# HAZARD **NOTE**

bushfire&natural **HAZARDS**CRC

# TURNING WARNINGS INTO ACTION

## ABOUT THESE PROJECTS

This is an overview of the *Communications and warnings* cluster of Bushfire and Natural Hazards CRC research projects. This cluster has five linked studies:

1. **Connecting communities and resilience** – Professor Vivienne Tippett, Professor Sharon Christensen, Professor Bill Duncan, A/Professor Amanda Stickley, Dr Dominique Greer, Dr Amisha Mehta and Dr Paula Dootson, Queensland University of Technology. For more information contact vivienne.tippett@qut.edu.au

2. **Managing animals in disasters** – Dr Mel Taylor, Megan McCarthy, Macquarie University, Dr Kirrilly Thompson, Dr Bradley Smith, CQUniversity, Dr Penny Burns, Rachel Westcott, Western Sydney University and Greg Eustace, RSPCA Queensland.

For more information contact mel.taylor@mq.edu.au

3. **Child-centred disaster risk reduction** – Prof Kevin Ronan, CQUniversity, Dr Briony Towers and Professor John Handmer, RMIT University, Dr Katharine Haynes, Macquarie University, Dr Eva Alisic, Monash University, Nick Ireland, Marla Petal, Susan Davie, Save the Children, Professor David Johnston and Dr Vicki Johnson, Massey University. For more information contact k.ronan@cqu.edu.au

4. **Improving hazard communications** – Dr Ilona McNeill, A/Professor Jennifer Boldero, Dr Paul Dudgeon, Professor Alex Wearing, University of Melbourne, Professor John Handmer, RMIT University and Professor

David Johnston, Massey University. For more information contact imcneill@unimelb.edu.au

5. **Understanding tsunami warnings systems** – Professor Douglas Paton, Katelyn Rossiter, Dr Petra Buergelt, Charles Darwin University, Professor David Johnston, Massey University and Sarah Anderson, Surf Life Saving Australia. For more information contact douglas.paton@cdu.edu.au

## CONTEXT

This cluster is investigating community resilience to natural hazards. Initial work has previously looked at bushfires, with these projects building on this work and extending it to other hazards, greatly assisting the development of policy and approaches to working with communities on resilience.

# CONNECTING COMMUNITIES AND RESILIENCE

## BACKGROUND

Community members experiencing natural disasters often do not comply with official government instructions during the response and recovery phases. Consequences of this can include obstructing the emergency response and putting lives at risk. This project is developing and testing emergency warning messages to establish which message framing best achieves compliance.

## RESEARCH ACTIVITY

Key activities to date included a social media analysis and community focus groups. The social media analysis examined 50,000 tweets during Queensland's Severe Tropical Cyclone Marcia in February 2015 to explore information processing, decision-making and risk communication in the response phase of the event.

Eight focus groups were conducted in Queensland, Victoria and New South Wales



▲ **Above:** A FLOODED ROAD IN MORAYFIELD, QUEENSLAND, IN THE AFTERMATH OF CYCLONE MARCIA IN FEBRUARY 2015. DECISION-MAKING AND RISK COMMUNICATION WAS EXAMINED AFTER THE CYCLONE. PHOTO: SHUTTERSTOCK.COM

(with two pending in Western Australia) to examine community comprehension of emergency warning messages. A number of workshops have also been conducted.

During the next year, the project will experiment with emergency warning messages to test which message framing best achieves compliance. As major natural disasters have a significant economic impact on society, even small changes in protective behaviours can be valuable. Informed emergency messaging can save lives and reduce the costs associated with disasters.

## RESEARCH OUTCOMES

The social media analysis recommends that emergency services add information to their warnings to increase the self-efficacy of community members. Increased precision of instructional messages will further meet this need. In addition, emergency services could integrate phrasing that personalises and visualises risk to enhance community members' ability to take effective action and share knowledge about damage. This could aid community members' understanding of their risk for subsequent emergencies. The community focus groups are ongoing.

## END USER STATEMENT

Agencies managing natural disasters have traditionally relied on techniques that deliver information to communities and prescribe actions to avoid in a natural disaster. Such top-down communication can often overlook the complexity of decision making in a crisis, and may even contribute to people ignoring or acting contrary to agency advice. This research is helping to explore new, innovative ways of working with, influencing, motivating and empowering community members, to share the responsibility for managing disasters and build the resilience of communities across Australia.

By keeping utilisation goals front of mind, researchers and agencies are well-positioned to readily adopt the research outputs. An example of these outputs could be effective, timely and targeted warning messages that motivate appropriate actions in an emergency.
– Andrew Richards, Manager, Community Engagement, NSW State Emergency Service.



▲ **Above:** HOW CAN EMERGENCY SERVICES BETTER WORK WITH ANIMAL OWNERS, WHETHER IT BE LIVESTOCK OR PETS, DURING EMERGENCIES? PHOTO: ASHLEY HOSKING CFS PROMOTIONS UNIT

# MANAGING ANIMALS IN DISASTERS

## BACKGROUND

Concern for animals can impact on people's decision-making and behaviour during natural disasters – sometimes risking lives. There has been little research in this area to guide policy development and training needs. This project is leveraging current initiatives, programs and research on prevention and preparedness by providing complementary research on the impact of animals on response and recovery, both for the community and responders.

## RESEARCH ACTIVITY

Initial scoping identified the challenges and needs of responders and other stakeholders, reviewed plans, policies and initiatives and identified priority areas with end users and other stakeholders.

The project is currently undertaking field work to focus on the issues around the integration of informal volunteers into animal emergency management, using South Australia's Sampson Flat bushfire in early 2015 as a case study.

A second field study will involve developing a multi-stakeholder research project in Tasmania to focus on animal owners in the urban/rural interface. The team is developing a method to collect data in order to map animal ownership distribution and owners' intentions in bushfires. This will support planning for the Tasmania Fire Service, the Department of Primary Industries, Parks, Water and Environment and local government. It is hoped that this proof of concept study can be tested with another

end user organisation in a different hazard situation, e.g. flood or cyclone, to assess its applicability in other contexts.

## RESEARCH OUTCOMES

Findings to date have been drawn together with other sources to prepare an audit report. This broad review spans the current legislation, plans, policy, community engagement resources, initiatives, needs, and research dissemination in animal emergency management in Australia. Summarised key findings include:

- The emergency management system needs to better integrate and recognise animal emergency management.
- Roles and responsibilities for managing animals during emergencies need to be better clarified and communicated.
- The 'non-core' status of animal emergency management leaves advances in this area more prone to unstable funding and organisational structures.
- The apparent disconnect between initiatives and communities may lead to duplication of activities, with no evidence available about their effectiveness.
- Animal emergency management needs to be reframed as a people issue; a rigid focus on animal welfare leads to discounting and disengagement by emergency response organisations.
- The better use of technology offers opportunities, e.g. for re-unification systems, management of emergent informal volunteers, and better data collection.

# CHILD-CENTRED DISASTER RISK REDUCTION

## BACKGROUND

Disaster education for children is a key priority in reducing the impacts of natural hazards. The child-centred disaster risk reduction (CC-DRR) approach is becoming increasingly popular, but rigorous empirical research on efficacy and implementation is scarce. This project is developing a research program to chart CC-DRR progress and identify policy-practice-research gaps and challenges. Key project objectives are:

- Understanding if CC-DRR programs are effective.
- Ensuring programs are stakeholder supported and evidence-based.
- Understanding if programs produce cost-effective outcomes and are able to be scaled up sustainably at schools, at the community level and in emergency management policy.

## RESEARCH ACTIVITY

The project has focused on the following themes: scoping and review of CC-DRR theory, policy, practice and research; consulting end users to establish a project and implementation road-map; and pilot research seeking views from major stakeholder groups (children, households, schools, emergency management/disaster risk reduction professionals).

A capacity-building workshop in April 2015 provided feedback from stakeholders that shifted the focus to the co-development of a CC-DRR/disaster resilience education practice and evaluation framework. This change was made to more clearly reflect the needs of end users.

Additionally, emergency services agencies have nominated disaster resilience education programs for evaluation. This evaluation looks for key, evidence-based practice elements, such as curriculum, pedagogy, assessment, evaluation and monitoring, and implementation.

## RESEARCH OUTCOMES

The team has concluded that a different mindset is needed by emergency services to achieve a large-scale, effective implementation of CC-DRR programs. Moving beyond a project mentality, such programs need to overcome known implementation obstacles to promote risk reduction and resilience, and be taught by well-trained teachers and emergency management professionals. This mindset requires a move from a short-term project-focused mentality to a longer-term, strategic curriculum and implementation mentality. That longer-term view would benefit substantially from research that evaluates the role and benefits of CC-DRR programs and identifies key implementation mechanisms and facilitators.

# IMPROVING HAZARD COMMUNICATIONS

## BACKGROUND

How effective are existing hazard communications and community engagement strategies in increasing preparedness and planning among residents of hazard-prone areas? This project addresses this question and identifies key barriers and enablers to motivating preparedness and planning by residents in order to improve the effectiveness of these strategies.

## RESEARCH ACTIVITY

Two studies conducted over the spring and summer of 2014/2015 investigated the effectiveness of existing communications strategies for bushfire and flood, such as community engagement groups, brochures, websites and advertising campaigns in increasing preparedness and planning by residents of hazard-prone areas. Data was gathered amongst residents of bushfire and flood-prone areas, measuring both active use of information sources such as community-based information meetings, brochures and websites, and passive awareness of TV-based advertising on bushfire and flood preparedness. Also captured was the extent to which these residents had performed a variety of preparatory and planning actions. This allowed a statistical determination of whether residents who had actively used information sources and/or were aware of advertising campaigns



▲ **Above:** RESIDENTS WHO USE INFORMATION FROM AGENCIES TO HELP THEM PREPARE FOR A NATURAL HAZARD CARRY OUT MORE PREPARATIONS THAN RESIDENTS WHO DO NOT. PHOTO: QUEENSLAND FIRE AND EMERGENCY SERVICES

ended up preparing more or less than those who did not.

The bushfire study began in October-December 2014 (location depending) with 514 participants from New South Wales, South Australia, Tasmania, Victoria and Western Australia (south of Geraldton). Information was collected at two time points, a month after the fire season began, and then six weeks after the initial survey.

Data for the flood survey were collected in February 2015. This resulted in a total of 286 responses from residents living in flood-prone areas in New South Wales and Queensland.

## RESEARCH OUTCOMES

Preliminary findings show that the majority of residents do not use any of the listed information sources to help them prepare (67% for bushfires, 69% for floods). Those who do use at least one of these information sources carry out more preparations than those who do not. These results cannot be fully explained by differences in risk perceptions and personality factors, so other factors must be at play.

Residents who remember seeing an ad on TV that focused on preparing for bushfires or floods do not carry out more preparatory actions than those who did not recall seeing an ad over the past six months. Bushfire-prone residents who go online to find information about preparing, go to information sessions and/or use a brochure have higher risk perceptions than those who do not. Flood-prone residents who report going to meetings and/or using websites have higher risk perceptions than those who do not.

# UNDERSTANDING TSUNAMI WARNINGS SYSTEMS



▲ **Above:** RESEARCH IS INVESTIGATING HOW PEOPLE RESPOND TO A TSUNAMI THREAT.

## BACKGROUND

The eastern Australian coastline faces some 8000km of active tectonic plate boundary that is capable of generating a tsunami that could reach Australia in two to four hours. This makes it imperative that coastal communities understand and can respond effectively to the Australian Tsunami Warning System. Activation of this warning system could result in warning times ranging from 90 minutes to three hours. Warning times of these durations could leave insufficient time for people to implement their emergency plan (e.g., to prepare their property, plan an evacuation etc.) on receipt of a warning. This project is researching key aspects of community response capability.

## RESEARCH ACTIVITY

This project has adopted a qualitative approach to understanding people's tsunami risk and warnings beliefs. Members of coastal communities are being interviewed about their views on causes of tsunamis, origin, tsunami travel times, warning times, warning sources and dissemination, as well as what people will be warned of and the actions warnings

should trigger. The project examines how community members and stakeholders can engage in ways that contribute to developing tsunami warning systems that can accommodate community and geographical diversity and facilitate the development of an enduring community capacity to respond in effective and timely ways on receipt of a warning.

The first study interviewed community volunteers from coastal communities around Australia that participate in coastal activities and emergency services in a range of Australian coastal communities. The aim was to identify community perceptions and understanding of tsunami risk and awareness of tsunami warning systems.

In response to consultations with end users, the project has now also incorporated two pilot studies investigating:

1. Tsunami community engagement and education both in schools and in communities.
2. Tsunami knowledge and existing communication processes within select coastal recreation groups and occupations.

## RESEARCH OUTCOMES

Initial interviews in communities in New South Wales, Queensland, Tasmania and Western Australia identified diverse views on what people should be warned of, and how to warn them. Views on warning content included long-term issues (e.g. evacuation problems) and immediate actions (e.g. knowing evacuation routes). The interviews identified a need to adapt warnings to specific localities and to enhance community readiness.

Among the insights from the 18 interviews were:

- Only eight acknowledged either the SES or Bureau of Meteorology as official sources of tsunami warning communications; only one acknowledged both.
- Participants were either unsure about the likelihood of a tsunami affecting them and their community, or thought that it was very unlikely, and this reduced their interest in considering their risk.
- People expected warnings to come from a number of sources (including internet/social media, word of mouth and TV) with radio and SMS being the most commonly mentioned. People would check information from several sources for consistency before considering taking action.
- People were more likely to consider preparing when they received a warning. People's beliefs about how long they would have to prepare ranged from 20 minutes to several hours, with a belief that 30 minutes would be sufficient time to prepare.

Following discussions with end users, the project is more clearly refocused on how interaction between community members and emergency service agencies influences tsunami risk and warning beliefs. The results of this work will help to develop and carry out a community engagement strategy to enable end user agencies to develop community warning and response strategies.