

From shaking to consequences: GEM to unveil new global earthquake risk products

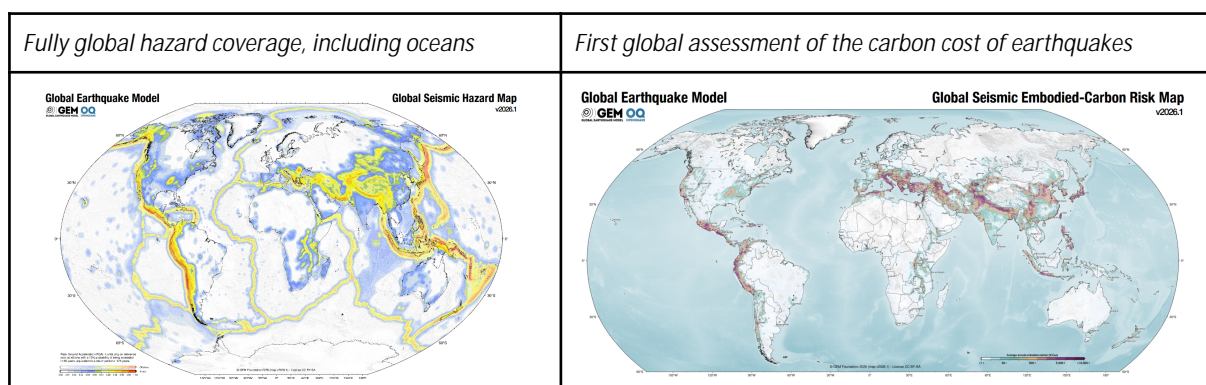
Building on GEM's landmark 2018 global release, the new 2026 products update and expand the global view of seismic hazard and risk to include infrastructure exposure to liquefaction, future risk trajectories, and the carbon cost of earthquake damage and reconstruction.

16 June 2026. Pavia, Italy. At GEM Conference 2026 in Zagreb next week, the Global Earthquake Model (GEM) Foundation will unveil a new generation of global seismic hazard and risk products, marking a major step forward from its first global release in 2018.

The 2018 release gave the world one of its first open, globally consistent views of earthquake hazard and risk. The 2026 release goes further. It updates GEM's core global hazard and risk models while widening the lens of earthquake risk analysis: from ground shaking and building losses to infrastructure disruption, future exposure and the carbon emissions associated with earthquake damage and reconstruction.

“Since GEM's first global release in 2018, both the science and the scope of earthquake risk analysis have advanced,” said Helen Crowley, Secretary General of the GEM Foundation. “The 2026 products are not simply updated maps. They show that earthquake risk is dynamic and multidimensional — affecting the buildings we live in, the roads we rely on, the emissions generated through reconstruction, and the decisions we make today that shape tomorrow's risk.”

The June 2026 release will include updated global seismic hazard and risk products, together with new global analyses of road network exposure to liquefaction, the carbon cost of earthquake damage, and future seismic risk through to 2065. Together, the products address a central question: how is the global picture of earthquake risk changing, and what does this mean for disaster risk reduction, planning and resilience?



For advanced coverage, journalists are invited to contact GEM at communication@globalquakemodel.org for approved preview material ahead of the 23 June public release.

A broader view of earthquake risk

The 2026 release expands global earthquake risk assessment beyond where the ground may shake to show how earthquakes can affect buildings, roads, recovery, emissions and future development.

A planetary-scale hazard map — GEM’s 2026 hazard product extends, for the first time, probabilistic seismic hazard coverage across the oceans, providing a more complete global foundation for impact and risk analysis.

Earthquakes and infrastructure disruption — The first global analysis of road exposure to liquefaction highlights where earthquake-induced ground failure could disrupt transport corridors, emergency access, logistics and recovery.

The carbon cost of earthquakes — GEM’s new embodied-carbon risk model estimates the emissions associated with earthquake damage, repair and reconstruction, adding an environmental dimension to seismic risk assessment.

Forward-looking risk scenarios to 2045 and 2065 — exploring how seismic risk may evolve as population, settlements, building stock and construction practices change.

A fully global view of seismic hazard

A key milestone in the 2026 release is GEM’s new Global Seismic Hazard Map, which extends probabilistic seismic hazard coverage across the oceans. The product builds on GEM’s global hazard mosaic, combining national, regional and GEM-developed models into a consistent global framework for estimating earthquake shaking.

“Any credible assessment of earthquake impacts begins with robust earthquake and hazard science,” said Marco Pagani, Head of Seismic Hazard at GEM. “Since 2018, GEM and its partners have continued to improve the global hazard mosaic, integrate new data and models, and move toward a more complete framework that now extends across the oceans.”

The 2026 hazard product provides the scientific basis for updated global seismic risk calculations and for new applications that depend on a consistent view of earthquake hazard across land, coastal regions and offshore areas.

From building losses to wider consequences

Alongside the hazard update, GEM will release updated global seismic risk maps covering exposure, vulnerability, economic losses, fatalities, buildings destroyed, built-up area destroyed, population rendered homeless and embodied-carbon loss.

The updated global risk model reflects changes in population, building stock, construction costs, exposure data, vulnerability modelling and the underlying seismic hazard models. It also provides a more detailed understanding of which types of buildings contribute most to different risk metrics, helping users move from identifying where risk is concentrated to understanding why it is concentrated there.

GEM Foundation

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The release also introduces a new global analysis of road network exposure to liquefaction. Liquefaction occurs when strong shaking causes saturated soils to lose strength, potentially damaging roads, bridges, buried lifelines and other infrastructure. By identifying where roads are exposed to both high shaking and severe liquefaction hazard, the new product highlights how earthquakes can disrupt transport links, emergency response, logistics and recovery.

The carbon cost of earthquakes

Another major innovation in the 2026 release is GEM's Global Seismic Embodied-Carbon Risk Map, which adds an environmental dimension to earthquake impact assessment.

Earthquake damage can trigger large-scale repair, demolition, debris management and reconstruction. These processes require materials, transport and construction activities that generate greenhouse gas emissions. GEM's new global embodied-carbon risk model estimates the carbon footprint of earthquake damage and reconstruction, allowing users to consider seismic risk not only as a human and economic issue, but also as a long-term environmental burden.

This work can support more integrated decisions on seismic safety, retrofitting, sustainable construction, post-earthquake recovery and life-cycle carbon assessment.

Looking ahead to 2045 and 2065

The 2026 release also points to the next horizon of earthquake risk analysis: how risk may evolve in the decades ahead.

Using future socioeconomic pathways, GEM's forward-looking risk work explores how changes in population, settlements, building stock and construction practices may affect seismic risk through 2045 and 2065. Rather than predicting a single future, the products provide transparent scenarios that can help governments, planners, humanitarian organisations, insurers, researchers and risk analysts explore how today's choices may influence tomorrow's earthquake losses.

"Uncertainty is inherent in any assessment of future earthquake risk, and also in comparing risk across time," said Vitor Silva, Head of Risk Engineering at GEM. "What matters is that uncertainty is treated transparently, using the best available science and clearly stated assumptions, so that users can interpret the results responsibly."

GEM emphasises that the products are decision-support tools, not predictions of individual future earthquakes. Built through open and collaborative scientific frameworks using GEM's OpenQuake Engine, they combine hazard, exposure, vulnerability and related datasets to support more informed decisions on risk reduction, planning and resilience.

How to watch the release and access the products

GEM Conference 2026 will take place from 23 to 25 June in Zagreb, hosted by the Croatian Centre for Earthquake Engineering at the University of Zagreb. Day 1 will feature the public release of the new products and will be livestreamed.

The viewing link will be made available on 23 June 2026 on the conference event page and the GEM homepage. After the release, the products will be available for download from the GEM website's Products page.

Event streaming URL:

<https://www.globalquakemodel.org/gemevents/gem2026-conference-from-faults-to-future-scenarios>

Products URL:

<https://www.globalquakemodel.org/products>

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