



NATIONAL REVIEW OF WARNINGS AND INFORMATION

Final Report
November 2014



An Australian Government Initiative

About this document

Document Information

Criteria	Details
Document title	National Review of Warnings and Information: Final Report November 2014
Document owner	Craig Lapsley, Commissioner, Emergency Management Victoria
Document custodian	Reegan Key, Manager Public Information and Warnings, Emergency Management Victoria
Document author	Cube Group
This version	1.0
Issue date	29/04/2014

Version	Release Date	Description	Author
1.0	29/04/2015	Final Report, endorsed by the Review's Steering Committee in November 2014 and subsequently formally accepted by the Australia New Zealand Emergency Management Committee (ANZEMC)	Cube

About this Report

The *National Review of Warnings and Information* has been funded by the Commonwealth Government's National Emergency Management Project (NEMP) Grants Program. It has been overseen by a national Steering Committee chaired by Emergency Management Victoria and was formally accepted by the Australia New Zealand Emergency Management Committee in April 2015. The following organisations have delivered elements of the project:



Recommended citation for this document:

Emergency Management Victoria (2014) *National Review of Warnings and Information: Final Report*, Victorian Government, Melbourne, Cube Group

Steering Committee Governing this Review

Member	Agency
Craig Lapsley	Emergency Management Victoria (Chair)
Amanda Leck	Australasian Fire and Emergency Services Authorities Council
Shane Patton/ Ross McNeil/ Andrew Crisp	Victoria Police
Andrew Lawson	SA Country Fire Service
Andrew Stark	ACT Rural Fire Service
Bruce Byatt	NT Police, Fire and Emergency Service
Chris Arnol	WA Department Fire and Emergency Services
Chris Beattie	SA State Emergency Service
Damien Killalea	TAS Fire Service
Gary McCormack	QLD Fire and Emergency Service
Joe Buffone	VIC Country Fire Authority (later moved to Emergency Management Victoria)
Linda Anderson-Berry	Bureau of Meteorology
Michael Hallows	Emergency Alert (VIC Department of Justice)
Peter Cinque	NSW State Emergency Service
Rob Rogers/ Steve Yorke	NSW Rural Fire Service
Sam Chard / Wendy Kelly	Attorney-General's Department, Commonwealth Government

Glossary

Term	Description
ABC	Australian Broadcasting Corporation
ACE	Australian Communication Exchange
ACT	Australian Capital Territory
AFAC	Australasian Fire & Emergency Services Authorities Council
AGD	Attorney-General's Department (Commonwealth Government)
AIIMS	Australasian Inter-Service Incident Management System
Alert SA	South Australia's multi-hazard warnings website
ANZEMC	Australia-New Zealand Emergency Management Committee
ANZCTC	Australia-New Zealand Counter Terrorism Committee
APCO	Association of Public-Safety Communications Officials
BCRC	Bushfire Cooperative Research Centre
BNHCRC	Bushfire and Natural Hazards Cooperative Research Centre
CFA	(Victorian) Country Fire Authority
CRIMSON	SA's Country Fire Service Incident Management and warnings publishing system
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAB+	Digital Audio Broadcast Plus (Radio)
DFES	(Western Australian) Department of Fire and Emergency Services
EMPA	Emergency Media & Public Affairs
EMV	Emergency Management Victoria
EWN	Early Warning Network
JATWC	Joint Australian Tsunami Warning Centre
MFB	(Victorian) Metropolitan Fire Brigade
MFS	(South Australian) Metropolitan Fire Service
NEMP	National Emergency Management Project
NSW	New South Wales
NT	Northern Territory
OSOM	One Source One Message (Victoria's publishing system)
PISC	Public Information Sub-Committee
QLD	Queensland
RFS	(New South Wales) Rural Fire Service
SA	South Australia
SBS	Special Broadcasting Service
SEWS	Standard Emergency Warning Signal
SPOT	Single Point of Truth (ACT's publishing system)
TAS	Tasmania
TAS Alert	Tasmania's multi-hazard warnings website
TFS	Tasmanian Fire Service
VIC	Victoria
VicEmergency	Victoria's multi-hazard warnings website
VicSES	Victorian State Emergency Service
VOST	Virtual Operations Support Team
WA	Western Australia

Table of Contents

About this document	i
Table of Contents.....	iv
Executive Summary	1
Introduction.....	1
Analysis and Recommendations.....	1
Introduction	6
Methodology	7
Summary of Findings and Recommendations	9
Analysis.....	16
Advancing a National Approach.....	16
Improving warning frameworks	20
The role of community education and preparedness.....	25
Trust, credibility and information validation	28
Publishing systems and a multi-channel approach	32
Tailoring messages, intuitive language and consistent terminology	38
The importance of targeted warnings and avoiding ‘warning fatigue’	42
Reaching diverse and at-risk groups.....	45
Emerging technology and the next frontier.....	49
Social Media	53
Building two-way conversation and information sharing.....	58
Emergency Alert (telephony based warnings).....	60
Multi-hazard websites	65
Working with partners and third parties.....	67
Workforce management and capability	72
Centralised and decentralised models in use.....	75
Evaluating the effectiveness of warnings and information.....	78
References.....	82
Appendix A: Illustration of warnings Frameworks	83
Appendix B: Examples of tailored warnings.....	88
Appendix C: Social Media Monitoring Example	91
Appendix D: Multi-hazard, multi-agency websites	93
Appendix E: Third party information and warnings examples	97
Appendix F: Information versus news.....	99
Appendix G: Contributors to this Review	102

Executive Summary

Introduction

The provision of warnings and information during emergencies has emerged over the last decade as a critical element of modern emergency management. In Australia, leadership and innovation in this area has seen significant progress across legislation, policy, operational practice, research and the use of technology. A national focus to better engage and empower communities has propelled change and continuous improvement.

Whilst the 2009 Victorian bushfires and subsequent Royal Commission has driven national action on improving how communities are warned, fire is only one of the emergencies confronting Australians each year. A number of large-scale events including cyclones and flooding in Queensland, and earthquakes in New Zealand have presented challenges and opportunities to improve the way that warnings and information are provided to communities.

The *National Review of Warnings and Information* has provided an opportunity to investigate across a multi-hazard and national sphere, how warnings and information are currently provided to communities. The Review has considered both warnings about hazards, such as those provided by the Bureau of Meteorology, and warnings about the potential impact of an incident, typically provided by emergency services and other statutory authorities. Exploration of strengths, challenges, opportunities and good practice has been undertaken, across a number of themes.

The Review has been conducted by Emergency Management Victoria in collaboration with all states, territories and the Commonwealth, and has been overseen by a national, multi-hazard Steering Committee. Funding has been provided through the National Emergency Management Project (NEMP) grants program.

The Review has comprised a number of distinct elements including:

- Development of a literature review on research and material focused on the provision of warnings and information;
- A multi-agency workshop hosted by the Australasian Fire and Emergency Services Authorities Council (AFAC) to consider a synthesis of community safety and warnings research produced by the Bushfire Cooperative Research Centre (BCRC) in the previous decade;
- Good practice interviews with practitioners and subject matter experts across Australia;
- A multi-agency workshop to explore and define information gathered during the Review; and
- A specific review into the use of Emergency Alert as a warning channel¹.

This Report presents key outcomes of the above elements in a consolidated view.

Analysis and Recommendations

The Review has identified a number of themes, ranging from policy and governance to use of technology, and to workforce management. Each theme identifies findings and opportunities focused on improving warnings practice. A short summary of the themes is provided below, and high-level recommendations are included. All themes and findings are explored in greater detail throughout the report.

¹ The Emergency Alert Review has been separately funded however it has been incorporated with this Review, and overseen by the Review's Steering Committee.

Advancing a National Approach

The provision of warnings and information during emergencies has advanced significantly in recent years. Governments and agencies have clearly invested time and resources into this area, with a range of evidence highlighting that ‘warnings’ are today considered to be a modern emergency management priority.

There is a strong call for increased national governance and coordination of public information practice development. Awareness of various national arrangements and protocols varies across agency representatives and practitioners, and many have also explained that the lack of clarity on the authority and status of agreements and protocols, or who to approach to foster innovation or progress issues, is thwarting progress in this area of emergency management.

Recommendation 1

As a priority, establish a dedicated, multi-hazard National Working Group for Public Information and Warnings. As a part of its role, this Working Group should be charged with sharing the outcomes of the Review, addressing the findings and opportunities throughout, and overseeing implementation of this Report’s recommendations.

Recommendation 2

Improve knowledge management on warnings and information with a focus on: reviewing the status and availability of key national documents; consolidating documentation where appropriate; and setting standards for document review and minimum metadata. Practitioners across all hazards should also be better supported to access information and connect with their peers.

Improving warning frameworks

Warnings frameworks provide agencies and practitioners with a standardised approach to assessing the need for, and issuing, warnings and information to communities during emergencies. In recent years, many jurisdictions have continued to look for opportunities to build consistency of public information frameworks and protocols across different hazards.

A number of different hazard specific frameworks are currently in place and some practitioners believe that more can be done to improve national harmonisation of protocols. Others caution against harmonisation which might compromise warnings for specific hazards and confuse communities. This highlights the need for evidence based change.

Recommendation 3

Pursue greater national consistency of warning frameworks across jurisdictions by leading a coordinated review of current frameworks, assessing the evidence base for change, and identifying opportunities for harmonisation. While this requires a longer term focus, in the short term, build national consistency within individual hazard areas.

The role of community education and preparedness

Practitioners and researchers agree that the success of warnings during an emergency is highly dependent upon prior efforts to build community preparedness and resilience. The concept of a ‘total warnings system’ draws an explicit connection between community preparedness and the provision of warnings during emergencies. The discipline of public information should always be considered in this broader community resilience and public safety context.

Trust, credibility and information validation

Research stresses the importance of community trust in information and warnings to motivate community response. In addition, it highlights that communities will seek to validate information before acting on it, regardless of the source or level of warning provided. The use of local information and recognition of local and personal networks are critical to effective warning provision, and public information policy makers can better integrate this knowledge into warnings practice.

Publishing systems and a multi-channel approach

A multi-channel approach to provision of information and warnings has been an aim of emergency services for some years now and is embodied in the nationally adopted *Emergency warnings guidelines and principles (2007)*. Agency capacity to utilise a diversity of channels is continuing to develop well, with many now focused on better tailoring and targeting of messages through this multi-channel approach.

Tailoring messages, intuitive language and consistent terminology

Understanding of good practice message design and use of appropriate language has continued to grow in recent years, however more can be done to improve and embed the use of intuitive language and well-tailored content. Importantly, the widespread use of templates to improve timeliness and consistency requires a corresponding commitment to tailoring of individual warnings.

The importance of targeted warnings and avoiding 'warning fatigue'

Many agencies and practitioners are building real-life experience on the value of well targeted warnings, and the effects of poorly targeted warnings, including warning fatigue. Recently completed research provides insight into factors that contribute to warning fatigue and actions which can mitigate the effects of this phenomenon.

Reaching diverse and at-risk groups

Challenges in reaching vulnerable or at-risk groups during emergencies are widely recognised by both practitioners and researchers. Those deemed 'at risk' can very much depend on circumstances and the risk at hand, but often include the elderly, ill, disabled, culturally and linguistically diverse communities, children and young people. Good practice highlights that agencies should establish community profiles prior to any emergency and develop relationships with community leaders to assist in the dissemination of warnings.

Emerging technology and the next frontier

Significant progress has been made by a number of agencies in recent years to provide information and warnings using a range of technologies. Increasing community expectations require continued focus on innovating and developing solutions, particularly in the area of spatial, geo-located and visual information.

The next frontier for warnings will see a transition from purely text-based warnings to more dynamic and visual content. National collaboration and shared investment is needed in this area to create economies of scale, collectively partner with and influence technology providers and to develop common standards.

Recommendation 4

Invest in and prioritise improved use of technology to create and disseminate warnings and information. As a priority, develop warnings which offer visual and spatial information.

Social Media

The rapid growth of social media over the last decade has seen it emerge as one of the most dynamic channels used to share information, and the use of social media during emergencies featured prominently in discussion throughout the Review. Findings highlight a need for more mature policy on the adoption and use of social media, along with advancement of practical tools and solutions.

Recommendation 5

Improve the use of social media placing immediate focus on: the use of social media as a 'two-way' conversation with communities; resourcing; and sharing of current innovation and good practice across agencies.

Building two-way conversation and information sharing

There are increasing community expectations for emergency services to engage in *two-way* communication during emergencies via active listening, information exchange and engagement with communities. This spans not only social media channels but others including community meetings and broadcast radio. For most agencies, a shift to this style of communication represents a substantial and challenging change in how warning communication is managed.

Emerging research suggests that strategies which empower communities to share information and warnings help to foster shared responsibility and resilience. While there are concerns and very real challenges to address, this is a critical feature of focus for future warnings practice.

Emergency Alert (telephony based warnings)

Emergency Alert has featured as a key discussion area and is noted as an important warning channel. Operational experience with this channel continues to increase and while greater national consistency is called for by some, there is currently great diversity in preferred use. Further, there is evidence of increasing and significant community dependence upon Emergency Alert as their primary warning service.

Multi-hazard websites

Many states and territories have established shared multi-hazard warnings websites, often run by a government department rather than a single emergency service. Providing a single point of truth enacts sound principles for provision of warnings and information, however current challenges being tackled include presentation of multi-hazard information in a single interface and building the credibility of these new channels.

Working with partners and third parties

While partnerships with media broadcasters have continued to mature in recent years, the emergence and growth of third parties providing information and warnings during incidents, both commercial and community based, presents a growing challenge for agencies, who must consider how they will interact with or support these groups.

There is opportunity to develop a nationally agreed position on how to best interact with third parties, and to engage with these groups to build a stronger, shared code of practice. Interaction with the media on days of high activity can also be improved, to ensure that the statewide situation and priorities are clearly understood.

Recommendation 6

Build better partnerships with third parties to improve development and dissemination of warnings:

(a) Establish a national protocol for working with third parties (including media, international service providers, private warnings providers and not-for-profit entities).

(b) Increase focus on providing more accessible, sharable and easily republished warnings. Mandate compliance with the Common Alerting Protocol (CAP-AU) for all new and upgraded warnings systems, and set a goal date for reaching CAP-AU compliance nationally.

Workforce management and capability

Across jurisdictions, a variety of different public information workforce arrangements are in place, drawing upon various expertise and experiencing different strengths and challenges. Some agencies have established clear Public Information Section roles, operating procedures and training programs, and many have established their models for a multi-hazard environment. Others, particularly smaller agencies, could benefit from the sharing of this practice. Recognising the impact that working in these roles can have on individuals is critical.

Recommendation 7

All agencies to ensure that post-incident debriefing and critical incident stress programs are effectively executed for all public information personnel, regardless of the level of their involvement or the nature of their substantive role.

Centralised and decentralised models in use

Emergency services are using a number of different models to resource and coordinate the creation and issue of warnings. While some rely on a centralised 'headquarters' model which draws upon smaller teams with high levels of expertise, others have a highly decentralised model in place with warnings created and published by local Incident or Regional Control Centres. Both approaches offer strengths and challenges and there is no evidence of a winning 'best practice' model for resourcing and managing Public Information teams.

Evaluating the effectiveness of warnings and information

Apart from independent research and ad-hoc post-incident analysis, there appears to be little evidence of *planned* evaluation of the effectiveness of warnings being undertaken. Establishment of performance measures and a consistent approach to evaluation would build a stronger evidence base to inform further improvement of Public Information. Related to this point, the sharing and utilisation of research and evaluation outcomes can also be improved.

Recommendation 8

In order to build a stronger evidence base to inform policy and practice, develop agreed research methods and commission targeted research which focuses on community behaviour and response to warnings across diverse hazards.

Recommendation 9

Develop nationally agreed performance indicators and formalise post-incident evaluation processes for the provision of warnings and information during emergencies.

Introduction

Just over a decade ago the provision of warnings and information to communities during emergencies was fast becoming a challenging priority. In a short period of time, both agency capability and community expectations have grown significantly, and the provision of warnings is now considered an essential activity during any emergency.

In recent years, a significant amount of work has been undertaken across the country to improve community information and warnings. This has included development and enhancement of warning protocols, systems and technology, and been supported by a volume of research focused on understanding community response and expectations.

Concurrently, there have been shifts in how people access information, in the emergence of 24/7 news cycles and increasing media engagement with emergency broadcasting, and in the ever diversifying availability of technology to publish and share information.

Whilst the 2009 Victorian bushfires and subsequent Royal Commission propelled national action on improving how communities are warned, fire is only one of the emergencies confronting Australians each year. A number of large-scale events including cyclones and flooding in Queensland, and earthquakes in New Zealand have provided both challenges and opportunity to improve approaches to providing warnings and information. A national focus on building disaster resilience and better engaging and empowering communities has driven change and continuous improvement.

The *National Review of Warnings and Information* provides an opportunity to investigate across a multi-hazard and national sphere how warnings and information are provided to communities. Exploration of strengths, challenges, opportunities and good practice has been undertaken, and key findings and recommendations have been identified.

Overseen by a national, multi-hazard Steering Committee, the Review has been chaired by Emergency Management Victoria and funded by the National Emergency Management Project (NEMP) grants program.

Analysis and findings highlight a diverse and dynamic sector approach to this critical community safety function. In every aspect from policy to message design, and from use of technology to post-incident evaluation, agencies and organisations are actively learning more and improving their approach to warnings provision.

In a short period of time, substantial progress has been made in this relatively new discipline of emergency management. In many areas, Australia's innovation and leadership in its pursuit to provide emergency warnings and information to communities is world leading. Progress has not only been in policy and technological innovation, but has resulted in tangible changes in operational practice and organisational culture. Traditional 'response' activities for emergency services have evolved to incorporate the development and rapid provision of warnings and information to communities. Communities are actively engaging in the use of these services.

Many challenges remain, and development continues at a rapid pace. This Review presents findings focused on driving continuous improvement, and highlights a wide range of opportunities and current good practice to support governments and emergency service organisations to continue their important work.

Methodology

The National Review of Warnings and Information has comprised of a number of elements.

Project Mandate

The Review has been conducted by Emergency Management Victoria in collaboration with all states, territories and the Commonwealth. Funding has been provided through the National Emergency Management Project (NEMP) grants program.

Governance

The Review has been governed by a National Steering Committee and supported by a Reference Group. Membership of the Steering Committee has included representation from each jurisdiction and a number of hazard areas. Steering Committee members are listed at the beginning of this report. Reference Group membership is noted at [Appendix G](#).

The Steering Committee has met regularly, generally via teleconference to consider project scope, direction and progress of deliverables.

Scope

A number of discrete activities have been undertaken throughout 2014 as part of the Review, and brought together in this final report. They include:

Literature Review

A literature review has been completed, focusing on research and material on warnings and information during emergencies. Conducted by Ipsos, the literature review focuses on Australian research completed in the previous five years, however extends to international research in some areas. A range of material has been considered, including reports provided by agencies and practitioners and the literature review is referenced throughout this report.

Workshop: A Synthesis of Community Safety Research

In April 2014, a multi-agency workshop hosted by the Australasian Fire and Emergency Services Authorities Council (AFAC) was held to consider a synthesis of community safety and warnings research produced by the Bushfire Cooperative Research Centre (BCRC) in the previous decade. The synthesis was prepared by Skinner and Skinner consulting, and the workshop, facilitated by Professor Timothy Skinner, included 36 subject matter experts and practitioners across a broad range of agencies.

Good Practice Interviews

The Review has explored current and good practice with ninety practitioners and subject matter experts across Australia, representing 35 organisations. The Steering Committee and Reference Group nominated a number of people for interview, focusing on public information practitioners – those with hands on experience of the development and provision of warnings during emergencies. Nominees were supplemented by further representation and expertise as required. Interviewees are included in the list of stakeholders provided at [Appendix G](#).

Cube Group coordinated and conducted the interviews, including design of an interview approach spanning six themes:

- Policy and practice;
- Channels and systems;

- Construction of warnings;
- Community response;
- Workforce capability; and
- Continuous improvement.

Interviews were held between May and July 2014 and generally conducted over a 60-90 minute period, using a semi-structured approach. Each interview drew on the particular expertise of the interviewee(s).

In addition to identification of good practice via interview, and in recognition of broad interest to provide input, opportunity to provide a written submission to the Review was also promoted through agency communication networks. Through this approach, a small number of written commentaries or submissions were received and several short telephone interviews were also conducted.

Workshop: Consideration of Review findings to date

In September, 2014 a two day workshop held at the NSW Rural Fire Service headquarters explored the findings of the project to date and defined priority areas for action. 34 participants representing 22 organisations contributed to this workshop. Workshop outcomes were documented and shared with participants, Reference Group members and Steering Committee members. Findings have contributed to the development of this final report.

National Review of Emergency Alert

A review of the telephony based warning system Emergency Alert has also been carried out as a coordinated component of this broader Review. Funded by the Victorian Department of Justice as national coordinators of Emergency Alert, and completed by Ipsos, this Review has included:

- In-depth interviews with 31 users of the Emergency Alert system. Participants varied in their level of involvement in the decision making process from those who authorised Emergency Alerts to be sent to those whose primary role was to create messages;
- 16 discussion groups with members of communities in NSW, VIC, SA, QLD and NT;
- 16 minute telephone surveys with 1,600 members of the community, segmented by location, emergency type (e.g. fire, flood, cyclone), jurisdiction, and experience receiving an Emergency Alert;
- 10 minute online surveys with 1,051 members of the community to provide a broad overview of community sentiment and canvassing of locations other than those that have recently experienced an emergency event; and
- 6 in-depth telephone interviews following the surveys to further explore survey findings.

While the *National Review of Emergency Alert* is provided as a separate final report, selected key findings and analysis are also included in this report.

Development of Findings

This report brings together analysis of the literature, good practice interviews, national workshop and review of Emergency Alert to provide an outline of strengths, issues, opportunities, good practice and findings across seventeen areas for consideration. Recommendations have also been included, in consultation with the Steering Committee.

Summary of Findings and Recommendations

All key findings are summarised below, and accompanied by recommendations which have been developed in consultation with the Review's Steering Committee. Implementation of each recommendation should take into account relevant analysis and findings.

Key findings

- 1 Over the past decade emergency management warning protocols and practice have evolved and matured significantly. The prioritisation and provision of warnings and information as a key feature of modern emergency management is evident across the sector.
- 2 There is a lack of clear governance and national leadership on the provision of emergency management public information, which is inhibiting progress, collaboration and maturation of this discipline.
- 3 Practitioner knowledge of nationally agreed standards or protocols, current practice and relevant research findings is limited and development of improved knowledge management, including establishment of practitioner networks for knowledge sharing is needed. In addition, many key documents lack important detail on authority, ownership, and process for review.
- 4 Community understanding of the various warning frameworks in use across hazards is untested. As a result, agency desire for greater harmonisation of warnings frameworks across hazards lacks a strong evidence base for public value benefit, and fails to provide guidance on the direction future frameworks should take.
- 5 There are diverse views on the benefit of a single national multi-hazard framework for warnings. The sector lacks a nationally coordinated 'roadmap' for considering the opportunities and business case for harmonisation and as such any exploration of common frameworks has been ad hoc and localised.
- 6 The emergency management sector lacks an agreed definition on what a 'warning' is. While for some, a 'warning' focuses on providing information to the public about an expected hazard (such as a cyclone), others provide 'warnings' with a focus on outlining the *impact* of that hazard and risk to life and property.
- 7 Various warning frameworks exist across hazards and agencies but they are difficult to locate and authenticate as agreed current practice. While the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) is widely noted as a milestone achievement and precedent in national warnings Frameworks, it is difficult to source and lacks a clear current owner and custodian. (See Recommendation 2)

8 Practitioners and researchers agree that the success of warnings largely relies on efforts to build community resilience, awareness and preparedness prior to an emergency. There is merit in the 'total warning system' concept, already adopted by flood response agencies, being more formally considered across other hazards in the development of future warning frameworks.

9 Understanding how to design warnings which will effectively interrupt or breakthrough to individuals leading busy, complex lives is limited. Although some research on this area has explored the issue, others see this as a gap in sector knowledge which should be informing warning protocols. (See Recommendation 8)

10 There is a wide range of research now available on how people trust and validate warnings prior to taking action, however there is limited evidence of how this research has been adopted, or is specifically informing continuous improvement. (See Recommendation 8)

11 The importance of local networks and of issuing and sharing warnings through local sources is highlighted by a range of research. While a multi-channel approach provides important avenues for individuals to access and validate information, there is a need to increase focus on developing links into local community networks and leaders who can share warnings and act as a trusted local source during emergencies. These networks are critical to the effective dissemination and validation of warnings.

12 Research also provides evidence that warnings are most effective when they are provided by agencies and people who are recognised or known. Given that emergency services and the Bureau of Meteorology are typically well recognised by the general public, the sector is well placed to take a greater leadership role supporting lesser known control agencies.

13 Multi-channel publishing systems which support the production of timely, tailored and relevant warnings are growing in use. Smaller agencies are less likely to be benefiting from these kinds of tools unless intra-state or interstate offers to share or utilise existing systems are provided.

14 While the nationally endorsed Common Alerting Protocol (CAP-AU Standard) is widely supported by agencies, adoption of the Standard remains low. This constrains opportunities to share warnings and information across multiple channels and jurisdictions, particularly where messages are re-used or re-posted by other agencies, jointly developed, or shared with third parties. (See Recommendation 6)

15 The role of the Standard Emergency Warning Signal (SEWS) within the contemporary warnings environment can be better integrated within a modern warnings environment to maximise its value

16 The increasing use of mobile smart devices requires that agencies provide information and warnings in suitable formats. Whether this is through mobile apps or mobile friendly websites (or both), it is important that content is easily accessible, good practice development standards are followed and that greater consideration be made to support all operating systems.

- 17 While the use of online and digital channels continues to mature, traditional channels including radio, print media, television and face-to-face meetings also provide critical information services, particularly for remote communities, those with limited mobile and internet connectivity and those in long-running events. It is essential that warning protocols consider both the incident and affected communities to tailor diverse use of available channels.
- 18 The critical importance of tailoring warnings has continued to feature in research, post-incident reviews and inquiries. While the use of templates to support the construction of information and warnings is now common practice, it is important that training programs and local procedures stress the need for each warning to be tailored for the situation and community it is provided for.
- 19 Both formal research and agency consultation with communities has found that a clear call to action, rather than vague or generalist statements about safety, is preferred. The need to better tailor warnings, minimise vague information within templates, and to remove 'slogans' about community safety within warnings is highlighted.
- 20 While post-incident reviews and research have led to the minimisation of jargon or technical information within emergency service warnings, the Bureau of Meteorology's warnings continue to retain a greater degree of detail. If not already undertaken, targeted community-based evaluation of weather warning content and formats would provide an evidence basis for this differentiation.
- 21 The *Emergency Warnings: Choosing Your Words* (2008) guideline provides a researched and collated view on how to construct and tailor warnings and information, however practitioner knowledge and use of this document appears to be limited, and the best use of language for more recently developed digital channels is not incorporated. (See Recommendation 2)
- 22 As experience and capability to provide warnings is maturing, many agencies are now looking at how best to provide multiple warnings within a single incident, providing more targeted advice to specific areas and communities. Agencies would benefit from sharing current solutions and good practice.
- 23 In long running incidents, a number of practitioners have experienced scenarios in which formal warning protocols and/or publishing system constraints result in too many warnings being repeatedly issued with little or no change. Any arrangements which provide a lack of flexibility for decision makers to target warnings based on each incident and scenario require attention.
- 24 Research on the prevalence of warning fatigue has recently been released. The findings of this research and recommendations for mitigating this phenomenon are yet to be considered, tested and applied by agencies and there is clearly more to learn here. (See Recommendation 8)
- 25 Emergency services acknowledge that they still have a considerable way to go to communicate effectively with diverse and at-risk communities, however many agencies have found progress to be challenging. There are opportunities to drive action at a national level, building a collective capacity which all agencies can benefit from.

26 One of the greatest challenges with reaching diverse and at-risk groups is identifying and understanding where these groups are, and how they might best be approached and influenced to behave safely if in danger. Agencies working to better profile these communities, and to establish relationships with relevant community leaders and agencies supporting those at-risk are to be commended.

27 A multi-channel warnings approach helps agencies connect with more diverse audiences however continued development of warnings which include visual and spatial information is necessary as this style of information can directly support people with low literacy or a non-English speaking background. (See Recommendation 4)

28 Available and emerging technologies are under-utilised and community expectations on the provision of information and warnings continue to grow. While development of publishing systems, websites, apps and social media channels is evident across a majority of agencies interviewed, there is a continued need to innovate. The next frontier for warning design and construction requires spatial, visual and geo-location based information.

29 While most agencies are focused on improving their use of social media as a warnings channel, the majority are still primarily 'broadcasting' information via this channel and wary of losing control of information and warnings. In reality, information will be shared via social media with or without the participation of emergency services and their presence is essential to provide a credible and authoritative voice.

Constraints to improved use of social media are primarily due to internal protocols which are not tailored for open and ongoing dialogue via social media channels, and very real resourcing challenges.

30 More innovative solutions to effectively resource Public Information teams to contribute and respond to social media discussion are required. Although a new frontier for many, trusted digital volunteers or virtual operations support teams (VOSTs) are emerging as a legitimate way to resource social media monitoring and activity.

31 While the reach of social media channels and their strength in targeting young people in particular is noted, the common use of algorithms by these channels to filter content can dramatically reduce effectiveness. Some reports note that as little as 6% of posts will reach an individual on Facebook. While individually, agencies are unlikely to sway policy and practice with large companies like Facebook and Twitter, there may be an opportunity for collective partnerships or influence with a national approach on this issue.

32 Establishing two-way communication or 'conversation' with communities during emergencies is a growing expectation and critical feature of future warnings practice. One of the key benefits of two-way information sharing is that agencies can 'listen' and 'see' in real-time to how individuals perceive and act upon risk. Whether this be through social media, community meetings or talk-back radio, conversation not only assists communities but can provide powerful insight to Incident Management Teams.

33 There is inconsistency nationally on whether Emergency Alert should be used for 'imminent threat' warnings only or also to issue advice on expected high risk. While nationally agreed guidelines provide all jurisdictions with autonomy in relation to whether, when and how they deliver a telephone warning, there remains a demand for improved national consistency. Given the already diverse use of the channel, significant national consistency will be challenging to achieve. Analysis of the drivers for consistency including expected benefits for communities might provide greater incentive for change.

34 Both practitioners and researchers note growing community expectation that a personal fixed line telephone or mobile phone warning will always be provided, negating the need to actively seek out information and remain informed. The *National Review of Emergency Alert* notes that 32% of people expect to rely upon Emergency Alert as their only source of warning, and that 80% of people who have previously received an Emergency Alert expect to receive one in the event of a future incident.

It is critical that communication and education campaigns continue to stress that a warning may not be received, and encourage and empower communities to proactively access information and assess their risk.

35 The level of community trust in more recently established multi-hazard websites remains untested and research into community awareness, trust and perception of these websites would be valuable. (See Recommendation 8)

36 The popularity and number of private or community based channels providing and sharing warnings continues to rise. Agency support or connection with many of these providers seems limited and appears to be due to any combination of suitable policy or clear position on engaging with third parties, motivation to connect and resourcing constraints. Without agency guidance and expertise, private operators may introduce new risks to communities during emergencies.

37 Australia's *Code of Practice for Warning Republishers* provides sound advice to third parties, however non-mandatory government advice is likely to have little influence on innovators who may not even be aware of the document's existence. Improved engagement, for example the convening of a group of third party warning providers, would provide insight into what they understand, what they would like to see, and whether they have views on how a Code of Practice could be improved and better utilised.

38 Partnerships with Australia's media as emergency broadcasters have continued to mature in recent years and the importance of these working relationships must be highlighted. For maximum effectiveness, media agencies and emergency services require strong working relationships and practical support. Provision of timely advice to broadcasters on active days to assist in prioritising communication and understanding complex situations is important to optimal outcomes. National coordination of media accreditation would also assist many media teams.

39 Personnel working in Public Information sections can be affected by the impact and gravity of their work, particularly in high impact or high stress incidents. Provision of post-incident debriefing and critical incident stress programs are essential activities. Ineffective support for personnel is not only detrimental to an individual's wellbeing but can also impact upon future availability and willingness of people to take on Public Information roles.

40 Various centralised and decentralised models for the provision of public information are in use and each carries pros and cons. While opportunities to discuss workforce arrangements or provide case studies on alternative models would be valuable, agencies should be encouraged to tailor fit-for-purpose arrangements rather than conform to any particular model.

41 The sector lacks an agreed approach to monitoring and evaluation of warnings. The lack of a common framework for this activity results in great disparity in how the effectiveness of warnings is assessed, including evaluation undertaken during formal inquiries, and lost opportunity to build a consolidated base of lessons learned.

42 It would appear that many practitioners are aware of a range of research and of many post-incident inquiries, but that few have time available to reflect upon and apply the findings. Continued effort to summarise, present and 'make ready' research for agencies to easily utilise would be valuable.

Recommendations

Recommendation 1

As a priority, establish a dedicated, multi-hazard National Working Group for Public Information and Warnings. As a part of its role, this Working Group should be charged with sharing the outcomes of the Review, addressing the findings and opportunities throughout, and overseeing implementation of this Report's recommendations.

Recommendation 2

Improve knowledge management on warnings and information with a focus on: reviewing the status and availability of key national documents; consolidating documentation where appropriate; and setting standards for document review and minimum metadata. Practitioners across all hazards should also be better supported to access information and connect with their peers.

Recommendation 3

Pursue greater national consistency of warning frameworks across jurisdictions by leading a coordinated review of current frameworks, assessing the evidence base for change, and identifying opportunities for harmonisation. While this requires a longer term focus, in the short term, build national consistency within individual hazard areas.

Recommendation 4

Invest in and prioritise improved use of technology to create and disseminate warnings and information. As a priority, develop warnings which offer visual and spatial information.

Recommendation 5

Improve the use of social media placing immediate focus on: the use of social media as a ‘two-way’ conversation with communities; resourcing; and sharing of current innovation and good practice across agencies.

Recommendation 6

Build better partnerships with third parties to improve development and dissemination of warnings:

(a) Establish a national protocol for working with third parties (including media, international service providers, private warnings providers and not-for-profit entities).

(b) Increase focus on providing more accessible, sharable and easily republished warnings. Mandate compliance with the Common Alerting Protocol (CAP-AU) for all new and upgraded warnings systems, and set a goal date for reaching CAP-AU compliance nationally.

Recommendation 7

All agencies to ensure that post-incident debriefing and critical incident stress programs are effectively executed for all public information personnel, regardless of the level of their involvement or the nature of their substantive role.

Recommendation 8

In order to build a stronger evidence base to inform policy and practice, develop agreed research methods and commission targeted research which focuses on community behaviour and response to warnings across diverse hazards.

Recommendation 9

Develop nationally agreed performance indicators and formalise post-incident evaluation processes for the provision of warnings and information during emergencies.

Analysis

The following findings and analysis traverse a broad range of themes related to the provision of warnings and information during emergencies. The strengths, issues and impacts, and opportunities within each theme are discussed before findings are outlined.

Advancing a National Approach

The provision of warnings and information during emergencies has advanced significantly in recent years. Governments and agencies have clearly invested time and resources into this area, with a range of evidence highlighting that ‘warnings’ are today considered to be a modern emergency management priority.

There is a strong call for increased national governance and coordination of public information practice development. Awareness of various national arrangements and protocols varies across agency representatives and practitioners, and many have also explained that the lack of clarity on the authority and status of agreements and protocols, or who to approach to foster innovation or progress issues, is thwarting progress in this area of emergency management.

Strengths

There is clear interest and motivation across many agencies to establish a coordinated national focus on the development of public information practice.

It is important to acknowledge recent endeavours to establish agreements, guidelines and frameworks

Given the rapid advance of the role of warnings and public information in emergency management in recent years, it is important to acknowledge and build upon recent endeavours to establish agreements, guidelines and frameworks.

From a practical perspective, the Bureau of Meteorology’s *Standardisation of Warning Services* project, along with work to implement the Next-Generation Forecasting and Warning System, provide two tangible examples of work aimed at improving consistency of services, and clarity of arrangements and responsibilities for emergency service organisations.

Similarly, the increasing prominence of public information in the recently released AIIMS 4 is widely seen by interviewees as positive, and a driver to increasing consistency of practice.

Adoption by fire services of the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) in 2009 also represented a milestone in establishing a national approach to warnings provision, and has inspired thinking on further opportunities for harmonisation.

From a governance perspective, many acknowledge the Attorney-General’s Department (AGD) as a key coordinator for ongoing document development and management. AFAC has also provided leadership and coordination over some years in this area and continues to host or sponsor multi-agency work.

The role of Emergency Media & Public Affairs (EMPA) is also appreciated by many, however it is primarily valued for its hosting of an annual conference.

Issues and Impacts

Despite endeavours, variance in policy and practice for provision of warnings across hazards and jurisdictions remains the norm.

Throughout this Review, stakeholders have expressed confusion or frustration about a number of nationally endorsed documents which lack authority or credibility due to poor information on who authored them, whether they have been formally endorsed, how they are currently

maintained or who to contact with questions or requests for revision of content. This is likely to be affecting uptake or compliance with nationally agreed positions and protocols (See Figure 1).

Local development of new protocols appears to be occurring in isolation to national agreements or documented protocols – in part due to lack of clarity on who to approach to advance *national* change, and in part due to the pace of social and technical development which individual jurisdictions and agencies must respond to. Examples here include extension of the *National Framework for Scaled Advice and Warnings to the Community* for bushfire to apply to other hazards in some jurisdictions, and development of state protocols such as Victoria's multi-hazard warnings protocol.

Such customisation and extension of practice does not appear to be an intentional deviation from national position per se, but it is creating diversity of practice, and for some, a frustration that they are not being included in, or are not in the same position to advance change.

A lack of clear governance arrangements and authority for further development of public information as a discipline is inhibiting agencies to collaboratively advance the practice of issuing warnings and information during emergencies.

A lack of clear governance arrangements and authority for development of public information as a discipline is inhibiting progress at a national level

While the AGD plays an important role, it is not to 'lead' development of operational policy and practice but to engage with and at times facilitate jurisdictional action. And while AFAC plays an important role in fostering coordination and collaboration, some note that without jurisdictional Ministerial endorsement of decisions, progress is limited, particularly if policing organisations and local government (in QLD particularly) are not also engaged.

National documents highlighted during good practice interviews and review

The below list illustrates a range of key documents currently available, several of which provide no detail on author, owner or process for review. Many practitioners are unfamiliar with these documents.

- National Best Practice Guidelines for the Request and Broadcast of Emergency Warnings
Ministerial Council for Police and Emergency Management – Emergency Management, 2007
- Guidelines for Emergency Management in Culturally and Linguistically Diverse Communities
Emergency Management Australia, 2007
- National Emergency Warning System Principles
Ministerial Council for Police and Emergency Management - Emergency Management, October 2008
- Emergency Warnings: Choosing your words
Attorney-General's Department, December 2008
- National Framework for Scaled Advice and Warnings to the Community (For bushfire)
Australian Emergency Management Committee, September 2009
- National strategy for disaster resilience
Council of Australian Governments, 2011
- National Telephony Warning Guidelines
Office of the Emergency Services Commissioner, Victoria, November 2012
- Australia's Emergency Warning Arrangements
Attorney-General's Department, April 2013
- Best Practice Guide for Warning Originators
Attorney-General's Department, June 2013
- Code of Practice for Warning Republishers
Attorney-General's Department, April 2013
- The Australasian Inter-Service Incident Management System: Version 4
Australian Fire and Emergency Service Authorities Council, 2013

Figure 1: An example of key national documents available which specifically guide the development and use of warnings. Many lack suitable information on their authority, ownership and planned review.

Opportunities

It is apparent that there are opportunities to improve and clarify, roles and responsibilities at a national level. Existing organisations and arrangements can be better utilised to play a coordinating role at the national level. In particular, the role of the AGD, AFAC and other entities, including the Australia-New Zealand Emergency Management Committee (ANZEMC) as (for example) sponsor, custodian or coordinator of various initiatives, should be clarified.

A dedicated multi-hazard public information and warnings working group to govern and guide continued development of warnings and information should be established. This opportunity has been discussed at length during the Review's national workshop and has also been discussed by the Review's Steering Committee.

A dedicated multi-hazard public information and warnings working group to govern and guide continued development of warnings and information should be established

At a recent meeting of the AFAC Council, there was a resolution to formally seek the secretariat for national warnings through the establishment of an AFAC Warnings Group under AFAC's collaboration model. Given the broad representation on the AFAC Council, this decision should guide and inform any future arrangements.

The benefits of such a group to progress development of contemporary issues, research requirements and innovation have been explored with stakeholders. They highlight a need for senior representation across hazards and jurisdictions (including the commonwealth), and inclusion of both policy and practitioner expertise.

In addition, there is strong support for any working group to report to ANZEMC, though a preferred structure has not yet been defined. Taskforces addressing specific issues should be established and governed by this working group as required, along with communities of practice to contribute to policy and practice development. Finally, the Working Group should be given responsibility to address the recommendations, findings and analysis within this Review.

It should be noted that the Bureau of Meteorology's *Standardisation of Warnings Services* project has also considered a national approach to ongoing work, and any new governance arrangements should also connect with their proposed Bureau of Meteorology Hazards Services Advisory Board (the Hazards Advisory Board).

There is opportunity to learn from and connect with other existing committees. For example, the Australia-New Zealand Counter-Terrorism Committee (ANZCTC) has created a Public Information Sub-Committee (PISC) to provide strategic leadership on key public information and communication issues relating to national security and incident response. The PISC provides the policy framework for jurisdictions to enhance coordination of public information as it relates to national security issues and incidents.

Another jurisdictional example which could be extended is QLD's High Level Media Working Group. This Working Group has senior representation from peak police and emergency service departments as well as media organisations. The focus of the group is to build strong partnerships between Government and media agencies, in turn promoting public safety messages and streamlining processes for the issuing of community warnings before, during and after emergencies and disasters.

A better connected network of public information professionals could be established. This would improve knowledge sharing and also help jurisdictional representatives to connect with broader stakeholders representing organisations such as the Bureau of Meteorology and Geoscience Australia. Current networking and knowledge sharing seem based on broader community safety forums and personal networks.

At a practical level, improved document and knowledge management for existing documentation, including confirmation of document owners, custodians, level of endorsement and anticipated review dates would be immediately valuable. All future documents should

provide this information as a standard inclusion. Currently available national documents should also be reviewed to confirm currency and/or determine a plan for review or archiving. A 'quick win' action would coordinate development of a short reference guide to existing key documents and information, and their status.

Note that a number of knowledge management hubs already exist, including the AGD's *Australian Emergency Management Knowledge Hub*, and these hubs could be much better utilised to publish and share key documentation related to the provision of information and warnings.

Key findings

- 1 Over the past decade emergency management warning protocols and practice have evolved and matured significantly. The prioritisation and provision of warnings and information as a key feature of modern emergency management is evident across the sector.
- 2 There is a lack of clear governance and national leadership on the provision of emergency management public information, which is inhibiting progress, collaboration and maturation of this discipline.
- 3 Practitioner knowledge of nationally agreed standards or protocols, current practice and relevant research findings is limited and development of improved knowledge management, including establishment of practitioner networks for knowledge sharing is needed. In addition, many key documents lack important detail on authority, ownership, and process for review.

Recommendation 1

As a priority, establish a dedicated, multi-hazard National Working Group for Public Information and Warnings. As a part of its role, this Working Group should be charged with sharing the outcomes of the Review, addressing the findings and opportunities throughout, and overseeing implementation of this Report's recommendations.

Recommendation 2

Improve knowledge management on warnings and information with a focus on: reviewing the status and availability of key national documents; consolidating documentation where appropriate; and setting standards for document review and minimum metadata. Practitioners across all hazards should also be better supported to access information and connect with their peers.

Improving warning frameworks

Warnings frameworks provide agencies and practitioners with a standardised approach to assessing the need for, and issuing, warnings and information to communities during emergencies. In recent years, many jurisdictions have continued to look for opportunities to build consistency of public information frameworks and protocols across different hazards.

A number of different hazard specific frameworks are currently in place and some practitioners believe that more can be done to improve national harmonisation of protocols. Others caution against harmonisation which might compromise warnings for specific hazards and confuse communities. This highlights the need for evidence based change.

Strengths

Across various hazards and jurisdictions, the development of warnings frameworks to guide consistent assessment of hazards and risk, and to support practitioners in designing and delivering warnings has been maturing. (See [Appendix A](#) for a snapshot of some of the frameworks currently in place).

The *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) is acknowledged by fire agencies as a milestone advance for standardising fire warnings. Some jurisdictions have since gone on to establish multi-hazard models and arrangements based on this Framework. This has helped to improve consistency, share resources and tools, and build public awareness of warnings.

Warnings frameworks provide agencies and practitioners with a standardised approach to assessing the need for, and issuing, warnings and information to communities during emergencies.

In South Australia for example, the Metropolitan Fire Service (MFS) has taken the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) and extended this conceptually across a range of other hazards

In Western Australia, the Department of Fire and Emergency Services (DFES) has operated for many years within a multi-hazard context, and where practical, internal warning protocols and arrangements are common. Warning levels and features such as naming conventions, colour codes and timeframes for warnings differ for cyclone, flood and fire/hazmat warnings.

In Victoria, Public Information practitioners across agencies meet monthly to continually build and strengthen consistency in policy and practice.

The Bureau of Meteorology's role in providing cyclone and flood warnings nationally also provides a foundation for developing consistent and nationally adopted agency Frameworks for these hazards. In Queensland the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) has been used as a reference Framework by some local governments as a guide to providing flood warnings.

Issues and Impacts

While good work has been ongoing in a number of jurisdictions, there are challenges to the effectiveness of warning frameworks.

Many practitioners acknowledge that various warning levels, types and terms may not be well understood by the public, particularly those who are likely to be exposed to multiple hazards.

Research exploring community comprehension and value placed in scaled warning levels for various hazards is limited however Skinner and Skinner remark that research *has* explored community understanding of the national fire danger rating system revealing that "few residents

understood the implications of all of the different fire danger levels for their safety except for the level ‘catastrophic’”. (2014, p6²)

Of specific concern is the fact that various agencies use any combination of numbers, colours, symbols and words to describe a warning level. For example, while the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) uses words (Advice, Watch and Act and Emergency Warnings), different naming conventions of ‘watch’ and ‘warning’ are used for flood by the Bureau of Meteorology.

For cyclone, many jurisdictions use colour for cyclone warning levels (e.g. blue, yellow and red levels), with practitioners noting that the public are also likely to assess their level of risk via the Bureau of Meteorology’s numerical cyclone rating system of ‘Category 1-5’³. Other terms such as ‘severe’ or ‘extreme’ and ‘warning’ are used in different contexts across hazards.

Discussion on various warning frameworks during this Review has invariably led to discussion on the definition of a warning. The *Australian Emergency Manuals Series: Manual 3: Australian Emergency Management Glossary*⁴ defines a warning as the ‘dissemination of a message signalling an imminent hazard, which may include advice on protective measures’. It should be noted however that this Manual was produced in 1998, and there is a need to review this definition in a modern context.

Related to this point, continued use of the word ‘hazard’ has raised discussion about the need for greater delineation between *hazards* and expected community *consequences*. This point was a feature of discussion at the Review’s national workshop.

While building consistency is desirable, the need for fit-for-hazard warnings is recognised. One of the challenges discussed on building consistency of warning arrangements across hazards has been ensuring that tailored warnings are not compromised – many caution a rigid one-size-fits-all approach as there are concerns about whether this is the most beneficial endeavour.

While the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) is well supported, discussion throughout the Review has highlighted constraints with its ‘point in time’ development and frustration that there is no clear document owner to approach to coordinate the next stage of development and evolution. Indeed, even sourcing the document is challenging due to this lack of clear ownership.

Experience over a number of seasons has allowed for reflection on the flexibility of this Framework to support different scenarios such as long-running events like SA’s Bangor fire, or peri-urban grassfires like Victoria’s Donnybrook fire. Other practical challenges exist, such as testing completed by Victoria which flagged that those with low-vision might have difficulty differentiating between the Frameworks’ three prescribed colours used for each level.

A broad range of practitioners have questioned the ‘watch and act’ warning level title within this Framework, concerned that the combination of the relatively passive ‘watch’ with the more active ‘act’ sends a mixed message to community members. Various suggestions for change have been offered, typically removing the word ‘watch’ from any naming. In Victoria for example, discussion on future options has considered a scaled multi-hazard naming convention of Alert > Warning > Emergency Warning.

Any change to warning frameworks should be underpinned by compelling evidence of the benefit to communities

Many have stressed however, that any change should be underpinned by compelling evidence of the benefit to communities, and take their views into account rather than the views of agency representatives alone. Research to date presents mixed analysis. “Several studies have found

² Referencing: Bushfire Cooperative Research Centre (BCRC) Fire Note 119, reporting on the 2013 NSW fires.

³ Known formally as the Australian Tropical Cyclone Intensity Scale

⁴ Emergency Management Australia, Attorney-General’s Department, *Australian Emergency Manuals Series: Glossary* (1998), p 115.

that the general public often lacks awareness of the different levels or definitions of warnings or what they mean (such as ‘emergency’, ‘watch and act’ and ‘advice’ used for bushfires), but simply want to know how immediate the threat is, and what they should do about it” (Literature Review⁵, p53). Research conducted into the 2013 Tasmanian Bushfires also found that ‘Bushfire Watch and Act’ messages confused and stressed residents about what to do next (Literature Review p53).

Overall, practitioner interviews and agency submissions have highlighted that various arrangements, including the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire), do have limitations, and evolution is still occurring. No particular framework has been identified as the ‘best’ or most obviously suited to multi-hazard extension. In fact, a number of agencies have cautioned against the use of any particular framework as a basis for building a future emergency warnings framework.

Opportunities

As an essential precursor activity, in order to clarify between *practitioner* desire for harmonisation and *community* desire or expectations for same, exploration with diverse communities on their comprehension and preferences for current scaled warnings frameworks across different hazards would be valuable.

For example, there are subtle differences in how WA, NT and QLD emergency services communicate cyclone warnings, despite being provided with the same warnings from the Bureau of Meteorology. These jurisdictions feel that their communities understand local arrangements and are not motivated to make change just for the sake of harmonisation, unless research with communities suggests that this would be highly valued. Opportunities for greater service efficiency may also contribute to motivation for change.

Targeted campaigns to build understanding of different warning types or levels were raised by some practitioners as something which they would like to pursue in coming seasons. It is evident that community awareness and education campaigns about hazard and risk could benefit from improved harmonisation and a shared approach to communication.

It is also noted that multiple jurisdictions are making headway into building common frameworks for warnings. A more detailed comparison of various frameworks in use could be conducted, with jurisdictions sharing both advantages and current constraints or challenges. This work, as a first step, could inform development of a clear national statement on the current level of diversity in warning frameworks.

A number of practitioners have argued that initial focus should also be placed on building a common foundation to framework design and protocols such as use of colour, terminology, symbology, incident naming conventions, and data protocols.

At this Review’s national workshop of public information leaders and practitioners, many felt that building national consistency across jurisdictions for a hazard type (as is currently the case with bushfire for example), would also provide a pragmatic next step. For example, a national framework for flood would be valued.

In addition to the above approaches, the development of any new or improved frameworks should be informed or validated by broader input from relevant experts, ranging from risk communication specialists to operational and hazard expertise. A logical approach to activities is required and the above opportunities are integrated into an example roadmap at Figure 2 below.

⁵ Victorian Government, (2014), National Review of Warnings and Information: Literature Review, Ipsos – This is the Literature Review produced as part of the National Review of Warnings and Information. It will be consistently referenced throughout this report as ‘Literature Review’.

A roadmap for warning Frameworks in Australia

A roadmap towards establishing multi-hazard (or 'multi-impact') Frameworks for warnings should be produced, setting targets for completion of necessary research and analysis and development and adoption of commonly agreed elements.

Based on actions designed during the Review's national workshop along with analysis to date, the following actions are suggested:

- Conduct research with communities to understand their comprehension and use of current warnings Frameworks across multiple hazard types;
- Agree on key definitions – What is a 'warning'?
- Gather and review the various warnings Frameworks currently in place, identifying commonality and difference, strengths and weaknesses;
- Review and develop improved consistency of elements including (but not limited to) use of colour, symbology, terminology, categories, levels, language and data naming protocols;
- Agree on the level of harmonisation to be pursued, and determine milestones for achieving this change;
- Consider staged harmonisation of Frameworks for hazards other than bushfire (e.g. a single national framework for flood warnings), as a potential milestone;
- Re-test intended approach with communities (throughout as required); and
- Guide and support implementation of change across all states and territories.

Figure 2: A suggested approach to advancing warning frameworks for multiple hazards

Implementation activity arising from the Bureau of Meteorology's *Standardisation of Warning Services* project may provide opportunities to further improve consistency of warnings across specific hazards. Future frameworks should also support the Standardisation of Bureau of Meteorology Hazards Services Taskforce recommendations on roles and responsibilities for warnings.

At a practical level, existing frameworks are typically difficult to locate and to authenticate as current frameworks in use. All warnings frameworks in use should be made readily available, preferably in a collated and regularly maintained location, and including custodian information.

While not specific to warnings, practitioners have highlighted the opportunity to create multi-hazard 'general' messaging across all hazards. For example, the use of 'Prepare, Act, Survive' does not need to belong to a single hazard.

Finally, there is a need to develop a contextual definition of 'warnings', as this issue invariably arises when discussing the future of warnings.

Good Practice

- Creation of the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) provides a strong illustration of coordinated national effort to produce a shared outcome. Further, its broad adoption since 2009 is well evidenced, ensuring that the Framework has moved 'from paper to practice'.
- Extension and adaptation of the bushfire Framework to apply to other fire and hazmat events has been undertaken and documented by a number of agencies including SA's MFS (See [Appendix A](#)).

Key Findings

4 Community understanding of the various warning frameworks in use across hazards is untested. As a result, agency desire for greater harmonisation of warnings frameworks across hazards lacks a strong evidence base for public value benefit, and fails to provide guidance on the direction future frameworks should take.

5 There are diverse views on the benefit of a single national multi-hazard framework for warnings. The sector lacks a nationally coordinated 'roadmap' for considering the opportunities and business case for harmonisation and as such any exploration of common frameworks has been ad hoc and localised.

6 The emergency management sector lacks an agreed definition on what a 'warning' is. While for some, a 'warning' focuses on providing information to the public about an expected hazard (such as a cyclone), others provide 'warnings' with a focus on outlining the *impact* of that hazard and risk to life and property.

7 Various warning frameworks exist across hazards and agencies but they are difficult to locate and authenticate as agreed current practice. While the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) is widely noted as a milestone achievement and precedent in national warnings Frameworks, it is difficult to source and lacks a clear current owner and custodian. (See Recommendation 2)

Recommendation 3

Pursue greater national consistency of warning frameworks across jurisdictions by leading a coordinated review of current frameworks, assessing the evidence base for change, and identifying opportunities for harmonisation. While this requires a longer term focus, in the short term, build national consistency within individual hazard areas.

The role of community education and preparedness

Practitioners and researchers agree that the success of warnings during an emergency is highly dependent upon prior efforts to build community preparedness and resilience. The concept of a 'total warnings system' draws an explicit connection between community preparedness and the provision of warnings during emergencies. The discipline of public information should always be considered in this broader community resilience and public safety context.

Strengths

"Significant literature emphasises that the success of warnings relies heavily on groundwork performed to foster community resilience and preparedness long before a threat occurs. Preparing the community to respond appropriately in an emergency can increase the likelihood that when the warning is issued, people receive it and know what it means and what they should do" (Literature Review, p60)

The success of warnings relies heavily on groundwork fostering community resilience and preparedness long before a threat occurs

In alignment with research findings, the vast majority of practitioners interviewed for this Review highlighted their strong belief in the connection between community education and preparedness, and the potential effectiveness of warnings provided during an emergency.

In practice, some agencies ensure that community education campaigns include specific information on how to seek out and act upon information and warnings. Many agencies have noted the value of building relationships with community groups and leaders and see this as a direct investment in future warning scenarios.

Flood agencies have for some years been working to a 'total warnings system' concept, which acknowledges the role of preparedness and engagement with communities well prior to any emergency occurring, as part of an effective warnings system. (See for example, the *Australian Emergency Manuals Series Manual 21: Flood Warning*⁶).

Issues and Impacts

Despite continued education and communication, the public have increasingly high expectations that they will receive timely, targeted and tailored 'personal' warnings. Agencies note that in their experience, many people still expect a knock at their door, or highly localised information on how they should respond.

Post-incident research has shown that people regularly report that they did not receive a warning, even though they were aware of an incident via multiple channels. Geoscience Australia research into the 2011 and 2013 QLD flood events highlights that in 2011, 54% of respondents said they did not receive a warning, however many went on to explain which channels they sourced warning information from (Geoscience Australia 2014⁷). This illustrates challenges in expectations of what a 'warning' is, and what form it might take.

"Comrie notes that there will always be a segment of the community that have the unrealistic expectation that a warning will be delivered to them personally, without a need to take any information seeking action" (Literature Review, p59 citing Victorian Government (2011)⁸). Indeed, survey analysis by the *National Review of Emergency Alert* highlights that close to 1 in 3 people think that agencies should take full responsibility for protecting them from

⁶ Commonwealth Government, (2009), *Flood Warning*, Manual 21, Australian Emergency Manuals Series

⁷ Geoscience Australia (2014), *Warning sources and their value to Brisbane and Ipswich households during the 2011 and 2013 floods*, Professional Opinion 2014/02, Canterford, S., Juskevics, V.

⁸ Victorian Government (2011), *Review of the 2010-11 Flood Warnings and Response*, Comrie, N.

emergencies, and 50% of these people are not motivated to make changes to reduce their risk⁹.

Skinner and Skinner highlight a research gap in community response to warnings noting that “much of the research to date has been undertaken in isolation from the other contexts that impact on communities in bush fire prone areas (e.g. social pressures, environmental considerations).” (2014 p v). Indeed, “Paton (2006) recommends that strategies designed to get people to take action in relation to a particular risk, such as bushfire, need to show why this particular risk is as worthy, or more worthy of people’s time and resources, than the many other risks and attractions that compete for their attention” (Skinner & Skinner p21, citing Paton). A number of practitioners during this Review have discussed the complexity of this issue and the challenge of ‘breakthrough’ for warnings.

One of the practical challenges for many agencies is sharing the local knowledge of community education and preparedness program teams with public information teams. The practice of capturing local knowledge in formats that can be quickly utilised during an incident was rarely highlighted by practitioners as part of their standard operation.

Key Opportunities

Future development of warnings frameworks across multiple hazards can be informed by the ‘Total Warnings System’ concept.

There is also opportunity for shared investment in design of expert risk communication which responds to research. Many agencies have discussed plans to further tailor their pre-season communication messaging to focus on warnings, and to provide greater detail on where to access information and what to expect. There is a sense that agencies want to move on from ‘you may not get a warning’ to more proactive statements about seeking out information and better illustration of the kind of information that warnings typically contain (and don’t contain).

Research and learning which extends beyond the immediate emergency management sector and looks more broadly at risk communication, traditional marketing and consumer (community) decision-making may also be valuable. The *National Review of Emergency Alert* has identified, for example, that households are more motivated and more likely to prepare an emergency safety plan soon after an event has threatened or impacted them. Consideration of this analysis in more detail and tailoring of post incident communication and programs to capitalise on this period of motivation could have a positive influence.

Given the importance of local knowledge to construct and disseminate warnings and information, there may also be opportunity to improve practices and systems to better capture relevant data. For example, if local teams capture information on key community networks and local leaders, this provides an immediate resource to public information teams during an incident, rather than reliance upon ad hoc processes when an incident is already underway.

Good Practice

- Encouraging or scheduling drills and exercises within communities appears to have good effect for at least some hazards. Emergency drills in earthquake-prone areas have been shown to increase the likelihood of informed and predictable response to warnings. (Literature Review, p61)
- In NSW, SA and Victoria the FloodSafe program raises awareness of flood risk to improve community resilience. An independent examination of the total flood warning system following the 20/11 Victorian floods found that “those in communities in the state’s north east who had participated in the program were more prepared and more responsive to warnings than those in the north west who had received little or no education about flood”. (Literature Review, p61)

⁹ *National Review of Emergency Alert* (2014)

- Dedicating funds and resources to community education campaigns is a commonly cited challenge. Sharing of campaigns across jurisdictions is highlighted as good practice. QLD's "If it's flooded forget it" campaign was shared with NSW, who were able to rebrand it with their own agency information and re-use this collateral.

Key Findings

8 Practitioners and researchers agree that the success of warnings largely relies on efforts to build community resilience, awareness and preparedness prior to an emergency. There is merit in the 'total warning system' concept, already adopted by flood response agencies, being more formally considered across other hazards in the development of future warning frameworks.

9 Understanding how to design warnings which will effectively interrupt or breakthrough to individuals leading busy, complex lives is limited. Although some research on this area has explored the issue, others see this as a gap in sector knowledge which should be informing warning protocols. (See Recommendation 8)

Trust, credibility and information validation

Research stresses the importance of community trust in information and warnings to motivate community response. In addition, it highlights that communities will seek to validate information before acting on it, regardless of the source or level of warning provided. The use of local information and recognition of local and personal networks are critical to effective warning provision, and public information policy makers can better integrate this knowledge into warnings practice.

Learning from research

The following short extracts from multiple literature scans focus on trust, credibility and validation of information.

“Trust is built over the long term, and pre-existing perceptions of the authorities will shape how warnings are perceived and acted upon. Indeed, Paton has argued that public faith in the source of information will have a greater bearing on how they react to the emergency than the content of the warning”.(Literature Review, p56¹⁰)

“To be effective, sources of information and influence need to be trusted by individuals and the community. This trust can be unwittingly eroded by seemingly minor acts or omissions, or may not exist at all if relationships have not been built.” (Skinner & Skinner, 2014 p9)

“It seems that lack of local knowledge in information and warning updates is a persistent cause of trust erosion, and [that there is a] need for individuals to validate and verify information with trusted sources before committing to safe action”. (Skinner & Skinner, 2014 p iv)

Trust can be eroded by “mispronunciation of place names, referring to a fire being ‘in town’ when it has only reached the outskirts of the council boundaries, or on a road that is 50 plus kilometres long. When this is combined with commercial radio phone-ins, the result is that faith in official announcements is eroded (Skinner & Skinner, 2014, p9).

“Community trust in the organisations issuing warnings has a significant impact on how likely they are to respond. As such, all forms of warnings should clearly identify the information source so that it is perceived as credible”.(Literature Review, p54)

“There is also some evidence to suggest that people trust who they know, and that warnings should therefore be issued by as local a source as possible”.(Literature Review, p56)

“Although agency knowledge is typically sought, communities often rely on local knowledge and experience to provide understanding, meaning and context to official advice.” (Literature Review, p45)

“The importance of an individual’s networks for validating and verifying information cannot be stressed enough” (Skinner & Skinner, 2014, p11)

“Studies have demonstrated that while certain channels are relied upon by the public for initial warnings, further information is often sought via other channels to corroborate the warning and provide more detailed information.” (Literature Review, p67). For example, “after hearing a warning about the 2007 tsunami, 59% of residents surveyed in Townsville and Cairns used the Bureau of Meteorology website to access further information.”(Literature Review, p45)

“Literature has shown that in cases where the warnings provided are contradictory or inadequate, the public may lose faith in the authorities and instead rely on rumour systems and unofficial media reports”.(Literature Review, p56)

“As researchers noted when interviewed, even when receiving official warnings, residents only act when this is confirmed through other sources.” (Skinner & Skinner 2014, p10)

¹⁰ Referencing: Hagan, P., Maguire, B., and Bopping, D. (2008). Public behaviour during a pandemic. *The Australian Journal of Emergency Management*, 23 (3), 35 – 40, and Paton, D. (2007) Preparing for natural hazards: the role of community trust. *Disaster Prevention and Management*, 16 (3): 370-379

Strengths

Emergency service personnel are generally highly trusted by communities¹¹, providing a sound basis for the issue of information and warnings during incidents.

Both practitioners and subject matter experts generally concur with researchers on the value of local sources to improve trust and credibility of information. Many have highlighted the essential nature of trusted relationships and the value of engaging with local networks. They also note the importance of a recognisable face or voice, whether that be via radio interview or in a local community meeting. Of note, trust placed in an *individual representative* appears to be as important as trust in an agency's general communication.

A multi-channel approach to providing information and warnings not only provides a consistent, credible foundation, it also assists people to validate information through trusted sources. This is an important strength and feature to Australia's warning frameworks. Skinner & Skinner also note that this approach engenders trust (2014, p10).

A multi-channel approach assists people to validate information through trusted sources

Many agencies are aware that their presence on social media is not only an additional information channel, but also a source of authority and credibility in a space filled with 'unofficial' commentary and information. Both practitioners and subject matter experts such as Google Crisis Response representatives believe that crowd-sourced input and insight will continue to grow and that therefore, authoritative, credible content must also be available via these same channels.

Some note that agency provided mobile applications (apps) offer a channel with an inherent level of trust because the information provided within them clearly belongs to the agency providing the app.

In the Northern Territory, practitioners believe that one of the reasons communities respond very well to watches and warnings is that through their experience of relatively frequent cyclone and flood, a level of trust in the advice provided has been established. Maintaining this trust is therefore critical to continued safe behaviour.

Issues and Impacts

Should trust be lost, the consequences can be significant. Community safety can be compromised and agency performance can be questioned. "It has been observed that regardless of the operational response to an event and the outcomes of that event, a poor communications strategy will lead to a public perception that the emergency response was a failure" (Literature Review p59¹²).

In addition, lesser known control agencies or departments responsible for some incident types are likely to have greater difficulty earning trust and credibility with communities as often they do not have a pre-existing presence or relationship with communities.

A number of agencies do not currently use social media to share information and warnings. This lack of presence reduces the options that community members have to access or validate information. It also results in unofficial entities or individuals posting and sharing warnings which cannot easily be validated or refuted by official sources. On social media channels, misinformation or dated advice is a risk which a number of agency representatives have raised.

¹¹ Catalyst Consultancy and Research conducted a poll of over 1200 adults in March 2014 for the 10th *Trusted People Poll* by Australia's Readers Digest. Paramedics, firefighters and rescue volunteers ranked in positions 1-3. <http://www.readersdigest.com.au/trusted-people-2014>

¹² Referencing: Bushfire CRC (2013), *Preliminary Report on the January 2013 Fires in the South-Eastern Tasmania Research Project*, Boylan, J., Cheek, C., and Skinner, T., noting remarks by Esplin, B., at the EMPA Conference, May 2009

The effort required to monitor these channels can be prohibitive for emergency services (See also Social Media).

The increasing presence of third-party private or non-profit organisations providing warnings also creates challenges. Many members of the public build an awareness and preference for these sources, with various 'storm chaser' teams providing one such example cited by Bureau of Meteorology representatives. Maintaining credibility and authority in the midst of alternative information options requires attention to and understanding of what communities are seeking out.

Opportunities

Frameworks, systems, training and education campaigns should work from a basis of understanding the importance of building and maintaining trust, providing credibility and recognising that people will validate information before acting upon it. Assumptions that people will immediately act because they have been warned should be eschewed.

People will validate information, regardless of its source or urgency, before acting upon it.

If prior trust and recognition of an agency is important to how people will credit and respond to a warning, it follows that should a lesser known control agency or government department issue warnings, they should be supported by better known and highly credible authorities such as police, emergency services or the Bureau of Meteorology. If not already in place, more formal arrangements should be put in place to support control agencies for different hazards. Relevant research should also be shared with these organisations. At the very least, key agencies should help to promote lesser known agency advice and warnings.

The need for this to occur is well illustrated above, where 59% of people hearing about a tsunami, consulted the Bureau of Meteorology's website, most likely unaware of the shared role of Geoscience Australia through the Joint Australian Tsunami Warning Centre (JATWC) (Literature Review, p45¹³).

Continued development of multi-channel approaches containing authorised and coordinated information and warnings will help to provide people with primary and secondary sources of information. Rapid validation which minimises confusion can be a clear goal. In this same vein, continued development of approaches to two-way conversation rather than just distribution of information will also improve opportunities to validate information.

The level of community trust in more recently established multi-hazard websites (VicEmergency, TAS Alert, and Alert SA for example) is unclear for some agencies. Testing of community awareness, trust and perception of these 'neutral' emergency service information websites would be valuable.

There is also an opportunity to connect with the wealth of research available on this subject and to better utilise it in the planning, design and issue of warnings and information. This Review's Literature Review provides further information on some of the relevant, recent research.

¹³ Referencing: King, D (2008). How people responded to the April 2007 tsunami warning in Cairns and Townsville. *The Australian Journal of Emergency Management* 23 (1):10-20

Good Practice

- Research highlights that small details can have a big impact on the level of trust placed in a warning. The following examples of good practice have emerged from literature:
 - Every message should clearly state who has authored and issued a warning;
 - Agency and organisation logos should be included in information for immediate visual validation;
 - Accurate and obvious local knowledge within a message is important to provide credibility. For example, correct pronunciation of town and road names, and correct reference to local place names, road names as they are locally known, and local features is critical; and
 - Provision of detail such as 'Dr Smith' rather than 'the officer' will improve trust and credibility of advice.
- The ACT's Emergency Services Agency provides a 'single point of truth' for community members via its single website for all warnings across multiple hazards. One of the mechanisms utilised to build trust in this channel is to provide regular incident information and updates on incidents throughout the year, even when incidents are small and pose no risk to communities. This not only sustains interest in monitoring information, but teaches readers that the site provides a comprehensive and 'always on' location for emergency information.
- At a recent coalmine fire incident in Victoria, the Chief Health Officer became a key spokesperson as air quality became a significant concern for the community. At community meetings and in media briefings, the Chief Health Officer was regularly accompanied by the heads of police and fire agencies. This uniformed 'visual' no doubt provided additional credibility to the relatively unknown public servant, for a community who were distrustful of official messaging.

Key Findings

10 There is a wide range of research now available on how people trust and validate warnings prior to taking action, however there is limited evidence of how this research has been adopted, or is specifically informing continuous improvement. (See Recommendation 8)

11 The importance of local networks and of issuing and sharing warnings through local sources is highlighted by a range of research. While a multi-channel approach provides important avenues for individuals to access and validate information, there is a need to increase focus on developing links into local community networks and leaders who can share warnings and act as a trusted local source during emergencies. These networks are critical to the effective dissemination and validation of warnings.

12 Research also provides evidence that warnings are most effective when they are provided by agencies and people who are recognised or known. Given that emergency services and the Bureau of Meteorology are typically well recognised by the general public, the sector is well placed to take a greater leadership role supporting lesser known control agencies.

Publishing systems and a multi-channel approach

A multi-channel approach to provision of information and warnings has been an aim of emergency services for some years now and is embodied in the nationally adopted *Emergency warnings guidelines and principles (2007)*. Agency capacity to utilise a diversity of channels is continuing to develop well, with many now focused on better tailoring and targeting of messages through this multi-channel approach.

Strengths

Overall, there is high awareness and confidence in the importance of a multi-channel strategy as outlined in the nationally agreed principles. Practitioners are readily able to discuss and illustrate the strengths of different channels noting that successful use of multiple channels requires a balance of consistency of messaging and flexibility to tailor messages to suit each channel (For example, providing detailed, short form, visual or audio messages).

Many agencies now have multi-channel publishing systems in place to support their multi-channel approach, such as CRIIMSON for SA CFS, One Source One Message (OSOM) in Victoria, or Single Point of Truth (SPOT) in ACT. The principle of 'write it once' which has previously been established¹⁴ is gaining traction and improving timeliness, consistency and efficiency of messages for agencies.

Many agencies now have multi-channel publishing systems in place

Where arrangements are in place for a multi-agency and collaborative approach to system design, smaller agencies are able to benefit from the systems which larger organisations have established.

Despite the diversity of systems in use, practitioners have generally highlighted a high degree of confidence in local systems, with the flexibility to tailor to local needs seen as a particular strength. Of note, none of the jurisdictions or agencies consulted during this Review have called for harmonisation of systems. Continued adoption of the CAP-AU Protocol (See inset) for constructing messages is increasing, and this is particularly important to ensure consistency in warnings regardless of publishing system, capability to provide cross-border warnings and ability to share and promulgate warnings and information.

Common Alerting Protocol (CAP)

The Common Alerting Protocol (CAP) is a standardised system that allows consistent and easy to understand emergency messages to be broadcast across a variety of communication systems. CAP can be used to alert and inform emergency response agencies, media and the general public. CAP ensures that messages remain consistent and clearly indicate to the recipient the severity of the threat and best response. The CAP Australian Profile (CAP-AU-STD) was nationally endorsed in 2012 and is freely available for download, along with supporting information and tools at <http://www.em.gov.au/CAP>

Figure 3: A short explanation of the Common Alerting Protocol

Many jurisdictions have continued to expand and utilise a diverse set of channels. Agencies have been developing mobile device applications (apps), which are seen to offer highly tailored options for end users to request notification of incidents and warnings, and to provide a known 'go to' channel.

In further examples, loudspeakers installed for the Olympic Games throughout Sydney's central business district can be used as an intrusive communication channel for emergency announcements. This system is tested regularly, and engages central businesses. This

¹⁴ See AFAC's 2009 *Discussion Paper: A National Systems Approach to Community Warnings*

channel can be used for emergency and non-emergency scenarios and as a result offers broad public value. In Innisfail, large dynamic signage in the central business district can share warnings about pending cyclone or storm.

Literature clearly endorses a multi-media approach to issuing emergency warnings (Literature Review p67). Research notes that different mediums vary widely in their reach to different audiences (such as age and gender) and different channels work best for different types of events or warnings. For example, survey of community views during the *National Review of Emergency Alert* has highlighted that while the internet is the 'most useful' channel during bushfire (37%, over radio 23%), radio is preferred during storm or cyclone (42%). The internet and radio are both useful during flood events (25% and 28% respectively), and television plays an increased role during flood (18%)¹⁵.

Coupled with the use of Emergency Alert as a popular method to provide an intrusive alert, the need for continued reach across many different channels is clear.

Issues and Impacts

Publishing systems and technology platforms are not consistent between jurisdictions, or even agencies and hazards. It is evident that many agencies have had little opportunity to see and explore alternative publishing systems in use by other organisations, and this has been a contributor to the diversity of systems now in use.

This creates challenges to consistency and presentation of multi-agency, multi-hazard warnings for the public. Further, some smaller agencies are yet to benefit from more sophisticated publishing tools. This is particularly the case where multi-agency approaches to public information are not in place or where there is yet to be a truly collaborative approach to system design and development (rather than a 'use our system as it stands' offer).

There are challenges in preparing and disseminating warnings in cross-border incidents as systems can have limitations warning communities outside of their own jurisdictions. While there has been national support for the CAP-AU standard, most agencies are yet to develop CAP-AU compliant systems. This constrains opportunities to share warnings and information across multiple channels and systems, particularly where messages are re-used or re-posted by other agencies and parties.

Across the various channels, "community expectations of websites are particularly high. In many instances, the community has expected websites to provide 'live' information about an event, and been disappointed where this has not been the case." (Literature Review p46¹⁶)

Despite advancements in the online space it must be recognised that many communities in high risk areas are by the very nature of their location left with poor (or no) internet access. This fact, along with high web traffic loads can mean that websites are not necessarily a viable information point during an emergency. It is therefore essential that multi-channel strategies continue to pursue face-to-face or analogue warnings wherever possible.

Many high risk communities have limited mobile and internet access. It is essential that multi-channel strategies continue to pursue face-to-face and 'analogue' warnings

While television is another widely available channel, both researchers and practitioners highlight a major drawback in Australia in that programming is often provided by the eastern states. This means that it is difficult at times to provide timely and targeted warnings in the Northern Territory, South Australia, Tasmania and Western Australia. (Literature Review p37).

Further research has highlighted the value of television as a channel, particularly in longer duration events such as inland flood. The use of "scrolling updates [TV 'crawlers' or 'ticker

¹⁵ *National Review of Emergency Alert* (2014)

¹⁶ Referencing: Bushfire CRC, (2013), *Preliminary Report on the January 2013 fires in the South-Eastern Tasmania Research Project*, Boylan, J., Cheek, C., Skinner, T. and Country Fire Authority (2014) *Warrandyte: What did you do on the 9th February 2014? Community survey results*.

tapes'] during evening news bulletins has been identified by the public as a particularly useful way to provide clear, timely and concise messaging".(Literature Review p37¹⁷)

Research notes that ABC radio is a particularly valued and credible source, however overdependence of radio to the exclusion of other channels has also been a past community criticism. Also of note, both researchers and practitioners have found that many commercial radio stations lack the same level of experience and legitimacy as the ABC, despite being a likely source of information in some communities (Literature Review, pp38-39).

While many agencies are now using social media, and several publishing systems in use have the ability to automatically create tweets and Facebook posts, agencies report mixed success to date, and challenges with automated production of content lacking the more personal and conversational style typical of these channels.

Some interviewees of this Review, including agency nominees and third party subject matter experts, have questioned the priority being applied to mobile device application (app) development. Provision of an app by agencies has limited value unless individuals can, and choose to, install and use that app, while other channels have more immediate accessibility to broad audiences in an emergency.

Still, some research suggests that apps can provide a more user friendly experience than websites for mobile device users with the Yellow Social Media Report finding that (for social media interactions) users strongly favoured access through an app over a website. (Sensis 2014) Some call for testing the business case for decision to prioritise investment in app development over improvement of existing websites and other channels.

Where app development does occur, ensuring that it operates across all operating platforms is important, with Microsoft Windows advocates highlighting an increasing mobile device market share¹⁸ and poor access to emergency service apps. In addition, standards for public safety app development developed by organisations such as the Association of Public-Safety Communications Officials (APCO International) might be considered.

One of the lesser discussed tools is the Standard Emergency Warning Signal (SEWS). Exploration of views on SEWS has revealed that a majority of practitioners believe that it still has a role to play, but a changed one. A number have reported that in practicality, SEWS is no longer in use, and has been superseded by more sophisticated scaled advice frameworks and practices. Some practitioners were not familiar with SEWS, or the arrangements in place to activate it. Modern use of SEWS needs to reflect the evolution of warnings provision, and multi-channel strategies now in use.

In recent years, due to both the frequency and volume of emergency messages being published, radio broadcasters have limited their use of SEWS even when requested by agencies to sound the alert. This is generally due to concern that audiences will tune out. In WA for example, the SEWS siren was repeatedly played over a 16 hour period for one emergency, as per protocol at the time, as a cyclone moved through a region. There appears to be agreement of both agencies and media that SEWS should be used only at the highest level of warning, for an imminent emergency, and with improved arrangements for how to manage repeated sounding of the alert.

¹⁷ Referencing: Country Fire Authority (2009) *A qualitative research report on CFA warnings*, Sweeney Research

¹⁸ Kantar WorldPanel analysis notes that at Sept 2014, 6.2% of Australians are using Windows devices
<http://www.kantarworldpanel.com/global/smartphone-os-market-share/>

Opportunities

It is evident that many agencies have had little opportunity to see and explore alternative publishing systems in use by other organisations. Providing a forum to support this exploration and to share innovation or lessons learned in system design, functional features and operation would provide value. Further, the continued development of systems in coming years should also look to improve integration with and utilisation of situational awareness ('intel') systems and services.

Agencies yet to be supported by a warnings and information publishing system should be given every opportunity to utilise existing systems rather than further expand the already diverse range of systems with new development or procurement. While intra-state support here is logical, inter-state support would also offer value.

Focus on achieving CAP-AU compliance should be increased. In order to assert CAP compliant warnings as a 'must' have, rather than a 'nice to have', it may be worth asking agencies to self-nominate a target date for their compliance and to share this goal with peers. Of note, the Bureau of Meteorology is currently working towards a CAP-AU compliant system for its warnings. As one of the most widespread and re-published warnings providers, this advance will be of benefit to many agencies and broadcasters (See Figure 4 below).

Exploration of lesser known channels such as Sydney and Innisfail's inner-urban warning infrastructure may well be of value to other agencies supporting urban centres.

Further exploration and sharing of inner-urban warning infrastructure and communication arrangements should take place

A review on contemporary and integrated use of SEWS within a multi-channel environment should be conducted. Once revised protocols are in place, re-education should also occur. Of note, ABC radio has developed an additional unique short tone which it plays prior to broadcasting official emergency information. While quite distinct from the SEWS alert, the value of this protocol and use of a short sound might inform a review of SEWS protocols, providing insight into use of different sounds to alert listeners to different alert levels.

Finally, agencies and organisations who do not currently provide 'mobile device friendly' warnings on their websites should attend to this as a priority.

Good Practice

- Sharing or building upon inter-agency development is to be commended. The NSW RFS 'Fires Near Me' app has now been adopted by the ACT and TAS. Similarly, the websites Alert SA and TAS Alert have built upon earlier development of a multi-hazard website in QLD.
- Some jurisdictions have made good headway supporting the provision of cross-border warnings, with SA's CFS and Victoria providing one such example. Their respective systems (CRIIMSON and OSOM) are capable of automatically issuing warnings to communities interstate and standing protocols are in place to do so. Between Vic and NSW borders, a process also exists but includes additional steps as warnings must be exchanged via email for re-publishing.
- A number of agency publishing systems originally designed for bushfire information and warnings have since been extended for use in other hazards and by other agencies. Agencies have highlighted that good practice allows for genuine adaptation and extension of these systems, rather than expectation on agencies to adapt their warnings and protocols to suit a bushfire context.
- In SA, the CFS has maintained its use of SEWS with a modified approach which the ABC has highlighted as preferred practice. In SA, the SEWS signal can be played on request for a short period (5 seconds) prior to specific warnings. The request process is simple, and

included in the warning header. This arrangement is seen as good practice; It amalgamates SEWS with existing warning protocols, avoids separate and lengthy approval processes, removes use of a separate form for warning information, and reduces the suggested play length of 15 seconds.

- Victoria's One Source, One Message system is not only capable of publishing information and warnings to multiple channels, but now incorporates built-in functions to sound community sirens and open community fire refuges (where available).
- Research has found that given the exponential rise in use of mobile smart devices "it is crucial that emergency organisations have accessible mobile friendly sites" (Literature Review p46). A review of a diverse range of agency websites via mobile device highlights progress in this area by many, including NSW RFS, NSW Police, NSW SES, WA DFES, SA CFS, SA Police, VicEmergency, Vic CFA, and VIC SES. Many others are yet to modify their websites to properly accommodate mobile device viewing.
- Utilising channels to respond to different scenarios is highlighted in Victoria's response to a protracted hazmat incident in the regional town of Portland. Due to advice to stay indoors, community meetings were held in an 'on air' format with the local radio station. Questions were received via both talkback and social media.

Key Findings

13 Multi-channel publishing systems which support the production of timely, tailored and relevant warnings are growing in use. Smaller agencies are less likely to be benefiting from these kinds of tools unless intra-state or interstate offers to share or utilise existing systems are provided.

14 The role of the Standard Emergency Warning Signal (SEWS) within the contemporary warnings environment can be better integrated within a modern warnings environment to maximise its value

15 The increasing use of mobile smart devices requires that agencies provide information and warnings in suitable formats. Whether this is through mobile apps or mobile friendly websites (or both), it is important that content is easily accessible, good practice development standards are followed and that consideration be made to support all operating systems.

16 While the use of online and digital channels continues to mature, traditional channels including radio, print media, television and face-to-face meetings also provide critical information services, particularly for remote communities, those with limited mobile and internet connectivity and those in long-running events. It is essential that warning protocols consider both the incident and affected communities to tailor diverse use of available channels.

Section	g ^a	h ^b	Sub-Section	(AMOC) ^c	Metadata	(CAP) ^c	Sample	
PREAMBLE	M	t_	CODE	<identifier>	<identifier>	part	IDN20100	
	M	Ts	BANNER	<source><sender>	<sender>		Australian Government Bureau of Meteorology	
	M	T_	SOURCE	<source><region> Or <source><office>	<source>		New South Wales	
	C	—	SEWS				Use of the Standard Emergency Signal is ...	
	C	—	PRIORITY				PRIORITY: The Bureau and State Emergency Service would appreciate this message being broadcast regularly.	
Space								
HEADER	C	T_	STATUS	<phase>	<msgType>		[UPDATED] [CANCELLATION OF]	
	C	TS	SEVERITY	<hazard severity>	<info><severity>			
	M	TS	TITLE & TYPE	<hazard type=> <product-type>	<info><event>		[EXTREME][EMERGENCY] SEVERE WEATHER WARNING Number 7	
	S	TS	SEQUENCE ^d					
	S	TS	PHENOMENA	<hazard><phenomenon-list>			for damaging wind	
	M	TS	AREA	<hazard><area-list>	<info><area>		for the Southwest Slopes, Riverina and Lower Western Districts	
	M	TS	ISSUE	<issue-time>	<info><effective>		Issued at 4:28pm EDT Tuesday 29 December 2009	
	S	TS	ISSUE AUTHORITY					
	S	TS	VALIDITY	<validity-bgn-time> <validity-end-time>			Valid for the rest of today and tomorrow	
	Space							
HEADLINE	O	TS	HEADLINE				Land Gales for southwest parts NSW	
CAVEAT	S	T_	CAVEAT					
BODY	O	TS	SITUATION		<info><description>	part	Synoptic Situation: there is a vigorous cold front moving over the southeast of the country.	
	Space							
	O+	TS	Sub-Head >Sub-area	<hazard severity=> <hazard><headline> <hazard><area-list>	<info><severity> <info><headline> <info><area>		[EXTREME] [EMERGENCY] WARNING for Riverina District	
	M+	TS	WARNING TEXT		<info><description>	part	Damaging winds are expected to affect the Riverina district overnight, mostly in the southern parts.	
Space								
ACTION & ADVICE	M	TS	ATTRIBUTE				The State Emergency Service advises that people:	
	M	TS	ACTION				<ul style="list-style-type: none"> Avoid parking or camping under trees Secure tents and other loose items 	
	O	T_	RECENT EVENTS				Reports of wind damage have been reported in western Victoria this afternoon.	
	C	TS	PART CANCELLED				Cancelled severe weather warning for Alpine District, gales no longer expected.	
Space								
FOOTER & GRAPHIC	M	TS	NEXT WARNING	<next-routine-issue-time>	<expiry>		The next warning is due to be issued by 5:30 pm Tuesday.	
	M	T_	LINKS				This warning is also available through TV and Radio broadcasts; the Bureau's website at www.bom.gov.au or call 1300 859 216. SES (NSW and ACT) available on 132 500.	
	O	t_	MEDIA				The Bureau and State Emergency Service would appreciate warnings being broadcast regularly.	
	O	t_	GRAPHIC			<reference>		

Notes:

- Is this essential? M=Mandatory; S=Mandatory for Specific Products; O=Optional; C=Conditional += may be repeated for multiple parts
- Is this broadcast? T=text; S=Speech; Lower case indicates "sometimes"
- AMOC & CAP: Links to respective specification are provided at start of this document
- SEQUENCE: is located at end of Header section for Flood Warnings

Figure 4: The Bureau of Meteorology has developed a draft warning structure in a CAP-AU compliant message format. Source: Bureau of Meteorology Draft Warnings Structure Specification

Tailoring messages, intuitive language and consistent terminology

Understanding of good practice message design and use of appropriate language has continued to grow in recent years, however more can be done to improve and embed the use of intuitive language and well-tailored content. Importantly, the widespread use of templates to improve timeliness and consistency requires a corresponding commitment to tailoring of individual warnings.

Strengths

There has been a continued aim over recent years to design information and warnings with intuitive 'plain English' language, removal of emergency service jargon and complexity. This pursuit has been supported by a wide range of research, post-incident evaluation and reviews on what communities understand, and how they respond to different messages and warnings.

The broad utilisation of templates by emergency service organisations to construct warnings assists in avoiding jargon and overly-technical information, and in prioritising the order of content. Templates are also seen to assist in providing timely and consistently formatted warnings. Many agencies report that templates continue to be refined based on post-season or post-incident reviews.

The adoption of the *National Framework for Scaled Advice and Warnings to the Community* (for bushfire) has helped to improve consistency of language for fire warnings. For example, in NSW the Rural Fire Service no longer refers to numerical alert levels and instead uses titles and language reflective of the level of warning (e.g. a 'level 3' warning has been replaced with an 'emergency warning').

In Victoria and Western Australia, reviews and consultation with communities have been undertaken, highlighting community desire for detailed, clear action rather than vague or generalist statements. Western Australia has also tested different message formats directly with communities in order to refine their templates. (Literature Review pp52-53)

Agencies are also increasingly aware of the need to tailor language and content for different channels. Many are focused on improving processes and systems in order to tailor information for online publishing, radio broadcast, television crawlers, or social media (for example).

In Tasmania and Victoria for example, recent changes have been made to arrangements for radio broadcasters to better tailor their communication of information and warnings, particularly on high activity days where multiple updates are provided. In both states, general information included in the latter half of a message is no longer required to be read out for every message, and broadcasters can use their discretion as to when this is needed.

Issues and Impacts

Despite the focus on improving 'easy to understand' messages, criticism remains from communities and independent reviews on the clarity or suitability of advice and warnings. While many agencies have made good progress, this work remains challenging.

In his expert report to the 2014 Victorian Hazelwood Mine Fire Inquiry evaluating communication by a number of government departments and agencies during the incident, Lachlan Drummond noted that "failure to adequately 'speak the

'Failure to adequately 'speak the language' and use the channels of the community will lead to poor, piecemeal and ultimately deficient communications'

language' and use the channels of the community will lead to poor, piecemeal and ultimately deficient communications" (Victorian Government 2014¹⁹, p389, citing Drummond, L expert witness submission p34).

General or vague messages, rather than providing intended broad advice, can instead cause confusion. "A review of enquiries to the Victorian Bushfire Information Line found that a considerable proportion of calls involved customers questioning the use of the phrase 'If you live in a bushfire prone area', asking what this meant and if it applied to them". (Literature Review p53²⁰)

Skinner and Skinner note that "diverse researchers highlight issues that reflect the need for tailoring of information and programs." (2014, p13). Increasing use of templates by agencies can discourage or inhibit an operator's ability to tailor messages for differing scenarios or communities. Conversely, taking time to tailor each message can delay its release or add complexity and risk.

Increasing use of templates by agencies can discourage or inhibit an operator's ability to tailor messages for differing scenarios or communities

The pursuit of a 'perfect' message is forever challenging.

Skinner and Skinner highlight a body of research, asserting that "one message for all is not going to engage even the majority." (p13), and Anderson (2012) notes that "a 100% perfect warning (if such a thing exists) after the threat has passed is useless" (Literature Review p55 citing Anderson²¹)

There remains a high degree of disparity across jurisdictions and agencies in how messages for different areas and hazards are designed and presented, and in how terminology is used. Slight differences between an 'alert' versus 'advice' or between a 'warning' and a 'severe warning' are likely to be confusing for the public.

The Bureau of Meteorology highlights their role in providing warnings about a hazard, rather than a focus on the *impact* of that hazard. While there is intention to move further towards an impacts-based approach through collaboration with relevant agencies, at present their warnings differ to those typically provided by emergency services in that they provide more detailed and sometimes scientific and technical information.

The Bureau notes that this can lead to agencies and other groups editing their official information in order to provide shortened or simplified advice. Whereas agencies and third parties (including the media) are keen to impart the information in what they feel is an 'easier to read' format, the Bureau's concern is that this changes the meaning of the message and might confuse the public.

Opportunities

Skinner and Skinner (2014) highlight the emergency management sector's focus on risk and risk perception in communication, and the opportunity to learn from broader research and expertise in this area. They note that without the right emphasis or design, information may not be achieving the desired effect.

A range of recent and relevant research exists in the area of tailoring effective communication during emergencies. It would appear that many practitioners are 'aware' of research but few have the time available to dedicate to consuming and applying the findings. Continued effort to summarise, present and 'make ready' research for agencies to utilise would be valuable. On a practical note, all agencies can review their templates to respond to research findings,

¹⁹ Victorian Government (2014) Hazelwood Mine Fire Inquiry Report, Teague, B., Catford, J., Petering, S.

²⁰ Referencing: CFA (2010), Review of enquiries based on warnings and the OSOM Incident Summary page.

²¹ Referencing: Anderson, M (2012), Integrating social media into traditional emergency management command and control structures: the square peg into the round hole? Paper presented at the Emergency Media and Public Affairs Conference, Melbourne 8 May, 2012.

minimising vague information, removing safety ‘slogans’ and ensuring that a clear call to action is provided.

The Australian Government document *Emergency Warnings: Choosing your words* (2008) was established following a review of available literature and further consultation. It is designed to support agencies with guidelines for the construction of warnings (See inset below). Last updated six years ago, there is opportunity to review the content, ongoing sponsorship and ownership of the document, and re-promote this resource to public information practitioners, many of whom may be unfamiliar with it given the rate of growth and change across public information teams. Recent research findings should also be incorporated, and advice on tailoring warnings for channels which have emerged or matured since 2008 is necessary.

Emergency Warnings: Choosing your words

The Australian Government document *Emergency Warnings: Choosing Your Words* provides advice on how to word emergency warning messages. It emphasises that warnings should:

- Take into account varying levels of knowledge and understanding of and experience with the hazard
- Suggest the sensible action to take, rather than issue an ‘order’
- Provide a means for the community to confirm the warning
- Ensure consistency within and between messages from different sources
- Be accurate and specific
- Reference previous similar emergencies to create an understanding of the scale of the event
- Use clear, simple language

Commonwealth of Australia (2008), Emergency Warnings: Choosing your words

Figure 5: An extract from Choosing Your Words, a Commonwealth Government guideline on constructing warning message

Findings and recommendations of the Bureau of Meteorology’s *Standardisation of Warning Services* project might provide further insight into future development of good practice weather warnings. There may also be value in commissioning community-focused research or evaluation into community understanding of official and ‘unofficial’ (edited) weather warnings, and preferred information formats.

The ABC has also expressed interest in increasing their involvement in the design of effective messaging. Their knowledge of creating engaging public information, and accurately or clearly conveying a range of detail could be well utilised.

Good Practice

- Consultation with communities has shown that clear, achievable call to action messages are preferred by communities, rather than vague or generalist statements. (See Literature Review pp51-53, and *National Review of Emergency Alert* (2014)).
- Multiple agencies have commissioned research and evaluation to improve the construction and language of their warnings, including CFA in Victoria, DFES in Western Australia, CFS in South Australia and TFS in Tasmania.

Key Findings

- 17 The critical importance of tailoring warnings has continued to feature in research, post-incident reviews and inquiries. While the use of templates to support the construction of information and warnings is now common practice, it is important that training programs and local procedures stress the need for each warning to be tailored for the situation and community it is provided for.
- 18 Both formal research and agency consultation with communities has found that a clear call to action, rather than vague or generalist statements about safety, is preferred. The need to better tailor warnings, minimise vague information within templates, and to remove 'slogans' about community safety within warnings is highlighted.
- 19 While post-incident reviews and research have led to the minimisation of jargon or technical information within emergency service warnings, the Bureau of Meteorology's warnings continue to retain a greater degree of detail. If not already undertaken, targeted community-based evaluation of weather warning content and formats would provide an evidence basis for this differentiation.
- 20 The *Emergency Warnings: Choosing Your Words* (2008) guideline provides a researched and collated view on how to construct and tailor warnings and information, however practitioner knowledge and use of this document appears to be limited, and the best use of language for more recently developed digital channels is not incorporated. (See Recommendation 2)

The importance of targeted warnings and avoiding ‘warning fatigue’

Many agencies and practitioners are building real-life experience on the value of well targeted warnings, and the effects of poorly targeted warnings, including warning fatigue. Recently completed research provides insight into factors that contribute to warning fatigue and actions which can mitigate the effects of this phenomenon.

Strengths

Practitioners feel confident that the increased application of a scaled approach to warnings across hazards provides a framework for better targeting warnings. Surveying of community views by the *National Review of Emergency Alert* found that 72% of people who have experienced an emergency event believe that ‘about the right amount of information’ was provided (2014).

It is also apparent that emergency service experience with provision of information, advice and warnings during protracted incidents is growing, and as a result, agencies are building confidence in what works (and doesn’t) in these scenarios. A range of research has been conducted into how to better target warnings, and on the potential of a ‘cry-wolf’ effect or warning fatigue.

Warning Fatigue

Brenda Mackie’s recently completed PhD thesis on warning fatigue for the Bushfire Cooperative Research Centre argues that the phenomenon of warning fatigue can and does occur when the following factors combine:

- A high frequency of warnings over a prolonged period, issued far in advance of the threat;
- Multiple recent false alarms for similar threats;
- Community distrust of the message source; and
- A feeling of helplessness to mitigate the threat.

Importantly, Mackie argues that these warnings can come from both official and unofficial sources and her research found that the public does not generally distinguish between the two.

She suggests that emergency services should rethink the way they provide warnings for hazards that involve a prolonged lead-time, including, but not limited to:

- Understanding the relationship between agencies and impacted communities as this will have an effect on the credibility of warnings during a prolonged event;
- If a threat fails to eventuate as advised or warned, provision of an explanation is imperative, once again to maintain credibility and encourage attention to any future incident warnings rather than dismissive reaction;
- Careful consideration of the content of warnings in prolonged events, removing unnecessary information or advice if the threat is not near;
- Noting that it is just as valuable to tell the public what is *not* known about a threat, as what is known; and
- Appreciating that a sense of helplessness contributes to feelings of warning fatigue. Providing proactive, achievable advice can mitigate this effect.

Mackie, B., (2013) Warning Fatigue: Insights from the Australian Bushfire Context (pp223-224)

Figure 6: A snapshot of Brenda Mackie’s recently released research on the phenomenon of ‘warning fatigue’

Issues and Impacts

Broad warnings across large geographic areas are known to be a contributor to warning fatigue. For those who are not in the immediate path of the hazard, these warnings can cause confusion or unnecessary panic, and quickly erode the credibility of authorities. Conversely, a blanket warning may not contain sufficient information or adequate notice for people located directly in the path of a hazard.

Many jurisdictions have raised concerns over the potential 'cry-wolf' effect during large or prolonged events that require sustained warnings over broad geographic areas. Notably, the nature of the event often drives this situation where agencies cannot be certain of the risk or expected time to impact and have little choice but to issue regular warnings.

However, some practitioners question the notion of 'warning fatigue' and feel that the key contributor might be more accurately described as weariness from the threat itself and a sustained sense of helplessness. Regardless, maintaining the attention of individuals when it is most pertinent to their safety remains a Public Information Officer's challenge.

Maintaining the attention of individuals when it is most pertinent to their safety remains a Public Information Officer's challenge

In some instances, practitioners have noted that current warning protocols are not well suited to prolonged events, and can result in too many warnings being repeatedly issued for a long running incident. Some agencies have sought to address this issue with guidelines to support adaptation, while others feel constrained by policy or 'locked in' by technology in these scenarios. Warning protocols, systems and training should empower Incident Controllers to determine the ideal frequency of updates.

For some agencies, current warning systems lack the required sophistication to more clearly target different warnings to different areas in the vicinity of a running incident. For example, in a large incident, some communities may indeed require a warning to take action, while others on the periphery require general advice and information only. Sharing of advice or good practice on how to best develop and provide multiple scaled warnings within a single incident would be well received.

When multiple incidents are running simultaneously, multiple messages and warnings can make targeting communities even more complex. Media practitioners have reported that clear understanding on the priority of warnings, along with improved briefing on the overall situational context would be valued. As it stands, the media (particularly radio broadcasters spanning multiple incidents) are often left to work through the information and build a regional or state view themselves.

Targeting of warnings is particularly challenging in peri-urban areas as relevant media channels may be less effective due to their (typically) more urban focus and broad broadcast reach. In these scenarios, emergency services sometimes need to rely on small community broadcasters for targeted messages to peri-urban communities, and on community knowledge that these alternative communication channels exist.

Opportunities

Research on the prevalence of warning fatigue has recently been released. The findings of this research and recommendations for mitigating this phenomenon are yet to be considered, tested and applied by agencies and there is clearly more to learn here.

Some agencies have begun to explore how current frameworks for scaled advice and warnings might be better adapted to support prolonged incidents. Future development of scaled advice frameworks should take into account lessons learned and the need for suitably targeted warnings. The dynamic and diverse nature of different hazards should also be considered, as time between updates should reflect both the nature of the incident and the communities impacted.

Future development of technology, particularly noting opportunities for spatial and visual display of warnings, should consider how multiple warnings for different areas of a large incident could be better targeted and delivered to communities.

Good Practice

- The ABC works with many emergency services to build a proactive partnership approach to better understanding and prioritising the provision of information and warnings. This approach enables the broadcaster to understand the agency's priority messages and the agency to understand where listener or viewer concern is highest. A feature of this approach requires 'real time' interaction between the agency and broadcaster during incidents and high activity days.
- In SA, protocols within the CRIIMSON publishing system for updating messages have been adjusted to provide the public information officer with greater autonomy on how often a warning should be re-issued.
- In Victoria, fire services have looked to experiences during flood to inform practice change. This year they will be trialling VicSES's 'community updates' template during long running incidents, removing the need for 'warnings' unless there is a direct threat while retaining regular updates.
- A number of agencies now display more significant warnings in 'priority' format at the top of lists or pages – this is particularly helpful during active days or large events with a high volume of information and warnings.
- As an example of targeted warnings within a single event, the Bureau of Meteorology's flood warnings distinguish minor and major flood areas within the same basin.

Key Findings

21 As experience and capability to provide warnings is maturing, many agencies are now looking at how best to provide multiple warnings within a single incident, providing more targeted advice to specific areas and communities. Agencies would benefit from sharing current solutions and good practice.

22 In long running incidents, a number of practitioners have experienced scenarios in which formal warning protocols and/or publishing system constraints result in too many warnings being repeatedly issued with little or no change. Any arrangements which provide a lack of flexibility for decision makers to target warnings based on each incident and scenario require attention.

23 Research on the prevalence of warning fatigue has recently been released. The findings of this research and recommendations for mitigating this phenomenon are yet to be considered, tested and applied by agencies and there is clearly more to learn here. (See Recommendation 8)

Reaching diverse and at-risk groups

Challenges in reaching vulnerable or at-risk groups during emergencies are widely recognised by both practitioners and researchers. Those deemed ‘at risk’ can very much depend on circumstances and the risk at hand, but often include the elderly, ill, disabled, culturally and linguistically diverse communities, children and young people. Good practice highlights that agencies should establish community profiles prior to any emergency and develop relationships with community leaders to assist in the dissemination of warnings.

Strengths

A review of emergency service policies and procedures has found that they “generally acknowledge the need to communicate in different ways with different audiences in the community, and the unique needs of vulnerable communities, those who come from a non-English speaking background and those with a disability”.(Literature Review, p62)

Many agencies have discussed the importance of connecting with multicultural communities through the development of relationships with community leaders, prior to any emergency. This building of interpersonal networks enables warnings to be disseminated by local and trusted leaders in the event of an emergency.

Literature supports this focus, with one study finding that “non-English speaking background communities are particularly dependent on having messages delivered by a person of trust, specifically community leaders and established social networks, raising an opportunity for emergency service organisations to use networks highlighted by multilingual organisations to distribute messaging”.(Literature Review, p63)

Many culturally and linguistically diverse communities are particularly dependent on having messages delivered by a person of trust, from within their established social network

Although not explored in detail within this Review, some practitioners have highlighted approaches to tailoring connection with remote and indigenous communities during an emergency. They note that while ‘traditional’ warnings such as web or radio are less likely to be effective, a face-to-face approach with trusted leaders is highly effective, particularly when combined with indigenous knowledge of the impact of natural hazards, and practical support to evacuate an area.

A multi-channel warnings approach, by its nature, helps to connect with more diverse audiences, and all agencies have established this approach as a foundation.

A number of emergency services have established relationships with community radio stations with multilingual programming, and CFA (Vic) commissioned research has illustrated that this reflects community and stakeholder preferences for availability of information via radio (Literature Review, p63).

Issues and Impacts

Most organisations agree that more needs to be done to provide warnings to diverse communities and at-risk groups and “much of the literature suggests that emergency services still have a considerable way to go in communicating as effectively as possible in different languages and formats.” (Literature Review, p62)

Identifying those who are or might be ‘at-risk’ is, in itself, a challenge for many. Some evidence exists of agencies building this profiling into their preparedness and risk assessment work, so that it can inform public information teams during an incident. Building understanding of at-risk groups and developing suitable public information strategies *during* an incident is particularly challenging.

Many agencies lament the constraints they face dedicating resources to tackle this area of public information, noting limitations to invest time in developing relationships and programs for small communities relative to the broader population. Others are tackling this issue by closely connecting their day-to-day community engagement teams with public information teams.

Despite a range of research finding that gender affects decision-making and behaviour, Skinner and Skinner highlight that “the majority of agency respondents were unaware that gender was an issue” (2014, p8). They go on to highlight that many still feel that this is irrelevant. Tailoring warnings to better connect with both men and women is a challenging proposition requiring further consideration.

Opportunities

Many agencies have affirmed that progression of solutions via a sector wide or national approach would be valuable, as individually most agencies struggle to invest in this area, but collectively it may be more achievable. Many simply don't know how to respond to these complex challenges at an individual agency level. Previous reviews have also argued for national or state level guidance on communicating with vulnerable people during emergencies (Literature Review, p62). Shared work might include for example, development of guidelines, technology or partnerships with relevant organisations.

Literature highlights the value of relationships with local leaders to assist with the credible and practical dissemination of warnings (Literature Review, p63). If not already undertaken, agencies should pre-identify ‘known’ diverse or at-risk communities and consult with these communities to obtain specific advice on how to communicate effectively with them.

Connection with communities might not only span local community leaders, but extend to targeted connection with local governments and local community service organisations who are often more immediately connected to small community groups and aware of community diversity and specific needs. Connection *prior* to any emergency offers the greatest value.

Development of improved visual and spatial warnings would immediately assist sharing of information with diverse communities, including those with low-literacy or non-English speaking community members.

Development of improved visual and spatial warnings would assist those with low-literacy or from a non-English speaking background to better understand information and warnings

Research highlights that younger people are less likely to engage with traditional channels such as broadcast radio or television. As such, improvement of how agencies utilise and warn through smart devices and on social media is likely to better connect with this group.

The Australian Government's, *Choosing your words* (2008) includes principles, practical advice and examples of warnings tailored to culturally diverse communities or communities with low literacy. (See p27 for example). As outlined earlier, there may be merit in refreshing promotion of this document.

Guidelines for emergency management in culturally and linguistically diverse communities (2007) are part of the Australian emergency manual series. These Guidelines focus on engaging with diverse communities to educate and prepare them for emergencies and do not span communication *during* emergencies. There may be potential to develop national guidelines on provision of warnings within this manual (rather than create another separate document).

Some practitioners have noted that while establishing working partnerships with community radio to support dissemination of warnings in multiple languages is valuable, many of these organisations are very small and have limited resources. One opportunity to improve connection with such groups includes a coordinated, multi-agency approach to discuss the importance of public information and dissemination practice. Multiple approaches by individual agencies may create unnecessary confusion.

Ensuring that warnings are effective for tourists and visitors to a location remains an area for improvement. “The national *Best Practice Guide for Warning Originators* emphasises that authorities should use language which will “adequately communicate action required, especially by someone unfamiliar with local arrangements” (Australian Government, 2013, p8). Earlier discussion around the importance of local knowledge to inform warnings, should extend to local knowledge on popular tourist areas and well known markers.

Good Practice

- Some organisations have community profiling tools in place to support emergency management planning and response activity. In Victoria, the Department of Human Services and Department of Health are piloting a community profiling template designed specifically for emergency scenarios, which assists practitioners to consider and better plan their incident communication and response. It can be used prior to or (if required) during an emergency.
- Several jurisdictions, including the Northern Territory for example, require all warnings issued online to be published in accessible formats consistent with broader Web Content Accessibility Guidelines to avoid discrimination based on disability. (Literature Review p65²²). Federal government accessibility requirements and the adoption of Government 2.0 (Gov 2.0) also call for accessible, open communication.
- In Victoria, the One Source One Message (OSOM) system has recently been enhanced to provide automated translation and delivery of warnings and advice in five different languages (Modern Chinese, Greek, Italian, Arabic and Vietnamese) at the same time as English messages are published. While OSOM is has built-in capability to publish messages in forty languages, CFA and the Metropolitan Fire Brigade (MFB) engaged with the Victorian Multicultural Commission to ensure that automated translation retained the correct intent and interpretation of information and warnings, which is critical. Multi-lingual messages are distributed to SBS radio and relevant community radio stations, however distribution focus has been on connecting with people of trust within communities.
- Building upon an innovation introduced by the (then) Premier Bligh in QLD during the 2010/11 floods, many agencies are now employing Auslan interpreters to provide warnings to members to the deaf community. They can be seen alongside speakers during live media conferences or community briefings.
- During the 2010/11 floods in Victoria, some community meetings were recorded, broadcast on radio and made available online for those unable to attend. While this action assisted a number of people, it was particularly helpful for those with poor mobility or with limited capability to travel.
- The Australian Communication Exchange (ACE) and Conexu Foundation are not-for-profit organisations providing services for the deaf, hearing and speech impaired communities. They have developed a mobile application which can convert audio based public announcements to text based alerts on a user’s smart device, based on their preferences. Information such as airline departure gate changes, train cancellations, and warnings can be provided. Victoria has recently established an automated feed of warnings to this app and other agencies are encouraged to include their information.

²² Referencing: Northern Territory Government (n.d.). Whole of Government Social Media Policy

Key Findings

24 Emergency services acknowledge that they still have a considerable way to go to communicate effectively with diverse and at-risk communities, however many agencies have found progress to be challenging. There are opportunities to drive action at a national level, building a collective capacity which all agencies can benefit from.

25 One of the greatest challenges with reaching diverse and at-risk groups is identifying and understanding where these groups are, and how they might best be approached and influenced to behave safely if in danger. Agencies working to better profile these communities, and to establish relationships with relevant community leaders and agencies supporting those at-risk are to be commended.

26 A multi-channel warnings approach helps agencies connect with more diverse audiences however continued development of warnings which include visual and spatial information is necessary as this style of information can directly support people with low literacy or a non-English speaking background. (See Recommendation 4)

Emerging technology and the next frontier

Significant progress has been made by a number of agencies in recent years to provide information and warnings using a range of technologies. Increasing community expectations require continued focus on innovating and developing solutions, particularly in the area of spatial, geo-located and visual information.

The next frontier for warnings will see a transition from purely text-based warnings to more dynamic and visual content. National collaboration and shared investment is needed in this area to create economies of scale, collectively partner with and influence technology providers and to develop common standards.

Strengths

Agencies have been proactively adopting and developing technology in order to provide warnings for some years now, and there is momentum to continue to improve. This momentum should not be lost as expectations for improvement continue to grow. The Review's workshop highlighted investment in improving warnings systems and technology as a priority area for action.

As a practical example of ongoing transformation, a number of agencies now host their warning services in the cloud²³, reducing the risk of websites and services failing during an emergency, and providing a responsive solution to management of short term but sudden and extreme peaks in website traffic.

Investment in understanding and utilising digital and social media is also significant and is outlined in a dedicated discussion on use of social media below.

Issues and Impacts

Agencies are confronting increasing expectations from the public for 'real time' and detailed information about emergencies. Their exposure to innovative services in other sectors and understanding of what technology is capable of drives a view that 'more can surely be done'.

These expectations are particularly noted around a call for spatial and visual information to accompany warnings. As one community member has explained, "They must know where the actual fire is. Why don't they show us a map with more than a 'pin point' on it?" (*National Review of Emergency Alert*, 2014)

At the Review's workshop, participants noted that as across the sector current warnings are largely text-based, there is increasing likelihood that some community members will not understand the warning due to lack of additional visual cues. They argue for development of consistent visual protocols for warnings and a focus on increased visual information.

Community expectations for information are high. As one community member has explained, "They must know where the actual fire is. Why don't they show us a map with more than a 'pin point' on it?"

The diversity of spatial information or geographic information systems across agencies is seen by some to be an inhibitor to consistent solution design. In addition, there is concern or uncertainty over how to translate spatial products typically used by trained operational personnel to products suitable for public consumption.

Technical capability and investment in improvement appears to be at least in part one of the reasons that only a handful of Australian emergency service organisations are sharing information with third parties such as Google Crisis Response.

²³ 'Cloud' hosting services host websites on virtual servers which pull their computing resource from extensive underlying networks of physical web servers. Cloud hosting can enable rapid expansion of capacity when required, without significant agency investment in IT infrastructure.

Opportunities

Many practitioners highlight opportunities to improve the use of visual and spatial information. They recommend continued work to build consistency and inter-operability, including potential partnership or support from specialist spatial information groups. In addition to spatial representation, there is also opportunity to consider inclusion of geo-location data as standard in all text based warnings, perhaps even modifying CAP-AU to require this. This addition would enable individuals to use their own local applications to display warnings visually on a map.

Further research on the benefits of how people receive, understand and respond to additional visual and spatial information within a warning might provide incentive to invest in advancing warnings in this form. It would also be valuable to understand how spatial and visual information supports those with low-literacy or a non-English speaking background to receive and understand warnings. Learning from public domain services already provided in spatial and visual form also provides a sound opportunity.

In addition, the ongoing development of spatial services for operational use, including predictive services, should naturally lead to improved information for communities too. In short, waiting for the 'perfect' system or *assuming* that community members won't understand spatial information only delays the inevitable effort required.

Given their communication expertise, partnerships with media organisations could provide opportunities to co-design multi-media online warnings including audio, visual and spatial information. In interview, ABC noted their work to develop suitable maps for use on their own websites which are simplified and easy to access for the community, along with their willingness to work with agencies to collaborate on further development in this area.

The majority of imagery and vision of emergencies is generally provided to the public via media. When we understand that trust and credibility of information is essential to motivating safe behaviour, it seems important that emergency services endeavour to provide informative imagery with appropriate warnings. In Victoria, cameras providing real-time imagery are now being mounted to firefighting aircraft. In Hobart, powerful cameras are mounted in some national park areas including the Mt Wellington area overlooking Hobart itself. There are opportunities for agencies to consider how imagery can be gathered and shared with the public.

Continually emerging technologies expand opportunities to innovate in the emergency management warnings environment. Wearable devices (smart watches) will alert a wearer to an incoming message on their smart phone, even if they are outside preparing their home and property; the increasing availability of drones is likely to see opportunities for more detailed and cost effective survey of local areas (for example in a flood scenario). New satellite technology will soon be operational in Australia, and the Bureau of Meteorology is introducing new technology across a range of analysis and forecasting services.

Continually emerging technologies expand opportunities to innovate in the emergency management warnings environment

A number of opportunities also exist to develop intrusive alerting systems if needed. For example, existing technology in use within Australia provides for 'break in' radio messaging, and modern in-car navigation systems could also incorporate and display emergency information and warnings.

Digital Audio Broadcast Radio (DAB+) is an emerging channel providing opportunities for targeted broadcast during emergencies. While take-up of DAB+ ready equipment is still growing, over three million Australians already listen to DAB+ every week²⁴ and Commercial Radio Australia are investing in its development and use, including within new vehicles and through mobile devices.

²⁴ Commercial Radio Australia, Quarterly GfK survey results:

http://www.commercialradio.com.au/CR/media/CommercialRadio/Media%20Releases/Generic%20Images/v5-DigitalRadioNewsletterTemplate_November.pdf

Finally, the need for rapid intelligence gathering and analysis tools is noted as a priority, not only in the context of warnings and information but for broader emergency management practice. Crowd-sourcing and intelligence tools are becoming more usable and available and have potential to revolutionise the development and sharing of warnings in the future, but a period of learning and development is to be expected.

Good practice

- Commercial Radio Australia has been working with the ACT's Emergency Services Agency to trial use of Digital Audio Broadcast (DAB+) radio where new stations can be established quickly (reportedly in less than 1 hour) to target specific communities during emergencies. Whilst broad roll-out of digital radio across Australia is still limited, dissemination of information via new and emerging channels provides an example of good practice innovation.
- In SA's CFS, lessons learned about cloud hosting arrangements and surges in web traffic have led to the establishment of hosting agreements that provide for rapid and automated expansion of server capacity when it is needed. Previously, CFS needed to request additional capacity when it was required, and this additional step provided a risk to information continuity during an emergency.
- Victoria's mobile app allows users to create and save multiple 'watch zones'. Once created, the user will automatically be notified of information or warnings published for areas within that watch zone(s). This establishes an additional early alert channel, and targeted messaging service.
- NSW RFS and TFS have been working with Google Crisis Response to consider how emergency information might be integrated into Google's standard search interface. The example scenario is that if a user searches for 'pizza' in an area where an advice message or warning has been raised, then they will be alerted to the warning (as well as being provided with their pizza results). Areas of the USA and Japan are also collaborating on this innovation.

Key Finding

- 27 Available and emerging technologies are under-utilised and community expectations on the provision of information and warnings continue to grow. While development of publishing systems, websites, apps and social media channels is evident across a majority of agencies interviewed, there is a continued need to innovate. The next frontier for warning design and construction requires spatial, visual and geo-location based information.

Recommendation 4

Invest in and prioritise improved use of technology to create and disseminate warnings and information. As a priority, develop warnings which offer visual and spatial information.

Figure 7: A number of agencies can now provide an automated feed to Google's Crisis Response platform, which displays warnings in a spatial view

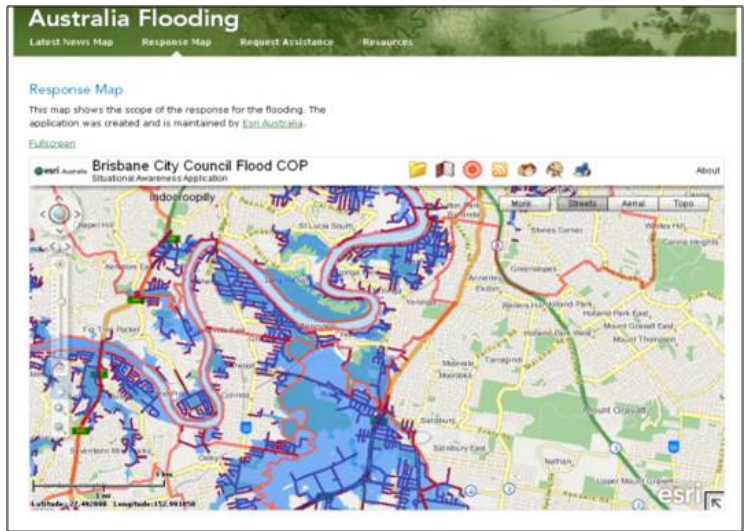
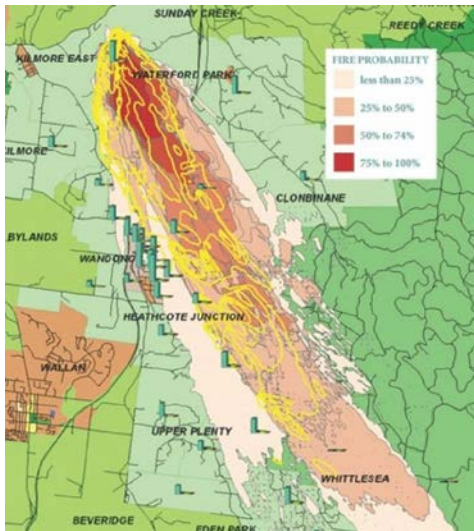


Figure 8: Predictive services software for bushfire and flood mapping products are maturing as aids which would benefit communities

Social Media

The rapid growth of social media over the last decade has seen it emerge as one of the most dynamic channels used to share information, and the use of social media during emergencies featured prominently in discussion throughout the Review. Findings highlight a need for more mature policy on the adoption and use of social media, along with advancement of practical tools and solutions.

Strengths

A majority of agencies are currently developing their capability to use social media, and see this as a priority area for further work. Indeed, many agencies have incorporated automated publishing to social media channels within their standard tools and processes.

A key strength of social media is the ability to reach a wide range of people quickly. Information shared via social media enables targeting of communication by community members to people within their own network. Research indicates that principles of shared responsibility are activated when communities are empowered to share warnings in this way.

Both researchers and practitioners have highlighted that social media channels are increasingly more likely to reach younger people than traditional channels such as radio and television. Further, some practitioners see social media warnings as an excellent channel to alert community members to an issue and motivate them to find out more via other channels such as websites and radio.

At a practical level, social media channels enable images, maps and links to be easily shared by both agencies and the public. For example, the ACT has developed its own digital media monitoring and analysis tool, custom built to meet emergency management needs, and incorporating geo-location analysis (See [Appendix C](#)).

Social media's two-way communication capacity is a key feature. Social media channels are often referred to as 'listening' tools, as they can give agencies great insight into what communities are talking about or concerned about. Literature highlights their value in helping to quickly see and correct mis-information which may be being circulated by the public.

Given the apparent benefits, many agencies are currently trialling social media monitoring tools.

Issues and Impacts

Social media by its nature is a conversational channel rather than a broadcast channel. There are significant challenges for most agencies around how to meet expectations that community commentary and questions will be 'answered' by authorities in real-time. Practically, this kind of activity requires dedicated resourcing. Pragmatically, typical warning processes use templates and see messages drafted and then authorised before release. Social media conversation does not lend itself to that approach.

Indeed, most agencies are currently using social media as a broadcast channel and lack arrangements to monitor and respond to conversation. This has been described in literature as similar to "phoning someone to tell them an important piece of information and then hanging up as soon as they asked a question" (Anderson 2012²⁵).

Information will be shared via social media with or without the participation of emergency services. Their presence is essential to provide a credible and authoritative voice.

²⁵ Anderson, M., (2012) *Integrating social media into traditional emergency management command and control structures: the square peg into the round hole?* Paper Presented at Emergency Media & Public Affairs Conference, Melbourne 8 May 2012.

Using the medium primarily as a broadcast channel raises other issues. Literature highlights that one of the challenges of automated publishing to social media channels via agency tools is that these messages can look 'robotic' and lack the usual style of voice seen on social media channels. This might negatively affect their influence.

Some stakeholders are also concerned that the public will use social media channels for '000' style communication from the public and, indeed, there are already examples of this behaviour.

The loss of control of information creates concern for many. Via these channels there is a proliferation of unofficial content being provided on hazards and warnings. Many agencies are also concerned about dated information continuing to be promoted and shared after situations have changed. Others argue that information will be exchanged over social media by the community with or without the participation of emergency service organisations, and that their presence is essential to provide credible and authoritative advice.

For most agencies however, effectively resourcing teams to support social media information and discussion is challenging or even seen as impossible at this time. Some are looking to see how social media monitoring tools might be able to assist them with strategies to better target responses and interaction.

While the reach and influence of social media is growing, there are limitations on its ability to reach an intended audience. Increasingly, social media channels use algorithms to select and filter content for their subscribers. As a result, posts are not guaranteed to reach individuals who believe they are 'following' an emergency service. Some reports suggest that as little as 6% of posts will reach an individual on Facebook. Education on the need for active listening by communities rather than passive behaviour waiting for information to arrive is essential, and highly relevant for this channel.

The use and sign-up to social media can fluctuate. While the reach of Facebook in Australia is extensive with an estimated 13.6 million users, use of Twitter is still relatively low with an estimated 2.8 million users²⁶. Of note, research by the Queensland University of Technology has highlighted that peak periods of growth in the number of Twitter accounts in Australia have primarily been during times of major disaster or major sporting events. This illustrates that people are searching for information via these channels during emergencies.

Finally, independent inquiries are now beginning to highlight social media as a particular area of focus. The 2013 Hyde Report into the 2013 Tasmanian bushfires included a specific recommendation for the State Emergency Management Committee to make arrangements to actively manage the use of social media in the community during an emergency.

Opportunities

Social media activity can be utilised to build situational awareness for agencies. While protocols to validate information require development, the effective use of social media can represent a significant shift in reliance upon 'traditional' communication from agency resources at the frontline to provide all information for warnings. For example, if multiple users are posting images of flood waters rising to a particular level in a recognisable location, then this information can be quickly authenticated.

In terms of analysis, there are a range of social media monitoring and analysis tools on the market ranging from free tools to solutions requiring sizeable investment. Many agencies reported current or

Many agencies are currently trialling social media monitoring tools. The results of these trials should be shared with the broader sector to promote discussion and progress action.

²⁶ <http://www.socialmedianews.com.au/social-media-statistics-australia-september-2014/> Note that Australian usage statistics are calculated rather than officially reported, and that there may be variation to actual user numbers.

recent trials of tools. It would appear that these trials have been initiated and conducted locally within jurisdictions, with little awareness of any similar interstate activity. There is certainly opportunity for the sector to share results and discuss common requirements and solutions.

There may be an opportunity to collectively influence companies like Facebook to increase likelihood and priority of display of emergency warnings to members. Individually, agencies lack influence with such an approach, however a national, sector wide, multi-hazard argument might have more weight.

In terms of resourcing, virtual operations support teams (VOSTs) are emerging as a legitimate way to resource social media monitoring and activity. These teams are not physically based within incident control centres, and can even be located interstate or overseas depending on the scenario or need. Some agencies are beginning to explore the use of VOSTs. In early 2014, a VOST was activated to monitor and support communication during the Hazelwood Coal Mine Fire. Effort should be made to pilot and learn more here, and to share results and lessons learned.

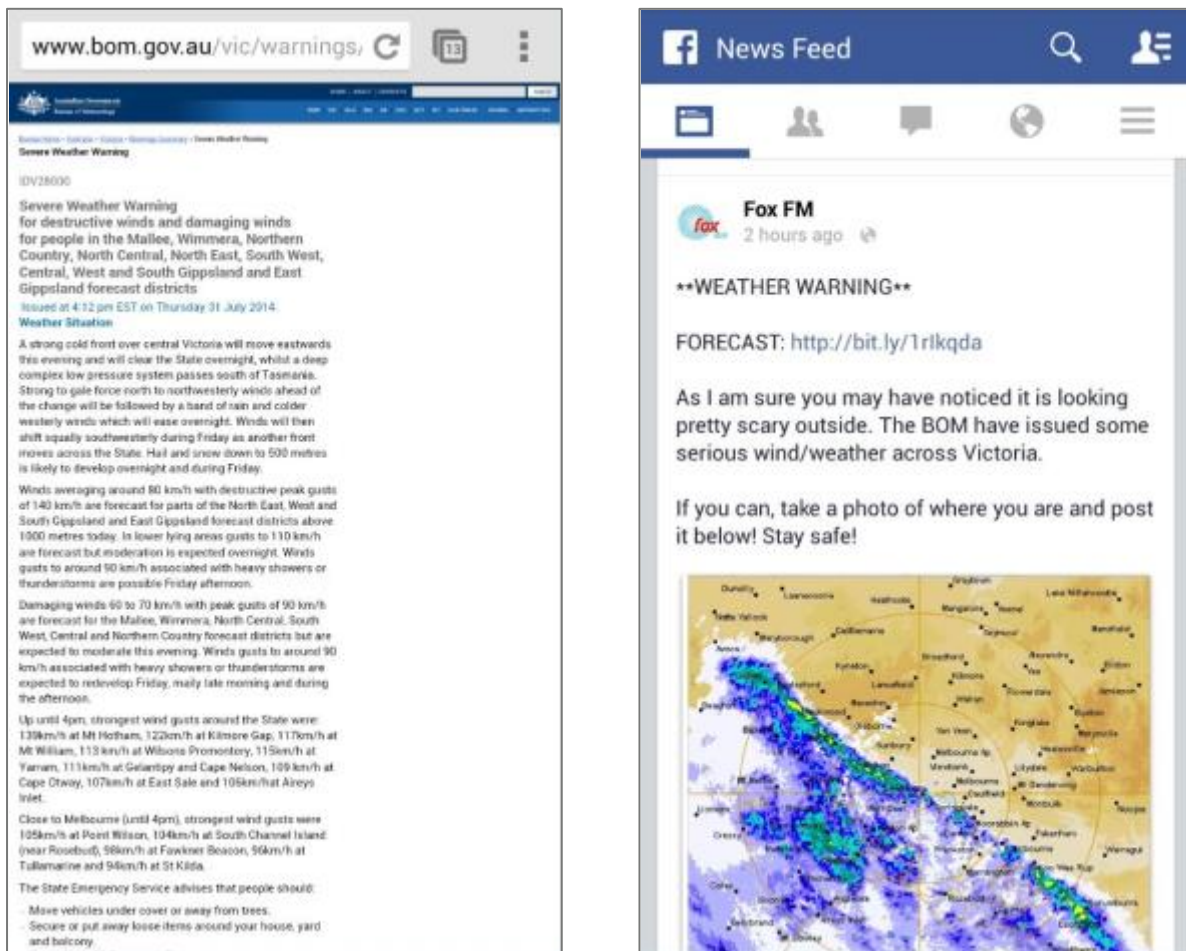


Figure 9: An example of the Bureau of Meteorology's weather warning (left) and a metropolitan radio station's post to Facebook referencing the weather warning by link, and providing additional comments and imagery

Tailoring content for social media - third party innovation and sharing

The above example illustrates the use of social media to communicate warnings by third parties. On the left, the Bureau of Meteorology's Severe Weather Warning is captured via their website. (Note that the Bureau does not post warnings to social media channels). On the right is Victorian radio station Fox FM's Facebook post. It includes a clear title, link to the official warning, personalised message and visual information (also sourced from the Bureau's site).

Fox FM has proactively warned a large audience of severe weather, and tailored the message to suit their audience.



Figure 10: An example of social media interaction with individual posts. This reply to a question from WA Police became popular.

A personal response – community expectations

This year, WA Police engaged in this friendly interplay on Twitter, and provided a timely and personalised response to a tongue-in-cheek request for help from a member of the public. On the positive side, this kind of interaction builds relationships and offers a personal connection which is important for social media effectiveness. However, this style of interaction also educates the general public that WA Police will respond to a tweet for help, or at the very least, that there is a real 'person' behind the account. In doing so, expectations are no doubt raised for response to more serious calls for help in the case of emergency.

Good Practice

- The ACT's Emergency Services Agency uses its own custom digital media monitoring tool called NEWS Tag. The tool has been designed for emergency management, is easy to use, and when the Public Information Centre is activated, can be utilised by any member of the team. Following a period of testing and operational use, planning for the next upgrade of NEWS Tag is now underway. (See [Appendix C](#))
- While resourcing social media is recognised as a challenge by many, some agencies, including CFA in Victoria, have focused on recruiting existing staff and volunteers who are already regular social media users to support the dissemination of warnings and information.
- Some agencies, including NSW RFS as an example, have now installed monitors in State/Incident Control Centres dedicated to displaying social media feeds. This provides personnel with an immediate view of both the nature and volume of conversation occurring amongst the public about particular incidents
- ACT's Public Information teams promote appropriate social media behaviour by asking people to avoid putting themselves at risk to capture information, and to turn on their location services to improve the value of their posts (as the post will automatically display spatially within monitoring systems).

- In South Australia, SA Police have developed their Facebook audience using specific social media audience building strategies. In simple terms, this has involved proactively posting highly 'likeable' content (Think new police puppies) so that when more significant content (e.g. warnings, or a missing person alert) is posted, it is more likely to be seen by more people.
- QLD Police's use of social media during the 2010/11 QLD floods was widely praised for its innovation and good practice (See inset below).

Use of social media during the 2010/11 Queensland Floods

The use of social media during the Queensland Floods of 2010/11 has been praised as good practice. Throughout this event the Police Media Director tweeted directly from his meetings with Premier Anna Bligh and during media conferences to ensure the media and community received the latest information, quickly. All media releases about the event were also released on Queensland Police's Facebook and Twitter pages, media conferences were streamed live on the Facebook page and subsequently posted on YouTube, and enquiries from the public via social media were responded to where possible. If misinformation began to circulate, it was corrected by this credible source.

Key Findings

- 28 While most agencies are focused on improving their use of social media as a warnings channel, the majority are still primarily 'broadcasting' information via this channel and wary of losing control of information and warnings. In reality, information will be shared via social media with or without the participation of emergency services and their presence is essential to provide a credible and authoritative voice.

Constraints to improved use of social media are primarily due to internal protocols which are not tailored for open and ongoing dialogue via social media channels, and very real resourcing challenges.

- 29 More innovative solutions to effectively resource Public Information teams to contribute and respond to social media discussion are required. Although a new frontier for many, trusted digital volunteers or virtual operations support teams (VOSTs) are emerging as a legitimate way to resource social media monitoring and activity.

- 30 While the reach of social media channels and their strength in targeting young people in particular is noted, the common use of algorithms by these channels to filter content can dramatically reduce effectiveness. Some reports note that as little as 6% of posts will reach an individual on Facebook. While individually, agencies are unlikely to sway policy and practice with large companies like Facebook and Twitter, there may be an opportunity for collective partnerships or influence with a national approach on this issue.

Recommendation 5

Improve the use of social media placing immediate focus on: the use of social media as a 'two-way' conversation with communities; resourcing; and sharing of current innovation and good practice across agencies.

Building two-way conversation and information sharing

There are increasing community expectations for emergency services to engage in *two-way* communication during emergencies via active listening, information exchange and engagement with communities. This spans not only social media channels but others including community meetings and broadcast radio. For most agencies, a shift to this style of communication represents a substantial and challenging change in how warning communication is managed.

Emerging research suggests that strategies which empower communities to share information and warnings help to foster shared responsibility and resilience. While there are concerns and very real challenges to address, this is a critical feature of focus for future warnings practice.

Strengths

Many practitioners are aware of the increasing prevalence, value and capability of two-way communication with and between communities during emergencies. Indeed, communities are increasingly sharing information during emergencies and some practitioners and researchers argue that supporting and indeed, encouraging this action, builds a culture of shared responsibility for warning dissemination (Literature Review p48).

Some practitioners and researchers argue that supporting and indeed, encouraging two-way conversation builds a culture of shared responsibility for warning dissemination

Two-way communication is not restricted to use of social media channels. The relatively traditional communication option of holding community meetings during an incident provides a strong example of two-way communication in action.

Radio also provides an excellent channel for two-way conversation about current emergency information, and although this conversation is generally between broadcasters and community members rather than emergency services, the desire and demand for this format of communication is evident during major events.

In a number of remote and regional areas, two-way conversation remains the norm, and is a feature of these resilient communities. In WA, 'river networks' in remote areas provide trusted flood information to both neighbours and emergency services. This telephone or private radio based conversation spanning a number of large properties is an effective and efficient way to share information.

Impacts and issues

Although many agencies are aware of increasing expectations for two-way communication during emergencies across multiple channels, few feel well equipped to manage this style of public information. Where creating and disseminating warnings has been the key challenge to date, now exchanging and sharing communication represents a new, major shift.

Literature also highlights that given the growing popularity and use of social media to create a dialogue, "emergency services will need to further adapt and embrace the use of social media" (Literature Review, p67).

Shifting expectations for two-way communication can be seen across multiple channels including telephone information lines. Recent research in Victoria has found that while information hotlines are not typically designed for use as a reporting channel, 71% of survey respondents believe that they should also be used to report hazards and emergencies (Literature Review, p40²⁷).

For many agencies, particularly those with smaller media and Public Information teams, resourcing two-way communication remains a daunting prospect, with flexible arrangements or partnerships with other agencies yet to be developed.

²⁷ Referencing: CFA (2014). Exploratory research for the Victorian Emergency Information Line (VEIL) Model. GfK.

Opportunities

Literature supports development of communication strategies which empower communities to share information. “Price-Robertson and Knight argue that a community-focused approach builds resilience, with several studies showing that communities with high levels of social capital respond more effectively to difficult situations and emergencies. They suggest that this can be achieved through a number of strategies, including empowering community groups and volunteers to provide information and assistance during emergencies” (Literature Review, p45, citing Price-Robertson, R and Knight, K²⁸).

Research has also argued for communication rather than ‘information’ during emergencies, not only to empower communities but to increase trust in authorities, provide agencies with a better understanding of current community needs, and enable agencies to ‘see’ in real-time how individuals are perceiving risk and acting during an emergency. (Literature Review, p58). All agencies should be actively promoting listening skills and practices within their teams.

Limited evaluation exists of practices which encourage the sharing and exchange of information. There is opportunity to validate research by exploring agency work focused on building empowered communication and dialogue.

A number of community-led or community empowering communication campaigns have been initiated in the relief and recovery stages of emergencies. They include Mel Irons’ ‘Tassie Fires –We can help’ page on Facebook following the Tasmanian Bushfires, and Sam Johnson’s ‘Student Army’, established immediately following the Christchurch earthquakes. There may be a number of relevant lessons to learn and apply to emergency information and warnings communication (See also Working with partners and third parties).

Good Practice

- The benefits of understanding and utilising community networks were highlighted during the *Western Australian Community Information Networks During Emergencies Project*. The Project utilised existing social networks and traditional communication channels within the community to facilitate a more effective flow of information into and within communities. (Literature Review, p45)
- “Following the 2011 Christchurch Earthquake, social media was used by authorities to monitor and evaluate ‘word-of-mouth’ communication in the community and immediately correct misinformation and rumours” (Literature Review, p48²⁹).
- For storm and flood in some areas, the Bureau of Meteorology relies upon trusted volunteer storm and river observers to exchange information. This is an example of pre-planning and innovative use of volunteer resources to build two-way conversation and share warnings.
- Of note, the ABC proactively enables two-way conversation during major incidents by building emergency focused community talk-back into programming at these times.

Key Finding

31 Establishing two-way communication or ‘conversation’ with communities during emergencies is a growing expectation and critical feature of future warnings practice. One of the key benefits of two-way information sharing is that agencies can ‘listen’ and ‘see’ in real-time to how individuals perceive and act upon risk. Whether this be through social media, community meetings or talk-back radio, conversation not only assists communities but can provide powerful insight to Incident Management Teams.

²⁸ Price-Robertson, R and Knight, K, 2012 *Natural Disasters and Community Resilience -A framework for support*, Australian Institute for Family Studies, Melbourne

²⁹ Referencing: Poole, M. (2012). Public Information management in Christchurch following the February 2011 earthquake: lessons learned. *Australian Journal of Emergency Management*, 27 (4), 7-14.

Emergency Alert (telephony based warnings)

Emergency Alert has featured as a key discussion area and is noted as an important warning channel. Operational experience with this channel continues to increase and while greater national consistency is called for by some, there is currently great diversity in preferred use. Further, there is evidence of increasing and significant community dependence upon Emergency Alert as their primary warning service.

For further detail on this topic, see the *National Review of Emergency Alert (2014)*, conducted in parallel to this Review.

Strengths

Emergency Alert is one of few intrusive alert channels that emergency services have at their disposal. Its ability to interrupt or intentionally intrude upon individuals, households and businesses via their mobile or fixed line telephone service is a noted strength.

The Emergency Alert Review has found that many community members see an Emergency Alert message as a highly credible and authoritative source, which increases their motivation to act. In a national survey of people who had previously received an Emergency Alert message, 48% of people agreed that receiving an Emergency Alert was their main trigger in deciding what to do³⁰.

A study of community behaviour during the 2013 Tasmanian bushfires found that receiving an emergency alert was the warning most likely to motivate householders to leave their home.

Emergency Alert is viewed by agencies and in research as an effective warning channel, "A study of community behaviour during the 2013 Tasmanian bushfires found that receiving an Emergency Alert was the official emergency warning most likely to motivate householders to leave their home" (Literature Review, p41³¹)

Consultation with communities during the *National Review of Emergency Alert (2014)* has highlighted that the public is increasingly used to being communicated with via text message for a range of services. This Review and other research also highlight that the short, intrusive message motivates many individuals to seek out further information or advice as a result of receiving an Emergency Alert (Literature Review p41).

Many agencies report of greater confidence and awareness on when and how to best use this form of warning, largely through increasing experience in recent years. One of the practical strengths of the Emergency Alert system allows operators planning release of a warning to effectively 'see' how many people will be warned within the targeted zone. Further, they can later confirm the impact of a message by preparing (but not necessarily sending) a subsequent message for the same area, as the system reports how many people (mobile telephony devices) remain in the area.

The Emergency Alert system also provides a thorough data capture and audit function, providing excellent quantitative data on which to base learnings.

Finally, National Telephony Warnings Guidelines provides a common foundation for all agencies and operators.

³⁰ See *National Review of Emergency Alert (2014)* for more detail. Results are based on n=902 and weighted to ABS 2011 Census figures for age and gender.

³¹ Referencing: Bushfire CRC (2013). *Community Understanding and Awareness of Bushfire safety: January 2013 Bushfires*. Mackie, B, McLennan, J and Wright, L

Issues and Impacts

There is inconsistency nationally on whether Emergency Alert should be used for emergency warnings only or also to issue advice of expected high level risk. As an example, on the eve of a Catastrophic Fire Day in January 2014, NSW RFS made the decision to issue an Emergency Alert to over one million people, alerting them to tomorrow's catastrophic fire risk. Anecdotally, multiple interviewees explained that this appeared to be well received by communities, however it has caused other agencies to query their own policies on whether they should take similar action.

Similarly, "during the 2010-2011 Victorian Floods, there was community confusion over the fact that an Emergency Alert was issued in some instances to provide warnings, but also to provide information about upcoming community meetings". (Literature Review, p56³²).

Community consultation during the Emergency Alert Review has indicated that Emergency Alert should be used minimally in order to retain the significance of its status when received.

Some agencies and in QLD, local governments, report challenges in timely release of Emergency Alert warnings due to complex approval processes. These processes are designed to appropriately manage the gravity of use but also have practical consequences. In addition, a number of QLD local governments utilise alternative telephony information and warning systems, some of which are provided on an 'opt in' basis. As a result, there is a mixed experience and understanding of Emergency Alert across these agencies and Councils.

As the use of Emergency Alert increases, new technical challenges are emerging. For example, location based warnings can be difficult to define to targeted areas when individual signal receiving towers have broad geographic coverage. For many interviewees, improvement in how to manage this issue is a priority to providing more targeted and credible warnings.

For others, challenges exist with maintaining familiarity and skill with the Emergency Alert operating system, particularly given its rare utilisation. While guidelines promote regular interaction with the system through skills maintenance training, it would appear that this guidance has mixed success.

The name of the system is confusing for some within agencies. For fire agencies for example, the scaled advice framework includes an 'emergency warning' level. Thus, when personnel request an 'emergency alert', there is often a need to confirm whether they are referring to the telephony channel and/or the level of warning. In QLD there is also confusion due to use of alternative systems with similar names. In addition, an Emergency Alert may not in fact be used for an 'emergency'. A more descriptive and unique working name may be beneficial. In Victoria, for example, the channel is referred to as a telephone alert and in Western Australia, as the Telephone Warning System (or TWS).

For some agencies, concerns are raised on bearing the cost of using Emergency Alert, particularly as expectations for its use continue to grow within the community. Many practitioners are unclear on where the cost of issuing an Emergency Alert is borne, and this appears to have some influence on their inclination to use the system. Agencies who are already regularly utilising Emergency Alert with positive outcomes seem less concerned by this matter.

Community education campaigns have been limited in many jurisdictions, in large part due to lack of targeted funding. As a result, some express concern about limited or inaccurate

Agencies differ in their views on when an Emergency Alert should be utilised

"It's a last resort to warn the community of a life threatening situation." *TAS Fire Service Emergency Alert User*

"We might put out an emergency alert just for a Watch and Act, depending on the complexity of the fire and the communities that might be affected. It's not just for emergency warnings." *WA DFES Emergency Alert User*

Source: National Review of Emergency Alert consultations

³² Referencing: Victorian Government (2011), *Review of the 2010-11 Flood Warnings and Response*, Comrie, N.

community understanding. In Victoria, information about Emergency Alert is integrated into broader community education campaigns for bushfire. The *National Review of Emergency Alert* (2014) has found that approximately 64% of community members are aware of telephony warnings, with variation across states and territories between 53% and 89%.

There is broad concern over growing community expectation that they will receive a personal fixed line telephone or mobile phone warning, negating the need to actively inform themselves and seek out information. Research supports this concern highlighting that “Emergency Alerts have been identified in a number of studies as the preferred method of warning for many in the community” (Literature Review, p41³³).

There is broad concern over growing community expectations that they will receive an Emergency Alert if they need to take action in an emergency.

The *National Review of Emergency Alert* (2014) has found that 80% of people who have previously received a telephone or text message warning would expect to receive an Emergency Alert in any future events and “the 2011 Victorian Floods review also found there was some over-dependence on Emergency Alert, and some who failed to receive an alert did not respond to the emergency” (Literature Review, p42³⁴).

Many agencies have also recognised the impact that publishing an Emergency Alert will have on other channels and systems. Literature highlights that given that Emergency Alert provides only brief warnings, it is critical that emergency service organisations ensure they have the capacity to meet a substantial increase in requests for further information that will occur after an Emergency Alert is sent. For example, after an Emergency Alert was issued in South Australia in relation to the Crafers West Bushfire in early 2014, calls to the Bushfire Information line increased by almost 1000% over the following hour. (Literature Review, p42³⁵).

Some agencies, including WA’s DFES and SA’s CFS now have formalised processes in place to better coordinate this impact. Others have reported a ‘best endeavours’ approach to promptly notify key stakeholders when an Emergency Alert has been sent. Post-incident evaluation has highlighted the importance of coordinated and consistent information across channels in this scenario (Literature Review, p42). Of note, some practitioners caution a direct correlation between the release of an Emergency Alert and increased demand across other channels, noting that the imminent emergency itself will also increase demand for information.

Finally, assumptions that Emergency Alert is particularly well tailored for younger community members may be challenged by emerging analysis. While research has highlighted that Emergency Alert, particularly via SMS on a mobile phone or mobile device, is favoured by younger audiences over television and radio (Literature Review, p41³⁶), the *National Review of Emergency Alert* survey highlights that only 15% of people under 34 nominate a telephone or text message as the *most useful* channel, overwhelmingly preferring the internet (54%). While this statement doesn’t at all disqualify the need for Emergency Alert, it does illustrate the value of rich and dynamic information sources such as the internet.

³³ Referencing three separate Bushfire Cooperative Research Centre Reports/Surveys

³⁴ Referencing: Victorian Government (2011), *Review of the 2010-11 Flood Warnings and Response*, Comrie, N.

³⁵ Referencing: Alert SA (2014), *Emergency Alert and the Impact on Inbound Call Management*

³⁶ Referencing: Department of Fire and Emergency Services WA (2013) *Bushfire Alerts and Warnings*, TNS.

Opportunities

While all Australian jurisdictions have autonomy in relation to whether, when and how they deliver an Emergency Alert, and are supported by nationally agreed guidelines, there remains a demand for improved national consistency. This desire has been raised in multiple workshops including a 2013 AFAC community warnings workshop and this Review's national workshop.

To address the fact that one in three people rely on receiving an Emergency Alert as their single source of information during an emergency³⁷, agencies have noted that a public communication campaign to set expectations and promote shared responsibility would help to combat the 'wait for a text message' approach.

Torrens Resilience Institute research notes the increasing relevance of including a link within an Emergency Alert message given the rising use of smart phones, and the fact that many people will be motivated to seek out further information at this point (Literature Review, p42). While to date, the length of a message has been constrained to 160 characters to meet international standards for a short message service, there is opportunity to explore the pros and cons on this limitation, taking into account community preferences and increasingly flexible technology (See Figure 11 below).

Given that analysis undertaken within the *National Review of Emergency Alert* highlights that those under the age of 34 identify the internet, apps and social media as the most useful channel for warnings, there may be opportunity to better understand this particular group and to learn more about how they would like to receive information and warnings.

Communities and researchers have highlighted the negative impact of poorly pronounced or described locations. Availability of a phonetic dictionary for place names and locations would directly assist practitioners and help to increase the credibility of messages sent.

Finally, there may be benefit in providing further training and organisational awareness sessions on the role and protocols for use of emergency alert. This should include re-publishing and re-acquaintance with the *National Telephony Warning Guidelines*.

Community preferred components of an Emergency Alert

As identified during community discussion groups within the Emergency Alert Review, members of the community want Emergency Alert messages to:

- Be clear on the seriousness of the situation
- Include information on the level of warning being provided
- Provide clarity on who the sender is, fully spelt out, avoiding acronyms
- Offer specific information on locations affected and detail of where impact is likely
- Accurately describe locations – people are particularly wary of descriptions that 'aren't quite right' as a local would refer to them
- Include a clear call to action
- Provide a link to further information within the message (and not just a link to a website homepage)

Figure 11: Preferred components of an Emergency Alert as defined by community members consulted during the *National Review of Emergency Alert* (2014)

³⁷ *National Review of Emergency Alert* 2014 survey results

Good Practice

- Some agencies, including DFES (WA) and CFA (SA) have developed localised protocols and checklists to ensure coordinated release of an Emergency Alert. They include, for example, consideration of increased website traffic and information hotline calls, notification of triple zero call centres, updating of warnings on other channels to remove any contradictory information, and advice to relevant personnel.
- Many agencies have pre-prepared templates to assist with the timely construction of an Emergency Alert. Some have even pre-prepared shape files ('polygons') for areas that have a higher likelihood of an incident occurring – this is particularly the case for agencies managing flood, storm and tsunami.
- SA CFS has conducted post-incident reviews on the impact of publishing an Emergency Alert to improve prediction of impact on inbound call centre traffic. In doing so, they have also identified that coordination of up-to-date recorded information services will satisfy a majority of callers, and minimise increased call rates to call-takers.

Key Findings

For a more extensive outline of findings related to Emergency Alert, see the *National Review of Emergency Alert*.

32 There is inconsistency nationally on whether Emergency Alert should be used for 'imminent threat' warnings only or also to issue advice on expected high risk. While nationally agreed guidelines provide all jurisdictions with autonomy in relation to whether, when and how they deliver a telephone warning, there remains a demand for improved national consistency. Given the already diverse use of the channel, significant national consistency will be challenging to achieve. Analysis of the drivers for consistency including expected benefits for communities might provide greater incentive for change.

33 Both practitioners and researchers note concern about growing community expectation that a personal fixed line telephone or mobile phone warning will always be provided, negating the need to actively seek out information and remain informed. The *National Review of Emergency Alert* notes that 32% of people expect to rely upon Emergency Alert as their only source of warning, and that 80% of people who have previously received an Emergency Alert expect to receive one in the event of a future incident.

It is critical that communication and education campaigns continue to stress that a warning may not be received, and encourage and empower communities to proactively access information and assess their risk.

Multi-hazard websites

Many states and territories have established shared multi-hazard warnings websites, often run by a government department rather than a single emergency service. Providing a single point of truth enacts sound principles for provision of warnings and information, however current challenges being tackled include presentation of multi-hazard information in a single interface and building the credibility of these new channels.

Strengths

A well-built and credible multi-hazard website embodies the goal of a 'single point of truth'. Multi-hazard websites are seen by many practitioners as an effective channel, particularly in emergencies led by lesser known agencies, or where the 'lead' agency might not be obvious to communities. Importantly, these websites mean that the public doesn't need to know who is leading an event, in order to find relevant information, and they can also remove the need for members of the public to search multiple websites to gather or collate information.

A number of jurisdictions have had good success building public confidence in these channels. In the ACT, the Emergency Services Agency has provided a multi-hazard website since late 2011. Website traffic has shifted from an average of 200 unique users per day in 2011 to up to 150,000 unique users on days of high fire danger. In Victoria, VicEmergency is promoted as 'Victoria's website for emergency warnings' and individual emergency services actively direct users to VicEmergency.

Some jurisdictions, notably SA and TAS, provide a multi-agency and multi-hazard website which focuses on providing a detailed feed of all social media activity by various agencies. This view ensures that all agency posts are visible to the public, helping to bypass the issue of social media channels selectively filtering posts for users (See also Social Media). For some jurisdictions such as Tasmania, a multi-hazard web platform also provides a known channel for unusual or low frequency incidents such as animal health emergencies, environmental emergencies, or unplanned road closures.

Issues and Impacts

Generally speaking, many jurisdictions are still building 'good practice' as they resolve a variety of challenges, ranging from public awareness and trust in these new websites, to the amount of information to communicate. The use of conflicting warning types, symbology, terminology and alert colours for different hazards, and alignment of information with other websites are all active issues.

For those presenting warnings in a spatial or list form, use of common symbology is a particular challenge. For example, if the colour blue means different things across different hazards, or the word 'alert' has different meanings, then a common interface can be confusing for the public. Some spatial displays of warnings can also be very busy, making it difficult to clearly identify relevant warnings.

It should be noted that a small number of jurisdictions including NSW have not commissioned a multi-agency or multi-hazard website and at this time, continue to provide warnings on relevant agency websites. Some practitioners highlight concern over redundancy or failure of a single combined website if alternative online warning channels are not in place. Despite continually improving technology to mitigate this risk, residual risk nonetheless remains.

The technology or mechanisms used to aggregate multi-agency warnings on a single site differ, with various challenges encountered. In TAS and SA, aggregate websites are populated with

Many jurisdictions are still building good practice as they resolve a variety of challenges, ranging from public awareness and trust in these new websites, to the amount of information to communicate

the aid of social media hashtags, automated ('rss'³⁸) feeds and strict publishing protocols for agencies to ensure that their message is captured.

There also remains a question around whether websites perceived as 'government' operated are seen as credible in a real time scenario, in comparison to 'emergency service' information which might be seen as closer to the source, or more highly trusted information. As Skinner and Skinner note in their review of literature, "To be effective, sources of information and influence need to be trusted by individuals and the community. This trust can be unwittingly eroded by seemingly minor acts or omissions, or may not exist at all if relationships have not been built." (2014, p9) Several practitioners acknowledged that there is more to learn on whether communities see shared warning websites as trusted and credible sources of information.

On a related point, literature also highlights the need for "all forms of warnings [to] clearly identify the information source so that it is perceived as credible." (Literature Review p54). It would therefore seem important that aggregated warnings websites take care to include clear information on the source of each warning, and indeed, to provide clear authority for the website itself, given the rising number of unofficial or non-government warnings websites (See also Working with partners and third parties).

Key Opportunities

Continued adoption of CAP-AU will provide improved opportunity for commonly framed warnings and information to be immediately shared on multi-hazard websites.

Development and adoption of common warnings frameworks for hazards, and common symbology and language will also improve opportunity to display multi-hazard and multi-agency information in a single interface, and reduce complexity for users.

Further research on community response to 'government' provided information and aggregated website information (rather than individual agency provided information) would provide greater understanding of how community members trust and validate these sources. The design and use of these websites can then be informed by this research. As a practical and immediate improvement, all warnings, regardless of their collation and presentation should clearly identify the original agency information source to ensure that warnings remain credible.

Good Practice Highlights

- Alert SA and TAS Alert provide an aggregated view of social media feeds from emergency services. This not only provides a convenient single location for users to track information, but also combats the reality that social media channels display only a selected number of posts (reportedly as little as 6%) to followers.
- Some jurisdictions, including Victoria, the ACT and WA provide a multi-hazard spatial view of incidents and warnings, with Victoria's VicEmergency providing a spatial view as the default home page. Visual presentation of information and warnings provides an alternative view to busy text-based pages and in Victoria's case, symbology has been recently updated based on testing with communities.
- It is worth highlighting the good practice collaboration between SA and TAS. SA established Alert SA based on an earlier QLD solution. They have since shared their learning and arrangements with TAS to support establishment of TAS Alert on the same platform.

Key Finding

34 The level of community trust in recent multi-hazard websites is untested. Research into community awareness, trust and perception of these would be valuable (see Recommendation 8)

³⁸ Commonly known as 'really simple syndication' and technically referring to 'rich site summary'

Working with partners and third parties

While partnerships with media broadcasters have continued to mature in recent years, the emergence and growth of third parties providing information and warnings during incidents, both commercial and community based, presents a growing challenge for agencies, who must consider how they will interact with or support these groups.

There is opportunity to develop a nationally agreed position on how to best interact with third parties, and to engage with these groups to build a stronger, shared code of practice. Interaction with the media on days of high activity can also be improved, to ensure that the statewide situation and priorities are clearly understood.

Strengths

Agencies have, for many years now, been working closely with media agencies, particularly the ABC, to provide information and warnings to communities via radio, print and television media. The value of the ABC's efforts to serve as an emergency broadcaster must be acknowledged. Many practitioners, along with the ABC, have also highlighted the growing value and maturity of relationships to strengthen sharing and dissemination of information and warnings.

A growing number of third party non-profit and commercial providers are emerging in the market of warning dissemination, growing opportunities to reach people at risk.

The Attorney-General's Department has provided a *Code of Practice for Warning Republishers* (2013) setting out good practice arrangements for all private third parties who re-issue official or unofficial warnings.

The Attorney-General's Department has provided a Code of Practice for Warning Republishers setting out good practice for all private third parties who re-issue official or unofficial warnings

Impacts and Issues

The use of third parties to further communicate and share warnings and information is still questioned or challenging for many. While there are a multitude of community and private organisations keen to play a role in sharing or disseminating warnings during emergencies, there is limited action by agencies to proactively connect with and utilise these channels.

NSW RFS and SA CFS were earlier adopters of Google's Crisis Response platform, and a number of other agencies have been developing their capability to provide data. While agencies are working with Google to establish capability to disseminate warnings via this platform, it remains unclear whether technical constraints, policy on sharing warnings with third parties, or motivation to prioritise development of this channel are limiting progress.

In addition, an increasing number of amateur or semi-professional interest groups are establishing themselves as popular digital media information and warnings providers. Some practitioners share concerns about the ability of these groups to warn effectively and consistently, and about the risks of community members relying on them for warnings.

'Storm chasing' or 'cyclone chasing' groups are particularly common with many running popular digital media sites. Some Bureau of Meteorology personnel have expressed concern at the information provided by these groups, however these 'unofficial' sources are clearly responding to community interest.

During the *National Review of Emergency Alert* community discussions, one Townsville community member (Female, 50+) noted that "Everyone up north gets on Facebook so you know where [the storm] is and you can track it. Townsville storm chasers are most accurate, they tell you what's going on, it just comes up [in my Facebook feed]." The Townsville Storms Facebook page (See [Appendix E](#)) has over 36,000 'likes'. With a population of approximately 172,000 this represents one in five Townsville community members.

Turning to the role of television and broadcast media, one of the key themes arising from the Skinner & Skinner review of community safety research focused on delineation between 'information' and 'news'. They proposed that at times "there are clear conflicts between the emergency services need for dissemination of information and media agencies need for audience attention, even when using the same media" (p iv). This tension was also discussed by some practitioners although most highlighted that professional relationships and engagement with media outlets help to ensure that official warnings are not compromised.

While the ABC believes that the delineation between official emergency information and news is clear, Skinner & Skinner (2014) note that community members may not discern well between the two. Indeed, the diversity of information available can add to this scenario and in some cases reduce trust in media as a source for warnings. [Appendix F](#) provides illustration of three web pages presenting information about a 'Watch and Act' message issued in QLD. One is an official 'Watch and Act' message for bushfire on ABC's 'emergency' area, published as provided by QLD Fire and Emergency Services. The second is a *news* article on ABC's website about the fire and the related warning. The third is a news article on QLD's Courier Mail website, *referencing* the Watch and Act message, but not displaying or linking to the official message.

During this Review, the ABC has raised the value of a partnership approach to provide high quality information and warnings to communities. They note that challenges can arise on active days where a number of events and warnings are in place, and they cannot speak with emergency services to check information and priorities in a timely fashion. Distinct from 'interviews', this action assists producers and journalists to understand priorities, and the complexity or connection between different incidents.

Media agencies have also reported challenges providing continued resourcing during large or prolonged events. Some broadcast and television media teams have encountered issues when seeking support from interstate peers as many emergency services will not accept media accreditation provided by other jurisdictions. This issue was realised for the ABC during the 2013 NSW Blue Mountains fires.

Opportunities

There is significant opportunity, and even a necessity, to develop a stronger, national position on how agencies will engage with third party warning providers. The rate of ongoing establishment and development of these providers, whether they be community groups or commercial arrangements, is not expected to slow. The emergency management sector has enormous experience and robust research to share.

The importance of sharing knowledge to sustain and foster community safety rather than an avoidance of what these parties do and how they approach their work should be stressed. This is particularly so when connected with research that says that individuals will seek to validate warnings and information, and that the use of digital channels to find and monitor information is increasing.

Indeed, Google Crisis Response representatives report that they are also driven by research on trusted information and community behaviour on information validation. In their view, ensuring that multiple channels provide credible information will support people to rapidly and easily validate warnings and information and take appropriate action.

Opportunity also exists to work with providers including not only Google, but local entities such as Ripe Intel, the Early Warning Network (EWN), CSIRO and others to keep up with technological innovation. Government agency adoption of new technology can be slow and costly, and 'trailing' of new approaches with the public can represent an intolerable risk to agencies. Improved partnerships and sharing of experience and good practice may support sector wide reform.

There is significant opportunity to develop a stronger, national position on how agencies will engage with third party warning providers.

The current *Code of Practice for Warning Republishers* (2013) may not be widely disseminated and understood by non-government entities. One opportunity would be to convene a group of current third party warning providers to provide insight into what they understand, what they would like to see, and whether they have views on how a Code of Practice could be improved and better utilised. Without engagement and knowledge sharing, non-mandatory government documentation will likely have little influence on innovators.

The utilisation of trusted digital volunteers, often referred to as ‘Volunteer Operational Support Teams’ or VOSTs is increasing in practice, although experience in Australia is still very limited. These teams can be engaged by emergency services to provide monitoring, analysis and capture of social media activity, and generally see themselves as an extended team for incident managers and agency leaders. Research and literature on the use of trusted digital volunteers is growing, and there are opportunities to learn and develop here.

The use of Memorandums of Understanding (MoU’s) between emergency services and media outlets or broadcasters has become relatively common practice across Australia. Some practitioners feel that the need for MoU’s may be decreasing. For example, emergency broadcasting is now a formal part of the ABC’s own national protocols, and considered part of ‘normal business’. Others value MoUs as they provide an instrument for sharing specific expectations on standards and protocols. If MoUs are to be renewed, there may be value in reducing the high number of individual agency MoUs with media outlets and adopting multi-hazard or multi-agency agreements.

A national approach to provision of training and media accreditation to access a fireground or other incident area should be considered. While training and accreditation processes are known to differ, a review of this issue would be of great value to media outlets, particularly during large or prolonged incidents. In QLD, training for media attending flood events is currently being developed. The ABC has highlighted an opportunity for this training to be shared across multiple jurisdictions.

Good Practice

- In QLD, a High Level Media Working Group meets once a quarter to progress relationships and arrangements between emergency services and the media. The Group comprises executive level representation, including senior operational personnel. See inset, below.

Queensland’s High Level Media Working Group

The purpose of the high level media working group is to build a strong partnership between Government and media agencies, to promote public safety messages and to streamline processes for the issuing of community warnings to the public before, during and after emergencies and disasters.

The group acts as a central trusted liaison point for media outlets, acts as a focal point for early advice and briefings on potential activity and response from emergency services agencies and serves as a forum for emergency management media discussion.

The critical focus of the working group is:

- To ensure that Government warnings to the community are provided to media as quickly as possible and in a format suitable for media purposes.
- Ensure that information management systems and processes provide the media with timely access to emergency response information relevant to their planning needs.
- To ensure that media agencies are engaged early during an emergency or disaster response.

Figure 12: A short overview of QLD’s High Level Media Working Group

- QLD's Public Safety Business Agency has recently run a trial to embed journalists within their media centre during incidents, including them in the operation of the centre and regular agency briefings. QLD practitioners once again highlight trusted relationships and mutual respect as key to this approach.
- For SA's CFS, a decision has been taken to recognise media accreditation from other jurisdictions, enabling local media to be supported by interstate teams. Tasmania's TFS has also recently recognised SA's accredited media. SA practitioners have noted that a national training package would be welcomed.
- A number of online news channels require subscription and use a 'pay wall' to limit access. In early 2014, the Mickleham grassfires in outer urban Melbourne generated high demand for information. *The Age* newspaper made a decision to remove their paywall for information related to this fire, setting good precedent for continued availability of this channel during emergencies. If not already undertaken, governments and agencies should consider discussion with relevant online news media outlets around their paywall policy in the event of a major incident.
- The ABC highlights the 2013/14 Bangor fires in SA as representing good practice on *exchange* of information between CFS and ABC. A good working relationship prior to the fire underpinned a process where the ABC provided CFS with a range of information from communities in a timely manner, which was utilised by CFS to inform their activity and updates.
- The importance of an effective relationship between agencies and media has also been highlighted by Tasmania's Fire Service and acknowledged by the recent Hyde Inquiry, where the approach on a busy day includes direct engagement with program producers on an as needs basis to assess communication priorities and clarify the relationship between different messages if required.
- There have been occurrences in recent years of community members and other agencies establishing new digital media forums *during* an incident in response to a need to share information. Proactive, constructive and timely contact with these groups represents good practice. During the Tasmanian bushfires, TFS connected with the new 'Tassie Fires We Can Help' Facebook page administrator to quickly build rapport and to help her to understand the highly dynamic nature of warnings. This resulted in a decision not to post warnings, but to consistently refer to the TFS website.
- During the Hazelwood Coal Mine fire in Victoria, Emergency Management Victoria engaged with a VOST to provide monitoring and analysis support across digital media channels.

Key Findings

35 The popularity and number of private or community based channels providing and sharing warnings continues to rise. Agency support or connection with many of these providers seems limited and appears to be due to any combination of suitable policy or clear position on engaging with third parties, motivation to connect and resourcing constraints. Without agency guidance and expertise, private operators may introduce new risks to communities during emergencies.

36 Australia's *Code of Practice for Warning Republishers* provides sound advice to third parties, however non-mandatory government advice is likely to have little influence on innovators who may not even be aware of the document's existence. Improved engagement, for example the convening of a group of third party warning providers, would provide insight into what they understand, what they would like to see, and whether they have views on how a Code of Practice could be improved and better utilised.

- 37 Partnerships with Australia's media as emergency broadcasters have continued to mature in recent years and the importance of these working relationships must be highlighted. For maximum effectiveness, media agencies and emergency services require strong working relationships and practical support. Provision of timely advice to broadcasters on active days to assist in prioritising communication and understanding complex situations is important to optimal outcomes. National coordination of media accreditation would also assist many media teams.

Recommendation 6

Build better partnerships with third parties to improve development and dissemination of warnings:

(a) Establish a national protocol for working with third parties (including media, international service providers, private warnings providers and not-for-profit entities).

(b) Increase focus on providing more accessible, sharable and easily republished warnings. Mandate compliance with the Common Alerting Protocol (CAP-AU) for all new and upgraded warnings systems, and set a goal date for reaching CAP-AU compliance nationally.

Workforce management and capability

Across jurisdictions, a variety of different public information workforce arrangements are in place, drawing upon various expertise and experiencing different strengths and challenges. Some agencies have established clear Public Information Section roles, operating procedures and training programs, and many have established their models for a multi-hazard environment. Others, particularly smaller agencies, could benefit from the sharing of this practice. Recognising the impact that working in these roles can have on individuals is critical.

Strengths

Some jurisdictions have established their Public Information workforce with a multi-agency approach, or even a whole-of-government approach. In the ACT, all government communications and media teams have been trained to support emergency services, and to utilise relevant publishing protocols and systems. DFES in Western Australia also provides public information across all hazards in a centralised model.

Jurisdictions utilising a distributed and/or multi-agency resourcing model have been progressively building their capability. In Victoria, a multi-agency, multi-hazard approach is maturing so that fire agency teams can readily provide services during floods and vice-versa.

Public information teams often include multi-disciplinary expertise including operational experience, specialist media and communications skills and community safety or community development capabilities. This combination and diversity of skill and experience is seen by many to provide important depth and stability to teams.

Many practitioners have noted that the recognition and profile of public information teams is improving, particularly where such activity is sponsored by senior operational leaders. As a consequence, and as illustrated with the introduction of AIIMS 4, public information is now tending to be better integrated into broader operational and incident management.

Agencies have been building a good understanding of the type and nature of personnel who are most effective in Public Information roles (See Figure 13 below). There is consensus that these roles tend to best suit a particular type of personality or capability set.

The 'best operators' in a public information team will:

- Be able to identify and clearly communicate priorities
- Have strong time management and prioritisation skills in an intense environment
- Display empathy with community. They keep in mind that others in an Incident Control Centre are not acutely focused on community thinking and are relying on the Public Information team to do so.
- Be 'switched on' and articulate
- Be good listeners and have excellent situational awareness – picking up more than just the words and noticing (rather than being told) that an incident or situation is intensifying
- Have a good understanding of AIIMS and general operations
- Possess strong liaison skills and build relationships across teams
- Be capable of (appropriately) challenging the process in unexpected scenarios rather than blindly following the book
- Include a mix of operational experience, communications, media and community liaison experience – any one of these missing will be challenging
- Know about and utilise local community networks – sports clubs, informal leaders, phone trees etc.
- Quickly earn an Incident Controller's trust with calm, responsive, and well-tailored action

List developed using collective practitioner views

Figure 13: Characteristics of a strong Public Information Section member as defined by practitioners during this Review

Issues and Impacts

Increasing expectations for information and warnings during incidents has a corresponding increasing need for resources. Generally speaking, provision of public information is a resource hungry action.

Public Information is a resource hungry function

While AIIMS 4 outlines the functions of a Public Information section including an indicative team structure, it should be noted that wide variation exists on how Public Information teams are designed and functions are coordinated. This is particularly the case where the Public Information function is centrally located rather than deployed within local incident control centres.

Scaling up quickly and taking on multiple roles as required – publisher, social media specialist, community engagement officer and media liaison requires a great deal of flexibility, and is challenging.

Some agencies have highlighted difficulties attracting and retaining the right people to Public Information roles. For some, these roles seem daunting, or carry high responsibility while for others, the roles don't yet carry the weight or kudos of other incident management roles (or are still perceived as 'non-operational').

Some agencies, including WA's DFES and Tasmania's TFS, attach all incident management roles to standing organisational positions. The impact of this is that when staff move to a new substantive role, they are re-allocated to the incident management role attached to that new position. While this arrangement is in place to ensure overall workforce capacity and balance, good people are regularly lost and new operators must be trained. Several senior practitioners highlighted this regular loss of skill and aptitude in their teams as a real challenge.

There are also challenges in sustaining the workforce over long incidents. Many individuals in Public Information roles are 'public servants' rather than operational staff. This often means that they are employed under a standard corporate services agreement rather than an operational agreement providing for 24/7 service scenarios. This can present a very real challenge in attracting, retaining and rostering resources.

There can be tension between operational teams and Public Information teams if they are perceived as 'media and communications people who don't understand operations'. Appropriate training, exercising and development of trusted working relationships is required to mitigate this tension.

It is noted that approaches to training for Public Information roles vary greatly across organisations. For some, formal, multi-day and multi-hazard training is standard, while for others, a small dedicated team in place means that formalised training for others is not established.

Some practitioners are wary of the scrutiny and criticism that they might find themselves under should a formal inquiry be held following an event. This wariness appears to have increased in recent years as reviews and inquiries have given increasing prominence to analysing the information and warnings made available to communities. This is perceived as a definite detractor for personnel considering Public Information roles.

There appears to be a need for greater attention to provision of debriefing and post-incident support to those in Public Information roles. Multi-agency and multi-disciplinary teams can make it easier to 'miss' individuals in post-incident support activities. Regardless of the duration or nature of their role carried out, intense pressure or responsibility can regularly be experienced in what can feel like a 'frontline' role. Some practitioners interviewed during this Review discussed feeling isolated or disconnected following incidents.

Opportunities

Public Information roles under AIMS 4 are still being defined by some agencies. Sharing of role descriptions, recruiting methods, training programs and materials would benefit these agencies. A considered approach should avoid simplistic 'document dumping' in shared repositories and email inboxes, and include supporting discussion or information on the materials provided. In some states, including Victoria for example, multi-hazard training programs for Public Information have also been developed and are run regularly. This experience could be shared with others.

In reality, 'Public Information' is managed by some agencies with teams as small as one or two people. Opportunities to develop and mature multi-agency arrangements, including the utilisation of training and exercising, should be pursued to better support these smaller teams.

Continued focus on establishing Public Information as a legitimate and priority area of incident management is warranted. While many senior leaders have adapted to this shift in modern emergency management, practitioners continue to experience challenges to their advice or action from less experienced operational members. Similarly, some operational members interviewed during this Review explained their own learning curve around Public Information as a priority aspect of their roles.

For non-operational personnel taking up Public Information roles, including traditional media teams, increased opportunity to experience the operational environment, through mentoring, shadowing or exercising for example, should be promoted.

Taking a broader view of the workforce, policing agencies have highlighted the need to consider the frontline when publishing information and warnings. They report on the importance of keeping the broader workforce informed of new warnings as members of the public will often approach officers in the community and seek further advice. If the members are unaware of the message, it loses credibility and they can find themselves in an unfortunate 'last to know' scenario.

Good Practice

- In Victoria, common public information training has been developed for multi-agency and multi-hazard use. While content is still being refined to equally and effectively support multi-hazards, this shared approach is seen as both efficient and effective. Importantly, public information team members can be confident that their peers have received the same training and will follow the same protocols and practices.
- In the ACT, all government communications teams have been trained to take up Public Information roles.

Key Findings

- 38 Personnel working in Public Information sections can be affected by the impact and gravity of their work, particularly in high impact or high stress incidents. Provision of post-incident debriefing and critical incident stress programs are essential activities. Ineffective support for personnel is not only detrimental to an individual's wellbeing but can also impact upon future availability and willingness of people to take on Public Information roles.

Recommendation 7

All agencies to ensure that post-incident debriefing and critical incident stress programs are effectively executed for all public information personnel, regardless of the level of their involvement or the nature of their substantive role.

Centralised and decentralised models in use

Emergency services are using a number of different models to resource and coordinate the creation and issue of warnings. While some rely on a centralised 'headquarters' model which draws upon smaller teams with high levels of expertise, others have a highly decentralised model in place with warnings created and published by local Incident or Regional Control Centres. Both approaches offer strengths and challenges and there is no evidence of a winning 'best practice' model for resourcing and managing Public Information teams.

Strengths

Jurisdictions have created Public Information resourcing models to meet their local needs, with a mix of centralised and decentralised models in use. While there isn't a preferred or 'best' approach, smaller agencies are particularly reliant upon a centralised model.

Jurisdictions adopting distributed models can benefit from:

- Superior local knowledge in teams to inform tailoring of warnings;
- A more timely authoring and publishing approach;
- Greater capacity on days of high / widespread activity;
- Less need to prioritise the creation of warnings; and
- Local incident controller sign-off on all warnings.
- Shared knowledge, practice and liaison enabling cross regional support

Jurisdictions adopting centralised models can benefit from:

- More experienced public information resources in place;
- A supportive model for Incident Controllers and local Public Information Officers who can call upon specialist support to craft and issue warnings;
- A constant, state-wide view of the overall situation and warnings in place (or national view for Commonwealth agencies);
- Minimised training and re-training of diverse teams, particularly around changes to publishing systems and protocols;
- Simplified rostering; and
- Greater consistency in determining warning levels and content.

On a technical note, publishing systems used by agencies are increasingly capable of supporting either model, however some agencies do remain limited in their ability to establish a distributed publishing model due to system limitations.

Issues and Impacts

Various arrangements for approval of messages are in place across both centralised and decentralised models with various challenges noted by practitioners.

In either model, approval processes appear to work best where the Public Information representative is appropriately senior and experienced enough to have a trusted relationship with the Incident Controller and/or state level manager. Of note, there is a range of anecdotal evidence that in addition to formal protocols, shared work experience and personal relationships within these teams is important.

For some agencies using centralised publishing models, local incident controllers effectively approve a warning before it is written, with local Public Information Officers providing only a verbal request to the centralised team. While this process supports the priority for timely warnings, it places a high degree of trust in the centralised team for accuracy and appropriateness of warnings.

Timeliness can also be a challenge in these centralised Public Information teams as they rely on information and instruction from local Incident Control Centres. Conversely, some bushfire agencies argue that initial 'advice' messages can be provided in a more timely manner via a centralised team.

For agencies and jurisdictions adopting a centralised model, the ability to tailor information and warnings and to provide accurate, high quality local information and context can be problematic. Research highlights the importance of local knowledge being accurately referenced and included in warnings, and Skinner and Skinner note, "that lack of local knowledge in information updates is a persistent cause of trust erosion" (2014, p9). Communities will place a higher degree of trust in information that clearly emanates from a local source and correctly references (or pronounces) local geography, place names and roads (See also Trust, credibility and information validation).

However, unintended consequences of issuing warnings at a local level without state control involvement (or national where relevant) can occur. For example, a major change in situation or release of an emergency warning without adequate involvement of state control might mean that supporting or connected activity – state media briefings, ministerial liaison, multi-agency liaison, coordination and resourcing of centralised information hotlines and Triple Zero call centres etc. could be impacted. Some agencies, NSW RFS for example, have attended to these challenges by establishing specific protocols and monitoring around release of high impact messages.

Decentralised teams can also lack experience and exposure to different scenarios, requiring support or intervention from a state team, and events spanning large geographic areas and affecting many communities have proven difficult for local teams to manage.

Regardless of the model in place, tensions between headquarters and local incident management teams can arise. Agencies report that this kind of issue is managed largely through building stronger working relationships and personal contact or knowledge of peers in teams. Realistically, for many smaller agencies a centralised model is the most pragmatic option available, as Public Information resources and suitable publishing systems are not available. Good practice interviews highlight that for some of these agencies, telephone communication with local teams to craft appropriate warnings is common.

Opportunities

There would be value in further exploring and sharing the pros and cons of centralised versus decentralised models for managing public information in incident management, as several interviewees have acknowledged that they are yet to realise the 'perfect' arrangement.

To this end, as AIIMS 4 continues to be adopted and tested, there may be opportunity to evaluate good practice specifically in centralised *and* decentralised models.

The following three examples describe some centralised and decentralised approaches. Note that each jurisdiction and agency has their own model in place and these examples may not be illustrative of further alternative arrangements.

An illustration of different models in use

A centralised model

In South Australia, the SES is the designated hazard leader for storm, flood and heatwave events. Their Public Information function is managed through a small, centralised team. Advice messages and warnings are crafted centrally, based on hazard information provided through sources such as the Bureau of Meteorology and specific risk information provided by local planning and response teams. In a prolonged or complex scenario, the SA SES relies upon Public Information support being provided by other SA police and emergency service organisations.

A semi-centralised model

In Western Australia, DFES establishes a Public Information Officer within the Incident Control Centre, to support the Incident Controller to execute his or her role. When advice or warnings are required to be issued, the Public Information Officer contacts DFES HQ to request that a message be created and published, providing the necessary detail for the centralised team to do so. Authorisation of the message is provided by the Incident Controller prior to the PIO calling HQ.

A decentralised model

In Victoria, a team of over 400 staff and volunteers across multiple agencies is available to State, Regional and Incident Control centres across the state in a highly distributed model. Working to a local Incident Controller, Public Information Officers and their teams can create and publish advice and warnings without intervention from the State Control Centre. The State Control Centre provides a monitoring and support function across all public information, working with local teams if they require additional support.

Key Finding

- 39 Various centralised and decentralised models for the provision of public information are in use and each carries pros and cons. While opportunities to discuss workforce arrangements or provide case studies on alternative models would be valuable, agencies should be encouraged to tailor fit-for-purpose arrangements rather than conform to any particular model.

Evaluating the effectiveness of warnings and information

Apart from independent research and ad-hoc post-incident analysis, there appears to be little evidence of *planned* evaluation of the effectiveness of warnings being undertaken. Establishment of performance measures and a consistent approach to evaluation would build a stronger evidence base to inform further improvement of Public Information. Related to this point, the sharing and utilisation of research and evaluation outcomes can also be improved.

Strengths

There is a growing base of research and post-incident evaluation, and with this, a growing community of researchers and professionals to draw upon. A number of agencies have commissioned post-incident analysis to learn more about public information and warnings, and this is seen as a genuine learning opportunity rather than a compliance driven exercise.

The continued level of interest in evaluating the effectiveness of warnings is illustrated in the inclusion of a *Communications and Warnings* program in the Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC). Specialised centres for research such as the BNHCRC and the previous Bushfire Cooperative Research Centre (BCRC) have been acknowledged by many as providing an important contributor to research and evaluation.

Continued interest in evaluating the effectiveness of warnings is illustrated in the inclusion of a Communications and Warnings program in the Bushfire and Natural Hazards Cooperative Research Centre

Indeed, the BNHCRC is sponsoring research on '*Creating Effective Multi-channel Communication during Disaster Response and Recovery*'. This project is analysing the effectiveness and efficiency of official emergency messages during the response and recovery phases and is expected to test and mature suitable models for evaluation. This is, however long term work, and improved approaches for today's 'business as usual' practice are necessary.

On that front, message publishing tools used by agencies and jurisdictions are increasingly including reporting modules which can provide critical data and reporting on incident warnings, publishers, the number and type of messages created and updated, and publishing date/time information. For example, the Emergency Alert system is highly auditable, capturing details including when a message was sent and how many people received it.

In Victoria, a framework for monitoring and evaluation of public information has recently been developed and is currently being piloted. It establishes a common approach for post-incident evaluation, provides for three levels of review (from internal reviews to community facing reviews) and includes key performance indicators (from the Victorian Inspector General-Emergency Management). In QLD, their recently released *Standard for Disaster Management* includes target outcomes and indicators for emergency communications and warnings.

Issues and Impacts

As public information is still a relatively new emergency management function, monitoring and evaluation capability is clearly still developing. There are a number of issues to consider.

Formal evaluation activity is often resource intensive and costly. For many agencies, a major event is most likely to be the trigger for such investment, but paradoxically evaluation of public information can be postponed or avoided in these events due to formal inquiries or broader incident reviews.

There is also a lack of consistency in how evaluations are undertaken and the performance indicators used to evaluate 'success'. Practitioners have highlighted the challenge of understanding or measuring success for public information. For example: is success that targeted communities received a warning, or that they both received and acted appropriately upon that warning? The scope of public information evaluation in the broader context of

community education, preparedness and communication campaigns also brings complexity to the task.

Skinner & Skinner flag both the need to evaluate against desired outcomes, and the complexity of evaluating individual programs or activities within a broader program of intervention. They also highlight that “the majority of interventions used in community safety are based on lay theories of promoting preparation. Few interventions are informed by empirically tested theories by professional researchers and practitioners involved in behaviour change, from disaster management or other areas promoting pro-activity” (2014, p v)

Some interviewees have highlighted concern at public information being measured based on ‘activity’ tracking alone. While many publishing systems now provide quantitative data about messages created and published, and online channels can provide quantitative data around audiences, unique visits and ‘hits’, this kind of activity tracking does not provide an adequate evaluation outcome.

It is noted that the lack of common standards or performance indicators to support evaluation means that each inquiry, evaluation or research program designs a different methodology to evaluate, and does so without a framework for comparison to other events and outcomes. Skinner & Skinner remark that “at present we don’t know what works for whom in what context, in terms of promoting community preparedness and safety. Little of the research undertaken involves high quality evaluations of interventions” (2014, p v)

At present, each Inquiry, evaluation or research program designs a different methodology to evaluate

Given the number of recent formal inquiries³⁹ there can also be added pressure on teams to create and publish warnings, with a view that it is better to send a warning when in doubt, than not send one. While there is merit in this approach, interviewees note that this can lead to a tendency to ‘over warn’, and can decrease message effectiveness to the community. In contrast there is also a concern that with intensive evaluation, every keystroke, message or mistake will be analysed and practitioners can feel that if they do issue a warning they will be subject to that scrutiny.

Indeed, it is quite possible that the recent frequency of formal inquiries following incidents is affecting agency or industry motivation to self-evaluate. If a formal inquiry is underway, agencies understandably see that it is best left to those investigating to evaluate success. As a consequence however, targeted and expert investigation of public information and insight using mature evaluation models is rare.

Opportunities

There is opportunity to create an evaluation framework that more effectively measures success, and value in considering the methodologies already used to date by researchers and others who have conducted formal inquiries and evaluations. The establishment of guiding notes for evaluators (both internal and independent) would build a more consistent evidence base for ongoing practice improvement.

AFAC’s Strategic Directions Statement for Fire and Emergency Services in Australia and New Zealand 2014-2016 was approved by the (then) Standing Council of Police and Emergency Management in late 2013 (See Figure 14 below). Work is currently underway to establish performance indicators against the five key directions, and these should inform a foundation for future evaluation.

³⁹ NB: An independent consultant specialising in emergency management has compiled a comprehensive list of Coronial and Independent Inquiries, Royal Commissions, government reviews and agency commissioned reviews undertaken in recent years. The list is actively maintained. <http://casuscalamitas.com/2012/12/16/disaster-inquiries-in-australia/>

In addition, both Victoria and Queensland have recently developed performance indicators on the provision of warnings and may be well placed to share their arrangements and standards with other agencies.

Strategic Directions Statement for Fire and Emergency Services in Australia and New Zealand 2014-2016

Direction 1: Supporting resilient communities through risk reduction

Direction 2: Providing trusted response

Direction 3: The source of credible and timely information

Direction 4: Effective governance and resource management

Direction 5: Informed by research

Publisher: AFAC. Endorsed by the (then) Standing Council on Police and Emergency Management, Nov 2013.

Figure 14: Strategic Directions Statement for Fire and Emergency Services in Australia and New Zealand. Performance indicators are being developed to drive achievement of these statements.

The sharing of evaluation outcomes between agencies and jurisdictions could also be improved. During this review, it has been apparent that many evaluations are known of in general terms, but not necessarily easy to find. Further to this, key findings of inquiries or evaluations are not easily referred to across agencies, and are often not easily found via publicly accessible websites. While organisations such as Emergency Management Australia, AFAC and EMPA have fostered information sharing hubs they remain under-utilised, and there is a need and opportunity to improve information exchange and sharing of lessons learned.

A practical opportunity involves the broad dissemination and promotion of the literature review completed as a component of this Review, highlighting the availability of an executive summary considering key themes across warnings research.

Market research and evaluation is often undertaken to assess the effectiveness of education campaigns, along with media analysis provided by specialist groups. Whilst these are effective tools they come at a cost. There may be opportunities to better utilise these evaluation and analysis opportunities to support specific public information evaluation or to pool resources for this form of evaluation.

Some practitioners have highlighted a need to understand more about the impact on communities of post-incident analysis and research. For example, SA's Country Fire Service will from time to time hold community debriefs or meetings following an event. These meetings provide an opportunity for the community to reflect on their experience and ask questions, and for agencies to listen and provide information. The question however is, is there a best timeframe or a best approach to run these sessions? How can the best outcomes be achieved?

Good Practice Highlights

- A number of agencies have commissioned targeted research in order to learn more about public information. For example, following the 2013/14 Bangor fires in South Australia, the Country Fire Service commissioned the BNHCRC to provide research and evaluation into a number of areas of focus around community safety, including risk perception and response to public information.
- Emergency Management Victoria has developed a Public Information Monitoring and Evaluation Framework which it is currently piloting. The Framework includes principles, performance areas to structure evaluations, key performance indicators developed by the Inspector-General Emergency Management, three levels of evaluation so that small and large events can be appropriately evaluated, and evaluation templates.

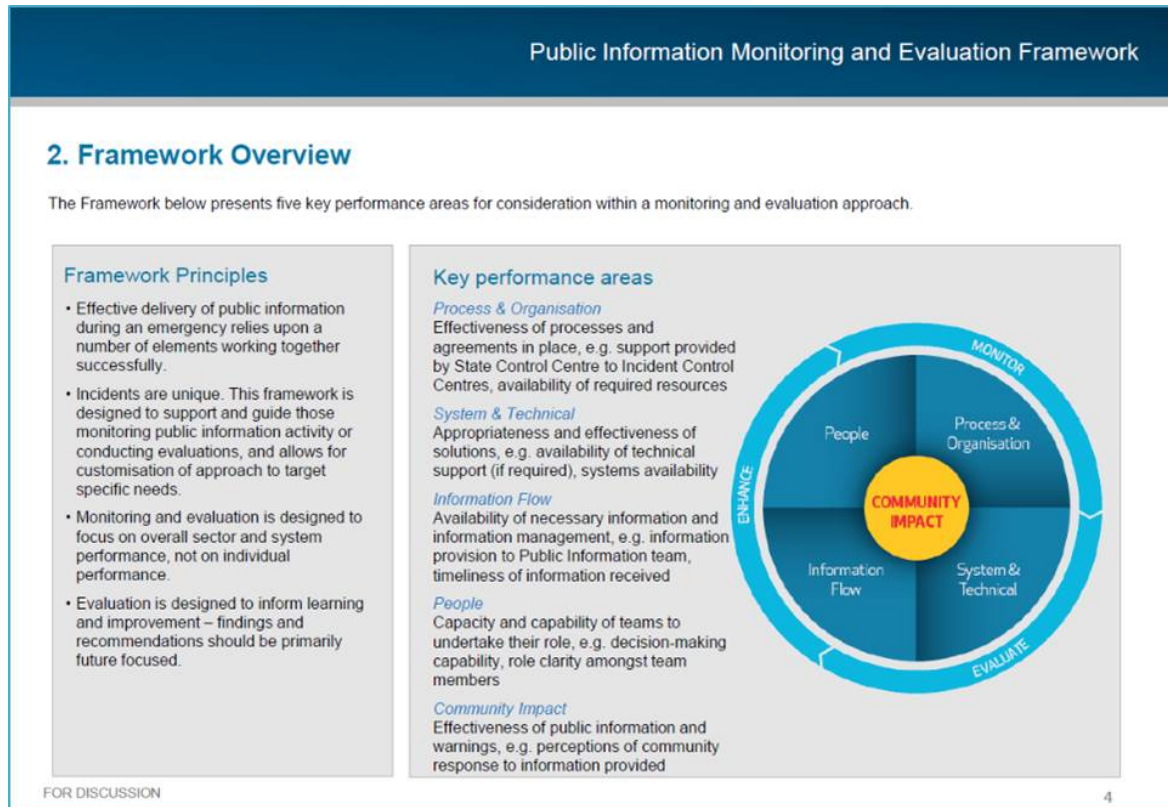


Figure 15: Emergency Management Victoria has developed a Public Information Monitoring and Evaluation Framework which it is currently piloting. The Framework includes a structured approach to evaluations and provides for three levels of evaluation, from small internal reviews to larger, public facing reviews

Key Findings

40 The sector lacks an agreed approach to monitoring and evaluation of warnings. The lack of a common framework for this activity results in great disparity in how the effectiveness of warnings is assessed, including evaluation undertaken during formal inquiries, and lost opportunity to build a consolidated base of lessons learned.

41 It would appear that many practitioners are aware of a range of research and of many post-incident inquiries, but that few have time available to reflect upon and apply the findings. Continued effort to summarise, present and 'make ready' research for agencies to easily utilise would be valuable.

Recommendation 8

In order to build a stronger evidence base to inform policy and practice, develop agreed research methods and commission targeted research which focuses on community behaviour and response to warnings across diverse hazards.

Recommendation 9

Develop nationally agreed performance indicators and formalise post-incident evaluation processes for the provision of warnings and information during emergencies.

References

- AFAC, (2009), *Discussion Paper: A National Systems Approach to Community Warnings*
- AFAC, (2013), *Strategic Directions Statement for Fire and Emergency Services in Australia and New Zealand 2014-2016*
- Australian Emergency Management Committee, (2009), *National Framework for Scaled Advice and Warnings to the Community (For bushfire)*
- Australian Government, (2008) *Emergency Warnings: Choosing your words*, Attorney-General's Department
- Australian Government, (1998), *Australian Emergency Manuals Series: Glossary, Manual 3*, Attorney-General's Department - Emergency Management Australia.
- Australian Government, (2007), *Guidelines for Emergency Management in Culturally and Linguistically Diverse Communities*, Attorney-General's Department - Emergency Management Australia
- Australian Government, (2009), *Australian Emergency Manuals Series: Flood Warning, Manual 21*, Emergency Management Australia
- Australian Government, (2013), *Australia's Emergency Warning Arrangements*, Attorney-General's Department
- Australian Government, (2013), *Best Practice Guide for Warning Originators*, Attorney-General's Department
- Australian Government, (2013), *Code of Practice for Warning Republishers*, Attorney-General's Department
- Australian Fire and Emergency Service Authorities Council, (2013), *The Australasian Inter-Service Incident Management System: Version 4*
- Bushfire CRC & Skinner & Skinner (2014). *A Synthesis of Bushfire CRC Community Safety research (2003-2013) including Post-fire Contact Surveys*
- Council of Australian Governments, (2011), *National strategy for disaster resilience*
- Geoscience Australia (2014), *Warning sources and their value to Brisbane and Ipswich households during the 2011 and 2013 floods*, Professional Opinion 2014/02, Canterford, S., Juskevics, V.
- Ministerial Council for Police and Emergency Management – Emergency Management, (2007), *National Best Practice Guidelines for the Request and Broadcast of Emergency Warnings*
- Ministerial Council for Police and Emergency Management - Emergency Management, (2008) *National Emergency Warning System Principles*
- Victorian Government (2012), *National Telephony Warning Guidelines*, Office of the Emergency Services Commissioner
- Victorian Government, (2014), *National Review of Emergency Alert*, Ipsos
- Victorian Government, (2014), *National Review of Warnings and Information: Literature Review*, Ipsos
- Victorian Government, (2014), *Hazelwood Mine Fire Inquiry Report*, Teague, B., Catford, J., Petering, S.
- Mackie, B., (2013), *Warning Fatigue: Insights from the Australian Bushfire Context*, University of Canterbury, New Zealand
- Queensland Government, (2014), *Emergency Management Assurance Framework*, Inspector-General Emergency Management

Appendix A: Illustration of warnings Frameworks

The following information provides illustration of a sample of existing Frameworks in use for various hazards.

Flood Warnings

Bureau of Meteorology Flood Warnings

The Bureau of Meteorology provides a flood warning service for most major rivers in Australia. This service is provided with the cooperation of other government authorities, such as the State Emergency Service in each State/Territory, water agencies and local Councils.

The Flood Warning Service provides different types of information that depends on the type of flooding and the flood risk. The range of information, which may vary between States and areas within a State, includes:

An **Alert or Watch** of possible flooding, if flood producing rain is expected to happen in the near future. The general weather forecasts can also refer to flood producing rain.

A **Generalised Flood Warning** that flooding is occurring or is expected to occur in a particular region. No information on the severity of flooding or the particular location of the flooding is provided. These types of warnings are issued for areas where no specialised warnings systems have been installed. As part of its Severe Weather Warning Service, the Bureau also provides warnings for severe storm situations that may cause flash flooding. In some areas, the Bureau is working with local councils to install systems to provide improved warnings for flash flood situations.

Warnings of 'Minor', 'Moderate' or 'Major' flooding in areas where the Bureau has installed specialised warning systems. In these areas, the flood warning message will identify the river valley, the locations expected to be flooded, the likely severity of the flooding and when it is likely to occur, predictions of the expected height of a river at a town or other important locations along a river, and the time that this height is expected to be reached.

This type of warning is normally the most useful in that it allows local emergency authorities and people in the flood threatened area to more precisely determine the area and likely depth of the flooding. This type of warning can only be provided where there are specialised flood warning systems and where flood forecasting models have been developed.

Minor flooding: Causes inconvenience. Low-lying areas next to watercourses are inundated. Minor roads may be closed and low-level bridges submerged. In urban areas inundation may affect some backyards and buildings below the floor level as well as bicycle and pedestrian paths. In rural areas removal of stock and equipment may be required.

Moderate flooding: In addition to the above, the area of inundation is more substantial. Main traffic routes may be affected. Some buildings may be affected above the floor level. Evacuation of flood affected areas may be required. In rural areas removal of stock is required.

Major flooding: In addition to the above, extensive rural areas and/or urban areas are inundated. Many buildings may be affected above the floor level. Properties and towns are likely to be isolated and major rail and traffic routes closed. Evacuation of flood affected areas may be required. Utility services may be impacted.

Figure 16: The Bureau of Meteorology provides a scaled approach to flood warnings ranging from 'alert' through to 'major flood warning'

Cyclone Warnings

Australia's Cyclone Warning System

The Bureau of Meteorology provides information and warnings for tropical cyclones in Australia.

Tropical Cyclone 'Advices' are issued whenever a tropical cyclone is expected to cause winds in excess of 62 km/h (gale force) over land in Australia. A tropical cyclone advice may be a watch and/or a warning, depending on when and where the gales are expected to develop.

When is a Tropical Cyclone Advice issued?

A tropical cyclone **watch** is issued for coastal communities when the onset of gales is expected within 48 hours, but not within 24 hours.

A tropical cyclone **warning** is issued for coastal communities when the onset of gales is expected within 24 hours, or they are already occurring.

Each advice issued for a particular cyclone will be numbered sequentially, starting at number 1 for the first advice. A tropical cyclone advice may contain a combined watch and warning, that is, it will provide information on the area under watch status and the area under warning status.

How often is a Tropical Cyclone Advice issued?

While the threat remains, a tropical cyclone advice will be issued every six hours, increasing to every three hours when cyclone warnings are required. In some circumstances, when a cyclone approaching the coast is under radar surveillance, the advices may be issued hourly.

Source: <http://www.bom.gov.au/cyclone/about/warnings/advice.shtml>

Figure 17: The Bureau of Meteorology outlines cyclone warnings and provides a two-step system of 'watch' and 'warning'

Western Australia's 'blue, yellow, red' scaled warnings for cyclone



Figure 18: Western Australia's colour coded alert levels for cyclone

Tropical Cyclone Category System
CATEGORY 1 (<i>tropical cyclone</i>)
Negligible house damage. Damage to some crops, trees and caravans. Craft may drag moorings. A Category 1 cyclone's strongest winds are GALES with typical gusts over open flat land of 90 - 125 km/h. These winds correspond to Beaufort 8 and 9 (Gales and strong gales).
CATEGORY 2 (<i>tropical cyclone</i>)
Minor house damage. Significant damage to signs, trees and caravans. Heavy damage to some crops. Risk of power failure. Small craft may break moorings. A Category 2 cyclone's strongest winds are DESTRUCTIVE winds with typical gusts over open flat land of 125 - 164 km/h. These winds correspond to Beaufort 10 and 11 (Storm and violent storm).
CATEGORY 3 (<i>severe tropical cyclone</i>)
Some roof and structural damage. Some caravans destroyed. Power failures likely. A Category 3 cyclone's strongest winds are VERY DESTRUCTIVE winds with typical gusts over open flat land of 165 - 224 km/h. These winds correspond to the highest category on the Beaufort scale, Beaufort 12 (Hurricane).
CATEGORY 4 (<i>severe tropical cyclone</i>)
Significant roofing loss and structural damage. Many caravans destroyed and blown away. Dangerous airborne debris. Widespread power failures. A Category 4 cyclone's strongest winds are VERY DESTRUCTIVE winds with typical gusts over open flat land of 225 - 279 km/h. These winds correspond to the highest category on the Beaufort scale, Beaufort 12 (Hurricane).
CATEGORY 5 (<i>severe tropical cyclone</i>)
Extremely dangerous with widespread destruction. A Category 5 cyclone's strongest winds are VERY DESTRUCTIVE winds with typical gusts over open flat land of more than 280 km/h. These winds correspond to the highest category on the Beaufort scale, Beaufort 12 (Hurricane).

Figure 19: Explanation of the 'category' system for cyclones which includes description of wind gust speeds and potential impacts (Source: <http://www.bom.gov.au/cyclone/about/intensity.shtml>)

Bushfire Warnings

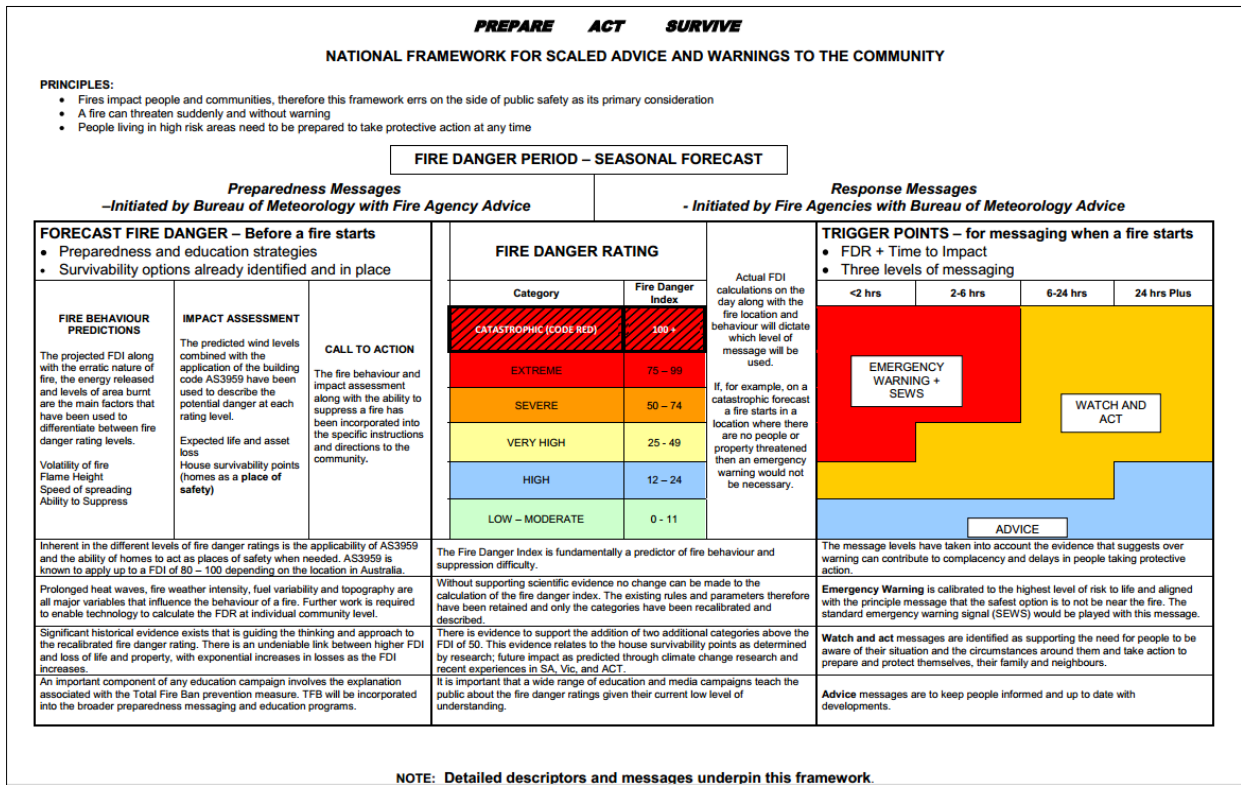


Figure 20: The National Framework for Scaled Advice and Warnings to the Community (for bushfire) was developed and adopted by the Australian Emergency Management Committee in 2009.

Urban and other hazard Warnings (in South Australia)

3. Advice, Watch & Act and Emergency Warning Messages for Emergency Incidents (Other Than Bushfires)

Advice, Watch & Act and Emergency Warning Messages for incidents other than bushfires are issued via the MFS Non-Bushfire Advice, Non-Bushfire Watch & Act and Non-Bushfire Emergency Warning Message Media Release template available in CRiiMSON. The CRiiMSON Media Release templates are available under the 'ADV', 'WAM' and 'EWM' under the 'i' icon in CRiiMSON. This is a different process to issuing an Advice, Watch and Act or Emergency Warning message on CRiiMSON for bushfire.

When Media Releases are issued for significant non-bushfire emergency incidents, it is advisable to utilise a heading that includes one of the three following levels of warning: Advice, Watch and Act or Emergency Warning Message.

When issuing an incident Advice, Watch and Act or Emergency Warning message for emergency incidents (other than bushfires), the Community Risk Rating (from Low to Severe) should be established by the Incident Controller with consideration to the following relevant potential risk factors available in Table 1.

TABLE 1 – Criteria for issuing an Incident Advice, Watch and Act Messages (WAM) or Emergency Warning Messages (EWM) (For **Non-bushfire incidents)**

COMMUNITY RISK RATING FACTORS:	COMMUNITY RISK RATING	Immediate Impact < 2 HOURS TO IMPACT	Delayed Impact 2+ HOURS TO IMPACT
	To determine the <i>Community Risk Rating</i> (Low-Moderate, High or Severe) consider: <ul style="list-style-type: none"> • Life risk • Risk to motorists • Property risk • Potential for escalation • Rate of spread (of fire, gas, smoke, fumes, chemical, radiation etc.) • Toxic or non-toxic smoke, gas or odour • Environmental risk • Weather conditions (including temperature and wind strength) • Likelihood of evacuation/relocation requirements • Fire load 	Severe	Emergency Warning
		Emergency Warning Message – Non Bushfire CONSIDER EMERGENCY ALERT & IVR	Watch and Act Message – Non Bushfire
High		Watch and Act	Advice
		Watch and Act Message – Non Bushfire	Advice Message – Non Bushfire
Low-Moderate	Advice	Advice	
	Advice Message – Non Bushfire	Advice Message – Non Bushfire	

IMPORTANT: Advice, Watch & Act and Emergency Warning Messages for non-bushfire incidents are not designed to be used for minor emergency incidents.

Figure 21: An extract from South Australia's arrangements for issuing information and warnings for urban fire and rescue incidents, based on the agreed Framework for bushfire.


Appendix B: Examples of tailored warnings

Agencies tailor their warnings in a diverse number of formats. A small set of examples illustrating that diversity are shown below.

Figure 22: An example of the Bureau of Meteorology's weather warnings, which includes both meteorological information and advice from the relevant local emergency service.

The screenshot shows the Bureau of Meteorology website interface. At the top, there is a navigation bar with links for HOME, ABOUT, CONTACTS, and a search box. Below this, there are regional links for NSW, VIC, QLD, WA, SA, TAS, ACT, NT, AUSTRALIA, GLOBAL, and ANTARCTICA. The main content area features a breadcrumb trail: Bureau Home > Australia > Queensland > Warnings Summary > Fire Weather Warning. The title of the page is 'Fire Weather Warning'. Below the title, the ID is listed as IDQ20035. The main heading is 'Fire Weather Warning for the Northern Goldfields and Upper Flinders and Darling Downs and Granite Belt forecast districts'. The warning was issued at 4:23 pm EST on Saturday 25 October 2014. The 'Weather Situation' section describes a weak ridge along the Queensland coast and a broad area of low pressure extending through the interior, leading to severe fire dangers in the Northern Goldfields and Upper Flinders and the Darling Downs and Granite Belt districts. It notes that hot to very hot temperatures, combined with dry fresh and gusty winds, are expected to cause severe fire dangers in the Darling Downs and Granite Belt district tomorrow. The page provides specific advice for Saturday 25 October and Sunday 26 October, including a list of forecast districts affected by severe fire danger. Safety advice from the Rural Fire Service Queensland is provided, including instructions to check bushfire survival plans, monitor fire and weather situations, and call Triple Zero if a fire is seen. The page also includes information on fire bans and how to prepare, act, and survive, with a reference to the Rural Fire Service website and a hotline number. The next warning is scheduled for 5:00 am EST on Sunday.

Figure 23: (Below) The Department of Fire and Emergency Services in Western Australia has worked with community focus groups to test and enhance the structure and language used in its warnings. An example of their warnings is provided on the following page.



DFES
Department of Fire & Emergency Services

000 for fire or life threatening emergencies
132 500 for SES assistance
13 DFES (13 3337) for emergency information
[Hearing or speech impaired contacts](#)

Alerts and Warnings Map
[CLICK HERE](#)

Home | Publications | Subscriptions | Links | Contact Us

Text Size A A High Contrast Print Search this site...

About Us

News and Media

Safety Information

Recruitment and Training

Volunteers

Education and Heritage

Regulation and Compliance

Emergency Services Levy

State Emergency Management

Alerts & Warnings
 Fire Danger Ratings
 Total Fire Bans
 Media Releases

Alerts and Warnings

Home | Alerts | 2014 | October | Bushfire ADVICE for Neerabup Lake in the City of Wanneroo

[Back](#)

Bushfire ADVICE for Neerabup Lake in the City of Wanneroo

Friday 24 October 2014 - 2:59 PM

RSS

[Refer this page to a friend](#)

[Current Alerts & Warnings](#)

[Alerts & Warnings Map](#)

[Warning Systems](#)

[Prescribed Burning](#)

[Information Sources/Links](#)

[FACs](#)

[Emergency Alert](#)

Bushfire BEHAVIOUR:

- The bushfire is stationary.
- The fire is burning in peat, which is a build-up of decaying plant matter that forms in wetlands, and because peat burns underground it can be difficult to extinguish.
- It is contained but not under control.

WHAT TO DO:

- Stay alert and monitor your surroundings.
- Watch for signs of a bushfire, especially smoke and flames.
- Close all doors and windows, and turn off evaporative air conditioners but keep water running through the system if possible.
- Read through your bushfire survival plan.
- If you do not have a plan decide what you will do if the situation gets worse.

ROAD CLOSURES:

No roads are closed.

Avoid the area and be aware of fire and other emergency services personnel working on site.

WHAT FIREFIGHTERS ARE DOING:

Up to 85 volunteer firefighters from the Wanneroo, East Swan, Gosnell, Muchea, South Coogee, Byford, Bedforddale, Waterloo, Jandakot, Kalamunda and Quimms Rocks Bush Fire Brigades and the Bullsbrook Volunteer Fire Service are actively fighting the fire.

EXTRA INFORMATION:

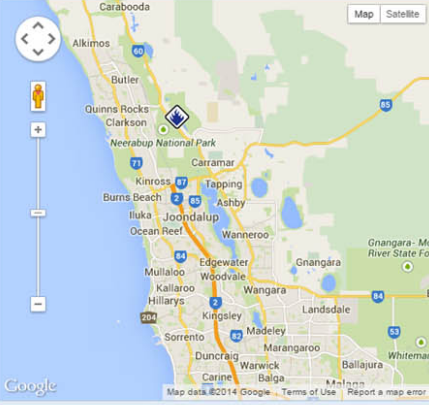
- The incident was reported at 1.11pm on Tuesday 21 October 2014.
- The cause of the fire is a lightning strike.
- It has burnt approximately three hectares.
- The City of Wanneroo is managing the fire.

KEEP UP TO DATE:

Visit www.dfes.wa.gov.au, call 13 DFES (13 3337), follow DFES on Twitter @dfes_wa or listen to news bulletins.

The next update will be provided by 11am tomorrow, Saturday 25 October 2014 unless the situation changes.

Please note: The map below only provides a general indication of the location of the warning area.



Map Legend

Bushfire - Advice	Cyclone - Advice	Flood Alert
Bushfire - Watch and Act	Cyclone - Blue Alert	Tsunami Alert
Bushfire - Emergency Warning	Cyclone - Yellow Alert	Other Alert
Bushfire - All Clear	Cyclone - Red Alert	

wa.gov.au

[Disclaimer](#) | [Privacy](#) | [FOI](#) | [Copyright](#) | [Contact Us](#)

© 2014 Government of Western Australia. All rights reserved.

Sample Cyclone Advice - 'Warning and Watch' (sourced from Bureau website)

IDW24100

BUREAU OF METEOROLOGY

WESTERN AUSTRALIAN REGIONAL OFFICE

Transmitters serving the Onslow and Barrow Island areas are requested to sound the Standard Emergency Warning Signal before broadcasting the following warning.

TOP PRIORITY

TROPICAL CYCLONE ADVICE NUMBER 24

Issued at 11:55 pm WST on Sunday, 29 February 2004

BY THE BUREAU OF METEOROLOGY

TROPICAL CYCLONE WARNING CENTRE PERTH

A CYCLONE WARNING for a SEVERE CATEGORY 4 CYCLONE is now current for coastal areas between Roebourne and Exmouth. A CYCLONE WATCH extends south to Coral Bay and includes adjacent inland parts of the western Pilbara.

At midnight WST SEVERE TROPICAL CYCLONE MONTY was estimated to be

185 kilometres west northwest of Karratha and

170 kilometres north of Onslow and

Moving southwest at 10 kilometres per hour.

Severe Tropical Cyclone Monty is expected to cross the coast in the vicinity of Onslow during Monday. Gales with gusts to 125 kilometres per hour are likely in coastal communities between Roebourne and Onslow extending to Exmouth during the day.

Very destructive winds with gusts to 250 kilometres per hour are likely to develop at Barrow Island tonight and in the vicinity of Onslow during Monday.

Residents of Onslow are specifically warned of the potential of a very dangerous storm tide as the cyclone centre approaches the coast.

Tides are likely to rise significantly above the normal high tide mark with very dangerous flooding, damaging waves and strong currents.

Widespread heavy rain and further flooding are likely in western parts of the Pilbara Gascoyne over the next few days.

Details of Severe Tropical Cyclone Monty at midnight WST.

Location of centre: within 20 kilometres of Latitude 20.1 South Longitude 115.2 East.

Recent movement: southwest at 10 kilometres per hour.

Central Pressure: 935 hPa.

Maximum wind gusts: 250 kilometres per hour.

Severity Category: 4

FESA-State Emergency Service advises of the following community alerts:

RED ALERT: People in communities at Barrow Island should move to shelter.

YELLOW ALERT: People in or near the communities of Mardie, Onslow, Fortescue Roadhouse, Pannawonica and Nanutarra should commence action in readiness for the cyclone's arrival.

BLUE ALERT: People in or near the communities of Roebourne, Wickham, Karratha, Dampier and Exmouth should be taking precautions.

The next advice will be issued at 1 am WST.

Cyclone advices and State Emergency Service Community Alerts are available by dialling 1300 659 210

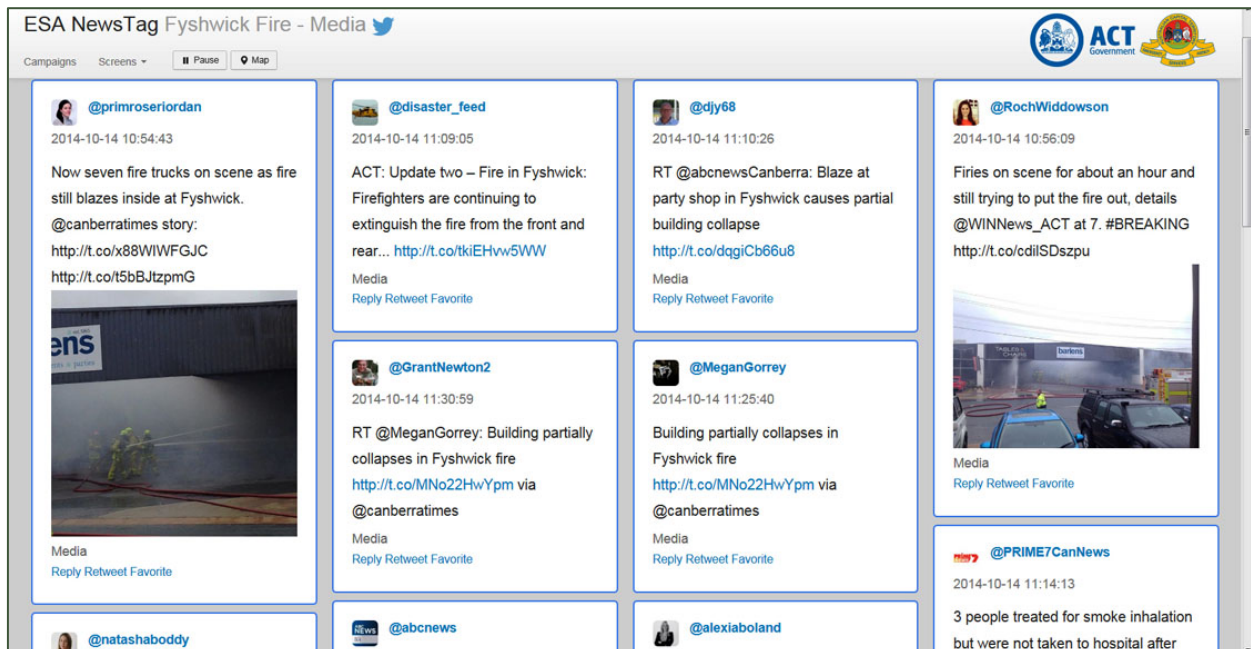
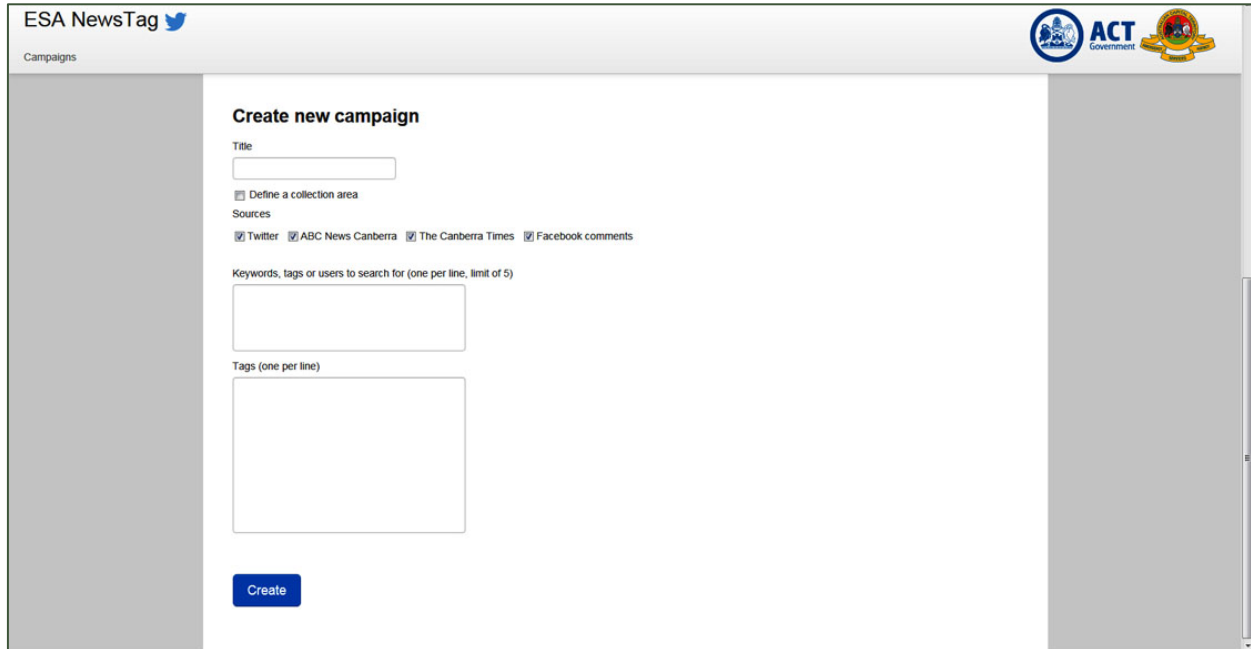
A map showing the track of the cyclone is available at: <http://www.bom.gov.au/wa/cyclone>

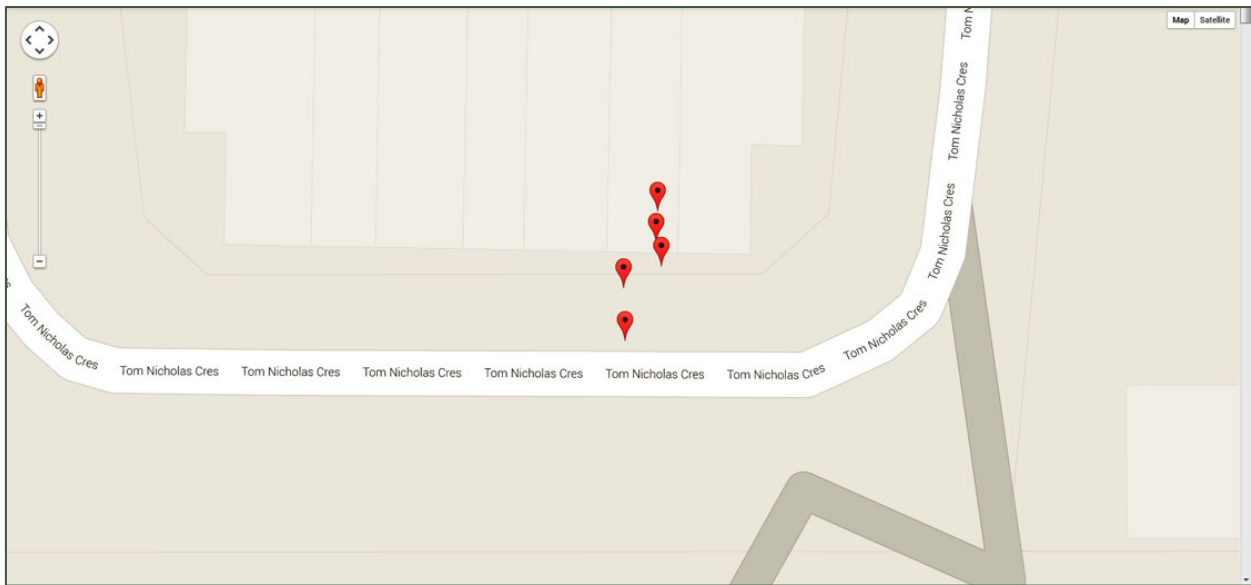
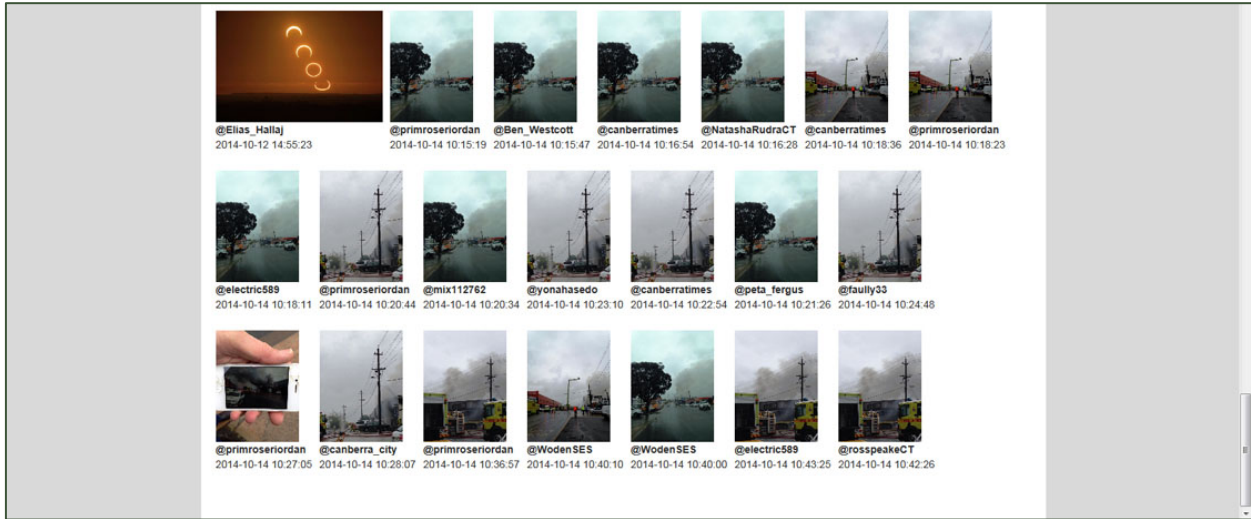
Figure 24: An example of the Bureau of Meteorology's cyclone warnings

Appendix C: Social Media Monitoring Example

ACT Emergency Service Agency's Digital Media Monitoring Application, NEWS TAG

Figure 25: In the four images below, the ACT Emergency Services Agency's digital media monitoring tool is profiled. Specific campaigns can be quickly set up and include geo-located display. Images posted can be collated to assist with rapid validation of information.





Appendix D: Multi-hazard, multi-agency websites

Below, the multi-hazard, multi-agency warnings websites for South Australia, Tasmania, Victoria and the ACT are shown. Different approaches to collating and presenting information are used, some focused on presentation of social media updates and others providing a spatial view of current incidents and alerts.

The screenshot displays the 'Alert SA' website interface. At the top, the logo 'Alert SA' is accompanied by the tagline 'Social Media Messages In an Emergency In One Place'. Navigation buttons include 'Home', 'About', 'Emergency Contacts', and 'Emergency Alert'. A legend indicates 'Alerts Explained' with categories: Advice (blue square), Watch & Act (yellow square), and Emergency Warning (red square).

The main content area is divided into two sections: 'Video' on the left, featuring a video player showing a woman in a car, and 'Alert SA Explained' on the right, which provides a brief overview of the website's purpose and data sources (CFS, SAPOL, SES, MFS, and the Bureau of Meteorology). A 'Read the About section to find out more' button is located below this text.

Below these sections is a navigation bar with 'All Feeds', 'Current Alerts', and 'Videos' tabs. The 'All Feeds' tab is active, displaying a grid of social media feeds from various emergency services:

- SA Police News (Facebook):** A post from 13 hours ago reporting a car theft in Woodville South, where a woman's car was stolen and later found on South Avenue.
- Country Fire Service (Facebook):** A post from 6 hours ago announcing a campaign launch for a 25km/h speed limit for emergency vehicles starting on 1 September 2014.
- State Emergency Service (Twitter):** A tweet from 12 hours ago regarding the new 25km/h speed limit for emergency vehicles in Adelaide.
- SA Police News (Twitter):** A tweet from 11 hours ago thanking the public for their concern regarding a missing boy, Ken Nguyen, who has been found and returned home.
- Country Fire Service (Twitter):** Two tweets from 3 and 4 hours ago reporting vehicle accidents on Tarlee Road and Glenwood Drive.
- Metropolitan Fire Service (Twitter):** A tweet from 10 hours ago advising that emergency vehicles will use red/blue flashing lights from 1 September.

Figure 26: Alert SA displays the social media feeds of multiple SA emergency services

The screenshot displays the TASALERT website interface. At the top left is the TASALERT logo, a red network diagram, followed by the text "TASALERT | Tasmania's official emergency information source". To the right is the Tasmanian Government logo. Below the header is a navigation bar with "Home", "Resources", "Get Ready", and "About" tabs, and a secondary bar for "Emergency Services: Fire | Police | SES".

The main content area features a map of Tasmania on the left with a "View full page map" link. To the right of the map is a text box stating: "TasALERT is the Tasmanian Government's official emergency website that brings together information from emergency services and government agencies. In case of emergency, dial Triple Zero (000)".

Below the map and text are social media links: "Like TasALERT on Facebook" and "Follow TasALERT on Twitter". A prominent blue banner with a red heart and "AED" icon reads "Shockingly easy Save a life with a defibrillator" and includes the Tasmanian Ambulance logo.

The lower section is divided into three columns of social media feeds:

- Tasmania Fire Service (Facebook):** Shows a post from 1 hour ago about a structure fire at Georges Bay Esplanade, Saint Helens, with an update from 10-Aug 21:19. A second post from 10 hours ago mentions a structure fire incident at East Derwent.
- Tasmania Police (Facebook):** Shows a post from August 7 at 9:55pm titled "National Missing Persons Week Profile" for Rachel Funari, a 36-year-old American tourist last seen on March 3, 2011, at Bruny Island.
- SES Tasmania (Facebook):** Shows a post from 11 hours ago titled "VOLUNTEER AND HELP MAKE TASSIE A SAFER PLACE" seeking volunteers in Northern Midlands, Dorset, and West Tamar.

Below these are Twitter feeds for "Tasmania Fire Service" and "Tasmania Police", and a Facebook feed for "TasALERT" showing a post from August 7 at 11:41pm encouraging users to share the site with friends and family.

Figure 27: TAS ALERT displays the social media feeds of multiple SA emergency services. It is also designed to easily include information from broader government agencies or departments if required.

Now in Victoria: Text only About this site Map icons explained Terms of use More

Incidents and warnings Prepare and get ready Relief and recovery

Enter a location Search filters & map layers

Sorted by: Type

- Advice**
Fire
17 hours ago [More](#)
Comblenbar
- Advice**
Fire
17 hours ago [More](#)
Barnadown
- Fire**
Building Fire - Responding
20 hours ago Vehicles attending: 4
Truganina
- Fire**
Bushfire - Not Yet Under Control
21 hours ago Vehicles attending: 7
Comblenbar
- Fire**
False Alarm - Safe
3 minutes ago Vehicles attending: 2
Leopold
- Fire**
Building - Safe
5 minutes ago Vehicles attending: 1
Leopold

Map data ©2014 GBRMPA, Google Terms of Use

Powered By: FireReady

Figure 28: VicEmergency is Victoria's official multi-hazard, multi-agency warnings and information channel. It displays all current incidents, alerts and warnings in a single spatial view. Users can edit their preferences to show particular information using the 'filters and map layers' tab (e.g. to display warnings only).

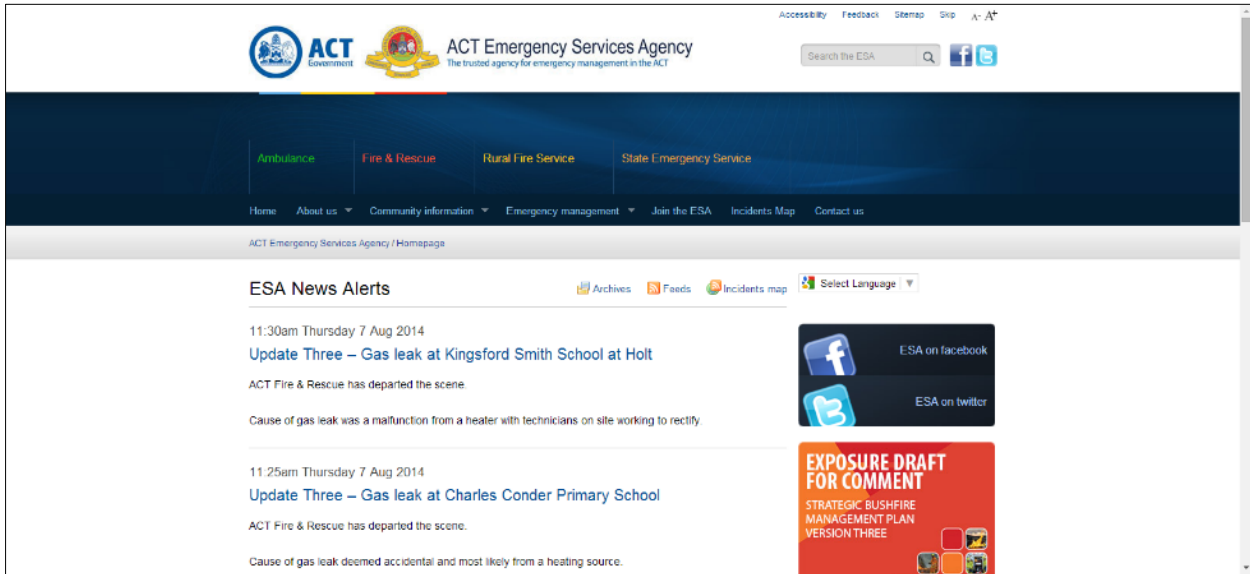
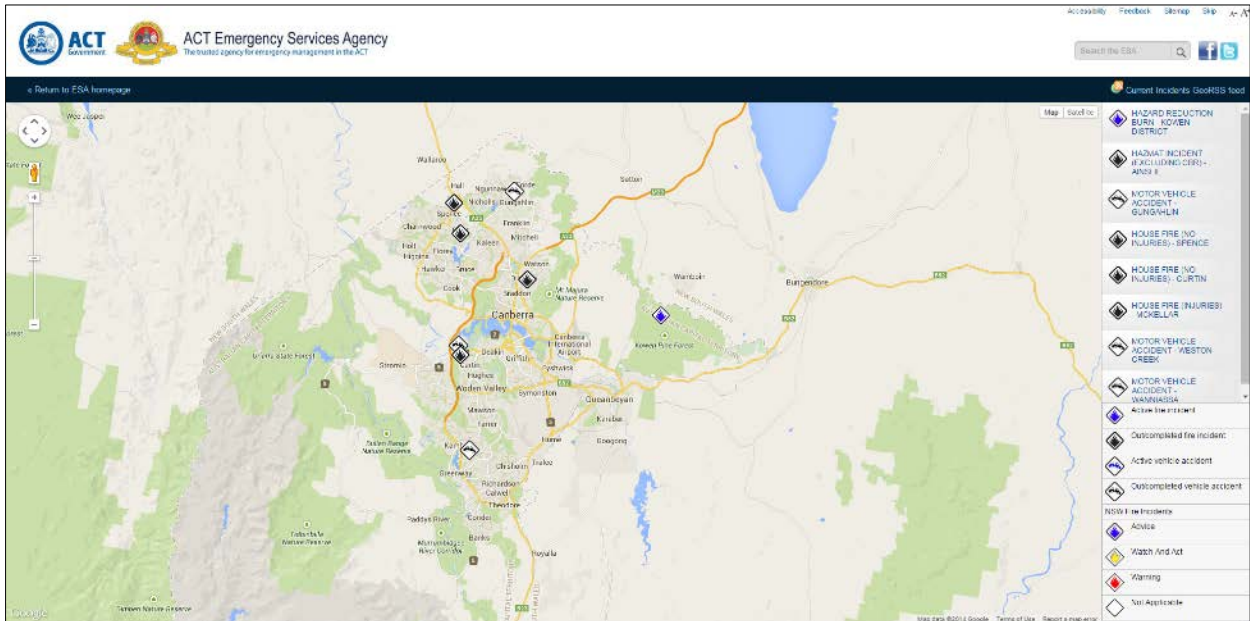


Figure 29: The ACT Emergency Services Agency provides a news feed style multi-hazard, multi-agency website and is promoted as a trusted source of information.

Figure 30: The ACT Emergency Services Agency also provides a spatial view of current incidents, advice and warnings



Appendix E: Third party information and warnings examples

The screenshot displays the Facebook profile for 'Townsville Storms', a community organisation. The page features a cover photo with the text 'Townsville Storms Community organisation' and a profile picture with the website URL 'www.townsvillestorms.com'. The navigation menu includes 'Timeline', 'About', 'Current Warnings', 'Townsville RADAR', and 'More'. On the left sidebar, there are sections for 'PEOPLE' (36,184 likes), 'ABOUT' (providing weather information for a large area from Cooktown to Gladstone), 'APPS' (Current Warnings, Townsville RADAR, Chase Cam Live), and 'VIDEOS'. The main content area shows two posts: one from 12 minutes ago with a photo of a beach and the text 'Good morning Townsville!! This is your morning at The Strand. ENJOY and SHARE. - Shane.', and another from 2 hours ago with the text 'Good morning Northern Queensland!! Welcome to the new day. It's Sunday the 2nd day of November 2014.' followed by details about 'Cyclone Sunday' at Strand Park Townsville. A warning summary is also visible at the bottom of the page.

Figure 31: The popular Townsville Storms Facebook page provides weather information.

The screenshot shows the EWN website interface. At the top, there is a navigation menu with options: Warnings, Personal, Services, Industries, Government, and Contact Us. A 'Start Free Trial!' button and a 'Sign In' button are also visible. Below the navigation is a map of the Newcastle region in NSW, Australia, with a red pin marking the location of Old Swan Bay Rd. The main content area features a large orange banner with a flame icon and the text 'FIRE WARNING The Early Warning Network'. To the left of the banner, it says '18:08 about 17 hours ago' and 'NSW Bushfire Watch & Act: Old Swan Bay Rd, Swan Bay (Port Stephens LGA)'. Below the banner, it states 'Source: NSW Rural Fire Service' and 'Sat 01 Nov 14 18:08:37 (about 17 hours ago)'. To the right of the banner, there is a 'Stay Updated' section with 'Share' buttons for Twitter and Facebook. Below that is a 'Recent Warnings' section listing two warnings: 'QLD Severe Thunderstorm Warning: Damaging Winds' issued on Sat 01 Nov 14 20:50:33 (about 14 hours ago) and another issued on Sat 01 Nov 14 18:36:56.

Figure 32: The early warning network is a commercial enterprise offering weather information and emergency warnings. A number of government organisations utilise this service to share information and warnings with community members.

Appendix F: Information versus news

A recent fire in Ravensbourne, QLD saw a 'watch and act' message issued by QLD Fire and Emergency Services. The below images illustrate how the warning is shared, in contrast to 'news' about the incident.

The screenshot shows the ABC Emergency website interface. At the top, there is a navigation bar with 'Sites', the ABC logo, and a search icon. Below this is a red header with 'ABC Emergency' in white. A secondary navigation bar contains links: 'Warnings and Alerts', 'Get Ready & Survive', 'Recovery Information', 'Emergency Services', and 'Disasters in Australia'. The main content area is titled 'Queensland' and includes sub-sections for 'CYCLONE FORECAST', 'FIRE DANGER FORECAST', and 'RAIN & RIVER READINGS'. The primary heading is 'Current Warnings: Queensland' followed by 'Current ABC Emergency Coverage'. A sub-heading reads 'Current Alerts and Warnings: Queensland' with a note: 'Note: this listing may contain non-emergency related information.' Below this, a specific warning is displayed: 'A bushfire WATCH AND ACT has been issued for people in the locality of RAVENSBOURNE in the local government area of TOOWOOMBA.' The warning is dated 'Issued 4:49:00 PM AEST on Wednesday 29 October 2014'. The text of the warning describes the fire's location at Mount Jockey Road, its direction, and the expected impact on the Ravensbourne community. It provides instructions for residents, such as leaving if possible, staying in protective clothing if staying, and preparing homes for safety. A sidebar on the right contains several sections: 'ABC Emergency delivers official warnings and alerts...' with a link to 'Read more about us'; 'ABC RADIO FREQUENCY FINDER' with a link to 'Find the ABC Radio frequencies for your area'; 'STORIES FROM ABC QUEENSLAND' with a list of links including 'Look back at Tropical Cyclone Ita', 'VIDEO: Great Keppel thrashed by storm surge', and 'Golf ball-sized hail buckets down on SE Queensland'; and a 'Tweets' section showing two tweets from ABC Southern Qld and ABC Emergency regarding the fire and storm warnings.

Figure 33: This Watch and Act message is displayed in full in the ABC's 'emergency' area. In the following image, the ABC's news area also provides an article on the incident.

The screenshot shows the ABC News website interface. At the top, there are navigation links for 'Sites', 'ABC', and 'Search'. Below that is a 'NEWS' banner with a 'SET LOCATION' button for local news and weather. A secondary navigation bar includes 'Just In', 'Australia', 'World', 'Business', 'Sport', 'Analysis & Opinion', 'Fact Check', 'Programs', 'More', and 'Topics'. The main article is titled 'Ravensbourne bushfire: Property may be lost to fast-moving fire north-east of Toowoomba', updated 12 minutes ago. The sub-headline reads: 'A large, out-of-control bushfire is threatening homes north-east of Toowoomba, the Queensland Fire and Emergency Services (QFES) says.' The article text states that QFES has issued a Watch and Act alert and advised residents in Ravensbourne to either enact their bushfire plan or leave now. It further details that in a statement issued at 4.45pm (AEST), QFES said a large bushfire was travelling in a southerly direction and was expected to impact the areas of Perseverance Road, Ravensbourne Dip Road, Post Office Road and Garvey Road in approximately two hours. The fire was moving quickly and firefighters were experiencing difficulty in controlling it. QFES said spot fires might occur ahead of the fire front and embers were also being thrown from the fire. A quote from the statement reads: 'Power, water and mobile phone supplies may be lost in the area over the next several hours,' the statement read. Another quote says: 'It will be very hot and windy and as the fire approaches it may become increasingly difficult to see, hear or breathe'. To the right of the article are 'RELATED STORY' links, a 'MAP: Ravensbourne 4352' link, and a 'TOP STORIES' list with various news items.

Figure 34: Here, ABC's news article references the Watch and Act message, as distinct from providing it in full

NEWS

Subscribe and get a **HarperCollins eBook** *Conditions apply **Courier Mail** Find out more

Subscribe and get **WEEKEND PAPER DELIVERY** *Conditions apply **Courier Mail** Find out more

Residents told to leave as bushfire threatens at Ravensbourne

TOM CHAMBERLIN, HARRY CLARKE, KATE MCKENNA THE COURIER-MAIL
OCTOBER 29, 2014 5:30PM

SHARE f t in g+ ✉ 1 COMMENTS SAVE THIS STORY

NEVER MISS AN OPPORTUNITY TO



Ballandean bushfire picture tweeted by Channel Nine.

RESIDENTS are being urged to leave their homes as firefighters battle to control a fast-moving fire in Ravensbourne, near Toowoomba on the Great Dividing Range.

The watch and act message covers people living in the area of Perseverance Rd, Ravensbourne Dip Rd, Post Office Rd and Garvey Rd.

Queensland Fire and Emergency Services is advising those residents to enact their bushfire plan as the fire is predicted to impact the area in about two hours.

There is a chance "that some property may be lost," the QFES message said.

The fire is moving quickly and crews are "experiencing difficulty in controlling it."

"Spot fires may occur ahead of the fire front and embers are also being thrown from the fire."

Most Viewed

1. Man beheads woman in New York
2. Rice rushed to hospital and into emergency
3. Taxi driver shares awesome Tom Hanks story
4. 'It was looking right at me'
5. X-rated marks the spot in this suburb
6. 'Hitchhiker Murderer' who was never caught
7. Kiwis to Muslims: Go back to own country
8. Kim Jong Un mystery solved

News

Second test result for suspected Ebola case

UPDATE: As Premier Campbell Newman seeks tighter border controls to protect the state from an Ebola outbreak, a suspected patient has received her second test result.

French visitor's arresting food review

Figure 35: A QLD newspaper provides a news article about the fire and although noting that a watch and act message has been issued, there is no link to the official message.

Appendix G: Contributors to this Review

The following individuals have contributed to this Review in a variety of ways. Many were engaged in good practice interviews, others have participated in the Review's governance, or Reference Group, or national workshop. Some have also provided written submissions or spoken with the Review team on particular issues and themes.

Thank you to all for your contribution.

Individual	Representing
Alan Sharp	Bureau of Meteorology
Alicia Rattenbury	TAS Fire Service
Allen Gale	WA Department of Fire and Emergency Services
Amanda Leck	Australasian Fire and Emergency Service Authorities Council
Andrew Crisp	Victoria Police
Andrew Lawson	SA Country Fire Service
Andrew McGuinness	TAS Fire Service
Andrew Orange	TAS Fire Service
Andrew Richards [^]	NSW State Emergency Service
Andrew Stark	ACT Rural Fire Service
Andrew Tupper	Bureau of Meteorology
Anne Leadbeater	Independent
Anthony Clark [^]	NSW Rural Fire Service
Ben McFadgen [^]	VIC State Emergency Service
Ben Shephard	NSW Rural Fire Service
Bethany West	Bureau of Meteorology
Brendon Scully	Victoria Police
Brett Anderson	Bureau of Meteorology
Brian Edmonds	TAS State Emergency Service
Bruce Byatt	NT Fire and Rescue Service
Carl Peterson	QLD Moreton Bay Regional Council
Caroline Milligan	Crest Advisory
Chris Arnol	WA Department of Fire and Emergency Services
Chris Beattie	SA State Emergency Service

Craig Lapsley	Emergency Management Victoria
Craig Waters	WA Department of Fire and Emergency Services
Damien Killalea	TAS Fire Service
Daniel Nolan	Commonwealth Attorney-General's Department
Darren Cutrupi	ACT Emergency Services Agency
David MacFarlane	TAS Fire Service
Dominic Lane	ACT Emergency Services Agency
Drew Griffiths	WA Department of Parks and Wildlife
Evan Morgan	Bureau of Meteorology
Felicia Andrews	NSW State Emergency Service
Fiona Dunstan^	SA Country Fire Service
Gary Gaffney	WA Shire of Wyndham
Gary Gifford	WA Department of Fire and Emergency Services
Gary McCormack	QLD Fire and Emergency Services
Ged Griffin	Victoria Police
Geoff Russell	VIC Department of Human Services
George Cretu	TAS State Emergency Service
Gerry Cartwright	Victoria Police
Glen Lord	NSW Fire and Rescue
Greg Feeney	WA Department of Fire and Emergency Services
Greg Howard	SA Metropolitan Fire Service
Greg Mair	WA Department of Parks and Wildlife
Hayley Gillespie	QLD Fire and Emergency Services
Ian Mannix	ABC Emergency Broadcasting
Ilona McNeill	Melbourne University
Jane Connors	ABC Emergency Broadcasting
Joan Warner	Commercial Radio Australia
Joe Buffone	Emergency Management Victoria
John Bally	Bureau of Meteorology
John Holloway^	TAS Fire Service

John Nairn	Bureau of Meteorology
Jon Carr	SA State Emergency Service
Jude Scarborough	SA Fire and Emergency Services Commission
Karen Passmore	Independent
Kevin Daley	NSW Police
Laura Keating	WA Department of Fire and Emergency Services
Lee Symons	NT Police, Fire and Emergency Services
Linda Anderson-Berry	Bureau of Meteorology
Martin Southgate	ABC Emergency Broadcasting
Mel Cooper	WA Department of Fire and Emergency Services
Meryl Stone	Google
Michael Goldsmith	TAS Fire Service
Michael Hallows	VIC, Department of Justice
Michelle Neil [^]	WA Department of Fire and Emergency Services
Mike Lollback	QLD Redland City Council
Murray Bawden	WA Department of Fire and Emergency Services
Nicole Ely	SA Metropolitan Fire Service
Patrick Byrne	QLD Fire and Emergency Services
Paul Carr	WA Department of Fire and Emergency Services
Paul Fletcher	SA Metropolitan Fire Service
Paul Symmington	TAS Fire Service
Peta Miller Rose AFSM	QLD Fire and Emergency Services
Peta O'Donohue	SA Country Fire Service
Peter Cinque	NSW State Emergency Service
Peter Keppel	WA Department of Parks and Wildlife
Peter Levett	NSW Fire and Rescue
Peter McKechnie	NSW Rural Fire Service
Peter Sutton	WA Department of Fire and Emergency Services
Phil Nickerson	QLD Office of the Inspector General Emergency Management
Rebecca Gollings	NSW State Emergency Service

Reegan Key^	Emergency Management Victoria (Reference Group Chair)
Rob Morton	Bureau of Meteorology
Rob Rogers	NSW Rural Fire Service
Robin Hicks	Bureau of Meteorology
Rosemary Patterson	TAS Fire Service
Ross McNeill	Victoria Police
Sally Lowenstein	VIC State Emergency Service
Sally Woolford^	SA Fire and Emergency Services Commission
Samantha Chard	Commonwealth Attorney-General's Department
Scott Duval	SA Police
Shane Murrhly	Bureau of Meteorology
Shannon Fox	TAS Department of Parks and Wildlife
Shelby Canterford	Geoscience Australia
Shoni Maguire	Bureau of Meteorology
Simon Goodwin	SA Fire and Emergency Services Commission
Simon Hiscock	TAS Department Premier and Cabinet
Stephanie Keir	QLD Department of Agriculture, Fisheries and Forestry
Steve Matthews	WA Department of Fire and Emergency Services
Steve Yorke	NSW Rural Fire Service
Suellen Flint^	WA Department of Fire and Emergency Services
Tim Foley	WA Department of Parks and Wildlife
Tim Gerritsen	ABC Emergency Broadcasting
Tony Pearce	Emergency Management Victoria
Trevor Butterfield	QLD Fire and Emergency Services
Trina Read^	Bureau of Meteorology
Troy Davies	QLD Fire and Emergency Services
Warwick Richardson	NSW Fire and Rescue
Wendy Kelly	Commonwealth Attorney-General's Department
Yvette (Pixie) Dowling	SA Country Fire Service
Zoran Jovanovic	WA Department of Parks and Wildlife

^ Project Reference Group member

Project Delivery Team	Representing
Reegan Key (Project Manager)	Emergency Management Victoria
Amber Brodecky	Cube Group
Deb Symons	Cube Group
Ruth Cockerton	Cube Group
Dan Pole	Ipsos
Jennifer Brooks	Ipsos
Julia Knapp	Ipsos
Julie Young	Ipsos
Samantha Liew	Ipsos