CYCLONE JUSTIN. IMPACT AND COMMUNITY RESPONSE IN CAIRNS, MAREEBA AND INNISFAIL

HOUSEHOLD SURVEYS CONDUCTED BY THE DISASTER STUDIES CENTRE OF JAMES COOK UNIVERSITY OF NORTH QUEENSLAND, ON BEHALF OF

THE BUREAU OF METEOROLOGY

CAIRNS, MAY 1997

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RESEARCH METHOD

A survey of 200 households was carried out in all urban suburbs of Cairns, and 30 in each of Innisfail and Mareeba between 27th and 29th March, one week after cyclone Justin had crossed the Northern Suburbs and Tablelands on Saturday 22nd March. Households were selected randomly within each suburb. The number of households selected from each suburb was based upon the number of households enumerated in each suburb in the 1991 census. Thus the sample is proportionately representative of all communities within the urban areas of Cairns, Innisfail and Mareeba.

Data were collected by survey, using a questionnaire instrument which was administered directly to each respondent by a team of interviewers. This enabled both a rapid turn around of interviews as well as the collection of open ended comments or opinions. Answers were coded and analysed using SPSS (Statistical Package for the Social Sciences). This report was written by David King, Director of the Centre for Disaster Studies, and interviews were carried out by Linda and Ted Berry, Susan Sologinkin, Nigel Weston, Rob Hindson, Maggie Serewko, Katherine Davies and Matthew Gordon. Rob Hindson entered and sorted the data.

A similar survey was carried out after Cyclone Gillian had approached the Townsville coast in February. The main aim of the Gillian survey was to test public response to cyclone warnings, as no winds eventuated. The Gillian survey was modified for use in Cairns following Justin. In fact Townsville experienced almost as much damage as Cairns during Cyclone Justin, but the emphasis of this survey was also in testing the public response. Thus Cairns, Innisfail and Mareeba were selected. Many other communities in North Queensland were of course also affected by the cyclone.

While the population of Cairns is 5 to 7 times greater than that of either Innisfail or Mareeba, a fixed number of 30 households was selected in each of Mareeba and Innisfail. In all cases the sample size is necessarily very small, but the numbers of households are sufficient to be able to make reasonable statements about community response and attitudes. It would be wrong however, to attempt any more sophisticated statistical analysis, or to infer these

results as anything other than indicators. For example (table 1 below), it is correct to state that 60% of the respondents believed that the weather was less than they had expected, and to infer that the people in Cairns considered this so, but it is incorrect to state that 60% of the households of Cairns considered the weather to have been less than expected, although the structuring of the survey aimed to make this sample representative, such that therefore the response is a reasonable indicator of community reaction. Problems are increased if the responses are broken down by other categories, so that generally cross tabulations have not been used. Because of the difference in size of the surveys, percentages have been used to allow an easy summary and comparison of the communities. It should be borne in mind that small percentages are insignificant and that differences between towns of up to 10% are also not significant. One person in Cairns is only 0.5% of the survey, while one individual in Mareeba or Innisfail makes up 3.3%. Graphs have been produced for a number of the questions, but only for the Cairns data.

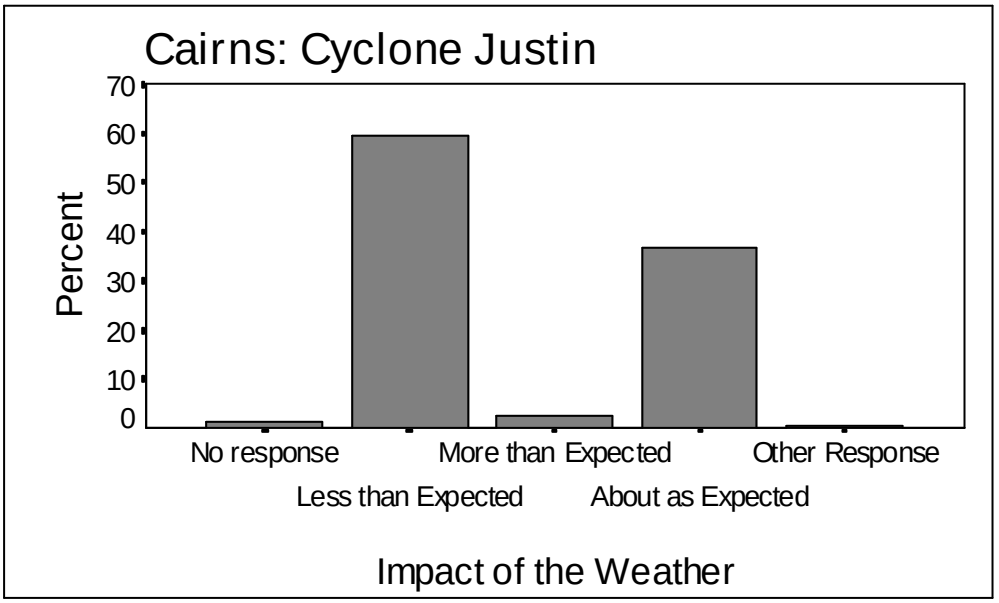
RESULTS

Weather and Plotting

The weather impact of cyclone Justin was definitely not more than was expected from warnings. Table 1 and the following bar graph illustrate the response rates.

Table 1. Impact of the Weather in Cyclone Justin. Percentages of Responses.

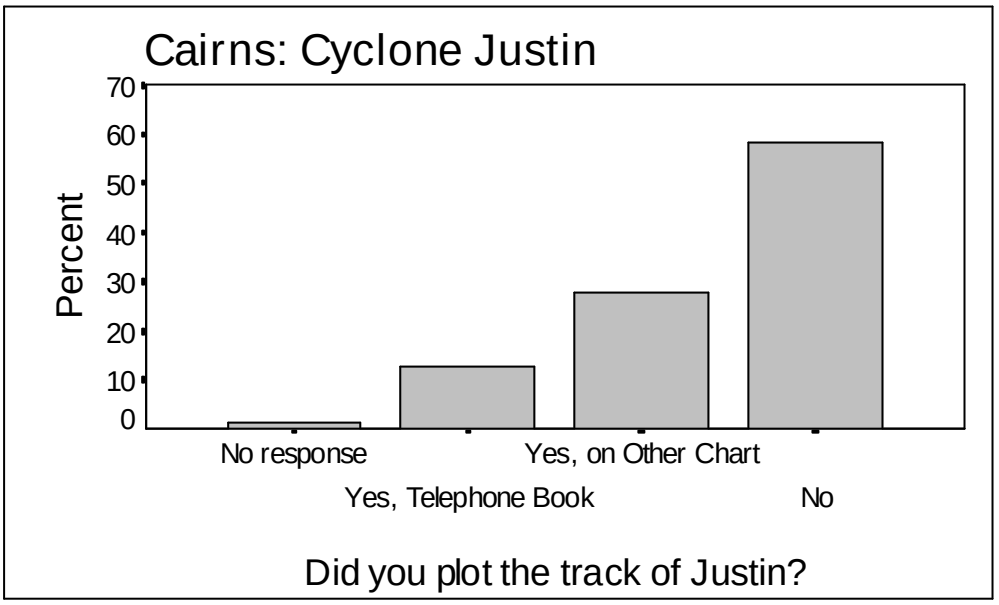
	Cairns	Innisfail	Mareeba
Less than Expected	60	43.3	50
More than Expected	2.5	6.7	
About what was Expected	37	50	50
Other Response	0.5		



Most people did not plot the track of cyclone Justin. This is not altogether surprising given the amount of time it was out there, but the response in Cairns, Innisfail and Mareeba was very similar to that in Townsville following cyclone Gillian. Reliance on television maps is probably the main cause of the lack of interest.

Table 2. Did You Plot the Track of Cyclone Justin ? Figures in Percentages.

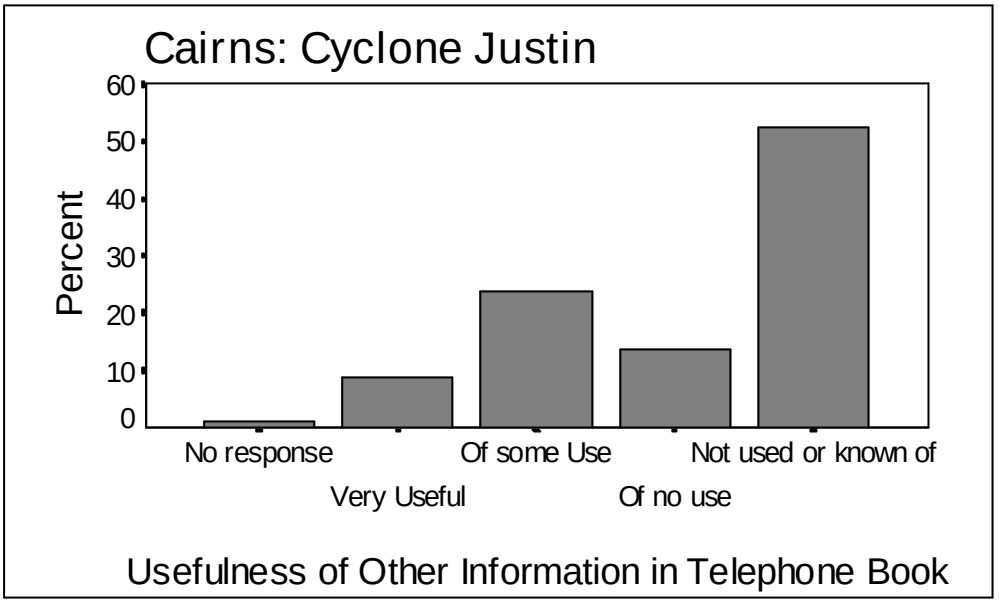
	Cairns	Innisfail	Mareeba
Yes, from the telephone book	13	6.7	13.3
Yes, from another chart	28	23.3	16.7
No	59	70	70



Other information on cyclones and preparations that is contained in the telephone book was uniformly not used. Most people did not even know it was there. Again this mirrors the response in Townsville following cyclone Gillian.

Table 3. Usefulness of Other Information in Telephone Book.
Responses in Percentages.

	Cairns	Innisfail	Mareeba
Very useful	9	3.3	
Of Some Use	24	13.3	10
Of No Use	14	40	23.3
Neither used it nor knew it was there	53	43.3	67.7



Information on the Approach of Cyclone Justin

Question 4 elicited the source of information on the approach of the cyclone and question 5 the source of information used by people while cyclone Justin was crossing the coast etc. Commercial radio and television are dominant sources, but there was some use of ABC radio, who provided excellent and quite fascinating coverage and insights during the event, especially from their phone in. Table 5 records the actual station that was used during the course of the cyclone. The main stations were 4CA in Cairns, 4KZ in Innisfail and a combination of 4AM and ABC radio in Mareeba. Television is little used. Presumably this reflects the cyclone advice to listen to local radio for updates during the event. Comments from respondents, in Cairns, Innisfail and Mareeba, the same as in Townsville after Gillian, suggested greater accuracy and reliability from radio as opposed to television.

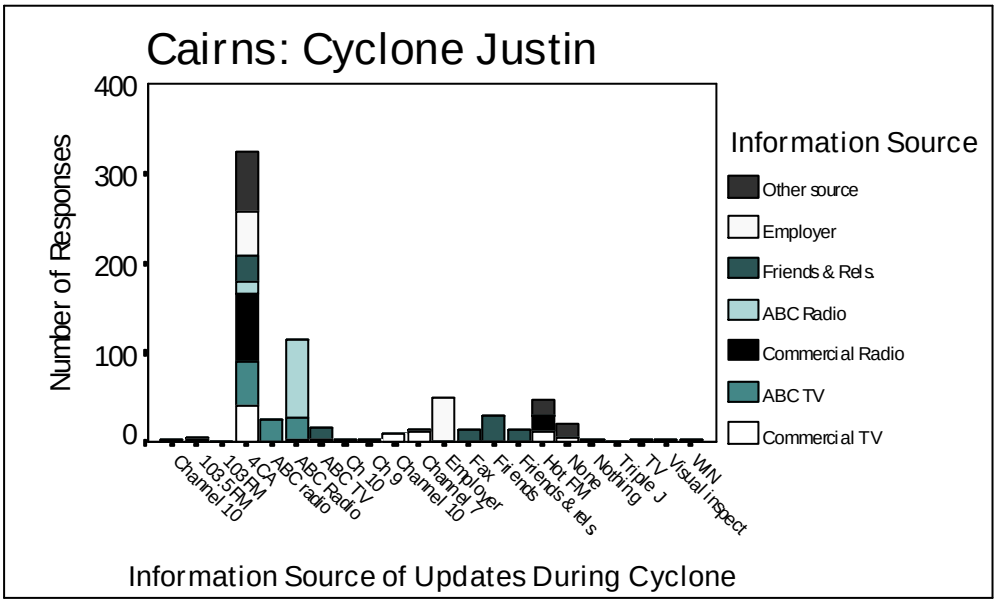
Table 4. Source of Information on Approach of Cyclone. Responses in Percentages.

	Cairns	Innisfail	Mareeba
Commercial TV	22	23.3	46.7
ABC TV	2		3.3
Commercial Radio	53.5	46.7	23.3
ABC Radio	15	20	26.7
Friends and Relatives	3.5		
Employer	1		
Other Source	3	10	3

Table 5. Source of Information on Updates During Cyclone Justin. Percentages

	Cairns	Innisfail	Mareeba
Channel 10	3		16.7
103.5 FM	2		
4CA	55.5		6.7
ABC Radio	15	20	26.7
ABC TV	1		3.3
Channel 7	3.5	6.7	3.3
Employer	0.5		
Fax or Internet	0.5	3.3	
Friends and Relatives	1.5		
Hot FM	13		3.3
Triple J	0.5		
TV - generally	0.5	3.3	3.3
Visual Inspection	0.5	3.3	
WIN	1	6.7	10
None	2		
4AM			26.7
4KZ		50	
Other Response		3.3	
Police Scanner		3.3	

The graph below breaks down the information source used during the approach of the cyclone, against the source of updates during its passage overhead. The expectation was that the same source would be used both before and during the cyclone. Clearly this is not the case, although it appears that ABC users may have been a little more loyal.



Note that this graph has cumulated pairs of responses, thereby exaggerating the vertical axis. This diagram is included for cross tabulation purposes only.

Question 6 aimed to test knowledge of the direction of the scale of cyclone categories, by using the two lowest numbers. Fortunately nearly everyone seems to be aware of which category is the more dangerous.

Table 6. Perception of More Dangerous Cyclone Category. Percentages.

	Cairns	Innisfail	Mareeba
Category 1	5.5		3.3
Category 2	94.5	100	93.3
Other Response			3.3

Preparations

Table 7. Preparations Made Before Saturday, when Cairns Under Cyclone Warning. Percentage Responses.

	Cairns	**Innisfail**	**Mareeba**
Cleaned Yard - Yes	72.5	73.3	66.7
No	27.5	26.7	33.3
Bought Food - Yes	38.5	33.3	26.7
No	61.5	66.7	73.3
Bought Petrol - Yes	3.0	6.7	
No	97	93.3	100
Bought Other Supplies - Yes	46.5	53.3	23.3
No	53.5	46.7	76.7
Stored Water - Yes	21.5	20	10
No	78.5	80	90
Stored Important Documents - Yes	2.5		3.3
No	97.5	100	96.7

Table 8. Additional Preparations on Saturday Morning. Responses in Percentages.

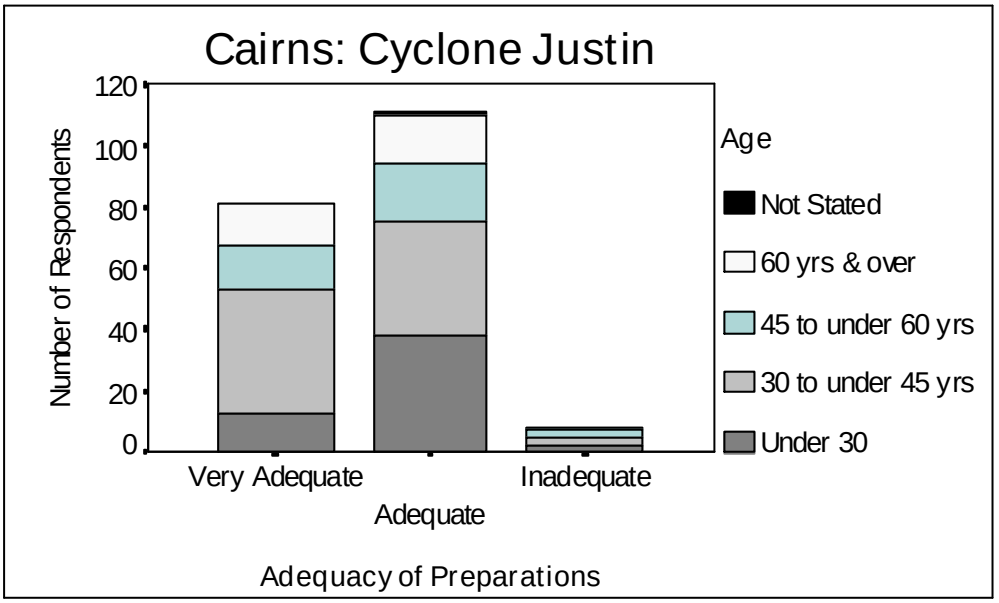
	Cairns	**Innisfail**	**Mareeba**
Made additional preparations - Yes	43	50	30
No	57	50	70
No extra preparations - Yes	41.5	46.7	26.7
No	58.5	53.3	73.3
Cleaned Yard - Yes	16	13.3	13.3
No	84	86.7	86.7
Bought Food - Yes	5.5	3.3	
No	94.5	96.7	100
Bought Petrol - Yes	2	3.3	
No	98	96.7	100
Bought Other Supplies - Yes	15.5	10	6.7
No	84.5	90	93.3
Stored Water - Yes	17	10	23.3
No	83	90	76.7
Stored Important Documents - Yes	0.5	20	
No	99.5	80	100

Cleaning the yard was practised by most respondents. All other preparations before the cyclone were responded predominantly in the negative. On Saturday morning, just before the cyclone crossed, the majority of the respondents made no extra preparations, although this is only just over 50%. For most specific activities only a small proportion did anything further. This implies that only one additional preparatory activity was carried out by most of the households that responded that they had done something. Unfortunately we were not able to tell whether or not the food and other supplies that were purchased had anything to do with the imminent approach of the cyclone.

Table 9. Perceived Adequacy of Preparations. Responses in Percentages.

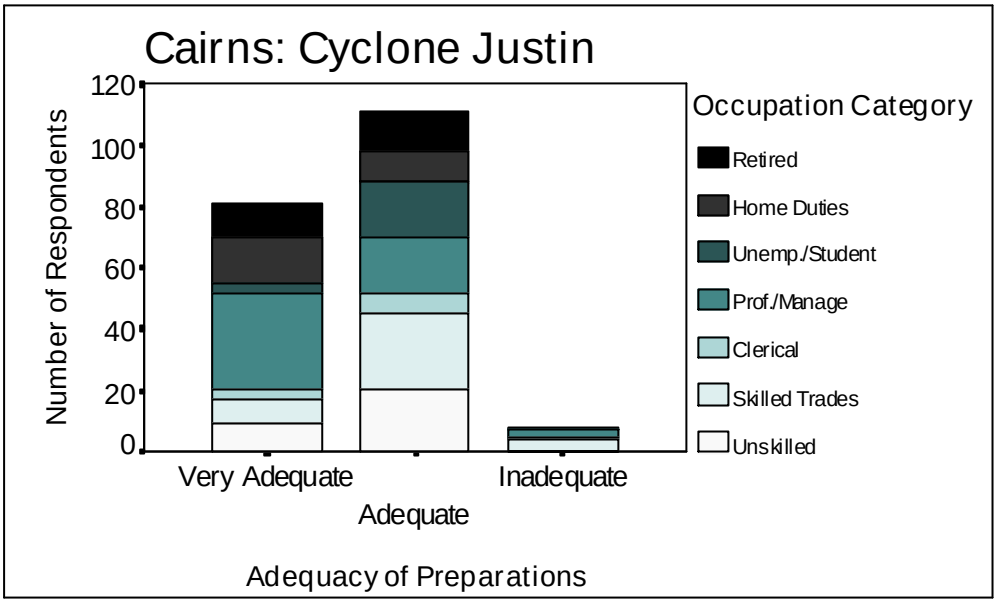
	Cairns	Innisfail	Mareeba
Very adequate	40.5	73.3	33.3
Adequate	55.5	26.7	53.3
Inadequate	4		13.3

The lack of additional preparations is borne out by the perceived adequacy of the preparations.



The perceptions of preparation adequacy were broken down by age (diagram above) and occupation category (diagram below). The graphs show no significant variability with either age of occupation. Professional/ managerial people described their preparations as predominantly very adequate, rather than just adequate, whereas all other occupation categories tended towards a feeling that what they done was just adequate rather than very adequate.

Most of the other questions in this survey were cross tabulated with age and occupation, but showed no patterns that were any more significant than those indicated in these two graphs.

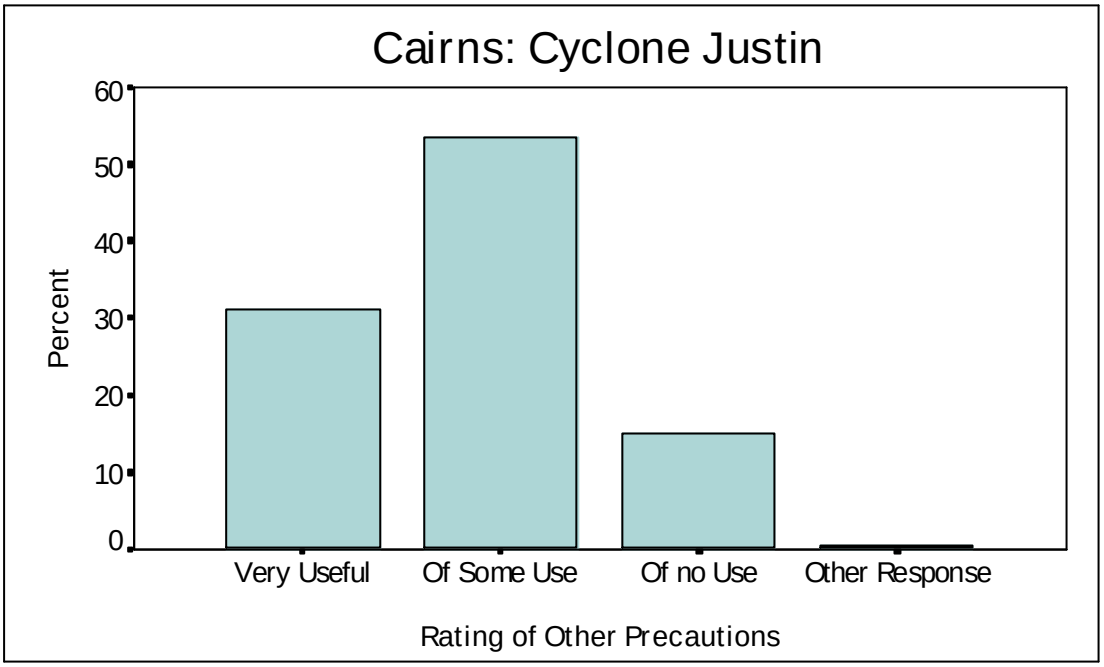


Ratings of Warnings

Table 10 relates to other cyclone advice that was provided in the telephone book, and general advice on safety and precautionary advice and warnings. The responses are generally ambivalent, but tend towards the positive.

Table 10. Rating of Other Information on Cyclone Advice Precautions. Responses in Percentages.

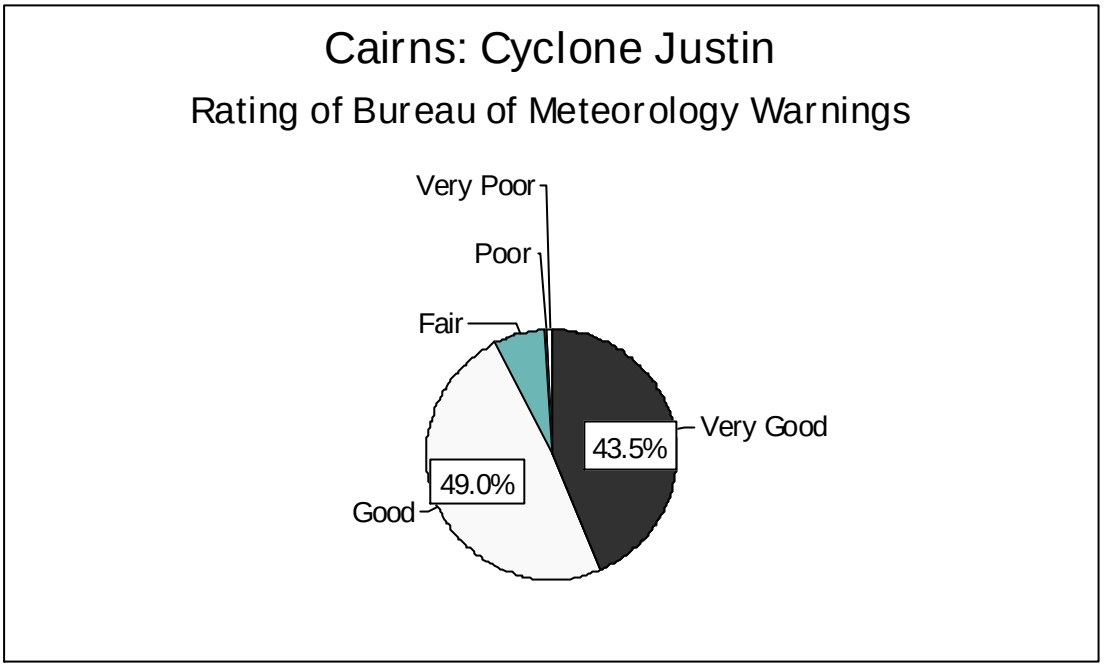
	Cairns	Innisfail	Mareeba
Very Useful	31	26.7	36.7
Of some use	53.5	43.3	53.3
Of no use	15	30	10
Other Response	0.5		



The Bureau of Meteorology warnings are rated highly. This result is the same as in the cyclone Gillian survey of Townsville.

Table 11. Rating of Weather Bureau Warnings. Responses in Percentages.

	Cairns	Innisfail	Mareeba
Very Good	43.5	43.3	43.3
Good	49	53.3	46.7
Fair	6.5	3.3	10
Poor	0.5		
Very Poor	0.5		



Just as the Bureau of Meteorology warnings were rated well, table 12 shows a generally high level of satisfaction with the clarity of warnings.

Table 12. Perceptions of Clarity of Bureau Warnings. Responses in Percentages.

	Cairns	Innisfail	Mareeba
Did they contain information needed ? - Yes	98	93.3	93.3
No	2	6.7	6.7
Easy to Understand - Yes	96.5	100	96.7
No	3.5		3.3
Were warnings too technical ? - Yes	7	3.3	
No	93	96.7	100

Table 12a. General Comments on Bureau of Meteorology Warnings.

Mareeba. Comments on BoM Warnings

After cyclone passed TV coverage poor . After it crossed coast, not regular enough. Conflicting statements about position. Exaggerated reporting. Improve Tracking Capability. More info. for Tablelands. Need to be more specific. No comment x 21. Size of eye not made clear. TV coverage not as good as it used to be.

Innisfail Comments on BoM Warnings

No comment x 19. Improve tracking capability. Inaccurate tracking of cyclone. More accuracy for Innisfail area. More accuracy less scaremongering. More accuracy needed. Need more updates on TV. Not very accurate for Innisfail. Some inaccuracies. TV Inaccurate. More updates (15 minutes). When cyclone passed winds worse than predicted. Brisbane bureau was behind. Need resources in FNQ.

Cairns. Comments on BoM Warnings

Delay time when it passed over. Get rid of siren noise. Info. on shelters needed. Storm surge threat. Info on shelters. More info needed as it gets closer. More frequent updates. Get the story right. Time delay on flood updates. Say where it is relative to Cairns. More frequent updates plus news on restoration of power. Report updates slow. Bit more accuracy about where eye was. More precise location details. Unsure of location. Don't like sirens. More technical info required. Distribution of the effects of a cyclone through the season. Confusion with technical data direction. Clarification of terms. eg. severe??. More frequent. Greater accuracy. Greater accuracy in reporting. Exaggerated warnings. Warning too early went on too long. Contradictions and mistakes in broadcasts. Need a more local source of Met Bureau info. Contradictions and exaggerations. What is the grid ref of Cairns? Over dramatised. More accuracy on wind strength. Contradictory advice on different media sources. Over exaggerated wind strength. Contradictions on eye position. A lot of fuss over a storm. Siren is horrible. Inaccuracies in wind speed. Too often. More regular update. Not enough on TV. Too much. Too much hype. Exact location unclear. Would prefer info from bureau reps not radio people. Not updated often enough. Earlier warnings for passengers at airport. Not always accurate. Lost track of eye at one point. Size exaggerated. More frequent updates. Increase frequency when cyclone close. Eye not accurately located. Have cyclone alert sound earlier. Confusion over exact position of cyclone. Wind info could be improved. Wind speeds confusing (Knots????). More general advice. Not enough info after eye passed. Exaggerated reports. Use siren more on TV/Radio. Lost cyclone at times. Not technical enough. Confusing distance from coast varied. Less conflict between state and local report. Radio did not pass on info. Need to update more frequently.

The general comments on Bureau of Meteorology warnings as they were relayed by the media are summarised in table 12a above. Each persons' comment is listed. Of the 200 Cairns households, 134 respondents made no comment. Of the 30 Innisfail households 21 made no comment, and in Mareeba 19 had no comment to add. Thus around two thirds in each place had no comment to make or possibly any great interest in the issue. Of those who did make a comment, the main issues concern frequency of warnings, specifically a greater frequency being needed, the need for more updates, problems of contradictions and exaggerations, and a lack of sufficient information.

Experience, Demographics and Shelters

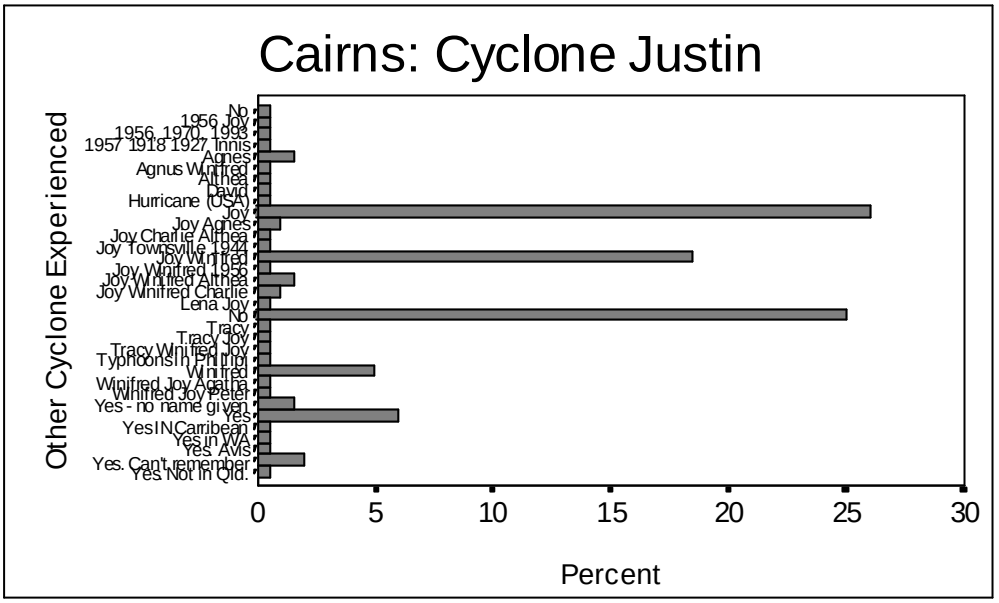
Table 13 lists previous cyclones experienced by the respondents. Previous cyclone experience is high: 76% in Cairns, 67% in Mareeba and 90% in Innisfail. However, 26.5% of the Cairns respondents had only previously experienced cyclone Joy. In Mareeba and Innisfail only 2 people in each place had only experienced cyclone Joy. Thus the problem is greatest in Cairns. If we exclude cyclone Joy as being experience of a significant cyclone, then half of the respondents (and likely the general population of Cairns) had not experienced a bad cyclone before.

As it is we now have the situation where virtually everyone has experienced a cyclone, ie. Justin, but with a quarter of the population only knowing a cyclone by that experience, and a further quarter who only have cyclone Joy as a further measure. This leaves us with a population that has largely not experienced a real cyclone, but thinks it has.

Table 13. Other Cyclones Experienced By Respondents. Numbers of People.

Cairns 1997.	
Other Cyclones Experienced	**Number**
1956 Joy	1
1956, 1970, 1993	1
1957 1918 1927 Innisfail	1
Agnes	3
Agnes Winifred	1
Althea	1
Avis	1
David	1
Hurricane (USA)	1
Joy	53
Joy Agnes	2
Joy Charlie Althea	1
Joy Winifred	36
Joy Winifred 1956	2
Joy Winifred Althea	3
Joy Winifred Charlie	2
Lena Joy	1
No	48
Tracy	1
Tracy Joy	1
Tracy Winifred Joy	1
Typhoons in Philippines	1
Winifred	10
Winifred Joy Agatha	1
Winifred Joy Peter	1
Yes	18
Yes in WA	1
Yes In Caribean	1
Yes. Can't remember	4
Yes. Not in Qld.	1
Grand Total	200
Innisfail 1997.	
Other Cyclone Experienced	**Number**
Alfred	1
Althea	1
Joy	2
No	3
Winifred	5
Winifred Charlie Joy	1
Winifred Joy	16
Winifred Joy Ida	1
Grand Total	30
Mareeba 1997.	
Other Cyclones Experienced	**Number**
Althea	1
Althea Joy Winifred	1
Joy	2
Joy Winifred	3
No	10
Winifred	5
Yes. 1956	1

Yes. Can't remember	7
Grand Total	30



Tables 14 and 15 list the demographic and socio-economic characteristics of respondents in each town. Numbers of people are listed in these tables, rather than percentages, because they are broken down by gender.

Table 14. Characteristics of Respondents: Occupation by Gender. Responses in Numbers of Persons.

Occupation/	Cairns		Innisfail		Mareeba	
Gender	Male	Female	Male	Female	Male	Female
Unskilled	17	11	1	1	6	1
Skilled Tradesperson	30	7	10	2	3	
Clerical	1	10				
Professional & Managerial	19	32	1	1		1
Unemployed or Student	13	8		1		3
Home Duties		25		8		10
Retired	14	11	5		4	2

There is no particular dominance of either sex or age group, although on face to face rapid household surveys of this type, there is a tendency to meet an older and more often female population. Occupations are also not dominated by any particular group. The professional/managerial category is over represented in comparison to the 1991 census data, but people tend to over assess their occupational status (the ABS "corrects" such census data), and we included all para professionals and many junior managerial positions, some of which may otherwise be classified as clerical.

Table 15. Characteristics of Respondents: Age/Sex. Responses in Numbers of Persons.

	Cairns		Innisfail		Mareeba	
Age/Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Under 30 years	26	26	3	3		7
30 to under 45 years	32	49	5	4	5	7
45 to under 60 years	21	13	5	4	5	2
60 years and over	15	16	4	2	3	1

Note. There were 2 unstated ages in Cairns.

Despite the Council and Emergency Services position that shelters are misunderstood by the public, it is an issue. With the exception of Innisfail, most people do not know where a cyclone shelter is. Basically they do not know what the shelters are, or what they are for. They thus make comments like "they know, but they won't tell us." There was no point asking a more complex or precise question in this survey because people do not know the purpose of shelters, but it is an issue. The problem is a lack of knowledge as to purpose of shelters, as well actual location.

Table 16. Knowledge of Cyclone Shelter. Responses in Percentages.

Knowledge of Location of Shelter	**Cairns**	**Innisfail**	**Mareeba**
Yes	10.5	86.7	
No	89.5	13.3	100

Cyclone damage was largely environmental, to trees and plants, rather than to property.

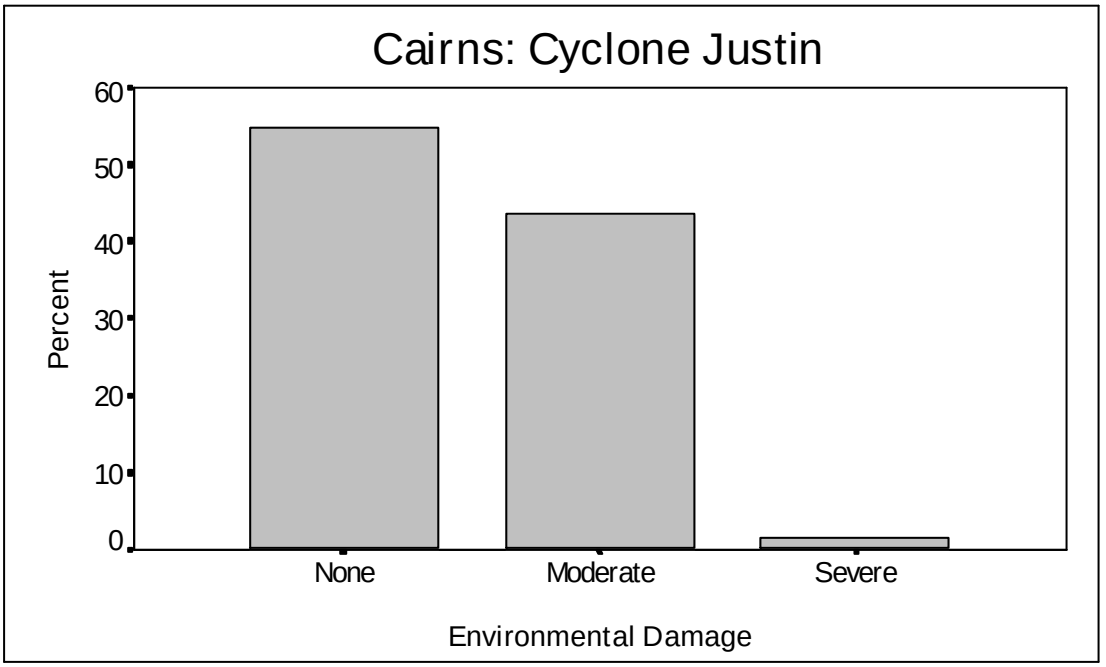


Table 17. Cyclone Damage. Responses in Percentages.

Experience of Cyclone Damage	Cairns	Innisfail	Mareeba
Yes	53	23.3	16.7
None	47	76.7	83.3

Table 18. Type and Extent of Cyclone Damage. Responses in Percentages.

	Cairns	Innisfail	Mareeba
Environmental Damage - None	55	80	90
Moderate	43.5	20	10
Severe	1.5		
Property Damage - None	80	86.7	90
Moderate	18.5	10	10
Severe	1.5	3.3	

SUMMARY

- People do not plot cyclones or pay attention to information in the telephone book.
- Respondents felt that it was a minor cyclone with weather as expected or less than expected.
- Commercial radio is used most for information and warnings.
- People cleaned their yards before the cyclone, but did relatively little else, and considered those preparations to have been adequate.
- Bureau warnings and advice are rated highly and seen as easy to understand.
- High proportions of respondents had experienced a cyclone before Justin, but around half had not experienced a bad cyclone, and still have not.
- Damage was limited and primarily occurred to vegetation.
- Shelters are an issue to people, who do not know where they are, and appear not to know what they are for.

APPENDIX

Survey Instrument