Assessment of the Effectiveness of Various Methods of Delivery of Public Awareness Information on Tropical Cyclones to the Queensland Coastal Communities

Report prepared for Emergency Management Australia

by

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Table of Contents

1 Introduction 6

2 Aims 8

3 Methodology.....9

3.1 Survey technique 9

3.2 Population Sample..... 10

3.2.1 Gender..... 10

3.2.2 Age distribution 10

3.2.3 Length of residence 11

3.2.4 Home ownership – residency status 11

4 Results 12

4.1 Cyclone awareness information..... 12

4.1.1 Pre-cyclone season cyclone awareness information . 12

4.1.2 Pre-cyclone season public meetings 13

4.1.3 Cyclone awareness information in households..... 13

4.1.4 Cyclone tracking maps 15

4.1.5 Weather forecasts and weather information 16

4.2 Cyclone preparedness..... 18

4.2.1 Preparing properties for the cyclone season 18

4.3 Cyclone awareness 19

4.3.1 Cyclone categories 19

4.3.2 Awareness of storm surge 20

4.4 Cyclone warnings 21

4.4.1 Residents understanding of **cyclone watch**..... 21

4.4.2 Residents understanding of **cyclone warning** 22

4.4.3 Where residents access warnings during a cyclone .. 23

4.5 Previous cyclone experience 24

5 Discussion 26

5.1 Awareness of Information 26

5.2 Public meetings 27

5.3 Plotting Cyclones 28

5.4 Tropical Cyclone awareness 29

5.5 Weather forecasts 31

5.6 Cyclone preparation 31

6 Conclusion and Recommendations 33

7 References 36

8 Appendices 39

8.1 Appendix 1 Survey Questionnaire 39

8.2 Appendix 2 : When does a cyclone watch begin? – Survey responses 42

8.3 Appendix 3: What does a cyclone warning mean? – Survey responses 44

1 Introduction

The northern coastal areas of Australia are vulnerable to the impact of tropical cyclones and associated storm surges, particularly within the tropical wet season between the beginning of November and the end of April. Most of the population of this coastal zone is concentrated in Queensland, where all of the coastline from the Gold Coast to the Gulf of Carpentaria may be impacted by cyclones. Every year at least one, but usually several cyclones will cross this coastline. In Queensland alone, 409,000 people (ABS 1998a) live in Census Collection Districts that are within 1 kilometre of the coast, while almost three million live within 30 kilometres of the coast. Over the past decade Queensland coastal communities have experienced relatively rapid and sustained population growth and economic development. Australian Bureau of Statistics (ABS) census data confirms that during the early 1990's these coastal regions experienced a 15% increase in population; a 17% increase in the proportion of over 65 year-olds in the population; a 12% increase in those under 5 years old; a 26% increase in single parent families; a 31% increase in population from a non-English-speaking background; and a 40% increase in the indigenous population. (ABS 1998b)Thus, not only is there a large population in this cyclone prone region, it is a rapidly increasing population in which specifically identified vulnerable communities are also increasing rapidly in numbers.

Every year the Bureau of Meteorology conducts cyclone awareness campaigns before the cyclone season begins. The aim of these is to educate people, raise awareness of the cyclone hazard and instil behaviour and attitudes that contribute towards preparedness. The goal is to reduce the resident population's vulnerability to cyclone related losses through greater knowledge and awareness of both the hazard itself and appropriate defensive and protective actions. The campaigns take place through public meetings in coastal towns, local government briefings, and presentations to school students, media briefings, press articles and supplementary literature such as brochures and pamphlets. Post cyclone impact studies carried out throughout the North and Far North Queensland region since the mid-1990's, and general cyclone awareness and preparedness studies conducted by researchers, including those at the Centre for Disaster Studies, indicate however, that cyclone awareness within the resident

population remains less than ideal and that communities are generally not well prepared for land-falling tropical cyclones.

2 Aims

This study aims to evaluate the effectiveness of various components of the cyclone awareness campaigns that are currently supported by the Bureau of Meteorology - either individually or in cooperation with other agencies and organisations. The evaluation will identify strengths and weaknesses of the campaigns, and any failures of coverage within the community. The study further aims to explore community preferences for cyclone awareness information and education in terms of format and mode of delivery. It is anticipated that an understanding of any identified strengths and weaknesses will enhance the development of future cyclone awareness campaigns.

The overall goal of the study is to provide the Bureau of Meteorology with information that will enable it to improve the effectiveness of cyclone awareness campaigns. And thus ultimately reduce vulnerability to the cyclone hazard.

3 Methodology

The effectiveness of current cyclone awareness campaigns has been assessed using household surveys carried out in two Queensland cyclone-prone communities. Townsville and Cairns.

3.1 Survey technique

The survey instrument, to be delivered by telephone, was developed and administered to a population sample of 415 and 500 household residents in Townsville and Cairns respectively. An example of the survey questionnaire may be found in Appendix 1. Residents included in the survey were selected randomly from Telstra's white pages database of landline telephone numbers. Household residents in residential properties were specifically targeted for the study. Therefore, telephone numbers identified as belonging to business and commercial premises were excluded.

A team of interviewers and research assistants administered the questionnaire concurrently in Cairns and Townsville. Each team was trained, supervised and under the management and control of the Centre for Disaster Studies throughout the survey period. To avoid the possibility of systematically excluding any one group in the total population, telephone surveys were carried out between the hours of 0830 and 2100 seven days a week throughout December 2001 and January 2002. The purpose and origins of the study was explained to adult (>18 years old) household residents that answered the telephone calls. They were then invited to participate in the study. Approximately 25% of the telephone calls that were answered resulted in the successful completion of a questionnaire. Administration of the questionnaire took approximately 5 minutes. It explored residents, knowledge and experience of warnings, previous hazard response and behaviour, and included knowledge questions that unobtrusively explored people's understanding of weather forecast terminology, the hazard dangers and cyclone warnings. Questions relating to respondent demographics were included to ensure population samples could be confirmed as being representative and to facilitate comparison between data sets. Survey responses included both qualitative and quantitative data. Qualitative data has been categorised, presented and discussed.

Simple statistical frequency and descriptive analyses of quantitative data has been carried out using the computer based SPSS software.

Participation in surveys was voluntary. Respondents were assured that individual responses would remain confidential and that only aggregate data would appear in the final report. Ethical approval was obtained from appropriate institutional ethics committees.

3.2 Population Sample

3.2.1 Gender

Overall marginally more females than males responded to the survey questionnaire. This was consistent throughout both samples. It is highly unlikely that this will significantly bias survey findings.

Table 3.2.1. Gender
(% of total responses)

	Cairns N = 500	Townsville N = 415	All N = 915
Male	41.9	41	42
Female	58.1	59	58

3.2.2 Age distribution

Age distribution of adult respondents is generally representative of the total population with approximately 60% of the adult community being aged between 30 and 60 years old (ABS 1998b)

Table 3.2.2 - Age distribution of survey respondents
(% of total responses)

	Cairns N = 500	Townsville N = 415	All N = 915
18 < 30	20.6	21.7	20.8
30 < 40	26.0	21.2	23.8
40 < 60	37.2	37.3	37.3
60 < 75	8.7	15.7	11.9
> 75	7.1	3.4	5.8
No response	0.4	0.7	0.4

3.2.3 Length of residence

Survey results indicate that approximately 20% of residents in both Cairns and Townsville have moved to the city they currently live in, within the last five years. This result is consistent with other ABS data (ABS 1998b) and reflects the relatively rapid population growth and mobility of population in Queensland's coastal communities.

Table 3.2.3 Length of residence in current city of residence
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Less than 1 year	3.7	3.3	3.8
1 – 5 years	17.9	15.8	16.9
5 – 10 years	19.9	15.5	17.9
10 – 20 years	21.7	18.5	20.1
> 20 years	22.2	32.4	26.8
All life*	14.6	14.5	14.3

* As all respondents were older than 18 years this category reflects >18 years residence

3.2.4 Home ownership – residency status

The level of home ownership is shown to be significantly higher in Townsville than in Cairns. When the rate of outright home ownership and those with mortgages is combined in both Cairns and Townsville the result is roughly consistent with the national average of approximately two thirds of residential properties being tenanted by home owners/buyers and approximately one third by those renting.

Table 3.2.4 Residency status of Cairns and Townsville residents
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Owned	46.6	59.5	54.0
Paying mortgage	21.1	14.2	18.0
Private rental	25.8	19.8	23.1
Govt rental	3.0	3.3	4.1
No response	0.4	1.2	0.5

4 Results

4.1 Cyclone awareness information

4.1.1 Pre-cyclone season cyclone awareness information

To determine the success of the pre-season cyclone awareness campaigns that are carried out annually by the Bureau of Meteorology - often in cooperation with Queensland Department of Emergency Services and Cairns City Council - residents were asked to identify any cyclone awareness information they could recall having seen in the last two months. Results displayed in Tables 4.1.1a and 4.1.1b. indicate that a substantial proportion of the community (80%) is aware of having seen pre-season information about cyclones. This information has usually been accessed on the television, in pamphlets and in the newspaper. Very few residents recall seeing any information on the internet.

Table 4.1.1a - Residents that could recall seeing any information about cyclones during the past two months
(% of total responses

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Yes	78.9	82.4	80.5
No	21.1	17.6	19.5

Table 4.1.1b – Type of information about cyclones residents could recall seeing during the past two months
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Pamphlet	13.8	26.7	22.4
Newspaper	9.8	18.4	15.6
Magazine	0.8	0.2	0.6
Book	1.8	2.9	2.6
TV	45.6	26.7	41.8
Radio	3.0	2.2	3.0
Internet	1.0	0.2	0.8
BoM* web site	0.6	1.7	0.4
Other	1.2	1.1	2.6
No response	22.4	19.9	10.2

*Bureau of Meteorology

4.1.2 Pre-cyclone season public meetings

In addition to preparing and producing pre-season cyclone awareness literature, Bureau of Meteorology severe weather specialists annually conduct pre-cyclone-season public meetings to raise cyclone awareness in specifically identified community sectors. To date these have been targeted at the tourist industry and industries and individuals whose work and leisure pursuits are carried out in coastal waters. These meetings are generally well attended and are deemed to be successful in the context within which they are delivered. Results displayed in Table 4.1.2 however, indicate that the benefit of these public meetings is not reaching the greater community.

Table 4.1.2 – Residents that have attended a public meeting about cyclones
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Yes	4.2	4.8	4.5
No	95.8	95.2	95.5

4.1.3 Cyclone awareness information in households

Respondents were asked whether they had any information about cyclones 'on hand' in their homes, and if so to identify its type and its source. Results displayed in Table 4.1.3a and Table 4.1.3b indicate that three quarters of the households had some form of cyclone information in their homes, most often in the form of pamphlets or booklets.

Table 4.1.3a – Households with cyclone information 'on hand'.
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Yes	75.3	75.2	75.2
No	23.5	22.4	23
No response	1.2	2.4	1.8

Table 4.1.3b Type of information 'on-hand' in households (% of total responses)			
	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Pamphlet	42.6	51.0	56.8
Newspaper	3.4	5.8	5.5
Magazine	1.2	1.7	1.7
Book/Booklet	17.8	8.7	16.7
TV	1.0	0.5	0.9
Radio	-	0.5	0.3
Internet	0.2	1.4	0.1
Other	0.4	8.0	4.7
No response	33.4	22.4	13.3

While residents were generally aware of the type of information they had 'on-hand' there appears to be much confusion about its source. Data contained in Table 4.1.3c show that more than 60% either do not know or chose not to respond to the question.

Table 4.1.3c – Source of cyclone information 'on-hand' in households (% of total responses)			
	Cairns N = 500	**Townsville N = 415**	**All N = 915**
BoM	2.6	1.0	1.9
Council	9.4	10.4	9.8
Suncorp	3.2	0.7	2.1
QES,SES	1.6	1.4	1.5
Other	2.8	30.8	15.5
Cairns Post	16.4	-	9.0
Don't know	23.0	26.0	23.4
No response	41.0	29.7	36.8

To facilitate an investigation of the success of the direct Bureau of Meteorology public education efforts to raise community cyclone awareness, residents were asked to identify and describe any cyclone information they had in their homes that they believe to have been produced by the Bureau of Meteorology. Responses as shown in Table 4.1.3d and Table 4.1.3e indicate that very few believe the information they have on-hand is a product of the Bureau of Meteorology. This is significant as the credibility of the

source (or perceived source) of the information largely determines how people will act on it – and the advice it contains.

Table 4.1.3d - Households with cyclone information believed to have been produced by the Bureau of Meteorology 'on-hand'.
(% of total responses)

	Cairns N = 500	Townsville N = 415	All N = 915
Yes	25.2	5.3	16.3
No	56.8	92.8	73.2
No response	18.0	1.9	10.5

Table 4.1.3e – Type of information in households believed to have been produced by the Bureau of Meteorology.
(% of total responses)

	Cairns N = 500	Townsville N = 415	All N = 915
Pamphlet	5.2	1.4	3.5
Newspaper	1.8	0.2	1.1
Book/Booklet	8.8	0.5	5.0
TV	0.4		0.1
Radio	-	0.2	0.1
Internet	5.0	0.2	2.7
BoM web site		0.5	0.2
Other	3.4	2.2	2.8
No response	75.4	94.8	84.5

4.1.4 Cyclone tracking maps

When a tropical cyclone warning is current, residents are advised to listen to warning messages and to plot the track of the cyclone themselves. It is likely that some of the cyclone information available in households includes a copy of a Bureau of Meteorology cyclone-tracking map. Data displayed in Table 4.1.4 suggest that a significant proportion of residents do not use such maps to track the position and path of tropical cyclones that are threatening their communities. It is interesting to note that Townsville residents are more likely than Cairns residents to plot cyclone tracks.

Table 4.1.4 – Households where a cyclone-tracking map is used to plot the position of tropical cyclones posing a threat to coastal communities. (% of total responses)			
	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Yes	45.6	60.0	52.5
No	53.0	39.3	47.1
No response	1.4	0.7	0.4

4.1.5 Weather forecasts and weather information

An understanding of how people acquire and use weather forecasts and weather information – generally – has implications for the ideal preparation, format and presentation of specific weather information, particularly warnings. Within the survey, residents were quizzed about their weather forecast needs and habits and were then given the opportunity to indicate their preferred source and format of supporting weather information. Data contained in Tables 4.1.5a and 4.1.5b confirm that virtually all residents regularly and habitually access weather forecasts - usually daily.

Table 4.1.5a. Residents that use weather forecasts (% of total responses)			
	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Yes	96.0	97.8	97.6
No	2.6	1.4	2.1
No response	1.4	0.7	0.3

Table 4.1.5b When / how often weather forecasts are accessed and used (% of total responses)			
	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Daily	81.5	88.4	84.7
Few times a week	5.1	4.1	4.6
Once a week / weekends	1.8	0.5	1.2
Special occasions / recreation	5.1	0.7	3.1
Occasionally	3.2	1.7	2.5
Rarely	0.8	2.2	1.1
Other	-	1.1	0.5
Never	0.6	0.7	0.7
No response	1.8	1.2	1.5

Overwhelmingly residents choose to access weather forecasts on the television where the presentation is graphical and usually animated and the information is 'personally' delivered by the television stations 'weather-person'. Data contained in Table 4.1.5c reveal that residents frequently go to more than one source for weather forecasts with the radio, the newspaper, and increasingly the internet, being favoured second sources. 'Other' sources include work places and personal communications – usually family and friends.

Table 4.1.5c - Sources of weather forecasts*
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Newspaper	21.4	14.2	18.1
TV	86.0	88.7	87.2
Radio	43.8	55.9	49.3
Internet	9.6	5.5	7.8
BoM web site	4.6	8.2	2.5
Other	6.4	6.5	6.5

*Respondents may have indicated several or no responses to this question

Given the opportunity to express a preference for ways that information about weather related terms could be conveniently accessed residents frequently indicated a relatively lesser preference for the television and newspaper and a relatively greater preference for the Internet. Data contained in Table 4.1.5d details information sources residents consider would be convenient to access when actually **searching** for greater depth and detail in weather information.

Table 4.1.5d – What residents consider would be the most convenient way to find out more about weather related terms (weather information)*

(% of total responses)	**Cairns N = 500**	**Townsville N = 415**	**All N = 915**
Pamphlet	1.2	2.4	1.7
Newspaper	10.8	4.6	8.0
TV	19.6	20.0	19.8
Radio	7.8	4.6	6.3
Internet	34.6	8.0	22.5
BoM web site	9.8	11.6	10.6
Other	24.8	9.7	18.0

*Respondents may have indicated several or no responses to this question

4.2 Cyclone preparedness

4.2.1 Preparing properties for the cyclone season

Cyclone awareness campaigns include recommendations for pre-season household preparations that may minimise the effect of cyclone impact on properties. The effectiveness of the campaign may, in part, be measure by residents willingness to act on this advice. Survey results displayed in Table 4.2.1 indicate that two thirds of households carried out pre-season clean up of their homes and yards.

Table 4.2.1 - Households that carried out pre-cyclone-season clean-up of house and yard
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Yes	62.5	66.7	64.4
No	36.9	32.6	35.0
No response	0.6	0.7	0.6

Residents are generally aware of the preparatory behaviours that are recommended, yet one third of households fail to carry them out. In most instances it appears that these residents need support to achieve the clean-up, either from local authorities or from other people - for example, a local handy-man. (Table 4.2.2). This result tends to indicate that the campaigns are successful in giving information about the need to prepare properties.

Table 4.2.2 – Residents that needed help or support to clean yard and house
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
No	57.6	78.1	67
Council pick-up	28.2	12.5	21.1
Other	6.3	4.8	5.6
No response	7.9	4.3	6.3

4.3 Cyclone awareness

4.3.1 Cyclone categories

Tropical cyclones (in Australia) are rated in categories from 1 to 5 with Category 1 being the least severe and Category 5 the most destructive. Residents were asked to describe how cyclones are rated or put into categories. It is acknowledged that this question (18) as it appears in the survey questionnaire is poorly structured. Recognising this, telephone surveyors were trained to ask the question in a way that eliminated confusion without 'leading' the response.

It is clear that a majority of residents are aware that Australian cyclones are categorised by number – from 1 to 5 (Table 4.3.1a). There was some confusion about the extent of the categories with several respondents indicating 1 to 4 and 1 to 10. This is reflected in the following question (Table 4.3.1b) when just three-quarters of respondents correctly identified Category 5 as the category indicating the most severe cyclone.

Table 4.3.1a – Residents awareness of how cyclones are rated or put into categories (% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
1-5	86.0	78.1	82.7
Colour code	0.6		0.3
Letter code	0.2		0.1
Words	-	0.7	0.3
Other numerical scale	6.7	13.7	9.9
Don't know	5.9	6.5	6.2
No response	0.6	0.5	0.4

Table 4.3.1b – Residents awareness of category indicating the most severe cyclone. (% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
1	7.5	10.4	8.8
2	-	0.7	0.3
3	2.8	2.2	2.5
4	4.5	4.8	4.6
5	79.1	74.2	76.9
Other answer	5.3	2.9	4.2
No response	0.8	4.8	2.6

4.3.2 Awareness of storm surge

The risk of storm surge inundating coastal communities is associated with any land-falling tropical cyclone. In an attempt to investigate the community's awareness and understanding of this hazard, residents were asked to describe what they understood a 'storm surge' to be and any defensive actions they would take in the event of a storm surge being forecast. Data included in Tables 4.3.2a and 4.3.2b indicate that, despite the fact that information about storm surge is included in cyclone awareness campaign's, the community is inexactly informed about this hazard and residents have generally not considered what they would do when confronted with a storm surge threat.

Table 4.3.2a – Residents understanding of storm surge
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Raised dome of water	3.2	5.6	4.2
Higher sea level	16.6	18.6	18.1
Wind raising the water	8.3	13.0	10.7
Higher tide	31.4	46.7	38.6
Back up of water	1.4	3.6	5.4
Flood	5.7	0.7	3.5
Strong winds	1.2	0.5	0.9
Other	9.1	11.3	10.1
Don't know	1.4	19.8	20.7
No response	21.2	0.7	1.1

Table 4.3.2b – Residents intentions in the event of a forecast storm surge
(% of total responses)

	Cairns N = 500	**Townsville N = 415**	**All N = 915**
Evacuate	23.9	9.9	17.5
Go upstairs	1.0	0.2	0.7
Stay indoors	1.8	1.9	1.9
Wait for instruction	1.8	1.9	1.9
Other	2.2	3.6	2.9
Don't know	4.7	1.7	4.7
No response	64.5	77.5	70.5

4.4 Cyclone warnings

4.4.1 Residents understanding of cyclone watch

According to information provided on the Bureau of Meteorology web site a Tropical Cyclone Watch is issued:

(i) for the Gulf of Carpentaria Coast as soon as gales associated with a tropical cyclone or potential cyclone are expected to affect any coastal or island communities **within 48 hours but not within 24 hours.**

(ii) for the East Coast as soon as gales associated with a tropical cyclone or potential cyclone are expected to affect any coastal or island communities **within 48 hours but not within 24 hours** and it is considered likely that the mean winds will strengthen to exceed 75km/h (41 knots which is Beaufort force 9 or "strong gales")

Tropical Cyclone Watches contain a brief estimate of the cyclone's location, intensity, severity category and movement and the coastal area that could be affected. Watch messages are renewed every six hours.

Advice contained in cyclone awareness campaigns recommends specific preparatory and defensive actions to be carried out during the watch period. The effectiveness of these actions depends on their being carried out efficiently and in a timely manner. It is therefore essential that residents clearly understand what an active cyclone watch means to them in terms of the current - and potential future - threat the cyclone poses to them personally and to their communities.

Survey responses indicate a persistent and generalised poor understanding of when a cyclone watch is likely to begin. A table of all survey responses to this question appears in Appendix 2. Less than 10% of all respondents could give a correct answer – as defined by the Bureau of Meteorology. A further 10% stated clearly and directly that they did not know.

Understanding of A Cyclone Watch. Townsville and Cairns			
When Does a Cyclone Watch Begin ?	**Cairns percent**	**Townsville percent**	**Total**

Incorrect Answer	95	94	94.5
Correct Answer- “within 48 hours but not within 24 hours”	5	6	5.5
Total Numbers	493	415	908

Of the remaining responses – approximately half were partially correct or in some way demonstrated some limited understanding or awareness of risk. These responses frequently referred to the formation of a cyclone but incorrectly defined its position and movement - both spatially and temporally - in terms of when the watch period began. It is alarming that approximately 40% of all responses were absolutely incorrect. For example, those that stated that the entire wet/cyclone season (often defining the wrong months) was included in the watch period and those that suggested that cyclone watches start when atmospheric air pressure is low – or falls below 1000mb, or simply when weather is windy and wet. Any decisions and actions residents may take to mitigate cyclone-related loss based on these demonstrated understandings of a cyclone watch period will be seriously flawed.

4.4.2 Residents understanding of cyclone warning

According to information provided on the Bureau of Meteorology web site, a Tropical Cyclone Warning is issued:

(i) for the Gulf of Carpentaria coast as soon as gales associated with a tropical cyclone or potential cyclone are expected to affect any coastal or island community **within 24 hours.**

(ii) for the East Coast as soon as gales associated with a tropical cyclone or potential cyclone are expected to affect any coastal or island communities **within 24 hours** and it is considered likely that the mean winds will strengthen to **exceed 75 km/h** (41 knots).

Cyclone warnings will be issued for ALL cyclones that are expected to directly affect the coast or islands.

Tropical Cyclone Warnings identify the communities being threatened and contain the cyclone's name, its location, intensity (including maximum wind gusts and its severity category) and its movement. Forecasts of heavy rainfall, flooding and abnormally high

tides are included when necessary. Communities under threat are also advised to take precautions necessary to safeguard their lives and property.

Tropical Cyclone Warnings are issued every three hours. When a cyclone is under radar surveillance close to the coast and poses a severe threat, hourly advices are issued

Understanding of Meaning of Cyclone Warning.			
What does a Cyclone Warning Mean?	**Cairns percent**	**Townsville percent**	**Total**
Various incorrect answers	70	63	67
Various responses on being prepared	23	30	26
Cross coast "within 24 hours"	7	8	7
Total	493	415	908

North and Far-North Queensland residents' understanding of cyclone warnings, while not precise, does not appear to be as poorly informed as their understanding of cyclone watches. A list of all responses to the survey question relating to the meaning of a cyclone warning is included in Appendix 3. Very few respondents were able to accurately define a cyclone warning however, the majority demonstrated an awareness of the risk. More than three-quarters of the responses suggested an imminent threat and/or the need to be prepared. Few (< 3%) were actually incorrect and only 5% of respondents did not know. It should be noted that few that attempted to define the threat, spatially or temporally were absolutely correct in their response.

4.4.3 Where residents access warnings during a cyclone

Tropical Cyclone warning advice messages are issued by the Bureau of Meteorology and are disseminated to the public via a range of media. Content is essentially the same but presentation obviously depends on the media used. Residents are advised to have a battery operated radio available (tested and working) so that, in the likely event of a power blackout, they are able to continue to receive warning messages. Data displayed in Table 4.4.3 confirm that radio and television are the preferred media for accessing cyclone warnings. Cairns residents indicate a greater use of the radio than Townsville

residents. This probably reflects the relatively greater recent cyclone experience in Cairns and the unreliability of the local power supply during cyclones.

Table 4.4.3 – Where residents access tropical cyclone warnings during a cyclone*.
(% of total responses)

	Cairns N = 500	Townsville N = 415	All N = 915
Radio	90.5	73.0	82.3
Television	49.1	18.8	36.0
Internet	2.7	-	1.4
Telephone / fax	0.6	0.2	0.4
Family / Friends	0.6	3.4	1.9
Other	1.6	0.2	1.0
Don't know	0.6	0.7	0.6

*Respondents may have indicated several or no responses to this question

4.5 Previous cyclone experience

Cairns and Townsville have both experienced the direct, or near, impact of several land-falling tropical cyclones since 1997 (albeit usually low category cyclones). It is widely accepted that direct personal experience of a hazard is a powerful 'teacher' and effectively raises awareness of both the hazard and the risk. Residents were asked to identify their past cyclone experiences. Results presented in Table 4.5.1 confirm that the vast majority of residents consider that they have direct personal cyclone experience. Most of these have been cyclones that have impacted the North and Far North Queensland regions.

Table 4.5.1 Residents previous cyclone experience
(% of total responses)

	Cairns N = 500	Townsville N = 415	All N = 915
Yes	93.3	81.9	88.3
No	5.5	17.3	10.9
No response	1.2	0.2	0.7

For most residents the experience is described as being relatively recent. Many could not accurately identify cyclones by name and often responded in terms of *"…..the one that was about three or five years ago"* Overall the most commonly noted cyclone experiences were Althea (Townsville 24 December, 1971); Joy (24 December 1990 – did not make landfall in region); Justin (Cairns 23 March 1997); Rona (Daintree 11 February 1999); Steve (Cairns 27 February 2000) Tessi; (Townsville 3 February 2000); and Abigail (Cairns 24 February 2001).

5 Discussion

5.1 Awareness of Information

A range of cyclone awareness information is made available throughout Queensland's cyclone prone communities prior to and during the tropical cyclone season. This is produced by various agencies, including the Bureau of Meteorology, local Councils and Emergency Services, and presented via a range of media. Information is disseminated throughout the community electronically via the television, radio and internet; personally via public meetings; and in printed formats via newspapers, brochures, leaflets etc that are dropped in letterboxes, picked up from various offices, delivered to households and inserted in local newspapers.

Survey findings show that in the middle of the cyclone season, around 80% of the household residents could, in fact, recall having recently seen some information about cyclones and that approximately two thirds had kept information pamphlets and booklets in their households. A previous study in Cairns during the 1996 cyclone season found that less than 50% of residents could recall having received any pre-season cyclone information (Berry 1996). The current result indicates a level of success in agencies actually getting the information materials out into the community and shows that they have been successful in 'capturing' community attention. This reflects an increased effort by the information providers. It is also possible that the direct personal cyclone experience of many residents since 1996 has raised community awareness of a need for the information contained in these materials. It is significant however, that while most residents were aware of having seen information about cyclones, they often had difficulty in explaining the content and identifying the agency responsible for producing it. Sources of information that are readily available in many households, and that residents are apparently not well aware of, include the front section of most local telephone directories; the internet – on the Bureau of Meteorology web site and many others; and via various telephone information services.

The availability of cyclone awareness materials does not necessarily mean that people will effectively use the information it contains. Before a person will decide to act on hazard awareness information it must be understood, believed and internalised so that the individual personalises the risk. The information must also be consistent with their personal experience and belief systems. It is also true that education campaigns are more successful when individuals perceive a need to become more informed and actively seeks information. (Mileti and Sorensen, 1990)

It is interesting that when residents were asked to identify convenient ways of finding out more information about weather and weather related terms few identified the sources that they had previously stated were readily available in their households. More than 80% of respondents said that they had information in pamphlets, newspapers, magazines and booklets 'on-hand' in their households yet less than 10% said that they would go to these sources if they were actually looking for information. It is significant that overall almost one third of the residents surveyed considered that the internet would be a convenient way to find information if they perceived a need to search for more. The difference between the Cairns and Townsville responses to this question is difficult to explain. Population samples were shown to be representative and surveyor bias is unlikely.

5.2 Public meetings

The Bureau of Meteorology participates in the organisation and delivery of cyclone awareness information at public meetings annually, prior to the cyclone season. The most popular of these is notably the 'Weather on Water' series that is presented in all major coastal centres. The meetings are targeted at specific industry and interest groups and are run co-jointly with various other agencies such as Queensland Department of Emergency Services, Queensland Transport, local Councils etc. They are open to the general public and are widely advertised. While well attended by the targeted population they are not usually attended by the generally public. This is not unexpected, the targeted groups have identified specific information needs which are directly addressed

in this forum, individuals within the general population may not perceive a need to be informed on issues and topics discussed in the meetings. The Queensland Department of Emergency Services is currently evaluating the effectiveness of these meetings in disseminating cyclone awareness information and early indications are that the presentations are both well received and well understood (pers coms QDES Feb 2002).

5.3 Plotting Cyclones

Cyclone watch and warning advice messages that are graphically presented on the television include an animated threat map and/or satellite imagery and/or radar imagery. The message is both spoken and written on the screen. The SEWS (warning siren) may accompany the warning. Residents are both alerted to the message and given a very clear 'picture' of where they are in relation to the tropical cyclone.

Power blackouts frequently occur during cyclone warning periods, particularly as the cyclone approaches the coast. When televised warnings are no longer available residents must rely on an audio delivery of the message only. The position of the centre of the cyclone is described geographically (latitude and longitude) and by the distance (in kilometres and hours) from the coast – usually in relation to the direction and speed in which it is travelling. With no graphical image, residents with poor geographical knowledge of the coastal townships frequently have difficulty 'visualising' where the cyclone is currently positioned and the extent of the 'threat' area. It is therefore essential that residents plot the cyclone track themselves, preferably using a cyclone tracking map. These maps are based on the Bureau of Meteorology maps and are generally widely available throughout the community during the cyclone season. They are included in many of the pre-season cyclone awareness publications, in the front of most telephone books and may also be freely picked up at local Council offices, local branches of the SES, insurance offices, many banks, and regional offices of the Bureau of Meteorology. It is of some concern that in 40% of Townsville households and 53% of Cairns households, residents do not use cyclone-tracking maps to plot the position of tropical cyclones posing a threat to their communities.

5.4 Tropical Cyclone awareness

Tropical Cyclone awareness campaigns contain recommended preparatory and defensive actions that will enhance residents safety when tropical cyclones pose a threat to their households and their communities. The effectiveness of these recommended actions depends on them being carried out efficiently and in a timely manner. For residents to achieve this it is essential that they understand the information and the meaning of the weather terms being used. It is only then that they will accept the relevance of the information to them personally and perceive the risk accurately. Throughout the survey it was increasingly apparent that a significant proportion of residents did not have a good understanding of some of the weather terms relating to tropical cyclones.

Residents' understanding of cyclone categories was generally shown to be sound. While many had difficulty accurately defining the range of categories, 90% were aware that a low numbered category indicated a lower intensity cyclone and higher numbers indicated higher intensity cyclones. This result has been consistent throughout previous community cyclone awareness and post-disaster studies (Berry 1998; 199a; 199b; King 1999; King and Goudie 1998; Anderson-Berry 2000). Confusion about cyclone categories has previously been shown to be common, and while not directly addressed in this study it is useful to mention here that earlier studies have found that residents are frequently unable to accurately identify the categories that describe a 'Severe Cyclone' (Categories 3 – 5). This has been largely attributed to the way various television and radio presenters have announced cyclone warnings – for example Cyclone Steve (February 2000) was persistently referred to as a 'severe' Category 2 cyclone. This underscores the need for accuracy and consistency in the use of weather terms as they are presented to the public.

When a tropical cyclone poses a real or potential threat to coastal communities, the Bureau of Meteorology issues staged tropical cyclone advice messages throughout two phases. The first is the cyclone watch when residents are alerted, and the second is the warning phase when the threat is more imminent. Each phase indicates a specific level

of threat and particular defensive actions are indicated. Throughout the survey it was shown that residents generally have a poor understanding of what a cyclone watch means and when a cyclone watch is likely to begin. This seriously compromises their ability to prepare themselves and their properties adequately. The meaning of a cyclone warning is generally better understood. While many residents cannot accurately define a cyclone warning most are able to demonstrate an awareness of the seriousness of the situation and the need for them to take action that will enhance the safety of their households.

The need for residents to have a good understanding of what a cyclone watch and warning means, and when each is issued has particular relevance for this community. Various studies carried out over the past six years have clearly identified a trend whereby residents are increasingly preparing their household less efficiently for the cyclone season but more efficiently during the warning period (Anderson-Berry 2002)

The potential impact of a tropical cyclone is described throughout the cyclone awareness campaigns. Residents are generally highly aware of wind and rain effects but appear to be less aware of storm surge. This situation however, is gradually improving. In 1996 only half of the community residents could define a storm surge (Berry 1996; Anderson-Berry 2002). Since then successive cyclone awareness campaigns have included additional information about storm surge. These campaigns have been successful in raising community awareness of the phenomenon and its association with land-falling tropical cyclones but not in accurately explaining the processes. Therefore, residents perception of the risk is likely to be biased and decisions to take preparatory and defensive actions are likely to be ill-informed. This interpretation of the survey findings is supported by the fact that almost three quarters of the survey respondents could define storm surge in terms of an impact on the level of the sea, but that approximately the same proportion were unable to describe any actions they may take if a storm surge was forecast.

5.5 Weather forecasts

Almost everyone in the community pays some attention to daily weather forecasts. Residents are often critical of the accuracy of these forecasts but regularly tune into television and radio weather segments. Many seek more than one source and may watch the evening weather segment on television and listen to the morning forecasts on the radio or look in daily newspapers. What decisions people actually make that are based on the weather forecast information in not known. What **is** known however, is that for a short period of time each day almost every adult in the community seeks and focuses on weather forecast information that is usually televised, presented by a 'familiar' weather presenter and supported with animated graphics. This presents an excellent opportunity to introduce cyclone awareness information simply and concisely. It was interesting that throughout the survey process respondents frequently mentioned the local (regional) weather presenter and attributed some of their (correct) responses to what they had recalled him talking about during the weather segment. The weather presenter in question is a retired Bureau of Meteorology forecaster. He frequently 'adds' information and explains the weather charts that viewers are watching and various weather terms. He also includes a daily photograph (sent in by viewers) depicting interesting weather phenomena, and he quickly discusses the images. Judging on the anecdotal evidence, it appears that his efforts to personalise and localise the weather message are both popular and successful.

5.6 Cyclone preparation

The effectiveness of cyclone awareness campaigns is often measured in terms of the demonstrated level of community uptake of the recommendations. Throughout the cyclone awareness literature the need to adequately prepare properties at the beginning of the cyclone season – ahead of a realised cyclone threat – is emphasised. Survey responses indicate that approximately two thirds of the community did in fact carry out some level of seasonal preparation. Care must be taken when interpreting this result as proof of the success of the awareness campaign however as other North and Far North Queensland studies have shown that the level of seasonal preparation carried out is often minimal and decreasing over time (Anderson-Berry 2002). It is likely that many

respondents in the current study may have answered the question directly asking if they had carried out any pre-season clean up of their homes positively, because they believed this was the answer expected of them. Respondents were not asked to describe what type of clean-up they had carried out.

6 Conclusion and Recommendations

Throughout the literature there is consensus that hazard experience together with hazard education increases hazard awareness and contributes to a true perception of the hazard risk. Participants in the current study have been exposed to both the experience of land-falling tropical cyclones and intensified tropical cyclone awareness campaigns over the past six years. It is difficult therefore, to attribute the relative overall success of the cyclone awareness campaigns.

Based on the findings of the current study it is possible however, to attribute the relative success and effectiveness of various methods of delivery of public awareness information on tropical cyclones to North and Far North Queensland communities. This study has found residents in both Cairns and Townsville have demonstrated a growing awareness of some need to be informed about cyclones. They are generally taking notice of pre-season cyclone awareness campaigns and most keep some level of cyclone information in their homes, presumably to refer to when and if the need arises. The most successful media for disseminating pre-cyclone season cyclone awareness information is the television, followed by brochures and booklets that are short, concise and attempt to convey a simple and direct message that is usually focussed heavily on defensive and preparatory actions.

Residents express a need to be well informed about weather and weather events. Daily weather forecasts are regularly and habitually accessed, primarily via television, radio and newspapers, and tropical cyclone warnings are most often accessed via radio and television. For more detailed weather information residents increasingly suggest that the internet would provide a convenient a convenient source.

While residents demonstrate an awareness of the need to become informed and a willingness to access various sources of weather information many remain poorly informed and are often confused about the meaning of some of the information they access. In order to improve this situation and based on the findings of this report the following recommendations are included for consideration.

Brochures, leaflets and booklets are an effective mode of delivery for cyclone awareness information. The agency/ies using this media to provide the general public with focussed information should clearly identified. Where possible information should be localised and based on identified community needs.

All cyclone awareness information should include an emphasis on identifying and explaining risk - in addition to recommending preparatory and defensive actions.

Public meetings are successful in raising tropical cyclone awareness when prepared and presented to targeted industry and community sectors - but they are not a successful vehicle for educating the general public. They should therefore be supported and expanded in terms of identified target audiences.

Cyclone awareness campaigns should include a more detailed explanation of the use and relevance of cyclone tracking maps

Spoken tropical cyclone warning messages (both on radio and television) should aim to include a more detailed description of the threatened area – this would require enhancing at a local level and using local knowledge of the coast-line and familiar landmarks.

The use and meaning of weather information, weather terms and warning advice messages should be consistent across all media and modes of delivery.

Better use should be made of locally produced televised weather forecast sessions to introduce and explain weather terms.

The amount and quality of weather information available on the internet should be increased to meet community expectations.

Cyclone awareness brochures, that are likely to be kept 'on-hand' in community households should include a short directory of sources of further information – including the internet – for the benefit of residents who may be encouraged to search for further detail and depth of information.

The widespread community confusion and misunderstanding about the tropical cyclone watch and warning periods should be immediately addressed. This could be achieved with an intensified cyclone awareness campaign. Given that residents are increasingly leaving much of their cyclone preparation until the warning phase, it may be useful to consider a change of warning terminology eliminating the 'watch' and extending the warning period with various levels of warning.

All modes and methods of delivering tropical cyclone awareness information to the Queensland public that were investigated throughout this study were shown to enjoy some degree of success. Most usefully imparted information relating to the hazard itself and a range of preventative and defensive actions that would mitigate loss. Few however were successful in 'delivering the message' – that is – they did not usually explain the risk well nor did they encourage residents to seek further information. Given the range of information needs within the community and the diversity of the general population the continued enhancement and support of a wide range of methods of delivering cyclone awareness is indicated.

7 Recommendations

Residents remain poorly informed and are often confused about the meaning of some of the information they access. In order to improve this situation the following recommendations are made.

1) Brochures, leaflets and booklets are an effective mode of delivery for cyclone awareness information. Where possible information should be localised and based on identified community needs.
2) All cyclone awareness information should include an emphasis on identifying and explaining risk in addition to recommending preparatory and defensive actions.

3) Public meetings should therefore be supported and expanded in terms of identified target audiences.
4) Cyclone awareness campaigns should include a more detailed explanation of the use and relevance of cyclone tracking maps
5) Spoken tropical cyclone warning messages should aim to include a more detailed description of the threatened area using local knowledge of the coast-line and familiar landmarks.
6) The use and meaning of weather information, weather terms and warning advice messages should be consistent across all media and modes of delivery.
7) Better use should be made of locally produced televised weather forecast sessions to introduce and explain weather terms.
8) The amount and quality of weather information available on the internet should be increased to meet community expectations.
9) Cyclone awareness brochures, that are likely to be kept 'on-hand' in community households should include a short directory of sources of further information.
10) Widespread confusion and misunderstanding about the tropical cyclone watch and warning periods should be immediately addressed.

8 References

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9 Appendices

9.1 Appendix 1 Survey Questionnaire

Good day. My name is …….

The Bureau of Meteorology is currently reviewing its delivery of Public Awareness Information on Tropical Cyclones. We are surveying a wide range of individuals and organisations in the community to find out how effective the educational messages are. We would be very grateful if you would help us by completing this survey. It will take about ten minutes of your time and all responses to the questionnaire will be completely confidential. In the final report only aggregate data will be used. No individual responses will be published.

1. Street Address		2. Suburb		
3. During the last two months have you seen any information about cyclones?			Yes	No
4. If yes – What sort of information have you seen or heard? Pamphlet newspaper magazine book TV public meeting radio internet BoM website other		Where?	When?	
5. Have you attended any public meetings about cyclones?		Yes	No	
6. If yes -	Where was the meeting?	When was it		
7. Do you have any information about cyclones or what to do in cyclones, in your house?		Yes	No	
8. If yes – what sort of information is it? Pamphlet newspaper magazine book TV public meeting radio internet BoM website other	Do you know who produced it?			
9. Do you have any information about cyclones that was produced by the Bureau of Meteorology?		Yes	No	
10. If yes – what sort of information is it?				
11. When there is a cyclone around do you plot its position on a tracking map?		Yes	No	

12. Do you use, or pay attention to weather forecasts?	Yes	No
13. When or how often do you use weather forecasts?		
14. Where do you get the weather forecast from? Please list all sources of information.	Pamphlet newspaper magazine book TV public meeting radio internet BoM website weather fax other	
15. What would be the most effective and convenient way for you find out more about weather related terms?	Pamphlet newspaper magazine book TV public meeting radio internet BoM website other	
16. Did you carry out a pre cyclone season clean up of your house and yard at the beginning of the cyclone season?	Yes	No
17. Is there anything that would help you with a clean up or make it easier?	Council pickup	
I should be grateful if you will answer a few short questions on what you know about some of the words and phrases that are used when cyclones are around.		
18. How are cyclones rated or put into categories?	1-5	
19. Which cyclone category is the most severe?	1 2 3 4 5	
20. When does a cyclone watch begin?		
21. What does a cyclone warning mean?		
22. Where will you get cyclone warnings from during a cyclone ?		
23. What do you understand is meant by a storm surge? Raised dome of water higher sea level wind raising the sea higher tide backup of water		
24. Do you know if you are you in a storm surge zone?	Yes	No
25. If yes – What will you do if a storm surge is forecast?	evacuate	
26. Have you experienced a tropical cyclone?	Yes	No
27. If yes – What was the name of the cyclone?		What year?
28. Where or in what town did you experience the cyclone?		

29. How long have you lived in this town?	Less than year	1 – 5 years	5 – 10 years	10 – 20 years	20 or more years	All life
30. Which age group do you fall into?	Under 18 years	18 to <30 years	30 to <40	40 to <60	60 to <75	75 and above
31. What is your tenancy of the house you are living in?	Own it	Paying a mortgage	Rent from a private landlord	Rent from a government agency		other
32. Gender of respondent	male		female			

Thank you very much for you assistance in answering these questions.

9.2 Appendix 2 : When does a cyclone watch begin? –

Survey responses

When air pressure < 1000 hpa (36); before cat 1 (4); when cat 1 or 2; when 2 or 3 is reached (2) ; cat 1 (19); cat 2 (7); cat 3 (2); cat 4; Cat 5 (3**); don't know / no idea / not sure (139); certain (undefined) distance from coast (33);** 100kms off coast (17); 200 kms (5); when less than 200 miles; few hundred km off coast (2); 400 km; 250 kms (2); 500 kms (9); when 1000 kms (4); **24 hours away (37); 48 hours away (45)**; 1 week before its due to hit (3) 1st one in area ; 2-3 hrs before its due; 6 hrs off coast; 8 hrs; 12 – 24 hours (10); >24 hours < 48 hours (17); 48-72 hrs (2); 72 hrs (4); 96 hrs (5); about start of cyclone season (11); **When a low forms / develops / is developing (122)**; about November (2); **December (21)** ; January (2); February (2); certain time of year; Nov-April (3); Nov-Mar (3); November (18); Oct-March (2); Oct (3); October – May; Dec-April (5); Dec-March (5); December – January); in the dry season; During the cyclone season (3); **when a cyclone starts to form (50)** After a **cyclone has formed (65)**; when the cyclone is named (7); when the siren sounds and announcement on radio and TV (11); heading to coast; could form; about to hit coast; according to wind levels and distance from coast; as soon as on radar in Australia; at beginning (2); before cyclone is named (3); begin tracking; close to coast (9); coming; concern of damage – forms; Cooktown/Cardwell in danger; cyclone possible (2); depends; depends on distance; - heading towards coast early this year; fair way off; far away; first chance of cyclone; first noticed (2); first one; first spotted; first warning; formed - threatening to hit; forms; keep tv on one is well away; looks it could be a threat; lot of rain (2);forms at sea; forms at sea moves towards land; from a low; get ready; heading this way earlier than warning; heavy rain; hits category 1; hourly reports; if likely to get cyclone; imminent; in area - in area (9); in Brisbane; in Coral Sea; in summer; in the cyclone season; inc wind; maybe distance; media alert; miles out at sea; monitoring it; near coast (5); no threat (2); no, but within proximity; not close listen 4 hourly; not soon enough; not specifically (2); off coast (3); out there but not a threat (2); picking up speed getting close potential cyclone (2); pre warning (2); predicting cyclone; pressure below a certain level (4); radio informs; rain

starts; several days out; some distance off (2); strong wind warning strong winds (4); threat; **thunderstorms (20);** uncertain direction; usually couple of days away; warning; watch first; when BoM think they want to; when close; when coastal areas are threatened; when experts say; when far away; when gets certain distance; when heading in our area; when identified; when it is detected; when it starts (2); when its out at sea; when its summer; when out to sea somewhere; when possibility of a cyclone; when pressure drops; when probability exists; when seen on radar (2); when several km off shore; when so far off the coast; when spotted; when the BoM wants to; when weather a certain distance away; when weatherman says (3); wind over 100 kms (12); within a particular distance from coast (2); within area; within certain radius of towns;

9.3 Appendix 3: What does a cyclone warning mean?

Survey responses

< 24hrs off coast be ready (14); **24 hrs away (43)**; cyclone could cross 24 hrs (4); cyclone crossing coast 24 hrs (6); closer within 12/24 hrs be prepared;1 hour; 12-24 hrs (2); 12 hrs (4); 4 hrs; 3 hrly,1hrly; 5-10 hrs; 6-12 hrs away (4); 6 hrs (2); 8 hrs; 12-48 hours (4); 10 kms; 100 kms (6); 1000 kms; 200 km from hitting (2); 300 kms; 500 kms; **close (26) closer (25)** in vicinity within 100 km; possible cyclone alert then warning be prepared; approaching take precautions; area affected - get prepared; aware & prepare; batten the hatches and get ready (2); be prepared (4); be prepared - get food; **be prepared (133);** be prepared cyclone close (4); be prepared its serious; be ready (2); be prepared wait; be prepared may hit; batten down getting close; clear yard prepare everything; cleaning up; clean up get ready; clean up get ready; watch forecast; **coming be prepared (38);** get ready for cyclone; get ready water food batteries; get ready; get kit together; get home batten down hatches; get everything ready (2); Get ready get water food in etc; get things in order; get everything inside; be prepared pay attention tape windows store food; take things inside; take note; start preparing; take care get batteries; take all necessary steps prepare; in vicinity; in neighbourhood; likely to cause damage; in line of cyclone; immediate threat in area; could affect you; impending cyclone; is approaching at a certain distance; is affecting your area; **when it is going to hit in area (21)**; depends on category; definitely cyclone coming; close; definite cyclone; declared cyclone; cyclone depends on what stage; developed into a cyclone; depression forming; may not hit for hours; cyclone coming - be prepared (2); be aware cyclone arriving (2); 6 hourly intervals; going to hit; a cyclone coming your way (9); a cyclone is approaching (2); a cyclone moving towards your way (5); a cyclone present could head your way; a few hours before it hits; a lot closer; after cyclone watch; after named; after the watch (3); alert; alert may come your way; alert there is a development; anything could happen; destruction; approaching (2); area under threat; around, could hit (2); as it hits; be alert (4); be aware (9); be aware cyclone could develop; be careful (3); be cautious, high winds rain; be warned there is a cyclone being monitored by BoM; between certain points will be affected; beware; beware follow updated; BoM starts tracking cyclone; building up; certain area; chance cyclone will affect area; chance of

cyclone; chance to hit us; classified; coming towards coast; coming this way (13); coming closer (3); coming (8) closer & named; closer than watch; count the kids; could come; could be coming your way soon; common sense; could be a cyclone; cyclone - may cross coast (6); cyclone in area (8); cyclone declared; cyclone developed (3); cyclone formed (9); cyclone getting close (13); cyclone forming (4); get out of the way; further away; fairly close; distance/alert; don't go out; different stages; getting close (12); going to hit (7); heading here (6); formed and coming (3); its coming in; it is turning into a cyclone; it is sitting close; it is named and on its way; it is going to hit; it is around; it is a cyclone; it's moving; it's so far off coastline; likely to hit your area; likely to hit between 2 towns; likely to become worse; lets you know location of cyclone; lets you know its off the coast; its near us; its named and coming; its going; its in radio; its going to hit; its developed (2); its closer; its close; its building up; its around; be prepared its around; its around - low its there; its very close; just a warning keep an eye out; keep aware; keep eyes and ears open (6); gonna hit (3); may be forming; has formed; named; watch out listen and prepare; listen often make sure everything in place; low classified and named looking like coming (2); may hit; low developed (2); nearby might hit; approaching coast might hit; in the area might form off coast; currently a low might be coming in; more severe and close; much closer out there(?); out there somewhere; one out there (4); one in area ;one has formed; on its way; on its way be ready; one brewing; watch out power lost; at this stage potential to hit; possible strike; possible hit; in position/intensity; position panic; - coming our way panic !; over coast siren; location, wind speed siren is on; siren risk real close; pretty close; **there is one out there (20)** then warning ; its close; that there's a cyclone; there’s a cyclone; that there is one on the way; that there is a cyclone coming; that its present formed; something coming; getting a cyclone; that cyclone is coming (30); take care be alert stay inside; stay indoors be prepared; start preparing and be aware; start precautions; below 1000 hpas (2); cat.1; crossing coast (3); drum it into you; it is a low far away - no direct threat; not ready; not formed; one in area not coming in; possible threat; possibility of cyclone coming; possible cyclone (6); no concern - 48 hr before it arrives (4); 24-36; be prepared no threat at present; no concern tape windows etc; a danger to area but not imminent**; Don’t know (48)**