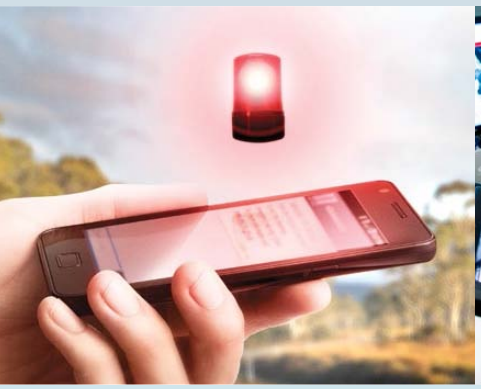
Review of local governments' emergency warning capability

Report 1: 2014-15



Local governments have a responsibility to warn communities before, during and after disaster events. This report examines a system that needs to deliver locally and embrace centralised support. Recommendations focus on delivering the best possible community outcomes.

Queensland Government

Document Details

Security Classification	For official use only
Security Classification Review Date	12 June 2015
Author	Inspector-General Emergency Management
Authority	Office of the Inspector-General Emergency Management
Version control	V1.0

Information security

This document has been classified using the Queensland Government Information Security Classification Framework (QGISCF) as PUBLIC and will be managed according to the requirements to the QGISCF.

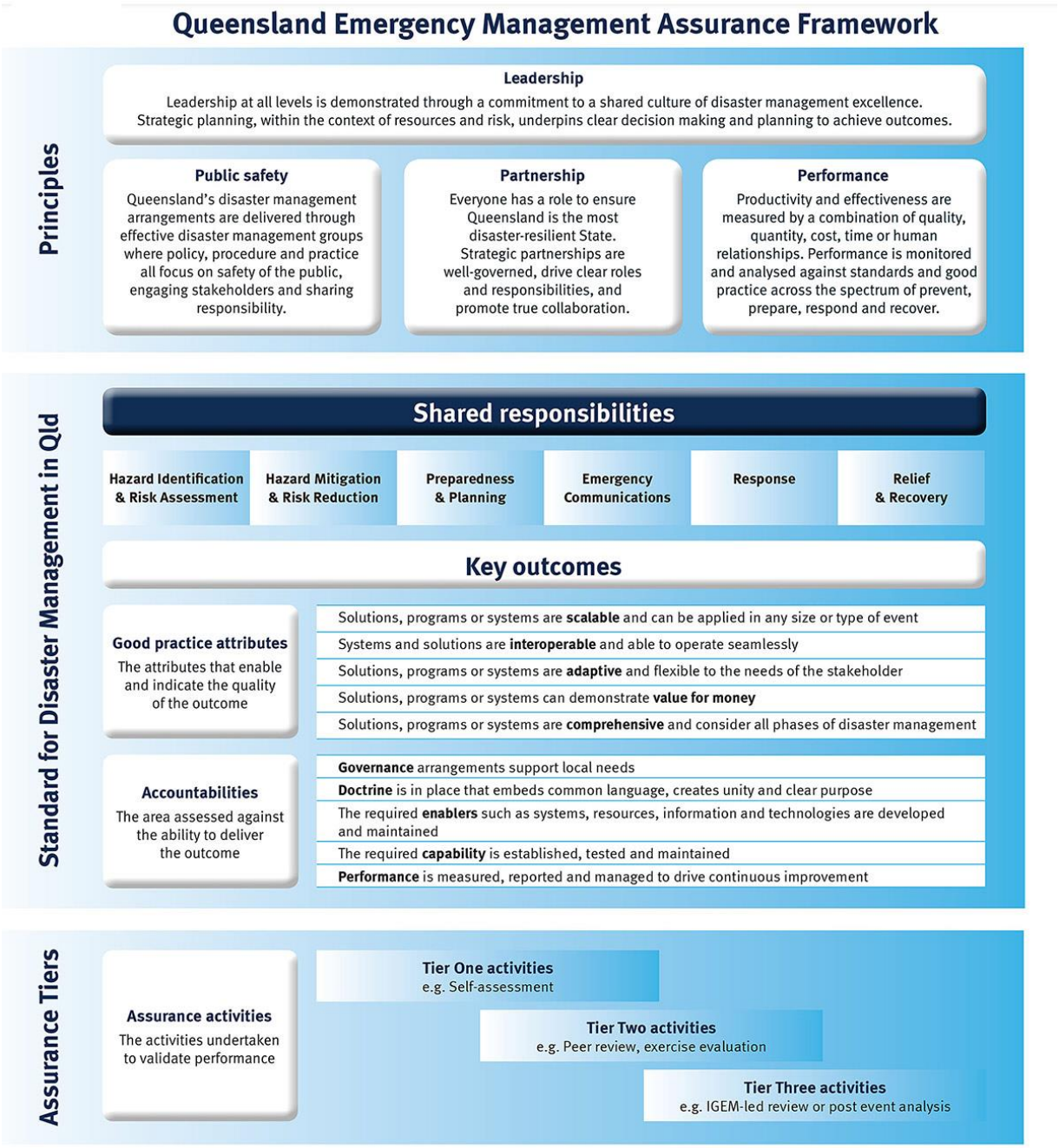
Copyright

Contact details

All enquiries regarding this document should be directed to the Office of the Inspector-General Emergency Management:

- Email: info@igem.qld.gov.au
- Tel: 07 3227 6588
- Mailing Address:
  Mail Cluster 15.7
  GPO Box 1425
  Brisbane Qld 4001

ISSN 2204-969X


Queensland Emergency Management Assurance Framework
Principles
Leadership
Leadership at all levels is demonstrated through a commitment to a shared culture of disaster management excellence. Strategic planning, within the context of resources and risk, underpins clear decision making and planning to achieve outcomes.
Public safety
Queensland's disaster management arrangements are delivered through effective disaster management groups where policy, procedure and practice all focus on safety of the public, engaging stakeholders and sharing responsibility.
Partnership
Everyone has a role to ensure Queensland is the most disaster-resilient State. Strategic partnerships are well-governed, drive clear roles and responsibilities, and promote true collaboration.
Performance
Productivity and effectiveness are measured by a combination of quality, quantity, cost, time or human relationships. Performance is monitored and analysed against standards and good practice across the spectrum of prevent, prepare, respond and recover.
Standard for Disaster Management in Qld
Shared responsibilities
Hazard Identification & Risk Assessment
Hazard Mitigation & Risk Reduction
Preparedness & Planning
Emergency Communications
Response
Relief & Recovery
Key outcomes
Good practice attributes
The attributes that enable and indicate the quality of the outcome
Solutions, programs or systems are scalable and can be applied in any size or type of event
Systems and solutions are interoperable and able to operate seamlessly
Solutions, programs or systems are adaptive and flexible to the needs of the stakeholder
Solutions, programs or systems can demonstrate value for money
Solutions, programs or systems are comprehensive and consider all phases of disaster management
Accountabilities
The area assessed against the ability to deliver the outcome
Governance arrangements support local needs
Doctrine is in place that embeds common language, creates unity and clear purpose
The required enablers such as systems, resources, information and technologies are developed and maintained
The required capability is established, tested and maintained
Performance is measured, reported and managed to drive continuous improvement
Assurance Tiers
Assurance activities
The activities undertaken to validate performance
Tier One activities
e.g. Self-assessment
Tier Two activities
e.g. Peer review, exercise evaluation
Tier Three activities
e.g. IGEM-led review or post event analysis

The purpose of our papers

All papers and reports produced by the Office of the Inspector-General Emergency Management (IGEM) provide independent assurance and advice about the effectiveness of emergency management arrangements in Queensland. The Office of the IGEM bases all publications on the Emergency Management Assurance Framework, which encompasses the Standard for Disaster Management in Queensland.

Briefing paper

A briefing paper provides the decision-maker with a summary of facts about an issue, or an overview of a situation or arrangements. The briefing paper may address opportunities for improvement or highlight exemplary practice. The briefing paper provides the decision-maker with the next steps to consider, which may include advice to entities.

Discussion paper

A discussion paper provides greater analysis of an issue, situation or arrangements than a briefing paper, considering trends, other sector or jurisdiction approaches or current best practice research. The discussion paper may address opportunities for improvement or highlight exemplary practice. The IGEM may suggest improvements to entities through advice, or more formally through professional practice considerations.

Review report

A review report provides a comprehensive analysis of the effectiveness of a particular disaster management issue, situation or set of arrangements. The review report is based on evidence, and may include discussion of underlying themes, contributing factors and root causes of issues. The review report includes findings, and bases recommendations for improvement on lessons identified, research and good practice.

Research paper

A research paper may be produced as a result of a review report, or initiated by the IGEM. A research paper explores an issue, generates discussion and seeks best practice solutions.

Contents

Contents 5
Executive summary 6
Background 6
Findings 7
Conclusion 8
Recommendations 9
Context 11
Purpose 12
Scope 12
Methodology 12
Planning for warnings 15
Profiling communities at risk 15
Community understanding of warnings 19
Adding value to warnings 20
Delivery of warnings 23
Effective warning systems and arrangements 23
Warning messages use common language 25
Warning systems are tested regularly 26
Warnings are delivered by those with authority 27
Conclusion 32
Recommendations 33
Bibliography 36
Appendix A: Scope 39
Appendix B: Contributors 40
Appendix C: Reference Material 42
Appendix D: Warning channels, products and ratings 44
Appendix E: Tropical Cyclone Marcia 55
Appendix F: Research 58
Appendix G: Summary of feedback 69

Executive summary

Background

This review assesses the capability of local government in Queensland to issue contextualised, fit-for-purpose, consistent and accurate warnings through all phases of events.

We have analysed information collected against each outcome and indicator within the Warnings component of the *Standard for Disaster Management in Queensland* (the Standard). We compared what we expected to find against our actual observations. From these we have delivered a number of findings and recommendations.

The Warnings component of the Standard focuses on two key outcomes:

> *7.1 Communities at risk of impact from an event are defined and can be targeted with contextualised warnings.*
>
> *7.2 Communities at risk of impact from an event, receive fit-for-purpose, consistent, accurate warnings through all phases of events.*[1]

Profiling communities is a challenge for local governments because of difficulties in collecting and maintaining records and interpreting privacy legislation. Often, the complexities of communicating with diverse communities are not well understood by local governments.

We found that few have undertakensufficient planning to profile their communities and identify barriers to effective communication. This makes it difficult for local governments to effectively issue warnings. As a result, communities may not understand the warnings or know what action to take during a disaster. Devolved responsibility for warnings to the local level occurs without adequate centralised support through disaster management arrangements.

Generally, warnings are not tested with the relevant communities to ensure people receive them and understand them correctly. Testing warnings with the community is beyond the capacity of many councils. The decentralised model for warning responsibility means there is often insufficient investigation of emerging technologies, use of social media and contemporary research.

Despite the endeavours of local governments to give effective warnings to communities, the disconnect between statewide approaches, arrangements and disaster management doctrine[2] has restricted the capacity of local government to achieve this. Warning systems and arrangements do not allow for the continuous flow of critical, up-to-date and relevant information between stakeholders.

[1] Office of the Inspector-General Emergency Management, *Emergency Management Assurance Framework,* 2014, p. 25.
[2] '…collective knowledge that has been structured and systematised to facilitate its application in practice and prepared for dissemination in a way appropriate for its intended audience', Australasian Fire and Emergency Services Authorities Council, *Fundamentals of doctrine: A best practice guide*, 2011, p. 2.

The primary barriers are the independent approaches to disaster management by many stakeholders, such as different procedures, systems and arrangements for specific hazards. There is considerable opportunity to improve stakeholder engagement in planning processes and for improved planning for emergency warnings.

There was evidence of goodwill and effort dedicated to achieving consistent messaging, but current doctrine does not provide sufficient clarity on responsibilities. Nor is there adequate governance to integrate the approaches of state and local government in relation to communication and warnings.

Legislation and doctrine is at times conflicting and lacks clarity regarding roles and responsibilities for the delivery of emergency warnings. This lack of clarity, coupled with local and state government agencies sometimes operating independently, is likely to result in different terminology and possibly inconsistent messages from disaster management entities.

The sharing of responsibility for public information and warnings, between and within documents, has also resulted in a range of interpretations. The key doctrine does not articulate the value of an integrated system, nor how it should occur through clear and detailed roles and responsibilities.

Findings

1. Many local governments do not have well-documented plans for emergency warnings, based on research into the community's ability to receive or respond to warnings.
2. Some local governments are over-reliant on community groups to deliver and modify warnings. This leaves some sections of the community unrepresented and does not provide optimal results.
3. The complexities of communicating with communities in diverse situations must be given higher regard when planning for public warnings.
4. Data sets to inform community profiles are being withheld or not requested due to misinterpretation of privacy legislation.
5. Testing the effectiveness of warnings requires a level of expertise in developing methodology and analysing results. Not all local governments possess this capacity and capability.
6. Where there are deficiencies in risk assessment and hazard identification, community profiling, message testing, and integrated disaster management arrangements, it is challenging for local government to value-add to warnings to ensure they meet local requirements.
7. The current decentralised arrangements do not support equitable access or best use of emerging technologies and require greater centralised support.
8. Some local governments place too great a reliance on the undocumented local knowledge of a few individuals to identify hazards and assess risks.

9. In many local governments there is a tendency for risk knowledge to be limited, and not clearly or practically linked to planning for emergency warning delivery.
10. The current approach to warnings and public information is likely to result in different terminology, and possibly inconsistent messages, from disaster management entities.
11. A number of local governments do not review, test or exercise their warning messages and systems on a regular basis.
12. Legislation and doctrine are at times conflicting and lack clarity about roles and responsibilities for the delivery of emergency warnings.

Conclusion

The ability of local governments to give clear, timely warnings is hindered by:

- insufficient collaboration between stakeholders
- a lack of risk-based planning
- inadequate doctrine.

A decentralised model, coupled with a lack of doctrine outlining the roles and responsibilities of stakeholders, accentuates this performance gap. We expected to find that local governments had identified which communities were at risk, and developed communication channels that enabled those communities to receive consistent, accurate and fit-for-purpose warnings. We found this capability varied widely between local governments.

The decentralised model for warnings responsibility should provide local governments with the flexibility to tailor systems and messages to their communities but, in practice, it has created barriers. A lack of risk-based planning across the sector further contributes to the differing approaches to warnings. Current arrangements, supporting doctrine and training underestimate the need for targeted and modified warnings at the local level.

Mismatched roles and responsibilities, as well as inconsistent use of language, may reduce the clarity of emergency warnings. These shortfalls result in confusion amongst disaster management practitioners. Ultimately, this may impede communities from receiving and understanding a warning and taking appropriate action during a disaster.

To address these gaps, further guidance should be provided to local government to support the development of effective risk-based plans, enable greater sharing of knowledge, and encourage good practice for emergency warnings. Amending existing doctrine to align to the Standard will ensure local governments have the tools they need to send out unambiguous warnings to the right people at the right time. Equally, this will provide greater clarity regarding the roles and responsibilities of agencies and establish a more integrated approach to emergency warnings in Queensland.

Recommendations

Emergency warning planning and doctrine

We recommend that:

Recommendation 1

The *Queensland State Disaster Management Plan* is reviewed to:

- clarify core disaster management functions in relation to the issue of warnings, and provide guidance on state agency lead, co-lead and support roles and responsibilities
- include direction for primary agencies to ensure local groups are included in the development and issue of hazard-specific warnings and public information
- ensure the role of the Crisis Communications Network and the Public Safety Business Agency Public Information Cell is clearly articulated to enable effective public information and messaging at all levels of the arrangements, including local government.

Recommendation 2

The *State Disaster Coordination Centre Notification Matrix* is reviewed to ensure local governments are notified of any event affecting, or likely to affect, their local government area.

Recommendation 3

The *Queensland Emergency Alert Guidelines* is reviewed to reflect current practice and incorporate evidence-based improvements informed by lessons learned and research.

Recommendation 4

The *Public Information and Warnings Sub-plan Guide* is reviewed to include:

- good practice examples
- a broader range of considerations for barriers to effective communication
- guidance to ensure warnings and public information are linked with state agency arrangements, when the event is led by a hazard-specific primary agency.

Recommendation 5

A qualitative assessment of *public information and warnings* arrangements is undertaken as part of the 2016 disaster management plan assessment process.

Emergency warning training

We recommend that:

Recommendation 6

The Warning and Alert Systems training package is updated to align content to the *Standard for Disaster Management in Queensland* and include advice and scenarios from the Information Commissioner.

Recommendation 7

Warning and alert systems training (including the use of Emergency Alert and the requirements of the guidelines) is delivered to:

- relevant local and district disaster management group members
- authorising officers
- other relevant stakeholders.

Emergency warning research, innovation and collaboration

We recommend that:

Recommendation 8

A dynamic online list of positions and contact details is published for those able to authorise Emergency Alert, and made accessible to local government.

Recommendation 9

Formal research is commissioned or meta-analysis is undertaken to provide a better understanding of the effectiveness of warnings and other relevant message testing. The outcomes are disseminated to all disaster management entities and learnings used to inform practice.

Professional practice considerations[3]

Professional Practice Consideration 1

Queensland Fire and Emergency Services should consider new and emerging technologies for issuing warnings (including opportunities for Emergency Alert to be distributed in other languages or to people with vision or hearing impairment).

Professional Practice Consideration 2

Queensland Fire and Emergency Services should consider developing and implementing mechanisms, such as face-to-face forums, for disaster management practitioners to share knowledge, contemporary research findings and document good practice about warnings.

Professional Practice Consideration 3

Queensland Fire and Emergency Services should consider supporting local governments in the annual development of at least one pre-formatted Emergency Alert message and polygon map based on a risk assessment and hazard modelling.

[3] 'Formal advice resulting from research, evaluation or assessment activities where the evidence to inform the preferred course of action may be anecdotal… tracked by the Office of the IGEM, but no action plan or formal response is required by the entity', Office of the Inspector-General Emergency Management, *Assurance Activity Handbook*, 2014, V1.1.

Context

Local governments have an important and often challenging responsibility to warn communities of a disaster event. They are well placed and are an appropriate entity to define, target and contextualise warnings for communities at risk of impact from an event. However, with a multitude of event types and diverse communities, there is no simple, single method to effectively warn everyone.

Helping communities respond to, and recover from, a disaster by providing appropriate information is an intent of the *Disaster Management Act 2003* (Qld) (the Act). The Act recognises that local governments are primarily responsible for managing events in their local government area and must have a disaster response capability, including the capability to issue warnings. The Act stipulates that local governments, through their local disaster management groups (local groups), must ensure their communities receive appropriate information about preparing for, responding to, and recovering from a disaster.

The *Standard for Disaster Management in Queensland* (the Standard) recognises that emergency communications is one of the six responsibilities that governments, entities and practitioners need to share to achieve an effective disaster management program. The Standard divides emergency communications into three components: public engagement, communication systems and warnings. Each of these components is fundamental to a successful warning. Communication systems enable entities to share critical information during a disaster event for both the construction and dissemination of a warning. Public engagement empowers communities to understand their risk and the meaning and significance of a warning.

This review focuses primarily on warnings, which according to the Standard is:

> *The ability for the community to take appropriate action in the event of a disaster…Warnings include any communication to the broader community which requires the community to take action to protect life or property.*[4]

Ineffective warnings can have life threatening implications. The Victorian Bushfires Royal Commission found that delays in the provision of warnings and inaccurate and inconsistent warning messages made it difficult for residents to know how to respond during the *Black Saturday* bushfires.[5] The Queensland Floods Commission of Inquiry also revealed that warnings issued during the 2010-11 Queensland floods lacked sufficient detail to enable residents to respond appropriately.[6]

While recent reviews, inquiries and commissions across Australia have identified areas for improvement in the provision of emergency warnings, few have focused on the warning capability of local government. This review aims to assess this capability against the Warnings component of the Standard.

[4] Office of the Inspector-General Emergency Management, loc. cit.
[5] Parliament of Victoria, *The 2009 Victorian Bushfires Royal Commission Final Report*, 2010.
[6] Queensland Floods Commission of Inquiry, *Queensland Floods Commission of Inquiry Interim Report*, 2011.

Purpose

This review examined the capability of local government in Queensland to issue contextualised, fit-for-purpose, consistent and accurate warnings through all phases of events with a view to identifying means to improve outcomes for the community.

Scope

This review aims to assess the activities of local government against the Standard, specifically considering Component 7 Warnings. The review seeks to provide a level of assurance regarding the effectiveness of, and cooperation between, entities responsible for emergency warnings at the local level of Queensland's disaster management arrangements.

As this review focuses on the capabilities of local governments, the following are outside of scope:

- the Bureau of Meteorology review of the effectiveness of current Tropical Cyclone Warning update arrangements for Category 1 and 2 cyclones for Western Australia, the Northern Territory and Queensland
- the National Review of Warnings and Information by the Office of the Emergency Services Commissioner, Victoria. The review made recommendations to improve operational protocols, procedures and systems that ensure a consistent and community-focused approach to the use of emergency warnings
- processes regarding the timely supply of information to local authorities from any source.

Methodology

We conducted the review between October 2014 and January 2015. The research and planning phase included a literature review and consideration of formal submissions from the disaster management sector. We also collected scoping evidence based on the following criteria:

- 2013-14 disaster management plan assessment results, including good practice examples
- natural hazard risk data from the preceding five years
- the weather outlook for the 2014-15 storm season
- 15 disaster events in the preceding five years with activation of the Natural Disaster Relief and Recovery Arrangements
- the number of emergency alert campaigns
- population demographics
- other identified risks/influencers, for example, large scale reception events.

From that analysis, we selected 14 local government areas for in-depth data collection and analysis:

- Balonne Shire Council
- Banana Shire Council
- Brisbane City Council
- Burdekin Shire Council
- Cairns Regional Council
- City of Gold Coast Council
- Mackay Regional Council
- Moreton Bay Regional Council
- Mt Isa City Council
- Southern Downs Regional Council
- Townsville City Council
- Western Downs Regional Council
- Whitsunday Regional Council
- Wujal Wujal Aboriginal Shire Council.

The collection and analysis phase involved discussions with stakeholders from these selected local governments, as well as state agency representatives and other stakeholders from related local and district disaster management groups. A full list of contributing entities is included at Appendix B.

The analysis was mostly qualitative, including the judgements, perceptions, attitudes and satisfaction of stakeholders. The review team also attended a number of local and district disaster management group meetings and a Queensland Fire and Emergency Services (QFES) community warnings workshop.

Analysis was against the Standard, informed by evaluation of disaster management plans, relevant sub-plans, terms of reference, and disaster group meeting minutes. We analysed information collected against Component 7 Warnings, of the Standard:

> *The ability for the community to take appropriate action in the event of a disaster is vitally important to reducing the risk of loss of life and property. Warnings include any communication to the broader community which requires the community to take action to protect life or property.*[7]

For each key outcome and indicator within the Standard shown below we have detailed what we expected to find, our observations, and a number of conclusions drawn from the available information. Stakeholders interviewed for this review were given a final draft for consultation and asked to indicate their agreement with, and acceptance of, recommendations.

[7] Office of the Inspector-General Emergency Management, loc. cit.

No.	Key Outcomes	Good Practice Attributes	
7.1	Communities at risk of impact from an event are defined and can be targeted with contextualised warnings.	Scalable, Adaptable, Value for Money	
7.2	Communities at risk of impact from an event, receive fit-for-purpose, consistent, accurate warnings through all phases of events.	Comprehensive, Interoperable	
Indicators		**Accountabilities** (Linked to Key Outcomes)	
a	Communities at risk of impact from an event are profiled to identify and define groups with an emphasis on determining barriers to effective communication.	Enablers, Doctrine	7.1 7.2
b	Warning systems and arrangements support the continuous flow of critical, up-to-date, and relevant information between key stakeholders.	Doctrine, Enablers	7.2
c	Warning messages use common language and are consistent with other public information and advice.	Doctrine, Enablers	7.2
d	Warning messages and systems are regularly reviewed, tested and exercised.	Performance	7.2
e	Warning messages are delivered by entities with authority to do so, in line with agreed and documented roles and responsibilities.	Capability, Doctrine, Governance	7.2
f	Warnings are tested with the community to determine community understanding of content, message receipt, perception of authority and resultant action.	Performance, Capability	7.1
g	Entities value-add to warnings with appropriate local context and content and tailor dissemination approaches to local needs.	Enablers, Doctrine	7.1 7.2

Planning for warnings

Profiling communities at risk

Indicator 7a Communities at risk of impact from an event are profiled to identify and define groups with an emphasis on determining barriers to effective communication.

What we expected to find

The ability to achieve this indicator requires a foundation of well-developed risk knowledge formed from comprehensive risk assessment, hazard identification processes and documentation.[8]

Local governments should include profiles of the communities at risk of impact from an event in disaster management plans. They should do this in consultation with those communities, community leaders, and/or support agencies so they fully understand the communication needs of the community.[9] The purpose of a profile is to understand the nature of the risk, and to inform mitigation strategies through the selection of appropriate warning channels and tailored content. An at-risk community profile may include:

- the location of the community, particularly if the risk or barriers to effective communication are caused or compounded by location. For example, a community that may be cut off from usual communication channels, such as: people in transit; tourists; people in detention; gatherings at entertainment venues; instances or locations where radio, telephony or internet services may be interrupted or unavailable (black spots)
- the nature of risk
- preferred and required communication channels
- modifications required to messaging such as AusLan, translation and delivery by a trusted community leader
- the number of individuals in the community.

Community profiles should be made available to the relevant community to support collaborative engagement and information accuracy.[10] Barriers to effective communication include anything that reduces the likelihood individuals in that community will receive, or be able to effectively respond to, an emergency warning.

Modifications to emergency warnings may include using a community's preferred channels of communication and ensuring the message content is tailored or translated. Such modifications increase the chance the emergency warnings will be received and enable individuals to mitigate the danger. The *Queensland Local Disaster Management Guidelines* state a public information and warnings sub-plan should include *special needs recipients.*

[8] E. Jacks et al., *Guidelines on early warning systems and application of nowcasting and operation warnings,* 2010.
[9] ibid.
R. Basher et al. (eds)., *Global survey of early warning systems*, 2006.
H. Spahn et al., Experience from three years of local capacity development for tsunami early warning in Indonesia: challenges, lessons and the way ahead, 2010, *Natural Hazards and Earth System Sciences*, vol. 10, pp. 1411-1429.
[10] R. Basher et al. (eds)., loc. cit.

The sub-plan guide has a non-exhaustive list of *vulnerable people* who may suffer if special efforts aren't made to communicate with them, including:

- individuals who are less able to receive, understand or follow advice or instructions without assistance
- schools, pre-schools, day care centres
- hospitals, hospices, nursing homes
- detention centres
- island resorts
- people with vision impairments
- the deaf community
- people in transit
- culturally and linguistically diverse communities.

The *Queensland State Disaster Management Plan* (the State Plan) has adopted a definition of vulnerability from the *National Emergency Risk Assessment Guidelines*, being 'the conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards'.[11] Interim recommendations from the Queensland Floods Commission of Inquiry reinforced the need for councils to work with service providers to identify and make arrangements for residents who may need assistance during an evacuation and include these arrangements in their evacuation sub-plans.[12]

What we found

Profiling communities is a challenge for local governments, with several barriers to collecting and maintaining records. Service providers and state agencies with clients who have diverse communication needs can be reluctant or legislatively unable to share personal details of individuals until the response phase. This may hamper planning by local government, but should not prevent it, as some claim. General information such as numbers of individuals and the nature of communication requirements could be gathered by local government, without privacy concerns.

The Information Commissioner has confirmed there is no statutory restriction on sharing data sets without identifying information:

> *… aggregated or de-identified data does not raise privacy issues and could be used where the identity of individuals is not needed (e.g. 'two people with diabetes, four pregnant women, two elderly people and five children are currently in the evacuation centre').*[13]

Broad data may be sufficient for discussion and planning with those stakeholders on the ways in which messages are best received and tailored to meet the needs of their clients. This would be a better method of profiling than the more common approach of using census data - information that may be some years old at the time of use. Some local governments

[11] Queensland Police Service, *2014-2015 Queensland State Disaster Management Plan*, 2014, p.45, [draft]. National Emergency Management Committee, *National Emergency Risk Assessment Guidelines*, 2010, p. 53.
[12] Queensland Floods Commission of Inquiry, loc. cit.
[13] Advice from the Office of the Information Commissioner to the Inspector-General Emergency Management, *Privacy flexibilities in the management of disaster events*, available at www.igem.qld.gov.au.

are using commercial information technology solutions designed to connect community groups and identify vulnerable individuals.

Local governments vary significantly in the way they profile their communities. Our discussions with individuals in different roles within local government revealed a lack of broad or shared understanding of community profiles. Some local governments were familiar with their communities at risk of impact from an event or specific hazard, but had not documented this knowledge in plans.

Other local governments approached profiling and defining vulnerable populations by inviting community groups to participate in the local group. Responsibility for forwarding warnings for specific vulnerable populations was left to those community groups. This is a recognised approach[14] and has the benefits of source credibility, which research suggests may increase message effectiveness.[15]

Another commonly discussed approach was to include *tell your neighbour* content in messaging, though this tactic did not appear in any sub-plans reviewed. Where formal mapping was completed, it was generally only related to hazards that had previously attracted funding or external assistance for mapping development, such as flooding or storm surge.

Identifying and defining vulnerable people with different communication needs was less advanced and often focused on those people who required physical assistance to respond to warnings, especially evacuation. Cairns Regional Council maintains a vulnerable persons register with strict criteria for admission and retention on the register. Around 200 people are identified for individual support. The Council has also formed strong relationships with service providers and established communication arrangements so emergency warnings are made relevant to community groups, such as aged care facilities. These successes may, in part, be attributed to a dedicated position within local government focusing on community engagement for disaster management.

Cairns Regional Council has a dedicated community engagement officer who supports the local government's proactive approach to identifying and responding to diverse community needs in disasters.

A number of other local governments have not identified barriers to, or opportunities for, effective communication. This is not to suggest that a council's success depends on having a dedicated community engagement officer. However, accountability for this area must be allocated to ensure sufficient planning and documentation on how warnings will be delivered to community groups with varying communication needs.

Barriers to effective communication are often thought of in narrow terms, without due regard for the complexity of effective communication with diverse communities. Local governments often consider the challenges of warning those in aged care facilities, childcare centres, as well as the homeless, and culturally and linguistically diverse communities.

[14] Australian Emergency Management Institute, *Communicating with people with disability: National guidelines for emergency managers,* Handbook 5, 2013, p. 11.
[15] Country Fire Authority, *Multilingual pilot – 2012/13 final report,* 2014.

Other communication challenges are often overlooked, such as warning tourists, people in transit or in communication black-spots, individuals with hearing or vision loss, mental health issues, or cognitive impairment. Furthermore, many local governments do not consider gender or age when designing warnings and the way they are conveyed. Guidelines and other resources for developing a warning capability for diverse audiences are available[16] but not widely referenced in local government sub-plans. The National Review of Warnings and Information also found that such resources were not well-known or referred to by practitioners.[17]

Ultimately, many local governments do not have comprehensive public information and warnings sub-plans, or comprehensive risk assessments to inform them. We found practitioners' perceptions of the value of planning contrasted significantly between local governments.

Regardless of the level of interest in planning, we were frequently told by stakeholders that relationships were more important. When responding to disasters, plans are often neglected. A lack of understanding and interest in the content may also be reasons for not relying on plans. Additionally, where plans have been prepared by consultants, some may have the primary purpose of minimum compliance with guidelines instead of addressing community needs.

The primary contributing factors identified were insufficient focus on comprehensive risk assessment and hazard identification to inform planning, and too great a reliance on relationships.

Finding 1

Many local governments do not have well-documented plans for emergency warnings, based on research into the community's ability to receive or respond to warnings.

Finding 2

Some local governments are over-reliant on community groups to deliver and modify warnings. This leaves some sections of the community unrepresented and does not provide optimal results.

Finding 3

The complexities of communicating with communities in diverse situations must be given higher regard when planning for public warnings.

Finding 4

Data sets to inform community profiles are being withheld or not requested due to misinterpretation of privacy legislation.

[16] See Appendix C: Reference material
[17] Emergency Management Victoria, *National review of warnings and information final report*, 2014.

Community understanding of warnings

Indicator 7f Warnings are tested with the community to determine community understanding of content, message receipt, perception of authority and resultant action.

What we expected to find

Ideally, local governments would prepare emergency warning samples for a range of scenarios and test them with intended recipients. They would survey communities to determine:

- whether the messages are likely to be received
- how well they would be understood
- how authoritative they are perceived to be
- what action the recipient is likely to take.

This would help develop effective messaging in advance of events. Surveying communities would also increase local governments' understanding of how best to adapt messages to community needs in unexpected circumstances.

Where local government does not have capacity or capability to complete its own testing, we would expect local government to seek support. Support may come from local disaster management group members, larger councils, academics, or involvement in others' testing including volunteering as a test site for research.

What we found

Generally, warnings are not tested with the relevant community to ensure receipt, content understanding, perception of authority and resultant action.[18] Testing warnings with the community is beyond the capacity of many councils, and the limited activity in this area is predominantly driven by academia.

Testing for valid findings that can be applied with confidence requires large sample sizes and expertise in evaluating the complex factors that may impact the results, such as psycho-social factors.[19] Many local governments told us this is costly, time consuming and resource intensive, and is unlikely to be prioritised to the detriment of core service delivery.

A literature review linked to the National Review of Warnings and Information noted that, even in academia, 'little of the research undertaken involves high quality evaluations of interventions'.[20] However, we note that the Bushfire and Natural Hazard Cooperative Research Centre has begun carrying out relevant Queensland research.[21]

Finding 5

Testing the effectiveness of warnings requires a level of expertise in developing methodology and analysing results. Not all local governments possess this capacity and capability.

[18] Evidence of community understanding and perception is also discussed at Indicator 7d at p. 25 of this report.
[19] Emergency Management Victoria, loc. cit.
[20] Bushfire Cooperative Research Centre, *A synthesis of bushfire CRC community safety research (2003-2013) including post-fire contact surveys*, 2014, p. v.
[21] V. Tippett et al., *Compliance-gaining messages in natural hazards: A framework of message compliance*, 2014.

Adding value to warnings

Indicator 7g Entities value-add to warnings with appropriate local context and content, and tailor dissemination approaches to local needs.

What we expected to find

This indicator is closely linked to Indicator 7a. An understanding of the communities within a local government area is necessary to add useful local content to warnings and tailor delivery to meet various community needs. Local governments should collaborate with entities with source information, such as the Bureau of Meteorology or hazard-specific lead agencies. This will help add and interpret local intelligence such as flood gauge data to improve the value of emergency warnings to the community.[22]

The Queensland Floods Commission of Inquiry highlighted that the responsibilities of local and state authorities and the Bureau of Meteorology are interrelated, and that they must work together to provide effective warnings to communities.[23]

Local context and content is more than interpreting weather information. It may include safer locations, key road closures, or impacts on critical infrastructure. It follows that all entities with specialist knowledge or particular information that might help local government effectively warn the community, should cooperatively plan and respond at the local level. Tailoring dissemination approaches expands on the considerations of Indicator 7a to include all members of the community.

What we found

- Local governments that had capacity to value-add to warnings had a good understanding of their community profile
- well-developed stakeholder relations
- capability to source relevant data
- people with expertise in interpreting the data.

As these components are discussed elsewhere in this report, these points will not be remade here. The evidence we collected suggests that many local governments are either not contextualising warnings or tailoring dissemination methods, or are doing so without solid evidence for their choices and modifications.

The reasons for an absence of evidenced-based decision making were:

- a lack of risk knowledge (see discussion at Indicator 7b)
- limited understanding of community profiles or the various needs of sub-groups (see discussion on community profiling at Indicator 7a and community testing at Indicator 7f)
- sub-optimal integration of key stakeholders in local government planning and response (see discussion on integration of entities in the disaster management arrangements at Indicator 7b).

[22] R. Basher et al. (eds)., loc. cit.
[23] Queensland Floods Commission of Inquiry, loc. cit.

We found many local governments focused on finding technology-based solutions, but had not given adequate consideration to when technology was limited, did not meet local needs or failed. Some local governments expressed frustration at perceived limitations of traditional media, such as radio and television, due to poor coverage in certain areas. However, a recent Australian Communications and Media Authority investigation into local content on regional commercial television showed that most broadcasters exceeded regulatory requirements and met community expectations.[24] Additionally, there are examples of some local governments overcoming radio coverage issues with mobile transmission capabilities.

There are opportunities with emerging technologies for mobile radio override that may enhance local government's control of more traditional channels. Many local governments are using, or developing the use of, multi-channel warnings including social media, though many are not sharing their experiences or leveraging the advancements of others. Therefore, knowledge and capability varies considerably between local governments.

The decentralised model for warnings inhibits coordination of warning systems and capabilities. Even established social media channels are difficult for smaller local governments to use. The use of social media to engage in interactive communication with communities, especially to myth bust, requires significant resources to constantly scan and monitor resources so as to proactively manage unfolding events.[25] Recent regional community research shows that some parts of the community are likely to use local government websites as a source of local information.[26] However, since source credibility is seen as a vital component for trust of emergency warnings,[27] it is possible the social media presence of local government may benefit from links to other trusted sources.

Emergency Management Victoria has partnered with Connexu Foundation to ensure all Victorian-based Emergency Alerts are delivered via the free OpenAccess Alerts App for deaf and hard of hearing Victorians.

Many local governments use subscriber-based telephone alerts for both warnings and regular council business such as rate payment reminders. Some communities may, therefore, receive emergency and non-emergency communications from council via a subscriber service. They may also receive messages through the Emergency Alert system (when used by a hazard-specific lead agency or other entity such as critical infrastructure operators).

Sometimes, the opt-in services use the word *alert* in the name of the system, potentially causing confusion. Recent research suggests that warning fatigue is a reality in certain bushfire scenarios.[28] However, it is unclear how these findings would translate to communities with different experiences and facing different threats. We still don't understand the interplay between multiple channel warnings and how they contribute to warning fatigue.

[24] Australian Communications and Media Authority, *Local content investigation attachment B: Regional Australians access to local content – Community research*, 2014.
[25] Australian Centre of Excellence for Local Government, *Case study on social media use in emergency management*, 2014.
[26] Emergency Management Victoria, loc. cit.
[27] E. Jacks et al., loc. cit.
[28] B. Mackie, *'Warning fatigue is not a myth'*, Bushfire CRC Fire Note, Issue 122, 2014.

There are several examples of good practice using more traditional warning systems and informal arrangements. Several councils across Queensland have established Local Emergency Coordination Committees (LECCs). LECCs are made up of a core group of community members who possess the local knowledge and expertise. They inform local groups and also provide a conduit for authorised information from the group to the community. By opening a channel for continuous two-way information flow, that can be contextualised and delivered via appropriate methods to a local community, LECCs have the potential to significantly improve warning outcomes for communities.

Sunshine Coast Regional Council uses CB radio for Rural Fire Service Queensland and the State Emergency Service in a communications blackspot near Kenilworth, while the Gold Coast has disaster management vehicles fitted with sirens to alert the public. Wujal Wujal Aboriginal Shire Council, Burdekin Shire, and many other small communities use loud hailers, door knocking and community notice boards. The advantage these small communities have is the greater inherent understanding of local needs, and the ability to personalise service. Additionally, many traditional warning channels provide value-for-money and equal or superior outcomes to some high-technology alternatives.

Finding 6

Where there are deficiencies in risk assessment and hazard identification, community profiling, message testing, and integrated disaster management arrangements, it is challenging for local government to value-add to warnings to ensure they meet local requirements.

Finding 7

The current decentralised arrangements do not support equitable access or best use of emerging technologies and require greater centralised support.

Delivery of warnings

Effective warning systems and arrangements

Indicator 7b Warning systems and arrangements support the continuous flow of critical, up-to-date, and relevant information between key stakeholders.

What we expected to find

Warning *systems* are the physical or technical method of obtaining, storing, analysing and sharing information for emergency warning messages. *Arrangements* are the manner in which relationships and doctrine are structured. Both systems and arrangements should enable the connection of the right people with the right information at the right time.

This indicator requires integrated warning systems, supported by relevant data. The systems should be obtained and maintained through active stakeholder engagement and include clearly documented roles and responsibilities.

What we found

Warning systems and arrangements do not widely support the continuous flow of critical, up-to-date and relevant information between stakeholders. The primary barriers are the independent approaches to disaster management by many stakeholders, using different procedures, systems and arrangements for specific hazards.

The State Plan acknowledges that 'coordination and operational procedures for specific hazards may be different to those for generic disaster management'.[29] However, we heard many examples where hazard-specific operations did not align with *generic disaster management* arrangements and prevented the flow of information.

Lead agencies for specific hazards gave examples of separate arrangements for managing those events, including issuing independent warnings. For example, QFES has an online newsroom for coordinating information from QFES operations centres and disseminating warnings, including fire-related warnings. Local governments must subscribe to email alerts from the newsroom to stay informed. We heard other instances of local government not being included in information flows for events such as pandemics, biohazard events and animal diseases. In some cases, local government was called only when the agency required council resources or action.

Emergency Alerts have also been issued within a local government's boundary, but without the local group or local government's knowledge. The *State Disaster Coordination Centre Notification Matrix*[30] previously omitted affected forecast districts / local government areas from Emergency Alert notifications. While the matrix was updated to align with the QFES information management system in November 2014, in its current form it still does not consider advice to local governments on Emergency Alerts. We consider a representative of the local government and/or the local disaster management group – preferably the local

[29] Queensland Police Service, op. cit., p. 22.
[30] Queensland Fire and Emergency Services, *State Disaster Coordination Centre Notification Matrix*, 2014.

disaster coordinator – should be advised when any Emergency Alert is initiated within their local government area.

Using different disaster management and online information technology platforms means many local governments cannot easily share information in any direction within the disaster management arrangements. This is compounded by the number of incident, operational or coordination centres activated by various agencies during a disaster, each driven by its own information and reporting requirements. There are several initiatives to overcome these barriers, such as the Information Exchange Platform project and Guardian disaster management software which has improved the sharing of data with the Department of Transport and Main Roads. Yet many other state agency operation centres operate independently of Queensland's disaster management arrangements, and information flow is often less than ideal.

At times, information flow is interrupted due to lack of awareness of the value of data or unwillingness to share sources. Several interviewees from state government agencies were surprised at suggestions their plans or data sources could be relevant to local government. Others told us of instances where intelligence sources, such as closed-circuit television footage, were not actively shared, despite specific requests.

Ensuring only relevant information is transmitted during an event is another challenge. We found significant gaps in the risk knowledge of councils needed to plan messages about hazards and who may be affected by them. Many councils could not generate accurate, timely intelligence to help understand when information was critical or relevant. This is partly due to a lack of comprehensive hazard identification and risk assessment, and a lack of stakeholder engagement.

One local government had only recently discovered a high-risk industry near a town centre, even though the infrastructure was long-established and had been included in an exercise scenario by the district disaster management group. Local governments often rely on the experience of a few individuals to identify hazards rather than a thorough and documented risk assessment, or consultation with stakeholders. Through planning processes that involve risk assessment, hazard identification and engagement of relevant stakeholders, relevance of warnings is likely to be improved.

Where some warnings-related planning was completed, for example flood mapping, this did not necessarily translate to prepared warnings for different zones or scenarios. Where flood zones existed, public information and education was generally well catered for. However, triggers for warnings weren't always known, and warning content (templates or sample wording) had not been developed.

We heard several instances of warnings issued that resulted in unintended consequences (e.g. an evacuation bottleneck, no evacuation, evacuation to areas of equal risk or public attending to observe the areas of increased risk). These scenarios may have been avoided had warning content been prepared and evaluated in advance.

We observed some good practices, such as the employment of hydrologists by local governments to work in local disaster coordination centres. However, even when those good practices exist, there is no plan to articulate how this real-time advice and modelling

influences emergency warnings, other than the preparation of related polygons for Emergency Alert campaigns.[31] Details such as pertinent local government contacts, or when and to whom messages should be sent, is often lacking from local government plans.

Finding 8

Some local governments place too great a reliance on the undocumented local knowledge of a few individuals to identify hazards and assess risks.

Finding 9

In many local governments there is a tendency for risk knowledge to be limited, and not clearly or practically linked to planning for emergency warning delivery.

Warning messages use common language

Indicator 7c Warning messages use common language and are consistent with other public information and advice.

What we expected to find

Local government should support, through a process of stakeholder engagement, agreed and documented terminology for warning messages. The structure, language, delivery and timing of local government emergency warnings should complement concurrent messaging undertaken by stakeholders and agencies at local, state and national levels. This will help ensure consistency, accuracy, user understanding and effectiveness.

This indicator requires the adoption of statewide guidelines and common language, supported by agreed and documented information-exchange protocols across all levels of government and pertinent external stakeholders. Achieving a common understanding of disaster operations through information sharing will support consistent messaging.

What we found

We observed a general absence of stakeholder engagement in planning processes and minimal planning for emergency warnings. Despite this challenge, there was evidence of goodwill and effort dedicated to achieving consistent messaging. For example, the Department of Transport and Main Roads shares intelligence with local governments. Good relationships have also resulted in the commonly-used local governments' Guardian system being able to display both local and state information on road closures.

In many places we visited, the Department of Transport and Main Roads had a good relationship with local government. This resulted in a two-way flow of intelligence, and support for consistent advice to the public from the individual call centres.

Local governments also contribute local information to the state 131940 system, which acts as a single point of truth and provides a common understanding for all entities - an essential element of providing consistent information to the public. An active communication sub-

[31] For the purpose of disaster management, a *polygon* is a 2-dimensional shape made up of closed straight lines that is defined as an emergency incident area on a map using a geographic information system, and that defines an area to receive an Emergency Alert, Emergency Management Queensland, *Queensland Emergency Alert Guidelines*, 2012.

group for the Sunshine Coast Local Disaster Management Group also brings together relevant stakeholders to achieve consistent messaging and public information at the local level. Unfortunately, we did not observe integration of disaster management entities with communication sub-groups to be commonplace.

We found that there was inconsistency in language, with a variety of warning products across hazards, and different ratings within them (Appendix D). Only one sub-plan reviewed referred to the publication *Emergency warnings - Choosing your words.*[32] Its use may assist stakeholders with consistent messaging.

There is no agreed, single source of common language. The Office of the Inspector-General Emergency Management will facilitate a project to consider agreed disaster management terminology this year. Additionally, the Australasian Fire and Emergency Services Authorities Council has proposed a project titled *Advancing a National Approach for Warnings* that will consider the development of a single national doctrinal publication articulating how warnings are constructed and disseminated across all hazards experienced in Australia. These bodies of work have the potential to contribute to common language and consistency of warnings in Queensland.

Finding 10

The current approach to warnings and public information is likely to result in different terminology, and possibly inconsistent messages, from disaster management entities.

Warning systems are tested regularly

Indicator 7d Warning messages and systems are regularly reviewed, tested and exercised.

What we expected to find

This indicator builds on Indicator 7f that is concerned with understanding the community's perspective of warnings. Local government should also review warning messages, particularly if template messages are used, to ensure the information is still relevant from council's perspective.

Messages should be tested and exercised to build expertise, familiarity, and understanding of the process and timeframes. Similarly, warning systems should be reviewed to assess the viability of each channel and whether there are value-for-money alternatives.

Regular testing and exercising of warning systems not only increases the effectiveness of real-time use, it should determine the points of failure and adequacy of redundancies in place.

What we found

We found a variation among local governments in the regular review, testing or exercising of warning messages and systems. Some larger local governments integrate warning messages and systems in their exercise programs, while others, including smaller councils,

[32] Attorney-General's Department, *Emergency warnings: Choosing your words*, 2008.

schedule testing of flood sirens or monitoring systems. River height monitoring systems[33] generally have built-in testing functionality to send a weekly confirmation SMS that the system is operational.

Only a handful of local governments have pre-loaded polygons with the State Disaster Coordination Centre (SDCC) for Emergency Alert, and testing of this system is infrequent. Eleven local governments (14%) have polygons stored with the SDCC and only five of those have completed tests in the last two years. The Queensland Floods Commission of Inquiry recommended (4.2) that 'councils should prepare SMS alert templates covering a range of different flood scenarios before the wet season'.[34]

QFES provides assistance for local government in preparing compliant polygons for Emergency Alert campaigns. However, this does not appear to be widely known. During Tropical Cyclone Marcia, a high percentage of Emergency Alert requests required amendments because the polygons were not compliant. This resulted in significant delays to the approval and dissemination of Emergency Alerts (Appendix E).

The primary method for assessing the effectiveness of messages and systems is not through reviewing, testing or exercising, but via direct feedback from the public. This is consistent with the findings of the national review of Emergency Alert that operational users are broadly unaware of the community reaction.[35]

Much feedback on warning messages or system use takes the form of complaints. This includes those submitted to local government call centres or the local media. However, some local governments infer warning fatigue, indicated by users unsubscribing from text-based opt-in alert services shortly after receiving messages.

Others spoke of a small number of people who were vocal about particular aspects of the warning received. This had made the local government hesitant to repeat the element complained about. These negative reactions may have a disproportionate impact on an assessment of a warning's efficacy.

Finding 11

A number of local governments do not review, test or exercise their warning messages and systems on a regular basis.

Warnings are delivered by those with authority

Indicator 7e Warning messages are delivered by entities with authority to do so, in line with agreed and documented roles and responsibilities.

What we expected to find

A guiding principle of the Act is that 'local governments should primarily be responsible for managing events in their local government area'.[36] We expected to see that principle

[33] River alert systems are variously operated / controlled by the Bureau of Meteorology, local and state governments, and other private entities. There are approximately 2000 gauges owned by around 50 entities.
[34] Queensland Floods Commission of Inquiry, op. cit. p. 130, recommendation 4.2.
[35] Social Research Institute, *National review of Emergency Alert – Consolidated report on findings*, 2014.
[36] *Disaster Management Act 2003,* s. 4A(c).

reflected in clearly documented roles and responsibilities in all disaster management doctrine.

Supporting local government as the primary vehicle for delivering warnings should be achieved through a process that engages all relevant stakeholders,[37] and arrives at mutually agreed and detailed statements of each entity's contribution to the delivery of warnings.

What we found

There are several sources of confusion about authority, roles and responsibilities for emergency warnings. The State Plan says a hazard-specific lead agency 'needs to include provision for communicating with the public in its planning', though goes on to say this is 'primarily done through local governments'. [38] The same plan also assigns functional responsibility for warnings to QFES.[39] Neither *public information* nor *emergency warning* are defined in the State Plan, although it says 'providing warnings to the public is part of the wider activity of public information and must be closely aligned.'[40] The interdependencies between warnings and public information compound the complexity of documenting roles and responsibilities.

The bounds of responsibility for the Department of the Premier and Cabinet in their functional lead agency role for public information is also unclear. The *Queensland Local Disaster Management Guidelines* refer to the *Queensland Government Arrangements for Coordinating Public Information in a Crisis*, and require consistency with Crisis Communication Network arrangements. However, there is no information on how the Crisis Communication Network interacts with local arrangements, only for coordination of state agency warnings and public information.

The State Plan reinforces the Crisis Communication Network's role at the state level, noting a lead agency will be nominated for every event. However, it is silent on how the Crisis Communication Network interacts with the local level to ensure consistency across all tiers of the disaster management arrangements. Additionally, there is no disaster management doctrine that details how entities with responsibilities for issuing warnings, should reconcile their obligations with local government.

At the local and district levels, the Act provides a function 'to ensure the community is aware of ways of mitigating the adverse effects of an event, and preparing for, responding to and recovering from a disaster' for both district and local groups.[41] The *Queensland Local Disaster Management Guidelines* suggests notification and dissemination of warning products should be the *automatic responsibility* of local group executives and members, regardless of the status of activation of the group.[42] However, the *Queensland Disaster Management Training Framework* does not support warnings and alert systems training for local group members, only for the local disaster coordinator and chair of the group.[43]

[37] Also refer to indicator 4d of the Standard: 'The planning and assessment process, including documenting roles, responsibilities and timelines, involves engagement with all stakeholders', Inspector-General Emergency Management, op. cit., p. 23.
[38] Queensland Police Service, op. cit., p. 38.
[39] Queensland Police Service, op. cit., p. 33
[40] Queensland Police Service, op. cit., p. 38.
[41] *Disaster Management Act 2003*, s. 23(f); s. 30(e).
[42] Emergency Management Queensland, *Local Disaster Management Guidelines*, 2012, p. 29.
[43] Public Safety Business Agency, *Queensland Disaster Management Training Framework*, version 3.0.

Additionally, the training content mostly focuses on Emergency Alert and does not clarify roles and responsibilities.

Through this lack of consistency, plans do not always reflect practice. We reviewed a selection of local disaster management plans and public information and warnings sub-plans. They showed wide variation in levels of understanding and applying local government's role and responsibilities in relation to warnings. Many plans lacked detail, and some were unclear on the role of the local group compared to that of individual member agencies or the local government.

One plan shared responsibility for warning content with the district disaster coordinator once the district group activated. One council disaster management officer said warnings are not local government's responsibility, in conflict with the information in their local disaster management plan. Some local governments were aware of their responsibilities, and raised concerns about warnings delivered in their local government area by the SDCC without their prior knowledge. Other plans did not reflect the true capability of local governments which had experienced operational successes. In general, these issues indicate a lack of clarity regarding authority, roles and responsibilities for warnings, and available guidance does not provide sufficient direction to inform local plans.

The following table outlines the primary sources of documented roles and responsibilities in legislation and doctrine:

Entity	Source	Role/Responsibility
Disaster Management Act 2003		
Local Disaster Management Group	Section 30(e) Functions	'to ensure the community is aware of ways of mitigating the adverse effects of an event, and preparing for, responding to and recovering from a disaster'
District Disaster Management Group	Section 23(f) Functions	As above
Local Government	Section 80(1)(a) Functions of local government	'to ensure it has a disaster response capability'(from the Dictionary in the Act: *responding to a disaster* includes, for example, the following— (a) issuing warnings of a disaster)
State Disaster Management Plan 2014-2015		
Local Government	Page 38	'The agency identified as being primarily responsible for a specific hazard needs to include provision for communicating with the public in its planning; although this agency may not be responsible for issuing any alerts and warnings. This is primarily done through local governments.'
State Disaster Coordination Centre (SDCC)	Page 38	'…will issue warnings and alerts to key stakeholders'

Hazard-specific lead agency	Page 38	'...needs to include provision for communicating with the public in its planning; although this agency may not be responsible for issuing any alerts and warnings'
Queensland Fire and Emergency Services supported through SDCC	Page 33	State Response Functional Lead Agency …'responsible for performing a disaster management function in support of local government disaster operations'
Queensland District Disaster Management Guidelines		
District Disaster Management Group Executives and members	Page 50	'…important role in ensuring the notification and dissemination of warnings to member agencies of the district group, local groups and in some instances, elements of the community that may fall under the responsibility of district group member agencies…regardless of the status of activation of the district group'
Queensland Local Disaster Management Guidelines		
Local Disaster Management Group Executives and members	Page 29	'The process for notification and dissemination of warning products…should be the automatic responsibility of local group Executives and members…'
Local Disaster Management Group	Page 44	'It is the role of the local group to provide the public with hazard awareness, household preparedness and emergency planning information about events and recommended actions'
Local Government	Public Information and Warnings Sub-plan Guide	Functional Responsibility
Water Supply (Safety and Reliability) Act 2008		
Dam owners	Section 352H Content of Plan	'(1) (b) (ii) …state when and how the owner of the dam must notify the relevant entities of the emergency condition, if it happens, including the order of priority in which the relevant entities are to be notified…' '(2) …relevant entities...means… (a) the relevant disaster management group for the plan; (b) the persons whose safety or property may be threatened by the emergency condition; (c) each local government whose…area may be affected…'

The sharing of responsibility for public information and warnings between, and within documents, has resulted in a range of interpretations. We heard from local government representatives who believed the Bureau of Meteorology was responsible for warnings and QFES staff who said their agency only issued fire warnings.

Even the Queensland Government website[44] has *Emergency Services* as the primary entity for issuing warnings, with local government listed only for information on disaster management plans and evacuation routes. The reference to both local groups and local government among the documents is reflected in the inconsistent views we heard from across the disaster management sector on where one entity's responsibilities end and the other's begin.

Without clarity of roles and responsibilities, agreement on detail cannot be reached, and entities with authority are likely to inconsistently or unexpectedly fulfil their role and responsibilities.

Finding 12

Legislation and doctrine are at times conflicting and lack clarity about roles and responsibilities for the delivery of emergency warnings.

[44] Queensland Government, *Tune into warnings!,* https://www.qld.gov.au/emergency/dealing-disasters/tune-into-warnings.html.

Conclusion

The ability of local governments to give clear warnings of events is hindered by a lack of collaboration between stakeholders at state and local levels, a lack of planning and inadequate doctrine. A decentralised model, coupled with a lack of clear stakeholder roles and responsibilities accentuates this problem. We expected to find that local governments had identified their communities *at risk*, and developed communication channels that enabled communities to receive consistent, accurate and fit-for-purpose warnings. We found this capability to be widely variable.

The decentralised model for warnings responsibility should provide local governments with flexibility to tailor systems and messages to their communities but, in practice, it has created barriers. A lack of risk-based planning across the sector further contributes to the differing approaches to warnings. Current arrangements, supporting doctrine and training underestimates the need for targeted and modified warnings at the local level.

Mismatched roles and responsibilities as well as the inconsistent use of language have the potential to influence the validity of emergency warnings. These shortfalls result in confusion amongst disaster management practitioners. Ultimately, this may prevent communities from receiving and understanding a warning and taking appropriate action during a disaster.

To address these gaps, further guidance should be provided to local government to support the development of effective risk based plans, enable greater sharing of knowledge, and encourage good practice for emergency warnings.

Amending existing doctrine to align with the *Standard for Disaster Management in Queensland* will ensure local governments have the tools they need to effectively construct and disseminate contextualised warnings. This will also provide greater clarity about the roles and responsibilities of agencies, and establish a more integrated approach to emergency warnings in Queensland.

Recommendations

Emergency warning planning and doctrine

We recommend that:

Recommendation 1

The *Queensland State Disaster Management Plan* is reviewed to:

- clarify core disaster management functions in relation to the issue of warnings, and provide guidance on state agency lead, co-lead and support roles and responsibilities
- include direction for primary agencies to ensure local groups are included in the development and issue of hazard-specific warnings and public information
- ensure the role of the Crisis Communications Network and the Public Safety Business Agency Public Information Cell is clearly articulated to enable effective public information and messaging at all levels of the arrangements, including local government.

Accountable agency	Date of Completion
Lead: Queensland Police Service **Support:** Queensland Fire and Emergency Services, Department of the Premier and Cabinet, Public Safety Business Agency **Further consultation:** Lead and support agencies should consult with IGEM to enable alignment with the EMAF	December 2015

Recommendation 2

The *State Disaster Coordination Centre Notification Matrix* is reviewed to ensure local governments are notified of any event affecting, or likely to affect, their local government area.

Accountable agency	Date of Completion
Lead: Queensland Fire and Emergency Services	September 2015

Recommendation 3

The *Queensland Emergency Alert Guidelines* is reviewed to reflect current practice and incorporate evidence-based improvements informed by lessons learned and research.

Accountable agency	Date of Completion
Lead: Queensland Fire and Emergency Services	December 2015

Recommendation 4

The *Public Information and Warnings Sub-plan Guide* is reviewed to include:

- good practice examples
- a broader range of considerations for barriers to effective communication
- guidance to ensure warnings and public information is linked with state agency arrangements, when the event is led by a hazard-specific primary agency.

Accountable agency	Date of Completion
Lead: Queensland Fire and Emergency Services	September 2015

Recommendation 5

A qualitative assessment of *public information and warnings* arrangements is undertaken as part of the 2016 disaster management plan assessment process.

Accountable agency	Date of Completion
Lead: Queensland Police Service **Support:** Queensland Fire and Emergency Services, **Further consultation:** Lead and support agencies should consult with IGEM to enable alignment with the EMAF	October 2016

Emergency Warning Training

We recommend that:

Recommendation 6

The Warning and Alert Systems training package is updated to align the content to the *Standard for Disaster Management in Queensland* and to include advice and scenarios from the Information Commissioner.

Accountable agency	Date of Completion
Lead: Public Safety Business Agency	September 2015

Recommendation 7

The Warning and Alert Systems training (including the use of Emergency Alert and the requirements of the guidelines) is delivered to:

- relevant local and district disaster management group members
- authorising officers
- other relevant stakeholders.

Accountable agency	Date of Completion
Lead: Queensland Fire and Emergency Services	November 2015 (ongoing)

Emergency Warning Research, innovation and collaboration

We recommend that:

Recommendation 8

A dynamic online list of positions and contact details is published for those able to authorise Emergency Alert, and made accessible to local government.

Accountable agency	Date of Completion
Lead: Queensland Fire and Emergency Services	September 2015

Recommendation 9

Formal research is commissioned or meta-analysis is undertaken to provide a better understanding of the effectiveness of warnings and other relevant message testing. The outcomes are disseminated to all disaster management entities and learnings used to inform practice.

Accountable agency	Date of Completion
Lead: Queensland Fire and Emergency Services **Support:** Queensland Police Service, Public Safety Business Agency	March 2016 (Ongoing)

Professional practice considerations

Professional Practice Consideration 1

Queensland Fire and Emergency Services should consider new and emerging technologies for issuing warnings (including opportunities for Emergency Alert to be distributed in other languages or to people with vision or hearing impairment).

Professional Practice Consideration 2

Queensland Fire and Emergency Services should consider developing and implementing mechanisms, such as face-to-face forums, for disaster management practitioners to share knowledge, contemporary research findings and document good practice about warnings.

Professional Practice Consideration 3

Queensland Fire and Emergency Services should consider supporting local government in the annual development of at least one pre-formatted Emergency Alert message and polygon map based on a risk assessment and hazard modelling.

Bibliography

Attorney-General's Department, *Emergency warnings: Choosing your words*, Commonwealth of Australia, Canberra, 2008.

Australasian Fire and Emergency Service Authorities Council, *Fundamentals of doctrine: A best practice guide,* 2011, http://www.afac.com.au/docs/guideline/fundamentals-doctrine-best-practice.pdf?sfvrsn=14.

Australian Centre of Excellence for Local Government, *Case study on social media use in emergency management*, 2014, http://www.acelg.org.au/case-study-social-media-use-emergency-management.

Australian Communications and Media Authority, *Local content investigation attachment B: Regional Australians access to local content – Community research*, 2014, http://www.acma.gov.au/Industry/Broadcast/Television/Local--regional-content/local-content-investigation.

Australian Emergency Management Institute, *Communicating with people with disability: National guidelines for emergency managers,* Handbook 5, Commonwealth of Australia, Victoria, 2013.

Basher, R., Global early warning systems for natural hazards: systematic and people centred, *Philosophical Transactions of the Royal Society*, 2006, vol. 364, pp.2167-2182.

Basher, R. et al (eds)., *Global survey of early warning systems*, United Nations International Strategy for Disaster Reduction, 2006, http://www.unisdr.org/2006/ppew/info-resources/ewc3/Global-Survey-of-Early-Warning-Systems.pdf.

Bureau of Meteorology, *Review of the effectiveness of category 1 and 2 tropical cyclone warning update arrangements*, 2014, http://www.bom.gov.au/inside/cyclone-review.shtml.

Bushfire Cooperative Research Centre, *A synthesis of bushfire CRC community safety research (2003-2013) including post-fire contact surveys*, 2014, http://www.bushfirecrc.com/sites/default/files/managed/resource/final_community_safety_crc_synthesis_2014-29-04_v1_0_.pdf.

Collins, M.L., & Kapucu, N., Early warning systems and disaster preparedness and response in local government, *Disaster Prevention and Management: An International Journal*, 2008, vol. 17, no. 7, pp. 587-600.

Country Fire Authority, *Multilingual pilot – 2012/13 final report,* Melbourne, Victoria, 2014.

Disaster Management Act 2003 (Qld)

Dufty, N., Progress made with early warning systems in Australia since 2005, *Australian Journal of Emergency Management,* vol. 29, No. 4, 2014, pp. 43-47.

Ebi, K.L., & Schmier, J.K., A Stitch in time: Improving public health early warning systems for extreme weather events, *Oxford Journals: Epidemiologic reviews*, 2005, vol. 27, pp. 115-121.

Emergency Management Queensland, *Queensland Emergency Alert Guidelines,* 2012, http://www.disaster.qld.gov.au/Disaster-Resources/Documents/Queensland%20Emergency%20Alert%20Guidelines.pdf

Emergency Management Queensland, *Queensland Local Disaster Management Guidelines*, 2012, http://www.disaster.qld.gov.au/DisasterResources/Documents/Queensland%20Local%20Disaster%20Management%20Guidelines.pdf.

Emergency Management Victoria, *National review of warnings and information final report*, Victorian Government, Cube Group, 2014.

Jacks. E. et al., *Guidelines on early warning systems and application of nowcasting and operation warnings,* World Meteorological Organisation, Switzerland, 2010, p. 9.

Einstein, H., & Sousa, A., Warning systems for natural threats, *Georisk: Assessment and management of risk for engineered systems and geohazards,* 2006, vol. 1, no. 1.

Hall, P., Early warning systems: Reframing the discussion, *The Australian Journal of Emergency Management*, 2007, vol. 22, no. 2, pp. 32-36.

Henstra, D., Evaluating local government emergency management programs: What framework should public managers adopt?, *Public Administration Review Journal*, 2010, vol. 70, no. 2, pp. 236-246.

Mackie, B., *Warning fatigue is not a myth*, Bushfire CRC Fire Note, Issue 122: March 2014.

McEntire, D, A., & Myers, A., Preparing communities for disasters: Issues and processes for government readiness, *Disaster Prevention and Management: An International Journal*, 2004, vol. 13, no. 2, pp. 140-152.

Moore, L.K., *The Emergency Alert system (EAS) and all-hazard warnings*, 2010, https://www.fas.org/sgp/crs/homesec/RL32527.pdf.

National Emergency Management Committee, *National Emergency Risk Assessment Guidelines*, Tasmanian State Emergency Service, 2010.

Office of the Information Commissioner, Privacy flexibilities in the management of disaster events*, Right to Information and Privacy Guidelines,* advice provided to the Inspector-General Emergency Management, 22 December 2014, available at www.igem.qld.gov.au.

Office of the Inspector-General Emergency Management, *Emergency Management Assurance Framework*, 2014, https://www.igem.qld.gov.au/assurance-framework/pdf/IGEM-EMAF.pdf.

Parliament of Victoria, *The 2009 Victorian Bushfires Royal Commission Final Report*, 2010, http://www.royalcommission.vic.gov.au/Commission-Reports.html.

Public Safety Business Agency, *Queensland Disaster Management Training Framework,* version 3.0.

Queensland Police Service, *2014-2015 Queensland State Disaster Management Plan*, 2014, [draft].

Queensland Fire and Emergency Services, *State Disaster Coordination Centre Notifications Matrix,* 2014.

Queensland Fire and Rescue Service, *Incident directive 21.2: Community Warnings Version 2*, 2012.

Queensland Floods Commission of Inquiry, *Queensland Floods Commission of Inquiry Interim Report*, 2011, http://www.floodcommission.qld.gov.au/__data/assets/pdf_file/0006/8781/QFCI-Interim-Report-August-2011.pdf.

Queensland Government, *Queensland Government Arrangements for Coordinating Public Information in a Crisis,* http://www.disaster.qld.gov.au/Disaster-Resources/Documents/DPC2739_Crisis_Communication_Document_FINAL.PDF.

Queensland Government, *Tuni into Warnings!,* 2015, https://www.qld.gov.au/emergency/dealing-disasters/tune-into-warnings.html.

Social Research Institute, *National review of Emergency Alert – Consolidated report on findings*, Victoria, 2014, p. 14.

Sorensen, J,H., & Mileti, D.S., Decision-making uncertainties in emergency warning system organisations, *International Journal of Mass Emergencies and Disasters*, 1987, vol. 5, no. 1, pp. 33-61.

Spahn, H. et al., Experience from three years of local capacity development for tsunami early warning in Indonesia: Challenges, lessons and the way ahead, *Natural Hazards and Earth System Sciences*, 2010, vol. 10, pp. 1411-1429.

Tippett, V. et al., Compliance-gaining messages in natural hazards: A framework of message compliance, *Bushfire and Natural Hazards Cooperative Research Centre,* 2014.

Villagran de Leon, J.C., et al., *Early warning systems in the context of disaster risk management*, 2006, http://www.unisdr.org/2006/ppew/info-resources/docs/ELR_dt_23-25.pdf.

Appendix A: Scope

The following legislated functions of the Office of the Inspector-General Emergency Management have shaped the scope of this review:

Disaster Management Act 2003	**Part**
S 16 (c)	To regularly review and assess cooperation between entities responsible for disaster management in the State, including whether the disaster management systems and procedures employed by those entities are compatible and consistent
S 16 (f)	To monitor compliance by departments with their disaster management responsibilities
S 16 (i)	To identify opportunities for cooperative partnerships to improve disaster management outcomes

The following are included in the scope of this review:

1. To assess local government against the following Key Outcomes
2. Develop recommendations against the Key Outcomes to improve warnings.

Key Outcomes	**Indicators**
Communities at risk of impact from an event are defined and can be targeted with contextualised warnings (7.1)	Communities at risk of impact from an event are profiled to identify and define groups with an emphasis on determining barriers to effective communication (a)
	Warnings are tested with the community to determine community understanding of content, message receipt, perception of authority and resultant action (f)
	Entities value-add to warnings with appropriate local context and content and tailor dissemination approaches to local needs (g)
Communities at risk of impact from an event, receive fit-for-purpose, consistent, accurate warnings through all phases of events (7.2)	Warning systems and arrangements support the continuous flow of critical, up-to-date, and relevant information between key stakeholders (b)
	Warning messages use common language and are consistent with other public information and advice (c)
	Warning messages and systems are regularly reviewed, tested and exercised (d)
	Warning messages are delivered by entities with authority to do so, in line with agreed and documented roles and responsibilities (e)

Appendix B: Contributors

Local Government
Balonne Shire Council
Banana Shire Council
Brisbane City Council
Burdekin Regional Council
Cairns Regional Council
City of Gold Coast Council
Mackay Regional Council
Moreton Bay Regional Council
Mt Isa City Council
Somerset Regional Council
Southern Downs Regional Council
Tablelands Regional Council
Townsville Regional Council
Western Downs Regional Council
Whitsunday Regional Council
Wujal Wujal Aboriginal Shire Council

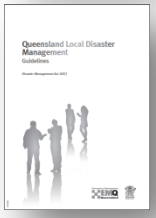
Other Entities
Australian Broadcasting Corporation
Bureau of Meteorology
Department of Agriculture and Fisheries
Department of Communities, Child Safety and Disability Services
Department of Education and Training
Department of Environment, Heritage and Protection
Department of Housing and Public Works
Department of Infrastructure, Local Government and Planning
Department of National Parks, Sport and Racing
Department of Natural Resources and Mines
Department of the Premier and Cabinet
Department of Science, Information Technology and Innovation
Department of Tourism, Major Events, Small Business and Commonwealth Games
Department of Transport and Main Roads
Local Government Association of Queensland
Maritime Safety Queensland
Public Safety Business Agency
Queensland Treasury
Queensland Ambulance Service
Queensland Health
Queensland Fire and Emergency Services
Queensland Police Service
Australian Red Cross

* As they existed at time of consult.

Appendix C: Reference Material

State Resources

Emergency Management Assurance Framework
Office of the Inspector-General Emergency Management
https://www.igem.qld.gov.au/assurance-framework/index.html

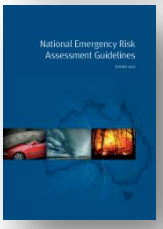


Queensland Local Disaster Management Guidelines
Queensland Fire and Emergency Service
http://www.disaster.qld.gov.au/DisasterResources/Documents/Queensland%20Local%20Disaster%20Management%20Guidelines.pdf

Queensland Evacuation Guidelines
Queensland Fire and Emergency Service
http://www.disaster.qld.gov.au/Disaster-Resources/Documents/2907EMQ_SDMG_QLD_Evac%20Guide_web.pdf

National Resources

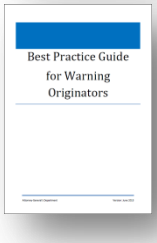
Emergency Warnings – Choosing your words
Attorney-General's Department
https://www.em.gov.au/Emergency-Warnings/Documents/EmergencyWarningsChoosingYourWordsEdition2.pdf



National Emergency Risk Assessment Guidelines
Emergency Management Australia
http://www.em.gov.au/Documents/National%20Emergency%20Risk%20Assessment%20Guidelines%20October%202010.PDF

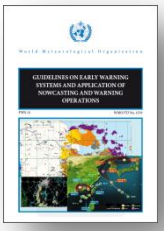
Guidelines for Emergency Management in Culturally and Linguistically Diverse Communities
Emergency Management Australia
http://www.em.gov.au/Documents/Manual44-GuidelinesforEmergencyManagementinCulturallyandLinguisticallyDiverseCommunities.pdf

Public and Private Sectors Information – Emergencies and disasters
Office of the Privacy Commissioner
http://www.oaic.gov.au/privacy/privacy-resources/privacy-fact-sheets/other/information-sheet-public-and-private-sectors-1-emergencies-and-disasters,

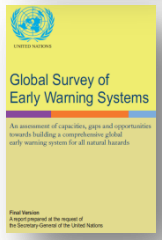


Best Practice Guide for Warning Originators
Attorney-General's Department
http://www.em.gov.au/EmergencyWarnings/Documents/Best%20Practice%20Guide%20for%20Warning%20Originators.PDF

International Resources



Guidelines on Early Warning Systems and Application of Nowcasting and Operation Warnings
World Meteorological Organisation
http://www.wmo.int/pages/prog/amp/pwsp/documents/PWS-21.pdf



Global Survey of Early Warning Systems
United Nations
http://www.unisdr.org/2006/ppew/info-resources/ewc3/Global-Survey-of-Early-Warning-Systems.pdf,

Appendix D: Warning channels, products and ratings

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
Biological	Queensland Health (QH) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by Queensland Health. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Subscription based notifications - Face to face	No specific warning products exist.	No specific warning ratings exist.
Bushfire	Queensland Fire & Emergency Services (QFES) Bureau of Meteorology (BoM) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by the Queensland Fire & Emergency Services and the Bureau of Meteorology. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Signage - Location based sirens	**Advice –** there is a fire in your area, there is currently no threat to property, but stay informed and consider taking a series of preparatory actions; **Watch and act –** there is a fire in your area, you could be impacted and should prepare to enact your Bushfire Survival Plan; and **Emergency warning –** there is a fire in your area, you need to enact your Bushfire Survival Plan immediately and prepare for impact.	**Low-moderate -** A fire with a 'low to moderate' rating can be easily controlled and pose little or no risk to life or property. During a fire with a 'low to moderate' rating, you should know where to get more information and monitor the situation for any changes. **High -** A fire with a 'high' danger rating is a fire that can be controlled where loss of life is unlikely and damage to property will be limited. During a fire with a 'high' danger rating, you should know where to get more information and monitor the situation for any changes. **Very high -** A fire with a 'very high' danger rating is a fire that can be difficult to control with flames that may burn into the tree tops. During a fire of this type some

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
		- Subscription based notifications - Face to face		homes and businesses may be damaged or destroyed. During a fire with a 'very high' danger rating, you should use your home as a place of safety only if it is well prepared and well-constructed. **Severe -** A fire with a 'severe' rating may be uncontrollable and move quickly, with flames that may be higher than roof tops. A 'severe' fire may cause injuries and some homes or businesses may be destroyed. During a fire with a 'severe' rating, leaving is the safest option for your survival. Use your home as a place of safety only if it is well prepared and well-constructed. **Extreme -** A fire with an 'extreme' rating may be uncontrollable, unpredictable and fast moving. The flames will be higher than roof tops. During an 'extreme' fire, people may be injured and homes and businesses may be destroyed. During an 'extreme' fire, well-prepared and well-constructed homes may not be safe. Leaving is the only option for your survival. **Catastrophic** - A fire with a rating of 'catastrophic' may be uncontrollable, unpredictable and fast moving. The flames will be higher than roof tops. Many people may be injured and many homes and businesses may be destroyed. During a 'catastrophic' fire, well-prepared and constructed homes will not be safe. Leaving is the only option for your survival.
Chemical	Queensland Fire & Emergency Services (QFES)	Official warnings are issued by the Queensland Fire & Emergency Services (QFES). The State Disaster Coordination Centre and disaster management	No specific warning products exist.	No specific warning ratings exist.

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
	Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Subscription based notifications - Face to face		
Cyclone	Bureau of Meteorology (BoM) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by the Bureau of Meteorology. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Signage - Subscription based notifications - Face to face	**Tropical cyclone information bulletin** – active cyclone in Qld, but not expected to affect communities within 48hrs. **Tropical cyclone watch** –expected to affect communities within 48hrs *(Issued every 6hrs)* **Tropical cyclone warning** – expected to affect communities within 24hrs *(Issued every 3hrs or can be issued hourly).* The **tropical cyclone forecast track map** is a graphical product that provides a track of the cyclone showing recent movement, and forecast movement (with uncertainty indicated) 72 hours hence.	**Cat 1 (< 125km/h) – Damaging winds** – negligible damage to homes, limited damage to some caravans, crops and trees, boats may drag moorings. **Cat 2 (125-164km/h) – Destructive winds** – minor damage to homes, significant damage to caravans, signs and trees, heavy damage to some crops, risk of power failure, small boats may break moorings. **Cat 3 (165-224) – Very destructive winds** – Some roof and structural damage to homes, some caravans destroyed, power failure likely. **Cat 4 (225 – 279) – Very destructive winds** – Significant roof and structural damage to homes, many caravans destroyed and blown away, dangerous airborne loose items, widespread power failures. **Cat 5 (> 280) – Very destructive winds** – extremely dangerous with widespread destruction, a lot of damage to homes and structures.

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
Dam failure	Department of Energy and Water Supply (DEWS) Seqwater, SunWater and other referrable dams owners Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by dam owners and operators in association with disaster management groups. The State Disaster Coordination Centre may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Subscription based notifications - Face to face	No specific warning products exist. Emergency Alert can be used if there is potential for dam failure to occur. Both SunWater and Seqwater have voluntary subscription systems in place so that people can request updates for their dams. It is expected that these will complement Emergency Alert.	No specific warning ratings exist. The Bureau of Meteorology's flood ratings could be used as a point of reference during a dam failure event. Relevant stakeholders are in discussion regarding the development of warning ratings and terminology.
Earthquake & landslide	Geoscience Australia Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Geoscience Australia monitors, analyses and reports on earthquakes within Australia and internationally, however there is no warning system for earthquakes that occur in Australia. Reporting, after an earthquake has occurred, is done on a 24/7 basis by duty seismologists as part of the Australian Tsunami Warning System and to alert the Commonwealth and State/Territory governments and the public of earthquakes in Australia and overseas.	No specific warning products exist.	No specific warning ratings exist.

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
Flood	Bureau of Meteorology (BoM) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by the Bureau of Meteorology. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Signage - Location based sirens - Subscription based notifications - Face to face	**An alert, watch or advice** of possible flooding, if flood producing rain is expected to happen in the near future. **A generalised flood warning** that flooding is occurring or expected to occur in a particular region. No information on the severity of the flooding. **Warnings of minor, moderate, or major flooding** where the BoM has installed specialised warning systems.	**Minor flood warning:** Causes inconvenience. Low-lying areas next to watercourses are inundated which may require the removal of stock and equipment. Minor roads may be closed and low-level bridges submerged. **Moderate flood warning:** In addition to the above, the evacuation of some houses may be required. Main traffic routes may be covered. The area of inundation is substantial in rural areas requiring the removal of stock. **Major flood warning:** In addition to the above, extensive rural areas and/or urban areas are inundated. Properties and towns are likely to be isolated and major traffic routes likely to be closed. Evacuation of people from flood affected areas may be required.
Heatwave	Queensland Health (QH) Bureau of Meteorology (BoM) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by Queensland Health and the Bureau of Meteorology. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Subscription based notifications - Face to face	The **heatwave forecast** is disseminated by the BoM for severe and extreme heatwaves for the current day extending out for the next four days.	**Low intensity heatwaves (Yellow)** - local communities expected to have adequate adaptation strategies for this level of thermal stress. **Severe intensity heatwaves (Orange)** - will challenge some adaptation strategies, especially for vulnerable sectors such as aged or the chronically ill. **Extreme intensity heatwaves (Red)** - will challenge many normally reliable sectors, including power and transport infrastructure and anyone who does not adopt protective adaptation strategies.

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
Other critical infrastructure failure (gas, electricity, communications, transport systems, water, health services, sewerage infrastructure, etc.)	Critical infrastructure owner (e.g. Energex, Telstra, DTMR, QH, UrbanUtilities, etc.) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	The critical infrastructure owner will issue warnings or communique for infrastructure failure. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Signage - Community number (Roads) 13 19 40 - Subscription based notifications - Face to face	No specific warning products exist.	No specific warning ratings exist.
Pandemic	Queensland Health (QH) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by Queensland Health. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Subscription based notifications - Face to face	No specific warning products exist.	No specific warning ratings exist.

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
Plant and animal pest or disease	Department of Agriculture and Fisheries (DAF) Biosecurity Incident National Communication Network (NCN) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by the Department of Agriculture and Fisheries. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Radio - TV - Websites www. - Social media - Signage - Subscription based notifications - Face to face	No specific warning products exist. However, biosecurity briefs and communique have been developed for specific animal diseases (e.g. FMD, avian influenza) and would be disseminated if the likelihood of the disease presence was considered high. Note: Pest alerts (plants, weeds and animals) give a brief description of the pest or disease, including its status and potential impacts, and outline any steps that should be taken including if a suspect specimen is found.	No specific warning ratings exist.
Radiological	Queensland Health (QH) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by Queensland Health. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Subscription based notifications - Face to face	No specific warning products exist. Note: Separate plans exist for the visitation of nuclear powered warships.	No specific warning ratings exist.

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
Severe weather (gale force winds, flash flooding, etc.)	Bureau of Meteorology (BoM) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by the Bureau of Meteorology. The State Disaster Coordination Centre and disaster management groups may issue and disseminate warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Signage - Subscription based notifications - Face to face	**Severe weather warnings** are issued for potentially hazardous or dangerous weather that is not directly related to severe thunderstorms, tropical cyclones or bushfires. Note: The BoM also issues **marine weather warnings** whenever strong winds, gales, storm force or hurricane force winds are expected.	There are no specific warning ratings for **severe weather warnings,** they are issued for: - Sustained winds of gale force (63 km/h, 34 knots) or more. - Wind gusts of 90 km/h (48 knots) or more. - Very heavy rain that may lead to flash flooding. - Abnormally high tides (or storm tides) expected to exceed highest astronomical tide. - Unusually large surf waves expected to cause dangerous conditions on the coast. - Widespread blizzards in Alpine areas.
Severe thunderstorm	Bureau of Meteorology (BoM) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by the Bureau of Meteorology. The State Disaster Coordination Centre and disaster management groups may issue and disseminate warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Signage - Subscription based notifications - Face to face	**Severe thunderstorm warnings for Queensland** are issued as an alert to the public, emergency services and other organisations when severe thunderstorms are likely to develop, or extend into, a specified area over the next few hours. The warnings are issued for all parts of Queensland. **Severe thunderstorm warning - South East Queensland** is a more detailed alert issued to the public, emergency services and other agencies when severe thunderstorms are actually detected in the southeast, from Gympie to Gold Coast & west to Dalby. *(Issued every 3 hrs, or every 30-*	There are no specific warning ratings for **severe thunderstorm warnings,** they are issued for thunderstorms that produce one or more of the following: - A tornado - Hail of diameter 2cm or greater - Wind gusts of 90 km/h or greater - Very heavy rain leading to flash flooding. For **severe thunderstorm warnings for Queensland** the area covered by the warning and under threat from severe thunderstorms is indicated by yellow shading. For **severe thunderstorm warnings for South East Queensland** the area covered by the warning is indicated by yellow shading, the immediate threat is indicated by orange shading and the location of the thunderstorm is indicated by a red eclipse. An arrow indicates the forecast direction of movement of each

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
			60 mins for more detailed city warnings.	thunderstorm.
Ship-sourced pollution	Department of Transport and Main Roads (DTMR) - Maritime Safety Queensland (MSQ) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by the Department of Transport and Main Roads. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Subscription based notifications - Face to face	No specific warning products exist.	No specific warning ratings exist.
Storm tide	Bureau of Meteorology (BoM) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC) Department of Science, Information Technology and Innovation (DSITI)	Official warnings are issued by the Bureau of Meteorology. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Signage - Subscription based notifications - Face to face	**Storm tide standby bulletin -** provides an initial estimate of the possible storm surge associated with a coastal crossing of a Severe Tropical Cyclone at the forecast intensity. **Storm tide warning -** is issued during a Cyclone Warning phase when the chance of a storm tide risk exceeding HAT is identified and it is expected that wind gusts along the threatened coast could increase to 100 km/h or more within 24 hours. *(Where possible STW will be issued 24 hours*	The warning specifies **maximum 'worst case' storm tide** estimates assuming the peak surge coincides with local high tide and the locations specified experience the maximum onshore winds (the eyewall). Storm tide heights in the warnings are referenced to both Australian Height Datum (AHD) and Highest Astronomical Tide (HAT). The warning also specifies additional **'forecast track'** scenario estimates of the predicted storm tide for key locations, based on the most likely forecast track and tide conditions at the expected time of coastal crossing. Storm tide heights in the warnings are referenced to both AHD and HAT.

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
			prior to the forecast onset of 100km/h wind gusts affecting coastal and island communities).	
Terrorism	Queensland Police Service (QPS) Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are disseminated by the Queensland Police Service. The State Disaster Coordination Centre and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Community number 1800 1234 00 - Subscription based notifications - Face to face	The **National Terrorism Public Alert System** is a range of four levels that communicate an assessed risk of terrorist threat to Australia. The National Threat Assessment Centre, located within the Australian Security Intelligence Organisation, prepares assessments of the likelihood and probable nature of terrorism and protest violence, including against Australia, Australians and Australian interests here and abroad, special events and international interests in Australia.	The four levels are: **Low**—terrorist attack is not expected **Medium**—terrorist attack could occur **High**—terrorist attack is likely **Extreme**—terrorist attack is imminent or has occurred.
Tsunami	Joint Australian Tsunami Warning Centre (JATWC) Operated by Bureau of Meteorology and Geoscience Australia Local, District & State Disaster Management Group/s State Disaster Coordination Centre (SDCC)	Official warnings are issued by the Bureau of Meteorology. The State Disaster Coordination Centre, agencies and disaster management groups may disseminate these warnings. Channels may include: - Emergency Alert - Standard Emergency Warning Signal - Radio - TV - Websites www. - Social media - Community number 1300 TSUNAMI	**National no threat bulletin:** To advise people that the earthquake has been assessed and that no tsunami threat exists. **National or state/territory watch -** To advise people that a tsunami threat may exist and that they should look out for further updates. **State/territory warning** - To advise people that a tsunami threat does exist and to advise them of the level of threat and action they should take	**No threat** - An undersea earthquake has been detected, however it has not generated a tsunami, or the tsunami poses no threat to Australia and its offshore territories. **Marine and immediate foreshore threat** - Warning of potentially dangerous rips, waves and strong ocean currents in the marine environment and the possibility of only some localised overflow onto the immediate foreshore. **Land inundation threat -** Warning for low-lying coastal areas of major land inundation, flooding, dangerous rips, waves and strong ocean currents.

Hazard	Relevant entities	Warning channels	Warning products	Warning ratings
		- Subscription based notifications - Face to face	marine = blue, land = red *(Issued 90 minutes before Tsunami impact)*	

Appendix E: Tropical Cyclone Marcia

Review of Emergency Alerts issued during Tropical Cyclone Marcia February 2015

We reviewed all Emergency Alerts (EA) issued by the State Disaster Coordination Centre (SDCC) during Tropical Cyclone Marcia (TC Marcia).[45]

Findings

1. Forty seven percent (47%) of Emergency Alerts required amendment resulting in significant delays to the approval and dissemination of Emergency Alerts.
2. There is inconsistent knowledge and training about Emergency Alert arrangements at a local, district and state level.
3. Variance exists in the quality of the Emergency Alert warning messages issued through the State Disaster Coordination Centre.

Background

Severe TC Marcia rapidly intensified from a Category 1 system on Thursday 19 February to Category 5 when it crossed the coast near Shoalwater Bay north of Rockhampton on the morning of Friday 20 February 2015. Extensive rainfall was forecast and experienced on Friday across central and south-eastern Queensland. The SDCC moved to 'stand up' as of 0600hrs on the 19 February 2015 to support local and district disaster management groups, including the dissemination of EA warnings. The SDCC issued 19 EA campaigns from the 19th to the 24th February - a total of 511,056 alerts.

Issue

Based on the analysis, we identified several areas for improvement. Forty seven percent (47%) of EA requests submitted by local and district disaster management groups to the SDCC required amending. Reasons included:

- poor quality maps (some files were supplied as a PDF, which are not up-loadable)
- file shapes (polygon map) were too large or complex
- some requests did not contain a polygon map
- too many characters in the SMS text message
- incorrect wording in the warning message
- lack of information about who the warning was from (i.e. council or group)

[45]Please note the Office of the Inspector-General Emergency Management will review the effectiveness of EA's issued to residents impacted by the Callide Creek flood event, as part of the Callide Creek Flood Review 2015.

- lack of training for requesting and authorising officers.

As a result of the number of requests requiring amendment, there were delays issuing EAs.

The Gladstone Local Disaster Management Group (LDMG) submitted an EA request at 6:27pm on Thursday 19 February; however there was a three hour delay before the SDCC issued the EA, at 9:28pm. The SDCC reported that the shape files supplied were too large and that the Gladstone LDMG had requested a change to the message during the campaign, contributing to the delay. The Queensland Emergency Alert Guidelines state 'it can take up to 30 minutes to prepare and release a campaign'. On average, it took the SDCC one hour and 23 minutes to issue EAs on behalf of disaster management groups. It did, however demonstrate capacity to issue multiple EAs within a small time frame, issuing six EA's within 30 minutes on Friday 20th February.

There was also a variance in the quality of EA warning messages sent via voice message, compared with those sent via text message. Several EAs sent via text message included content that was unclear or disparate, increasing the likelihood of public confusion. A useful example is the EA campaign issued for Boyne Island and Tannum Sands on the 19th February 2015, which said:

Voice Message	**Text Message**
'This is a storm tide watch and act message from the Gladstone Regional Council. Storm tide zones 1, and, 2, are likely to be affected by a storm tide caused by cyclone Marcia, at about 10am Friday. Predicted to be 80cm above highest tide of the year. You should take precautions. For more information, listen to local radio, council social media or visit the council website at www.gladstone.qld.gov.au.'	*'Storm tide Watch and Act Gladstone region storm tide zones 1 and 2 likely at 10am Friday, 80cm above highest tide. Take precautions. Listen to local radio.'*

This warning presumes a level of public knowledge regarding the meaning of a 'watch and act' alert, community understanding about storm tide zones and the consequences of tide heights. Although limitations exist in the number of characters that can be used for EAs sent via text message (160 characters), improvements can be made to ensure the EA warning message, whether voice or text message, can be easily understood by the community and meets the Standard for Disaster Management in Queensland (the Standard).

Summary

Based on feedback provided by Rockhampton and Livingstone Local Disaster Management Group members, communities responded to the EAs appropriately. However, without further investigation, any consequences of the time delays and message ambiguity cannot be validated. The findings documented in this appendix are consistent with those already identified in this report. They reinforce the need to update the EA guidelines, improve current training practices for emergency warnings and support local government in the development of pre-loaded polygons.

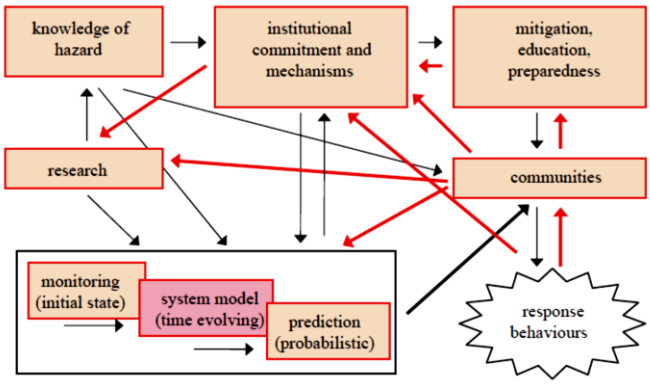
Supporting local government in the development of pre-loaded polygons and EA templates is likely to increase the quality of maps (polygon map) and file shapes. Providing training to relevant local and district disaster management group members and authorising officers is likely to increase the number of EA requests that comply with the EA guidelines, and therefore improve the speed at which the SDCC can issue EAs to communities at risk. Collectively these improvements will enhance the ability of disaster management stakeholders to ensure EAs are fit-for-purpose, consistent and accurate, and provide communities with relevant information to take action during a disaster.

Appendix F: Research

Early warning systems - what the research tells us

Basher (2006) notes the expression *early warning* is used in many disciplines to mean 'the provision of information on an emerging dangerous circumstance where that information can enable action in advance to reduce risks involved' (Basher, 2006:2168). Hall (2007:33) suggests that *early warning system* is an accurate description for the *functionality* provided by the specialised science and technology based systems and processes, such as those focused on the detection and interpretation of hazard events, or issuing alerts and warnings for those events. A National Review of Warning and Information Services concluded that within Australia, there is no national definition of *warnings*, with greater clarification required to distinguish between warnings and hazard impacts (Cube, 2014). Basher (2006) outlined the progressive development of early warning systems:

1. pre-science early warning systems based on unrelated factors such as meteor occurrence, cloud shapes or plant flowering; and indigenous observations of relevant factors such as the state of the oceans or visibility of the stars
2. ad hoc science-based early warning systems typically established on the initiative of scientists or community groups concerned with particular hazards, such as a nearby volcano or a flood-prone river
3. systematic end-to-end early warning systems, involving the organized, linear and largely uni-directional delivery of warning products by experts to users
4. integrated early warning systems, emphasising linkages and interactions among all the elements necessary for effective early warning and response, the role of the human elements of the system and the management of risks rather than just warning of hazards.



As the name indicates, the *system* component of IWS includes linkages and pathways to achieve a *desired result* e.g. communities that are warned and take appropriate action (Basher, 2006). IWS *effectiveness* is determined by how well understood, designed and

operated each of the components are. IWS includes entities and actors that may not be typically recognised as part of traditional warning systems (Basher, 2006), including political-administrative supporting entities, district and community members and even the broader research community. This approach also includes feedback from the community level back through relevant representative organisations to the political-administrative entities and the integration of early warning systems into the day-to-day policy processes of government (Collins & Kapucu, 2008).

The UNISDR (2006) identified governance, multi-hazard approaches, involvement of local communities and the consideration of gender perspectives and cultural diversity as overarching issues that will affect the development, maintenance and operation of early warning systems. In the literatures, governance is identified as significant to the development and implementation of effective early warning systems (Ebi & Scgmier, 2005; Villagran de Leon et al.,2006; Collins & Kapucu, 2008; Kusumasari et al., 2010; Spahn et al., 2010). Hall (2007:33) states that strategically, an early warning capability is the 'management integration of expert local knowledge with existing specialised systems and processes, each of which are separately owned and operated by a variety of service providers'. The UNISDR (2006) identified four components of governance and institutional arrangements that will support the implementation and maintenance of early warning systems:

1. early warning systems are secured by government as a long term local priority
2. legal and policy frameworks are established, supporting the implementation of early warning systems; clarification of roles and responsibilities; supporting formal relationships and partnerships between all organisations and entities involved; integrating the system into broader disaster management policies, plans and arrangements; and the monitoring system performance
3. institutional capacities are assessed and enhanced; linking capacity building plans and training programs to support development
4. financial resources are secured, with government funding mechanisms supporting early warning systems.

Kusumasari et al. (2010) further identified key *functional success factors* supporting local government early warning systems capability including: institutional factors; technical and human resourcing; financial arrangements; and leadership for decision making. The importance of role clarification and clear delegation of responsibilities is reinforced by Sorensen and Mileti (1987), Einstein et al. (2006) and Golnaraghi (2013). Rogers and Tsirkunov (2011) cite good governance and supportive institutional arrangements, including

robust legal and regulatory frameworks, as providing the foundations upon which early warning systems are *built, strengthened and maintained*. Researchers such as Betts (2003) have highlighted the challenges associated with operationalising the frameworks at a local level, citing issues such as entity partnerships, communication processes, the operational culture and context and the focus on technical information, as affecting early warning systems development.

Basher (2006) notes that institutions are required to capture and sustain political commitment, capitalise on scientific knowledge, assess and manage system investment and guide and resource supporting scientific research. Failures in early warning systems usually occur in the communication and preparedness elements, for example a lack of knowledge about risk and hazard. Strong political commitment and institutional capacity as well as public awareness and *appreciation* of the benefits of the warning system are keys to the longevity of the system. Golnaraghi (2013) identified political recognition of the benefits of early warning systems reflected in policies, legislation, and institutional coordination and budgeting as the number one common principle for successful early warning systems. System design and implementation must be aligned with resource availability.

Hall (2007) and Golnaraghi (2013) note the importance of collaboration between emergency managers, agencies responsible for issuing warnings and scientists/technical advisors responsible for generating the intelligence/data to support warnings. Rogers and Tsirkunov (2011) highlight the commitments to cooperation and information exchange, promoting partnership benefits for early warning systems including expertise in development from a range of non-scientific disciplines such as community planning; more consistent messaging from multiple credible sources; and leveraging existing resources for awareness and preparedness. Golnaraghi (2013) stresses the importance of collaboration more broadly across the stages/elements of early warning systems, from forecasting ability to preparedness and response.

The evaluation of system *effectiveness* has been identified as a weak or often missing stage in the implementation of early warning systems (Ebi & Scgmier, 2005; Basher, 2006; Golnaraghi, 2013; Cube, 2014; Dufty, 2014). Evaluation of the components of the early warning systems as well as overall system effectiveness should become a routine part of implementation, particularly following events (Dufty, 2014). However, as Basher (2006) notes, there are few *systematic mechanisms* to improve early warning systems through user feedback, with more research required to develop indicators and benchmarks against which to measure *effectiveness*.

Key components of an early warning system

International best practice indicates there are **four interlinked parts/components** of an effective, integrated, people-centred early warning system (UNISDR, 2003; UNISDR, 2006; Basher, 2006; Rogers & Tsirkunov, 2011; Golnaraghi, 2013; Dufty, 2014):

1. risk knowledge—systematically collecting data, knowledge and intelligence about the hazards, community and vulnerabilities and undertaking risk assessments;
2. monitoring and warning services—technical capacity to monitor hazards, forecast hazards and issue warnings;
3. dissemination and communication—mechanisms for dissemination of understandable warnings and preparedness information to vulnerable/ exposed communities;
4. response capability—knowledge, plans and capacities for timely and appropriate action by authorities and exposed communities.

The objective of people-centred early warning systems is to

> *empower individuals and communities threatened by hazards to act in sufficient time and in an appropriate manner to reduce the possibility of personal injury, loss of life and damage to property and the environment* (UNISDR, 2006:2).

Risk knowledge

The aim of this component is to 'establish a systematic, standardised process to collect, assess and share data, maps and trends on hazards and vulnerabilities' (UNISDR, 2006:5). Villagran de Leon et al. (2006) and Golnaraghi (2013) reinforce the need for sound scientific basis for predicting events. The National Review of Warning Systems and Products identified inconsistent use of spatial data across the hazards and jurisdictions as a source of potential confusion for the community (Cube, 2014). The UNISDR (2006) identify five key elements of the risk knowledge component of early warning systems:

a. organisational arrangements established—Key government agencies involved in hazard and vulnerability assessment should be identified and their roles clarified, delegations specified and agreed to (e.g. responsibility for maintaining data sets). There should be a legislative framework and supporting doctrine that requires and supports the preparation of hazard and vulnerability maps and assessments for impacted communities.
b. natural hazards identified—The characteristics of the key natural hazards should be analysed and accompanying maps generated to show areas and communities potentially exposed.

c. community vulnerability analysed—Assessments should be conducted to identify the vulnerable members of the community, critical assets and lifelines, and significant environmental assets. These vulnerabilities should be documented and mapped.
d. risk assessed—The community should be consulted to ensure the risk information is adequate, with the results of the assessment integrated into local risk management plans and warning messages.
e. information stored and accessible—A central repository should be used for storing the risk and hazard data, along with protocols for data management, retention and review, with data accessible by both the government and public.

Monitoring and warning service

The aim of this component is to 'establish an effective hazard monitoring and warning service with a sound scientific and technological basis' (UNISDR, 2006:6) Basher (2006) and Einstein et al. (2006) note that high-quality predictions by themselves are insufficient unless they are *linked* to warning and monitoring capabilities. The UNISDR (2006) identify three key elements of the monitoring and warning service component of early warning systems:

f. institutional mechanisms established

There should be standardised processes, roles and responsibilities of all organisations generating and issuing warnings, supported by agreements and interagency protocols established to ensure consistency of warning language and communication channels. Warning systems should be subject to regular system-wide tests and exercises and include means to verify that warnings have reached the intended recipients.

g. monitoring systems developed

Doctrine and plans for monitoring networks should be developed with experts and relevant authorities. Technical components of the systems should be suited to local conditions and supported with trained personnel and regular maintenance. Consideration should be given to sharing data/information with neighbouring jurisdictions and networks. Data collected through the monitoring systems should be processed and available in meaningful formats in real-time. The data should also be routinely archived for verification and research purposes.

h. forecasting and warning systems established

Data analysis, prediction and warning generation should be based on accepted scientific and technical methodologies, with products issued within relevant standards and protocols. Systems should be in place to ensure redundancy. Warnings should be generated and disseminated in an efficient and timely manner and in a format suitable to user needs. The

plans and processes implemented should be routinely reviewed and evaluated to examine data quality and warning performance.

Dissemination and communication

Rogers and Tsirkunov (2011) note that vertical and horizontal communication and coordination between early warning systems stakeholders is essential to supporting the system. Betts (2003) identified concerns raised by the public about the way in which warnings are communicated and expectations about timely and accurate information from emergency services. Engagement with the community has typically been passive and based on gauging opinions as opposed to active involvement in system development (Esplin, 2001; Dufty, 2014). The aim of this component is to

> *develop communication and dissemination systems to ensure people and communities are warned in advance of impending natural hazard events and facilitate national and regional coordination and information exchange* (UNISDR, 2006:7).

The UNISDR (2006) identify three key elements of the dissemination and communication component of early warning systems:

i. organisational and decision-making processes institutionalised

The warning dissemination chain or notification matrix should be enforced through policy or legislation. Recognised authorities should be empowered to disseminate warning messages, with functions, roles and responsibilities and delegations specified.

j. effective communication systems and equipment installed

Communication and dissemination systems should be tailored to the needs of individual communities, considering factors such as seasonal populations and remote communities. Multi-modal mediums should be used to support dissemination, with agreements developed to utilise private sector resources where appropriate.

k. warning messages recognised and understood

Warning messages should be tailored to the specific needs of those at risk, reflecting geographic boundaries, CALD, educational backgrounds and the values and interests of those who will need to take action. Warning messages should include follow-up actions when required and include mechanisms to inform the community when the threat has ended. Follow-up studies should be done where possible to examine how messages have been accessed and interpreted, with lessons learnt incorporated into early warning systems development.

Response capability

The aim of this component is to 'strengthen the ability of communities to respond to natural disasters through enhanced education of natural hazard risks, community participation and disaster preparedness' (UNISDR, 2006:8). Betts (2003) and Spahn et al (2010) identified that the *chain of communication* supporting early warning systems needs to have agreement amongst stakeholders about processes and message focus, with trust between government and the public built through mutual understanding about needs, knowledge and perception of risk. Further, Ebi and Scgmier (2005), Einstein et al. (2006) and Dufty (2014) highlighted the need to strengthen links between community education programs and early warning systems to support the behavioural changes and responses desired by emergency managers. The National Review of Warning Products and Services workshop raised the issue of the need to validate the views of the agency/entity with *robust* community consultation and input (Cube, 2014). The UNISDR (2006) identify four key elements of the response capability component of early warning systems:

l. warnings respected

Warnings should be generated and disseminated by credible sources (e.g. government, community leaders and organisations). Public perceptions of the hazards and risks and the warning services should be analysed to predict community responses. False alarms should be minimised and improvements to communicated to maintain trust in the warning system.

m. disaster preparedness and response plans established

Disaster preparedness and response plans should be empowered by law. Hazard and vulnerability maps should be used to prepare disaster management plans, which are regularly practiced and exercised. Lessons learnt from previous events and responses should also be incorporated into the review and development of new disaster management plans.

n. community response capacity assessed and strengthened

The ability of the community to respond *effectively* to early warnings should be assessed where possible. The responses to previous events should be used to develop community capacity building resources and programs with the support of community-focused organisations and groups. These should also include community and volunteer education and training programs.

o. public awareness and education enhanced

Information on hazards, risks, vulnerabilities and how to reduce disaster impacts should be disseminated to the community, along with education about the warning system and

messaging. Public awareness strategies and programs should be regularly evaluated and updated where required.

National systems and products

A national review of warning products coordinated by Cube (2014), identified six emerging themes in the Australian early warning systems environment:

1. policy and process
    a. advance a national position on warnings.
    b. improve consistency in the use of warning arrangements across hazards.
    c. evaluate the effectiveness and success of systems and products.
2. channels and systems
    a. explore the diversity of systems and technology available.
    b. expand emergency alert training, consistency of use, community education etc.
    c. explore the use of multi-hazard warnings websites.
    d. explore opportunities and challenges presented by social media.
3. construction of warnings
    a. use intuitive language and logical order of content.
    b. explore challenges with 'over-warning' and/or poorly targeted warnings.
    c. reach vulnerable groups.
4. community response
    a. ensure community education is integrated with early warning systems.
    b. tailor warnings to diverse communities.
    c. support information validation
    d. encourage sharing of information as a community response.
5. workforce capability
    a. recognise resource requirements to support public information offices, develop capacities, skills and characteristics.
    b. use post-incident debriefs and critical incident stress support for those involved in EWS.
6. continuous improvement
    a. maintain credibility and trust in the systems and products.
    b. embrace future information systems and technologies.
    c. keep pace with social media innovation.

Within the Australian context, there is a range of products to support the development and implementation of early warning systems at the state and local government levels and

recognise the roles of the Commonwealth Government, individuals and communities, the broadcast media and business and other organisations. In 2008 the Ministerial Council of Police and Emergency Management (now the Standing Council on Police and Emergency Management) endorsed 12 national emergency warning principles that should be used by jurisdictions to guide public warning activities. However, the national review workshop reported that many delegates were unaware of the principles. In summary, these principles state that early warning systems need to be:

- coordinated: This will avoid duplication of effort and support a shared understanding of the emergency situation between the agencies involved in managing the response to the incident.
- authoritative and accountable: The decision of whether or not to disseminate warnings needs to be made by an authorised person.
- consistent / standards based: Message content needs to be coordinated across all mechanisms and be consistent across different sources.
- complete: Warnings should include pertinent details, including direction to other sources of information if required.
- easily understood by diverse groups: Messages also need to be presented in way that is easy and quickly understood and targeted to the whole community, including those from culturally and linguistically diverse backgrounds and those who are vision or hearing impaired.
- multi-modal: Warnings should be disseminated via different delivery mechanisms and in multiple formats.
- comprehensive: Any warning system developed should be able to provide warnings for any type of emergency.
- targeted: Messages should be targeted to those at risk to reduce the complacency that may result from 'over warning'.
- interoperable: Warning systems should have coordinated delivery methods that can be used across jurisdictional borders.
- accessible and responsive: Early warning systems should respond to and deliver warnings in an environment of demographic, social and technological change.
- verifiable: The community should be able to verify and authenticate warnings to reduce incidents of accidental activations or prevent malicious attempts to issue false alerts.
- underpinned by education and awareness raising activities.

The guideline Emergency Warnings: Choosing Your Words (2008) provides additional advice on how to word emergency warning messages, while the Code of Practice for Warning Republishes (2013) can be used by local governments to support the development of processes for disseminating warnings out to the community. The Common Alerting Protocol is an international standard that facilitates the construction and exchange of emergency alert and warning messages between various warning systems and networks. In 2012, the Australian Government standard for the Common Alerting Protocol - Australia Profile (CAP-AU-STD) was released for public use by the CAP-AU stakeholder group, representing Commonwealth, state and territory governments, and industry. It provides a common standardised national approach for:

- governments seeking to distribute warnings about all hazards
- organisations seeking to be interoperable with emergency alerting agencies or internally with their employees
- industry who market technologies that facilitate the distribution of alert and warning messages to the Australian public, or manage incidents of interest to organisations.

Applying the CAP-AU-STD standard to Australian emergency warnings assists people from non-English speaking backgrounds and people with disabilities, including people who are deaf or hearing impaired, and people who are blind or vision impaired, as it facilitates the delivery of warnings through a variety of widely-used technologies (Attorney-General's Department, 2013).

Summary

An integrated EWS contains four components:

- risk knowledge—evidence base, risk and vulnerability assessments
- monitoring and warning services—using intel to generate warning messages and products
- dissemination and communications—multi modal methods to reach as many end users as possible
- response capability—ensuring system stakeholders and end users know their roles, responsibilities and have the capability and capacity to respond effectively.

Data and intelligence are a significant part of an effective emergency warning system. Governance is a critical aspect that affects EWS adoption, development and review. Importantant governance principles include:

- government commitment to investing financial, human and technical resources in the EWS across all components as well as the interoperability of systems
- policy and legislative frameworks and environments that enable EWS, including risk assessments, access to data, clear definitions of roles and responsibilities, capacity building for system users and end-users within a shared responsibility approach
- a broader disaster management vision that links EWS to community education and engagement programs.

EWS evaluation is a critical, but neglected part of developing, implementing and maintaining system relevance and effectiveness.

Appendix G: Summary of feedback

In addition to substantial engagement during the course of this review, a copy of the draft report was provided to its contributors seeking final feedback. Below is a summary of feedback, which was provided in writing or verbally to the Office of the Inspector-General Emergency Management. The views of contributors have been considered and are represented to the extent relevant and warranted in preparing this report.

Summary of comments from stakeholders accountable for leading or supporting recommendations:

Queensland Fire and Emergency Services (QFES)
The recommendations are accepted. [The report is] a valuable program of work that comprehensively captures the issues and associated risks for emergency warnings in a local government context.
Queensland Police Service (QPS)
The QPS accepts all recommendations. Recommendation 1 - The action items of this recommendation will be incorporated into the review of the State Disaster Management Plan, however clarification is requested as to whether direction for primary agencies to ensure local governments are included in the development and issue of hazard-specific warnings relates to all messaging or locally specific messaging.
Department of the Premier and Cabinet (DPC)
The DPC is grateful to consider a draft of the Inspector-General Emergency Management's Review of Local Governments' Emergency Warning Capability, and acknowledges that the issues it identifies require action. DPC looks forward to receiving the final report and collaborating with other stakeholders to improve both local governments' capability and Queensland's overall disaster management arrangements to maximise the effectiveness of emergency warnings.
Public Safety Business Agency (PSBA)
Recommendation 7 - QFES is responsible for ensuring all training programs align with required standards and protocols. PSBA Media works with QFES as part of the process of reviewing Warnings and Public Information training but only at the request of QFES.

Recommendation 10 - The subject matter of this recommendation has been considered as part of a soon to be publically released National Review of Bushfire Warnings and Information. PSBA is listed as a support agency for this recommendationand will incorporate the National Review to inform meta-analysis and research.

Summary of comments from other stakeholders:

Department of Communities, Child Safety and Disability Services (DCCSDS)
While implementation of proposed recommendations are not within the scope of this department, any improvements to warning capability and execution would benefit our client base.
Department of Infrastructure, Local Government and Planning (DILGP)
Thank you for the opportunity to review the Report… the DILGP has no further comments to make on this report.
Queensland Parks and Wildlife Service, Department of National Parks, Sport and Racing (QPWS)
QPWS has a statutory requirement to ensure visitors to its estate are safe and alerts visitors through SMS, web based park alerts and face to face engagement in times of possible extreme events. QPWS Regional Emergency and Disaster Management Plans (REDMPs) are shared with local disaster management groups. These plans provide information on how QPWS provides emergency warnings. The interdependencies between warnings and public information do compound the complexity of documenting roles and responsibilities, however, QPWS must maintain its responsibilities for alerts and warnings to visitors to the areas under the agencies management. The sharing of QPWS REDMPs, in addition to formal and informal membership on district and local disaster management groups, will assist integration into and with local government warnings.
Department of Science, Information Technology and Innovation (DSITI)
The DSITI supports the findings and conclusions of the report. In particular, I would like to draw attention to Recommendation 1 regarding a review of the State Disaster Management Plan, and Recommendation 3 regarding the Crisis Communication Network terms of reference. In both instances it would be timely for our agencies to collaborate on potential opportunities to enhance the quality of information being provided to the public through channels that DSITI manage.

Queensland Ambulance Service, Department of Health (QAS DoH)
The QAS supports the recommended changes and supports all efforts to ensure that communities receive current, accurate and appropriate warnings to allow them to make informed decisions during periods of potential emergencies and or disasters.
Department of Health (DoH)
The DoH supports the recommendations proposed in the report.
Department of Transport and Main Roads (DTMR)
The DTMR supports the report.
Livingstone Shire Council
We suggest consideration of the state adopting a procedure of issuing targeted messages using the SMS whenever a community is identified as within the path of a Cat 2 (plus) cyclone. It is acknowledged this would require some thought to determine timing and footprint but it has become apparent that warnings via traditional media may not be achieving adequate coverage within communities. It is envisaged there would be an initial alert message and then regular updates to notify changes in strength, direction and timing of impact. The messages could include information obtained from the local disaster management groups updates as an event matures. The SMS was utilised during Tropical Cyclone Marcia to notify residents in the potential storm surge areas to evacuate. We expended considerable effort attempting to confine the target group receiving the message to just those affected, however, the message was sent to a much larger footprint and upon reflection, this was beneficial as relatives and friends outside the impact area were able to take action to contact those potentially affected, and in particular, the aged or incapacitated. Hence, our suggestion is that a standard protocol be developed for how to utilise the SMS to best advantage including standard message types for inclusion in local disaster management subplans. It is acknowledged these suggestions are predicated upon the mobile network being available and should be utilised to complement existing warning notification services, not replace them.

OUR REF IGEM
BCM:SB

15 May 2015

Inspector-General Emergency Management
Office of the IGEM
info@igem.qld.gov.au

Mackay Regional Council Feedback Submission
Review of Local Governments' Emergency Warning Capability

Dear Inspector-General,

Mackay Regional Council generally supports the recommendations made in this Review and would like to add the following feedback/comments for consideration.

- Any warnings promulgated at a State level that may have some impact to a local government boundary must touch base with the Local Government before sending out. For example; the EA that went out for Cyclone Anthony/Yasi. The EA that was sent out was contrary to what was happening on the ground at the local government level. This only added confusion to the community with LG (LDMG) saying one thing and then State saying another.

- Local dissemination of warnings must be done at a local level to the community. An EA is to be developed at the local level and then sent to State for distribution. It will pass via the DDMG for their notification.

- Community understanding of warnings; it is important to take into account human behaviour (psychological and sociological) when it comes to understanding and interpretation of warnings by the community. It is important to remember that when planning for public information and warnings (sub plans), it is better to plan for what people will do, rather than what they should do.

- Generic templates for warnings are fine, however local government still need the ability to contextualise the warning to suit their local government area. For example; a warning to the community for flooding in a particularly intersection should include the roads i.e. Nebo Road and Shakespeare road, but also include the common name for that intersection that most people in the community will also know as well i.e. Fourways.

Civic Precinct, Gordon Street
PO Box 41 Mackay I QLD 4740 I Australia
Phone 1300 MACKAY (1300 622 529)
Fax 07 4944 2400
Email council@mackay.qld.gov.au
ABN 56 240 712 069

- There was mention in the document (page 21) about Local Emergency Coordination Committees (LECC) and using them as potential conduits of warnings to the communities. I would also make mention about Emergency Liaison Officers (ELO's) and there potential to provide vital information to communities and vice versa feeding information back into the LDMG's. These officers are becoming more prominent in local government areas in Queensland. Some other local governments call them Flood Wardens.

- On page 21, where it mentions about Local Emergency Coordination Committees (LECC) in addition to Emergency Liaison Officers (ELO), some LG are promulgating warnings to their Local Disaster Recovery Subgroups. Thereby getting the membership on the front foot to be able to respond and using their communication networks, as an alternate messaging channel.

- On page 21, where it mentions use of CB radio, the Tablelands Regional Council have set up an Emergency Radio Network that would be considered "best practice" and "problem solved black spots to achieve a sustainable communication network using mainly existing facilities and channels". Sarah Dean of TRC was the Project Manager.

- Page 22: There should be requirement in the Incident Management System directive for QFES Information and Public Warning Unit to advise a local government area if an event may or is impacting them i.e. pandemics, biohazard and animal hazards. Even though there are threat specific functional lead agencies to deal with these events. In my experience (preparations for pandemic outbreak in 2009, equine influenza, oil spills) they have all relied on LG (LDMG's and DDMG's) to provide some assistance. At least then the Local Government (LDMG) will be on the front foot to start pre-empting some of the requests that may come their way from the lead agency.

- Emergency Warnings would be better contextualized when the media organisations have an understanding of disaster management practices/procedures/terms particularly QDMA, terms use such as levels of activation and what each level means. For example, in Public Cyclone Shelter areas what is the purpose of PCS, what is the criteria for opening PCS and who should go and who shouldn't go to PCS, what can you take.

  Some Local Governments have embarked on having these pre-season training sessions with local media, however this could be greatly assisted and enhanced if PSBA produced a media training package for media organisations that Local Government and QFES could deliver. This has been previously suggested to EMQ Media.

- There is a need to promote the fact that multiple channels are used in delivering warnings and residents should not wholly depend on one warning type. Often I have heard comments along the lines of "Well, we did not even get a SMS about that." Multiple Channel Warning Promotion needs to be done at State Level.

- There is a major issue with Storm Tide Warnings with the "only three stations" can be reported on in the official warnings.

  In TC Dylan, Mackay was advised on Thursday 11am of a worst case scenario of 0.7m storm tide above HAT at high tide the following day (Friday 10.00am). After midnight Thursday (about 12.30am), we realized that the storm tide warning for Airlie Beach had increased by over a metre (within 100km), so we contacted the BoM to be advised "no modelling had occurred for Mackay" and after approximately one and half hours (1.54am, we were advised that worst case scenario had increased to 2.4m (most probable 1.7M) within 8 hours of impact that would result in approximately 35,000 residents having to be evacuated on worst case. Fortunately the situation rapidly eased back to 0.7m worst case with the cyclone crossing the coast by 3am.

  So the first issue was "no direct" advice was received by the LDMG about Mackay's potential impact. The BoM advised they could not provide written warnings before 6am over 4 hours after the verbal advice was given. If we had not looked outside the square and/or were not receiving Whitsunday LDMG media releases, we would not have expected or planned for a very dangerous situation.

  The second issue that morning was the verbal information would be given sometimes without "wave setup of 0.7m" included and sometimes with - so common reporting is needed.

- State Severe Weather Briefings (SWB) should be disseminated to the wider audience, this year we had the case of initial SWBs not being received from SDCC as they believed we were out of the warning area. Yet the Courier Mail indicated Central Queensland was also under threat, which proved correct, but we missed the first set of SWBs. Fortunately QFES from outside of our region were able to supply the SWBs on request. Council are of the opinion that we would be better informed if all SWBs are issued to all LDMGs. We also have MOUs under Guardian with other Councils to assist and this also gives us the ability to plan earlier for ourselves and be informed of the situation. It would not be considered an oversupply of information because it was only released once a day.

- On page 29, it is mentioned about Dam Owner Responsibilities for notification of warnings etc., however the "Provisional Emergency Action Planning For Referable Dams - June 2013" page 12 states:-

  The main function of an EAP is to specify what the dam owner will do in an emergency in order to:

  (a) provide timely notification to ***people who are or may be at immediate risk during an emergency event*** *so that they can take appropriate measures for their own safety.*

  (b) provides timely warning to appropriate emergency management

agencies for their implementation of protection measures for downstream communities; and
(c) monitor and operate the dam to mitigate the consequences of the emergency event

The emergency actions that may be considered reasonable and necessary to be provided for and undertaken will depend on the particular circumstances of the dam - including the consequences and the probability of occurrence i.e. it is a risk management exercise.

An EAP should indicate who is responsible for undertaking particular actions under emergency circumstances and must be tailored to the conditions at each dam. EAPs should identify ***the downstream limit for people who will be notified by the dam owner*** *and communication processes for the dam owner to notify such people directly.*

The issue is some dam owners (Sunwater) believe they can draw a line in the sand at a set mileage and say after that it is not our issue, it is the issue of the LDMG to notify and warn residents. Yet there is no consultation on why or how that point was determined or whether the LDMG has the lead time from notification of the incident to time needed for residents to act or the resources to notify beyond that point, especially in the worst case scenarios of dam failure.

- Recommendation 4 – Emergency Alert Guidelines to be reviewed. Council would request that Local Governments and the LGAQ be "Support Agencies" be involved/invited in determining and reviewing the guidelines. The reason for the request is on a number of occasions during previous EMQ reviews of the EA Guidelines, Council have suggested that the Disaster District Coordinator" should also be an "Authorising Officer". The supporting case for this is on Page 5 of the Queensland Emergency Alert Guidelines it states:-

  "The AO should have a good situational awareness of the event, the appropriateness and timeliness of the warning, the consequences on the community, and the political impact of warning."

  Yet all the AOs listed are EMQ and more than 330 kilometres away and therefore the LDMG have to repeat the situational awareness to the Regional Director EMQ. Whereas the DDC is within the District and would have the second best situational awareness after the LDC on local issues. This Council would be keen to participate in the review.

- Recommendation 5 – Warnings and Public Information Sub-Plan Guide Review - Council would request that Local Governments and the LGAQ be "Support Agencies" and be involved/invited in determining and reviewing the guide. The reason supporting the request is that already Councils have some best practices Sub Plans, so rather than re-inventing the wheel, let's build on the best practices that exist already. This Council would be keen to participate in the review.

- Conclusion page 31; there is sharing of knowledge within local governments that share boundaries and further afield that State would not be aware of. There needs to be more sharing of knowledge of information and consultation from a State level with Local Governments. Particularly from a systems perspective.

- It is probably worth noting in this document; local governments will not use just one form of warning to get the message out to the public. Even though an EA will go to a particular area, LDMG's will also use all other medians to get the information out i.e. TV, Radio, Radio Communications, Social media, door knocking by emergency services etc.

- Intelligence from the SDCC, BOM etc. to Local Government must be given in a timely manner if possible. The greater lead time available to the LDMG will reduce time delays in getting warnings out to the community. Extra time if possible, will ensure messages will be consistent, accurate and fit for purpose.

  Again it is up to the LG (LDMG) to ensure they have done as much work during peace time in developing pre-loaded polygons, templates for SMS messaging and so on.

- Preventative messaging needs to be contextualized to change people's beliefs rather than tell them what to do. A tragic example is in the latest SE Qld event, five people tragically died because the driver's belief was that is it okay to drive thru flooded waters and it will be okay. Until we can collectively start changing driver's beliefs it will unfortunately continue to occur. People don't like being told what to do so we need to change how we message.

  Maybe school education is a good way to start changing the beliefs of the next generation.

- Council does note the comments and inference in the Executive Summary to local government's inability to not understand their diverse communities impedes the issuing of warning alerts. We would question if other levels of government have a greater understanding of local communities to which they issue alerts.

- Council would add that LGAQ as our representative body be a key part of the team implementing the recommendations across the state and working with individual local governments.

Thank you for the opportunity to take part in this review and Council looks forward to working with you in the future.

Yours sincerely,

Jason Devitt
Local Disaster Coordinator
Mackay Local Disaster Management Group

Whitsunday Regional Council

Customer Service Centres

Bowen
P: 07 4761 3600
67 Herbert Street
Bowen Qld 4805

Collinsville
P: 07 4785 5366
Cnr Stanley and Conway Streets
Collinsville Qld 4804

Proserpine
P: 07 4945 0200
83-85 Main Street
Proserpine Qld 4800

F: 07 4945 0222
E: info@whitsundayrc.qld.gov.au
W: www.whitsundayrc.qld.gov.au

ABN: 63 291 580 128

Our reference: Disaster Management
Your reference:
For further information please contact: Scott Tellegen
Direct dial no.: (07) 4945 0681

15 May 2014

Inspector General Emergency Management
Iain Mackenzie
Via e-mail: info@igem.qld.gov.au

Dear Inspector General,

RE: WHITSUNDAY REGIONAL COUNCIL – REVIEW OF LOCAL GOVERNMENTS' EMERGENCY WARNING CAPABILITY – DRAFT REPORT FOR COMMENT

Reference is made to your e-mail regarding the above.

Whitsunday Regional Council generally supports the recommendations made in this Review Report.

Whitsunday Regional Council acknowledges and appreciates that feedback from Council staff interviewed in relation to this review in November 2014 has been considered and contributed to the draft report content.

Whitsunday Regional Council and the Whitsunday Local Disaster Management Group are continually improving and looking for ways to improve our emergency warning capability, especially to the community, within available budget and resource capacity.

In recent years as an example, Whitsunday Regional Council has employed an additional full time equivalent Communications Manager to enhance and improve our communications team strategy and ability through media and the wider community. Whitsunday Regional Council is also in the process of delivering a new website which has superior ability to deliver Emergency Warnings through e-mail and Emergency Alert banner displays before, during and after disaster threats or events.

Whitsunday Regional Council (WRC) would like to offer the following specific feedback / comments for consideration in relation to the draft review report:-

- Page 14 – WRC's Disaster Management Coordinator has commenced 'Community Profiling'. Initially this has involved the Whitsunday Island Resorts, but is intended to be expanded across the rest of the Region. WRC agrees with the importance of effective disaster management community profiles and your findings.
- Page 24 – WRC agrees that the integration of '13 19 40' Department of Transport and Main Roads with the Guardian Road Closures system has been an excellent advancement in the communication of road closures to the public during disaster and severe weather events.
- Page 25 – WRC agrees that the testing of warnings should be conducted, sometimes though it will take an actual disaster event to test a systems capability and limits which cannot otherwise be easily achieved. As an example, during Cyclone Dylan in 2014, WRC instigate Emergency Alerts for storm tide threat. Over 100,000 Emergency Alerts were issued, resulting in over 13,000 people attempting to download Storm Tide maps from our website. This resulted in our website

Address all correspondence to the Chief Executive Officer, Whitsunday Regional Council, PO Box 104 Proserpine Qld 4800

crashing and through the website provider, had a flow on effect of several other Local Government websites crashing. There were several factors that lead to this failure, both within WRC and external to WRC. WRC has taken several steps to reduce any chances of reoccurrence, but it is unlikely any testing or reviewing of systems would have identified this failure before it occurred.

- Page 25 – WRC is one of the eleven Council's to have pre-loaded polygons stored with the SDCC, this was as a result of Cyclone Dylan.
- Page 31 – WRC fully supports the sharing of knowledge in the disaster management field. WRC with Mackay Regional Council and Isaac Regional Council have an excellent knowledge sharing and consultation arrangement that would be the envy of many other Local Governments and State Government departments. This has resulted in substantial tangible and intangible cost savings, shared learning, support and improvements.
- WRC requests that the SDCC notify WRC of any warnings or alerts relating to the Whitsunday Region that are issued at a State level. WRC should be aware of any warnings issued by the State in our area to ensure WRC can respond to any questions or concerns from the community with consistent and accurate information.
- WRC supports the formulation of Emergency Alert templates at a State level and supports consistent statewide messaging and formatting.
- Although an excellent (if not the best) method of mass communication is by Emergency Alert, since Cyclone Yasi in 2011, the community appears to have some expectation now that they will received a phone call or text message if a Cyclone is threatening them, which in some ways contrary to the Resilience strategy ideology.
- There is a need to promote that multiple communication channels are used to deliver warnings and the community should not rely on only one warning type.
- In WRC opinion, there is further scope for improved early warning and information sharing from the SDCC and the Bureau of Meteorology to Local Disaster Management Groups potential affected by a Cyclone event, acknowledging that improvements in this area have already been made.
- WRC would support State level templates / wording for additional emergency warning strategy's such as:-
    - 'Loud Hailer' warnings from Emergency Service agencies
    - Evacuation information hand out to affected community members
    - Additional 'Media Releases' templates for a range of events and scenarios

Whitsunday Regional Council would like to thank you for allowing us to be a stakeholder and to take part in this review.

Please feel free to contact Council's Local Disaster Coordinator Scott Tellegen on (07) 4945 0681 should you have any questions or require any further additional information in this matter.

Yours faithfully,

Scott Waters
Chief Executive Officer

Queensland
Government