CoreLogic®

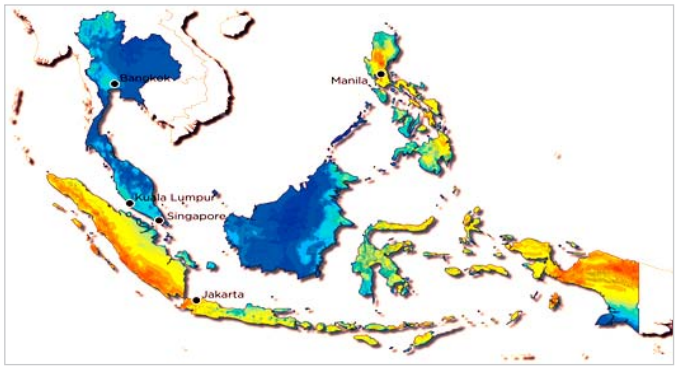
CATASTROPHE RISK MANAGEMENT

Southeast Asia Earthquake Model

Offering the latest understanding of seismic science and vulnerability in Southeast Asia

Regional Model

The Southeast Asia Earthquake model covers a regional tectonic setting which incorporates the geographical territories of Indonesia, Malaysia, Philippines, Singapore, and Thailand. This allows for consistency of results and seamless cross-country spatial correlation of seismic risk. The model employs a 300,000-year simulation catalog, with over 385,000 simulated earthquake events.



It also explicitly includes losses from Earthquake Ground Shaking, Landslide & Liquefaction, and includes Demand Surge as an On/Off feature.

Comprehensive Seismic Source Modeling Methodology

Southeast Asia is one of the more complex tectonic regions in the world where the Australia, Eurasia (Sunda subplate), Philippine Sea, and Pacific plates interact on a global scale.

The model incorporates a comprehensive seismotectonic model that includes:

- Active crustal sources
- Stable Continental Region (SCR) sources
- Subduction Zone megathrust sources
- Subduction Intraslab (Wadati–Benioff zone) sources

Ground Motion Modeling

Ground motion intensity defines the hazard to a building, and this intensity changes as seismic waves move outward from the event epicenter.

Up-to-date Ground Motion Prediction Equations (GMPEs) describe the ground-shaking intensity at a site given the physical characteristics of an earthquake scenario. Spectral acceleration is the primary hazard parameter used to define ground motion intensity and create these event footprints.

Key Benefits:

- Regional model capturing cross-country seismic risk for 5 countries.
- Explicitly models damage due to liquefaction and earthquake-induced landslide
- High resolution hazard model employing a Variable Resolution Grid (VRG)
- Two recurrence frequency models: Time-Dependent and Time-Independent
- Offers a competitive advantage with a current, accurate, relevant model
- 3-D disaggregation methodology for aggregate data
- Supports all the latest geocoding options for each territory

As based on the United States Geological Survey (USGS) 2014 hazard model, multiple weighted GMPEs are used to capture epistemic uncertainty with firm-rock as a reference site condition. These differ for each of the tectonic sources listed above. The model also incorporates high resolution soil maps to apply the site adjustment factors to translate hazard intensity for local soil conditions.

Liquefaction and Landslide

Specific site-deformation probability models have been developed for liquefaction and landslide risk; Peak Ground Acceleration (PGA) is used as the hazard intensity measure for site failure.

Two Frequency Models: Time-Dependent and Time-Independent View of Risk

Modeled losses are significantly influenced by the recurrence frequency of larger earthquakes that occur on subduction sources. CoreLogic® has implemented time-dependent recurrence frequencies for the large earthquakes on the Sunda Subduction zone where appropriate. This means that the probability of occurrence of the next event is dependent on the previous event. This reflects the scientifically-accepted physical mechanism of stress build-up on faults caused by tectonic plate forces. It also portrays risk within the foreseeable future—not just the theoretical long-term. The Time Dependent view is the CoreLogic default view of risk; in addition, the Time Independent (long-term) is also offered as an alternative frequency model.

Vulnerability Modeling

CoreLogic treats each country within the Southeast Asia earthquake model region differently, having 5 vulnerability regions. Using an engineering approach to design vulnerability functions, and including a comprehensive review of local laws on building codes and construction quality. ensures the model captures the vulnerability changes due to the evolution of each country's infrastructure. This is validated against expert opinion and claims data (international and local where available) to develop vulnerability functions within the model. Vulnerability functions are created to calculate potential losses for a full suite of structure types, occupancy codes, building age, and building height (Low, Mid, and High-Rise).

3D-Disaggregation Methodology for Aggregate Data

CoreLogic utilizes multiple data sets including population density and land-use data; these maps are overlaid in a 3D layer and are used as a smarter way of disaggregating and geocoding aggregate exposure. Exposure will be geocoded differently for Residential, Commercial, Industrial, and Agricultural classes of business.

Financial Model Output

Available in the global multi-peril catastrophe modeling platform, Risk Quantification and Engineering (RQE®). RQE uses a Simulation Financial model with a Year Loss Table (YLT) that produces loss sample outcomes. This allows for a more robust capture of uncertainty, and the financial model can capture complex insurance and reinsurance conditions.

For more information, please call 866.774.3282
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