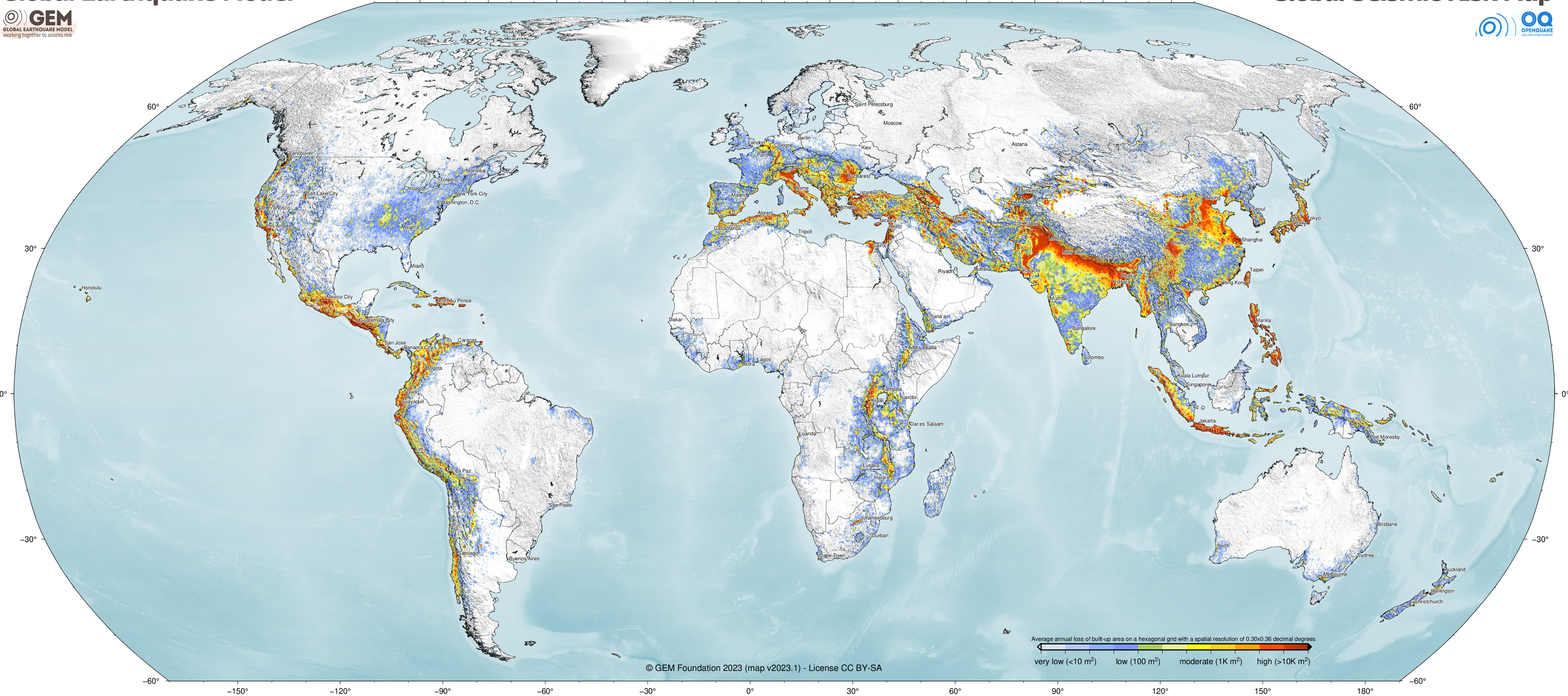


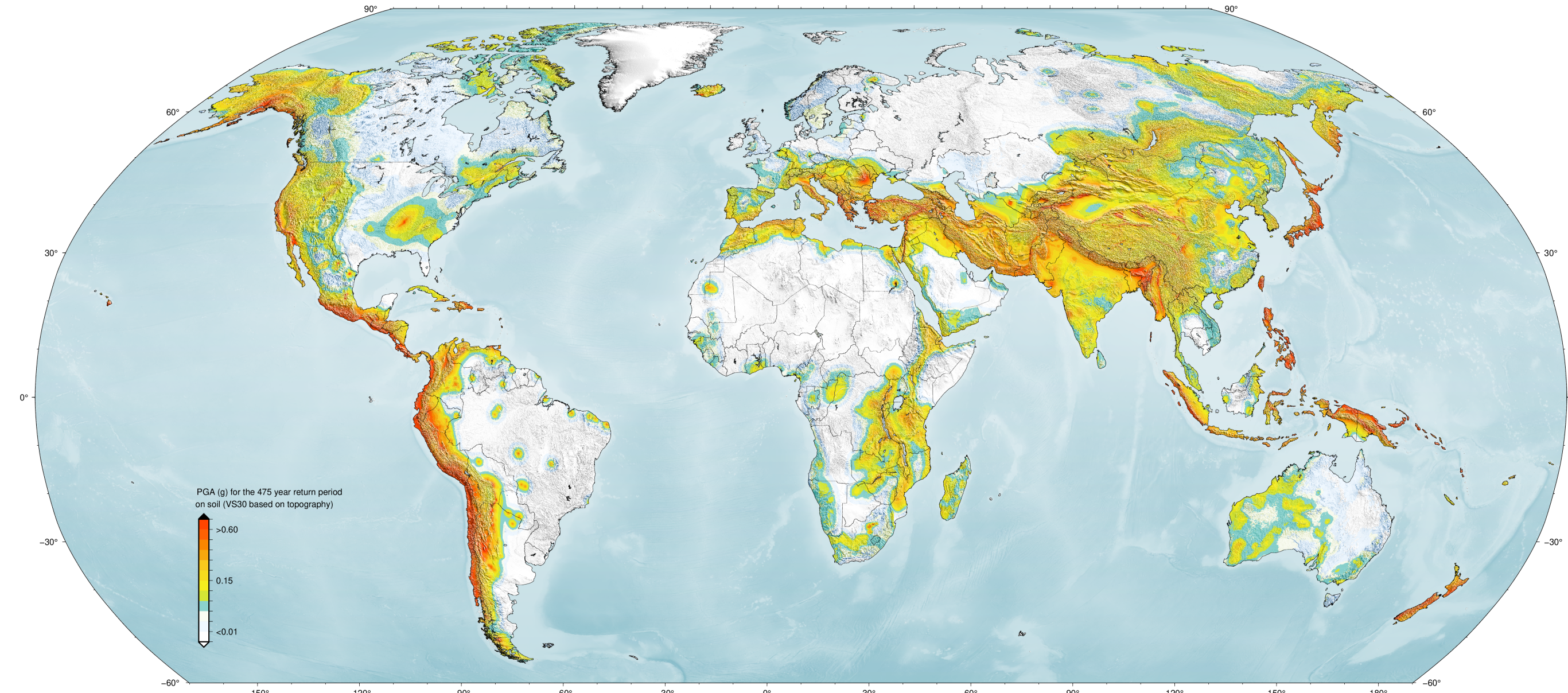
Global Earthquake Model



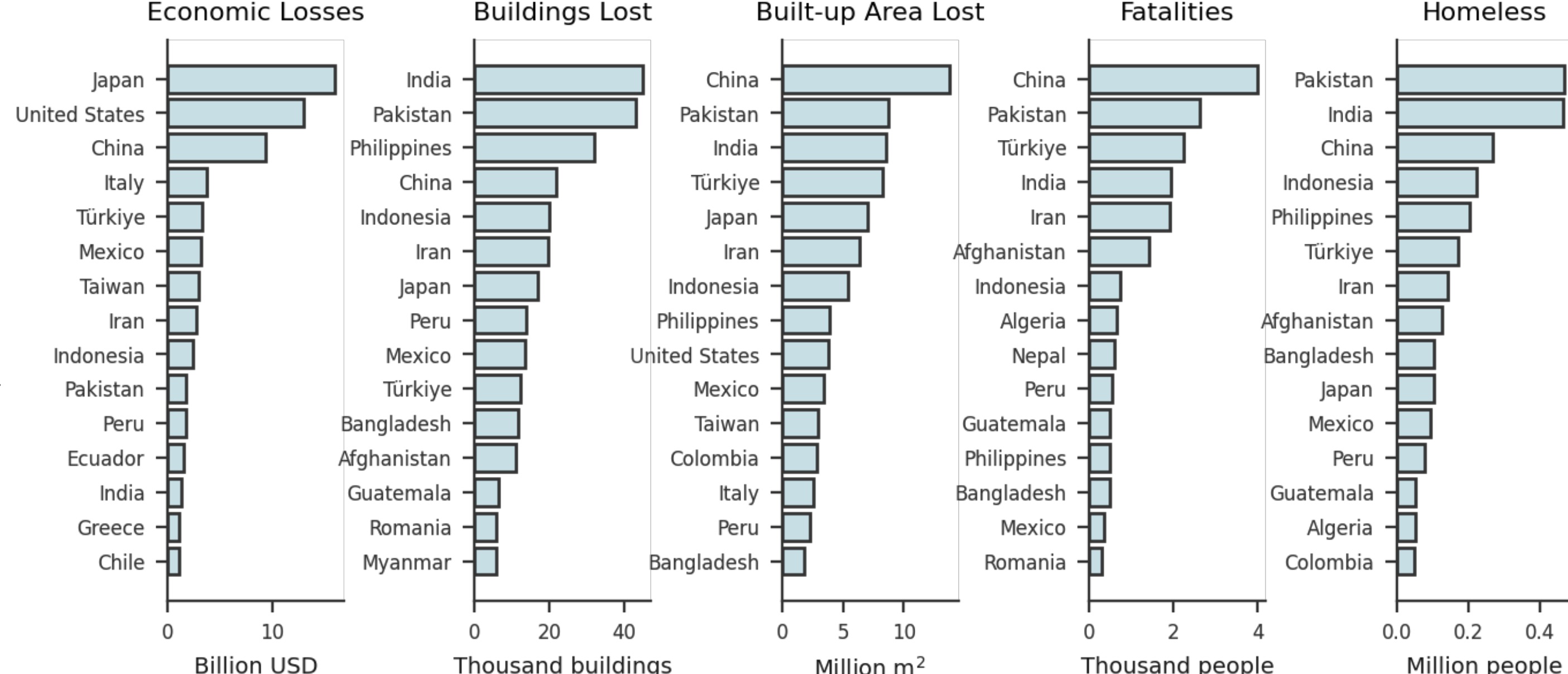
Global Seismic Risk Map



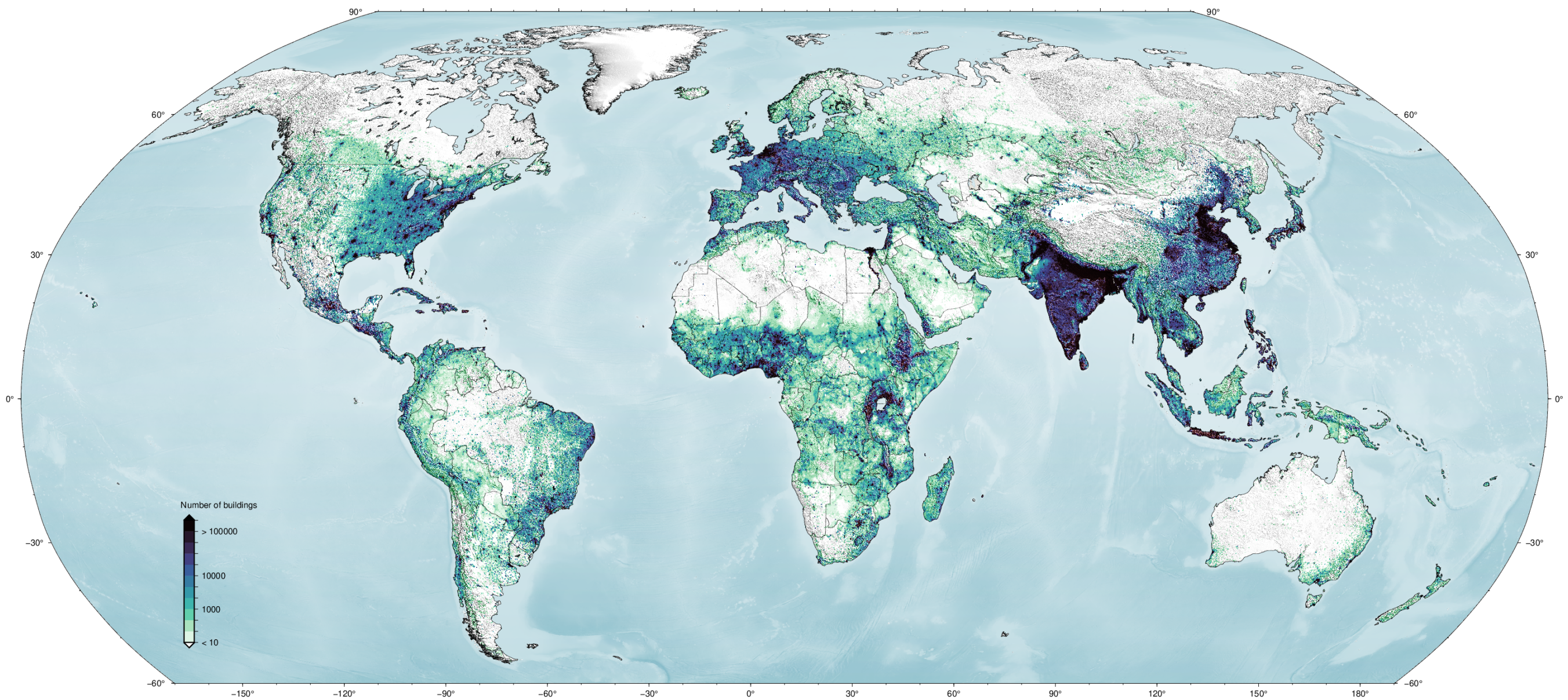
Global Seismic Hazard Map



Global Risk Ranking of Top 15 Countries and Territories



Global Exposure Map



Global Earthquake Model (GEM) Global Seismic Risk Map

The Global Seismic Risk Map (v2023.1) poster comprises three global maps, and a ranking of the top 15 countries or territories according to five risk metrics. These results are an update of the global maps released in 2018, as described in Silva et al. (2020). The main map presents the geographic distribution of average annual loss of built-up area due to ground shaking in the residential, commercial, and industrial building stock. It does not consider the effects of tsunamis, liquefaction, landslides, and fires following earthquakes. 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 soil conditions (shear wave velocity based on topography). The Global Exposure Map depicts the geographic distribution of residential, commercial, and industrial buildings. The average annual losses and number of buildings are presented on a hexagonal grid, with a spacing of 0.30 x 0.36 decimal degrees (approximately 1,000 km² at the equator). The central bar plots present the ranking of the top 15 countries or territories according to five risk metrics: Average Annual Economic losses (in billions of USD), Average Annual Number of Buildings Lost (in thousands), Average Annual Built-up

Area Lost (in millions of m²), Average Annual Fatalities (in thousands), and Average Annual Population Left Homeless (in millions). The economic losses 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 fatalities are due to earthquake-induced structural collapse of buildings and do not consider indirect fatalities such as those from post-earthquake epidemics. These risk metrics 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. Additional hazard and risk metrics for each country can be explored at globalquakemodel.org/gem/.

The Global Earthquake Model (GEM) Foundation

The GEM Global Seismic Risk Map is a product of the GEM Foundation. Initiated by the OECD's Global Science Forum in 2006, GEM was formed in 2009 as a non-profit foundation in Pavia, Italy, funded through a public-private partnership with the vision to create a world that is resilient to earthquakes. Participants represent national research, applied science or disaster management institutions, the private sector and international organisations. GEM continues the tradition of the Global Seismic Hazard Assessment Program (GSHAP), which produced the first global seismic hazard map arising from a global collaborative effort of scientists in 1999 in support of the UN International Decade of Natural Disaster Reduction (IDNDR). GEM's collaborative network comprises more than 100 public and private institutions, which has led to GEM's participation in more than 50 regional, national, and multilateral projects. Observing its core values of collaboration, openness, credibility and serving the public good, the GEM initiative extends the scope of work of GSHAP to the risk domain, providing an institutional framework for continuous updates and fostering direct applications to risk reduction and prevention projects. GEM's

mission is to become one of the world's most complete sources of risk resources and a globally accepted standard for seismic hazard and risk assessment. GEM's open-source OpenQuake engine enables probabilistic seismic hazard and risk calculations worldwide and at all scales, from global to regional, national, local, and site-specific, all within a single software package. GEM's strategy and roadmap to 2030 is underpinned by the global drivers for disaster risk reduction and sustainability - namely the Sendai Framework for Disaster Risk Reduction (SFDRR), the Paris Agreement on climate change, and the Sustainable Development Goals. GEM supports these goals by contributing openly accessible products for hazard and risk assessment and capacity development for 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.

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