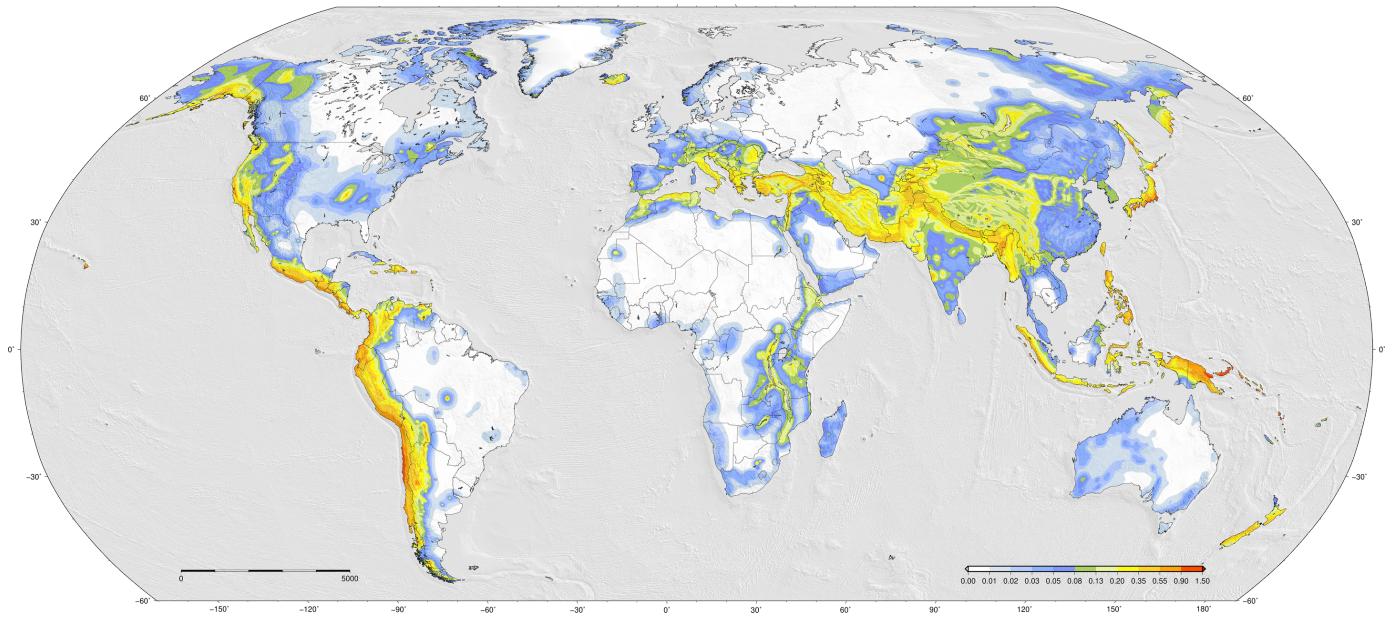
MAY 2021 | VER. 2019.1

GLOBAL EARTHQUAKE HAZARD MAP



OVERVIEW

In 2018, GEM released the Global Seismic Hazard Map (GSHM), and now maintains a series of global digital hazard map layers derived from the global hazard model that are available for purchase for commercial use (and by request for public good or non-commercial use). The GEM GSHM was the first of its kind since the GSHAP was presented in 1999. The GSHM was updated in 2019 and is now available as a digital data set.

The GEM GSHM was created by collating maps computed using national and regional probabilistic seismic hazard models developed by various institutions and projects, and by GEM Foundation scientists. The OpenQuake Engine, an open-source seismic hazard and risk calculation software developed principally by the GEM Foundation, was used to calculate the hazard values. A smoothing methodology was applied to homogenise hazard values along the model borders.

> *The GEM map is the first of its kind since GSHAP was presented in 1999.*

GEM GLOBAL EARTHQUAKE MODEL working together to assess risk

OPENQUAKE calculate share explore

CONTACT US

GEM Foundation
Via Ferrata 1, Pavia, Italy
product@globalquakemodel.org
www.globalquakemodel.org

TECHNICAL DESCRIPTION

The Global Earthquake Model (GEM) Global Seismic Hazard Maps (version 2019.1) comprise 12 global data layers containing georeferenced hazard values: peak ground acceleration (PGA), spectral acceleration (SA) at 0.2s and 1.0s, on reference rock and with soil amplification for 10% and 2% probability of exceedance (PoE) in 50 years. The maps were computed on a global grid of sites, spaced approximately 8 km, using GEM's global hazard compilation of 31 national and regional hazard models.

Map layer details

Main layer: Global seismic hazard map in terms of PGA for a 10% PoE in 50 years (475-year return period) computed on a uniform grid with reference rock conditions (Vs30 = 760-800 m/s).
Use case: Risk screening or ranking based on indication of earthquake hazard at individual locations. Not for use to evaluate risk that is correlated between two locations.

- **Spectral periods:** Main layer also available at SA(0.2s) and SA(1.0s).
  Use case: Provides ability to refine loss estimates to accommodate vulnerability models for buildings at different vibration periods. SA(0.2s) is better suited for screening low-rise structures and SA(1.0s) is more appropriate for taller buildings.

- **Local geology:** All layers accounting for local site conditions. Site properties are characterized at each grid point using Vs30 approximated from surface topography and an inferred basin depth.
  Use case: Risk screening in low-lying or flat areas underlain by sediments, where soil amplification may contribute significantly to risk.

- **Return periods:** All layers for spectral periods and soil amplification also available for 2% PoE in 50 years (2475-year return period).
  Use case: Risk screening where hazard at longer return periods may be important. Provides ability to estimate damage or loss when combined with building vulnerability curves.

Licensing information

Please contact us for more information on:

- End User License agreements for internal use (but not redistribution) of the map layers.
- Collaboration and revenue sharing agreements for resellers, brokers and other organizations wishing to provide map layer information to third parties.
- Information on map layers for other spectral periods or return periods for internal use or redistribution.

GEM Foundation

Via Ferrata 1, Pavia, Italy
product@globalquakemodel.org
www.globalquakemodel.org

Hannover Re's partnership with GEM, which now spans a decade, has significantly expanded in-house expertise on earthquake risk and strengthened our overall internal and external risk management processes to better serve our client needs.

Jörg Steffensen, Hannover Re