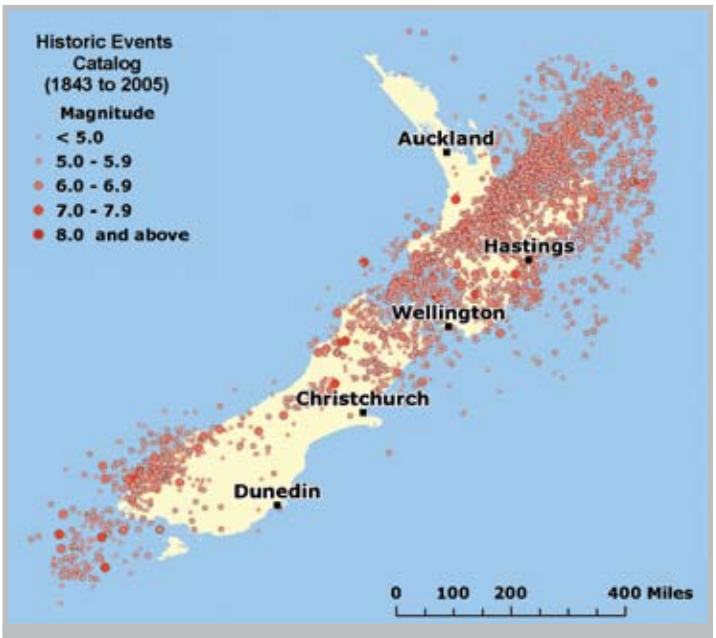
Astride the juncture of the Pacific and Australian tectonic plates, New Zealand's frequent and potentially severe earthquakes distinguish its location as one of the Earth's more geologically volatile environments. RMS has partnered with leading seismic specialists in New Zealand to incorporate their knowledge and understanding of this unique seismic setting into a detailed and fully probabilistic earthquake loss estimate model.

New Zealand Earthquake

New Zealand's position in a highly seismically active region results in numerous earthquakes, shallow and deep, on land and offshore. The 1855 magnitude 8.1 Wairarapa Earthquake, one of the largest earthquakes to occur in New Zealand, caused severe and extensive damage. The recurrence of such an event would isolate Wellington from the rest of the country, and is considered one of the worst-case scenarios for New Zealand. The uncertainty around the recurrence of large events, combined with the potential levels of loss, highlights the need for metrics and tools to manage and mitigate these losses. The fully probabilistic RMS® New Zealand Earthquake Model addresses these concerns by providing a standardized framework for assessing seismic risk in New Zealand.

Partnering with Science and Industry Leaders

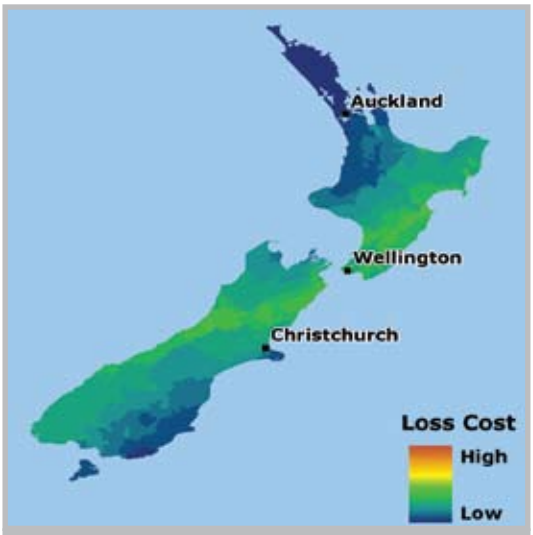
RMS' global earthquake modeling expertise is supported and strengthened through partnerships with New Zealand's leading earthquake institutes. Working in close conjunction with the Institute of Geological and Nuclear Sciences (GNS) and the National Institute of Water and Atmospheric Research, RMS has been able to draw from extensive research on earthquake hazard and building vulnerability, and to incorporate this expertise into the event set, hazard, and vulnerability components of the earthquake model. Working with the insurance market, RMS refined the financial modeling assumptions coded within the residential profiles of the RMS® Aggregate Loss Module (ALM) to more accurately capture the contribution to the losses of Earthquake Commission residential policies.



Seismicity of New Zealand (Catalog Source: GNS)

Modeling Earthquake Hazard

Utilizing the most advanced RMS methodologies, the New Zealand earthquake model benefits from improved modeling accuracy through highly detailed modeling, while optimizing the trade-off between model resolution and run-time. A full suite of seismic sources across the entire country, including nearly 350 faults, has been identified



General commercial loss cost across New Zealand

using the latest seismic parameters developed by GNS for the New Zealand Seismic Hazard Maps, and includes magnitude uncertainty and time-dependent recurrence on selected faults. These seismic sources were used to develop a probabilistic set of over 16,600 simulated earthquakes that capture the potential for both moderate and large earthquakes in New Zealand.

Ground motion calculations capture the effects of local site conditions, such as soil type and susceptibility to liquefaction, by using a proprietary RMS geographic indexing system known as the variable resolution grid (VRG), with up to 100-meter resolution to store detailed hazard data. Grid cell size varies depending on exposure density and hazard gradient, enabling more accurate loss calculations. Analysis output is now available at the newly released 2006 vintage postcode level.

New Zealand Building Inventory and Vulnerability Modeling

The RMS New Zealand Earthquake Model includes the calibration of building inventory data and vulnerability curves to represent the unique seismic behavior of the New Zealand building stock. The model provides the option to enter building attributes on a risk-by-risk basis; when this information is not available, or aggregate data is entered, the model retrieves building inventory assumptions from databases included in the model. Vulnerability regions are based on the latest recommendation in the New Zealand Seismic Design Code.

The RMS spectral response methodology provides the most advanced approach available for modeling property value in this high-risk region. This approach provides a robust link between ground motion and building damage, taking into account building characteristics, local soil site conditions, the distance and magnitude of the earthquake for ground shaking, and liquefaction susceptibilities. Post-event loss amplification and the RMS® Fire Following Earthquake Model are also implemented. In addition, the earthquake model includes tsunami accumulation footprints for key historical events, which can be used to quantify the exposure affected by each of the reconstructed events.

Model Specs

History

Original release 1995, most recent upgrade in 2007

Geographic Scope

All of New Zealand

Geocoding Resolution

Coordinate, Postcode, City, TLA, Region, CRESTA

Lines of Business and Coverages Modeled

39 residential, commercial, industrial and agricultural occupancies. Building, contents and business interruption losses are included

Special Features

Tsunami accumulation footprints, Fire Following Earthquake Model; Industrial Facilities Model available separately

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