

Example S_{Ms} and S_{M1} Changes

Building Seismic Safety Council (BSSC) Provisions Update Committee (PUC) Meeting

Nicolas Luco & Sanaz Rezaeian
Research Structural Engineers
Geologic Hazards Science Center
Golden, Colorado

Causes of S_{M1} & S_{MS} Changes

1. 2018 USGS National Seismic Hazard Model updates (NGA-East, WUS basin effects, smoothed seismicity, fewer WUS GMMs)
2. Max-direction scale factors (e.g., $1.1 \rightarrow 1.2$ @ $T=0.2s$, $1.3 \rightarrow 1.25$ @ $T=1.0s$)
3. Deterministic capping (deterministic lower limits, “active” faults, and “characteristics” earthquakes/magnitudes)
4. $S_{MS} = 0.9 * \max(S_{M0.2} , \dots , S_{M5.0})$
 $S_{M1} = \max(S_{M1.0} , \dots , T * S_{M2.0})$ for $V_{S30} > 365$ m/s
 $= \max(S_{M1.0} , \dots , T * S_{M5.0})$ for $V_{S30} \leq 365$ m/s
5. GMM site terms vs. NEHRP site coefficients

34 Example Cities from 2009 NEHRP Provisions

Part 2, Commentary

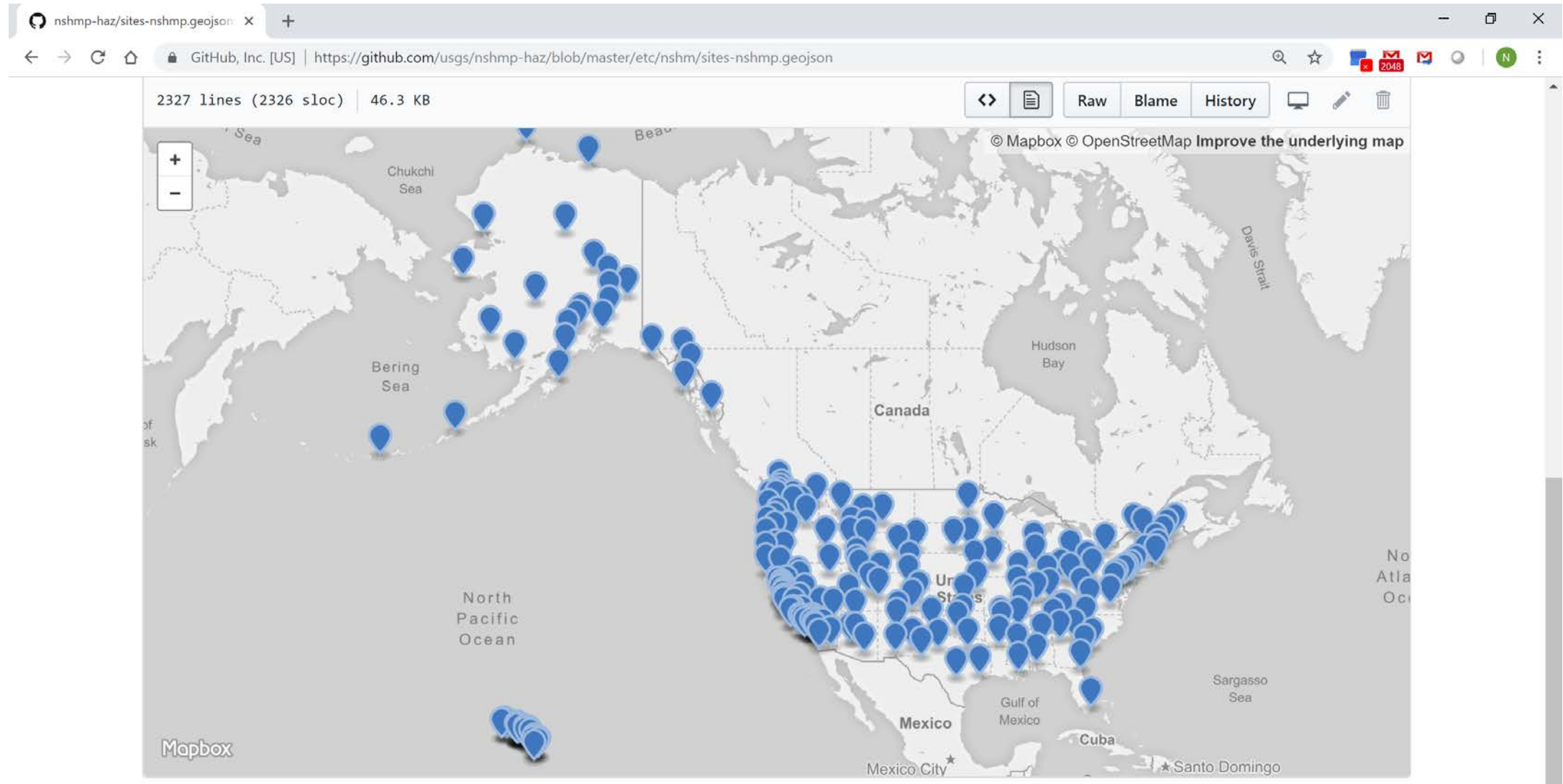
Table C22.1 From the 2009 Provisions, the 34 Locations (Latitudes and Longitudes) for which MCE_R and MCE_G Ground Motions from these 2015 Provisions and ASCE/SEI 7-10 are Compared in Tables C22.2 Through C22.4

It is important to note that these locations are each just one of many in the named cities, and their ground motions may be significantly different than those at other locations in the cities.

Region	City and Location of Site			County or Metropolitan Statistical Area	
	Name	Latitude	Longitude	Name	Population
Southern California	Los Angeles	34.05	-118.25	Los Angeles	9,948,081
Southern California	Century City	34.05	-118.40		
Southern California	Northridge	34.20	-118.55		
Southern California	Long Beach	33.80	-118.20		
Southern California	Irvine	33.65	-117.80	Orange	3,002,048
Southern California	Riverside	33.95	-117.40	Riverside	2,026,803
Southern California	San Bernardino	34.10	-117.30	San Bernardino	1,999,332
Southern California	San Luis Obispo	35.30	-120.65	San Luis Obispo	257,005
Southern California	San Diego	32.70	-117.15	San Diego	2,941,454
Southern California	Santa Barbara	34.45	-119.70	Santa Barbara	400,335
Southern California	Ventura	34.30	-119.30	Ventura	799,720
Southern California	Total Population - S. California		22,349,098	Population - 8 Counties	21,374,778
Northern California	Oakland	37.80	-122.25	Alameda	1,502,759
Northern California	Concord	37.95	-122.00	Contra Costa	955,810
Northern California	Monterey	36.60	-121.90	Monterey	421,333
Northern California	Sacramento	38.60	-121.50	Sacramento	1,233,449
Northern California	San Francisco	37.75	-122.40	San Francisco	776,733
Northern California	San Mateo	37.55	-122.30	San Mateo	741,444
Northern California	San Jose	37.35	-121.90	Santa Clara	1,802,328
Northern California	Santa Cruz	36.95	-122.05	Santa Cruz	275,359
Northern California	Vallejo	38.10	-122.25	Solano	423,473
Northern California	Santa Rosa	38.45	-122.70	Sonoma	489,290
Northern California	Total Population - N. California		14,108,451	Population - 10 Counties	8,621,978

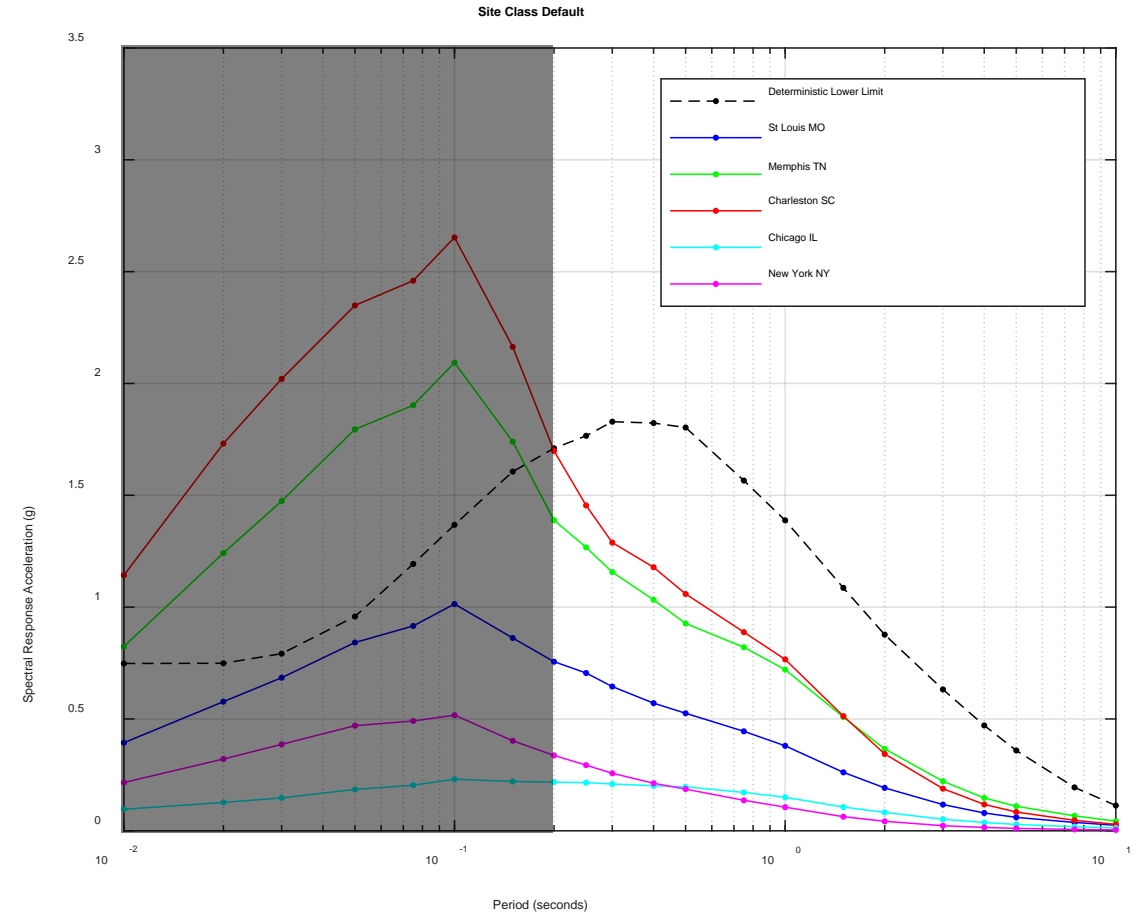
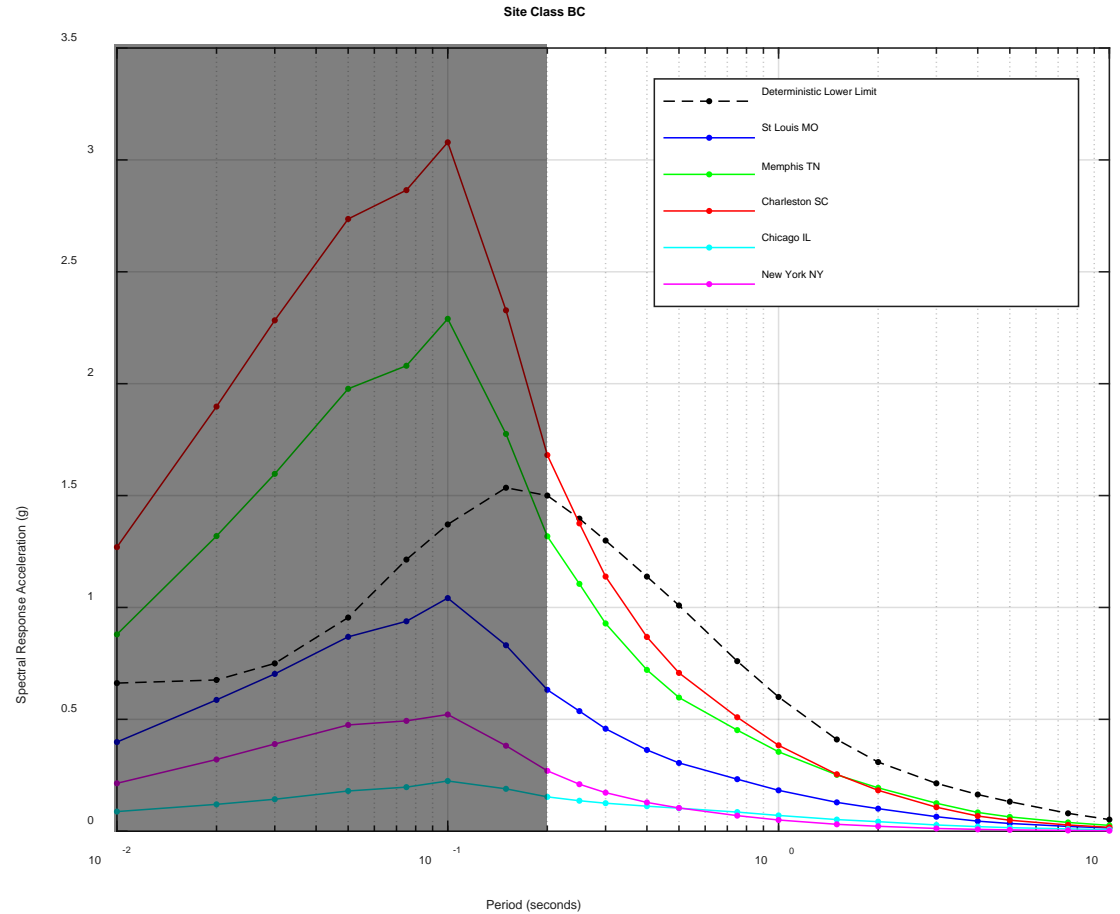
Pacific Northwest	Seattle	47.60	-122.30	King WA	1,826,732
Pacific Northwest	Tacoma	47.25	-122.45	Pierce WA	766,878
Pacific Northwest	Everett	48.00	-122.20	Snohomish WA	669,887
Pacific Northwest	Portland	45.50	-122.65	Portland Metro OR (3)	1,523,690
Pacific Northwest	Total Population - OR and WA		10,096,556	Population - 6 Counties	4,787,187
Other WUS	Salt Lake City	40.75	-111.90	Salt Lake UT	978,701
Other WUS	Boise	43.60	-116.20	Ada/Canyon ID (2)	532,337
Other WUS	Reno	39.55	-119.80	Washoe NV	396,428
Other WUS	Las Vegas	36.20	-115.15	Clarke NV	1,777,539
Other WUS	Total Population - ID/UT/NV		6,512,057	Population - 5 Counties	3,685,005
CEUS	St. Louis	38.60	-90.20	St. Louis MSA (16)	2,786,728
CEUS	Memphis	35.15	-90.05	Memphis MSA (8)	1,269,108
CEUS	Charleston	32.80	-79.95	Charleston MSA (3)	603,178
CEUS	Chicago	41.85	-87.65	Chicago MSA (7)	9,505,748
CEUS	New York	40.75	-74.00	New York MSA (23)	18,747,320
CEUS	Total Population - MO/TN/SC/IL/NY		48,340,918	Population - 57 Counties	32,912,082

USGS Test Sites



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Draft CEUS Probabilistic vs. Det. Lower Limit



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Draft Site Class BC CEUS S_{MS} & S_{M1} vs ASCE 7-16

Changes due to USGS update, max direction, and S_{MS} & S_{M1} definitions ...

City, State	Latitude	Longitude	ASCE 7-16 S_S	Draft BC S_{MS}	% Change	ASCE 7-16 S_I	Draft BC S_{MI}	% Change
St. Louis, MO	38.60	-90.20	0.46	0.57	23%	0.16	0.20	25%
Memphis, TN	35.15	-90.05	1.0	1.2	16%	0.35	0.39	12%
Charleston, SC	32.80	-79.95	1.4	1.5	7%	0.41	0.38	-7%
Chicago, IL	41.85	-87.65	0.12	0.14	18%	0.063	0.085	36%
New York, NY	40.75	-74.00	0.29	0.24	-16%	0.060	0.050	-16%

Changes due to S_{MS} & S_{M1} definitions ...

City, State	Latitude	Longitude	Draft BC $S_{M0.2}$	Draft BC S_{MS}	% Change	Draft BC $S_{MI.0}$	Draft BC S_{MI}	% Change
St. Louis, MO	38.60	-90.20	0.63	0.57	-10%	0.18	0.20	10%
Memphis, TN	35.15	-90.05	1.3	1.2	-10%	0.35	0.39	9%
Charleston, SC	32.80	-79.95	1.7	1.5	-10%	0.38	0.38	0%
Chicago, IL	41.85	-87.65	0.15	0.14	-10%	0.071	0.085	21%
New York, NY	40.75	-74.00	0.27	0.24	-10%	0.050	0.050	0%

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