

GLOBAL SEISMIC HAZARD MAP (GSHM)

OVERVIEW

In 2018, GEM released its first version of the Global Seismic Hazard Map (GSHM). The GEM GSHM was the first of its kind since the GSHAP was presented in 1999. 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 GSHM maps now comprise 12 layers for PGA and spectral acceleration (0.2s and 1.0s) computed on rock and on soil by considering two return periods: 475 years and 2475 years. These layers are regularly updated (the latest release was completed in 2019) with an annual or bi-annual cadence. These global digital hazard maps are available for purchase for commercial use (and by request for public good or non-commercial use).

ATLAS 1.0

A NEW AND EASIER WAY OF ACCESSING SEISMIC HAZARD INFORMATION

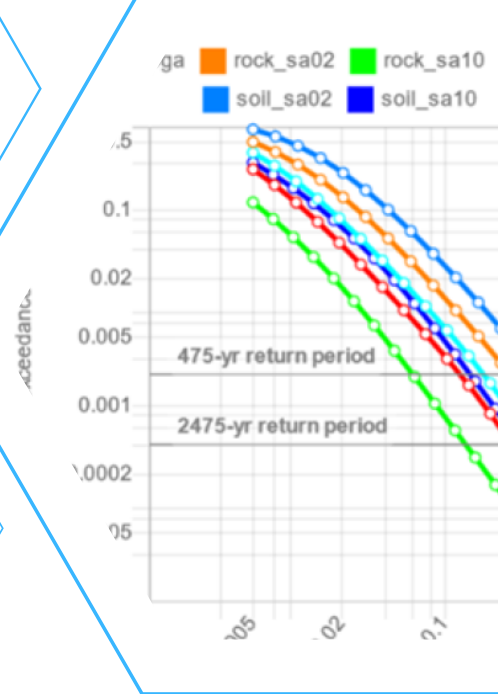
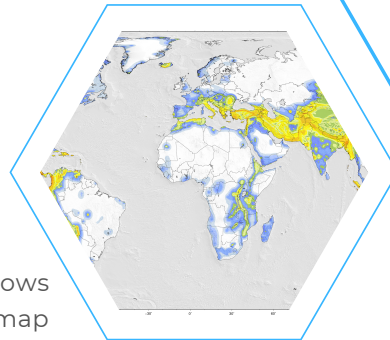
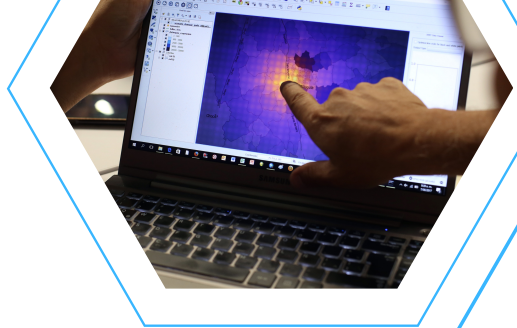
Atlas is a dynamic web portal that allows subscribers to view the GSHM in a GIS style map viewer featuring instant display and download of hazard curves for the selected sites.

The Atlas-GSHM has hazard curves available at each location shown on the hazard maps. There are six hazard curves for each location. These curves describe the annual probability of exceedance versus ground motion values for three intensity measure types [PGA, SA(0.2s) and SA(1.0s)] and two site conditions [soil and rock].

This is a subscription service which provides clients with a pay-as-you-go alternative to licensing the GSHM data layers directly.

TECHNICAL DESCRIPTION

The Global Earthquake Model (GEM) Global Seismic Hazard Maps (version 2019.1) comprise 12 global data layers containing georeferenced hazard values for peak ground acceleration (PGA), spectral acceleration (SA) at 0.2s and 1.0s, on reference rock and with soil conditions for 10% and 2% probability of exceedance (PoE) in 50 years. The maps were computed on a global grid of sites, spaced approximately 12 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 ($V_{s30} = 760-800$ 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 characterised at each grid point using V_{s30} 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 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 & SUBSCRIPTION INFORMATION

Digital Global Maps

End User License Agreements permitting internal use (but not redistribution) of the map layers are available today, please contact GEM Products for details. Resellers, brokers and other organizations wishing to provide map layer information to third parties should contact GEM Products to discuss the terms of possible collaboration and revenue sharing.

Atlas - Interactive Map

Subscriptions permitting access to the **Atlas** are available today; please contact GEM Products for details. Resellers, brokers and other organizations wishing to provide map layer information to third parties should contact GEM Products to discuss the terms of possible collaboration and revenue sharing.

CONTACT US AT

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- for free trial access to the Atlas or a limited sample of the data layers; and for information on map layers for other spectral periods or return periods

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- for public good, research or academic purposes (subject to review and approval)