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BUILDING RESILIENT COMMUNITIES: EFFECTIVE MULTI-CHANNEL COMMUNICATION IN DISASTERS

Annual project report 2015-2016

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Bushfire and Natural Hazards CRC





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Cover: Flooded house in Victoria. Photo by Victoria SES.



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ABSTRACT

Recent natural hazard events in Australia and around the world provide constant reminders of why people should prepare and how people should behave. Yet, industry experiences and research shows that community members still fail to comply with instructions issued by government agencies [1]. Particularly in the response and recovery phases of a natural disaster, individuals ignore official emergency instructions in favour of community-generated warnings. While non-compliant behaviour is often not in the best interest of the individual or community, non-compliance is not necessarily malicious or even intentional. However, individuals who fail to comply with instructions issued during natural hazards significantly impede the emergency response because they (a) divert resources to compliance enforcement, (b) risk the lives of emergency service workers who may later be required to assist them, and (c) confuse the core safety message or instruction. Moreover, there is a limited understanding of the legal ramifications of non-compliance from perspectives of individuals, agencies, or corporations.

This year the team have undertaken two work packages: (1) assessing message comprehension of emergency warnings (completed) and (2) experiments on message compliance (ongoing). Community message comprehension of emergency warnings was examined through ten focus groups across Australia. This qualitative work built on research conducted by end-user organisations and addresses issues raised by the National Review of Warnings and Information. Key findings included: time between message updates is used as a proxy for event severity, visuals aid in personalising the risk and overcoming limitations of geographic knowledge, location triggers attention and the personalisation of risk, hazard knowledge and past experience can influence message comprehension in ways that lead to negative unintended consequences, and over-warning is preferred to under-warning. Recommendations are made for how to amend existing emergency messages to improve community member message comprehension. Findings were reported to the BNHCRC 30 June 2016.

The experiments on message compliance are seeking to produce an evidence base for the effectiveness of existing message strategies, and work towards optimising those messages using theoretical insights from psychology, marketing, and behavioural economics. The findings from the community focus groups informed the different manipulations used in the experiments. For example, one experiment manipulated the time between updates with varying degrees of specificity and tested its effect on risk perceptions, information-seeking, and intentions to take protective action. Data collection is still underway and will be reported to the BNHCRC later this year.

Other activities completed during this reporting period included a workshop run by the Queensland University of Technology's Centre for Emergency and Disaster Management titled "2036 Flood Hypothetical". The event was attended by emergency services agencies, government agencies, and other key stakeholders, including representatives from the BNHCRC. The team has also engaged in on-going expert discussions with end-users and other key emergency management personnel around research results and utilisation.



In May 2016 the team attended the BNHCRC Research Advisory Forum in Hobart, Tasmania, where they presented an update on the project and ran a workshop with the end-users in attendance. The forum was valuable in gaining end-user input into the utilisation of the research. End-user engagement has been ongoing throughout the year through one-on-one contact, teleconferences, bulletins, cluster bulletins, and face-to-face meetings where possible.

Some team members also attended and presented at the Australia New Zealand Emergency Management and Disaster Conference on the Gold Coast, Queensland in May 2016. The team also submitted a poster to the AFAC/BNHCRC 2015 Conference in Adelaide, South Australia.

As the project moves forward, the next year will see completion of the required deliverables and utilisation of the research. As major natural disasters have a significant economic impact on society, even small changes in protective behaviours can be valuable [2]. Informed emergency messaging can subsequently reduce the costs associated with disasters, which are largely attributed to the public response to the disaster [3], and could potentially save lives.



END USER STATEMENT

Andrew Richards, *Manager Community Engagement, SES, NSW*

The *Connecting communities and resilience: A multi-hazard study of preparedness, response and recovery communications* project has blossomed as a result of significant effort in community focus testing regarding warnings message comprehension and a case study on Tropical Cyclone Marcia in 2015 and the commencement of experiments around modifying the messaging to optimise the desired community response in 2016.

The project team are looking at several key communication channels including social media, especially the networking, key influencers and agency connections. Some of the preliminary findings centre around the timing of the warnings message; using visual cues in messaging; aggregating emergency information; and the tendency for a warning to initiate an information search.

To my knowledge, in 2015 -16 the team have pro-actively pursued regular interactions with end users including teleconferences with end-users; one-on-one briefings; Workshops and presentations at the BNHCRC Research Advisory Forum; AFAC Conference; AFAC Warnings Group; AFAC Community Safety Group; NSW, Vic, QLD Flood Warnings Harmonisation Workshop; NSW Ministry for Police and Emergency Services Behavioural Insights Masterclass.

It is proposed that utilisation of this project will provide Australian Emergency Service Organisations with:

- a) Decision support tools
- b) Best practice warnings guidelines and / or application
- c) Input into doctrinal documents:
- d) Audit and compliance assessment:
- e) Reports, guidelines and other publications

From my perspective as Lead End User, a majority of end-users seem satisfied with the direction that the project is taking and seem engaged as part of the continued efforts by the project team to maintain contact, seek input and receive feedback on project directions.



INTRODUCTION

Australia is exposed to a range of natural disasters including severe storm, fire, cyclone, flood, and to a lesser extent, earthquake and tsunami. These disasters have an estimated cost of \$9 billion a year [4], alongside the more difficult to measure social impact on society and individuals' wellbeing. Governments, authorities, and organisations dedicate significant resources to encourage communities to prepare for and respond to natural hazards. However, recent events, media attention, and ongoing academic research continue to highlight cases of non-compliance. Non-compliance can include an individual's refusal to evacuate when a voluntary or mandatory evacuation message is issued, evacuating when advised not to, and travelling through hazardous areas when advised not to, to name a few. The consequences of non-compliance during a natural hazard can include personal injury or loss of life, and damage to, or loss of property. Individuals who fail to comply with instructions issued during natural hazards significantly impede the emergency response because they divert resources to compliance-enforcement, and risk the lives of emergency service workers who may be required to assist them. The consequences of non-compliance drive the need to understand how to influence individual-level compliance in a natural hazard, through more effective communication.

This project adopts a multi-hazards approach to examine the effectiveness of response and recovery communication in communities (comprising individuals, groups, and businesses) affected by natural hazards. The core project objectives are two-fold:

1. Develop methods to maximise the effectiveness of response and recovery messaging to the community during a range of natural hazard events.
2. Promote both community and disaster agency understanding of the legal motivators for maximising engagement with emergency messages and instructions.

Achieving these objectives will enable the project to deliver evidence-based message content to guide operational and communication strategy, and improve community understanding, decision-making, and compliance during the emergency response and recovery phase of natural disasters.



PROJECT BACKGROUND

The project adopts a highly collaborative, multi-disciplinary, multi-phase and multi-hazards approach to maximise both the engagement of end-users and impact on community behaviours and decision-making. Specifically, the team draw on demonstrated expertise in communication, consumer psychology and marketing, emergency management, and law. The collaborative research activities encompassed by this project focus on developing strategies that maximise the effectiveness of response and recovery messaging in the community. This research program will adopt a multi-hazards approach to:

- examine the content and delivery strategies of official emergency messages;
- develop evidence-based advice to guide trigger communications during hazards;
- analyse the effectiveness and efficiency of official emergency messages in the response and recovery phases;
- promote both community and end-user understanding of the psychological and legal motivators for maximising engagement with response plans and emergency instructions; and
- examine opportunities for application of new technology and communication systems (e.g. emerging digital and social media platforms) to maximise the comprehension and compliance of communities at risk.

Governments, authorities, and organisations dedicate significant resources to educate and encourage disaster preparedness using instructional messages. Instructional messages are the lynchpin of risk and warning communication because they persuade Australians to respond to natural hazards with specific and immediate behaviours [5]. These instructions, which vary from simple messages warning citizens not to drive through floodwater to complex messages about safe ways to evacuate from a hazard-affected district, are designed to protect community health, welfare, and safety.

An investigation of risk and warning communication research suggests three implicit assumptions influence natural hazard research and practice: (1) that community members will comply with instructions issued by governments and agencies that represent the most authoritative voice, (2) that communication campaigns are shaped by intuition rather than evidence-based approaches [6], and (3) that hazards occur as stand-alone rather than linked events [7]. These assumptions have influenced the style of existing risk and warning communication, including instructional messages. In response to these assumptions, this project proposes collaborative research that integrates industry and cross-disciplinary perspectives to provide evidence-based approaches for risk and warning communication across the response and recovery phases of a natural disaster.

Recent natural hazard events in Australia and around the world provide constant reminders of why people should prepare and how people should behave. Yet, industry experiences and research shows that community members still fail to



comply with instructions issued by government agencies [1]. In some cases, individuals ignore official emergency instructions in favour of community-generated warnings, which are often driven through digital platforms. While non-compliant behaviour is often not in the best interest of the individual or community, non-compliance is not necessarily malicious or even intentional. Individuals who fail to comply with instructions issued during natural hazards significantly impede the emergency response because they (a) divert resources to compliance enforcement, (b) risk the lives of emergency service workers who may later be required to assist them, and (c) confuse the core safety message or instruction. Further, the team do not yet have a nuanced understanding of the legal ramifications of non-compliance from perspectives of individuals, agencies, or corporations.

Consequently, this project uses several motivation theories and frameworks to explore key factors that may impede compliance with instructional messages. For example, Protection Motivation Theory [8] examines how individuals protect themselves when coping with a hazardous event. This theory suggests that an individual will appraise both the severity and probability of the threat they face, as well as the efficacy of the instructed action and their self-efficacy in performing that action, before being persuaded to act in the instructed manner. Similarly, the Motive-Opportunity-Ability framework examines an individual's motivation, opportunity, and ability to perform a desired behaviour. The framework first seeks to identify individuals' intrinsic and extrinsic motives to enact (non-) compliant behaviour. For example, individuals may be less motivated to obey an evacuation order if they perceive (rightly or wrongly) that their personal exposure to risk is low, or that the instructions have not been issued from a credible source. The framework also identifies the opportunities that individuals have to perform a compliant behaviour. For example, individuals who intend to obey an evacuation order may be inhibited by environmental mechanisms such as a means of transport or knowledge of a shelter location. Finally, the framework seeks to understand the abilities (i.e. skills and proficiencies) individuals must possess to comply with instructions. For example, individuals who do not understand instructional messages are unlikely to comply.

Finally, drawing on compliance-gaining research from communication and psychological literatures [e.g. 9, 10, 11, 12], the team propose that there are a number of ways in which a message can be framed to increase the likelihood of compliant behaviour. By using these theories and frameworks, the team take a comprehensive psychological approach to explore the individual drivers of non-compliant behaviour in order to improve risk and warning communication effectiveness. As the team develop an understanding of the drivers of non-compliance to instructional messages, they can examine the implications of this behaviour within an Australian legal framework. More specifically, the team seek to investigate the legal vulnerabilities or liabilities of the various stakeholders, such as governments and first responders, within the current legal framework across the Prevention-Preparation-Response-Recovery spectrum to determine if the legal framework creates barriers or enablers to effective communication.

Following an analysis of the peer reviewed literature, policy documents, legislation, inquiry and industry reports, the researchers will draw on multiple and mixed methods including focus groups with the community and experiments to



evaluate the effectiveness of risk and warning communication. This project will explore emergency message content, timing, mode of delivery, and the interplay of 'unofficial' information with concurrent 'official' messaging to promote better understanding of the psychological and legal motivators for maximising compliant community response in the face of a natural hazard.

The results will inform the development of best practice principles for risk and warning communication and recommended changes to the regulatory framework. The messages recommended would take into consideration the legal issues emergency agencies may face when communicating with the community. As major natural disasters have a significant economic impact on society, even small changes in protective behaviours can be valuable [2]. Informed emergency messaging can subsequently reduce the costs associated with disasters, which are largely attributed to the public response to the disaster [3], and could potentially save lives.



WHAT HAS THE PROJECT BEEN UP TO

This section will review the primary project activities for the July 2015-June 2016 year.

1. ASSESSING MESSAGE COMPREHENSION OF EMERGENCY WARNINGS

The purpose of this research work package was to assess emergency warning message comprehension. We sought to examine how existing strategies for emergency warnings during natural hazards are perceived by members of the community, and how/if this information is comprehended and translated into an action or intended action by recipients.

Research Design

Ten focus groups were conducted across Australia. Two focus groups were undertaken in Brisbane (22 June 2015; 25 June 2015), two in Hervey Bay at request of the Inspector General's Office of Emergency Management (25-26 June 2015), two in Victoria: Dandenong at request of Emergency Management Victoria (30 June 2015) and Melbourne at the request of Victoria SES (1 July 2015), two in New South Wales in Kempsey at the request of New South Wales SES, and two in Western Australia, at the request of the Department of Fire and Emergency Services, in Busselton and in Kalamunda. In the focus groups we tested how members of the community comprehended tsunami, severe storm, cyclone, fire, and flood emergency warning messages, which were supplied by our end users as stimuli for discussion.

This research extends on past industry and academic research in four distinct ways:

- *Use of less informed focus group participants* – Our research investigates the message comprehension of emergency warning messages among those in the community not currently involved in emergency-related community groups (including volunteers). Using this sample offers a different perspective to the existing research, which has demonstrated that those involved in emergency-related community groups have a higher than average comprehension of emergency warning messages.
- *Conducted on 'cold' participants* – This research did not follow a recent disaster where participants are likely 'warmed up' to emergency warning messages. Instead, our research assesses message comprehension on a group that is 'cold': the cognitive state of most individuals prior to receiving an initial hazard alert or emergency warning message.
- *Data captures recent changes in communication* – The data collected in these focus groups is more recent, enabling it to capture the changes in emergency communication that arose out of past industry research and event inquiries.
- *Multi-hazard* – Taking a multi-hazard approach to this research is consistent with recommendations from the National Review of Warnings and Information (2014) in order to create congruency across all hazards in emergency communication. Understanding similarities and differences



between community comprehensions of different hazard warnings will add insight to best practice guides.

The focus group findings address issues raised by the [National Review of Warnings And Information](#), which was endorsed in May 2015.

The sample for the focus groups were recruited using Q&A Market Research, a Brisbane based market research company. The sample included an equal mix of genders, and were aged 18 years old and over. Participants were invited to partake in a 90-minute focus group. In the focus group, the participants were first asked to complete a short survey containing a series of demographic and hazard experience questions. Next, participants were shown one of the stimuli and asked whether they understood the message, what they think the message is asking them to do, and what they would do with the information. After discussion of the first stimuli, participants were shown a second stimulus and asked the same questions. The stimuli – emergency warning messages – used in the focus groups were either provided by end-users for testing, or were messages used in a recent natural hazard event. The hazards tested in each focus group included a familiar and unfamiliar hazard for the location (see Table 1).

TABLE 1. FAMILIAR AND UNFAMILIAR HAZARD TESTED IN FOCUS GROUPS, WITH SOURCE OF MESSAGE

Location	Familiar Hazard Tested	Source of Message	Unfamiliar Hazard Tested	Source of Message
Brisbane, QLD	Storm	BOM	Fire	QFES
Hervey Bay, QLD	Cyclone	BOM	Tsunami	BOM
Kempsey, NSW	Flood	NSW SES	Storm	BOM
Dandenong, VIC	Fire	VIC CFA	Flood	VIC SES
Melbourne, VIC	Fire	VIC CFA	Flood	VIC SES
Kalamunda, WA	Fire	WA DFES	Storm	WA DFES
Busselton, WA	Fire	WA DFES	Storm surge	WA DFES

Dissemination

The results were disseminated in a number of ways:

- Preliminary findings were shared in a poster presented at the AFAC Conference in Adelaide, South Australia on September 1-3, 2015 (poster is found [here](#)).
- Preliminary findings were compiled in a report to the BNHCRC on October 31, 2015.
- Findings and recommendations were presented at the Australian and New Zealand Emergency and Disaster Management Conference (ANZDMC) on May 30, 2016 at the Gold Coast, Queensland (abstract available [here](#), page 23).
- A full report on the findings was presented to the BNHCRC on June 30 2016.



Next Steps

The findings from the focus groups were used to inform the development of new emergency warning templates for experimental testing.

FIGURE 1. PRELIMINARY RESEARCH FINDINGS POSTER DISEMINATED TO END USERS

PRELIMINARY RESEARCH FINDINGS
Assessing message comprehension of emergency warnings

bushfire/natural HAZARDS CRC

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PURPOSE
The purpose of this study was to assess emergency warning message comprehension. We sought to examine how existing strategies for emergency warnings during natural hazards are perceived by members of the community, and how/ if this information is comprehended and translated into an action or intended action by recipients.

RESEARCH DESIGN
Ten focus groups have been conducted across Australia (Brisbane and Hervey Bay, Queensland; Kempsey, New South Wales; Melbourne and Dandenong, Victoria; Kalbarinda and Busselton, Western Australia), in the focus groups we tested how members of the community comprehended tsunami, severe storm, cyclone, fire, and flood emergency warning messages, which were supplied by our end users as stimuli for discussion.

PRELIMINARY FINDINGS:

1. **Timing:** frequent (infrequent) updates implies high (low) severity of an event, potentially increasing (decreasing) perceptions of risk
2. **Information seeking:** an emergency warning triggers further information seeking rather than immediate action; people seek localised information to inform risk perceptions and actions; they are looking for confirmation that their potential action will be supported by others
3. **Damage/impact v strength:** highlighting the potential damage/impact of the disaster rather than just the strength (e.g. 200km/hour winds will uproot trees) adds context to decision-making
4. **Familiar v unfamiliar events:** individuals process the messages very differently; requiring more detail about unfamiliar events
5. **Visuals:** community members actively seek out visuals as they help to personalise the risk by indicating likely affected areas
6. **Style:** community members appreciate the use of bolding, headings, and text boxes to highlight important information; information is processed quicker and engages the reader for longer
7. **Aggregate the information:** Not all states aggregate their warnings like in South Australia at www.dierf.sa.gov.au for example, but community members are often seeking a single source of "truth" or a common portal to aid decision-making.

FURTHER ANALYSIS
A report on the preliminary findings was provided to the CRC on October 31st 2015. A full report will be provided to end users and the CRC approximately January 2016. While the final report is being prepared, the findings will be used to design the message compliance experiments we will conduct in our next phase of research.

RESEARCH LIMITATIONS
There were no English as second language participants. This is a unique population that would require specific investigation to make tailored recommendations on message framing to achieve message comprehension in this group. Further, while qualitative research provides rich insights about a phenomenon, it is limited in the generalisability of findings. This however, is not the goal of qualitative research. Finally, the findings are limited to message comprehension in the response phase of a natural disaster. Early recovery messages (e.g. "all clear") were not tested, the focus was on response messaging.

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FIGURE 2. PRESENTATION OF FINDINGS AT THE AUSTRALIA AND NEW ZEALAND EMERGENCY AND DISASTER MANAGEMENT CONFERENCE

bushfire/natural HAZARDS CRC

UNDERSTANDING AND IMPROVING COMMUNITY COMPREHENSION OF EMERGENCY MESSAGES TO FACILITATE PROTECTIVE ACTION

Dr Paula Dootson
Queensland University of Technology

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2. EXPERIMENTS ON MESSAGE COMPLIANCE

The aim of this research is to produce an evidence base for the effectiveness of existing message strategies, and work towards optimising those messages using theoretical insights from psychology, marketing, and behavioural economics.

In conducting these experiments, our objective is to develop research evidence on the effectiveness of instructional messages that end users can integrate with their professional judgement to optimise how instructions are issued to members of the community during the response and recovery phase of natural disasters.

Research Design

Experiments are small, iterative studies that aim to manipulate a specific element of a stimulus and observe any response to this change. To date, a series of five studies have been designed based on qualitative findings from end-user research, our prior research, and end user input. In order to record a baseline level of effectiveness for existing emergency message strategies, and then work towards optimising those messages, we developed a set of location-neutral stimuli for a single hazard event. These basic stimuli are then manipulated across a series of experiments to optimise community members' intentions to perform the desired behaviour and their perceived self-efficacy.

Experimental participants are community members who may at some point be exposed to an emergency message and will need to make a decision on how to act on that message (e.g., evacuate, shelter in place, etc.). Participants comprise a sample of Australians sourced from SSI, a market research organisation with national coverage. Participants are an equal mix of genders, and aged 18 years old and over, and represent each Australian state proportionally. The series of experiments include:

Baseline messages

The messages developed for manipulating in the experiments.

Stylised messages

These messages were formatted using different style tactics (see Table 2).

TABLE 2. FRAMING MANIPULATIONS

MANIPULATION	EXAMPLE OF MANIPULATION
Bolding salient information	You need to leave now and go immediately to a safer place . Your safest option may be to visit family or friends who live away from the affected area.
Colour text for salient information	You need to leave now and go immediately to a safer place . Your safest option may be to visit family or friends who live away from the affected area.
No headings	Headings are removed from the baseline messages.
Textboxes	A textbox is placed around the instructions.
All formatting in one message	All of the above formatting is placed on to one message.



Presence and absence of responders

These messages identify that responders to an event are present in the area with varying levels of specificity (see Table 3).

TABLE 3. RESPONDERS MANIPULATIONS

MANIPULATION	EXAMPLE OF MANIPULATION
Responders present – specific explanation	Fifty swift water rescue responders are in the area.
Responders present – ambiguous explanation	Additional responders are in the area.

Time

These messages manipulate the time between updates with varying specificity to alter risk perceptions (see Table 4).

TABLE 4. TIME MANIPULATIONS

MANIPULATION	EXAMPLE OF MANIPULATION
Specific, long time between updates accounting for situational changes	The next update will be provided at [1 hour from the issue time] or as the situation changes.
Specific, short time between updates accounting for situational changes	The next update will be provided at [15 minutes from the issue time] or as the situation changes.
Vague, long time between updates accounting for situational changes	The next update will be provided in about one hour or as the situation changes.
Vague, short time between updates accounting for situational changes	The next update will be provided in about 15 minutes or as the situation changes.
Specific, long time between updates	The next update will be provided at [1 hour from the issue time].
Specific, short time between updates	The next update will be provided at [15 minutes from the issue time].
Vague, long time between updates	The next update will be provided in about one hour.
Vague, short time between updates	The next update will be provided in about 15 minutes.

Message order

These messages manipulate when the information describing the event is presented in the message (see Table 5).

TABLE 5. MESSAGE ORDER MANIPULATIONS

MANIPULATION	EXAMPLE OF MANIPULATION
Instruction presented prior to details	The instructions for responding to the event are presented before the description of the event.
No details	A description of the event is omitted.
Details last	A description of the event is placed at the end of the message, above the time for the next update.
Details prior to instructions	A description of the event is presented prior to the instructions (similar to the baseline messages).



Future studies

There are additional variations that we would like to test in the next round of experiments:

- Personalisation through visuals: the presence and absence of visuals; static V interactive visuals; maps V images of the event; user-generated V official visuals.
- Deadlines to prompt action: providing a deadline for instructions to be completed by
- Manipulating cognitive load when testing optimised messages to simulate stress

Next Steps

As data collection is currently underway, the next steps would be to:

- Run additional experiments identified as pertinent at the RAF,
- Distribute a report on the experiments by September 2016,
- Disseminate the results of end-users, and
- If end users opt in, run live testing of the messages in hazard season 2016-2017 and 2017-2018.

FIGURE 3. EXAMPLE STIMULI - MESSAGE ORDER WITH NO WEATHER DETAILS

PREPARE TO EVACUATE

Time of issue: 10:00am
Date of issue: Friday January 15th

People in Pebble Bay in the mid-north coastal region should PREPARE TO EVACUATE due to flooding.

You do not need to evacuate at this time but you should prepare to evacuate if the situation changes.

How to Prepare for Evacuation:

- Raise belongings by placing them on tables, beds and benches. Put electrical items on top. You may be able to place light items in the roof space.
- Collect together medicines, personal and financial documents, mementos and photos.
- If possible, check to see if your neighbours need help.
- Make arrangements for care of pets or other animals, or take pets with you when you evacuate.
- Collect together spare clothing, medicines, and personal hygiene supplies.
- Find out where to turn off the electricity and gas.
- Continue to listen to your local ABC radio station for updates.

If you are prepared and wish to evacuate early, your safest option may be to visit family or friends who live away from the affected area. Alternatively, you may evacuate to a temporary evacuation centre that has been set up at **Gaagoil** Community Centre.

Never drive, ride, swim, or walk through floodwater as it is dangerous and potentially toxic.

Keep Up to Date:

Road closures:	www.traffic.gov.au	Phone: 1300 100 200
Weather warnings and river heights:	www.bom.gov.au	Phone: 1300 659 217
SES information:	www.ses.gov.au	Phone: 1300 842 000
Transport:	www.transport.gov.au	Phone: 13 10 00

If You Need Assistance:

For SES assistance, call 1300 842 000.
For life threatening emergencies, call 000.

FIGURE 4. EXAMPLE STIMULI – ALL FORMATTING IN ONE MESSAGE

SAFE TO RETURN

Time of issue: 10:00am
Date of issue: Friday January 15th

It is now safe for people to **RETURN** to **Pebble Bay** in the **mid-north coastal region**.

What to Do:

- Be aware of road hazards such as mud, debris, and damaged roads or bridges.
- Check your home or building for damage before you re-enter.
- If your property has been flooded, all electrical and gas appliances should be checked by a licensed technician before you use them.
- Dry out and clean buildings straight away.
- When cleaning up, wear strong boots, gloves, and protective clothing, and wash your hands and clothes regularly.

Never drive, ride, swim, or walk through floodwater as it is dangerous and potentially toxic.

Keep Up to Date:

Road closures:	www.traffic.gov.au	Phone: 1300 100 200
Weather warnings and river heights:	www.bom.gov.au	Phone: 1300 659 217
SES information:	www.ses.gov.au	Phone: 1300 842 000
Transport:	www.transport.gov.au	Phone: 13 10 00
Recovery information:	www.hs.gov.au	Phone: 13 50 10
Recovery information (farm and rural):	www.dpi.gov.au	Phone: 13 51 00

If You Need Assistance:

For SES assistance, call 1300 842 000.
For life threatening emergencies, call 000.

3. RESEARCH ADVISORY FORUM

As part of the BNHCRC project, the team attended the 2016 Research Advisory Forum (RAF) in Hobart, Tasmania, May 11-12. In attendance at the RAF were Professor Vivienne Tippett, Dr Dominique Greer, and Dr Paula Dootson. During the RAF the team was able to run a workshop with end-users to discuss the project deliverables and upcoming work. The RAF was an excellent opportunity to engage with end-users and seek input to tailor future research outputs to their needs, within the scope of the existing project plan. To ensure the RAF was valuable for the researchers and end-users, the team sent out preparatory materials updating end users on progress to date and outlining the opportunities for utilisation. A teleconference was subsequently held with end users who were unable to attend the forum. The team is now working one-on-one with end users to utilise the research findings.



FIGURE 5. DR DOMINIQUE GREER SPEAKING AT THE RESEARCH ADVISORY FORUM, HOBART, TASMANIA, 12 MAY 2016



4. WORKSHOPS AND EXPERT DISCUSSIONS

Beyond the workshops and RAF, the team has also engaged in a number of workshops and expert discussions with end-users and other emergency management practitioners to disseminate research findings and to gauge the value and validity of our hypotheses and research findings. During this period, the team has also been invited to participate in a number of workshops as experts in the field. These are discussed below.

AFAC Warnings Group and Community Safety Group

Dr Amisha Mehta was invited to represent the project team at the AFAC National Warning Frameworks Workshop in Melbourne at State Control Centre on 26 and 27 April 2016. The workshop aligns to Recommendation 3 from the 2014 National Review of Warnings and Information.

Dr Amisha Mehta was invited to represent the project team at the AFAC Warnings Group meeting in Sydney on 1 December 2015. Dr Mehta presented findings from the recent focus groups on message comprehension and findings from the first social media package looking at emergency services, media, and community member use of social media during Tropical Cyclone Marcia.

Dr Amisha Mehta presented '*Building resilient communities: Effective communication during response and recovery phases of natural hazards*' to the Community Safety Group in Melbourne, Australia with BNHCRC end-users on 22 April, 2015.

WasteNSW 2016 Natural Disasters

Dr Paula Dootson was invited to speak at the Waste Management Association of Australia's (WMAA) WasteNSW 2016 Natural Disasters, Risk Management Conference. The WMAA is the peak body for the waste and resource recovery industry. The conference aimed to provide organisations with a better understanding of how the increasing frequency and ferocity of natural disasters may affect their business. The conference was held at Crowne Plaza Hunter Valley, NSW from 27 – 29 April 2016.

Disaster Education

Dr Amisha Mehta presented the project research to two cohorts of students in PUZ104 Leadership in Disaster Management (2 February 2016; 8 March 2016; 10 March 2016). PUZ104 Leadership in Disaster Management is a short course designed to develop managers' knowledge and understanding of the human impact of disasters and the principles and practice of disaster management, enabling them to work effectively with individuals, communities and organisations in a disaster management context. The students used the information and risk communication themes in their first assessment item, a briefing of an impending event to a group of their choice which included local, district, state groups or media.



Flood Hypothetical: Brisbane 2036

The QUT Center for Emergency and Disaster Management held a full-day practical workshop on February 4th 2016 that connected practitioners and leading academics to unravel scenarios of a future Brisbane flood in the year 2036. The event provided an opportunity to hear from Local and State Governments, emergency services, utilities, consultants, insurers, researchers and the media, of their views and plans for the next 20 years. Dr Amisha Mehta presented at this event. BNHCRC representatives were in attendance.

Bundaberg Local Disaster Management Group Meeting

Dr Paula Dootson was invited by Disaster Management Officer Matt Dyer of the Bundaberg Regional Council to present to the Bundaberg Local Disaster Management Group Meeting with representatives from all the key agencies involved when there is a natural disaster (16 December 2015). The Mayor led the meeting. The presentation was on applying marketing principles and behavioural economics to emergency communication. The presentation included data from the social media work package and the community focus groups. This presentation was tailored to how emergency agencies can craft messages that enable the community to make informed decisions during the response and recovery phases of a natural hazard. Attendees wrote down ways in which they could apply the information in their emergency communications during an event. Some of the qualitative feedback on how some of the attendees would implement the ideas presented includes:

- Simplifying technical language in all messages including all public facing documents and guidelines, personalising messages, adding times, utilising bolding, chunking tasks to make them easier, simplifying the storm tide language, positioning the community as 'prepared', resilience messaging in recovery phase (prompting preparation), use of first person accounts to influence behaviour, better use of visuals throughout the event.

An impact statement from the trip to Bundaberg is provided in Appendix A.

ABC Wide Bay Planning Day

Dr Paula Dootson was invited by Regional Content Manager of ABC Wide Bay, Scott Lamond, to present to the ABC Wide Bay team (including their radio, online, social media, and TV staff) at their planning day (15 December 2015). The presentation was on applying marketing principles and behavioural economics to emergency communication. The presentation included data from the social media work package and the community focus groups. This presentation was tailored to how the media can aid in crafting and disseminating messages that enable the community to make informed decisions during the response and recovery phases of a natural hazard. The team was enthusiastic about the interactive presentation and all of the team wrote down ways in which they could apply the information in their emergency planning and during an event. Some of the qualitative feedback on how some of the attendees would implement the ideas presented includes:

- Gathering film and audio content on the preparation activities of different members of the community to demonstrate the descriptive norm that



people in Bundaberg do prepare, offering preparation advice in the recovery phase of the disaster, using examples in their radio broadcasts to turn technical weather language into information the community can understand, aggregating information into one place to remove friction costs of information seeking during an event, not using “update in 15 minutes” and use “live updates” to overcome the community using time as a proxy for event severity, engaging with and sharing community content to prevent putting journalists in high risk situations, avoiding reporting from inside a hazard zone, make important information more salient in print content, using social media to link people to the live radio stream (for those not listening to the radio), use direct links to the information not to a home page, use more visuals, highlighting the positive stories (like evacuating early).

Message Harmonisation

Professor Vivienne Tippett was invited by NSW SES Community Engagement Officer Andrew Richards to attend a workshop with Wollongong NSW SES on harmonisation of emergency messaging across NSW and Victoria SES agencies (17 August 2015). These agencies are seeking to harmonise their messaging and Prof. Tippett was there to advise and share knowledge on behalf of the project team. This meeting was driven by a recommendation of the recent National Review of Warnings and Information.

Operation Seaweed

Dr Paula Dootson was invited by Julie Bruynius, Community Engagement Officer North Coast Region, QFES, to speak at ‘Operation Seaweed’, the QFES training day where a number of agencies involved in emergency response and recovery (QFES, Police, Ambulance, Defence, etc.) were presented with a scenario to workshop. Prior to the scenario activity, a number of speakers presented including:

- Mr. Iain MacKenzie – Inspector General of Emergency Management, IGEM
- Mr. Mark Roche Deputy Commissioner Operations & Emergency Management, QFES
- A panel of DDMG Executive Officers, QPS
- Dr. Richard Wardle – Bureau of Meteorology Senior Staffer, BOM
- Dr. Paula Dootson – Postdoctoral Research Fellow, Queensland University of Technology and Bushfire and Natural Hazard Cooperative Research Center
- Mr. John Bolger – A/Assistant Commissioner, QFES North Coast

QFES Pre-Season Briefing

Dr Paula Dootson was invited by Sarah Canon, Emergency Management Coordinator of QFES to speak at the QFES pre-season briefing session on 28 October 2015. The invitation was based on Dr Dootson’s presentation at



'Operation Seaweed', as reported in last quarter's report. Dr Amisha Mehta spoke alongside Dr Dootson at the pre-season briefing, sharing the findings from the social media analysis of Twitter use during Cyclone Marcia.

Emergency Management Conference 2015

Dr Vivienne Tippett was invited by the organising committee to present at the Emergency Management Conference (EMC) in Melbourne 7-8th July. This was the 15th annual EMC, attended by around 500 delegates from police, fire, ambulance and SES, local government, state departments and response and recovery agencies. The conference was presented by the Emergency Services Foundation, a charitable trust, which financially supports families of emergency services workers injured or killed on duty. It also awards a number of overseas study scholarships each year to emergency management volunteers and professionals. Dr Tippett shared insights from research conducted for this project.

Panel: Emergency Communication for Severe Weather Events

Dr Vivienne Tippett was invited to participate on a panel arranged by the Australian Meteorological and Oceanographic Society [AMOS] (14 July 2015). This was a public panel chaired by science journalist and ABC broadcaster, Robin Williams entitled *Emergency Communication for Severe Weather Events*. Panel members included:

- Lt. Commander Joanna Beadle: Director, Resilience and Recovery at the Department of Local Government, Community Recovery and Resilience
- Prof. Jim McGowan AM: Previous Director-General of the Queensland Department of Community Safety
- Prof. Vivienne Tippett: Leader of a Bushfire and Natural Hazards CRC consortium on emergency warnings and crisis communication
- Mr. Rob Webb: Queensland Regional Director of the Bureau of Meteorology; BOM, past Director General of Emergency Services & current



5. INTERNATIONAL ENGAGEMENT

National Consortium for the Study of Terrorism and Responses to Terrorism (START), University of Maryland, USA

Dr Amisha Mehta visited and collaborated with Dr Brooke Liu at the University of Maryland's National Consortium for the Study of Terrorism and Responses to Terrorism (START) research center in Washington DC (6-8 June 2016). Dr. Liu serves as the Director of START'S Risk Communication & Resilience Program. Her research investigates how effective risk and crisis communication can optimally prepare the public to respond to and recover from disasters. In recent years, her research has focused on the unique roles that governments' social/new media can play in building community resilience. Dr Mehta presented a communication skills clinic to START student interns. Dr Mehta and Dr Liu shared research findings from respective research centers to build a mutually beneficial relationship between the US and Australia on risk communications research in natural disasters.

Natural Hazards Workshop 2015, USA

Dr Paula Dootson received a BNHCRC grant to attend the 40th annual Natural Hazards Workshop, in Broomfield, Colorado (July 19-22). Over four days Dr Dootson represented the BNHCRC and the Queensland University of Technology, learning about the key issues in natural disasters facing the U.S. and other countries around the world. Following the conference, Dr Dootson wrote a blog post for the BNHCRC website that is available at: <http://www.bnhcrc.com.au/news/blogpost/paula-dootson/2015/hazard-learning-colorado>

Behavioural Exchange Conference 2015, UK

Dr Dominique Greer and Dr Paula Dootson attended the Behavioural Exchange conference run by the Behavioural Insights team on September 2-3, 2015 in London, UK. The purpose of attending was to learn from global leaders in the behavioural economics field. While this was not funded by the BNHCRC project, the learnings gathered from the event are relevant to the ongoing experiment work package on compliance based emergency messaging. While behavioural economics has been used in a number of contexts to inform behaviour and public policy, emergency management is a context yet to be tested.



6. CONFERENCES

The team has presented at a number of conferences across the health, communications, and emergency management fields. The presentations, locations, and presenters are listed below.

Australia and New Zealand Disaster and Emergency Management Conference 2016

An extended abstract titled 'Understanding and improving community comprehension of emergency messages to facilitate protective action' was peer reviewed and subsequently accepted for this conference. Dr Paula Dootson presented the work at the Jupiter's Casino at the Gold Coast, Queensland (May 30-31, 2016). The presentation included the findings of the focus groups on community emergency message comprehension, conducting across Australia in mid-late 2015.

AFAC Conference 2015

PhD student Melanie Baker-Jones attended the AFAC conference in Adelaide (31st August – 5th September). Ms Baker-Jones' attendance included the pre-conference workshop, 'How do I get my first journal paper published', delivered to improve students understanding of the publication process. Ms Baker-Jones also presented a poster during the conference entitled, 'Social Media: The difference between public expectation and the ability to blame at law when expectations are not met?' explaining the core premise of her PhD thesis. The poster is available here: <http://www.bnhcrc.com.au/resources/poster/2022>. During the stream on Information and Warnings, Ms Baker-Jones delivered a 3 minutes thesis presentation. On the final day Ms Baker-Jones attended the post conference workshop, 'Beyond Engagement: building the social media program you community needs'. Attendance at this workshop, brought Ms Baker-Jones in touch with further end-users interested in social media, as a result, she has now joined the AFAC social media Facebook group for the purpose of sharing relevant information.

A poster was presented for this project at the AFAC conference 2015, September 1-3rd, Adelaide, South Australia. The poster can be found here: http://www.bnhcrc.com.au/sites/default/files/managed/downloads/v._tippett_d._greer_a._mehta_s._christensen_b._duncan_a._stickley_p._dootson.pdf



7. UTILISATION

Utilisation Tools

Through discussions with end-users, a number of opportunities have been identified for utilising the research conducted on this project. Provided here is a summary of the types of utilisation being actioned over the coming year. Table 6 provides a brief overview of how each work package is being utilised.

Decision Support Tool (“Warning Wizard”)

The decision support tool involves communication tips being built into existing warning systems that agencies use (e.g. Whisper). The decision support tool will provide support to agencies on the unknowns of emergency warnings, such as: compliance-gaining message framing, community comprehension inhibitors, encouraging the personalisation of risk, and triggering protective action. End-user live testing of the decision-support tool will begin during summer 2016-17.

Best Practice Warnings

This utilisation strategy can take three possible forms: (1) providing end users with a file of best practice messages, (2) consult with agencies to incorporate evidence base of best practice messages into their existing message templates, or (3) workshops with relevant end-users on best practice warnings through platforms like the Australian Institute for Disaster Resiliemce. Some end users have already scheduled some consulting work with us in this space. End-user live testing of message will likely occur during summer 2016-17 and 2017-18.

Input into Doctrinal Documents

Amanda Leck (AFAC) and Reegan Key (EMV) have offered us an opportunity to co-create doctrinal guidelines around effective communication, which offers utilisation at a policy level.

To date:

- Input in to the AFAC Warnings Group and Community Safety Group (ongoing)

Audit and Compliance Assessment Tool

Following end-user support at the Research Advisory Forum 2016, an audit and compliance assessment tool will be developed for our end users. The goal is to provide a response to the common legal concerns while also offering tailored solutions for each end-user as required, accounting for any jurisdictional differences. Steps to utilisation include:

1. Contact end users individual to ascertain what their primary legal concerns are around risk and warning communication, taking in to account the existing protocols in place in that jurisdiction. [June – December 2016]



2. Collate the concerns from end-users and prepare advice, tools, and/or processes to mitigate the commonly identified legal concerns around risk and warning communication. [January – June 2017]
3. Create scenarios for use in training that address common concerns and misconceptions about negligence, 'in good faith', and other legal concerns for risk and warning communication. [January – June 2017]
4. Disseminate these tools to end-users for testing and feedback. [June 2017]

Using the skills from our legal researchers, we can offer workshops and, or consulting around legal compliance issues for emergency communication.

Legacy Content

While the previous utilisation opportunities are quite practical, the team will still be preparing reports for each work package as an evidence base for the practical utilisation of the research. The legacy content will be available following the completion of each work package. We will also be disseminating podcast overviews of each work package to highlight the key findings of value to end-users. These will be available in the second half of 2017.

TABLE 6. WORK PACKAGE AND UTILISATION CROSS OVER

WORK PACKAGE	Decision Support Tool	Best Practice Warnings	Input into Doctrinal Documents	Legacy Content	Audit and Compliance Assessment Tool
Message Comprehension Of Emergency Warnings	√	√	√	√	
Message Compliance Experiments	√	√	√	√	
Audit and Compliance			√	√	√
Social Media Communications		√	√	√	√
Business Resilience		√	√	√	

Utilisation Activity

The current utilisation activity includes the following.

Consulting with Country Fire Service (CFS), South Australia

The team was asked to review the CFS emergency warning messages for the upcoming hazard season. The team is liaising with Fiona Dunstan, CFS Manager Information Operations, and Peta O'Donohue, Acting Manager Information Operations. A review was conducted (23 June 2016) on all the templates for



each level of event escalation and associated fire warnings. The research informing the review included the community emergency message comprehension focus group findings and the message compliance experiments preliminary findings. A teleconference was held (24 June 2016) to discuss the possible changes and what implications that would have for the messages being used in the upcoming hazard season. In August 2016 the team will travel to Adelaide to work with the CFS team to discuss changes and the opportunities to evaluate the changes in the upcoming hazard season.

Emergency Management Victoria (EMV)

Marc Unsworth, Senior Officer Public Information & Warnings, invited the team to have input on changes EMV is making to their emergency warning messages. A teleconference was held with EMV to guide their changes (24 June 2016). The research informing our suggestions includes the community emergency message comprehension focus group findings and the message compliance experiments preliminary findings. In August 2016 the team will travel to Melbourne to work through changes and assess how research findings can be embedded into the existing warning systems (e.g. Whisper). We will also discuss the opportunities for evaluating how effective the changes are in the upcoming hazard season.

SEQwater

The work for South-East Queensland Water (SEQwater) is discussed below in section 9, under the requests for follow up projects.

Next steps

This is just the beginning of the utilisation activities that will make up the 2016-17 reporting period.



8. MEDIA

There are a number of media pieces to report this period, including:

- Blog post on BNHCRC website by Dr Amisha Mehta, "Designing warnings with community at the start and heart of national frameworks", found here: <http://www.bnhcrc.com.au/news/blogpost/amisha-mehta/2016/designing-warnings-community-start-and-heart-national-frameworks>
- Tippett, V. 2016. Expectations and harsh reality: why bushfire warnings fail. *The Conversation* <http://theconversation.com/expectations-and-harsh-reality-why-bushfire-warnings-fail-53050>
- Professor Vivienne Tippett did a radio interview with ABC South Australia on Tuesday January 19, 2016 about her article on The Conversation regarding bushfire warnings.
- Dr Paula Dootson did an interview with ABC Wide Bay radio promoting the work by QUT and the BNHCRC (aired Monday 21 December 2015)
- Blog post on BNHCRC website by PhD student Melanie Baker-Jones, "Social media in emergency management", found here: <http://www.bnhcrc.com.au/news/blogpost/melanie-baker-jones/2015/social-media-emergency-management>



9. REQUESTS FOR FOLLOW-UP PROJECTS

South-East Queensland Water

South-East Queensland Water (SEQwater) approached the team seeking help with improving their dam release messaging, as required by a recent Inspector General of Emergency Management Queensland review of SEQwater messaging during a recent flood event. With permission from the BNHCRC, we have secured funding from SEQwater to run focus groups and experiments similar to those run for the BNHCRC project that ascertains community message comprehension and optimises the dam release message to trigger protective action. This project is running March 2016-August 2016. Team members involved in this project are Professor Vivienne Tippett, Dr Amisha Mehta, Dr Dominique Greer, and Dr Paula Dootson.

Queensland Fire and Emergency Services

The BNHCRC requested the team lead a project co-funded by the BNHCRC and the Queensland Fire and Emergency Services (QFES) in North Queensland to better understand community expectations of emergency service providers.



PUBLICATIONS LIST

JOURNAL – PEER REVIEWED

1. Tippett, Vivienne, Mehta, Amisha M., Greer, Dominique, Dootson, Paula, Duncan, William D., Christensen, Sharon A., et al. (2015) [\[Conference abstract\] Effective communication during disasters: What effects community decision making & action?](#) *Prehospital and Disaster Medicine*, 30(1), s83.
2. Dootson, Paula, Mehta, Amisha M., Greer, Dominique, Tippett, Vivienne, Duncan, William D., Christensen, Sharon A., et al. (2015) [\[Conference abstract\] Effective emergency messaging during natural disasters: An application of message compliance theories.](#) *Prehospital and Disaster Medicine*, 30(1), s12-s13.
3. [Under review]
4. Public policy analysis on emergency warnings and communications, *Public Administration Review* [H Index= 80; Q1 SCImago]
5. [In preparation]
6. Improving emergency message comprehension to encourage protective actions *Prehospital & Disaster Medicine* [H index=33; Q1 SCImago rating]
7. Message comprehension and message framing, *Journal of Business Research* [H index = 100, Q1 SCImago rating]

CONFERENCE PAPER – PEER REVIEWED

1. Mehta, Amisha, Greer, Dominique, Dootson, Paula, Christensen, Sharon Anne, Duncan, Bill, Stickley, Amanda, et al. (2014) Making smart decisions: key steps towards a typology for emergency communication during natural hazards. In International Communication Association 2014: Digital Transformations, Social Media Engagement and the Asian Century, 1-3 October 2014, Brisbane, QLD.

CONFERENCE ITEM – PEER REVIEWED

2. Dootson, Paula., Greer, Dominique. A., Mehta, Amisha, and Tippett, Vivienne. Understanding and improving community comprehension of emergency messages to facilitate protective action. In Australian & New Zealand Disaster and Emergency Management Conference, 30-31 May 2016, Gold Coast, Qld.
3. Tippett, Vivienne, Mehta, Amisha M., Greer, Dominique, Dootson, Paula, Duncan, William D., Christensen, Sharon A., et al. (2015) Effective communication during disasters. In Australian & New Zealand Disaster and Emergency Management Conference, 3-5 May 2015, Gold Coast, Qld.
4. Tippett, Vivienne, Mehta, Amisha M., Greer, Dominique, Dootson, Paula, Duncan, William D., Christensen, Sharon A., et al. (2015) Effective communication during disasters: What effects community decision making & action? In 19th World Congress on Disaster and Emergency Medicine (WCDEM), 21-24 April 2015, Cape Town, South Africa.



5. Dootson, Paula, Mehta, Amisha M., Greer, Dominique, Tippett, Vivienne, Duncan, William D., Christensen, Sharon A., et al. (2015) Effective emergency messaging during natural disasters: An application of message compliance theories. In 19th World Congress on Disaster and Emergency Medicine (WCDEM), 21-24 April 2015, Cape Town, South Africa.
6. Baker-Jones, Melanie, Duncan, William D., Christensen, Sharon A., Stickley, Amanda P., Tippett, Vivienne, Mehta, Amisha M., et al. (2015) Legal mechanisms for maximising community engagement with formal evacuation messaging: How well are these understood? In 19th World Congress on Disaster and Emergency Medicine (WCDEM), 21-24 April 2015, Cape Town, South Africa.
7. Tippett, Vivienne, Greer, Dominique A., Mehta, Amisha M., Christensen, Sharon A., Duncan, William D., Stickley, Amanda P., et al. (2015) Building resilient communities: Creating effective multi-channel communication during disaster response and recovery. In AFAC 2015, 1-3 September 2015, Adelaide, SA.
8. Tippett, Vivienne, Greer, Dominique, Mehta, Amisha, Dootson, Paula, Christensen, Sharon, Duncan, Bill, et al. (2014) Building resilient communities: creating effective multi-channel communication during disaster response and recovery. In AFAC: After Disaster Strikes, Learning from Adversity, 2-5 September 2014, Wellington, New Zealand.



CURRENT TEAM MEMBERS

RESEARCHERS

Professor Vivienne Tippett (QUT Health), Professor Sharon Christensen (QUT Law), Professor Bill Duncan (QUT Law), Associate Professor Amanda Stickley (QUT Law), Dr Dominique Greer (QUT Business School), Dr Amisha Mehta (QUT Business School), and Dr Paula Dootson (QUT Business School).

STUDENTS AND RESEARCH ASSISTANTS

Melanie Baker-Jones (PhD student – law) attained “Associate Student” status of the BNHCRC and top-up scholarship from BNHCRC (February 2015).

END USERS

Lead

Andrew Richards, Community Engagement Manager, State Emergency Services, NSW

Ongoing

Anthony Clark, New South Wales Rural Fire Service; Fiona Dunstan, Country Fire Service, South Australia; Gwynne Brennan, Country Fire Authority, Victoria; Laura Keating and Suellen Flint, Department of Fire and Emergency Services, Western Australia; Reegan Key, Emergency Management Victoria; Iain McKenzie, Office of the Inspector-General Emergency Management, Queensland; Wendy Kelly, Attorney-General's Department, ACT; Trent Curtin, Metropolitan Fire and Emergency Services Board, Victoria; Sandra Barber, Tasmania Fire Service; Karen Enbom, Country Fire Authority, Victoria; Nicole Ely, Metropolitan Fire Service, South Australia; Simon Goodwin and Michelle Coombe, South Australia Fire and Emergency Services Commission; and Heather Larkin, Office of the Inspector General for Emergency Management, Victoria.

Unofficial end-users

Amanda Leck, Australasian Fire and Emergency Service Authorities Council, Rowena Richardson and Nicola Moore, Office of the Inspector General Emergency Management, QLD, Samantha Chard, Attorney-General's Department, ACT, Shannon Panchuk, Bureau of Meteorology, ACT, Mark Unsworth, Emergency Management Victoria, VIC.



REFERENCES

1. Dash, N., & Morrow, B. H. (2000). Return Delays and Evacuation Order Compliance: The Case of Hurricane Georges and the Florida Keys. *Environmental Hazards*, 2(3), 119-128.
2. Lindell, M. K., & Perry, R. W. (2012). The Protective Action Decision Model: Theoretical Modifications and Additional Evidence. *Risk Analysis*, 32(4), 616-632.
3. Burns, W. J., & Slovic, P. (2012). Risk Perception and Behaviors: Anticipating and Responding to Crises. *Risk Analysis*, 32(4), 579-582.
4. Deloitte. (2016). The economic cost of the social impact of natural disasters. Retrieved 2 March 2016 from <http://australianbusinessroundtable.com.au/our-papers/social-costs-report>
5. Sturges, D. L. (1994). Communicating through Crisis A Strategy for Organizational Survival. *Management Communication Quarterly*, 7(3), 297-316.
6. Wood, M. M., Mileti, D. S., Kano, M., Kelley, M. M., Regan, R., & Bourque, L. B. (2012). Communicating Actionable Risk for Terrorism and Other Hazards. *Risk Analysis*, 32(4), 601-615.
7. Ren, C. H. (2000). Understanding and managing the dynamics of linked crisis events. *Disaster Prevention and Management: An International Journal*, 9(1), 12-17.
8. Rogers, R. R. (1975). A Protection Motivation Theory of Fear Appeals and Attitude Change. *The Journal of Psychology: Interdisciplinary and Applied*, 91(1), 93-114.

APPENDIX A



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Impact statement prepared for Dr Paula Dootson

In relation to:

Presentation delivered to Bundaberg Local Disaster Management Group, December 2015

Following Dr Dootson's (Postdoctoral Research Fellow, School of Advertising, Marketing & Public Relations, Queensland University of Technology) participation at the Queensland Government's "Exercise Seaweed" on the Sunshine Coast in September 2015 – at which Bundaberg Regional Council Disaster Management Officer and other senior officers observed firsthand the relevance of her research to local disaster management arrangements - Dr Dootson was invited to present salient aspects of her research associated with emergency/disaster warnings to the Bundaberg Local Disaster Management Group (LDMG). As part of Dr Dootson's visit to the Bundaberg Local Government Area (LGA), she presented and workshopped elements of her research around warnings in a separate session with Wide Bay ABC Radio (which is a vital and active member of the Bundaberg LDMG).

The Bundaberg LDMG is committed to, and proactive in, establishing and maintaining highly-effective disaster management arrangements. In January 2013 Bundaberg LGA along with numerous other LGAs experienced severe weather associated with Ex-Tropical Cyclone Oswald. The effects at Bundaberg in particular were extreme and included storm tide, five tornadoes (an Australia mainland record for tornado quantity in a 24 hour period) and Extreme Major Flooding (as a result of the unprecedented flooding on the Burnett River BoM introduced a qualitative augmentation to the traditional Minor, Moderate, Major flood descriptors, by including the word "Extreme").

The severe weather resulted in the largest mandatory evacuation in Queensland history (in excess of 5,500 people); approximately 2,000 people were accommodated in official evacuation centres throughout the region, with thousands more self-evacuating to friends and family or "unofficial" evacuation centres). More than 4,000 properties were impacted by floodwaters; more than 100 properties were impacted by tornadoes. Issues were observed around the community's response to official warnings from the Local Disaster Management Group, Council, Police, Bureau of Meteorology (BoM) and other emergency service agencies.

The threat posed to Bundaberg LGA by Category 5 Tropical Cyclone Marcia in February 2015 was a further reminder that community safety is more likely to be an outcome of local disaster arrangements when warnings are apt and citizens and visitors know what to do with information provided by warnings.

Dr Dootson provided members of the Bundaberg Local Disaster Management Group a rational, evidenced set of considerations to enhance local warnings. The fact that there is pertinent research being undertaken by institutions such as QUT was in and of itself an invaluable realisation for members of the LDMG. The Bundaberg LDMG strives to be professional and contemporary



disaster management team. Bringing in outside expertise along with critical reflection (that is meaningful and more valuable than the ubiquitous "debrief") are mechanisms by which this is achieved. Dr Dootson's research and expertise as presented to the Bundaberg LDMG provided a grounding upon which members of the LDMG can enhance existing warnings and Dr Dootson has expanded our understanding of the psychology of the constituent part of communities: the humans.

Following Dr Dootson's presentation to the Bundaberg LDMG, the wording of existing warnings is being reconsidered. So too are the delivery methods and frequencies with which warnings are provided to the community. Improvements to existing pre-formatted warnings will be captured in the next review of the Bundaberg Local Disaster Management Plan and subordinate plans. Also noteworthy is that the Bundaberg LDMG is considering how to involve the community in future warning development and identifying how local citizens would best receive warnings but that is practicable and timely in a disaster context.

Measuring the *effect* of the evolution in warnings at the Bundaberg LGA level may be difficult in a strictly scientific sense. However, discussions have commenced about the possibility of utilising methodologies and scales from the behavioural/social sciences to seek data that indicates effect. Anecdotal and observational evidence obtained by the Bundaberg LDMG indicated that during the 2013 floods at Bundaberg a significant number of people did not respond appropriately to earlier advices to evacuate at-risk areas, contributing to the extraordinary utilisation of helicopter evacuation from North Bundaberg in 2013. It has been suggested (only half tongue-in-cheek) that "*counting the number of helicopters*" be an indicator of warnings efficacy. More generally, an increased level of community resilience is something that can be measured (or at least inferred) and it may be through qualitative tools (eg: interviews; open-ended items on survey instruments) that a sense for the effect of change over the next time period will be sensed. Also, GeoScience Australia (a Commonwealth agency) undertakes social research following disasters and does indeed include a focus on "warnings": research undertaken by agencies such as GeoScience Australia figures to be an invaluable source of information to understand the effect of efforts to improve warnings.

One of the key aspects that the Bundaberg LDMG sought to achieve by inviting Dr Dootson to Bundaberg was to open some doorways between academia and practice, and to enable "on-the-ground" solutions for disaster managers that have a sound theoretical basis. The dialogue that occurred both in-session, but importantly out-of-session, between key members of the Bundaberg LDMG and Dr Dootson was extremely prized. Minds have been expanded; opportunities have been glimpsed and a realisation had that there is an existing and emerging body of information that can be integrated into local arrangements.

It must be said that Dr Dootson's visit was probably the first tangible indication for a majority of the members of the Bundaberg LDMG – people who have non-trivial responsibility as "doers" and managers at a local level - of the significant work that collectives such as the Bushfire and Natural Hazards Cooperative Research Centre have undertaken, let alone individual universities across Queensland and Australia. The Bundaberg LDMG is proud to model an example of how to build relationships across sectors to the greater disaster management good.

A great deal of credit needs to be given to Dr Dootson in terms of how she engaged with the group. It should probably be no surprise that a person who is researching areas that include disaster communication efficacy is herself a skilled communicator. She enlivened the group, introduced new ideas without eliciting a round of "folded arms", and then empowered the group by outlining clear strategies and bite-sized actions that could have immediate effect improving disaster arrangements at Bundaberg LGA.



Dr Dootson's work with the Bundaberg LDMG has left an indelible mark on how this LDMG thinks about future warnings. Thus, the group as a whole and individual members representing a wide array of key local agencies have better skills in disaster management as an outcome of this visit.

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