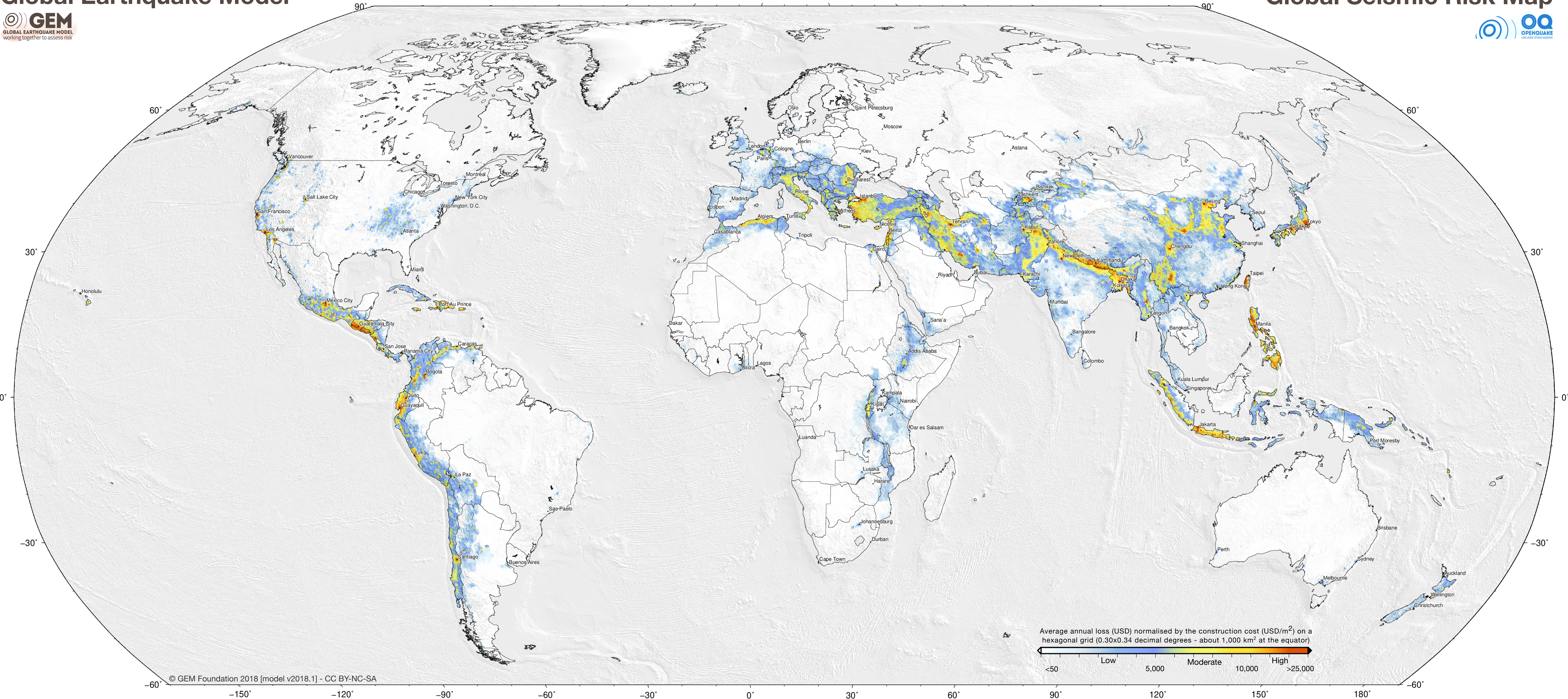


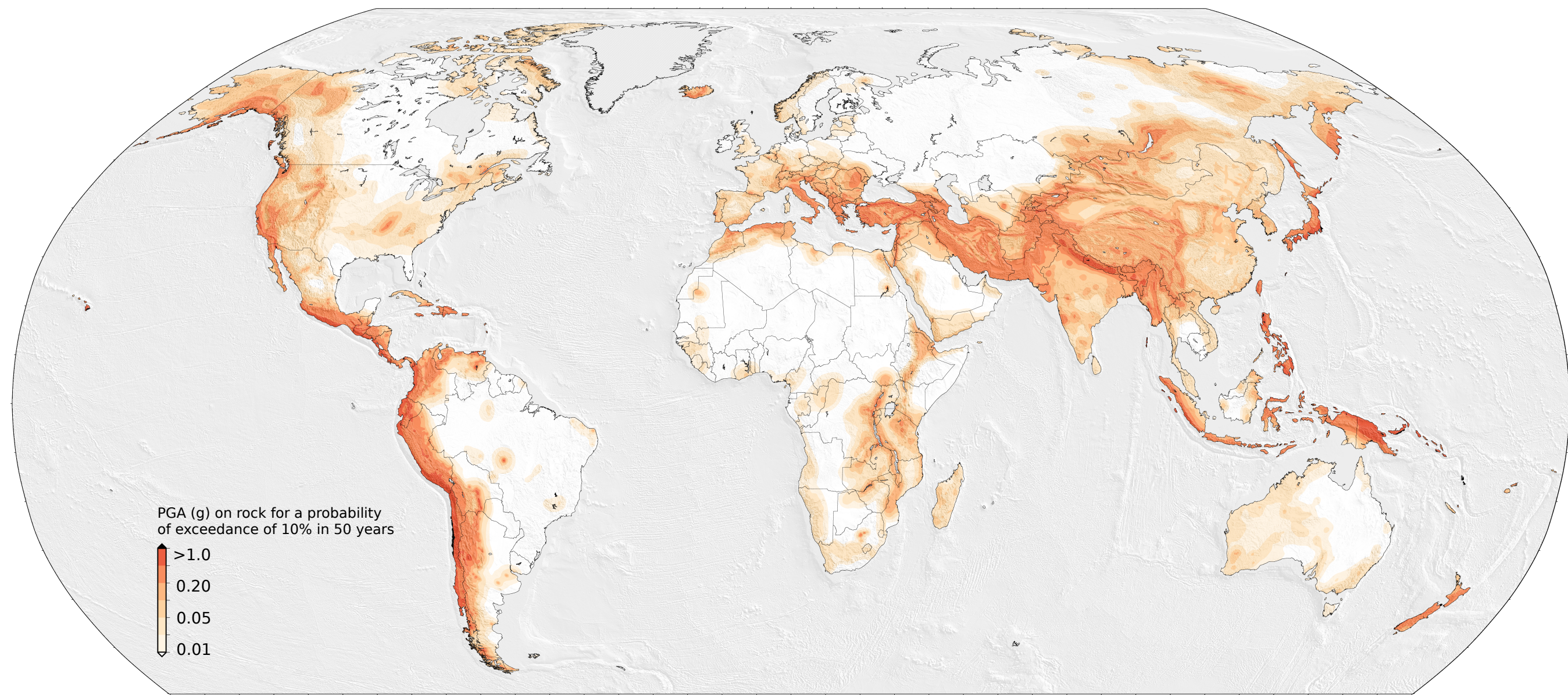
Global Earthquake Model



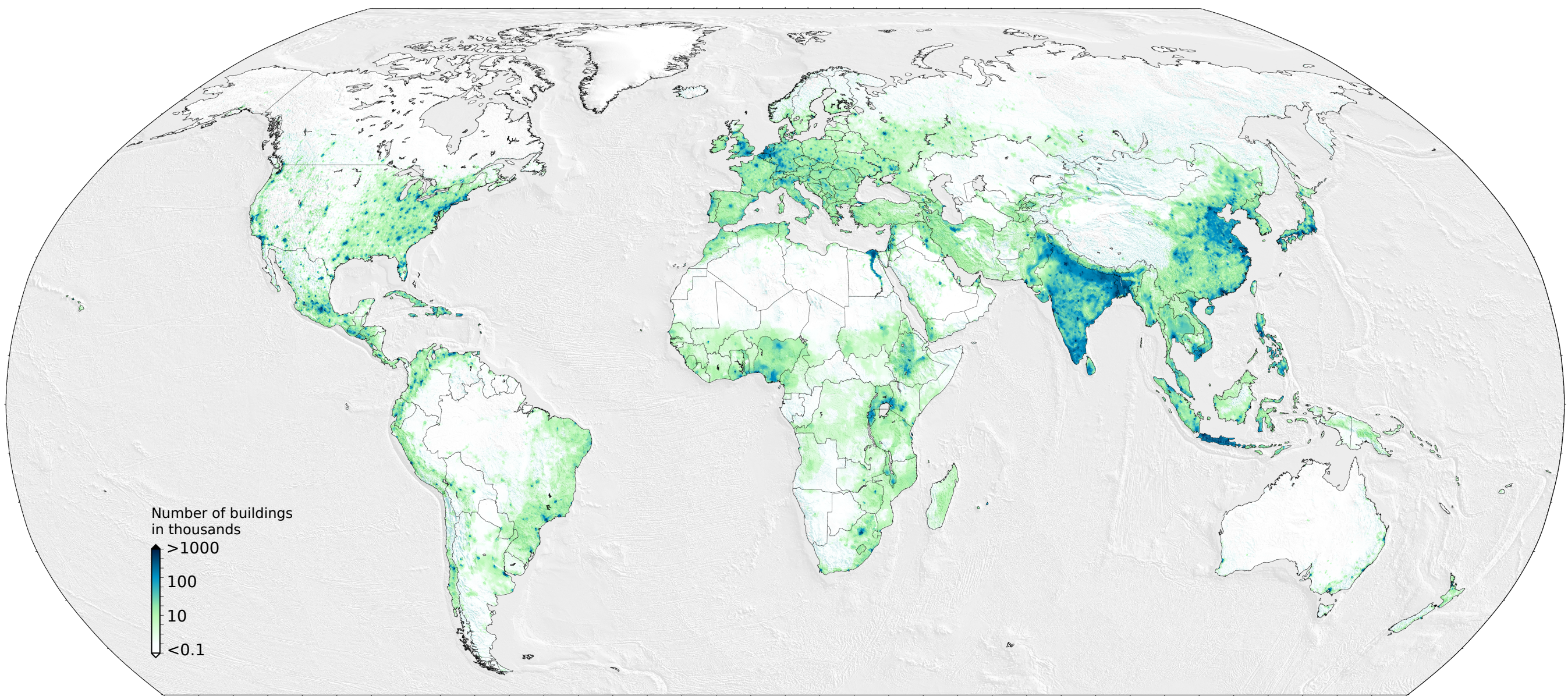
Global Seismic Risk Map



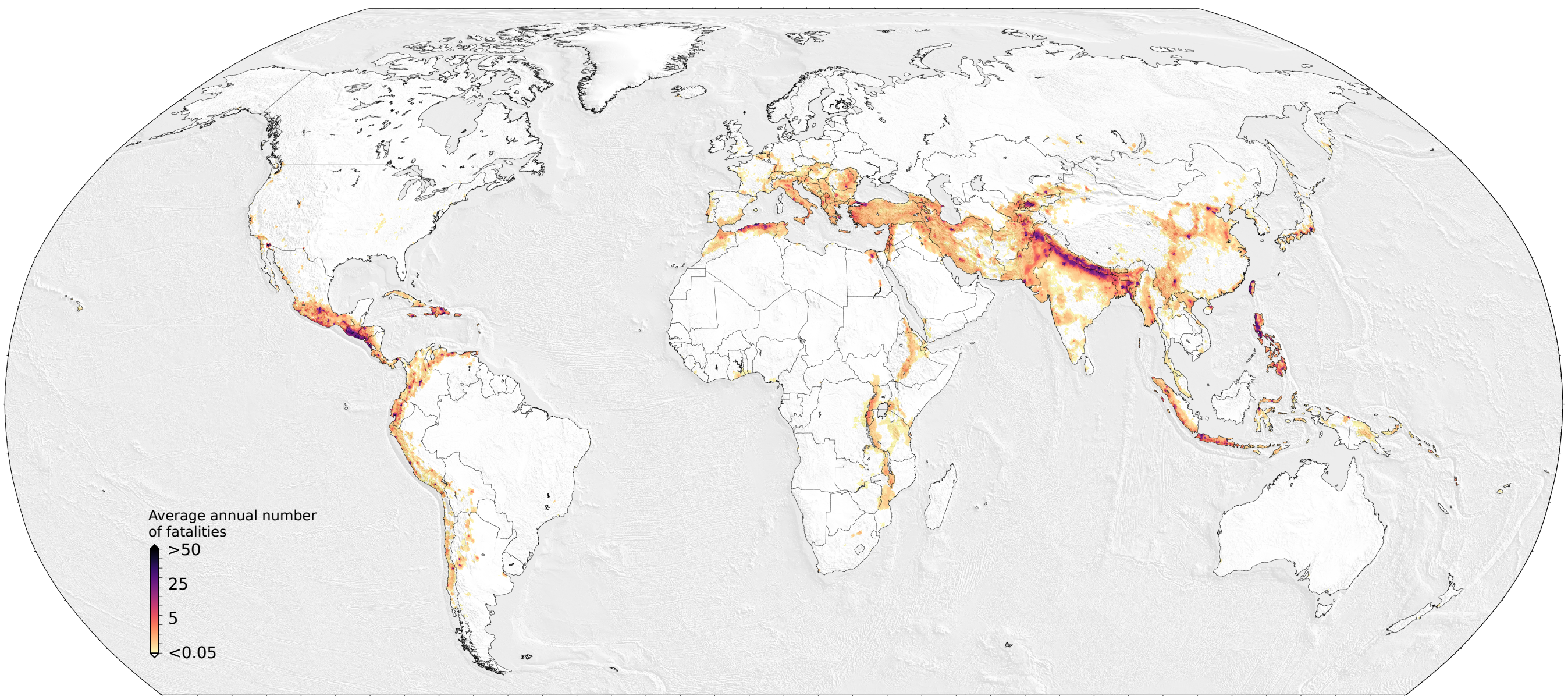
Global Seismic Hazard Map



Global Exposure Map



Global Seismic Fatalities Map



Global Earthquake Model (GEM) Global Seismic Risk Map
The Global Seismic Risk Map (v2018.1) comprises four global maps. The main map presents the geographic distribution of average annual loss (USD) normalised by the average construction costs of the respective country (USD/m²) due to ground shaking in the residential, commercial and industrial building stock, considering contents, structural and non-structural components. The normalised metric allows a direct comparison of the risk between countries with widely different construction costs. It does not consider the effects of tsunamis, liquefaction, landslides, and fires following earthquakes. The loss estimates are from direct physical damage to buildings due to shaking, and thus damage to infrastructure or indirect losses due to business interruption are not included. The Global Seismic Hazard Map depicts the geographic distribution of the Peak Ground Acceleration (PGA) with a 10% probability of being exceeded in 50 years, computed for reference rock conditions (shear wave velocity of 760-800 m/s). The Global Exposure Map depicts the geographic distribution of residential, commercial and industrial buildings. The Global Seismic Fatalities Map depicts an estimate of average annual human losses due to earthquake-induced structural collapse of buildings. The results for

human losses do not consider indirect fatalities such as those from post-earthquake epidemics. The average annual losses and number of buildings are presented on a hexagonal grid, with a spacing of 0.30 x 0.34 decimal degrees (approximately 1,000 km² at the equator). The average annual losses were computed using the event-based calculator of the OpenQuake engine, an open-source software for seismic hazard and risk analysis developed by the GEM Foundation. The seismic hazard, exposure and vulnerability models employed in these calculations were provided by national institutions, or developed within the scope of regional programs or bilateral collaborations. These global maps and the underlying databases are based on best available and publicly accessible datasets and models. Due to possible model limitations, regions portrayed with low risk may still experience potentially damaging earthquakes. The GEM Risk Map is intended to be a dynamic product, such that it may be updated when new datasets and models become available. Releases of updated versions of the seismic risk map are anticipated on a regular basis. Additional hazard and risk metrics for each country can be explored at globalquakemodel.org/gem.

The Global Earthquake Model (GEM) Foundation
The Earthquake Risk Map 2018 is a product of the GEM Foundation. Initiated by the Organisation for Economic Co-operation and Development (OECD) Global Science Forum in 2006, GEM was formed in 2009 as a non-profit foundation in Pavia (Italy), funded through a public-private sponsorship with the vision to create a world that is resilient to earthquakes. Participants represent national research or disaster management institutions, the private sector and international organisations. GEM expands the assessment of seismic hazard at the global scale initially started by the Global Seismic Hazard Assessment Program (GSHAP) in support of the UN International Decade of Natural Disaster Reduction in 1999 to the consideration of direct economic and human losses. Observing its core values of collaboration, transparency, openness, credibility, and serving the public good, GEM goes beyond GSHAP by extending the scope of work to the risk domain, providing an institutional framework for continuous updates, and fostering direct applications to risk reduction and prevention projects. GEM's collaborative network comprises more than 70 public and private institutions organised under more than 25 regional, national and multilateral projects.

GEM's OpenQuake platform (platform.openquake.org) provides access to all data, models, tools and software behind the maps. GEM's open-source OpenQuake engine enables probabilistic hazard and risk calculations worldwide and at all scales, from global down to regional, national, local, and site-specific in a single software package. The Sendai Framework for Disaster Risk Reduction (SFDRR) calls for "decision-making on disaster risk reduction to be based on solid and openly accessible scientific work". GEM supports the SFDRR goals by contributing openly accessible products for hazard and risk assessment and capacity development in risk reduction projects. GEM also serves as a baseline or exemplar for the development of a broader multi-hazard framework for risk assessment in support of a holistic and comprehensive approach to disaster risk reduction. Technical details on the development and compilation of the hazard and risk maps, underlying models and the list of contributors can be found at globalquakemodel.org/gem.

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Legal statements
This map is an informational product created by the GEM Foundation for public dissemination purposes. The information included in this map must not be used for the design of earthquake-resistant structures or to support any important decisions involving human life, capital and movable and immovable properties. The values of seismic hazard and risk in this map do not constitute an alternative nor do they replace building actions defined in national building codes or earthquake risk estimates derived nationally. Readers seeking this information should contact the national authorities tasked with seismic hazard and risk assessment. The seismic risk map results from an integration process that is solely the responsibility of the GEM Foundation.

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