



Report 1: 2017–18

The Cyclone Debbie Review

Lessons for delivering
value and confidence
through trust and
empowerment



Front cover images

***Flooding encroaching on
Rockhampton airport***

*Photo courtesy Queensland
Fire and Emergency
Services*

***Airlie Beach lashed
by wind and rain***

*Photo courtesy ABC News
– Dan Peled*

***Pine Creek Road cut at Springbrook,
Gold Coast hinterland***

*Photo courtesy of ABC News
– supplied: Kira Lowe*

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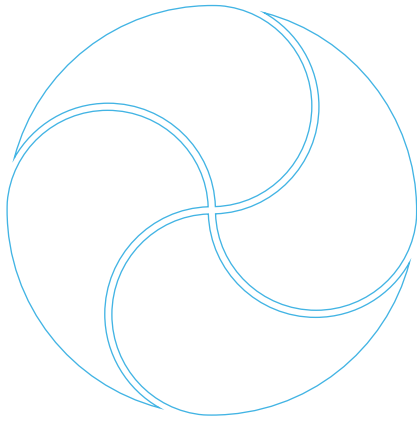
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A chapel on Hamilton Island.

Photo courtesy ABC News – supplied: Dennis Garrett



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21 August 2017



The Honourable Mark Ryan MP
Minister for Police, Fire and Emergency Services and
Minister for Corrective Services
PO Box 15195
BRISBANE QLD 4001

**Inspector-General
Emergency Management**

Dear Minister

In accordance with your instruction of 13 April 2017, I present a report into the effectiveness of the disaster management system in response to Tropical Cyclone Debbie and associated weather events.

We have undertaken this review with the future in mind. We have focussed on identifying the many examples of very good practice that were evident during this event, celebrating them and encouraging their sharing across the sector to assist others.

We have also strived to identify, analyse and fully understand any issues that arose and propose a range of improvement strategies.

Our recommendations are aimed at enabling the system to deliver greater public value and confidence through trust and empowerment across the sector.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Iain S MacKenzie'.

Iain S MacKenzie AFSM
Inspector-General Emergency Management

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Foreword



Inspector-General Emergency Management

The impact of Severe Tropical Cyclone Debbie across a large area of Queensland is now well documented and the vast recovery effort underway will continue into the future. Many people, businesses and indeed the environment still have a long road ahead.

The Queensland Reconstruction Authority reports that damage to infrastructure and industry in Queensland following Debbie will exceed \$1 billion. So far, the damage to agricultural crops is estimated at almost \$1 billion and loss of coal exports could exceed \$1.5 billion. Queensland's tourism industry has also been severely impacted and the assessment of this cost is still underway. Within one month of the event, more than 100,000 requests for recovery assistance were received and \$25 million in recovery grants issued. More than 2,300 residential properties were damaged, with almost 1,000 of them declared uninhabitable.

In addition, airports and sea ports were closed, rail lines were cut and numerous major and local road networks sustained significant damage. More than 30 local government authorities were activated for Natural Disaster Relief and Recovery Arrangements.¹

The State Recovery Plan includes specific recovery plans for eight local governments from the Whitsundays to the Gold Coast. Debbie, while causing widespread damage in multiple locations, resulted in three concurrent events across these council areas. These were:

- cyclonic impact and consequential damage including major flooding,
- rapid-onset flood events in the south eastern corner of the state, and
- slow-onset flood events in Central Queensland, particularly Rockhampton.

This Office was tasked with examining these three events, not from the perspective of reviewing the performance of any individual agency or any individual disaster management group, but how the disaster management system as a whole responded. Reinforcing the Government's desire to ensure a robust approach to continuous improvement across the system this Office undertook to work closely with Queensland Fire and Emergency Services, Queensland Police Service and the Local Government Association of Queensland and to attend as many debriefing activities as possible.

We undertook this review with the aim of identifying, analysing and fully understanding any issue that arose and to consider improvement strategies for the future. Importantly we also focused on identifying examples of the very good practice that had been evident, celebrating these and encouraging their sharing across the sector to assist others.

We actively sought the views of community members in order to validate our collective actions and inform future strategies that could improve the integration of government services and deliver safer and inclusive communities.

This review notes impacts, actions and activities for a number of councils and state agencies. These examples have been used to specifically enhance our examination of the disaster management system. We acknowledge that not all communities impacted are specifically mentioned. This in no way diminishes our concern and respect for these communities, or the value and importance of their work and activities.

Inspector-General Emergency Management

Foreword

In conducting this review we fully expected to be told of differing viewpoints, opinions and perceptions, and to be given robust feedback on the performance (whether perceived or real) of some aspects within the system. We have approached this from a viewpoint of delivering an outcome that has the community at the centre of our considerations, uninfluenced by political, professional or personal consideration, recognising that within such high stress environments, with everyone focused on doing the right thing, there are bound to be issues and differences arise.

We were pleased that a number of previously identified issues, particularly in the area of communications had improved and generally noted the commitment and dedication of all in seeking to deliver quality outcomes and value.

While we expect our emergency services and major operational departments to be well prepared to respond in numbers and in a coordinated fashion, which was evident, other departments are often less rehearsed at large scale deployments.

In response to Debbie we noted the effort of, and collaboration between, Regional Hospital and Health Services and Queensland Health in order to ensure core service delivery to the Mackay area in particular. Queensland Health's approach to capturing learnings from the event and sharing them across all HHS's and the Department is also to be commended.

Also commendable is the approach to debriefing adopted by Burdekin Local Disaster Management Group. This approach actively focused on identifying and documenting those things the group wanted to be able to repeat and areas it wanted to improve, specifically looking to produce guidance for members on what needs to be done in the first 12, 24, 48 and 72 hours after an event.

A notable observation has been the difference in community knowledge, perception and preparedness between the north of the state and the south east.

Although we had heard in the past from North Queensland that its communities "knew" cyclones, the community survey provided evidence to support the suggestion that those who lived in areas that regularly experience these events were in fact better prepared. Whether this is due to experience, community education campaigns or simple folklore is less clear. It does however reinforce that those with responsibilities for less-aware communities should do more to lessen the knowledge void.

While every review will identify opportunities for improvement, it has been pleasing to see how proactive disaster management groups and others have been in honestly and thoroughly appraising their efforts and identifying these opportunities. Equally important to not focus only on these, there are many excellent examples of cooperation and ingenuity identified in responding to this event. These too need to be shared so others can adopt them and improve outcomes.

The clear takeaway from this work is that the disaster management system in Queensland is well constructed, experienced and practiced. Communities can have confidence that, at all levels, Government and all supporting entities are focused on delivering value and have the community as the centre of thinking.

Iain S Mackenzie

Inspector-General
Emergency Management



Flood gauge in the Fitzroy River.

Photo courtesy of Rockhampton Regional Council

Executive Summary

INTRODUCTION

As a severe tropical cyclone, Debbie crossed the coast in the Whitsunday area on Tuesday 28 March 2017. The impacts of this slow-moving weather system were immediately felt by local communities and Mackay. Over the coming days, strong winds and torrential rain resulted in significant damage to homes, infrastructure and agriculture across the region. Major flooding isolated or impacted many communities.

By the night of Thursday 30 March Debbie's rainfall in the south east corner of Queensland led to rapid-onset flooding affecting communities within the Scenic Rim, Gold Coast and Logan council areas. As Debbie continued her track south into Northern New South Wales, Queensland's Disaster Management System (the System) moved from response to recovery.

The impact of Debbie across a large area of Queensland is now well documented and the vast recovery effort underway will continue into the future. The Queensland Reconstruction Authority (QRA) reports that damage to agriculture in Queensland following Debbie will exceed \$1 billion and in excess of \$1.5 billion to coal exports.

Debbie resulted in three events which at times were concurrent:

- Cyclonic impact and consequential damage including major flooding,
- Rapid-onset flood events in the south eastern corner of the state, and
- Slow-onset flood events in Central Queensland, particularly Rockhampton.

The Office of the Inspector-General Emergency Management (IGEM) was tasked by the Minister for Police, Fire and Emergency Services and Minister for Corrective Services with examining these three events, not from the perspective of any individual agency or disaster management group but how the System as a whole responded.

To inform this report we engaged with 80 entities. We also actively sought the views of 1,200 members from impacted communities in order to validate our collective actions and inform future strategies.

The disaster management sector is experienced at reviewing "how things worked" following operational activity. While local lessons are often identified, lessons for the broader system are less so. Shortcomings have stemmed from attention on what went wrong. Lessons, good practice and innovation emerging from Debbie must continue to inform continuous improvement.

Our perspectives of this review are that leadership at all levels of government and non-government are committed to ensuring the best community outcomes. Queensland's size and decentralised nature underpins its local leadership of the management of disasters. Local governments across Queensland differ in many ways. All have the same responsibility, but their practical capability and capacity varies.

Twenty-two disaster districts support local governments and local disaster management groups. Supporting the disaster districts and providing direction about disaster management are a range of state-level committees, groups and agencies. At their peak sits the Queensland Disaster Management Committee (the QDMC or Committee). The Committee is chaired by the Premier of Queensland. Its standing members are ministers, supported by "attending officials," who are senior public servants.

The QDMC is supported by the State Disaster Coordinator (SDC) and the State Disaster Coordination Group (SDCG). The SDCG comprises senior officers from all Queensland Government departments, the Queensland Reconstruction Authority, and the Public Safety Business Agency (PSBA). Non-government organisations and commonwealth agencies are standing invitees. Energy Queensland's two electricity distributors – Energex and Ergon – along with Telstra, Optus, and dam operators SunWater and Seqwater are included.

All governments strive to ensure the communities they serve value, or receive value from, the services that they deliver. Building and maintaining community confidence and participation in the System, as public value changes over time is difficult. For all levels of government, maintaining trust with communities is key to both engaging people and delivering disaster management community outcomes. If information given to the community about disaster events does not meet its needs, it can lead to confusion, unrealistic expectations and ineffective or unsafe responses.

Community engagement should not just refer to the one-way provision of information. For the community to accept they have a role, collaborative engagement requires honesty and transparency. Realistic expectations must be set. When the government's management of disaster response is implemented alongside an empowered community, there is a greater chance that activities will be better targeted, received and sustainable.

Notes

- a. Throughout this review, we refer to the weather caused by this event by the name given to the cyclone by the Bureau – Debbie.

THE THREE CONCURRENT EVENTS

North Queensland – cyclone and flooding

As Debbie approached, councils alerted their communities through door-knocks, radio, website, and social media. The Townsville Local Disaster Management Group (Townsville group) convened on Friday 24 March. Work continued into Sunday 26 March to evaluate the chances of the various storm surge possibilities and plan evacuations accordingly. Directed evacuation for parts of Townsville's red evacuation zone was issued on Sunday night to start at 6.00am the next day. People in this area were told to seek shelter with friends and family in a safer location. During the morning of 27 March, the cyclone's predicted tracks were more southerly, and by 11.00am Townsville was clear.

The Burdekin local group similarly met on 24 March and started early messaging. It planned for three options, a crossing to the north, to the south or a direct impact. A directed evacuation of some beach locations followed. On Monday 27 March, after a state decision, buses were provided for a voluntary evacuation of Ayr and Home Hill to Cairns.

Despite early cyclone forecast tracks that put Whitsunday outside the risk zone, preparation by the local group again started on 24 March. Messaging complemented new easier-to-understand storm tide zones that had been publicised during pre-season campaigns. Cyclone shelters were well stocked and readied, and the movement of tourists away from the area began, although many remained until after the cyclone passed.

Debbie intensified to a category 4 severe tropical cyclone off the coast of the Whitsunday Islands on Monday 27 March. On Tuesday it passed over them, bringing dangerous and destructive winds. At 12.40pm it reached the mainland, still at category 4. The eye crossed directly over Airlie Beach before moving across Proserpine as a category 3 cyclone.

The system continued further inland, reaching Collinsville at category 2, and finally dissipated to a tropical low south west of Collinsville in the early hours of Wednesday 29 March. Damage in Proserpine Bowen, Airlie Beach and in the Whitsunday Islands was significant.

Thunderstorms followed, hampering assessment and relief. Evacuation of tourists from resort islands restarted on 30 March. Transition to recovery followed swiftly on 3 April.

Mackay was initially well south of the predicted track. Nonetheless, the Mackay local group started messaging on Saturday 25 March. Storm tide predictions for Mackay followed on 27 March. It advised the most vulnerable areas north of Mackay to evacuate. The District Disaster Coordinator (DDC) later directed the evacuation from similar areas in Mackay. Later thunderstorms exacerbated widespread rainfall totals of 250-700mm in 48 hours in the Pioneer River catchment.

Isaac Regional Council also experienced the effects of dangerous winds, high intensity rainfall and rapid onset flooding. Properties became isolated. The weather disrupted supply and product movement. The local group's planning with mining companies helped. Its analysis of lessons and action plan will help mitigate future events.

For all managing the immediate response in the impact area, the slowness of Debbie to pass resulted in considerable fatigue.

South East Queensland – rapid-onset flooding

By Tuesday 28 March, as the cyclone impacted North Queensland, southern councils began their preparations. On the morning of Thursday 30 March, Debbie was tracking south east of Emerald and projected to reach the south east corner of Queensland by Thursday afternoon. Expectations of what this meant, though, differed from local group to local group.

The worsening weather resulted in the decision, early on Thursday 30 March, to close schools. In South East Queensland most rain fell between the morning of Thursday 30 March to midday Friday 31 March. By early Thursday evening, flash flooding occurred on the Gold Coast, isolating areas in the hinterland. The rain caused unprecedented demands on the *QLDTraffic* website. By late evening on Thursday 30 March, increased-severity flood warnings in the Albert and Logan rivers were issued for the Redland, Gold Coast, Scenic Rim and Logan councils.

By late Friday 31 March Debbie was offshore and affecting northern New South Wales. It had caused major flood levels within the Albert and Logan catchments. Seventy-six properties were deemed uninhabitable. By 8 April ongoing operations had transitioned to recovery and all local groups and district groups in the South East had stood down.

Rockhampton – slow-onset flooding

Central Queensland is strongly influenced by the Fitzroy River basin. On Wednesday 29 March, as Debbie moved south west of Collinsville, an Emergency Alert (EA) message, issued by Central Highlands Regional Council, warned of potential flash flooding.

On Friday 31 March, the Rockhampton local group stood up to respond to the recent rain and began preparations for the town's third major flood in six years. Two sets of EA messages were sent on behalf of the Rockhampton Regional Council. The first, issued on Sunday 2 April, included some residents in Livingstone, causing confusion there. The second was more targeted to addresses likely to be affected by the flood. Previous floods had led to a number of mitigation projects being jointly funded by Rockhampton Regional Council and the Queensland and Commonwealth governments. These mitigation measures worked. The Yeppen overpass, constructed after the 2011 floods, prevented Rockhampton's isolation. Evacuation centres in Rockhampton and Livingstone were prepared; although Rockhampton's received few people. The Rockhampton local group concluded that the town was the most prepared it had ever been and that excellent support had been provided by the state.

State-level operations

Preparation

By March 2017, at a state level, much work had been done to prepare for disaster events such as Debbie. Improvements to the State Disaster Coordination Centre (SDCC or the Centre) had resulted in sound procedures, good – though not perfect – technical systems, and people well prepared to deal with an event.

The Department of Transport and Main Roads (TMR) had put significant effort into developing the *QLDTraffic* website as a single source of truth for road closure. The Department of Communities, Child Safety and Disability Services (DCCSDS) had developed an online grants and electronic funds transfer (EFT) payments system, and released the *People with vulnerabilities in disasters – a framework for an effective local response*. The utilities sector also played a significant part in the state's preparedness. In mid-December 2016 the QDMC had held a pre-season exercise.

Hazards

Several agencies had made improvements to flood and storm tide hazard identification, and the communication of risks. In 2015, *Queensland's Tropical Cyclone Storm Tide Warning – Response System Handbook* had been updated to include a list of 64 potential locations where the Bureau of Meteorology (the Bureau) would produce Storm Tide Warnings. In September 2016 the Bureau introduced standardised content, structure and language for flood warnings. The Queensland Fire and Emergency Services (QFES) had developed the *Queensland Emergency Risk Management Framework*.

By March 2017 the QRA had worked with QFES, the Bureau and more than 40 priority councils to identify and recommend improvements to flood warning systems and design improved networks. We commend the success of this work.

Warnings

The national Emergency Alert (EA) telephone-based warning system sends voice messages to landlines and text messages to mobile phones in a defined geographic area. During Debbie, between 26 March and 5 April, 75 EA campaigns were issued across Queensland with more than 5.9 million messages sent to impacted areas.

Evacuation planning

The decision to evacuate is a critical one. In some cases there were differing opinions between the state and local groups about the need for evacuation.

We observe that differing decisions may be due to information on the situation being incompletely shared, or different snapshots of information considered at different times. We do note that decision-makers at state level and most local and district groups had only most likely and worst case scenarios, with little qualifying information about the probability of either.

Response

The SDCG coordinates disaster response operations for the QDMC. However, the proactive involvement of QDMC somewhat eclipsed its formal role. The SDCC provides a single point of truth about an event. One debrief comment was that "TC Debbie was probably the best planned disaster we have ever had."

However, some of those working in the Centre still noted scope for improvement, particularly in the areas of information requirements, report-writing, and systems for reporting.

Health

Debbie was felt in one of the State's 16 Hospital and Health Services (HHS) – that covering Mackay and the Whitsunday area. The activation showed that Queensland Health acquitted its disaster management accountabilities well. Most effort went into providing clinical support and mental health support.

But public health advice about water, sewage, food hygiene, medicines and vaccines, hazardous waste, and vector control was also much in demand.

Lessons related to technology, and systems used to communicate with staff could confuse, with staff viewing Bureau online videos slowing internal networks.

Other learnings related to processes for deployment, coordination with aged-care facilities.

Recovery

The transition at State-level from response to recovery has been supported, since June 2015, by the QRA (Queensland Reconstruction Authority) as a permanent agency. The State's transition to recovery was fast.

A State Recovery Coordinator (SRC) was appointed at 2.00pm on 28 March, while Debbie was still making landfall. Eight impacted council plans are included in *Operation Queensland Recovery*.

THEMES

Five major themes emerge from the three events above:

- planning,
- public information and engagement,
- information management,
- evacuation, and
- capability.

Planning

Plans and planning are a fundamental part of disaster management. In the response to Debbie we found some higher-capacity councils with good plans and sub-plans, and the capability to conduct robust event planning, particularly when time was available. Others with lower capacity or less experience were pleased to take up offers of support and guidance, provided by the SDCC and state agencies, to inform local planning and preparation.

Risk

Risk-based planning improves understanding of priorities for preparation and mitigation. In some areas the risk of hazards is well understood; in others it is less so, resulting in pressure on planners during an event. Queensland relies on an extensive flood gauge network to predict flood risk. Information from the network, and its efficient operation and maintenance, is vital for disaster management.

While there has been significant investment in improving it, the number of owners, the range of maintenance regimes, the methods of passing gauge data, and the need for redundancy continue to produce challenges.

In Debbie, perhaps the highest risk to communities was of storm tide inundation. Probabilistic models exist that can show decision-makers the chance of the risk in a particular area at a particular time.

Such knowledge allows decisions on the level of acceptable risk to be made and documented ahead of any potential event. Decisions can be recorded with the logic explained, rather than arrived at in the heat of the moment.

Planning for hazard mitigation

Rockhampton's hazard mitigation projects have been successful in reducing Debbie's flood impact on the town. Building infrastructure back better is one effective mitigation strategy. Effective land use planning is another. There is scope to better integrate the disaster management sector with those at both local and state-level involved in land use planning.

Business Continuity Planning

Business continuity planning (BCP) can mitigate the impact of disasters by building business and organisational resilience. Debbie highlighted gaps in business continuity. Plans should include better links between Queensland Government agencies and businesses.

Business continuity, communities and local critical infrastructure

All communities have local critical infrastructure essential to their wellbeing. Its restoration can be a key enabler of recovery. The Debbie experience showed that such infrastructure is less well identified, and that continuity plans could be improved. Much infrastructure – and therefore business continuity – relies on power, telecommunications and water. Knowing about restoration times will help recovering communities. We found instances of insufficient knowledge of the power requirements of facilities critical to the community. We were told of local groups not always able to get local critical infrastructure representatives to their meetings. Broader understanding of the role of utilities would be enhanced by their greater integration into collaborative planning.

Integration of plans and planning

The importance of collaborative planning was demonstrated by traffic plans, following the opening of the Bypass at Yeppen. We heard from some other councils that managing road closures across multiple entities remains challenging for the sector.

Experience

Event planning that builds on known and practised plans to direct operations continues to be critical. In general we note that more successful event planning was evident in those groups that had understood risks, planned, engaged the public, and developed their capability. These groups activated early in readiness for possible impact, even when they weren't sure if they would be affected.

Planning for transition to recovery

The *Interim Queensland Recovery Plan* set out disaster recovery arrangements for the 2016-17 disaster season.

Recovery groups were activated early, while response was still happening. The state's proactive approach was welcomed in places. Yet some had reservations about the quick transition from planning to implementation. Coordinating offers of assistance to affected communities appears not to have been as well planned centrally during this event, but was undertaken by a number of agencies.

Public information and engagement

The sharing of relevant, accurate and timely information that is easily understood, and useable by people to take necessary action is critical. Both local and district groups are responsible to ensure the community is aware of how to prepare for, and what to do during and after, a disaster.

To support this area, Queensland established the Crisis Communication Network (CCN), a whole-of-government communication network.

Remote communities

Checking on remote communities remains a potential issue.

In previous events, isolated communities could not make contact, and were assumed not to need help. One way to overcome this is the development of Emergency Liaison Officers (ELOs) within these communities.

Sources and Survey

During Debbie, Queensland residents and communities received information and warnings from a variety of sources.

People also sought information themselves. Councils cited high traffic to their Facebook, call centres and website pages. Despite the high traffic, the community survey showed the Bureau and the Australian Broadcasting Corporation (the ABC) are important for communities. An opportunity exists for councils to partner with these agencies or explore opportunities to maximise the message effect.

Media

Many councils stressed the importance of the media in disseminating information.

Increased centralisation of media agencies was problematic in getting coverage of local events. The volume, reach and diversity of sources did give most people access to information that they then used to inform their actions.

Communications infrastructure

One issue was not being able to communicate to, and hear from, the community. Communication plans must include contingencies that communities are aware of, and can activate should critical communication infrastructure be lost. Communications staff have a role to play in driving the importance of communication plans.

Information that influences action

Trust and empowerment

An informed and empowered community results from information that is informative, consistent, and understandable.

It is important that people are given clear information about the consequences of decisions and actions they choose to take. Some councils raised concern that providing such information had not necessarily translated into a more proactive and responsive community.

Despite council concerns, the majority of respondents to the community survey felt they were ready and able to deal with the impacts of the event.

Authoritative point of truth

Authority and consistency

Unpredictable events demand a communication system that provides clear information on what is known, and is delivered consistently by all parties.

The establishment of a “point of truth” was often expressed to us as pivotal in reducing inaccurate reporting. At both a state and local level there must be the capacity to distil information, and then coordinate consistent messaging using agreed words that tell the community what they seek.

Warnings and Emergency Alerts

Warnings empower communities to take appropriate action during a disaster. During Debbie, a range of strategies was used to inform and advise the community.

We recognise the significantly improved messaging put in place by SunWater and Seqwater over the past two years. The widespread nature and volume of warnings was reflected in the community survey.

The demographic profile of a community is central to understanding how best to warn those at risk.

Emergency Alert

Emergency Alert performed as expected in getting messages to people for the majority of campaigns. While the message may get through, its timeliness is imperative. The EA system was used to advise about school closures. If decision-makers were aware of how long this would take they may have decided to warn in other ways.

Many pre-planned campaigns have been developed, but *ad hoc* campaigns were issued during Debbie. Most campaigns were run in a timely manner for the event, however warnings to multiple sites can be slower.

Alerts issued along local government boundaries at times resulted in people on one side of a river receiving a warning, while those opposite did not. Content of warnings sometimes caused problems, with people left unsure what action to take. Previous reviews have highlighted the need for greater training and exercising of the EA system.

Overall the EA system has improved, but the issues identified still reflect a need for greater preparedness and training.

INFORMATION MANAGEMENT

Reviews, inquiries, and research highlight the importance of managing and sharing information to support effective disaster management. In Queensland, such information is captured, shared and used by various entities. Many data sets and information systems are not utilised fully. The *Disaster Management Act (2003)* (the Act) and disaster management guidelines cover sharing information through the levels of the System in Queensland.

The Debbie experience highlighted three related aspects of Queensland's information management:

- reporting,
- visibility, and
- interoperability.

Reporting

During Debbie the SDCC Event Management System (EMS) was used for the first time for situation reporting and noticeably improved it. However, coordinating up-to-date reports from others is difficult. Requirements changed often, reports were very large, and many local groups were constantly asked for information.

Visibility

Disaster management information systems should provide situational awareness to aid decision-makers. We heard that local situation reports were not visible in EMS, that a system that existed to show them was not known about or used, that information was sometimes sought but not provided, and that capability available was not used because the information about it was not visible.

We wonder how agencies involved in disaster management can make the best decision or avoid conflicting decisions if they do not know what information or resources each entity has.

Interoperability

The Debbie experience demonstrated strong interoperability between groups, agencies and systems in some circumstances. The integration of the main local, district, and state systems had improved information sharing, but had not solved interoperability issues adequately. We note that QFES, which has been solely responsible for leading the work to integrate the various information systems, has plans for further interoperability between these three systems. We recognise the barriers to introducing a common system across different agencies, but more work is needed here.

Briefings

Aside from reporting, considerable time and effort in disasters is spent trying to keep the many people involved fully informed.

EVACUATION

In Queensland, evacuation arrangements are in line with nationally-agreed principles and concepts. Planning takes account of five stages of evacuation:

- the decision,
- warning,
- withdrawal,
- shelter, and
- return.

Decision-making for evacuations is a shared responsibility. Local groups may call for the voluntary evacuation of local people and will coordinate such evacuations in their area. The authority for directing evacuation requires the Declaration of a Disaster by a DDC from the Queensland Police Service (QPS).

Several local groups reported community confusion surrounding the terms "cyclone shelter" and "evacuation centre."

Early community engagement about safer locations and what to expect in terms of services and facilities should form part of regular pre-season preparation.

Planning effort was evident throughout Debbie. Townsville's planning used probabilistic modelling to assess the risk. Burdekin integrated the local aged care provider into planning. However, aged-care providers more often require support in evacuation.

Return is critical to the recovery of communities. During Debbie this seems to have worked. Both in Mackay and Whitsunday more than 90 per cent of our community survey respondents were satisfied with the speed with which they could return home after being evacuated.

Community engagement

Engagement seems to have been done particularly well in North Queensland. Only a very few of our community survey respondents saw room for improvement. In the planning and engagement for evacuation during Debbie there was increased awareness of the needs of vulnerable people.

Decisions

Generally, decisions about evacuation before the event were made and conveyed to those affected in sufficient time. We observe that differing decisions may be due to information not shared completely, or different snapshots of information considered at different times.

Evacuation and tourism

Transient populations are a particular challenge for evacuation planners. The Whitsundays local group is particularly aware of these risks. Local tourism representatives told us that support from the Whitsunday Regional Council was superb.

They also told us about aspects of evacuation where further consideration is needed: where tourists should go if told to evacuate, and how they should get there, and the management of new arrivals after the cyclone had crossed.

Post-cyclone evacuation

Once Debbie had passed, the evacuation of tourists from the islands produced further challenges. Tourists and some accommodation providers found themselves caught up in conflicting information and parallel arrangements. The experience of tourist evacuation during Debbie suggests that clarity is needed about who is responsible for tourists once removed from their location, and who should expect to pay.

We recognise that cyclones are inherently unpredictable, and it may be unsustainable to evacuate in the face of every one. But the question of mandatory evacuation should be a stronger consideration in any future event.

CAPABILITY

Requests for Assistance

In Debbie, the number of Requests was smaller compared to previous events. The response to Requests passed up the system did not always meet expectations.

Staffing and sustainability

The State Disaster Management Plan (SDMP) guides the necessary staffing requirements for an agency to fulfil its functions. Though local groups manage disasters in their local area, in some circumstances councils may not have enough staff, or the right staff.

Prior to Debbie crossing the coast, pre-deployment occurred from a number of organisations. Due to the three events, the pre-deployment also provided sustainability challenges for disaster managers. Deployed staff from South East and Central Queensland were unavailable to their local groups when the subsequent flooding was predicted.

Fatigue management strategies were not sufficiently effective. One reason was the reliance in many places on one person in a key position. Fatigue management among volunteers was also a challenge.

Volunteers

A number of volunteer organisations play a role in disaster management to enhance capacity, particularly at the local level.

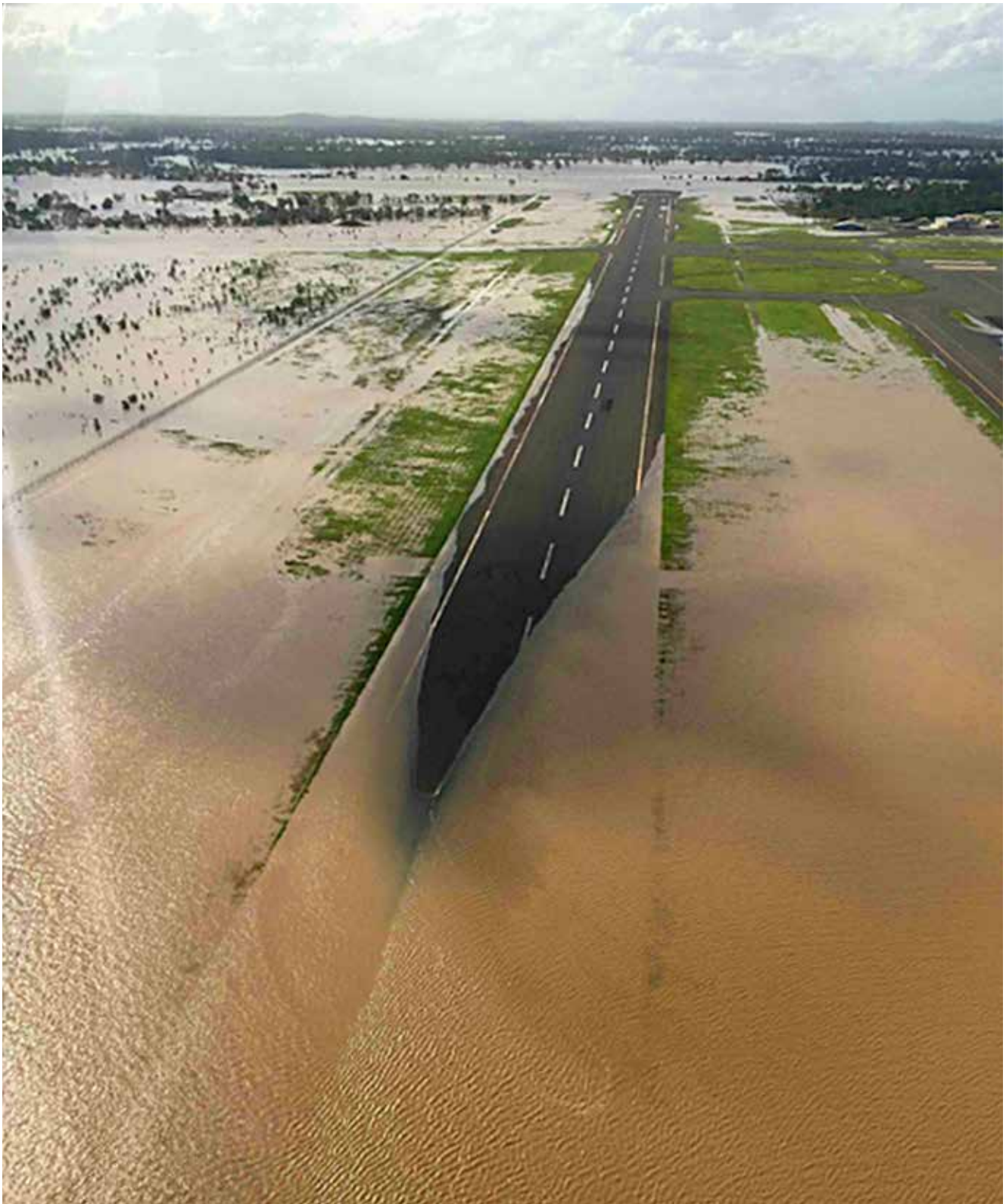
In Debbie, the deployment of additional State Emergency Service (SES) resources to support local capacity was done quickly. Volunteering Queensland led the management of offers from spontaneous volunteers in Logan. The recently-released QFES *Volunteerism Strategy* has identified a “critical need to develop more flexible strategies” to support volunteering.

Exercises and training

Debbie emphasised the value of training and exercises in preparing for disasters. Most involved had completed the appropriate training to manage the event. Some groups and agencies reported that they had exercised response activities or scenarios like Debbie recently.

From our invitation to debriefs and interviews we note that local disaster management groups, district, and state groups and state agencies largely exercise independently.

Despite the training and exercising that does occur, Debbie highlighted that misunderstood terminology is a barrier to effective disaster management. It is important that key terms are defined and that definition has a shared meaning across the sector.



Aerial view to the north west of Rockhampton airport from above the submerged threshold of runway 33.

Photo courtesy of Queensland Fire and Emergency Services

The weather of Queensland's summer months in early 2017 had been relatively benign. In late March 2017 a tropical low in the Coral Sea formed into a cyclone that the Bureau named Debbie. Severe Tropical Cyclone Debbie crossed the coast in the Whitsunday area on Tuesday 28 March 2017.

The impacts of this slow-moving weather system were immediately felt by the communities around the Whitsundays and Mackay. Over the coming days, strong winds and torrential rain resulted in significant damage to homes, infrastructure and agriculture across numerous local government areas. Major flooding isolated or impacted many communities. By the night of Thursday 30 March, Debbie's rainfall in the south east corner of Queensland led to rapid-onset flooding affecting communities within the Scenic Rim, Gold Coast and Logan council areas. As Debbie continued her track south into Northern New South Wales, Queensland's Disaster Management System moved from response into recovery for the state's affected communities.

The role of communities at the forefront of disasters is clearly communicated in the *Queensland Disaster Management Strategic Policy Statement* of 2016. One of the key objectives is to "Empower and support local communities to manage disaster risks, respond to events and be more resilient".² The Queensland Government is keen there is a robust approach to continuous improvement across all aspects of disaster management in Queensland, importantly, ensuring that the expectations of Queensland communities are met.

This report examines how the Queensland Disaster Management System prepared for, responded to and provided early relief and recovery to those impacted by Debbie. Views of impacted communities have been taken into account in this review. Its findings form part of the approach by the Queensland Government, in partnership with communities, non-government organisations and businesses, to continue to reduce disaster risk and strengthen resilience.

The Queensland Government has also committed to ensuring improvement strategies focus on responsive, coordinated and integrated government services. Ultimately, these will encourage safer and inclusive communities.

Role of the Inspector-General Emergency Management

The Minister for Police, Fire and Emergency Services and Minister for Corrective Services tasked the Inspector-General Emergency Management to undertake this review to:

- provide assurance that there is a robust approach to continuous improvement across all aspects of the disaster management system in Queensland
- ensure that lessons from these events are captured, that common themes for improvement are identified, and that the sharing of good practice is enabled, and
- ensure that any issues that have arisen during Debbie are fully understood, and improvement strategies identified.

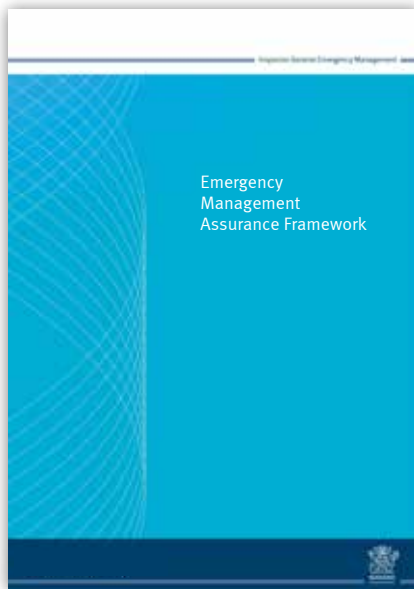
Section 16C of the *Disaster Management Act 2003* provides the Office of the Inspector-General Emergency Management (the Office) with the authority to undertake this review. Our functions include:

- to review and assess the effectiveness of disaster management in the state, including the State Disaster Management Plan (SDMP) and its implementation,
- to regularly review and assess the effectiveness of disaster management by district groups and local groups, including district and local disaster management plans, and
- to regularly review and assess the 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.

Introduction



Introduction



The Emergency Management Assurance Framework supports accountability and builds consistency across all levels of the disaster management arrangements and reinforces a shared responsibility for delivering better disaster management outcomes for the community.

Source: IGEM

Approach

The review process aligns with the *Emergency Management Assurance Framework*. Specifically, the review of the System's effectiveness is considered against the *Standard for Disaster Management in Queensland* (the Standard).

Considering the track and impact of this weather system, the review looked at three key facets of Debbie:

- the direct cyclone impact in North Queensland,
- the rapid-onset weather conditions after the cyclone's coastal crossing, in particular within South East Queensland, and
- the slow-onset flooding experienced in the Rockhampton area.

In considering these three interconnected, and at times concurrent events, we also considered disaster management operations at a state level and the integration of disaster management functions at the local and district levels of the System.

We have not considered the performance of individual state government agencies or disaster management groups. We have, however, highlighted examples of good practice that we have seen, with the view that others may seek out more information and further share experiences.

The review has been undertaken within the framework of the current legislation and arrangements. The review does not consider the significant longer term recovery efforts instituted in the wake of Debbie.

We collected evidence from 80 entities (Appendix B) to inform this report and its findings. The sources of evidence for this review have included:

- attending 22 formal debrief sessions undertaken by local, district and state disaster management groups,
- engaging with entities, including Local Disaster Management Groups (LDMGs), District Disaster Management Groups (DDMGs), and state government, non-government and commonwealth agencies,
- reviewing policy, plans and other associated data that supports disaster management activities,
- analysing specific data related to Debbie, e.g. Emergency Alert campaigns,
- researching good practice evidence and case studies to inform identified themes for improvement, and
- analysing previous reviews undertaken by the Office and other entities.

In addition, an experienced and independent market research company was engaged to undertake a community survey of 1,200 residents from impacted communities regarding their experiences of the event and other factors related to disaster management. The report, *Quantitative Research with Community Members* (community survey), is available online on the IGEM website at www.igem.qld.gov.au

During the review we liaised closely with QFES, the QPS, the Disaster Management Interdepartmental Committee (DMIDC) and impacted local governments. Draft findings and recommendations were considered by all key stakeholders who provided input into the review process. Feedback is reflected in the final report.

Notes

Source links for the Emergency Management Assurance Framework and the Standard for Disaster Management in Queensland (the Standard) are:

- <https://www.igem.qld.gov.au/assurance-framework/Pages/default.aspx>
- <https://www.igem.qld.gov.au/assurance-framework/Pages/standard.aspx>

Introduction

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 Emergency Management Assurance Framework.

Source: IGEM

Findings



Culture of learning

Where there were comprehensive and consistent approaches to debriefing, opportunities for improvement and good practice were better identified.

Ability to plan

The individual plans of stakeholders in the sector are sound. Some are excellent. Stakeholders told us, though, that many are developed in silos. The quality of plans would be enhanced by greater reference to risk and more collaboration.

Risk

Queensland is well positioned, in places, to understand the risks of cyclone and flood. The implementation of the Queensland Emergency Risk Framework by Queensland Fire and Emergency Services, and the work by the Queensland Reconstruction Authority to improve understanding of floods through the flood gauge network and programs addressing flood studies is contributing to an enhanced understanding of risk.

Models, which show decision-makers the probability of events occurring, enable better decision making and improved community outcomes. In cyclones, models which provide this interpretation of chance give decision makers with this level of sophistication. For any other event, the Queensland Emergency Risk Framework has great potential to also help drive such improvements.

Worst case planning is valuable and at times needed, and in this instance was used appropriately in places. Decisions based on a “worst case” should be considered very carefully before being applied. A finer-grained approach to risk based planning and one where information is shared between decision-makers at different levels would benefit all.

Business continuity, communities and local critical infrastructure

Enhanced business continuity planning within state agencies, businesses and communities will help all to be more resilient to the impact of events. Communities will benefit when such plans of businesses and local critical infrastructure are integrated with the plans of others on which they rely

Integration of plans and planning

The planning and implementation of road closures is a shared responsibility between local and state authorities. Coordination and public messaging proved problematic in some places during Debbie. Focused attention combined with exercising of plans and sharing of good practices and efficiencies before next season will deliver tangible benefits.

Planning for transition to recovery

Despite the good work by Queensland Fire and Emergency Services in 2016 in updating the policy and guidelines for Offers of Assistance, there remains a level of confusion over who is accountable. Similarly, GIVIT, which is charged with managing public donations, felt there are opportunities to improve the process.

We found a number of exemplary approaches to preparation and planning. These include:

- Townsville local group’s planning for evacuation, both immediately before the event and over the past four years, in preparedness, planning and exercises.
- Whitsunday’s early activation and approach to “worst case planning”, anticipating a direct impact on the area.
- Rockhampton’s implementation of betterment projects to reduce the effects of flooding on the city.
- Ipswich local group’s scenario planning approach to possible rainfall events, and its readiness for an event on the scale of the 2011 flooding.
- Energy Queensland’s upgraded disaster assessment and tasking approach that speeds the time of electricity restoration.
- State government agencies’ anticipatory deployments that provided community reassurance and enabled resources to be on hand quickly when needed.
- Planning for the transition to recovery, underpinned by considerable preparation by the Department of Communities, Child Safety and Disabilities Services and Queensland Reconstruction Authority in the months before Debbie.

Culture of learning

Queensland should implement and maintain a system-wide lesson management program.

Ability to plan

NO RECOMMENDATION

Risk

The operation and maintenance of flood gauges should be developed and planned for on a catchment basis.

Queensland should examine the feasibility of the installation of storm tide markers in prominent public places and the exploration of new technology to highlight storm tide risk to the community and its visitors.

Planning and warnings for storm tide should be based on modelling that shows the chances of an event occurring (probabilistic).

Business continuity, communities and local critical infrastructure

Business continuity planning should feature permanently in disaster management doctrine.

Integration of plans and planning

Local disaster management groups should focus on the business continuity of local critical infrastructure and its integration with other plans.

Planning for transition to recovery

The Queensland Offers of Assistance Policy, particularly for corporate donations, should be updated and exercised prior to the next season.

NO RECOMMENDATION

Recommendations



Findings

Public information and engagement

Our survey revealed that, currently, the public principally uses the Bureau of Meteorology and the media as key sources of information. There are opportunities to link these sources more closely with information from local government and state agencies. The Office of the Inspector-General Emergency Management, is aware of a range of research activities that could be leveraged and intends to explore these in the future.

Communications infrastructure

Loss of communications, in some areas, affected the ability to respond, and to keep the community informed. Not all continuity planning sufficiently considered alternative arrangements.

Throughout the review we identified that messaging and information must be more explicit and simplify complex situations for the public. Messaging and engagement must be tailored to the knowledge and experience of the community.

Consistent messaging across entities is essential to ensure community confidence and to enable a well-informed community.

Given the pivotal role that the media plays during disaster events, there is a clear need for coordinated messaging coming from councils and agencies to reduce the risk of inaccurate information being broadcast. One of the key roles of the Crisis Communication Network is to monitor the media and correct inaccuracies. The full utilisation of the Network may have been beneficial.

Warnings and Emergency Alerts

Emergency Alert and other digital ways of warning are important but need to be used in a suite of tools to adequately inform the public. Information works best when it is timely, contextualised, informative, consistent and understandable.

Planning for the use of Emergency Alert significantly enhanced the relevance of messages and the speed with which they were delivered.

Information management

Much effort was made by many to share information across systems, often by repeating or reproducing information. The resulting volume had its own challenges. Reports that concentrated on discrete issues were better received than long comprehensive ones. Future reporting may be improved by greater analysis rather than just data.

Sharing of information in disasters is hindered by the number and connectivity of systems in which it is managed. We understand the background to the systems' variety, and commend the initiative, energy and workarounds, of those who manipulate the system to make it work.

The technical inability to share information successfully contributes to misunderstandings between decision-makers at different levels. Misunderstanding erodes trust, and trust affects the relationships that are an important enabler of successful disaster management operations.

Briefings worked well, but there is still scope for efficiencies in appropriate attendance and focus. In a dynamic situation, briefs get out-dated quickly. Live feeds are preferable – the Bureau of Meteorology's website to a weather slide-pack, for example.

Public information and engagement

A Local Government Association of Queensland representative should be included on the Crisis Communications Network to enhance the delivery of consistent information across and between levels of government.

Communications infrastructure

NO RECOMMENDATION

NO RECOMMENDATION

NO RECOMMENDATION

NO RECOMMENDATION

Warnings and Emergency Alerts

Efforts are made to improve the timeliness, accuracy and targeting of Emergency Alert messaging by:

- educating the sector about how Emergency Alert works in detail, and involving them in its testing.
- ensuring the preparation and authorisation of Emergency Alert campaigns consider those to be warned, and are not limited by disaster management boundaries.
- allowing the operation of Emergency Alert and the authorisation of its campaigns by disaster management practitioners at a district and local level.

NO RECOMMENDATION

Information management

NO RECOMMENDATION

NO RECOMMENDATION

A strategy should be developed to improve the availability of information to decision-makers and other audiences. Information should be searchable, more specific, timely, and allow stake-holders to find what they want.

Significant effort should be invested to provide disaster decision-makers at every level with a shared understanding of risks, the situation, and capability, so that they can agree on the best decisions for the communities they serve.

Recommendations

Findings

Evacuation

A number of evacuation plans for aged care facilities were overly reliant on agencies that had not been involved in the planning. The plans therefore had no guarantee of implementation.

We recognise that good work has been done, by both local governments and the tourism sector to mitigate the effects of cyclones. Gaps in arrangements still remain, particularly around evacuation and new arrivals.

The arrival of tourists and other visitors immediately after a disaster, inhibited recovery effort and potentially reflected badly on Queensland's tourist reputation. Return of tourists as early as possible to holiday areas is however essential to sustained recovery.

The tourism and disaster management sectors have different perspectives of evacuation arrangements and how they should be organised. There is scope for better understanding of each other's perspectives and agreement on how arrangements will work in the future. Tourists will benefit if this happens.

Responsibility for tourists who require evacuation is unclear, causing confusion among authorities and tourism operators, and frustration for tourists themselves.

Capability

The arrangements for Requests For Assistance are complex. Whether from resources within the state, or from the Defence Assistance to the Civil Community, they involve funding, bureaucracy and authorisation. A range of obstacles were evident to initiators, slowing the timely delivery of support.

Carefully planned pre-deployment of trained staff enhanced capability, ensuring rapid relief and recovery activities. This was evident for state agencies, non-government organisations and critical infrastructure providers. Triggers for, and models of, deployment should continue to be refined using learnings from Debbie.

Fatigue significantly impacted the sustainability of critical roles during Debbie. This is especially evident at all levels of the system where disaster management expertise, combined with contextual knowledge is relied upon. In prolonged events fatigue may impact on critical decision-making.

Disaster groups and state agencies that plan for human resourcing requirements during operations are more likely to deliver expected outcomes.

Volunteers played a vital role during Debbie. Traditional emergency management volunteers, such as State Emergency Services, and spontaneous volunteers ensured rapid relief to communities. Continued support and advocacy of informal and non-traditional volunteering through organisations such as Volunteering Queensland and the social sector ensure the community is rapidly supported following an event.

Exercises and training

Exercising is often undertaken in a siloed manner - limited to local and district groups, or internal to an agency, state group or centre.

Where disaster management plans were tested, groups were trained and had exercised risks, good outcomes were more evident. This reinforced that emergency management exercises are one of the best ways to test capability.

From our checking of pre event activities we note that exercising has been undertaken in siloed manner - limited to local and district groups, or internal to an agency, state group or centre. Enhanced shared understanding of roles and responsibilities, critical decision points and information flow is likely if exercising focused on vertical integration and included all levels of the system.

Terminology that is not consistent and well understood by disaster management practitioners may lead to confusion. We acknowledge the work that is ongoing in the Queensland Disaster Management Lexicon Program, facilitated by the Office of the Inspector-General Emergency Management, and the National Disaster Resilience Glossary Project facilitated by the Australian Institute for Disaster Resilience.

Evacuation

The Queensland Chief Health Officer should work with the Office of the Inspector-General Emergency Management to raise, with the Commonwealth, the need for all aged care providers to plan and exercise for evacuation to a similar safe establishment.

NO RECOMMENDATION

A strategy should be developed between the key tourism and transport operators, and local and state government. It should address the arrival of visitors and tourists after a disaster, and should ensure that their arrival matches communities' needs for recovery and return to normal business. The Department of Tourism, Major Events, Small Business and the Commonwealth Games should monitor its implementation.

Relevant authorities should work with the tourism sector to clarify future arrangements for evacuation. In particular they should look closely at differentiating voluntary and directed evacuations in their messaging, ensure the differences are explained to the community in pre-season campaigns, and that necessary information is passed on to tourists.

Principles, applicable to all tourist budgets, covering liabilities for costs and shelter in the event of evacuation should be developed and promulgated as part of tourism marketing.

Capability

The provision of system-wide education, guidance and testing to enhance Requests for Assistance is strengthened.

NO RECOMMENDATION

Fatigue management strategies and guidance should be improved to ensure sustainable staffing practices are incorporated into disaster management planning.

NO RECOMMENDATION

NO RECOMMENDATION

Exercises and training

Exercising should focus on vertical integration and include all levels of the system. A strategic program of exercises should be developed and implemented.

NO RECOMMENDATION

Recommendations

Unless otherwise referenced, data is drawn from the State Recovery Plan 2017–19 as at 4 May 2017

Environment

- Damage to and loss of flora and fauna
- Reduced water quality: Moreton Bay and Great Barrier Reef
- Erosion of stream banks and gullies



Buildings

(as at 21 April 2017)

944 properties assessed as uninhabitable

2,360 properties assessed as damaged



Cyclone Debbie Statewide impacts...

Insurance Council of Australia members:

- Claims: 58,000+
- Value: \$1.4 billion
- Home/home contents: 80%

(as at 17 July 2017)



Queensland coal estimates of export impact: potentially upwards of \$1.5 billion

Economic



The National Farmers' Federation has cited industry groups estimating damage to crops of up to \$1 billion





33% of all urban premises damaged
208 properties severely damaged or destroyed

Other horticultural losses: \$100 million



Cane industry damage: \$250 million

80+ marine vessels

- run aground
- missing
- sunk



In Whitsunday local government area alone ...



Power disrupted to 65,000 premises
(95% restored within 16 days)

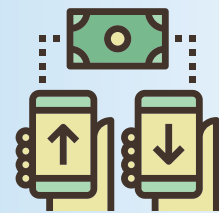
Storm surge threat: 4,357 premises directed to evacuate



63,000+ calls to Community Recovery Hotline



315 emergency housing assistance requests received



106,624 applications to the Online Grants Portal
(at 28 April 2017)

Human and Social



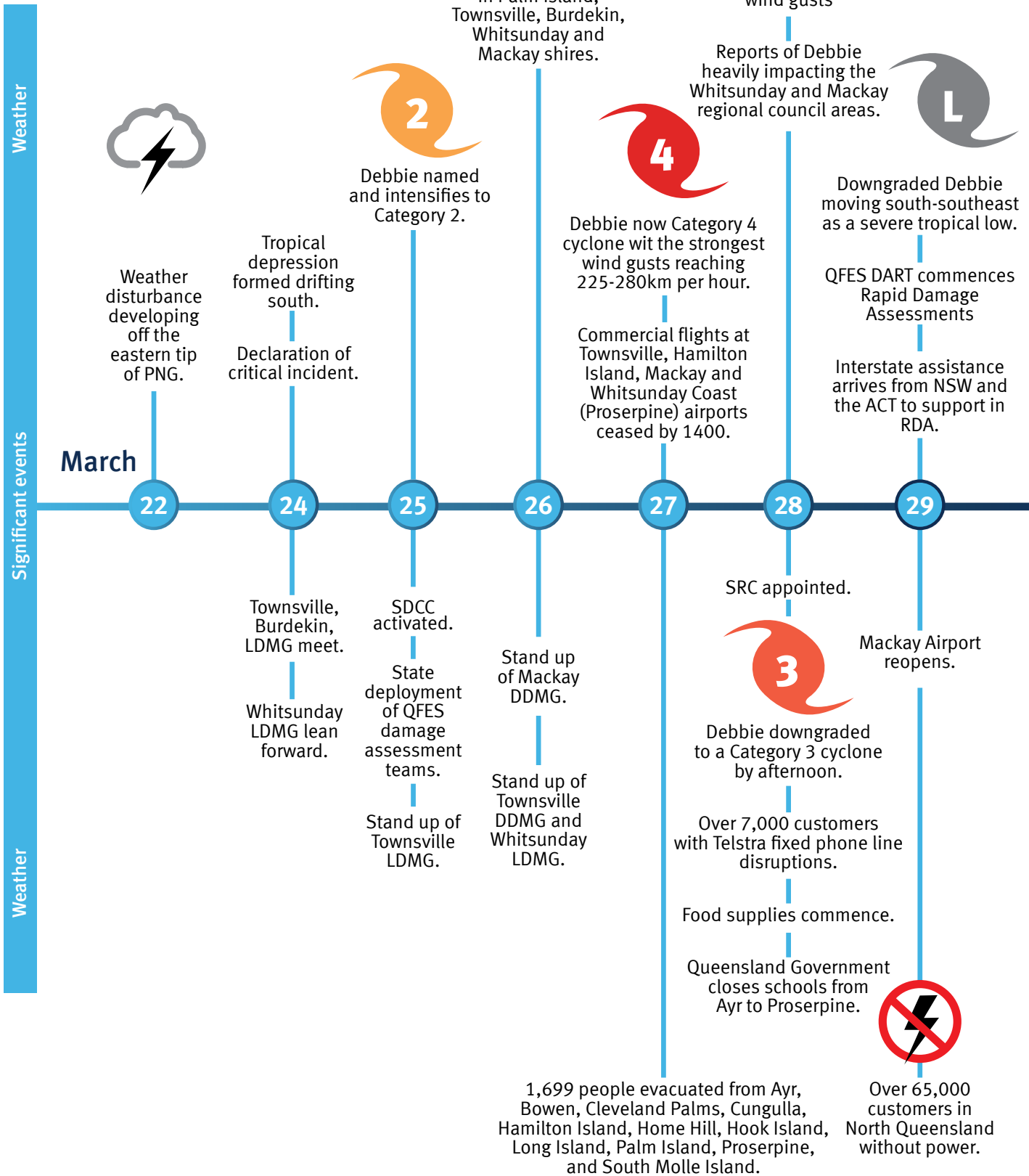
36 local government authorities activated for Natural Disaster Relief and Recovery Arrangements



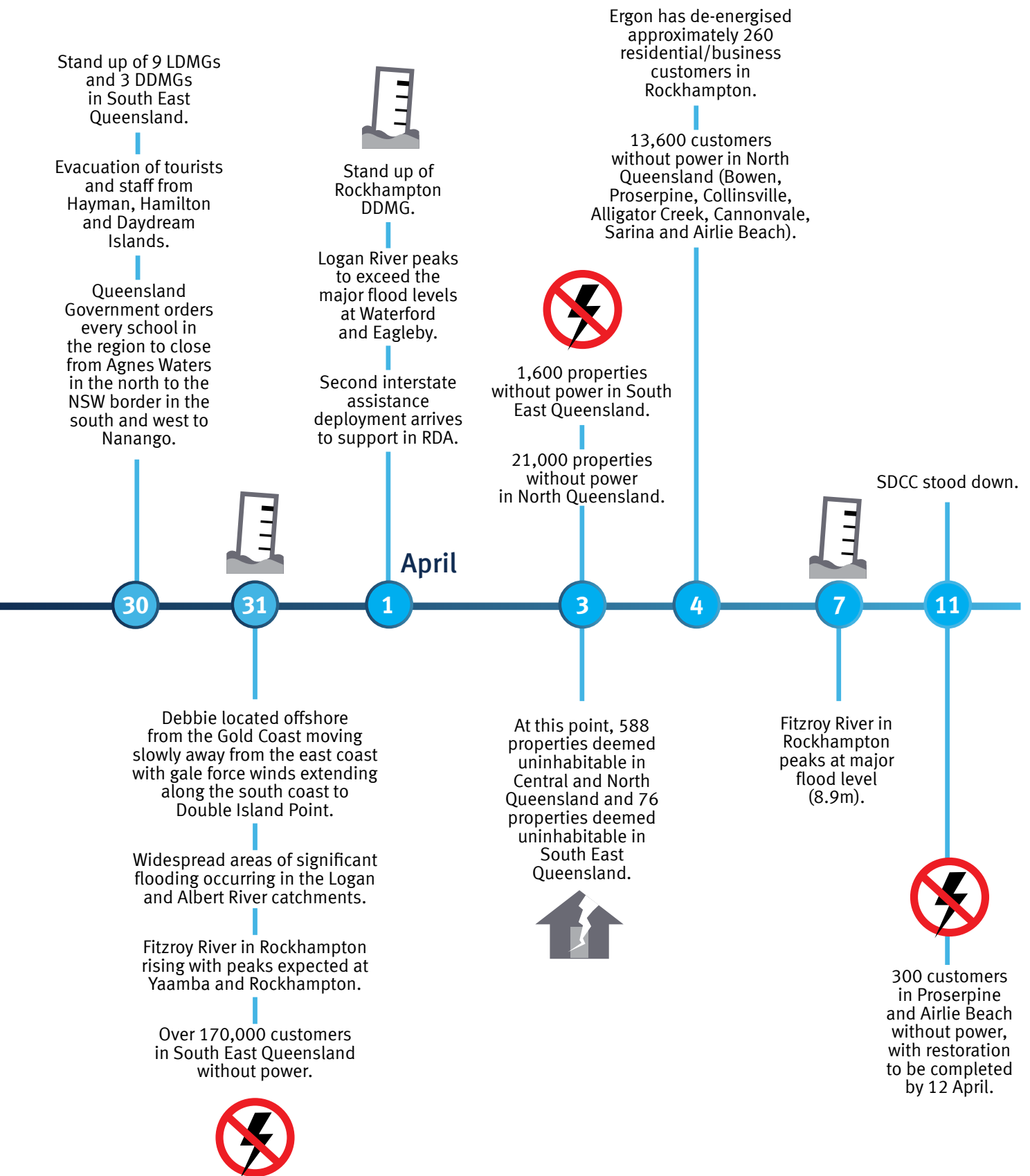
\$25 million grants/debit cards paid through Department of Communities
(at 28 April 2017)

Timeline of Queensland disaster events

22 March 2017 to 11 April 2017



Timeline of Queensland disaster events



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A culture of learning

The disaster management sector is experienced at reviewing “how things worked” following operational activity. Queensland’s Emergency Management Assurance Framework underpins a maturing culture of performance, focusing on improved disaster management outcomes for the community.

Various mechanisms for sharing experiences have emerged. These mechanisms are generally termed **lessons management**,^b and include tools and various kinds of approaches (e.g. debriefs) to learning. These processes vary but have the common goal of sharing information in order to better contend with situations and problems that are likely to arise again.

While local lessons are often identified by individual disaster groups and agencies, lessons for the broader system are less so. Even more challenging for the sector is turning lessons identified during post operations analysis into sustainable future improvements. Themes that are discussed throughout this report are not new. They have likely been identified through debriefs, reviews or event analyses following previous disaster events. The same system issues often appear to arise repeatedly after events. One reason for this is that debriefs may be undertaken in isolation, while local solutions may well be identified, this reduces the likelihood of the sharing of solutions to problems or examples of good practice.

Through the commissioning of this review, the Minister for Police Fire and Emergency Services and Minister for Corrective Services has signaled a clear intent, to ensure that lessons identified across the entire sector are synthesised, shared and result in sustainable and positive change.

Underlying precepts

Fundamental to the review approach, the IGEM and the review team attended debrief activities from all significantly-impacted local and district disaster management groups. It was evident that debrief activities are undertaken using various approaches. The Burdekin LDMG’s approach to debriefing is an example of a rigorous, contextual and local systems review. Isaac’s LDMG is to be commended. The group has undertaken extensive analysis of lessons. An action plan, endorsed by the Chair, will ensure that local improvements continue to be made.

We also attended debriefs that were held by the State Disaster Coordination Group, State Disaster Coordination Centre and a range of state government agencies, key social sector organisations (e.g. Australian Red Cross, Volunteering Queensland) and critical infrastructure providers. We also received debrief notes from less-impacted disaster groups. Attendance and gathering of debrief information, was in part, a mechanism to collect data to inform this review. It has also been an opportunity to ensure a consistent approach is adopted to debrief activities. By applying the Standard to debrief information, data has been collected in a systematic manner, providing opportunity for reliable analysis and theming.

This systems-based approach enabled candour – we saw an incredible level of openness from practitioners and community members willing to share their experiences before, during and after Debbie. This has contributed to our Office hearing much detail about the Debbie event from different perspectives. Robust analysis has enabled the identification of strengths and opportunities for improvements.



Notes

- b. The Australian Disaster Resilience Handbook Collection ‘Lesson Management’ Handbook 8 Attorney-General’s Department 2013 defines lessons management as an overarching term that refers to collecting, analysing and disseminating experiences from operations, exercises, programs and reviews.

Underlying precepts

Finding

Where there were comprehensive and consistent approaches to debriefing, opportunities for improvement and good practice were better identified.

Recommendation

Queensland should implement and maintain a System-wide lesson management program.

This openness is a strong indicator of the positive evolution of the culture within the disaster management system in Queensland.

Anecdotally, a major contributor to shortcomings in the previous learning of lessons has been a tendency to focus attention on what went wrong. Through this review we have been conscious of equally focusing on what went well as much as opportunities for improvement.

This has produced a number of good practice examples and positive solutions, at a local and broader system level. These examples are shared throughout the report and will form a range of examples that can be applied by disaster management practitioners. Lessons, good practice and innovation emerging from Debbie must continue to inform continuous improvement in disaster management. There are problems which reoccur because they are naturally difficult to solve. Yet the consequence of failing to learn is potential loss of property, or worse, lives. Learning must occur in collaboration and challenge siloed thinking. Multi-agency, multi-group and system-wide lesson learning and information sharing is crucial to improve future practice.

Findings contained in this report must inform disaster management planning, training, exercising and practice. Opportunities to seek innovative solutions to enduring problems also exist through partnering with tertiary organisations, including the current Bushfire and Natural Hazard Collaborative Research Centre.

Through the gathering of information for this review, it is clear that leadership at all levels of government and non-government are committed to ensuring the best community outcomes. Strengthening of partnerships with the community remain vital to ensure that the solutions to lessons identified continue to meet community expectations.

System-wide dissemination of lessons and a robust method of monitoring and reporting on improvement strategies will lead to sustainable improvements. These improvements are more likely to be embedded if they are incorporated into a cycle of planning and are tested through exercising. Lessons won't be lost until the next review, leading to sustainable and measureable change in the system.

What the System set out to achieve

Queensland's arrangements for managing disasters have evolved, and been well tested, since the introduction of the Act. The Act states, as one of its principles, that local governments should primarily be responsible for managing events in their local government area. It mandates that strategic policy, plans, and guidelines should shape the management of all disasters. These documents recognise that communities are at the forefront of disaster impacts and show how Queensland local, district and state levels of government all work together to reduce disaster impacts and build the capacity of communities to manage disaster risks.

Queensland's size and decentralised nature underpins this exceptional local leadership of the management of disasters. Under legislation, local government councils must form a Local Disaster Management Group (LDMG or local group) and provide its key staff. The chair of the group is typically the mayor. The Local Disaster Coordinator (LDC) must be an officer from council. Members have specific roles and responsibilities that reflect the agency or organisation they represent.

The local group has a range of functions for disaster management. Some for preparing plans, community awareness, communications, information, reporting, and reviewing and assessing, it shares with the next level of the System. This level is a regional grouping of state agencies, known as the District Disaster Management Group (DDMG or district group).

Two other functions differentiate the local group from other levels in the System, and give it primacy for dealing with events. It must first let the district group know what it needs "to facilitate disaster management and operations."³ Second, the local group has the responsibility to manage disaster operations in its local area, under policies and procedures decided by the state.⁴

Disasters are usually managed out of a Local Disaster Coordination Centre (LDCC). The LDC acts as the conduit between the local group and the LDCC.

Local governments across Queensland differ in many ways. All have the same responsibility to appoint members to groups but the practical ability to do so will vary. Larger councils command the influence to almost replicate the district group for state agency membership. Smaller ones sometimes struggle to reach beyond the local emergency services representatives. Consequently capability to manage disaster operations varies. Support to them must vary accordingly.

That support is delivered through strong regional arrangements. Twenty-two disaster districts provide the framework for the delivery of government services. The chairperson for the district group, the District Disaster Coordinator (DDC), is a police officer, appointed by the Police Commissioner. A district group coordinates their activities from the District Disaster Coordination Centre (DDCC). The district structure was reassessed in 2013-14 on the basis that disaster districts should align with local government boundaries.

Queensland's disaster districts also have functions that span the prevention, preparedness, response and recovery spectrum. In addition to those they share with local groups for preparing plans, community awareness, communications, information, reporting, and reviewing and assessing, district groups have two functions that define their support for disaster operations. They must first identify useful resources in the district, and, second, coordinate such resources and services to support local groups.

Underlying precepts



Underlying precepts

Supporting the disaster districts, and providing direction about disaster management are a range of state-level committees, groups and agencies. At their peak sits the Queensland Disaster Management Committee (QDMC). Its role is to ensure the development and implementation of effective disaster management for the state and to provide clear and unambiguous senior strategic leadership in relation to the four phases of disaster management – prevention, preparedness, response and recovery.⁵

In November 2016, the Committee endorsed one of the main documents required by the Act. The *Strategic Policy Statement's* objectives are direct:

- “Strive to safeguard people, property and the environment from disaster impacts.
- Empower and support local communities to manage disaster risks, respond to events and be more resilient.”⁹

During Debbie the Premier continually reiterated these objectives: “prevent loss of life and keep everyone safe”

(SDCG minutes 27 March 2017)

When responding to a disaster the main legislative functions of the Committee are establishing relations with the Commonwealth, identifying resources, and coordinating assistance for disaster operations.⁶ The QDMC formally allows direct Ministerial participation in the strategic management of disaster events, resulting in faster and better informed decision-making during a disaster event.⁷

The Committee is chaired by the Premier of Queensland. Its standing members are ministers, supported by “attending officials,” who are senior public servants. Together they represent the portfolios of local government, transport, roads, police, fire and emergency services, housing and public works, health, ambulance, communities, child safety, disability services, and treasury. Others may be invited. The Australian Defence Force, the Bureau, the Local Government Association of Queensland (LGAQ), Surf Life Saving Queensland and the Australian Red Cross are external representatives co-opted as required.⁸ Since 2016 the State Recovery Policy and Planning Coordinator attends meetings during disaster response operations.

The QDMC is supported by the State Disaster Coordinator (SDC) and the State Disaster Coordination Group (SDCG). The permanently-appointed SDC, a police deputy commissioner, ensures that “accurate timely and relevant information is given to the QDMC during disaster response, and that the strategic decisions of QDMC about disaster response operations are implemented.”¹⁰

The SDCG also supports the SDC. Its 2014 Terms of Reference give it the role of “coordinating disaster response operations for the QDMC and ensuring, as far as reasonably practicable, that any strategic decisions of the QDMC about disaster response operations are implemented.”¹¹ The SDCG has no role outside the response phase, although its Terms of Reference allow for preparedness activities and an effective handover to recovery.¹² The SDCG is made up of senior officers from all Queensland Government departments, the Queensland Reconstruction Authority, and the Public Safety Business Agency. Non-government organisations and commonwealth agencies are standing invitees.

In any disaster, access to communications, power, and clean water are critical enablers of recovery. The state's arrangements, through the SDCG, now reach providers of these utilities directly. Energy Queensland's two electricity distributors – Energex and Ergon – along with Telstra, Optus, and the dam operators, SunWater and Seqwater are included as standing invitees, complementing their associated departments.

Depending on the event, the importance of agencies' roles change. In a cyclone, the Coastal Sciences division of the Department of Science, Information Technology and Innovation (DSITI) works with the Bureau to provide storm tide and wave height information and expertise.¹³ In a flood, the Bureau's flood forecasting service, now based on forecast rainfall, in addition to actual rainfall, is much in demand. The effects of flooding – how waters will affect people and local infrastructure – is managed by local governments, and relies on locally commissioned flood studies to aid land use planning and decisions in disaster operations.¹⁴ The Department of Energy and Water Supply (DEWS), ensures both that dam owners operate their infrastructure according to revised regulations, and that the concerns and reporting of energy providers are heard in the right quarter.

The QRA plays a major part in recovery. Its Chief Executive Officer (CEO), permanently appointed as the State Recovery Policy and Planning Coordinator, sits on QDMC, and its staff are members of SDCG. Together, they stand ready to oversee the effective delivery of relief and immediate recovery operations, ensure the efficient transition from response to recovery, and that recovery activities provide the best outcomes for Queenslanders.

State-level coordination of disaster operations in Queensland happens in the State Disaster Coordination Centre (SDCC) at Kedron. During events the SDCG is based there. The Centre also hosts many QDMC meetings and press briefings. The building provides appropriate accommodation and technology for all those – largely from Police and Fire and Emergency Services – activated there. A meteorologist from the Bureau has been in place since 2014.

The role of the SDCC is to provide a single point of truth about the current state of an event, ensuring accurate, timely and relevant information is available to the QDMC (via the SDC) and to district groups and Local Disaster Management Groups (LDMG or local group). It aims to do this through strong engagement and leadership supported by contemporary processes and systems. The SDCC also ensures appropriate information is passed on to the public.¹⁵

Public messaging in disasters is important. Agency media teams can come under particular pressure. To relieve this and ensure commonality of messaging, the Crisis Communication Network (CCN) – a whole-of-government communication network – may be activated in times of crisis to deliver coordinated and consistent messaging, and ensure appropriate sharing of resources. The Department of the Premier and Cabinet (DPC) chairs and provides secretariat support for the Network. Through a Critical Incident Reserve Pool, trained staff from across government are able to be deployed to support the Public Information Cell of the SDCC. In 2015, for example, members of the pool supported operations when the SDCC was activated in response to Severe Tropical Cyclone Marcia.¹⁶

Preparation and readiness of the system is the remit, under the Act, of the Chief Executive – the Queensland Fire and Emergency Services (QFES) Commissioner. The Commissioner is responsible for ensuring:

- that arrangements with the Commonwealth about disaster management are established.
- that disaster management and disaster operations in the state are consistent with the state group's strategic policy framework; and disaster management plans, standards and guidelines,
- that those performing disaster operations functions are appropriately trained, and
- that advice and support is given to QDMC as well as local and district groups about disaster management and disaster operations.

Underlying precepts

Underlying precepts

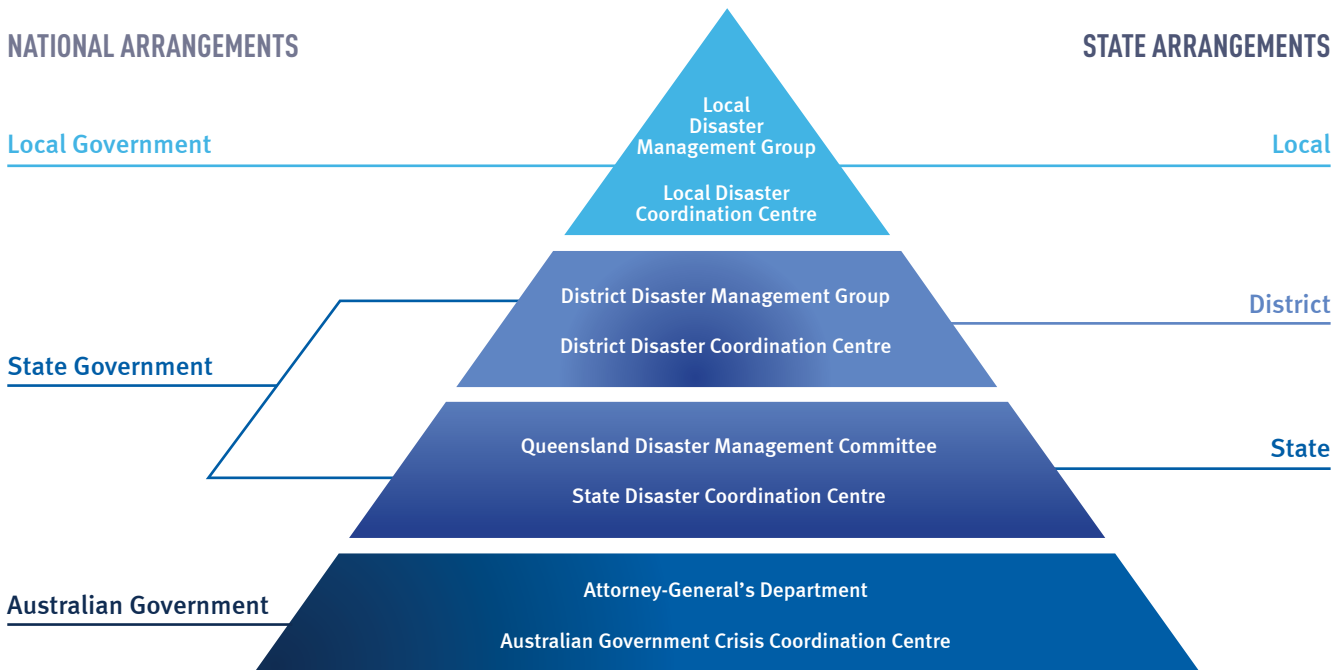
Leading up to the summer of 2016-17 Standing Order SO-Q-OM-3.63, Operation Fortitude 2016-17 set out the Commissioner’s intent for a unified services approach to the season, allowing for the rapid planning mobilisation and response to severe weather incidents. Four mission objectives would be pursued, dealing with protection of life, provision of public information and warnings, preservations of assets and property and support to the recovery of the community.¹⁷

In March 2017 this well-refined system wound up to face the 20th cyclone to cross the Queensland coast since the turn of the century.¹⁸ What it initially set out to achieve is captured in the SDCG teleconference minutes of Friday 24 March, a focus of agency preparedness and support to local and district groups, and the recommendation that all agencies continue preparations and operationalise any strategic intent from the QDMC.¹⁹

The SDCC Commander’s intent, circulated on Saturday 25 March, was similar:

Provide effective and efficient Whole of Government support to the community, local groups, district groups, SDCG and QDMC in the management of the response to the disaster event – Cyclone “Debbie”.

1. Support all levels of the Queensland Disaster Management Arrangements (QDMA) to respond to the event
2. Maintain the SDCC in support of disaster operations
3. Maintain situational awareness of the event and briefing of all levels of the QDMA.



The disaster management arrangements.

Source: www.disaster.qld.gov.au/About_disaster_management/Pages/Disaster-management-arrangements.aspx

Public value and mobilising community

All governments strive to ensure the communities they serve value, or receive value, from the services that they deliver. The public value of all levels of government is ultimately determined by how well policy and practice are perceived as meeting community need and expectations.²⁰ This is particularly true of disaster management, when the spotlight of public interest can be intense and community needs and safety must be demonstrably at the forefront of government policy.²¹ Maintaining community confidence and participation in the disaster management system in today's economic, social and climatic pressures is a priority.²²

Building and maintaining community confidence and participation in the System, as public value changes over time is difficult. In the disaster management field, global/current trends such as: changes in climate; increased migration to eastern-seaboard communities; changing disaster risk exposure; demographic shifts within communities; and increasing public demand on governments to deliver security and prosperity,²³ all contribute to changes in public value. The public sector needs to be able to adapt to these changing community and government needs. As such, those operating within the disaster management system also need to accommodate changes in community expectations and community needs.

We need to do so within our development and implementation of policy. We all need to "continuously improve" to ensure the relevance of the disaster management system endures and delivers appropriate community outcomes across the range of contexts in Queensland.

For all levels of government, maintaining a level of trust with communities is key to both engaging community and delivering on disaster management community outcomes. Evidence demonstrates that during disaster events, inadequate information and warning provided to communities can quickly erode public trust in disaster management systems and government at all levels.²⁴

If information given to the community about disaster events does not meet its needs, it can lead to confusion, unrealistic community expectations and ineffective or unsafe response actions. A lack of relevant and timely information directly affects people's ability to prepare and protect themselves and what's important to them. "The public expect clear guidance which requires behind-the-scene interagency collaboration."²⁵

The efficacy of warnings is dependent not only on our weather forecasting, our planning and inundation modelling, but also on factors at the community level. These can include:

- Pre-existing community perceptions of risk and potential impacts.²⁶
- Previous experience of disaster events.²⁷
- Community-held knowledge of what to do to reduce impact and capabilities to carry out those actions (self-efficacy).
- Understanding of what a warning means²⁸ at individual, household and neighbourhood levels (requiring an ability to contextualise warning information provided).

Underlying precepts



Underlying precepts

Community engagement should not just refer to the one-way provision of information at community events, letterbox drops, inclusion in rates notices, on our agency websites, radio interviews with local experts, media articles and advertising/marketing campaigns. All of these efforts are worthwhile and required elements of community engagement but if they are not resulting in improved community outcomes then they are not meeting our society's needs.

We can invest our effort and resources to develop the most sophisticated early warning technology and systems. We can excel at producing an integrated system that ticks all the boxes in terms of interoperability, instant communications across the sector. But if the individuals within our communities don't believe or understand their risks, if they don't know what to do and where to go and how to protect themselves and what is important to them, it doesn't matter how much effort and resourcing we've dedicated to the disaster management system, we will have missed the mark.

The public/community are the key stakeholder group and client of the disaster management system. If they are unaware of the risk, or underestimate their risk and overestimate their capability in preparing and responding, despite all allocated resources and effort in planning, preparedness and warning, it will be really difficult to mobilise them to respond appropriately.

Our collective challenge is to move beyond the rhetoric, to improve our practice of engaging and mobilising community to ensure we can meet changing community needs and create public value. The prize of doing so is improved community risk perceptions and better community outcomes from warnings issued during disaster events. This will further enable our communities to be able to take the required actions to minimise impacts to them and their property.

Shared responsibility and a coordinated approach have many ingredients. All agencies must work together. For the community to accept they have a role, our collaborative engagement practice requires honesty and transparency with our communities. Realistic expectations must be set. Awareness and understanding of risk must be built, roles and responsibilities understood by all and skills to achieve win-win outcomes developed. When the governments' management of disaster response is implemented alongside an empowered community resilience model, there is a greater chance that activities will be better targeted, received and sustainable.²⁹ Such an approach recognises that, in disasters, communities:

- are First Responders in most events
- have the most to gain and the most to lose
- know their community best; and
- have a vested interest in lessening future impacts, or stopping it happening again.³⁰

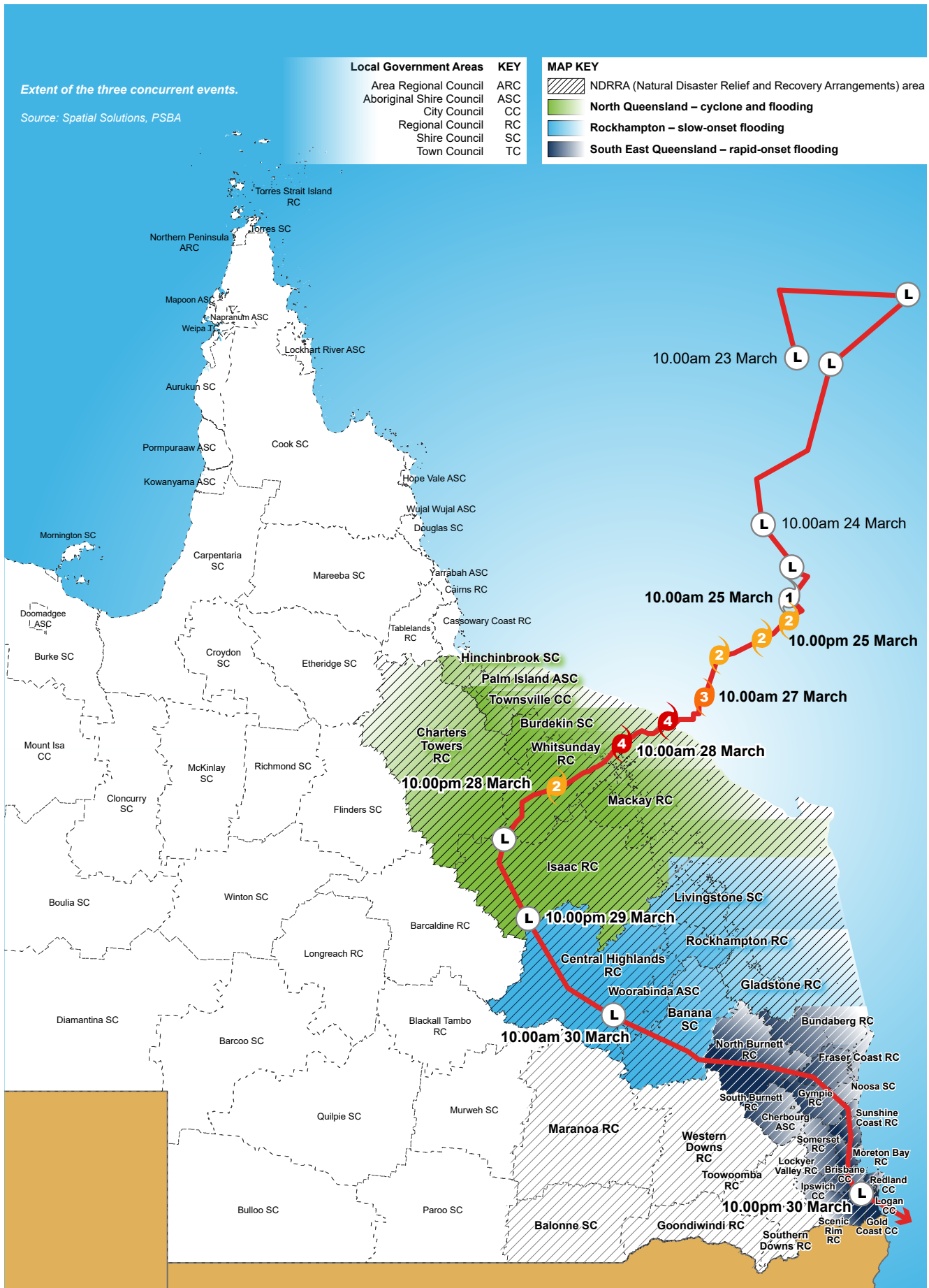
Positioning the community as active and empowered stakeholders, rather than victims or aid recipients, recognises the value that they can, and do, add to emergency management.³¹ Benefits from greater community participation can include:

- Ability to tap into a key resource. Harnessing the collective knowledge, skills and experience of a community will enhance.
- Better planning. Community members will always know their community better than external parties. This information can complement external data.
- Shared responsibility. Greater involvement in decisions will in turn improve implementation, sustainability and ownership of outcomes.
- Maximises scarce resources. By utilising communities to identify resources available, finite resources can be better utilised.
- Greater two-way information. Processes where communities and experts work alongside each other enhances knowledge transfer, supports the development of responses that are 'fit for purpose', and increases local problem-solving capacity.

Underlying precepts

“The most resilient societies will also be those that unleash the full potential of individuals ... to create and cooperate. Such societies will be moving with, rather than against, historical currents, drawing upon the ever-expanding scope of human agency and skill to shape the future. In all societies, even in the bleakest circumstances, there will be those who choose to improve the welfare, happiness, and security of others — and who will use transformative technologies to do so at scale. The opposite will be true as well — destructive forces will be empowered as never before. The central choice before governments and societies is how to blend individual, collective, and national endowments in a way that yields sustainable security, prosperity, and hope.”³²

Responses to the community survey commissioned for this review provide us with a window into the very real experiences of individuals impacted by these events. The community survey data was used alongside other data sources in informing the analysis and discussion across a range of emerging themes in this review report.



The three concurrent events

Our discussion about the experience of Debbie considers the challenges for communities, disaster management groups and practitioners in preparing for, responding to and recovering from an event that has cascading and concurrent impacts.

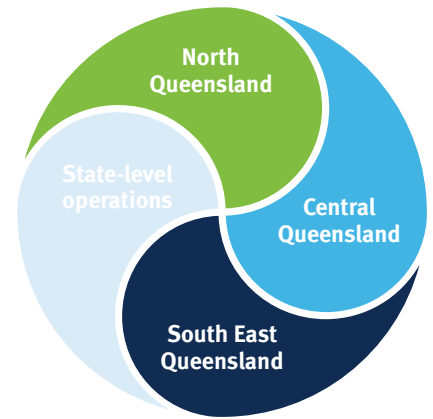
Initially the focus of Debbie was on the north as communities in Whitsunday and Mackay were significantly impacted by the cyclone and the risk of storm surge and flooding.

As Debbie dissipated from a severe tropical cyclone it tracked south resulting in torrential rainfall and strong winds. The consequences were sequential: rapid-onset flooding, predominantly in Logan, Gold Coast and the Scenic Rim; and the much slower rise of the Fitzroy River, resulting in flooding across its catchment.

Overall the disaster management system met these challenges and demonstrated the agility and capability required to address emergent needs.

On the following pages is a matrix of the statewide activations to meet the unfolding events.

The LDMGs are listed first, in geographical sequence from north to south, then east to west to broadly accord with Debbie's track and the affected areas. The DDMGs sit beneath this data, arranged in the same sequence, with state-level oversight underlying all.



Damage to Shute Harbour.

Photo courtesy of ABC News – Dan Peled



	2/4 3pm	3/4 5am	3/4 5pm	4/4 5am	4/4 5pm	5/4 5am	5/4 5pm	6/4 5am	6/4 4pm	7/4 5am	7/4 4pm	8/4 6am	09/4 6am	10/4 6am	10/4 4pm	11/4 6am	
																	Hopevale
																	Cook
																	Wujal Wujal
																	Douglas
																	Yarrabah
																	Cairns
																	Mareeba
																	Cassowary Coast
																	Tablelands
																	Etheridge
																	Palm Island
																	Hinchinbrook
																	Townsville
																	Burdekin
																	Charters Towers
																	Flinders
																	Richmond
																	Whitsunday
																	Mackay
																	Isaac
																	Livingstone
																	Rockhampton
																	Central Highlands
																	Woorabinda
																	Gladstone
																	Banana
																	Bundaberg
																	North Burnett
																	Fraser Coast
																	Gympie
																	South Burnett
																	Noosa
																	Sunshine Coast
																	Somerset
																	Moreton Bay
																	Brisbane
																	Redland
																	Logan
																	Gold Coast
																	Scenic Rim
																	Ipswich
																	Lockyer Valley
																	Toowoomba
																	Southern Downs
																	Western Downs
																	Maranoa
																	Balonne
	2/4 3pm	3/4 5am	3/4 5pm	4/4 5am	4/4 5pm	5/4 5am	5/4 5pm	6/4 5am	6/4 4pm	7/4 5am	7/4 4pm	8/4 6am	09/4 6am	10/4 6am	10/4 4pm	11/4 6am	
																	Far North
																	Innisfail
																	Townsville
																	Mackay
																	Rockhampton
																	Gladstone
																	Bundaberg
																	Maryborough
																	Gympie
																	Sunshine Coast
																	Redcliffe
																	Brisbane
																	Logan
																	Gold Coast
																	Ipswich
																	Toowoomba
																	Warwick
	2/4 3pm	3/4 5am	3/4 5pm	4/4 5am	4/4 5pm	5/4 5am	5/4 5pm	6/4 5am	6/4 4pm	7/4 5am	7/4 4pm	8/4 6am	09/4 6am	10/4 6am	10/4 4pm	11/4 6am	Queensland

Activation matrix key

Alert	Yellow
Lean forward	Orange
Stand up	Red
Stand down	Green



North Queensland – cyclone and flooding

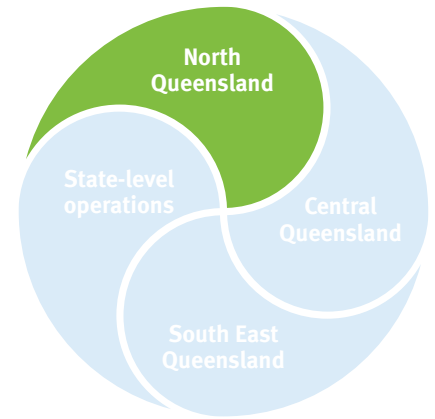
Tropical cyclones are a hazard faced by North Queensland every year from November to April. On 28 March, Debbie made landfall at Airlie Beach. The tropical low responsible was identified six days earlier, on 22 March, and was named as a tropical cyclone at 10.00am on 25 March.³³

Debbie intensified to a category 4 severe tropical cyclone off the coast of the Whitsunday Islands on Monday 27 March. On the morning of Tuesday 28 March, it passed over Hayman Island, Hook Island, Whitsunday Island, Hamilton Island, North and South Molle Islands and Daydream Island, bringing dangerous and destructive winds. Hamilton Island recorded the highest peak wind gust of 263km/h. At 12.40pm Debbie reached the mainland, still at category 4. The eye of the storm crossed directly over the town of Airlie Beach before moving across Proserpine as a category 3 cyclone.

The system continued further inland, reaching Collinsville as a category 2 cyclone, still producing winds in excess of 125km/h and finally dissipated to a tropical low southwest of Collinsville in the early hours of Wednesday 29 March.

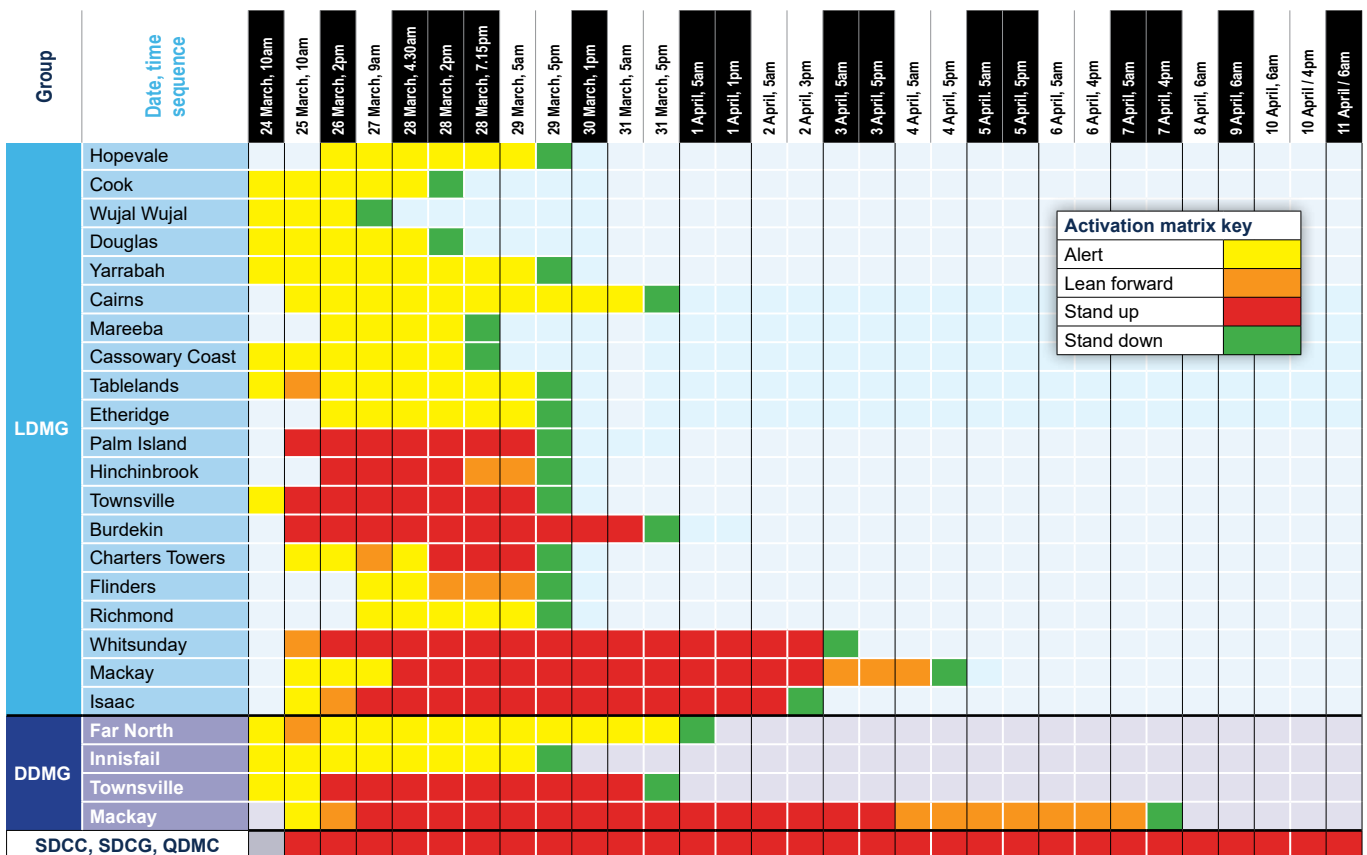
In the days leading up to landfall, Queensland watched and waited. Initial forecast tracks indicated that Townsville, Ayr in Burdekin, or Bowen in the Whitsundays would mark Debbie's crossing point or could bear the brunt of an associated storm surge. Other North Queensland local governments in its potential path, including Hinchinbrook, Charters Towers, Flinders and Palm Island were also preparing for its effects. Subsequent forecasts for Debbie showed a more southerly track, leading to concerns about storm surge in Mackay and flooding in the Isaac council area.

The three concurrent events



North Queensland local and district disaster management group activations and state activations.

Data sourced from SDCC, local and district disaster management group reports and interviews



Date	North Queensland – TOWNSVILLE
22 March	<ul style="list-style-type: none"> • Tropical low identified
24 March	<ul style="list-style-type: none"> • LDMG convened in Townsville • Burdekin local group starts meeting • Whitsunday LDMG leaned forward
	<ul style="list-style-type: none"> • Townsville LDMG leaned forward • Townsville Local Disaster Coordinator appointed • Townsville LDCC on standby
	<ul style="list-style-type: none"> • Townsville LDMG stood up • Townsville Local Disaster Coordinator stood up • Townsville LDCC stood up
	<ul style="list-style-type: none"> • Townsville LDMG stood up • Townsville Local Disaster Coordinator stood up • Townsville LDCC stood up
25 March	<ul style="list-style-type: none"> 4.51am • BoM predicts crossing coast south of Townsville as category 4 on 28 March 10.00am • Low named as TC Debbie 6.00pm • Shute Harbour pilotage area closed 12 midnight • Townsville LDMG evacuation sub-group activated
	<ul style="list-style-type: none"> Before 7.00am • Whitsunday LDMG moved to stand up 11:25am • Whitsunday red and orange zones advised to evacuate 5.22pm • BoM issued storm tide warnings
	<ul style="list-style-type: none"> 5.24pm • Burdekin chair directed voluntary evacuation to commence the following day 7.49pm • BoM issues cyclone track map for Townsville Late evening • Burdekin directs specific evacuations via EA of areas
26 March	<ul style="list-style-type: none"> Morning • Bowen and Proserpine cyclone shelters opened 6.00am • Directed evacuation of Cape Cleveland, Cunggulla and Cleveland Palms started 6.00am • Remaining Townsville red zone directed to evacuate 6.00am • Heatley evacuation centre activated 8.00am • Burdekin multipurpose facility opened as place of refuge 9.00am • Buses provided for the voluntary evacuation of Home Hill and Ayr to Cairns 10.11am • Whitsunday yellow zone evacuated Whitsunday islands and Airlie beach tourists commenced evacuation 11.00am • Townsville deemed outside the cone of uncertainty 11.47am • Mackay LDMG issued act and evacuate now EAs for Midge Point, St Helens Beach areas 1.37pm • Mackay storm tide advice worsened 2.00pm • Four places of refuge opened in Townsville 2.40pm • Mackay issued further EAs to prepare and act 6.00pm • Mackay LDMG advise sto evacuate now the Mackay area Between 5.00pm–12 midnight • TC intensified to category 4 off Whitsundays
	<ul style="list-style-type: none"> 5.22pm • BoM issued storm tide warnings
	<ul style="list-style-type: none"> 7.49pm • BoM issues cyclone track map for Townsville
	<ul style="list-style-type: none"> Late evening • Burdekin directs specific evacuations via EA of areas
	<ul style="list-style-type: none"> Morning • Bowen and Proserpine cyclone shelters opened
	<ul style="list-style-type: none"> 6.00am • Directed evacuation of Cape Cleveland, Cunggulla and Cleveland Palms started
	<ul style="list-style-type: none"> 6.00am • Remaining Townsville red zone directed to evacuate
	<ul style="list-style-type: none"> 6.00am • Heatley evacuation centre activated
	<ul style="list-style-type: none"> 8.00am • Burdekin multipurpose facility opened as place of refuge
	<ul style="list-style-type: none"> 9.00am • Buses provided for the voluntary evacuation of Home Hill and Ayr to Cairns
27 March	<ul style="list-style-type: none"> 10.11am • Whitsunday yellow zone evacuated Whitsunday islands and Airlie beach tourists commenced evacuation 11.00am • Townsville deemed outside the cone of uncertainty 11.47am • Mackay LDMG issued act and evacuate now EAs for Midge Point, St Helens Beach areas 1.37pm • Mackay storm tide advice worsened 2.00pm • Four places of refuge opened in Townsville 2.40pm • Mackay issued further EAs to prepare and act 6.00pm • Mackay LDMG advise sto evacuate now the Mackay area Between 5.00pm–12 midnight • TC intensified to category 4 off Whitsundays
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	<ul style="list-style-type: none"> Between 5.00pm–12 midnight • TC intensified to category 4 off Whitsundays

Debbie's slow development and changing course revealed the high levels of capability of North Queensland's local disaster management groups and their readiness to deal with such an event. All groups had recognised the importance of lessons and implemented learnings from previous events.

This section focuses on the actions of five LDMGs – Townsville, Burdekin, Whitsunday, Mackay and Isaac – to draw out lessons for all.

Getting ready

Substantial engagement with the community happens before every summer across Townsville, Burdekin, Whitsunday and Mackay. The aim is to tell the public about the season's hazards, and how to get ready for them. There are indicators that the strategy worked: the extent of resident cooperation in evacuations, and the low numbers arriving at cyclone shelters and evacuation centres. The accessibility of evacuation maps on council websites also enabled effective movement out of communities.

Townsville, Burdekin and Mackay local groups all communicated with residents in a variety of ways throughout the event: by door knocks, through radio, website, and social media. Most emphasised that the council website was the source of truth for the community, and provided additional information via their Facebook pages. Whitsunday went further towards social media and made clear that their point of truth was a dedicated Facebook page.

The "Facebook approach" allowed easy and shared community feedback, and replies to it. Posts on the Mackay Regional Council's Facebook site indicated some members of the community needed further information and struggled to understand the evacuation maps. The Facebook environment allowed other people in the community as well as council staff to respond, providing clarity where possible.

Despite extended periods of power outages affecting communication, councils continued to push messages focused on service delivery, power outages, water supply, waste collection and clean-up activities via the Facebook pages and council websites as soon as they were able.

Townsville

The Townsville LDMG (Townsville group) convened for the first time in this event on Friday 24 March when the tropical low that would form into Debbie was within the monsoon trough off southern Papua New Guinea. Landfall was predicted between Cairns and Townsville some time from late Sunday to Tuesday.

The Townsville group "leaned forward", adopting the second highest of three levels of activation, and, in accordance with their governance arrangements, formally endorsed and appointed a new LDC. The Townsville group also put the LDCC on standby, ensuring it was prepared for activation. It used this lead-in time to test their Emergency Alert^c messaging and maps were ready for its storm surge zones.

On Saturday 25 March, the Bureau's forecast put the cyclone crossing the coast south of Townsville the following Tuesday as a category 4 cyclone. Both the Townsville group and the LDCC adopted the highest level of activation and "stood up". The evacuation sub-group of the Townsville group was also activated at midday. Its task was to plan evacuations for three cases, the most likely, least likely, and worst case.

Evacuations take time to organise. In the lead-up to any decision, planners must allow for time to warn the community, time for those moving to get themselves ready, as well as the time to move to a safe place. When moving people en masse the time taken for all to get past a point is a further factor, as is whether movement will be in daylight or, more riskily, at night.

Notes

- c. Emergency Alert (EA) is the national telephone warning system used by emergency services to send voice messages to landlines and text messages to mobile phones within a defined area about likely or actual emergencies.

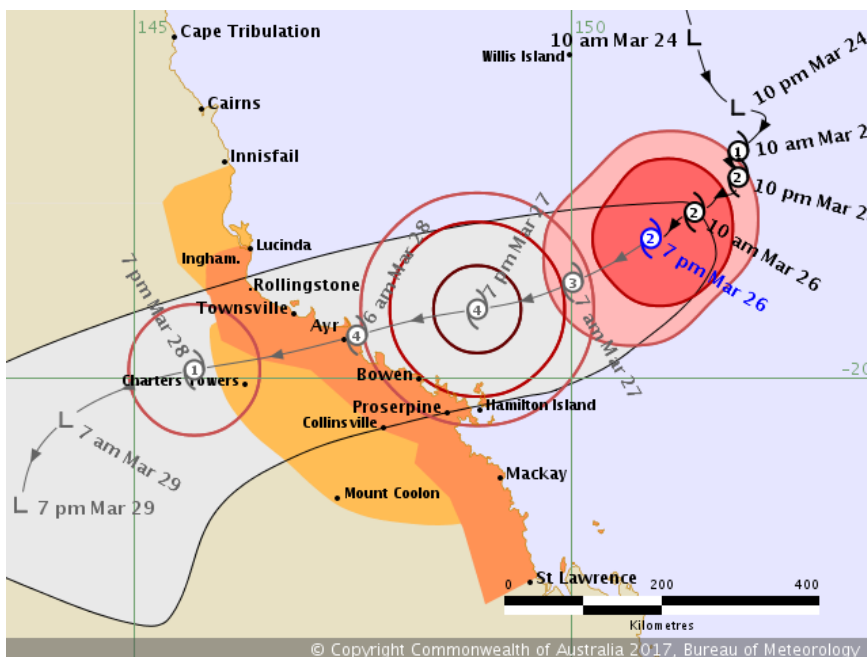
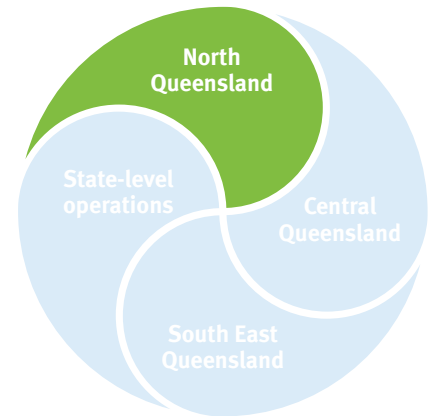
In a cyclone when wind gusts get above 100 km/h, it is considered too dangerous to continue preparations. This is the time at which any evacuation movement should cease, and emergency services will no longer be able to respond to calls.

The Bureau issues two products to help planners: a Tropical Cyclone Advice for planners and the public and a Storm Tide Warning for specific disaster management organisations. The Tropical Cyclone Advice and associated track map shows the location and most likely track of a cyclone, set in a “cone of uncertainty” of its possible range of movement. The Storm Tide Warning shows, for 10 locations, the time when wind gusts are expected to exceed 100km/h, and possible heights of cyclone-driven storm tides, both for the forecast track and a worst case. Storm tide heights, therefore, are very dependent on the time the cyclone crosses the coast and the corresponding state of the tide.

In Townsville, planning continued into Sunday, with the sub-group evaluating the chances of the various storm surge possibilities. They were using the Bureau’s cyclone track maps and storm tide warning information based on the SEAtide™ probabilistic modelling system. DSITI storm tide advisors provided additional graphical overviews of the SEAtide™ model results to inform their evacuation plans.

Over the afternoon the Bureau had issued four Storm Tide Warnings to the government. The one issued at 5.22pm spelled out the worst case and the most likely, based on the predicted cyclone track. The earliest onset of 100km/h wind gusts was forecast at 4.00pm on Monday 27 March and a worst case storm tide of 3.8 metres above the highest high tide of the year. The more likely predictions for the forecast cyclone track was for gusts expected by 2.00am on Tuesday 28 March and a storm tide height of just below the highest tide of the year.

The three concurrent events



BoM cyclone track map issued at 7.49pm on 26 March

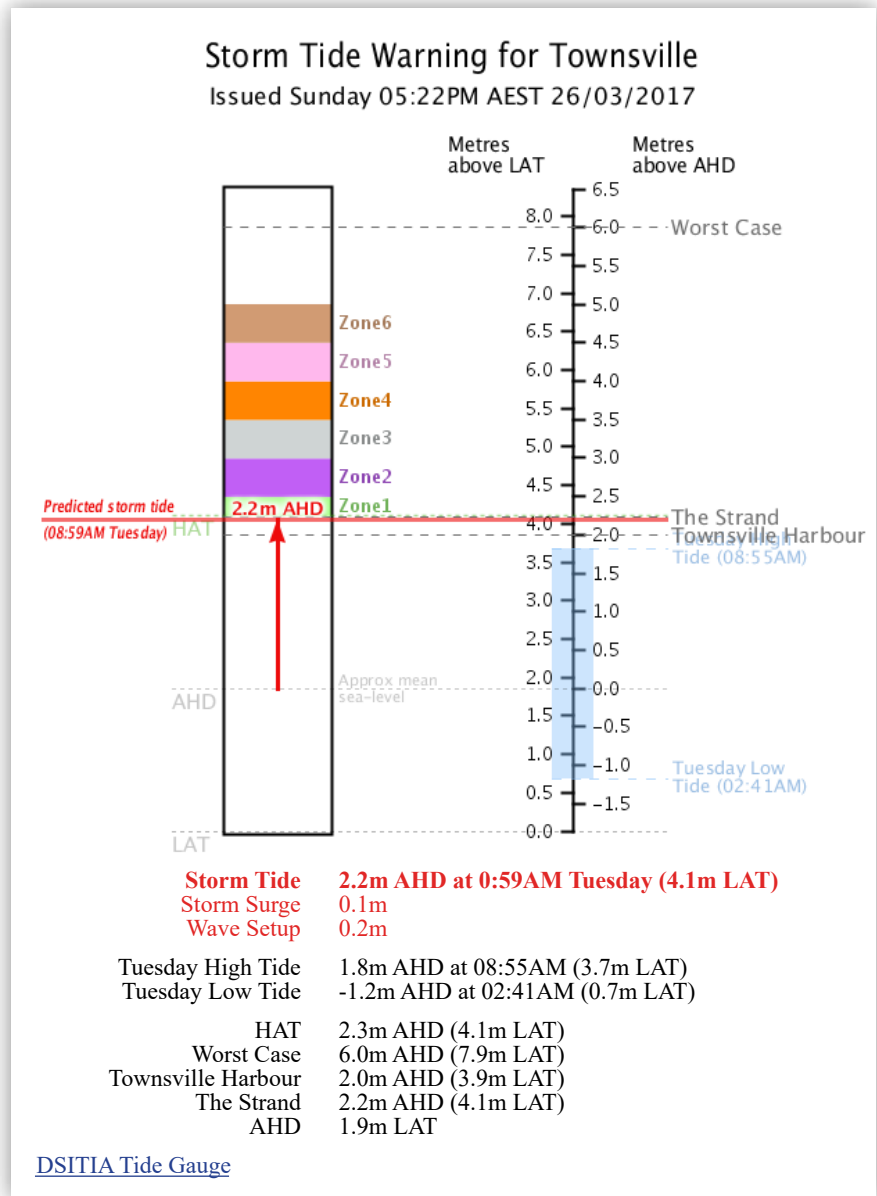
Source: Bureau of Meteorology

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	<ul style="list-style-type: none"> 26 March
	<ul style="list-style-type: none"> 27 March

At 6.00pm on Sunday 26 March the Townsville group met to consider the latest Bureau forecasts and the results of planning. Forecasts kept arriving. During the meeting an updated cyclone advice, showed a track that reversed the day's trends and ran closer to Townsville, illustrating the difficulty of decisions in such circumstances.

Armed with the results of the SEAtide™ probabilistic model the planners had calculated the chance of a storm tide reaching the top of Townsville's red evacuation zone was 13 per cent (see also section on Planning).



Storm Tide Warning for Townsville issued at 5.22pm on 26 March by the Bureau.

NB: The Storm Tide Warning graphic is accessible via a registered user webpage, available to agencies involved in disaster management.

Source: Bureau of Meteorology

The meeting resulted in two direct outcomes. Late in the evening, a directed evacuation^d for parts of Townsville's red evacuation zone, Cape Cleveland, Cungulla and Cleveland Palms was issued through the Emergency Alert (EA) community warning system.

People in this area were directed to evacuate from 6.00am Monday 27 March 2017, and seek shelter with friends and family in a safer location. The Townsville group also decided they would be unable to receive evacuees from the Burdekin region, indicating an understanding of both risk and the limits to their capacity.

The Townsville group met again the next morning at 4.30am to discuss whether the remainder of the red zone required evacuation. It decided to advise remaining residents in the red zone to consider a voluntary evacuation to family and friends. On Monday 27 March at 6.00am, the directed evacuation of the Cape Cleveland area including Cungulla and Cleveland Palms commenced. The governance processes for recording decision-making is robust. The Heatley Public Cyclone Shelter was activated from 6.00am and four places of refuge were opened from 2.00pm.

The group was also aware of staff safety as a result of the cyclone, and decided that the LDCC would not be staffed "until it was deemed safe to return."³⁴ During the morning of 27 March, the cyclone's predicted tracks resumed their southerly drift, and by 11.00am Townsville was outside the "cone of uncertainty."

On 29 March the Townsville local group "stood down." Their approach throughout demonstrated the kind of effective risk-based planning and action that is encouraged by Queensland's arrangements.

Burdekin

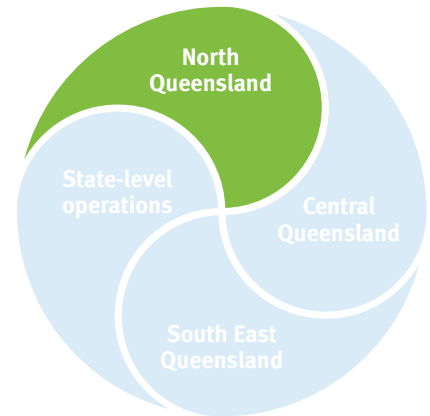
Like Townsville, the Burdekin group started meeting on 24 March. Its arrangements were well established. Its agenda for reporting, and reporting mechanisms, its understanding of member's status, scalability and actions gave it the information about the situation and the capability to perform effectively. In the event all agencies had representatives available. Messaging to the community, about sandbag availability and warnings on the Bureau's website, started early. Community members were advised to undertake any necessary pre-event clean-ups.

Not everyone is able to deal with the effects of a cyclone by themselves. Recent work by the Department of Communities, Child Safety and Disability Services (DCCSDS) has gone a long way to help service providers identify people with vulnerabilities in disasters. During Debbie, these people included the elderly particularly those in aged-care facilities, tourists, transient workers, and the homeless. Some councils have already put measures in place to support them. Burdekin Shire Council includes the Lower Burdekin Home for the Aged as a specialist adviser on the Burdekin local group, enabling a high level of integration for planning purposes.

On Saturday 25 March, with the cyclone forecast to cross the coast in its area and early predictions showing coastal communities impacted by storm surge, the chair of the Burdekin local group advised those in the community who wished to evacuate to do so on Sunday – the next day.

Due to the unpredictable nature of Debbie, the Burdekin local group planned for three options, a crossing to the north, to the south or a direct impact. The prepared storm tide evacuation zones worked well from a planning perspective. However, in hindsight, the Burdekin group itself realised that they would have worked even better had the warning messages contained place names rather than been aimed at coastal communities in general as this would have made the messages easier for the community to understand.

The three concurrent events



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Notes

- d. Exposed persons are directed by the DDC or Declared Disaster Officer under legislation to evacuate an exposed area – Queensland Evacuation Guidelines for Disaster Management Groups.

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On Sunday 26 March, as the cyclone track consistently pointed to a crossing at Ayr, the Burdekin local group directed evacuations of Alva Beach, Groper Creek, Jerona, Wunjunga and some areas of Rita Island. The advice was provided by Emergency Alert late in the evening. Following a state decision to facilitate the safety of residents of Home Hill and Ayr, buses were also provided for a voluntary evacuation to Cairns the next day at 9.00am. More than 30 people arrived in Cairns, to be received and accommodated through arrangements put together between the Far North District and Cairns local group partners on Monday morning - an excellent case study of how a council and agencies unaffected by an event can play an important role.

The next day, on Monday 27 March, the Burdekin Multi-Purpose Facility was opened as a place of refuge from 8.00am. It eventually took in around 70 people.³⁵ While the cyclone intensified to a severe tropical cyclone, its predicted tracks slipped further south, taking the Burdekin out of the most affected area. On 28 March, the Bureau advised that gale force winds would impact Ayr from 3.00pm. There was loss of data from river gauges for a six to eight hour period which lead to concern over the validity of the information provided by the Bureau to the Burdekin group and the public.

On 31 March, the Burdekin local group “stood down.” The Burdekin local group had been supported by strong leadership and governance processes, which were tailored to their needs. Its actions during the event reflected a strong understanding of the disaster management system and its application.

Whitsunday

On Friday 24 March, with the cyclone track predicted well north of Townsville and the council area outside the “cone of uncertainty” of possible tracks, the Whitsunday local group “leant forward.”

This pre-emptive action was the result of a new trigger process for activations developed by the local groups in the Mackay District in response to lessons from cyclones Marcia and Dylan.

The Whitsunday local group had recently developed new storm tide evacuation zone maps, and the same day the group began notifying the community about the tropical low, its proximity to the region and the need for residents to plan for evacuation. It did so via the Whitsunday Regional Council website and the dedicated Whitsunday Disaster and Emergency Information Facebook page.

On Sunday 26 March, as the predicted track moved south and encompassed the Whitsundays, the group moved to “stand up”. Both the local group and council increased their messaging to raise the community’s awareness and understanding of the new storm tide zones and processes for evacuation. The storm tide maps showed the need to evacuate more than 4300 property blocks from the red and orange zones. Their residents were advised to evacuate on Sunday 26 March and a second set of residents, whose properties lay in the yellow zone, were evacuated the following morning.

The effective evacuation and cooperation of residents from these areas was made possible by the extensive pre-season community engagement and awareness-raising activities run by the local group.

The Whitsunday Regional Council and LDMG recently redesigned their storm tide evacuation maps. The maps have been simplified, by reducing the number of coloured zones and ensuring only one zone per residence, to make it easier for the community to identify their home and cyclone shelters, and to follow evacuation routes. The effects of climate change on storm tide, such as sea level rise have also been included. These maps were used for the first time during Debbie. We heard that they made processes and decision making easier and, thanks to significant efforts to socialise the new maps with the local community, they encouraged the cooperation of residents during the evacuation.

The evacuation of tourists, however, would become a different matter.

Pre-season work was not limited to public events alone. Regular meetings throughout the year with members of the LDMG helped to build positive and effective relationships between agencies and individuals. Extensive planning and preparedness resulted in timely and effective communication between members of the local group and staff at the LDCC and effective coordination and decision-making. Collaboration between Ergon and the local group, particularly, worked well and fixed outages while keeping the community informed.

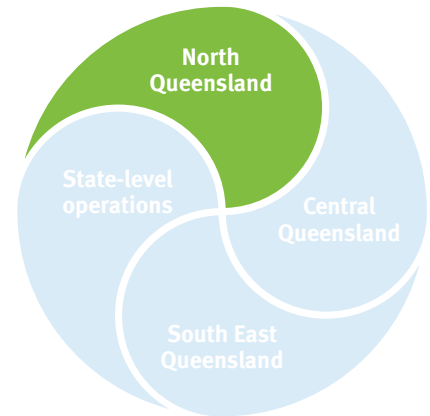
The cyclone shelters at Bowen and Proserpine were stocked and ready for operation on Saturday 25 March, opened on the morning of Monday 27 March and transitioned to evacuation centres on Wednesday 29 March. Learning from previous cyclone events in Queensland, the Whitsunday LDMG stocked the cyclone shelters with enough food and supplies to allow for their transition to evacuation centres following the event. The slow-moving weather system meant that cyclone shelters were open for longer than guidelines expect before lock-down.^{36 37} However, effective hazard-specific planning resulted in a transition from cyclone shelter to evacuation centre that worked well. An additional evacuation centre was opened at the Whitsunday PCYC building on Thursday 30 March.

On the morning of Tuesday 28 March, the cyclone passed Hayman Island, Hook Island, Whitsunday Island, South Molle Island and Daydream Island, with peak wind gusts of over 260km/h recorded at Hamilton Island. The cyclone reached the mainland as a category 4 system at 12.40pm. The eye of the storm crossed directly over Airlie Beach before moving past Proserpine as a category 3 cyclone.

The Whitsunday LDCC in Proserpine sustained significant damage. Restricted access to the building affected planned staff rotations, and this, paired with the prolonged timeline of the event, meant that fatigue was a major problem. Evacuation of a significant number of tourists and backpackers from the islands and Airlie Beach commenced the morning of 27 March and continued after Debbie had passed. This was coordinated by the Whitsunday LDMG, working closely with resort owners. Three 48-seater buses were arranged to move tourists and backpackers from Airlie Beach to Rockhampton. Others moved to Townsville, which, by 1 April, was able to receive evacuees.

Some lessons were identified about the evacuation of tourists in the Whitsunday area and are explored in the evacuation case study later – in particular, the need for improved communication between the harbour master and the LDMG to support rapid decision-making and coordination of operations.

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Hamilton Island roof damage.

Photo courtesy of ABC News – supplied: Dennis Garrett

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In addition, there was the need to manage the expectations of tourists and backpackers who anticipated accommodation would be paid for by the local council. Fresh ideas, such as setting up mobile information hubs for tourists and developing multi-lingual communication resources for resorts, are already being considered in the Whitsunday region.

The system continued further inland, reaching Collinsville as a category 2 cyclone, where gusts range between 125 to 164km/h, and finally dissipated to a tropical low southwest of Collinsville in the early hours of Wednesday 29 March.

The severe thunderstorms that followed the cyclone hampered rapid damage assessment and relief activities for an additional 24 hours. When the severe weather finally passed, the region was left with significant power outages – 100 per cent of Proserpine and 99.8 per cent of Bowen – which also affected the local water supply. Road closures were prevalent and there was extensive damage to the townships of Airlie Beach, Bowen, Collinsville, and to the economic hub of Proserpine.

Significant structural damage was sustained by the resorts, jetties, wharfs and other critical infrastructure on the Whitsunday Islands. Resorts on Hamilton Island, Daydream Island and Hayman Island closed for repairs and reconstruction. Hamilton Island reopened for visitors on Saturday 8 April³⁸ and the latter two are expected to open in mid-2018.^{39,40}

The LDMG transitioned to recovery on Monday 3 April. There were some concerns the transition took place too early. The impacts were mainly felt in the shifting focus of efforts away from response operations, and in the readiness of the community to transition to recovery, which needed the support of the SES.

Overall the transition to recovery went well. The Whitsundays was one of the first local groups to develop and finalise the new recovery plan. The plan was completed and circulated very efficiently however there was limited awareness of the process by LDMG members. Better socialisation of the new recovery planning process would improve awareness and input into this part of transition to recovery in future events.

Mackay

On Saturday 25 March, Mackay lay about 220 kilometres south of the cyclone's predicted track and outside the "cone of uncertainty" of possible track lines. Notwithstanding, a media release was issued for residents, advising them to continue emergency preparations for their home and ensure they were familiar with the storm inundation zones that are particular to the Mackay council area. This media release also advised members of the community that regular updates will be posted on council's Facebook page.

Although the Bureau's 9.00am Storm Tide Warning on Monday 27 March made no predictions for Mackay, the situation changed during the day.

The Bureau advised Mackay could be impacted by dangerous storm tide, and in low-lying areas the risk of storm surge was significant. Police from the Whitsunday district which overlaps some of Mackay local government had doorknocked residents of Midge point and St Helens directing them to evacuate. An EA was issued at 10.48am to residents of the green, red, orange, brown and yellow zones in Midge Point to "act and evacuate now." The Mackay LDMG advised residents to evacuate to friends and family in high places. They were also able to access the cyclone shelters in Proserpine and Bowen. Not many went.

The Mackay local group Interim Evacuation Sub-plan dated September 2013 has thresholds for directed evacuation to enable prompt decision-making. They start at 0.5 metres above the highest tide mark. But the plan also allows for refinement "based on the event specific factors".⁴¹ By 12.07pm the Bureau's Storm Tide Warning was for a worst case of 1.8 metres and a most likely tide of 0.3 metres above the highest tide of the year at Mackay. By 1.37pm storm tide figures had worsened to 2.7 and 1.0 metres respectively.

After this updated Bureau warning, at around 2.40pm, the local group issued Emergency Alerts for residents in the green, red and orange zones in Mackay and its beach communities. The message was: "prepare and act." There were eleven campaigns, targeting more than 185,000 fixed and mobile numbers.

By around 3.00pm the storm tide figures had moderated slightly to a worse case of 2.5 metres and most likely tide of 0.8 metres. Around 6.15pm on Monday 27 March, and after discussion between state and local officials, advice to residents was further revised. As a consequence directed evacuations of those in the Green and Red zones in the Mackay area and associated beaches commenced.

The Mackay group requested an EA to convey the direction to evacuate immediately to family and friends. These messages were reiterated on the council's Facebook page.

Although Debbie crossed the coast north of Mackay, there were areas that were substantially impacted by the event. The area suffered the most power outages in the north but around 40 per cent of it remained connected.⁴² While the ports remained closed, by Wednesday 29 March its airport was open with restrictions.⁴³

Thunderstorms exacerbated widespread rainfall totals of 250-700mm in 48 hours in the Pioneer River catchment. The Pioneer reached a minor flood peak in Mackay and major flood levels 30 kilometres to the west at Mirani. On the Sarina Range a number of residents were isolated. The Mackay local group also had challenges with record flooding that affected Eton and other areas, and outflows from the Kinchant Dam.

The IGEM recognises that a separate assessment of the issues surrounding Kinchant Dam has been undertaken by the Office of the Chief Scientist.

We note that the independent report found that the Kinchant Dam would have had little or no significant impact on local flooding following Debbie.

Isaac

Isaac Regional Council also experienced the effects of dangerous winds, extraordinary high intensity rainfall and rapid onset flooding across the majority of the region. Although only few residential properties were damaged, significant social and economic impacts have been felt. A number of agricultural properties, a school and a small business, such as the service station, became isolated due to flooding. Significant damage to transport infrastructure (road and rail) was evident.

This caused major disruption to supply and product movements. Response and recovery efforts were challenged, exacerbated by communication and power failures. As a result, major economic impacts of state significance are evident in the local agricultural and mining industries.

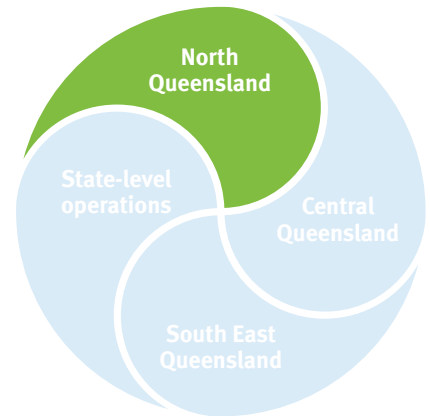
The Isaac LDMG had undertaken some planning activities in conjunction with regional mining companies. Subsequent to the event, the group has identified that improved integration of plans will enhance operational activity. This will lead to decisions that are better informed and enhance the understanding of local capacity, including the utilisation of resources (e.g. equipment) in response. The LDMG has also identified a number of other challenges that will require longer term partnerships and a strategic outlook to mitigate the effects of future disaster events.

A common experience

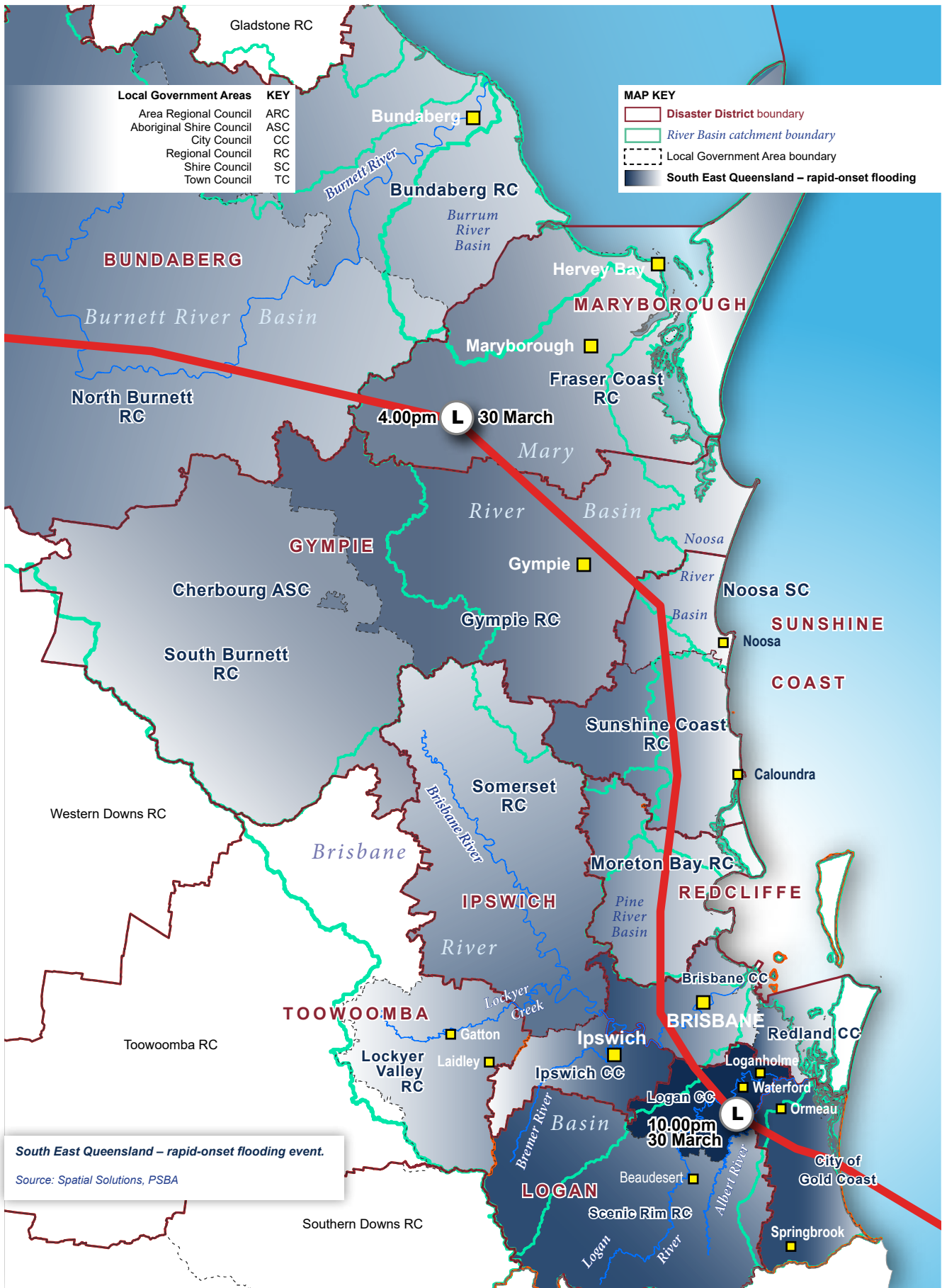
A challenge for all involved was the time Debbie took to cross the coast.

Unlike recent severe tropical cyclones experienced in Queensland, Debbie moved comparatively slowly, maintaining cyclone strength for over 24 hours in some areas. The slowness in crossing the coast resulted in staff on duty for days in some cases, and put particular pressure on key people for an extended period. Despite the pressure, we heard the early activation of recovery groups and associated planning was effective across North Queensland. All groups identified early the importance of rapid damage assessment for recovery planning.

The three concurrent events



	4.30am • "Approx. 4000-5000 guests/ staff on Hamilton Island, 430 guests/ staff on Daydream Island and 607 guests/ staff/contractors on Hayman Island" taff/ contractors on Hayman Island"
	Morning (approx. 10.30am) • TC crossed over Whitsunday islands
28 March	12.40pm • TC Debbie made landfall Airlie Beach as a category 4
	1.00pm • TC crossed over Proserpine as a category 3
	From 3.00pm • BoM advised gale force winds to impact Ayr
	10.00pm • TC crossed over Collinsville as a category 2
	Bowen and Proserpine cyclone shelters transitioned to evacuation centres
	Early hours • System dissipated to a tropical low south west of Collinsville
29 March	Townsville LDMG stood down
	Mackay airport reopened with restrictions
	3.00pm • Whitsunday Pilotage Area reopened
	Commercial flights arranged from Hamilton Island to Cairns, Sydney and Bowen
	Whitsunday PCYC opened as evacuation centre
	pm • Navy evacuates 200 from Daydream Island to Airlie Beach
30 March	5.00pm • Police assist evacuation flights on Hamilton Island
	9.30pm • Last 100 evacuees from Daydream Island move from Airlie Beach to Townsville
	Late evening • Private charter takes Hayman Island guests to Sydney via Hamilton Island
31 March	Burdekin LDMG stood down
3 April	Whitsunday LDMG transitioned to recovery



South East Queensland – rapid-onset flooding

By Tuesday 28 March, as the impact of the cyclone was unfolding in Northern Queensland, many of the southern councils began their preparations. On Wednesday 29 March Debbie was downgraded to a tropical low.⁴⁴ Wind and rain intensified in the south east with the Bureau expecting widespread daily rainfall totals of 150 to 250mm, with significantly higher totals possible locally.⁴⁵

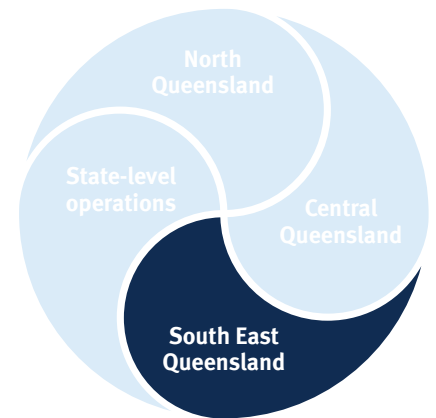
Drawing on experiences from previous cyclones many councils moved to “alert” and communities began preparing for the possibility of tidal surges and flooding.

A number of councils commenced community messaging. Requests for local staff to be deployed north were no longer approved to ensure local capacity was retained in the south east corner, and people and resources were pre-deployed into areas often isolated by flooding.

Overview of South East Queensland local and district disaster management group activations and state activations; the matrix on the following page focuses on the period from 29 March in more detail.

Data sourced from SDCC, local and district disaster management group reports and interviews

The three concurrent events



Group	Date, time sequence	24 March, 10am	25 March, 10am	26 March, 2pm	27 March, 9am	28 March, 4:30am	28 March, 2pm	28 March, 7:15pm	29 March, 5am	29 March, 5pm	30 March, 1pm	31 March, 5am	31 March, 5pm	1 April, 5am	1 April, 1pm	2 April, 5am	2 April, 3pm	3 April, 5am	3 April, 5pm	4 April, 5am	4 April, 5pm	5 April, 5am	5 April, 5pm	6 April, 5am	6 April, 4pm	7 April, 5am	7 April, 4pm	8 April, 6am	9 April, 6am	10 April, 6am	10 April / 4pm	11 April / 6am			
LDMG	Bundaberg																																		
	North Burnett																																		
	Fraser Coast																																		
	Gympie																																		
	South Burnett																																		
	Noosa																																		
	Sunshine Coast																																		
	Somerset																																		
	Moreton Bay																																		
	Brisbane																																		
	Redland																																		
	Logan																																		
	Gold Coast																																		
	Scenic Rim																																		
	Ipswich																																		
	Lockyer Valley																																		
	Toowoomba																																		
	Southern Downs																																		
	Western Downs																																		
Maranoa																																			
Balonne																																			
DDMG	Bundaberg																																		
	Maryborough																																		
	Gympie																																		
	Sunshine Coast																																		
	Redcliffe																																		
	Brisbane																																		
	Logan																																		
	Gold Coast																																		
Ipswich																																			
Toowoomba																																			
Warwick																																			
SDCC, SDCG, QDMC																																			

Activation matrix key

- Alert (Yellow)
- Lean forward (Orange)
- Stand up (Red)
- Stand down (Green)

The three concurrent events

In the Scenic Rim road equipment was repositioned to respond to any emergent road damage, while in Bundaberg district group liaison staff were pre-deployed into North Burnett council to ensure ongoing linkage should the area become inaccessible. Resources were also deployed to pre-established community response groups in the Fraser Coast and Gold Coast hinterland, enabling self-sufficiency in case of isolation. These early preparations were identified by some councils as key to ensuring they were well prepared should the local group move to stand up. We are pleased to see that these activities are lessons really learned; they represent sustained and continuous improvement.

On the morning of Thursday 30 March Debbie was tracking south east of Emerald and projected to reach the south east corner of Queensland by Thursday afternoon with the heaviest falls in Brisbane expected in the evening.⁴⁶ In the southeastern quarter of the state widespread daily rainfall totals of 200mm were expected.

Significant isolated falls in excess of 400mm were also predicted for South East Queensland, bringing a high risk of flooding across the region.⁴⁷ Damaging winds and torrential rainfall were already occurring from Central Queensland to the New South Wales border and flood watches across coastal catchments.

By 6.00am on Thursday 30 March all district groups from Brisbane to Bundaberg were on “alert” and by that afternoon all district and local disaster management groups in the South East had been activated, with nine local groups and three district groups at “stand up.”⁴⁸

The event they were anticipating, though, differed from local group to local group. As outlined later in the discussion on information management, varying information sources and data, compounded by the pressure of timing, made the decision-making process even more complex.

Overview of South East Queensland local and district disaster management group activations focusing on the period from 29 March in more detail.

Data sourced from SDCC, local and district disaster management group reports and interviews

		Wednesday 29 March				Thursday 30 March											
		12 mn	5am	Noon	5pm	5am	6am	7am	8am	9am	10am	11am	Noon	1pm	2pm	3pm	4pm
LDMG	Bundaberg																
	North Burnett																
	Fraser Coast																
	Gympie																
	South Burnett																
	Noosa																
	Sunshine Coast																
	Somerset																
	Moreton Bay																
	Brisbane																
	Redland																
	Logan																
	Gold Coast																
	Scenic Rim																
	Ipswich																
	Lockyer Valley																
Toowoomba																	
Southern Downs																	
DDMG	Bundaberg																
	Maryborough																
	Gympie																
	Sunshine Coast																
	Redcliffe																
	Brisbane																
	Logan																
	Gold Coast																
	Ipswich																
	Toowoomba																
Warwick																	

The three concurrent events

Date	South East Queensland
22 March	Tropical low identified
25 March	4.51am • BoM predicts crossing coast south of Townsville as category 4 on 28 March
	10.00am • Low named as TC Debbie SDCC stood up
26 March	5.22pm • BoM issued storm tide warnings QRA stood up
27 March	Between 5.00pm–12 midnight • TC intensified to category 4 off Whitsundays
28 March	Morning (approx. 10.30am) • TC crossed over Whitsunday islands
	12.40pm • TC Debbie made landfall Airlie Beach as a category 4
	2.00pm • State Recovery Coordinator appointed
29 March	1.00pm • TC crossed over Proserpine as a category 3
	10.00pm • TC crossed over Collinsville as a category 2
30 March	Early hours • System dissipated to a tropical low south west of Collinsville
	6.00am • All district groups from Brisbane to Bundaberg on alert
	7.32am • DET tweeted school closures of Metro, North Coast and SE regions
	8.33am • Advice to departments to enact Business Continuity Plans
	9.30am • EAs advising school closures from Agnes Waters to NSW border and west to Nanango commence
	Later • Queensland Government advises businesses to consider closing after midday
	Afternoon • All districts and local groups in the SE activated
	From 4pm • 26 Flood warnings issued across the SE before 9am / 31 March
	12 local groups, and three district groups at stand up
	Evening • Flash flooding across Gold Coast (hinterland isolated)
31 March	Late evening • BoM issues flood warnings for Albert and Logan Rivers rapid rises and major flooding for Redlands, Gold Coast, Scenic Rim and Logan
	11.40pm • BoM issues major flood warning for Albert river and broadcasts SEWS for Logan River Beaudesert

The worsening weather resulted in the decision, early on Thursday 30 March to close schools. At 7.32am the Department of Education and Training tweeted that “all state schools in Metropolitan, North Coast and South East Regions are closed.”

Around 9.30am a series of EAs carried the same advice about all schools from Agnes Waters to the New South Wales border, and west to Nanango. This decision by the Queensland Government to close schools and later to advise businesses “to think about closing after midday” was identified by many agencies as a significant factor in reducing risk and managing people on the roads. It provided challenges to others, draining organisations of staff as they prepared for the event, and reducing their ability to get provisions from usual suppliers.

While there was some confusion around the timing of the message and the breadth of schools included, the decision also signalled to the community that this was a significant weather event. Schools south of the Sunshine Coast remained closed on Friday 31 March.

By 3.00pm on Thursday 30 March the low tracked over the Fraser and Sunshine Coasts, pushing continuous heavy rainfall and strong winds from Gympie through to Noosa, causing fallen trees and some loss of power. Power providers responded quickly, with electricity restored to most properties within three days. Messaging by Wide Bay Water for properties downstream of Lenthall Dam was executed seamlessly, strengthened by lessons learnt from a recent exercise on the effectiveness of their warning systems.

Media campaigns using social media and radio were considered an effective means of communicating with the public. The value of community engagement was demonstrated in the Scenic Rim where a direct appeal by the Mayor to conserve water saw an immediate drop in water usage.

In 62 Queensland locations the rainfall records for March were broken.⁴⁹ In South East Queensland the majority of rain from Debbie fell in a 36 hour period from the morning Thursday 30 March to midday Friday 31 March.^{50 51} The heaviest rain occurred on Thursday night, resulting in the Bureau issuing 26 flood warnings for South East Queensland between 4.00pm Thursday 30 March and 9.00am Friday 31 March.⁵²



Springbrook’s Pine Creek Road, Queensland.

Photo courtesy of ABC News – supplied: Kira Lowe

Access to council flood mapping data and technical specialists significantly enhanced the capacity of a number of local and district groups to identify at-risk properties and effectively target messaging, door-knocking and evacuation processes.

The investment in flood gauges and river cameras in the Lockyer Valley enabled greater knowledge of unfolding events locally, with live feeds from the cameras to the council website every 15 minutes enabling residents to also monitor changes. Traffic to their website peaked at 8000 hits at the height of the event.

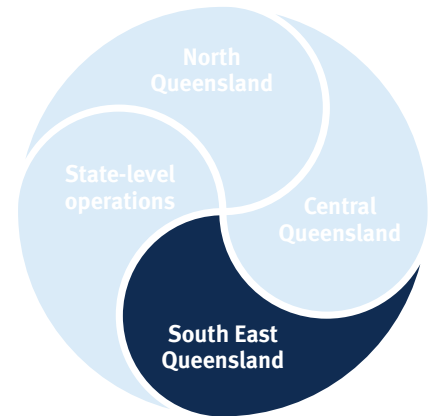
By early Thursday evening, flash flooding was occurring on the Gold Coast with areas in the hinterland being isolated by road.⁵³ In the 24 hour period from 9.00am Thursday 30 March, Springbrook and the Scenic Rim experienced rainfall exceeding 600mm.⁵⁴ By 11.40pm on Thursday 30 March, the Bureau had issued a major flood warning for the Albert River, reporting record major flood levels at Beaudesert on the Logan River and asking media to broadcast the Standard Emergency Warning Signal.⁵⁵

The rain caused unprecedented demands on the *QLDTraffic* website, which was unable to keep up with the number of roads that were flooded or unsafe. The ability to locally monitor roads using CCTV enabled the City of Gold Coast to supplement information on road closures on the council website. While no evacuation centres were needed on the Gold Coast, the extended opening of council libraries provided a comfortable and “safer space” for the community where they could also access up-to-date information.

By late evening on Thursday 30 March, increased severity flood warnings for rapid rises and major flooding in the Albert and Logan rivers were being issued by the Bureau for the Redland, Gold Coast, Scenic Rim and Logan councils.⁵⁶

EA messages followed the next morning, for Scenic Rim at around 1.00am, for parts of Logan around Eagleby around 7.00am, and for the Gold Coast around 8.40am.

The three concurrent events



Landslide, Lamington National Park, Queensland.

Photo courtesy of ABC News - supplied: David Higgins

Date	South East Queensland
31 March	1.00am • EA for scenic rim
	Early hours • Houses and properties along Albert River inundated
	5.30am • Logan River peaked at 14.76m at Beaudesert (and again at 1.30pm)
	7.00am • EA for parts of Logan around Eagleby
	8.40am • EA for Gold Coast
	Morning • Directed Evacuation issued on behalf of Gold Coast for Ormeau area of Albert River
	11.00am • Albert River peaked at 8m at Beenleigh
1 April	Four evacuation centres opened across Logan
	Evening • Logan River peaked at 10.5m at Waterford
3 April	Power restored to 1600 properties
	DCCDS established a community recovery hub at Beenleigh
8 April	Ongoing operations had transitioned to recovery
	Local and district groups had stood down

The three concurrent events

Date	South East Queensland
22 March	Tropical low identified
25 March	4.51am • BoM predicts crossing coast south of Townsville as category 4 on 28 March
	10.00am • Low named as TC Debbie SDCC stood up
26 March	5.22pm • BoM issued storm tide warnings QRA stood up
27 March	Between 5.00pm–12 midnight • TC intensified to category 4 off Whitsundays Morning (approx. 10.30am) • TC crossed over Whitsunday islands
28 March	12.40pm • TC Debbie made landfall Airlie Beach as a category 4
	2.00pm • State Recovery Coordinator appointed
	1.00pm • TC crossed over Proserpine as a category 3 10.00pm • TC crossed over Collinsville as a category 2
29 March	Early hours • System dissipated to a tropical low south west of Collinsville
30 March	6.00am • All district groups from Brisbane to Bundaberg on alert
	7.32am • DET tweeted school closures of Metro, North Coast and SE regions
	8.33am • Advice to departments to enact Business Continuity Plans
	9.30am • EAs advising school closures from Agnes Waters to NSW border and west to Nanango commence
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11.40pm • BoM issues major flood warning for Albert river and broadcasts SEWS for Logan River Beaudesert	

Only one EA was a directed evacuation, issued on behalf of the City of Gold Coast Council for the Albert River in the Ormeau area on the morning of Friday 31 March. Problems in EA messaging and the loss of mobile reception in the upper catchment of the Albert hampered communications. In the early hours of Friday 31 March residents along the Albert River awoke to find their houses and properties inundated. While door knocking and the quick action of neighbours minimised the loss of life, 10 swift water rescues were undertaken overnight across South East Queensland.⁵⁷ That morning also saw the dramatic rescue of a family by the SES from the roof of their Luscombe home 15 minutes before the house was swept away.⁵⁸

By late Friday 31 March Debbie was located offshore from the Gold Coast and impacting northern New South Wales. The flow from catchments saw further flooding occurring over the next few days. This required the Logan LDMG to simultaneously undertake recovery work with communities around the Albert River, whilst also preparing for the Logan River to peak as water moved down the catchment. Four evacuation centres were opened across Logan, at Crestmead, Beenleigh PCYC, Logan Metro and Jimboomba, although less than 60 people were accommodated in total.⁵⁹

The capacity to respond across multiple sites and stages of the event were clearly identified as pivotal to managing this event, and demanded strong collaboration and communication across local groups, districts and agencies.

By the time Debbie had passed through South East Queensland, most rivers and creeks within the Albert and Logan catchments had recorded major flood levels. The catchment generally experienced its highest levels since 1974, with some areas experiencing record levels.

At 5.30am on 31 March the Logan peaked at 14.76m at Beaudesert and again at 1.30pm, higher than the 1991 levels. The Albert River reached 8.0m at Beenleigh at 11.00am on Friday 31 March,⁶⁰ just below the 1887 record. On the evening of Saturday 1 April the Logan River peaked at Waterford at a height of 10.5m, exceeding the major flood levels of 2013 and shy of the 1887 record of 13.7m,⁶¹ effectively isolating many Logan residents.



Flooded car park in Beenleigh, south of Brisbane.

Photo courtesy of ABC News – Matt Roberts

Following the completion of rapid damage assessments, 76 properties were deemed uninhabitable in South East Queensland. Approximately 1,600 properties lost power, though all were restored by 3 April.⁶² Throughout the region there was significant loss of stock, crops and damage to rural infrastructure. The DCCSDS established a community recovery hub at Beenleigh⁶³ and approximately 150⁶⁴ people accessed the centre on Monday 3 April.⁶⁵

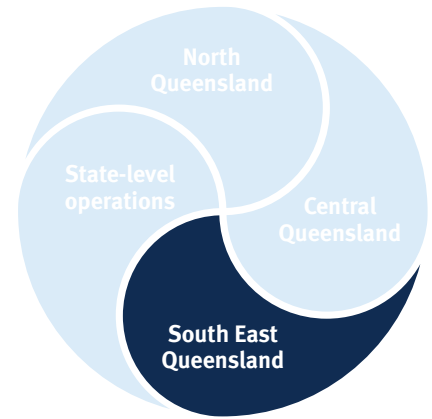
Volunteers, managed through Volunteering Queensland supported the Logan recovery.

All local councils in South East Queensland region impacted by the rapid-onset weather event were eligible for Natural Disaster Relief and Recovery Arrangements (NDRRA) funding, as well as five from the Wide Bay-Burnett region (Appendix D).

By 8 April ongoing operations had transitioned to recovery and all local and district groups in the South East had “stood down.”^e To some the term “stand down” may have sounded as though groups had stopped work, and this caused concern. Councils in the South East made the point the term “stand down” does not convey the “appropriate graduated scaling back” that councils can undertake. A number of local governments had made provision for an early transition to recovery.

City of Gold Coast began while still in the response phase, with the Mayor committing to replace the term “stand down” with “transition to recovery” to emphasise the point. While some local and district groups thought the initial request to stand up may not have been warranted, in hindsight, a number also flagged that the process enabled significant exercising of their disaster management capability.

The three concurrent events



Aerial view of Fitzzy's at Waterford south of Brisbane.

Photo courtesy of Logan City Council

Notes

e. Logan was the last LDMG to stand down on 8 April 2017.

Date	South East Queensland
31 March	1.00am • EA for scenic rim
	Early hours • Houses and properties along Albert River inundated
	5.30am • Logan River peaked at 14.76m at Beaudesert (and again at 1.30pm)
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8 April	Ongoing operations had transitioned to recovery
	Local and district groups had stood down



Rockhampton – slow-onset flooding

Central Queensland is heavily reliant on, and strongly influenced by, the Fitzroy river basin, at 143,000 square kilometres the largest river system on Australia's east coast.⁶⁶

Those familiar with the workings of the river system were alert to the potential impact of Debbie. Not only in its cyclonic phase, but as an ex-cyclone it had the capacity to drop substantial rainfall into the catchment and cause significant riverine flooding. Before Debbie crossed the coast, much rain had already fallen in some communities within the basin and one northern tributary (the Isaac River) was already at minor flood levels. In the days after Debbie made landfall there was further heavy rain, strong winds and localised flooding across Central Queensland.

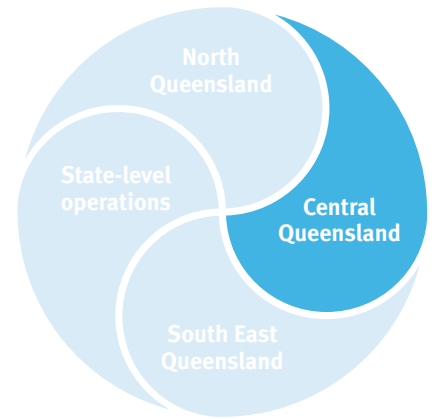
On Wednesday 29 March an EA was issued on behalf of Central Highlands Regional Council to warn of the potential for flash flooding. Two EAs were issued on behalf of the Banana LDMG on Thursday 30 March advising of rising water in the Callide and Kroombit Dams. Although the entire Banana shire had been officially drought-declared in early March,⁶⁷ memories of the release from Callide Dam in 2015 led to a desire by SunWater to provide early warning to the community.

We were told the Banana local group was reluctant to send messages too early, and resisted their suggestions at first. However, the LDMG was very pleased with how SunWater managed the inflows and outflows of Callide Dam.

As Debbie passed over Central Highlands, Woorabinda and Banana on 29 March, taking a more easterly track than expected, these local government areas experienced rural flooding, road closures and crop, stock and equipment losses.



The three concurrent events



Flooding in the Central Highlands.

Photo courtesy of Central Highlands Regional Council

Activation matrix key	
Alert	Yellow
Lean forward	Orange
Stand up	Red
Stand down	Green

Central Queensland local and district disaster management group activations and state activations.

Data sourced from SDCC, local and district disaster management group reports and interviews.

Group	Date, time sequence	24 March, 10am	25 March, 10am	26 March, 2pm	27 March, 9am	28 March, 4,30am	28 March, 2pm	28 March, 7,15pm	29 March, 5am	29 March, 5pm	30 March, 1pm	31 March, 5am	31 March, 5pm	1 April, 5am	1 April, 1pm	2 April, 5am	2 April, 3pm	3 April, 5am	3 April, 5pm	4 April, 5am	4 April, 5pm	5 April, 5am	5 April, 5pm	6 April, 5am	6 April, 4pm	7 April, 5am	7 April, 4pm	8 April, 6am	9 April, 6am	10 April, 6am	10 April / 4pm	11 April / 6am				
		LDMG	Livingstone																																	
Rockhampton																																				
Central Highlands																																				
Woorabinda																																				
Gladstone																																				
DDMG	Rockhampton																																			
	Gladstone																																			
SDCC, SDCCG, QDMC																																				

The three concurrent events

Date	Central Queensland
22 March	Tropical low identified
25 March	4.51am • BoM predicts crossing coast south of Townsville as category 4 on 28 March
	10.00am • Low named as TC Debbie
26 March	5.22pm • BoM issued storm tide warnings
27 March	Between 5.00pm–12 midnight • TC intensified to category 4 off Whitsundays
28 March	Morning (approx. 10.30am) • TC crossed over Whitsunday islands
	12.40pm • TC Debbie made landfall Airlie Beach as a category 4
	1.00pm • TC crossed over Proserpine as a category 3
	10.00pm • TC crossed over Collinsville as a category 2
29 March	EA issued on behalf of Central Highlands Regional Council warning of flash flooding
	TC Debbie passing over Central Highlands, Woorabinda, and Banana
30 March	Two EAs issued on behalf of Banana LDMG advising of rising water in Callide and Kroombit dams
	Rail line to Mackay closed
31 March	Rockhampton LDMG stood up
1 April	Disaster declaration made for Rockhampton and Livingstone council areas
	Livingstone LDMG stood up
2 April	Rockhampton evacuation centre opened
	1.50pm • EA watch and act issued advising Fitzroy flood expected to peak on 5 April
3 April	Rockhampton airport closed
4–9 April	Diversion through Rockhampton open to Bruce Highway traffic
5 April	6.14pm • EAs issued to selected addresses most likely to be flooded
6 April	Recovery Committee established in Rockhampton
	Rockhampton recovery hub established
7 April	10.30am • Flood peaked at 8.9m in Fitzroy River
11 April	Rockhampton evacuation centre closed
13 April	Rockhampton airport re-opened
14 April	Rockhampton recovery hub closed

On Friday 31 March the Rockhampton local group “stood up” to respond to the recent rain and begin preparing for the town’s third major flood in six years. The adjoining Livingstone local group stood up on Saturday 1 April and a disaster declaration for the two council areas was made the same day. A concerted media campaign commenced in both Livingstone and Rockhampton that included daily media releases, radio interviews, videos and Facebook posts and there were daily updates on the evening news from the Chair of the Rockhampton LDMG.

Two sets of EAs were sent on behalf of the Rockhampton Regional Council. The first, issued on Sunday 2 April and including more than 200,000 voice and text messages, was a “watch and act,” advising the Fitzroy River was expected to peak on 5 April. The extensive area receiving a warning message included Livingstone Shire Council and created some confusion amongst residents and facility owners. As the Capricorn Coast was still accessible, this messaging created the assumption that business were closed. A second series of EAs was issued on Wednesday 5 April. Following close liaison between the Rockhampton Disaster Management Officer and the SDCC, this second series was sent to more targeted blocks, based on specific addresses most likely to be affected by the flood.

The peak was then predicted for Thursday 6 April. As the river rose, some flood gauges washed away, meaning the council and Bureau received less regular updates of their predictions. Eventually the flood peaked at 8.9m on Friday 7 April,⁶⁸ below the predicted peak of 9m. About 200 homes and businesses were inundated and about 3,000 properties affected by road closures.



Previous floods had led to a number of mitigation projects being jointly funded by Rockhampton Regional Council and the Queensland and commonwealth governments. These mitigation measures worked, allowing sporting fields to reopen sooner, and keeping approximately 400 more properties flood-free.

North Rockhampton mitigation measures

- Installation of backflow prevention valves on storm water drains
- Purchase of a temporary flood barrier
- Refurbishment of sewerage network to reduce inflow of flood waters
- Construction of a small levee and associated drainage
- No new development approvals in flood-prone areas.

The Yeppen overpass, constructed after the 2011 floods cut the highway for several weeks, allowed access to Rockhampton from the south and prevented its isolation. Traffic could continue north from Rockhampton but because sections of the Bruce Highway in Rockhampton’s southern outskirts still flood, that traffic was diverted through the city. Between 4–9 April the diversion was open to all Bruce Highway traffic.

Despite significant disruption to the local community and last minute alterations to council roads to permit access by B-Double trucks on local streets, this enabled an important transport artery to remain accessible.

Transport to the west of Rockhampton however, including the Capricorn Highway, was still affected by heavy rainfall causing road damage. The rail line to Mackay closed on 30 March and Rockhampton airport was closed 3–12 April.

An evacuation centre and related support services were placed on standby for 10 days by Livingstone Shire Council, although it transpired that the centre was not needed. A Rockhampton evacuation centre operated 2–10 April under QPS leadership and received 23 people. This was far fewer than during previous similar events, although the “no pets” policy may have influenced the decisions of many pet-owning residents. In a more nuanced approach than had been adopted in the past, Ergon pre-assessed properties that would clearly be affected by flooding and arranged 467 electricity disconnections ahead of the flood.

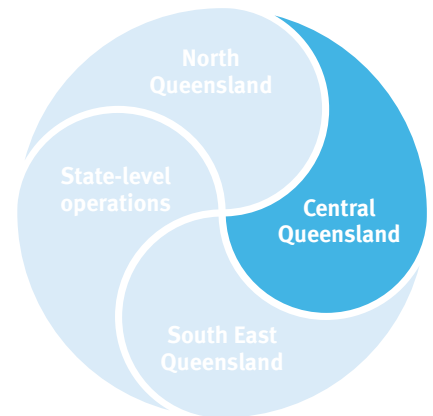
The extensive preparations in advance of the flood also assisted the subsequent relief efforts. Advice about likely hardship numbers, provided in advance by the council to DCCSDS, permitted more rapid and efficient delivery of assistance. Rapid damage assessments were undertaken, although, from the Rockhampton LDMG debrief, we learned that this was not always in consultation with the local group.

A recovery hub was established in Rockhampton between 6–13 April which processed 950 applications for immediate hardship assistance. A recovery committee, chaired by the Mayor and focusing on economic recovery, was established. The four councils of the District are eligible for NDRRA funding (Appendix D).⁶⁹

The Rockhampton LDMG concluded, at its debrief meeting, that the town of 85,000 was the most prepared it had ever been and that excellent support had been provided by the state to support local capability. Throughout the activation period, disaster management staff in the council’s and district office worked closely together to provide coordinated operations and communications and, critically, psychological support to each other.

Nevertheless, the length of this activation, preceded by periods of heavy rain and minor flooding, proved gruelling for those disaster management staff who lacked access to trained people to relieve them.

The three concurrent events



Tartrus Station on the Mackenzie River.

Photo courtesy of Central Highlands Regional Council



The Mackenzie River upstream from Leura Station at 4.17pm on 1 April.

Photo courtesy of Central Highlands Regional Council

communityrecovery



Tools that have been used for the first time ...

... and made a real difference during TC DEBBIE, 2017



online grants & EFT payments

Grants paid up to 51 times faster*, saving 258 'Hub days'. 92% chose EFT payment option!

* Compared to TC Marco, 2015



social media engagement

Twitter and Facebook posts reaching over 1 MILLION people, with more than 70,000 video views



grants over the phone

More than 72,400 calls to the SSQ Hotline, with the majority of calls being about grants and follow ups



DeployMe app

578 active users during TC Debbie, with most accessing info about the disaster, deployment kit and social media feed



GIS mapping & analytics

Geo-spatial mapping analysis, incl. flood prediction, accommodation exposure and vulnerability analysis



new processes with DHPW

Electronic transmission of data with DHPW has provided more rapid assessment and processing of grants



internal operating protocols

New arrangements successfully operationalised with State Human & Social Recovery Coordinator supporting Regional Human & Social Recovery Controllers across 3 regions



coordinated comms to MPs

More than 60 targeted e-updates provided to MPs in disaster locations during operations - resulted in significantly less queries and complaints from MPs



SSRG National Guidelines for Interstate Assistance

The Guidelines, used for the first time, facilitated the provision of 142 recovery workers from other states & territories to supplement our Ready Reserve workforce

Preparedness

By March 2017, at a state level, much work had been done to prepare for disaster events such as Debbie. Whole-of-government operational response capabilities are coordinated through the SDCC. In 2014 an improvement strategy was developed for the structure, operations and activities of the Centre. The strategy outlined key deliverables across three streams, People, Place and Processes. It, and its implementation roadmap, included the establishment of senior partnerships between QFES and QPS, organisational and physical changes, and clearer governance reinforcing the authority of the permanently-appointed SDC to coordinate the disaster response operations for the state group.⁷⁰

Prior to Debbie forming into a cyclone, we observe that sound procedures were in place, backed up by good – though not perfect – technical systems, and people well prepared to deal with the developing weather. Although the new improvements had been untested in a big event, we note that, overall, the Centre knew what to expect and how to deal with it. A later, transparent and honest debrief of the SDCC cell leaders echoed these findings.

One small note of caution raised by staff in the Centre itself, both before and after the event, was the sustainability of the Public Information Cell for a big event. Despite the DPC's maintenance of a Critical Incident Reserve Pool of media staff,⁷¹ it had been difficult over the previous year to find appropriate people to train. Those very capable officers staffing the system were aware of their lack of depth.

At state-level, pre-season preparation went well beyond the Centre, and involved agencies from across government. We have already commented on how the Standing Order – *Operation Fortitude* – characterised the approach of QFES. In mid-December the QDMC held a pre-season exercise.

The Department of Transport and Main Roads (TMR) had put significant effort into developing the *QLDTraffic* website as a single source of truth for road closure data, and concentrating on the currency of real-time information. The investment paid off, but some councils and agencies noted the volume of road information was almost overwhelming and that *QLDTraffic* was not able to portray current information quickly enough, and that it did not reflect road closures on the ground. TMR notes that this will be considered as part of ongoing improvement strategies. Local clarity of information was sought after, and prized. The Department also recognised the challenges in closing roads – a topic that was to reoccur in local debriefs later.

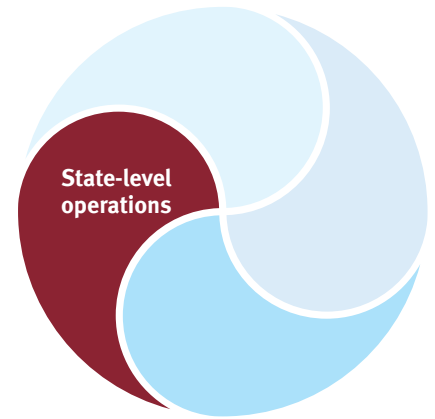
The DCCSDS had undertaken a number of initiatives,⁷² including an online grants and EFT payments system, the ability to issue grants over the phone, and a financial assistance toolkit.

They also developed coordinated communications packages for Members of Parliament, providing baseline information to those likely to be involved in disasters at short notice. In August 2016, DCCSDS released the *People with vulnerabilities in disasters – a framework for an effective local response*. The aim of this framework is to reduce the impact of disaster on people with vulnerabilities, by informing the development of strategies to engage them prior to any event.⁷³

In a commendable breakthrough for information sharing, DCCSDS had also established an agreement with the National Disability Insurance Agency to allow the sharing of information about people getting assistance at household level. This information proved useful to district groups during the event.

Additionally, QRA had released the *Interim Queensland Recovery Plan* to provide guidance to the sector on how to plan for and manage recovery.

State-level operations



Opposite: Community Recovery service delivery firsts!

Source: Department of Communities, Child Safety and Disability Services

State-level operations

Date	Queensland – State-level
22 March	Tropical low identified
	QDMC convened
25 March	4.51am • BoM predicts crossing coast south of Townsville as category 4 on 28 March
	10.00am • Low named as TC Debbie
	10.30am • SDCG Weather Telecon
	SDCC stood up
	SOC activated
26 March	State deployment of QFES damage assessment teams
	EA campaigns delivered to coastal areas in Palm Island, Townsville, Burdekin, Whitsunday and Mackay shires
	Stand up of Mackay DDMG and Townsville DDMG
27 March	QRA stood up
	1,699 people evacuated from Ayr, Bowen, Cleveland Palms, Cungulla, Hamilton Island, Home Hill Hook Island, Long Island Palm Island, Proserpine and South Molle Island
	Between 5.00pm–12 midnight • TC intensified to category 4 off Whitsundays
	Morning (approx. 10.30am) • TC crossed over Whitsunday islands
28 March	12.40pm • TC Debbie made landfall Airlie Beach as a category 4 with 185–260 km/h wind gusts and 150–250 mm rainfall totals with 400mm in isolated areas
	11.00am • SDCG telecon
	Reports of STC Debbie heavily impacting the Whitsunday and Mackay regional council areas
	1.00pm • TC crossed over Proserpine as a category 3
	2.00pm • SRC appointed
	Over 7,000 customers with Telstra fixed phone line disruptions
	Media: “Food Supplies commence; Qld Govt closes schools from Ayr to Proserpine”
29 March	10.00pm • TC crossed over Collinsville as a category 2
	Early hours • System dissipated to a tropical low south west of Collinsville, moving south east
	QFES DART commences RDA
	Interstate assistance arrives from NSW and the ACT to support in RDA
30 March	11.00am • SDCG Telecon
	Over 65,000 customers in North Queensland without power
30 March	Qld Government orders every school in region to close from Agnes Waters in the north to the NSW border in the south and west to Nanago
	8.33am • Advice to departments to enact Business Continuity Plans
	Later • Queensland Government advises businesses to consider closing after midday

The utilities sector also played a significant part in the state's preparedness. Utilities see disaster planning as business as usual, rather than anything exceptional. Queensland is a disaster-prone state and, particularly for isolated communities, we heard that corporations want to show that everything possible has been done to restore services in the event of an emergency, especially for isolated communities.

Energy Queensland wrote to councils asking about power requirements for council's critical sites – with varying degrees of response. Upgrades to their Geographic Information System (GIS) gave better visibility of their network, and touch pad technology issued to their field crews enabled quicker damage assessment and tasking.

Optus and Telstra had carried out their common practice of pre-season checks, testing of equipment and readying for deployments. Both had transportable satellite communications equipment available. In terms of dams, SunWater and Seqwater in particular had put in place systems and significantly improved messaging over the past two years. Both have raised the need for continual collaboration with councils and local groups to clarify roles and responsibilities for messaging.

Hazards

Several agencies have roles in flood and storm tide hazard identification, and the communication of risks.

In 2015, *Queensland's Tropical Cyclone Storm Tide Warning – Response System Handbook* was updated to include a list of 64 potential locations where the Bureau of Meteorology would produce Storm Tide Warnings and warning graphics.⁷⁴ To complement this, DSITI is currently collecting photographs and heights of local landmarks at each warning location to relate them to Storm Tide Warning levels. The project will promote awareness and a better understanding of vulnerability to storm tide in groups at local, district and state level.

In September 2016 the Bureau introduced standardised content, structure and language for flood warnings, enabled by a next generation hydrological forecasting system capable of using forecast, as well as actual, rainfall to predict flooding.

QFES had developed the *Queensland Emergency Risk Management Framework*, a methodology to inform risk-based planning. Its purpose is to provide a consistent state-wide approach to assessing risk, assisting local, district and state-level practitioners to focus on this issue from the perspective of their roles and responsibilities within the Queensland Disaster Management Arrangements.⁷⁵ When used, it helps to link residual risks at one level to planning at the next, when and where it is appropriate. By March 2017 it had just been implemented with disaster districts, but not with local governments. (We have heard since that local implementation is occurring, and is being well received.)

The QRA is responsible for policy oversight of the networks of flood warning gauges in Queensland. Collectively, these networks help ensure people in flood-prone communities have appropriate warning of flood events. In 2015, a review identified the Bureau used data from more than 3,400 rainfall and river gauges owned and operated by 54 entities. The review also identified priority locations for improved early flood warning infrastructure.

By March 2017 the QRA had worked with QFES, the Bureau and more than 40 priority councils to identify and recommend improvements to flood warning systems and design improved networks. Such work is intended to improve the visibility of data to all, raise the standard of flood warning gauge networks to one approved by the Bureau, and ensure that data from them is suitable for their use.⁷⁶ We note the importance that local governments put on flood gauges and the need for redundancy in systems. We commend the success of this work so far, and advocate that it continues.

Also by March 2017 the QRA's work with government agencies and four local councils on a larger project to develop a long-term plan to manage the impact of future floods was well advanced. The Brisbane River Catchment Flood Studies aim to improve community safety and resilience within the Brisbane River catchment.⁷⁷ The importance of a catchment-wide approach would become apparent during the Debbie event.

Warnings

The national EA telephone-based warning system is one tool that can be used to warn the community of a possible threat or emergency. EA sends voice messages to landlines and text messages to mobile phones in a defined geographic area. It works across all telecommunication carriers, does not rely on the need for anyone to subscribe, and does not give a choice to opt out. EA is considered a critical element of emergency response and should be complemented by other warning strategies.⁷⁸

Each use of the EA system is called a campaign.^f A campaign includes a message and a geographic area, defined by a polygon.^g A campaign has three options for methods of communication, a recorded voice message for landlines at their registered service address, and an SMS for mobiles. This may be sent to mobiles, either based on their registered service address, or on the last known location of the handset at the time of the emergency. A combination of these options may be used.

Types of alert campaigns used throughout Debbie.

Source: IGEM

Messages included warnings or information about:

<ul style="list-style-type: none"> • The cyclone • Storm Tide • Evacuation 	<ul style="list-style-type: none"> • School closures • Road closures • Dam releases 	<ul style="list-style-type: none"> • Flood warnings • Contaminated water • Recovery
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Notes

- f. A campaign is a single approved message sent to telephone numbers in response to an event.
- g. 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, 2015.

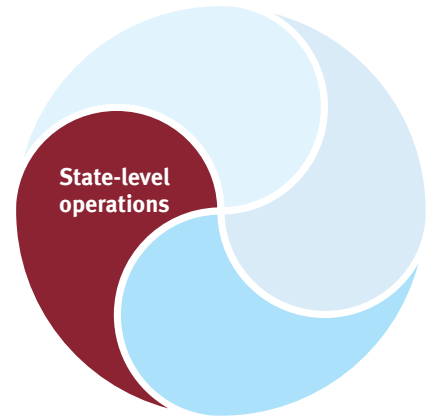
Campaigns are prioritised for action. Priority 1 categories identified as a Warning. These campaigns take precedence over Watch and Act (priority 2), and Advice (priority 3).

Once a campaign is loaded into the EA system the messaging to both land and mobile telephones is exceedingly fast. There are however a few limitations to the system, notably;

- the system is only designed for eight concurrent campaigns nationally at any one time
- the format of the polygon is limited, and
- the SMS handset location method sends messages via mobile towers that service the polygon. This often results in mobiles outside the polygon also receiving the message.

Queensland is a regular user of EA and requests for campaigns can originate from both state and local groups.⁷⁹ Within QFES, the SDCC issues such warnings on behalf of all.⁸⁰ The process in Queensland starts with either a local or state level requestor. The requestor defines the polygon, writes messages in both SMS and recorded voice form, ensures the implications of sending messages are considered and actioned – alerting call centres for instance, and contacts the SDCC. Those in the SDCC trained to use the system will contact an Authorising Officer for approval, and if needed, clarify details with the requestor. The Authorising Officer checks that everyone who needs to know has been told, that call centres and supporting media are ready, and authorises the campaign. SDCC staff prepare the campaign in EA, confirm it with the requestor, get final approval to release it and release the campaign.

State-level operations



31 March	Widespread areas of significant flooding occurring in the Logan and Albert River catchments
	Fitzroy River in Rockhampton rising with peaks expected at Yaamba and Rockhampton
	More than 170,000 customers in South East Queensland without power
1 April	Stand up of Rockhampton DDMG
	Logal River peaks to exceed the major flood levels at Waterford and Eagleby
3 April	Second interstate assistance deployment arrives to support RDA
	11.00am • SDCG Telecon
	1600 properties without power in South East Queensland
	21,000 properties without power in North Queensland
4 April	At this point, 588 properties deemed uninhabitable in central and North Queensland and 76 properties deemed uninhabitable in South East Queensland
	Ergon has de-energised approximately 260 residential/business customers in Rockhampton
	13,600 customers without power in North Queensland (Bowen, Prosperpine, Collinsville, Alligator Creek, Cannonvale, Sarina and Arlie Beach)
5 April	10.00am • SDCG Telecon
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11 April	SDCC Stood down
	2.00pm • Strategic Leadership Meeting – SDCC Response to QRA Recovery Transition
	300 customers in Proserpine and Airlie Beach without power, with restoration to be completed by 12 April

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During Debbie between 26 March and 5 April, 75 EA campaigns were issued across Queensland with more than 5.9 million warning messages sent to impacted areas. Of these alerts, one warned of the impacting cyclone as it crossed the coast, and 39 were issued for the associated storm surge in coastal areas around the Whitsundays, Burdekin and Mackay. EAs were also issued for flooding in south Queensland. One EA was sent for flash flooding in the south east corner for the Tallebudgera Valley area of the Gold Coast, and seven alerts issued for the flooding of the Albert and Logan Rivers (around Scenic Rim, Gold Coast and Logan areas).

In Central Queensland four alerts were sent for flash flooding, and a further four later in the week warning of the slow-onset flooding of the Fitzroy River. In addition, 12 EAs were issued advising of the immediate closure of schools in South East Queensland, four for advice on recovery funding support and two issued to advise of the need to boil water in the Whitsundays. Overall, the use of EA as a tool during the event was seen by stakeholders as a success with some reservations about timeliness, accuracy and understanding.

Evacuation planning

The decision to evacuate is a critical one. In a cyclone, the triggers to evacuate are often contained in Storm Tide Warnings. During the event, the Bureau issued 24 warnings, from the initial one in the early hours of the 25 March 2017 to when the cyclone crossed in the afternoon of the 28 March 2017.

In some cases there were differing opinions between the state and local groups about the need for evacuation. Mostly, directed evacuations happened at the request of local groups. Where state decisions were involved, they were either carried out as a voluntary evacuation or, later, through a locally-directed evacuation.

We observe that differing decisions may be due to information on the situation being incompletely shared, or different snapshots of information considered at different times. We do note that decision-makers at state level and most local and district groups had only most likely and worst case scenarios, with no qualifying information about the probability of either. This is explored in more detail later in the report.

Response

The coordination of disaster response operations for the QDMC is the role of the SDCG. The mechanics of the group worked well and were widely applauded by its membership. Its sessions were well-chaired, minuted and inclusive. However, the group operated in a different way to that in previous events. The proactive involvement of QDMC somewhat eclipsed its formal role. Requests from local and district groups for logistical support were relatively few in number – 25 over 19 days. One member commented on the focus of briefings on updates about numbers, rather than discussion on priorities, progress and cross-entity coordination.⁸¹

Few decisions were required from the group as these were being made at QDMC-level. The Leadership Board, comprised of all directors-general, also regularly met during this period. The Director-General DPC also hosted teleconferences with the government leadership team before each QDMC meeting to ensure there was coordination across agencies and to ascertain support required at that level.

Providing a single point of truth about the current state of an event is the role of the SDCC. The leadership team for the Centre established a calm and relaxed environment that permeated through to all and contributed towards efficient operations. One comment from the SDCC cell leader debrief was “that TC Debbie was probably the best planned disaster we have ever had.” Interviews with other stakeholders supported this, remarking on more efficient operations since the implementation of the SDCC improvement strategy.

Some local governments valued the level of information coming from the state. However some of those working in the Centre still noted scope for improvement, particularly in the areas of information requirements, report writing, and systems for reporting.

Health

At more than 80,000 staff, including the Queensland Ambulance Service, Queensland Health is the largest department in Government.⁸² Any event that affects Queensland affects Queensland Health. While this review is more concerned with how the system of agencies working together operated, due to its size Queensland Health acts as a microcosm of the system itself.

The immediate effects of Debbie were felt in just one of the state's 16 Hospital and Health Services – Mackay – which covers both that city and its surrounds, and the Whitsunday area. Later demands emerged in Rockhampton as the river slowly rose. To cover the event the State Health Emergency Coordination Centre (SHECC) was also activated. Eleven other Hospital and Health Services contributed 179 staff to the response and recovery over the following four weeks. Most were clinical staff but the deployments also included mental health, public health, building, engineering and maintenance services and emergency management functions. While clinical support and mental health support dominated, public health advice about the usual post disaster issues, including water, sewage, food hygiene, medicines and vaccines, hazardous waste, and vector control, was much in demand.

The activation showed that Queensland Health acquitted its disaster management accountabilities well. It proved the agency had the *Enablers* in place to activate and brief staff, coordinate operations with the Queensland Ambulance Service and keep the SHECC informed. It had the *Capability* to muster and deploy staff. Staff themselves were willing to deploy to assist others and had the commitment to work extended hours and manage changes inevitable in disasters. Internal health logistics ensured emergency operations centres were well staffed and equipped, deployment teams were fully resourced and the movement of critical medications and supplies continued.

The learnings of wider relevance were related to technology. The multiplicity of systems used to communicate with staff – Facebook, WhatsApp, and others – could confuse, and the increasing use of videos by the Bureau slowed internal networks as staff went online to keep up-to-date. Other learnings related to processes for deployment, coordination with aged-care facilities, and the need to manage internally the implications of government messaging.

Recovery

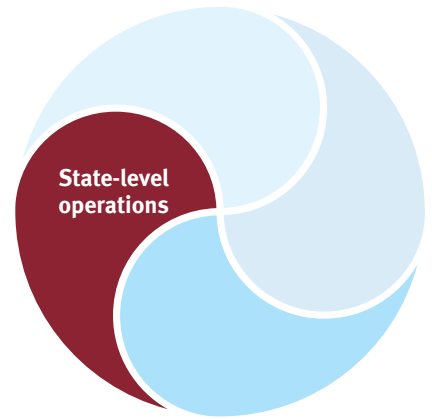
The transition at state government agency level from response to recovery has been supported by the presence, since June 2015, of the QRA as a permanent agency.⁸³ The QRA's vision is to build a more disaster-resilient Queensland.⁸⁴ The Authority "stood up" at the same time as the SDCC on Saturday 25 March. QRA representatives were embedded in the SDCG early and, due to this and the increased planning for recovery, SDCG representatives considered the transition to recovery was better than previous events.

The state's transition to recovery was fast. The appointment of a State Recovery Coordinator under legislation was made at 2.00pm on 28 March, while Debbie was still making landfall on Airlie Beach. In late 2016 an *Interim State Recovery Plan* had been approved. This informed the event recovery plan, *Operation Queensland Recovery*.⁸⁵ The state's preparations and actions matched those of some local governments which had also prepared for recovery early.

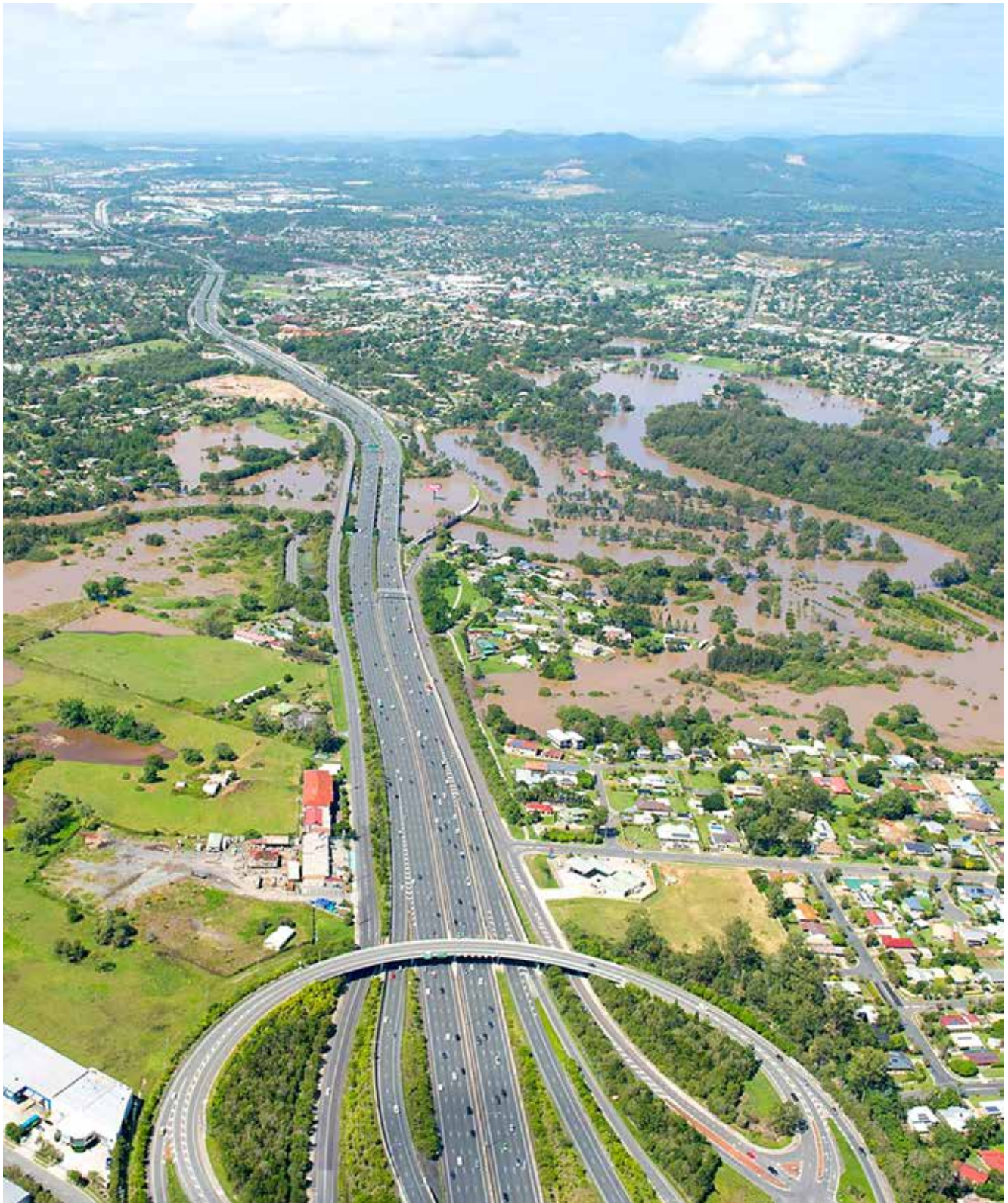
As Debbie approached, DCCSDS contacted the various peak bodies that look after vulnerable people about the steps they needed to take. The Department was also quick to open up recovery hubs in affected communities. A number of pop-up recovery centres worked well, including one for displaced tourist workers for economic assistance, and one for "457 visa" cucumber pickers in Logan City.

Eight impacted councils were advised about the creation of recovery plans and these plans are included in *Operation Queensland Recovery* as a benchmark for future events. Plans for the recovery functional areas of Human and Social, Economic, Environment, Building, and Roads and Transport, are also included.

State-level operations



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Aerial view to the south east above Loganholme and the Pacific Motorway spanning the flooded Logan River.

Photo courtesy of Logan City Council

Introduction

The recovery for Debbie is still going on. This review has not attempted to look at the good practice and lessons that will undoubtedly emerge from it.

Five major themes emerge. They highlight how Queensland dealt with Debbie, and what should be done to prepare for the next similar event.

Preparedness, response, and recovery in a disaster is all dependent on good **planning**. Plans based on risk that include mitigation, business continuity, emergent events and the subsequent transition to recovery, will work better with the involvement of the community.

Public information and engagement is therefore important. **Information management** will enable better planning, messaging and decisions. In Debbie, **evacuations** brought out lessons that otherwise may have been overlooked. All the above rely on **capability** for their implementation. We have used these themes to structure this section of the review.

Themes



Planning

Plans and planning are a fundamental part of disaster management. Planning activities that bring representatives from across the sector together can build relationships and lead to a shared understanding of each other's roles, priorities, capability limits and trigger points. The results should be documented in an effective plan that is exercised regularly and updated by lessons from exercises, events, or thorough review.

As one experienced DDC put it, "it's not the plan that's important, but the planning."^h

Ability to plan

During our recent review of the effectiveness of the *State Disaster Management Plan*, we heard from a range of stakeholders about disaster management planning. Their view was that planning was regularly undertaken in a siloed manner, leading to a duplication of effort and a lack of understanding of the responsibilities and functions of different entities.⁸⁶

The review showed that agency plans were not necessarily consistent with each other, neither based on jointly agreed priorities, nor integrated, nor linked.⁸⁷ Many were not visible to other entities in the sector. There was also great variation in the resourcing and capacity of the 77 councils operating across the diverse geography and demography of Queensland.

In the response to Debbie we found some higher capacity councils with good plans and sub-plans, and the capability to conduct robust event planning, particularly when time was available. Others with lower capacity or less experience were pleased to take up the offers of support and guidance, provided by the SDCC and state agencies, to inform local planning and preparation. For example, the Isaac local group was delighted with the deployment by QFES of an experienced emergency management coordinator from Brisbane. The officer supported the LDCC through Debbie and then assisted council to draw up their recovery plan.

Notes

h. Warwick DDC.

Themes

Finding

The individual plans of stakeholders in the sector are sound. Some are excellent. Stakeholders told us, though, that many are developed in silos. The quality of plans would be enhanced by greater reference to risk and more collaboration.

Banana Shire Council's Mayor was in regular contact with senior state government representatives, drawing on learnings from the Callide Creek flood of 2015. Commendably, SunWater has expressed a keen desire to continue to be more closely engaged with the likes of Banana Shire Council to ensure clarity of roles, responsibilities and certainty of messaging to the community in particular. Regardless of the capacity of a local council or local group, they possess valuable local knowledge that, when tapped, leads to better community outcomes.

Operational planning for an event is founded on an understanding of existing plans, the situation and the risk. We heard from many involved about the uncertainties in this event. The "friction" of disasters – where even the simplest task can be difficult - contributed in part to this: forecasts that changed with time, snippets heard or misheard, multiplicity of communications, ranges of possibilities.

Understanding the risks posed by Debbie relied on the effectiveness of storm tide prediction and the reliability of the flood gauge networks. Access to flood mapping data and technical specialists significantly enhanced the capacity of a number of local and district groups to identify at-risk properties and effectively target messaging, doorknocking and evacuation processes.

Risk

In our review of the State Disaster Management Plan, we emphasised the importance of robust risk-based planning in order to improve shared understanding of priorities for preparation and mitigation. In Queensland, the Queensland Emergency Risk Framework is being rolled out as an example of how to do this.

During our review of Debbie, we have found that those local groups who had undertaken robust risk assessments driven by local knowledge of hazards, were far better positioned than those who had not. For example, the Rockhampton flood risk is well known and built into its plans. In parts of South East Queensland, the extent and effects of flood risk appear to have been less well understood, resulting in greater pressure on event planning and operations as the event unfolded.

To better support predictions about flood risk, including flash flooding, Queensland relies on an extensive flood gauge network. It, and other systems, provide information about weather, tides and river flows. The information is then passed to disaster management practitioners and the affected community, and combined with local knowledge to both raise awareness of risk, and support planning.

While there has been significant investment in improving the flood gauge systems, several issues emerged during Debbie. These issues related to the number of owners, the range of maintenance regimes, the methods of passing gauge data, and the need for redundancy. Along the Fitzroy River and its tributaries, flood gauges were washed away, leading to delays in the Bureau's forecast about flood peaks. This prompted the Mayor of Rockhampton to comment, "*we need double or triple redundancy for our flood gauges.*"

In the Lockyer Valley following the 2010 Grantham events the investment in flood gauges and river cameras paid off. Live feeds from these cameras to the council website every 15 minutes allowed local decision-makers and residents alike to monitor changes and take necessary action. Information from the flood gauge network, and its efficient operation and maintenance is vital for disaster management.

Recommendation

The operation and maintenance of flood gauges should be developed and planned for on a catchment basis.

We recognise that there is already a Queensland Flood Risk Coordinating Committee, chaired by QRA, with a role that includes providing advice on all matters relevant to the good management of flood risk. We also note there has been collaborative work, led by QRA, between state agencies and local governments, particularly smaller local governments, that has already led to efficiencies in operations and maintenance in the gauge network.

In this event, perhaps the highest risk to communities was of storm tide inundation, depending on where and to what extent this might impact. Information available from remote sensors and in the Bureau's own cyclone advices enables them to issue a Storm Tide Warning, containing what are known as "most likely" and "worst case" scenarios.

These two, from a spectrum of possibilities, follow direction set out in the *Tropical Cyclone Storm Tide Warning – Response System Handbook*.⁸⁸ However, the technology exists with probabilistic models like SEAtide™ and others being progressively developed by the Bureau to produce outputs so that decision-makers, and ideally the public, can see and easily understand the likelihood of the risk in a particular area.

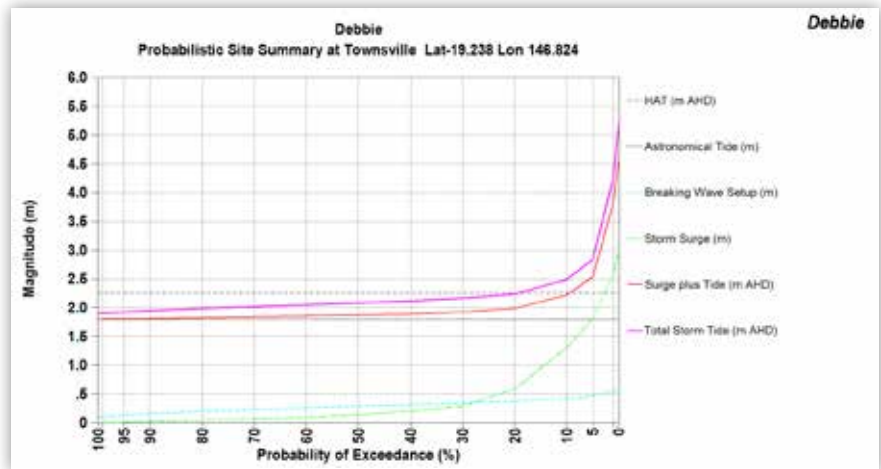
In the case of a storm tide these outputs might be in the form of a simple bar graph for a specific location (see example below).

This might show the highest tide, the colours of evacuation zones – which the public already know, together with familiar landmarks – a bridge or headland, with the chances of various storm tide heights superimposed.

This has implications for new ways of messaging that we discuss below.

In Townsville, inundation level probabilities from SEAtide for particular locations were layered over evacuation zones, to support decisions by the Townsville local group about risks to the community.

Themes

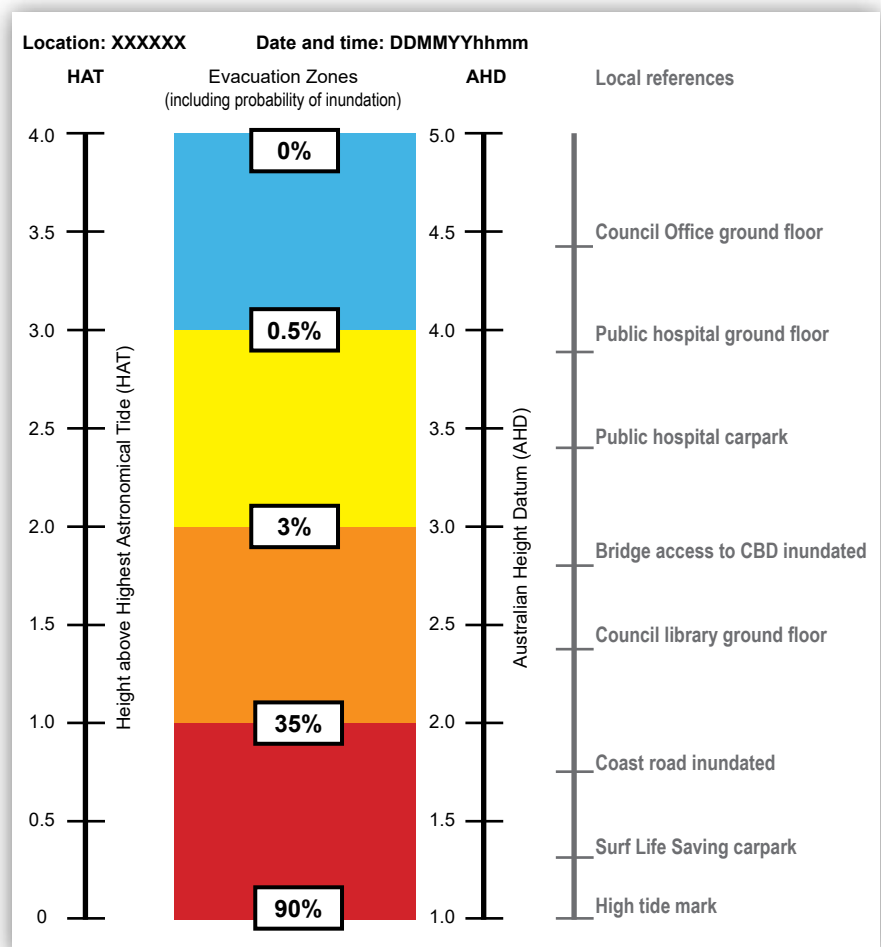


This graph produced by SEAtide™ shows the information to which the Townsville LDMG had access.

Courtesy of DSITI

An example of a future storm tide warning product for potential use in public information and warnings.

Based on: Bailey, W. and Preedy, W.; "Decisions, Decisions, Decisions. Basing Townsville's evacuation decision for Cyclone Debbie on probabilistic storm tide modelling" (Unpublished)



Revealing risks to the community

In Japan, tsunami stones – sometimes going back generations – mark the point below which houses should not be built. Modern technology could help convey such risks to the community and its visitors. QR codes are becoming commonplace. The power of related technology is emerging. Augmented Reality, showing the imaginary in a phone-camera view, has been popularised by Pokemon Go.

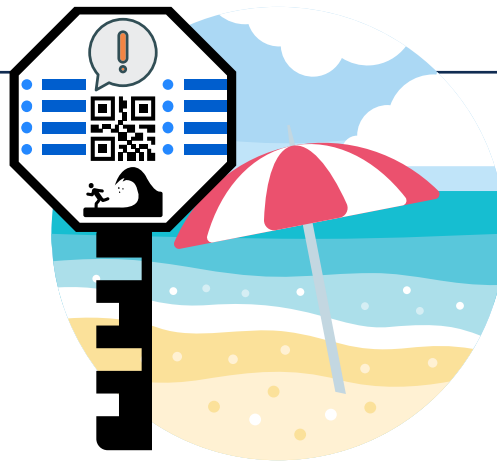
In much the same vein as roadside flood markers, storm tide markers along a foreshore area and in at-risk areas inland could convey the risk to all that see them.

Markers should be colour-coded in line with local plans and according to height above Highest Astronomical Tide (HAT). This would mean each one is specific to where it is placed. Markers should include a QR marker which should take the viewer to local plans and evacuation routes. For councils with less capacity a more generic explanation of risk of storm surge may be a more useful description.

Augmented reality could demonstrate tide heights at each location bringing warnings graphically to those who otherwise might miss them. The intent would be both inform and educate the public as to extent of storm tide risk in terms of depth and penetration.

Recommendation

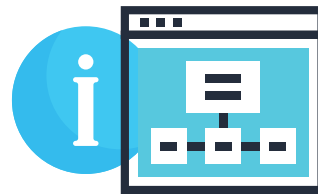
Queensland should examine the feasibility of the installation of storm tide markers in prominent public places and the exploration of new technology to highlight storm tide risk to the community and its visitors.



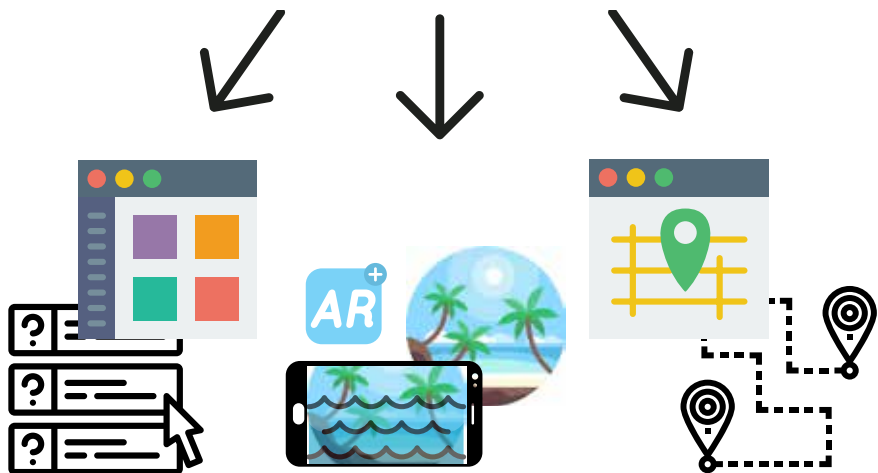
Storm tide marker information / warnings



Readable by smartphone



Website with more information



Council emergency management plans

Augmented reality overlays

Routes and evacuation maps

The key point is that probabilistic modelling of risks allows planning and decisions to be made and documented ahead of any potential event. Decisions can be recorded with the logic explained, rather than arrived at in the heat of the moment.

Regardless of the level willing to be accepted – whether one per cent or 50 per cent probability – this risk appetite can be debated, decided and then publicised well ahead of any event. Triggers and decision points can be established, so a particular community can know, for example, that if the forecast is a 20 per cent chance of storm tide inundation exceeding one metre that they will be called upon to evacuate.



Coastal inundation at Seaforth Beach, Mackay.

Photo courtesy of ABC News – supplied: Lisa Hunter

Themes

Finding

Queensland is well positioned, in places, to understand the risks of cyclone and flood. The implementation of the Queensland Emergency Risk Framework by Queensland Fire and Emergency Services, and the work by the Queensland Reconstruction Authority to improve understanding of floods through the flood gauge network and programs addressing flood studies is contributing to an enhanced understanding of risk.

Finding

Models, which show decision-makers the probability of events occurring, enable better decision-making and improved community outcomes. In cyclones, models which provide this interpretation of chance, provide decision-makers with this level of sophistication. For any other event, the Queensland Emergency Risk Framework has great potential to also help drive such improvements.

Finding

Worst case planning is valuable and at times needed, and in this instance was used appropriately in places. Decisions based on a “worst case” should be considered very carefully before being applied. A finer-grained approach to risk-based planning and one where information is shared between decision-makers at different levels would benefit all.

Recommendation

Planning and warnings for storm tide should be based on modelling that shows the chances of an event occurring (probabilistic).

Themes

Planning for hazard mitigation

Debbie has had significant impact on the economy. Rockhampton's hazard mitigation projects have been successful in reducing Debbie's flood impact on the town.

Other projects in Central Queensland to upgrade previously damaged infrastructure to a more resilient standard also proved beneficial.⁸⁹

The Queensland Betterment Fund

The Queensland Betterment Fund is jointly funded by Queensland and Australian governments under Category D of the Natural Disaster Relief and Recovery Arrangements for extraordinary disaster assistance.

Betterment projects principally comprise works to increase the resilience of roads, culverts and floodways damaged as a result of repeated natural disasters. More resilient infrastructure allows communities to stay connected and recover quicker after a flood. It ensures roads and bridges can stay open, water treatment plants and sewerage infrastructure can keep operating, and businesses, including primary producers, who rely on vital transport routes, can stay on track.

Following damage from Tropical Cyclone Oswald in 2013 and Tropical Cyclone Marcia in 2015, 295 Betterment projects have been approved, with an estimated Betterment cost of almost \$100 million. Prior to Debbie in March 2017, 49 of the 63 approved 2015 Betterment projects in the areas impacted were already complete.

Of these completed projects, 40 have been confirmed as sustaining no damage with nine sustaining some minor damage.⁹⁰

Building infrastructure back better is one effective mitigation strategy. Effective land use planning is another. Although not directly connected with Debbie, we heard from interviews during the State Disaster Management Plan review that there is scope to better integrate the disaster management sector with those at both local and state level involved in land use planning.

The amount of property damage from Debbie emphasises the importance of getting this right in future planning. We heard that better guidance from the disaster management sector was needed.

We note that Queensland is already developing good practice here.

The recently completed Brisbane River Flood Studies and the emerging Brisbane River Strategic Floodplain Management Plan are examples. The Plan will provide a coordinated and consistent approach throughout the floodplain for land use planning, building controls, disaster management, community resilience and prioritisation of flood-related infrastructure. More importantly, it may serve as a benchmark for others.

Business Continuity Planning (BCP)

In the same way that the sector seeks to build community resilience, BCP can mitigate the impact of disasters by building business and organisational resilience.

The Standard emphasises the need for comprehensive BCP:

“approved plans address all phases of disaster management, including continuity of operations and entities’ essential services.”

Business Queensland already provides sound guidance about BCP, and refers to the prevention, preparation, response and recovery risk management model of emergency management agencies as a guide for responding to disasters.⁹¹

Debbie highlighted visible gaps in business continuity. For example, when businesses were advised to close in the south east, at least one council lost its ability to get disaster supplies from its usual stockist.

Queensland Health found that its business continuity would be improved by technology to remotely attend disaster management group meetings, as decision-makers in regions frequently could not leave their health-care facility. Queensland Health has also identified that BCP needs to consider supply chains, and the numbers and skills of frontline staff required to ensure functioning of critical services.

The advice at 8.33am on Thursday 30 March for departments to enact their BCPs and for all non-essential services staff to have flexible work arrangements, including working from home, caused confusion among some departmental staff.

Business continuity should also consider the clear links between Queensland Government agencies and business.

A culture of trust and sharing of information must be developed. In the United States, the Federal Emergency Management Agency (FEMA) places significant emphasis on BCP:

“Continuity is more than just a good business practice that needs to be incorporated into day-to-day planning; it is a key foundation to how a community can work together to reduce vulnerabilities and recover from an incident.”⁹²

Themes

Themes

Finding

Enhanced business continuity planning within state agencies, businesses and communities will help all to be more resilient to the impact of events. Communities will benefit when such plans of businesses and local critical infrastructure are integrated with the plans of others on which they rely.

Recommendation

Business continuity planning should feature permanently in disaster management doctrine.

Recommendation

Local disaster management groups should focus on the business continuity of local critical infrastructure and its integration with other plans.

Business continuity, communities and local critical infrastructure

This focus on communities and their business continuity is important. All communities have critical infrastructure identified by local governments as essential to the wellbeing of their communities. The restoration of this local critical infrastructure can be a key enabler of recovery. Some are well-known and planned for. The program that the Department of Housing and Public Works adopts to inspect, rectify and open schools is longstanding and effective. The Debbie experience showed that other types of infrastructure are less well-identified, and that plans could be improved.

Good intentions to do so already exist. The Townsville local group proposes to undertake an audit of local critical infrastructure, such as shops and fuel stations, seeking to identify those with generators.

Much infrastructure – and therefore business continuity – relies on the utilities of power, telecommunications and water. After Debbie, Queensland's critical utility providers performed remarkably. The restoration of power and telecommunications after Debbie has been widely praised. This infrastructure will always be affected by extreme weather. To mitigate the loss of power, communications and water, the requirements of utilities during restoration should be considered in the continuity plans of councils, businesses and residents.

Knowing about restoration times will help recovering communities. Our community survey found, for example, that respondents did not expect restoration to happen any faster; but they did wish to have a better idea of when they could expect these important utilities to be returned. Public communication of timetables for restoration of services may be easily improved in future similar events, for example by word-of-mouth through existing community networks, or signs at council offices, recovery hubs and community meeting places.

We heard from Energy Queensland that some councils have insufficient knowledge of the power requirements of facilities critical to their community, and insufficient understanding of the hazards that might follow a breakdown of these facilities. They suggest the loss of power to some disaster coordination centres and local sewerage treatment works, and the continuing roll-out of the National Broadband Network (NBN) with its total reliance on electricity, needs a more comprehensive response. Providers of power, water and telecommunications were part of the SDCG during Debbie. The information provided gave the SDC clarity and understanding of what was occurring with the state's critical infrastructure.

It is clearly good practice to have these providers further integrated into the state's disaster management arrangements. Currently, local groups cannot always get local critical infrastructure representatives to their meetings. Some critical infrastructure owners will not share their risks or contingency plans on the basis of commercial confidentiality. A longer-term approach to critical infrastructure business continuity planning at the local level would help build trust between agencies.

Greater understanding about the nature and priority of Queensland's local critical infrastructure – for example, through the injection of local priorities into utilities' existing prioritisation plans – would assist with event planning and transition to recovery. Broader understanding of the role of utilities would be enhanced by their greater integration into collaborative planning.⁹³

Integration of plans and planning

The importance of collaborative planning was demonstrated in diverting traffic through Rockhampton following the opening of the Bypass at Yeppen. TMR staff were not present when the local coordination centre stood up to deal with the flood. The traffic management plan, developed by TMR, had not been discussed by the local group in advance. As a result, curb and guttering changes had to be made quickly by council field staff the evening prior to the opening to permit heavy vehicle access to residential areas. The arrival of heavy traffic also created questions and complaints from the public that needed to be fielded by the LDCC.

We heard from some other councils that managing road closures across multiple entities remains challenging for the sector. The lesson for all is that agencies with overlapping responsibilities should agree how contingency plans work together before an event, and if the plans are likely to affect the community, then it should be consulted. TMR is conducting an internal review of performance during Debbie.

Experience

No amount of advance planning can prepare for every eventuality, so “event planning” that builds on known and practised plans to direct operations continues to be critical. The planning and preparation undertaken by North and Central Queensland councils is heavily influenced by the regular natural disasters or near-misses that those areas experience. In the Whitsundays, the experienced local group prepared for a category 4 direct hit when Debbie was still a tropical low.

Some areas of the southeast are affected less frequently by major events and, compounded by the rapid-onset of flooding, event planning in some places appears to have been more reactive and the trigger points for escalation less clear-cut. However, in other parts of the south east, previous experience led to careful preparation. Lessons identified by Lockyer Valley Regional Council, from the events of 2011, resulted in its group standing up early Thursday morning, 30 March, at the onset of heavy rain, and standing down at midday on Friday once they were confident of a reasonably minor impact on their area.

In general we note that more successful event planning was evident in those groups that had:

- thoroughly understood local risks
- previously undertaken comprehensive planning
- put effort into public engagement activities around preparedness
- good capability, developed through exercising and training.

These groups activated early in readiness for possible impact, even when they weren’t sure if they would be affected. While the rapid-onset of floods in the south east made operations more difficult, in general good preparation allowed groups to be more adaptable during the event itself.

The disaster management adage “go hard, go early” seems to still apply. Good practice is evident in the further planning examples that follow.

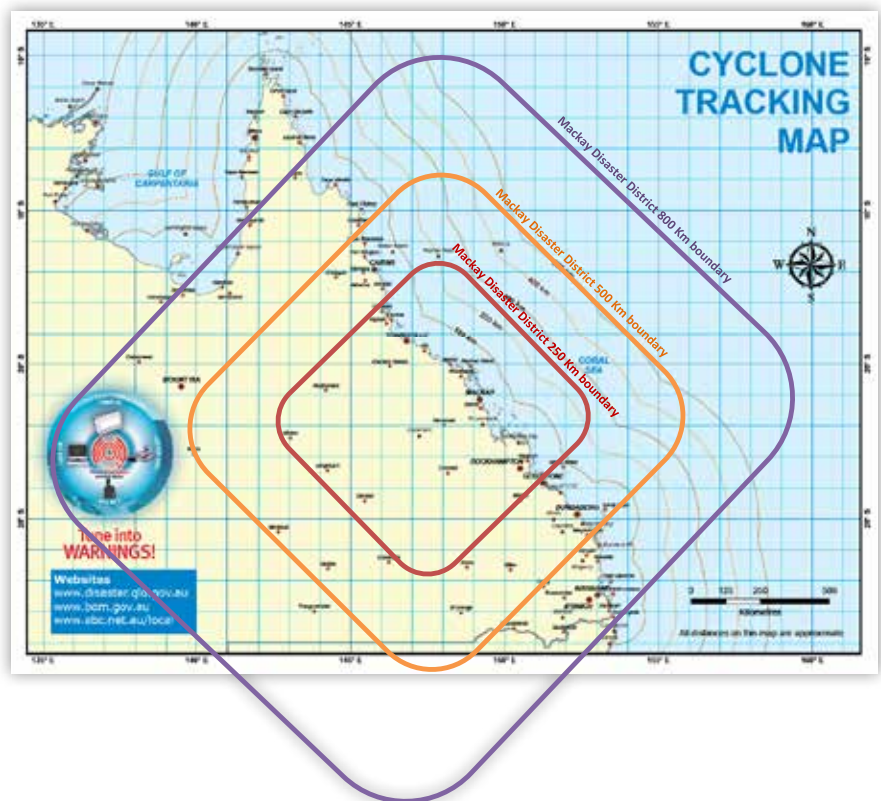
On Saturday 25 March, with the cyclone forecast to cross the coast in its area, Burdekin local group considered three contingency plans based on the cyclone tracking north or south of the council area, or if it found itself directly in Debbie’s path. The Burdekin LDMG’s decision-making was helped by the availability of pre-prepared evacuation maps in the event of a storm surge. Its event planning was made in time blocks – the next 12 hours, 12-24 hours, 24-36 hours and on.

The Mackay Disaster District has developed a new activation plan for severe weather events.

Themes

Finding

The planning and implementation of road closures is a shared responsibility between local and state authorities. Coordination and public messaging proved problematic in some places during Debbie. Focused attention combined with exercising of plans and sharing of good practices and efficiencies before next season will deliver tangible benefits.



Map depicting Mackay disaster district tropical low escalation points.

Mackay LDMG, Cyclones and Tropical Lows – triggers and actions (2016), Appendix B

Themes

In the past, local groups were activated according to the severity of the cyclone. However, experience from events such as Tropical Cyclone Marcia in 2015, resulted in activation triggers set according to the weather system's proximity to the coast.

In practice, this meant the Whitsunday local group "leant forward" while the system was still a tropical low, allowing much more time for the group, aged care facilities, island resorts and the community to prepare before Debbie made landfall.

Moreton Bay Regional Council (MBRC) was well prepared with technical specialists and data. Flood data and modelling information was made available and actively used. Information was also available to the community from the MBRC website. Generators were checked and mobile generators deployed. Sand and sandbag stations opened. The LDCC activated on the morning of Wednesday 29 March, 24 hours before the heaviest rain in the south east. Its Human and Social Recovery Group "leaned forward" on the same day.

Ipswich's four activations for flooding over the last seven years, good local intelligence, and stability of staff and council gave it much knowledge and experience. We heard and saw a convincing case for its strong internal capability in prediction and planning.

During Debbie, the local group planned for, but did not implement, contingencies for a worst-case scenario, should the intense rain have fallen 50 kilometres further west. Ipswich has its own targeted messaging system, designed to keep appropriate parts of the community informed, without alarming others. An evacuation centre was capable of being opened in three hours.

The Deputy Local Disaster Coordinator summed up council's preparedness:

"We have a whole heap of tools we can use, we use the most relevant at that time."

Planning for transition to recovery

The *Interim State Recovery Plan* sets out disaster recovery governance, preparedness, planning and operations arrangements for the 2016-17 disaster season. The mission from the Debbie recovery plan, *Operation Queensland Recovery*, sums up the planning approach:

"Queensland Government will work with local governments and communities to facilitate locally led efforts to recover, reconnect and rebuild stronger communities following the impacts of STC Debbie."⁹⁴

Recovery groups were activated early, while response was still happening or, in the case of Rockhampton, even before the flood peak had arrived. The DCCSDS representative at the Rockhampton district debrief suggested local recovery was more efficiently conducted compared to previous events because the prior planning and preparation was done well.

Recovery hubs were initially the only places for the community to go, and this impacted their capacity to deliver recovery-focused services.

An acknowledgement that this will be inevitable when there is no power or telecommunications may assist future planning. Referrals from the hubs to other community-based agencies and established groups did happen in some places, and helped support on-going recovery.

The state's proactive approach was welcomed in places. Yet some closely involved in the recovery process had reservations about the quick transition from recovery planning to its implementation, finding benefits for the community in allowing time for resilience.

Others recognised the importance of the National Recovery Principles, which emphasise that recovery should seek to address the needs of all affected communities, and do so flexibly as they change.⁹⁵

The *Australian Institute for Disaster Resilience Handbook 2 – Community Recovery* discusses this contrast between planning and implementation:

“Planning/preparedness prior to an event is also a critical aspect of community recovery ... Community and individual needs vary prior to and post-disaster, and a community’s recovery is a dynamic process – so adaptive management/governance, monitoring, and review and adaptation of programs is essential.” ⁹⁶

Coordinating offers of assistance to affected communities appears not to have been planned centrally during this event, but was undertaken by a number of agencies. We heard there was some confusion over which state government agency was responsible for oversight of corporate offers of assistance. This may be due to a machinery of government change that separated the QRA from the Department of Infrastructure, Local Government and Planning. The absence of a “Premier’s Appeal”, familiar from past events, may have added to uncertainty about who to contact to offer assistance.

GIVIT, active throughout the event, and the Queensland Government have a partnership for donated goods and corporate donations during recovery. GIVIT operates a virtual warehouse to manage the donated goods and matches these goods to requests from those impacted by a disaster. They were used by some, but not all, local groups.

A number of councils have memorandums of understanding with GIVIT that enable councils to give them information directly for the benefit of the community. GIVIT also works with DCCSDS to provide goods to individuals, based on referrals received during the recovery process. The difficulty of managing physical donations recurred, resulting in charities “overflowing with donated goods” that created logistical challenges and did not necessarily meet needs.

While the model of support that QRA aspires to is outlined in *Operation Queensland Recovery*,⁹⁷ strong relationships to bring the model to life have yet to be formed.

Recovery efforts under way at the local level were not always visible to state government agencies. In keeping with the earlier discussion about the wide variation of capacity and capability across Queensland, it is suggested by QRA that a single recovery model won’t work. Instead we need an agreed range of models, based on consistent recovery principles, with local governments choosing one which they believe will work for a particular event.

Understanding the local context for recovery and the value of tapping into existing community networks, irrespective of whether those networks are emergency-focused, needs more emphasis by state and national providers of recovery services.

Themes

Finding

Despite the good work by Queensland Fire and Emergency Services in 2016 in updating the policy and guidelines for Offers of Assistance, there remains a level of confusion over who is accountable. Similarly, GIVIT, which is charged with managing public donations, felt there are opportunities to improve the process.



Recommendation

The Queensland Offers of Assistance Policy, particularly for corporate donations, should be updated and exercised prior to the next season.

Finding

We found a number of exemplary approaches to preparedness and planning. These include:

- Townsville local group’s planning for evacuation, both immediately before the event and over the past four years, in preparedness, planning and exercises.
- The Whitsundays’ early activation and approach to “worst case planning,” anticipating a direct impact on the area.
- Rockhampton’s implementation of betterment projects to reduce the effects of flooding on the city.
- Ipswich local group’s scenario planning approach to possible rainfall events, and their readiness for an event on the scale of the 2011 flooding.
- Energy Queensland’s upgraded disaster assessment and tasking approach that speeds the time of electricity restoration.
- State government agencies’ anticipatory deployments that provided community reassurance and enabled resources to be on hand quickly when needed.
- Planning for the transition to recovery, underpinned by the considerable preparation by the Department of Communities, Child Safety and Disabilities Services and Queensland Reconstruction Authority in the months before Debbie.



Themes



Public information and engagement

Why

The sharing of relevant, accurate and timely information that is easily understood and able to be used by people to take necessary action is critical.

It allows governments to build responsive, resilient and engaged communities.

Community engagement processes not only prepare people to respond to an event, but can be fundamental to empowering a community and reducing their reliance on council and state resources.

The Standard is clear on the key outcomes:

WHY

- **Communities are empowered through timely public information and through education initiatives to prepare for, respond to, and recover from disasters**
- **Public engagement outcomes have a positive effect on the action taken by the community across all phases of disaster management**

WHO

Under the *Disaster Management Act 2003* (Qld), both LDMGs and DDMGs have the responsibility 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.⁹⁸

Who

The diversity of communities, the complexity of events and the multitude of agencies and information sources available can often mean that informing the public appropriately is a challenging process. Many reviews both in Australia and internationally have identified the importance of coordinated public information in a disaster, and that business as usual arrangements are not sufficient given the complexity of these events.⁹⁹

While the Act gives primary responsibility for managing disaster operations to local groups, given the shared responsibilities of agencies, it is often necessary for state and federal agencies to also provide information to the public.

Support

In recognition of this complex interplay, Queensland established the Crisis Communication Network (CCN), a whole-of-government communication network. The purpose of this network is to coordinate and distribute reliable and consistent public information to maintain public safety, keep people informed and engaged, and support the Queensland Government's crisis management activities.¹⁰⁰

The Debbie experience

Checking on remote communities remains an issue, one which has arisen in the past after the likes of Tropical Cyclone Marcia and the township of Byfield – and further in the past after Tropical Cyclone Ului and the Eungella community.

Similarly, there were other communities such as Keswick Island that felt there was inadequate attention to their needs in the lead-up to and in the immediate aftermath of Debbie.

This is a problem exacerbated by our reliance on telecommunications. Work to address this problem has been done in some areas. It needs to be undertaken in collaboration with communities ahead of disasters to identify the best way of contacting them and gaining situational awareness during disasters. An example of good practice to overcome this is the development of Emergency Liaison Officers within these communities that can provide succinct and relevant information to local groups when communications allow.

We note there is a very real difference between ‘there is no report of damage’ and ‘there are reports of no damage’; the former may simply be due to a communication failure.

In previous events, there were instances where isolated communities could not make contact, which led to the assumption that they did not need help. In contrast, lessons from previous events were applied during Debbie and a considered effort was made to ensure contact could be made with all isolated communities to assess when and where assistance was needed.

Sources

During Debbie, Queensland residents and communities received information and warnings from a variety of sources. Many councils noted that interviews or media conferences by mayors and elected officials were a successful way of engaging the public, and ensured that the information provided was seen as authoritative.

Sources and survey

People also sought information themselves from a range of sources. Councils cited high traffic to their Facebook, call centres and website pages during the event. In contrast, respondents to the community survey identified the Bureau website and news media as the key sources of information. In the areas directly affected by the cyclone, 76 per cent of respondents indicated the Bureau website was a key information source.

Of those who experienced the slow-onset flooding in Rockhampton, 68 per cent indicated they relied equally on the Bureau website or other radio/TV/online news sources. In the Logan/Scenic Rim/Gold Coast region 63 per cent of respondents who experienced rapid on-set weather conditions utilised the Bureau website, and 77 per cent indicated using a news source (other than the ABC).¹⁰¹

Themes



A badly-damaged plumbing business in Proserpine, 101km north west of Mackay.

Source: ABC News (supplied)

Clearing a fallen tree in Carmila, 88km south of Mackay.

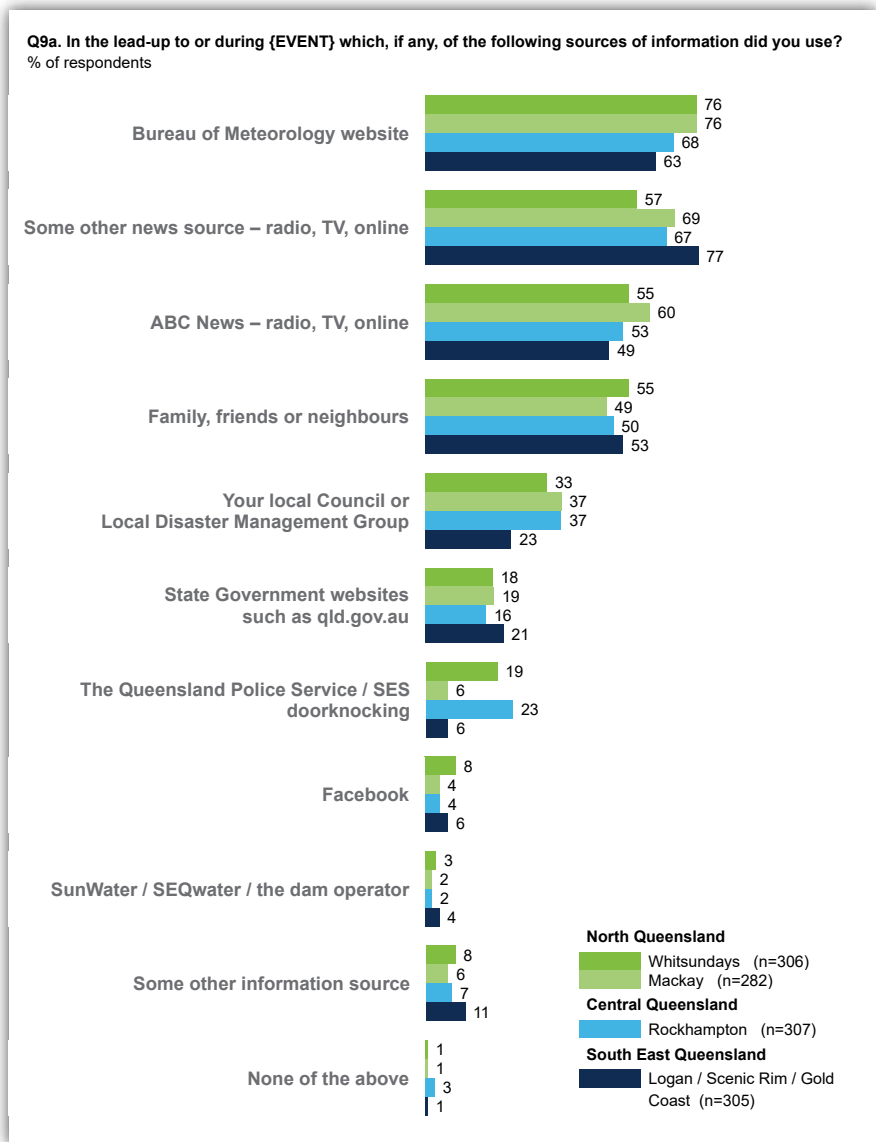
Source: Isaac Local Disaster Management Group



Themes

Information sources used in the lead-up to and during the event.

Source: MCR Community Survey



Finding

Our survey revealed that the public currently uses the Bureau of Meteorology and the media as key sources of information. There are opportunities to link these sources more closely with information from local government and state agencies. The Office of the Inspector-General Emergency Management, is aware of a range of research activities that could be leveraged and intends to explore these in the future.

Despite the high traffic to council sites, the community survey showed the importance for communities of the Bureau and the ABC. An opportunity exists for councils to partner with these agencies or explore opportunities to maximise the message effect.

Social media

Social media played an important role during Debbie as a source of information and avenue to contact or interact with local councils, members of the community and other sources. Information made available through social media was also used to inform intelligence within the SDCC and LDCCs.

Information accessed by the public included a range of data sources, such as live feeds of river heights, road cameras and the ability to monitor data on rainfall levels as events develop.

The Lockyer Valley Regional Council emergency management dashboard has a live map, rainfall, river heights, and social media feed. At the height of the event, the peak of website traffic was about 8,000 views, with an average across the event of 6,000 views. This represents a solid proportion of the population (32,000) using the dashboard. Whitsundays Regional Council noted that one post on their Disaster and Emergency Facebook page about evacuation zones had a reach of 440,855 people, and that its page followers more than doubled during Debbie.

A number of councils¹⁰² told us how this access to data and detailed information kept people informed and assisted them to be more self-reliant during the event. Our community survey however highlighted only limited public use of local government social media and online sources in the survey areas.

More specifically, the community survey revealed only very limited use of Facebook in all four areas surveyed. The same limited social media and online use was also demonstrated for state government agencies in these areas.

Themes

Perceived effectiveness of methods of receiving warnings.

Source: MCR Community Survey

	Whitsundays	Mackay	Rockhampton	Logan / Scenic Rim / Gold Coast
Method	% rating method of receiving warning as effective			
Text message to mobile from authorities	76	77	79	83
Radio broadcasts	76	90	77	69
Television broadcasts	57	77	81	79
Phone call to mobile from authorities	66	71	74	74
Being door-knocked by police or SES	64	74	73	72
The websites of relevant authorities	66	66	69	63
Social media such as Facebook or Twitter	65	67	64	64
Phone call to landline from authorities	44	51	59	47

Traditional media

Traditional media, whether it be radio, television or online continues to be one of the main sources of information accessed by the community. Approximately 54 per cent of all community survey respondents identified using an ABC news source for information, and 67 per cent of respondents indicated using another news source. Radio is identified in the community survey as the most common way of receiving ABC news, which reinforces the importance of encouraging households to ensure access to a battery operated radio during events.

The community survey also showed many respondents rated radio broadcasts and television broadcasts as very effective, if not more effective as a method of receiving warnings than text messages sent to mobile phones by authorities.

Many councils indicated the pivotal role that the media played in disseminating information.

- “(the) Media conference by the Mayor on Tuesday really pushed out and reinforced the ‘get ready’ messaging.”¹⁰³
- “Media coverage brilliant compared to 2011 as we were where the ‘action’ was ...media-messaging on local radio was faster than official notification i.e. school closure messaging.”¹⁰⁴
- Daily media from the Chair, regular updates to the community.¹⁰⁵

Media coverage

The increased centralisation of media agencies was raised by some councils, highlighting that with fewer regional offices and local media staff, getting coverage of local events was problematic.

A number of councils also voiced concerns that the media reporting was inaccurate. One council highlighted the confusion caused when the media reported a higher level of flood to the central business area as certain, when the Bureau had advised it as a “possibility.” Similarly, coverage on an evacuation incorrectly reported that the population of an entire town was being evacuated.

There was also much concern expressed about the media showing people and reporters in high risk situations or acting in an unsafe way during the event. Examples cited include coverage of people swimming in the surf during the cyclone, people using jet skis and surf boards in flooded areas and reporters standing out in the eye of the cyclone or in flood waters.

The volume, reach and diversity of sources did give most people access to fit-for-purpose information that they then utilised to inform their actions.

We did identify a number of factors, though, that affected some communities’ ability to prepare and take appropriate action. These were:

- the ability for people to get information when normal communications infrastructure fails
- access to consistent and understandable information that enabled people to take appropriate action
- an authoritative “point of truth” for the dissemination of information.

Themes



Finding

Loss of communications, in some areas, affected the ability to respond, and to keep the community informed. Not all continuity planning sufficiently considered alternative arrangements.

Communications infrastructure

Loss of communications

Earlier sections of this report have described the importance of local critical infrastructure, and the preparedness of the power and communications utilities to deal with inevitable outages. Councils emphasised their impact. One local group told us their biggest issue during this event was not being able to communicate to, and hear from, the community, “no power equals no communications.”

At least six local and district groups identified they lost communication with parts of their community during the event.

Mackay Regional Council, for example, encountered significant issues when it experienced loss of communications both with its community and for internal operations, due to power outages and severe weather conditions.

Heavy rain and cloud caused issues for satellite phone usage, and SES volunteers could not be deployed due to the inability to send and receive activation text messages. Furthermore, during the power disruption, the council was unable to engage with the community to ascertain situational awareness of impacted areas and to provide updates to the affected community.

An information void can lead to increased fear, anxiety and inadvertent risk-taking. Communication plans must include contingencies that communities are aware of and can activate should critical communication infrastructure be lost. Communications staff have a role to play in driving the importance of communication plans. Such actions are key to building communities that are resilient and able to cope when disconnected.

Information that influences action

Trust and empowerment

Fundamental to creating an informed and empowered community is the provision of information that is informative, consistent, and understandable. These factors add to a community’s sense of safety and trust as well as enabling people to act as needed.

While there is growing evidence that information and awareness campaigns do inform the actions people take, a number of councils raised concern that this had not necessarily translated into a more proactive and responsive community.

A direct appeal by the Scenic Rim Mayor to conserve water showed an immediate drop in water usage.

Many councils also recorded low attendance levels at evacuation centres citing that community messaging on these centres as places of ‘last resort’ was getting traction.

Across Queensland, councils cited examples of people who did not prepare to be without power and resources for a few days, who refused to leave their homes when advised of the risks, and care facilities that had little or no evacuation plans and a general false sense of security in clearly high risk locations.

Confidence and optimism

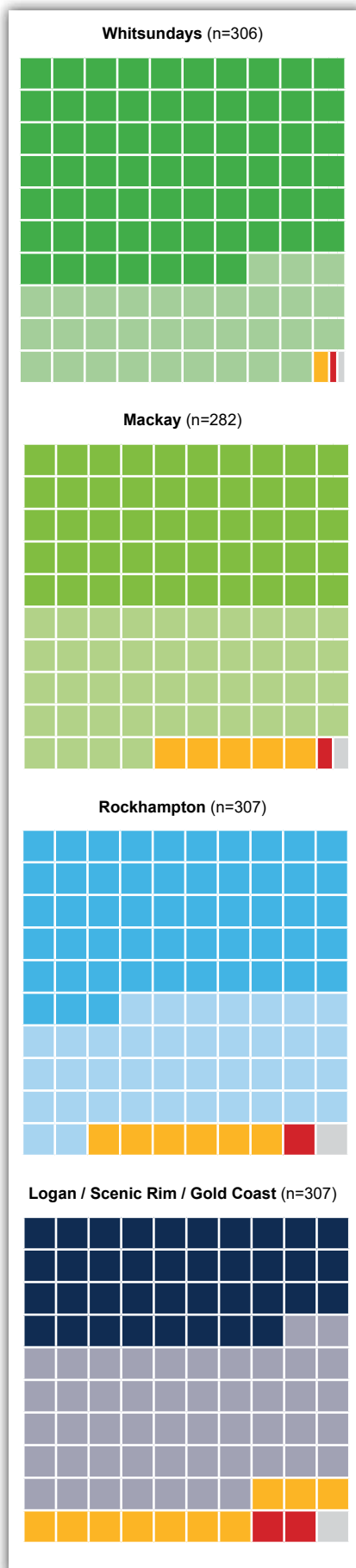
Despite evidence, referred to earlier, of lack of preparedness, the majority of respondents to the community survey felt they were ready and able to deal with the impacts of the event.¹⁰⁶ Ninety-nine per cent of people in the Whitsundays identify as “very confident” or “confident” in being prepared for, and knowing how to respond to, events in the future. Respondents from Mackay, Rockhampton and Logan/Scenic Rim/Gold Coast reported similar levels of overall confidence.

Interestingly, the level of those who identified as “very confident” did vary across locations. While two-thirds of respondents in Whitsundays and approximately half of those from Rockhampton and Mackay identified as “very confident”, this dropped to just over a third for respondents from Logan/Scenic Rim/Gold Coast.

The difference between council experience and our community survey may be driven by a number of factors. There may be a very high level of awareness and capacity developing across community. There may also be pockets of the community that do not fully understand the risk posed in events.

Weather events such as Debbie are complex and unpredictable. This often means that it is hard for authorities to provide definitive guidance on what will occur. Often, information outlines a possible scenario based on worst case predictions.

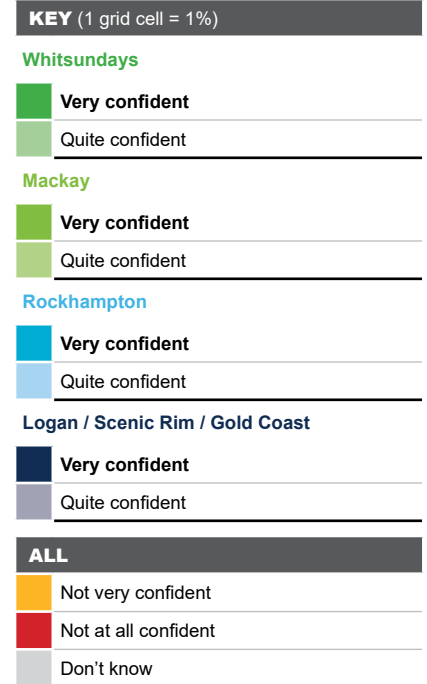
This can make sense as a planning approach, but for some communities it can cause concern and confusion, and sometimes be seen as the authorities creating false alarm.



Themes

Levels of community confidence in preparations.

Source: MCR Community Survey



Finding

Throughout the review we identified that messaging and information must be more explicit and simplify complex situations for the public. Messaging and engagement must be tailored to the knowledge and experience of the community.

Themes

Finer-grained information

The development of contextualised information will assist the public to understand the nature of the event, as well as the risks and consequences attached to various potential scenarios.

It is important that people are given clear information about the consequences of their decisions and actions they choose to take. As one practitioner reflected, “it’s about managing the expectations when the lights do go out.”

The management of expectations underpins the Sunshine Coast messaging sent to their local community before Debbie’s weather arrived:

“Disaster resilience is a shared responsibility and individuals must take appropriate actions to ensure their safety during disaster events. All Sunshine Coast residents should be prepared to survive at least 3 days without assistance during disaster events.”

Finding

Consistent messaging across entities is essential to ensure community confidence and to enable a well-informed community.

Finding

Given the pivotal role that the media plays during disaster events, there is a clear need for coordinated messaging coming from councils and agencies to reduce the risk of inaccurate information being broadcast. One of the key roles of the Crisis Communication Network is to monitor the media and correct inaccuracies. The full utilisation of the Network may have been beneficial.

Recommendation

A Local Government Association of Queensland representative should be included on the Crisis Communications Network to enhance the delivery of consistent information across and between levels of government.

Authoritative point of truth

Authority and consistency

The unpredictable nature of events demands a communication system that provides clear and consistent information on what is known, and one that is delivered consistently by all parties.

We were told of a number of examples where information being provided to the public by an “authoritative” source, conflicted with similar messaging from another “authoritative” source. One council experienced backlash from community members when their data and the Bureau’s data did not “match up,” resulting in some distrust in the council’s information.

Feedback from mayors was that messages needed to be updated more quickly. Particularly at the transition to recovery, they saw a need for consistent messaging about their local area being “open for business.”

The establishment of a “point of truth” was often expressed to us as pivotal in reducing errant or inaccurate reporting. If there is a gap or inconsistency in information from an authoritative source, it creates confusion, can erode confidence in the authorities, and cause the community to seek information from less valid or reliable sources in order to fill the information void.

This increases the risk that people may put themselves in danger by following poor advice. This is particularly pertinent when considering the community survey results, which emphasise community reliance on the Bureau’s data. Our community survey showed people already use a range of sources, some providing information of varying accuracy and content.

State authority

At both a state and local level there must be the capacity to distil information and then coordinate consistent messaging using agreed words that tell the community what they seek. As we have highlighted, previously the CCN has been pivotal in managing these issues.

While we know it is not possible to control all information by non-authoritative sources, the more that state and local agencies deliver consistent and timely advice, the more likely they will become the “point of truth” for the public.

Warnings and Emergency Alerts

The Standard is clear about the outcomes for warnings:

Warnings are at the sharp end of public information and engagement, as they enable and empower communities to take appropriate action during a disaster. They include any communication sent to the community that requires people to take action to protect life or property.

During Debbie, a range of strategies was used to inform and advise the community. Councils used door knocking, letter box dropping, the media, and digital warnings through the Early Warning Network, other technology systems and the national Emergency Alert system. Warnings were also issued by other agencies and utilities including dam operators and harbour masters.

With regard to dam operations, we recognise the significantly improved messaging and systems that have been put in place by SunWater and Seqwater over the past two years. In particular, we acknowledge their approach to implementing various recommendations and suggestions from previous reviews. We heard from dam operators that, on some occasions during this event, they felt they were the only providers of information, and attracted community blame as a result. We also heard from one local group that they felt the timings of the SunWater messaging was too early. There is clearly greater collaboration needed here.

The widespread nature and volume of warnings was reflected in the community survey where one in two respondents could recall receiving some form of official warning via text message leading up to the event.¹⁰⁷ While many respondents (31-41 per cent) could not recall who the text message was from, the local council was identified as the most common source of the text message warning.

The demographic profile of a community is central to understanding the best communication methods and possible barriers that people identify in both receiving and understanding a message.

A clear example of this is age difference. Our community survey identified that, generally, people under 45 years were more likely to use mobile phones, online and social media channels, than people over 45 years. The use of mobile phones and online sources also declines sharply with those aged over 65 years, while information accessed through television and landline telephones significantly increases. The community survey also identified that, overall, one of the least effective methods of receiving official warnings was a phone call to landlines from authorities. Yet, when looking at results for people aged over 60 years, the value of this method increased. Other effective methods identified in the community survey were face-to-face engagement, such as door knocking by SES or QPS officers, in likely impact areas.

These demographic factors are important when considering how best to warn those at risk in an event. They also highlight the importance of warnings and alerts being part of a multi-modal communication approach that utilises different methods, tailored for different communities and purposes. This approach was best captured by Ipswich City Council. Their approach to community messaging is summarised in the précis of interview notes, below:

Community messaging is an escalated approach; we (Ipswich City Council) use social media for general information to keep people informed, we use door knocking and messaging to phone numbers to targeted areas. It also allows us to assess any key issues in the community, as well as keeps the community calm. We also get a better response as people know you have taken the time.

We have rarely – maybe once – used the EA system, but as we know our at-risk area, targeted doorknocking and direct calls works better. The community knows “you will hear from us when it’s a problem for you.” This approach encourages self-sufficiency as it conveys a message of “monitor yourself” but also lets them know what sources we will advise them through.

Themes

Communities at risk of impact from an event are defined and can be targeted with contextualised warnings.

Communities at risk of impact from an event receive fit-for-purpose, consistent, accurate warnings through all phases of events.

Finding

Emergency Alert and other digital ways of warning are important but need to be used in a suite of tools to adequately inform the public. Information works best when it is timely, contextualised, informative, consistent and understandable.

Themes

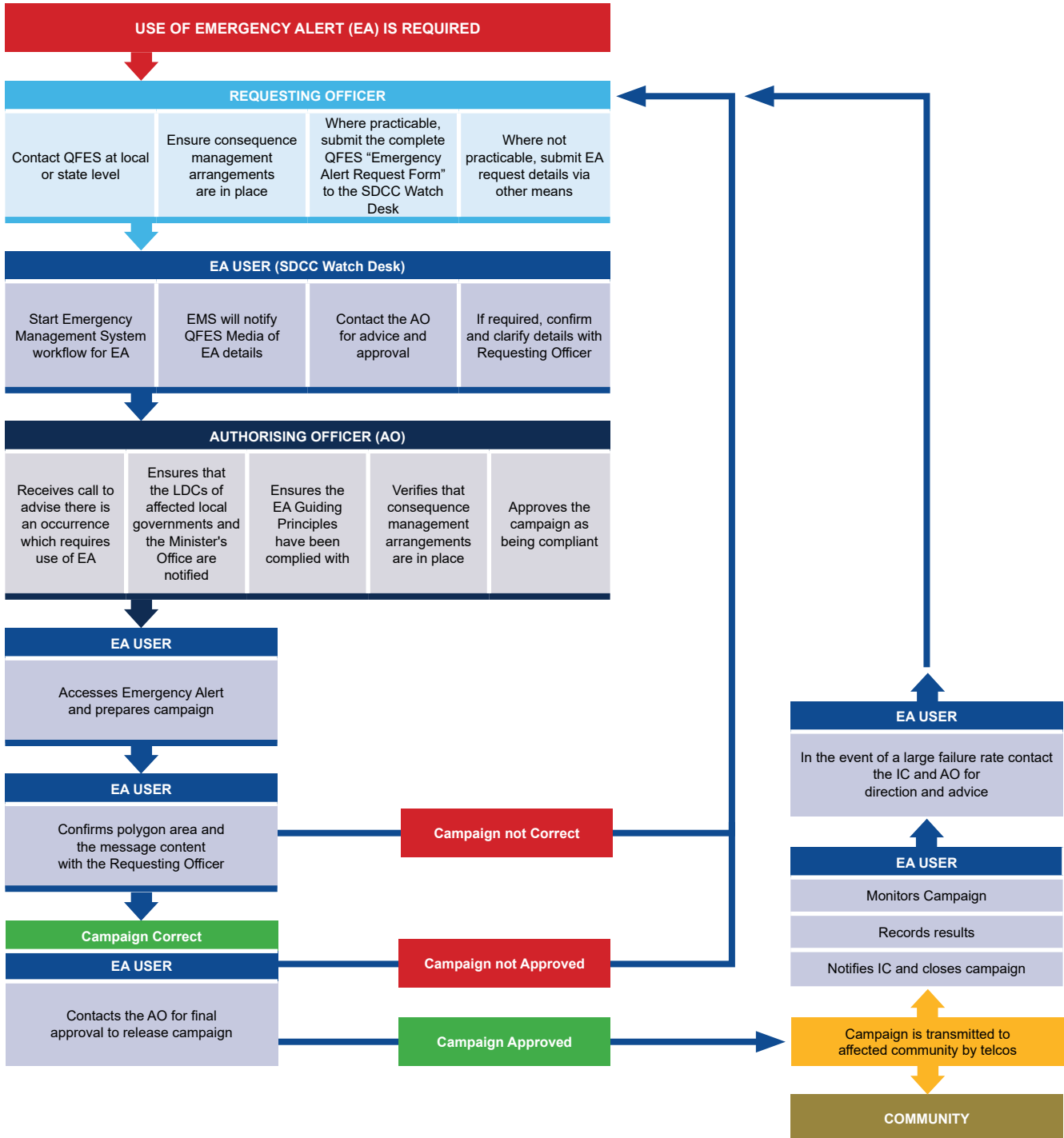
Emergency Alert

The EA is one element in a suite of tools for warning the public. Given the often rapid and complex nature of emergency events, local governments have been encouraged by QFES to pre-prepare EA campaign messages and polygons for known disaster risks.

The pre-prepared campaigns are stored by QFES and tested by SDCC Watch Desk staff. Many councils have prepared EAs for storm tide and flood inundation areas, as these risks are often known.

Emergency Alert process diagram.¹⁰⁸

Source: Queensland Emergency Alert Guidelines



In Debbie, more than 5.9 million messages were sent across Queensland during the event – about one quarter of all EA messages sent nationally since the system was introduced in December 2009.¹⁰⁹ About 3.6 million of these were for advice on school closures. The majority of campaigns used both the wide-coverage SMS-to-handset-location and voice-to-landline options. Only three campaigns used the more precise SMS-to-registered-service-addresses. This was to warn of the slow-onset flooding of the Fitzroy River.¹¹⁰

The EA performed within expectations for getting messages to people for the majority of campaigns. The average successful delivery rates of the QFES campaigns were 88 per cent for SMS to handset location, 60 per cent for SMS registered service address based and 63 per cent for voice.¹¹¹ As a rule of thumb,ⁱ the average successful delivery rates are greater than 90, 70 and 60 per cent, respectively. However, for a number of campaigns the performance was less than normal expectations:

- Eleven campaigns with the voice option reached less than 50 per cent of landlines.
- Less than 60 per cent of the school closure campaigns were successful due to the size and concurrency of the campaigns exceeding either the capacity of the system or campaign limits.

While the message may have got through in many cases, its timeliness is imperative when warning the community ahead of an impending event. Any delay in delivery can pose additional risks to community members. We heard mainly positive feedback about the timeliness of campaigns. Our community survey showed 65 to 85 per cent of respondents who had received a message stated it had arrived at the right time.

However, a few local government stakeholders thought some campaigns took longer than expected, as did some respondents. One local government stated the centralised process for issuing campaigns led to a backlog and delay of their campaign.

EA was also used to advise about school closures. If decision makers were aware of how long this would take – more than four hours from an email that showed the decision had been taken to when the last EA campaign ended – they may have decided to warn in other ways.

Themes

School closure

The biggest Emergency Alert campaign undertaken was to communicate the decision to close all schools south of Agnes Water and west to Nanango. While it was identified by most councils and agencies in the southeast as an effective strategy to reduce the volume and risks of people on the roads, there were problems identified in the implementation of the campaign in regards to timing, scope and clarity of the messaging.

The decision to close was taken early. At 7.32am the Department of Education and Training tweeted that “all state schools in Metropolitan, North Coast and South East Regions are closed.” An email to all South East Queensland public servants at 8.35am on Thursday 30 March told readers that “all schools from Agnes Water to the border of New South Wales, and west to Nanango are closed today.” But the first EA campaign did not start until 9.39am. Given the length of time to issue 11 campaigns to more than 3.6 million people, some EAs did not commence until 10.50am, and finalised at 12.50pm. As timing was a critical factor to ensure children did not end up at schools or in transit, the use of other more time efficient methods would have enhanced the process. Many people were aware of the closure hours before via radio, Facebook or websites. This emphasises that EA is just one of a suite of potential messaging tools, and circumstances should influence which is the most appropriate.

Many councils reported high volumes of calls from people seeking clarity on the decision having heard the information via radio or Facebook. As one council identified: “council was not consulted and found out at the same time as the community. This created confusion as people began ringing the council call centre who at that stage didn’t know what was happening. They received inconsistent advice as no formal information to use it made the state and local look at odds.”

Most councils also identified that the timing of the message as critical, identifying that children were already at school or in transit, and in particular noting that rural school buses often commence by 7.00am. The Queensland Evacuation Guidelines for Disaster Management Groups strongly recommends that the community is informed of school closures as early as possible and preferably before the school day starts, given the impact for carers. In particular the Guidelines note that an early decision will reduce traffic on the roads and the need for carers to return and collect children from school.

Better coordination of the message, scope, timing and best method for informing the public would have greatly have enhanced the implementation of the decision. Given that the decision to close the schools was made at a state level and not at the local level the full utilisation of the CCN may have also strengthened the communication around the decision.

Notes

i. Based on the averages of campaigns since the introduction of EA.

Themes

The 2015 *Review of Local Governments' Emergency Warning Capability* specifically identified the importance of pre-populated and crafted messages.

We note that many pre-planned campaigns have been developed but still many *ad hoc* campaigns were issued during Debbie for areas where the risk of inundation would have been known. Campaigns that were approved and issued in a timely manner through the SDCC were most often ones where the local group had pre-prepared and had also been tested.

Many of the councils contacted by the Office of the IGEM identified that they had pre-planned and populated campaigns available, some indicating that one of the preparatory tasks they undertook as the event approached was to review these messages and polygons. Watch Desk staff also contacted many of the northern councils in the potential path of the cyclone to review and preload their messages should they be needed. These processes enabled these campaigns to be approved and issued much quicker.

When we looked at campaign details we concluded that there are varying factors that can cause delays. Some delays were for EAs produced *ad hoc*, not from those that were pre-prepared. We saw and heard examples where polygons had to be resubmitted because of wrong format, and where delays resulted from Watch Desk staff difficulty relating the polygon to the system's map. Other issues arose when the message needed changing. We saw several campaigns with email exchange between SDCC and local group before the message content was agreed.

One council thought this back-and-forth in communications lost valuable time. The result was that a flood warning came out just minutes before the follow-up message to evacuate.

While we consider that most campaigns were done in a timely manner *for the event*, we do note that complex events requiring warnings to multiple sites can be slower. When issues with campaigns need drawn-out resolution and approvals, the Queensland centralised approach can further delay campaigns.

In New South Wales and Victoria, EA operators are often deployed forward to work directly with incident controllers to prepare and disseminate Emergency Alerts. We heard a standard time frame to issue an EA in Queensland is 30-40 minutes. We also heard from a Victorian forward deployed operator that their normal time to issue an alert is 7-8 minutes – within 15 minutes being the aim. If it takes more than 15 minutes, the operator said they “would be nervous.”

We understand that software that could resolve the polygon format issues is available in the Kedron GIS unit.

We also heard from both Watch Desk Staff and from local groups that indicate not enough is known about EA. In many debriefs councils raised the problem of unintended people receiving the SMS. These comments perhaps signal a lack of awareness about how the SMS location based service works.

We also note that the issuing of alerts along local government boundaries at times resulted in people on one side of a river receiving a warning while those directly across the river did not. This failure to coordinate warnings along catchments has been noted in previous IGEM reviews and remains a significant risk.

The content of messages sometimes caused problems, with both councils and communities indicating that people were unsure what action to take when receiving the warnings.

In some places the message “go to higher ground” ran the risk of sending people through flood waters. When community respondents were asked to identify key improvements for emergency warnings, 31 per cent of respondents suggested the provision of more detailed and clear information on topics like road closures and evacuation centres.

Previous reviews have highlighted the need for greater training and exercising of the EA system.

QFES has 17 Watch Desk staff all trained in EA and they are exercised by creating a campaign every two months. We note that no local or district groups are involved in these exercises. We also note a lack of awareness by many local groups of the capabilities of EA and the requirements for issuing a campaign.

The *Queensland Disaster Management Training Framework* offers training in warnings and alerts through “Module 1 – Introduction to Warning and Alert Systems” and “Module 2 – Working with Warning and Alert Systems”. We conclude that the course content does address most issues raised and also includes some paper-based exercises.

We heard, and agree, there is scope to include an element of practice so that local initiators of EA better understand what is involved.

Overall the EA system has improved since the IGEM’s *Emergency Warning Capability Review* was undertaken. While the system did cope extremely well, the issues identified still reflect a need for greater preparedness and training in EAs to develop the message and polygon.

Discussion with Telstra has revealed that they will “sponsor” training exercises, at no cost to the jurisdiction, to generate a campaign. The exercises will test a jurisdiction’s ability to request, generate, authorise and initiate an EA campaign, and report on its success. We are unaware of any recent such activity with the Queensland Disaster Management context.

Themes

Previous recommendations about warnings

Review of Local governments’ emergency warning capability

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.

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.

Review of Seqwater and SunWater warnings communications

Recommendation 7

Emergency Alert messages for dam related events are:

- pre-formatted, consistent and current polygons are identified
- content aligned with the Queensland Emergency Alert Guidelines
- stored and practised in consultation with the State Disaster Coordination Centre.

Themes

Information management

The accessibility of information helps to avoid duplication of effort and facilitates learning from the experiences of others ¹¹²



A number of reviews and inquiries, and research conducted in Queensland, highlight the importance of managing and sharing of information to support effective disaster management and operations.

In particular, the Queensland Floods Commission of Enquiry emphasises the need for collation and sharing of relevant and useful information between local and state governments.¹¹³

Collectively, these reports identify the need for a single point of truth that provides a common understanding and situational awareness, enabling decisions and timely and effective response across all levels and all phases of disaster events.

An effective information management approach can provide this through transparent data infrastructure, sharing accurate data between agencies, streamlined processes, and appropriate training and resources.

In Queensland, the information used in disaster management and operations is captured, shared and used by various entities including local governments, not-for-profits, government-owned corporations, utilities companies and state government agencies. Of great importance is a common understanding of contextual information such as roads, rivers and local demographics; and knowledge of resources, such as drinking water, generators and bedding, their availability and where they can be sourced.

Many data sets and information systems are not utilised fully. For example, local governments hold information about infrastructure critical to their local areas but, this information is not readily available to Energy Queensland to use in cases where backup power is required.

There are many agencies involved in disaster management with information systems producing considerable information that can help to support effective disaster management.

The Act and disaster management guidelines direct the process of sharing information through the levels of the disaster management system in Queensland. Different information systems are used at each level of the arrangements to support operations.

The Event Management System (EMS) is used at the state level and is run by QFES. At the district level, the Disaster Incident Event Management System (DIEMS) is used and run by QPS. At the local level, a range of systems is used, the most common being Guardian Control, used by around 40 councils.

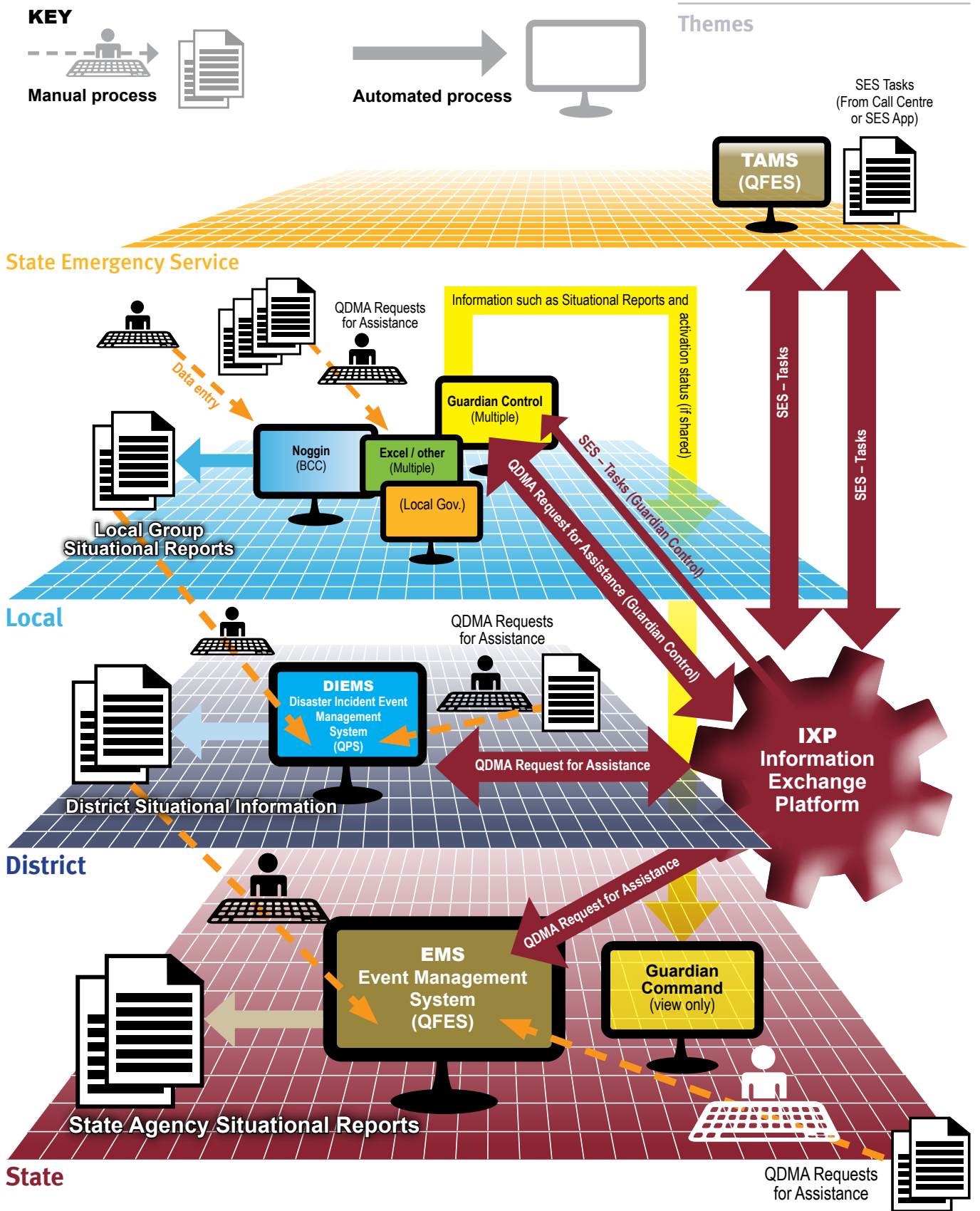
Various other information systems are essential in the sector, such as the Task and Management System (TAMS) used by SES. The agency specific mapping system, Total Operational Mapping (TOM), effectively visible only through QFES staff and their computers, is used to manage and display different pieces of information during disaster events.

The Information Exchange Program (IXP) was developed to exchange information between Guardian Control, DIEMS and EMS. Yet, between these systems there is a general lack of sharing information with other systems and agencies.

The Debbie experience highlighted three related aspects of Queensland's information management: reporting, visibility, and interoperability.

This diagram illustrates the interoperability of systems, developed specifically for the sharing of disaster management information between the three levels.

Source: Diagram based on information provided by PSBA and QFES.



Themes

Before we examine these three aspects, it is important to recognise the challenges of the disaster environment for information management. During Debbie we heard of disaster management staff who were overwhelmed with the volume of emails and phone calls received during the event.

Examples include an officer who received more than 2000 emails in a 24 hour period, and local disaster management officers who were being called so frequently that, as they were returning calls, they would receive several more voicemail messages.

Power outages and “black spots,” where communications continued to fail, also occurred. Work-around solutions often involved changing the mode of communication according to what was working, such as emails, phone calls, online surveys and various forms of social media. The volume of calls, emails and social media messaging, paired with attempts to use whatever mode of communication would work, contributed to confusion about the validity and priority of each piece of information.

We recognise that those involved in Debbie dealt with these challenges exceptionally well, and our commentary below is aimed to improve their environment for the next event.

Awareness and training

We heard there is not enough awareness of how the various systems work and exchange data, to allow operators to use them effectively. We found some of the issues, identified as gaps or failures in the IT system, are contributed to by user error.

There is a lack of understanding of what the systems can and cannot do. Customised business processes are not visible nor part of training for users. Their incorrect use can lead to errors instead of their intended efficiencies.

For example, we heard from local groups that there were issues between the integration of Guardian and TAMS; in one case we heard TAMS stopped working altogether, creating further frustration and the need for manual work arounds by LDCC staff.

We also heard that the IXP system has strict requirements and will not process entries that show even minor inconsistencies with workflow rules, resulting in a high number of errors. Some local groups stated the need for ‘refresher’ Guardian training ahead of the wet season and training for more staff.

Reporting

A common way to manage information in disasters is through situation reports. Situation reports aim to capture accurate information from operations at set times in a concise format that communicates the current and forecast situation during a disaster event.¹¹⁴

The expectation of practitioners is that situational reports will provide a common understanding between local, district and state levels of the details of the emergency, the needs generated, and the responses undertaken as they become known.¹¹⁵

During operational activity, a local group is responsible for preparing situational reports and sending these to the district group. We understand the requirements for this are up to each district group. Local groups that have Guardian Control use this to generate and store these reports. Situation reports generated in this way cannot be seen in the district DIEMS systems; their entry is a manual process, and not easily checkable by local groups. During Debbie, some local groups regularly emailed through their situational reports to the SDCC. When reports were received, the SDCC would load these into EMS which then made them accessible to EMS users at the state level.

District groups do not have a requirement to prepare situational reports, although we heard that one district was preparing these at set times and sending them to the SDCC. Rather than prepare situational reports, districts are required to enter key information into DIEMS as an activity log. This is not normally available to local groups. In one case where access to DIEMS was provided at the local level, the disaster management officer said they did not have time to look at it.

At the state level, each SDCG member agency prepares an agency situational report. Significant work has been done by QFES to integrate reporting across the state level. Information is entered directly into EMS by each agency. However, we heard there were not enough resources to manage the reporting demands.

An example of the high volume of reporting during this event comes from Queensland Health, which provided 473 situational reports (“sitreps”) to the SDCC over a 19 day period.¹¹⁶

It is important to note there is no integration vertically between district (DIEMS) and state (EMS) reporting systems, except for the process of escalating Requests for Assistance. Situational information about the local and district levels is entered into EMS by QPS staff in the SDCC. This is done manually from each district’s activity log. The Emergency Management System then automatically collates this information to help produce a series of reports. Some additional manual editing is required before these can be published. Debbie saw EMS used as a reporting tool for the first time since the SDCC improvement strategy.^j Its three reports – Executive Summary, State Update, and Key Messages – are aimed at different audiences.

From a systems perspective, we heard these were a great improvement from previous event reporting methods. We heard positive feedback about the system, including that it was easy to use, reliable because information could be updated as changes occurred, and accessible, as it could be used remotely and those on duty did not have to be in the SDCC to update their information. We heard positive feedback about the reports, in particular that the level of detail included was useful. More broadly, Debbie showed further good practice in reporting. Briefs generated by DCCSDS and sent to elected members were well received. The Department of Energy and Water Supply advised us of internal reporting which got accurate information to the appropriate levels of the disaster management system at the right time.

However, coordinating up-to-date reports from more than 30 local groups, over 15 district groups, and over 35 state government agencies, utilities companies, not-for-profits, and others¹¹⁷ is difficult. There were issues, mainly with pressure and timings for information, the volume of information in the final products and the process for getting it.

Themes

Notes

j. The report, prepared in June 2014, provides an improvement strategy for the structure, operations and activities of the SDCC.

Themes

Finding

Much effort was made by many to share information across systems, often by repeating or reproducing information. The resulting volume had its own challenges. Reports that concentrated on discrete issues were better received than long comprehensive ones. Future reporting may be improved by greater analysis rather than just data.

Recommendation

A strategy should be developed to improve the availability of information to decision-makers and other audiences. Information should be searchable, more specific, timely, and allow stakeholders to find what they want.

Pressure and timings

We heard from many agencies about constant changes in reporting requirements, including changes of timings for when information was needed. We also heard the demand for information and live reporting was considerable. Some state agencies updated their situation reports in EMS more than 200 times a day.

We also heard from the SDCG debrief about the “thirst for information,” difficulties in meeting changing requirements, as well as the need to provide more succinct reports. Others remained philosophical, regarding such demands as always part of disaster management. We noted during the review that the information requirements determined by the news cycles (5.00am, 12 noon and 5.00pm) remain constant, and see benefits if these were more clearly the drivers for all reporting.

Volume

Many agencies commented on the volume of information in the Executive Summary and State Update reports. A number of these were over 30 pages long; one Executive Summary report was 62 pages long. The length of the reports meant they were time consuming to read and difficult to decipher key information.

One agency told us that many of the reports were so large, they did not have the time to read them to get the information they needed. In contrast, we heard of successes where more targeted and discrete reporting was used, highlighting that there is scope for improvement.

Situation reports should provide key information in a way that is easily digested by the audience with an option to drill down to more detailed information only where necessary.

Process

We heard from many local groups that they were being constantly asked for information. One LDMG told us of four state agencies repeatedly calling the local group for information, even though their own representatives were in the LDCC.

They also continued to receive phone calls from state agencies for information that was available online. Many local groups were repeatedly contacted about evacuation centres and the numbers of people in them. The Livingstone LDMG told us they received phone calls from state agencies asking for numbers of people in their evacuation centre, even though their situation report said that it was not open.

Visibility

The information from the various systems that operate in disaster management can be used to provide situational awareness to aid decision-makers. However, during this event we saw many examples where information was visible to some agencies but not others. At times, this lack of visibility resulted in conflicting decisions being made at state and local level. We saw cases where:

- information was accessible but stakeholders were not aware of it,
- stakeholders had access to information but did not recognise the importance of sharing it with others,
- stakeholders made decisions without having access to all of the relevant information available to them, and
- systems containing useful information were not used.

We heard that during the event one state agency was trying to source local situational reports but had no visibility of them in EMS. This resulted in that agency requesting information from the local government through their normal departmental channels.

QFES has 10 licences for Guardian Command. Guardian Command is a cloud system that has the capacity to directly connect to local groups' Guardian Control information. Guardian Control has access to many local situational reports from local groups willing to share this information. When we spoke to a number of QFES staff in SDCC, they were unaware that Guardian Command existed. Although Guardian Command was purchased to provide more visibility of local group's information at the state level, we found it was not widely known about and could have been better utilised during this event.

We heard that prior to the event Energy Queensland contacted local governments to collect information about critical infrastructure and backup power requirements, with varying success. During the event, backup power requirements for one critical asset were not known by the associated council, which resulted in insufficient supplies being deployed to fix the problem.

We also heard of one agency that had resources ready and available to deploy for support. However, their assistance was never requested, and so the resources were not offered or used.

In January 2014, the Office conducted a survey of state government agencies to find out what datasets they owned that might have relevance to disaster management activities. The survey found 588 datasets were potentially relevant. However, only 36 per cent of these datasets were publicly available on the Queensland Government data website. Additionally, agencies said 76 per cent of these datasets could be shared, without restriction, to agencies involved in disaster management.

We wonder how agencies involved in disaster management can make the best decision or avoid conflicting decisions if they do not know what information or resources each entity has.

“Reports that say that something hasn't happened are always interesting to me, because as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don't know we don't know. And if one looks throughout the history of our country and other free countries, it is the latter category that tend to be the difficult ones.”¹¹⁸

Donald Rumsfeld's quote above will be familiar to many. Knowing what information other agencies have can guide the formation of relationships, build trust, and prioritise the exchange of information when needed.

The experience of Debbie suggests that Queensland's disaster management information is in danger of falling into that last category if it is not captured and shared within a transparent system that connects information with decision-makers.

Themes

Themes

Finding

Sharing of information in disasters is hindered by the number and connectivity of systems in which it is managed. We understand the background to the Systems' variety, and commend the initiative, energy and workarounds, of those who manipulate the system to make it work.

Finding

The technical inability to share information successfully contributes to misunderstandings between decision-makers at different levels. Misunderstanding erodes trust, and trust affects the relationships that are an important enabler of successful disaster management operations.

Recommendation

Significant effort should be invested to provide disaster decision-makers at every level with a shared understanding of risks, the situation, and capability, so that they can agree the best decisions for the communities they serve.

Interoperability

The Debbie experience demonstrated strong interoperability^k between groups, agencies and systems in some circumstances. The Rapid Damage Assessment^l data is shared by QFES to many local governments and state agencies through data feeds. This information can then be overlaid in other agencies' systems. Many local governments share local road closure information with TMR through Guardian Control. The information is combined with state road closure information by TMR, which then provides a complete overview of road closures. This information is shared through data feeds with various agencies and made available to the public through the *QLDTraffic* website.

It was identified at the SDCG debrief that the integration of the Guardian, DIEMS and EMS systems had improved information sharing, but had not solved interoperability issues adequately.

Users of these three systems appear satisfied with them for managing disasters at their level, but not up and down the system. Recipients of the outputs of these systems also seem to be satisfied. However, other than for the processing of Requests for Assistance, the lack of interoperability between these systems slows processes and increases user error.

It requires workarounds, manual adjustments, and more staff. We heard examples of inaccurate information being shared. In one case, information from a utility's public website was used by a state agency in situational reports, but it was not the point of truth and was not current information.

We also heard that information made visible through Guardian Command is not always relied upon. One reason for this is that the validity of the information varies.

We heard cases where information was not shared in an appropriate format – for example, mapping information sent as a PDF rather than a GIS file – and cases where information was not always up-to-date, such as the activation status of local groups. We heard this resulted in poor visibility of the situation which puts an increased demand on local groups in the form of additional information requests.

We note that QFES, which has been solely responsible for leading the work to integrate the various information systems, has plans for further interoperability between these three systems. There have been a number of disaster management reviews highlighting the need for better data sharing. In 2011, the All Hazards Information Management System program, which resulted in the development of the IXP, sought to address this complex issue. The program's objective was "the right information, to the right place, at the right time."

The Debbie experience showed that this is still an aspiration in some places.

We recognise the many barriers to introducing a common system across different agencies with separate agendas, priorities, and procurement processes. However, the facts are that the current system is inefficient in its use of staff, contributes to sub-optimal information being presented to decision-makers, and is a cause of concern for practitioners at all levels.

Notes

- k. Interoperable is defined in the Macquarie Dictionary as '(computer systems or software) able to connect with each other for the exchange of data, programs, etc.' The Standard for Disaster Management in Queensland expands on this to 'interoperability of systems, programs and resources to enable integration seamlessly across the sector.'
- l. Rapid Damage Assessments (RDA) are conducted by Queensland Fire and Emergency Service to support Local and District Disaster Management Groups with an assessment of the amount of damage sustained immediately following a significant event.

Themes

Our experience outside Debbie is that technology alone will not guarantee greater interoperability and information sharing. Those who own information must believe in the usefulness of sharing it, and trust that their interests will not be adversely affected if they do. We have seen some evidence over years that the beginnings of this trust exists.

However, a major initiative is needed to support and encourage the trusted sharing and management of information for disaster management.

A future strategy should consider the critical decisions that are asked at each level, the information that is needed to answer these questions, and the best way for each piece of information to be shared.

At the time of writing this report, we were not aware of a future strategy for disaster management information systems being developed.

Briefings

Aside from reporting, considerable time and effort in disasters is spent trying to keep the many people involved fully informed. In Debbie, as in disasters before, the focus for briefings was the main teleconferences and meetings of the state's peak bodies at SDCC.

In general, these briefings given throughout the event were positively received by attendees, and the information shared was considered relevant and timely. The Gold Coast local group found the briefings very useful, as they gave the group situational awareness before the weather system reached them. We also heard suggestions for the improvement of briefings, such as:

- The most up-to-date weather information was on the Bureau website. Slide-packs, though convenient, were labour-intensive to prepare, took staff away from answering the many interested parties, were sometimes out-of-date when presented, and were not visible to all relevant parties. Greater use of the Bureau's website and a pre-distributed set template of links to inform briefing participants have been suggested.

- The provision of briefings on the entire weather event and its impacts across the state were praised by local groups with time to listen and whose planning benefitted from the whole picture. However, some local groups – typically those most active – said they only had capacity for information directly relevant to their area and would prefer shorter briefings contextualised for their region.
- Appropriate attendance was an issue at all three levels. In one case the increasing numbers in attendance created the need for follow-up meetings, attended by a smaller cohort, so that decisions could be made. Other briefings extended invitations to district but not local group representatives, requiring the information to be passed on rather than being heard directly.

Finding

Briefings worked well, but there is still scope for efficiencies in appropriate attendance and focus. In a dynamic situation, briefs get out-dated quickly. Live feeds are preferable – the Bureau of Meteorology's website to a weather slide-pack, for example.

Themes



Evacuation

“Before Katrina, it was a longstanding tradition in our country for political officials to wait until the last minute to warn, to take action, to evacuate. No more. With [Hurricane] Irene, you had mass evacuations – mandatory ones – issued days ahead of time. That was the right thing to do.”

Lt-Gen Russel L Honoré, US Army - Commander of Joint Task Force Katrina

Evacuation in Queensland

The decision to evacuate is significant. Safety is its primary driver. But an evacuation carries risk, both to those being evacuated and to those managing the evacuation.

Those deciding must balance a range of factors: the hazard, numbers, time of day, weather, routes, destination, communications, and available resources. Whether before or after an event, they will do so in a climate of uncertainty and pressure. Since the 1970s, it has been recognised that mass evacuation in disasters can cause anxiety and stress, leading to panic and loss of life. An evacuation affects the whole community: young, old, families, pets, friends, those in hospital, transport workers, hoteliers, emergency workers and more.

In a prepared community, all with responsibility should understand how evacuation works and their part in it.

In Queensland evacuation arrangements are in line with nationally-agreed principles and concepts. The evacuation process and a guide for plans are set out in *The Queensland Evacuation Guidelines for Disaster Management Groups*. These guidelines identify the agencies involved in evacuation and the roles they play. In partnership with the Australian Red Cross, the Queensland Government has also produced the *Queensland Evacuation Centre Management Handbook*, which provides guidance to decision-makers responsible for the operation and management of an evacuation centre.

 Themes

Roles and responsibilities for agencies in evacuations in Queensland¹¹⁹

District Disaster Coordinator – authorise the directed evacuation and exercise any statutory powers under sections 77-78 of the Act which are required to enable the evacuation.

Local Disaster Management Group – management of all aspects of the evacuation process that are not the responsibility of the DDC

Queensland Police Service – coordinate evacuation operations

Department of Transport and Main Roads – assist with the safe movement of people as a result of mass evacuation of a disaster affected community

Department of Housing and Public Works – coordinate technical advice on the structural suitability of buildings for use as community evacuation centres, places of refuge or cyclone shelters

Queensland Health – Queensland Ambulance Service – participate in search and rescue, evacuation and victim reception operations, participate in health facility evacuations

Department of National Parks, Sport and Racing – safety of users of national parks and agency-owned recreational centres, including issuing warnings in extreme conditions, closing areas where necessary and coordinating evacuations with QPS.

Australian Red Cross – work to ensure basic human needs are met during the response to a disaster, focus on assisting local government authorities with sheltering (evacuation centres and cyclone shelters)

Royal Society for the Prevention of Cruelty to Animals – monitor the responsible care of animals, provide standards of care for animals and protect animals from unjustifiable, unnecessary or unreasonable pain.

Councils, supported by their local group, have responsibility for a Local Disaster Management Plan. The Evacuation Sub Plan describes the arrangements and triggers, where known, for evacuation at local level. Ideally a range of people is involved in creating this plan. Doing so ensures its relevance and helps create the wide understanding that will make it work. The Queensland Arrangements recognise three types of evacuation.

- **self-evacuation** is the choice of individuals to move prior to an announcement of the need to evacuate,
- **voluntary evacuation** is the encouragement for people exposed to an impending hazard to move, and
- **directed evacuation** is the direction for people to evacuate an exposed area.

Planning is done for the last two. It needs to take account of the five stages of evacuation: the **decision**, **warning**, **withdrawal**, **shelter**, and **return**.

Themes

Decisions

As with its implementation and management, decision-making for evacuations is a shared responsibility. The Australian Institute for Disaster Resilience *Handbook 4 Evacuation Planning* sums up the approach:

“The authorised agency usually makes the decision in a collaborative environment in consultation with other agencies. The agency with the authority to order an evacuation may not necessarily carry out the physical evacuation.”¹²⁰

In Queensland “... the LDMG does not have the statutory power to authorise a directed evacuation.”¹²¹ However, the LDMG will be responsible for the management of all facets of the evacuation process (s.30(c) of the Act) which are not the direct responsibility of the District Disaster Coordinator (DDC).

LDMGs are responsible for making decisions to call for the voluntary evacuation of local people from affected areas and will coordinate such evacuations in their area. Voluntary evacuations are usually called early to reduce the numbers to move in a more critical directed evacuation. For this strategy to be effective, considerable community engagement is required on a regular basis beforehand.

The authority for directing evacuation is clearly laid out in legislation, and in events like Debbie, requires the Declaration of a Disaster.¹²² Directed evacuation is the process where “Exposed persons are directed by the DDC or Declared Disaster Officer under legislation to evacuate an exposed area.”¹²³ Explicitly, the authority to direct evacuations lies with the DDC. Our earlier work on evacuation management with experienced stakeholders from both local and district groups explored this issue. In practice it showed a high degree of collaboration over both voluntary and directed evacuations between those with the authority to direct and those with the planning responsibility.

Warnings

Many methods, from door-knocking to social and traditional media, can pass warnings to a community. Successful evacuation depends on recipients acting on them. Whether they do, depends, in turn, on education, awareness and engagement programs run well before any event. The language of warnings must be covered by such programs. Even the terms above, describing types of evacuation, can be misunderstood without some prior education. Confusion in the minds of those warned to evacuate can derail the most careful planning.

Withdrawal

Estimating the duration of a withdrawal is a critical early planning factor. The movement to a safer location involves transport options and route capacity. Their consideration, along with warning time, people’s preparation time, and the time for the estimated number of vehicles to pass a particular point, all help determine the time taken. Logistics are a further consideration. Signage, route maintenance, breakdown services, first aid, fuel, food, and rest places on a long journey will all contribute to a smooth withdrawal. If the mass movement of people from risky locations to a safer place is to succeed, all these must be assessed and planned for carefully. They are essential elements of an evacuation sub-plan.

Shelter

Guidance about the shelter stage of an evacuation can start with the seemingly contradictory advice about sheltering-in-place. Sheltering-in-place is a viable option for a safer location, depending on the geographical area and type of disaster. This is particularly true of cyclones, where those outside the storm tide impact zone may have adequate shelter in the strongest part of the house. Planners should consider the likely duration and needs of evacuees in their safer location. These may cover power, water, cooking, ablutions, access and pets, recognising that better options may be further away. As with the types of evacuation, there is scope for confusion in the terms describing where to go.

 Themes

Sheltering terminology

Defining widely-used terms in such a way that the message doesn't get lost through the different media channels is an important requirement of public messaging before, during and after an event. When defining sheltering, information is not just needed on what a facility or safer location is, but also where it is, what is provided, and when to go there.

Several LDMGs reported community confusion surrounding the terms cyclone shelter and evacuation centre. This was particularly apparent with the building at the Ayr Showgrounds, referred to as the *Multi Purpose Centre, Shelter, Facility, Public Cyclone Shelter and Place of Refuge* in various public messaging. The community was also encouraged to evacuate to it, as a place of last resort. The building then transitioned into an evacuation centre directly after the event. The naming convention of these buildings can contribute to public confusion and also the ability to provide services. The Australian Red Cross offers assistance in public cyclone shelters, and evacuation centres, but not places of refuge.

What people can bring and the services that are available also changes. In public cyclone shelters possessions are limited to items that can be carried in a backpack. There are no sleeping arrangements, and cooking facilities and food is not available. Evacuation centres usually offer basic food supplies, cooking facilities and provide a place to sleep if residential housing is unliveable. Evacuation centres are also used as recovery hubs in the recovery phase, providing "a range of welfare, support, financial and emotional recovery services for disaster affected persons."

Information to the community is available. The Burdekin Shire Council may have used different terminology but did provide a detailed media release on the code of conduct and services provided at the facility. Whitsundays Regional Council have produced a brochure on "Cyclone Shelter and Evacuation Options for residents of the Whitsunday Regional Council." It provides information on when to shelter in place, when to evacuate to a public shelter and the limitations and code of conduct for those shelters. This information is reproduced on their website with the cyclone shelter code of conduct available in several different languages.

Early community engagement about safer locations and what to expect in terms of services and facilities should form part of regular pre-season preparedness. Livingstone Shire Council have taken this engagement a level further, running "full scale" public cyclone shelter field exercises and inviting the public to participate. The engagement and advice should be reinforced in warnings.

Return

Return is critical to the recovery of communities. Following the evacuation of around 35,000 people after Cyclone Tracy, it took five months for Darwin to return to three-quarters of its population. Return requires the same careful planning as other evacuation phases. Factors include staging – due to safety and the availability of goods, utilities and services, and timeliness to speed psychological recovery. Getting the message about returning to dispersed evacuees, some of whom will have moved on their own accord, again needs specific consideration. During Debbie this seems to have worked. Both in Mackay and Whitsunday more than 90 per cent of our community survey respondents were satisfied with the speed with which they could return home after being evacuated.

Themes

Evacuation in Debbie

We recognise from the 2016-17 disaster management plan assessments, that evacuation is an important topic for local and districts disaster management groups. Results from the assessments showed local governments made improvements to evacuation plans and tested evacuation arrangements, more than in any other areas of plans. Many involved in Debbie activated their plans, whether evacuation occurred or not. We note that this work occurred in two separate contexts; evacuations before the event, and evacuations after the event.

Planning

Planning effort was evident throughout Debbie, from the significant planning, informed by probabilistic modelling used by Townsville, to integrated planning with local aged care providers in Burdekin. Burdekin considered three possible cyclone crossing outcomes and planned contingencies accordingly. Whitsunday prepared for a category 4 direct hit when Debbie was still a tropical low. Efforts were made there to plan the evacuation of tourists. In Moreton Bay previous experience prompted the evacuation of horses and equipment from a low-lying business. Early availability of public information enabled community members to be more resilient. Ipswich modelled rain falling 50km west of forecast, and considered evacuation options for a 2011-size event. Accommodation for pets was planned in evacuation centres in Ipswich and Logan.

Such improvements, embodying lessons learned, were underpinned by a noticeable and stronger-than-before focus on the needs of Queensland's vulnerable people. Effective community engagement and clarity about local needs and expectations were reflected in local activities. All the arrangements that we heard about planned for evacuation before an event.

In Burdekin, the LDMG had not only identified the local aged care service provider but also invited a representative to join its group. This resulted in a well-integrated plan catering to the vulnerable and provides a model worthy of consideration across Queensland. In Charters Towers, event-specific planning and engagement saw the LDMG help the local aged-care facility organise transport, and identify their own staff's capabilities. Planning identified the centre's capacity for taking in additional people if their area was not directly affected. The process prompted business continuity planning to include all hazards, and the need for emergency action plans for them.

However, it is more common than not that aged care providers require significant support and encouragement in planning and exercising evacuation.

A lack of consistency across the range of providers results in varying levels of preparedness and engagement with LDMGs. In one instance, numerous attempts to engage a private aged-care service provider in disaster management planning failed. Inevitably the provider required a significant last minute response, affecting the evacuation process, and stressing the local emergency management workers. In such circumstances, we note that there would have been an effect on the clients of the service as well. In collaboration with the Queensland Chief Health Officer, the Office will raise, with the commonwealth, the need for all aged care providers to plan and exercise for evacuation to a similar safe establishment.

Finding

A number of evacuation plans for aged care facilities were overly reliant on agencies that had not been involved in the planning. The plans therefore had no guarantee of implementation.

Recommendation

The Queensland Chief Health Officer should work with the Office of the Inspector-General Emergency Management to raise, with the Commonwealth, the need for all aged care providers to plan and exercise for evacuation to a similar safe establishment.

Community engagement

Engagement seems to have been done particularly well in North Queensland. Before Debbie, as for other cyclone seasons, significant educational programs were dedicated to raising public awareness. They covered seasonal hazards and the need to prepare well, and resulted in residents heeding advice from local groups in Debbie-related evacuations. This empowered individuals to take ownership of their own preparedness and increased the overall community's resilience for Debbie and flooding hazards.

The early availability of evacuation maps on council websites also enabled effective evacuation of communities. Whitsunday in particular has put considerable effort into its evacuation zones and public messaging. The effectiveness of such work was evident in the relatively low numbers presenting at cyclone shelters and evacuation centres. Many local residents self-evacuated to stay with family and friends. In Mackay, people moved to hotels on higher ground.

Only a very few of our community survey respondents saw room for improvement. In the cyclone-affected areas of Mackay and Whitsunday around seven per cent of respondents wanted either more information or education about how to prepare and where to evacuate to, or more evacuation centres or cyclone shelters.¹²⁴ Our community survey of permanent residents revealed that, in the Whitsundays, only four per cent of those who evacuated went to an official evacuation facility, and in Mackay two per cent. Residents perceived their choices to be more comfortable than the centres and viewed the centres (correctly) as a place of last resort.

In the planning and engagement for evacuation during Debbie there was increased awareness of the needs of vulnerable people. The DCCSDS reported a substantial shift towards better support for their needs and arrangements. At both the local and state levels the needs of different communities had been pre-identified. Special consideration had been given to the evacuation of:

- older people living at home alone
- people with disabilities
- people with hearing or visual impairment
- single parents with young children
- large families
- people with identified illness, e.g. on a dialysis machine
- people newly arrived to the area, the state or even the country such as tourists or migrant workers.

Greater engagement of vulnerable people was also achieved in Debbie, by leveraging pre-existing relationships across statewide networks. These relationships included the National Disability Insurance Scheme stakeholders. Service providers including the Australian Red Cross, RSL Care, BlueCare, industry peak bodies, state agencies, advocacy groups, and other local community centres all contributed. Each assisted in getting information about Debbie to the more vulnerable residents of Queensland by using their own networks to increase the reach of the messaging.

This increased ability to get clear messages to the vulnerable has been informed by the work of the DCCSDS. The development of the "vulnerabilities framework,"¹²⁵ *People with vulnerabilities in disasters – a framework for an effective local response*, assisted this process. The framework aims to help identify and engage people likely to be vulnerable in disasters, and the stakeholders who know them or provide services to them.

This approach is indicative of how sharing information outside of traditional channels, can be utilised to increase community resilience to disasters. Where local groups had directly engaged the aged care sector, for example, care homes understood the warnings. In directed evacuations they were able to enact their previously exercised evacuation plans, and use pre-arranged transport options.

Themes

Themes

Finding

The technical inability to share information successfully contributes to misunderstandings between decision-makers at different levels. Misunderstanding erodes trust, and trust affects the relationships that are an important enabler of confidence and successful disaster management operations.

Recommendation

Significant effort should be invested to provide disaster decision-makers at every level with a shared understanding of risks, the situation, and capability, so that they can agree the best decisions for the communities they serve.

Finding

Exercising is often undertaken in a siloed manner – limited to local and district groups, or internal to an agency, state group or centre.

Recommendation

Exercising should focus on vertical integration and include all levels of the system. A strategic program of exercises should be developed and implemented.

Decisions

Generally decisions about evacuation before the event were made and conveyed to those affected in sufficient time. In Whitsunday and Mackay about 9 in 10 people said message warnings were easy to understand. Deciding about evacuations was more challenging

During Debbie, decision makers in the SDCC and local groups, apart from Townsville, were using information about the most likely and the worst-case scenarios, with little understanding about their probability. In some cases there were differing opinions between state and local groups about the need for evacuation.

Mostly, directed evacuations happened because local groups wanted them. Where state decisions were involved, they were either carried out as a voluntary evacuation or later, through a locally directed evacuation. We also heard of pressure on local groups to open evacuation centres before the cyclone crossed, and the subsequent flooding.

We observe that differing decisions may be due to information not shared completely, or different snapshots of information considered at different times. More effective communication between local and state, all parties seeing the same data sets, and all agreeing the triggers for decisions relating to evacuation and evacuation centres, would reduce confusion and build trust for rapid decision-making during an event.

We see opportunities to integrate and exercise evacuation planning vertically with those considering options at state level. The legislated roles and responsibilities for decision-making should underpin such exercises. We reiterate findings and recommendations from other areas of the report.

Evacuation and tourism

Transient populations are a particular challenge for evacuation planners. They often have no experience and potentially limited knowledge of Queensland disaster events. Currently, they fall outside the reach of traditional seasonal community engagement programs. They are unlikely to have nearby friends or relatives to whom they can turn for shelter. Looking forward to a holiday, they may be relaxed and off-guard. Many may not have access to a vehicle to self-evacuate. Their safety and evacuation depends, therefore, on the tourism sector and its links with the disaster management arrangements.

The Whitsundays LDMG is particularly aware of these risks. The new evacuation zone maps and the significant community engagement, undertaken to increase awareness and understanding of these new zones and the subsequent processes relating to different types of evacuation, had been well received by organisations in the region.

In Debbie, its local group and coordination centre activated early under new activation triggers for their area. Stakeholders, including local residents, aged care facilities and tourism operators were alerted earlier than in previous years. A disaster was declared early to allow for evacuations. Alerts and warnings were followed up by police and SES with pre-agreed scripts to ensure the communication had reached everyone and it was consistent. This allowed more time to prepare, enact plans, and for self-evacuation from the cyclone's path. Due to capacity limits, messaging reinforced that cyclone shelters were really the last resort, and for those with no alternative.

Local tourism representatives recognise this. They told us that the overall process, dedication and support from the Whitsundays Regional Council, the local group and the emergency services working in Debbie was, without doubt, superb.

Much of the planning worked. After strong messaging and weather alerts, many tourists cancelled bookings. Local tourism businesses made attempts to inform those who had pre-booked and to deter travel to the area. In Airlie Beach, on the advice of local tourism operators and emergency services, tourists with access to their own transport self-evacuated. Some tourists staying on the islands managed to change their flights departing Hamilton Island. This contributed to the lower occupancy rates at the time.

However, some tourists had already left their departure points, unaware of the unfolding situation. These people from interstate and international locations, some of whom did not speak English, were looking forward to a holiday, and were likely to have been unaware of the possibility of evacuation within 24 hours of arriving. Others still remained in the path of the cyclone, looking for support and answers about where to go, where to buy food as shops closed, where they could wash, charge their phones and, critically, where they could go to feel and be safe, all in a place that was foreign to them.

Tourism operators told us about aspects of evacuation where further consideration is needed:

- where tourists should relocate to, if told to evacuate, and how they should get there, and
- the management of new arrivals after the cyclone had crossed.

On the first point of relocation, we heard conflicting views. Tourism operators believed, from advice they received, that cyclone shelters and subsequent evacuation centres were only for use by local residents evacuated from the storm tide zones, and not available to tourists. Local government, while not encouraging their use, said they were open to tourists and, indeed, looked after some during the event.

The status of the evacuation prior to arrival may have contributed to the misunderstanding. Confusion over the type of evacuation that took place during Debbie endures among local accommodation providers. Tourism operators thought they were being directed to evacuate their guests and wanted to know where to, and who ultimately was responsible for them. Police, acting according to legislation, say they were passing on advice about a voluntary evacuation and were not in a position to tell them. The State's Key Messaging of 27 March reported evacuations directed by local groups.

On the second point, of arrivals after Debbie, we heard strong views from the tourism sector. There was insufficient accommodation for these people and no electricity, nor water, in some places. The town of Airlie Beach was at this point an estimated 3,000 beds short, and the situation was about to be further compounded by fly-in response and recovery workers. Few shops were open and local businesses and families did whatever they could. Local residents opened up their homes to tourists, and we heard of reports that some backpackers were left with no option but to sleep in the street.

We are aware of the conflicting pressures of needing to be "open for business" and for the time to recover. In 2002 work to develop the *Emergency Management on Offshore Island Resorts; Cyclone and Storm Surge Preparation and Response* training package for the tourism sector recognised the same issue.

To give time for recovery, there is a need to keep tourists away, at least for the first few days. That relies on reaching the providers of travel services, often based some distance away. Powers exist under disaster declarations to control or regulate the movement of persons. They may be an ultimate sanction, but a tourism-wide negotiated approach would seem a better way to prevent this from occurring in future events.

Themes

Finding

The arrival of tourists and other visitors immediately after a disaster, inhibited recovery effort and potentially reflected badly on Queensland's tourist reputation. Return of tourists as early as possible to holiday areas is however essential to sustained recovery.

Recommendation

A strategy should be developed between the key tourism and transport operators, and local and state government. It should address the arrival of visitors and tourists after a disaster, and should ensure that their arrival matches communities' needs for recovery and return to normal business. The Department of Tourism, Major Events, Small Business and the Commonwealth Games should monitor its implementation.

Themes

Finding

The tourism and disaster management sectors have different perspectives of evacuation arrangements and how they should be organised. There is scope for better understanding of each other's perspectives and agreement on how arrangements will work in the future. Tourists will benefit if this happens.

Recommendation

Relevant authorities should work with the tourism sector to clarify future arrangements for evacuation. In particular they should look closely at differentiating voluntary and directed evacuations in their messaging, ensure the differences are explained to the community in pre-season campaigns, and that necessary information is passed on to tourists.

Post-cyclone evacuation

Tourism is one of Queensland's most economically important industries and contributes, directly and indirectly, \$25 billion to the Queensland economy. The industry employs 225,000 Queenslanders, or 9.5 per cent of all people employed in the state.¹²⁶ Tourists tweeting about bad experiences as they wait in queues in cyclone-devastated resorts damage the reputation of this industry. The smooth evacuation of tourists is, therefore, important.

Once Debbie had passed, the evacuation of tourists from the islands produced further challenges. Without doubt the destruction was a major contributing factor. Significant structural damage was sustained by the resorts, jetties, wharfs and other critical infrastructure on the Whitsunday Islands. The region was left with significant power outages – 100 per cent of Proserpine, 99.8 per cent of Bowen – which also affected the local water supply. Road closures were prevalent and there was extensive damage to the townships of Airlie Beach, and to the local government centre in Proserpine. Telecommunications were interrupted from the Whitsunday islands to Mackay.¹²⁷

Guests and resort staff – about 5,000-6,000 between Hamilton, Hayman and Daydream Islands – needed to leave accommodation that was without sufficient power and water. Commercial airlines, ferry operators, the Royal Australian Navy and bus companies were all involved. With the weather too bad on 29 March for flights and the Whitsundays pilotage area open late in the day, evacuations started on 30 March.

Tourists and some accommodation providers found themselves caught up in conflicting information and parallel arrangements that had been put in place by the local providers and the local group. Defence Assistance to the Civil Community, in the form of Navy, assisted the relocation of tourists and staff off Daydream Island. The local group made arrangements to assist the islands, but were unaware of other measures that made them unnecessary. Buses were arranged in Bowen to take tourists to Townsville. When they arrived onshore in Airlie Beach, further arrangements were needed. Hamilton Island worked strenuously to avoid long queues building up at its airport with continuous free airport shuttles. By 9.30pm on 30 March the last of the tourists evacuated from Daydream Island to Airlie Beach were moved on to Townsville. This was all achieved amid the cyclone's damage, by tired staff, and despite telephone outages.

We heard, and have tried to convey, the sense of confusion, duplication of effort, and unanticipated problems that would not normally have occurred. We also reflect some dissatisfaction from the tourism sector with this aspect of the arrangements. But the evacuations *did* happen in a day, and amid the considerable other problems associated with the aftermath of a cyclone. The fact that they did is a tribute to all involved.

The experience of tourist evacuation during Debbie, however, leads us to conclude that some arrangements need further clarity.

The types of evacuation used in Queensland, the responsibility for initiating them, their implied liabilities, and their dissemination are not clear in the minds of many. They need greater discussion and understanding by all. If a police or other uniformed officer knocks on a door and talks about evacuation, many will conclude they have been ordered to go. Directed evacuations are not accompanied by efforts to forcibly remove people.

The distinction between a door-knock about voluntary evacuation and one about directed evacuation is slim. If the two terms are to remain, greater efforts to differentiate voluntary and directed evacuation should be made in messaging, and feed into pre-season engagement. The tourism industry should know exactly what they mean, and what the implications are.

Further clarity is needed about who is responsible for tourists once removed from their location and who should expect to pay.

This may be the individual tourist, it may require greater emphasis on holiday insurance, it may be a duty-of-care in a holiday contract, it may be part of resort business continuity plans, or exceptionally it may be the responsibility of emergency management authorities for a short time. Tourists and tourism operators should know this in advance of holidays and travel. There is opportunity to learn from international examples of how to do this well.

An engaged and valued local tourism sector enables clearer understanding of everyone's roles and responsibilities in managing disasters. Such knowledge builds trust and confidence among decision-makers at all levels. This, in turn, makes it easier to share information consistently and confidently before, during and after disasters.

Engagement of transport companies as part of the business continuity and recovery process, and developing new partnerships with accommodation providers in different locations may enable reciprocal agreements about the care for tourists and transient people for future events. Mapping of local assets such as local transport companies, and identifying more places of refuge for tourists, could be shared as options with all involved.

With the benefit of hindsight it seems obvious that an evacuation from an island after a cyclone would be more difficult than one before. We recognise that cyclones are inherently unpredictable, and economically it may be unsustainable to evacuate in the face of every one. But the question of mandatory evacuation, put forward by one tourism operator we heard from, and raised in our opening quote, should be a stronger consideration in any future event.

Themes

Finding

Responsibility for tourists who require evacuation is unclear, causing confusion among authorities and tourism operators, and frustration for tourists themselves.

Recommendation

Principles, applicable to all tourist budgets, covering liabilities for costs and shelter in the event of evacuation should be developed and promulgated as part of tourism marketing.

Themes



Capability

While disaster management capability is defined in many ways in Queensland, there is no doubt of its importance. In this section of the report “capability” refers to the System’s collective ability to manage the consequences of a disaster event. Aspects of capability may include humans, resources, systems and underlying responsibilities.

The Standard outlines Shared Responsibilities.

The Components of the Shared Responsibilities reflect the key capabilities of disaster management.

As an Accountability, “Capabilities” to refer to an entity using training and exercising to improve performance to meet disaster management outcomes.

The Act views disaster response capability in terms of equipment and people – “the ability to provide equipment and a suitable number of persons, using the resources available to the local government ...”¹²⁸

The results of our community survey indicated there is some awareness of the importance of local government in providing capability. In each region the local council is the entity most likely to be nominated as being responsible for disaster management. For Mackay and Whitsunday this was 70 per cent, Rockhampton 69 per cent, and less, but still significant, in the South East at 50 per cent.

But support for disaster response comes from a wider range of agencies. Local governments are supported first by disaster districts, subsequently by the state and ultimately the federal level. At these levels “capability” broadens to a more extensive range, adding services to equipment and people.

The focus on “local” remains important. One feature beneficial to successful recovery was the appointment of deputies, to support the State Recovery Coordinator. Those positions provided a local focus to each of the affected areas.

In the same way there may be benefits of the appointment of deputy disaster coordinators. In concurrent events this could make the state’s attention and focus more relevant to local and district events.

Requests for Assistance

The process for providing capability support is known by its nature: a Request for Assistance (Requests). The Requests must “provide the required description, quantity and delivery time detail to ensure efficient and timely resource delivery.”¹²⁹ If the district is unable to source the assistance from another council or state agency representative on their group, that Request is escalated to the state level. State in turn may ask the Australian Government for assistance.

In Debbie, the number of Requests was smaller compared to previous events. The response to Requests that were passed up the system did not always meet expectations. Some initiators said that Requests took too long to be processed. Others spoke of many phone calls, all from different people, about each Request; asking if it was accurate and “really needed.” Some were denied because the wording was not clear, highlighting the need for further training and guidance. We also heard that, on occasion, denials were justified. More than one utility provider commented on the difficult process associated with the provision of Australian Defence Force assistance.

One simply wanted to know, quickly, whether they needed to look further for support. Another made the point that, as a commercial business, if they asked, they really had exhausted their usual options.

Planning helps to identify the potential resources required by a group to prepare for, respond to and recover from a disaster. From a resource management perspective it is important for the system to be aware of what is available within the council area and how to get it. All groups have the ability to hire locally available resources if they require extra capacity to deal with disasters. If the local groups are unable to access resources, logistics planners need to know what is available at the broader district and at the state-level to ensure Requests are met quickly.

One of the resources deployed to Debbie’s potential impact zone were generators. Power failures were expected after the crossing, and access to affected areas was predicted to be difficult. The agencies responsible for this deployment provided high levels of support to the relevant groups and were praised for their flexibility in responding to a changing environment.

Staffing

At state level, roles and responsibilities in the State Disaster Management Plan guide the necessary staffing requirements for an agency to fulfil its functions.

During Debbie the activation of the SDCG, SDCC and DCCSDS Recovery Ready Reserve^m were further triggers for the provision of government staff. Utilities activated contingency plans, sometimes with interstate providers, under industrial and workplace instruments to ensure available staffing.

Disaster districts – a subset of state capacity – have the full resources of the Queensland Police Service to draw on,¹³⁰ in addition to their district group members.

Though local groups formed by councils manage disasters in their local area, this does not imply that council employees must perform all the roles needed during disaster operations. In some circumstances councils may not have enough staff or staff with the right expertise.

Local group members share the responsibility, and council local disaster management plans may include community organisations or groups to fulfil roles such as evacuation centre management, dependant on their presence in each community. Despite plans and agreements, there were reports of at least one organisation not being able to support local groups due to capacity issues.

Themes

Finding

The arrangements about Requests for Assistance are complex. Whether from resources within the state, or from the Defence Assistance to the Civil Community, they involve funding, bureaucracy and authorisation. A range of obstacles was evident to initiators, slowing the timely delivery of support.



Recommendation

The provision of system-wide education, guidance and testing to enhance Requests for Assistance is strengthened.

Notes

m. When Queensland communities are hit by cyclones, floods or other disasters, the Department of Communities, Child Safety and Disability Services draws together a temporary community recovery workforce of public servants from across Queensland to help out.

Themes

Finding

Carefully planned pre-deployment of trained staff enhanced capability, ensuring rapid relief and recovery activities. This was evident for state agencies, non-government organisations and critical infrastructure providers. Triggers for, and models of, deployment should continue to be refined using learnings from Debbie.

Deployment

Another way organisations increase their capability in disaster events is to move staff from one location to another. This process is known as deployment. Deployments can occur before an event commences or during an event. If deployment has occurred before an event it is referred to as pre-deployment.

Prior to Debbie crossing the coast there was much pre-deployment from a number of organisations. Staff from Central and South East Queensland were moved to North Queensland to provide extra capacity. They moved to ensure there was enough support for the community in areas planners believed were going to be heavily impacted by the event. We heard of direct benefits.

The pre-deployment of QFES staff and the QPS reinforced a feeling of safety for some community members in the Burdekin Region. We also recognise the indirect training benefits of early deployment: of greater exposure to disaster management operations for those without the experience.

The DCCSDS resources community recovery programs by deploying staff known as the Ready Reserves. The staff base for the Ready Reserves traditionally came from DCCSDS staff complemented by “volunteer” staff released by other government departments. During Debbie two factors affected their capacity. The DCCSDS has a smaller workforce after the introduction of the National Disability Insurance Scheme, reducing the pool of experienced people available for recovery, and providing planning challenges. Additionally, other agencies did not release their staff in the numbers required. Fortunately, the interstate recovery memorandum of understanding allowed for staff from South Australia and Victoria to be deployed.

We mentioned earlier the difficulty in getting departmental media staff to training for the SDCC. In a system where departmental staff with specialist skills are needed to support disaster operations, it is important that they are encouraged by supportive leadership to take part, and that solid agreements are in place to ensure their release for training, exercising and deployments.

Sustainability

Due to the nature of the tropical cyclone and the associated flooding the pre-deployment also provided challenges for disaster managers. The initial planning focus was the response to the cyclone crossing. The deployments were based on previous knowledge of cyclone behaviour.

However, Debbie did not cross the coast as quickly as anticipated which resulted in a number of staff being deployed and then waiting for a lengthy period of time to be utilised. This highlights two related issues about the sector's sustainability.

The first was that deployed staff from South East and Central Queensland were unavailable to their local groups when the subsequent flooding was predicted. Staff were then recalled to provide assistance in their own communities. The ability to move staff around is a benefit of the disaster management arrangements in Queensland and highlights the scalability of the system.

To do this effectively though, it is important to have adequate business continuity plans and well-trained deputies to ensure capability can be sustained in a region in case of a concurrent event.

The second was a lack of effective fatigue management strategies. The fatigue meant that when deployed staff returned they were tired and could not be used immediately which continued to impact the available capacity for groups.

Fatigue did not only affect those pre-deployed to assist with Debbie. It affected members of local, district and state groups, coordination centre staff, government departments, and not-for-profits alike. We heard comments from every level and type of agency, affecting all from CEO-level to volunteers. In some instances and areas staff members worked for 10 days straight. They were also contacted on their time off as there was a limited number of trained staff available to replace them.

The Queensland Government issued *Directive 10/14 Critical Incident Response and Recovery*¹³¹ to support a flexible workforce ready to assist with critical incident response and recovery. This directive includes fatigue management. The Public Safety Business Agency (PSBA) has written *Guidelines on Critical Conditions and Entitlements* (V2 May 2015)¹³² which specifies hours of work during a critical incident and how to manage fatigue, including accessing fatigue leave. Fatigue management is a shared responsibility between the employee, the deploying agency and the supervisor.¹³³

One reason for the high levels of fatigue was the reliance in many places on one person in the key position. Often it is a decision-maker, or disaster management expert who has the knowledge or the extra responsibility of the event placed on them. Due to these circumstances there is a tendency for others to continually contact them, even whilst they are off duty, exacerbating issues of fatigue.

Fatigue issues are inherently connected to capacity. This is particularly so in regional and rural local government areas. The Mackay disaster district, including local groups, had identified through planning that they were likely only to have enough human resourcing capacity to manage disaster operations effectively for three days.

Pressure was particularly evident on councils' disaster management officers or positions such as the QPS District Executive Officer – positions that possess disaster management expertise and local knowledge. Additionally, there are some positions who do not have a deputy position including district disaster coordinators. The State Disaster Coordinator has no explicit deputy under legislation, making effective leadership by example, in fatigue management terms, difficult.

Suggestions to improve fatigue management include: different shift arrangements, better trained and more knowledgeable delegates, a "Plus One" backup with the same information to assist effective handovers, succession planning, formal fatigue management plans, guidelines to limit work hours, improved workforce planning, on call arrangements with other states, and better support arrangements for critical accountable officers.

The issue is particularly important for the upcoming season, due to the possibility of the Commonwealth Games coinciding with a similar event.

Fatigue management among volunteers was also a challenge. The State Emergency Service identified some local volunteers could operate within a culture that encourages individuals "to push themselves beyond fatigue". However, the SES noted when volunteers were deployed to locations to assist, there was more control over fatigue management. Volunteering Queensland advised they attempt to manage fatigue by ensuring "volunteers are well organised and have rigid times and number of days they can volunteer."

Themes

Finding

Fatigue significantly impacted the sustainability of critical roles during Debbie. This is especially evident at all levels of the system where disaster management expertise, combined with contextual knowledge is relied upon. In prolonged events fatigue may impact on critical decision-making.

Finding

Disaster groups and state agencies that plan for human resourcing requirements during operations are more likely to deliver expected outcomes

Recommendation

Fatigue management strategies and guidance should be improved to ensure sustainable staffing practices are incorporated into disaster management planning.

Themes

Volunteers

A number of volunteer organisations play a role in disaster management to enhance capacity across all levels of disaster management but particularly at the local level. There are two types of volunteers recognised in the Queensland Offers of Assistance Guidelines. These are:

“Volunteers” – individuals who are formally affiliated with an emergency service organisation or NGO, and act under the respective organisations direction and authority, and

“Spontaneous volunteers” – individuals or groups who are not skilled or trained to perform specific roles in disasters and are often not affiliated with an emergency or community organisation but are motivated to help.¹³⁴

Finding

Volunteers played a vital role during Debbie. Traditional emergency management volunteers, such as State Emergency Services, and spontaneous volunteers ensured rapid relief to communities. Continued support and advocacy of informal and non-traditional volunteering through organisations such as Volunteering Queensland and the social sector ensure the community is rapidly supported following an event.

Organisations including but not limited to the SES, the Australian Red Cross, Surf Life Saving Australia, the Salvation Army, Lifeline, St. Vincent de Paul, Adventist Development and Relief Agency Australia, RSPCA, BlueCare, St. John Ambulance and GIVIT have a pre-existing volunteer base. Together they provide distinct services across disaster preparedness, response and recovery.

Local governments also used volunteers to assist with disaster management. There is potential for councils to extend their use of volunteers, matching them with gaps identified by business continuity planning.

In Debbie, the deployment of additional SES resources to support local capacity in areas requiring assistance was done quickly, although power outages and resultant communications failures prevented alerting text messages getting through to some. As in previous events their role was not completely understood.

The SES is an emergency service for the community. It will prioritise households before businesses, and can only repair storm damage, not rebuild houses. After Debbie, there was a concerted effort to ensure SES got to all communities, not just the ones known to have been affected.

This was a positive outcome as this practice was based on the experience of Tropical Cyclone Marcia where some communities were reportedly forgotten.

Volunteering Queensland leads the management of offers from spontaneous volunteers in times of disaster.¹³⁵ It matches those offers with the needs of councils or others seeking support, who then take on responsibility for their management and costs. Effective volunteer management needs pre-existing arrangements. In Debbie, Volunteering Queensland was asked to support Logan City Council. It was able to assist until relieved, and this arrangement worked well. However direct volunteer management on the ground is not the role of Volunteering Queensland, and it is not anticipated to be the model for the future.¹³⁶

The recently released QFES *Volunteerism Strategy* has identified a “critical need to develop more flexible strategies to support the broader community and to ensure we have the systems in place to attract, retain and support our volunteers both now and in the future.”¹³⁷

There is potential for further work in this area. Complementing the QFES work is the research being undertaken by the Bushfire and Natural Hazard Collaborative Research Centre into volunteering. The research is examining sustainable emergency volunteering, improving retention and engagement, and non-traditional emergency volunteering.

Exercises and training

The Debbie experience emphasised the value of training and exercises in preparing for disasters. The *Queensland Disaster Management Training Framework* outlines courses needed by disaster management stakeholders to enable effective performance in their roles.¹³⁸ It highlights the training courses available for each level of the arrangements, and whether they are mandatory or needs based. The courses are usually delivered online or by QFES staff. Most involved had completed the appropriate training to manage the event. The event did help identify that further training would be beneficial.

We reported earlier on the need for greater understanding of the EA system and Requests for Assistance process. Procedures would be better understood with more extensive supporting materials for those making requests and others acting on them. Reports of fatigue from all levels and agencies highlight the importance of training more staff to make operations more sustainable and ease pressure on individuals. We heard the benefits from one council of giving training to elected representatives, given their prominent roles in disasters. While cyclones are seasonal, other hazards are not. Such training should be given as soon as possible after taking office.

To complement the training, it is important there are the staff and procedures available in centres to lead and guide others. One group told us that “the use of experienced staff as team leaders guided the flow of information, tempo and priority of actions. Those with previous experience gave timely and sound advice to those seeking to understand how the procedures worked.” A further way to reinforce the training and procedures is to ensure exercises occur.

Some groups and agencies reported that they had exercised response activities or scenarios like Debbie recently. Townsville, for instance, reported that they had exercised for evacuation for the last four years. These agencies highlighted that the exercises provided a practical understanding of the “how to” of disaster management and assisted with their response activities.

One council highlighted that whilst they have consistently exercised response, they have not exercised recovery and recognise this is an area where they can enhance performance.

From our invitation to debriefs and interviews we note that local disaster management groups, district groups and state agencies largely exercise independently. These groups need to test their plans through exercising the relationships and functions that exist between the groups. Particularly, they need to exercise communications from local to district and district to state. Such exercising would enhance understanding of other’s hazards, event planning techniques, decision-making and operational challenges across the groups.

We commented earlier on the importance of catchments and the need for warnings to reach across boundaries. It is also important for neighbouring districts to consider exercising together when they share a hazard risk - the same catchment or a single vulnerable highway.

Themes

Finding

Exercising is often undertaken in a siloed manner – limited to local and district groups, or internal to an agency, state group or centre.

Themes

Finding

Where disaster management plans were tested, groups were trained and had exercised risks, good outcomes were more evident. This reinforced that emergency management exercises are one of the best ways to test capability.

Finding

From our checking of pre-event activities we note that exercising has been undertaken in a siloed manner – limited to local and district groups, or internal to an agency, state group or centre. Enhanced shared understanding of roles and responsibilities, critical decision points and information flow is likely if exercising focused on vertical integration and included all levels of the system.

Recommendation

Exercising should focus on vertical integration and include all levels of the system. A strategic program of exercises should be developed and implemented.

Finding

Terminology that is not consistent and well understood by disaster management practitioners may lead to confusion. We acknowledge the work that is ongoing in the Queensland Disaster Management Lexicon Program, facilitated by the Office of the Inspector-General Emergency Management, and the National Disaster Resilience Glossary Project facilitated by the Australian Institute for Disaster Resilience.

Despite the training and exercising that does occur, Debbie highlighted that misunderstood terminology is a barrier to effective disaster management. The confusion over terminology also extended to the media. Previous reviews have identified the same issues.

The Standard makes mention of the importance of terminology as a contributor to Doctrine:

'The use of key terminology, including activation levels, is consistently applied across all levels'

As we have reported earlier, there was substantial confusion over terms linked to safer places: including public cyclone shelter, evacuation centres, place of refuge and place of last resort.

In order to enhance disaster management outcomes for the community and practitioners, it is important key terms are defined and that definition has a shared meaning across the sector. Such is the contribution of doctrine to capability. Without a shared understanding, these challenges will continue to occur and limit the effectiveness of disaster management.

The rewrite of the *State Disaster Management Plan*, the Office's *Lexicon Project* and the *Australian Disaster Resilience Glossary* should assist with providing clarity at the system level. Broader community education in relation to terminology also needs to be the responsibility of everyone involved in disaster management to ensure consistent messages.

Queensland is at the forefront of disaster management in Australia and the findings from our review into the effectiveness of arrangements relating to Severe Tropical Cyclone Debbie bear testament to this.

Our review set out to examine whether there was a robust approach to continuous improvement across all aspects of Queensland's disaster management system.

Specifically, the review sought to ensure that lessons learnt from these events are captured; that common themes for improvement are identified; that the sharing of good practice was enabled, and any issues arising are fully understood and improvement strategies were highlighted.

This review included:

- attendance at key post-Debbie local and district disaster management group debriefs in the identified review areas,
- a significant number of individual interviews with stakeholders,
- consultation and engagement with 80 key groups and organisations,
- a commissioned attitudinal survey of 1200 residents, and
- comprehensive referencing against both national and international good practice and Queensland's Standard for Disaster Management.

What we found was a disaster management system that generally performed well in preparing for and responding to the Debbie event, and one which adopted a positive transition to recovery.

What we uncovered was a series of lessons for the disaster management sector, which, if acted on, will deliver greater public value and confidence through trust and empowerment.

Under these broad findings our review identified:

- the value of timely, contextualised, informative, consistent and understandable public messaging,
- the continued need for addressing information sharing in disasters and interoperability of systems,
- the need for fatigue management planning for sustained events such as Debbie,
- the benefits of coordinated exercises across all levels of the System that focus on information flow and integration of roles and responsibilities; and
- the benefits of improved business continuity planning across state agencies, businesses including tourism, and communities, to help build resilience.

Importantly, within these findings, we saw direct and repeated evidence of tangible improvements within the System arising from past events, enquiries, reports and reviews.

These improvements are already leading to better disaster management outcomes for communities across Queensland.

We need however to capitalise on these improvements for the benefit of all Queenslanders and take the findings and recommendations from this review to the next level.

Accordingly, our principal recommendation from this review is for Queensland to embrace a learning framework which is firmly embedded in future plans.

When this occurs and when we truly grasp the concept of continuous improvement through a culture of a learning, disaster management in Queensland will move to heights of excellence and improved community outcomes not seen before in Australia.

Conclusion



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Appendix A



Glossary

ABC	Australian Broadcasting Commission
AEST	Australian Eastern Standard Time
AHD	Australian Height Datum
BCP	Business Continuity Plan
CCN	Crisis Communications Network
CEO	Chief Executive Officer
DCCSDS	Department of Communities, Child Safety and Disabilities Services
DDC	District Disaster Coordinator
DDCC	District Disaster Coordination Centre
DDMG	District Disaster Management Group
DART	Disaster Assistance Response Team
DEWS	Department of Energy and Water Supply
DIEMS	Disaster Incident Event Management System
DMIDC	Disaster Management Interdepartmental Committee
DPC	Department of the Premier and Cabinet
DSITI	Department of Science, Information Technology and Innovation
EA	Emergency Alert
EFT	Electronic Funds Transfer
ELO	Emergency Liaison Officer
EMS	Event Management System
GIS	Geographic Information System
HAT	Highest Astronomical Tide
HHS	Hospital and health Services
IGEM	Inspector-General Emergency Management
IXP	Information Exchange Program
LAT	Lowest Astronomical tide
LDC	Local Disaster Coordinator
LDCC	Local Disaster Coordination Centre
LDMG	Local Disaster Management Group
LGAQ	Local Government Association of Queensland

Appendix A

NDRRA	Natural Disaster Relief and Recovery Arrangements
PSBA	Public Safety Business Agency
QDMA	Queensland Disaster Management Arrangements
QDMC	Queensland Disaster Management Committee
QFES	Queensland Fire and Emergency Services
QPS	Queensland Police Service
QRA	Queensland Reconstruction Authority
RDA	Rapid Damage Assessment
Requests	Request for Assistance
SDC	State Disaster Coordinator
SDCC	State Disaster Coordination Centre
SDCG	State Disaster Coordination Group
SDMP	State Disaster Management Plan
SES	State Emergency Service
SHECC	State Health Emergency Coordination Centre
SOC	State Operations Centre
SRC	State Recovery Coordinator
TAMS	Task and Management System
TC	Tropical Cyclone
TOM	Total Operational Mapping
TMR	Department of Transport and Main Roads
the Act	<i>Disaster Management Act 2003</i>
the Bureau	Bureau of Meteorology
the Committee	Queensland Disaster Management Committee (QDMC)
the Office	the Office of the Inspector-General Emergency Management
the Standard	the Queensland Disaster Management Standard

Appendix B



Consultation and engagement

Australian Red Cross

Banana Shire Local Disaster Management Group

Big Four Adventure Whitsunday Resort

Brisbane City Local Disaster Management Group

Brisbane District Disaster Management Group

Bundaberg District Disaster Management Group

Bundaberg Local Disaster Management Group

Burdekin Local Disaster Management Group

Bureau of Meteorology

Central Highlands Local Disaster Management Group

Charters Towers Regional Local Disaster Management Group

City of Gold Coast Local Disaster Coordination Centre

City of Gold Coast Local Disaster Management Group

Department of Communities, Child Safety and Disability Services

Department of Energy and Water Supply

Department of Premier and Cabinet

Department of Science, Innovation Technology and Innovation

Department of State Development

Department of Tourism, Major Events, Small Business and the Commonwealth Games

Department of Transport and Main Roads

Emergency Management Victoria

Energy Queensland

Fraser Coast Local Disaster Management Group

GIVIT

Gladstone District Disaster Management Group

Gladstone Regional Local Disaster Management Group

Gold Coast District Disaster Management Group

Gympie District Disaster Management Group

Gympie Regional Local Disaster Management Group

Hinchinbrook Shire Local Disaster Management Group

Ipswich Local Disaster Management Group

Ipswich District Disaster Management Group

Isaac Local Disaster Management Group

Livingstone Local Disaster Management Group

Local Government Association of Queensland

Lockyer Valley Local Disaster Management Group

Logan District Disaster Management Group

Logan City Local Disaster Management Group

Appendix B

Mackay District Disaster Management Group
 Mackay Local Disaster Management Group
 Maryborough District Disaster Management Group
 Moreton Bay Local Disaster Management Group

 Noosa Shire Local Disaster Management Group
 North Burnett Local Disaster Management Group

 Optus

 Palm Island Local Disaster Management Group
 Public Safety Business Agency

 Queensland Fire and Emergency Services
 Queensland Health
 Queensland Reconstruction Authority
 Queensland Police Service
 Queensland Tropical Cyclone Consultative Committee

 Redcliffe District Disaster Management Group
 Redlands Local Disaster Management Group
 Rockhampton District Disaster Management Group
 Rockhampton Local Disaster Management Group
 Rockhampton Regional Council
 RSPCA Australia

 Scenic Rim Local Disaster Management Group
 Seqwater
 Somerset Local Disaster Management Group
 South Burnett Local Disaster Management Group
 Southern Downs Local Disaster Management Group
 State Disaster Coordination Centre
 State Disaster Coordination Group
 Sunshine Coast District Disaster Management Group
 Sunshine Coast Local Disaster Management Group
 SunWater

 Telstra
 Toowoomba District Disaster Management Group
 Toowoomba Local Disaster Management Group
 Tourism Whitsundays
 Townsville District Disaster Management Group
 Townsville Local Disaster Coordination Centre
 Townsville Local Disaster Management Group
 Trustees Australia

 Volunteering Queensland

 Warwick District Disaster Management Group
 Whitsunday Local Disaster Management Group
 Woorabinda Local Disaster Management Group

Appendix C

Summary of relevant recommendations, findings and discussion points from previous Office of the IGEM reviews

Debbie Themes	Report	Commentary
Culture of learning	2014-15 Evaluation of Emergency Management Training and Exercise Arrangements	Finding: Greater sharing of lessons from exercises is identified as an area for improvement. There is an opportunity for the future QFES system to consider previous work in this area and lessons management systems in other jurisdictions.
Risk	2015 Callide Creek Flood Review	Recommendation: Banana Shire Council investigate means to prioritise the commissioning of a fit-for-purpose flood study for high-risk areas across the Banana Shire to better inform flood risk management, including improved town planning. The outcomes of such a study should be available to the public and inform flood awareness campaigns, flood warnings, and building approvals.
		Recommendation: Banana Shire Council coordinates the development of a strategy to significantly enhance public education regarding local disaster management arrangements within the Banana Shire, focusing on key identified risks.
		Recommendation: SunWater provide downstream residents with easily understood information regarding operation of the dam, and the impacts that various outflows may have for them, in accordance with mapping prepared for the Emergency Action Plan. This information should be complementary to any information from the Banana Shire Council.
Business continuity, communities and local critical infrastructure	2014-15 Review of Cyclone and Storm Tide Sheltering Arrangements	Professional Practice Consideration: Queensland Fire and Emergency Services should consider examining regulatory provisions to improve disaster management and business continuity planning for aged care providers.
	2015 Callide Creek Flood Review	Recommendation: Banana Shire Council completes business continuity planning as a matter of priority, including documentation and testing of the plan. Recommendation: State Disaster Coordination Centre considers requesting a representative from critical infrastructure owners be present as a liaison officer in the State Disaster Coordination Centre during activations for events that may impact on their assets.
Information management	2014-15 Review of Local Government Emergency Warning Capability	Recommendation: 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.
Emergency Alert	2014-15 Review of Local Government Emergency Warning Capability	Recommendation: The Queensland Emergency Alert Guidelines is reviewed to reflect current practice and incorporate evidence-based improvements informed by lessons learned and research.
		Recommendation: A dynamic online list of positions and contact details is published for those able to authorise Emergency Alert, and made accessible to local government. Professional Practice Consideration: 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.
	2015 Callide Creek Flood Review	Recommendation: As part of the above, both the Banana Shire Council and SunWater ensure Emergency Alert messages are pre-formatted, consistent, polygons are identified according to risk, and that they are tested and practised with the State Disaster Coordination Centre.
	2015-16 Review of Seqwater & SunWater Warnings Communications	Recommendation: Emergency Alert messages for dam related events are: <ul style="list-style-type: none"> • pre-formatted, consistent and current polygons are identified • content aligned with the Queensland Emergency Alert Guidelines • stored and practised in consultation with the State Disaster Coordination Centre.

Appendix C

Note: Recommendations from previous disaster management sector reviews and enquiries also should be noted. Pertinent recommendations can be found in the Queensland Flood Commission of Enquiry Interim and Final reports (<http://www.floodcommission.qld.gov.au/>) and 2009 Victorian Bush Fire Royal Commission (<http://dpc.vic.gov.au/index.php/component/content/article/22-html/867-2009-victorian-bushfires-royal-commission>) which were accepted by the Queensland Government.

Debbie Themes	Report	Commentary
Warnings	2014-15 Review of Cyclone and Storm Tide Sheltering Arrangements	Recommendation: A state-wide engagement strategy is coordinated to ensure community messaging is consistent across all levels of Queensland's disaster management arrangements.
	2014-15 Review of Local Government Emergency Warning Capability	Recommendation: The Public Information and Warnings Sub-plan Guide is reviewed to include: <ul style="list-style-type: none"> • 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: Warning and alert systems training (including the use of Emergency Alert and the requirements of the guidelines) is delivered to: <ul style="list-style-type: none"> • relevant local and district disaster management group members • authorising officers • other relevant stakeholders.
	2015 Callide Creek Flood Review	Recommendation: Prior to September 2015, the Banana Shire Council develops a multi-channel warning strategy and associated public information campaign, including common language and consistent messaging, for the Banana Shire. Recommendation: Prior to September 2015, SunWater and the Banana Shire Council jointly develop a multi-channel, common warning strategy, including common language and consistent messaging, for residents downstream of SunWater assets within the Banana Shire Council, and clearly articulate procedures for dissemination.
Evacuation	2014-15 Review of Cyclone and Storm Tide Sheltering Arrangements	Recommendation: An audit of all local government areas vulnerable to storm tide events is undertaken to identify gaps in evacuation zone planning and ensure consistency with neighbouring local government areas and the Queensland Evacuation Guidelines for Disaster Management Groups. Recommendation: A state-wide strategy, including a common definition, is developed for identifying and engaging vulnerable people in emergencies.
	2015 Callide Creek Flood Review	Recommendation: The evacuation sub-plan component of the Local Disaster Management Plan should be reviewed, including any identified triggers for activation. Ideally, the plan should be tested in a live, multi-agency exercise prior to next summer.
Exercises and training	2014-15 Evaluation of Emergency Management Training and Exercise Arrangements	Finding: The role of exercises in disaster management is unclear from available documents. There appears to be a gap at state level between evaluation of groups' performance through exercises, and the training of individuals covered earlier. In addition to their role in testing and evaluation, there is scope to emphasise a type of exercise as a "training exercise", to allow newly-trained individuals to rehearse and practice their skills together.
		Finding: There is a lack of clarity about arrangements for state level exercises. There is scope for the peak disaster management body (Queensland Disaster Management Committee) to clearly assign responsibility for coordination of exercises and capture this in the State Disaster Management Plan.
		Finding: Requirements and responsibilities for participating in, and conducting, exercises are set out in guidelines for local and district disaster management groups. However, there is less stakeholder involvement in the planning of exercises, and in actual participation, and less guidance of an overall exercise program than in other good practice examples. There is scope to improve the strategic level direction of disaster management exercises.
		Finding: Training and exercises have common stakeholders, and in both sets of arrangements we identified a need for improved stakeholder representation. A single governance structure, covering both disaster management training and exercises, may benefit the outcomes of each. The Counter Terrorism Training and Exercise Management Committee model may be a start-point, and further work might examine how a model could cover disaster management and counter terrorism.
		Finding: There is scope to improve guidance, arrangements and delivery of both training and exercises; to ensure lessons from exercises feed back into both doctrine and training curriculum development.
		Finding: Queensland appears to demonstrate good practice in training people to manage exercises, and this capability needs to be maintained. There is an opportunity to better coordinate this through improved governance. Finding 6 also highlighted similarities in exercise management between the counter-terrorism and disaster management arrangements. Further work might establish how these could best be exploited.

Appendix D

Queensland Reconstruction Authority

NDRRA Event – Severe Tropical Cyclone Debbie and associated rainfall and flooding, 28 March – 6 April 2017**Assistance activated**

The Minister for Police, Fire and Emergency Services activated the Commonwealth/State Natural Disaster Relief and Recovery Arrangements (NDRRA).

The Prime Minister has approved Category C Clean-up and Recovery Grants under the Commonwealth/ State Natural Disaster Relief and Recovery Arrangements (NDRRA).

NDRRA relief measures activated

- Counter Disaster Operations
- Essential Services Safety and Reconnection Scheme
- Essential Working Capital Loans Scheme for Non-profit organisations
- Essential Working Capital Loans Scheme for Primary Producers
- Essential Working Capital Loans Scheme for Small Businesses
- Freight subsidies to Primary Producers
- Natural Disaster Assistance (Concessional Loan and Grant Packages) for Non-profit organisations
- Natural Disaster Assistance (Concessional Loans) for Primary Producers
- Natural Disaster Assistance (Concessional Loans) for Small Businesses
- Personal Hardship Assistance Scheme
- Restoration of Essential Public Assets
- Special Disaster Assistance (Clean-up and Recovery Grants) for Non-profit Organisations
- Special Disaster Assistance (Clean-up and Recovery Grants) for Small Business
- Special Disaster Assistance (Clean-up and Recovery Grants) for Primary Producers

Area activated

The area formally defined for receipt of the NDRRA relief measures is: *'Queensland communities impacted by Severe Tropical Cyclone Debbie and associated rainfall and flooding between 28 March and 6 April 2017'*.

Queensland Reconstruction Authority

Appendix D

Local Government Area	Counter Disaster Operations	Restoration of Essential Public Assets	Personal Hardship Assistance Scheme	Essential Services Safety and Reconnection Scheme	Essential Working Capital Loans Scheme for Non-profit organisations	Natural Disaster Assistance (Concessional Loan and Grant Packages) for Non-profit organisations	Essential Working Capital Loans Scheme for Small Business	Natural Disaster Assistance (Concessional Loans) for Small Business	Essential Working Capital Loans Scheme for Primary Producers	Freight subsidies to Primary Producers	Natural Disaster Assistance (Concessional Loans) for Primary Producers	Special Disaster Assistance (Clean-up and Recovery Grants) for Primary Producers	Special Disaster Assistance (Clean-up and Recovery Grants) for Non-profit organisations	Special Disaster Assistance (Clean-up and Recovery Grants) for Small Business
Balonne Shire Council		✓ Activated 18/05/17												
Banana Shire Council	✓ activated 3/04/17	✓ activated 3/04/17							✓ activated 13/04/17	✓ activated 13/04/17	✓ activated 13/04/17			
Brisbane City Council	✓ activated 21/04/17													
Bundaberg Regional Council	✓ activated 31/05/17	✓ activated 12/04/17												
Burdekin Shire Council	✓ activated 28/03/17													
Central Highlands Regional Council	✓ activated 1/04/17	✓ activated 3/04/17							✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ ⁸ Activated 14/04/17		
Charters Towers Regional Council	✓ activated 28/03/17													
Fraser Coast Regional Council	✓ activated 21/04/17	✓ activated 12/04/17												
Gladstone Regional Council	✓ activated 1/04/17	✓ activated 1/04/17							✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17			
Gold Coast City Council	✓ activated 1/04/17	✓ activated 1/04/17	✓ ¹ activated 2/04/17	✓ ¹ activated 2/04/17	✓ activated 8/04/17	✓ activated 8/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ ⁷ Activated 14/04/17		
Goondiwindi Regional Council	✓ activated 12/04/17	✓ activated 12/04/17												
Gympie Regional Council	✓ activated 7/04/17	✓ activated 3/04/17												
Hinchinbrook Shire Council	✓ activated 28/03/17													
Ipswich City Council	✓ activated 7/04/17	✓ activated 3/04/17												
Isaac Regional Council	✓ activated 28/03/17	✓ activated 1/04/17	✓ ² activated 1/04/17	✓ activated 1/04/17			✓ activated 12/04/17	✓ activated 12/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ ⁸ Activated 14/04/17	✓ ¹² Activated 18/05/17	✓ ¹² Activated 18/05/17
Livingstone Shire Council	✓ activated 1/04/17	✓ activated 1/04/17	✓ ⁵ activated 7/04/17	✓ ⁵ activated 7/04/17			✓ activated 5/04/17	✓ activated 5/04/17	✓ activated 7/04/17	✓ activated 7/04/17	✓ activated 7/04/17	✓ ⁹ Activated 14/04/17		
Lockyer Valley Regional Council	✓ activated 1/04/17	✓ activated 1/04/17							✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ ¹¹ Activated 14/04/17		
Logan City Council	✓ activated 1/04/17	✓ activated 1/04/17	✓ ³ activated 1/04/17	✓ ³ activated 1/04/17	✓ activated 8/04/17	✓ activated 8/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ Activated 14/04/17	✓ ¹³ Activated 18/05/17	✓ ¹³ Activated 18/05/17
Mackay Regional Council	✓ activated 28/03/17	✓ activated 29/03/17	✓ ² activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ Activated 14/04/17	✓ ¹⁴ Activated 18/05/17	✓ ¹⁴ Activated 18/05/17
Maranoa Regional Council	✓ activated 13/04/17	✓ activated 13/04/17												
Moreton Bay Regional Council	✓ activated 1/04/17	✓ activated 3/04/17												

Version 19
Current as at 2 June 2017

Further information:
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Website: www.qldreconstruction.org.au

Queensland Reconstruction Authority

Appendix D

Local Government Area	Counter Disaster Operations	Restoration of Essential Public Assets	Personal Hardship Assistance Scheme	Essential Services Safety and Reconnect on Scheme	Essential Working Capital Loans Scheme for Non-profit organisations	Natural Disaster Assistance (Concessional Loan and Grant Packages) for Non-profit organisations	Essential Working Capital Loans Scheme for Small Business	Natural Disaster Assistance (Concessional Loans) for Small Business	Essential Working Capital Loans Scheme for Primary Producers	Freight subsidies to Primary Producers	Natural Disaster Assistance (Concessional Loans) for Primary Producers	Special Disaster Assistance (Clean-up and Recovery Grants) for Primary Producers	Special Disaster Assistance (Clean-up and Recovery Grants) for Non-profit organisations	Special Disaster Assistance (Clean-up and Recovery Grants) for Small Business
Noosa Shire Council	✓ activated 3/04/17	✓ activated 3/04/17												
North Burnett Regional Council	✓ activated 5/04/17	✓ activated 3/04/17						✓ activated 13/04/17	✓ activated 13/04/17	✓ activated 13/04/17				
Palm Island Aboriginal Shire Council	✓ activated 28/03/17													
Redland City Council	✓ activated 6/04/17													
Rockhampton Regional Council	✓ activated 1/04/17	✓ activated 1/04/17	✓ ⁴ activated 5/04/17	✓ ⁴ activated 5/04/17	✓ activated 5/04/17	✓ activated 5/04/17	✓ activated 5/04/17	✓ activated 5/04/17	✓ activated 5/04/17	✓ activated 5/04/17	✓ activated 5/04/17		✓ ¹⁵ Activated 18/05/17	✓ ¹⁵ Activated 18/05/17
Scenic Rim Regional Council	✓ activated 1/04/17	✓ activated 1/04/17	✓ ³ activated 1/04/17	✓ ³ activated 1/04/17	✓ activated 8/04/17	✓ activated 8/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ activated 4/04/17	✓ Activated 14/04/17		
Somerset Regional Council	✓ activated 7/04/17	✓ activated 3/04/17												
South Burnett Regional Council	✓ activated 4/04/17	✓ activated 4/04/17												
Southern Downs Regional Council	✓ activated 1/04/17	✓ activated 1/04/17												
Sunshine Coast Regional Council	✓ activated 7/04/17	✓ activated 3/04/17												
Toowoomba Regional Council	✓ activated 1/04/17	✓ activated 1/04/17												
Townsville City Council	✓ activated 28/03/17													
Western Downs Regional Council	✓ activated 13/04/17	✓ activated 13/04/17												
Whitsunday Regional Council	✓ activated 28/03/17	✓ activated 29/03/17	✓ ² activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ activated 29/03/17	✓ Activated 14/04/17	✓ Activated 14/04/17	✓ Activated 14/04/17
Woorabinda Aboriginal Shire Council	✓ activated 1/04/17	✓ activated 7/04/17							✓ activated 21/04/17		✓ activated 21/04/17	✓ ¹⁰ Activated 14/04/17		

Version 19
Current as at 2 June 2017

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Queensland Reconstruction Authority

Appendix D

- 1 The Immediate Hardship Assistance component of the Personal Hardship Assistance Scheme commences on 2 April 2017
The Immediate Hardship Assistance – Essential Services component of the Personal Hardship Assistance Scheme commences on 4 April 2017 (if required)
Personal Hardship Assistance Scheme and Essential Services Safety and Reconnection Scheme activation for the Gold Coast is limited to the areas of Advancetown, Alberton, Austinville, Bonogin, Cedar Creek, Currumbin Valley, Lower Beechmont, Luscombe, Mudgeeraba, Natural Bridge, Numinbah Valley, Springbrook, Stapylton, Tallebudgera, Tallebudgera Valley and Yatala
- 2 The Immediate Hardship Assistance component of the Personal Hardship Assistance Scheme commences on 29 March 2017
The Immediate Hardship Assistance – Essential Services component of the Personal Hardship Assistance Scheme commences on 2 April 2017 (if required)
- 3 The Immediate Hardship Assistance component of the Personal Hardship Assistance Scheme commences on 2 April 2017
The Immediate Hardship Assistance – Essential Services component of the Personal Hardship Assistance Scheme commences on 4 April 2017 (if required)
Personal Hardship Assistance Scheme and Essential Services Safety and Reconnection Scheme activation for Logan is limited to the areas of Bannockburn, Beenleigh, Bethania, Buccan, Carbrook, Cedar Creek, Cedar Grove, Cedar Vale, Chambers Flat, Cornubia, Crestmead, Eagleby, Edens Landing, Flagstone, Greenbank, Holmview, Jimboomba, Kingston, Logan Village, Logan Reserve, Loganholme, Loganlea, Marsden, Meadowbrook, Mount Warren Park, Munruben, New Beith, North McLean, Park Ridge South, Slacks Creek, South McLean, Stockleigh, Waterford, Waterford West, Windaroo, Wolffdene, Woodhill, Tanah Merah, Veresdale and Yarrabilba
Personal Hardship Assistance Scheme and Essential Services Safety and Reconnection Scheme activation for Scenic Rim is limited to the areas of Allenview, Beaudesert, Biddaddaba, Bromelton, Canungra, Christmas Creek, Fassifern Valley, Gleneagle, Harrisville, Hillview, Illinbah, Josephville, Kagaru, Kooralbyn, Laravale, Moogerah, Rathdowney, Tamborine and Tambrookum
- 4 The Immediate Hardship Assistance component of the Personal Hardship Assistance Scheme commences on 6 April 2017
The Immediate Hardship Assistance – Essential Services component of the Personal Hardship Assistance Scheme commences on 11 April 2017 (if required)
Personal Hardship Assistance Scheme and Essential Services Safety and Reconnection Scheme activation for Rockhampton is limited to Alton Downs, Fairy Bower, Pink Lily, Port Curtis, Ridglands and specific streets in Allenstown, Berserker, Depot Hill, Garnant, Gracemere, Kawana, Koongal, Lakes Creek, Midgee, Nine Mile, Park Avenue, Parkhurst, Rockhampton City, South Yaamba, The Common, The Range, Wandal and West Rockhampton
- 5 The Immediate Hardship Assistance component of the Personal Hardship Assistance Scheme commences on 6 April 2017
The Immediate Hardship Assistance – Essential Services component of the Personal Hardship Assistance Scheme commences on 11 April 2017 (if required)
Personal Hardship Assistance Scheme and Essential Services Safety and Reconnection Scheme activation for Livingstone is limited to Nerimbera.
- 6 Special Disaster Assistance (Clean-Up and Recovery Grants) for Primary Producers activation for Central Highlands Regional Council that is east of the Fitzroy Developmental Road and north of the Capricorn Highway.
- 7 Special Disaster Assistance (Clean-Up and Recovery Grants) for Primary Producers activation for Gold Coast City Council that are within or adjacent to the Albert River Catchment. These are analogous to the SA2 ABS regions of Jacobs Well – Alberton, Ormeau – Yatala, Kingsholme – Upper Coomera, Pimpama – Coomera, Pimpama – Coomera, Oxenford – Maudsland, and Nerang and those parts of Guanaba – Springbrook north from the shire boundary along the SA1 boundary and then east, bordering along the Lower Beechmont Conservation Area.
- 8 Special Disaster Assistance (Clean-Up and Recovery Grants) for Primary Producers activation for Isaac Regional Council that is east of the Fitzroy Development Road to the Peak Downs Highway, and north and east of a boundary consisting of the Peak Downs Highway, the Suttor Development Road; and the Collinsville Elphinstone Road.
- 9 Special Disaster Assistance (Clean-Up and Recovery Grants) for Primary Producers activation for Livingstone Regional Council to the north and west of the Apis Creek Road, the Marlborough Road, Glenprairie Road and west of the North Coast Rail Line).
- 10 Special Disaster Assistance (Clean-Up and Recovery Grants) for Primary Producers activation for Woorabinda Aboriginal Shire Council areas that are north of the Capricorn Highway.
- 11 Special Disaster Assistance (Clean-Up and Recovery Grants) for Primary Producers activation for Lockyer Valley Regional Council limited to the southern section linking to Scenic Rim Regional Council, this incorporates areas south of the Gatton – Clifton road, the Gatton – Helidon road, the Gatton – Laidley road, and the Rosewood – Laidley road (buffer zone).
- 12 Special Disaster Assistance (Clean-Up and Recovery Grants) for Non-profit Organisations and Small Businesses activation for Isaac Regional Council limited to Clarke Creek and Lotus Creek.
- 13 Special Disaster Assistance (Clean-Up and Recovery Grants) for Non-profit Organisations and Small Businesses activation for Logan City Council limited to Beenleigh, Carbrook, Eagleby, Jimboomba, Loganholme, Loganlea, Meadowbrook, Slacks Creek and Waterford West.
- 14 Special Disaster Assistance (Clean-Up and Recovery Grants) for Non-profit Organisations and Small Businesses activation for Mackay Regional Council limited to Balnagowan (south of Doyles road until the Pleighstowe Connection road and then north along the Mandarana rail line until the creek crossing south of Maraju Yakapari Road), Devereux Creek (south of Devereux Creek Road and west of Mirabellas Road), Dumbleton (south and west of Maraju Yakapari Road), Eton, Greenmount (west of Peak Downs Highway and including that part of Greenmount west of Bergmans Road), Marian, Mirani, North Eton, Pleystowe, Victoria Plains and Walkerston (west of Palms Road and Walkerston Homebush Road).
- 15 Special Disaster Assistance (Clean-Up and Recovery Grants) for Non-profit Organisations and Small Businesses activation for Rockhampton Regional Council limited to Allenstown (from its eastern most boundary up to and including 150m west of Gladstone Road), Depot Hill, Lakes Creek (south of a line from the intersection of Stenhouse Street and Cooper Street "as the crow flies" to the intersection of Scholl Lane and Hartington Street) and Port Curtis.

Source: <http://qldreconstruction.org.au/u/lib/cms2/V19%20NDRRA%20Activation%20Summary%20-%20Severe%20Tropical%20Cyclone%20Debbie.pdf>



*Aerial view to the north west
of the Pacific Motorway and
flooded Logan River Parklands.*

Photo courtesy of Logan City Council



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