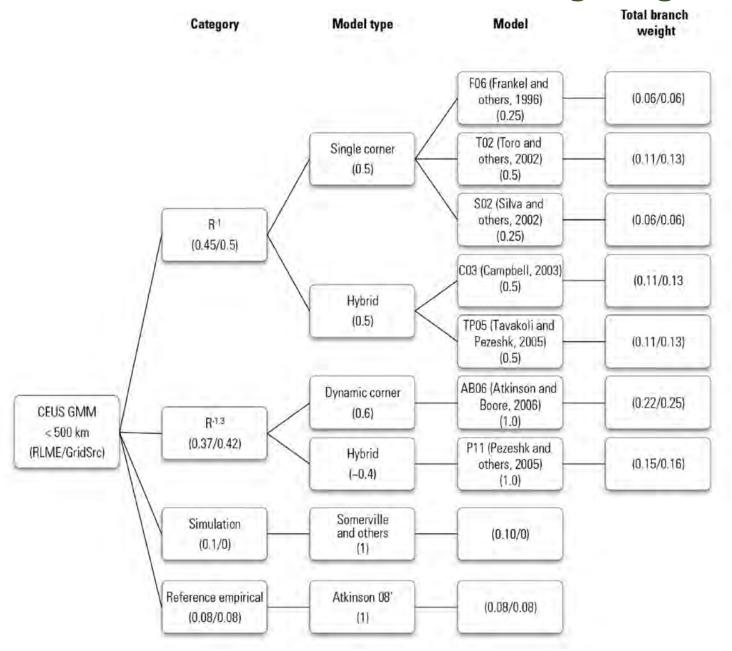


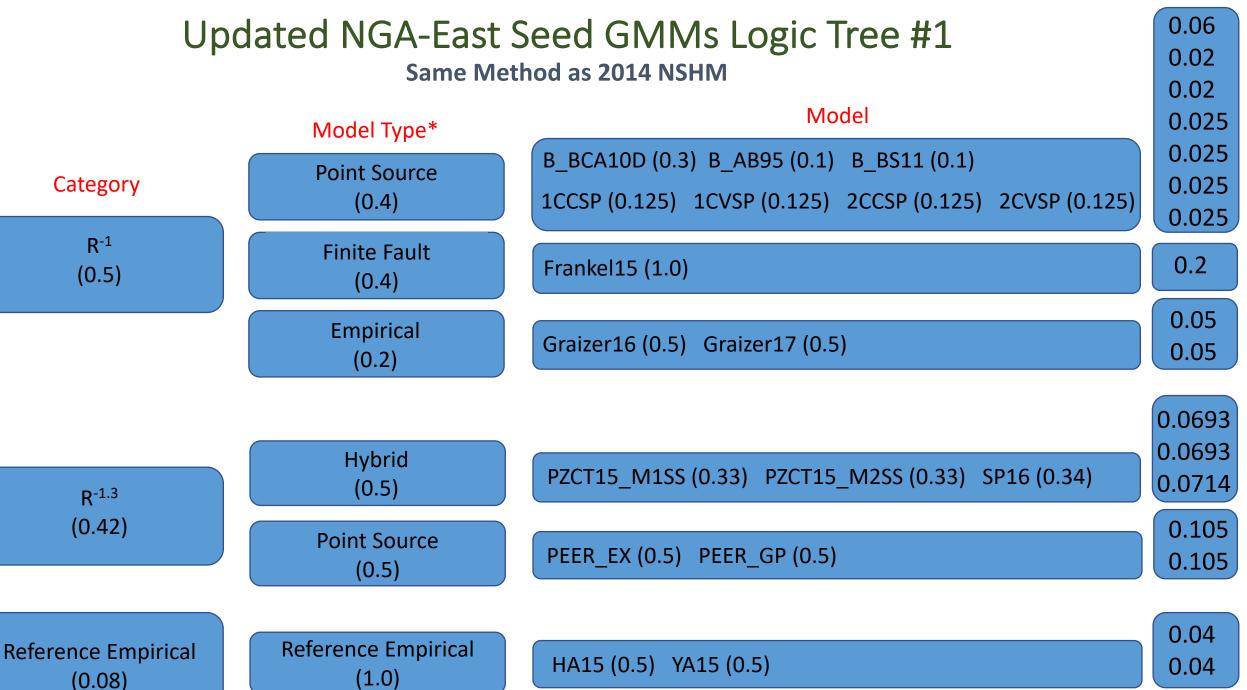
# Proposed Epistemic Weighting

Mark Petersen
USGS, Golden, CO
USGS 2018 NSHM Update Workshop
Wednesday, March 7<sup>th</sup>, 2018

U.S. Department of the Interior U.S. Geological Survey

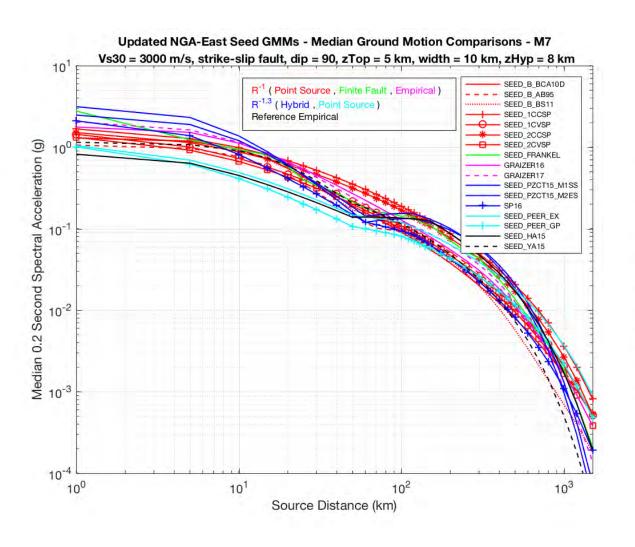
## 2014 NSHM CEUS GMM Weighting

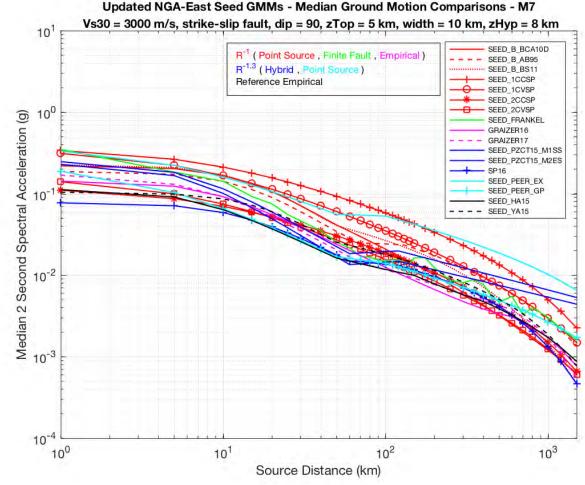




\*Note: Workshop participants mentioned that some model types may be misclassified.

# Updated NGA-East Seed Ground Motions (Logic Tree #1)





# Updated NGA-East Seed GMMs Logic Tree #2

**Alternative Categories, no Model Type** 

Category\*

R<sup>-1</sup> (0.35)

R<sup>-1.3</sup> (0.35)

Finite Fault (0.2)

Reference Empirical (0.1)

Model\*

B\_BCA10D (0.204) B\_AB95 (0.068) B\_BS11 (0.068)

1CCSP (0.0825) 1CVSP (0.0825) 2CCSP (0.0825) 2CVSP (0.0825)

Graizer16 (0.165) Graizer17 (0.165)

PZCT15\_M1SS (0.165) PZCT15\_M2ES (0.165)

PEER\_EX (0.165) PEER\_GP (0.165)

SP16 (0.34)

Frankel15 (1.0)

HA15 (0.5) YA15 (0.5)

\*Note: Workshop participants mentioned that some model types/categories may be misclassified.

0.05575

0.0714

0.0238

0.0238

0.028875

0.028875

0.028875

0.028875

0.05775

0.05775

0.05575

0.05775

0.05775

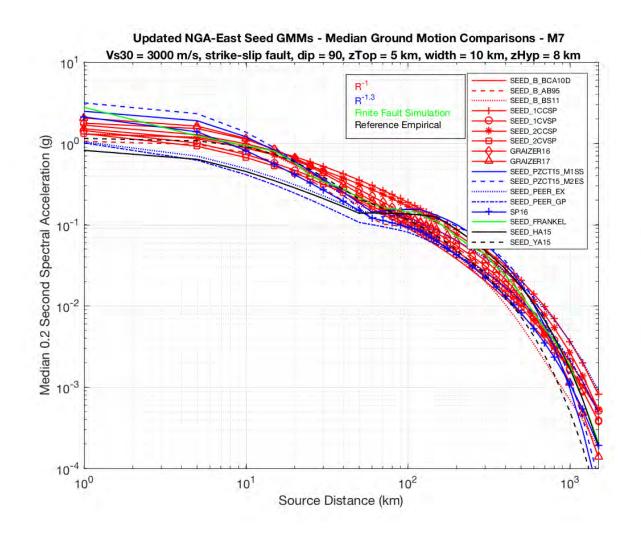
0.119

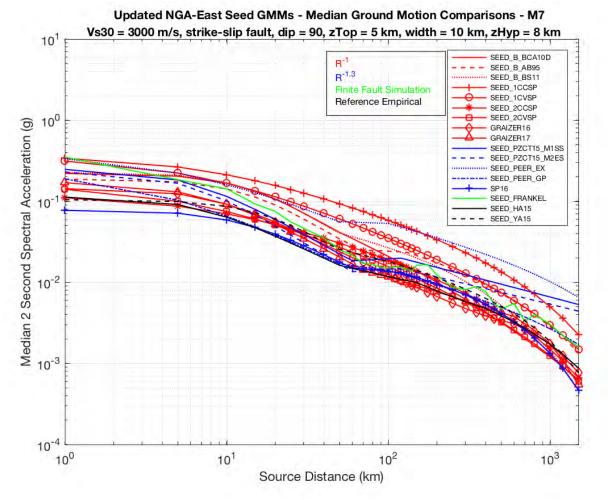
0.2

0.05

0.05

# Updated NGA-East Seed Ground Motions (Logic Tree #2)





<sup>\*</sup>Note: Workshop participants mentioned that some model types may be misclassified.

## NGA-East USGS GMMs Logic Tree

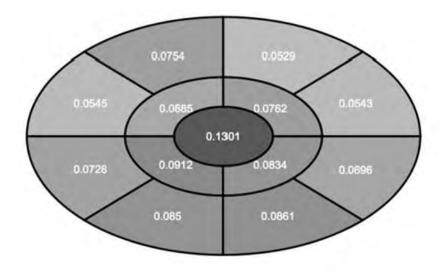
#### Model

NGA EAST USGS 1 NGA EAST USGS 2 NGA\_EAST\_USGS\_3 NGA EAST USGS 4 NGA EAST USGS 5 NGA EAST USGS 6 NGA EAST USGS 7 NGA EAST USGS 8 NGA EAST USGS 9 NGA EAST USGS 10 NGA EAST\_USGS\_11 NGA EAST USGS 12 NGA\_EAST\_USGS\_13

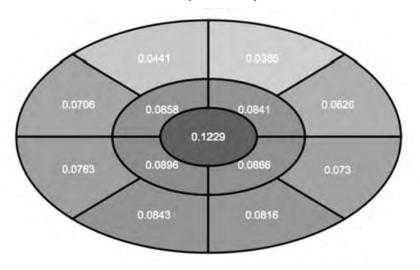
#### **Model Weights**

Sammon's mapping weights are period and magnitude dependent

0.2 Sec (5 Hz)



2 Sec (0.5 Hz)



## Proposed Logic Tree for 2018 NSHM CEUS GMMs

### **Logic Tree Weights**

**NGA-East Model** 

CEUS GMMs < 1000 km (RLME/GridSrc) Updated NGA-East Seed GMMs (Logic Tree #2) (0.5)

NGA-East USGS GMMs (0.5)

B\_BCA10D (0.0357) B\_AB95 (0.0119) B BS11 (0.0119) 1CCSP (0.0144375) 1CVSP (0.0144375) 2CCSP (0.0144375) 2CVSP (0.0144375) Graizer16 (0.028875) Graizer17 (0.028875) PZCT15\_M1SS (0.028875) PZCT15\_M2SS (0.028875) PEER EX (0.028775) PEER GP (0.028775) SP16 (0.0595) Frankel15 (0.1) HA15 (0.025) YA15 (0.025)

Note: This would require implementing 30 models (tables)

NGA-East USGS (0.5)