

Community engagement: Weather matters in Indigenous communities

Workshop and Evaluation Report

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“We cannot stop natural calamities, but we can and must better equip individuals and communities to withstand them.”

UN Secretary-General Kofi Annan (UN/ISDR, 2005a).

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Community Engagement Workshop: Weather matters in Indigenous communities

Executive summary/key findings/recommendations

The workshop format is successful for training to enhance understanding of weather reports.

In order to maintain a research project on track the following features are important:

- establish and develop relationships;
- adhere to cultural protocols;
- use appropriate check list to ensure a project remains ethical and appropriate.

To maintain and enhance understanding of the workshop content the following must be undertaken:

- consider the needs and skills of the target audience;
- evaluation of words and materials presented.

To develop utilisation of learning and enhance the implementation of knowledge:

- stretch, enhance and test the boundaries of the participants' knowledge;
- increase levels of confidence to share knowledge with facilitator, colleagues and audience;
- seek further interactions with participants at appropriate intervals.

The following recommendations have resulted from the initial Reading the Weather workshop:

- workshop-type weather training to be a component of broadcasters' general training;
- commence the processes to establish an appropriate level of BoM coverage in the Torres Strait;
- review by BoM of all remote area equipment needs to provide adequate data;
- review of the cyclone naming process and the usage of weather warning language;
- note implications for training of ethnic and other community radio and broadcasting;
- call for tenders by BoM for continuation of weather workshops in regional and remote areas.

Project Outline

This research project builds on the initial Bushfire Cooperative Research Centre (BCRC) case study in Thuringowa, North Queensland (Bushnell, Cottrell, Spillman & Lowe, 2006), which aimed to develop a better understanding of communities in bushfire prone areas of Australia. This project is extended to include how the more remote of these communities relate to and understand the weather information provided by the Bureau of Meteorology (BoM).

The beginnings of this project came as a result of research across northern Australia in 2003 which resulted in publication of the report, written by Dr Douglas Goudie, "Disruptive weather warnings and weather knowledge in remote Australian Indigenous communities" by the Centre for Disaster Studies at James Cook University. In relation to local weather reports the following comment was noted:

... radio announcers were not well trained to understand either the weather maps or the real meaning of the BoM weather reports. They download the BoM information and 'translate' it as best they can, but don't feel all that confident about it. The feeling was that a training session for radio operators to understand the information so they could 'translate' the reports into everyday language or even local languages would be very useful (Goudie, 2004, p. 28).

This project is about developing, facilitating, and evaluating workshops for radio presenters with the Broadcasting to Remote Aboriginal Communities Services/Remote Indigenous Broadcasting Services (BRACS/RIBS) programs. Presenters will benefit from the workshop by having an opportunity to better understand the BoM weather reports, maps and websites. Presenters will also be able to interpret the information to provide more meaningful weather reports for their local communities.

This project is in accordance with those BoM's basic objectives (BoM, 2007) which are related to community welfare whereby it undertakes activities which contribute effectively to the reduction of the social and economic impact of natural disasters and the improvement of the safety of life and property.

This project will increase insights into the processes associated with engaging communities in the decisions that affect their welfare and how these processes can be enhanced to increase the breadth and depth of community engagement.

In addition, this project is in accordance with the Queensland Government and the Department of Emergency Services' (DES, 2004) key themes of: strong families, strong cultures; and safe places, as well as supporting the key result area of enhancing community safety and prevention capability.

Furthermore, in relation to warning messages and systems, Handmer (2001) has discussed some matters which are relevant to this project. The research literature indicates, in part, that warning messages should have local and individual meanings and should suggest appropriate responses. In addition the warning systems should incorporate continuous learning and updating procedures and those weaknesses such as centrally run systems that are poorly connected to local needs, should be avoided.

Finally, the third group of five priorities for disaster reduction action from the International Strategy for Disaster Reduction Hyogo Framework for Action 2005-2015 (UN/ISDR, 2005) include using knowledge, innovation and education to build a culture of safety and resilience at all levels, and focuses on the following features:

Disasters can be substantially reduced if people are well informed and motivated towards a culture of disaster prevention and resilience, which in turn requires the collection, compilation and dissemination of relevant knowledge and information on hazards, vulnerabilities and capacities (UN/ISDR, 2005b, p. 9).

Methodology

The BoM has funded the first phase of this project. The first workshop was held at the offices of Radio 4K1G in Townsville on 3 and 4 April 2007. The workshop included briefings by BoM staff on the meaning of various components of their weather reports, weather maps and weather warnings. A visit to the local BoM facilities at the Townsville RAAF Base was also undertaken.

Participants were BRACS/RIBS presenters from the Torres Strait Islands; Darwin; Daly River area; the Tiwi Islands; Arnhem Land; Broome; Townsville; and Palm Island.

Senior broadcasting staff members at 4K1G in Townsville provided the contact details of the local manager or coordinator of the relevant BRACS/RIBS offices who then consulted with local presenters who in turn decided who would participate. This strategy for the selection of participants was well received.

Future workshops will be conducted using a modified format on the basis of suggestions made by the original participants. Workshops are likely to be planned at major centres where there are BRACS/RIBS facilities. Batchelor College (NT) has also expressed interest in workshops of this nature for their media training courses.

The research activity reported here was essentially a three-step evaluation of the workshops. The first phase was a process evaluation during the workshop, an immediate follow-up with participants shortly after the workshop and then eight months later a telephone follow-up with participants. Participants from the workshops were asked to identify the criteria that would allow evaluation of whether the workshops were useful and in what ways, and how the workshops might be improved.

Verbal consent was sought at each evaluation stage and required 10 to 15 minutes of people's time in the follow-up evaluations. Verbal consent was appropriate in this case because the interview was by phone; radio presenters have a 'verbal' approach and are used to talking by phone and verbal consent is also preferable with Indigenous Australians. Participants were also asked if they consented to their photographs being used for reports and other publications.

The project was conducted in partnership with the Bureau of Meteorology in Queensland and Victoria.

Cultural Protocols

Appropriate sections of the Australian Broadcasting Commission in conjunction with Indigenous people have developed the cultural protocols which should be employed in interactions of this type, and which are based on the following principles (ABC, 2002):

- Respect;
- Indigenous control;
- Consultation, communication and consent;
- Interpretation, integrity and authenticity;
- Secrecy and confidentiality;
- Attribution;
- Continuing cultures;
- Sharing of Benefits;
- Recognition and protection under the law.

Other appropriate documents, web sites and organisations listed in Appendix 2 were consulted before commencing the project to ensure maintenance of these features.

Finally, it is considered important by many organisations including the National Health and Medical Research Council (NHMRC), to ensure that research projects remain ethical and appropriate in order that both the communities and the organisation benefit, that both are fully aware at all of the steps and that research projects in the future are not impeded by breaches or ignorance.

The NHMRC (2005) publication provides details of the following steps of the research journey:

- establishing relationships;
- conceptualisation - thinking and planning;
- development and approval - finalising the research agreement;
- data collection and management;
- analysis - working out what the data means;

- report writing;
- dissemination - sharing the findings or research results;
- learning from the experience.

The NHRMC points out that not every research project will have all of the eight steps; that the sequence will vary; or steps will be bypassed, however, questions should be asked at each of the eight steps to maintain the trust and the confidence that the research project remains on track.

In order to assist in keeping research projects on track and achieving goals it is important that these concepts associated with cultural protocols are drawn into the development of presentation materials and communications utilised during the workshops.

Process evaluation – evaluation of materials presented at the workshop

The BoM Service Charter for the Community indicates that in relation to the quality of information, the community can expect that the Bureau will:

present our information, including forecasts and warnings, clearly, using plain English, understandable graphics, or other means relevant to your needs, being sensitive to the diversity of the Australian public (BoM, 2007, p. 3).

The Communication Resource Centre (CRC) states that in considering any communication it is critical to have an understanding of the target audience; the information and the level of detail required; and the type of medium being used for the communication (CRC, 2005).

People from culturally and linguistically diverse communities (CRC, 2005) or people for whom English may be a third or fourth language sometimes find it difficult to read complex text or understand unfamiliar concepts, terms and graphics. Research ethics monitors and experienced researchers strongly recommend that all text and graphics for use in these contexts use plain English.

Features of plain English (CRC, 2005), which are relevant to this project, include the following:

- use clear, simple language, do not use slang;
- use one idea per sentence and use short sentences;
- present information in a sequence of clear steps;
- use direct language, address readers as 'you';
- use font size 14;
- use clear examples that highlight the point you are making;
- use active rather than passive sentences;
- use full names and do not use acronyms or contractions of words;
- use pictures, logos or photographs to add meaning to the text;
- when starting a sentence with a number, always write the word;
- keep punctuation marks to the minimum;
- use clear photographs and graphics, remove foreground and background clutter.

Additional instructions which arise from the usage of plain English which apply in particular to electronic presentations (e.g. PowerPoint), pamphlets, information sheets, flyers etc. include the following:

- use left justification for the text, do not centre the text;
- use colour, character and line spacing and the bold function for emphasis;
- use upper and lower case letters, do not use upper case only;
- use regular text, do not use italics or other complicated fonts;
- finish words on the line on which they start;
- use dot points or numbers and write key points only;
- careful and sparing use of pictographs can be used to add meaning;
- use the underline function for web sites only.

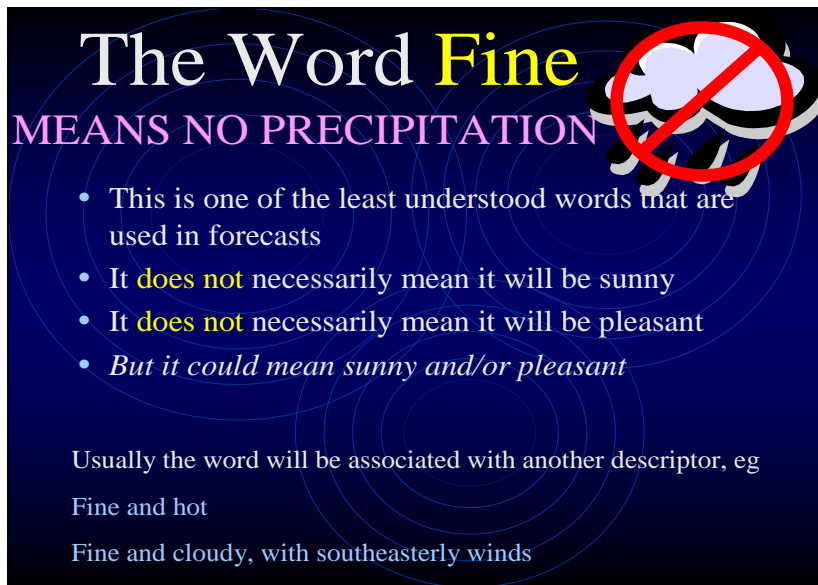
In appropriate instances it may also be worth applying some of these above features which are relevant to oral presentations.

A final test of any text-based materials must be a check of the readability of the text, for example in Microsoft Word using the Flesch Reading Ease function - a readability score of 85% or above means the content of the document should be relatively easy to read.

It is appropriate that the sections above on cultural protocols and the process evaluation be considered to provide an evaluation of the materials that were presented at the workshop.

The comments offered in this section below are related to how the group that was in attendance at this particular workshop may have their understanding of the presentation enhanced – this was a group of people, some of whom were from Indigenous communities from locations remote from capital cities and for some English is not their first language.

As an example Figure 1 below should be evaluated against some of the criteria presented in the previous sections.



The Word Fine
MEANS NO PRECIPITATION

- This is one of the least understood words that are used in forecasts
- It **does not** necessarily mean it will be sunny
- It **does not** necessarily mean it will be pleasant
- *But it could mean sunny and/or pleasant*

Usually the word will be associated with another descriptor, eg
 Fine and hot
 Fine and cloudy, with southeasterly winds

Figure 1 – The word ‘fine’ (Appendix 4)

Figure 1 is slide number 20 from the ‘Interpreting Forecasts’ series and its meaning could be enhanced for this workshop by removing the background clutter of the concentric rings, using regular text instead of italics and using a lighter blue for the background. The further use of coloured text and the bold function could provide emphasis where required. The reader may develop other opinions in view of the criteria for plain English.

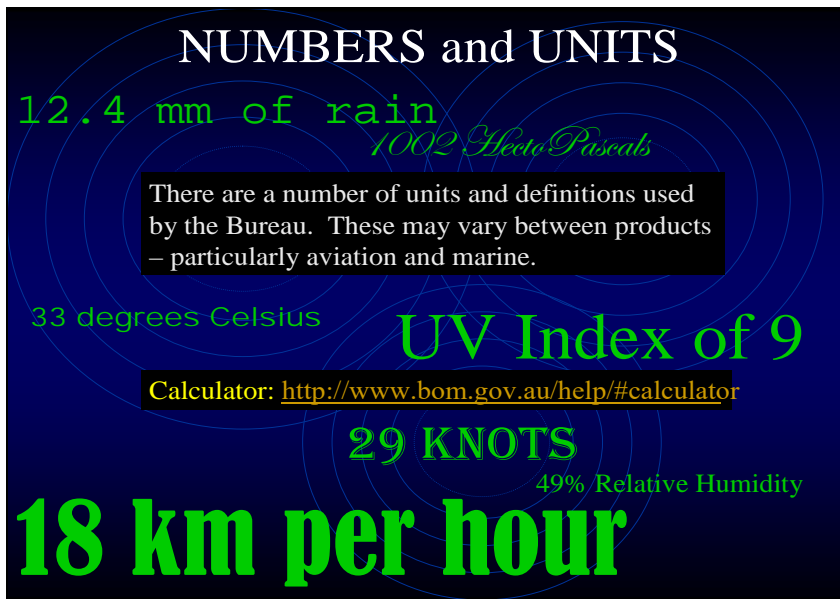


Figure 2 - Numbers and units (Appendix 4)

Figure 2 is slide number 22 from the 'Interpreting Forecasts' series and understanding of its meaning could be enhanced in similar ways to Figure 1 above. For example, the use of regular text rather than italics or other complicated fonts and a reduction in the number of ideas.

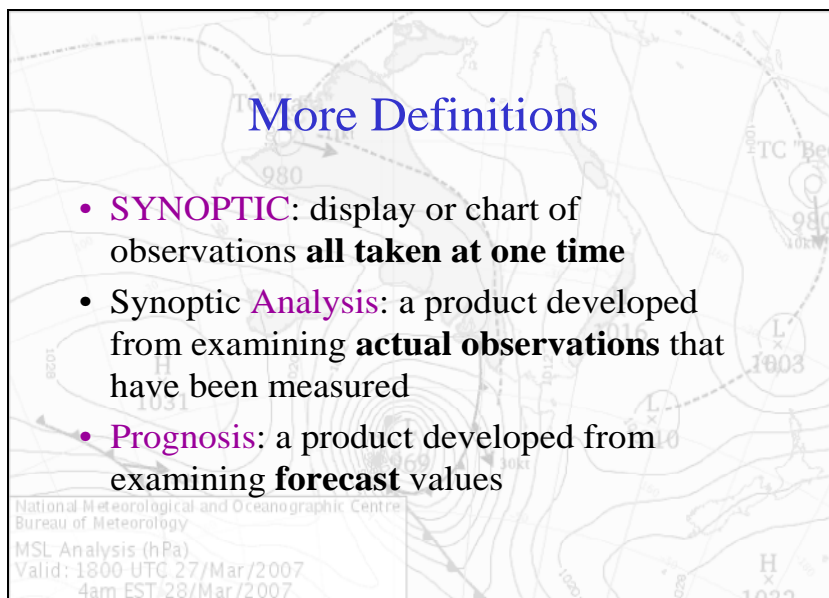


Figure 3 - More definitions (Appendix 5)

Figure 3 is slide number 8 from the 'Weather Graphics' series and its meaning could be enhanced by removing the cluttered background of the synoptic chart. In an unfamiliar concept situation it may be more appropriate not to include this slide in a particular presentation.

Infra-Red Satellite Pictures

The satellite pictures shown on TV are Infra-Red pictures – the advantage is that the clouds show up day and night.

The **colder** surfaces are displayed as **brighter** on the image

As you go higher, the air gets colder – as can be seen with this mountain

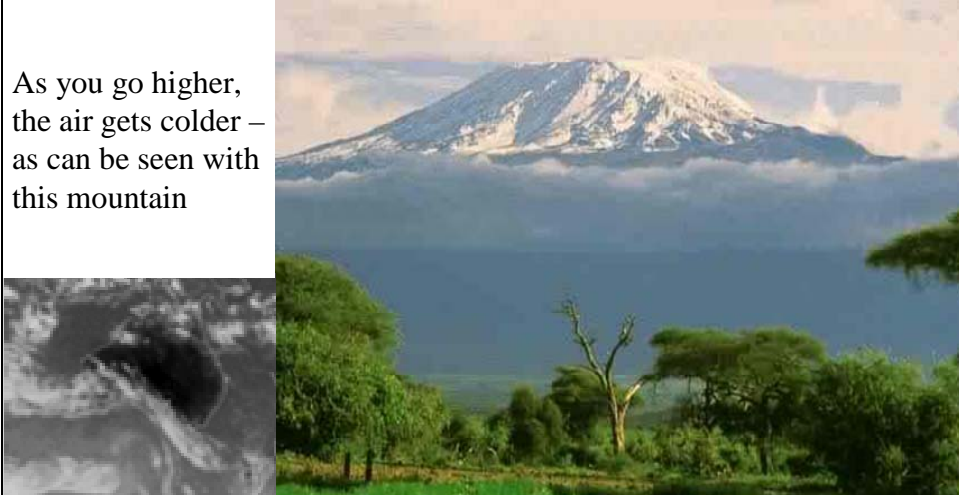


Figure 4 - Infra-red Satellite Pictures (Appendix 5)

Figure 4 is slide number 16 from the 'Weather Graphics' series and understanding could be enhanced if further consideration of the particular target audience was undertaken. It is unlikely that given the great diversity of the Australian public that all audiences would have a good understanding of the unfamiliar concept of tall snow-covered mountains and that as you go higher the air gets colder. In an unfamiliar concept situation it may also be more appropriate not to include this slide in a particular presentation.

Primary evaluation – Reading the Weather Workshop, 3-4 April 2007

The Reading the Weather Workshop was presented as a collaborative forum using the facilities at Radio 4K1G in Townsville.



Figure 5 – Reading the weather workshop

The Queensland Tsunami Warning, which had been issued by BoM at 7:52 am on the previous day, Monday 2 April 2007 following an undersea earthquake near the Solomon Islands, provided a great icebreaker for everyone at the commencement of the workshop.

The combined meeting guide and agenda for the workshop is presented at Appendix 1.

Appendix 2 and Appendix 3 are referred to in other sections of this report concerning cultural protocols and organisations and weather language.

BoM staff presented and discussed the data in the following documents which have been collated in the listed appendices:

Interpreting forecasts	Appendix 4
Weather graphics	Appendix 5
Indigenous weather knowledge	Appendix 6
Structure of a warning	Appendix 7
Tropical cyclone warning	Appendix 8
Tropical cyclone synoptic chart	Appendix 9
Weather forecasts	Appendix 10.

During the workshop one of the researchers constantly observed the reactions of people to the activity, and asked questions about how they were feeling about the activity and how it may affect their reading of the weather in their communities.

Participants expressed positive opinions about how helpful it was to have face-to-face interaction with BoM staff and other weather presenters.

There was general agreement that participants had learned a lot from the workshop. The content was pitched at the right level for participants. There were a few items that were a little difficult (see previous section), but it is anticipated these could be addressed easily.

There was agreement that participants felt more confident about being able to present and explain the weather reports. Participants felt that being together made them feel better that they weren't the only ones who didn't really understand the weather information provided. This made it easier to discuss and to learn.

The trip to the BoM facilities at the Townsville RAAF Base was very popular. Participants felt that after all the theory to see the wide range of equipment used and how all the information was collected was really helpful to them. Watching how the duty forecasters used the Internet crystallised for them their perceptions of their existing capacity to use that type of information.

There was a great deal of interest in the BoM Indigenous Weather Knowledge website, and much discussion. It was noted the website was in its early stages of development and would be progressively expanded to include information for additional communities, as well as other facets of Aboriginal and Torres Strait Islander interactions with, and knowledge of, weather and climate. Participants were encouraged to undertake the necessary consultations for more communities to be added to the website (Appendix 6).

The general view was that when they went home their jobs would be easier because they now understood better the weather reports from BoM. They would be able to give clearer messages and clearer information. In six months time they felt they would be looking for what was new to learn.

There was unanimous agreement that this kind of training should be part of the broadcasters' general training.

The issue of a perceived lack of BoM coverage of the Torres Strait was raised. Participants noted that this situation was defended by a statement that it would be forthcoming in couple of years. Considering the population of the Torres Strait is approximately 8,000 people (DATSIPD, 2003) spread over more than 15 inhabited islands of around 100 widely-dispersed remote islands, it is strongly recommended that the BoM commence planning, consultation and community engagement processes to remedy this situation.

Proposed future regional workshops were viewed very positively; in locations such as the Torres Strait, Cairns, Broome, Darwin and elsewhere. A focus would be on using the Internet to get information on the weather and understanding the BoM website was critical in relation to how to use the Internet in the studio to interact with communities about the weather.

Weather is not just about telling what is likely to happen, it is about linking with people and colleagues from other locations. Talk time needs to be 20 minutes maximum and then participants undertake an appropriate activity. It is also important that people have a mix of activities to undertake. People need time to talk about what they do with the weather reports; this is an important part of beginning the workshop and how they relate to their colleagues.

Participants disclosed that weather stations at broadcasting facilities and schools are in many cases self-funded with rudimentary and inadequate weather-measuring equipment. The existence of these home-made weather facilities may indicate a requirement for government spending of a capital nature in remote communities.

Comments about other sources of weather information including four-day forecasts and the availability of tide times indicate a requirement for the provision of hands-on training for improved understanding of web-site layout and search techniques.

There was an interesting situation where a BoM presenter was using a graph (see Figure 6 below) to talk about wind gusts, it was clear that many people did not understand the graph. One participant made the comparison with the volume indicator in the studio and the facilitator talked about a wind gust knocking off someone's hat or umbrella. These types of interpretations are important when broadcasting to remote local areas. The information alone is not enough; it is often the interpretation into local meaning which is important.

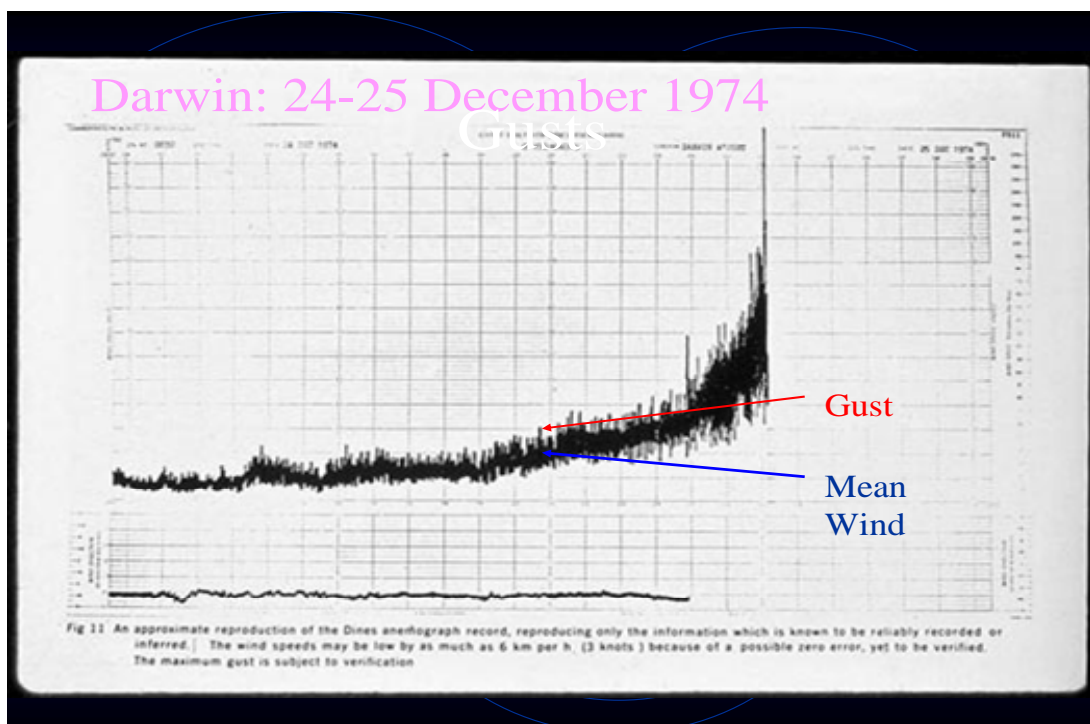


Figure 6 - Image of wind speed recording, Darwin December 1974 (Appendix 4)

One of the most insightful moments in the workshop was when a BoM presenter was talking about the naming of cyclones. Many in the group were aware of the cultural constraint in Indigenous communities about talking about recently deceased relatives.

In the context of the naming discussion participants revealed that it was very difficult for them sometimes if a cyclone had the name of a deceased relative. BoM staff immediately recognised how difficult it was in that situation for people to be able to do their work properly.

Further discussion also indicated that plants and animals can be totems for different communities and it can vary in how the names of these totems can be used in a community and when away from a community. These are complex matters for Indigenous communities and further extensive consultations are recommended.

Given the size of communities and spread of communities that are affected by a particular cyclone and how many Indigenous people there are in those communities, there is a strong requirement to review the cyclone naming process.

In another example related to cultural sensitivity, the word severe has been the subject of research, the results of which have been strong recommendations not to use the term (Goudie, 2004; V. Gara, personal communication, June 14, 2005 – Appendix 3). The BoM, however, is yet to adopt these recommendations (see Figure 7 below).

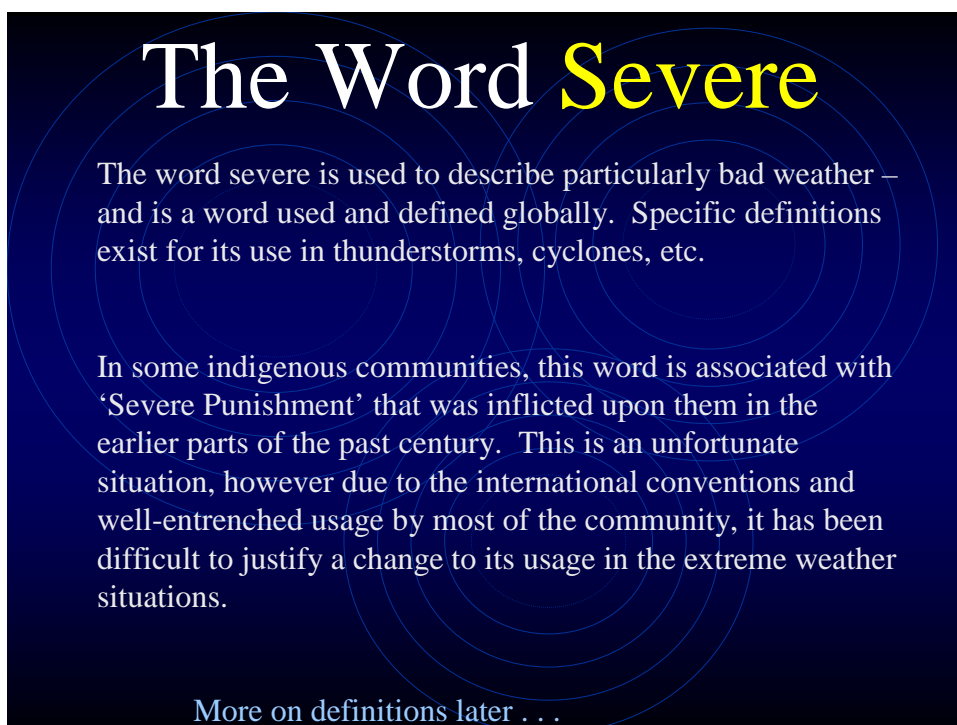


Figure 7 - The word ‘severe’ (Appendix 4)

BoM staff argues that the objections to the word severe are not as prevalent as has been suggested above and that the numbers of affected persons would be a small and diminishing section of the population.

It is arguable that the use of the word “severe” may continue to cause problems, and if this does continue then consultation with communities affected by decisions or non-decisions in this matter is a recommended starting point. Despite this difficulty further consideration should still be given to previous recommendations on weather warning language contained in Appendix 3.

It is recommended the BoM considers calling tenders for the continuation of the Reading the Weather Workshops in other locations. This weather project is definitely a worthwhile activity and it has implications of the training art of broadcasters for ethnic and other community radio and broadcasting.

It is believed strongly that this project presents an exciting challenge for the Bureau of Meteorology and has a great potential to progress their community engagement objectives in a very effective and meaningful manner and also to enhance the effectiveness of the usage of the Bureau’s reports in remote local communities.

Secondary evaluation – follow-up discussions

Follow up discussions were undertaken by telephone with nine of the eleven participants in December 2007 and January 2008. The period between April and December/January provided the participants with sufficient time to implement the information gained from the workshop and reflect on its utility. The discussions were based upon the following five questions:

- what two or three things did you find the best or most useful about the workshop?
- what two or three things about the workshop could be improved for another time?
- have you used the workshop information in any way?
- have there been any difficulties in using the information?
- what would you like to know next if there was another workshop?

Detailed notes of these discussions are presented in Appendix 11 while a summary of the benefits of the workshop and topics for future workshops, as expressed by the participants, are presented below.

Benefits of the workshop

The participants felt the workshop was well worthwhile and they benefited from the interaction with each other and BoM staff; they made a positive distinction between the benefits from learning including the increase in knowledge and the way in which it was presented.

The explanation of BoM terminology by breaking down into components the BoM descriptions of weather was particularly useful as participants present the weather with more confidence now and sometimes add their own comments.

The visit to the BoM facilities at the RAAF base was invariably very interesting to all participants who are now more aware of the technology utilized in the development of a weather report and the differences in technology available at different communities which impact upon their weather reports.

Some participants now talk to local BoM staff directly or contact staff “on air” as a result of the workshop, although links with BoM vary. The participants feel they are contact points into their communities.

Topics for future workshops

The participants felt the presentation was sometimes too fast as the technical detail and terminology was unfamiliar to them, although the presenters slowed down when requested.

The participants would like more time for discussion to allow for a two-way conversation so that presenters and participants could learn from each other. They felt this would allow a more relaxed interaction and provide clarity and understanding.

It was suggested that the inclusion of more Indigenous information in discussions about the weather would help communities’ understanding and interest.

Participants would like weather information more specific to their local areas and knowledge on where to find it.

Cyclone names are an issue: some participants do not use the names of cyclones irrespective of gender - this seems to imply that human names are an issue irrespective of whether the name is of a person who may be deceased.

Participants would like more time for Internet access and training on how to find local weather information and develop links to other communities.

Participants are requesting information on climate change and its impact as island communities are already noticing and commenting on changes.

Conclusions

The following conclusions are provided at the completion of the initial Reading the Weather Workshop and the first follow-up discussions:

- the workshop format is successful for training to enhance understanding of weather reports;
- the participants learned some of the BoM terminology, how to access information on the Internet and how to make the weather reports in their communities more informative and meaningful;
- the participants provided insights for improvements to the program;
- the participants are more comfortable about the amount of knowledge they have and their confidence levels were enhanced by interactions at the workshop where they realised they were not the only ones having difficulty understanding some of the content of weather reports.

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Meeting guide and agenda*Reading the Weather*

Workshop at Radio 4K1G in Townsville for Indigenous Radio/TV announcers and journalists about understanding weather reports and weather maps.

Collaboration between Indigenous Radio 4K1G, Bureau of Meteorology (BoM), Centre for Disaster Studies (CDS), James Cook University (JCU)

Aim: to provide training for Indigenous media announcers and journalists so that formal weather information and warnings can be explained to communities in a way that they can understand what will actually happen locally; and to provide ongoing feedback from communities to BoM about the information and warning content.

Tuesday, 3 April 2007

Participants arriving.

Arrive 4K1G at 2:00pm for afternoon tea.

Workshop starts at 3:00pm.

Velma Gara (4K1G) to welcome participants and open workshop.

Alan Johnston (Chair, Townsville Aboriginal and Islander media association) welcome.

Introductions and acknowledgement of Indigenous traditional owners.

Douglas Goudie (JCU) to brief the workshop on the background research that led to this workshop.

Alison Cottrell (JCU facilitator)

First session - what people hope to get out of the workshop and how do we measure its success in the short, medium and longer term.

How do you interpret the information that is provided at present?

4:00 to 6.30pm

Second session - BoM - where can we find weather information, what does a weather report tell us, what does a weather map tell us, and what does the Internet tell us?

Participants - provided with examples of a series of weather maps and what they mean. Compare weather maps with weather reports.

Participants identify items that need clarifying and BoM staff explain.

Last 15 minutes review how it is all going for everyone.

6.30 to 8.00pm

Third session - dinner and discussions about the day and any issues for the following day.

Wednesday, 4 April

9:00am - 12:30pm

Hazardous weather information, including visit to BoM site on RAAF Base Garbutt.

Look at weather warnings and maps to understand what they mean, using hazardous weather warnings from NWA, NT, TSI and NQ.

12:30 - 1:00pm

Discussion on what was achieved, and learning for future training workshops.

1:00 to 2.00pm

Lunch and farewells.

APPENDIX 2

Cultural Protocols and Organisations

The documents and related web sites listed below were consulted before commencing the project:

Aboriginal and Torres Strait Islander Protocol – Acknowledgement of Traditional Owners
<http://www.premiers.qld.gov.au/index.asp>

Mina Mir Lo Ailan Mun: Proper Communication with Torres Strait Islander
<http://www.indigenous.qld.gov.au/resources/cultures.cfm>

Protocols for Consultation and Negotiation with Aboriginal People
<http://www.indigenous.qld.gov.au/resources/cultures.cfm>

Message Stick – Cultural Protocol
<http://www.abc.net.au/message/proper/>

Cooperative Research Centre Torres Strait - Protocols for radio interviews
<http://www.crctorres.com/forcrctorres/radioprotocols.htm>

The organisations listed below provided advice on a range of matters and were sources of participants for the workshops:

Townsville Aboriginal and Islander Media association (TAIMA) – Radio 4K1G - Townsville
<http://www.4k1g.org/index.html>

Top End Aboriginal Bush Broadcasting Association (TEABBA) - Darwin
<http://www.teabba.com.au/>

Pilbara and Kimberley Aboriginal Media (PAKAM) - Broome
<http://www.pakam.com.au/>

St Pauls Island Council - Radio 4W6 - St Pauls Moa Island
http://www.lgworks.net.au/council/St_Pauls

Torres Strait Islanders Media Association (TSIMA) – Radio 4MW - Thursday Island
<http://www.tsim4mw.org.au/>

Weather warning language**Identify weather warning language which could be improved for listeners at urban and remote Indigenous Communities**

"Listeners were offended by the word 'severe' because of the cultural memory of repressive 'severe punishment' from colonial and mission days. Also, we pointed out that 'near' is better for us than 'in the vicinity of'."

After reading through the ninety pages of weather warnings, I found there were nearly 20 words that need to be looked at and maybe changed to make it easier for our Aboriginal and Torres Strait Islander people to understand.

It should be noted that the English language is either second, third or fourth language to many of us Indigenous Australians. I feel that if weather warnings are kept simple, more of us would listen and actually 'hear' what the important message is all about.

Below here are the words that I feel should be looked at and changed:

Intensify	make stronger / build up
Specifically	especially
Significantly	a lot
Destructive	very rough
Preliminary	beginning / first round
Exceeded	go above / over
Localized	local community / area
Hazardous	not safe / at high risk /
Rapidly	quickly / very fast
Visibility	to see / notice
Inclement	stormy / rainy / windy
Fluctuating	up-and-down / changes
Meteorological models	
Watercourses	
Inundation	

I feel the wording with FESA's SES paragraph could be made easier to read and announce on air. Words such as relocate, adversely, reconsidered and velocity can be changed.

Relocate	move to another area
Adversely	badly
Be reconsidered	change
Velocity	of rapid pace

As for other recommendations to improve the relationship between the Bureau and Indigenous communities, so that messages are well communicated and understood - how about producing a Manual and CD for the Indigenous media organisations?


The Manual can be like a resource booklet and the CD can be on how to prepare for various weather warnings.

Another recommendation is making sure Indigenous media organisations regularly use their local Bureau.

Velma Gara
Senior Broadcaster
Radio 4K1G, Townsville, North Queensland
14 June 2005

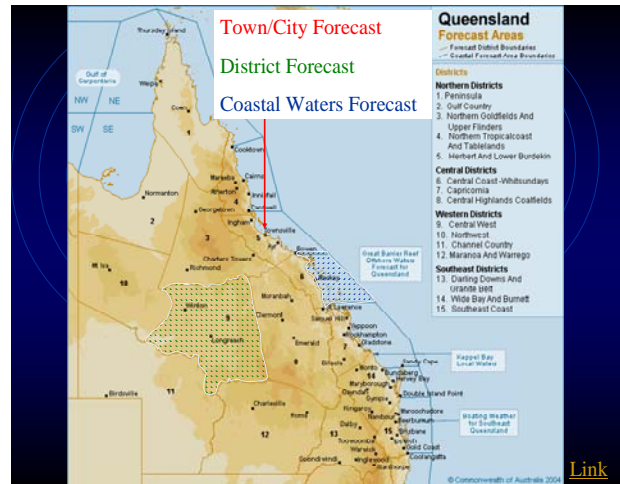
Interpreting forecasts

Interpreting Forecasts



A guide to common weather terminology

Image by: Mike Rosel, Bureau of Meteorology

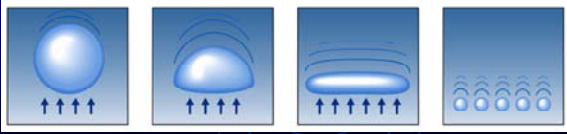


Precipitation

- Rain
- Showers
- Hail
- Thunderstorm
- Drizzle
- Snow
- Sleet

Rain

- Rain drops - water or ice origin
 - Range in size between 0.5 to 5 mm
 - Terminal velocities ~ 5-7 m/s
- Rain Showers
 - short duration episodic precipitation associated with convection
- Why don't rain drops get very large??

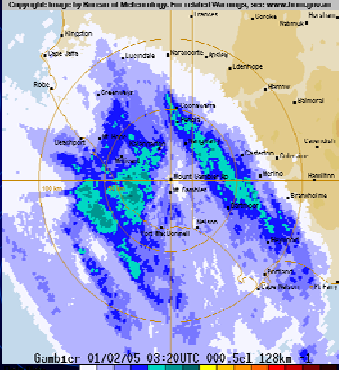


Rain vs Showers

Rain occurs continuously over a broad area

Usually starts and ends slowly

Can last for a long time



Copyright: Images by Bureau of Meteorology. For related Web pages, visit www.bom.gov.au

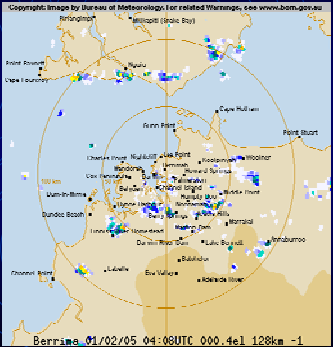
Gumberg 01/02/05 03:20UTC 000.5e1 128km -1

Rain vs Showers

A shower covers a small area

It usually starts and ends quite suddenly

It is usually quite brief

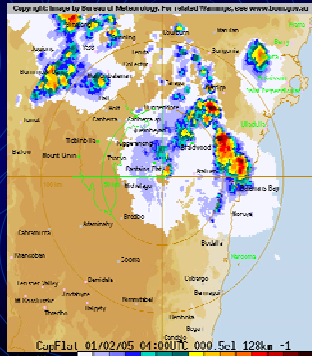


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Berrima 01/02/05 04:08UTC 000.4e1 128km -1

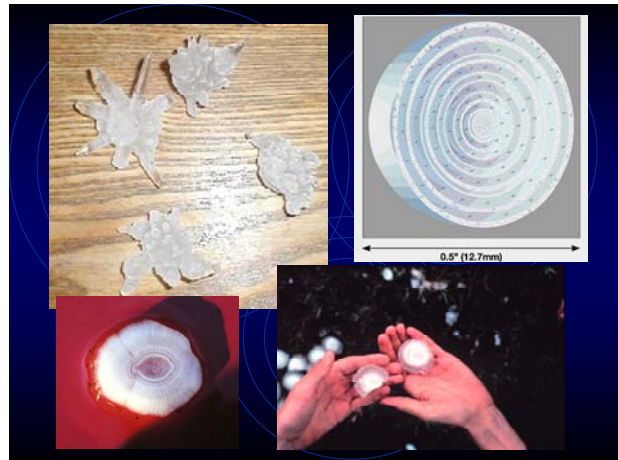
Rain vs Showers

There can be a mixture of rain and showers



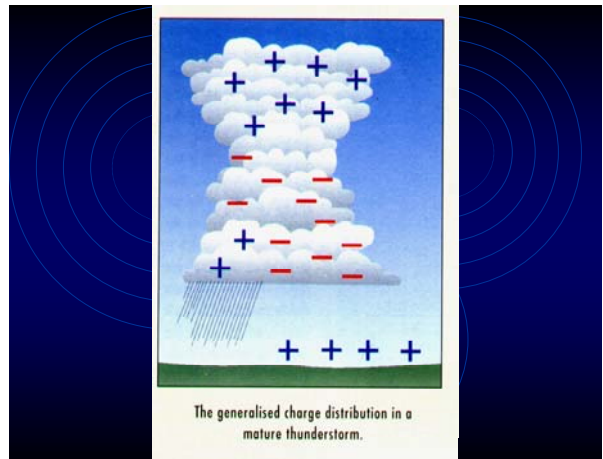
Hail

- Hail is (hard) frozen rain and can occur in the tropics.
- It is more common in thunderstorms and also in cold outbreaks in the southern states.
- Precipitation often starts out as hail in the cloud, melting before it reaches the ground



Thunderstorm

- Thunder is the sound of lightning
- A thunderstorm is generally a (usually heavy) shower with associated lightning activity



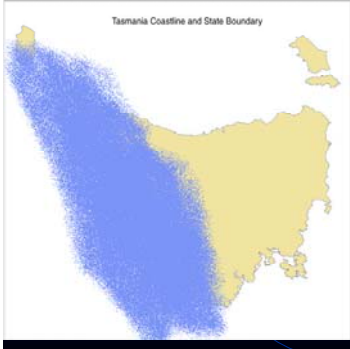
Other Precipitation

Not so relevant here

- Drizzle: very light misty rain
- Snow: Soft frozen precipitation
- Sleet: Mixture of snow and rain



Describing Amounts



Tasmania Coastline and State Boundary

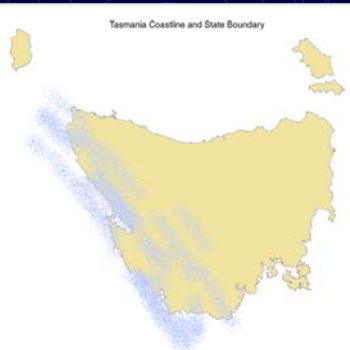
TIME

- Rain
- Rain developing
- Rain easing tonight
- Rain, heavy at times

SPACE

- Rain
- Widespread rain
- Rain developing from the west
- Rain clearing to the south

Describing Amounts



Tasmania Coastline and State Boundary

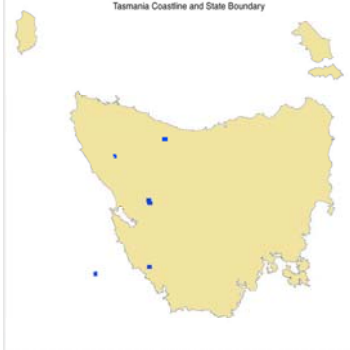
TIME

- Patchy rain
- Rain periods

SPACE

- Patchy rain
- Rain areas

Describing Amounts



Tasmania Coastline and State Boundary

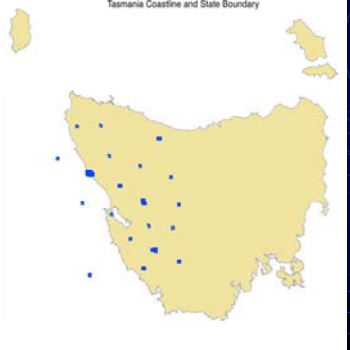
TIME

- Chance of a shower
- A shower or two
- A Morning Shower
- A Shower in the area

SPACE

- Isolated showers

Describing Amounts



Tasmania Coastline and State Boundary

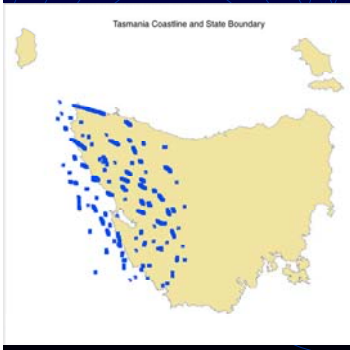
TIME

- A few showers
- Some showers developing

SPACE

- Scattered showers

Describing Amounts



Tasmania Coastline and State Boundary

TIME

- A showery day
- Occasional showers
- Showers increasing later

SPACE

- Widespread showers in the west
- Showers, mostly in the west

Intensity

- Light
- Moderate
- Heavy
- **Severe**

The use of the words light, moderate and heavy are used quite subjectively. They are used to compare with what is normally experienced in the location.

Light rain in Darwin summer would be considered moderate-heavy in Hobart.


The Word **Severe**

The word severe is used to describe particularly bad weather – and is a word used and defined globally. Specific definitions exist for its use in thunderstorms, cyclones, etc.

In some indigenous communities, this word is associated with ‘Severe Punishment’ that was inflicted upon them in the earlier parts of the past century. This is an unfortunate situation, however due to the international conventions and well-entrenched usage by most of the community, it has been difficult to justify a change to its usage in the extreme weather situations.

More on definitions later . . .

The Word **Fine**

MEANS NO PRECIPITATION 

- This is one of the least understood words that are used in forecasts
- It **does not** necessarily mean it will be sunny
- It **does not** necessarily mean it will be pleasant
- *But it could mean sunny and/or pleasant*

Usually the word will be associated with another descriptor, eg
 Fine and hot
 Fine and cloudy, with southeasterly winds

NUMBERS and UNITS

12.4 mm of rain
1000 HectoPascals


There are a number of units and definitions used by the Bureau. These may vary between products – particularly aviation and marine.

33 degrees Celsius **UV Index of 9**

Calculator: <http://www.bom.gov.au/help/#calculator>

29 KNOTS
49% Relative Humidity

18 km per hour




Temperature Units

- Australia and most of the world uses the Celsius scale (also known as centigrade)
- Australia converted to using Celsius in the early 1970's
- USA still uses the Fahrenheit scale

Wind Speed Units

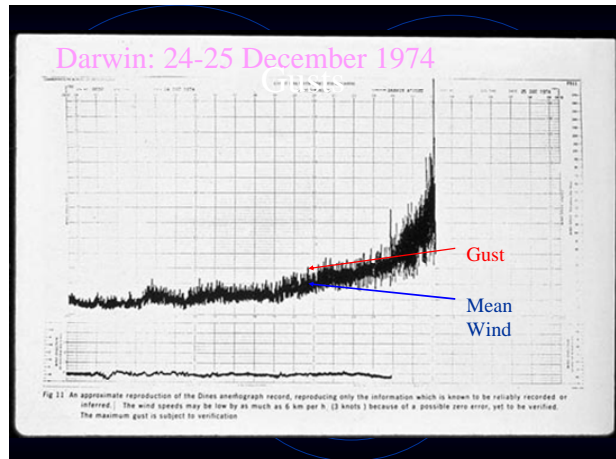
- Marine forecasts describe wind speeds in knots: 1 knot = 1 nautical mile per hour
- Other public forecasts describe wind speeds in kilometres per hour
- In some countries, they use miles per hour
- In some places they use the [Beaufort Scale](#)



10 kilometres = 5.4 nautical miles = 6.2 miles

More on Wind

- Direction is where the wind comes from. If you face north, a northerly wind will blow into your face.
- Wind speed is measured as the speed of the wind averaged over ten minutes
- Wind Gust is measured as the speed of the wind averaged over 3 seconds
- Isolated gusts will be stronger than the mean wind – it is these gusts that can cause structures to fail during cyclones



Rainfall Units

- Measured in mm, and represents the depth of water the rain would leave on the ground, if it were not to flow away, evaporate or soak into the ground



25.4 millimetres = 100 points = 1 inch

Humidity

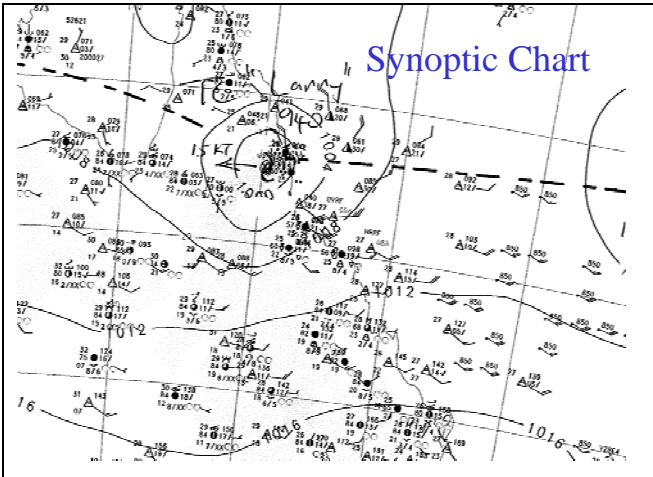
- Relative humidity is the ratio of the amount of moisture in the atmosphere to the maximum amount that can be held by the air at that temperature
- When 100% humidity is exceeded, the moisture will condense into cloud or fog
- Warm air can hold more moisture than cold air
- Dew point is the temperature at which the air will reach 100% humidity if cooled

Others

- **Atmospheric Pressure:** 1000 hectoPascals = 1000 millibars = 29.53 inches of Mercury
- UV Index - [link](#)
- Cyclone Category – [link](#)
- Time Zones: UTC = GMT
 - WST = UTC + 8hrs
 - CST = UTC + 9.5 hours
 - EST = UTC + 10 hours
 - Add one more hour for daylight savings

Weather graphics

<h2 style="text-align: center;">Weather Graphics</h2> <p style="font-size: small;">National Meteorological and Oceanographic Centre Bureau of Meteorology MSL Analysis (hPa) Valid: 1800 UTC 27/Mar/2007 4am EST/28/Mar/2007</p>	<h3 style="text-align: center;">We will look at</h3> <ul style="list-style-type: none"> • Standard weather charts • Satellite Images • Radar Images
<h2 style="text-align: center;">The Weather Chart</h2> <h3 style="text-align: center;">Interpretation and meanings</h3>	<h3 style="text-align: center;">What is the Weather Chart?</h3> <p>The basic weather chart is created by drawing isobars on a map. Major features can then be drawn in</p> <p>An ISOBAR is a line joining points of equal atmospheric pressure</p>
<h3 style="text-align: center;">Winds and Isobars</h3> <p>On a stationary earth, the air in high pressure areas would flow towards low pressure areas</p> <p style="text-align: center;">BUT</p> <p>The Earth rotates on its axis once a day; this affects the flow of air causing it to follow the isobars (almost – there is still some flow from high to low pressure).</p>	<h2 style="text-align: center;">Wind</h2> <ul style="list-style-type: none"> • Clockwise around lows • Anti-clockwise around highs • Close Isobars = stronger wind



More Definitions

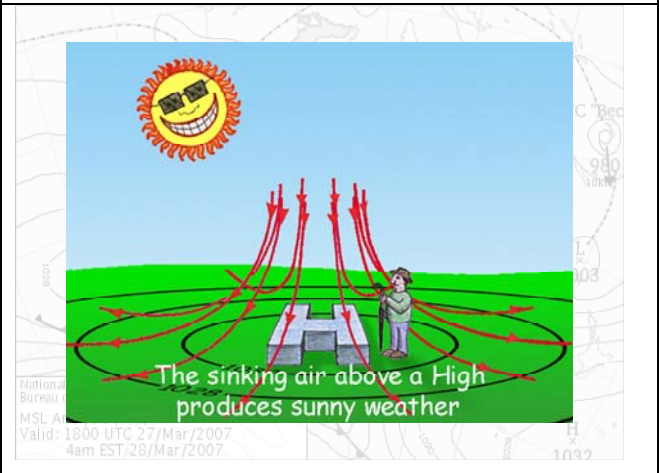
- **SYNOPTIC**: display or chart of observations **all taken at one time**
- Synoptic **Analysis**: a product developed from examining **actual observations** that have been measured
- **Prognosis**: a product developed from examining **forecast values**

National Meteorological and Oceanographic Centre
Bureau of Meteorology
MSL Analysis (hPa)
Valid: 1800 UTC 27/Mar/2007
4am EST:28/Mar/2007

High Pressure System

- Area of high atmospheric pressure - also known as:
 - Anticyclone
 - High
 - Ridge (of high pressure)

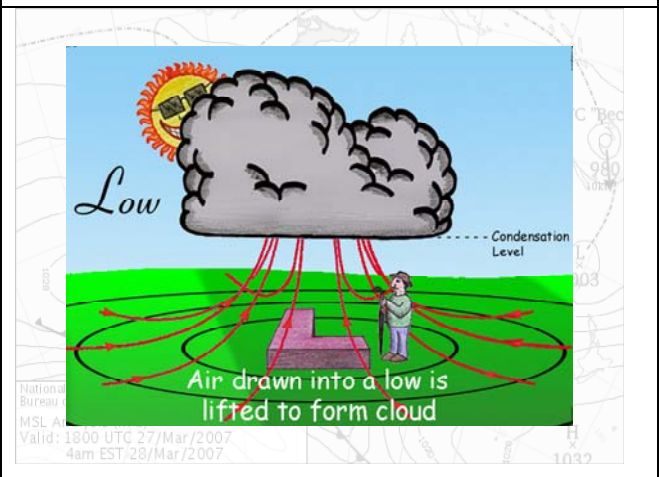
National Meteorological and Oceanographic Centre
Bureau of Meteorology
MSL Analysis (hPa)
Valid: 1800 UTC 27/Mar/2007
4am EST:28/Mar/2007



- Area of low atmospheric pressure - also known as:
 - Low
 - Cyclone
 - Depression
 - Monsoon Low
 - Tropical Low
 - Tropical Cyclone
 - Tropical Depression
 - East Coast Low

Low Pressure System

National Meteorological and Oceanographic Centre
Bureau of Meteorology
MSL Analysis (hPa)
Valid: 1800 UTC 27/Mar/2007
4am EST:28/Mar/2007



- Line along which pressure reaches a minimum
 - Cold Front
 - Warm Front
 - Occluded Front
 - Trough
 - Low Pressure Trough
 - Monsoon Trough
 - Dry line
 - Heat Trough

There will often be different air masses on either side of a trough – maybe warmer or cooler, dryer or moister

Troughs and fronts

MSL Analysis (hPa)
Valid: 1800 UTC 27/Mar/2007
4am EST 28/Mar/2007

Streamline Analysis

Used in tropics where pressure variations are small

Satellite pictures

Visual and Infra-Red

MSL Analysis (hPa)
Valid: 1800 UTC 27/Mar/2007
4am EST 28/Mar/2007

Infra-Red Satellite Pictures

The satellite pictures shown on TV are Infra-Red pictures – the advantage is that the clouds show up day and night.

The colder surfaces are displayed as **brighter** on the image

As you go higher, the air gets colder – as can be seen with this mountain


Source: 10F41815 Date/Time: 2007/03/26 03:55 UTC

Radar

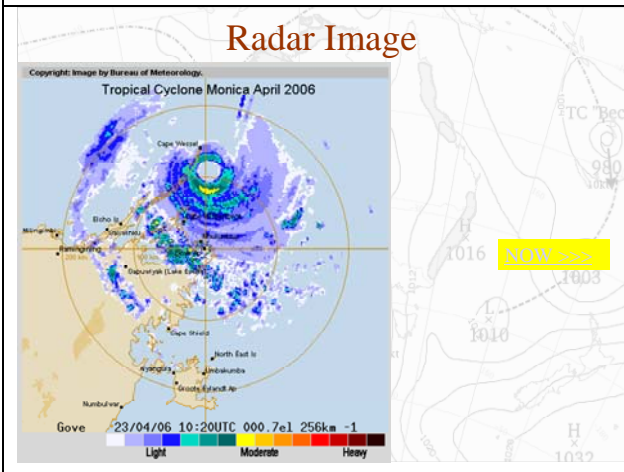
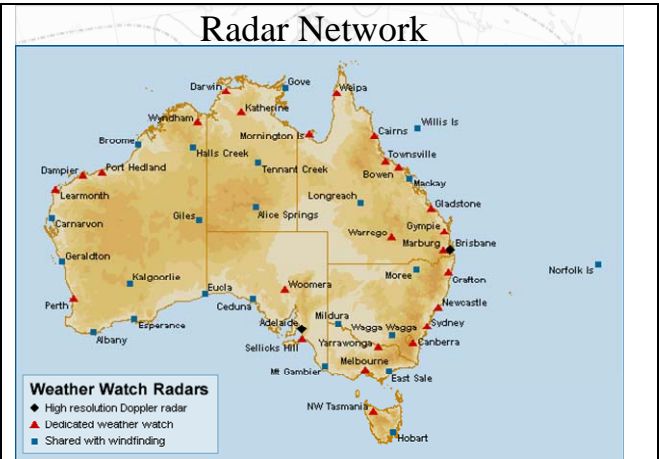
Govc: 23/04/06 10:20:11 000 / c1 256km 1

Light Medium Heavy

WEATHER WATCH RADAR



- The radar sends out a radio signal
- The signal reflects of raindrops, hail
- The reflected signal is detected back at the radar
- The time it takes for the signal to return determines the distance to the object
- Radar signals will reflect of other objects



Indigenous weather knowledge

<http://www.bom.gov.au/iwk/>

Australian Government
Bureau of Meteorology

IWK HOME | IWK FEEDBACK |

Indigenous Weather Knowledge

Indigenous Australians have long held their own seasonal calendars based on the local sequence of natural events. To the right is a map of Australia with hyperlinks to the corresponding seasonal calendars for given regions. To access the seasonal calendars, click on the appropriate red dot.

Seasonal Calendars
Click on the red dot to access the seasonal calendar for that region

Wardaman • Jawoyn • Yanyuwa • Walabunba • Brambuk

Torres Strait Is

[Indigenous Climate Weather & Culture](#)

[About the IWK Project](#)

[Bureau of Meteorology Climate Zones](#)

FEEDBACK

Australian Government Bureau of Meteorology

MONASH UNIVERSITY

ATSIC

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Structure of a warning

<p style="text-align: center;">Structure of a Warning Severe Tropical Cyclone George</p> 	<p style="text-align: center;">Explanation</p> <p style="text-align: center;">We will look at the sections of the warning provided to you</p>
<p style="text-align: center;"><u>Product Code</u></p> <p style="text-align: center;">IDW24100</p> <p style="text-align: center;"><i>Product number code – helps in distribution, otherwise of no interest.</i></p>	<p style="text-align: center;"><u>Banner</u></p> <p style="text-align: center;">Australian Government Bureau of Meteorology Western Australia</p> <p style="text-align: center;"><i>Identifies the source of the product – including the Region from which it was issued.</i></p>
<p style="text-align: center;"><u>SEWS</u></p> <p>Media: Transmitters serving the area between Wallal and Mardie are requested to sound the Standard Emergency Warning Signal before broadcasting the following warning.</p> <p style="text-align: center;"><i>Advises on the need to precede the warning with the SEWS.</i></p> <p style="text-align: center;"><i>If there is nothing stated then it is assumed there is no requirement for the signal.</i></p> 	<p style="text-align: center;"><u>Issue Details</u></p> <p style="text-align: center;">TROPICAL CYCLONE ADVICE NUMBER 35 Issued at 1:05 pm WDT on Thursday, 8 March 2007 BY THE BUREAU OF METEOROLOGY TROPICAL CYCLONE WARNING CENTRE PERTH</p> <p style="text-align: center;"><i>Identifies the product type and issue time: that is the time it was disseminated from the Bureau of Meteorology</i></p>

<p style="text-align: center;"><u>Priority</u></p> <p>Top Priority</p> <p><i>Identifies the urgency for transmission:</i></p> <ul style="list-style-type: none"> •Flash: For Immediate broadcast – indicates significant change •Top Priority: For immediate broadcast (if possible) – interrupt programs if necessary. Repeat at least hourly. •Priority: Broadcast at first opportunity within an hour •None: Broadcast with routine weather reports if not able to do so earlier 	<p style="text-align: center;"><u>Affected Area</u></p> <p>A CYCLONE WARNING for a SEVERE CATEGORY 3 cyclone is now current for coastal areas from Onslow to Broome, extending inland to include Tom Price, Marble Bar and Nullagine.</p> <p>A CYCLONE WATCH is now current for coastal areas from Coral Bay to Onslow, and extending into the southern Pilbara and northern Gascoyne to include Newman and Mt Augustus.</p> <p style="text-align: center;"><i>Identifies the areas affected by the warning and warning severity for each area</i></p>
<p style="text-align: center;"><u>Current (synoptic) Situation</u></p> <p>At 12:00 pm WDT Severe Tropical Cyclone George was estimated to be 230 kilometres north northeast of Port Hedland and 360 kilometres northeast of Karratha and moving south at 19 kilometres per hour.</p> <p>Severe Tropical Cyclone George is continuing to move southwards bringing it closer to the coast. The system is showing some signs of further intensification and may reach Category 4 before landfall. The system is now in radar range and we will commence issuing hourly advices from 2pm WDT.</p> <p style="text-align: center;"><i>Describes the current weather situation related to the warning</i></p>	<p style="text-align: center;"><u>Impact Statement</u></p> <p>GALES with wind gusts to 120 kilometres per hour are developing along the Pilbara coast near Port Hedland and are expected to extend along the coast and to inland areas tonight.</p> <p>VERY DESTRUCTIVE winds with wind gusts to 235 kilometres per hour may develop along the central Pilbara coast overnight tonight or Friday morning as the cyclone approaches.</p> <p>WIDESPREAD HEAVY RAIN and FLOODING are likely across the Pilbara in the next two days.</p> <p>DANGEROUSLY HIGH TIDES could cause EXTENSIVE FLOODING at the coast between Wallal and Dampier.</p> <p style="text-align: center;"><i>Describes the expected impact of the event on the affected area</i></p>
<p style="text-align: center;"><u>Action Statements</u></p> <p>Residents on the coast between Wallal and Dampier including Port Hedland and Karratha, Dampier and Roebourne are specifically warned of the potential of a VERY DANGEROUS STORM TIDE as the cyclone crosses the coast. Tides are likely to rise significantly above the normal high tide mark with very dangerous flooding and damaging waves.</p> <p style="text-align: center;"><i>Gives advice to the community on what actions may be appropriate.</i></p> <p style="text-align: center;"><i>Note that these have been developed after liaison with Emergency Services in the State or Territory – and EMA</i></p>	<p style="text-align: center;"><u>System Summary</u></p> <p>Details of Severe Tropical Cyclone George at 12:00 pm WDT.</p> <p>Location of centre : within 35 kilometres of latitude 18.3 south longitude 119.1 east</p> <p>Recent movement : south at 19 kilometres per hour Central Pressure : 950 hectopascals</p> <p>Maximum wind gusts : 195 kilometres per hour near the centre. Severity category : 3</p> <p style="text-align: center;"><i>Brief summary of cyclone details</i></p>

Emergency Services Statement

FESA-State Emergency Service advises of the following alerts.
YELLOW ALERT: People in or near coastal and island communities between Wallal and Mardie including Port Hedland, Roebourne, Wickham, Karratha, Point Samson and Dampier should be taking action in preparation for the cyclone's impact.

BLUE ALERT: People in or near coastal and island communities between Mardie and Onslow and between Wallal and Broome, and in or near the inland communities of Marble Bar, Nullagine, Tom Price and Pannawonica should commence taking precautions.

Official FESA alerts added to Bureau product

(not all Regions)

Next Issue

The next advice will be issued by 2:00 pm WDT Thursday 08 March.

*Advises when next schedule warning should be expected.
 Note that if expectations change significantly, a warning may be issued at an earlier time*

Links to Other Information

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

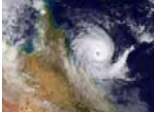
A map showing the track of the cyclone is available at: <http://www.bom.gov.au/weather/wa/cyclone>

Provides information on other sources for this and other relevant information

Other Information on Warnings



Cyclone vs Tornado



A tornado IS NOT a "Mini cyclone"

- | | |
|---|--|
| <ul style="list-style-type: none"> • Circulation driven by Earth's Rotation • 100's-1000km across • Lasts for days | <ul style="list-style-type: none"> • Circulation driven by local rotation + "ballerina effect" • 10's – 100m across • Lasts for minutes |
|---|--|

A **Willy-Willy** has had different meaning in time. In the 19th and early 20th Century – Cyclones were sometimes called Willy-Willies; in more recent times this refers to "Dust Devils", a tamer cousin of tornados.

It originates from an Aboriginal dialect



(above left) Tornado, Victoria. (Photography by Jan Osmotherly)
 (above right) Dust devil, Western Australia. (Photography by Fritz Fitton)

Warnings Information on the Web

Bureau Web Site >>>>

Radio – when all else fails



Check the batteries and HOLD ON TIGHT!

Greg Hattum B&H

**DON'T
PANIC!**

Tropical cyclone warning

IDW24100

Australian Government Bureau of Meteorology
Western Australia

Media: Transmitters serving the area between Wallal and Mardie are requested to sound the Standard Emergency Warning Signal before broadcasting the following warning.

TOP PRIORITY

TROPICAL CYCLONE ADVICE NUMBER 35

Issued at 1:05 pm WDT on Thursday, 8 March 2007

BY THE BUREAU OF METEOROLOGY

TROPICAL CYCLONE WARNING CENTRE PERTH

A CYCLONE WARNING for a SEVERE CATEGORY 3 cyclone is now current for coastal areas from Onslow to Broome, extending inland to include Tom Price, Marble Bar and Nullagine.

A CYCLONE WATCH is now current for coastal areas from Coral Bay to Onslow, and extending into the southern Pilbara and northern Gascoyne to include Newman and Mt Augustus.

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GALES with wind gusts to 120 kilometres per hour are developing along the Pilbara coast near Port Hedland and are expected to extend along the coast and to inland areas tonight.

VERY DESTRUCTIVE winds with wind gusts to 235 kilometres per hour may develop along the central Pilbara coast overnight tonight or Friday morning as the cyclone approaches.

WIDESPREAD HEAVY RAIN and **FLOODING** are likely across the Pilbara in the next two days.

DANGEROUSLY HIGH TIDES could cause **EXTENSIVE FLOODING** at the coast between Wallal and Dampier.

Residents on the coast between Wallal and Dampier including Port Hedland and Karratha, Dampier and Roebourne are specifically warned of the potential of a **VERY DANGEROUS STORM TIDE** as the cyclone crosses the coast. Tides are likely to rise significantly above the normal high tide mark with very dangerous flooding and damaging waves.

Details of Severe Tropical Cyclone George at 12:00 pm WDT.

Location of centre : within 35 kilometres of
latitude 18.3 south longitude 119.1 east
Recent movement : south at 19 kilometres per hour
Central Pressure : 950 hectopascals
Maximum wind gusts : 195 kilometres per hour near the centre.
Severity category : 3

FESA-State Emergency Service advises of the following alerts.

YELLOW ALERT: People in or near coastal and island communities between Wallal and Mardie including Port Hedland, Roebourne, Wickham, Karratha, Point Samson and Dampier should be taking action in preparation for the cyclone's impact.

BLUE ALERT: People in or near coastal and island communities between Mardie and Onslow and between Wallal and Broome, and in or near the inland communities of Marble Bar, Nullagine, Tom Price and Pannawonica should commence taking precautions.

The next advice will be issued by 2:00 pm WDT Thursday 08 March.

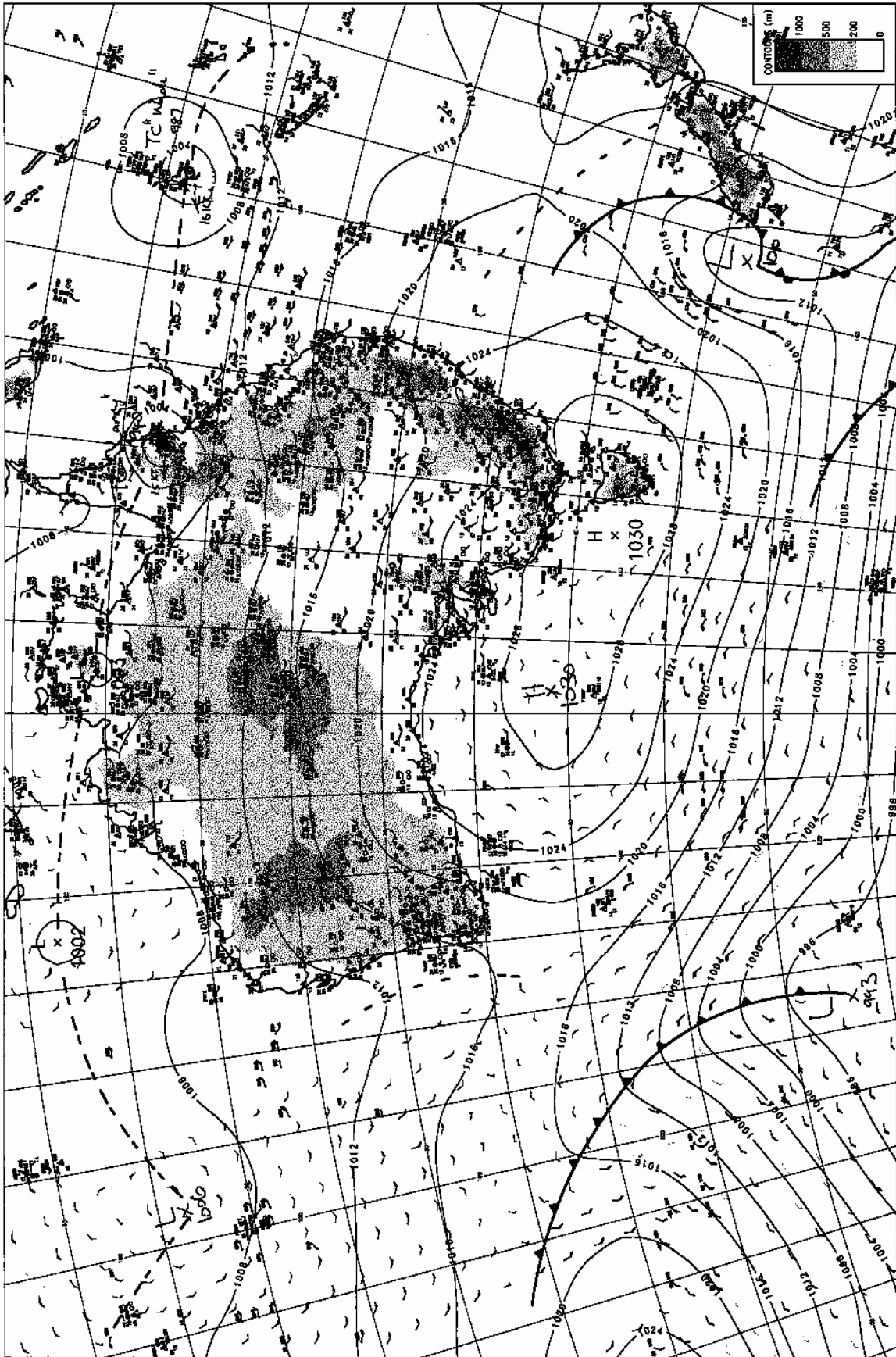
Cyclone advices and State Emergency Service Community Alerts are available by dialling 1300 659 210

A map showing the track of the cyclone is available at:

<http://www.bom.gov.au/weather/wa/cyclone>

Tropical cyclone synoptic chart

Surface chart- 00:00UTC Monday 20 Mar 2006
MSL PRESSURE (mb) DT 0Z 20/ 3/ 6 T+0 VT 0Z 20/ 3/ 6
Archive printed at 08:11UTC 20/03/2006



Surface chart- 00:00UTC Monday 20 Mar 2006 10am EST

Weather forecasts**FORECASTS FOR Monday, 20 March 2006****CONTENTS**

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Weather Chart Provided Separately

DEFINITION: Précis: - summary

COASTAL WATERS FORECAST

IDQ11260

Australian Government Bureau of Meteorology
Queensland

Coastal Waters Forecast for Northern Queensland
Issued at 3:05 pm EST on Sunday 19 March 2006
Valid until midnight Wednesday

Please Be Aware

Wind gusts can be a further 40 percent stronger than the averages given here, and maximum waves may be up to twice the height.

IDQ1126005

Warnings

A storm warning is current between Cairns and Bowen.

A gale warning is current from Cape Tribulation to Cairns and from Bowen to Mackay.

A strong wind warning is current from Cape Melville to Cape Tribulation and south of Mackay.

Synoptic Situation

The monsoon trough extends across northern Cape York Peninsula. At 1pm EST, TC Larry was located about 250 nautical miles east of Innisfail and moving west at 15 knots. The cyclone is expected to cross the north tropical coast, between Cairns and Cardwell early Monday morning.

IDQ1126001

Peninsula Waters, Torres Strait to Cooktown:

A strong wind warning is current south of Cape Melville.

Sunday until midnight: SW/SE winds 10/15 knots, increasing to 15/20 knots south of Lockhart River, 20/33 knots south of Cape Melville. Seas to 1.2 metres in the north increasing to 2 to 3 metres in southern waters. Showers and isolated thunderstorms with squalls.

Monday: W/NW winds 10/15 knots in northern waters, increasing to 15/25 knots south of Lockhart River, 25/33 knots south of Cape Melville gradually easing in the afternoon and evening. Seas to 1.2 metres in the north grading to 3 to 5 metres in the south. Showers and isolated thunderstorms with squalls.

Tuesday: NW/NE winds easing to 10/15 knots.

Wednesday: SE/NE winds 10/15 knots.

IDQ1126002

North Tropical Waters, Cooktown to Cardwell:

A storm warning is current south of Cairns. A gale warning is current from Cape Tribulation to Cairns. A strong wind warning is current north of Cape Tribulation.

Sunday until midnight: SW/SE winds 25/33 knots, increasing 34/40 knots south of Cape Tribulation and reaching 40/60 knots south of Cairns tonight. Seas and SE/E swell 4 to 5 metres outside the reef, and seas rising to 2 to 3 metres inside.

Showers increasing to rain areas.

Monday: Clockwise winds 45/65 knots early, reaching 90 knots near the centre of TC Larry south of Cairns. Seas and swell 5 to 6 metres outside the reef, and seas to 3 to 4 metres inside. Rain areas with squalls. Winds and seas gradually easing during the afternoon and evening.

Tuesday: SE/E winds 20/30 knots.

Wednesday: SE winds 20/25 knots.

IDQ1126003

Tropical Waters, Cardwell to Bowen:

A storm warning is current.

Sunday until midnight: S/SE winds 25/33 knots, increasing to 40/60 knots this evening. Seas and swells 4 to 5 metres. Showers increasing to rain with squalls at night.

Monday: SE/E winds 40/60 knots, reaching 50/70 knots in the north early. Winds gradually easing during the afternoon and evening. Seas and swells 4 to 5 metres. Rain areas with squalls.

Tuesday: SE/E winds 25/33 knots.

Wednesday: SE winds 20/30 knots.

IDQ1126004

Central Coast Waters, Bowen to St Lawrence:

A gale warning is current north of Mackay. A strong wind warning is current south of Mackay.

Sunday until midnight: Bowen to Mackay.. SE winds 30/40 knots, increasing to 35/45 knots in far northern waters. Seas 4 to 5 metres in open waters. Showers increasing to rain areas in the evening.

Mackay to St. Lawrence.. SE winds 25/33 knots. Seas to 3 metres in open waters. Showers increasing to rain areas in the evening.

Monday: Bowen to Mackay.. SE winds 35/45 knots in far northern waters, and gradually easing 30/40 knots during the afternoon and night. Seas 4 to 5 metres in open waters. Rain areas with squalls.

Mackay to St. Lawrence.. SE winds 25/33 knots. Seas to 3 metres in open waters. Rain areas with squalls.

Tuesday: SE winds 25/33 knots.

Wednesday: SE winds 25/30 knots.

The next routine forecast will be issued at 4:35 am EST Monday.

SMALL BOATS FORECAST

IDQ17500

BUREAU OF METEOROLOGY

Queensland Region

Brisbane Office

BOATING WEATHER FOR SOUTHEAST QUEENSLAND COASTAL WATERS

Issued at 3:40pm on Sunday the 19th of March 2006

PLEASE BE AWARE

Wind gusts can be a further 40 percent stronger than the averages given here, and maximum waves may be up to twice the height.

[issued 1506 Sunday]

SYNOPTIC SITUATION

A large high about 1030 hPa will move slowly east from the Bight and strengthen the ridge along the southern Qld coast. TC Larry was located about 250 nautical miles east of Innisfail at 1pm and moving west at 15 knots. The cyclone is expected to cross the north tropical coast, between Cairns and Cardwell early Monday morning.

[issued 1105 Sunday]

FORECAST FOR MORETON BAY

Sunday until midnight: SE winds 15/20 knots. Seas to 0.9 metres in open waters.

Isolated showers.

Monday: S/SE winds increasing to 20/25 knots. Seas rising to 1.2 metres in open waters. Scattered showers.

Tuesday: SE winds 20/30 knots.

Wednesday: SE winds 20/30 knots.

[issued 1506 Sunday]

DOUBLE ISLAND POINT TO COOLANGATTA A strong wind warning has been issued.

Sunday until midnight: SE winds 15/20 knots, increasing to 20/25 knots north of Cape Moreton. Seas to 1.8 metres, rising to 2.5 metres north of Cape Moreton. A 1.5 metre E'y swell increasing in northern waters. Isolated showers.

Monday: SE winds increasing to 25/30 knots. Seas rising to 2.5 to 3 metres on an increasing SE/E swell. Scattered showers.

Tuesday: SE winds 25/30 knots.

Wednesday: SE winds 25/30 knots.

WEATHER REPORTS

	Time	Wind	Weather	Seas	Swell
	EST	Dir	Knots	Ht	Ht/Length Dir
Double Is Pt	1530	SSE	19		

Tewantin - - -

Maroochydore 1530 SE 14

Brisbane Ap 1530 ESE 10

Redcliffe 1530 SSE 16

Cape Moreton 1530 SE 18

Spitfire Chnl 1530 ESE 15

Inner Beacon 1530 SSE 13

Banana Bank 1530 SSE 14

G C Seaway 1530 SE 13

Coolangatta 1530 SE 10

Point Lookout 1500 SSE 15 3 <2 E

TIDES AT THE BRISBANE BAR

[courtesy Marine Safety Queensland and the National Tidal Centre]

High Tide: 2.1m on Mon at 12.22am and 1.8m on Mon at 12.19pm

Low Tide: 0.5m on Sun at 06.00pm and 0.8m on Mon at 06.42am

TIDES AT MOOLOOLABA

[courtesy Marine Safety Queensland and the National Tidal Centre]

High Tide: 1.6m on Sun at 10.58pm and 1.3m on Mon at 10.49am

Low Tide: 0.4m on Sun at 04.24pm and 0.6m on Mon at 05.10am

TIDES AT GOLD COAST SEAWAY

[courtesy Marine Safety Queensland and the National Tidal Centre]

High Tide: 1.4m on Sun at 11.10pm and 1.1m on Mon at 11.08am

Low Tide: 0.2m on Sun at 04.27pm and 0.4m on Mon at 05.23am

TIME OF SUNRISE/SUNSET FOR BRISBANE

Sunday

Sun and Moon

Sunrise 0551 Moonset 0918

Sunset 1801 Moonrise 2014

A voice recording of these forecasts and weather reports is now available on 1900 926 115 at a call charge of 77 cents per minute.

STATE FORECAST

IDQ10700

UPDATED

Australian Government Bureau of Meteorology
Queensland

QUEENSLAND WEATHER FORECAST

Issued at 3:14pm on Sunday the 19th of March 2006

IDQ1070001

UPDATED

WARNING SUMMARY

1. A Tropical Cyclone Warning is current for coastal and island communities from Cape Tribulation to Mackay, and extending to inland areas about Croydon, Greenvale and Charters Towers.
2. A Storm Warning is current for coastal waters Cairns to Bowen.
3. A Gale Warning is current for coastal waters Cape Tribulation to Cairns.
3. A Strong Wind Warning is current for coastal waters Cape Melville to Cape Flattery, and Mackay to Coolangatta including Hervey and Moreton Bays.

STATE FORECAST

for the rest of Sunday and Monday

A few showers and thunderstorms about Cape York Peninsula and the Gulf of Carpentaria. Showers about the tropical coast increasing to heavy to flood rain overnight between about Cairns and Mackay with flooding of some low-lying areas. Rain spreading west across the tropical interior on Monday with at least moderate to heavy falls. Isolated showers near the remaining east coast, scattered on Monday. Gale to above storm force winds developing about the coast between Cape Tribulation and Mackay overnight. Fresh to strong SE winds developing about the remaining east coast. Lighter SE to NE winds elsewhere.

IDQ1070002

EXTENDED OUTLOOK

In the short term, Tropical Cyclone Larry will continue to move in a general westerly direction and on present indications cross the tropical coast between Innisfail and Cardwell Monday morning. The cyclone will then slowly decay overland, and the ex-cyclone is likely to pass near the southeast corner of the Gulf of Carpentaria during Tuesday and later enter the Northern Territory. It will be monitored for any further development as it nears the Gulf waters. Rain and isolated thunderstorms with at least moderate to heavy falls to spread across the northern interior of the state with the ex-cyclone, contracting further north and west by mid-week. A few showers and thunderstorms will continue over Cape York Peninsula during this period also.

A new large high will move slowly east from the Bight and reach the Tasman Sea on Tuesday, then remain in this area until the end of the week. While winds should gradually ease along the north tropical coast in the wake of the cyclone, SE winds can be expected to remain at least strong along the rest of the east coast to the New South Wales border. Scattered showers near the east coast, more isolated about the adjacent inland. Some high cloud over the southwest may give some patchy light rain due to an upper trough over New South Wales.

Overnight minimum temperatures will tend above the March average over much of the state due to the moist and cloudy conditions, particularly in the north and west. However, maximum temperatures will tend below average particularly in the north as the cloud and rain spreads west with the ex-cyclone.

MAJOR CITIES: PRECIS

IDQ10740

Australian Government Bureau of Meteorology

Queensland

PRECIS FORECASTS FOR BRISBANE, CAIRNS AND TOWNSVILLE

Issued at 3:30pm on Sunday the 19th of March 2006

for Monday

BRISBANE : Shower or two MIN 20 MAX 30

Outlook for Tuesday ... A few showers MAX 29

Wednesday ... Shower or two MAX 28

Thursday ... A few showers MAX 28

CAIRNS : Rain, Showers, windy MIN 23 MAX 29

TOWNSVILLE : Rain, windy MIN 23 MAX 28

PROVINCIAL CITIES FORECASTS

IDQ10600

Australian Government Bureau of Meteorology

Queensland

PROVINCIAL CITY FORECASTS

Issued at 4:51pm on Sunday the 19th of March 2006

for Monday

	WEATHER FORECAST	MIN	MAX	UV FORECAST
Thursday Island	Showers, storm	26	31	16
Cooktown	Showers, storm	24	31	15
Cairns	Rain, Showers, windy	23	29	15
Mareeba	Rain, showers, windy	22	28	15
Innisfail	Rain, showers, windy	23	29	15
Ingham	Rain, windy	24	28	14
Townsville	Rain, windy	23	28	14
Ayr / Home Hill	Rain, windy	24	28	14
Bowen	Rain, windy	25	30	14
Charters Towers	Rain, windy	23	28	14
Normanton	Showers, storm	24	35	14
Weipa	Showers, storm	24	31	15
Mackay	Rain, windy	24	26	14
Rockhampton	A few showers	24	29	13
Gladstone	A few showers	24	29	12
Yeppoon	A few showers	25	27	13
Biloela	Mostly fine	22	31	12
Emerald	Mostly fine	24	29	13
Clermont	Mostly fine	23	32	13
Moranbah	Few showers	24	32	14
Mt Isa	Rain periods	23	34	14
Longreach	Rain developing	24	35	13
Winton	Rain developing	24	35	13
Charleville	Fine	22	35	11
Roma	Fine	21	34	11
Toowoomba	Fine	17	28	10
Dalby	Fine	17	32	10
Warwick	Fine	16	30	10
Goondiwindi	Fine	19	33	10
Bundaberg	A few showers	22	29	11
Hervey Bay	A few showers	23	28	11
Maryborough	A few showers	22	30	11

Gympie	Shower or two	20	30	11
Kingaroy	Mostly fine	17	31	10
Brisbane	Shower or two	20	30	10
Ipswich	Chance of shower or two	18	32	10
Gold Coast	A few showers	20	28	10
Sunshine Coast	A few showers	22	28	10

UV ratings are : greater than 10 - extreme (ex); 8-10 very high (vh); 6-7 high (h); 3-5 moderate (m). The first figure is for clear skies or scattered cloud.

If there is a second figure it is the UV rating when under cloud.

DISTRICT FORECASTS

IDQ10050

Australian Government Bureau of Meteorology

Queensland

FORECASTS FOR NORTHERN QUEENSLAND

Issued at 4:45pm on Sunday the 19th of March 2006

for Sunday night and Monday

IDQ1005001

NORTHERN REGION OVERVIEW

A cyclone warning is current for coastal and island communities from Cape Tribulation to Mackay, and extending inland to about Croydon, Greenvale and Charters Towers. A cyclone watch extends inland to Normanton. A preliminary flood warning has been issued for coastal rivers between Innisfail and Mackay. Rain areas and thunderstorms and heavy falls over SE coastal parts, extending further inland on Monday. Scattered showers and thunderstorms elsewhere, tending isolated this evening in southern inland parts.

IDQ1005002

PENINSULA DISTRICT

Scattered showers and isolated thunderstorms. Rain areas in the far south on Monday. Moderate SE to NE winds, tending fresh westerly in the south.

Outlook for Tuesday ... Scattered showers and thunderstorms. Rain in the south.

Outlook for Wednesday ... Scattered showers and thunderstorms.

IDQ1005003

GULF COUNTRY DISTRICT

A cyclone watch has been issued.

Rain areas and isolated thunderstorms in the far west at first and developing throughout during Monday. Light to moderate SE to NE winds, freshening on

Monday.

Outlook for Tuesday ... Rain areas and thunderstorms.

Outlook for Wednesday ... Rain areas and isolated thunderstorms.

IDQ1005004

NORTHERN GOLDFIELDS AND UPPER FLINDERS DISTRICT

A CYCLONE WARNING IS CURRENT.

Rain areas and isolated thunderstorms developing in far eastern parts this evening and extending throughout during Monday. Moderate to fresh SE winds, strong to gale force in the east by Monday.

Outlook for Tuesday ... Showers, storms and rain areas clearing from the southeast.

Outlook for Wednesday ... Isolated showers and thunderstorms in the north and west.

IDQ1005005

NORTH TROPICAL COAST AND TABLELANDS DISTRICT

A CYCLONE WARNING IS CURRENT. A preliminary flood warning has been issued for coastal rivers south of Innisfail.

Showers increasing, with rain periods and thunderstorms with moderate to heavy falls. SE winds increasing strong to gale force overnight then turning SW north of Severe Tropical Cyclone Larry.

Outlook for Tuesday ... Rain areas, showers easing during the day with moderate to heavy falls possible. Winds easing.

Outlook for Wednesday ... Showers and rain periods.

IDQ1005006

CAIRNS

A CYCLONE WARNING IS CURRENT.

Showers increasing, rain periods developing overnight with squally thunderstorms. Moderate to heavy falls likely. SE winds increasing to strong to gale force and turning SW tomorrow.

MIN 23 MAX 29

UV INDEX - 15 [Extreme]

Outlook for Tuesday ... Rain periods/thunderstorms.

IDQ1005007

HERBERT AND LOWER BURDEKIN DISTRICT

A CYCLONE WARNING IS CURRENT. A preliminary flood warning has been issued for coastal stream south of Innisfail.

Showers increasing to squally rain periods and thunderstorms overnight and Monday with moderate to heavy falls. SE winds strengthening to gale force tonight and Monday.

Outlook for Tuesday ... Rain areas.

Outlook for Wednesday ... Isolated showers.

IDQ1005008

TOWNSVILLE

A CYCLONE WARNING IS CURRENT.

Showers increasing to squally rain periods and thunder tonight and Monday. SE

winds increasing to gale force tonight and Monday.

MIN 23 MAX 28

UV INDEX - 14 [Extreme]

Outlook for Tuesday ... Rain periods.

IDQ1005009

NORTHERN CITIES PRECIS

for Sunday night and Monday

Forecast for Sunday

Night

Cairns	Showers, windy
Mareeba	Showers, windy
Innisfail	Showers, windy
Ingham	Rain, windy
Townsville	Rain, windy
Ayr / Home Hill	Rain, windy
Bowen	Rain, windy
Charters Towers	Rain developing

Forecast for Monday

		MIN	MAX	UV FORECAST
Cairns	Rain, Showers, windy	23	29	15
Mareeba	Rain, showers, windy	22	28	15
Innisfail	Rain, showers, windy	23	29	15
Ingham	Rain, windy	24	28	14
Townsville	Rain, windy	23	28	14
Ayr / Home Hill	Rain, windy	24	28	14
Bowen	Rain, windy	25	30	14
Charters Towers	Rain, windy	23	28	14

UV ratings are : greater than 10 - extreme (ex); 8-10 very high (vh); 6-7 high (h); 3-5 moderate (m). The first figure is for clear skies or scattered cloud.

If there is a second figure it is the UV rating when under cloud.

COASTAL WIND WARNING

IDQ20010

Australian Government Bureau of Meteorology

Queensland

TOP PRIORITY

Coastal Waters Wind Warning

For coastal waters from Cape Melville to Coolangatta.

Issued at 4:50 pm EST on Sunday 19 March 2006

Synoptic Situation

Severe Tropical Cyclone Larry with central pressure 935 hectopascals centred at 4 pm near 17.6S 149.7E, which is 210 nm east of Innisfail and moving in a general westerly direction at about 13 knots. Position good. The cyclone is expected to continue intensifying as it continues to move in a general westerly direction. The core of the cyclone is expected to be near the north Tropical Coast between Cairns and Cardwell early Monday morning.

Storm Warning

Cairns to Bowen

Clockwise winds at 40/60 knots will develop overnight and increase to hurricane force 100/110 knots near the centre of the cyclone. Seas will increase to above 3-5 metres. .

Gale Warning

Cape Tribulation to Cairns

SW/S winds will increase to 35/45 knots overnight and Monday morning. Seas will increase to 3-5 metres.

Gale Warning

Bowen to Mackay

SE winds will increase to 35/45 knots overnight. Seas will increase to 3-5 metres. These conditions are expected to continue on Monday.

Strong Wind Warning

Cape Melville to Cape Tribulation

SW to S winds are expected to increase to 25/30 knots overnight. Seas will rise to 3 metres on an increasing SE/E swell. These conditions are expected to continue on Monday.

Strong Wind Warning

Mackay to Coolangatta including Hervey and Moreton Bays

SE winds will increase to 25/33 knots during the evening and on Monday. Seas will rise to 3 metres on an increasing SE/E swell. These conditions are expected to continue on Monday.

The next warning will be issued by 8 pm AEST Sunday.

Please be aware

Wind gusts can be a further 40 percent stronger than the averages given here, and maximum waves may be up to twice the height.

----- End of warning -----

For coastal waters forecasts call 1900 969 923 (cost 77c per minute, incl GST)

Media: TOP PRIORITY (Broadcast on receipt and repeated at least hourly.)

Media: PRIORITY (Broadcast as soon as possible, but not later than one hour after receipt. Repeat in normal news and weather.)

TROPICAL CYCLONE ADVICE

IDQP0005

Australian Government Bureau of Meteorology

Queensland

Tropical Cyclone Warning Centre

Media: For immediate broadcast. Transmitters in the area Cape Tribulation to Mackay are requested to use the Standard Emergency Warning Signal.

TOP PRIORITY

TROPICAL CYCLONE ADVICE NUMBER 11

Issued by the Bureau of Meteorology, Brisbane

Issued at 4:51pm on Sunday the 19th of March 2006

A Tropical Cyclone WARNING is now current for coastal and island communities from Cape Tribulation to Mackay, and extending to inland areas about Croydon, Greenvale and Charters Towers.

A Tropical Cyclone Watch extends inland to near the Normanton area.

At 4 pm AEST Sunday, Severe Tropical Cyclone Larry, category 4 with central pressure 935 hectopascals, was centred in the Coral Sea near latitude 17.6 south and longitude 149.7 east, about 390 km east of Innisfail. The cyclone is expected to intensify further, and move in a general westerly direction at about 25 km/h over the next 24 hours. The centre of Severe Tropical Cyclone Larry is likely to be near the Queensland coast early Monday morning.

Damaging winds with gusts to 120 km/h are expected to develop about the Whitsunday Islands late this afternoon, and extend to the coast between Cape Tribulation and Mackay tonight.

Very destructive winds may develop on the coast between Cairns and Bowen on Monday morning, with maximum wind gusts reaching 280 km/h near the centre of the cyclone.

Coastal residents between Cairns and Townsville are specifically warned of the dangerous storm tide as the cyclone crosses the coast. The sea is likely to steadily rise up to a level which will be significantly above the normal tide, with damaging waves, strong currents and flooding of low-lying areas extending some way inland. People living in areas should be prepared to evacuate if advised by authorities.

A preliminary flood warning has been issued for coastal rivers and streams between Innisfail and Mackay.

Details of Severe Tropical Cyclone Larry, Category 4, for 4 pm AEST Sunday

Central Pressure : 935 Hectopascals

Location of Centre : within 20 kilometres of

latitude 17.6 degrees south

longitude 149.7 degrees east

about 390 kilometres east of Innisfail

Recent Movement : West at 25 kilometres per hour

Destructive winds : out to 120 kilometres from the centre

Maximum wind gusts : 240 kilometres per hour, intensifying

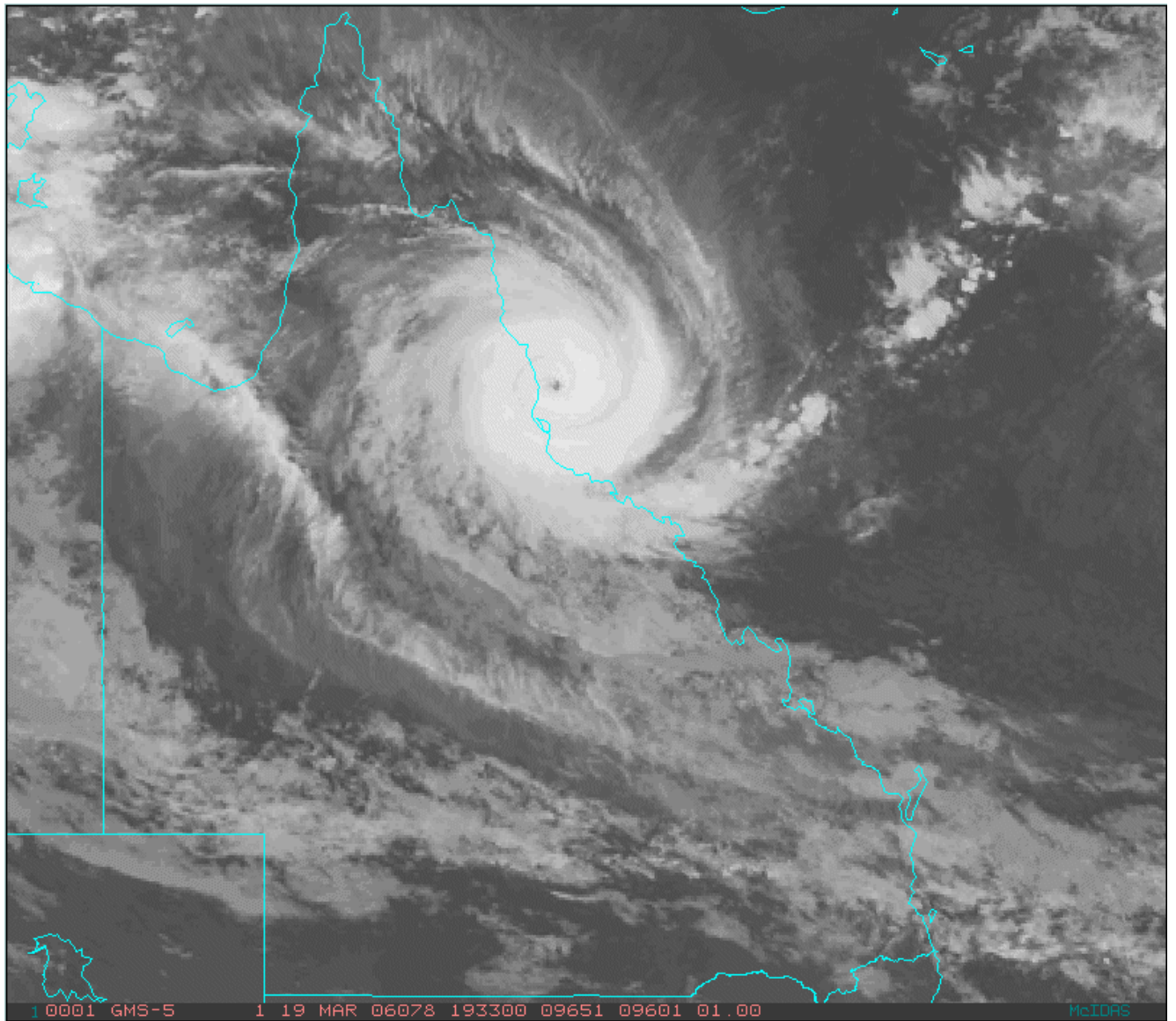
People between Cape Tribulation and Mackay and the adjacent inland should complete preparations before nightfall, especially the protection of boats and other property.

People over inland areas around Normanton and Croydon should consider what action they will need to take if the cyclone threat increases.

The next advice will be issued at 8 pm AEST Sunday.

This warning is also available through TV and Radio Broadcasts; the Bureau's website at www.bom.gov.au or call 1300 659 212. The Bureau and the State Emergency Service would appreciate this warning being broadcast regularly.

SATELLITE IMAGE



1933 UTC 19 March = 5:33 am EST 20 March

FORECAST DISTRICTS MAP



Notes from follow-up discussions

1. What two or three things did you find the best or most useful about the workshop?
 - A better understanding of BoM weather updates because of the breakdown of weather terms and descriptions which has increased confidence in presenting weather;
 - Indigenous website is useful and participants would like to see it expanded by BoM to include more Indigenous knowledge so they can tell weather in their language, BoM and broadcasters learning from each other and the website is a good cross-cultural initiative;
 - The visit to the weather station at the airport was really interesting to see how weather information is collated;
 - Networking and getting to know broadcasters from other communities and exchange ideas was good.

2. What two or three things about the workshop could be improved for another time?
 - More time for discussion/interaction to look at material with BoM people, participants would have liked longer to absorb the technical information and discuss what they were learning;
 - Presenter did slow down when asked to but some of presentations were too one way, time for more two way discussion would be good;
 - More involvement from other communities and broadcasters;
 - Some participants are from remote localities and it could help their participation if all those involved in the workshop are aware of the situation in remote localities.

3. Have you used the workshop information in any way?
 - Not used much directly, but expect to in future television program;
 - Try to make weather more interesting and give more explanation, if community is near a town the participant was more likely to contact BoM weather person and discuss the weather “on air”;
 - Participants had increased awareness of the Internet but not all can use Internet for varying reasons.

4. Have there been any difficulties in using the information?

- Participants receive weather updates in different ways; by fax, Internet or read from the newspaper, not all have Internet access or training to use it e.g. Indigenous Weather Knowledge and cyclone tracking map are useful only if communities have Internet access;
- Need to include local knowledge as often weather updates cover too broad a region for broadcasters to use effectively, difficulty finding local details e.g. tides times, one participant is keen to make their own weather station but it is too costly for personal expenditure;
- Weather is not an isolated source of information for Indigenous communities, would be of greater interest if incorporated with seasonal Indigenous knowledge of signs for hunting or gathering, two participants mentioned that they are preparing an Indigenous calendar including local tides, seasons for animal and plants, stinger season – no swimming etc;
- Cyclone names present problems for Indigenous communities and some participants said that they do not use the BoM names;
- Would be helpful for participants to have a permanent contact with BoM person for weather details to build up rapport.

5. What would you like to know next if there was another workshop?

- Tour of airport weather facilities worth having every time;
- More details on cyclone, tsunami warnings, storm surge, earthquake and information that is readily available to remote communities in their local area;
- More training on Internet use if/when they have the Internet available as links across the Top End with other communities are useful for weather and associated cultural activities;
- Not all areas are directly contactable by fax e.g. Palm Island fax is at the PCYC;
- Participants would like to know more about climate change as changes are already being felt and noticed in island communities, they feel they are the links to their communities.

 Prevention is not only more humane than cure; it is also much cheaper. Above all let us not forget that disaster prevention is a moral imperative, no less than reducing the risks of war.

United Nations Secretary-General
 Kofi Annan, July 1999.