The 2022 New Zealand National Seismic Hazard Model Revision

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ABSTRACT

We are embarking on the most significant revision of the NSHM in more than 20 years. An international team of more than 50 scientists is contributing to two working groups: 1) Seismicity Rate Models (SRM); and 2) Ground Motion Characterisation Models (GMCM). In both groups there is a critical focus on understanding and modelling of uncertainty via alternative models within the NSHM.

In the SRM many more ruptures are being modelled than was possible in the past. This includes, long, complex and multi-fault ruptures. We will no longer by limited by strict fault segmentation and a single earthquake magnitude per fault. This complexity also allows us to better model potential ruptures on the Hikurangi subduction zone. For low-seismicity regions we are aiming to account for the larger variability in occurrence rate that occurs in these regions and the reduced spatial precision that we have.

GMCM will use multiple recent international ground motion models. Where feasible, and significant for hazard, regional adaptations to the models will be implemented. This includes necessary improvements for near-source large magnitude events, path, and modelling of non-linear site response. As with the SRM, the Hikurangi is a critical focus of the model which requires better modelling of ground shaking from Auckland through to Wellington.

Hazard implications are still being understood, are complex and include the inter-play of many competing factors.

At the end of the project, all models and hazard results will be available online. This will include tools to explore different hazard metrics.