

Welcome to the latest of the research updates from the Joint Centre for Disaster Research. The centre opened in December 2006 and is a joint venture between Massey University and GNS Science within the School of Psychology, based at the Massey University campus in Wellington.

The centre undertakes multi-disciplinary applied teaching and research aimed at:

- gaining a better understanding of the impacts of natural, man-made, and environmental disasters on communities;
- improving the way society manages risk;
- enhancing community preparedness, response to and recovery from the consequences of natural, man-made and environmental hazard events.

Rebuilding Christchurch



Visitors to Cathedral Square, Christchurch in March 2012.

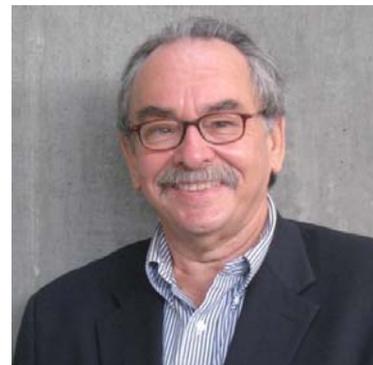
Visit our updated website: <http://disasters.massey.ac.nz/>

News from the JCDR Team

In December 2011 **Steve Glassey** left the centre to take up a position as General Manager - Emergency Management at the Ministry of Social Development.

Julia Becker successfully defended her PhD in March. Julia's project was on *"Increasing Community Resilience: Understanding how individuals make meaning of hazard information and how this relates to preparing for hazards"*.

In February and March the centre hosted **Dr William Siembieda** (photo right), Professor of City and Regional Planning, California Polytechnic State University, San Luis Obispo, California. See story on page 5.



In November the centre hosted **Dr Jeanette Sutton** from the University of Colorado, Colorado Springs who is studying the role of social media following the Canterbury earthquakes.

Dr Sarah Donovan (photo below) from the University of Otago has been working with the JCDR (in February and March) to analyse structured interviews for our Fire Service research project.



Maureen Mooney and **Victoria Parsons** have both started their PhDs at the centre. Maureen will continue working one day a week as part of the Psychosocial Recovery Advisory Group. Vic is also helping out with communications work for the centre.

The JCDR is working closely with the New Zealand Red Cross and we welcome Rochelle Berry and Mike Nuth as Research Affiliates of the Centre.

Rochelle Berry (photo right) is the Research Analyst for the Red Cross Recovery Team. The Recovery Team was set up in 2011 following the February earthquake. Its role is to work with communities to support recovery and disaster preparedness through community programming and grant development. As a Research Analyst, Rochelle's role involves sourcing and analysing information and research to support the development, implementation, review and evaluation of the activities within the recovery framework in order to provide an evidence base for programming and targeting vulnerability.



Mike Nuth (photo below) is the New Zealand Red Cross Research Advisor. Situated within Red Cross' Business Services team, Mike provides research guidance and support for the different divisions of Red Cross. At present this mainly involves conducting community needs assessments within greater Wellington in order to identify gaps in service provision to vulnerable people. Mike also provides extra research support for the Red Cross Recovery Team when needed. With a background in sociology, Mike's main area of interest is in community consultation and development. Mike's philosophy is that the best way to develop and deliver effective services is to take a bottom-up, collaborative approach to ensure community stakeholders have a say in the programmes that Red Cross delivers.

2012 Summer Institute and Disastrous Doctorates meeting



The annual JCDR Summer Institute is a short course programme developed to provide a theoretical and practical introduction to selected topics relating to emergency management. In the 2012 course 30 participants and 25 presenters took part during the week of 20-24 March. The above photo is from Day 4 – Classroom on the Coach. During the week a parallel event was also hosted with 28 Doctoral students attending the annual Disastrous Doctorates workshop (photo below). Next year's events will be held in late March 2013.



JCDR researchers visit the White House

During a visit to the National Science Foundation in Washington, DC, David Johnston, and PhD student Vicki Johnson, were invited to meet with members President Obama's National Security Staff at the White House to discuss JCDR's research around community resilience following the Christchurch earthquake. The Washington visit was part of a series of meetings on the recently signed Science and Technology collaborative research agreement between the U.S. and New Zealand. Also invited was Prof. Johnston's colleague, Dr. Pamela Bush of the University of Central Florida, who is working with Prof. Johnston on the use of mobile technologies for emergency management.

During the meeting, the JCDR researchers and White House staff discussed challenges to preparing communities for earthquakes and efforts to increase community resilience, highlighting the role of schools in educating children. New Zealand and the U.S. are collaborating on earthquake preparedness activities, including Shakeout, a large-scale 'drop, cover and hold' earthquake drill that will be held nationwide in New Zealand on 26 September 2012.



Photo caption: Vicki Johnson and Dr. Pamela Bush in front on the Eisenhower Executive Office Building, Washington, DC

Comparative Disaster Recovery Experience: Chile / Japan / US: Lessons from Practice

Recovery from extreme events (large scale disasters) is a process of inventing the future and assisting communities and citizens to achieve viability in their lives as they adapt to their new conditions. Extreme events have occurred with regularity in this decade. The United States in 2005, Chile in 2010 and Japan in 2011 experienced the largest disasters in their modern history. Each of these events creates urban planning challenges. In 2011 the United States national government issued its new National Disaster Recovery Framework in recognition of need for better pre-event planning for post-event recovery.

The recovery experience of the US, Chile and Japan in terms of the coordination of local, state (regional/prefecture) and national governments was presented by William Siembieda (photo below – during a recent visit to Chile) at the Auckland Branch of the New Zealand Planning Institute in February 2011. The talk discussed land use issues, mitigation planning procedures, temporary and permanent housing, economic, financial, and social factors that are important to achieving a viable recovery. Examples and lessons learned from each country are provided. Ideas on how to develop improved land use planning tools with a strong hazards safety component are presented. An important role of urban planners in disaster mitigation planning is outlined.

William Siembieda, an internationally known disaster mitigation and recovery planner, is Professor of City and Regional Planning, California Polytechnic State University, San Luis Obispo, California. Dr. Siembieda was a key member of the team that prepared the highly acclaimed 2010 State of California Multi-Hazard Mitigation Plan that promotes integration mitigation actions by state agencies. In 2004, his work on the legislative framework led to the first of its kind Federal District of Caracas (Venezuela) Mitigation and Preparedness Plan. In 2008 he conducted



studies of long-term disaster recovery studies in Niigata (Japan) and pre-disaster planning studies in Nara Prefecture (Japan). He holds the rank of Fulbright Specialist and as provided consultation on recovery planning in Chile, and Haiti. Other professional planning work has included large-scale land development plans in the Texas, New Mexico, and Arizona, and in Mexico.

He holds a PhD in Urban Planning from the University of California, Los Angeles; a B.A. in Economics from the University of California, Berkeley; and is a member in good standing of the American Institute of Certified Planners (AICP). In 2011-2012 he serves as Visiting Research Professor University Research Center for Disaster Reduction Systems, Kyoto University, Kyoto, Japan.

Japan & New Zealand NSF RAPID Workshop

The US-based Earthquake Engineering Research Institute (EERI) organised, at the direction of the National Science Foundation (NSF), a research needs workshop for recipients of Japan and New Zealand RAPID awards in Washington DC, USA, 9-10 March 2012. Attendees of the workshop included over 50 representatives from RAPID projects from institutions across the United States along with NSF program officers. In addition approximately 16 Japanese researchers with J-RAPID awards will be participating as well as four researchers from New Zealand (Kevin Berryman, John Vargo (photo: centre left) Jason Ingham and David Johnston).

The workshop was organised so that recipients:

- 1) share some of the initial findings from their research projects;
- 2) have the opportunity to interact and collaborate with other event researchers from a broad range of disciplines; and
- 3) provide NSF with solid recommendations for emerging research themes, opportunities, and needs.



The workshop included short oral and poster presentations on all RAPID award projects, followed by discipline, cross-discipline and themed breakout discussions to develop recommendations for major research themes and opportunities as they emerge from the investigations of the Japan and New Zealand earthquakes and their impacts.

A primary goal of the workshop was to provide guidance for NSF's future solicitations for major research needs related to earthquake mitigation, response, recovery, and rebuilding. A report summarizing emerging research themes will be delivered to NSF and published on this page, as well as disseminated as broadly as possible to interested research, recovery, and reconstruction communities.

Copies of presentations and summary of the meeting can be found at:

<http://www.eeri.org/japan-new-zealand-nsf-rapid-workshop/>

East Asia Summit Symposium on Post-Disaster Psychosocial Care

Sarb Johal (2nd on the left in photo below) was nominated by MFAT to represent New Zealand at the East Asia Summit Symposium on Post-Disaster Psychosocial Care in Beijing from Nov 27 - Dec 1, 2011, organised by the National Disaster Reduction Centre of China in the Ministry of Civil Affairs. The purpose of the symposium was to enhance the awareness of Asian countries about issues of psychosocial care after disasters, and talk about the difficulties and problems in delivering these interventions. Over 50 participants from ASEAN countries attended the 4-day symposium, including representatives from all over China, Japan, South Korea, Australia, India, Cambodia, Myanmar, The Philippines, The USA, Russia and New Zealand.



Sarb gave an oral presentation on his work in New Zealand for the Ministry of Health on 'Establishing a framework for psychosocial support after emergency events', and the challenges in maintaining momentum and interest (and funding) on the issue during periods when disasters are not an immediate threat. With the assistance of interpreters, he also chaired a session of the symposium where Chinese experts presented and discussed their work in developing new technologies for post-disaster psychosocial care, including a large scale mental health survey of earthquake affected children in China and an exploration of psychological interventions for indigenous minorities.



The symposium was a great success, and JCDR will become more involved with collaborations to increase research and skills capability and capacity in psychosocial assistance in the Asia-Pacific region.

Building Capacity for Psychological Intervention after Disasters in the Asia and Pacific Region

The International Union of Psychological Science, in partnership with the Chinese Psychological Society and the ICSU Regional Office for Asia and the Pacific (ICSU ROAP) held a capacity development workshop to enhance capacity in the Asia-Pacific region for psychological intervention after disasters. The workshop was held in Beijing, China from 18 to 22 February 2012, and was attended by 20 participants from China, India, Indonesia, Malaysia, New Zealand (Sarbj Johal from the JCDR), Sri Lanka, and Thailand.

The first objective of the workshop was to define an interpretive framework for the Asia and Pacific region based on current scientific understanding and application evidence, but also being mindful of cultural and infrastructural contexts. State of the art seminars from leading figures such as Professor Shu Li (Chinese Academy of Sciences), Professor Marinus van Ijzendoorn (Leiden University), Professor Joop de Jong (University of Amsterdam), and Professor Abigail Gewirtz (University of Minnesota) covered diverse issues such as intercultural psychiatry, the 'psychological typhoon eye' effect, and interventions to help children in disasters. The final phase of the workshop established a regional network to support recommended developments, building on the Union's links with its National Members and the ICSU Regional Office as well as the new Office for IRDR. In partnership with ICSU, Sarbj helped to facilitate a web structure to support this network development within two weeks of the resolution to make it happen.



During the workshop, Sarbj presented a poster entitled, "Seeking help after the Canterbury earthquakes" depicting some of the variations in health service demand since September 2010 in the Canterbury region, and how these fluctuations could be interpreted.

1st Workshop of Asia-Pacific Region Global Earthquake and Volcanic Eruption Risk Management (G-EVER1)

Hosted by Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology (AIST) the workshops aims were to:



- Enhance collaboration among geological institutes within the Asia-Pacific Region and rearrange existing information about the future risk for global earthquakes and volcanic disasters.
- Build international and national networks, set up a website, and establish a consortium so that we can share and provide the information.
- Create the environment to promote cooperative research, including personnel training, in the area with little information, especially in developing countries.
- Evaluate the risk of business activities in the Asia-Pacific region and seek to develop new business opportunities to provide information on the risk of catastrophic natural disasters.

The website of the G-EVER1 contains the proceedings volume, presentations and a summary of the meeting.

<http://geodp.gsj.jp/Event/AsiaPacific/indexE.html>

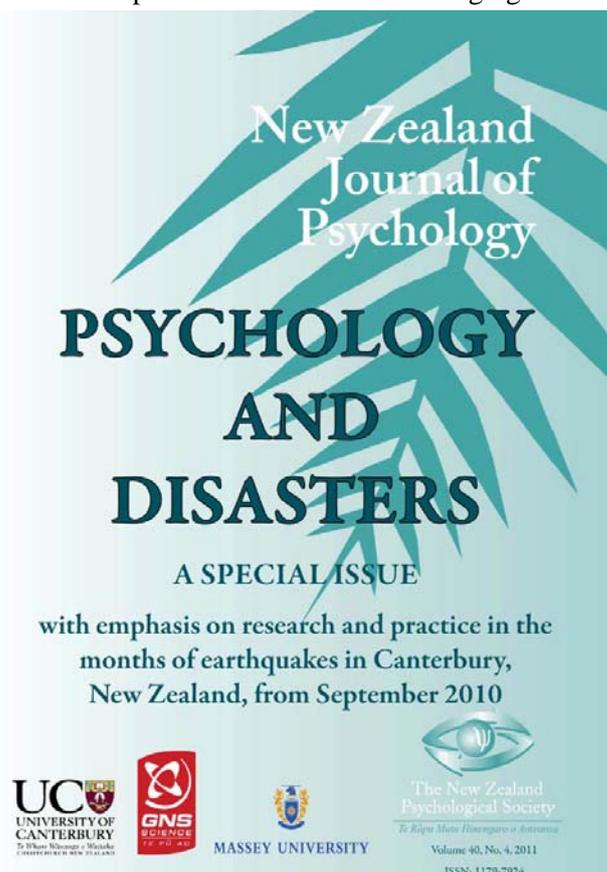
Special Issue of the New Zealand Journal of Psychology on the Canterbury earthquakes

The New Zealand Psychological Society (NZPS) has released a Special Issue of the New Zealand Journal of Psychology that presents sound research and a range of professional experiences related to the changing condition of the population of Canterbury in the aftermath of the last 10,000 shakes and 500 days.

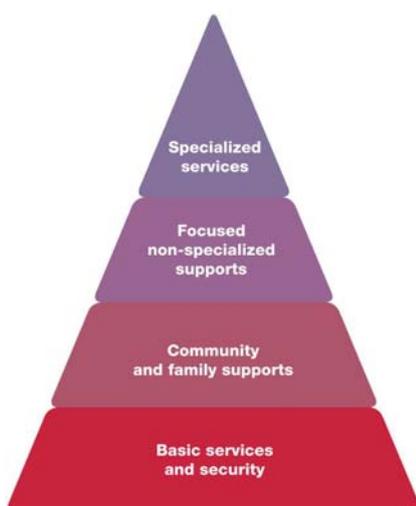
The Special Issue will be of interest to a wide audience as it brings together information on preparation for, survival of, and recovery from an ongoing disaster affecting a tenth of New Zealand's population, and a quarter of its economy. Pictures and commentaries help bring out the reality of what is being reported in each area. Other disaster settings offer lessons and methods. Data and analysis look at aspects of difficult decisions, such as how to communicate the little that is known, and of encouraging what can be done in future.

A Foreword and Editorial give more information on the purpose and scope of this collection of peer-reviewed science, professional experience and impressions from the field in a wide range of psychological matters: the responses of communities to the experience their members have been having; care for those who cope sometimes and not other times; identifying those who need special care; provisions made in education, health and the services to maintain capability for as long as it takes, keeping organisations going in the long, dark aftermath.

The journal is distributed digitally. You can obtain a PDF copy from our web portal at www.psychology.org.nz.



Psychosocial recovery from disasters: a framework informed by evidence



Following the Canterbury earthquakes, The Joint Centre for Disaster Research (JCDR), formed a Psychosocial Recovery Advisory Group to help support organisations involved in the recovery process. This advisory group reviews and summarises evidence-based research findings for those who make requests for such information. Extensive experience within the group adds a practitioner perspective to this advice. This article discusses the definition of psychosocial recovery used by the group to date, and the group's view that psychosocial recovery involves easing psychological difficulties for individuals, families/whānau and communities, as well as building and bolstering social and psychological well-being. Details of the group can be found in the recently published article as well as brief discussion of this literature to make practical suggestions for psychosocial recovery.

Mooney, M.F., Paton, D., de Terte, I., Johal, S., Karanci, A.N., Gardner, D., Collins, S., Glavovic, B., Huggins, T.J., Johnston, L., Chambers, R., & Johnston, D.M. (2011) Psychosocial recovery from disasters: A framework informed by evidence. *New Zealand Journal of Psychology*, 40, 26-39.

Culture and disaster risk reduction: Lessons and opportunities

The value of physical science in mitigating the effects of environmental hazards is well acknowledged. Less acknowledged are the cultural influences affecting adoption of disaster risk reduction strategies, that is what influence 'culture' has upon hazard and risk. This recently published paper explores the need to consider 'culture' within disaster risk reduction and cross disciplinary boundaries through four key questions: (a) How relevant is 'culture' to disaster risk reduction? (b) How can we engage with different cultures? (c) How can local knowledge be accessed and utilised? (d) How can local and scientific knowledge be integrated for the benefit of disaster risk reduction? The questions are answered through drawing upon case study snapshots from Indonesia, Papua New Guinea, USA and the Maldives that explore geological-related hazard phenomena, including earthquakes, volcanoes and tsunamis, and their effects within communities. Challenges and ways forward for ensuring the integration of cultural considerations into risk reduction and putting research into practice and practice into research are identified.

Mercer, J., Gaillard, J.C., Crowley, K., Shannon, R., Alexander, B., Day, S., Becker, J. (2012) Culture and disaster risk reduction: Lessons and opportunities. *Environment Hazards* iFirst article (2012) 1–22.
<http://dx.doi.org/10.1080/17477891.2011.609876>

Leadership through a school tragedy: a case study

By Ruth Tarrant

On April 15, 2008, six Year-12 students (aged 16 years) and one teacher (aged 29 years) from Elim Christian College (ECC), Auckland, New Zealand, lost their lives in a river canyoning tragedy. Students were attending an outdoor education programme provided by the Sir Edmund Hillary Outdoor Pursuits Centre (OPC), at Mangatepopo in the central North Island of New Zealand. The river rose rapidly after heavy rain, stranding the canyoning group on a ledge above the water. An attempt to leave the ledge and exit the river before the river rose further resulted in multiple loss of life. The canyoning group comprised 10 people: eight students; one teacher; and an instructor employed by the outdoor education centre. Two students and the instructor survived the activity.

The study investigated the school principal's leadership through the tragedy from the night of the tragedy, through the following two years. The study discusses strategies the school used to assist students, their families, and staff following the tragedy, and identifies areas where greater preparation and planning would be beneficial in crisis leadership and management for New Zealand schools in the future. There is a long aftermath to a tragedy, and the ongoing demands on the leader require considerable physical, mental and emotional energy. The principal had not been trained in crisis leadership, and there were no concise and readily available guiding documents available to him in the early phase of the crisis. It is recommended that such documents are developed for use by New Zealand school principals.



The study is presented in two parts in the *Australasian Journal of Disaster and Trauma Studies* (2011, 3). Part 1 (essentially, the first week) covers: first steps; guidelines and support available to the principal; needs of the school; initial responses to student- and staff-grief; and managing relationships. Part 2 covers the principal's leadership in the two years following the event. Part 2 covers: support for the school; support for grieving students, staff and families; tributes and memorials; issues of safety; and looking after the leader.

Tarrant, R. (2011). Leadership through a school tragedy: a case study (Part 1 The first week). *Australasian Journal of Disaster and Trauma Studies*, 3, 65-76.

Tarrant, R. (2011). Leadership through a school tragedy: a case study (Part 2 The next two years). *Australasian Journal of Disaster and Trauma Studies*, 3, 77-88.

New Zealanders' judgments of earthquake risk before and after the Canterbury earthquake: do they relate to preparedness?

Previous research has examined judgments about earthquake likelihood after citizens have experienced an earthquake, but has not compared judgments in the affected region with other regions. Following the Darfield (Canterbury) earthquake, research by McClure and colleagues compared earthquake risk judgments in the affected region and those outside the region. Participants in Christchurch, Wellington and Palmerston North judged the likelihood of an earthquake before and after the 2010 Canterbury (Darfield) earthquake, near Christchurch. Wellington was chosen as there had been higher expectations of an earthquake in that



area. Palmerston North was chosen to be comparable to Christchurch before the Darfield earthquake, in that many New Zealanders have expected an earthquake in Wellington, not Palmerston North. Participants judged earthquake likelihoods for their own city, for the rest of New Zealand and for Canterbury. Christchurch participants also indicated their preparedness before and after the earthquake. Expectations of an earthquake in Canterbury were low before the Darfield earthquake in all three regions and rose significantly after that earthquake. In contrast, Wellingtonians' judgments of the likelihood of an earthquake

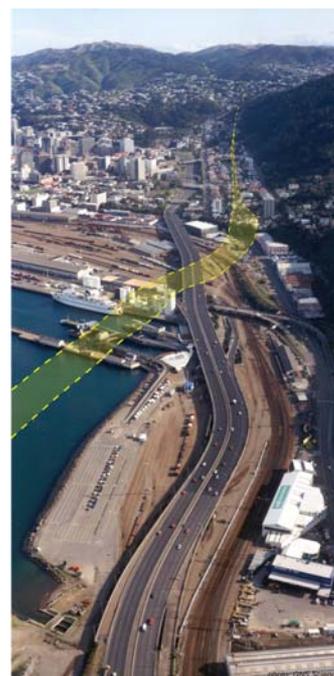
in Wellington were high before the Darfield earthquake and did not rise after that earthquake. Christchurch participants' risk perceptions showed only a weak relation to their preparedness. These results clarify how disasters such as major earthquakes affect judgments of earthquake risk for citizens inside and outside the affected area. The results show that these effects differ in cities where an earthquake is expected. Broader issues about preparing for earthquakes are also discussed.

McClure, J., Wills, C., Johnston, D., & Recker, C. (2011). New Zealanders' judgments of earthquake risk before and after the Canterbury earthquakes: Do they relate to preparedness? *New Zealand Journal of Psychology* 40:7-11.

The communication of uncertain scientific advice during natural hazard events

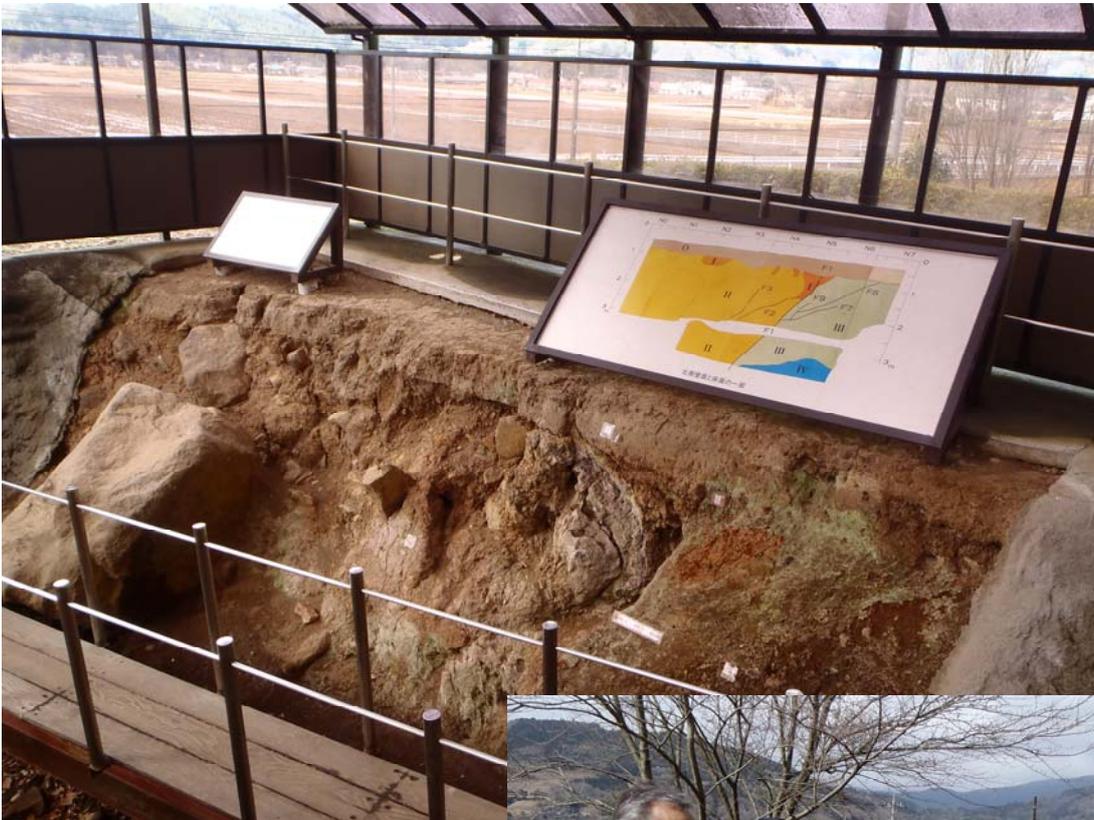
During natural hazard crises such as earthquakes, tsunamis, and volcanic eruptions, a number of critical challenges arise in emergency management decision-making. A multidisciplinary approach bridging psychology and natural hazard sciences has the potential to enhance the quality of these decisions. Psychological research into the public understanding of different phrasings of probability has identified that the framing, directionality and probabilistic format can influence people's understanding, affecting their action choices. We present results identifying that translations of verbal to numerical probability phrases differ between scientists and non-scientists, and that translation tables such as those used for the International Panel on Climate Change reports should be developed for natural hazards. In addition the authors present a preliminary result illustrating that individuals may 'shift' the likelihood of an event towards the end of a time window.

Doyle, E., Johnston, D.M., McClure, J., & Paton, D. (2011) The Communication of Uncertain Scientific Advice During Natural Hazard Events. *New Zealand Journal of Psychology*, 40, 39-50.



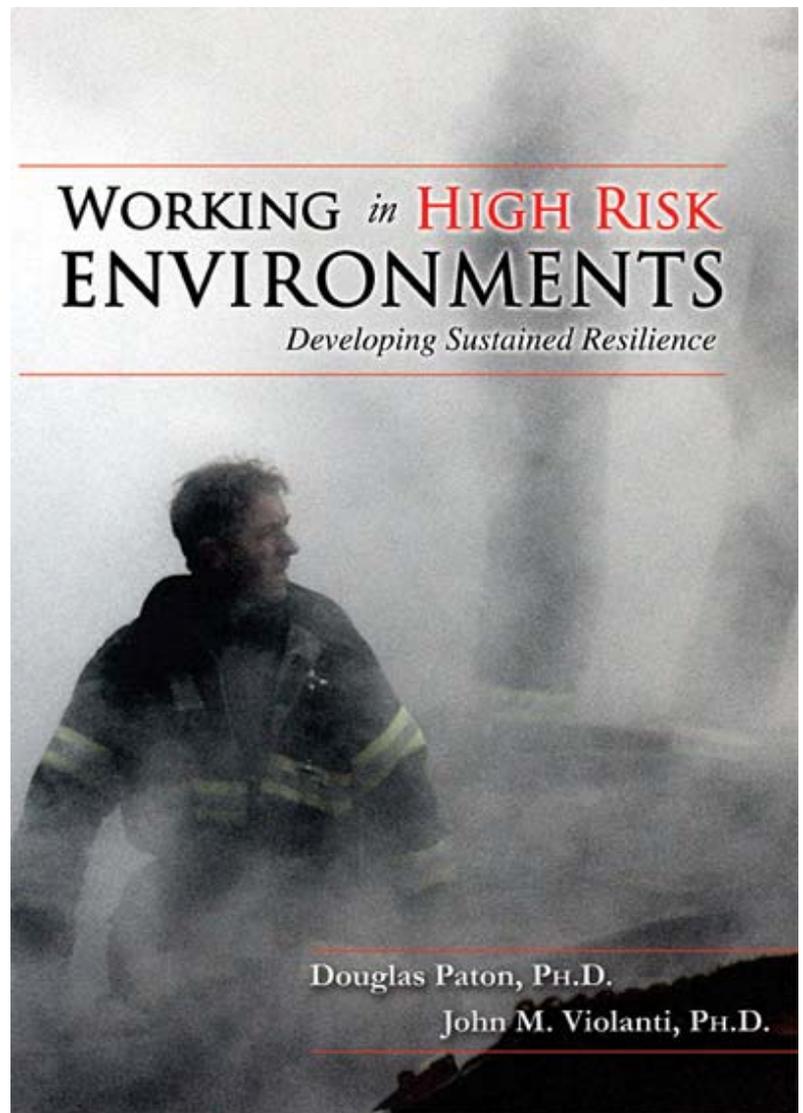
Earthquake hazard education in Japan - Tanna fault

Tanna Fault is a left lateral fault which runs along the northeast side of Izu Peninsula south 30 km to Izu City, Japan. It was responsible for the 1930, magnitude 7.3 Kita-Izu Earthquake. The fault trace has been trenched and preserved as a public education site. (Photos by D Johnston February 2012).



Douglas Paton has recently compiled a new text with John Violanti entitled **WORKING IN HIGH RISK ENVIRONMENTS: Developing Sustained Resilience**, and published by Charles C Thomas Publisher Ltd (ISBN 978-0-398-08692-3). As stated on their website:

“The impact of events such as the 9/11 terrorist attacks and Hurricane Katrina were felt across the spectrum of organizations. Such events provide vivid illustrations of the exceptional circumstances that emergency and protective service agencies and businesses alike can encounter. The goal of this book is to broaden the perspectives on the populations that need to be included when thinking about high risk groups and from whom insights into resilience and how it is enacted can be sought. The first chapter discusses high risk environments, sustained resilience and stress risk management. Chapter 2 explores family first responders and resilient mothers of special needs children, including case examples. Chapter 3 examines the resilience of Antarctic expeditioners, relationship dynamics, social support, and organizational climate. Information sharing, trust, empowerment and staying cool under pressure is also discussed. Chapter 4 covers business resilience, preventing loss versus facilitating survival, and the role of continuity planning. In Chapter 5, scientific advice for critical decision making, natural hazards and emergency management, uncertainty, team decision making, advice taking, and shared mental models is presented. Chapter 6 covers COP Shot, and the seeds of resiliency. Chapter 7 defines resiliency in high risk groups, and provides a qualitative analysis of law enforcement and elite military personnel. The Johns Hopkins Perspective is explored, focusing on the results and methods of structural modeling. Chapter 8 describes the psychological stress factors in modern military operations, mental hardiness, and leader influence. Chapter 9 pursues the ecological theory of resilience and adaptive capacity in emergency services. Ultimately, the book meets a need on how to respond effectively in a high risk environment, and the information contained will assist agencies and businesses to develop their capacity to adapt to unpredictable and challenging circumstances.”



In particular, we'd like to highlight Chapter 5, written by Emma Hudson-Doyle and David Johnston from the JCDR:

- Doyle, E. E. & Johnston, D. M (2011). Science advice for critical-decision making. In: Paton, D. and Violanti, J. M. (Eds) Working in High Risk Environments: Developing Sustained Resilience. Charles C. Thomas Publisher, Springfield, Ill. ISBN 978-0-398-08693-0 (Chap 5, pp 69 - 92)

Community engagement post-disaster: case studies of the 2006 Matata debris flow and 2010 Darfield earthquake, New Zealand

Engagement and participation are terms used to describe important processes in a democratic society. However, the definition and understanding of these terms is broad and varied. In a disaster context, community engagement and participation are recognised as important processes to support individual and community recovery. What these terms mean, who is responsible for leading engagement, and the processes that are to be used, are important issues that need to be clarified at the onset of recovery, if not before. Despite this, there are often barriers to community members being involved in the recovery process as active and valued participants. These include governance structures that do not adequately recognise the spectrum of community engagement and the power dynamics of information sharing and decision-making. This article discusses two New Zealand case studies where engagement activities were put in place to contribute to the communities' post disaster recovery.



Collins, S., Glavovic, B., Johal, S., Johnston, D. (2011) Community engagement post-disaster: case studies of the 2006 Matata debris flow and 2010 Darfield earthquake, New Zealand. *New Zealand Journal of Psychology* 40: 17-525.

Building an evidence base for public education post the Canterbury earthquakes

A workshop entitled Building an Evidence Base for Public Education Post the Canterbury Earthquakes was held on 13 September 2011 at the Joint Centre for Disaster Research (Massey University, Wellington campus). The workshop was a valuable opportunity to exchange ideas and further the discussion of both the needs and means of public education for emergency management in New Zealand. The main points for further consideration are:

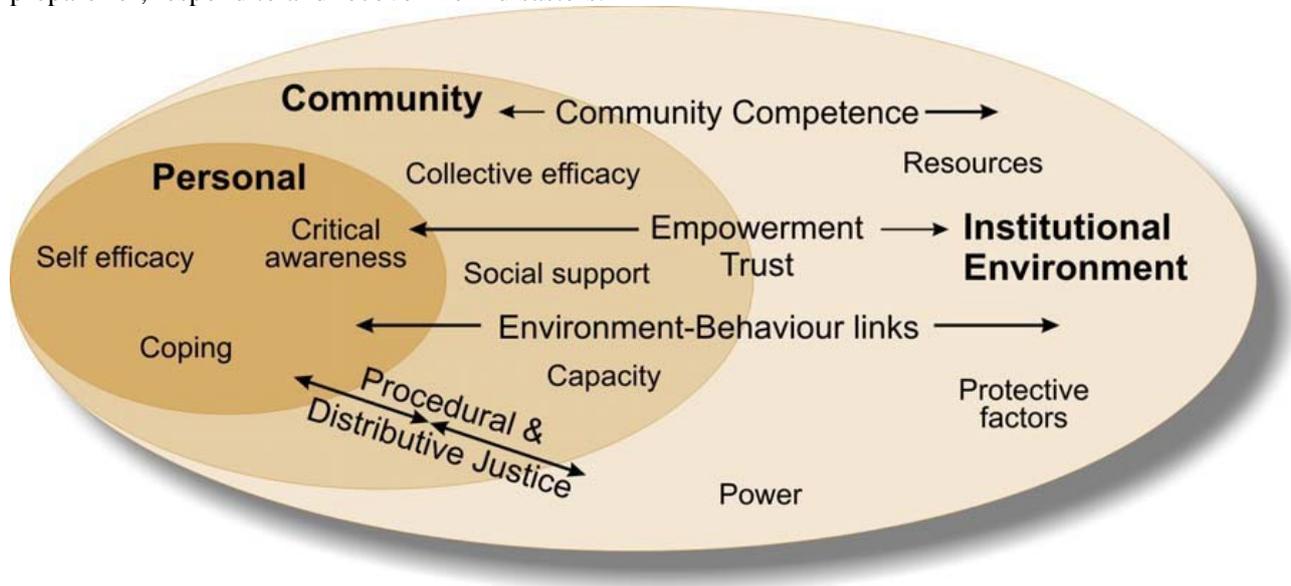
- **Public education for emergency management goes beyond the NZ CDEM sector and therefore harmonisation is important.** There are other sectors, such as health and education, which distribute information and promote activities directly and indirectly contributing to the public's understanding of risks and solutions. This could include, for example, a school science curriculum discussing climate change or a public health officer promoting safety for older adults.
- **Public education practices need to capitalise on the existing research.** CDEM practitioners and others involved in public education can draw support from the research literature to help make programs more effective. At the same time the research community needs to find better ways to disseminate research findings and make the information available and usable by the practitioner community.
- **More research is needed on public education to further support best practices.** This is a dynamic field and new information is needed to refine practices and identify new opportunities for improvement.
- **Ongoing evaluation of public education programmes is critical to future success.** Public education programmes must be assessed on their influence, not just their outputs Evaluation is another opportunity for greater cooperation between the practice and research components of the CDEM field.
- **The differences between public education and crisis communications need to be recognised in the research and practice.** Communicating with the public is framed by the context in which the information is being shared. In New Zealand many practitioners and researchers operate in both the pre-event public education and response oriented crisis communications contexts so it is even more imperative that the distinctions are acknowledged.

Lindsay, J.; Johnston, D.M. and Hughes, M.E., 2012. Building an evidence base for public education post the Canterbury earthquakes: A Research Workshop 13 September 2011, GNS Miscellaneous Series 41. 24 p.

Joint Centre for Disaster Research, GNS Science – Massey University, School of Psychology. Research Update – April 2012

Building community resilience to disasters: A practical guide for the emergency management sector

The Crown vision for Civil Defence Emergency Management (CDEM) is “Resilient New Zealand – communities understanding and managing their hazards”. Resilience can be considered with regards to several interdependent levels: built environment; attitudes/behaviours; and community and cultural factors. Working to develop resilience characteristics within a community can influence the way our communities prepare for, respond to and recover from disasters.



A recently published report discusses how to measure and build resilience and New Zealand society’s capacity to draw upon individual, institutional and collective resources to cope with and adapt to the demands and challenges of natural disaster occurrences. Research shows that individual and institutional attributes can be used as resilience indicators, and this paper looks at these indicators with regard to eight New Zealand case studies where community programmes have been successful in developing resilience.

This publication is a ‘how to’ guide aiming to provide an outline of how to measure and build resilience and what resilience means for New Zealand communities. The guide outlines the key indicators of resilience and provides details about each while providing suggestions for the emergency management community on targeting and developing these indicators in communities. The paper discusses available resources and communication messaging to help build resilient communities, and comments on how to link the development of disaster resilience with other community development initiatives to provide a cost-effective approach to risk management.



Becker, J.S.; Johnston, D.M.; Daly, M.C.; Paton, D.M.; Mamula-Seadon, L.; Petersen, J.; Hughes, M.E. and Williams, S. 2011. Building community resilience to disasters: A practical guide for the emergency management sector, GNS Science Report 2011/09. 44 p.

Teaching and Outreach

Staff and associates of the centre currently contribute to elements of the Graduate Diploma in Emergency Services Management and MA, MPhil and PhDs in Psychology, Emergency Management and other related disciplines. The Centre also plans to work with other organisations in the provision of training within the CDEM sectors. A series of Emergency Management short courses are organised by the centre in Summer and Spring.

Graduate Students – linked to the Centre

Debra Ellis (PhD student, School of Psychology, Massey University)
“Health sector emergency management roles in New Zealand”

James Hudson (PhD student, School of Psychology and Te mata o te Tau, Massey University)
“The Quantification of Iwi Development: A Framework for Iwi Development & Resilience”

Stuart Fraser (PhD student, School of Psychology, Massey University)
“The potential for using mid to high-rise buildings as vertical evacuation structures in near-source earthquake and tsunami events”

John Lindsay (PhD student, School of Psychology, Massey University)
“Maximising participatory planning in emergency management: implications for professional practice”

Yasir Javed (PhD student, Institute of Information and Mathematical Sciences, Massey University)
“Design, Implementation and Evaluation of Web-based Integrated Incident Resource Management System for decision support in Emergency Operation Centres”

Robyn Tuohy (PhD student, School of Psychology, Massey University)
“Disaster preparedness of older adults in New Zealand”

Sally Potter (PhD student, School of Psychology, Massey University)
“Effective management of a volcanic crisis at New Zealand calderas”

Vicky Johnson (PhD student, School of Psychology, Massey University)
“Evaluating disaster education programs for children”

Karlene Tripler (PhD student, School of Psychology, Massey University)
“Emergency management in New Zealand primary schools”

Maureen Mooney (PhD student, School of Psychology, Massey University)
“Childhood and caregiver post-disaster recovery following Canterbury earthquakes of 2010 and 2011”

Victoria Parsons (PhD student, School of Psychology, Massey University)
“Other voices: Stories from families about coping in a post-disaster world”

Belinda Beets (MSc student, School of Psychology, Massey University)
“Organisational responses to warnings of impending hazards: What can be learned from the September 2009 tsunami warning in New Zealand?”

Abdur Rehman Cheema (PhD student, Institute of Development Studies School of People, Environment and Planning, Massey University)
“Role of good governance in addressing vulnerabilities in disaster management in Pakistan”

Alexa Van Eaton (PhD student, Department of Earth Sciences, Victoria University of Wellington)
“On the dynamics of super-eruptions: Towards improved response to New Zealand’s caldera-forming eruptions”

Brenda Mackie (PhD student, School of Social and Political Sciences, University of Canterbury)
“Risk Communication, Perception and Warning Fatigue: the Australian Bushfires”

Charlotte Brown (PhD student, Department of Civil Engineering, University of Canterbury)
“Disaster debris management.”

- Jennifer DuBois** (PhD student, Department of Geological Sciences, University of Canterbury) “The plausibility of a submarine landslide generated tsunami at Kaikoura Canyon”.
- Michael Peters** (MSc student, Department of Geological Sciences, University of Canterbury) “Dissolution and Hazard Assessment of Volcanic Ash in Freshwater Environments”.
- Heather Bickerton** (MSc student, Department of Geological Sciences, University of Canterbury) “Volcanic Ash Impacts to Agriculture”.
- James Cowlyn** (PhD student, Department of Geological Sciences, University of Canterbury) “Pyroclastic Flows and Volcano-Ice Interactions at Ruapehu Volcano, New Zealand”.
- Sarah Beaven** (PhD student, Department of Geological Sciences, University of Canterbury) “Science and operational response partnerships after the Canterbury Earthquakes: a model facilitating research and operational collaboration”.
- Theodosios Kritikos** (PhD student, Department of Geological Sciences, University of Canterbury) “Disaster management in active mountain front regions using tectonic geomorphology and GIS: application to Western Southern Alps (New Zealand)”.
- Tom Robinson** (PhD student, Department of Geological Sciences, University of Canterbury) “Planning for a Great Alpine fault earthquake: consequences for the South Island, New Zealand”.
- Sonali Weerasekara** (MSc student, Department of Geological Sciences, University of Canterbury) “Modelling gastroenteritis prevalence in relation to liquefaction ejecta”.
- Sarah Bastin** (MSc student, Department of Geological Sciences, University of Canterbury) “Paleo drainage features as controls for the liquefaction pattern in Christchurch following the Canterbury earthquakes”.
- Marlene Villemure** (MSc student, Department of Geological Sciences, University of Canterbury) “Cost of Clean Up: Clean up time, costs and coordination following widespread soft sediment deposition in urban environments during natural disasters”.
- Shaun Williams** (PhD student, Department of Geological Sciences, University of Canterbury) “Tsunami Hazards, Samoa Islands: Palaeo-tsunami investigation, numerical source modelling and risk implications”.
- Jason McIntosh** (MSc student, Department of Geological Sciences, University of Canterbury) “Assessing the effects of large earthquakes on healthcare capacity in Christchurch.”
- Johnny Wardman** (PhD student, Department of Geological Sciences, University of Canterbury) “Quantitative analysis of “flashover” potential for high voltage transmission equipment exposed to volcanic ash.”
- Grant Wilson** (MSc student, Department of Geological Sciences, University of Canterbury) “The effects of volcanic ash and gas on modern laptop computers and materials used for volcano monitoring”.
- Julian Idle** (MSc student, Department of Geological Sciences, University of Canterbury) “Multi-hazard risk analysis of Lyttelton, New Zealand”.
- Zachary Whitman** (PhD student, Department of Geological Sciences, University of Canterbury) “Business risk perception and resiliency in an all-hazard environment: an analysis of the relationship between the public and private sectors in New Zealand”.
- Victoria Sword-Daniels** (EngD student, Department of Civil, Environmental and Geomatic Engineering, University College London) “Evaluating impacts on community infrastructure following recent volcanic eruptions.”
- Vivienne Bryner** (PhD student, Centre for Science Communication & Geology, University of Otago) “Communication of geoscience knowledge to achieve disaster risk reduction”.
- Mary Anne Thompson** (PhD student, School of Environment, University of Auckland) “The interface between probabilistic hazard and risk assessment and volcanic risk and crisis management”.

New Publications

- Bell, A., Patterson, L., Dryburgh, M., Johnston, D. (in press). Empire to Nation: education for nationhood through natural disaster stories. *History of Education Review*
- Becker, J.S.; Johnston, D.M.; Daly, M.C.; Paton, D.M.; Mamula-Seadon, L.; Petersen, J.; Hughes, M.E. and Williams, S. 2011. Building community resilience to disasters: A practical guide for the emergency management sector, GNS Science Report 2011/09. 44 p.
- Blackett, P. and Hume, T.M. 2011. Governance issues with respect to coastal erosion management in New Zealand, GNS Science Report 2011/34. 36 p.
- Collins, S., Glavovic, B., Johal, S., Johnston, D. (2011) Community engagement post-disaster: case studies of the 2006 Matata debris flow and 2010 Darfield earthquake, New Zealand. *New Zealand Journal of Psychology* 40: 17-525.
- Doyle, E., Johnston, D.M., McClure, J., & Paton, D. (2011) The Communication of Uncertain Scientific Advice During Natural Hazard Events. *New Zealand Journal of Psychology*, 40, 39-50.
- Doyle, E.E., Johnston, D.M. (2011). Science advice for critical-decision making. In Paton, D. and Violanti, J.M. (Eds) *Working in High Risk Environments: Developing Sustained Resilience*. Charles C. Thomas Publisher, Springfield, III. ISBN 978-0-398-08693-0 (Chap, 5, pp 69-92)
- Fraser, S., Raby, A., Pomonis, A., Goda, K., Chian, S.C., Macabuag, J., Offord, M., Saito, K., Sammonds, P. 2012. Tsunami damage to coastal defences and buildings in the March 11th 2011 Mw9.0 Great East Japan earthquake and tsunami. *Bulletin of Earthquake Engineering* (in press)
- Garside, R., Christianson, A., Johnston, D., & Leonard, G. (2011). Disaster preparedness in the tourism industry: A New Zealand case study of constraints and training response. *New Zealand Journal of Human Resource Management*, 11(2), 50-64.
- Javed, Y., Norris, T., and Johnston, D.M., (2011). Mass Evacuation Support System (MESS): Validating Information Requirements of Emergency Managers. 7th International Conference on Information Technology and Applications (ICITA 2011), Sydney, Australia, pp 249 - 254.
- Javed, Y., Norris, T., and Johnston, D.M., (2011). Combining Naturalistic and Rational Decision Models for Designing Mass Evacuation Support System (MESS). Intellect International Consortium Academic Conference (IIC 2011), Sydney, Australia. pp 105 - 116.
- Johnston D., Becker J., Paton D. in press. Multi-agency community engagement during disaster recovery: lessons from two New Zealand earthquake events. *Disaster Prevention and Management*.
- Johnston, D.M.; Coomer, M.A.; McClure, J.; Becker, J.S. and Wright, K.C. 2011. A bibliography of social research on the earthquake risk in Wellington, New Zealand: 1848 to 2010, GNS Science Report 2011/11. 29 p.
- Johnston, D. M.; Ronan, K. R.; Finnis, K.; Leonard, G. S. 2011. Children's understanding of natural hazards in Te Anau, New Zealand, following the 2003 earthquake, GNS Science Report 2011/05 18 p.
- Lavell A., JC Gaillard JC., Wisner B., Saunders W., van Niekerk D. (in press). National planning and disaster. In: Wisner B., JC Gaillard JC., Kelman I. (eds.). *The Routledge Handbook of Hazards and Disaster Risk Reduction*.
- Leonard, G.S.; Evans, N.; Fraser, S.; Saunders, W.S.A.; Pearse, L.; Monastra, D.; Prasetya, G. 2011. Scoping study for evaluating the tsunami vulnerability of New Zealand buildings for use as evacuation structures. Lower Hutt: GNS Science. GNS Science Report 2011/36 37p.
- Lindsay, J.; Johnston, D.M. and Hughes, M.E., 2012. Building an evidence base for public education post the Canterbury earthquakes: A Research Workshop 13 September 2011, GNS Miscellaneous Series 41. 24 p.
- O'Brien G., Bhatt M., Saunders W., Gaillard JC, Wisner B. (in press). Local government and disaster In: Wisner B., JC Gaillard JC., Kelman I. (eds.). *The Routledge Handbook of Hazards and Disaster Risk Reduction*.
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- Mooney, M.F., Paton, D., de Terte, I., Johal, S., Karanci, A.N., Gardner, D., Collins, S., Glavovic, B., Huggins, T.J., Johnston, L., Chambers, R., & Johnston, D.M. (2011) Psychosocial recovery from disasters: A framework informed by evidence. *New Zealand Journal of Psychology*, 40, 26-39.
- Reese, R.; Becker, J. S.; Johnston, D. M.; Coomer, M. A. and Tuohy, R. 2011. Flood perceptions, preparedness and response to warnings in Kaitaia, Northland, New Zealand: Results from surveys in 2006 and 2009, GNS Science Report 2011/10. 90 p.
- Ronan, K.R., Crellin, K., Johnston, D.M. (in press) Community readiness for a new tsunami warning system: quasi-experimental and benchmarking evaluation of a school education component. *Natural Hazards*
- Sword-Daniels, V.; Wardman, J.; Stewart, C.; Wilson, T.; Johnston, D. and Rossetto, T. 2011. Infrastructure impacts, management and adaptations to eruptions at Volcn Tungurahua, Ecuador, 1999-2010, GNS Science Report 2011/24. 73 p.
- Sinclair, H., Doyle, E. E., Johnston, D. M., Paton, D. (in press). Assessing emergency management training and exercises. *Disaster Prevention and Management*
- Tarrant, R. (2011). Leadership through a school tragedy: a case study (Part 1 The first week). *Australasian Journal of Disaster and Trauma Studies*, 3, 65-76.
- Tarrant, R. (2011). Leadership through a school tragedy: a case study (Part 2 The next two years). *Australasian Journal of Disaster and Trauma Studies*, 3, 77-88.
- Tuohy, R., Christine S. (2012). Older adults' narratives about a flood disaster: Resilience, coherence, and personal identity. *Journal of Aging Studies* 26: 26–34.
- Wardman, J.B., Wilson, T.M., Bodger, P. S., Cole, J.W., Johnston, D.M. (in press). Investigating the electrical conductivity of volcanic ash and its effect on HV power systems" *Journal of Physics and Chemistry of the Earth*.
- Wilson, T., Stewart, C., Sword-Daniels, V., Leonard, G., Johnston, D., Cole, J., Wardman, J., Wilson, G. and Barnard, S., 2011. Volcanic ash impacts on critical infrastructure. *Physics and Chemistry of the Earth* (2011), doi: 10.1016/j.pce.2011.06.006
- Wilson, T., Cole, J., Johnston, D., Cronin, Stewart, C. Dantas, A. (in press) Short- and long-term evacuation of people and livestock during a volcanic crisis: lessons from the 1991 eruption of Volcan Hudson, Chile. *Journal of Applied Volcanology*
- White, J., Stewart, C., Wareham, D., Wilson, T.M., 2011. Treatment of Volcanic Ash-Contaminated Surface Waters through the Optimisation of Physical and Chemical Processes, GNS Science Report 2011/35. 34p.





**University of Canterbury, Christchurch, New Zealand
21–22 August 2012**

Optional Workshops 20, 23 & 24 August 2012

The conference will provide a forum to discuss the integration of hazard information into effective risk management, including:

- Applying hazard information to best practice planning
- Developing effective warning systems
- Improved response and recovery from events
- Creating resilient communities through integrating science into practice

Our target audience is: Emergency managers, planners, risk assessors, asset and utility managers, natural hazards researchers and scientists.

Key dates:

October 2011	Call for papers, workshops and trade displays
March 2012	Registration details on the web and printed final circular available
1 April 2012	Deadline for abstract submissions
1 May 2012	Confirmation of programme
20–24 August 2012	Conference and workshops

Contact:

ahmc@hazards-education.org
www.hazardseducation.org/conference



New Zealand ShakeOut

9:26am, 26 September, 2012



Science/engineering organisations

At 9.26am on Wednesday 26 September (9:26-26:9), we aim to have 1 million people throughout New Zealand participate in the New Zealand ShakeOut earthquake drill. You could be anywhere – at home, at work, at school or on holiday. Everyone is encouraged to participate in the drill wherever you are at 9:26-26:9.

Everyone can participate! To register go to www.getthru.govt.nz

1 How to participate

Here are simple things science and engineering organisations can do to participate in New Zealand ShakeOut. Guidelines and resources can be found at www.getthru.govt.nz.

Today:

- Register your organisation at www.getthru.govt.nz to be counted in the ShakeOut drill, get email updates, and more.
- Note the time and date in your diary (9.26am on Wednesday 26 September 2012).

2 Between now and 26 September:

- Get detailed information at www.getthru.govt.nz or contact your local council.
- Consider what may happen when an earthquake shakes your area.
- Plan what you will do now to prepare your organisation.
- Talk to other science and engineering organisations and encourage them to join you in getting more prepared.
- Practise the Drop Cover and Hold drill with those in your organisation.

3 9.26am on 26 September do the Drop, Cover and Hold drill



DROP down onto your hands and knees (before the earthquake knocks you down). This position protects you from falling but allows you to still move if necessary.



COVER your head and neck (and your entire body if possible) under a sturdy table. If there is no shelter nearby, get down near an interior wall (or next to low-lying furniture that won't fall on you), and cover your head and neck with your arms and hands. If you are outside, move no more than a few steps away from buildings, trees, or power lines, then drop, cover and hold. If you are driving, pull over to a clear location, stop and stay there with your seatbelt fastened until the shaking stops. Once the shaking stops, proceed with caution and avoid bridges or ramps that might have been damaged.



HOLD on to your shelter (or your position to protect your head and neck) until the shaking stops. Be prepared to move with your shelter if the shaking shifts it around.

- While you are doing the drill, imagine that it is real and what might be happening around you. Then, consider what your organisation might need to do before a real earthquake happens to help protect yourself and those in your organisation?
- Practise what you will do after the shaking stops.
- After your drill is complete, have discussions with staff about what was learned and apply these lessons to your business continuity plan.
- Share your stories and photos with others.

4 Share the ShakeOut

Invite others to register for the New Zealand ShakeOut. With your help this can become the largest earthquake drill in New Zealand history!

As a registered New Zealand ShakeOut participant you will:

- Learn what you can do to get prepared
- Be counted in the largest earthquake drill New Zealand has ever seen
- Receive ShakeOut news and other earthquake information
- Set an example that motivates others to participate.



Location

The centre is part of the School of Psychology, in the College of Humanities & Social Sciences. The centre Director, staff and students are based at the Massey University campus in Wellington (Building T20). However, the centre draws on staff from other Massey campuses, GNS Science and other collaborating organisations. Visits to the centre are welcomed but by appointment only please.



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