	**8,528.77**	**8,645.14**	**6,167.73**	**5,938.15**	**6,574.96**	**7,031.94**	**7,546.75**	**4,116.00**	**4,472.94**	**7,574.96**	**4,560.00**
3.1 Provide up to date Website												
3.2 Distribute Quarterly newsletter												
3.3 Prepare an Annual Report												
TASK 4.0 EXPAND PARTNERSHIPS	**754.23**	**871.26**	**1,227.36**	**998.05**	**1,405.58**	**1,789.65**	**1,600.48**	**1,103.24**	**1,364.53**	**1,243.96**	**1,156.00**	**1,200.66**
4.1 Maintain Partnerships (e.g. ShakeOut)												
4.2 WSSPC Affiliate Member Program Outreach												
TASK 5.0 FINANCIAL MANAGEMENT	**7,417.74**	**6,265.69**	**4,557.51**	**6,261.76**	**6,586.13**	**5,905.61**	**5,800.27**	**4,326.98**	**5,334.98**	**6,276.71**	**6,203.04**	**7,063.58**
5.1 Manage Program/Financial of Co-Op Agreement												
5.2 Manage WSSPC Finances												
5.3 Maintain Office w/FT Exec Dir & Support Staff												
TASK 6.0 SUPPORT STATES	**50,500.00**											
6.1 Support States												

Western States Seismic Policy Council
FEMA 2014 Cooperative Agreement EMW-2014-CA-00189
August 1, 2014 - July 31, 2015

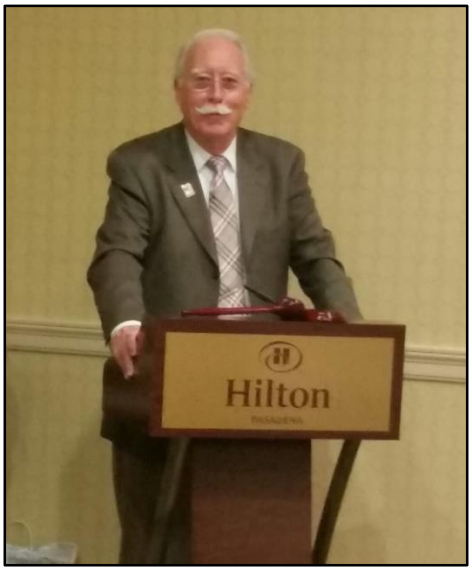
TASKS / EXPENSES	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015
ACTUAL MONTHLY COST	**8,960.45**	**12,536.99**	**14,554.80**	**19,210.69**	**13,923.55**	**18,906.80**	**14,255.14**	**21,495.60**	**19,733.07**	**52,000.65**	**23,905.51**	**27,892.73**
TASK 1.0 DEVELOP SEISMIC POLICIES	**859.59**	**909.51**	**1,907.92**	**5,730.26**	**191.61**	**1,342.95**	**1,757.87**	**2,957.25**	**7,396.58**	**10,958.24**	**715.25**	**1,217.69**
1.1 Develop Seismic Policies												
1.2 Hold Committees Meetings & Annual Meeting												
1.3 Hold Board Meetings												
TASK 2.0 PROVIDE FORUMS	**390.71**	**1,926.02**	**44.89**	**24.22**	**21.29**	**1,444.68**	**2,060.95**	**1,621.37**	**542.88**	**7,096.38**	**143.05**	**0.00**
2.1 Conduct WSSPC Awards in Excellence												
2.2 Organize National EQ Program Managers Meeting												
TASK 3.0 PROVIDE OUTREACH/PUBLIC EDUCATION	**703.29**	**2,264.86**	**7,092.99**	**6,031.75**	**7,504.66**	**5,959.07**	**4,381.23**	**10,721.82**	**3,991.19**	**1,756.22**	**6,091.52**	**8,967.48**
3.1 Provide up to date Website												
3.2 Distribute Quarterly newsletter												
3.3 Prepare an Annual Report												
TASK 4.0 EXPAND PARTNERSHIPS	**195.36**	**410.17**	**134.68**	**1,090.08**	**1,341.26**	**793.56**	**876.92**	**0.00**	**230.70**	**144.35**	**2,074.21**	**81.18**
4.1 Maintain Partnerships (e.g. ShakeOut)												
4.2 WSSPC Affiliate Member Program Outreach												
TASK 5.0 FINANCIAL MANAGEMENT	**6,811.50**	**7,026.43**	**4,915.71**	**5,232.36**	**4,864.73**	**9,366.54**	**5,143.53**	**4,820.17**	**2,676.19**	**4,631.09**	**5,602.76**	**10,248.86**
5.1 Manage Program/Financial of Co-Op Agreement												
5.2 Manage WSSPC Finances												
5.3 Maintain Office w/FT Exec Dir & Support Staff												
TASK 6.0 SUPPORT STATES	**0.00**	**0.00**	**458.61**	**1,102.02**	**0.00**	**0.00**	**34.64**	**1,374.99**	**4,895.53**	**27,414.37**	**9,278.72**	**7,377.52**
6.1 Support States - CA			**458.61**	**1,102.02**								
6.2 NEPM										**18,229.80**	**5,132.60**	
6.3 Arizona							**34.64**	**92.70**	**4,696.22**			
6.4 Nevada								**1,282.29**	**92.28**	**8,823.70**	**47.68**	
6.5 Wyoming									**107.03**	**360.87**	**4,098.44**	**7,377.52**

ANNUAL MEETING

WSSPC held our annual meeting on Friday April 24 in Pasadena, California. The Basin & Range Province; Engineering, Construction and Building Codes; and Tsunami Hazard Mitigation Committees met with full agendas and fruitful discussions leading to changes made to the policies. Four policy recommendation statements were approved by the members.

At the awards luncheon, the 2015 recipients of the Awards in Excellence were recognized. Special awards were given to John Parrish, WSSPC Board Chair, who will retire from the Board when his term expires this year, and John Madden, WSSPC Vice Chair, who is also leaving the Board. The members voted in Board members for 2015-2017 terms: Mark Ghilarducci (CA-EM), Peter McDonough (UT-At Large), and Karen Berry (CO-GS). Dave Norman (WA-GS) will be the new Board Chair.

Mike Mahoney, FEMA Building Science Branch, gave a presentation on the Performance of Buildings and Nonstructural Components of Buildings in the 2014 South Napa Earthquake.



Left: Special award given to John Parrish, WSSPC Board Chair, who will retire from the Board when his term expires this year.
Right: Ann Gravier accepted an award for John Madden, WSSPC Vice Chair, who is also leaving the Board.
Photos: WSSPC

WSSPC AWARDS PROGRAM

WSSPC implemented an awards program to support its mission to develop seismic policies and share information to promote programs intended to reduce earthquake-related losses. Since 1996, WSSPC awards have recognized the hard-working, creative and innovative efforts of those within the earthquake hazards reduction community, brought greater visibility to exemplary programs, projects and products, and facilitated the transfer of successful experiences to other agencies.

- Awards in Excellence are awarded annually to honor exemplary programs, projects, and products that have significantly contributed to addressing earthquake risk reduction through demonstrated achievements in earthquake mitigation, preparedness, response and recovery. If warranted, one award is selected to receive the Overall Award in Excellence.

- The National Awards in Excellence are awarded every four years in partnership with the Northeast States Emergency Consortium (NESEC), the Central U.S. Earthquake Consortium (CUSEC), and the Cascadia Region Earthquake Workgroup (CREW). These awards recognize persons, organizations and agencies in acknowledgement of their achievements, leadership and dedication in earthquake hazards reduction as demonstrated through exemplary programs, projects, and products that address earthquake risk reduction with the United States.

- Lifetime Achievement Awards are awarded periodically to honor outstanding leaders who are currently practicing, and who have demonstrated an extraordinary commitment, level of service, and contribution to earthquake risk reduction throughout their careers.

- WSSPC Leadership Awards are awarded periodically to honor individuals within the WSSPC membership who have demonstrated sustained leadership benefitting the WSSPC community.

The 2015 awards ceremony was held in Pasadena, California, on Friday, April 24. There were 3 Awards in Excellence winners. The winning projects and programs are highlighted on the following three pages.

Overall Award in Excellence for Legislation

Program/Project Name: *Senate Bill No. 135, Earthquake Early Warning*

Administering Agency: California Governor's Office of Emergency Services

Contact: Mark Ghilarducci

Address: 3650 Schriever Avenue, Mather, CA 95655

Email: Mark.Ghilarducci@caloes.ca.gov

Program Summary

Awarded to California Secretary of State Alex Padilla, for sponsoring Senate Bill 135, Earthquake Early Warning System.

Former California State Senator Alex Padilla, representing District 20 (parts of Los Angeles and San Bernardino Counties), is the author of S.B. 135 "Earthquake Early Warning System", a bill that requires California to build an earthquake early warning system. Padilla was successful over the course of five months in achieving unanimous approval of the bill by the Senate and Assembly and Governor Jerry Brown's signature on September 24, 2013.

Above: Bill Mabie, California Deputy Secretary of State accepted the Overall Award in Excellence for Legislation on behalf of Alex Padilla.
Photo: WSSPC

The law requires California Office of Emergency Services, in collaboration with the California Seismic Safety Commission, California Institute of Technology, California Geological Survey, University of California at Berkeley, the U.S. Geological Survey, and other stakeholders, to develop a comprehensive statewide earthquake early warning system that would disseminate earthquake information in support of public safety, emergency response, and loss mitigation.

The cost to build and operate the system for five years is $80 million. The Office of Emergency Services has until January 1, 2016 to identify funding sources other than the State's General Fund.

2015 Award in Excellence for Educational Outreach

Program/Project Name: *Prepare Del Norte*

Administering Agency: County of Del Norte Emergency Services

Contact: Cindy Henderson

Address: 981 H Street, Crescent City, CA 95531

Email: chenderson@co.del-norte.ca.us

Program Summary:

Awarded to Prepare Del Norte for their "Tsunami Safe Week"

Prepare Del Norte coordinates training programs including CERT, C.O.A.D. (Del Norte Community Organizations Active in Disaster), D.A.R.T. (Disaster Animal Response Team), and Neighbors Helping Neighbors, coordinates drills and exercises, provides emergency resources (weather, road, earthquake, tsunami information), promotes ShakeOut and Tsunami Week activities, provides detailed community tsunami information and is the Del Norte Coordination point for the Redwood Coast Tsunami Work Group. Details of these programs are found on the Prepare Del Norte web site – *preparedelnorte.com*. The group also maintains a Facebook page *www.facebook.com/DelNorteOfficeOfEmergencyServices* and a twitter account *@PrepareDN*.

Left: Cindy Henderson and Heather Holt jointly accepted the Award for Educational Outreach for Prepare Del Norte's Tsunami Week
Photo: WSSPC

2015 Award in Excellence for Multi-Jurisdictional Planning

Program/Project Name: *Alaska Shield 2014 Earthquake Exercise*

Administering Agency: Alaska Department of Homeland Security & Emergency Management

Contact: Mike O'Hare, Director; Kathy Cavyell, Lead Exercise Planner

Address: Alaska DHS&EM, P.O. Box 5750, Joint Base Elmendorf-Richardson, AK 99505-5750

Email: mike.ohare@alaska.gov, kathy.cavyell@alaska.gov

Program Summary:

Awarded to Alaska Department of Homeland Security and Emergency Management for their Alaska Shield Earthquake Exercise

The Alaska Shield 2014 exercise was the capstone event for the White House-directed 2014 cycle of national planning and preparedness exercises. The Alaska Shield exercise was a full-scale, live test of the ability of numerous State and Federal agencies (including the military), along with local government and non-government entities to respond to a devastating earthquake affecting a significant area (modeled after the M9.2 1964 Great Alaska Earthquake).

Above: Cathy Cavyell accepted the Multi-Jurisdictional Award for the Alaska Department of Homeland Security & Emergency Management's Alaska Shield Earthquake Exercise
Photo: WSSPC

This exercise was designed and conducted by the Alaska Department of Military & Veterans Affairs, Division of Homeland Security & Emergency Management (DHS&EM), with the support of FEMA Region X.

Alaska Shield 2014 was a linked exercise intended to improve Alaska's emergency response capacity (individual/organization/interagency), validate the State's, FEMA, Department of Defense, and local community response plans, test interagency coordination; and to explore recovery plans in the face of a catastrophic earthquake.

OUTREACH

e-Newsletter

Western States Seismic Policy Council has published a quarterly newsletter highlighting WSSPC member news since 1995; in 2008, the newsletter became an electronic "e-Newsletter". Sections include summaries of WSSPC member news; hazard mitigation and preparedness activities; research findings; updates on the recovery and resiliency of previous earthquake and tsunami-impacted areas; and earthquake and tsunami publications and resources.

The e-Newsletter is distributed by email to WSSPC members and affiliates, other earthquake consortia members, earthquake organizations, Federal Emergency Management Agency (FEMA) representatives, and United States Geological Survey (USGS) contacts. In addition, the e-Newsletter is posted on our website and the link is broadcast through social media announcements on Facebook and Twitter. Current and previous e-Newsletters are available for download from the WSSPC website at *www.wsspc.org/news/e-newsletters*. The e-newsletter is published in January, April, July, and October.

WSSPC encourages member agencies – as well as other earthquake and tsunami organizations – to forward their information and news items for inclusion in upcoming editions. To subscribe to the WSSPC e-Newsletter, send an email to *info@wsspc.org*.

Monthly Bulletin

Western States Seismic Policy Council began publishing a monthly bulletin in December of 2014. The online publication is distributed every month except when a quarterly newsletter is produced. Monthly bulletins include upcoming events and time sensitive news concerning WSSPC members.

The monthly bulletin is distributed by email to WSSPC members and affiliates, other earthquake consortia members, earthquake organizations, Federal Emergency Management Agency (FEMA) representatives, and United States Geological Survey (USGS) contacts. Current and previous monthly bulletins are available for download from the WSSPC website at *www.wsspc.org/news/monthly-bulletins*.

WSSPC encourages member agencies – as well as other earthquake and tsunami organizations – to forward their information and news items for inclusion in upcoming editions. To subscribe to the WSSPC monthly bulletin, send an email to *info@wsspc.org*.

Website: www.WSSPC.org

The WSSPC website – *www.wsspc.org*– showcases our official documents, policies and publications, and provides links to WSSPC members' agencies, WSSPC technical committee activities, annual Awards in Excellence profiles, e-Newsletters and Bulletins, and earthquake and tsunami resources. It also provides a password protected section for Board and Committee Members to access working documents and sensitive information.

To gauge the website's effectiveness and reach, WSSPC has been using Google Analytics to monitor visitor statistics to the website. This web-based tool provides us with an overview of website visits; visitors' geographical locations; pages viewed; keywords and third-party links used to find our site; how quickly visitors leave the site, and much more.

Website usage statistics on the number of Visitors, the number of Visits, and Page Views are monitored and provided to FEMA on a quarterly basis. The 2014-2015 fiscal year yielded over 23,000 page views.

With the exception of commercial traffic referred to the website, FEMA, *earthquakeconference.org*, NOAA, Oregon, USGS, Nevada, NIST, Colorado, Alaska, and Washington are the top 10 referrers to the website.

This year, Google searches led visitors to our pages from 124 countries around the world; the top five include the United States, Australia, Canada, United Kingdom, and China.

Member Links to WSSPC

The following WSSPC members and partners have added a *www.wsspc.org* hyperlink to their agency's website to refer them to WSSPC.

Member and Partner Organization	Link Location
Alaska Division of Geological and Geophysical Surveys	http://www.dggs.dnr.state.ak.us/links/geology-links.php
California Geological Survey	http://www.conservation.ca.gov/cgs/shzp/Pages/SHMPmorelinks.aspx
California Seismic Safety Commission	http://www.seismic.ca.gov/links.html
Cascadia Region Earthquake Workgroup	http://www.crew.org/news-events/blog/wsspc-releases-tsunami-report
Central U.S. Earthquake Consortium	http://cusec.org/earthquake-information/resources-a-links.html
Colorado Division of Emergency Management	http://www.coemergency.com/search/label/earthquake
Federal Emergency Management Agency	http://www.fema.gov/earthquake-contacts/regional-earthquake-consortia
Idaho Bureau of Homeland Security	http://www.bhs.idaho.gov/Pages/Preparedness/Hazards/NaturalHazards/Earthquake.aspx
Idaho Geological Survey	http://www.idahogeology.org/DrawOnePage.asp?PageID=179
Montana Bureau of Mines and Geology	http://mbmgquake.mtech.edu/news.html
Nevada Division of Emergency Management	http://dem.nv.gov/links/
Nevada Bureau of Mines and Geology	http://www.nbmg.unr.edu/Links.html
Nevada Earthquake Safety Council	http://www.nbmg.unr.edu/nesc/
New Mexico Dept. of Homeland Security and Emergency Management	http://www.nmdhsem.org/Preparedness_Links.aspx (Linked to "Earthquake and Seismic Activity Information")
New Mexico Bureau of Geology and Mineral Resources	http://geoinfo.nmt.edu/links/home.html
Oregon Office of Emergency Management	http://www.oregon.gov/OMD/OEM/Pages/plans_train/earthquake.aspx#Additional_Information
Oregon Department of Geology and Mineral Industries	http://www.oregongeology.org/sub/links/EQlinks.HTM
Oregon Seismic Safety Policy Advisory Commission	http://www.oregon.gov/OMD/OEM/Pages/osspac/osspac.aspx
United States Geological Survey	http://earthquake.usgs.gov/other_eqsites.php
Utah Geological Survey	http://geology.utah.gov/about-us/geologic-programs/geologic-hazards-program/for-consultants-and-design-professionals/useful-websites/#toggle-id-11
Utah Seismic Safety Commission	https://ussc.utah.gov/pages/help.php?section=Web+Links
Washington Emergency Management Division	http://mil.wa.gov/preparedness
Wyoming State Geological Survey	http://www.wsgs.wyo.gov/hazards/earthquakes
Yukon Emergency Measures Organization	http://www.community.gov.yk.ca/emo/links.html

Social Media

Western States Seismic Policy Council has integrated social media into its information sharing mission. WSSPC has Twitter and Facebook accounts that are used to distribute information and connect with a larger audience. Information postings include meeting announcements, webinars offered by partner agencies, calls for WSSPC award nominations, earthquake anniversaries, and other news of interest to our audience. Every time we distribute an e-newsletter or monthly bulletin, we also announce them on both platforms.

Between December 1, 2014 and November 30, 2015 the WSSPC Facebook page "likes" more than doubled, from 46 to 107. At the end of November 2015, WSSPC had 85 Twitter "followers," up from 50 the previous year.

The links to WSSPC's social media are located below.

Facebook: *www.facebook.com/WSSPC*

Twitter: *https://twitter.com/wsspc*

Outreach Events: Napa Strong

WSSPC shared an information booth with the California Governor's Office of Emergency Services (Cal OES) and the California Geological Survey (CGS) at the "Napa Strong" public commemoration event in August 2015. Napa Strong marked the one year anniversary of the damaging M6.0 South Napa earthquake and featured information booths from government agencies, public utilities, non-profit organizations and businesses that provided earthquake science, mitigation, preparedness, response, and recovery information to the public. A ceremony featured speakers including politicians, first responders, and a first-hand tale of recovery and courage by a teenager who was critically injured in the quake.

Above: Napa Strong Event photos
Photos: WSSPC

STATE SUPPORT PROJECTS

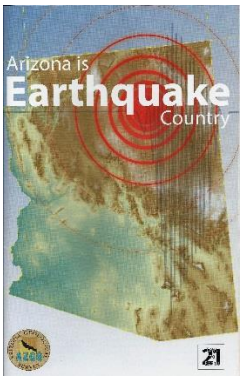
Alaska (FY15)

Alaska's Next Big Earthquake Workshop met November 12-13, 2015, in Fairbanks, Alaska. The overarching objective of this workshop is to create a forum to bring together State, Federal, regional, and local Subject Matter Experts and stakeholders with missions, knowledge and/or vulnerabilities related to earthquakes and lay the foundation for a new working group that can educate and advocate with the combined assets of all partners.

Specific workshop goals are to:
1) Create new multi-jurisdictional and public-private partnerships
2) Publish a summary document for legislators, media and interested parties outlining current earthquake awareness and preparedness efforts
3) Identify steps needed to make a long-term working group successful
4) Identify a small set of actionable state priorities

Approximately 50 people attended the workshop. Presentations focused on sharing earthquake knowledge; roles, needs and concerns of each organization; and ideas to explore future working relationships.

Arizona (FY14, complete)



The Arizona Geological Survey (AZGS) published the 44-page booklet *Arizona is Earthquake Country* in 2012. This colorful and illustrated booklet was written to inform the Arizona public regarding the earthquake hazards and risk in Arizona and provide information on how to prepare for and to mitigate the impacts of ground shaking. WSSPC printed 5,000 copies of the booklet for distribution to Yuma, Yavapai, Greenlee and Coconino Counties. Each County Emergency Manager's office received 1,000 copies to distribute to local agencies, offices and individuals who would benefit most. The remaining 1,000 copies were provided to the Arizona Geological Survey to distribute per request. *Arizona is Earthquake Country* is available online at the AZGS Document Repository (*http://repository.azgs.az.gov/uri_gin/azgs/dlio/1459*).

California (FY14, complete)

WSSPC provided funding to print 12,000 copies of *Mobile Homes in Earthquakes: How to Protect Your Home and Family* for California. These flyers were distributed after the 2014 South Napa earthquake, at LP25 commemorating the 25th anniversary of the Loma Prieta earthquake, and at the Napa Strong event 1 year after the Napa earthquake.

Hawaii (FY15)

The last big earthquake in Hawaii was in 2006 at Kiholo Bay on the Big Island. Hawaii's Earthquake and Tsunami Advisory Committee (HETAC) and WSSPC worked collaboratively to develop a workshop agenda that would identify progress made since that event, including improved building codes and strengthened infrastructure, and discuss with appropriate stakeholders how to further resilience within the State. The agenda will include new scientific and engineering knowledge, emerging technologies, and improved coordination among stakeholders. The workshop was scheduled for February 17-18, 2016.

Nevada (FY14-FY15, complete)

WSSPC partnered with Nevada to use billboards for the purposes of earthquake outreach and education to communities throughout Nevada. Billboard messaging is available 24 hours a day, 7 days a week and thereby enhances the significance of earthquake safety awareness and preparedness through repetitive viewing. All of urban Nevada was covered in two separate fiscal year projects.

The FY14 project focused on northern Nevada in the Carson City-Reno area during Preparedness Month (May 2015) using the billboard image above, left. We were able to obtain five (5) electronic billboards for four (4) weeks, and an extra bonus week due to one poor electronic display noted on our site visit by the Executive Director. Nearly 2 million impressions were estimated.

For the same amount of funding as in FY14, the FY15 project was able to obtain 10 electronic and 3 static billboards to run for approximately 4 weeks starting October 1, 2015 (ShakeOut month) in the Las Vegas, Nevada area, educating on "Drop, Cover, Hold On" during an earthquake. WSSPC worked closely with Ron Lynn, Chair of the Nevada Earthquake Safety Council and Director of Development Services in Clark County, Nevada; Stacey Welling, PIO, and Janell Woodward, Emergency Manager. Nevada supplied the distinctive artwork for the billboards, and leveraged it into banners, posters, and flyers. The

WSSPC Executive Director and Program Manager visited Las Vegas in October to ensure that the billboards were up and operational. The billboards produced 28 million impressions.

Utah, Idaho, Oregon (FY15)

The State of Utah has developed an outline and content for a handbook that is intended to support first responders after an earthquake, similar to the *Wildland Fire Incident Management Field Guide (http://www.nifc.gov/nicc/logistics/references/Wildland%20Fire%20Incident%20Management%20Field%20Guide.pdf)*. The need for this product was highlighted with the Wells, Nevada earthquake response where the first responder community did not have guidance or familiarity with earthquake issues, such as the building inspection process, triggers for re-inspection based on aftershocks, siting of field response operations centers, etc. The project is supported by WSSPC Policy 14-5 that "recommends that an Earthquake Emergency Handbook for first responders and incident commanders be developed, preferably by an interagency task force."

By the end of the WSSPC fiscal year November 30, 2015, WSSPC had created a webpage to post all of the documents submitted as examples, and an outline was developed for the document. The webpage is located at *http://www.wsspc.org/earthquake-response-handbook/* .

Wyoming (FY14, complete)

WSSPC was asked to print a flyer specific to Wyoming's earthquake hazard: *Did You Know Wyoming is Earthquake Country*. In 2012 the single-page flyer was distributed to the public as an insert to local newspapers in the Western third of the state, where the earthquake risk is greatest. Wyoming proposed an additional printing of the flyer, with the intent of utilizing it as a follow-up handout to all 90,000 school children participating in the annual Wyoming ShakeOut.

A cost effective printing of the 90,000 flyers permitted us to print additional items for Wyoming:

- 5000 ShakeOut invitation cards
- 2000 *My Pet in an Earthquake* cards
- 2000 decks of playing cards with earthquake preparedness messages

Earthquake Program Managers Meeting (FY14, complete)

WSSPC supported 15 state earthquake program managers and one speaker to attend the National Earthquake Program Managers Meeting in Charleston, South Carolina, May 5-8, 2015.

COLLABORATION

2015 National Earthquake Program Managers Meeting

The 2015 National Earthquake Program Managers meeting was held in historic Charleston, South Carolina on May 5-8, 2015. The goal of the meeting was to continue dialogue and relationship building between State Earthquake Program Managers and key stakeholders since the 2014 NEPM Meeting in Denver, Colorado. At the meeting were approximately 60 people from State and Territorial Earthquake Program Managers, Senior leadership from State and Federal Government, the NEHRP Secretariat, as well as the NEHRP Earthquake Consortia and Program Partners.

Additionally, there was a field trip to see lasting effects of the 1886 M7.3 earthquake which caused extensive damage in Charleston, and is one of the largest earthquakes on record in the United States.

Meeting sessions included:

- NEHRP Updates
- State, FEMA, Consortia, and Partner Updates
- Earthquake Program Framework Development
- EERI School Safety Initiative
- Napa Earthquake Case Study
- Mitigation Benefit Cost for Low Risk States

The meeting agenda, notes, and presentations are housed on the National Earthquake Program Managers website at *http://eqprogram.net/2015-nepm-meeting/.*

Co-Sponsored Events

WSSPC Co-Sponsored Events, December 2014-November 2015:

FEMA/FLASH QuakeSmart Business Summits
June 17, 2015 Kent, Washington
June 18, 2015 Portland, Oregon

ATC/USGS Seismic Hazard User-Needs Workshop
September 21-22, 2015
Presentations: *www.atcouncil.org/53-projects/278-atc-127*

AGI Critical Issues Program Webinar: Communicating Cascadia's Earthquake Risk
October 16, 2015
Webinar and Presentation Slides:
www.americangeosciences.org/critical-issues/webinars/communicating-cascadias-earthquake-risk

National Emergency Management Association (NEMA) Earthquake Subcommittee

An Earthquake Subcommittee of the NEMA Response and Recovery Committee was formed in 2015 with the purpose of representing "the national earthquake threat from the state perspective." Subcommittee members "will be asked to work together to address earthquake concerns in their regions and throughout the country. The subcommittee will also address issues with the National Earthquake Hazards Reduction Program (NEHRP)." (quoted from NEMA Earthquake Subcommittee Charter).

The WSSPC Executive Director is a non-voting member of the subcommittee. Voting members of the subcommittee are:

- Robert Ezelle, (Subcommittee Chair) Washington Military Department, Emergency Management Division
- Art Faulkner, Alabama Emergency Management Agency
- Mark Ghilarducci, California Governor's Office of Emergency Services
- Angee Morgan, Kansas Division of Emergency Management
- Mark Schouten, Iowa Department of Homeland Security and Emergency Management

The first meeting was held November 20, 2015 during which committee members were introduced, the Charter was amended and approved, and priorities for the 2016 Work Plan were agreed upon:

1. Addressing the issue of a national earthquake program on the federal level.
2. Reauthorization of the National Earthquake Hazard Reduction Program.
3. Outlining what a national earthquake program would look like.
4. Working with states that have current projects that contribute to the national discussion on earthquakes.
5. Earthquake early warning – education and monitoring.

SECTION 4

WSSPC Policy Recommendations

Subsection 4-1

WSSPC Policy Committees

WSSPC POLICY COMMITTEES

WSSPC uses policy committees – consisting of members, members' agency representatives, and affiliate members – to develop and provide initial review of WSSPC's earthquake and tsunami policy recommendations. There are three standing policy committees: Basin and Range Province Committee, Engineering, Construction, and Building Codes Committee, and Tsunami Hazard Mitigation Committee.

Basin and Range Province Committee

The Basin and Range Province Committee (BRPC) seeks to promote the understanding and study of seismic hazards in the Basin and Range Province (BRP) of the western U.S., and to provide advice and recommendations to policy-making bodies regarding seismic hazards and risk in that region.

Basin and Range Province
Image: USGS

The BRPC consists of geoscientists and emergency managers from Basin-and-Range Province states (Arizona, Idaho, Nevada, New Mexico, and Utah). The BRPC states share common concerns regarding earthquake hazards and risk in the Basin and Range Province (BRP). Among those concerns are the large number of poorly studied or unstudied potentially active normal-slip faults in the BRP; the close proximity of known active faults to BRP urban centers; long recurrence intervals between damaging BRP earthquakes, leading to complacency on the part of both citizens and policy makers; unknowns regarding BRP fault behavior (earthquake clustering and triggering, multi-segment rupture, stress drops, BRP-specific attenuation relations); and the difficulty of preparing for damaging earthquakes in rural areas lacking adequate resources for planning and emergency response.

Goals pursued by the BRPC include promoting scientific research and emergency management functions in the BRP, establishing post-earthquake technical information clearinghouses, establishing informal cooperative agreements between states for technical assistance in the event of a damaging earthquake anywhere within the BRP, and facilitating information dissemination regarding the latest technical research and emergency response issues in the BRP.

Members:

EM = Emergency management representative
GS = Geologic survey representative
SSC = State seismic commission representative

2015 Chair: Bill Phillips, Idaho Geological Survey

Rick Allis, Utah GS
Lee Allison, Arizona GS
Kent Atwood, Montana EM
Wendy Blackwell, New Mexico EM
Bob Carey, Utah EM
Michael Conway, Arizona GS
Anthony Cox, Arizona EM
Craig dePolo, Nevada GS
Jim Faulds, Nevada GS
Melinda Gibson, Wyoming GS
Rob Jackson, Colorado SSC
Dan Koning, New Mexico GS
Dave Love, New Mexico GS
Bill Lund, Utah GS (Past Chair)
Ian Madin, Oregon GS
John Metesh, Montana GS
Phil Pearthree, Arizona GS
L. Greer Price, New Mexico GS
Mark Stephensen, Idaho EM
Mike Stickney, Montana GS
Seth Wittke, Wyoming GS
Jeri Young, Arizona GS

Engineering, Construction, and Building Codes Committee

The Engineering, Construction, and Building Codes Committee considers the need for and requirements of seismic building codes and incentives for building owners to retrofit older buildings.

Members:

2015 Chair: Ron Lynn, Nevada SSC

Rob Jackson, Colorado SSC
Chris Knight, City of Las Vegas
Keith Knudsen, USGS
Mike Mahoney, Federal Emergency Management Agency
Pete McDonough, Utah SSC
Shahin Moinian, ICC-ES
Patrick Otellini, City and County of San Francisco
Woody Savage, U.S. Geological Survey, Emeritus
Buzz Scher, Alaska SSC
Mark Stephensen, Idaho EM
Fred Turner, California SSC
Yumei Wang, Oregon SSC
Barry Welliver, Utah SSC
Kent Yu, Oregon SSC

Tsunami Hazard Mitigation Committee

The Tsunami Hazard Mitigation Committee coordinates and implements tsunami hazards mitigation plans and focuses on developing policies based on the current technology and science.

Members:

2015 Chair: John Schelling, Washington EM

Dan Belanger, Alaska EM
Jacinta Brown, American Samoa EM
Pilar Carbullido, Guam EM
Robert Ezelle, Washington EM
Kathryn Forge, British Columbia EM
Ann Gravier, Alaska EM
Rich Koehler, Alaska GS
Richard McCarthy, California SSC
Kevin Miller, California EM
Dave Norman, Washington GS
Mike O'Hare, Alaska EM
Paul Okubo, Hawaii SSC
George Priest, Oregon GS
Kevin Richards, Hawaii EM
Althea Rizzo, Oregon EM
Tim Walsh, Washington GS
Jay Wilson, Oregon SSC
Rick Wilson, California GS

Subsection 4-2

Policy Recommendations Adopted in 2015

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 15-1

Earthquake and Tsunami Planning Scenarios

Policy Recommendation 15-1

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.

Executive Summary

Earthquake and tsunami planning scenarios provide policy makers, stakeholders, and emergency preparedness personnel with realistic assessments of the areas and types of structures and lifelines that are at most risk of damage, and estimated human casualties. Equally important, scenarios identify areas and infrastructure that are most likely to sustain little or no damage and remain functional following an earthquake, thereby minimizing the placement of valuable response assets in areas where they may not be needed.

The cost to prepare planning scenarios, and to update them regularly, is insignificant compared to the information gained and the future savings from reduced losses to infrastructure, business economics, and human life when the information is used to develop effective seismic-safety policies. Minimizing future earthquake and tsunami damage through prior planning, loss-reduction measures, and providing information to facilitate quick recovery is critical for promoting resilient communities.

Background

The U.S. Geological Survey indicates that losses to the U.S. built environment and to the U.S. economy from natural geologic hazards amount to tens of billions of dollars every year, and the cost of these losses continues to increase. A fundamental reason for this increase is the continued development of population centers and infrastructure in areas known to have significant natural hazards. Policy makers and public agencies at all levels of government must balance the desired needs for community growth and development with concerns for ensuring the safety of the citizenry. Knowledgeable professionals must provide government decision makers, community planners, and developers with factual, timely, and unbiased scientific and engineering assessments of a community's vulnerability to geologic hazards. Planning scenarios have proven to be an effective means for communicating these risks.

Earthquake and Tsunami Planning Scenarios have been prepared for several areas in the western U.S. over the past two decades and have resulted in numerous initiatives to reduce future losses (see Appendix 1). A planning scenario describes a realistic event and the estimated resulting damage and casualties in the affected areas. It may describe the fault rupture that initiates the earthquake, expected ground motion and acceleration, secondary effects triggered by the earthquake (landslides, liquefaction, surface rupture, tsunamis, fires), anticipated emergency response activities and needs, expected structural losses to the building stock and lifelines (major pipelines, power transmission lines, highways, bridges, airports, harbors, hospitals, etc.), and human casualties, as well as areas and types of infrastructure least likely to be damaged or destroyed. The purpose of a scenario is to provide accurate information that can assist governments and developers in engineering, planning, and protecting vulnerable facilities from the destructive effects of a future earthquake; prioritizing emergency relief operations in areas likely to suffer the greatest damage; or planning and conducting emergency response training exercises.

Appendix 1: Completed earthquake planning scenarios

Following the devastating eruption of Mount St. Helens in 1980, President Carter requested the National Security Council to consider the implications of the occurrence of a large damaging earthquake in California. The results of this analysis were presented by FEMA in 1981. One of the major conclusions was that it was unlikely that the collective emergency response capabilities of all levels of government and the private sector would be adequate to cope with a major destructive earthquake in metropolitan areas of California.

In response, the California Governor's Emergency Task Force on Earthquake Preparedness was established in February, 1981. Some 30 committees were formed to deal with improvement of the many emergency response functions that would be needed in such an earthquake emergency: e.g., communications, search and rescue, fire services, medical services, air transport, etc. Working with the Task Force, the California Geological Survey (CGS) developed the first two earthquake planning scenarios for the San Francisco Bay Area and the Greater Los Angeles Area. These two scenarios, funded by FEMA, were readily accepted, and a demand for additional scenarios covering other California metropolitan areas resulted in the production of five more scenarios over the following decade.

The State of Washington, through its Emergency Management Division of the Military Department, and the Earthquake Engineering Research Institute, prepared its first earthquake disaster scenario for the Seattle-Tacoma metropolitan area in 2001. This scenario describes potential damage from the Seattle Fault, and predicts 1,600 deaths, 24,000 injured, police and fire departments overwhelmed, inadequate emergency and shelter services, nearly 40,000 buildings destroyed or rendered uninhabitable, $33 billion in damages and loss, more than 130 fires, and years of rebuilding and recovery. Since that time, the State released its digital Earthquake Scenario Catalog that includes 20 earthquake scenarios using sources that are consistent with the U.S. National Seismic Hazard Map. The project was a collaboration between the Federal Emergency Management Agency, the U.S. Geological Survey, the Washington State Department of Natural Resources, Western Washington University, and URS Corporation.

In 1996, the Nevada Bureau of Mines and Geology (NBMG) produced a detailed scenario for a Reno-Sparks-Carson City earthquake. That scenario, published as NBMG Special Report 20, has been used numerous times in emergency response and recovery exercises, most recently in June 2008.

Most recently, the USGS, in collaboration with the California Governor's Office of Emergency Services (CalOES) and California Geological Survey (CGS) and many community agencies and organizations, has published *The ShakeOut Scenario – Effects of a Potential M7.8 Earthquake on the San Andreas Fault in Southern California* (USGS Open File Report 2008-1150; CGS Preliminary Report 25). Under this scenario, if no additional preparedness and mitigation actions are taken, the resulting damage will cause 2,000 deaths, 50,000 injuries, and $200 billion in damage along with severe, long-lasting disruptions. In 2014, the same groups at the USGS, CGS, and CalOES also completed a similar scenario evaluating the impacts from a large statewide tsunami originating from the Alaska Subduction Zone, which was published in *The SAFRR (Science Application for Risk Reduction) Tsunami Scenario* (USGS Open File Report 2013-1170 and CGS Special Report 229). The USGS SAFRR group and its state partners continue to work on similar useful scenarios for various hazards and vulnerable regions.

Other states with earthquake potential have also prepared these types of scenarios on a formal basis. Washington, in collaboration with the USGS, universities, and others, is undertaking studies of the potential damage from a very large earthquake along the Cascadia Subduction Zone. The California Geological Survey has considered this in one of its original scenarios. In 2007, Oregon completed an initial step in quantifying structures in the state that would be susceptible to damage from an earthquake in its publication *Statewide Seismic Needs Assessment Using Rapid Visual Screening.*

In Alaska, an earthquake planning scenario is in the initial stages of development for the Kodiak area. This scenario is a cooperative effort involving the Alaska Seismic Hazards Safety Commission, Alaska Division of Homeland Security & Emergency Management, city and borough government, FEMA, and U.S. Coast Guard.

Appendix 2: Resources for scenario development

State emergency management agencies and geological surveys as well as the USGS have numerous maps and products which can help form the foundation for earthquake and tsunami planning and mitigation scenarios. Because these products are familiar to and vetted by many of the communities they are prepared for, scenarios based on these products will be simpler and more effective for communities, utilities, and businesses to utilize. These resources may also provide a cost savings to the scenario developers in their hazard assessments, and provide a bridge for improving collaboration between state and federal agencies working on the scenarios.

Other valuable analytical tools are available for incorporation into earthquake and tsunami planning and mitigation scenarios. HAZUS is a powerful risk assessment software program developed by FEMA for analyzing potential losses from earthquakes (as well as from other types of natural hazards). HAZUS combines current scientific and engineering knowledge with geographic information systems (GIS) technology to produce estimates of hazard-related damage before or after an earthquake. A new tsunami module for HAZUS is being developed and should be available for use in the next several years. For HAZUS to be most effective, users should employ the latest census information and a current inventory of the built environment, including transportation and lifeline infrastructure.

Two other analytical tools are available from the USGS; these are ShakeMap and PAGER. ShakeMap combines measurements of ground shaking (actual or modeled) with information about local geology and earthquake location and magnitude to estimate shaking variations within a geographic region. Produced maps are a valuable tool for emergency response, public information, loss estimation, earthquake planning and modeling, and post-earthquake engineering and scientific analyses.

PAGER (Prompt Assessment of Global Earthquakes for Response) is an automated system designed to rapidly estimate the number of people, cities, and regions that have been exposed to severe ground shaking by an earthquake. PAGER products can be sent automatically to affected emergency responders, government agencies, and others with information as to the estimated scope of a potential disaster.

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 15-2

Developing Earthquake and Tsunami Risk-Reduction Strategies

Policy Recommendation 15-2

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.

Executive Summary

Given the high seismic activity in the western states, provinces and territories, and the high risk of loss of life, property damage and economic loss due to earthquakes and related hazards, state and local governments are encouraged to form partnerships that will develop earthquake risk-mitigation plans and risk-reduction strategies that will benefit local communities. Mitigation policies and activities are long-term, multifaceted processes where effective coordination, collaboration and communication among partners are critical. Partnerships with the many state and regional collaborative efforts among emergency management and other agencies and private organizations that have been created in WSSPC states are critical in the effort to educate state and local policymakers about the importance of sound seismic hazard policy.

Background

Given the high seismic activity in the western United States, Pacific territories, and Canada, mitigation of earthquake risks is a common interest among all the western states, territories, and provinces. FEMA's Report 366b, (April 2008), *HAZUS-MH Estimated Annualized Earthquake Losses for the United States*, clearly shows that the western states are most at risk, with 84% of the nation's estimated annual dollar losses from earthquakes. WSSPC, as a consortium of 13 western states, 3 Pacific territories, and a Canadian territory and province, is the ideal organization to promote the benefits of earthquake risk-mitigation policies, to promote collaboration among its members and the federal government, and to share mitigation successes between WSSPC and other organizations. From its inception, WSSPC has strongly supported reduction of losses from seismic events through policy recommendations and annual conferences.

The benefits of proper mitigation and planning is highlighted by cost/ benefit studies that show for every FEMA dollar spent on mitigation, four dollars are saved in reduced disaster relief. In addition, FEMA grants to mitigate natural-hazard risks are expected to save lives and injuries in future events (Multihazard Mitigation Council, 2005, *Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities*).

It is the responsibility and duty of the geological and emergency management community to organize and disseminate key information concerning proper earthquake-risk mitigation. WSSPC encourages its partners to seek potential mitigation outreach activities, mitigation plan development, or construction projects, some of which may be eligible for funding through various mitigation program grants from FEMA or the states/territories. These efforts complement FEMA's Pre-Disaster Mitigation initiatives.

Comprehensive statewide and local earthquake hazard mitigation plans and strategies should include the following elements:

- Assessment of all earthquake hazards to quantify and define the risk to communities;
- Assessment of infrastructure risks;
- Implementation of land-use and development policies to reduce exposure to earthquake hazards;

- Adoption and enforcement of the International Building Codes for the seismic and tsunami design, inspection, and construction of new buildings and structures;
- Adoption of the International Existing Building Code for the maintenance and retrofit of seismically “at risk” structures;
- Development and implementation of retrofit, redevelopment, grant, and abatement programs to help strengthen existing structures, where necessary;
- Support of continuing public-education efforts and public/private partnerships to raise awareness of seismically induced threats and build constituent support for earthquake hazard reduction programs.

Safety of communities and infrastructure can only be accomplished though diligent, informed, and coordinated efforts of regulators and stakeholders. WSSPC will continue to play a key role in that organization and communication effort.

Appendix A: WSSPC Member State Implementation of Policy Recommendation 15-2

Washington: The Resilient Washington State Initiative is a strategic plan for achieving state-level resilience with respect to earthquake hazards. The intent of the project is to identify actions and policies before, during, and after an earthquake that can leverage existing policies, plans and initiatives to realize disaster resilience to earthquakes within a 50-year life cycle.

Alaska: The State of Alaska implements earthquake and tsunami risk-reduction strategies across multiple agencies and by engaging in a variety of public-private partnerships.

The Alaska Seismic Hazards Safety Commission is a Governor-appointed commission consistent of public and private partners whose mission is to advise the Governor, legislature, public and private sectors on reducing the State's vulnerability to seismic hazards and mitigating earthquake and tsunami risk. The ASHSC's 11 membership positions include representatives from the insurance industry, public sector (three), local government (three), State Department of Military and Veterans' Affairs (emergency management), a Federal agency, and State Department of Natural Resources, and the University of Alaska.

The Division of Homeland Security and Emergency Management provides state-level coordination with FEMA programs including NEHRP and Emergency Management Planning Grant and with the NOAA Tsunami Hazard Mitigation Program. DHS&EM's emphasis is on risk-reduction through emergency state and local planning, mitigation, preparedness, response and recovery activities and technical assistance. DHS&EM co-chairs the public-private Alaska Partnership for Infrastructure Protection and leads the State interagency State Hazard Mitigation Advisory Committee. The SHMAC helps devise the all-hazard state mitigation strategy, provides inputs to the state hazard mitigation plan, and prioritizes statewide mitigation project and planning applications for funding.

The Division of Geological and Geophysical Surveys assesses geologic hazards to Alaska buildings, roads, bridges and other installations and structures. They work closely with the USGS. DGGS generates peer-reviewed information about the geology of Alaska and the potential impact of geologic hazards to Alaska's people and infrastructure. They are part of the interagency review committee for the NOAA NTHMP-sponsored tsunami inundation maps and other products. DGGS also administers the Seismic Hazards Safety Commission.

The Alaska Earthquake Center carries the state mandate to track and report earthquake information 24/7 and conduct earthquake hazard assessments. The center, located at the Geophysical Institute at the University of Alaska Fairbanks, is the state archive for seismic data and the historical record of earthquakes. The center partners closely with the USGS, NOAA, NSF and private entities to provided targeted monitoring and research products. The Alaska Earthquake Center is the state partner to the Advanced National Seismic System.

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 15-3

Definitions of Recency of Surface Faulting for the Basin and Range Province

Policy Recommendation 15-3

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 ≥**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.

Executive Summary

The fault activity definitions are limited to the Quaternary because this period of geologic time is considered by the scientific community to be most relevant to studies of active (hazardous) earthquake faults (Machette and others, 2004). The activity class of a fault is the youngest class based on the demonstrated age of most recent surface faulting. The latter two categories of recency are inclusive; that is, latest Pleistocene-Holocene faults are included within the definition of late Quaternary faults, and both latest Pleistocene-Holocene and late Quaternary faults are included in Quaternary faults. WSSPC 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.

The examples of surface-faulting recency categories are based on the ways that faults are portrayed on geologic maps and on the availability of geologic data in the BRP. Policy makers (owners, regulators,

governmental agencies) should consult with state and federal geological surveys and other earthquake-hazard experts to use these categories and additional geologic data in developing definitions of hazardous faulting or categories of faults to be considered in planning for development or infrastructure projects.

Proposed Policy Recommendation 15-3 replaces and updates WSSPC Policy Recommendation 11-2 **Definitions of Fault Activity for the Basin and Range Province**, which was allowed to sunset at the WSSPC Annual Meeting in Anchorage, Alaska, July 21, 2014.

Background

The BRP is a large extensional to transtensional tectonic domain that contains thousands of normal-slip and a lesser number of strike-slip Quaternary faults involved in contemporary deformation. Large earthquakes in the BRP, especially those associated with surface rupture, have occurred on faults with a wide range of recurrence intervals (time between successive surface-faulting earthquakes) and times since their most recent surface-faulting earthquakes. Many of the historic surface-faulting earthquakes in the BRP have ruptured multiple, distributed strands at the surface, which in some cases had significantly different geologic histories.

The tectonic behavior of Quaternary faults in the BRP differs from the more localized, higher slip-rate, chiefly strike-slip tectonics typical of plate boundary systems. These differences may warrant different approaches within the WSSPC region when categorizing recency of surface faulting. The examples of fault recency categories in this policy recommendation are considered appropriate for much of the BRP within the WSSPC region, and depend on whether the fault offsets, or is covered by, geologic materials of different ages. The recency categories are described in more detail below.

A **latest Pleistocene-Holocene** criterion (≤15 ka) for recency of faulting is based upon recognition of faulting in deposits known to be ≤15 kyr old that are widespread over much of the BRP. These deposits are chiefly associated with the last glacial maximum, and with large, well-dated pluvial lakes such as Lake Bonneville and Lake Lahontan. The deposits possess distinctive stratigraphy and geomorphology that can be reliably recognized by geologists without recourse to costly and time consuming dating techniques. The latest Pleistocene-Holocene criterion conforms to usage in the U.S. Geological Survey Quaternary Fault and Fold Database of the United States (*http://earthquake.usgs.gov/hazards/*). However, because major historical earthquakes have occurred in the BRP on faults that do not show surficial evidence of previous latest Pleistocene-Holocene activity, the latest Pleistocene-Holocene span of 15 kyr is too short to encompass the range of average earthquake recurrence intervals on faults in the BRP.

A **late Quaternary** criterion (≤130 ka) for recency of faulting uses the onset of the Sangamon interglacial period as a datum and spans many of the average fault recurrence intervals in the BRP. All but possibly one of the historical surface-faulting earthquakes in the BRP (1887 Sonoran earthquake; Bull and Pearthree, 1988; Suter and Contreras, 2002) occurred on faults that show evidence of late Quaternary activity.

The **Quaternary** criterion (≤2.6 Ma) for recency of faulting represents the onset of a major climatic change to the current cycle of glacial/interglacial intervals, during which most of the surficial deposits and much of the present landscape formed in the BRP. All historical surface-faulting earthquakes in the BRP occurred on faults that show evidence of Quaternary surface faulting. The Quaternary recency of activity criterion encompasses the average recurrence interval for essentially all faults that might produce future surface-faulting earthquakes (≥**M** 6.5) in the BRP.

Recency of Faulting, Fault Activity, and Seismic Hazard

The examples of recency of faulting categories in this policy recommendation are intended to fulfill the needs of a broad spectrum of users involved in evaluating and regulating/mitigating earthquake hazards in much of the BRP. Categories based on recency of faulting use easily obtained observational data, and as such represent a first step toward defining fault activity or seismic hazard associated with faults. Future large, surface-rupturing earthquakes in the BRP most likely will occur on faults that display evidence of prior surface faulting during the late Quaternary (≤130 ka), and almost certainly on faults that display evidence of prior faulting in the Quaternary (≤2.6 Ma). Evaluation of fault activity and seismic hazard should consider timing of the most recent surface-faulting earthquake, and a well-constrained average recurrence interval and/or slip rate spanning multiple paleoearthquake cycles (McCalpin, 2009). Whether a fault within a particular recency category constitutes a hazard or not depends on the time frame of concern and the size and frequency of future earthquakes.

Appropriate recency of faulting criterion allow policy makers to develop guidelines for identifying potential surface-rupture and ground-motion sources and evaluating the seismic hazard they present to a specific activity or infrastructure. Elapsed time since the most recent large earthquake and average earthquake recurrence intervals are critical parameters when determining fault activity, but those data must be evaluated in conjunction with other considerations related to type of facility, societal constraints (level of acceptable risk); and goals, costs, and benefits of risk reduction (Shlemon, 2010; Lund and others, in preparation) when assessing seismic hazard. It is then up to policy makers in each state to decide what degree of fault activity is hazardous and what level of seismic risk is acceptable.

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WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 15-4

Identification and Mitigation of Non-Ductile Concrete Buildings

Policy Recommendation 15-4

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.

Executive Summary

Non-ductile concrete buildings represent a class of structures considered by earthquake risk managers to be particularly susceptible to significant damage and/or collapse during earthquakes making them one of the most dangerous threats to life-safety and economic burdens for communities.

The 1971 San Fernando, California earthquake caused over $500 million in property damage (in 1971 dollars) and 65 deaths, due mainly to the collapse of older concrete buildings. A recent initiative by the City of Los Angeles calls for the assessment of all pre-1976 non-ductile concrete buildings and mandatory retrofitting within 30 years. For those buildings that would incur excessive damage in low levels of earthquake shaking, retrofits would also be required.

WSSPC strongly encourages jurisdictions to be proactive in reducing this threat to communities through legislatively mandated programs and/or municipally adopted ordinances.

Background

Non-ductile concrete buildings are a type of construction in which the walls and columns lack enough reinforcing steel to keep them from collapsing or being damaged beyond repair during earthquakes. These buildings can pose a great threat to life in major earthquakes because, although total collapse of these buildings is rare, just one collapse could cause hundreds of deaths. Non-ductile concrete buildings are generally considered to have been constructed before 1980 and include archaic construction methods dating back to the early 1900s.

The failure of these building types in the 1971 San Fernando, California earthquake directly resulted in significant changes to the building codes and standards for concrete buildings. Consequently, construction standards for concrete buildings since the late 1970's have been dramatically improved helping to provide adequate collapse resistance in earthquakes. The 2011 Christchurch earthquake underscores the vulnerability of non-ductile reinforced concrete structures.

Due to the high costs of retrofits and the infrequent occurrence of collapse, it is difficult to quantify their cost-effectiveness.

This building type is a noteworthy concern since many are of significant size and contain large numbers of occupants.

Subsection 4-3

Policy Recommendations Adopted in 2014

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 14-1

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

Policy Recommendation 14-1

WSSPC recommends expanding the efforts by NOAA, the USGS, FEMA, and WSSPC members to enhance public education programs about the potential for impacts from local tsunamis and the need to evacuate threatened areas immediately after strong or sustained ground shaking; giving prioritization to these efforts, which have an immediate and direct impact on life-safety for local 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.

Executive Summary

The efforts of the U.S. Geological Survey (USGS) and National Oceanic and Atmospheric Administration (NOAA) to maintain the current array of the nation's seismic monitoring system, coastal tide gauges, and the deep-ocean tsunami detection system (DART) are vital to reduce loss of life from distant tsunami. However, in the case of many locally sourced tsunamis, the time before impact is so brief that the most effective means for protecting the public is not through warning systems, but through sustained community outreach and education. Buoys, sirens, and loudspeakers, etc., are meaningless if the general public does not know what to do in the critical few minutes following an earthquake that generates a deadly and damaging tsunami.

To be most effective, community outreach and education requires an ongoing commitment by state and local governments partnering with the federal government through the National Tsunami Hazard Mitigation Program (NTHMP) to implement robust, long-term education programs reinforced by exercises and training, and subsequently measured and evaluated using social science surveys. The Tsunami Warning and Education Act provides the framework for the NTHMP collaboration and supports the full national effort to reduce loss of life from tsunamis. The Tsunami Warning and Education and Reauthorization Act (TWERA) is currently being considered by Congress.

Background

Tsunamis can be the most destructive and deadly hazard associated with an earthquake, not only to nearby coastal areas, but occasionally to regions thousands of miles from the source. According to the 2011 WSSPC paper titled: ***Tsunami Hazard Mitigation and Preparedness: A Perspective from State and Territory Tsunami Programs in the High Tsunami Risk Pacific Region***, eight significant tsunamis since 1946 have killed 392 people and caused over $1,600,000,000 in damages to WSSPC member states and territories. The 1946 and 1964 Alaskan earthquakes produced tsunamis that caused damage and/or loss of life in Hawaii, American Samoa and along the coasts of British Columbia, Washington, Oregon and California. The Pacific Tsunami Warning Center at Ewa Beach, Hawaii, and the National Tsunami Warning Center at Palmer, Alaska, were established as a result of these destructive tsunamis and because of the need to warn coastal populations of tsunamis from distant sources.

Pacific States, Provinces and Territories must also plan for locally generated coastal earthquakes that provide little or no time to issue a general public warning of a destructive tsunami. Recent events in Japan (2011), Chile (2010), and American Samoa (2009), and Sumatra (2004) validate findings that a well educated and trained public is the most effective way to avoid catastrophic loss of life from a local tsunami. The 2013 Uniform California Earthquake Rupture Forecast (UCERF3) estimates a ten percent probability of a M 8.0 or greater earthquake somewhere along the Cascadia Subduction Zone (Cascadia Megathrust) in the next 30 years (Frankel and Peterson, 2013). During the past century, the Alaska-Aleutian Subduction Zone had a M 8.0 or greater earthquake on the average of every 16 years, four of which produced destructive tsunamis.

Therefore, it is vitally important to continually educate coastal residents, businesses, and visitors about the importance of immediate evacuation to high ground upon cessation of strong or sustained ground shaking. In areas where no high ground is nearby, vertical evacuation in approved engineered structures may be the only option to survive a tsunami impact. Members of coastal maritime communities exposed to tsunami hazards must also understand how to best protect life and property. Through the use of scientifically researched and developed tsunami inundation models, maps, and other products, community evacuation plans and guidance must be developed showing evacuation routing and safe zones both on land and at sea.

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WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 14-3

Earthquake Monitoring Networks

Policy Recommendation 14-3

WSSPC advocates the continuation and expansion of earthquake monitoring networks as envisioned and supported by the Advanced National Seismic System (ANSS). ANSS emphasizes expanded strong-motion instrumentation in urban areas, including selected engineered structures, as well as increased regional broadband seismograph instrumentation. The resulting data will provide better understanding of future ground shaking potential, more rapid information for emergency response, and insights for the improved 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. In addition, WSSPC calls upon USGS to prioritize operation and maintenance of the ANSS networks to comply with the USGS performance metrics. To further these efforts, WSSPC encourages strengthening partnerships among the USGS, State, and local public and private entities, as well as with emergency managers, engineers, and corporate response and business interruption planners.

Executive Summary

Earthquake monitoring is essential to provide accurate and timely data and information on earthquakes that can damage some buildings and other structures. Reliable and optimally useful monitoring can only be accomplished by employing modern methods and technologies in conjunction with comprehensive regional coverage. Current challenges include obtaining funding to replace outdated, inadequate, analog weak-motion instrumentation with digital systems that include broadband and strong-motion sensors, and improving the operational efficiency and reliability of seismic networks. Perhaps what is most critical is the lack of sufficient and uniform geographic coverage in areas of relatively high earthquake risk. Large and damaging earthquakes are not limited to California. During the past six decades, of the eleven M>7 earthquakes that occurred in the lower 48 states during the past six decades, three occurred in the Rocky Mountain region (the rest occurred in California). Yet the northern Rocky Mountain region remains without sufficient modern instrumentation, as does much of the Basin and Range province. Support for the continuing expansion of the nation's monitoring networks will be crucial in the coming decades for refinement of seismic hazard maps and emergency planning, for acquisition of data for earthquake engineering research, and to make it possible to provide earthquake early warning.

Background

Earthquake monitoring networks are essential both to respond effectively to earthquakes where and when they occur and to characterize future earthquake hazards. The earthquake parameters produced by modern seismic networks, when combined with historic earthquake catalogs and the paleoseismic record, are essential input for developing the Nation's probabilistic seismic hazard maps and analyses. Automated processing of earthquake information by seismic networks in the United States provides near-real-time information on earthquake locations, magnitudes, and patterns of moderate and damaging ground shaking. In the last decade, seismologists have expanded the capabilities of the seismic monitoring systems throughout the nation to routinely produce ShakeMaps for quakes with M>3.5, fault rupture orientations, and slip distributions and aftershock probabilities for quakes with M>6. ShakeMap has become a valuable tool to assist emergency responders in identifying the likely extent of earthquake damage. Strong-motion data (now increasingly available in real-time) can be correlated with documentation and evaluation of the performance of the built environment, leading to understanding the causes of earthquake damage and the occurrence of good structural and non-structural performance..

Since the 1960s, the U.S. Geological Survey (USGS) has operated, supported and coordinated local seismic networks to detect micro-earthquakes, including aftershocks of larger earthquakes. Data from these early seismograph networks have been used to delineate the spatial relationships between earthquake hypocenters and active faults. Modern earthquake monitoring networks provide fundamental earthquake data in the form of catalogs specifying hypocenter location, time of occurrence, and magnitude, along with compiled recordings of strong earthquake shaking in urban areas and in the vicinity of the fault ruptures causing earthquakes. These data find uses in diverse applications ranging from earthquake hazard analysis to disaster response. Seismic networks throughout the U.S. have provided fundamental data for the U.S. Geological Survey's National Seismic Hazard Mapping Project, which is generating ever-advancing state-of-the-art earthquake hazard maps for the U.S. The availability of earthquake monitoring network data has led to new and innovative research that has advanced the science of seismology through an improved understanding of the physics of earthquake occurrence.

For the western states, modern monitoring of regional earthquake activity is crucial. The largest proportion of the Nation's seismic hazard is in the western states, which are all exposed to large and damaging earthquakes. Two of the largest earthquakes in the lower 48 states during the past six decades have occurred in the Northern Rocky Mountain region (magnitude 7.3 1959 Hebgen Lake, Montana; and magnitude 7.0 1983 Borah Peak, Idaho). Yet the Northern Rocky Mountain region remains the largest seismically active region of the lower 48 states without sufficient modern instrumentation to fully locate and characterize earthquakes to meet ANSS standards. A similar deficiency exists in many active seismic regions of Alaska.

The advent of digital instrumentation since 1990 has revolutionized seismology. High-fidelity earthquake data transmitted in real-time via terrestrial and satellite communication links and are essential for all aspects of seismology. Digital dataloggers coupled with broadband and strong-motion sensors have the capability to record the full spectrum of earthquake-related ground motions—everything from the high frequencies of nearby earthquakes to the low-frequency, rolling motion of distant earthquakes. Most importantly, digital instruments have dynamic range sufficient to detect tiny earthquakes and yet able to remain on-scale for a major, nearby earthquake. Additionally, all three axes of ground motion (up-down, north-south, and east-west) are recorded (as opposed to only the vertical direction of ground motion recorded by older seismographs). High-quality recordings by even a few broadband seismographs from earthquakes with magnitudes as small as 3.5 allow computations that uniquely characterize the type of faulting, amount of energy released, and the stress field responsible for the quake. Likewise, high-quality strong-motion recordings in the urban environment are necessary to understand how seismic shaking can cause damage to buildings and other structures. This information is rapidly posted to the Internet, and data centers provide ready access to the information for rapid response and recovery as well as long-term research.

The vision of the next generation of national earthquake monitoring, the Advanced National Seismic System (ANSS), was issued in 1999 by the U.S. Geological Survey. Its design and partial implementation has been developed in consultation with earthquake specialists in academia and the States together with the engineering community. The mission of the Advanced National Seismic System (ANSS) is to provide accurate and timely data and information on earthquakes and their effects on buildings and structures, employing modern monitoring methods and technologies.

Since the ANSS was established by Congress in 2000, the USGS has fostered the organization of regional seismic networks developed through incorporation of local efforts into regional systems. ANSS regions are established for California, the Pacific Northwest, Alaska, Hawaii, the Intermountain region, the Central U.S. (including the Southeast), and the Northeast. The ANSS has deployed more than 2500 modern monitoring stations throughout the U.S. since its inception, with many installed in urban areas with the highest earthquake hazard.

Automated processing and distribution of earthquake information by regional seismic networks and the USGS National Earthquake Information Center provides near-real-time information to the public about earthquake location, magnitude, fault orientation, slip distribution, and aftershock probabilities. Together with other parties, the USGS has developed ShakeMap, an analytical methodology that creates maps of the predicted severity of ground shaking computed from observed peak ground motions recorded by modern

instrumentation and from the computed earthquake magnitude. ShakeMaps are posted to the Internet within minutes following earthquakes and also are distributed to emergency responders and other users through technologies like CISN Display and ShakeCast. The initial maps are automatically revised as new seismic data become available. In areas with a relatively dense distribution of strong-motion sensors, ShakeMap can help emergency managers immediately identify areas that have been exposed to strong shaking before damage reports are available. ShakeMap is being used in conjunction with earthquake loss modeling to make preliminary estimates of casualties and earthquake damage costs, such as through the USGS Prompt Assessment of Global Earthquakes for Response (PAGER) system.

ANSS instrumentation of engineered buildings and other structures to monitor their responses to earthquake ground motion remains less developed. Because of limited funding, a comparatively small number (~135) of structures have been instrumented so far. This type of monitoring is very important to the establishment of better building code requirements and design practices to achieve improved earthquake resistance in both new construction and retrofitted structures. Following damaging earthquakes, real-time monitoring of the response of lifelines and buildings is also valuable in emergency response.

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 14-4

Identification and Mitigation of Unreinforced Masonry Structures

Policy Recommendation 14-4

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.

Executive Summary

Unreinforced masonry is recognized by the Federal Emergency Management Agency as one of the structural building types most prone to failure during an earthquake. A review of the U.S. Geological Survey Hazards Program website listing earthquakes that generated 1,000 or more deaths since 1900 shows that unreinforced walls are a significant contributing factor in losses in both the financial sector and human lives.

WSSPC strongly believes that jurisdictions must be proactive to address this threat to their citizens. Legislatively mandated programs and/or local municipally adopted ordinances have proved effective at addressing this risk.

Background

During earthquakes, unreinforced masonry (URM) structures are vulnerable to catastrophic collapse and represent a significant life safety threat, as occurred in the 2008 Wells, Nevada earthquake. Unreinforced masonry structures are made from brick, hollow clay tile, stone, concrete block, or adobe materials that are not strengthened by the addition of steel or other reinforcement. Common building examples include older industrial complexes, schools, mercantile establishments, and private residences.

Also of concern are components of these structures such as walls, unsupported parapets, and fireplace chimneys, which can fall on sidewalk pedestrians or people trying to exit a building. The masonry usually is held together with weak mortar and is unable to resist lateral forces. Wall and roof anchorage tends to be inadequate, allowing floors and roofs to separate from the walls and collapse. Historically, this type of building damage has been a major contributing factor to loss of life in earthquakes throughout the world.

WSSPC recognizes that there is a societal cost to the inventory and retrofit or replacement of unreinforced masonry buildings, but in areas of high seismicity, failure to address this issue will have expensive and lethal consequences. In order to minimize the cost and make programs more politically acceptable, the three-stage approach of identifying the population of hazardous buildings, analyzing the risk presented by these buildings, and prioritizing the retrofitting of those buildings deemed to be a hazard is recommended.

It is realized that resistance is to be expected when dealing with retroactive building ordinances. However, as can be seen by those areas that have adopted fire sprinklers retroactively, versus those that have not, even minimal remediation can yield discernible life-saving results. The International Existing Building Code Appendix Chapter 1, the American Society of Civil Engineers National Standard ASCE 41-13 “Seismic Evaluation and Retrofit of Existing Buildings” and retrofit concepts described in FEMA publications for unreinforced masonry structures are available; however, this in no way negates the need for local engineering analysis and design.

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 14-5

Earthquake Emergency Handbook for First Responders and Incident Commanders

Policy Recommendation 14-5

The Western States Seismic Policy Council (WSSPC) recommends that an Earthquake Emergency Handbook for first responders and incident commanders be developed, preferably by an interagency task force.

Executive Summary

Most emergency first responders and incident commanders have not experienced a damaging earthquake, and therefore are unfamiliar with the nature of earthquake hazards and how to properly respond to an earthquake emergency and its aftermath. An earthquake emergency guide, similar to the Fireline Handbook for wildfires, is needed to address response issues specific to earthquakes.

Background

The Fireline Handbook is a valuable tool for first responders and incident commanders dealing with wildfires. The Fireline Handbook was developed by the Incident Operations Standards Working Team, which was sponsored by the United States Department of Agriculture, the United States Department of Interior, the National Association of State Foresters, the United States Fire Administration, and the Intertribal Timber Council. This handy document is used at essentially all major wildfires, and the importance and utility of the handbook is underscored by the variety of organizations that joined together to produce and subsequently adopt it. Among other things, following the handbook can avoid putting fire responders at undo risk and avoid potential injuries because the handbook incorporates the hard won lessons learned and accumulated wisdom from fighting many fires, and compiles that information into an easy and quick to use format.

Most emergency first responders and incident commanders have not experienced an earthquake, and therefore are unfamiliar with the nature of earthquake hazards and how to properly respond to an earthquake emergency and its aftermath. This is because the repeat time between large, damaging earthquakes is relatively long compared to many other natural hazards such as wildfires. Unfortunately, the consequences of an earthquake and related hazards in its aftermath can be catastrophic. The incident commander for the 2008 Wells, Nevada earthquake was unfamiliar with earthquake hazards and had to learn the basics of earthquake emergency response while responding to the event. He expressed the need for an earthquake emergency guide similar to the Fireline Handbook. Developing an Earthquake Emergency Handbook was also the number one "lesson learned' in the emergency response section of the Wells earthquake disaster review (dePolo and LaPointe, 2011).

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WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 14-7

Earthquake Early Warning Systems

Policy Recommendation 14-7

WSSPC supports 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.

Executive Summary

An earthquake early warning is issued very rapidly following the initiation of an earthquake and provides alerts to people and communities that have not yet experienced ground shaking from the earthquake. Earthquake early warnings are possible because earthquakes produce differing types of waves that travel at different speeds. The faster P waves travel at about 6.5 kilometers per second and are first to arrive at seismic monitoring stations. These P waves contain important information about the size and location of the earthquake. Slower moving S waves (3.5 km per second) arrive after the P waves and cause more intense shaking capable of damage to buildings and infrastructure.

Based on information from the earlier arriving P waves, the expected shaking intensity can be estimated through rapid analysis and alerts can be issued to communities likely to be impacted by the earthquake. These alerts can be transmitted through high speed telecommunications systems so communities that are distant from the earthquake epicenter but vulnerable to strong motion may receive warning a few seconds to a few tens of seconds warning prior to the arrival of damaging S waves. Alert times vary from almost no warning in the area nearest the epicenter to 60-80 seconds in areas at some distance from the epicenter. As implied in this description, earthquake early warnings are of greatest benefit when large, though rare, earthquakes can impact vulnerable regions that are relatively remote from the epicenter.

Background

A nationwide earthquake early warning system was implemented in Japan on October 1, 2007. The system is based on Japan's extensive and dense seismologic and strong-motion networks that were enhanced following the January 17, 1995 Hanshin-Awaji (Kobe) earthquake. In Japan's earthquake early warning system, warnings are received through computers, cell phones, the media and signaling devices installed in homes, critical facilities and businesses. Early warnings are used to slow or stop high speed trains (*Shinkansen*), alert drivers of motor vehicles, control elevators (to prevent people being trapped), regulate industrial processes and notify people at home or work that they should move away from hazards and protect themselves. Limited systems are in place in Mexico, Turkey, Italy, and Greece, and Taiwan plans to introduce a system like Japan's in the near future.

The United States has followed scientific and technological developments in other nations, and although it has not yet implemented a fully operational earthquake early warning (EEW) system, the United States Geological Survey (USGS) has supported the development and trial operation of EEW with university partners and the State of California since 2006. Those efforts have resulted in a demonstration system called ShakeAlert that began sending test notifications to selected users in January 2012. While that system has demonstrated the feasibility of earthquake early warning in California, the system is still being tested for reliability and robustness.

An EEW system for the West Coast is being developed within the current operations of the Advanced National Seismic System (ANSS) regional seismic networks: California Integrated Seismic Network (CISN), and the Pacific Northwest Seismic Network (PNSN). This enables USGS/ANSS and its network partners to leverage its substantial investment in sensor networks, data processing centers, and software for earthquake monitoring, and takes advantage of the considerable expertise and experience of current personnel, reducing the cost of implementing EEW by using existing capabilities and facilities.

In September 2013 the California Legislature authorized (Section 8587.8 of the California Government Code) the California Governor's Office of Emergency Services, in collaboration with the California Institute of Technology, the California Geological Survey, the University of California, the United States Geological Survey, the Alfred E. Alquist Seismic Safety Commission

and other stakeholders, to develop a comprehensive statewide earthquake early warning system through a public-private partnership. In addition, the Office of Emergency Services will identify funding sources for the earthquake early warning system that do not specify the State's General Fund as a source. It is intended that the California Earthquake Early Warning System (CEEWS) commence full deployment in 2016.

Within California, development of CEEWS has begun by the core members of the California Integrated Seismic Network (USGS, Caltech, UC Berkeley, California Geological Survey, and California Office of Emergency Services). A primary constraint on the timeline for implementation of CEEWS in the highest risk area of the country is funding. In addition, policy, management structure, user applications, and public education and training will impact the implementation of earthquake early warning.

The California Office of Emergency Services plans to carry out the provisions of the legislation by convening five committees that include those institutions identified in the Government Code and other stakeholders and subject matter experts as deemed appropriate by the Project Managers. The product of these committees will be a well-articulated and comprehensive plan that describes an operational earthquake early warning system for California that is based upon a public-private partnership with clearly delineated organizational responsibilities and management structure, conforming to the highest scientific and technical standards of performance, and supported by a rational and feasible funding strategy independent of the California state General Fund.

Although earthquake early warning systems should not be imposed at the expense of hazard education and preparedness activities, and other mitigation programs, earthquake early warning systems have the potential to save lives and reduce financial losses. Those states that have urban populations and infrastructure vulnerable to major earthquakes as well as modern digital seismic networks may consider earthquake early warning as another useful tool for addressing the earthquake hazard. Earthquakes are often described as hazards without warnings, but seismic-network-based early warning systems could provide an alert with sufficient time to implement life safety actions and rapid mitigation.

Subsection 4-4

Policy Recommendations Adopted in 2013

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 13-1

Rapid Tsunami Identification and Evacuation Notification

Policy Recommendation 13-1

WSSPC recommends that each coastal state, province, and territory emergency management agency work with coastal jurisdictions to develop evacuation plans for both local- and distant-source tsunamis, which have in place evacuation and re-entry notification systems, 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.

Executive Summary

Coastal jurisdictions should develop emergency response plans which incorporate both local-source tsunamis, where there may be only minutes to evacuate, and distant-source tsunamis, where there may be hours to evacuate. For local-source tsunamis, a robust education and preparedness campaign should focus on the importance of "natural" warnings, such as earthquake ground shaking felt at the coast as precursor to an incoming tsunami. For distant source tsunamis, emergency response plans should utilize redundant warning and communication systems and use nationally standardized systems which, in addition to standard evacuation and re-entry protocols, could include evacuation instructions via EAS to television and radio broadcast participants, automated telephone notification systems (e.g. reverse-911) and implementation of cell phone notification capabilities. The use of social media, phone trees, NOAA weather radios, satellite and cable television, and possibly beach-front sirens, if sirens are deemed effective and within a community's budget could further augment rapid dissemination of time sensitive tsunami alerts. Portions of this could be accomplished through adherence to planned implementation of the Integrated Public Alert and Warning System (IPAWS). These warning and notification systems should be tested on a consistent basis for confirmation of performance and improved efficiency during an event. WSSPC will work with its federal partners and the National Tsunami Hazard Mitigation Program to help maintain a consistent and effective, top-to-bottom warning system and public preparedness strategy.

Background

Tsunamis have caused considerable damage and casualties to populated areas in the Pacific region over the last 100 years. Tsunamis most often are created by the rapid uplift of the sea floor during subduction zone earthquakes and by landslides triggered by the shaking locally. Tsunamis not only affect nearby coastlines within a few minutes following an earthquake, but can travel long distances and impact distant shorelines within several hours.

For distant source events, tsunami preparedness and response plans should include response to tsunamis, whether in "Warning" or "Advisory," in order to help reduce over or under evacuation of coastal areas.

Where nearby coastlines are affected, the public is instructed to move away from the shoreline and to high ground whenever strong or long ground shaking is felt, or in some cases, when any ground shaking is felt. People would only return to low lying coastal areas following receipt of an official all clear message. Whether the tsunami is generated from a distant source or from a local source, effective notification of the public is paramount.

Permanent residents and visitors occupy a variety of geographical locations and structures along the shoreline. Therefore, the use of redundant warning systems would increase the immediacy and the coverage of the evacuation notification. These warning systems could include evacuation alerts and instructions through radio broadcasts, NOAA weather radios, focused reverse-911 cell phone calls, social media, or sirens focused on beach areas, if sirens are cost-effective and beneficial for a community. Portions of this could be accomplished through adherence to planned implementation of the Integrated Public Alert and Warning System (IPAWS). Only with multiple systems can the best and most immediate coverage be obtained, thereby potentially minimizing the number of injuries and loss of life from the tsunami.

Placement of tsunami warning signs is an important aspect of educating the public about how to reach safety upon receipt of a warning. Signs are a proven education tool in recent tsunamis and should be implemented as determined appropriate by local authorities, with possible assistance from NTHMP in order to maintain continuity between coastal jurisdictions and states. Coastal jurisdictions should be encouraged to adopt standardized tsunami signs.
(See Also: *http://www.dot.ca.gov/hq/traffops/signtech/signdel/tsunami.htm*)

Regular and frequent testing of warning systems is essential to identify mitigation strategies for a more resilient and effective system. It is important to know that the system will work as intended should public safety officials ever need to send an alert or warning to a large region of the United States. Only a complete, top-down test can provide an appropriate diagnosis of the system's performance.

In some instances, ground shaking may be a precursor, and an "early warning," to the occurrence of a tsunami. People in all coastal jurisdictions should be prepared to evacuate for higher ground when they feel strong or long duration ground shaking. Because many earthquakes do not cause tsunamis, a tsunami warning system should also be able to determine as quickly as possible if evacuation activities are necessary. Unnecessary evacuations are costly not only in terms of human risk and lost commerce, but in the public's negative reaction to the next earthquake experienced on the coast. The warning system should include: 1) earthquake and tsunami detection by a modern seismic network and Tsunami Warning Centers, respectively; 2) tsunami warning transmissions from the Tsunami Warning Centers to state and local emergency operations personnel; and, 3) direct notification to the coastal inhabitants, through the use of broadcast media, as well as other locally appropriate measures (such as social media, coastal sirens, reverse 911, phone tree, etc.) to initiate emergency response plans.

Continued education is crucial to inform coastal residents and visitors of procedures to evacuate coastal areas upon feeling strong or long ground shaking and not wait for official notices.

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 13-3

Post-Earthquake Technical Clearinghouses

Policy Recommendation 13-3

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.

Executive Summary

Post-earthquake technical clearinghouses have been an important component of emergency response, recovery, and mitigation following large earthquakes. A technical clearinghouse, either established in a physical location or web based (virtual), can serve to coordinate post-earthquake investigations to provide timely hazards observations for state and federal emergency managers, scientific communities, and the public. This information is then used to improve our assessments of earthquake hazards, earthquake engineering, mitigation strategies, economic losses, and emergency response to damaging earthquakes. The clearinghouse also serves to integrate, manage, disseminate and archive information so that it is available to decision makers.

Multijurisdictional cooperation is especially important in the event of a large earthquake that affects multiple states. Previously established Memoranda of Agreements (MOA) between and among WSSPC members and Federal agencies would allow for the establishment of a single comprehensive technical clearinghouse for such an event.

Background

Post-earthquake technical clearinghouses have been an important component of emergency response, recovery, and mitigation following large earthquakes. Seismologists deploy instruments that measure aftershocks and investigate the mechanics of earthquakes. Geologists and geotechnical engineers document ground failures, including fault displacements, fissures, landslides, rock falls, and liquefaction. Geodesists investigate ground deformation and related strain. Structural engineers evaluate the effects of the earthquake on various types of buildings, bridges, dams, utilities, and other structures. Social scientists study direct and indirect impacts to people and businesses. This information is then used to improve our assessments of earthquake hazards, earthquake engineering, mitigation strategies for nonstructural hazards, and emergency response to damaging earthquakes.

The data collected in the days immediately following a major earthquake can be critical during emergency response and recovery. Scientists and engineers can determine the likelihood that landslides will move (from rain or aftershocks), and can assess the susceptibility of structures to collapse. Some data are perishable and must be collected as soon as possible, before erosion or bulldozers eliminate the evidence or before aftershocks die out.

Data collected through clearinghouses help us to be better prepared for future large earthquakes. In addition, data on strong ground motion and damage to buildings helps to calibrate loss-estimation models. The Federal Emergency Management Agency's (FEMA) HAZUS, can be an important component of a Governor's or the President's disaster declaration as well as provide useful information for response, recovery and hazard mitigation.

A technical clearinghouse, either physical or web based (virtual), can serve to coordinate post-earthquake investigations and to share resources and information among investigators. The clearinghouse also serves to integrate and disseminate information so that it is available to decision makers and the media.

Post-earthquake technical clearinghouses were successfully implemented following the Landers, California (1992); Northridge, California (1994); Nisqually, Washington (2001); and Wells, Nevada (2008) earthquakes. A clearinghouse provides a place for scientists and engineers to report

on their findings each day. In some post-earthquake situations, a clearinghouse may serve as one of the chief mechanisms for relaying critical information from scientists and engineers investigating the earthquake to emergency managers.

Only California, Utah, and Nevada have developed plans for post-earthquake technical clearinghouses. Few WSSPC members have the resources to fully staff and operate a clearinghouse. Opportunities exist for members to collaborate with one another and to coordinate with the U. S. Geological Survey (USGS), FEMA, Earthquake Engineering Research Institute (EERI), university researchers, and other groups. The National Earthquake Hazards Reduction Program (NEHRP) agencies (USGS, FEMA, National Institute for Standards and Technology, and National Science Foundation) developed *The Plan to Coordinate Post-Earthquake Investigations* in 2003 (USGS Circular 1242) that includes provisions for cooperating with states to establish post-earthquake technical clearinghouses. Under this plan, the NEHRP agencies can step in and take the lead if WSSPC members are not prepared to establish a clearinghouse.

Multijurisdictional cooperation is especially important in the event of a large earthquake that affects multiple WSSPC members. Previously established Memoranda of Agreements (MOA) between and among WSSPC members and Federal agencies would allow for the establishment of a single comprehensive technical clearinghouse for such an event.

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 13-4

Seismic Provisions in the 2012 International Building Codes

Policy Recommendation 13-4

WSSPC endorses the prompt adoption and enforcement of the seismic provisions of the 2012 *International Existing Building Code*, the 2012 *International Building Code*, and the 2012 *International Residential Code* 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 750) with a specific focus on purpose, education, incentives, lifelines and the business/industry and homeowner sectors.

Executive Summary

The *International Existing Building Code*, the *International Building Code* and the *International Residential Code* identify the minimum standards for the protection of life, limb and property. These consensus documents, which are supported by every major construction organization in the United States, provide the means for local jurisdictions, states and territories to protect their citizens, safeguard the economic vitality of their communities and provide for a sustainable environment. Amending seismic provisions out of the Code which are essential to the structural integrity of buildings compromises the effectiveness of the document and the safety of the community. Coinciding with Code adoptions is the need for appropriate training so the seismic resistant provisions may be consistently enforced and maintained. It is only through the unamended adoption of the seismic provisions of the International Code that a community has a legitimate expectation to be resilient in the event of disaster for its citizens, businesses and homes.

Background

Some states and many jurisdictions have not adopted the International Building Code, potentially leaving their citizens at continued risk. States should be encouraged to remove obstacles which hinder adoption, and to motivate local jurisdictions to diligently update existing codes. It is recognized that some jurisdictions which have adopted the International Codes have drastically modified or omitted the seismic provisions of the Codes. This action not only jeopardizes their structures by not providing for earthquake-resistant structures, but provides a false sense of security to their communities. Once adopted, the Codes must be uniformly and consistently enforced if they are to be effective. This will necessitate the training of building inspectors to some required standards for certification. Partnerships with the homeowners, residents, builders, insurers, owners, elected officials, scientific groups, and others with focused concerns on lifelines and public safety will be required to overcome the inertia of commitment to meet the desired outcomes.

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 13-6

Post-Earthquake Information Management System

Policy Recommendation 13-6

WSSPC supports the development of a national Post-Earthquake Information Management System. The Management System would provide permanent archiving of essential data related to natural and socio-economic earthquake effects and the performance of the built environment from earthquakes within the United States, and could be combined with similar data systems that assemble and archive data from other natural hazards events, or geosciences data repositories that archive physical and electronic data

Executive Summary

Data collected after a major earthquake by both the public and private sectors is often lost because there is no systematic way to archive it, and thus the knowledge that could benefit society in the future is also lost. A national archive repository of post-earthquake information would allow practitioners to document, preserve, and access data on the natural, built and socioeconomic environments and to use this information to improve our understanding of earthquakes and reduce earthquake losses.

A national Post-earthquake Information Management System is supported by the Strategic Plan of the National Earthquake Hazards Reduction Program as a mechanism to achieve national risk reduction and mitigation goals. A scoping study for an information management system conducted by the American Lifelines Alliance (2008) states that "any national effort to reduce earthquake losses and social disruption resulting from severe natural hazard events requires a mechanism to capture and preserve engineering, scientific, and social performance data in a comprehensive and coherent system that will contribute to our learning from each disaster. Such a resource can play a vital role in efforts to enhance infrastructure and building design and to optimize mitigation, disaster planning, and response and recovery activities."

Background

Future improvements in the ability to engineer and construct buildings and other structures and infrastructure systems that can perform as needed in strong earthquakes depends on knowing about the performance resulting from current and past design and construction practices. No mechanisms are in place to systematically collect and archive these performance data for future use. Technical clearinghouses provide a means to assemble damage data reports that provide decision support for emergency management operations immediately following a significant event; however, much of that data is incompletely documented and becomes essentially lost soon thereafter. Data collected through post-earthquake technical clearinghouses (see WSSPC Policy Recommendation 13-3) and activities such as those sponsored by the Earthquake Engineering Research Institute (EERI) can help us to be better prepared for future earthquakes – if the data are adequately documented, securely archived, and identified in a manner to make them available for use decades into the future.

The Management System data archive would contain technical information collected by post-earthquake clearinghouses as well as other information related to the particular event. The Post-Earthquake Information Management System would be consistent with the recommendations in National Earthquake Hazards Reduction Program (NEHRP) Plan to Coordinate Post-Earthquake Investigations (USGS Circular 1242):

"It is critical to develop strategies for the formal and systematic archiving of data collected during post-earthquake investigations. These data, which focus on the natural, built, and socioeconomic environments, address a wide variety of phenomena. The data are voluminous and are acquired in many forms (for example, digital recordings, digital images, clipboard survey sheets, photographs, and narratives). If not organized and archived soon after an earthquake event, these data are often lost. No mechanism currently exists either to archive these data or to make them readily accessible to the research community. Because of this failure to adequately document, preserve, and access data, an enormous volume of highly relevant data has been effectively lost."

A similar national effort of scientific data preservation has been undertaken by the state geologic surveys and the USGS. The National Geological and Geophysical Data Preservation Act of 2005, Section 315 of the Federal Energy Act of 2005, authorized $30 million for each of 5 years to help develop databases and sample repositories across the nation. Where applicable, the Post-

Earthquake Information Management System could coordinate with this effort and provide a comprehensive data repository for all earth science and hazard information.

References

American Lifelines Alliance, 2008, Post-Earthquake Information Systems (PIMS) Scoping Study, 107 p.
http://www.nehrp.gov/pdf/alapimsreport.pdf

NEHRP, 2008, Strategic Plan for the National Earthquake Hazards Reduction Program, Fiscal Years 2009-2013 Strategic Plan, 66 p.
http://www.nehrp.gov/pdf/strategic_plan_2008.pdf

U.S. Geological Survey. 2003, The Plan to Coordinate NEHRP Post-Earthquake Investigations: USGS Circular 1242, 27 p.
http://geopubs.wr.usgs.gov/circular/c1242/c1242.pdf

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 13-7

Seismic Design of New Schools

Policy Recommendation 13-7

WSSPC recommends that each member state, province, and territory establish and fund an active program to improve the seismic safety of new schools and ensure that seismic building code provisions for new schools are followed. WSSPC also recommends that appropriate responsible local, state, and federal entities provide dedicated financial support for the establishment of a program that improves the seismic safety of new schools.

Executive Summary

School facilities, in addition to caring for our children, are often used as public assembly areas as well as areas of refuge or impromptu command centers during natural disasters and other emergencies. The use of schools in this fashion is commonplace throughout most of America, particularly so in rural areas. Current Building codes and design standards typically identify schools as an intermediate priority risk category. School facilities that are designed and built under this set of assumptions are constructed to ensure that the structure has earthquake survivability and is not specifically designed to remain functional (i.e. safe and habitable) after a design level seismic event. Additionally, in most instances there are no special seismic performance requirements for utilities such as water, electrical, sewer, and HVAC (Heating Ventilation and Air Conditioning). This presents an obvious problem where school facilities are used as emergency shelters or command centers. Increasing the school's design category to that of an essential facility would be more in conformance with its actual use, assure the safety of our children, and enhance the resiliency of the community.

Background

Currently schools are designed using the International Building Code Risk_Category III. Design standards and professional practices of care are consistent with the code's guidance. WSSPC encourages increasing the Risk Category to a Level IV, while employing a minimum of Seismic Design Category C for school facilities with an occupancy load of greater than 250 persons, to be more consistent with the construction of essential facilities.

Individual School Districts and private operators should also be made aware of FEMA 241 which addresses mitigating non-structural hazards from building contents, its use and occupancy. Post disaster assessments have identified that many common injuries and some types of damage can be prevented by properly mitigating non-structural hazards. There is also the additional benefit that school children would be better protected while attending classes.

Reference

FEMA 241, *Identification and Reduction of Nonstructural Earthquake Hazards in Schools*: Federal Emergency Management Agency, 18 p., July 1993.

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 13-10

Joint Policy for the Evaluation and Seismic Remediation of School Buildings

Policy Recommendation 13-10

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. This recommendation that seismically vulnerable school buildings be retrofitted or replaced by new earthquake resilient school buildings is an important part of a nationwide school earthquake resiliency goal.

Executive Summary

Our elementary and secondary school buildings contain the future of our country. Parents send their children to school every day with the belief that their children will be safe. However, many of the schools located in WSSPC's states, provinces and territories are older structures vulnerable to severe damage and even collapse in future earthquakes.

This WSSPC Policy Recommendation is enacted in recognition that WSSPC member states and territories are attempting to undertake the process of increasing the seismic resilience of schools. The Policy Recommendation provides needed support for these efforts.

Background

The 1933 Long Beach, California M6.4 earthquake is best known for collapsing or severely damaging thousands of unreinforced masonry (URM) buildings, including over 230 school buildings. Fortunately, schools were not in session at the time of the earthquake. Had that been the case, thousands of children would have been injured or killed.

The outcry from this poor performance of school buildings directly led to the State of California passing the Field Act which mandated earthquake resistant construction requirements for future school buildings, and the Garrison Act which established the requirements for the seismic safety of existing school buildings.

Schools are increasingly used to shelter students in place during all hazards, including flood and hurricane as well as earthquakes. In addition, schools are often used as refuge zones for citizens within their communities. Thus school building resilience is a key to protecting the local population under diverse hazardous conditions.

There have been notable efforts by some WSSPC member states, including Idaho, Washington, Oregon and Utah, to identify at-risk school buildings and to begin the process of addressing the risk they present.

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 13-11

Reliability of Lifeline Infrastructure

Policy Recommendation 13-11

WSSPC encourages improving the reliability and survivability of lifeline infrastructure and hereby supports the development of seismic design and performance guidelines for both new and existing infrastructure.

Executive Summary

Lifelines form a critical segment of the nation's infrastructure. Disruption can significantly affect the well-being of a community. Guidelines can serve as an effective method of identifying and reducing risk.

Background

Lifeline infrastructure including, but not limited to, electricity, gas, telecommunications, water, and waste water are critical to a community's wellbeing. Lifelines are being constructed without adequate seismic design and/or performance guidelines. Many existing lifelines have been constructed using old methods and technologies that are known to be inadequate by seismic experts.

Much of the nation's existing infrastructure has not been designed to tolerate extreme conditions exerted by major earthquakes, or earthquake-induced tsunamis, fault rupture, large landslides and liquefaction. Lifelines should have reliable performance to ensure that the region can withstand future earthquake damage without crippling consequences. Critical infrastructure requires vulnerability studies in order to understand potential damages and consequences. Mitigation of infrastructure with a high likelihood of failure with extreme consequences should be addressed. This policy recommendation is a reinvigorated effort to follow through on resolving infrastructure liabilities originally identified in FEMA 271 "Plan for Developing and Adopting Seismic Design Guidelines and Standards for Lifelines" (1995).

WESTERN STATES SEISMIC POLICY COUNCIL
POLICY RECOMMENDATION 13-12

Earthquake Actuated Automatic Gas Shutoff Devices

Policy Recommendation 13-12

WSSPC recommends that each state, province or territory which is considering implementing requirements for installing 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 jurisdiction. The policy only advocates that if a decision is made to proceed with earthquake actuated automatic gas shutoff devices that the current state-of-the-art provisions be utilized.

Executive Summary

Natural gas piping and appliances may be damaged during earthquakes, causing gas leaks. These leaks, if ignited, can result in fires and explosions which may jeopardize personal safety as well as resulting in significant damage to structures.

Fires and explosions may be more destructive to buildings than the earthquake itself. The ability to manually shut off a gas valve after an earthquake may be difficult or impossible due to debris or ground movement. Risk of gas related damage is further exacerbated if structures are unoccupied, thus placing the burden of shutting off gas service upon utilities or government agencies. The reliability of automatic gas shutoff valves has been greatly improved with the adoption of ANSI/ASCE/SEI Standard 25.

Background

A survey after the 1994 Northridge earthquake indicated automatic shutoff valves prevented "numerous gas related fires or explosions which reduced the need for water, firefighters and other emergency services" (Strand, 1998). Earthquake activated automatic gas shutoff devices are relatively inexpensive and a proven method to prevent the loss of gas, resultant fires and possible community conflagrations which might result from an errant spark.

While the installation of excess flow valves is currently mandated by Federal Code on new or replacement natural gas service lines serving single family residences, these valves may not detect leakage within structures caused by damaged or overturned appliances or equipment. The value of these may be enhanced by the addition of an automatic gas shutoff valve.

The suitability and conditions of the use of earthquake-actuated automatic gas shutoff devices should be reviewed and approved by the local jurisdiction having authority and such devices should comply with ANSI/ASCE/SEI Standard 25. Use of automatic gas shutoff valves can save lives and reduce the risk of property damage in areas of significant earthquake hazard.

Reference

Strand, Carl L., 1998, *Performance of Seismic Gas Shutoff Valves and the Occurrence of Gas-Related Fires and Gas Leaks During the 1994 Northridge Earthquake, with an Update on Legislation*, p. III-813, in: Proceedings of the NEHRP Conference and Workshop on Research on the Northridge, California Earthquake of January 17, 1994, Sponsored by the National Earthquake Hazards Reduction Program (NEHRP), Published by California Universities for Research in Earthquake Engineering, Richmond, California.

Subsection 4-5

History of WSSPC Policy Recommendations: 1997-2015

History of WSSPC Policy Recommendations
1997-2015

Adoption Status	Title	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
PR 15-1	Earthquake and Tsunami Planning Scenarios													A 09-1	>>>>>	>>>>>	R 12-1	>>>>>	>>>>>	R 15-1
PR 15-2	Developing Earthquake and Tsunami Risk-Reduction Strategies							A 03-1	>>>>>	>>>>>	R 06-1	>>>>>	>>>>>	R 09-2	>>>>>	>>>>>	R 12-2	>>>>>	>>>>>	R 15-2
PR 15-3	Definitions of Recency of Surface Faulting for the Basin & Range Province	A 97-1	>>>>>	>>>>>	>>>>>	>>>>>	R 02-3	>>>>>	>>>>>	R 05-2	>>>>>	>>>>>	R 08-2	>>>>>	>>>>>	R 11-2	>>>>>	>>>>>	W	R 15-3
PR 15-4	Identification and Mitigation of Non-Ductile Concrete Buildings																			A 15-4
PR 14-1	Improving Tsunami Public Education, Mitigation, and Warning Procedures for Distant and Local Sources			A 99-1	>>>>>	>>>>>	R 02-1	>>>>>	>>>>>	R 05-1	>>>>>	>>>>>	R 08-1	>>>>>	>>>>>	R 11-1	>>>>>	>>>>>	R 14-1	>>>>>
PR 14-3	Earthquake Monitoring Networks	A 97-4	>>>>>	>>>>>	>>>>>	>>>>>	R 02-5	>>>>>	>>>>>	R 05-3	>>>>>	>>>>>	R 08-3	>>>>>	>>>>>	R 11-3	>>>>>	>>>>>	R 14-3	>>>>>
PR 14-4	Identification and Mitigation of Unreinforced Masonry Structures					>>>>>							A 08-4	>>>>>	>>>>>	R 11-4	>>>>>	>>>>>	R 14-4	>>>>>
PR 14-5	Earthquake Emergency Handbook for First Responders and Incident Commanders															A 11-5	>>>>>	>>>>>	R 14-5	>>>>>
PR 14-7	Earthquake Early Warning Systems														A 10-9	>>>>>	>>>>>	W	R 14-7	>>>>>
PR 13-1	Rapid Tsunami Identification and Evacuation Notification					A 01-1 & 01-2	>>>>>	>>>>>	R 04-1 & 04-2	>>>>>	>>>>>	R 07-1 & 07-2	>>>>>	>>>>>	R 10-1 & 10-2	>>>>>	>>>>>	R 13-1	>>>>>	>>>>>
PR 13-3	Post-Earthquake Technical Clearinghouses					A 01-3	>>>>>	>>>>>	R 04-3	>>>>>	>>>>>	R 07-3	>>>>>	>>>>>	R 10-3	>>>>>	>>>>>	R 13-3	>>>>>	>>>>>
PR 13-4	Seismic Provisions in the 2012 International Building Code					A 01-4	>>>>>	>>>>>	R 04-4	>>>>>	>>>>>	R 07-4	>>>>>	>>>>>	R 10-4	>>>>>	>>>>>	R 13-4	>>>>>	>>>>>
PR 13-6	Post-Earthquake Information Management System											A 07-6	>>>>>	>>>>>	R 10-6	>>>>>	>>>>>	R 13-6	>>>>>	>>>>>
PR 13-7	Seismic Design of New Schools														A 10-7	>>>>>	>>>>>	R 13-7	>>>>>	>>>>>
PR 13-10	Joint Policy for the Evaluation and Seismic Remediation of School Buildings																	A 13-10	>>>>>	>>>>>

Key: A = Adopted R = Re-adopted D=Discontinued N=Not Adopted W= Withdrawn/Returned to Committee

History of WSSPC Policy Recommendations
1997-2015

Adoption Status	Title	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
PR 13-11	Reliability of Lifeline Infrastructure																	A 13-11	>>>>>	>>>>>
PR 13-12	Earthquake Actuated Automatic Gas Shutoff Devices																	A 13-12	>>>>>	>>>>>
D	Development of National Earthquake Hazard Risk Mitigation Priorities	A 97-3	>>>>>	>>>>>	>>>>>	>>>>>	D													
D	Developing Guidelines for Fault Trace Setbacks	A 97-2	>>>>>	>>>>>	>>>>>	>>>>>	R 02-4	>>>>>	>>>>>	D										
D	Building Safe and Strong to Reduce Vulnerability to Earthquakes through Partnerships and Code Adoption						A 02-2	>>>>>	>>>>>	D										
D	Priorities for Applied Research on Earthquake Hazards								A 04-6	>>>>>	>>>>>	D								
D	Supporting Non-technical Explanation of USGS Uncertainty Maps to Accompany Probabilistic Seismic Hazard Maps								A 04-7	>>>>>	>>>>>	D								
D	Identification and Potential Mitigation of Seismically Vulnerable School Buildings														A 10-8	>>>>>	>>>>>	D		
D	Basin and Range Province Earthquake Working Group(s)								A 04-5	>>>>>	>>>>>	R 07-5	>>>>>	>>>>>	R 10-5	>>>>>	>>>>>	D		
Proposed	To Reduce the Earthquake Vulnerabiity of Existing Public Buildings and Schools								N											
Proposed	Generic State Executive Order for Earthquake Safety for Existing State-Owned Buildings									N										

Key: A = Adopted R = Re-adopted D=Discontinued N=Not Adopted W= Withdrawn/Returned to Committee

SECTION 5

2015 Policy Survey Report

Western States Seismic Policy Council
2015 Policy Recommendation Implementation Survey Results

In lieu of asking for an annual report of seismic activities and accomplishments, WSSPC requested response to this survey to establish the status of adoption and implementation of each adopted policy recommendation in every member state, province, and territory as of November, 2015. The survey was emailed to all members (Emergency Management and Geological Survey Directors and Seismic Commission Liaisons) and Representatives (State Earthquake 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.

Respondents:

Responses were received from at least one member agency for 14 of the 18 WSSPC states/provinces/territories (78%), representing 23 of the 39 member agencies (59%). Some states* provided a joint response from all member agencies. No responses were received from Arizona, New Mexico, the Northern Mariana Islands or Yukon Territory.

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

STATE/TERRITORY/ PROVINCE	CODE	GROUP	REPLIES	NOTES
Alaska		EM	1	(combined w/SC)
Alaska		GS	1	(combined w/SC)
Alaska	AK	SC	1	
American Samoa	AS	EM	2	
Arizona		EM	0	
Arizona	AZ	GS	0	
British Columbia		EM	1	
British Columbia	BC	GS	0	
California		EM	1	
California		GS	1	
California	CA	SC	0	
Colorado		EM	0	
Colorado		GS	1	
Colorado	CO	SC	1	
Guam	GU	EM	1	
Hawaii		EM	1	
Hawaii	HI	SC	0	
Idaho		EM	1	
Idaho	ID	GS	1	(combined w/ EM)
Montana		EM	0	
Montana	MT	GS	1	
Nevada		EM	0	
Nevada		GS	1	
Nevada	NV	SC	1	
New Mexico		EM	0	
New Mexico	NM	GS	0	
Northern Mariana Islands	MP	EM	0	
Oregon		EM	1	
Oregon		GS	0	
Oregon	OR	SC	0	
Utah		EM	1	(combined w/SC)
Utah		GS	1	(combined w/SC)
Utah	UT	SC	1	
Washington		EM	1	
Washington	WA	GS	1	(combined w/EM)
Wyoming		EM	0	
Wyoming	WY	GS	1	
Yukon		EM	0	
Yukon	YT	GS	0	
TOTAL			**24**	

* The term "state" will be used in this document to represent state/province/territory

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 4 states that provided two separate responses have been given one response using the following matrix.

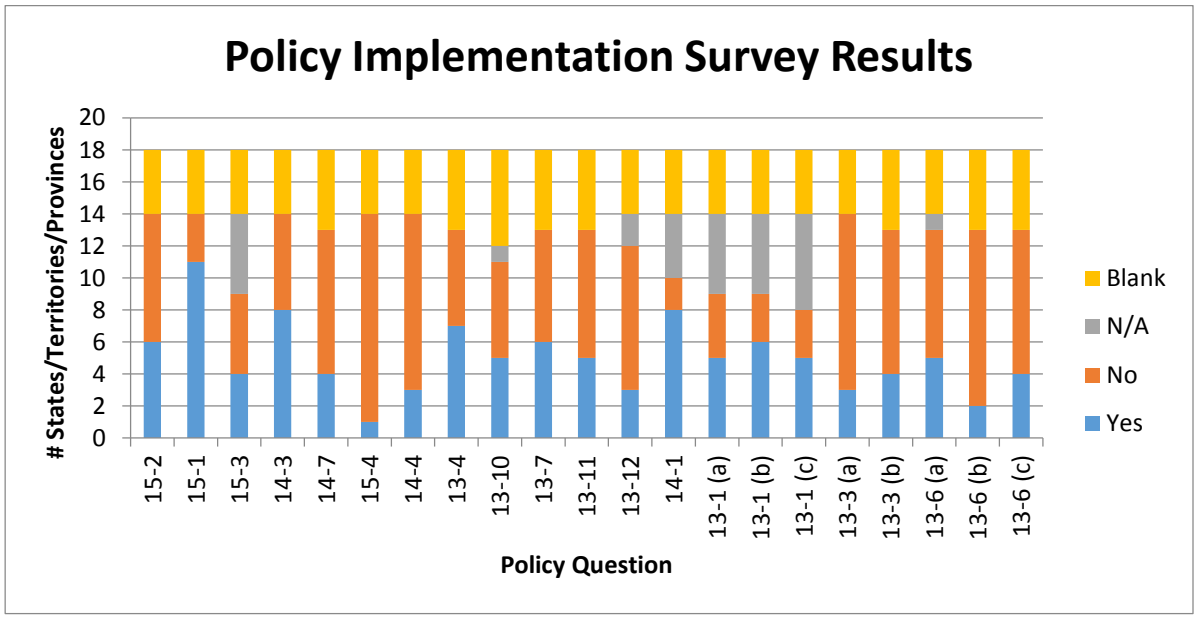
Responses	**Single value**
yes - yes	yes
yes - no	
yes - N/A	
yes – no response	
no - no	no
no - N/A	
no – no response	
N/A - N/A	N/A
N/A –no response	
no response – no response	blank

Policies:

The policies are organized by category rather than in numerical order. A project to implement Policy 14-5 (Earthquake Emergency Handbook for First Responders and Incident Commanders) under the category of Emergency Response Support is currently underway and was not included in the survey.

POLICY CATEGORIES	
Category	**Policy Number**
Risk Reduction Strategies	15-2
Hazard Identification and Assessment	15-1, 15-3
Earthquake Monitoring and Early Warning	14-3, 14-7
Building Codes	13-4, 14-4, 15-4
School Building Safety	13-7, 13-10
Lifelines	13-11, 13-12
Tsunami	13-1, 14-1
Post-Event Management	13-3, 13-6

The table below summarizes the responses.



The individual policy statements organized by categories, survey questions (in italics) and breakdown of responses follow. Note that the total number of responses in the list will total 22 while the number in the graph will be 18. The data has been edited to give one response per state as explained above.

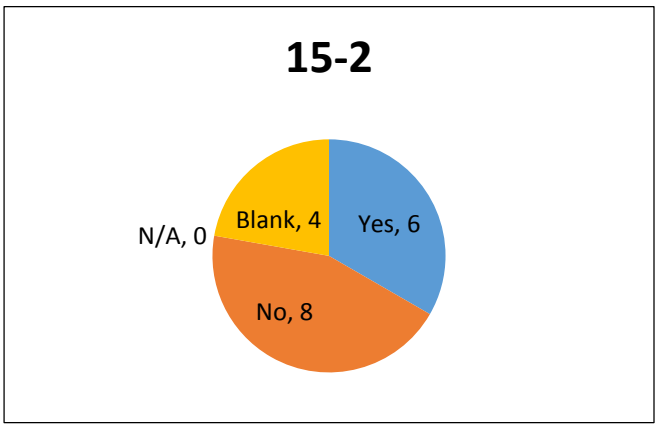
Risk Reduction Strategies

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.

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

Yes (7): AS-EM, GU, HI, NV-GS, NV-SC, UT, WA
No (9): AK, AS-EM, BC, CA-GS, CO-GS, ID, MT, OR, WY
N/A (1): CO-SC
Blank (5): AZ, CA-EM, MP, NM, YT

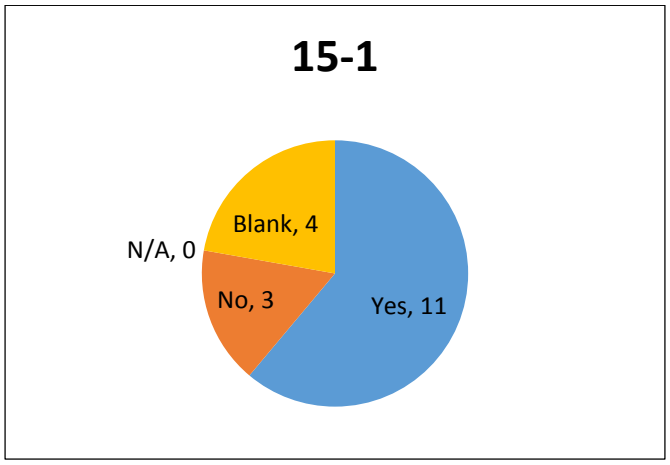


Hazard Identification and Assessment

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.

Has your agency developed and published any new earthquake planning scenarios since 2012?

Yes (13): AK, AS-EM, BC, CA-EM, CA-GS, CO-GS, HI, ID, MT, NV-GS, NV-SC, UT, WA
No (5): AS-EM, CO-SC, GU, OR, WY
N/A (0)
Blank (4): AZ, NM, MP, YT



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 ≥**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.

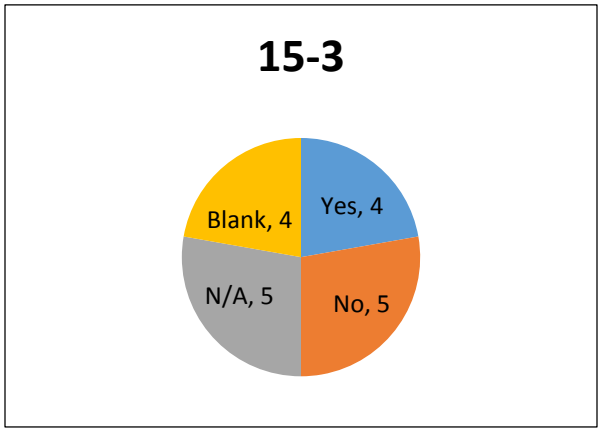
Late Quaternary fault – a fault whose movement in the past 130 ka has been large enough to break the ground surface.

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.

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

Yes (5): CA-GS, ID, NV-GS, NV-SC, UT
No (5): BC, CO-SC, MT, OR, WY
N/A (8): AK, AS-EM (2), CA-EM, CO-GS, GU, HI, WA
Blank (4): AZ, NM, MP, YT



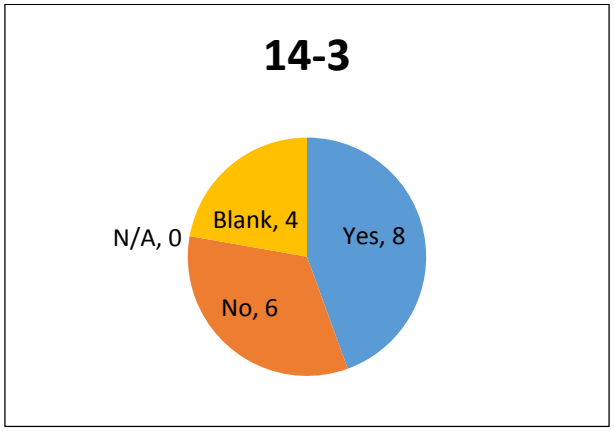
Earthquake Monitoring and Early Warning

Policy Recommendation 14-3: ***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 expanded strong-motion instrumentation in urban areas, including selected engineered structures, as well as increased regional broadband seismograph instrumentation. The resulting data will provide better understanding of future ground shaking potential, more rapid information for emergency response, and insights for the improved 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. In addition, WSSPC calls upon USGS to prioritize operation and maintenance of the ANSS networks to comply with the USGS performance metrics. To further these efforts, WSSPC encourages strengthening partnerships among the USGS, State, and local public and private entities, as well as with emergency managers, engineers, and corporate response and business interruption planners.

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

Yes (10): AK, BC, CA-EM, CA-GS, CO-GS, CO-SC, NV-GS, OR, UT, WA
No (7): AS-EM, GU, HI, ID, MT, NV-SC, WY
N/A (1): AS-EM
Blank (4): AZ, NM, MP, YT

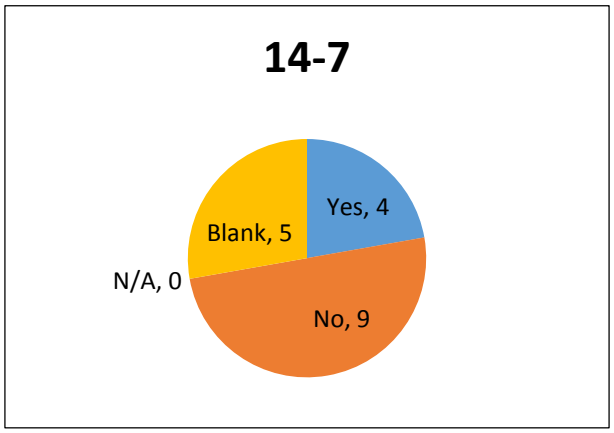


Earthquake Monitoring and Early Warning

Policy Recommendation 14-7: ***Earthquake Early Warning Systems***
WSSPC supports 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.

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

Yes (5): AS-EM, BC, CA-EM, CA-GS, GU
No (11): AK, CO-GS, CO-SC, HI, ID, MT, NV-GS, NV-SC, OR, UT, WY
N/A (1): AS-EM
Blank (5): AZ, NM, MP, WA, YT

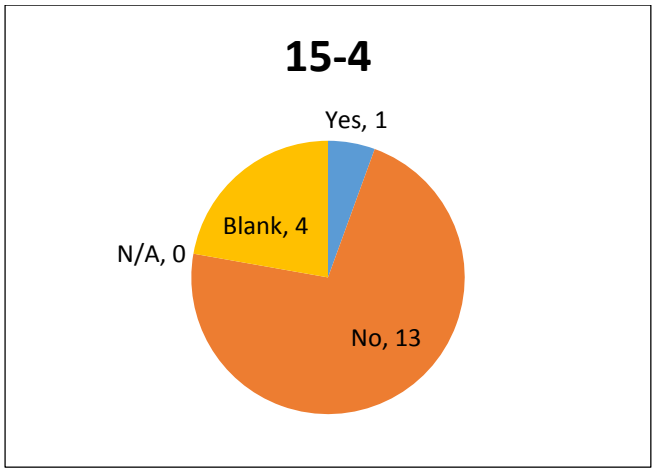


Building Codes

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.

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

Yes (2): CA-EM, CA-GS
No (15): AK, AS-EM, BC, CO-GS, CO-SC, GU, HI, ID, MT, NV-GS, NV-SC, OR, UT, WA, WY
N/A (1): AS-EM
Blank (4): AZ, NM, MP, YT



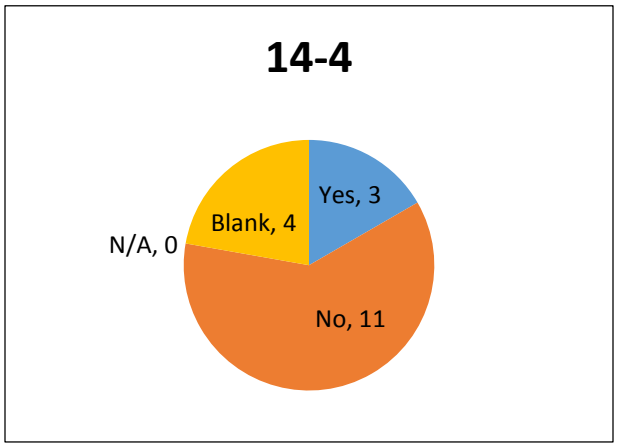
Building Codes

Policy Recommendation 14-4: ***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.

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

Yes (5): CA-EM, CA-GS, ID, NV-GS, NV-SC
No (12): AK, AS-EM, BC, CO-GS, CO-SC, GU, HI, MT, OR, UT, WA, WY
N/A (1): AS-EM
Blank (4): AZ, NM, MP, YT

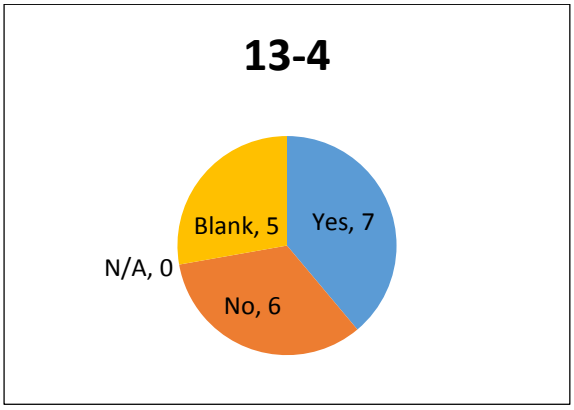


Building Codes

Policy Recommendation 13-4: ***Seismic Provisions in the 2012 International Building Codes***
WSSPC endorses the prompt adoption and enforcement of the seismic provisions of the 2012 *International Existing Building Code*, the 2012 *International Building Code*, and the 2012 *International Residential Code* 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 750) with a specific focus on purpose, education, incentives, lifelines and the business/industry and homeowner sectors.

Has your state, province, or territory adopted seismic provisions that meet or exceed those provisions in the 2012 International Building Code?

Yes (9): CA-EM, CA-GS, CO-GS, ID, NV-GS, NV-SC, OR, UT, WA
No (7): AK, AS-EM, BC, CO-SC, GU, HI, WY
N/A (1): AS-EM
Blank (5):, AZ, MT, NM, MP, YT

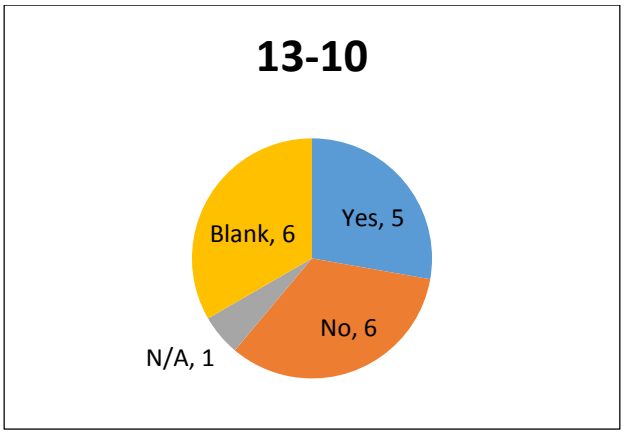


School Building Safety

Policy Recommendation 13-10: ***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. This recommendation that seismically vulnerable school buildings be retrofitted or replaced by new earthquake resilient school buildings is an important part of a nationwide school earthquake resiliency goal.

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 (5): AK, CA-EM, CO-GS, GU, NV-SC
No (9): AS-EM, CA-GS, CO-SC, HI, ID, NV-GS, OR, UT, WY
N/A (2): AS-EM, BC
Blank (6): AZ, MT, NM, MP, WA, YT

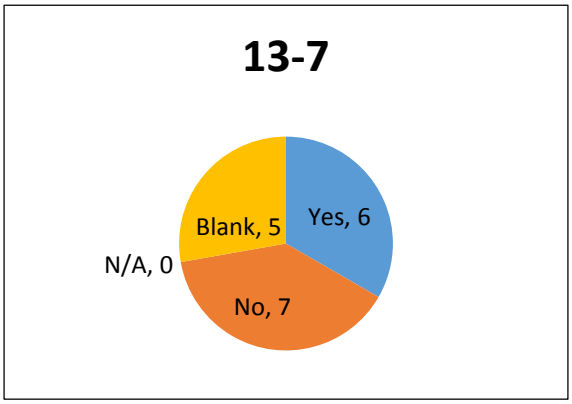


School Building Safety

Policy Recommendation 13-7: ***Seismic Design 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 and ensure that seismic building code provisions for new schools are followed. WSSPC also recommends that appropriate responsible local, state, and federal entities provide dedicated financial support for the establishment of a program that improves the seismic safety of new schools.

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

Yes (7): AK, CA-EM, CO-GS, GU, NV-GS, NV-SC, WA
No (9): AS-EM, BC, CA-GS, CO-SC, HI, ID, OR, UT, WY
N/A (1): AS-EM
Blank (5): AZ, MT, NM, MP, YT

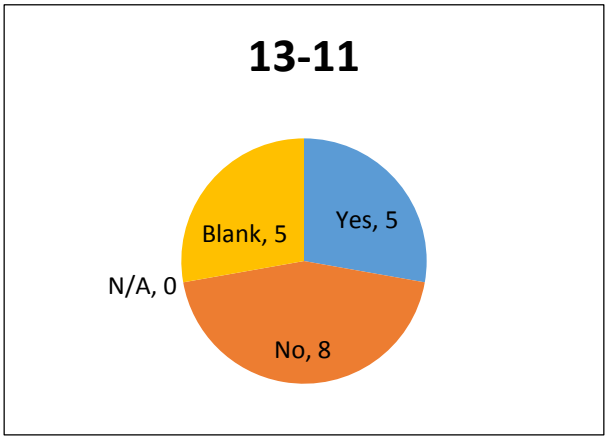


Lifelines

Policy Recommendation 13-11: ***Reliability of Lifeline Infrastructure***
WSSPC encourages improving the reliability and survivability of lifeline infrastructure and hereby supports the development of seismic design and performance guidelines for both new and existing infrastructure.

Has your state, province, or territory encouraged the American Society of Civil Engineers (ASCE) or other stakeholders to develop guidelines addressing the seismic resilience of critical infrastructure?

Yes (6): BC, CA-EM, CA-GS, NV-SC, UT, WA
No (10): AK, AS-EM, CO-GS, CO-SC, GU, HI, ID, NV-GS, OR, WY
N/A (1): AS-EM
Blank (5): AZ, MT, NM, MP, YT

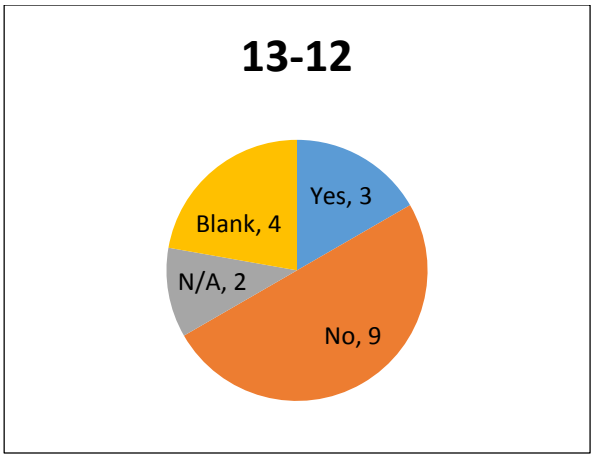


Lifelines

Policy Recommendation 13-12: ***Earthquake Actuated Automatic Gas Shutoff Devices***
WSSPC recommends that each state, province or territory which is considering implementing requirements for installing 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 jurisdiction. The policy only advocates that if a decision is made to proceed with earthquake actuated automatic gas shutoff devices that the current state-of-the-art provisions be utilized.

Has your state, province, or territory considered implementing requirements 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): CA-EM, CA-GS, MT, NV-GS
No (11): AS-EM, BC, CO-GS, CO-SC, HI, ID, NV-SC, OR, UT, WA, WY
N/A (3): AK, AS-EM, GU
Blank (4): AZ, NM, MP, YT

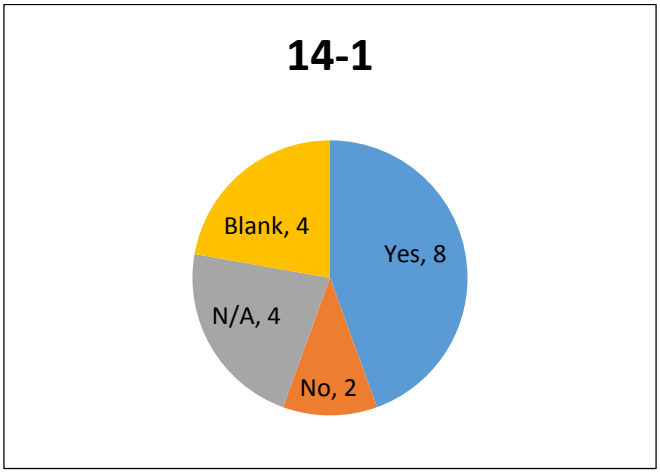


Tsunami

Policy Recommendation 14-1: ***Improving Tsunami Public Education, Mitigation, 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 the potential for impacts from local tsunamis and the need to evacuate threatened areas immediately after strong or sustained ground shaking; giving prioritization to these efforts, which have an immediate and direct impact on life-safety for local 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 increased mitigation, preparedness, and response efforts in communities at risk to local tsunami sources?

Yes (10): AK, AS-EM (2), BC, CA-EM, CA-GS, GU, HI, OR, WA
No (2): NV-GS, UT
N/A (6): CO-GS, CO-SC, ID, MT, NV-SC, WY
Blank (6): AZ, NM, MP, YT

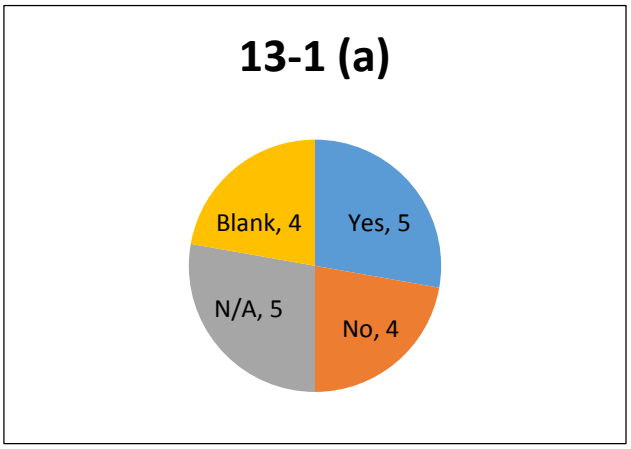


Tsunami

Policy Recommendation 13-1: ***Rapid Tsunami Identification and Evacuation Notification***
WSSPC recommends that each coastal state, province, and territory emergency management agency work with coastal jurisdictions to develop evacuation plans for both local- and distant-source tsunamis, which have in place evacuation and re-entry notification systems, 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.

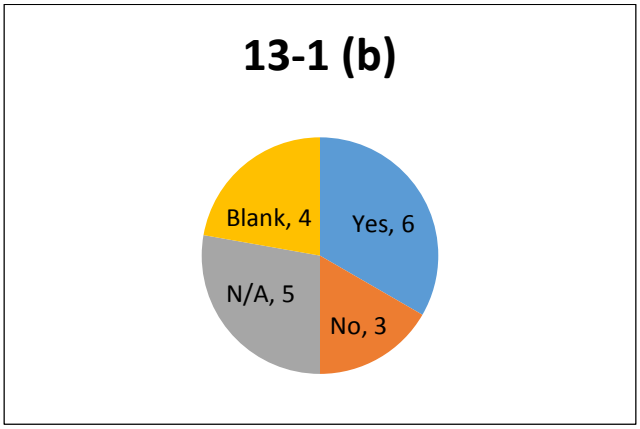
(a) Has your state, province, or territory shared Policy Recommendation 13-1 with your legislative delegations encouraging the development of rapid, multiple tsunami notification systems and support for tsunami education and awareness activities?

Yes (6): AS-EM (2), CA-GS, GU-EM, HI-EM, WA-all
No (5): BC-EM, CA-EM, NV-GS, OR-EM, UT-all
N/A (7): AK-all, CO-GS, CO-SC, ID-all, MT-GS, NV-SC, WY-GS
Blank (4): AZ, NM, MP, YT



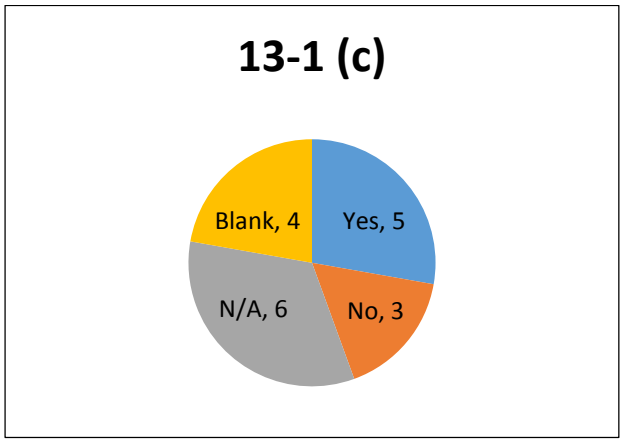
(b) Has your state, province or territory worked with NTHMP to support development of guidance on rapid identification and notification systems?

Yes (8): AS-EM (2), BC, CA-EM, CA-GS, GU, HI, WA,
No (4): NV-GS, NV-SC, OR, UT
N/A (6): AK, CO-GS, CO-SC, ID, MT, WY
Blank (4): AZ, NM, MP, YT



(c) Has your state, province, or territory forwarded Policy Recommendation 13-1 to NOAA, USGS, FEMA, or other organizations for budgetary and technical support?

Yes (7): AS-EM (2), CA-EM, CA-GS, GU, HI, WA
No (4): NV-GS, NV-SC, OR, UT
N/A (7): AK, BC, CO-GS, CO-SC, ID, MT, WY
Blank (4): AZ, NM, MP, YT

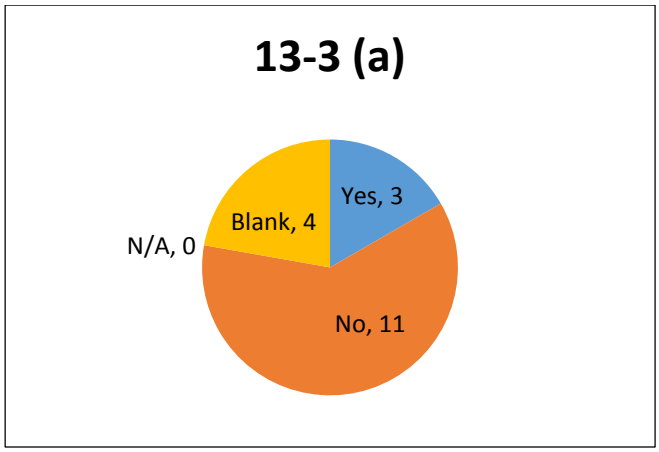


Post-Event Management

Policy Recommendation 13-3: ***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.

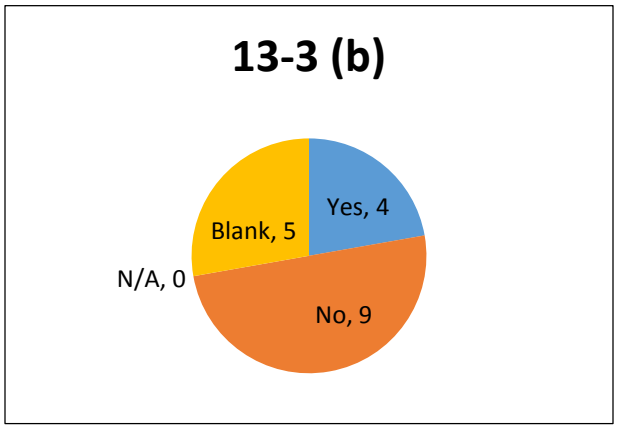
(a) Has your state, province, or territory established a plan for a post-earthquake clearinghouse?

Yes (4): CA-EM, CA-GS, UT, WA
No (13): AK, AS-EM, BC, CO-GS, CO-SC, GU, HI, ID, MT, NV-GS, NV-SC, OR, WY
N/A (1): AS-EM
Blank (4): AZ, NM, MP, YT



(b) Has your state, province, or territory established MOA's with NEHRP agencies or others?

Yes (4): CA-GS, CO-SC, NV-GS, UT
No (11): AS-EM, BC, CO-GS, GU, HI, ID, MT,NV-SC, OR, WA, WY
N/A (2): AS-EM, CA-EM
Blank (5): AK, AZ, NM, MP, YT

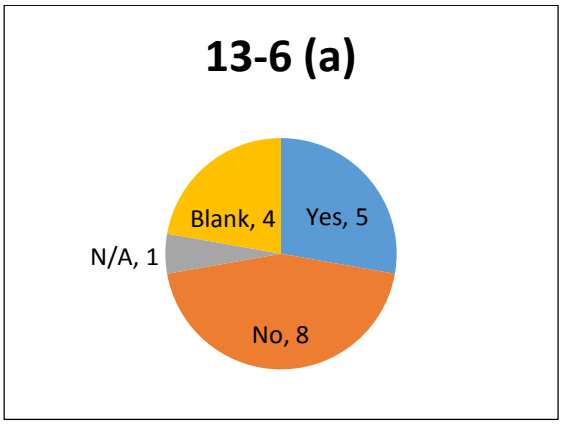


Post-Event Management

Policy Recommendation 13-6: ***Post-Earthquake Information Management System***
WSSPC supports the development of a national Post-Earthquake Information Management System. The Management System would provide permanent archiving of essential data related to natural and socio-economic earthquake effects and the performance of the built environment from earthquakes within the United States, and could be combined with similar data systems that assemble and archive data from other natural hazards events, or geosciences data repositories that archive physical and electronic data.

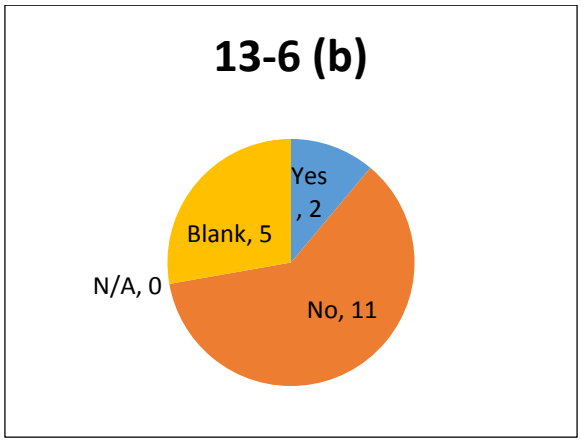
(a) Has your state, province, or territory communicated support to NEHRP agencies (or others) for the establishment of a national Post-Earthquake Information Management System?

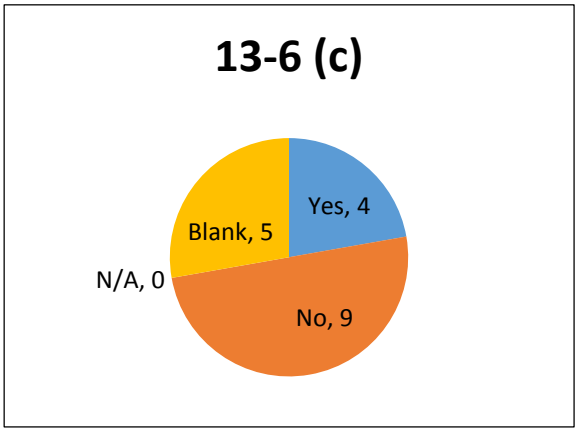
Yes (6): CA-EM, CA-GS, CO-GS, NV-SC, UT, WA
No (9): AK, AS-EM, CO-SC, GU, HI, ID, MT, OR, WY
N/A (3): AS-EM, BC, NV-GS
Blank (4): AZ, NM, MP, YT



(b) Has your state, province, or territory provided written support for the establishment of a pilot or demonstration Post-Earthquake Information Management System?

Yes (3): CA-EM, CA-GS, UT
No (13): AS-EM, BC, CO-GS, CO-SC, GU, HI, ID, MT, NV-GS, NV-SC, OR, WA, WY
N/A (1): AS-EM
Blank (5): AK, AZ, NM, MP, YT



(c) Has your state, province, or territory established one or more local or regional partnerships and agreements for the purpose of assuring the collection of post-earthquake performance and damage information for long-term use?

Yes (5): CA-EM, CA-GS, HI-EM, NV-SC, UT-all
No (10): AS-EM, BC-EM, CO-GS, CO-SC, GU-EM, ID-all, MT-GS, OR-EM, WA-all, WY-GS
N/A (2): AS-EM, NV-GS
Blank (5): AK, AZ, NM, MP, YT