

## Natural Hazards Inc. Building Resilience to Earthquakes and Other Natural Hazards

July 2019

Natural Hazards Inc. is a New Zealand based partnership of industry leaders delivering innovative solutions for earthquake and natural hazard risk management internationally. [www.naturalhazards.co.nz](http://www.naturalhazards.co.nz).

Many off shore project initiatives require diverse specialist skills and products. With the assistance of Natural Hazards Inc. these can be marshalled together from amongst the 30 member companies and organisations. The cluster helps members to develop and maintain international relationships, sustaining New Zealand's international standing in earthquake engineering and natural hazards disaster risk management.

### New Zealand and Indonesia Working to Introduce New Risk Technology in Palu

GNS Science and Gajah Mada University (UGM) in Indonesia as part of the Ministry of Foreign Affairs (MFAT) funded StIRRRD project are currently working with the Indonesian government to ensure that our new proposals are considered part of the recovery planning process following the recent earthquake and tsunami that have devastated the region.



These recovery proposals involving Natural Hazards Inc. members include: Building Damage Assessment training;

Build Back Better training and local government regulation review; and Integrated Spatial Decision Support System which will involve getting the most out of Indonesia existing spatial planning models.

Faisal Fathani, a UGM member of the StIRRRD team, is directly involved in the Recovery Plan Expert Advisory Group, meaning we are in a good place to be involved and contribute to the efforts.



As part of the RiskScape research programme, GNS Science and NIWA have had a team on the ground collecting tsunami damage data. The data collected will be used to explain how different types of structures perform in a tsunami. This is referred to as fragility function research. Please refer to the StIRRRD website for recent blog posts and photos from the visit (<https://stirrrd.org/2018/03/10/seismometer-in-schools-pilot-launched-in-central-sulawesi/>, <https://stirrrd.org/2019/05/>). This effort was organized through UNESCO and the International Tsunami Research Community. The group was supported on the ground by USM StIRRRD team members and Tadulako University of Japan.





StIRRDRD Partners.



Pictures: Local damaged buildings after earthquake in Palu, Indonesia.

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### Kestrel leads USAR training in Sicily

Kestrel Director Dave Brunson has just returned from Sicily where he was one of the two lead trainers for an international urban search and rescue (USAR) Structural Engineering Course. The course was held in the town of Poggioreale in the middle of Sicily and organised by the German Federal Agency for Technical Relief, THW. USAR engineers from 10 European countries – Spain, Morocco, Cyprus, Poland, Belgium, Jordan and France as well as Germany and Italy took part, with the other trainers coming from the UK and Peru.

“While every USAR engineer comes from a different background, and brings different perspectives, this was a remarkably diverse group, with some already working as part of civil protection arrangements in their countries, some as fire-fighters and others as consultants.”

Dave says the location for the workshop was chosen because the nearby thirteenth century town of Old Poggioreale was the scene of a devastating earthquake in 1968 which left most of the old masonry buildings unreparable.

“The town was eventually rebuilt several kilometres away, but the old town provides an excellent backdrop for USAR training at various different levels.”

As well as providing USAR training to the European engineers, another focus of the course was to further develop an international Technical Guidance Note to better define the role and function of USAR engineers. Along with fellow trainer Josh Macabuag from the UK, Dave facilitated a series of sessions to distil and document the range of USAR engineering inputs following a disaster event.



“There continues to be international interest in the USAR response to the Christchurch Earthquake of February 2011. As the last live person was extricated only 28 hours after the earthquake, the large contingent of NZ USAR engineers and international counterparts became involved in a range of other tasks beyond rescue activities.”

One of Dave’s tasks at the course was to prepare and run a half day building triage exercise in the earthquake-damaged town of Old Poggioreale. In this exercise, participants would apply the international methodology to buildings in various states of damage, based on scenario inputs that he and Josh developed.



“The actual damage to the buildings created a much more dramatic backdrop than the usual scenarios that the Kestrel team are able to create,” says Dave.

“These exercises helped participants focus on their key roles and helped develop the descriptions that will go into the Technical Guidance Note, which will hopefully be presented at the international USAR Team Leaders meeting in Chile in October.”

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## **GNS Science wins Vision Matauranga funding for two new projects**

Two projects developed by GNS Science of interest internationally have received funding from the latest round of the Government’s Te Punaha Hihiko: Vision Matauranga Capability Fund. The funding has been awarded to GNS Science and its two Maori partners – Tahorakuri A1 Section 30 Trust in Ohaki and Te Rarawa Anga Mua in Hokianga. The two projects consist of plans to revive land impacted by geothermal development near Reporoa and to improve the land and water quality around Hokianga Harbour in the Far North. This fund invests in programmes that help Maori development for the benefit of New Zealand. The projects will work to revive land which has suffered from subsidence, loss of geothermal surface features and westward migration of the Waikato River. The Trust wants to reconnect their community and economy with the geothermal land and unlock the value of resources of the land which ensuring its restoration. Project leader of GNS Science, Anya Seward, said the work would build a model combining geoscience and matauranga-a-hapu, to develop a plan for protecting, preserving, and possibly restoring wahi tapu and taonga. Communities want to restore and regenerate the harbor because human activity has resulted in species loss, poor water quality and damaging siltation. The project has a focus on environmental, social, economic and cultural wellbeing.

For the project, scientists would collect sediment cores from the harbour and analyse the material from the past 1000 years. The goal of this is to see changes in the environment before and after human settlement so we can understand how to regenerate it.

For more information, please view the project page at [www.gns.cri.nz](http://www.gns.cri.nz) or contact:

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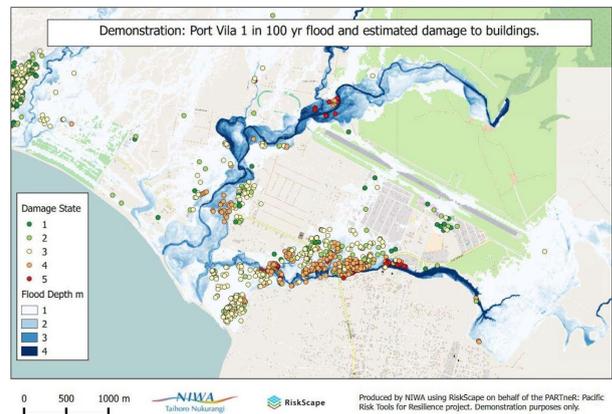
## NIWA's risk and resilience work in the Pacific



NIWA is focusing on three types of sciences, Climate, Freshwater, and Ocean Science. Contracted by MBIE, NIWA and the Strategic Science Investment Fund Platforms have come up with their Statement of Core Purpose Outcomes, which includes 6 different outcomes. The first is to increase economic growth through the sustainable management and use of aquatic resources. The second is to grow renewable energy production. The third outcome is increase resilience of New Zealand and South-West Pacific islands to tsunami, weather, and climate hazards. The fourth outcome intends to enable New Zealand to adapt to the impacts and exploit the opportunities of climate variability and mitigate changes in atmospheric composition from greenhouse gases and air pollutants. The fifth outcome focuses on enhancing the stewardship of New Zealand's freshwater and marine ecosystems and biodiversity. The sixth outcome is to increase the understanding of the Antarctic and Southern

Ocean climate, cryosphere, oceans and ecosystems and their longer-term impact on New Zealand.

RiskScape is a research programme led by NIWA and GNS Science that is designed to study the impacts of natural hazards on communities and to develop models to forecast future impacts. The goal of RiskScape is to collect post-disaster time series information that separates elements of the cause and the effect to inform estimates of future impacts and to monitor progress toward risk reduction targets. In short, it is a loss and impact modelling software that provides impact information for natural hazard events.



For more information regarding NIWA and RiskScape in the Pacific, please contact: Doug Ramsay at [Doug.Ramsay@niwa.co.nz](mailto:Doug.Ramsay@niwa.co.nz).

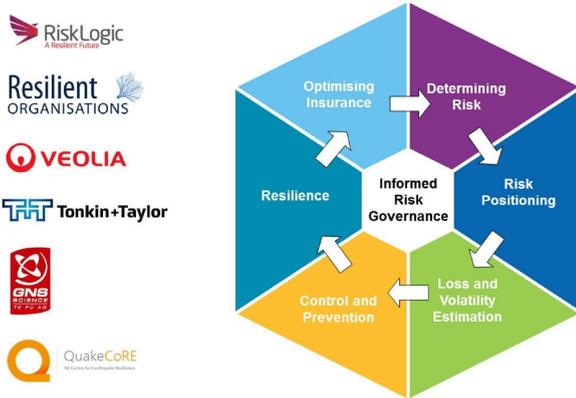
W: [www.niwa.co.nz](http://www.niwa.co.nz)

## AON – Infrastructure Risk and Resilience

Aon's Risk Engineering and Consulting team works to understand, quantify, and manage risks from the perspective of the client. Aon provides tailored strategic advice and innovative solutions in respect to insurable and non-insurable risks, helping to inform the client's decision making and enabling them to meet their business and risk management goals. Aon's vision is to deliver leading risk management solutions. Aon is using a four-step process for a risk determination and protection process. The four steps

are to discover asset valuations and loss quantification, develop solution assessment and design, insure risk transfer, and improve resilience and asset improvement.

**Joined up thinking and partnerships**



*AON gave a presentation on their services to May Natural Hazards Inc. Business Cluster meeting they hosted.*

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*AON Risk Engineer Mostaf Nayerloo speaking at the AON hosted Natural Hazards Inc. Business Cluster recent meeting.*

**Joint Centre for Disaster Research**

Starting in 2020, the GNS Science/ Massey University Joint Centre for Disaster Research will be offering a recently revised Master of Emergency Management qualification to international students.

This new and innovative course provides an excellent opportunity for international students to become skilled and capable leaders in directing and managing disasters of all sizes, all the while enhancing their sector-related skills and competencies.

Two study pathways are offered to students:

1. The Coursework Pathway requires completion of 180 credits worth of coursework chosen to provide a diverse academic platform tailored for those wishing to follow down the practitioner’s career-path. Or,
2. The Research Pathway, split into two 90 credit blocks consisting of both coursework and thesis

components to develop both the practice and research capabilities in emergency management.

For more information, please contact Raj Prasanna (Academic Coordinator): [R.Prasanna@Massey.ac.nz](mailto:R.Prasanna@Massey.ac.nz);

W:

[http://www.massey.ac.nz/massey/explore/departments/joint-centre-disaster-research/joint-centre-disaster-research\\_home.cfm](http://www.massey.ac.nz/massey/explore/departments/joint-centre-disaster-research/joint-centre-disaster-research_home.cfm)



*Pictured: students taking part in recent Joint Centre course.*

### **ADB – Build Back Better focus**

Build Back Better is a resilience enhancing planning approach being promoted by Asian Development Bank (ADB) that will strengthen natural disaster resilience and recovery in Asia. Building back better is a plan that focuses on building communities and infrastructure affected by natural disasters. ADB focuses on building structures back faster and making them safer, while also creating more opportunities for the people who use the facilities that have been affected.

This was the focus of a presentation by Ilan Noy, a consultant of ADB, at the May AON hosted Natural Hazards Inc. Business Cluster meeting. ([www.adb.org](http://www.adb.org))

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### **Tonkin + Taylor – Multi-Hazards Early Warning Systems for the Pacific**

Dr. Bapon Fakhruddin of Tonkin + Taylor gave a presentation at the fourth Pacific Meteorological Council and second Pacific Meteorological Ministers Meeting (PMMM) in Honiara, Solomon Islands. The presentation was on impact based multi-hazard early warning systems, beginning with community ownership and engagement. Dr. Fakhruddin's is a leading expert in early warning systems (EWS) and has developed frameworks for many Pacific and Asian countries vulnerable to natural hazards. His presentation focused on creating and bettering pre-existing effective EWS.

“Risk based early warning systems are essential. Practice shows that people and communities at risk need to be involved in the understanding of their exposure and the vulnerabilities of different groups, including the disabled, the elderly, children and pregnant women.”



*Tonkin + Taylor hosted the February Natural Hazards Inc. Business Cluster meeting, where Dr. Fakhruddin gave a presentation on their Multi-Hazards Early Warning System project in the Pacific.*

Dr. Fakhruddin focused on the communication aspect of risk management, stating that an effective system relied on expert risk assessment, interpretation, and communication. It is important that people understand the forecast, believe it applies to them, and feel that they are at risk when the time comes for a warning to go out and action is taken.

Accurate, appropriate information that translates early warnings into early actions at a community level is essential.

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### **Lessons Learned from Groningen induced earthquakes and Networking among Natural Hazards Members at Beca hosted June meeting**

Beca is a New Zealand-headquartered, employee-owned, professional services company with over 3000 staff in Australasia and South-East Asia. It delivers specialist disaster-mitigation services internationally. A presentation was made at the June Natural Hazards Inc. Business Cluster meeting on the shortcomings of the social/communications aspect of assessing the potential impact of gas-field extraction-induced earthquakes in Groningen, Netherland, on tens of thousands of unreinforced masonry residential buildings.



Natural Hazards Inc. members networking at the Beca hosted June Business Cluster Meeting.

For more information, please contact:

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## International Expansion of Seismic Restraint NZ

Seismic Restraints NZ has expanded international business opportunity through partnering with Australian based Gripple Seismic Bracing Systems. Restraint NZ General Manager, Mark Burling, has already been visiting the US and Australia as he works on developing new business opportunities.

Seismic Restraint NZ provides a range of non-structural elements of products and service solution for building services, laboratories, work sites and offices, and residential homes. Gripple Seismic Bracing System are specifically designed and engineered to brace and secure suspended non-structural equipment.



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## Intern NZ assistance with Natural Hazards Inc. Newsletter

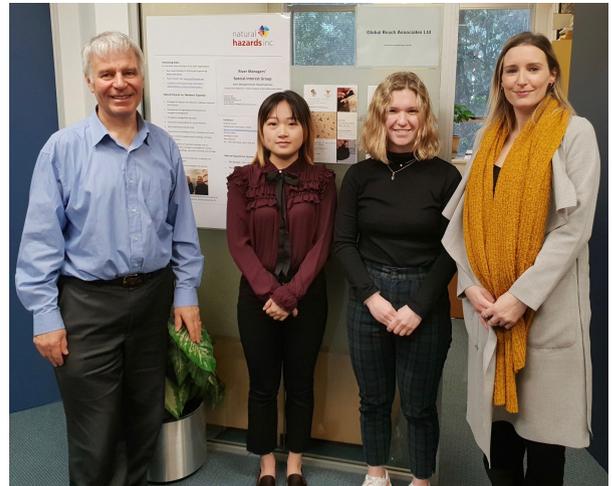


Photo: Natural Hazards Inc. Facilitator, Graeme Carroll, with US interns, Runyan Xu and Samantha Casey, and Theresa Hassett of Intern NZ.

Natural Hazards Inc. appreciate the efforts from two US Intern NZ Environmental Science Studies students from US universities with producing this newsletter. Namely Runyan Xu from Gustavus Adolphus College and Samantha Casey from Drexel University.

If you're interested in having international student interns spending some time with your business or other organisation in New Zealand, please contact:

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Ph: +64 4 390 3549, Office Ph: +64 4 384 0117  
W: [www.internnzoz.com](http://www.internnzoz.com)

## 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](http://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 on how to join or to find out more about Natural Hazards Inc. please visit our website

[www.naturalhazards.co.nz/join-us/](http://www.naturalhazards.co.nz/join-us/) to complete an application form.

You can also contact Co-chairs **Greg Szakats**, **David Johnston** or Facilitator **Graeme Carroll** for more details!

## Natural Hazards Inc. Key Contacts

### Co-Chairs:



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## Next Natural Hazards Inc. Business Cluster Meeting

The AGM, **Thursday 22 August From 3pm to 6pm**, hosted by Silvester Clark Consulting Engineers,  
**153 Thorndon Quay, Wellington.**

