

NATURAL DISASTER MITIGATION in EMERGENCY MANAGEMENT
– The ROLE OF THE BUREAU OF METEOROLOGY

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1. Introduction

The Australian Bureau of Meteorology is a recognised world-class national meteorological agency providing expertise and services to assist Australians in mitigating the harsh realities of our natural environment, including drought, floods, fires, storms, tsunamis and tropical cyclones. Through regular forecasts, warnings, monitoring and advice spanning the Australian and Antarctic region, the Bureau provides one of the most fundamental and widely used services of government.

Operating under the authority of the Meteorology Act 1955 and the Water Act 2007, which provide the legal basis for the Bureau's activities, it serves to meet the national need for climatic records, water information, oceanographic and marine weather services, scientific understanding of Australian weather and climate and effective service provision to the Australian community. The Bureau of Meteorology must also fulfil Australia's international obligations under the Convention of the World Meteorological Organization (WMO) and related international meteorological treaties and agreements.

Serving the meteorological and related needs and responsibilities of both the Commonwealth and the States, equally and concurrently, the Bureau of Meteorology operates as a single integrated national meteorological science and service organisation.

Around 1300 people are employed with the Bureau providing surveillance, forecasts and warning services 24 hours a day, every day of the year. The work-force is geographically dispersed with some 60 offices across Australia, its offshore islands and Antarctica. The Bureau is supported by over 7000 dedicated volunteer weather observers who work closely with professional meteorologists.

2. High Impact Weather Events, Floods and Tsunami

Severe weather events that include tropical cyclones, severe thunderstorms, flooding and tsunamis present a significant risk to safety of the Australian community. However, there is

always the risk that Australian community may not respond appropriately to any given warning and consequently suffer unnecessary loss. One of the Bureau's primary roles therefore is to mitigate this risk through the provision of comprehensive warning service.

The Bureau therefore strives to provide an end-to-end warning system where state-of-the-art weather forecasting technologies are used to produce severe weather warnings that are effectively communicated to the Australian community, understood and appropriately acted upon so as to minimise the loss of life and property.

3. How the Bureau Approaches its Warnings End-to-End Role

The primary focus of the Bureau's role in natural disaster mitigation relates directly to the Meteorology Act 1955 where one of the stated functions of the Bureau is as follows:

6. (1) [c] the issue of warnings of gales, storms and other weather conditions likely to endanger life or property, including weather conditions likely to give rise to floods or bush fires.

The outputs

In carrying out this function, the Bureau's Weather Services Program encompass a wide range of analysis and prediction products and forecasts, warnings and information services to the general public, national and international shipping and aviation, the Department of Defence and other users. Services are provided mainly through the seven Regional Forecasting Centres (RFCs) in the State capital cities and Darwin, and through the National Meteorological and Oceanographic Operations Centre (NMOC) located in Melbourne. All of these Centres maintain a 24-hour weather watch every day of the year, issuing forecasts, warnings and other weather information as required.

Receiving and understanding the message

The Bureau and its activities assist the community in preparing for and reducing the impacts of tropical cyclones, severe storms, bushfires, flash flooding and gales over land. These services are provided through the RFCs, with very close links with State and Commonwealth emergency services and disaster preparedness organisations. An important complementary role is to contribute substantively to national and international disaster mitigation and hazard awareness programs, with particular attention to improving effective communication of warnings, developing community awareness of hazards and documenting the risk of natural disasters.

To ensure improved warnings effectiveness among all Australian community sectors, the Bureau works to assist residents in remote communities; in culturally and linguistically diverse communities and the sight and hearing impaired understand, and respond appropriately to the warning services.

Specific Mitigation Activities in Emergency Management

In support of the natural disaster mitigation activities, the Bureau actively undertakes the following measures:

- ensures warning services match and support community and agency emergency management plans;
- actively engages in community and agency awareness programs;

- investigates the implementation of new warning services to meet identified community needs and expectations and enhanced community safety through a focus on natural disaster mitigation; and
- supports international disaster mitigation activities - especially those initiated by the World Meteorological Organisation (WMO) and those supported as part of the International Strategy for Disaster Reduction (ISDR) and particularly the Hyogo Framework for Action (HFA_ ISDR Regional Framework and Regional Climate Change Adaptation Framework.

The following strategies and initiatives have already been adopted and implemented:

The Tropical Cyclone Warning Centres (TCWC) located in Perth, Darwin and Brisbane provide a national tropical cyclone watch and warning service for the whole Australian community, especially those in remote and coastal communities.

The suite of tropical cyclone user friendly warning products is tailored to meet community feedback:

- Tropical cyclone Outlook and Seasonal Outlook;
- Tropical cyclone information bulletins;
- Tropical cyclone watch and warning services;
- Special tailored warning services and liaison between Severe Weather Sections and State and Territory Emergency Service organisations;
- Tropical cyclone forecast track map has been provided to complement the written Tropical Cyclone Warning message (see Fig 1 below).

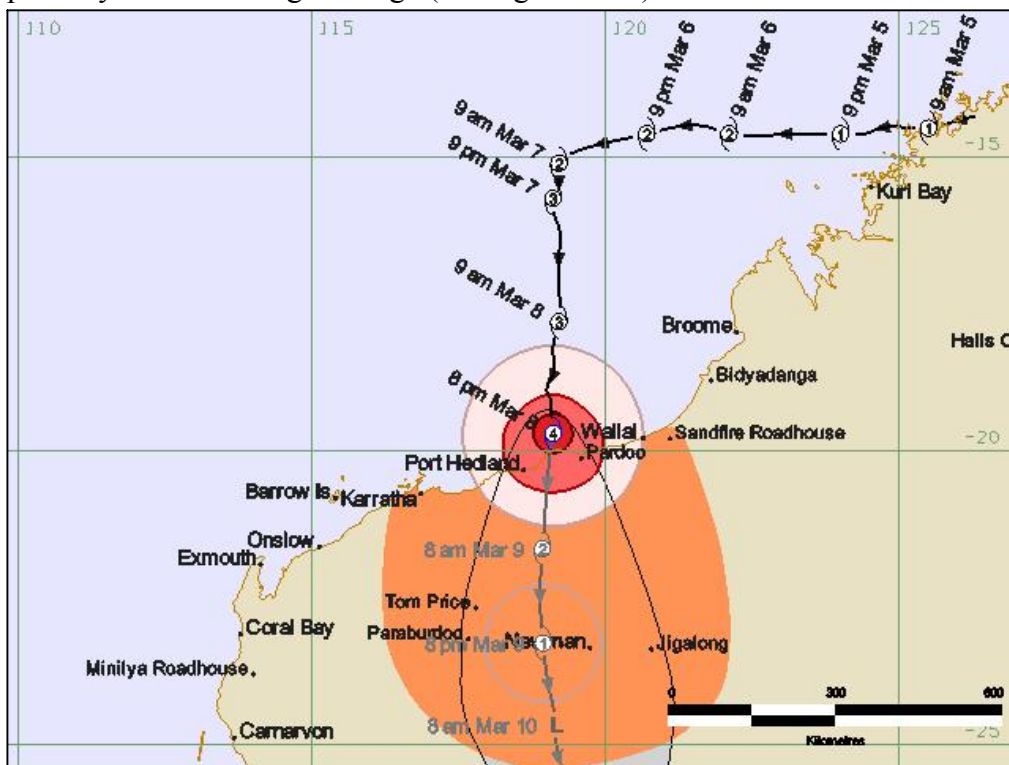


Figure 1: Tropical cyclone forecast track map

Community Education

Since the mid 1970's "pre-cyclone season community briefing tours" have been conducted in tropical cyclone prone communities by the Bureau's Severe Weather Sections in collaboration with emergency services, local government authorities, coastal protection authorities and other external stakeholders. The benefits from this initiative are twofold as they not only provide the community with a clearer understanding of the threats from tropical cyclones and the Bureau's warning service, but they have also provided the Bureau forecasting team with an enhanced appreciation of the challenges faced by these communities.

The Bureau developed a Graphical Thunderstorm Warning product that is used by the emergency services and public alike to describe areas that at risk of imminent thunderstorm activity. An example of this product is presented below. (see Fig:2).

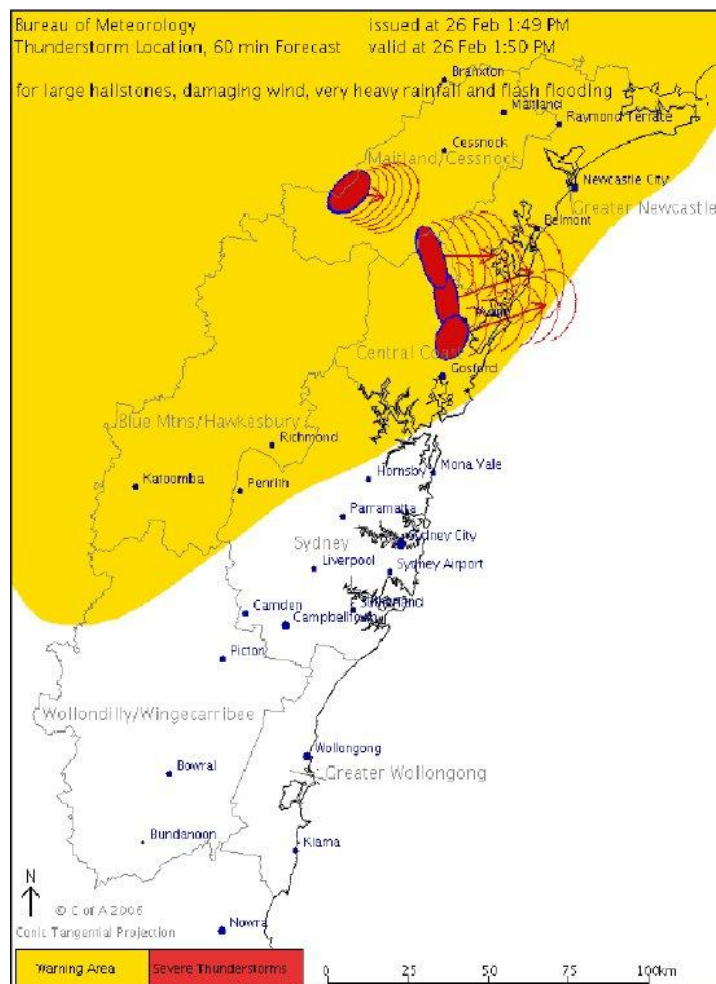


Figure2: Graphical Thunderstorm Warning product

Australian Indigenous communities are a primary focus of this community education. The Bureau has a strong awareness of the need to have our warnings received by the community as a whole. Even more importantly, how well they are understand and respond to them.

Recent research conducted by the James Cook University Centre for Disaster Studies noted that the Bureau 'continues to seek ways to best convey targeted weather warnings to people who need to know of a looming threat, so they can make informed decisions and responses'. It was further noted 'that this is largely successful and well appreciated by remote Aboriginal communities surveyed'. A collaborative project has been initiated between the Bureau and the

Indigenous Radio Network to refine the palatability of weather warnings as broadcast through their network of 150 radio transmitters from Mackay on the central Queensland coast to Broome in the west.

In 2006-07 a training workshop was conducted for radio broadcasters from remote aboriginal communities. The objective was to enhance the understanding and strengthen the link between the Bureau and the communities. The training was also evaluated by members of the James Cook University Centre for Disaster Studies and this strategy was found to be effective. Based on this outcome the Bureau is currently developing an indigenous media training module for national indigenous television and radio broadcasters that will be delivered through Bachelor Institute Indigenous Tertiary education located in the Northern Territory.

Warnings Effectiveness

The Bureau constantly monitors and assesses warnings effectiveness with the conduct of post-impact assessments following any major severe weather event. These are carried out within impacted communities and are undertaken by an independent agency and contain succinct recommendations for service improvements.

Recent initiatives for fire weather forecast services in particular have been the introduction an exchange program with the US National Weather Service to build capacity in the provision of fire weather services, provide cross fertilisation of specialised expertise and exchange knowledge on the effectiveness of services in similar countries (albeit with different policies); Also, out-posting of severe weather meteorologists to fire control centres in the field has enhanced the ability of fire services agencies in their response to bushfires.

Conclusion

The Bureau of Meteorology provides a full forecast and warning service for natural meteorological and oceanographic related high impact events, including tsunamis. The Bureau works within a whole of government framework (especially State and Territory emergency service organisations) to significantly strengthening inter-agency and external stakeholder links. This has also enabled the Bureau to maintain its relevance in the natural disaster mitigation community.

There is now confidence within the Bureau, based on regular user surveys and stakeholder feedback, that the Bureau of Meteorology is utilising effective warnings communications strategies and responds to and meets, the changing community needs and expectations for its services.