

# Hazard

**Programme Title:** Hazard: Resilience to NZ's hazard spectrum

**Programme Leader:** Professor Mark Bebbington (Massey University)

## Background

This Toolbox Programme will generate (involving closely integrated teams of community members/representatives, officials, and scientists) new hazard knowledge, and a set of fit-for-purpose hazard tools and solutions that meet community and stakeholder aspirations for nationally consistent delivery of risk information that underpin development of resilience solutions across all relevant natural hazard types.

Specifically, this Programme will develop new frameworks and methods to consistently express all parts of the hazard spectrum, from low-magnitude/high-frequency to high-magnitude/low-frequency cases. This will be incorporated with hazard and resilience-relevant knowledge among a wide range of community groups, governance and private agencies and other science stakeholders. This toolbox will further take into account the dynamic shifts that may occur along the hazards impact spectrum, due to factors including: climate change, societal change, and geological activity.

This Programme will provide the Resilience Challenge with accurate and useable information by developing:

- a better understanding of how co-creation will aid in exchanging hazard and impact knowledge between scientists and end users; and
- a better understanding of the 'what' and 'when' of natural hazards in a variety of contexts, including cumulative, cascading and unexpected hazards.

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## Programme Outcomes

**Contribution to the Resilience Challenge Mission:** Co-creation of new knowledge between communities, scientists and officials will allow the evaluation of the full spectrum of hazard impacts both expected and not yet anticipated in New Zealand. This will lead to better informed and more realistic resilience discussions, debates and solutions in our communities. This Programme will provide new tools to initiate and support community-led development of impact-reduction solutions that build local, regional and national resilience to both "normal" hazards (e.g., flood, drought, storm, rural fire, landslide, coastal erosion), through rare and often unexpected ones (e.g., earthquake, tsunami and volcanic events).

**Vision Mātauranga ("VM") outcome:** This Programme will provide scenarios to underpin exploration of hazard management and emergency response plans in the Mātauranga

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Māori Co-Creation Laboratory. This will support enhanced development of resilience to natural hazards among Māori, and will add a further dimension to non-Māori resilience.

**10-year outcome:** Multiple regions of New Zealand are confidently using reliable information on multi-hazard perils at regional and community scales to prioritize natural hazard reduction, readiness, response and recovery strategies and spending.

**5-year outcome:** A new framework for providing reliable and useable information on collective multiple natural hazards at regional and community-scales has been implemented in at least two regions.

#### **Specific Projects within Programme**

- 1. Co-creation of hazard impact and resilience scenarios:** This project will develop a nationally consistent framework for risk and impact information for New Zealand's natural hazards, using scenario-based approaches.
  - 2. Hazard spectrum and correlation modelling:** This project aims to statistically quantify multiple different natural hazards in terms of frequency and magnitude, allowing them to be incorporated in probabilistic analysis formulae.
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