

5th Australasian Natural Hazards Management Conference

2011

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Major Events, Major Impacts

OVERVIEW OF PAPERS
AND WORKSHOPS

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1. WORKSHOPS

Workshop A – Major Disaster Events

Co-hosted by:

**Mr Stephen Jenkins, Regional Director, Australia, New Zealand & Oceania Region,
TIEMS – The International Emergency Management Society**

**Assoc Prof David King, Centre for Tropical Urban and Regional Planning, James
Cook University, Townsville.**

Precis:

This workshop will focus on a number of major recent disaster events: flooding in Brisbane and Rockhampton, and Severe Tropical Cyclone Yasi in the Tully Region.

The workshop will draw on the expertise and experience of the presenters in disaster management and these recent events, in relation to: land use planning, risk communication and community perceptions of risk, emergency alerting and warning systems, planning and preparation, operational responses to disasters and community recovery.

Workshop B – Information Management Systems

Hosted by:

Mr Eddie Bennet, Regional Director South Eastern Region, Emergency Management Queensland.

Precis:

This workshop will focus on systems used to track and provide warning of disasters. In particular it will focus on systems that allow for the gathering and coordination of information. The workshop will include demonstrations of Emergency Alert by Telstra, CoastalCOMS, Guardian, and other information management systems.

Presentations:***Cowan, J., “Improving emergency preparedness nationally for major events, major impacts through an effective supplier partnership for a simulation training and exercising solution”***

The presentation covers a case study of how Telstra Radio and Emergency Managed Services Group worked with Avalias, a supplier of a simulation training solution called Avalanche ST, to enhance Telstra’s important role in supporting Public Safety organisations, national security and increase service to customers. We will discuss how the power of efficient project management for preparing for major natural hazards, good governance and strong customer/supplier relationships fast tracked a demanding project in record time and cost effectively provided a superior outcome. The purpose of the case study is to show how the challenge of a highly complex training and exercising requirement was achieved through effectively managed relationships, proper governance and project management efficiencies. The training solution was required rapidly to support skills development and responsiveness vital in the area of natural hazard emergency management and provide accuracy, behavioural and attitudinal data on their users. The presentation describes the approach of how this project was managed, the results and outcomes achieved from two organisations working effectively together that will ultimately benefit the entire emergency management community.

Available on the Avalias booth will be a demonstration that will show Emergency Alert processes as well as other training capability. The software system implements organisation-specific and customisable, scenario design methodologies (special ideas or master scenario events lists), with participants engaging with systems, processes and procedures as they would in a real situation. Their responses and specific actions are all recorded and logged to enable constructive and objective feedback. The opportunity to provide reports of performance and perform individual competency assessments is also demonstrated. In the present version, role specific scenarios and plug-in applications are able to be trained and the approach gives the opportunity to scale up according to operational needs. The system also allows easy updates, allowing new simulated systems to be added to the exercises. There is also the ability to train multiple role types simultaneously. One area of interest in this approach is to monitor whether a specific process workflow or application is able to support the operators’ ability to perform their role effectively. This research supports an organisational culture of continuous improvements.

Workshop C – Gender and Disasters

Hosted by:

Dr Maureen Fordham, Senior Lecturer in Disaster Management, University of Northumbria, UK.

Precis:

This workshop focuses on gender and families during disasters and examines issues such as: single-parent families during disasters, domestic violence during disasters, children's needs during disasters, rural families and disasters, and youth and disasters.

The workshop is drawing from international expertise in the United Kingdom, the United States, and New Zealand, as well as Australian research to inform local practitioners, policy makers and planners of what is currently being found in the latest research available.

It will give the opportunity for the practitioners, policy makers and planners to discuss their needs of the research community and potentially formulate future research directions.

Workshop D – Partnerships: Science and government enhancing capability

Hosted by:

Attorney-General's Department and Geoscience Australia.

Precis:

The purpose of this workshop is to bring the scientific and government communities together to enhance and strengthen relationships that will ultimately improve the resilience of Australian communities to natural disasters. By doing so, the scientific community will gain a clearer understanding of the key drivers for capability development within government, and government will gain a clearer understanding of the breadth of expertise within the scientific community.

The workshop will contain a number of presentations that will outline the needs from the Australian Government's perspective regarding natural hazard management. The workshop will provide an overview of the skills of the scientific community and a description of case studies. These presentations will be followed by discussions on how the scientific community can deliver against the needs of government in the short, medium and long term and how the two communities can engage more effectively.

Workshop E – Social Media and Disasters

Hosted by:

Corporate Communications Branch, Gold Coast City Council.

Precis:

This workshop will explore the emergent use of social media in preparation for and during times of disaster. It will examine examples from the various Australian Floods and Christchurch Earthquakes, and challenge participants to consider the future of social media within disaster management agencies.

Presentations:

Mr Philip Campbell, NSW State Emergency Service

Ms Sara Page, Outreach Coordinator, GeoNet, GNS Science, NZ

Workshop F – Professionalising emergency management

Hosted by:

Ms Raelene Thompson, Executive Director, Australian Emergency Management Institute

Precis:

This workshop will examine best practice and current trends in education and training of emergency management personnel

Workshop G – Pre-deployment preparation for emergency services personnel in large scale disasters

Co-hosted by:

Gina Mammone, Manager, Critical Incident and Counselling Services, NSW State Emergency Service

Craig Willmott, Managing Director, Employee Assistance Services Australia

Precis:

Emergency service personnel are repetitively exposed to high-risk situations, including critical incidents which may elicit intense emotional responses. Large scale disasters with have a devastating impact on members of the community with loss of life and property and the personnel sent in to provide this help also require preparation and support. Large scale incidents can impact on psychological wellbeing and as such, preparation, protection and support are imperative for these personnel.

The New South Wales (NSW) State Emergency Service (SES) is recognised as the most widely used rescue and public safety organisation, consisting of over 10,000 trained volunteers. Volunteers assist communities during emergencies such as storms, floods and serious road incidents. The Critical Incident and Counselling services branch of the NSW SES currently provide a Critical Incident Support Program (CISP) available to members of the SES who have experienced a traumatic incident or a stressful reaction following an event and has a significant role in influencing the preparation of members prior to these deployments.

In preparing teams to deploy into the “Black” Saturday Bushfires in Victoria in 2009 and in 2011 to support to EMQ SES QLD in the Brisbane Flood disaster and Cyclone Yasi the NSW SES provided pre deployment training to members of the Critical Incident Support Programs Peers and Chaplains and embedded Peers and Chaplains into the Taskforces from NSW SES being sent into Far North QLD to ensure NSW SES mitigated the impact of these events on members of the teams. In 2011 this preparation was extended to the Taskforces by way of stress management and awareness and pre-deployment health and wellbeing assessments.

This preparation ensures that NSW SES volunteers are not only prepared for the possibility of psychological and emotional difficulties during and following exposure to critical incidents, but also cared for and supported through such deployments and post deployment follow up as necessary.

This workshop will discuss the Pre-deployment considerations that are essential for emergency service organisations, the goals of on-scene support and training and how to consider the potential impact on responders that could compromise their ability to function on scene or post disaster and provide the necessary training.

Upon completion participants will be able to:

- Define the considerations for preparing teams of responders in pre-deployment training, health and wellbeing assessments;
- Understand the type of support required and the roles of Peer Support and Chaplains during large scale events
- Identify what last minute training and preparation needs to be considered related to the disaster, how this can be provided and considerations for the return of personnel.

2. MAIN CONFERENCE PAPERS

Achilles, T., “*Communicating Uncertainty of Weather Forecasts: from Meteorologists to End Users*”

A number of barriers exist for meteorologists endeavouring to communicate weather forecasts. The first challenge is the uncertainty in weather itself because weather and consequently weather forecasts are ‘inherently uncertain’ (Morss et al, 2008; Friday & Rapporteur, 2003; Tracton, 2002). This uncertainty has been greatly reduced over time due to improved understanding and technological advances, but it is understood that ‘it is scientifically impossible to predict the weather in 100% accuracy’ (Jun & Jing, 2010, pp.1, para.1). The second challenge, and the focus of this paper, is accurately conveying this uncertainty to end users with varying needs and meteorological knowledge. In order to develop a clear, interpretable and adequate weather forecast (Jun & Jing, 2010; Morss et al, 2009, 2008; Lorditch, 2009; Kloprogge, Sluijs & van der Wardekker, 2007; Brooks & O’Hair, 2006; Friday & Rapporteur, 2003) the end user need’s (both known and unknown to them) must be considered. Correctly interpreted messages are also of great necessity for the safety of the general public in times of severe weather events to ensure that the public receives and appropriately acts upon the message within the warning. Improvements in this area will ultimately enhance community resilience to severe weather events (Nicholls, 2011). The communication barriers that will be addressed include terminology; language; symbols; knowledge and understanding of users; access to information; and the level of determinism employed by meteorologists in the dissemination of the message. Along with the identification of possible options meteorologists may employ to reduce the uncertainty within their message to the end user.

Biographical Information:

Tamsin Achilles is a Disaster Mitigation Program Support Officer in the Weather and Oceans Services Branch of the Bureau of Meteorology.

Becker, J., Webber, D., Wright, K., Doody, B., McClure, J. Pritchard, S. Davies, B.
“Keeping people out of floodwaters: a review of reasons why people enter floodwater”

Flooding is a well known cause of death and injury in Australia. From 1950-2008 there were 206 flash flooding fatalities (Coates and Haynes, 2008) and from 1950-2007 125 riverine flood deaths are recorded in the Emergency Management Australia Disaster Database. Many deaths are avoidable, and a large proportion occurs when people voluntarily enter floodwaters. For example, Coates and Haynes (2008) report that 61% of flash flood deaths are transport related (vehicle, pedestrian, others). Coates and Haynes also (2008) found that approximately a third of flash flood deaths were from people inside a vehicle, while FitzGerald et al., (2010) report that from 1997 – 2008 nearly half of flood deaths were vehicle-related.

To find out more about why people enter floodwater, the New South Wales State Emergency Service commissioned a literature review study in 2010. The study reviewed the reasons why people drive, ride, walk or play in floodwater and reviewed current strategies employed to deter people from entering floodwater. The review found that males, younger people, and people with four-wheel-drive vehicles were more likely to enter floodwater, and there was some association with risk-taking and entry of flood water. Overall the study found seven main reasons why people enter floodwater including:

1. Attempting to reach a destination
2. Undertaking a recreational activity
3. Retrieving property, livestock or pets
4. Undertaking employment duties
5. Unaware of or underestimate risk
6. Influenced by others
7. Rescuing, or assisting with evacuation.

Internationally, a number of strategies have been developed to try and specifically deter people from entering floodwater. In Australia, there remains an opportunity to build upon these strategies to develop holistic and effective programmes that target behaviours around floodwater entry.

Biographical Information:

Julia Becker, GNS Science, Lower Hutt, New Zealand

Julia studied natural hazards, resource management and social science research to tertiary Masters level before joining GNS Science in 2000. Currently she is involved with research into enhancing community resilience and effective planning and policy for natural hazards in New Zealand, including a focus on weather and flood hazards. In addition to her work at GNS Science, Julia spent 2 years in the United Kingdom from 2002-2004 working on environmental impact assessment, energy issues and urban development.

Brackley, H. and Berryman, K., “Research and prior knowledge informing response and recovery following the Canterbury earthquakes of 2010 and 2011”

The M_w 7.1 Darfield earthquake rocked the South Island’s Canterbury region at 4.36 am on 4th September, 2010. No deaths and only two serious injuries resulted. Almost six months later, the devastating M_w 6.3 aftershock of February 22nd occurred at 12.51 pm close to Christchurch city. Approximately 50,000 people were in the inner city area, well-known for its heritage and unreinforced masonry buildings. Few of the earthquake prone buildings had been retrofitted. Consequently there were many failures under the extreme ground motions that exceeded 100% of gravity in the inner parts of the city and hillside suburbs south of the city.

Immediate roles for the scientific and engineering community included providing advice on the earthquake and likely impacts to the Ministry of Civil Defence and Emergency Management and senior government officials. Prior knowledge had contributed to the seismic coefficients of building code requirements, the earthquake prone building register for the city, identified areas prone to liquefaction, and for many decades contributed to the engineering and design of earthquake resistant buildings. Estimating the evolution of the aftershock occurrence was sought by the USAR teams undertaking search and rescue operations in badly damaged buildings, by infrastructure operators wanting to restore services, and the general public seeking reassurance about possible future safety and further damage to homes and businesses. Public briefings provided information to the general public on what were very rare events for the Canterbury region.

As response transitioned to recovery, requirements on the research community moved from “what did happen” to “what will happen”, and applied to:

- Aftershock or triggered earthquake occurrence (a M_w 5.3 earthquake causing further minor damage occurred on 16 April);
- What specifications will be required for rebuilding buried infrastructure networks, and residential and commercial buildings;
- Where and how should ground improvement take place to guard against future damaging liquefaction;
- Whether some areas are so badly damaged, and future damage so probable, that some areas should not be re-built;
- How to alleviate high levels of trauma among the impacted population which has led to significant migration, issues with school and university enrolments, and a reluctance by many to enter high rise buildings;
- Where and what will be the characteristics of future commercial enterprise in Christchurch;
- The heightened appreciation of earthquake hazard and risk is leading to new multi-hazard considerations for future urban development in the Canterbury region.

One of the few certainties at the early stages of recovery is that the new Christchurch will be significantly different in terms of buildings, the location of business activity, and attitude to natural hazard perils.

Buergelt, P., Morrison, D., Lawrence, C., Dunlop, P. & Clark, P., “Integrating research and practice: A holistic, multi-site and process-oriented action research designed to build community disaster capacity”

Resilient communities result from interactions between individuals and their environment. The dynamic interactions provide both with opportunities to gain capabilities important for survival and adaptation in the face of natural disasters. So far, disaster research has predominately focused on investigating single hazards and specific aspects of individuals and/or communities at one point in time through the lens of one discipline. Most research has used theory-driven top-down quantitative or mixed method research, and provided top-down recommendations concentrating on education and risk communication. While this research has greatly enhanced our understanding of factors and processes involved in preparing and responding to disasters, interventions based on this research have, arguably led only to small improvements in community preparedness and response. To identify and create new intervention opportunities, different research designs may need to be developed and implemented.

This presentation introduces a novel research design: an holistic, multi-site and process-oriented action research designed to empower individuals and communities to build up their capacity for coping with natural disasters. This approach will seek both generic and specific solutions, applicable to hazards more broadly as well as the identification of solutions that appear to be hazard specific. In so doing the research design takes a multi-level perspective and investigates the influence of individuals within communities, and their reciprocal interactions. Based on a synergy of four theoretical frameworks paradigms (i.e., salutogenic paradigm, symbolic interactionism, narrative theory, systems theory), the research will merge three qualitative methodologies (i.e., grounded theory, multi-site ethnography, multi-site action research) to inform both theory and measurement of relevant constructs.

In the first phase of the research, we will collect data with a combination of participant observation, episodic interviews, and surveys. The aim is to identify and describe similarities and differences between communities with respect to, for example, the influence networks, emergent community leadership characteristics and community proactivity. In the second phase, we will model differences between communities to identify statistically reliable effects with a view to develop effective and efficient interventions which will promote community proactivity, capacity and resilience. In the third phase, we will collaboratively with the communities identify, design and implement interventions based on the research findings. The outcomes of these interventions will be assessed and reflected on in phase four of the project. Throughout the project, the data from the case studies will be compared to identify the characteristics and processes that contribute to enhancing the resilience of individuals and communities.

Biographical Information:

Besides being a research associate with the Bushfire CRC & UWA, Petra Buergelt is also an honorary research fellow at Massey University's and GNS Science's Joint Centre for Disaster Research (NZ) and an international associate at the Centre for Applied Cross-Cultural Research (NZ). Petra gained her PhD in Psychology from Massey University (NZ). In her research she explores with a qualitative research approach the psychological and social factors and processes that influence resilience, health/well-being and adaptation of individuals and communities with respect to disaster preparedness and response, and contemporary migration between Western countries. She collaboratively designed and conducted various projects studied the psychological and social factors that influence individual and community preparedness for bushfires (Australia), tsunamis (USA) and bird flu (New Zealand). Petra is on the Editorial Board of the International Journal of Multiple Research Approaches (IJMRA) and the Journal of Psychology. Petra has been awarded numerous scholarships and fellowships including the TEC Top Achievers Doctoral Scholarship, the Ryoichi Sasakawa Doctoral Young Leaders Scholarship, and the NZVCC Claude McCarthy Fellowship.

Clarke, P., Dunlop, P., MacLeod, C., Buergelt, P. & Morrison, D., “Alert but not alarmed: Examining the potential benefits of anxiety and worry on behavioural preparedness for threat in bushfire affected communities”

The experience of anxiety and worry often carries negative connotations. However, anxiety can be a highly motivating force which encourages behavioural action in response to legitimate sources of threat. Similarly, worrying about potential dangers can assist in preparing for and limiting the likelihood of adverse consequences when this focuses on identifying ways and means of averting such negative outcomes. Yet, these processes can also disrupt preparation for potential threat. When anxiety is unrelated to real sources of danger, and worry focuses only on the negative consequences of a potential threat, they may in fact reduce preparatory behaviours for potential danger by motivating people to avoid actions that remind them of potential threats.

This presentation will briefly outline the possible causal relationships between anxiety, worry, and behavioural preparedness for potential threat. These theoretical perspectives will then be discussed in relation to recent data collected from bushfire affected communities. Following the February 6th fires in Roleystone, Kelmscott and Red Hill in Perth this year, a collaborative project was launched to sample 400 community members within these fire affected areas. The scale and locations of the February 6 fires meant that affected areas included rural, semi-rural, and urban regions. By sampling from these different areas we have been able to perform unique comparisons of individuals within these different communities in terms of their level of anxiety and worry about bushfires, their level of bushfire preparedness, and symptoms of traumatic stress following the event.

Questionnaire measures used in this study included a modified version of the Worry Domains Scale to examine individual differences in the tendency to worry about a number of different areas in life (e.g. finances, environment), including the risk of bushfires. General anxiety was assessed using the Spielberger State-Trait Anxiety inventory which examines the frequency and intensity with which people experience symptoms of anxiety. The Acute Stress Disorder Scale was also used to examine the presence of posttraumatic stress symptoms following the recent fires. Indicators of preparatory actions before the fire, and behaviours on the day of the fire were also gathered via interviews.

Insights derived from comparisons of these different communities will be discussed in relation to the role of anxiety and worry in affecting behavioural preparedness and subsequent traumatic responses to bushfire. These are considered along with implications for enhancing community preparedness and resilience.

Davidson, J., “Severe Tropical Cyclone YASI – seen but once in a generation”

Severe Tropical Cyclone YASI made landfall between Innisfail and Cardwell around midnight on 2nd February 2011 as one of the most powerful and largest cyclones to have impacted the state since records commenced. Fortunately, there was no direct loss of life and no serious injuries were reported. However, wind and storm surge damage along that section of the coast and nearby islands was quite extensive with insured losses expected to approach \$Aus1B. YASI was the 4th cyclone in the Queensland region this season and came on top of record rains in the previous 6 months and widespread flooding in December and January.

When tracking across the Coral Sea, YASI passed directly over Willis Island which is a permanently staffed Bureau of Meteorology facility located 400 km east of Cairns. To ensure their safety, occupants were evacuated the day before the cyclone struck. Significant damage occurred on the island both to the natural environment and to the Bureau’s facility. It will be some months before staff can return to the island and the weather radar is again operational.

Improvements in numerical modelling prediction enabled the Bureau to alert Queenslanders almost a week prior to landfall that YASI could form and later be a threat to the state. With the cyclone approaching the coast, the Queensland Tropical Cyclone Warning Centre was warning of wind gusts to Category 5 strength and the likelihood of a dangerous storm surge. At landfall, an eye pressure below 930 hPa was recorded along with a storm surge in excess of 5 metres. Wind estimates from interpretation of high quality satellite imagery placed the highest wind gusts in the vicinity of 280 km/h, equivalent to a borderline Category 5 cyclone.

In the aftermath of the event, the Bureau is following its standard practice of collating all relevant information including meteorological observations (pressure and wind in particular), storm surge measurements, satellite and radar data, wind and storm surge modelling results and field survey reports. As an integral part of the process, key stakeholders will also be consulted, both internal and external to the Bureau. It is expected that by Conference time, the Bureau will be in a position to provide its best estimate of YASI’s landfall intensity.

Severe Tropical LARRY crossed the coast a little further north near Innisfail on 20th March 2006 – a landmark cyclone with considerable impact. A direct comparison will be drawn between cyclones LARRY and YASI in regards to estimated landfall intensity. Various assessment techniques are applied, including satellite imagery interpretation. Internationally recognised US experts in this field provided valuable and ongoing assistance with the study.

Biographical Information:

Jim DAVIDSON is the Regional Director (Queensland), Bureau of Meteorology. With a career spanning over 4 decades with the Bureau of Meteorology, he was a Bench forecaster in the early years, former Queensland Weather Services Manager and Supervisor of the Tropical Cyclone Warning Centre. He has been the Bureau’s Regional Director in Queensland since 2002.

Gaillard, JC & Wisner B., “*Small events, small impacts?*”

This presentation focuses on events which are deemed ‘small’ or ‘minor’ by scientists, governments, aid organizations and media. It emphasizes why ‘small’ disasters are often neglected and why it is yet essential to give them more attention.

‘Small’ events are neglected first and foremost because of the magnitude of their impact as recorded by international databases such as the Center for Research on the Epidemiology of Disasters’ EM-DAT or those of insurance and reinsurance companies. The widely-used EM-DAT data base only records deaths and economic costs; while it also estimates the population ‘affected’. A threshold of 10 persons killed is used to define ‘disaster’. Scientists, governments, aid organizations and media focusing on the so-called ‘big’ disasters often fail to consider those primarily concerned, i.e. people whose daily life and livelihood may be heavily impacted without widespread damage to the built environment, a large number of deaths or high economic costs.

The cumulative, disruptive effect of repeated small hazard impacts on fragile livelihood systems is seldom considered. Yet small-magnitude, recurring and often persisting events often lead to chronic poverty and food insecurity. For millions of people at risk who struggle to make a daily living, ‘small events’, or ‘extensive disasters’ as coined by the 2009 Global Assessment Report of the UN International Strategy for Disaster Reduction, are therefore of much bigger threat than large-scale and rare events. Alternative database such as DesInventar suggests that the cumulative damage of these ‘small’ events is actually much larger than the impact of the ‘big’ disasters. The present presentation therefore advocates for a people-centred approach of disasters and disaster risk reduction. This considers the magnitude of the event in relative or acceptable terms for those most at risk.

Handby, R., Australian Red Cross International Disaster Response, “*Development of Disaster Response Tools*”

The Red Cross/Red Crescent Movement responds to disasters worldwide. Australian Red Cross is one of 186 National Societies and one of the primary roles of any Red Cross or Red Crescent National Society is to provide first-line disaster response services. The main tool used by the Red Cross/Red Crescent Movement internationally is the Emergency Response Unit (ERU), developed in response to large complex disasters in the 1980's and 90's. The ERU consists of standardised equipment and trained aid workers ready for rapid deployment throughout the World. These tools cover a number of sectors including water and sanitation, field hospitals, logistics and relief distribution.

I have been involved with Australian Red Cross international disaster response for the past 27 years. During the past 4 years, I have been responsible for advising and helping to establish the Australian Red Cross disaster response capacity. This process has included looking at disaster trends, considering the constraints that exist in responding to remote islands in the Pacific, reviewing what already exists and identifying gaps in the International response capacity of the Red Cross Movement.

This work has led to the establishment of two response tools, one being a Community Health approach to disease surveillance and the second being the establishment of the Australian Red Cross Disaster Response Team in the sectors of emergency water, sanitation, vector control and emergency shelter.

An important component of both of these tools is the training of aid workers and the preparation to enable a rapid and appropriate response. These tools have been deployed on ten occasions in the past four years. The tools are available for deployment nationally however they have mainly been deployed internationally with a small amount of equipment used within Australia.

This paper reviews these two tools including the deliberations about the decision to develop them, equipment that is available, training of aid workers and deployments undertaken.

Biographical Information:

Mr. Robert (Bob) Handby worked as an Environmental Health officer in local Government in Victoria for 27 years. During this time he took leave to work in disaster response with the International Committee of the Red Cross in countries including Uganda, Iraq, Rwanda, Former Yugoslavia, Sri Lanka and throughout Asia and the Pacific. This work included the provision of emergency water supplies, sanitation and the construction of Refugee and Internally Displaced Persons (IDP) camps

In 2007, Bob joined Australian Red Cross where he established the Australian Red Cross Disaster Response Team and the Community Health disease surveillance module. Bob is a life fellow of Environmental Health Australia and has been involved with this institute since 1984 running courses throughout Australia on the Public Health response to disasters.

Hanrahan, M., “*Building Situational Awareness: The role of media agencies through the ages*”

This presentation explores the role of media agencies in building situational awareness of disaster events amongst response agencies and the public. It commences with a brief historical account of how, over the past 100 years, changing technologies have changed the way media agencies get their stories to print or broadcast: from news arriving by sailing ships three months after events had occurred, to the current situation in which newsworthy events are able to be delivered live. The presentation explores how this ability to go live assists in building rapidly situational awareness of events that are about to happen, and have happened. The presentation provides examples of how warnings of the 2011 Japanese Tsunami were able to be broadcasted well before the rapidly approaching tsunami wave had arrived, which resulted in many lives being saved; and how live pictures of the tsunami were able to be televised by a news helicopter while the 10+ metre wave was still at sea. Finally, because of this ability to build situational awareness rapidly, the presentation challenges participants to consider the important role that media agencies can play in contemporary disaster management arrangements, and reminds participants that television media were working actively during the recent Christchurch and Haiti earthquakes, 2004 Asian Tsunami, the recent Queensland Cyclones, the South East Queensland floods, and the Victorian bush fires.

Hughes, M., “*Impact of the Christchurch earthquake on the future of public education within the hazard management context*”

This paper examines looks at the impact of the Christchurch earthquake on the future of public education within the hazard management context.

Biographical Information:

Dr Miriam Hughes is a public education advisor/researcher in the Joint Centre for Disaster Research, Massey University, New Zealand.

Johnson, D., “The role of multi-disciplinary research and collaboration for improving the resilience of communities to natural hazard events”

Over the last few decades it has been recognized that integrated multi-disciplinary research is needed to provide an understanding of the social, economic and cultural factors that influence the development of strong communities, resilient to the impacts of natural hazards and able to respond effectively when events occur. The benefits of a multi-disciplinary approach include: (1) improvements in governance structures and processes, such as policy and legislative frameworks, planning (including land use), governance institutions and leadership; (2) identification of the characteristics that make people, communities, organizations, and other social structures resilient, and the impediments that prevent it; (3) improvement in emergency management and disaster relief procedures and processes; (4) more efficient and effective recovery after an event; and (5) improved uptake and value of hazard related research investment; (6) the capture of emerging trends (e.g. how an aging population effects community resilience and what this means for research and policy); (7) a better understanding of the relationship between economics, resilience and recovery; (8) an assessment of the impact of hazards on society (including social, economic, environmental, cultural impacts); (9) a better understanding of vulnerability and how society perceives its own vulnerability; (10) strengthening the evidence-base at the research/policy interface; and (11) a better understanding of the linkages between the stakeholders, frameworks and institutions. The Integrated Research for Disaster Reduction (IRDR) (<http://www.irdrinternational.org/>) is a decade-long integrated research program co-sponsored by the International Council for Science (ICSU), the International Social Science Council (ISSC), and the United Nations International Strategy for Disaster Reduction (UN-ISDR). It is a global, multi-disciplinary approach to dealing with the challenges brought about by natural disasters, mitigating their impacts, and improving related policy-making mechanisms. The IRDR Program endeavors to bring together the natural, socio-economic, health and engineering sciences in a coordinated effort to reduce the risks associated with natural hazards.

Biographical Information:

David Johnston a Senior Scientist at GNS Science (New Zealand’s Geological Survey) and Director of the Joint Centre for Disaster Research in the School of Psychology at Massey University, Wellington. The Centre is a joint venture between Massey University and GNS Science. His research has developed as part of multi-disciplinary theoretical and applied research programme, involving the collaboration of physical and social scientists from several organisations and countries. His research focuses on human responses to volcano, tsunami and weather warnings, crisis decision-making and the role of public education and participation in building community resilience and recovery. David is a member of the Scientific Committee for the Joint International Council for Science (ICSU) and the International Social Science Council (ISSC) Integrated Research on Disaster Risk (IRDR); the Royal Society Social Science Advisory Panel; Leader, Cities and Volcanoes Commission, International Association of Volcanology and Chemistry of the Earth’s Interior; on the Editorial Board of The Australasian Journal of Disaster and Trauma Studies; and Deputy Editor of International Journal of Disasters and Mass Emergencies.

Khan, S., “*Extreme Events & Impacts: Contributions of Hazardscape and Gaps in the Response Practices*”

Extreme events and their catastrophic impacts are frequent, ongoing and very likely to increase in the future with global climate change. Significant investments in hazard mitigation, policies and emergency management have failed to stop recurrent disasters. Their persistence not only indicates gaps in the current response but also suggest a need for different perspective in which hazards have been seen, assessed and dealt by now. This paper views disasters through the lens of hazardscape. It finds that one major cause of response failure is inadequate consideration of the local hazardscape in planning. It presents a conceptual framework of hazardscape and discusses why it is essential to look at the various aspects of a local hazardscape in order to plan a response strategy. It argues that planning for response based on local hazardscape is likely to be more successful as it depicts both vulnerability and response. This is particularly significant in the context of climate change which is likely to shift risks over space and time.

The second part of the paper illustrates shortcomings of the current hazard response practices and recommends an holistic approach to emergency management. It finds that while globalization of hazard response practices is progressive, it has been less successful in dealing with local issues of vulnerability. Extreme events such as earthquakes in Japan (2011) represent complex hazards where excessive damage was not mainly caused by the shaking, but by subsequent or second order hazards such as tsunami, fires and nuclear blasts. The recovery became further difficult during cold waves and storms. The planning for emergency response often proves to be inadequate due to prevailing focus on a few dominant hazards. The integrated risk management system primarily deals with regular damaging events of certain intensity, while disasters occur by less likely hazards which are rarely planned either due to too much or too less risk. It is also noted that although legislative acts suggest planning for all hazards, not all hazards are efficiently planned at the local level. The rising costs of disasters, demands for immediate recovery and economic response lead to scenario based risk management rather than hazard mitigation. Multiple breakdowns during complex hazards also produce some unpredictable issues and complex public response that can be better understood and planned by having a focus on the hazardscape.

Biographical Information:

Dr. Shabana Khan is a researcher at the New Zealand Climate Change Research Institute at Victoria University of Wellington, New Zealand. She completed her PhD from the same university with a focus on the hazardscape of the Wellington Region and its influences on the intra-regional response. Her previous research background includes studies on disasters in India for her Master and M.Phil. theses in Geography from Delhi School of Economics, University of Delhi. She has worked on a number of research projects, and has attended several international workshops and conferences focusing on hazards, disasters and climate change.

Lari, F, Abbasi, H, Poryari, M., “*Experience of Flood Event Documentation in Transportation System*”

The rate of ever increasing natural disasters and high amount of expenditures that are allocated to engineering and executive approaches for management of numerous crises worldwide considerably justifies the necessity of review and evaluation of plans and programs pertaining to natural disasters mitigation.

A basic tool which could be used for review and evaluation of short term and long term plans is documents associated with an event in an extensive way including consequences, damages, and implemented measures covering four stages of disaster management cycle containing Prevention, preparedness, response and recovery.

Professional documentation of events covering all engineering and management activities in an extensive way provides executives with a very useful facility to be used for evaluation and review of plans, event routing, figuring out the down points of management processes and finally proposing corrective actions.

Documentation is as a subordinate of knowledge management that draws a logical process in order to gather different levels of with knowledge and to convert them from the most basic level(data) to the highest one(expertise) in a way to be considered in significant decision makings.

This paper has been written based on leading an applied research project which concentrates on designing an applicable structure which is targeted to document past flood events in ground transport system including road and railway section of MRT¹. In the mentioned project, the optimized level of documentation was set based on investigation of existing condition of documentation in MRT to understand their level of expectation, performing an extensive literature review from the patterns that have been implemented in other countries and finally following existing standards and guidelines.

Mirfenderesk, H., “Address-Based Flood Risk Indexing A Method of Communication of Flood Risk to Public and Industry”

To manage natural hazard risk effectively, an informed and fully engaged public is necessary. For full engagement, the public needs to receive accurate risk information. This means government has the responsibility to inform the public about risks in accurate, meaningful, and actionable ways.

Communicating flood risk is generally exercised through the publication of flood maps in the Local Government Planning Schemes. These maps aim to identify areas subject to flood hazard and act as a trigger map for development assessment. The information in these maps is available electronically to the public via flood search databases that are generally maintained by local authorities. By its nature, these maps reflect the flood associated with only one return period, generally 1 in 100 year ARI, as it is the recommended design flood event in the Building Code of Australia. On this basis, these maps divide a city into two sections namely: flood affected and non-flood affected. From a layperson’s point of view, areas inside a flood line are subject to flooding and areas beyond the line are safe.

These maps are basically designed to address statutory needs of the local governments with respect to flood. Such black and white representation of flood risk is misleading and can result in misinterpretation of flood risk by the public. In reality, no place within a floodplain is immune from flooding. Some areas may be prone to 1 in 2 year ARI flood and some areas may be prone to Probable Maximum Flood (PMF). Different flood types, such as local flood, regional flood, storm tide or a combination of them, can inundate properties. A challenge in communicating flood risk to lay people is to combine the risk associated with floods of different return periods, different durations and flood types with one representing index. This study presents a methodology that has been used to develop address-based flood risk index maps for the Gold Coast. This methodology combines the risk of flood with various return periods, durations, and types with ground level information and generates an attribute for each parcel of land, indicating the true risk of flood that the land is subjected to.

Morrison, D., Skinner, T., Lawrence, C., MacLeod, C., Buergelt, P., Dunlop, P. & Clark, P.,
“Information processing in the face of threat: A Multilevel Research Perspective”

The lessons drawn from the 2003 Victorian bushfires suggest that community and social context, information and its sources, and anxiety and emotional regulation crucially influence preparing for and responding to bushfires (McLennan & Elliott, 2010). This presentation discusses a three year research program that will explore the *combined and interactive* role of these three factors in decision making.

At the community level, individual behaviours in terms of preparing for and responding to an immediate threat are influenced by community characteristics. While large differences in community preparedness and responses are observed, as yet we appear to have no systematic account of how or why these differences exist. To address this gap a project entitled – “Community level influence on individual behaviours with respect to bushfire readiness and decision making in the face of immediate threat.” - aims at systematically identifying what factors and processes distinguish communities which are more prepared from those which are less prepared. It also endeavours to identify, implement, and assess interventions at the community level that improve preparedness and response.

Prior to and during a disaster, individuals seek and/or receive information, process the information, and act. However, decisions made under stress are frequently impulsive, based on imperfect information, and rigid. In many instances fear interferes with the mitigation of danger, resulting in bad decisions. Accordingly, a second project - “Information processing under stress: Community reactions” - seeks to understand the role fear plays when community members process the information they receive in the lead up to, and during, the bushfire season, as well as during bushfire emergencies. It aims to identify how individuals use information and warnings to guide their actions, what information should or should not be provided, how and when information is best delivered. How the community context moderates the effectiveness of these messages will be informed by findings from the community level project described previously.

At the individual level, research in clinical settings has shown how people vary systematically with respect to their typical attentional responses to threat cues. Some people tend to deliberately avoid or ignore threat cues. Other people tend to be especially vigilant for threat cues. Both low and high levels of dispositional anxiety can impair decision-making and action-taking capabilities. The goal of this project - “Managing the threat through the modification of thought” – is to develop an effective self-administered cognitive bias modification program that trains adaptive attentional styles for specific stress inducing events such as bushfires.

Biographical Information:

The research team combines the expertise and skills of established and early career researchers from clinical psychology, social psychology, health psychology, and organisational psychology. The research program will make use of the skills underpinning each area including expertise in statistical modelling and qualitative research methodologies. Additionally, use will be made of clinical expertise and the practical skills possessed by the team in designing laboratory and field based interventions and their evaluation.

Opper, S. & Yeo, S., “A Flood's Silver Lining: Developing Flood Intelligence for Enhanced Community Resilience”

Flood intelligence is the product of a process of validating and reviewing information about the impacts of flooding on communities. The primary tool of the NSW SES Flood Intelligence database is Flood Intelligence Cards, which relate flood heights at a stream gauge to consequences within the gauge's reference area. Good flood intelligence is essential for implementing an effective and pro active emergency response prior to consequences occurring including interpreting flood predictions, delivering meaningful warnings and public information, and informing decisions about resourcing and deployment. The SES routinely updates flood intelligence and emergency plans following changes to the floodplain, actual flood events or when synthetic information becomes available in floodplain risk management studies.

Associated with a strong La Niña event, widespread and in some cases record breaking flooding has occurred in many inland areas of NSW since late 2010 and included the Murray and Murrumbidgee catchments which is discussed as a case study in this paper. Flooding affected some communities that had not experienced serious flooding for many decades. Accordingly, the SES commissioned an unprecedented number of extensive flood intelligence reviews to take advantage of this rare data gathering opportunity across NSW. In addition to the collection of information from government agencies and in some areas via remote sensing, questionnaires were distributed to many thousands of residents across the State to gather first-hand observations. The flood intelligence generated from these reviews has been used to enhance Flood Intelligence Cards and Local Flood Plans, for the betterment of future flood responses. The flood level data will also be used to review behaviour indicated by existing Flood Studies and as an input to future Flood Studies, in partnership with local governments. Flood Studies are in turn a key input into the broader floodplain risk management process, of which one outcome is informed development control plans. This paper reports some of the key findings of the flood intelligence reviews, which represent an excellent example of the way in which flood science is being integrated into emergency management planning and floodplain development practice, for the creation of more flood resilient communities.

Biographical Information:

Simon Opper is a Planning and Research Officer in the NSW SES Emergency Risk Management Branch. Simon undertakes emergency planning and manages research projects for flood, storm and tsunami as well as providing emergency risk management and risk assessment advice during operational events. Simon is an Environmental Engineer.

Stephen Yeo works as a floodplain management specialist with Bewsher Consulting in Sydney and is an Associate with Risk Frontiers. Stephen has a doctorate from Macquarie University for his investigation of flooding in Fiji.

Rekers, P. , “*Is the age of strategic communications dead?*”

That information collection, management and dissemination in emergencies are crucial is a no brainer. That every emergency responder is therefore primarily a communicator takes more convincing. A whopping twenty percent of radio communications during the September 11 response were either repeated, unacknowledged or irrelevant.

In the 1990's the talk was the CNN effect, where almost real-time broadcast of battles drove Generals, finding themselves thinking on the back foot, to find tactical responses rather than being able to rely on strategic plans. The rapid growth of social media now permits any communicator to reach massive audiences at unprecedented speeds, changing the face of information management at rates unseen before.

The information explosion evident in every major event can intimidate and overwhelm agencies. Their challenge now is to develop and implement strategic communication plans that can react faster than ever and reach wider audiences during preparedness, response and recovery. To lose the strategic communication game is to lose control of the incident. The key is genuine and honest planning and training.

Biographical Information:

Peter Rekers has worked in theatre (musical comedy not operating), been the Pope's Stage Manager, been a sound engineer for Prince Charles, chased illegal foreign fishing vessels, survived nine cyclones at sea, qualified as a marksman, has investigated rapes, fires and frauds, led 100 bush fire fighters in the Blue Mountains, coordinated the media liaison for the Navy for the Tony Bullimore rescue, as a Management Consultant spent time in a lot of Prisons, in Australia, New Zealand and the US fixing their process management, was the Australian Naval Commander's Media Advisor during the 2003 Gulf War and later in Baghdad was the Coalition Media Director running press conferences for, among others, Colin Powell and Donald Rumsfeld. He was the Manager of Media and Strategy at QLD's then Department of Emergency Services managing all media liaison for Queensland Fire and Rescue Service and Emergency Management Queensland including coordinating all media liaison for Cyclone Larry. He is a Lieutenant Commander in the Navy Reserve, an Adjunct Associate Professor at the University of the Sunshine Coast and a co-founder and Chairman of Emergency Media and Public Affairs which has run five conferences, funds research in the field and took him to Washington DC in 2010 to speak at the Federal Emergency Management Agency's Public Information Officers' Conference.

Roche, K., “The Australian Great Flood of 1954: the cost of a similar event in 2010”

In many parts of the globe, migration to the coast and rapid regional development is resulting in large concentrations of population and insured assets. In Australia, one of the most rapidly growing regions is South-Eastern Queensland and Northern New South Wales, an area prone to flooding, severe thunderstorms and tropical cyclones. In this study we re-examine the *Great Flood of 1954* and estimate its likely cost if a similar event were to recur given current societal conditions. This cost is estimated using local council flood maps, Census information and Risk Frontiers' proprietary flood loss model, *FloodAUS*. The 1954 flood arose from heavy rainfall caused by the passage of an unnamed tropical cyclone (T137) that made landfall on the 20th February near the Queensland / New South Wales border, before heading in a southerly direction for some 500 km. Responsible for some of the largest floods on record for many northern New South Wales' river catchments, it occurred prior to the availability of reliable insurance statistics and the recent escalation in property values. In the 'dollars' of the day, the direct economic loss was of order £7.5 million and around 28 people lost their lives. Our best estimate of the insurance losses using given current (2010) exposure and assuming 100% insurance penetration is \$3.4 billion. Losses could also be considerably higher if the cyclone were to be more intense than T137 and wind damage significant over and above that due to riverine flooding. The magnitude of the modelled loss demonstrates the regional exposure of population and assets on floodplains and recent floods emphasize the failure of land-planning policies to take this risk into consideration.

Biographical Information:

Kevin Roche is a PhD candidate at Risk Frontiers, Macquarie University in Sydney, Australia. His research interests focus on the financial risk of natural hazards and creating economic incentives for the mitigation of these risks. Previously Kevin spent 7 years working in financial markets in London, Australia, Papua New Guinea and New Zealand.

Tafti, M., “*The role of the long-term post-disaster urban reconstruction policies in housing recovery and vulnerability reduction: a focus on urban tenants*”

This paper investigates how post-disaster urban reconstruction programmes and policies can affect low or middle income renters' condition of vulnerability as well as the level of recovery they achieve. A review of literature and past experiences of post-disaster urban reconstruction shows a considerable lack of knowledge and shortages in policies regarding this group of people both in developed and developing countries. This inadequacy in recovery policies explains why this group are among the last groups who recover from disasters. The research takes place in two cities in developing countries, Bhuj (India) and Bam (Iran) affected by earthquakes in 2001 and 2003 respectively. Looking at these two urban recovery experiences, the paper examines the impacts of reconstruction policies on housing recovery of tenants vis-à-vis another group, homeowners. For this purpose, the study is simultaneously pursued at two levels; first, a systematic analysis of policies and programmes relating to reproduction of the built environment and housing recovery, and second, an analysis of the qualitative data gathered in these two cities about changes occurred in people's condition of life in order to explore the planned or unintended impacts of the reconstruction policies upon them. Findings show how governmental assistance planned for tenants failed to reach its target group, and also, how the exclusion of tenants from recovery policies or implementation process can produce or reproduce social vulnerability and accentuate the pre-disaster inequalities. By adopting this approach in comparing two reconstruction experiences with relatively similar contexts and different attitudes towards recovery, this paper contributes to informing future urban reconstruction efforts about the possible impacts of policies exercising in the area of housing recovery. The results have implications for social equity and recommendations for future policy making and implementation are offered.

Biographical Information:

Mojgan Taheri Tefti is a PhD candidate at the University of Melbourne, Architecture, Building and Planning faculty. Her thesis is about vulnerability reduction in post-disaster urban reconstruction, and she is looking at urban reconstruction programmes in two developing countries, India and Iran. For more than eight years, she was working in the post-disaster reconstruction field with focus on the evaluation of the post-disaster housing recovery programmes in Iran.

Taylor, H., “*Children in Disasters: Lessons from Indonesia and Christchurch*”

Children represent a vulnerable group with unique needs in a natural disaster, but they can also be, depending on their individual social and psychological characteristics, a highly resilient group. Recent studies reveal that children have different perspectives as well as vast amounts of energy and creativity that can assist families and communities prepare for and recover from disaster. This paper presents on the experiences of children exposed to flooding in Indonesia, and in turn how this research assisted in the development of practical assistance for children and families following the Christchurch earthquake.

Widespread flooding and landslides occurred along the Bengawan Solo River in Central Java, Indonesia following heavy rains in December 2007-January 2008. Research was conducted with 32 children living in the riparian urban setting whose homes had been affected by minor to moderate flooding. Qualitative techniques, including group discussions, drawings and open-ended interviews, were used to elicit stories of the flood and its social impacts. Children’s capacity for disaster risk reduction and flood preparedness was also investigated by involving them as active researchers in their own community in creating flood-safe community plans and conducting interviews with their parents. Research revealed that in disaster situations where children are involved culture and context, the nature of the event and the nature of community and country’s response to the event, matter. While these aspects are relevant for both children and adults, children are social actors who have distinct and important capabilities that the disaster research field need to take into account.

The February 22nd earthquake in Christchurch interrupted the final stages of writing up this research, and I found myself in a natural disaster in my own city. Using the knowledge gained from the Indonesian case study, and with the support of other community members and organizations, a series of “Family Fun Days” were organized in three affected neighbourhoods around Christchurch. These events, which drew hundreds of individuals at each site, were designed to offer families a break from stress caused by the earthquake and provided them with the opportunity to share their earthquake experiences with friends and neighbours. Activities included an art space, bouncy castles, face painting, games, refreshments, treasure hunts and an educational talk by local academics which explained the science behind earthquakes and liquefaction.

This paper represents the culmination of research into children’s experiences of natural disasters and presents the results of their “unexpected” practical application.

Biographical Information:

Heather Taylor is a PhD candidate at the Joint Centre for Disaster Research on the Wellington campus of Massey University in New Zealand. She holds a BSc degree in Geological Engineering from Queen’s University in Canada and worked in this field for a brief time before beginning her doctorate. She is based at the geology department at the University of Canterbury in Christchurch, where she has resided for the last four years.

Wardman, J., Wilson, T., Cole J., Johnson, D., “Investigating the electrical conductivity of volcanic ash and its effect on HV power systems”

Volcanic ash contamination of high voltage (HV) power networks compromises the reliability of society's electricity supply. Ash-induced insulator flashover is a common problem on transmission networks during explosive eruptions, which is attributed to the high conductivity (σ) (low resistivity (ρ)) of volcanic ash. However, there have been few studies which have investigated the electrical conductivity of volcanic ash and how it may be influenced by different volcanological and environmental factors. In this study we have used a simple and rapid testing method to measure the influence of ash composition, grain size, soluble salt content, compaction and water content on ash conductivity. We also developed physically, chemically and electrically equivalent ash proxies to be used for current and future laboratory experimentation. Results indicate that dry volcanic ash is non-conducting ($\sigma = < 5.0 \times 10^{-8} \text{ S-m}^{-1}$, $\rho = > 2.4 \times 10^7 \text{ }\Omega\text{-m}$), however, the conductivity of volcanic ash increases abruptly with the adsorption of water. Further increase in conductivity has been observed with increasing soluble salt content and compaction. All grain sizes (<32 μm to 1.4 mm) can exhibit high conductivity values ($\sigma = > 0.01 \text{ S-m}^{-1}$, $\rho = < 100 \text{ }\Omega\text{-m}$) and therefore have similar potential to cause flashover on HV insulation. The methodology development and results herein represent a benchmark for in-field testing during volcanic crises and for future studies. Preliminary insulator contamination testing in the University of Canterbury's HV lab has shown that the operational performance of porcelain disc insulators contaminated with 2-3 mm of fine-grained (<105 μm) 0.18 M NaCl basalt wetted by a hand sprayer is reduced by nearly 40%.

Biographical Information:

Hailing from the island of Bermuda, Johnny is studying the effects of volcanic ash on high voltage power supply systems at the University of Canterbury in Christchurch, New Zealand. Johnny aims to quantify the vulnerability of HV power systems to ash fall hazards and looks to both identify and strengthen the shortcomings in infrastructural interdependencies during volcanic ash fall events.

Winn, L., “Vulnerable Communities Identification & Mapping Project (Renal Enable)”

Research illustrates that the human result after a disaster is hugely dependent on the quality of the planning carried out beforehand. This demonstrates a fundamental shift beyond disaster response and reaction, towards anticipation and mitigation. Therefore the NSW Health Counter Disaster Unit in conjunction with Emergency Information Collection Unit (EICU) of Lands & Property Management Authority, submitted a one year funding submission in 2008 to the Australian Government Natural Disaster Mitigation Program for the Vulnerable Communities Identification & Mapping Project (Renal Enable) which aimed to identify vulnerable individuals living in the community who are at risk in an emergency or disaster situation, and to establish and maintain a state-wide database of vulnerable individuals for use in emergency planning.

The aim of this project was to identify vulnerable individuals who may need assistance in times of utility failure or emergency. This project was limited to individuals on home dialysis and ventilators living in the community. The project also identified varied and limited information sources, a lack of uniformity and different methodology of data collection across various agencies. The project utilised geo spatial technology which displays the impact areas and vulnerable groups. The map allows visualization of information among agencies for priority planning and response in an emergency situation. Collaborative decisions can then be made on resource prioritisation and allocation. The timely access of information improves the efficiency and effectiveness of emergency management of the vulnerable population, thereby improving mortality and morbidity of disaster or emergency impacts.

The project was concluded with an upgrade the Information Technology infrastructure in NSW Health so that electronic map data can be sent to and received from various agencies including the Land and Property Management Authority and NSW Health. This enables NSW Health and Ambulance to share information through a secure central collaboration site accessible between the two agencies.

This presentation will demonstrate how this geo-spatial mapping information can be used in emergency situations, using scenarios on bushfires and floods.

Biographical Information:

Linda Winn is currently the Deputy Director of the NSW Health Counter Disaster Unit and has worked in emergency management for 10 years gaining experience in Australia and overseas. She is a Registered Nurse and is very passionate about disaster management issues, and in particular the role of Health Services in the prevention, preparedness, response and recovery from disasters or emergencies.
