

Final Report:

Knowledge transfer for sustainable risk communication practice: Advancing student and professionals skills in risk communication



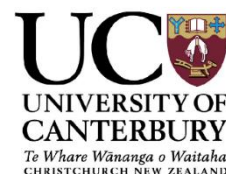
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Authors

Jacqueline Dohaney and Thomas Wilson

Project team

Jacqueline Dohaney (UC/VUW), Thomas Wilson (UC), Erik Brogt (UC), Emma Hudson-Doyle (JCDR), Brendon Bradley (UC), Ben Kennedy (UC), David Johnston (JCDR), and Jan Lindsay (UA)



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EXECUTIVE SUMMARY

In brief

- We summarised and translated findings from authentic risk communication curricula and training exercises for tertiary education and practitioners: <http://riskcommresources.strikingly.com/>)
- We 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 6 months.
- We hosted 3 workshops on applied natural hazard risk communication:
 - **Workshop 1.** Risk communication in context: Crossing the disciplinary boundaries, Christchurch, Nov 17 2016 ([powerpoint](#)) ([pdf](#)) (23 RSVPs, 13 attendees; *Limited attendance due to Nov 14 2016 Kaikoura earthquake*)
 - **Workshop 2.** Communicating your science: Geoscience communication research and practice, Wanaka, Nov 23 2016 (3:30-5:30pm) ([powerpoint](#)) ([pdf](#)) (22 RSVPs, 18 attendees). Jointly run with Dacia Herbulock from the Science Media Centre.
 - **Workshop 3.** Dimensions of risk communication: Systems, scale and dynamics, Wellington, Dec 9 2016 (2-4:30pm) ([powerpoint](#)) ([pdf](#)) (25 RSVPs, 8 attendees; *Limited attendance due to the Dec 9th Solomon Islands Tsunami*).
- 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](#))

Background

New Zealand (and international) natural hazard professionals often receive limited or no formal training in communication and may not have time to be up to date with current communication research. Additionally, science communication training is often 1-dimensional and recipe-style which doesn't allow us to explore the contextual and situational nature of communication. Since 2010, the Geoscience Education Research Group has developed authentic risk communication curricula and training exercises (e.g., Communicate the Quake or the Volcanic Hazards Simulation¹). Our experience developing such curricula provided us with teaching and communication best practice which we felt could be valuable for professionals. The development of the Communicate the Quake role-play and the associated research into its effectiveness at developing communication skills was funded by Ako Aotearoa, the National Centre for Tertiary Teaching Excellence and a final report of this work was completed in September 2016².

This Project

We built on this knowledge of training and risk communication best practice in a targeted risk communication engagement project called: "Knowledge transfer for sustainable risk communication practice: Advancing student and professionals skills in risk communication". The project ran for six months (with five months of funding provided by EQC and 1 month of funding provided by QuakeCoRE (Grant number 16059)) from July to December 2016, and was predominantly focussed on risk communication outreach through a participatory engagement model.

We aimed to engage with professionals, as partners, to share our experiences with communication training and raise awareness of the value of role-play and training exercises. As part of this process we consulted professionals in the sector to determine their risk communication strengths, needs and challenges and developed research-informed resources which promote risk communication best practice. The project

¹ Communicate the Quake: <http://serc.carleton.edu/introgeo/roleplaying/examples/143264.html>, Volcanic Hazards Simulation: <http://serc.carleton.edu/introgeo/roleplaying/examples/125523.html>

² A full report and executive summary from this project can be found at: <https://ako.aotearoa.ac.nz/improving-science-communication-skills>

culminated in a series of three workshops where the findings and resources were shared through interactive activities. Evaluations of the workshops indicated that participants were very positive about the experience, encouraged potentially more workshops, and the main criticism was that they wanted the workshop to be longer.

Planned outputs from this work will include a) a report which summarises and contextualises current practice, including strengths, weaknesses and opportunities in natural hazard risk communication in New Zealand and b) several teaching activities resulting from this project work.

Outcomes

We believe the project has made positive, useful and relevant contributions to the natural hazards education and practitioner sector. Engagement with a wide range of natural hazard risk communication professionals revealed attitudes and their perceptions of current strengths, weaknesses and challenges, and valuable insights of emerging future trends and needs. These interviews were used to inform the development and execution of three workshops, presented across New Zealand focused on enhancing and transferring practical research findings on natural hazard risk communication.

More broadly, the collaborations that were developed in this project are continuing to bear fruit. In particular, the project has directly supported and fostered the Communication Research and Natural Hazards Network ([eSocSci Group](#)) by raising awareness and directly contributing to informing the community of practise. Additionally, this project has supported Dr Jacqueline Dohaney, an early career researcher, to assist her developing new skills, experience and networks, which by default contributes to the development of New Zealand capability in natural hazard risk communication and education.

Summary of Activities

Project Design

This project used a participatory approach to risk communication engagement with professionals. It took place in four stages: 1) Share our education research findings with professionals, 2) Run research-informed workshops, 3) Co-create risk communication resources and share those with the wider community and, 4) Build professionals' capacity and capabilities in risk communication through targeted workshops.



We distilled our prior research into succinct recommendations on risk communication training from our experience and the literature. These lessons were compiled into a useful resource.

We partnered with interviewed researchers to develop resources that shared best practice and addressed needs and challenges identified during the interviewing phase. These resources are hosted on a custom website: <http://riskcommresources.strikingly.com>



We invited professionals from across emergency management, natural hazards and engineering sectors to participate in semi-structured interviews. The aim was to identify the current risk communication climate, and allow us to target strengths and weaknesses through professional development that suits the needs of the community



We developed and hosted a series of workshops to share the project's research findings, and engage practitioners in risk and crisis communication best practice. The workshops allowed us to build capability and capacity for risk communication within the professional sectors. Also, we invited participants to fill out a short evaluation survey to determine areas of value and explore areas of future improvement and development.

Interviews

To best serve the risk communication community, we met with leaders within the sector and identified individuals to interview and partner with. A list of targeted organisations and networks included: eSocSci, QuakeCoRE, GNS Science, GeoNet, NIWA, National and regional CDEM, and university academics from across the country. A human ethics application for the interviews was obtained from the University of Canterbury to protect the confidentiality of the responses. A list of contacts was created using a purposeful snowball sampling approach. We successfully recruited 20 individuals from across the organisations listed above.

The interview protocol was designed to identify the specific communication needs and styles of engagement suitable for professionals. During the interview, we shared a little bit about the project; its aims and goals, our lessons learned (See <http://riskcommresources.strikingly.com/#1-pagers>) derived from experience and research on risk communication training in the tertiary sector. The participants were asked to share their background, their current risk communication responsibilities, and what they felt we could do to improve communication practice.

The results of these interviews guided our engagement plan and helped us to develop resources and learning activities that targeted current risk communication challenges. Content analysis was carried out on the available data. Themes were checked using constant comparison, and refined as new data was included. Though deeper analysis of the interviews is ongoing, several major themes emerged and were targeted for our engagement:

- Most professionals reported that their organisation did not have a coherent strategy for communication (overall). Want/needs for senior leadership to endorse a wider communication strategy
- Targeted approach which allows scientists to communicate better to specific audiences, particularly vulnerable populations
- Help developing the means and strategies for evaluating what has already been done, and see what works
- Audiences struggle to understand what risk and resilience are, and have differing meanings. It would be good to develop basic strategies to help translate risk and resilience to the wider community
- Use communication as part of a participatory approach to engagement with their communities

The latter questions in the interview specifically asked the participants to discuss their preferred mode of engagement with professional development in risk communication. Overwhelmingly, participants favoured workshops and video-learning, followed by 1-pagers and websites. Longer form or formal reports/publications were not favoured. Based on the time constraints and resources available, we opted to develop 1-pager resources (hosted on a website) and workshops. Risk communication videos would be an ideal area for future research/engagement investment.

Resources

Many of the professionals interviewed are active communicators and communication researchers. Through the interview process, several key resources (existing and new) were identified that could be helpful to the targeted needs of the interviewees:

- Lessons learned from teaching risk communication (Dohaney, 2016)
- Crossing disciplinary boundaries for improved risk communication (Dohaney and McBride, 2016)
- Features (16Cs) and strategies (7Ts) for science and risk communication (Bryner, 2016)
- Using reflection in your communication practice (McBride, 2016)
- The message box exercise (written by Maguida and Borrow for the Gap2.eu project). Adapted by Dacia Herbulock of the Science Media Centre

Pdfs of these resources can be found at: <http://riskcommresources.strikingly.com/#1-pagers>.

Additional resources were identified as valuable, but postponed for future work to be carried out by the Communication Research and Natural Hazards network. With the idea of developing a long-term home for these resources and build a library of 1-pagers, videos and other helpful materials from existing and new network members in the coming years.

These include:

- 100 recommendations to scientists communicating about earthquakes (Vivienne Bryner, Otago)
- IAP2 spectrum of public participation (IAP2).
- Best practice for visual risk communication (Mary Anne Thompson, UA)
- Communicating uncertainty through probability statements (Emma Hudson-Doyle, JCDR)

Workshops

Three workshops were held at the end of 2016, to addressing natural hazards risk communication needs, challenges and innovations. We invited geoscientists, engineers, and emergency managers to learn from our research and contribute to improved risk communication across the sectors.

Workshop 1. Risk communication in context: Crossing the disciplinary boundaries

Christchurch, Nov 17 2016 (2-5pm) ([powerpoint](#)) ([pdf](#)) (23 RSVPs, 13 attendees; Limited attendance due to Nov 14 2016 Kaikoura earthquake)

Workshop 2. Communicating your science: Geoscience communication research and practice

Wanaka, Nov 23 2016 (3:30-5:30pm) ([powerpoint](#)) ([pdf](#)). (22 RSVPs, 18 attendees). Jointly run with Dacia Herbulock from the Science Media Centre.

Workshop 3. Dimensions of risk communication: Systems, scale and dynamics

Wellington, Dec 9 2016 (2-4:30pm) ([powerpoint](#)) ([pdf](#)), (25 RSVPs, 8 attendees; Limited attendance due to the Dec 9th Solomon Islands Tsunami).

Workshop Evaluation

Attendees were sent an anonymous survey following the workshops, through Qualtrics. For a summary of the evaluation data please see Tables 1 and 2. The first six questions were asked using rating scale questions with Likert-type scales. Responses in Table 1 are reported in mode (most frequently mentioned response) and the average, to help show the distribution of responses. Table 2 shows the open-ended remarks on the most valuable, least valuable, suggested improvements for the workshops.

Table 1. Workshop evaluation data

	Christchurch (n=7) Response rate 54%	Wanaka (n=5) Response rate 28%	Wellington (n=4) Response rate 50%	All (n=16) Response rate 41%
Statements:				
I would recommend this workshop to my colleagues.*	Strongly Agree 4.14 ± 0.55	Strongly Agree 4.20 ± 0.37	Strongly Agree 4.67 ± 0.33	Strongly Agree 4.27 ± 0.28
I will be able to use what I learned in this workshop.*	Strongly Agree 4.00 ± 0.58	Somewhat Agree 4.40 ± 0.24	Somewhat Agree 4.33 ± 0.33	Strongly Agree 4.20 ± 0.28
I would be interested in attending a follow-up, or more advanced workshop, on this same topic.*	Strongly Agree 4.29 ± 0.57	Somewhat Agree 4.00 ± 0.55	Strongly Agree 4.33 ± 0.67	Strongly Agree 4.20 ± 0.33
Given the topic we discussed, the workshop was...**	Too short 1.43 ± 0.20	Just right 1.6 ± 0.24	Just right 1.67 ± 0.33	Just right 1.53 ± 0.13
In your opinion, this workshop was...**	Introductory 1.29 ± 0.18	Introductory 1.20 ± 0.20	Intermediate 1.67 ± 0.33	Introductory 1.33 ± 0.13

* Likert five-point scale: Strongly agree (5), somewhat agree (4), neither agree nor disagree (3), somewhat disagree (2), and strongly disagree (1)

** Likert three-point scale: Too long (3), just right (2), too short (1) & Advanced (3), Intermediate (2) and Introductory (1)

Overall, the responses to the statements were very positive, with the majority of attendees stating that they would recommend the workshop, that they felt it was useful, and that they would like to attend a follow-up workshop. We developed the workshops to be at an introductory-level (i.e., accessible for people who do not have a deep familiarity with risk communication research) and that level was achieved, leaning towards intermediate.

The length of the workshop was an issue, and it was clear that many of the attendees felt that the workshops were too short. They ran from 2-3 hours in length, which was chosen because the pre-workshop interviewees indicated that a professional's time is precious. Future work will aim slightly longer format as there is a clear appetite for the longer format.

Table 2. Open-answer responses

Questions:	Responses
Describe what you feel were the most valuable aspects of this workshop?	<p>“{the} role play exercise to understand the thinking process of diverse disaster management actors.” (Christchurch). “{the} discussion and interactive exercises” (Christchurch). “Reflecting on your own strengths and weaknesses” (Christchurch)</p> <p>“Changing groups, talking with different colleagues, understanding each other’s perspectives and communication challenges” (Christchurch). “The breakout session was the most valuable as I heard personal experiences related to the topics with other people.” (Christchurch). “Exploring different roles related to risk and 16Cs and 7Ts” (Christchurch). “Getting to know other people working in this field, joining into some collaborative thinking, finding ways of addressing different perceptions of the problem/s being dealt with” (Christchurch). “{the} message box! Very quick to explain and make own examples.” (Wanaka). “Thinking about our own personal goals in communicating, discussions around differences in personal values in communication.” (Wanaka). “Listening to other people's approaches and attempts to communicating their science. Introduction of science media interaction and the understanding how to communicate the easiest” (Wanaka). “Opportunity to discuss topics across disciplines” (Wellington). “Talking about the 16Cs and which ones I was good at and would like to get better at.” (Wellington). “The cross-discipline nature of the workshop.” (Wellington). “Introduction to new risk communication frameworks” (Wellington)</p>
Least valuable aspects?	<p>“The introduction was just a little long” (Christchurch). “Perhaps structure the "put someone" else’s hat on a little more - very valuable exercise, but could perhaps allow people to be who they are (e.g., social scientist, engineer, physical etc.). Use the diagram as inspiration to write down what you as your normal self would want from communication, and then get some moving around and the swap to role-play the other. Would be good if this exercise had a little more time to then look at how to bridge the gaps.” (Christchurch). “The workshop could take the whole day. As I feel the discussion is too short.” (Christchurch). “Recorded notes were not retained for the purposes of reflection, no write-up of the workshop offered to take some of the lessons learnt or perspectives generated away” (Christchurch). “Would have liked more in depth examples/exercises, information too basic.” (Wanaka). “Its focus on specialists trying to communicate their own research. I feel I was not in the correct type of workshop.” (Wanaka). “An inability of some members to listen during group discussion. In part, this could be an artefact of a particular group.” (Wanaka). “Covering too much” (Wanaka). “The targeting diverse audiences exercise wasn't that helpful - it took us too long to figure out what we were supposed to be doing.” (Wellington)</p>
Please describe any improvements that you would recommend?	<p>“Make the exercises slightly less complex (no role assignments etc), so that we can talk about the substance of the task, rather than trying to understand / negotiate the structure of the task.” (Christchurch). “Timing should be improved.” (Christchurch). “Possibly find a better way to rotate people?” (Christchurch). “Generate some outputs from the workshop engagement that participants can take away with them, specifically to support future thinking about building resilience (as a key focus for communicating risk)” (Christchurch). The workshop may include a session of a mock-up Command Centre, or a multi-stakeholders coordinating team deployed with portable devices.” (Christchurch)</p> <p>“More examples/exercises, greater depth. (Wanaka) “Facilitate more dialogue. (Wanaka). “Spend more time doing the exercises and obtaining feedback in small groups of 3-4 rather than the whole session.” (Wanaka). “I was interested to hear more about the education theory behind the work - a bit more time on the key principles etc. from that point of view, which is one I have no background in.” (Wellington). “I would have liked a bit more focus on the 'how' - how I might apply some of the research findings in my own work.” (Wellington). “The research was based on the four sectors of science,</p>

	engineering, emergency management, and media/comms - some explanation at the beginning about how the findings are also relevant to other sectors/professionals would have been good - as I found it hard to place myself in one of these categories, I initially thought that perhaps the workshop wasn't going to be relevant to me, so I felt a bit 'on the back foot' at the beginning." (Wellington). "Would be good to run it again when more people are free to attend." (Wellington)
Any final comments that you would like to include?	"An extension in the role-play, i.e. media player to present a brief report after listening or interviewing various actors." (Christchurch) "Great job! Was fun" (Christchurch). "Great opportunity to create reflective practice" (Christchurch). "A role play in disaster communication may improve the process." (Christchurch). "There was some great discussion amongst the groups I was in and had wanted them to continue or at least an opportunity to continue them with the other participants. It seemed like a missed opportunity." (Christchurch) "It was good to realise how "nerdy" one can already be, even if one just recently started a PhD project." (Wanaka) "Great workshop" (Wellington)

The open-answer responses showed a good range of positive and constructive feedback. Attendees valued the activities where they could reflect on their own practice and collaborate with each other and also think about disciplinary differences within risk communication. We feel that these types of opportunities are less commonly incorporated into workshops, and that this feedback supports further use of reflective and perspective-taking exercises.

Some of the exercises will be adapted/and or dropped to better suit the goals of the workshop, and we used feedback from the Christchurch workshop to help refine some of the repeated activities in the later workshops (particularly the cross disciplinary and 16Cs and 7Ts exercise). Additionally, the length and depth of the workshop was touched on in the open answer responses which indicate a need for activities with more depth into the practical aspects of applying these ideas to their practice and further time for attendees to reflect and interact with each other.

These data support further engagement with professionals in a workshop format, with longer time to interact and get into greater depth, and potentially more intermediate to advanced risk communication topics. I would envision a risk communication practice "retreat", where the format is a mixture of interaction, reflection, applied practice and networking.

Websites

In order to share the advertisement to the workshops, we built a simple user-friendly website through strikingly (<http://riskcommrefresher.strikingly.com/>). This allowed easy information sharing about the workshops themselves, risk communication research and networks, and RSVP gathering. Once the resources (discussed above) were ready for sharing, we developed a sister site to host and share them: <http://riskcommresources.strikingly.com/>. These sites have worked for our short term project, but we would like to grow the resources list and house them within the Communication Research and Natural Hazards network to be added to and maintained in the longer term. Discussions on this topic have begun within the network.

Project Outputs

Peer-reviewed publications

Dohaney, J., Brogt, E., Kennedy, B., and Wilson, T.M. (Accepted, in press) Using role-play to improve students' confidence and perceptions of communication in a simulated volcanic crisis. In *Observing the Volcano World: Volcano Crisis Communication*.

Dohaney, J., Brogt, E., Wilson, T.M., Hudson-Doyle, E., Kennedy, B., Lindsay, J., Bradley, B., Johnston, D., and Gravley, D. (2016). Improving science communication through scenario-based role-plays. Wellington: Ako Aotearoa, National Centre for Teaching Excellence, New Zealand ([Final Report](#)) ([Summary Report](#)) ([Website](#))

Conference Proceedings

Dohaney, J., Brogt, E., Wilson, T.M. and Kennedy, B. (2016). The influence of prior experience and demographics on students' confidence in communicating science. *GeoSciences 2016*, Wanaka, New Zealand. Geoscience Society of New Zealand. ([Talk](#))

Dohaney, J. (2016) Science communication education and training: How are we preparing the next generation of science communicators? *SCANZ Annual Meeting 2016*. Science Communicators Association of New Zealand. Dunedin, New Zealand. ([Panel Discussion](#))

Dohaney, J., Wilson, T.M., Brogt, E., and Kennedy, B. (2016). Lessons in communication: bringing communication training and research to geoscience academics and professionals. *Geological Society of America Annual Meeting*, At Denver, Colorado, USA, Volume: 48, No. 7. ([Talk](#))

Dohaney, J., Wilson, T., Bradley, B., Brogt, E., Kennedy, B., Hudson-Doyle, E., & Johnston, D. (2016). Documenting natural hazard risk communication needs, challenges and innovations through participatory engagement. *QuakeCoRE Annual Meeting*, Wairakei, New Zealand. ([Poster](#))

Workshops

“Dimensions of Risk Communication: Systems, Scale and Dynamics” part of the Risk Communication Refreshers, Wellington, New Zealand, December 9. ([Talk](#))

“Communicating your science: Geoscience communication research and practice” part of the Risk Communication Refreshers, Wanaka, New Zealand, November 29. Co-facilitated with Dacia Herbulock ([Talk](#))

“Risk Communication in Context: Crossing the Disciplinary Boundaries” part of the Risk Communication Refreshers, Christchurch, New Zealand, November 17 ([Talk](#))

“Rhetorical Communication: Emotions, Persuasion and Influence” in “Risk Communication and disaster risk management”, the 9th Australasian Natural Hazards Management Conference, Wellington, New Zealand ([Talk](#))

Outreach

Communicate the Quake, University of Canterbury, 25 May 2016, DRRE401. Facilitated by Tim Davies, Mathew Hughes and Jacqueline Dohaney

Contributions to the Sector & Future Work

Though this project took place over a short period of time, we have gained a better understanding of the risk communication space in New Zealand. The interviews allowed us to engage a wide range of professionals and uncover their attitudes and perceptions of where we are now, and where we should be going. More detailed data analysis of the interviews is ongoing, and we plan to write a manuscript and develop 1-pager resources to be shared with EQC and in the community. In this manuscript we will outline the instruments used, the interview protocol, key results and suggestions for improved practice in New Zealand and the wider scientific community.

The collaborations that were developed in this project are continuing to bear fruit. The Communication Research and Natural Hazards network continues to grow and we hope to incorporate the experiences, lessons learned and research findings from this work into our practice. Additionally, this project has allowed us to support an early career researcher to widen her research network and identify areas for professional development into the future.

Planned Outputs

March 21 2017 - Communicating Risk Workshop, Disastrous Doctorates 2017, Christchurch. Facilitated by Jacqueline Dohaney

June 7-9 – Risk Communication Theory and Practice, Annual MCDEM Conference, Wellington. Facilitated by Jacqueline Dohaney, Mary Anne Thompson and Kate Crowley (Communication Research and Natural Hazards Network)

May 29-June 2 - Risk communication guest lecturers, University of Canterbury, GEOL354. Facilitated by Jacqueline Dohaney

Aug 17-18 – Risk and hazard communication seminar, South Island CDEM conference, Invercargill. Facilitated by Jacqueline Dohaney and Mary Anne Thompson

Manuscript: Dohaney J, Wilson T.M., Brogt E. and Kennedy B. (in prep) Natural hazard professionals Perceptions of Risk communication, Journal TBD.