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AKO AOTEAROA

# Completed Project Update

The **Improving science communication through scenario-based role-plays** project offers an excellent example of how science educators are using their collaborative expertise, enthusiasm and commitment to provide their learners with the best possible opportunities to excel, particularly when communicating during critical natural events and disasters.

The project led to the development of a suite of modular exercises - **Communicate the Quake**. This is a complex scenario-based role-play in which students take on roles as geologists, engineers and emergency managers during a simulated earthquake event.

## Meet the team

- Dr Jacqueline Dohaney, Dr Erik Brogt, Associate Professor Thomas Wilson, Dr Emma Hudson-Doyle, Associate Professor Ben Kennedy, Dr Jan Lindsay, Professor Brendon Bradley, Professor David Johnston, Dr Darren Gravley.

PROJECT ADVISORS

- Associate Professor Mark Quigley - University of Canterbury
- Dr Dan Hikuroa – Ngā Pae o te Māramatanga
- Vivienne Bryner, University of Otago
- Steve Glassey – Mercalli Consulting and University of Canterbury


Project team members from left Dr Jacqueline Dohaney, Dr Erik Brogt and Dr Thomas Wilson - University of Canterbury; pictured with Ako Aotearoa Director Dr Stanley Frielick (third from left) and acting Head of Department, Dr Marlène Villeneuve - University of Canterbury (far right).

## Project impact and developments post-completion

Completed mid-2016, this work has achieved positive impact for the learners, the project team members, their departments and the broader science community, as demonstrated through the following activities:

## Embedded in courses


As of April 2017, Communicate the Quake, associated lectures, and other complimentary role-play exercises are now integrated within:

- Eight Tertiary level courses, ranging from first year to post-graduate, across Geological Sciences, Earthquake Engineering and Disaster Risk and Resilience.
  - Estimated total of ~700 students who have been directly involved in the role-plays between 2014-2017
  - Elements of the programme have also been used within GEOL 113 which has impacted a further 300 under-graduate students between 2015 and 2017.
- These courses are within four degree programmes across two universities (University of Canterbury and University of Auckland).
  - Undergraduate BSc Geological Sciences (University of Canterbury)
  - Professional Masters of Disaster Risk and Resilience (University of Canterbury & Lincoln University – jointly taught)
  - Professional Masters of Engineering Geology (University of Canterbury)
  - Master of Science in Earth Sciences (University of Auckland)
  - Master of Earthquake Engineering (University of Canterbury)
- The scenarios have also been used within a range of practitioner courses and workshops, including:
  - GNS Science Short Course on Preparing for a Volcanic Crisis (2015-present)
  - Auckland CDEM Group/DEVORA[1] exercise – preparing for a Auckland Volcanic Field eruption (2014-present)
  - Asian Disaster Preparedness Centre course on Disaster Risk Assessment, Thailand and Laos in 2015 (co-delivered by members of the project team)
  - Contributed to various 'AF8' workshops across the South Island (2016-17). AF8 is a Ministry of Civil Defence and Emergency Management funded initiative to identify consequences of a large Alpine Fault earthquake and develop resilience building initiatives across all the South Island CDEM Groups (~$490k over two years)

Special mention is made of the Master of Disaster Risk and Resilience (MDRR) – which has been used as a teaching laboratory for exploring the pedagogy of these role-play simulations, and for other communication related teaching activities.

[1] Determining Volcanic Risk in Auckland

## Former student feedback

> The simulations developed by Jackie (Dohaney) changed the course of my career. In my first simulation, I got a glimpse of how government scientists and emergency management officials work together during an emergency that would be hard to replicate in any other method. This view into the field and the interdisciplinary nature of this work convinced me that I wanted to pursue emergency and disaster management courses. Subsequent simulations have convinced me that I have found a career that I want to pursue in addition to providing important training.

## Graduates

- The MDRR External Advisory Committee applauded the innovate use of role play simulations in their annual feedback. In particular they noted the importance of graduates needing strong science communication skills, particularly for operating in the dynamic, complex, interdisciplinary environment that disasters create.
- Our graduates routinely report that the role-play simulations helped prepare for and be more confident in dealing with the challenging situations they face in their jobs.
  - We can provide a range of graduates who have undertaken this training and have now been employed in relevant jobs:
    - Hazard Analysts – Environment Waikato and Environment Canterbury
    - Auckland Council CDEM Team; Christchurch City Council CDEM Team
    - Canterbury Earthquake Recovery Authority
    - West Australia Government – Disaster Risk Reduction team
    - US Federal Emergency Management Agency
    - Natural Hazard Policy Analysts – Ministry for the Environment
    - Various geo-engineering consultancies who specialise in natural hazard risk assessment and disaster resilience projects (e.g. Tonkin and Taylor)

Employers of graduates regularly comment that the communication and other skills developed through the scenario role play simulations, as part of the professional focus of the degrees, are a point of difference and highly valued.

## Sector capability development

Reducing disaster risk requires an interdisciplinary approach – which must include social sciences. However, New Zealand has a relatively small pool of natural hazard risk/disaster focused social scientists. This project has been an essential step in developing capacity and capability in this area, particularly in terms of robust science education research to inform professional development opportunities. It has done this in two ways:

1. Development of a suite of resources, including evaluation tools, for natural hazard risk and disaster communication.
2. Fostered development of academic and practitioner capacity across the project team, which creates a strong legacy for future self-sustained change within the sector. But in particular the support of Dr Jacqueline Dohaney as an emerging leader in this field has been critical. For example she has co-led the development of the 'Communication Research and Natural Hazards Network', along with a group of three other emerging scientists: http://www.esocsci.org.nz/networks-pages/communication-research-and-natural-hazards/

## Subsequent external work – a national approach

In 2016 the Earthquake Commission and QuakeCoRE (NZ Centre for Earthquake Resilience – a TEC Centre of Research Excellence) funded a follow-on project called "Knowledge transfer for sustainable risk communication practice: Advancing student and professionals skills in risk communication". This project under took the following:

- Summarised and translated findings from authentic risk communication curricula and training exercises for tertiary education and practitioners: http://riskcommresources.strikingly.com/)
- Undertook 20 interviews with a range of natural hazard risk communication practitioners and researchers to summarise and contextualise current practice, including strengths, weaknesses and opportunities in New Zealand. These were used to inform what workshops were presented (see next point). It is also planned to summarise this material in a report within the next six months.
- Hosted three workshops on applied natural hazard risk communication:
  - **Workshop 1.** Risk communication in context: Crossing the disciplinary boundaries, Christchurch, Nov 17 2016 (powerpoint) (pdf).
  - **Workshop 2.** Communicating your science: Geoscience communication research and practice, Wanaka, Nov 23 2016 (3:30-5:30pm) (powerpoint) (pdf).
  - **Workshop 3.** Dimensions of risk communication: Systems, scale and dynamics, Wellington, Dec 9 2016 (2-4:30pm) (powerpoint) (pdf).

  More information about these workshops and PPT slides at: www.riskcommresources.strikingly.com/
- Published two papers in international peer-reviewed journals and three conference presentations on topics directly related to this project were also completed during the project period.
- This project directly supported and fostered the Communication Research and Natural Hazards Network (eSocSci Group)

## Awards

The project team has been externally recognised with two awards for related work on one of the wider suite of role-play simulations:

- International Association of Emergency Managements, Oceania Region, Technology and Innovation Award Division 2 in 2015
- University of Canterbury 2016 Teaching Innovation 2016: http://www.teachlearn.canterbury.ac.nz/awards/2016winners/erik_tara_thomas.shtml

The project was co-funded through Ako Aotearoa's National Project Fund. To read more and download the full report and summary, go to: www.akoaotearoa.ac.nz/improving-science-communication-skills.

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