

Seismic Hazard Analysis for Engineering-based Insurance Applications

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**(with Navid Attary, Sait Ahmet Binselam, Elliot Klein,
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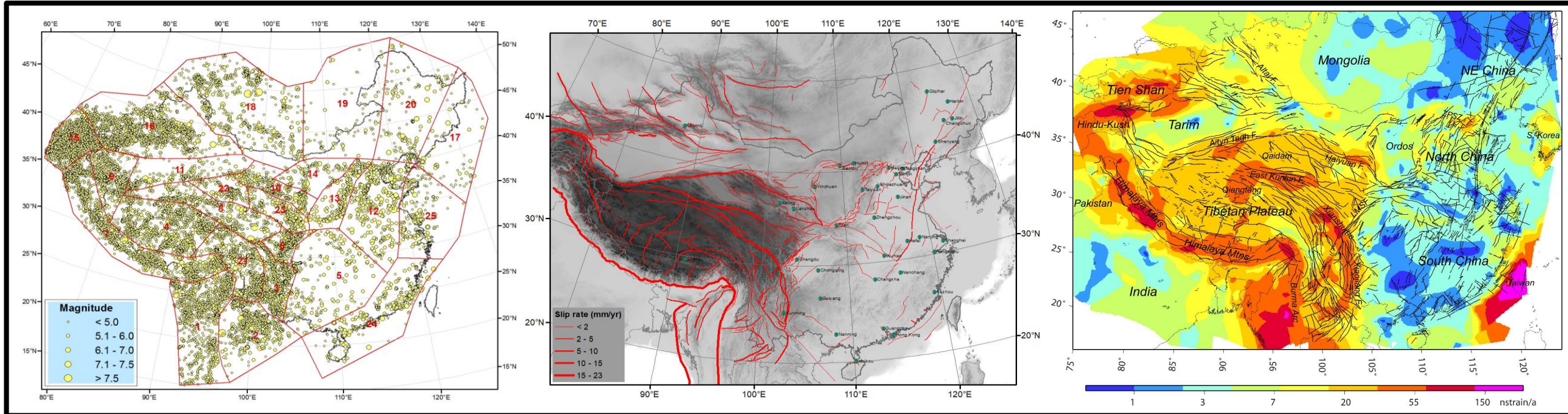
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Three Major Applications of OpenQuake Engine



- **Probabilistic Seismic Hazard Analysis for Mainland China**
- **Global Risk-Targeted Ground Motions**
- **Global Earthquake Risk Map**

Probabilistic Seismic Hazard Analysis for Mainland China

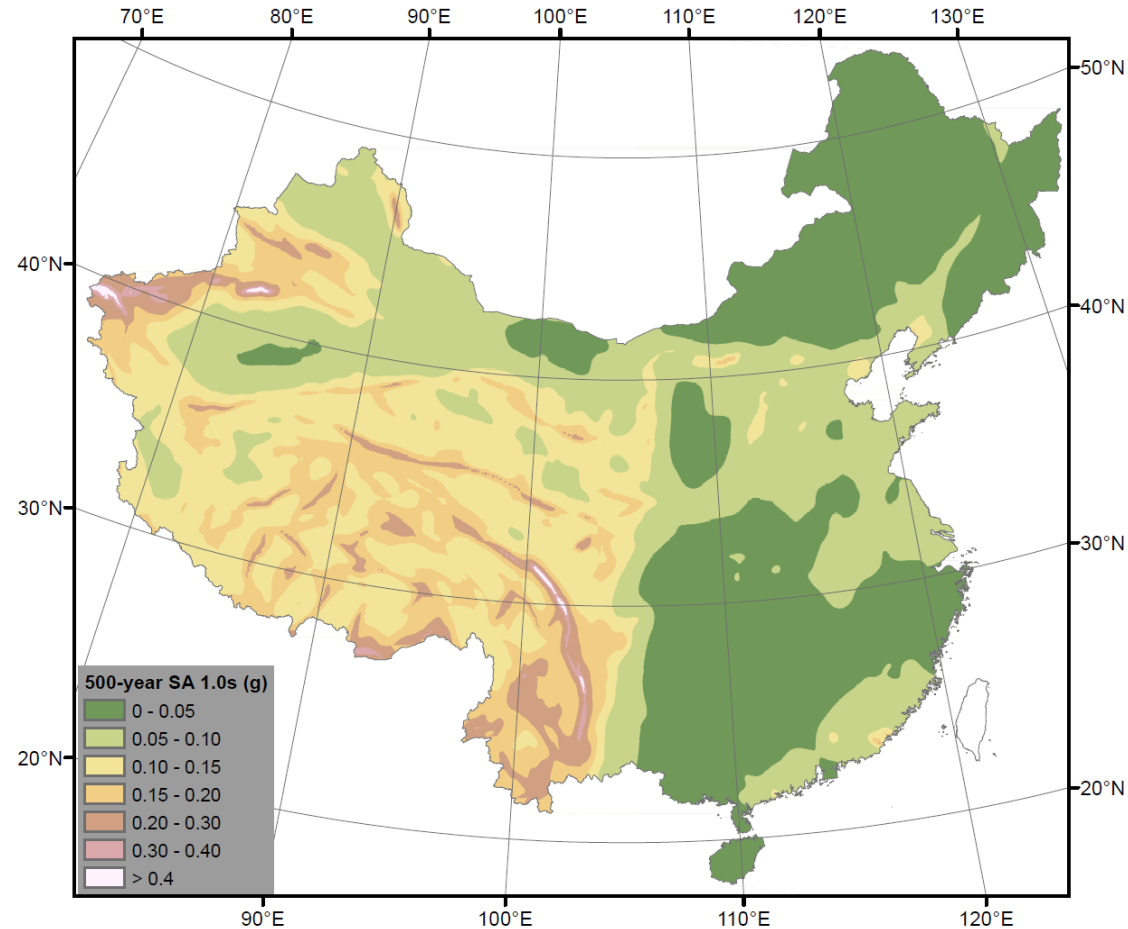


Earthquake Model Building Toolkit

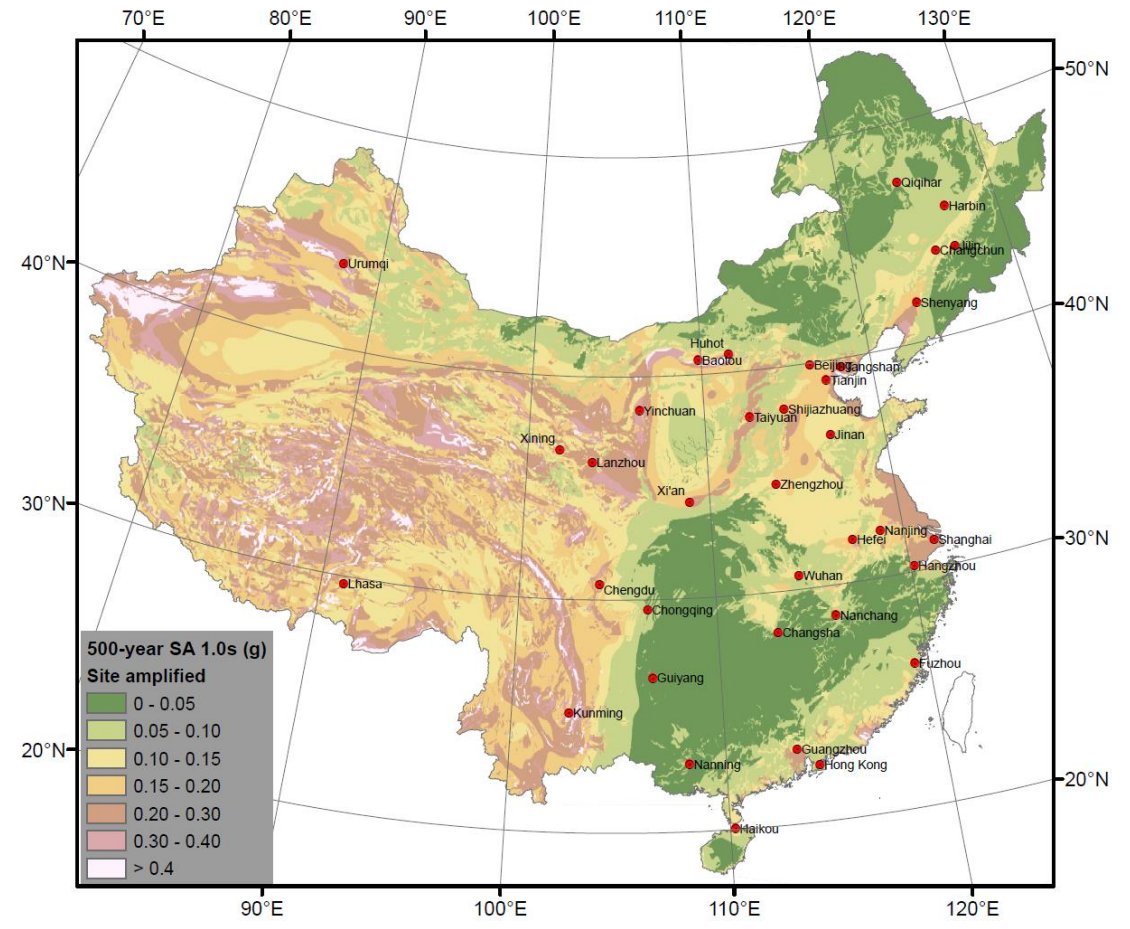
Earthquake Source Models

Rong, Y., Pagani, M., Magistrale, H. and Weatherill, G., 2017. Modeling seismic hazard by integrating historical earthquake, fault, and strain rate data, in the proceedings of the 16th World Conference on Earthquake Engineering, Santiago, Chile.

Use OpenQuake Engine to Calculate Seismic Hazard

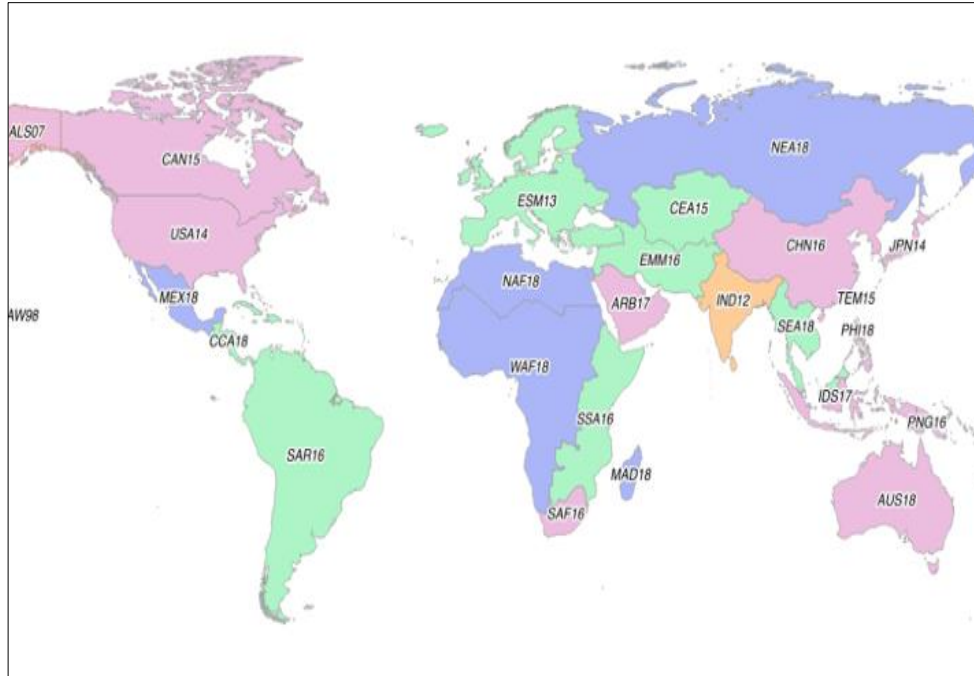


Before site amplification is considered



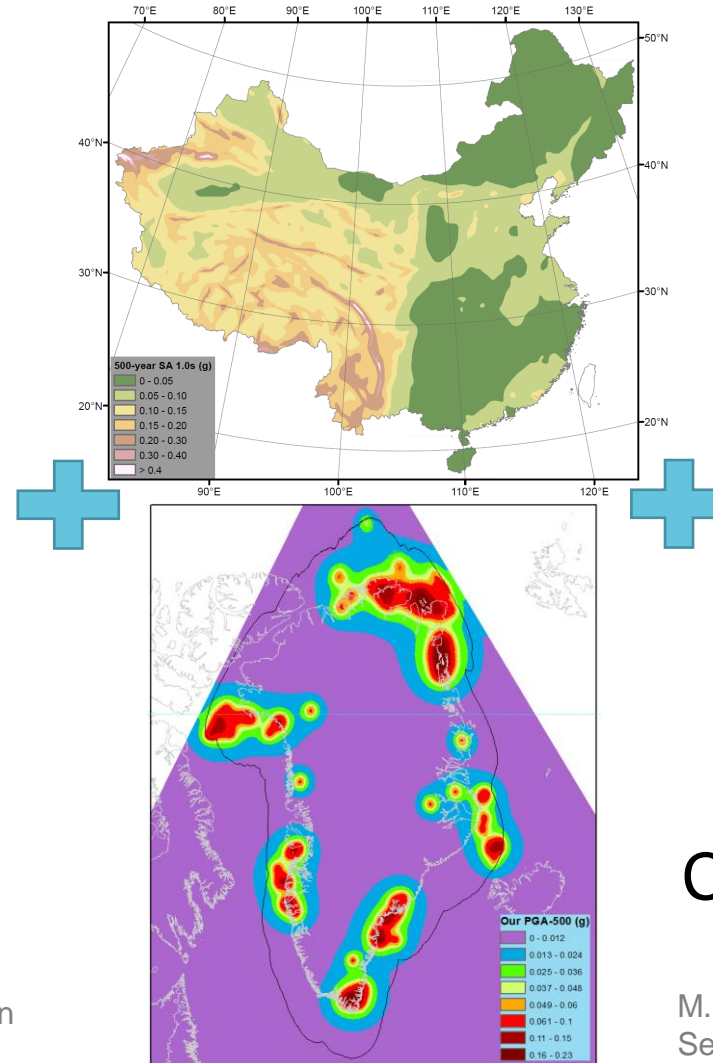
After site amplification is considered

Global Mosaic Seismic Hazard Models

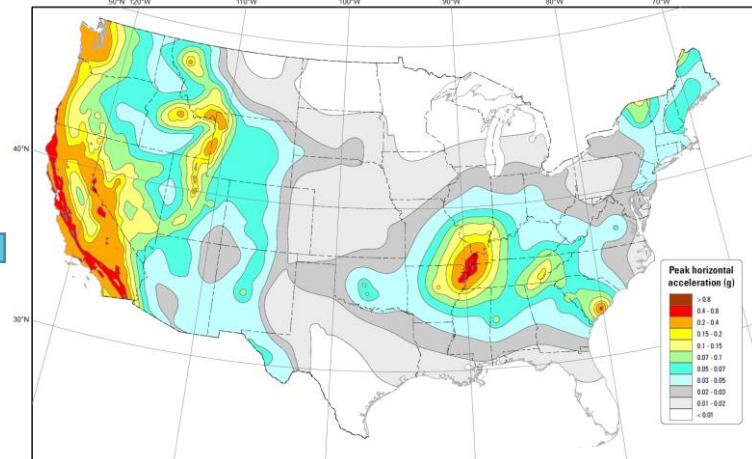


GEM mosaic hazard models

M. Pagani, J. Garcia-Pelaez, R. Gee, and others, The 2018 version of the Global Earthquake Model: Hazard component, 2020. Earthquake Spectra, 36, 226-251.



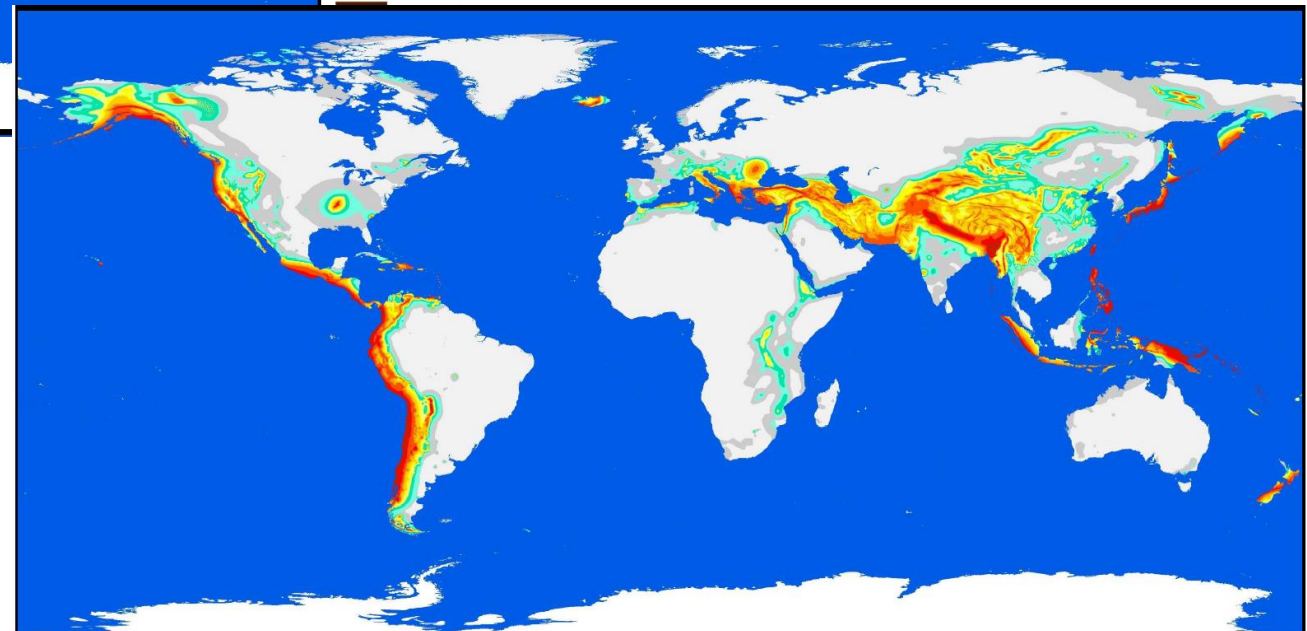
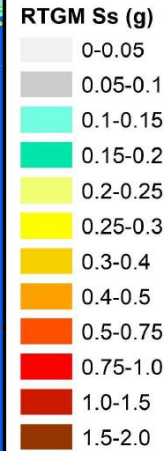
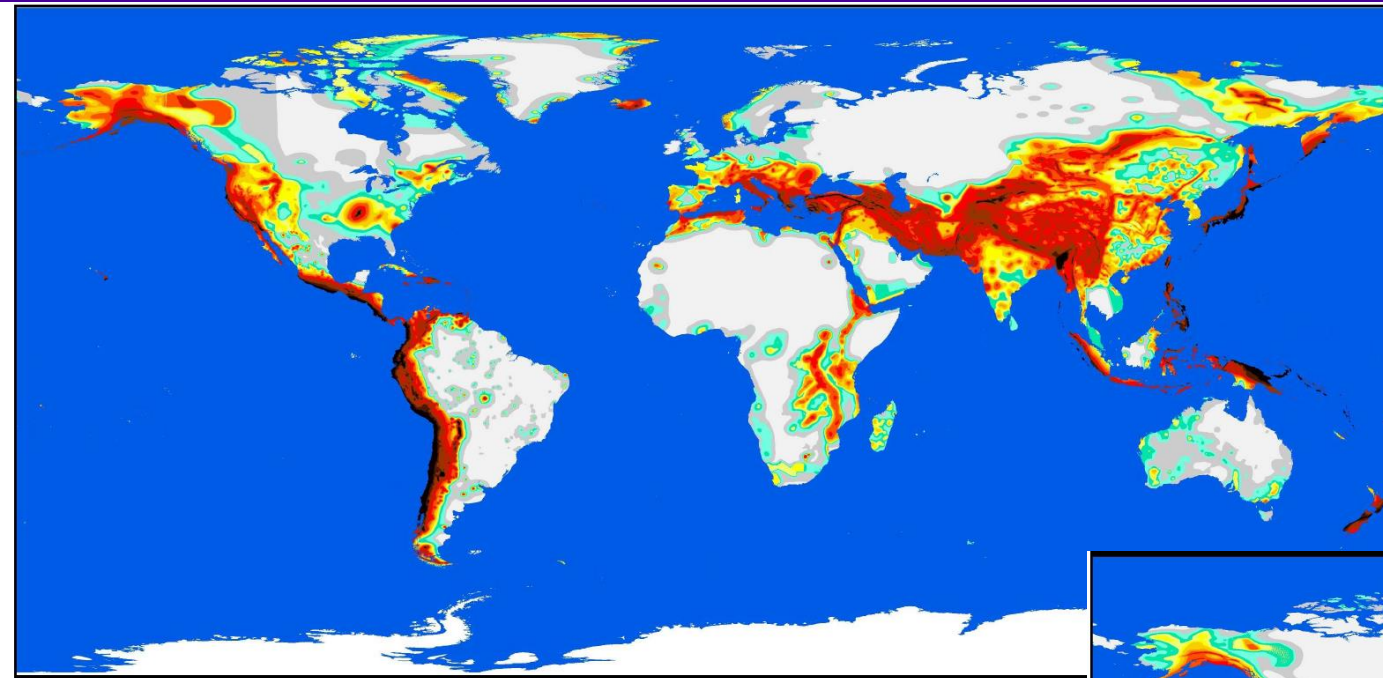
In-house models



2018 national model for Conterminous United States

M. D. Petersen et al., The 2018 update of the US National Seismic Hazard Model: Overview of model and implications, 2019. Earthquake Spectra, 36, 5-41.

Global Risk-Targeted Ground Motions



N. Attary, H. Mostafaei, E. Klein, Y. Rong, and H. Magistrale, 2020. Global risk-targeted ground motions, in the proceedings of the 17th World Conference on Earthquake Engineering.

FM Global Earthquake Risk Map

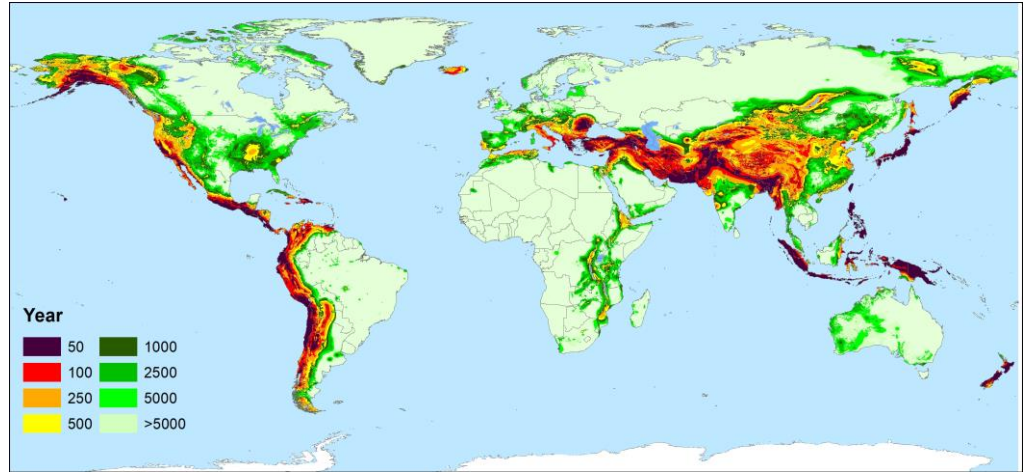
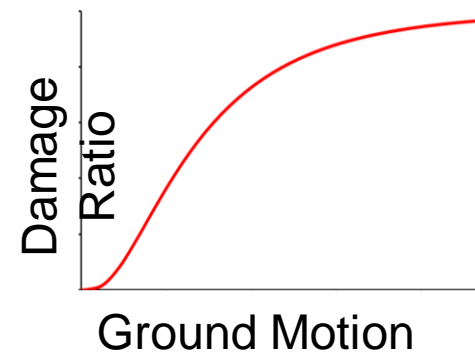
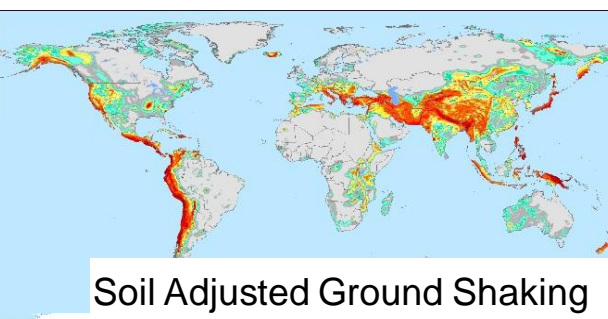
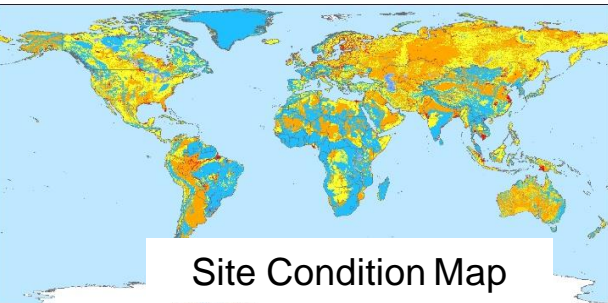
Hazard

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Vulnerability

=

Risk



Colors represent return periods of slight damage to weak buildings

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Thank you. Any questions?

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