

**Notes on successful projects from Natural Hazards Research Platform
contestable investment (2012-2015)**

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- 1. The funding is in two pools – “NZ Natural Hazards”, and “Lessons learned from Canterbury earthquakes”**
- 2. 11 successful projects in NZ Natural Hazards**
 - Dr Ursula Cochran (GNS) is leading a project on the history of past major earthquakes on the Alpine fault, and Dr Bruce Hayward (Geomarine Research) on major earthquakes in the Hikurangi subduction margin of eastern North Island (something of an analogue for the recent Tohoku earthquake and tsunami in Japan).
 - Two projects on tsunami hazard and risk – a GNS/U of Auckland project on tsunami impacts on NZ port facilities, and a NIWA/GNS project on tsunami initiation by undersea landslides.
 - A Massey U project led by Dr Jonathan Proctor documenting Mataurangi Maori knowledge of volcanic hazard.
 - A GNS-led project by Dr David Rhoades will contribute to improved methods for estimating further earthquake activity in a region following one or more large events.
 - Two engineering projects, one led by U of Canterbury researching methods to identify residual capacity and repair options in commercial buildings following earthquake, and a second led by U of Auckland on assessing earthquake demand and repair options in commercial steel frame construction.
 - A joint project between NIWA, GNS and Opus is examining wind flows over topography and reassessing wind engineering guidance documents
 - A NIWA-led project by Dr Rob Bell will assess storm tide hazards in estuaries.
 - A GNS-led project by Dr John Haines will develop new methods for assessing future earthquake and volcanic hazard by interpreting the data coming from the increasingly dense network of high resolution GPS receivers across NZ that are part of the GeoNet array.
- 3. 8 successful projects in Lessons Learned from Christchurch.**
 - 2 projects assessing economic impacts, one led by Dr Levi Timar at GNS and Motu looking at the Canterbury case study and the other using economic modelling software used in Canterbury transferred to modelling economic losses associated with major volcanic crisis at Mt Taranaki. The 2nd project will be led by Massey University.

- A project using voluminous data from Canterbury earthquake recording stations will examine the reasons for high levels of shaking and damage and dis-entangle the contributions from the earthquake characteristics at source, the path effects from 8-10 km depth to the surface, travelling through complex geological layers, and the near surface (top 20 m or so) weak soil effects. This project will be co-led by Dr Anna Kaiser from GNS and Dr Brendon Bradley from U of Canterbury.
- A project led by Dr Simon Cox from GNS will examine whether the severity of liquefaction-induced damage in Christchurch has been influenced by leakage from artesian water aquifers beneath Christchurch.
- Dr Philip Barnes from NIWA will use the excellent data collected last year in Pegasus Bay to examine characteristics of the fault structure in the region to improve the understanding of the causes and patterns of recent earthquakes.
- 3 projects will examine aspects of the built environment by using observations of damage in Canterbury to develop guidance for future building or retrofit around NZ. Dr Jason Ingham of U of Auckland and his team will develop guidance for effective retrofit solutions for unreinforced masonry heritage buildings, an Opus led team will address the question of acceptable levels of seismic risk of older buildings in New Zealand, using Wellington as a case study, and Dr Richard Henry from U of Auckland will examine issues exposed in Christchurch with respect to reinforced concrete walls in commercial buildings.

4. Other characteristics of the successful proposals are:

- The healthy spread of projects across the 5 themes of Platform research (geological hazards, weather-related hazards, societal resilience to hazards, risk, and resilient engineering);
- Projects are often being led by emerging researchers, and are from all the principal institutions engaged in natural hazards research in NZ;
- There is an excellent blend of cross-theme and multi-institutional projects;
- There is evidence of effective partnership with the user community in designing the research;
- International colleagues make an impressive contribution to almost all of the project teams.

Successful Proposals from 'New Zealand Natural Hazards'

NZ Natural Hazards	Funding (GST excl)	Duration	Short Title	Theme
PROP-28916-HAZNAT-GNS	\$311,000.00	3 yrs	Alpine Fault earthquake recurrence	Geol Haz
PROP-28920-HAZNAT-GNS	\$200,000.00	3 yrs	Hybrid earthquake forecasting models	Geol Haz
PROP-28931-HAZNAT-GNS	\$350,000.00	2 yrs	Inversion of GPS velocities	Geol Haz
PROP-28817-HAZNAT-HAYWARD	\$360,000.00	3 yrs	Great megathrust earthquake hazard	Geol Haz
PROP-29093-HAZNAT-MAU	\$270,000.00	3 yrs	Matauranga Maori for Volcanic Hazard	Social
PROP-28954-HAZNAT-NIW	\$440,000.00	3 yrs	Submarine Landslide-Tsunami Hazard	Geol Haz
PROP-29164-HAZNAT-NIW	\$300,000.00	3 yrs	Storm tide hazards in estuaries	Weather
PROP-29168-HAZNAT-NIW	\$420,000.00	3 yrs	Wind Speed Hill Shape Multipliers	Eng
PROP-29110-HAZNAT-UOA	\$299,000.00	3 yrs	EBF Demand and Repair	Eng
PROP-29158-HAZNAT-UOC	\$450,000.00	3 yrs	Residual Capacity and Repairing Options	Eng
PROP-28923-HAZNAT-GNS	\$600,000.00 merged	3 yrs	Tsunami impacts on ports and harbours	Geol Haz
PROP-29094-HAZNAT-UOA			Tsunami Resilience of NZ Ports	Eng
Total	\$4,000,000.00			

Successful Proposals from 'Lessons Learned from Christchurch'

Lessons Learned from Christchurch	Funding (GST excl)	Duration	Short Title	Theme
PROP-28917-HAZCHCH-GNS	\$490,000.00	2 yrs	Groundwater and liquefaction	Eng
PROP-28925-HAZCHCH-GNS	\$450,000.00	3 yrs	Economic lessons from Christchurch	Social; Risk
PROP-29152-HAZCHCH-MAU	\$250,000.00	3 yrs	Faster Rebuilds with MRCGE	Social
PROP-28880-HAZCHCH-NIW	\$280,000.00	4 yrs	Active Submarine Faulting	Geol Haz
PROP-29151-HAZCHCH-OPS	\$500,000.00	3 yrs	Acceptable seismic risk of older buildings	Social; Eng
PROP-28989-HAZCHCH-UOA	\$300,000.00	2 yrs	Retrofit solutions for heritage URM buildings	Eng
PROP-29017-HAZCHCH-UOA	\$230,000.00	3 yrs	Reinforced concrete walls	Eng
PROP-28928-HAZCHCH-GNS	\$500,000.00 merged	3 yrs	Quantifying contributions to seismic hazard	Geol Haz
PROP-29082-HAZCHCH-UoC		3 yrs	Stochastic Ground Motion Simulation of Christchurch Earthquakes	Geol Haz
PROP-29114-HAZCHCH-UoC		3 yrs	Seismic site response effects	Eng
Total	\$3,000,000.00			