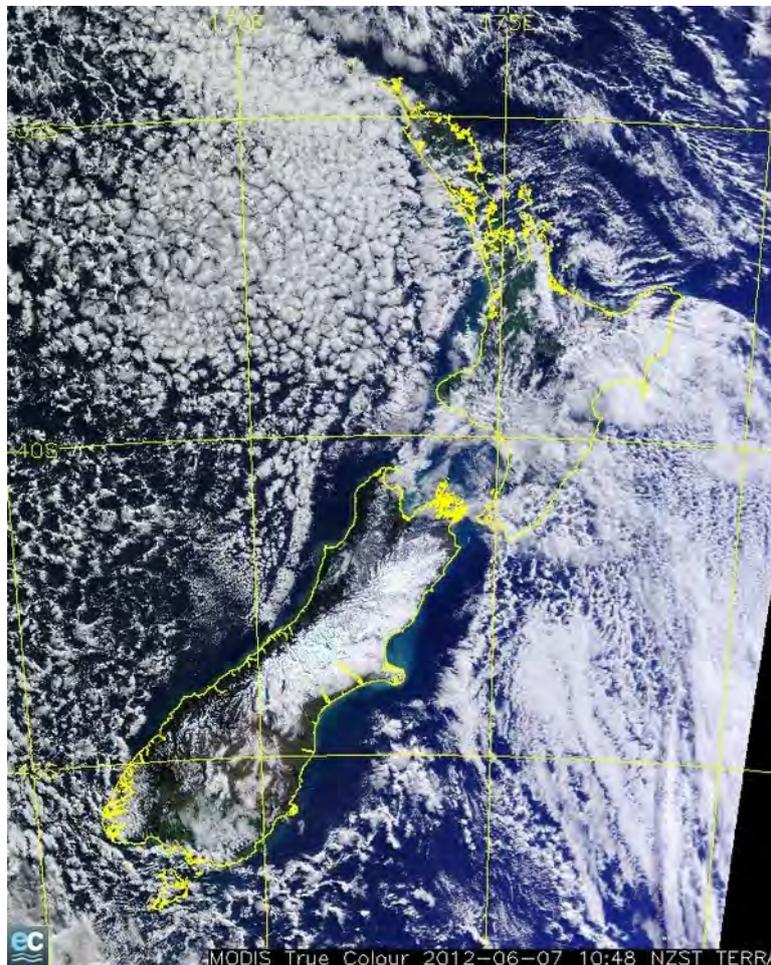


Welcome to the latest of the research updates from the Joint Centre for Disaster Research. The centre opened in December 2006 and is a joint venture between Massey University and GNS Science within the School of Psychology, based at the Massey University campus in Wellington.

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.



7 June 2012 image over New Zealand was created using data from one of the MODIS sensors flying aboard NASA's EOS satellites: AQUA (EOS-PM1), or TERRA (EOS-AM1). The data were received at NIWA's satellite receiving station at Lauder (Central Otago). Photo from NIWA.

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

News from the JCDR Team

The Joint Centre for Disaster Research (JCDR) was pleased to have four of its doctoral students (**Julia Becker, Wendy Saunders, Ian de Terte and Heather Taylor**) graduate during the recent ceremonies held at Massey University. The research undertaken by the candidates as part of their doctoral degrees focused on a wide range of topics within disaster and emergency management, as detailed on page 3).

Belinda Beets was awarded her Masters degree for her thesis on “Organisational responses to warnings of impending hazards: What can be learned from the September 2009 tsunami warning in New Zealand?”.

Charlotte Brown, a doctoral student, with Department of Civil Engineering, University of Canterbury also graduated in Christchurch. Her study was on “Disaster debris management.”

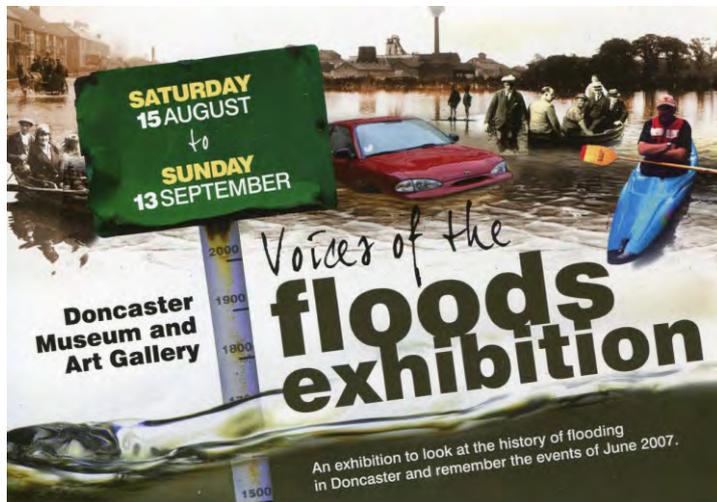
Wendy Saunders was presented with the New Zealand Planning Institute's Wallace Ross Graduate Research Award for her PhD thesis "Innovative Land Use Planning for Natural Hazard Risk Reduction in New Zealand". The award is presented to a researcher who has made a significant contribution through research to the understanding of planning in New Zealand. Significantly the Awards Panel was unanimous in its decision to give Wendy the Award.

Ian Evans retired from the School of Psychology at Massey in July. Professor Evans was the Head of School at the time of the creation of the JCDR and served for four years on the Centre's Board. All those involved with the JCDR thank Ian for his support over the years.

Steve Jensen and **Jon Mitchell** have been working with staff at the Centre to develop two new courses as part of the Emergency Management teaching programme.

Technologies of recovery: Plans and situated realities after disaster

Lucy Easthope, a UK based affiliate researcher of the JCDR has completed a five year ethnography of life after flooding. Her study began in the summer of 2007, when parts of the UK experienced exceptionally high rainfall and were devastated by floods. It is an observation of the residents and responders in one flooded village: of the relationships that are formed, the houses that are rebuilt, the personal items that are missed or



thrown away, and the places that are lost or impacted. It is also a reflection on the changing role of the researcher as an insider in strategic emergency planning. Lucy became entangled in the life of the village, including collaborating on an exhibition with the residents.

Drawing on literature from science and technology studies, human geography and disaster research this study shows how technologies of recovery, which Lucy defines as recovery plans and guidance documents, are transformed in localised practice. This enables actions to happen that are intertwined with a community's own existing strength and

resilience. The analysis shows, through a case study that makes visible practices that are often hidden, how localised emergency responders find ways to collaborate with residents. In an informal network they do different things with the instruments to co-produce regeneration within a community.

A key recommendation of the study is a need for the disaster studies communities to further reflect on the way social science research is conducted after disasters and this is something she will be exploring further with the JCDR team. Many of the themes should resonate with researchers at the JCDR and a number of areas have been identified for collaboration going forward. Lucy is a Teaching Fellow at the University of the Bath, an emergency responder in the UK and a speaker at the Emergency Management Institute; she is looking forward to seeing you all again soon! **Lucy Easthope** L.C.Easthope@btinternet.com

Four doctoral students graduate

Dr Wendy Saunders' doctoral research examined innovative land use planning for natural hazard risk reduction in New Zealand. The risk-based framework developed within the research by provides a significantly new approach to natural hazard management, where the consequences of an event are the primary concern allowing for levels of risk to be defined. This framework can be adapted to local risks communities may face, and defines 'acceptable' levels of risk that allows for risk-based planning to occur. This in turn will reduce the future risks and consequences from natural hazard events.

Dr Ian de Terte studied the psychological resilience of police officers who had been exposed to hazardous events. The five-part model looked at an individual's thoughts, feelings, behaviours, physical activities, and environment. There has been limited research evaluating psychological resilience from a multidimensional viewpoint. The psychological resilience model initially proposed by Dr de Terte in his doctoral research has been reconceptualised as a three-part model, but requires further empirical and theoretical development.



Dr Julia Becker's research sought to understand how individuals make meaning of earthquake information and how this relates to increasing household preparedness for earthquakes. Dr Becker found that in making decisions about whether or not to prepare for earthquakes, people draw upon a variety of types of information including passive information, interactive information and personal experience. Dr Becker also found that additional factors such as emotions or social situations have a bearing on people's decision-making. Dr Becker, as part of her recommendations has suggested that future earthquake education campaigns should be developed to incorporate a wider range of information types and account for broader contextual influences.

Dr Heather Taylor's research examined children's experiences of flooding in Surakarta, Indonesia. Dr Taylor's research presents a rich contextual discussion of the social effects of flooding on children in Central Java, Indonesia. Research in the Indo-Javanese context revealed that in disaster situations where children are involved, the cultural and social contexts and the geographic and circumstantial contexts matter. The knowledge generated by Dr Taylor's research furthers understanding of how the experiences and responses of children in disasters are shaped, and the factors which make children more resilient and less vulnerable to the challenges experienced in disasters.

Photos from left to right: Wendy, Ian, Julia, Heather.

THE NEW NEW ZEALAND IS THERE WHEN DISASTER STRIKES.



SARB JOHAL
ASSOCIATE PROFESSOR
IN PSYCHOLOGY
JOINT CENTRE OF
DISASTER RESEARCH
MASSEY UNIVERSITY

Helping people
rebuild their
lives after
disaster strikes.

Sarb and his colleagues at the Joint Disaster Recovery team at Massey University are helping the world get smarter at lessening the impact on people, socially and psychologically, after a disaster.

They gave practical advice to the teams involved in the Canterbury earthquake and are working internationally to help those, who help others, help them better.

At Massey University you don't just get a degree - you come out with the practical skills to create a better future for New Zealand, and the world.

Our students, staff and alumni are the 'engine' that is driving change, all over the world. Join us in the new New Zealand.

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**THE ENGINE
OF THE NEW
NEW ZEALAND**

Global Volcano Model

A new initiative, the Global Volcano Model (GVM), aims to develop an integrated global database system on volcanic hazards, vulnerability and exposure. It will make this information globally accessible and crucially involve the international volcanological community and users in a partnership to design, develop, analyse and maintain the database system. The GVM project will aim to establish new international metadata standards that will reduce ambiguity in the use of global volcanic datasets. Vulnerability and exposure data will be integrated into the GVM and again new methods of assessment and analysis will be investigated and tested.



The project also intends to establish methodologies for analysis of the evidence and data to inform risk assessment, to develop complementary volcanic hazards models, and create relevant hazards and risk assessment tools. The research will provide the scientific basis for mitigation strategies, responses to ash in the atmosphere for the aviation industry, land-use planning, evacuation plans and management of volcanic emergencies.

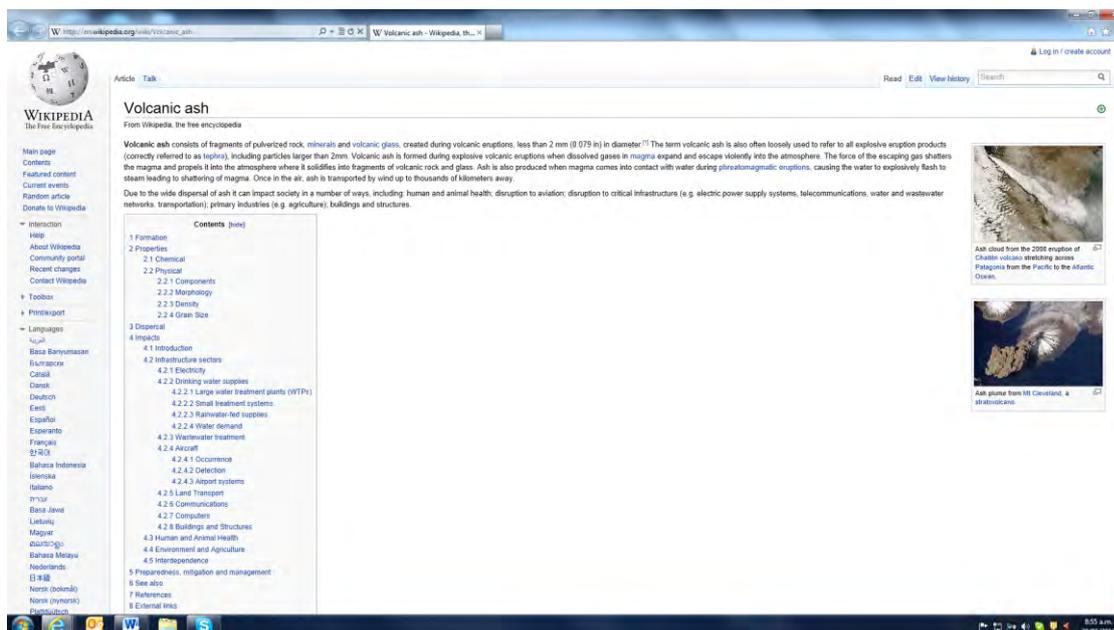
New Zealanders Gill Jolly (GNS Science) and David Johnston (JCDR Director) attended the first meeting in Edinburgh in April. Gill is on the Management Board and David the Steering Group.

www.globalvolcanomodel.org

Wikipedia page for 'volcanic ash'

Victoria Sword-Daniels, Johnny Wardman and Grant Wilson (PhD students linked to the Centre) have published a Wikipedia page for 'volcanic ash' incorporating much of our literature reviews from their projects and other work by JCDR colleagues and collaborators. The link to the page is here:

http://en.wikipedia.org/wiki/Volcanic_ash



LOCAL

Working to manage severe weather risks in Samoa



(L-R): James Lunny (MetService), Mulipola Ausetalia Titiamaea (SMD), Leigh Anne Eaton (NOAA), Luteru Tauvale (SMD), Henry Taiki (WMO), Eesees Ahken (SMD) and Jonathan Tunster (MetService).

By James Lunny
and Penehuo Lefale

New Zealand and United States meteorologists visited Samoa last week to provide training to help Samoa better forecast severe weather events.

Over the last two decades, Samoa has suffered serious socio-economic shocks caused by four natural disasters.

The worst of these were caused by three severe weather events, tropical cyclones Ofa in 1990, Val in 1991, Heta in 2004 and the tsunamis in 2009. The World Bank in 2010 estimated the economic damage from Ofa and Val alone was US\$554 million.

The training, under the auspices of the World Meteorological Organization (WMO), was delivered by James Lunny and Jonathan Tunster, meteorologists from the Meteorological Service of New Zealand (MetService), assisted by Leigh Anne Eaton, a numerical weather

prediction modeler from the United States National Oceanic and Atmospheric Administration (NOAA). The training was financially supported by New Zealand's Ministry for the Environment and Ministry of Foreign Affairs and Trade, and by NOAA.

Hosted by the Samoa Meteorological Division (SMD), and the Ministry of Natural Resource and Environment (MNRE), the workshop was one of many initiatives supported by the Samoan Government, aimed at enhancing resilience of Samoan communities to severe weather risks. The training was designed to assist Samoa forecasters in producing timely and effective severe weather warnings and getting them out as quickly as possible to the community.

The training was held from 7-11 May at the SMD headquarters at Mulinu'u, with a Disaster Risk Reduction workshop held at the MNRE in Apia on 9 May. Disaster Management Office manager Filomena

Nelson and other members of the Disaster Advisory Committee met with SMD staff to perform exercises and discuss the forecasting of heavy rain, strong winds, large waves and tropical cyclones and their impacts on Samoa.

"This training again reinforces the close relationships we have with New Zealand and the United States to develop our capacity in weather forecasting," said Mulipola Ausetalia Titiamaea, Acting CEO of SMD, in his closing remarks.

The training was the second to be held in Samoa by MetService since November 2009. As well as helping to fine tune the forecasting skills of the SMD, it also will help improve the interaction and communication of severe weather warnings between the SMD, the public, government and commercial sectors.

Other participating Pacific Islands are the Cook Islands, Kiribati, Fiji, Niue, Solomon Islands, Tuvalu, Tonga and Vanuatu.

JCDR researchers Graham Leonard and David Johnston have been working with MetService colleagues (James Lunny and others) to assist with the development of training for weather warnings in the Pacific.

Children and disasters *report by PhD Student Robyn Tuohy*

Children and disasters is an active topic at JCDR, and although my PhD topic covers the other end of the age spectrum, I was able to attend the conference sessions on children and disasters at a Moscow conference while on holiday in Russia. Three paediatricians presented their perspectives on disasters and the effects on children, pointing out that children were often neglected in a disaster and it was an area that paediatricians needed to become involved in. Professor Henri Ford spoke about his experiences of working in Haiti during the immediate post-earthquake recovery period. These included the medical challenges the American paediatric team faced: having reduced medical equipment to cope with the scale of the disaster in a country that already had limited surgical capacity or civil infrastructure prior to the earthquake; and the lack of adequate procedures for the reunification of children who were separated from their families. He spoke of the need for security for the medical team to ensure their safety and to stop medical supplies being stolen.



Dr Stephen Berman outlined an international training programme, which focuses on the physical and psychological needs of children in disaster preparedness planning and response. The aim of this education programme is to have enough trained health professionals available in a disaster to care for children in such situations. The manual contains 10 modules and includes the emotional impact of disasters in children and their families, this manual can be accessed online at: <http://www.aap.org/disasters/peds.cfm>

The final speaker was Dr Joseph Hagan who talked about the psychosocial implications of disaster terrorism on children, and the need for increased planning and preparation by health professionals to increase their capacity and knowledge base with regards to future disasters and terrorist acts. I have the abstracts and slides for each of the three speakers who presented at the conference: 2nd Global Congress for Consensus in Paediatrics and Child Health, and would be happy to email this information to anyone interested. Email me R.Tuohy@massey.ac.nz

International coastal sustainability panel

Massey scientist Bruce Glavovic has been appointed to a world-leading funding group that will allocate €20 million to coastal vulnerability and freshwater security research. Professor Glavovic, who is associate director JCDR, will serve as vice-chair of the Belmont Forum's International Opportunities Fund Panel of Experts on coastal vulnerability.



The Belmont Forum, which is a high-level group of the world's major funders of global environmental change research and science councils, joined with the G8 Heads of Research Councils to create the fund. It aims to speed-up global environmental research on sustainability by mobilising international resources. Australia, Brazil, Canada, Germany, India, Japan, Russia, South Africa, United Kingdom and United States are backing the fund with a combined €20 million. Professor Glavovic says the appointment is an honour. "This Belmont Forum is hugely significant in shaping what research on a global scale will unfold.

"My role is to evaluate and select proposals and cast a vote on what research will be undertaken on coastal sustainability issues. It's a hugely important responsibility." Importantly, the fund identifies and gives global recognition that coastlines are at the forefront of sustainability issues, he says. "Coastal

zones are the frontline of our struggle to build resilient and sustainable communities. Coasts are the primary habitat of humanity – the locus of population growth and economic development." But he explains coastal hazards are pervasive – from extreme waves, storm surges, coastal erosion and tsunamis to rising sea levels and other climate change impacts. Research proposals will focus on protecting vulnerable coastal environments and supporting the evolution of resilient coastal communities. Professor Glavovic will help to select panel members and the group will meet in London in September and Washington DC in March, to review and recommend research proposals. **Article from Massey News**

Coastal zones are the frontline of our struggle to build resilient and sustainable

Coastal zones are the frontline of our struggle to build resilient and sustainable communities. Coasts are the primary habitat of humanity – the locus of population growth and economic development. But coastal hazards are pervasive – including extreme waves, storm surges, coastal erosion and tsunamis – and compounded by sea level rise and climate change more generally.

UNESCO's Intergovernmental Oceanographic Commission has established a Technical Working Group to develop guidance for member states to manage coastal risk. Bruce Glavovic has been asked to lead a group of international experts to develop these guidelines (see http://www.unesco.org/new/en/media-services/single-view/news/development_of_new_adaptation_and_mitigation_guidelines_to_assist_coastal_managers/). The group has had two meetings and are on track to develop an accessible guide that outlines a step-by-step process for community-based coastal risk management.



This UNESCO appointment has enabled Bruce to integrate key elements of this research, which focuses on the role of land-use planning in building resilient and sustainable communities. Current projects examine comparative international experience in three main areas: (i) natural hazards planning, risk governance and disaster recovery experiences with a focus on the Greater Christchurch earthquake sequence recovery process, post-Katrina recovery and 2004 Indian Ocean tsunami recovery; (ii) climate change adaptation, with a focus on experience in coastal zones around the world, and lessons learned from natural hazards planning; and (iii) integrated coastal management, including a global assessment of coastal governance.



Professor Glavovic's coastal research is currently shaped by his role as Vice-Chair of the Scientific Steering Committee of Land-Oceans Interactions in the Coastal Zone (LOICZ) (see <http://www.loicz.org/>). Among other things, I have been working with leading coastal scholars on an assessment of global coastal governance and was co-author of several papers presented at the Planet Under Pressure conference held in March in London. He has also been appointed to a LOICZ and Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) joint Continental Margins Task Team to develop and implement a plan for global continental margins research. The first meeting is in Halifax, Canada, in mid-June.

While he is there he will present a paper on 'Disaster, Risk and Recovery on Margins' at Dalhousie University and another paper on 'Disasters and the continental shelf: Exploring new frontiers of risk' at 'The Regulation of Continental Shelf Development' conference. In July, he presenting a paper entitled 'The ecology of coastal disasters: lessons from Katrina, the Indian Ocean tsunami, Christchurch earthquakes and the Japanese tsunami' at the Association for the Sciences of Limnology and Oceanography conference in Japan.

The life and work Sir James Hector

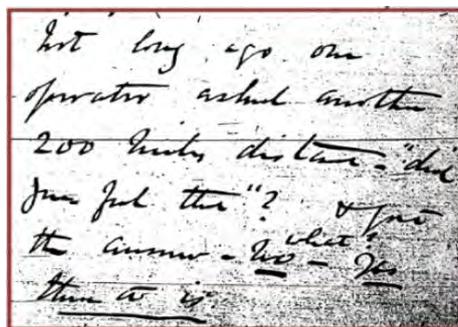
The JCDR is currently hosting a research project into the life and work of nineteenth-century science administrator Sir James Hector, founding director of the Colonial Museum and Geological Survey of New Zealand (now Te Papa Tongarewa and GNS Science). Rowan Burns is transcribing part of Hector's correspondence with local and international men of science, in order to learn more of the way in which the New Zealand scientific community and institutions developed. It is a task frustrated by Hector's notoriously untidy handwriting, which requires a steady perseverance to decipher.



Hector was one of the first scientists in New Zealand to take a systematic interest in natural disasters. The establishment of a cable link across Cook Strait in 1868 meant that he was able to quickly receive information about earthquakes from all over the country on the telegraph network, and also interrogate telegraph operators. Letters to his friend and mentor Sir Joseph Hooker, at Kew Gardens in London, shed light on the way in which he conducted his enquiries.

“Since the Telegraph has been completed thru the Island the clerks have strict orders to file notice of shocks at once to the head office ... so that I have a chance of making enquiries at the time by telegraph & finding out when & where the shock has been felt ... we will be able to have a capital Earthquake register ...

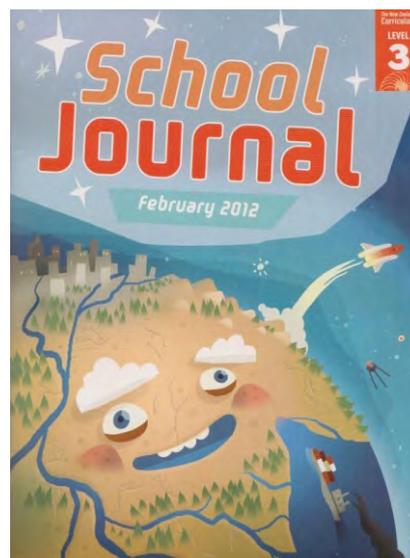
Not long ago one operator asked another 200 miles distant – “did you feel that”? & got the answer – no what? – Yes there it is.”



Hector started systematically recording observations of earthquakes, volcanic eruptions and tsunamis, and installed New Zealand's first seismograph at the Colonial Museum. His letters provide a personal viewpoint that is missing from the many official reports he prepared.

Empire to nationhood: heroism in natural disaster stories for children

Disaster stories narrate unsettling natural events and proffer scripts for social action in the face of unforeseen and overwhelming circumstances. A recently published research paper investigated stories of disasters recounted for New Zealand school children in the School Journal during its first 100 years of publication. Content analysis is used to categorise the disaster event and to identify two distinct periods of disaster stories – imperial and national. Textual analysis of indicative stories from each period centres on the construction of social scripts for child readers. In the imperial period tales of individual heroism and self-sacrifice predominate, while the national period is characterised by stories of ordinary families, community solidarity and survival. Through this investigation of natural disaster stories for children, the research identifies the shifting models of heroic identity offered to New Zealand children through educational texts.



Bell, A., Patterson, L., Dryburgh, M., Johnston, D. (2011). Empire to Nation: education for nationhood through natural disaster stories. *History of Education Review* 41(1):20-37.

Disasters education research at Te Papa

The Te Papa Education team, led by Learning Group Manager Dr Edy MacDonald, together with GNS Science-Massey University, JCDR, led by Dr David Johnston and Victoria Johnson, and EQC have undertaken research into the effectiveness of our Awesome Forces education programme at Te Papa.



In the pilot study, the impact of attending a disaster awareness and mitigation education programme at the museum was assessed. Four hundred and fifty students drawn from nine Wellington schools participated in the study; schools were a mix of high and low decile. Prior to visiting Te Papa, Te Papa educators visited the classroom to collect pre-visit data. Data was collected on four different measures and ascertained student knowledge, classroom preparedness, home preparedness, and teacher knowledge and preparedness. School visits were divided into four treatments and a control. The different treatments looked at the effect of different bridging items given to students after their education programme. Bridging items serve as memory and conversation devices to increase the likelihood of engaging in the behaviour sometime in the future. Bridging items were considered either novel or non-novel and required little effort to implement or high effort to implement. Following the programme, Te Papa educators visited the schools two weeks after the programme and collected data. Additionally, a parent survey was sent home to assess the impact of the education programme on family preparedness.

Our results found that attending a disaster awareness and mitigation education programme resulted in a significant increase in student knowledge of preparedness and mitigation behaviours. Moreover, novel bridging items were highly effective in eliciting conversations about disaster preparedness among children and parents, much more so than students who just attended the programme. Finally, almost one quarter of studies and families independently reported taking action at home directly due to the Te Papa education programme, although sample size was too small to make definitive conclusions.

In short, attending an education programme at Te Papa increases student knowledge but more importantly results in families taking disaster preparedness action at home. Novel bridging items are more effective in increasing family disaster preparedness behaviour. Our results are important to other museums and organisations that are committed to communicating disaster preparedness behaviour.

Caldera Unrest Management Sourcebook

The largest and most unpredictable of New Zealand's volcanoes are calderas, those which have erupted so explosively that the ground has collapsed to form large craters many kilometres across (such as Taupo and Rotorua volcanoes). These low frequency, high impact eruptions are preceded by geophysical and geochemical signals produced by the volcano as the magma forces its way through the ground, which can be interpreted by scientists to enable forecasting of the most likely future scenarios. The signals, collectively forming volcanic unrest episodes, occur far more frequently than there are eruptions. Volcanic unrest can be dangerous to nearby communities, even if there is no resulting eruption, as seen both in New Zealand and overseas. Caldera unrest can include damaging earthquakes, meters of ground deformation, hydrothermal explosions and poisonous gas emissions. New Zealand has eleven calderas, many of which have shown frequent signs of unrest in the past 150 years. Two of these unrest episodes have resulted in eruptions (Tarawera (1886) and Raoul Island (2006)). Unrest has the potential to affect the local and national economies, the tourism industry, infrastructure of national importance, the psychological and physical health of the nearby residents and to undermine the trust between the community, media, emergency management officials and scientists. Caldera unrest episodes can last for days to decades, and must be carefully prepared for to avoid casualties and minimise the impact on society. This report summarises the current understanding of the eruption histories of New Zealand's 11 most recently active calderas – Raoul Island, Maceauley Island, Mayor Island, Okataina, Rotorua, Kapenga, Reporoa, Ohakuri, Mangakino, Whakamaru and Taupo Calderas.

Potter, S. H.; Scott, B. J.; Jolly, G. E. 2012. Caldera Unrest Management Sourcebook, *GNS Science Report* 2012/12. 73 p.

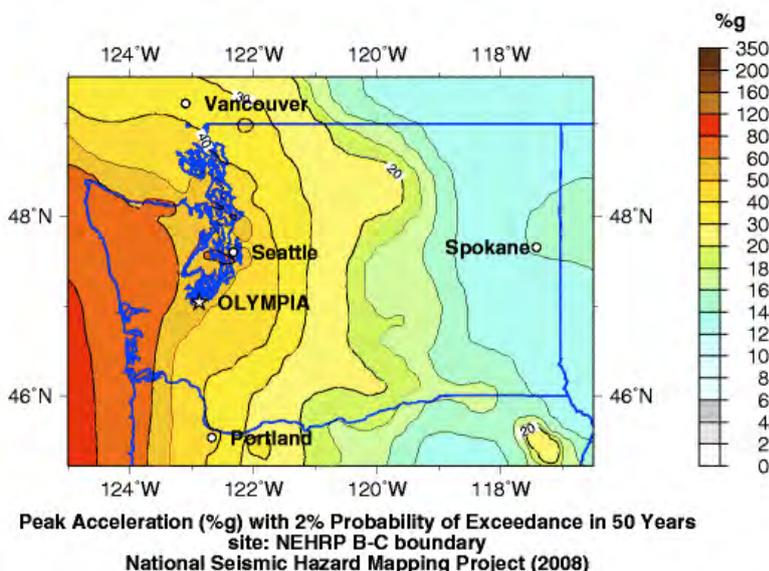
“Low risk does not equal no risk”: understanding barriers to earthquake risk reduction in low seismic hazard areas

Over the past few decades considerable effort has been devoted to improving our knowledge of seismic risk. Much of this work has resulted in improved seismic risk models and hazard maps, delineating variations in relative risk. However, disparities are still common between these expert assessments and the manner in which the public and authorities interpret and act on seismic risk information. Public understanding of, and response to, earthquake risk is determined by a range of factors, including scientific information, direct past experience of earthquakes, and the interaction of social, cultural, institutional and political processes. Many people in lower seismic hazard regions falsely interpret their relatively low seismic risk as a reason not to prepare. A joint initiative has been developed between the USGS (Craig Weaver – photo left) and a group New Zealand researchers from GNS Science (David Johnston, Sara McBride, Julia Becker), Massey University (Sarab Johal), University of Otago (Caroline Orchiston – photo right) and University of Canterbury (Tom Wilson) to explore lessons for the Canterbury earthquakes and lower seismic hazards zones in the Pacific Northwest of the USA.



Washington

Seismic Hazard Map



References

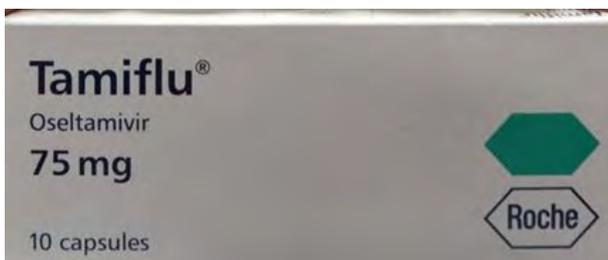
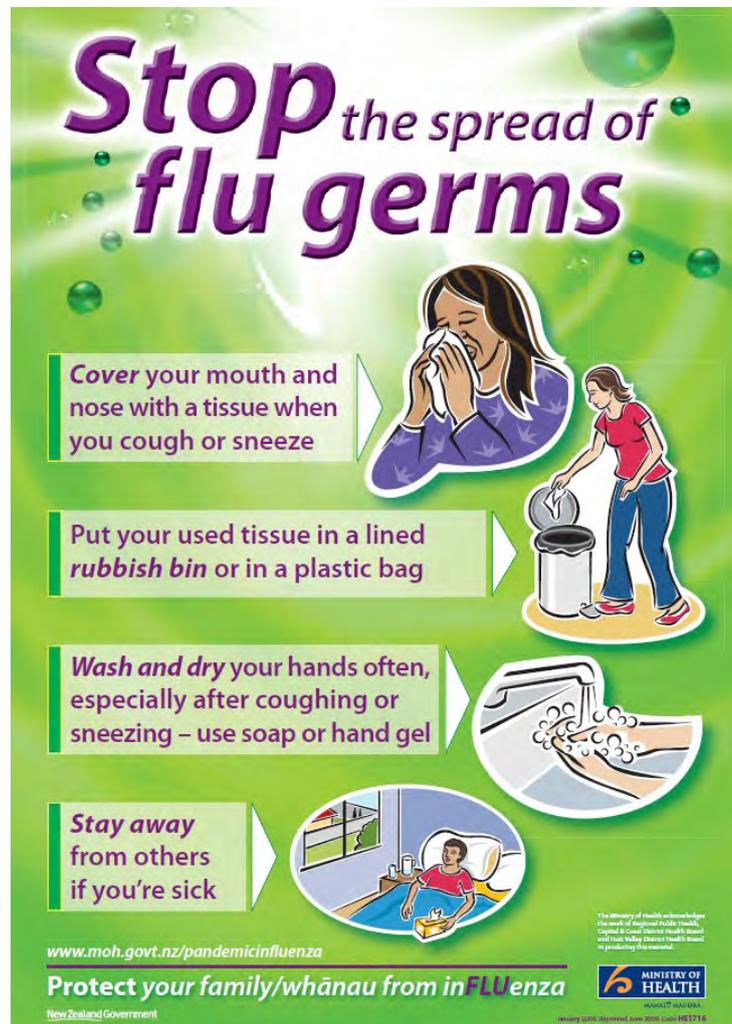
- Johnston, D., Orchiston, C., Becker, J. (2012) Eastern Washington resident perceptions of natural hazard risk. GNS Science Report 2012/05. 31p.
- Johnston, D., Orchiston, C., Weaver, C., J. Becker, S. McBride, D. Paton, J. McClure & T. Wilson. (2012). “Low risk does not equal no risk”: understanding barriers to earthquake risk reduction in low seismic hazard areas. Extended abstract, New Zealand Earthquake Engineering Conference, Christchurch, April 13-15th. Paper 45.

Community responses to communication campaigns for influenza A (H1N1): a focus group study

This research was a part of a contestable rapid response initiative launched by the Health Research Council of New Zealand and the Ministry of Health in response to the 2009 influenza A pandemic. The aim was to provide health authorities in New Zealand with evidence-based practical information to guide the development and delivery of effective health messages for H1N1 and other health campaigns. This study aimed to contribute to this initiative by providing qualitative data about community responses to key health messages in the 2009 and 2010 H1N1 campaigns, the impact of messages on behavioural change and the differential impact on vulnerable groups in New Zealand.

Qualitative data were collected on community responses to key health messages in the 2009 and 2010 Ministry of Health H1N1 campaigns, the impact of messages on behaviour and the differential impact on vulnerable groups. Eight focus groups were held in the winter of 2010 with 80 participants from groups identified by the Ministry of Health as vulnerable to the H1N1 virus, such as people with chronic health conditions, pregnant women, children, Pacific Peoples and Māori. Because this study was part of a rapid response initiative, focus groups were selected as the most efficient means of data collection in the time available. For Māori, focus group discussion (hui) is a culturally appropriate methodology.

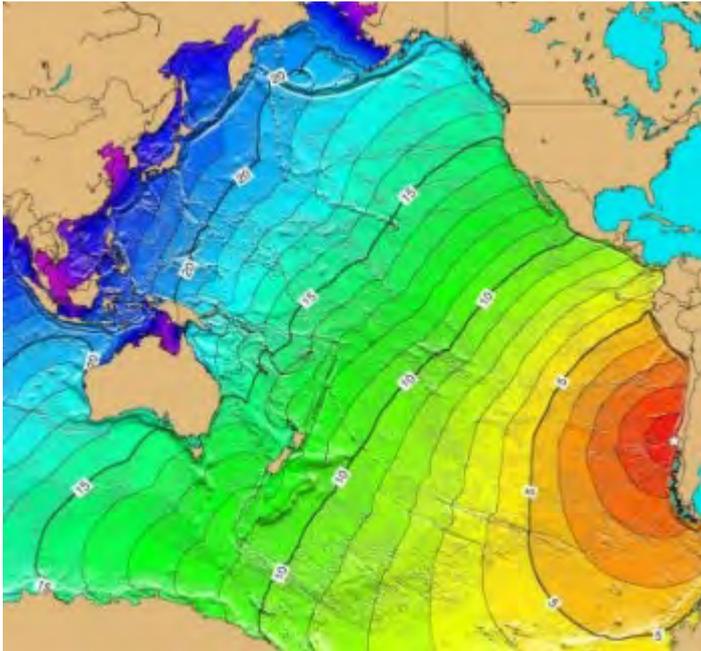
Thematic analysis of data identified four major themes: personal and community risk, building community strategies, responsibility and information sources. People wanted messages about specific actions that they could take to protect themselves and their families and to mitigate any consequences. They wanted transparent and factual communication where both good and bad news is conveyed by people who they could trust. The responses from all groups endorsed the need for community based risk management including information dissemination. Engaging with communities will be essential to facilitate preparedness and build community resilience to future pandemic events. This research provides an illustration of the complexities of how people understand and respond to health messages related to the H1N1 pandemic. The importance of the differences identified in the analysis is not the differences per se but highlight problems with a “one size fits all” pandemic warning strategy.



Gray, L., MacDonald, C., Mackie, B., Paton, D., Johnston, D., Baker, M., Community responses to communication campaigns for Influenza A (H1N1): A focus group. BMC Public Health 2012, 12:205. doi:10.1186/1471-2458-12-205

Community readiness for a new tsunami warning system: quasi-experimental and benchmarking evaluation of a school education component

Youth preparedness for disasters is a growing area of research. However, studies to date have relied on cross-sectional, correlational research designs. A recently published study by Kevin Ronan, Kylie Crellin and David Johnston replicated aspects of an earlier study that has used a quasi-experimental strategy to evaluate youth preparedness for disasters. This study evaluated whether children were more knowledgeable and prepared for hazards generally but particularly in relation to the rollout of a new tsunami warning system. Using a pretest–posttest with benchmarking design, the study found that following a brief school education program, supplementing a larger community-wide effort, children reported significant gains in preparedness indicators including increased knowledge as well as increases in physical and psychosocial preparedness.



Effects within the group compared favourably with those from the previous experimental study used to benchmark current intervention. It suggested that combining school education programs with larger community preparedness efforts can enhance preparedness. Given that this is only one of two experimentally-based studies in an area of research largely dominated by cross-sectional designs, future research should consider the use of experimental designs, including those that are pragmatic and fit with needs of the school. The current approach has limitations that need to be considered. However, it also has some real advantages, including being used more extensively in fieldwork studies that evaluate various types of interventions. Through increased use of experimental design strategies,



researchers can have increased confidence that educational programs are the source of increases in disaster resilience in youth and their families.

Ronan, K.R, Crellin, K., & Johnston, D. M. (2012). Community readiness for a new tsunami warning system: Quasi-experimental and benchmarking evaluation of a school education component. *Natural Hazards*, 61(3): 1411-1425.

An earthquake emergency response and evacuation exercise in a New Zealand school: A 2011 case study report

The Wellington region is an extremely hazardous place to live. This is due to the range of potential natural hazard events that could occur in the region e.g. flood, earthquake, landslide, ashfall, tsunami, coastal storm surge. Children and their families have been identified as especially vulnerable to the effects of hazards. An earthquake response and evacuation exercise was observed and evaluated in a fully occupied primary school in Wellington. The school has a well-developed protocol for keeping the pupils as safe as possible in the event of an earthquake. The purpose of this evaluation by practitioners and research personnel in emergency management, was twofold: to observe a school emergency evacuation in progress; to suggest modifications to the exercise by identifying issues for best practice in school earthquake preparedness and evacuation. Research aimed at assisting children, youth, and families to cope more effectively with the effects of disasters is being undertaken in the Wellington region, and key lessons emerging from the present case study will contribute to informing best practice for earthquake safety in New Zealand schools.

Coomer, M.A.; Tarrant, R.A.C.; Hughes, M.E. and Johnson, V. 2012. An earthquake emergency response and evacuation exercise in a New Zealand school: A 2011 case study report, GNS Science Report 2012/03. 16 p.

Tsunami evacuation: Lessons from the Great East Japan earthquake and tsunami of March 11th 2011

The Great East Japan moment magnitude (Mw) 9.0 earthquake occurred at 14:46 (Japanese Standard Time) on March 11th 2011. Significant seabed displacement generated the subsequent tsunami, which caused significant damage in Iwate, Miyagi, Fukushima and Ibaraki Prefectures. As a result of this event over 19,000 people are dead or missing, with over 295,000 collapsed buildings along 600 km of affected coastline.

Reconnaissance-level analysis of evacuation preparedness and actions related to the tsunami has been carried out using semi-structured interviews with local disaster prevention officials and emergency services officials. Interviews were carried out in Tarō Town, Kamaishi City, Ōfunato City (Iwate Prefecture) and Kesennuma City, Minami-Sanriku Town, Ishinomaki City and Natori City (Miyagi Prefecture). The interviews covered tsunami awareness, observations and response to natural and informal warnings; style and derivation of evacuation maps; official warning timing and dynamics; evacuation timing, mechanisms and issues; and vertical evacuation buildings – availability, designation, public awareness, utilisation, relationship to maps, and post-event review. The report also presents examples of hazard and evacuation maps and signs employed in the Tōhoku region.



Figure 50 The Prefectural Government offices suffered extensive scour and heavy inundation of 8 m. This building was constructed after 2004 and displays tsunami vertical evacuation signage at roof level. 200 people survived the tsunami in this building



Figure 51 The National Government office, where 120 people took refuge from the tsunami. This building is adjacent to the Prefectural Government offices and was left undamaged when light steel structures were washed into it. The lower two storeys were inundated.

Experiences in Tōhoku during this event are relevant to tsunami mitigation activities in the State of Washington and in New Zealand, which co-funded this research. These areas have local earthquake and tsunami risk posed by the Cascadia Subduction Zone and the offshore Hikurangi subduction margin, respectively. This report provides recommendations for further development of tsunami mitigation activities in these areas, based on findings from the interviews.

Overall there was a 96% survival rate of those living in the inundated area of the municipalities visited. This can be attributed to mostly effective education and evacuation procedures. Schools education, hazard maps and exercises appear to be the most common forms of education. Community involvement in planning of evacuation maps, routes and buildings is common, with many places conducting regular community-level exercises. However, hazard and evacuation maps lacked consistency and both maps and safe locations were generally designed for a tsunami height that under-represented the worst case scenario.

Fraser, S.; Leonard, G.S.; Matsuo, I. and Murakami, H. 2012. Tsunami evacuation: Lessons from the Great East Japan earthquake and tsunami of March 11th 2011, GNS Science Report 2012/17. 89 p.

Scoping study for evaluating the tsunami vulnerability of New Zealand buildings for use as evacuation structures

A recently published report scopes out needs and issues for guidance on evaluating the tsunami vulnerability of tsunami evacuation buildings in New Zealand – those specifically designed or designated as places to evacuate to in the event of a tsunami warning. It includes the results of a workshop attended by staff from GNS Science, Hawkes Bay Civil Defence Emergency Management Group, Opus (engineer), Department of Building and Housing, Ministry of Civil Defence and Emergency Management and Napier City Council (building inspector).

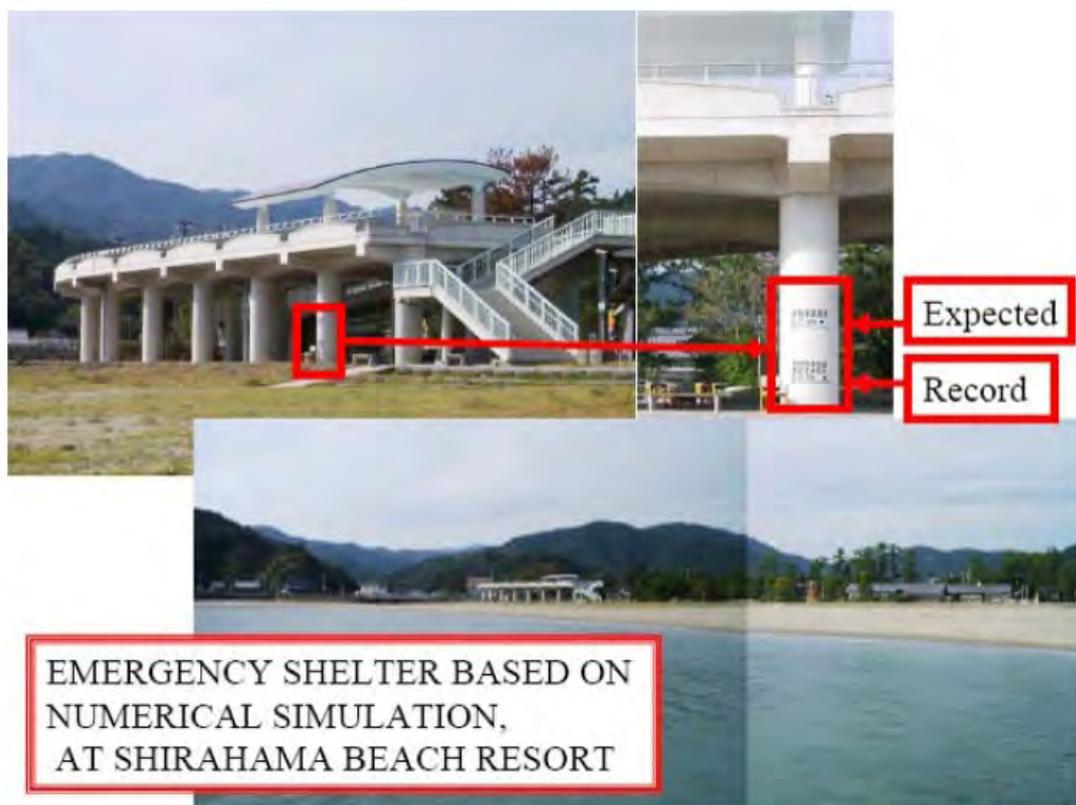


Figure 14 An emergency shelter based on numerical simulation assessment at Shirahama Beach resort, Japan. On the pile of the structure is written the tsunami inundation height expected based on numerical simulation and from the historical record (Source: Shuto and Fujima, 2009).

The outcomes are intended to fit within the context of nationally-consistent tsunami warning, evacuation mapping, planning and signage. Warning and evacuation should be considered in conjunction with other risk mitigation options, especially land use planning. Buildings selected or built for vertical evacuation must also be resistant to any initial earthquake. We briefly review the characteristics of tsunami, overseas tsunami building design and impact examples, tsunami impacts on infrastructure including typical load and force, categories and components of loading, and existing data on these loads. Example of tsunami resilient buildings are given for reinforced concrete, steel framed and timber framed constructions in a variety of countries that have experienced large tsunami.

Applications and limitations of tsunami evacuation buildings in New Zealand are discussed in the context of land use planning, emergency management, community issues, building consent, risk reduction, and liability. The specific scope of the Building Act, Building Code and compliance documents to cover different sizes of tsunami for different building types is explored. The application of these documents to both new and existing buildings is considered with possible future options suggested. A range of recommendations for detailed future work are given. These are mostly focussed on development of a New Zealand-specific Standard or technical information and the many aspects that need to be considered.

Leonard, G. S.; Evans, N.; Prasetya, G.; Saunders, W.S.A.; Pearse, L.; Monastra, D. and Fraser, S. 2011. Scoping study for evaluating the tsunami vulnerability of New Zealand buildings for use as evacuation structures, GNS Science Report 2011/36 39 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”

Gavin Treadgold (Masters student, School of Psychology, Massey University)
“Information management for post-disaster building assessment”

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”

Judy Lawrence (PhD student, Victoria University)
“Adaptive capacity of institutions in the face of uncertainty, dynamic change and intergenerational impacts of climate change”.

Paul Schneider (PhD student, Institute of Development Studies School of People, Environment and Planning, Massey University)
“The human face of climate change: Adaptation in a vulnerable coastal community context”

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

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Photo: Christchurch, June 2012



JSAR



Journal of Search and Rescue

The **Journal of Search and Rescue (JSAR)** is a free peer-reviewed electronic journal utilising the internet as a medium for the collation and distribution of original, scholarly, yet practitioner focused material on search and rescue.

It is being supported by the in-kind work and contributions of the global Editorial Board. There is currently a lack of a dedicated journal serving those with a direct interest in all disciplines of search and rescue.

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**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.



JOIN US AT Living in earthquake country: Building an evidence base for public education

Wednesday 17 October 2012 Te Papa

This workshop is for emergency managers, educators, communicators, and all those involved in public education and communication about disaster preparedness.

Morning session

A series of presentations will explore:

- which actions help before, during, and after an earthquake (based on evidence)
- which methods are effective in communicating these actions to the public (based on evidence).

Afternoon session

A series of group and panel discussions will explore:

- the gaps in evidence-based disaster-preparedness education
- synergies and complementary programmes to fill these gaps.

Discussion and outcomes from the workshop will be published.

RSVP by 5 October to Edy MacDonald edith.macdonald@tepapa.govt.nz
or (04)381-7498

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Ministry of Civil Defence
& Emergency Management
Te Kaitiaki Takekōwhiri



MASSEY UNIVERSITY



First Circular

New Zealand Geographical Society Conference 2012

‘Connecting Landscapes’

Welcome

The Manawatu Branch of the New Zealand Geographical Society has the pleasure of inviting geographers to the biennial conference of the Society in December 2012. In a break from tradition the conference this year will be held for the first time at Napier’s War Memorial Conference Centre. The theme for this year’s conference is ‘Connecting Landscapes’ and we encourage geographers of all stripes to participate in Napier. The conference is open to geographers anywhere in the world and we especially encourage graduate students as well as established faculty to attend and present their work.

Dates and Venue

3-6 December 2012

[Napier War Memorial Conference Centre](#), Napier

Timelines

The conference will open for panel proposals and individual abstracts on any geographic theme on the **15th May 2012**.

Registrations for the conference will open on the **24th September 2012**.

Further details about panel proposals, abstracts, fieldtrips, keynote speakers and registration will be added to the [NZGS website](#) in due course.

We look forward to welcoming you in Napier in December 2012.

If you have any questions please contact
Professor Mike Roche (m.m.roche@massey.ac.nz)
Dr Matthew Henry (m.g.henry@massey.ac.nz)

The NZGS2012 Organizing Committee
Manawatu Branch, New Zealand Geographical Society
Palmerston North, New Zealand

Quakes, meltdowns and outbreaks

A two-day symposium dedicated to leading-edge disaster communication will take place next February, bringing together science communicators from around the world.

The conference theme: *"Disasters - Communicating in the Crisis and Aftermath"* will explore the challenges of communicating science during major events, from earthquakes, tsunamis and pandemics to agricultural disease outbreaks, as well as sustainability and disaster prevention planning.

Hosted by the Science Communicators Association of New Zealand (SCANZ), the Symposium is being co-organised by SCANZ and the global science communication network PCST (Public Communicators of Science and Technology).



"The PCST network grants symposium status to conferences relatively infrequently, so it is something of a coup for New Zealand to get this coveted international accreditation for our event in February," SCANZ President Phil Johnstone said.

"Holding the conference on the 2nd anniversary of the devastating 22 February 2011 quake will add a poignant dimension to the symposium, and our programme will include opportunities for reflection and remembrance.

"Sadly New Zealand has experienced several significant natural and man-made disasters in recent years. As a result we have a number of experienced people able to share insights and learnings about the role communication can play in boosting public understanding during a crisis and the months that follow."

The conference programme would include international case studies such as the devastating Japanese tsunami of 2011 and provide world-class content of interest to journalists, science communicators, academics and scientists from around the globe.

Phil Johnstone said the decision to hold the event in Christchurch was taken after favourable feedback from SCANZ members in Canterbury and from civic leaders.

"We hope this event will make a small but none-the-less helpful contribution to the economic recovery of Christchurch. We are aiming to attract up to 250 delegates including as many as 150 from overseas."

The conference will be held at the Chateau on the Park hotel complex in Christchurch on 21-22 February 2013. Visits to a range of science sector and other destinations around Canterbury will be offered on 23 February.

A call for abstracts is now open. For more information visit www.scanz.co.nz/scanz-2013pcst.html

For further inquiries please contact:

Phil Johnstone, SCANZ President
021 501 380
pjohnstone@aucklandmuseum.com



EMERGENCY MANAGEMENT

Summer Institute

Massey University Campus,
Wellington, New Zealand

11 - 15 March 2013



Rockfalls near Redcliffs School, Christchurch, initiated by the 22 February 2011 earthquake and subsequent aftershocks. Photo: GNS Science

- DAY 1: Emergency management planning
- DAY 2: Developing effective all-hazard warning systems
- DAY 3: Evacuation planning and welfare
- DAY 4: Classroom in the Coach
- DAY 5: The role of public education, community engagement and public participation in building resilient communities

For more information go to <http://disasters.massey.ac.nz>

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.



Contact Details

Joint Centre for Disaster Research,
GNS Science/Massey University,
PO Box 756, Wellington 6140,
New Zealand
Ph: + 64 4 570 1444 Fax: + 64 4 801 4822
jcdr.enquiry@massey.ac.nz

