School of
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JAMES COOK UNIVERSITY
AUSTRALIA

Tropical Cyclone *Yasi*

Preparedness, Loss & Distress

James Cook University Research Report
September 2012

Cairns
Campus

www.jcu.edu.au

Published 2012
James Cook University
MacGregor Road
Smithfield, Cairns
Queensland 4870

Contact details: cindy.woods@jcu.edu.au

ISBN 978-0-9808572-8-3

Printed by Lotsa Print and Design

SCHOOL of NURSING, MIDWIFERY and NUTRITION
JAMES COOK UNIVERSITY

RESEARCH REPORT NO. 1

Tropical Cyclone Yasi

Preparedness, loss and distress

By
C. Woods[1], K. Usher[1], P. Buettner[2], C. West[1], J. Mills[1], H. Boon[3],
J. Chamberlain-Salaun[1], and M. Mason[4]

[1]School of Nursing, Midwifery and Nutrition, James Cook University, Cairns
[2]School of Public Health, Tropical Medicine and Rehabilitation Sciences, James Cook University, Townsville
[3]School of Education, James Cook University, Townsville
[4]School of Nursing, Midwifery and Nutrition, James Cook University, Thursday Island

Tropical Cyclone Yasi
Preparedness, loss and distress

EXECUTIVE SUMMARY

Tropical Cyclone Yasi (TC Yasi) made landfall in the early hours of Thursday 3rd February 2011 with the eye passing over the Mission Beach region. The maximum wind gusts were estimated to be 140 to 225 km/h across the area stretching from Townsville to Innisfail. The localities away from the Mission Beach to Cardwell region experienced wind gust speeds towards the lower end of the range.

The majority of survey respondents (58.7%) between Cairns and Townsville sheltered in their own homes during TC Yasi, 4.4% of respondents were evacuated or self-evacuated to cyclone shelters for the duration of the cyclone, 15.2% left town, and one quarter of residents (25.7%) sheltered with friends or family in the same town as their residence. Almost all respondents (99.3%) took the cyclone warning seriously or very seriously. More than a third (37.5%) of respondents started preparing for the cyclone more than 3 days before landfall and a majority (79.4%) felt well prepared.

One quarter of respondents (26.7%) reported moderate property damage and 13.7% reported major property damage caused by TC Yasi. Overall, 14.3% of participants were without electricity, 4.9% were without running water, and 2.1% were without any mobile or fixed phone contact for more than 21 days.

In terms of loss of energy resources, 12.2% reported major changes in their time for adequate sleep, 18.4% reported major changes to their free time due to TC Yasi, and 7.7% of respondents experienced a major loss in money available for living expenses.

In relation to the emotional impact and symptoms of acute stress, 17.1% of participants reported a moderate and 11.6% reported a major change in their feeling of whether they have control over their life. A major change in motivation to get things done was reported by 13.1% participants; while 7.9% reported a major change in their perception of feeling valuable to others. Thinking about the cyclone when they do not want to was reported by 21.1% of participants and 7.7% reported to have nightmares about cyclone Yasi.

Taking regular medication was reported by 42.7% of participants. Of these participants, 9.6% reported a disruption of the availability of their medication due to TC Yasi. Of those who reported disrupted availability of medication, 75.0% reported a disruption of less than 2 days, and 12.5% reported a disruption of 3 to 7 days. Preparedness was not significantly associated with Acute Stress disorder (ASD) symptoms. However, minor to major property damage, personal characteristic resource loss, condition resource loss, object resource loss, energy resource loss and basic object resource loss were significantly associated with ASD symptoms.

Participants located in the Mission Beach to Ingham areas were significantly more likely to report one or more symptoms of ASD followed by participants located in Innisfail and Babinda.

When the study looked only at participants who reported they were well prepared in terms of supplies, there was a significant relationship between preparation and psychological distress for participants whose residence was located in Tully and Ingham.

Participants who reported minor to major resource loss, that is personal characteristic resources, condition resources, object resources, energy resources, and basic object resources, were significantly more likely to report one or more ASD symptom.

Tropical Cyclone Yasi Preparedness, loss and distress

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Acknowledgements

The authors are extremely grateful to the residents of the Cairns, Babinda, Cardwell, Tully, Tully Heads, Mission Beach, Innisfail, Ingham and Townsville regions who generously assisted this study by completing surveys and sharing their experiences.

The authors wish to thank staff in the libraries, community groups, and cyclone recovery centres who displayed posters advertising the study and greatly assisted the study by distributing the questionnaire to potential participants.

This project was funded by a Research Infrastructure Block Grant (RIBG) from the School of Nursing, Midwifery and Nutrition, James Cook University, Cairns.

The views expressed in this report are those of the authors alone and should not be taken to represent the views of other persons or organisations with whom the authors have been in contact in respect of Tropical Cyclone Yasi.

1.0 Introduction

Tropical Cyclone Yasi (TC Yasi) was a Category 5 severe tropical cyclone that crossed the Queensland coast near Mission Beach in the early hours of Thursday 3 February 2011. The cyclone crossed at Mission Beach with a 35km eye that took 45 minutes to cross. Being such a strong and large system, Yasi maintained a strong core with damaging winds and heavy rain while tracking westwards across northern Queensland. Damage of varying severity between Townsville to Cairns was reported by the media, with the most severe damage located between Cardwell and Innisfail.

Warnings of TC Yasi were widely reported and the predictions were dire. Residents in low-lying coastal areas between Cairns and Townsville were evacuated, and many people self-evacuated to cyclone shelters for the duration of the cyclone, or to locations away from the predicted affected areas. Initially, a very significant storm surge was predicted to occur when TC Yasi crossed the coast. Fortunately, high tide did not coincide with the peak storm surge. Although a 5 metre tidal surge was observed at Cardwell, the sea water rise was significantly less than it may have been for the worst case scenario. Nonetheless, TC Yasi caused structural storm surge and wind damage between Innisfail and Townsville.

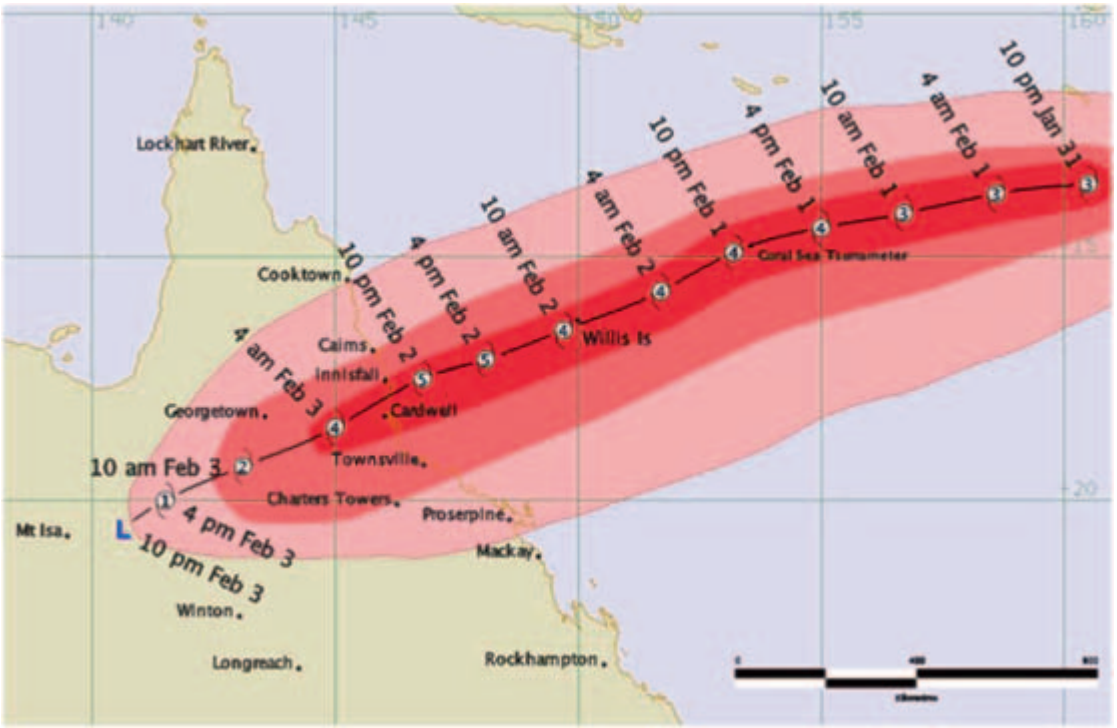

Figure 1.1: Track and intensity information for Severe Tropical Cyclone Yasi
(Image courtesy Bureau of Meteorology) Bureau of Meteorology, 2012, Severe Tropical Cyclone Yasi, [Retrieved 11 April 2012], http://www.bom.gov.au/cyclone/history/yasi.shtml

1.1 Meteorological information

In late February 2011, the Bureau of Meteorology published the following information on their website: http://www.bom.gov.au/cyclone/history/yasi.shtml

Information repeated here with thanks to the Bureau of Meteorology:

Summary
Severe Tropical Cyclone Yasi began developing as a tropical low northwest of Fiji on 29th January and started tracking on a general westward track. The system quickly intensified to a cyclone category to the north of Vanuatu and was named Yasi at 10pm on the 30th by Fiji Meteorological Service. Yasi maintained a westward track and rapidly intensified to a Category 2 by 10am on 31st January and then further to a Category 3 by 4pm on the same day.

Yasi maintained Category 3 intensity for the next 24 hours before being upgraded to a Category 4 at 7pm on 1st February. During this time, Yasi started to take a more west-southwestward movement and began to accelerate towards the tropical Queensland coast.

Yasi showed signs of further intensification and at 4am on 2nd February and was upgraded to a marginal Category 5 system. Yasi maintained this intensity and its west-southwest movement, making landfall on the southern tropical coast near Mission Beach between midnight and 1am early on Thursday 3rd February. Being such a strong and large system, Yasi maintained a strong core with damaging winds and heavy rain, tracking westwards across northern Queensland and finally weakened to a tropical low near Mount Isa around 10pm on 3rd February.

Yasi is one of the most powerful cyclones to have affected Queensland since records commenced. Previous cyclones of a comparable measured intensity include the 1899 cyclone Mahina in Princess Charlotte Bay, and the two cyclones of 1918 at Mackay (January) and Innisfail (March).

Wind Damage
At the time of writing there are no verified observations of the maximum wind gusts near the cyclone centre. However a barograph at the Tully Sugar Mill recorded a minimum pressure of 929 hPa as the eye passed over suggesting wind gusts of about 285 km/h were possible. This is supported by measurements (subject to verification) from instrumentation operated by the Queensland Government (Department of Environment and Resource Management) at Clump Point (near Mission Beach) which recorded a minimum pressure of 930hPa.

Significant wind damage was reported between Innisfail and Townsville where the destructive core of the cyclone crossed the coast. Tully and Cardwell suffered major damage to structures and vegetation with the eye of the cyclone passing over Dunk Island and Tully around midnight on 2nd February.

The largest rainfall totals were near and to the south of the cyclone and were generally in the order of 200-300mm in the 24 hours to 9am Thursday. These rainfall totals were experienced in the area between Cairns and Ayr, causing some flooding. The highest totals were; South Mission Beach 471mm, Hawkins Creek 464mm, Zattas 407mm, Bulgun Creek 373mm along the Tully and Herbert River catchments.

Storm Tides
A 5 metre tidal surge was observed at the Department of Environment and Resource Management (DERM) storm tide gauge at Cardwell, which is 2.3 metres above Highest Astronomical Tide (HAT). The anomaly occurred at about 1.30am on a falling tide, averting more serious inundation. Some significant, yet far less substantial sea inundation occurred on the late morning high tide on 3rd February between the Cairns Northern Beaches and Alva Beach, with peak levels measured at DERM's Townsville tide gauge close to the expected 0.6m above HAT causing inundation of parts of the city.

All information relating to intensity and track is preliminary information based on operational estimates and subject to change following post analysis
* All times mentioned is Australia Eastern Standard Time (EST)

Coastal Crossing Details
Crossing time: 12 am - 1am EST, 3 Feb 2011
Crossing location: Near Mission Beach, 138km S of Cairns
Category when crossing the coast: 5

Extreme Values During Cyclone Event (estimated)
Note that these values may be changed on the receipt of later information

Maximum Category: 5
Maximum sustained wind speed: 205 km/hr (estimated)
Maximum wind gust: 285 km/hr (estimated)
Lowest central pressure: 929 hPa

1.2 Preparedness

The need for emergency and disaster preparedness has never been greater, given the recent floods, earthquakes, cyclones and tsunamis that have impacted the Asian Pacific region and the current predictions for more extreme weather events in the future[1]. Preparedness is a key concept in disaster and emergency planning and management and involves not just practical preparedness, but also psychological preparedness[2,3]. The psychosocial needs of those affected by disaster are well recognised; members of the community experience shock and loss that may require intervention. The impact of these psychosocial stressors is not just immediate, but often prolonged and not well understood. A better understanding of the loss and levels of distress experienced by the community is essential for planning post emergency service delivery.

1.3 Psychological distress

Acute Stress Disorder (ASD) is related to posttraumatic stress disorder. DSM-IV diagnostic criteria for ASD include the following: (a) exposure to a life-threatening event in which the person experiences intense fear or feelings of helplessness and horror, and (b) either during or after the event the person displays dissociative reactions (e.g., subjective sense of numbing, emotional detachment), persistently re-experiences the event (e.g., recurrent images, thoughts, dreams), avoids stimuli that arouse memories of the event, and shows symptoms of anxiety or arousal (e.g., difficulty sleeping, irritability, exaggerated startle response)[4].

1.4 The study

A research team from James Cook University conducted a survey to investigate preparedness, loss and distress of people affected by TC Yasi. The purpose of the survey was to explore the preparedness of the community and to measure the amount of loss and levels of emotional distress experienced by community members. The study area extended from Cairns in the north to Townsville in the south along the coastline and extending inland to Tully. Ethical approval to conduct the study was received from the relevant committees. The survey was accessed online by participants via Survey Monkey or in hard copy through local libraries. The study commenced in April 2011 and was completed in April 2012. 433 responses were received. The survey collected information about:

Innisfail Council workers and Army soldiers clear a large tree that has fallen and damaged this Mission Beach resident's property during Cyclone Yasi
Photograph: Corporal (CPL) Melina Mancuso 1st Joint Public Affairs Unit (1JPAU) © Commonwealth of Australia

- demographic characteristics
- actions taken to prepare for the storm
- when preparation efforts began and perceptions of being adequately prepared
- property damage, loss of services, and days before returning to school or work
- resource losses as a result of the cyclone: loss of basic object resources (e.g., food, money for living expenses, sentimental possessions); object resources (e.g., sentimental possessions, household items, personal transportation); condition resources (e.g., family stability, stable employment, companionship); personal characteristic resources (e.g., sense of optimism, sense of humor, feeling that you have control over your life, feeling that your life has purpose); and energy resources (e.g., time for adequate sleep, free time, motivation to get things done)[5].
- symptoms associated with Acute Stress Disorder (ASD)
- Two open-ended questions asking about perceptions of preparedness and feelings about TC Yasi now.

1.5 Purpose of the report

This report presents the outcomes of the investigation into preparedness, loss and psychological distress experienced by those affected by Tropical Cyclone Yasi. It focuses on the following issues that are important for gaining a better understanding of the loss and levels of distress experienced by the community and for planning post emergency service delivery:

- The levels of psychological distress across locations.
- The relationship between preparation and psychological distress across locations.
- The relationship between resource loss and psychological distress, and how each type of resource loss contributes to distress

[1] CSIRO, & Australian Bureau of Meteorology. (2007). Climate Change in Australia: Technical Report 2007.
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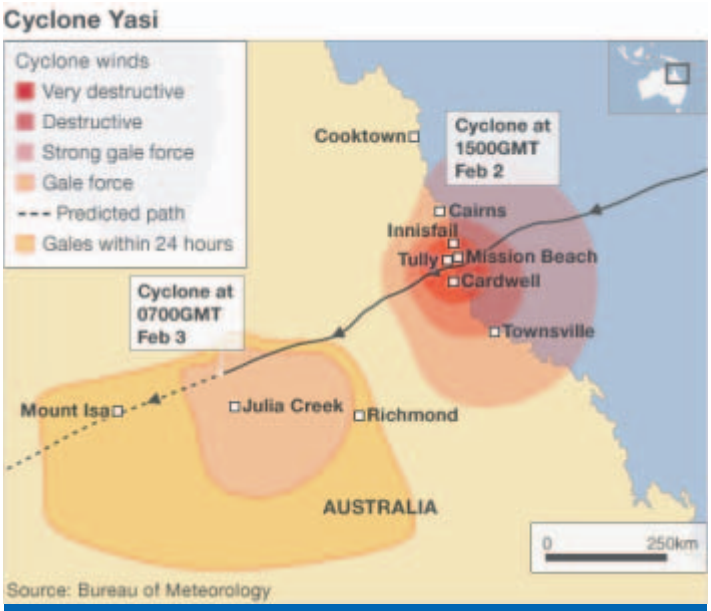
[4] American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed., Rev).Washington, DC: Author.
[5] Sattler, D. N., Preston, A. J., Kaiser, C. F., Olivera, V. E., Valdez, J., & Schlueter, S. (2002). Hurricane Georges: a cross-national study examining preparedness, resource loss and psychological distress in the U.S. Virgin Islands, Puerto Rico, Dominican Republic and the United States. Journal of Traumatic Stress, 15(5), 339-350.

2.0 Analysis of survey data

This research was initiated as an applied research activity, and as such sought to focus on how resource losses impact on the psychological recovery of people who experience a disaster such as a cyclone. The objective of this research was to investigate the experiences of survivors and victims of a natural disaster event such as Tropical Cyclone Yasi in February 2011. Although agencies may have a view of the experiences of the people they assist, to gain a better understanding it is necessary to start with the views of the survivors and victims themselves. To achieve this, a quantitative method was used to identify the nature and extent of the issue under investigation.

An online survey was devised using 'Survey Monkey®'. The study was advertised in local newspapers and libraries in cyclone affected areas inviting volunteers to participate in the online survey. A paper based survey was also available in the libraries and cyclone recovery centres. Researchers had a stall in several of the local markets in affected areas to promote and raise awareness of the study to those most affected by the cyclone. Paper-based surveys and reply paid envelopes were provided to interested persons at the market locations.

Recruitment of participants was purposive (on the basis of having resided in one of the areas affected by Cyclone Yasi), but the sample was self-selected and anonymous. There is therefore no way of knowing how representative the sample is of the total population of potential respondents. There were a total of 433 responses with a 94.7% completion rate (410). The first response was on 18 May 2011 and the final response was on 27 March 2012. Statistical analysis was conducted using SPSS (IBM SPSS Inc, Chicago, Illinois). Categorical characteristics are described using sample size and percentages. Relationships between variables were analysed using chi square analysis.



(Image courtesy Bureau of Meteorology)
Bureau of Meteorology, 2012, Severe Tropical Cyclone Yasi, *[Retrieved 11 April 2012], http://www.bom.gov.au/cyclone/history/yasi.shtml*

2.1 Respondents and affected locations

The 433 respondents were residents of towns affected by TC Yasi located between Cairns and Townsville, including the coastal communities of:

- Cairns (n=139; 32.1%),
- Babinda (n=12; 2.8%),
- Innisfail (n=42; 9.7%),
- Mission Beach (n=72; 16.6%),
- Tully (n=52; 12.0%),
- Cardwell (n=35; 8.1%),
- Ingham (n=19, 4.4%),
- Townsville (n=62; 14.3%).

2.1.1 Cairns

Cairns Base and Cairns Private Hospitals closed for over 24 hours and patients were either sent home or evacuated by plane to Brisbane. Airlines provided extra flights for people wishing to flee the area. Supermarket shelves were stripped of basic food supplies, non-perishable food, batteries, candles, torches and ice in the days leading up to the cyclone. Residents in the northern beaches of Cairns and other low lying areas were evacuated prior to Cyclone Yasi. Around 2,500 people evacuated to a large shopping centre that operated as a cyclone evacuation shelter for the duration of the cyclone, and other smaller evacuation centres were full by the afternoon before Yasi crossed land. Cyclone Yasi crossed land 138 km south of Cairns, exposing Cairns to gale force winds (Bureau of Meteorology, 2011). Cairns residents experienced heavy rains and powerful winds that twisted traffic lights and road signs, blew out glass, and destroyed trees. Electricity supply was cut in most areas of Cairns.

Respondents from this coastal regional city were 139 residents, 41 men and 98 women. The largest proportion (23.7%) was aged between 18 and 24. Most (98.4%) identified as Caucasian, were married (40.3%), and were sheltering at home when Cyclone Yasi made landfall (63.3%).

An Air Force C-17A Globemaster on the tarmac at Cairns Airport with local ambulances. *Photograph: LAC Philip Sharpe , Australian Defence © Commonwealth of Australia*

Uprooted tree on the roundabout on Bowen Road and Macarthur Drive in Townsville. *Photo by Flickr user robstephaustralia provided for use under a Creative Commons Licence cc by-2.0*

2.1.2 Townsville

Thousands of residents were evacuated from low lying Townsville suburbs in preparation for the arrival of the category five cyclone. TC Yasi crossed land 240 km north of Townsville, exposing Townsville to 150 km/h destructive winds (Bureau of Meteorology, 2011). Power was cut to most suburbs, and also to Townsville's water treatment plant. Townsville residents were warned to boil water and the city was at risk of running out of water if power was not promptly restored. Over 200mm of rain was recorded around Townsville, hundreds of trees were uprooted, and a storm surge wave was recorded. Record-high waves of up to 9m were recorded at Townsville, and parts of Townsville were inundated with floodwater. The Australian Defence Force deployed 4000 troops based in Townsville to help with the cyclone recovery effort.

The participants were 62 residents (14 men, 48 women) of Townsville. The largest proportion (40.3%) was aged between 18 and 24. Most (91.4%) identified as Caucasian, were married (38.8%), and were sheltering at home when Cyclone Yasi made landfall (69.4%).

2.1.3 Innisfail

Innisfail is located around 50 km north of Mission Beach. Thousands of Innisfail residents self-evacuated to safer areas prior to TC Yasi. Innisfail experienced significant wind damage when the destructive core of the cyclone crossed the coast. While Innisfail initially appeared to be in the path of the cyclone, the town was spared major destruction although significant damage was sustained across the town. The media reported hundreds of trees were knocked down, road signs tipped over and debris was spread across the towns. Some homes lost their roof, large banana farms were completely destroyed, and a barramundi farm south of Innisfail was destroyed, killing 8000 young fish. Thousands of homes lost power.

The participants were 42 residents (6 men, 36 women) of Innisfail. The largest proportion of participants (23.8%) was aged between 50 and 54. Most (88.1%) identified as Caucasian, were married (40.5%), and were sheltering at home when Cyclone Yasi made landfall (52.4%).

Banana prices soar after TC Yasi
Photograph: Dr Cullen Habel

Damage in Cardwell caused by Cyclone Yasi
Photograph: http://billyyicyclone.wikispaces.com/ licensed under a Creative Commons licence cc by-sa 3.0

2.1.4 Cardwell

Cardwell is located half-way between Cairns and Townsville. Cardwell residents were warned to evacuate the township but some residents chose not to leave. The coastal town bore the full force of TC Yasi with 200-220 km/h winds causing damage to over 200 homes. A 5m storm surge was recorded at Cardwell and coastal homes were inundated by up to 200mm of water. Cardwell lost power and residents were advised to boil drinking water. The marina was destroyed and damaged luxury boats were resting on land metres away from the marina. The town was isolated after TC Yasi as fallen trees and debris blocked the road and cut off both sides of the highway.

The participants were 35 residents (14 men, 21 women) of Cardwell. The largest proportion of participants (25.7%) was aged between 60 and 64. Most (88.6%) identified as Caucasian, were married (60%), and sheltered at home during the cyclone (37.1%).

2.1.5 Babinda

Babinda is located about 60 km south-east of Cairns, about 80 km north of Mission Beach, and 10 km inland from the coast. Hundreds of Babinda residents self-evacuated to Townsville prior to TC Yasi. The cyclone's centre was about 100km south of Babinda as it crossed the coast, causing extensive structural damage to homes and businesses. Cane and banana crops were flattened and houses lost their roof. Residents were without power for nearly two weeks.

The participants were 12 residents (1 man, 11 women) of Babinda. The largest proportion of participants (50.1%) was aged between 55 and 69. Most (83.3%) identified as Caucasian, were married (83.3%), and sheltered at home during TC Yasi (83.3%).

Severe Tropical Cyclone Yasi storm damage
Photo by Flickr user robstephaustralia provided for use under a Creative Commons Licence cc-by-2.0

Innisfail Council Cassowary Coast workers with Army soldiers cutting down trees that have fallen on a property in Mission Beach.
Photo by Flickr user owen65 provided for use under a Creative Commons Licence cc-by-nc-sa 2.0

2.1.6 Mission Beach

Mission Beach is located 140km south of Cairns. TC Yasi brought powerful wind gusts, storm surges and destruction as it ripped through Mission Beach. Mission Beach experienced both structural and vegetation damage. Nearly 3000 trees were snapped in half or upended. The media reported at least 90 per cent of businesses on the main street suffered extensive damage, cars were swept away, trees were down, roofs torn off and the sand on the beach had been blown away.

The participants were 72 residents (14 men, 58 women) of Mission Beach. The largest proportion of participants (19.4%) was aged between 55 and 59. Most (84.4%) identified as Caucasian, were married (54.2%), and sheltered at home during TC Yasi (47.2%).

2.1.7 Tully & Tully Heads

Tully is located 142 km south of Cairns and 209 km north of Townsville. The media reported up to one-third of the town's homes lost their roofs, a significant number of homes were inundated by up to 1-2m water, and up to 75% of banana and sugarcane crops were destroyed. Ninety percent of the main street was extensively damaged. Seven people were evacuated from Tully Hospital due to no electrical power once the road was cleared and reopened.

The participants were 52 residents (15 men, 37 women) of Tully and Tully Heads. The largest proportion of participants (19.2%) was aged between 55 and 59. Most (82.7%) identified as Caucasian, were married (59.6%), and sheltered at home during TC Yasi (63.5%).

Soldiers from 1st Battalion Royal Australian Regiment in Townsville work hard in the rain assisting in cleaning up the devastation Cyclone Yasi left in properties through out Tully Heads.
Photograph: Corporal (CPL) Melina Mancuso 1st Joint Public Affairs Unit (1JPAU) © Commonwealth of Australia

Diggers from Townsville assist in the clean up after Cyclone Yasi
Photograph: Corporal (CPL) Melina Mancuso 1st Joint Public Affairs Unit (1JPAU) © Commonwealth of Australia

2.1.8 Ingham

Ingham is located 111 km north of Townsville and 128 km south of Mission Beach. The eye of TC Yasi passed 70-80 km north of Ingham. The media reported Ingham experienced loss of treated water and power, businesses sustained damage, houses lost roofs, trees were uprooted, road signs were flattened, fences were blown over, and cane crops were seriously damaged. The Herbert River peaked at 12m, and the town was isolated as the Bruce Highway was closed by flooding.

The participants were 19 residents (5 men, 14 women) of Ingham. The largest proportion of participants (26.3%) was aged between 50 and 54. Most (84.2%) identified as Caucasian, were married (63.2%), and sheltered at home during TC Yasi (57.9%).

3.0 Demographic Characteristics

The following section describes the main demographic characteristics and questionnaire responses of the entire sample. Of the 433 respondents, 323 (74.6%) were female. The age distribution of respondents was bimodal with 17.8% aged 18 to 24 years and 10.2% aged 45 to 49, 13.9% aged 50 to 54, and 12.2% aged 55 to 59 years.

The majority of respondents identified as Caucasian (90.8%), while eight respondents (1.8%) were of Aboriginal and/or Torres Strait Islander descent. The majority of respondents were married or in a de-facto relationship (65.1%). When TC Yasi made landfall most respondents (n=254; 58.7%) were sheltering at home, 94 (21.7%) were with family and/or friends in the same town as their home, 66 (15.2%) were in another town, and 19 (4.4%) were sheltering in a cyclone evacuation centre.

Of all respondents, 84 (19.4%) were students, 255 (47.8%) were employed, 13 (3.0%) were unemployed and 81 (18.7%) were retired (Figure 3.4).

The majority of participant who evacuated to a cyclone shelter for the duration of the cyclone were single, divorced, separated or widowed. The results indicate that participants without family support (condition resources) were more likely to seek the safety of shelter with others rather than endure the storm, and cope with any damage, on their own.

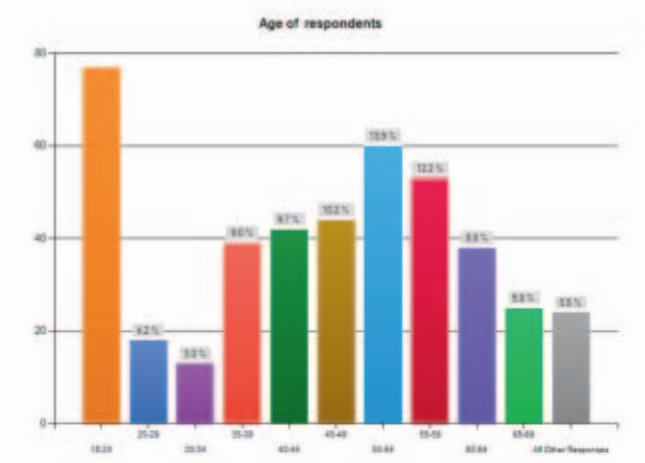


Figure 3.1: Age of respondents

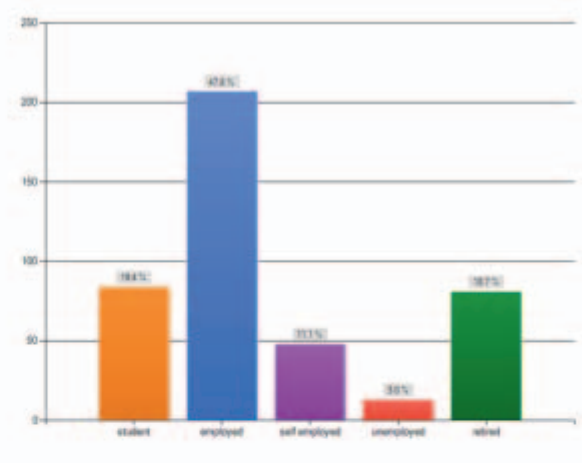


Figure 3.2: Occupation of respondents

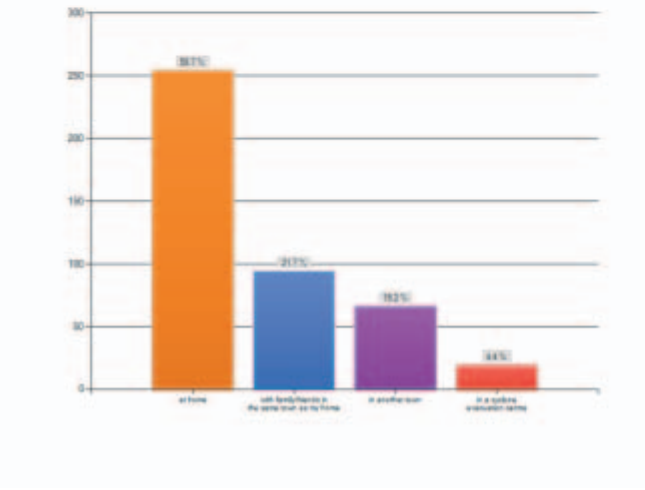


Figure 3.3: Where participants sheltered during TC Yasi

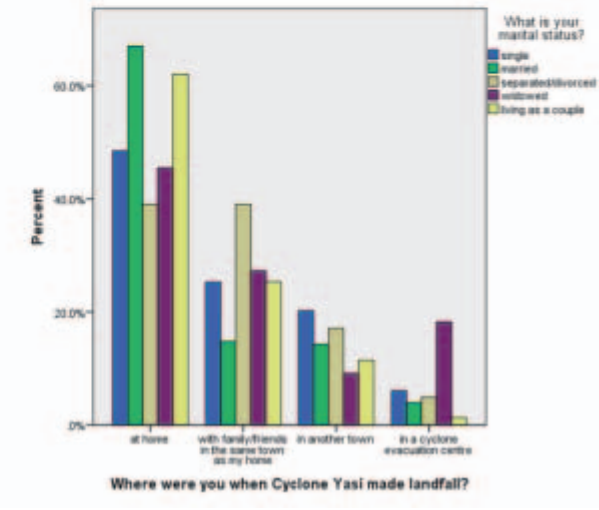


Figure 3.4: Marital status by where participants sheltered

Table 3.1 shows a significantly smaller proportion of Mission Beach to Ingham participants sheltered in an evacuation centre compared with participants in other areas. It is likely very few evacuation centres were available between Mission Beach and Ingham rather than a preference to shelter elsewhere as these comments reveal:

The lack of cyclone shelter in Cardwell and having driven to Ingham to get away from it only to find they had nothing organised was frightening.

But the Council was very unprepared with no evacuation centres available and no support afterwards by Council representatives.

Table 3.1: Demographic characteristics stratified by location of residence of 433 respondents from north Queensland, Australia.

	Cairns (n=139)	Babinda and Innisfail (n=54)	Mission Beach to Ingham (n=178)	Townsville (n=62)	p-value*
% Female	70.5%	87.0%	73.0%	77.4%	P=0.092
% Younger than 35 years	33.1%	14.8%	12.4%	51.6%	P<0.001
% Caucasian	91.4%	87.0%	88.8%	98.4%	P=0.036
% Married or de-facto	59.0%	72.2%	74.7%	45.2%	P<0.001
% With 2 to 4 people living in dwelling	74.1%	68.5%	65.2%	54.8%	P=0.154
% Employed	59.0%	79.6%	60.1%	37.1%	P<0.001
% In cyclone evacuation centre during landfall	6.5%	5.6%	2.2%	4.8%	P=0.019

*p-values results of Fisher's exact tests.

4.0 Preparedness

Almost all respondents (n=429; 99.3%) took the cyclone warning serious or very serious (Table 4.1). More than a third (n=162; 37.5%) of respondents started preparing for the cyclone more than 3 days before landfall and a majority (n=343; 79.4%) felt well prepared.

The comments below are representative of the level of preparedness in the community, but also show the psychological effect of a natural disaster despite a high level of preparedness.

My family and I prepare for cyclones at the start of every cyclone season...this means that when a cyclone does come what we have to do is minimal. Hence I feel we are always well prepared.

As a family we prepared very well for the cyclone. As a community and town we also prepared very well.

Generally, as a family we are always basically prepared with a kit supply of necessities such as first aid kit, radio, batteries, insect repellent etc.

I was well prepared physically. I was totally unprepared for the mental/emotional trauma, especially how long it lasts.

One of the themes that emerged from the qualitative data was prior experience with other cyclones resulted in better planning and preparation for TC Yasi.

We had plenty of warnings, good level of information and having been through Larry, knew the best way to prepare. Probably better prepared than Larry and certainly than Winifred in 1986.

Being through cyclone Larry we were well prepared for cyclone Yasi.

We were well prepared because we knew what was coming after experiencing cyclone Larry. We live on a block out of town and regularly we have power cuts or experience flooding so we are always prepared.

Having been part of the recovery / rebuild post Larry and as a North Queenslander and former resident of the NT and WA I am very well prepared.

Well prepared as I have been through 3 very severe cyclones so know what to expect and need.

Grew up with only one parent and have been through cyclones before I was able to prepare easily.

Activity	N (%)
Started preparing for the cyclone	
1 day before	62 (14.4%)
2 days before	127 (29.4%)
3 days before	81 (18.75%)
More than 3 days before	162 (37.5%)
Did fill car with petrol	363 (84.0%)
Did buy canned or dry food	366 (84.7%)
Did have a first aid kit	371 (85.9%)
Did have candles and matches	404 (93.5%)
Did cover windows	263 (60.9%)
Did have batteries for radios and torches	409 (94.7%)
Did take cyclone warnings	
Very seriously	333 (77.1%)
Seriously	96 (22.2%)
Not seriously	3 (0.7%)
How well prepared were you with supplies?	
Well prepared	343 (79.4%)
Could have been better	84 (19.4%)
Not prepared at all	5 (1.2%)

Table 4.1: Activities of 433* respondents to prepare for TC Yasi, February 2011, north Queensland, Australia. **One person did not answer these questions*

Table 4.2 shows preparation activities stratified by location of residence. A significantly greater proportion of respondents from Mission Beach to Ingham and Townsville began preparing for the cyclone more than three days before, compared with respondents from Cairns, Babinda and Innisfail (p = 0.019). Significantly fewer Cairns respondents filled their car with petrol compared with respondents from other areas (p = 0.001). Significantly fewer Townsville participants had batteries for radios and torches (p=0.017), took cyclone warnings very seriously (p=0.006), and were very well prepared with supplies (p=0.001), compared with respondents from other areas (Table 4.2). The following comment may explain why fewer Cairns participants refuelled:

We prepared well except for filling the car with fuel - left it until Thurs afternoon and the queue was too long - and there were reports of fights in queue.

People queued to buy ice at the ice works in Townsville
Photo by Flickr user mr_billiam provided for use under a Creative Commons Licence cc-by-sa 2.0

Table 4.2:
Activities of 433* respondents to prepare for TC Yasi, February 2011, north Queensland, Australia, stratified by location of residence.

	Cairns (n=139)	Babinda and Innisfail (n=54)	Mission Beach to Ingham (n=178)	Townsville (n=62)	p-value*
% Started preparing for the cyclone more than 3 days before	27.5%	29.6%	45.5%	43.5%	P=0.019
% Filled car with petrol	74.6%	94.4%	88.2%	83.9%	P<0.001
% Bought canned or dry food	81.9%	83.3%	87.6%	83.9%	P=0.511
% Had a first aid kit	81.9%	88.9%	89.3%	82.3%	p=0.200
% Had candles and matches	94.2%	92.6%	94.9%	88.7%	p=0.359
% Covered windows	68.8%	57.4%	57.9%	54.8%	p=0.129
% Had batteries for radios and torches	93.5%	98.1%	97.2%	87.1%	p=0.017
% Took cyclone warnings very seriously	76.8%	81.5%	82.0%	59.7%	p=0.006
% Very well prepared with supplies	79.0%	85.2%	84.8%	59.7%	p=0.001

*p-values results of Fisher's exact tests.

4.1 Property damage and loss of services

Of the 433 respondents, 115 (26.7%) reported moderate and 59 (13.7%) reported major property damage caused by TC Yasi, and 261 (60.7%) reported adequate insurance cover (Table 4.3). Overall, 61 (14.3%) participants were without electricity, 21 (4.9%) were without running water, and 37 (8.6%) were without any fixed telephone line contact for more than 21 days.

Reported impact	N (%)
Level of property damage	
None	78 (18.1%)
Minor	178 (41.4%)
Moderate	115 (26.7%)
Major	59 (13.7%)
Was your insurance cover adequate?	
Yes	261 (60.7%)
No	43 (10.0%)
Not applicable	126 (29.3%)
Days without electricity	
None	38 (8.9%)
Less than 2	51 (11.9%)
2 to 7	142 (33.2%)
8 to 14	71 (16.6%)
15 to 21	65 (15.2%)
More than 21 days	61 (14.3%)
Days without running water	
None	257 (60.0%)
Less than 2	57 (13.3%)
2 to 7	69 (16.1%)
8 to 14	13 (3.0%)
15 to 21	11 (2.6%)
More than 21 days	21 (4.9%)
Days without fixed telephone line connection	
None	128 (29.9%)
Less than 2	65 (15.2%)
2 to 7	123 (28.7%)
8 to 14	50 (11.7%)
15 to 21	25 (5.8%)
More than 21 days	37 (8.6%)
Days without mobile phone connection	
None	150 (35.0%)
Less than 2	116 (27.1%)
2 to 7	88 (20.6%)
8 to 14	43 (10.0%)
15 to 21	16 (3.7%)
More than 21 days	15 (3.5%)
How long after CT Yasi did it take you to return to your normal work or study?	
Worked all the time	12 (2.8%)
Within one week	269 (63.4%)
More than one week but within one month	21 (5.0%)
Longer	15 (3.5%)
Not applicable	107 (25.2%)

Table 4.3: Reported property damage and loss of services across all regions

The following comments show a high level of preparedness gave participants the resources to cope with a loss of services, and prevented property damage in some cases. However, a high level of preparedness could not prevent the damage and destruction of homes and businesses in the hardest hit areas such as Mission Beach, Tully, Tully Heads and Cardwell.

Well prepared. I lost power at noon on the day before the cyclone made landfall but I prepared a hot meal that night with the aid of my gas bbq. I have small battery operated touch lights for each room for use at times of blackout. I also have small book lights. I went to bed, read for a few hours, listened to the radio for a few hours but I went to sleep at what I believe was an hour before landfall - I slept through the cyclone!

House has power cut over so we were able to run most appliances/lights etc by generator. Had plenty of food and water on hand and adequate cash to carry us through the period of no power and no communications.

We prepared ourselves very well. Had small generator, bottled water, canned food, candles etc..although water and fuel for generator were running low towards the second week.

Good! Precautions / preparation for strong winds prevented any avoidable damage ie. sails lowered, loose items secured.

Having suffered severe damage after TC Larry (loss of most of house) we were much more prepared for Yasi. Lot of work paid off as windows and doors in main residence remained in place. Little we could do for rental property at Mission Beach and it ended up being demolished.

All the preparation in the world would have not made any difference due to the 300 km winds and 2.5 metre tidal surge.

Preparation good. Family protected (removed from tidal surge area). Property security good (until floods arrived).

Table 4.4 shows a significantly greater proportion of participants from Mission Beach to Ingham reported extensive property damage compared with participants from other areas ($p < 0.001$), and a significantly greater proportion of participants from Babinda, Innisfail, and Mission Beach to Ingham reported adequate insurance cover ($p < 0.001$) [Table 4.4]. A significantly greater proportion of participants from Mission Beach to Ingham reported electricity, water and phone services were cut off for extended periods of time ($p < 0.001$), and reported a longer period before returning to work or studies ($p < 0.001$), compared with participants from other areas.

Table 4.4: Impact on property damage and loss of services caused by TC Yasi, February 2011, as reported by 433* respondents, north Queensland, Australia, stratified by location of residence.

	Cairns (n=139)	Babinda and Innisfail (n=54)	Mission Beach to Ingham (n=178)	Townsville (n=62)	p-value*
% With level of property damage moderate or major	11.7%	29.6%	75.7%	12.9%	P<0.001
% With adequate insurance cover	40.9%	70.4%	73.4%	59.7%	P<0.001
% Without electricity for more than 21 days	0.7%	14.8%	29.7%	0%	P<0.001
% Without running water for more than 1 week	0.7%	9.3%	21.7%	1.6%	P<0.001
% Without fixed telephone line connection for more than 21 days	2.2%	9.3%	16.6%	0%	P<0.001
% Without mobile phone connection for more than 1 week	0.7%	18.5%	36.0%	0%	P<0.001
% Who took longer than 1 week to returning to work**	0.9%	11.1%	29.1%	0%	P<0.001

*p-values results of Fisher's exact tests.
**Based on 317 responses from people who worked or students.

4.2 Energy and object resource losses

Participants reported moderate to major losses in energy resources: 122 (29.2%) reported moderate to major changes in their time for adequate sleep and 143 (34.2%) reported moderate to major changes to their free time due to TC Yasi (Table 4.5). In terms of object resource losses, moderate to major loss of sentimental possessions was reported by 44 (10.5%) of participants, moderate to major loss of personal transportation was reported by 16 (3.8%) of participants, and moderate to major loss of household items was reported by 82 (19.6%) of participants. Participants reported moderate to major basic object resource losses: 88 (21.1%) respondents experienced a moderate to major loss in money available for living expenses (see Table 4.5), and moderate to major loss in availability of food was reported by 76 (18.2%) of participants.

	None	Minor	Moderate	Major
Experienced energy resource changes				
Time for adequate sleep	183 (43.8%)	113 (27.0%)	71 (17.0%)	51 (12.2%)
Free time	192 (45.9%)	83 (19.9%)	66 (15.8%)	77 (18.4%)
Experienced object resource changes				
Sentimental possessions	323 (77.1%)	52 (12.4%)	21 (5.0%)	23 (5.5%)
Personal transportation	374 (89.3%)	29 (6.9%)	8 (1.9%)	8 (1.9%)
Household items	229 (54.7%)	108 (25.8%)	51 (12.2%)	31 (7.4%)
Experienced basic object resource changes				
Availability of food	196 (47.0%)	145 (34.8%)	50 (12.0%)	26 (6.2%)
Money for living expenses	231 (55.4%)	98 (23.5%)	56 (13.4%)	32 (7.7%)

Table 4.5: Energy and object resource changes experienced due to TC Yasi, February 2011, as reported by 433* respondents from north Queensland, Australia.
*Between 14 and 16 persons did not answer these questions

Participants' comments below are representative of the steps North Queensland residents took prior to the cyclone to prevent the destruction of personal and sentimental possessions, and to ensure an adequate supply of food, water and money for living expenses.

Packed all our most valuable items, clothes etc, even the kids' uniforms and school bags in case I lost my roof and I felt they would need some normality.

In hindsight, cash is always a good commodity. Post cyclone, the corner store or motel may have supplies but no Eftpos facilities. Meaningful personal items are always packed and wrapped at the first sign of a cyclone threatening land.

The cupboard always has canned food and let's face it, post cyclone you have to use up perishable foods first. Drinking water is always a problem, we fill up as much as we can prior and set it up in an area of the house that will not be in the way in the event of a quick getaway. With a large family, you do go through this fast though.

We all come from Darwin so we knew the drill - Yasi was supposed to be bigger though so we wrapped up all our paintings, my violin, laptops etc in garbage bags in the bathroom and toilet. As soon as I heard that the power was likely to go off in the next day or so, I cooked bulk spaghetti sauce and pumpkin soup and froze it in small portions. This was great, as the food froze completely before the power outage and we ate it over the next few days.

However, some residents' preparations were limited due to work commitments, personal circumstances, and lack of funds or knowledge, while others in the most severely affected areas were unable to prevent the loss of basic supplies.

I wasn't as prepared as I could have been as I was not permitted to leave my workplace to prepare once the cyclone was seen as a serious threat. By the time I went shopping, I could not purchase gas canisters for my portable stove and most of the good canned foods were gone.

Due to me working as a Police officer in the Cardwell area at that time I was required to spend most of my pre Cyclone time

preparing and evacuating others in the area. This left me very little time to look after my family and my personal residence. Most of my preparations were done on the day of the cyclone, which added significantly to pressure being put on me to be able to protect my own residence and family.

Difficult to prepare as working night shifts at local hospital. Lack of sleep.

Could have been better prepared but was thrown out by baby deciding to arrive.

Living on a farm requires a very large area to be made prepared. Health and age stops the availability of time to do the prep.

I was short on cash to prepare properly for the cyclone- I'm a student on youth allowance/ casual work and didn't have any savings to deal with the outlay for torches/ food/ radio/ fuel etc. I drove to Townsville at midnight the night before the cyclone with a group of friends. It was lucky that the people I was staying with in Townsville had gas and water and plenty of food stocked.

I feel I prepared okay, but was really not prepared for power loss for seven days! Would have been great to have a generator but unfortunately they are not affordable.

We thought we were prepared (we had tinned food, water etc) but the loss of electricity for 5 days took a toll on us.

With being new to the district a cyclone list should be given out with safety areas marked on map. Also what you need to do to your home for safety.

Could have been better prepared as never been through cyclone before so didn't know what to expect afterwards.

Thought we had prepared for having enough water but the water tank blew down first thing. Did not think the power would be out for 23 days. No power no water from the big electric pump.

When energy, object, and basic object resource losses are stratified by location of residence (see Table 4.6), a significantly greater proportion of Babinda, Innisfail, and Mission Beach to Ingham respondents reported a moderate to major loss of time for adequate sleep ($p = 0.001$). A significantly greater proportion of Mission Beach to Ingham respondents reported moderate to major loss of free time ($p < 0.001$), loss of household items ($p < 0.001$) and loss of money for living expenses ($p < 0.001$). Many residents in the Mission Beach to Ingham area experienced the loss of roofs or leaking roofs, and inundation of their homes with seawater which damaged and destroyed household items. These areas also required extensive clean-up operations, the disposal of damaged and waterlogged household goods, the removal of materials from homes and/or outbuildings that were damaged or destroyed, and the extensive removal of vegetation. In the days and weeks after the cyclone, much free time was spent on these activities in the most affected areas.

Table 4.6: Reported energy and object resource losses stratified by location of residence

	Cairns (n=139)	Babinda and Innisfail (n=54)	Mission Beach to Ingham (n=178)	Townsville (n=62)	p-value*
% with moderate to major loss of time for adequate sleep	17%	36%	39%	22%	$p = 0.001$
% with moderate to major loss of free time	15%	28%	53%	29%	$p < 0.001$
% with moderate to major loss of sentimental possessions	1.5%	6%	23%	0%	n/a*
% with moderate to major loss of personal transportation	1.4%	2%	7.5%	0%	n/a*
% with moderate to major loss of household items	3%	14%	40%	2%	$p < 0.001$
% with moderate to major loss of availability of food	16%	10%	20%	25%	$p = 0.223$
% with moderate to major loss of money for living expenses	12%	18%	30%	19%	$p < 0.001$

*Does not meet chi square test assumptions

4.3 Personal characteristic and condition resource losses

Of the participants, 72 (17.1%) reported a moderate and 49 (11.6%) reported a major change in their feeling of whether they have control over their life (Table 4.7). Fifty-five (13.1%) participants reported a major change in their motivation for getting things done; while 29 (7%) reported a major change in feeling that life has purpose.

Participants reported a major change in their sense of humour (4.5%), in their sense of optimism (6.9%), in feeling independent (6.9%), feeling closeness with one or more family members (6.2%), in companionship (4.5%), in feeling valuable to others (7.9%), in support from co-workers (6.2%), and in closeness with at least one friend (5.5%).

	Emotional Change			
	None	Minor	Moderate	Major
Personal characteristic resources				
Feeling that you have control over your life	180 (42.8%)	120 (28.5%)	72 (17.1%)	49 (11.6%)
Motivation to get things done	193 (45.8%)	103 (24.5%)	70 (16.6%)	55 (13.1%)
Feeling that your life has purpose	258 (61.3%)	92 (21.9%)	42 (10.0%)	29 (6.9%)
Sense of humour	284 (67.5%)	81 (19.2%)	37 (8.8%)	19 (4.5%)
Sense of optimism	238 (56.5%)	109 (25.9%)	45 (10.7%)	29 (6.9%)
Feeling independent	258 (61.3%)	88 (20.9%)	46 (10.9%)	29 (6.9%)
Condition resources				
Closeness with one or more family members	240 (57.1%)	92 (21.9%)	62 (14.8%)	26 (6.2%)
Companionship	277 (66.0%)	73 (17.4%)	51 (12.1%)	19 (4.5%)
Feeling valuable to others	248 (59.0%)	76 (18.1%)	63 (15.0%)	33 (7.9%)
Support from co-workers	292 (69.5%)	62 (14.8%)	40 (9.5%)	26 (6.2%)
Closeness with at least one friend	275 (65.5%)	78 (18.6%)	44 (10.5%)	23 (5.5%)

Table 4.7: Personal characteristic and condition resource losses caused by TC Yasi, February 2011, as reported by 433* respondents from north Queensland, Australia.
*12 or 13 persons did not answer these questions

While the majority of participants reported none or minor changes to personal characteristic resources and condition resources, the comments below show some participants did experience moderate or major changes – some positive and some negative:

Having been through two cyclones in two days in Fiji (in my sister-in-law's house), I was aware of what to expect - this did not alter the feeling of having no control of my life after.

I was pretty pissed off as we have no family members here, only my husband and I and we had to struggle to get through this horror by ourselves.

We travelled to Townsville to stay with my in-laws which we found comforting to be with other family members.

Close knit group of friends supporting each other, all well educated regarding cyclone preparedness, with adequate cyclone supplies in place throughout the cyclone season.

I wasn't happy with the response of work when I couldn't get into work due to roads being blocked and no clean clothes.

When personal characteristic and condition resource losses are stratified by location of residence (see Table 4.8), a significantly greater proportion of participants from Mission Beach to Ingham experienced major personal characteristic and condition resource losses compared with participants from other regions.

Table 4.8: Major personal characteristic and condition resource losses as reported by 433* respondents from north Queensland, Australia, stratified by location of residence

	Cairns (n=139)	Babinda and Innisfail (n=54)	Mission Beach to Ingham (n=178)	Townsville (n=62)	p-value*
Personal characteristic resources					
Feeling that you have control over your life	2.9%	9.8%	20.8%	6.6%	p <0.001
Motivation to get things done	7.4%	5.9%	21.4%	8.2%	p < 0.001
Feeling that your life has purpose	3.7%	2.0%	12.1%	3.3%	p < 0.001
Sense of humour	1.5%	2.0%	9.2%	0.0%	n/a**
Sense of optimism	2.2%	5.9%	12.7%	1.6%	p < 0.001
Feeling independent	1.5%	2.0%	13.9%	3.3%	p < 0.001
Condition resources					
Closeness with one or more family members	4.4%	0.0%	10.4%	3.3%	p = 0.091
Companionship	3.7%	2.0%	6.4%	3.3%	p = 0.024
Feeling valuable to others	5.9%	5.9%	12.1%	1.7%	p = 0.002
Support from co-workers	3.7%	7.8%	8.7%	3.3%	p = 0.061
Closeness with at least one friend	4.4%	3.9%	8.1%	1.7%	p = 0.006

*12 persons did not answer these questions
**Does not meet chi square test assumptions

5.0 Symptoms of Acute Stress Disorder

Of all participants, 62 (14.9%) reported that they try not to talk about the cyclone, 66 (15.8%) reported that they avoid things that remind them of the cyclone, 56 reported they have difficulty remembering important things about the cyclone, 88 (21.1%) reported they think about the cyclone when they do not want to, and 32 (7.7%) reported to have nightmares about cyclone Yasi (Table 5.1).

When the data is stratified by location of residence, a significantly greater proportion of participants from Mission Beach to Ingham reported symptoms of ASD compared with participants from the other areas (Table 5.2).

Reported ASD symptoms	Answered "True" (%)
I try not to talk about the cyclone	62 (14.9%)
I avoid things that remind me of the cyclone	66 (15.8%)
I have difficulty remembering important things about the cyclone	56 (13.4%)
I think about the cyclone when I do not want to	88 (21.1%)
I have nightmares about the cyclone	32 (7.7%)

Table 5.1: Symptoms of acute stress disorder due to TC Yasi, February 2011, as reported by 433* respondents, February 2011, north Queensland, Australia. *16 persons did not answer these questions

	Cairns (n=139)	Babinda and Innisfail (n=54)	Mission Beach to Ingham (n=178)	Townsville (n=62)	p-value*
I try not to talk about the cyclone					
True	5.1%	17.6%	24.0%	8.5%	p <0.001
False	94.9%	82.4%	76.0%	91.5%	
I avoid things that remind me of the cyclone					
True	7.4%	19.6%	25.1%	5.1%	p < 0.001
False	92.6%	80.4%	74.9%	94.9%	
I have difficulty remembering important things about the cyclone					
True	4.4%	9.8%	21.6%	13.6%	p < 0.001
False	95.6%	90.2%	78.4%	86.4%	
I think about the cyclone when I do not want to					
True	4.4%	19.6%	38.0%	11.9%	p < 0.001
False	95.6%	80.4%	62.0%	88.1%	
I have nightmares about the cyclone					
True	2.2%	5.9%	14.6%	1.7%	**n/a
False	97.8%	94.1%	85.4%	98.3%	

Table 5.2: Symptoms of Acute Stress Disorder as reported by 433* respondents from north Queensland, Australia, stratified by location of residence
*16 persons did not answer these questions **Does not meet chi square test assumptions

The following comments are representative of the anxiety and emotional distress reported by participants:

Small town...everyone knows where everyone else lives but then you have to listen for hours, days, weeks of everyone coming in and telling you what they were experiencing...breaking down crying, ranting about getting no help, and you just don't want to hear this...you want to say ..... shut up and go away..this went on for weeks!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! You live not only your shock of the whole experience but up to 200 people or more a day telling you their experience.

Nothing can prepare for the fear of that night, then the relief that we were alive in the morning, the shock of seeing the town and the stresses ever since from insurance claims, etc etc.

Hard to write things as it still hurts.

I was well prepared physically. I was totally unprepared for the mental/emotional trauma, especially how long it lasts.

I was unprepared for the emotions that would go through me. Guilt at leaving my family and what may happen to them, but also felt compelled to go to work in case of mass casualties the next day. My emotions were like a yo-yo and then post cyclone I felt so much guilt that we got through unscathed and others lost everything.

Lost everything, job, all I own as most was in storage and was boarding, but those were only items ...it has been the loss of all I have worked for and future with my fiancé and family we had planned - all gone through nobody's fault.

6.0 Loss of regular medication

Of all participants, 178 (42.7%, 16 missing values) reported to having been on regular medication. Of these 178 participants, 16 (8.9%) reported a disruption of the availability of their medication due to TC Yasi. Twelve (75.0%) participants reported a disruption of less than 2 days, two (12.5%) reported a disruption of 3 to 7 days and another two participants reported a disruption of between 8 days and 2 weeks.

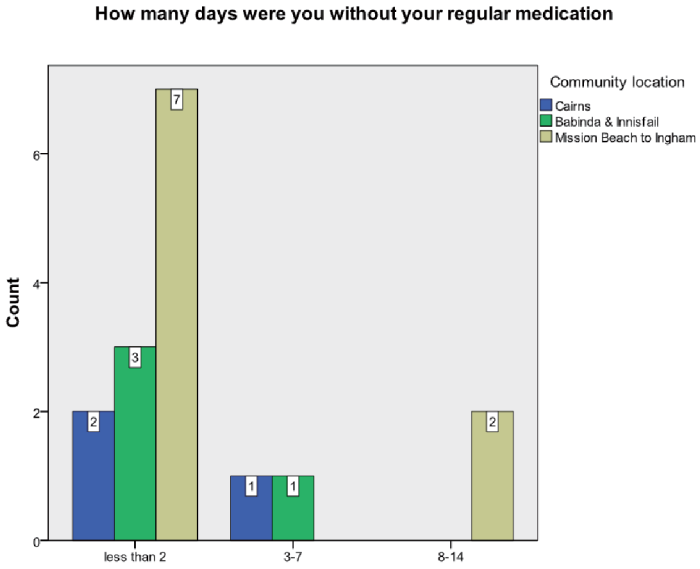


Figure 6.1: Reported loss of regular medication stratified by location of residence

When the data is stratified by location of residence, the majority of participants who experienced a disruption in the availability of their regular medication were residents of Mission Beach to Ingham. The comments below indicate it did not occur to some participants to stock up on regular medications, while others plan carefully for times when they may not be able to access their health care provider or a pharmacy.

I take regular medication and did not think to stock up on supply- I had less than a week's worth when the cyclone hit.

In respect to my regular daily medications for blood pressure - scripted medications are generally supplied for a 30 day period, but the scripts can be filled at 21 days. By keeping this personal process in place throughout the year I generally end up holding enough medications for a period of about 6 weeks at least. Additionally before a big cyclone impact, I attend the chemist and buy the next month in advance (some chemists will do this others will not) and then I can be self sufficient for about 10 weeks or more if not overly active & medications rationed out - using my own BP monitor.

7.0 Media

Although participants were not directly asked any questions about the role of the media before, during and after TC Yasi, the media emerged as both a positive and negative theme as the representative comments below show. The ABC radio and television coverage of the cyclone was singled out as a trusted and reliable source, while other media outlets were perceived as providing unnecessary hyperbole over the cyclone threat. National and local news organisations continued to give dire warnings and newspapers were running dramatic headlines in the days leading up to TC Yasi crossing the coast. However, if TC Yasi had not veered south before crossing land, and the worst case scenario had occurred - a major regional city bore the full force of TC Yasi - the media coverage may not have been perceived as hyperbole.

ABC Radio great job.

Kept informed prior to the cyclone by the media.

Felt well informed by media and by mobile phone.

I think due to the sheer size of the cyclone and the hype from the media the experience leading up to this cyclone was very scary!! I remember reading the BOM site and the words about worst in generations and catastrophic was gut-wrenching. I remember I could not stop crying and shaking. Having Cyclone Yasi so close to Cyclone Larry was just unreal in its self for us Innisfail-ites. I think the hype from the media was necessary due to the sheer size and intensity of the cyclone, and it proved successful as there were no deaths. Whatever it takes to get people to pay attention and take action to make themselves safe is worth it. I have spoken to a lot of people who disagree about the media and found the whole hype over rated.

Was probably more anxious due to the overhype of media reporting.

Based on similar info before Cyclone Larry we thought a lot of the info pre Yasi was also a lot of hype. Should only be one (1) outlet of info - radio/TV ABC.

Media were providing conflicting information to the residents living in the city about mandatory evacuation. Information was clarified after phone calls were made to the emergency services.

I was not happy with how the national media handled themselves. I had friends and family calling crying, thinking we were going to die, and very concerned for our well being.

8.0 Reported preparedness and Acute Stress Disorder

The majority of participants who experienced one or more ASD symptoms felt they were well prepared with supplies (81%).

How well prepared were you with supplies?	ASD symptoms	
	No ASD symptoms	One or more ASD symptoms
well prepared	216 (78.3%)	114 (80.9%)
could have been better prepared	57 (20.7%)	25 (17.7%)
not prepared at all	3 (1.1%)	2 (1.4%)

Table 8.1: Prepared with supplies by Acute Stress Disorder symptoms

8.1 Reported preparedness and Acute Stress Disorder by location of residence

As the majority of participants reported they were well prepared in terms of supplies, this analysis focussed only these participants to determine if there was a significant relationship between preparation and psychological distress across locations. Of those participants who reported they were well prepared (n = 330), the majority reported they had not experienced any ASD symptoms except for participants who resided in Tully and Ingham. For participants located in Tully and Ingham, there was a significant relationship between preparation and psychological distress (p < .001).

ASD symptoms	Cairns	Innisfail	Babinda	Mission Beach	Cardwell	Tully	Ingham	Townsville	P value
None	89.7	67.6	70.0	51.7	55.2	34.1	33.3	70.6	<.001
1 or more	10.3	32.4	30.0	48.3	44.8	65.9	66.7	29.4	

Table 8.2: Reported preparedness and Acute Stress Disorder by location of residence

9.0 Reported property damage and Acute Stress Disorder

Table 9.1 shows participants self-reported level of property damage by ASD symptoms. There is a significant association between property damage and one or more ASD symptoms (p < .001). Participants with none or minor property damage are more likely to report no ASD symptoms, whereas participants with moderate and major property damage are more likely to report one or more ASD symptoms.

How would you rate your level of property damage following the cyclone?	ASD symptoms	
	No ASD symptoms	One or more ASD symptoms
none	67 (24.3%)	9 (6.4%)
minor	131 (47.5%)	43 (30.5%)
moderate	62 (22.5%)	49 (34.8%)
major	16 (5.8%)	40 (28.4%)

Table 9.1: Level of property damage by ASD symptoms

10.0 Reported resource loss and ASD symptoms

10.1 Personal characteristic resources

Table 10.1 shows a significant association between personal characteristic resource loss and ASD symptoms (p <.001). Participants who experienced no change in personal characteristic resources were more likely to report no ASD symptoms, whereas participants who experienced a minor to major change in personal characteristic resources were more likely to report experiencing one or more ASD symptoms.

Personal Characteristic Resource	% No ASD Symptoms	% One or more ASD Symptoms	p value
% Feeling that you have control over your life			
No change	82.2	11.8	< .001
Minor change	27.3	30.3	
Moderate change	10.9	29.6	
Major change	4.7	25.4	
% Motivation to get things done			
No change	58.5	20.4	< .001
Minor change	21.5	30.3	
Moderate change	10.9	28.2	
Major change	9.1	21.1	
% Feeling that your life has purpose			
No change	77.5	28.9	< .001
Minor change	13.8	38.0	
Moderate change	6.2	17.6	
Major change	2.5	15.5	
% Sense of Humour			
No change	80.7	40.8	< .001
Minor change	13.5	31.0	
Moderate change	4.7	16.9	
Major change	1.1	11.3	
% Sense of optimism			
No change	72.0	26.8	< .001
Minor change	19.6	37.3	
Moderate change	5.8	20.4	
Major change	2.5	15.5	
% Feeling independent			
No change	75.3	33.8	< .001
Minor change	17.1	28.2	
Moderate change	4.4	23.9	
Major change	3.3	14.1	

Table 10.1: Personal characteristic resources by ASD symptoms

10.2 Condition resources

Table 10.2 shows a significant association between condition resource loss and ASD symptoms ($p < .001$). Participants who experienced no change in condition resources were more likely to report no ASD symptoms, whereas participants who experienced a minor to major change in condition resources were more likely to report experiencing one or more ASD symptoms.

Condition Resource	% No ASD Symptoms	% One or more ASD Symptoms	p value
% Closeness with one or more family members			
No change	66.5	38.7	< .001
Minor change	18.5	28.2	
Moderate change	10.9	22.5	
Major change	4.0	10.6	
% Companionship			
No change	77.5	43.0	< .001
Minor change	10.2	31.7	
Moderate change	8.4	19.7	
Major change	4.0	5.6	
% Feeling valuable to others			
No change	69.8	38.0	< .001
Minor change	14.9	24.6	
Moderate change	10.2	23.9	
Major change	5.1	13.4	
% Support from co-workers			
No change	77.8	54.2	< .001
Minor change	11.6	21.1	
Moderate change	7.3	12.7	
Major change	3.3	12.0	
% Closeness with at least one friend			
No change	75.3	46.5	< .001
Minor change	14.5	26.8	
Moderate change	6.5	17.6	
Major change	3.6	9.2	

Table 10.2: Condition resources by ASD symptoms

10.3 Object resources

Object resources were significantly associated with ASD symptoms ($p < .001$). Participants who reported no change in object resources were more likely to report no ASD symptoms while participants who reported minor to major object resource changes were more likely to report one or more ASD symptoms (Table 10.3).

Object Resource	% No ASD Symptoms	% One or more ASD Symptoms	p value
% Sentimental possessions			
No change	88.4	54.9	< .001
Minor change	8.7	19.7	
Moderate change	0.7	13.4	
Major change	2.2	12.0	
% Personal transportation			
No change	93.8	80.3	< .001
Minor change	4.4	12.0	
Moderate change	0.7	4.2	
Major change	1.1	3.5	
% Household items			
No change	68.0	29.6	< .001
Minor change	22.9	30.3	
Moderate change	5.5	25.4	
Major change	3.6	14.8	

Table 10.3: Object resources by ASD symptoms

10.4 Energy resources

Energy resources were significantly associated with ASD symptoms ($p < .001$). Participants who reported no change in energy resources were more likely to report no ASD symptoms while participants who reported minor to major energy resource changes were more likely to report one or more ASD symptoms (Table 10.4).

Object Resource	% No ASD Symptoms	% One or more ASD Symptoms	p value
% Time for adequate sleep			
No change	54.9	21.8	< .001
Minor change	23.3	34.5	
Moderate change	14.5	21.8	
Major change	7.3	21.8	
% Free time			
No change	56.0	26.1	< .001
Minor change	18.5	22.5	
Moderate change	14.5	18.3	
Major change	10.9	33.1	

Table 10.4: Energy resources by ASD symptoms

10.5 Basic object resources

Basic object resources were significantly associated with ASD symptoms (Table 10.4). Participants who reported no change in availability of food were more likely to report no ASD symptoms while participants who reported minor to major changes in availability of food were more likely to report one or more ASD symptoms (p = .010).

Participants who reported no change in money for living expenses were more likely to report no ASD symptoms while participants who reported minor to major changes in money for living expenses were more likely to report one or more ASD symptoms (p < .001).

Basic Object Resource	% No ASD Symptoms	% One or more ASD Symptoms	p value
% Availability of food			
No change	51.6	38.0	< .010
Minor change	33.8	36.6	
Moderate change	8.7	18.3	
Major change	5.8	7.0	
% Money for living expenses			
No change	64.7	37.3	< .001
Minor change	20.7	28.9	
Moderate change	11.3	17.6	
Major change	3.3	16.2	

Table 10.5: Basic object resources by ASD symptoms

Vehicle crushed by a fallen tree
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11.0 Conclusions

Tropical Cyclone Yasi (TC Yasi) made landfall in the early hours of Thursday 3rd February 2011 with the eye passing over the Mission Beach region. Estimated maximum wind gusts experienced in the highest wind areas of the study area were around 200-220 km/h.[6]

This study was guided by the conservation of resources (COR) stress theory.[7,8] COR stress theory predicts a threat of loss, or an actual loss, of resources results in psychological stress.[7] COR stress theory proposes people with readily available financial resources and strong social support networks fare better than those who cannot readily replace lost resources and do not have strong social support networks.[9,10] The theory also suggests resource gains or resource conservation may have positive effects. For example, the value of preparation and coping skills may be positive effects to survivors or victims of disasters and provide some level of protection or resilience from psychological stress.[11]

The levels of psychological distress across locations – participants located in the Mission Beach to Ingham areas were significantly more likely to report one or more symptoms of ASD followed by participants located in Innisfail and Babinda. This finding is not unexpected given these were the regions hardest hit by TC Yasi[12] and residents experienced an extended loss of services and some residents experienced extensive property damage.

The relationship between preparation and psychological distress across locations – a significant relationship between preparation and psychological distress was not found in this study. However, the majority of participants who reported experiencing one or more ASD symptoms also reported being well prepared (80.9%). When the study looked only at participants who reported they were well prepared in terms of supplies, there was a significant relationship between preparation and psychological distress for participants whose residence was located in Tully and Ingham.

The relationship between resource loss and psychological distress, and how each type of resource loss contributes to distress - participants who reported minor to major resource loss, that is personal characteristic resources, condition resources, object resources, energy resources, and basic object resources, were significantly more likely to report one or more ASD symptom. The loss of resources following a disaster can lead to secondary stressors such as delays in obtaining resources (shelter, food, water) and services (electricity, phone), relocation, delays in returning to work, employment difficulties, delays in insurance and rebuilding efforts, and financial difficulties. These secondary stressors can take a toll on personal characteristic (feelings of control over your life, motivation, sense of humour, optimism, feeling independent), energy (time for adequate sleep, free time), and condition resources (closeness with family members and friends, companionship, feeling valuable to others, support from co-workers) and contribute to a downward spiral of psychological distress.[13,14,15]

These findings and COR stress theory indicate that recovery programs should focus initially providing resources essential for survival such as food and water, shelter and alternate means of cooking and lighting if homes are still inhabitable.[15] The means to contact friends and family is also important to maintain a strong social support network. Education about stress management techniques and coping strategies can help disaster victims and survivors to process their experiences and avoid the downward spiral of psychological distress.[15] Re-establishing normalcy and routines, and organising support groups to develop or boost personal characteristic and energy resources may alleviate the downward spiral of psychological distress.[15]

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A Tully home destroyed by Cyclone Yasi
Photo by Flickr user Kenski1970 provided for use under a Creative Commons Licence cc by- nc-nd 2.0

Confronted by the devastation created in the small town of Cowley Beach by Cyclone Yasi, are Soldiers from Support Company, 1st Battalion Royal Australian Regiment who flew into the town by helicopter ready to assist the locals in any clean up required.
Photograph: Corporal (CPL) Melina Mancuso 1st Joint Public Affairs Unit (1JPAU) © Commonwealth of Australia

The devastated marina at Port Hinchinbrook where Royal Australian Navy Clearance Divers and Queensland Police divers search for any sunken infrastructure and vessels destroyed in Cyclone Yasi.
Photograph: Corporal (CPL) Melina Mancuso 1st Joint Public Affairs Unit (1JPAU) © Commonwealth of Australia

Diggers from Townsville assist in the clean up of Cardwell after Cyclone Yasi tore through the town.
Photograph: Corporal (CPL) Melina Mancuso 1st Joint Public Affairs Unit (1JPAU) © Commonwealth of Australia

Townsville foreshore damaged by Cyclone Yasi
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JAMES COOK UNIVERSITY
AUSTRALIA

James Cook University
Townsville Campus
Townsville QLD 4811

Cairns Campus
PO Box 6811
Cairns QLD 4870

CRICOS Provider Code: 00117J

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