

June 2022

Natural Hazards Inc.
Collaborating to Create a More Resilient Tomorrow

Natural Hazards Inc. Business Cluster is a New Zealand based partnership of industry leaders delivering innovative solutions for earthquake and other natural hazards risk management internationally. www.naturalhazards.co.nz.

Natural Hazards Inc. helps to promote and facilitate the application of New Zealand based innovation and specialist expertise that can be applied offshore to provide benefits for the safety and well-being of people in many parts of the world.

Borders have now been opening again, with international travel for face to face meetings once again gaining momentum following two years of Covid-19 pandemic period online communications. Members have adapted to undertaking international work remotely. There are excellent examples of collaborative project work undertaken by our members in New Zealand working virtually with partners elsewhere in the world.

Climate Change is front and centre in the Pacific and globally. COP 26 in Glasgow November last year will be followed by COP 27 in Egypt later this year.

Increased funding, including from MFAT, and other resources is now going to climate change initiatives in our Pacific region as well as elsewhere.

Members are very actively involved with a range of climate change initiatives in the Pacific and elsewhere.



Natural Hazards
 Pacific focus – Covid-19 and climate change solutions



Images from a Natural Hazards Inc presentation by:
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Massive Tonga Eruption & Tsunami



Photo from Natural Hazards Inc Presentation from Graham Leonard, Carol Stewart & Tom Wilson (GNS Science, Auckland, Massey & Canterbury Universities)

The massive Tonga Hunga Ha’apai volcanic eruption and tsunami took place 15 January this year, causing widespread devastation. The Pacific community quickly responded to help. Recovery and reconstruction will take time and considerable resources.



Photo: UN News

An estimated 85,000 people across Tonga have been affected. Parts of Tonga’s most populated islands experienced the worst of the tsunami. The World Bank soon after estimated US\$90m in damages – the equivalent of about 18.5% of Tonga’s Gross Domestic Product (GDP).

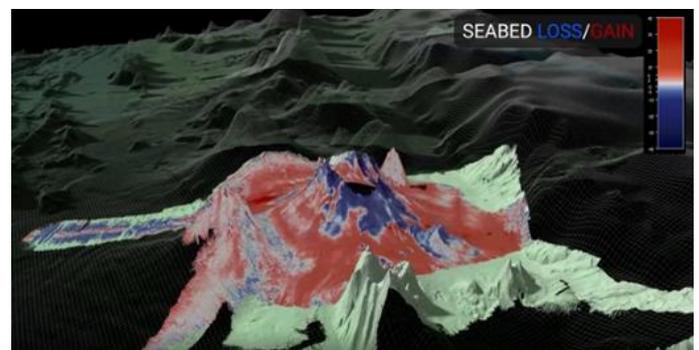
A range of members and associates have been involved in recovery and research efforts over recent months. This has included NIWA, GNS Science, Tonkin+Taylor, working in partnership with MFAT, NEMA, Met Service, NZ Defence, Pacific WASH (Fiji), Tonga Geological Service, Tonga Meteorological Services, Tonga HN-ASH Cluster, ESR, MOH, Massey, Auckland, Canterbury and Otago Universities, USGS, USAid, VDAP, Nippon Foundation and others.

NIWA RV *Tangaroa* voyage aftereffects research

Results from a month-long NIWA RV *Tangaroa* voyage, part of the Nippon Foundation-funded Tonga Eruption Seabed Mapping Project (TESMaP), have been widely shared internationally. The astonishing photography, swath imagery and analysis from this research has given a real appreciation of the extent of the capabilities of NIWA and partners and its global significance towards better future preparation.

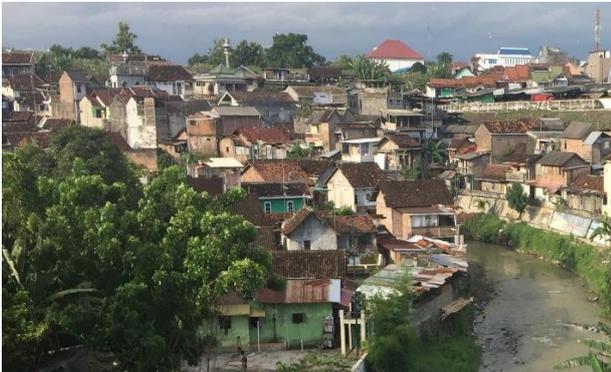


<https://niwa.co.nz/news/tonga-eruption-discoveries-defy-expectations> [Photo: NIWA-Nippon Foundation TESMaP / Rebekah Parsons-King]



NIWA image: Bathymetric mapping showed the extent of the displacement of sediment and debris.

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Indonesia Virtual Meeting – hosted by the Indonesian Embassy

Presentations in July 2021 with interactive discussions.

Indonesia National Assessment of Early Warning Preparedness and Capability Project – by GNS Science with Indonesian partner Universitas Gadjah Mada UGM for the Indonesian Government, funded by the World Bank. Photo images from GNS Science



Covid-19 travel restrictions adaptation to undertaking project work through online virtual means. Critical to this have been the ability to build on the personal and organisational relationships established over the last several years.



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Images: GNS Science



Improving Building Safety in Indonesia

VUW School of Architecture Professor Andrew Charleson has been working virtually from Wellington with leading Schools of Architecture in Indonesia in Bandung, UGM Yogyakarta and UIN Malang in Java to assist with them achieve earthquake-safe buildings. This follows pre Covid-19 time spent in Indonesia with these tertiary education providers.

Professor Charleson has been presenting nation-wide webinar workshops for lecturers teaching Structures on earthquake-resistant design for students studying architecture in Indonesia.

He has also been working with a team of Indonesian associates to the production of a series of 25 single page illustrated articles on how to achieve earthquake-safe buildings written for wider public use.

For further information:

Professor Andrew Charleson

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Indonesia AHA Centre Online Training Project

GNS Science has been providing MFAT funded ACE Disaster Management training courses since 2014 that include visits to various places and organisations in New Zealand for the Indonesian Jakarta based ASEAN Coordinating Centre (AHA Centre) for Humanitarian Assistance on disaster management.

With Covid-19 there was a need to change in 2021 to a virtual training delivery approach, with a series of videos produced in New Zealand with the assistance of The Open Polytechnic and use of webinars.



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Member Profile



Helen Barnes, Business Development Manager, GNS Science

Helen Barnes is the new Business Development Manager for GNS Science who has a particular focus on international development projects, connecting scientists to government, industry and communities.

Helen is seeking to strengthen the positive impact from applying GNS Science to those who benefit from it, and supporting GNS's mission of a cleaner, safer and more prosperous New Zealand. Her role is in the Business Partnerships team who are charged with enhancing and developing business opportunities and key relationships for GNS Science.

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BECA Led Initiatives in Europe, Pacific & Asia

Earthquake Engineering NZ and Natural Hazards Inc founding member BECA has over the years provided leadership for a number of business cluster initiatives, with Richard Sharpe, Technical Director Earthquake Engineering an important part of these. Richard at a BECA hosted Natural Hazards Inc Business Cluster meeting last year spoke of the history of the business cluster and importance of the relationships that have been established and continue to be built on.



Photo: Left to right - Courtney Chapman & Richard Sharpe of BECA with Bapon Fakhruddin of Tonkin+Taylor, during a BECA presentation on the BECA Groningen project in the Netherlands and sustainability project work in the Pacific.

Groningen Web-based Seismic Engineering

BECA project led by Technical Director Earthquake Engineering Richard Sharpe developed a world-class seismic engineering and advisory software expertise system that enables fast reliable and consistent structural assessments of buildings in Groningen in the Netherlands.

Structural Engineer Courtney Chapman, who gave a presentation on this project to Natural Hazards Inc members, provided on the ground support based in the Netherlands and then with Covid-19 continued to provide support virtually from the BECA base in Wellington, New Zealand.

BECA introduced efficient and pragmatic analysis techniques reducing analysis times from three months to three days.

This has enabled a web-based seismic assessment process for local engineers in the Netherlands to use, combining seismic and software expertise. Project work included developing the Dutch seismic code for local engineers to use and providing advice to the Dutch government based on BECA's world-class seismic expertise.

120,000 homes in the Groningen area are potentially at risk from induced earthquakes arising from a reduction in gas pressure as gas has been extracted from what has been the largest onshore gas field in Europe. The buildings in this area were not designed to resist earthquake loading and are particularly vulnerable given their age, materials and construction method.

<https://www.beca.com/getmedia/6f7eca12-4927-451d-8227-72aa20b5c5f8/Beca-Earthquake-Engineering-Capability-Statement.pdf>



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David Dewar Pacific Trade Commissioner

NZTE (NZ Trade & Enterprise) in August 2021 appointed David Dewar as the new Trade Commissioner for the Pacific, based at the New Zealand High Commission in Suva, Fiji.

This appointment forms an important part of the New Zealand Government's commitment to recharging its partnerships in the Pacific and is assisting the region recover from the effects of Covid-19 as well as impact of the Tonga Hunga Ha'apai volcanic eruption and tsunami.

David has quickly become engaged with a wide range of business initiatives in the region including with members and associates of the Natural Hazards Inc Business Cluster and Pacific Export Network.

<https://www.nzte.govt.nz/blog/nzte-appoints-pacific-trade-commissioner>



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Silvester Clark Consulting Engineers jointly hosted meeting with Robinson Seismic

Last August before the Omicron surge Silvester Clark Consulting Engineers jointly hosted with Robinson Seismic Ltd an informative meeting for Natural Hazards Inc Business Cluster members, with presentations from both members on their respective impressive range of specialist services and projects.



www.silvesterclark.co.nz

SILVESTER/CLARK
CONSULTING ENGINEERS

www.robinsonseismic.com

robinson
seismic limited

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Disaster Risk Reduction and Climate Change Adaptation – Global Project with 10 Countries



The use of virtual online remote communication has enabled much valuable international project work to be undertaken by New Zealand based consultancies during the Covid-19 pandemic, where previously these projects would have required in person travel.

An example of this has been a project undertaken by Tonkin+Taylor for the UN Office for Disaster Risk Reduction (UNDRR), led by their Technical Director Disaster Risk Reduction and Natural Hazards, Bapon Fakhruddin with DRR Consultants Benjamin Sims and Neeraj Shankar. Integrating climate change, disaster risk and sustainable development is crucial to building and sustaining resilience.

However, there are significant challenges to getting effective co-ordination and collaboration between the established international frameworks of the Paris Agreement, the Sendai Framework for Disaster Reduction (DRR) and the 2030 Agenda for Sustainable

Development. This has resulted in duplicate activities, risk-related data gaps that hamper decision-making and incomplete or ineffective planning and policy development.

Tonkin+Taylor has undertaken an extensive analysis across 10 climate-vulnerable countries to identify the roadblocks. The countries included are Benin, Ethiopia, Fiji, Guyana, Kiribati, Malawi, Saint Vincent and the Grenadines, Sri Lanka, Sudan and Uganda. This 10 country study has enabled the UNDRR to provide more targeted and effective technical support to current and future national adaptation planning.

<https://www.tonkintaylor.co.nz/news/2021/6/disaster-risk-reduction-and-climate-change-adaptation-understanding-the-framework-roadblocks/>

Early Warning and Early Action: Example of Fiji's Multi-Hazard Early Warning System

Tonkin+Taylor has assisted with the development of a Multi-Hazard Early Warning System (MHEWS) for Fiji. This has been developed using a bottom up collaborative approach. The forecast system runs on a desktop computer and produces rapid results from an integrated approach to forecasting, monitoring and warning for coastal flooding, no matter what the cause – river or ocean. Alerts are now broadcast 48 hours ahead of time with a 24 hour lead time, and gives advanced warning of an impending cyclone by up to 3 to 4 days compared with 15 hours previously.

<https://www.tonkintaylor.co.nz/news/2022/3/early-warning-and-early-action-a-look-at-fijis-multi-hazard-early-warning-system/>

For further information:

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Disaster Risk Management at the World Bank – a personal perspective

GNS Science Senior Disaster Risk Management Specialist Dr Nicolas Pondard gave a personal perspective presentation on his experiences from working at the World Bank on projects in Asia and Africa to a meeting of Natural Hazards Inc members and associates last September. His specialist interest areas include hazard and risk assessment, risk reduction through strengthening critical infrastructure, risk financing and international development. He was part of the team that contributed to the World Bank assessment report on Tonga immediately following the 15 January Hunga Ha'apai volcanic eruption and tsunamis.



Philippines Seismic Risk Reduction and Resilience Project (US\$ 300 million)

- Prioritisation and investment planning support for the Department of Public Works and Highways seismic resilience programme in Greater Manila.
- Retrofitting of 425 Public Buildings, Feasibility studies, detailed quality assurance.
- Emergency Response Equipment for transport and mobility resources communication; and Capacity building for emergency preparedness response in public works.

Indonesia Disaster Risk Financing Strategy for Public Assets (US\$ 510 million)



East Africa - Comoros recovery investments, 2019 Cyclone Kenneth (US\$ 45 million)

- National housing reconstruction programme for the most vulnerable Cyclone-affected households.
- Coastal resilience and infrastructure rehabilitation.
- Emergency preparedness capacity, mainly enhancing DRR operational and technical capacities of civil defence.

For further information:

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Seismic Health Monitoring of Buildings

Dr Caroline Holden of SeismoCity and **Steven McLauchlan** of Global Seismic Data (GSD)/Survive-it gave presentations at the February virtual meeting hosted by **Engineering NZ** showing the value of their latest seismic health monitoring of buildings research and commercial systems. This included the use of Wellington buildings examples, including an office building owned by The Wellington Company that is installed with a Global Seismic Data system, and a VUW building Te Puni installed with a GNS Science GeoNet research sensor system, with both systems providing valuable data for tracking structural response to earthquakes.

www.seismocity.co.nz www.gsdhq.io

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Natural Hazards Inc. Members' Expertise

- Strategies for disaster risk reduction, readiness, response and recovery.
- Development of organisational frameworks for emergency management.
- Emergency management education.
- Community preparedness for natural disasters.
- Multi-hazard land use planning.
- Improvement of building controls, standards and codes.
- Seismic retrofit strengthening of buildings, including simple houses.
- Seismic isolation of important buildings such as hospitals, schools, emergency management centres, government buildings, apartment buildings and heritage buildings.
- Tsunami and flood risk assessment, modelling and mitigation strategies.
- Disaster risk insurance strategies and systems.

For More Information, please visit

www.naturalhazards.co.nz

New Members Always Welcome!

If you are interested in joining Natural Hazards Inc. we have a range of membership options available. For more information including more about Natural Hazards Inc. please visit our website: www.naturalhazards.co.nz/join-us/

Natural Hazards Inc Business Cluster Meetings

Thursday 30 June 4.00pm to 5.30pm

BECA, Level 6, 85 Molesworth St; Wellington

AGM Thursday 18 August 3.30pm to 5.30pm

Joint Centre for Disaster Research (JCDR),
Massey University

Thursday 20 October 4.00pm to 5.30pm

Concrete Structural Investigations,
230 Cuba Street, Wellington

Natural Hazards Inc. Key Contacts:

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Committee Members

**Neville Ching, NIWA (Treasurer); Yogesh Kumar, Beca;
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