

1	2
3	4

1. Satellite image of Severe Tropical Cyclone Yasi, 6:30pm on 02/02/2011.
2. Aerial Photo of Giru Township on the Haughton River in flood following Severe Cyclone Yasi, 2 February 2011 – Photo courtesy of the Burdekin Shire Council
3. Aerial Photo of Giru Township on the Haughton River in flood following Severe Cyclone Yasi, 2 February 2011 – Photo courtesy of the Burdekin Shire Council
4. – Radar Imagery from the Cairns Radar at 11:10pm on 02/02/2011.

Note:

1. Data in this report has been operationally quality controlled but errors may still exist.
2. This product includes data made available to the Bureau by other agencies. Separate approval may be required to use the data for other purposes. See Appendix 1 for DERM Usage Agreement.
3. This report is not a complete set of all data that is available. It is a representation of some of the key information.

Table of Contents

1. Introduction	1
2. Meteorological Summary	1
Figure 2.1 Track of Tropical Cyclone Anthony 22 nd to 31 st January 2011.	2
Figure 2.2 Track of Severe Tropical Cyclone Yasi 1 st to 3 rd February 2011.	3
Figure 2.3 MSLP Charts for Australia from the 28 th to 30 th January 2011.	4
Figure 2.4 MSLP Charts for Australia from the 31 st January to 3 rd February 2011.....	5
Figure 2.5 Radar Images of Severe Tropical Cyclone Yasi crossing the coast.	6
Figure 2.6 Radar Images of Tropical Cyclone Yasi weakening as it moves inland to the south of the Gulf of Carpentaria.	7
3. Hydrology	7
3.1 Peak River Heights	8
Figure 3.1.1 Peak height map 1 st to 8 th February 2011.....	8
Table 3.1.1 Historical peak height comparison.....	9
Table 3.1.1 (cont) Historical peak height comparison.....	10
3.2 Rainfall Maps	11
Figure 3.2.1 Rainfall map of Queensland for the week ending the 8 th February 2011.	11
Figure 3.2.2 Daily rainfall map of Queensland for the 3 rd February 2011.	12
3.3 Rainfall Intensity	13
Table 3.3.1 Highest daily rainfalls recorded to 9am on the 3 rd February 2011.	13
Figure 3.3.1. Hourly hyetographs for Bulgun Creek Alert.	14
Figure 3.3.2. Hourly Hyetographs for Keelbottom TM and Japoonvale TM.....	15
Figure 3.3.3 Rainfall IFD Analysis – Bulgun Creek Alert and Keelbottom TM.....	16
Figure 3.3.3 (con't) Rainfall IFD Analysis for Japoonvale TM - Johnstone River.	17
3.4 Rainfall Totals	17
Table 3.4.1 Significant rainfall totals – North Tropical Coast Rivers.....	18
Table 3.4.2 Significant rainfall totals – Central Queensland Coast Rivers.....	21
Table 3.4.3 Significant rainfall totals – Connors and Isaac Rivers.....	24
Table 3.4.4 Significant rainfall totals – Gulf Rivers.	25
3.5 Flood hydrographs associated with Severe TC Yasi	28
Figure 3.5.1 Flood hydrographs - Johnstone River.....	28
Figure 3.5.2 Flood hydrographs – Herbert River.....	29
Figure 3.5.3 Flood hydrographs - Burdekin River.	32
Figure 3.5.4 Flood hydrographs – Tully & Murray Rivers.	33
Figure 3.5.5 Flood hydrographs - Haughton River.....	34
Figure 3.5.6 Flood hydrographs – Bohle River and Bluewater Creek.	36
Figure 3.5.7 Flood hydrographs – Connors & Isaac Rivers.....	37
Figure 3.5.8 Flood hydrographs – Gregory River.	38
4. Warning Services	38
Table 4.1 Flood Warnings and Predictions issued following rainfall associated with TC Yasi. ...	39
Appendix 1. DERM Usage Agreement	40

Floods associated with Severe Tropical Cyclone YASI

February 2011

1. Introduction

Severe Tropical Cyclone Yasi crossed the North Tropical Queensland coast on the 3rd of February 2011 producing heavy rainfall over the North Tropical Coast and Central Coast regions of Queensland between the 2nd and 4th of February, extending into the Gulf of Carpentaria region between the 4th and 6th of February.

The heavy rainfall produced major flooding in the Johnstone, Herbert, Burdekin, Haughton, Bohle and Gregory River catchments and Bluewater Creek.

This report provides a brief discussion of the meteorology and a more detailed summary and analysis of the hydrology of the flooding associated with Severe Tropical Cyclone Yasi during February 2011. A more detailed discussion of the meteorology associated with Severe Tropical Cyclone Yasi can be found [here](#).

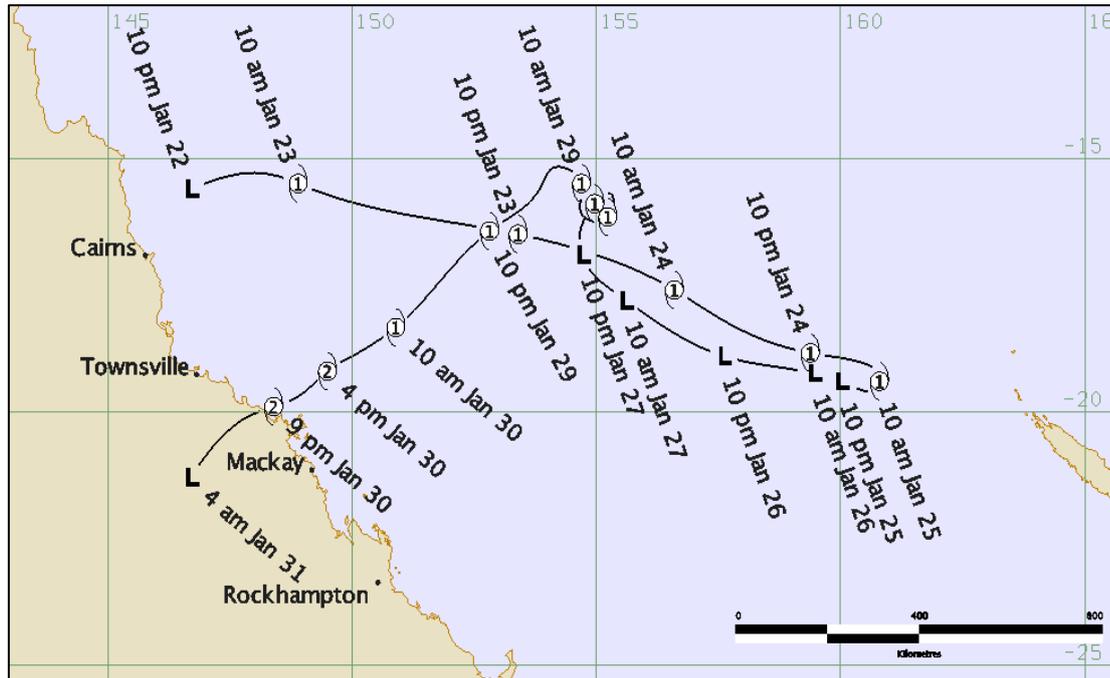
The following link provides a complete list of [maps of the relevant river catchments and flood warning stations](#) referred to in this report.

2. Meteorological Summary

An active phase of the monsoon trough saw the development of three tropical cyclones to the east of Australia and Tropical Cyclone Bianca off the west coast. Tropical Cyclone Wilma developed to the north of Fiji and meandered east then south and passed to the near north of New Zealand. Wilma had little impact on Queensland apart from increased swell off the southeast coast.

Cyclone Anthony developed on the 22nd January 2011. The system was first identified as a tropical low on the monsoon trough to the near northeast of Cairns. Anthony tracked eastward away from the coast and then weakened below cyclone strength late on the 25th January. A low level system remained and meandered around the Coral Sea before re-intensifying again to cyclone strength on the 28th of January. The system tracked steadily southwest and crossed the Queensland coast near Bowen around 10pm EST on the 30th January 2011. Anthony produced heavy rainfall to the near south of the system centre causing only isolated major flooding in the upper reaches of the Pioneer River and in Denison Creek in the Fitzroy River Basin.

A track mapping the path of Tropical Cyclone Anthony is shown in Figure 2.1.

Figure 2.1 Track of Tropical Cyclone Anthony 22nd to 31st January 2011.


Tropical cyclone Yasi formed as Tropical Cyclone Anthony was nearing the Queensland coast. The system developed to the north of Vanuatu on the 30th January 2011 and intensified rapidly to become severe by the afternoon of the 31st of January.

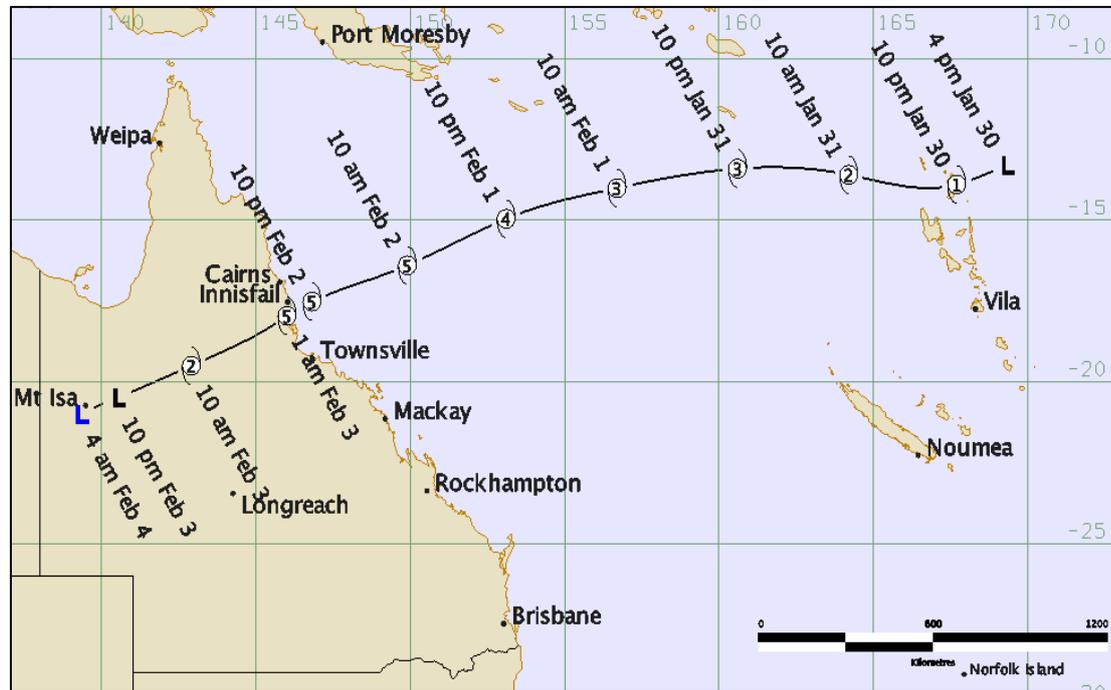
Severe Tropical Cyclone Yasi then strengthened further to a category 5 cyclone by 4am EST on the 2nd of February. Yasi then maintained its intensity as it moved steadily southwest and crossed the North Tropical Queensland coast near Mission Beach between midnight and 1am EST on the 3rd February.

Yasi was an intense and very large system, and remained above cyclone strength as it tracked over land to the south of the Gulf of Carpentaria, finally weakening to a tropical low around 10pm on the 3rd of February, near Mt Isa, in the northwest of the state.

Yasi produced heavy rainfall about the North Tropical and Central Coasts of Queensland between the 2nd and 4th February resulting in major flooding in the Johnstone, Herbert, Burdekin, Haughton and Bohle rivers and Bluewater Creek. As the system tracked inland to the south of the Gulf of Carpentaria, heavy rainfall was recorded over the Gulf River catchments with major flooding occurring along the Gregory River.

A track mapping the path of Severe Tropical Cyclone Yasi is shown in Figure 2.2.

Figure 2.2 Track of Severe Tropical Cyclone Yasi 1st to 3rd February 2011.



The sequence of mean sea level pressure charts for the period from 28th to 30th January as Tropical Cyclone Anthony crossed the Queensland coast are shown in Figure 2.3. Figure 2.4 shows a similar sequence of mean sea level pressure charts for the period from the 31st January to 3rd February as Severe Tropical Cyclone Yasi intensified and crossed the North Queensland coast.

Figure 2.3 MSLP Charts for Australia from the 28th to 30th January 2011.

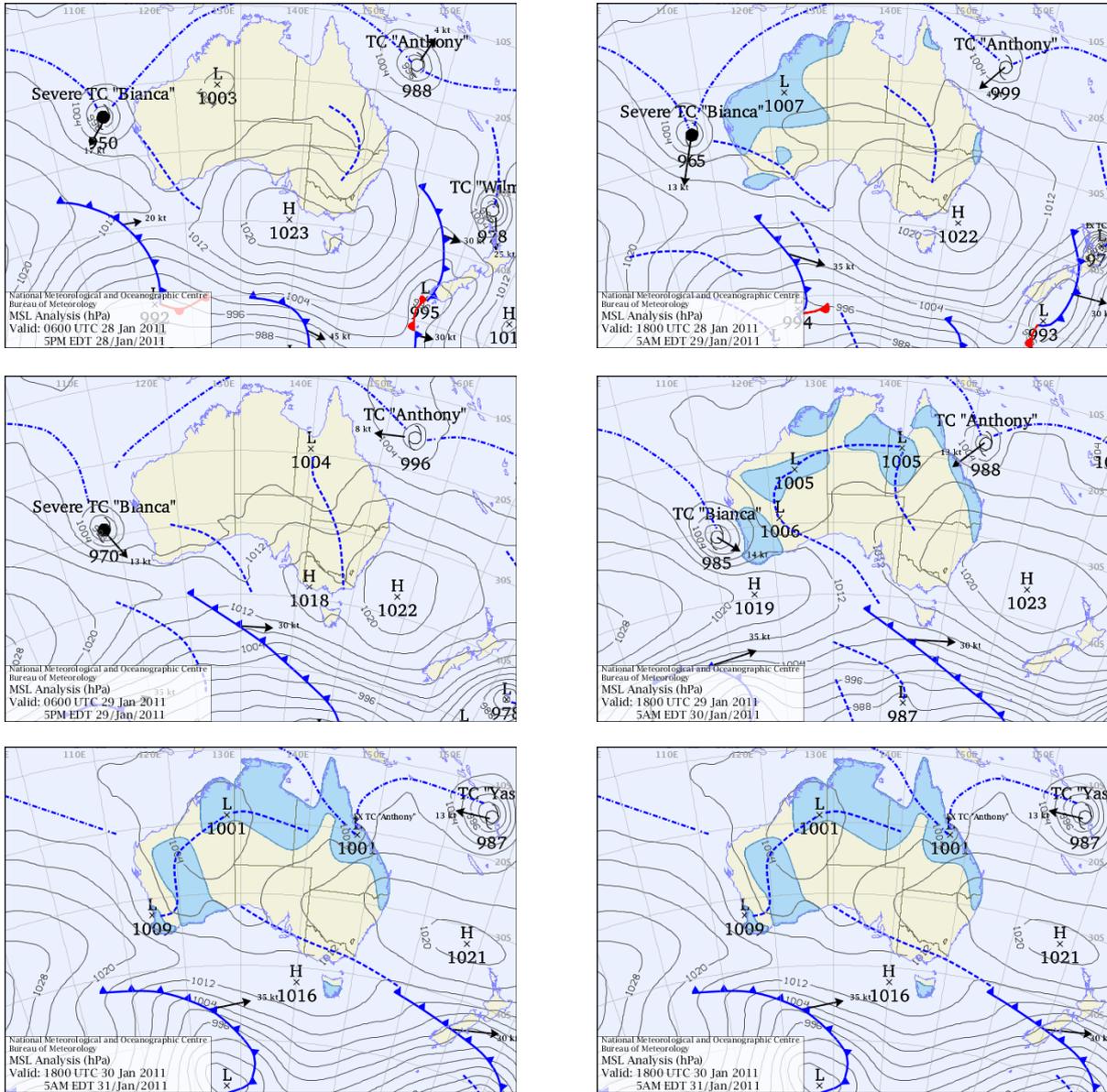
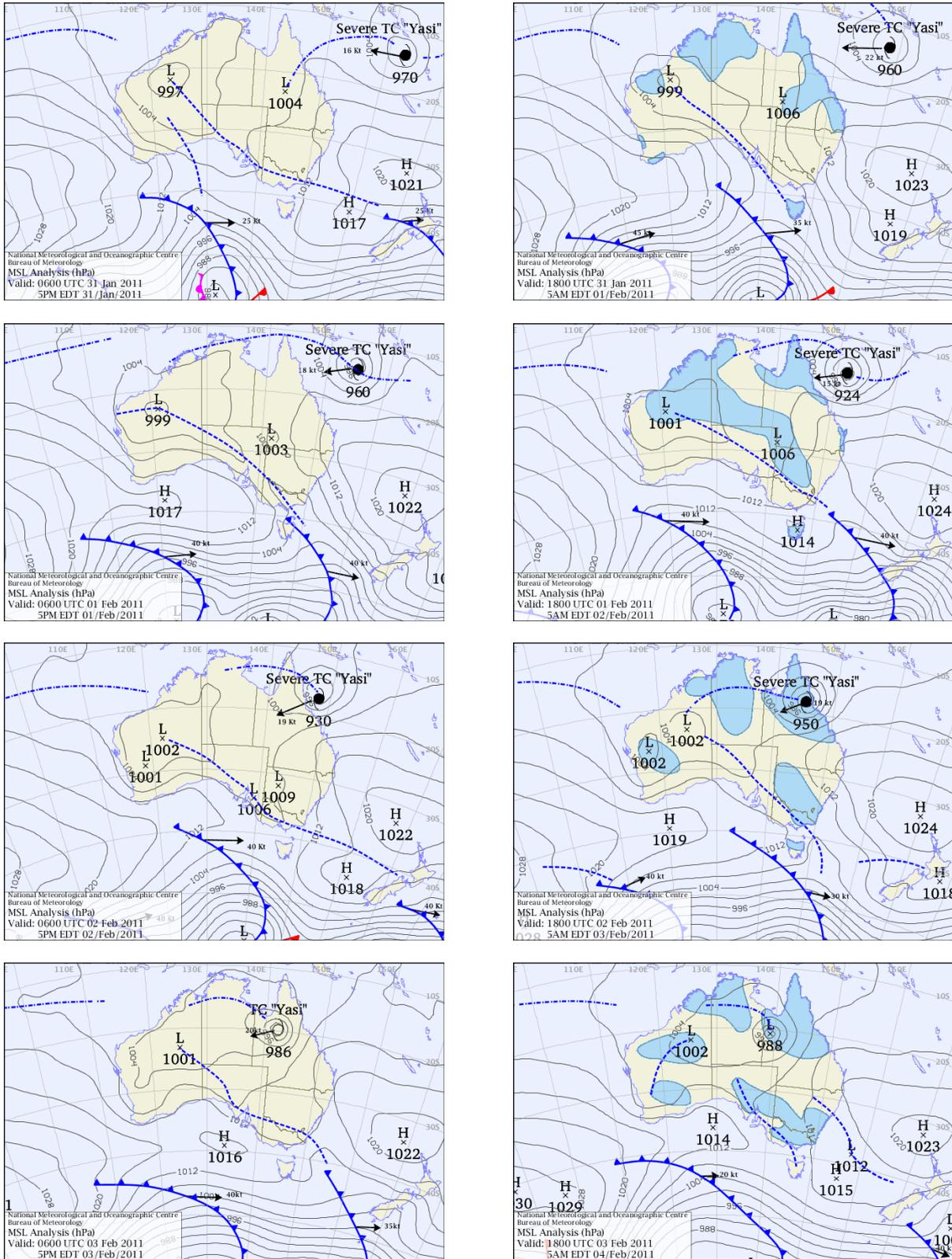
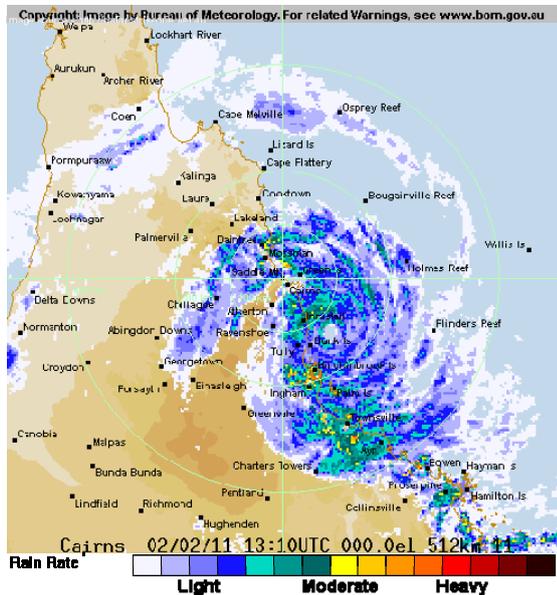


Figure 2.4 MSLP Charts for Australia from the 31st January to 3rd February 2011.

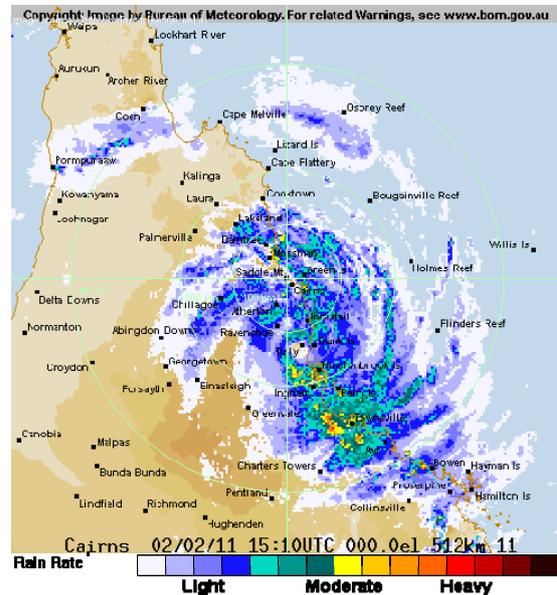


Radar imagery from Cairns Radar, Figure 2.5, clearly shows the eye of Severe Tropical Cyclone Yasi as it crosses the coast near Mission Beach. The weakening of the rain bands around the system centre is evident 4 hours after the system centre crosses the coast.

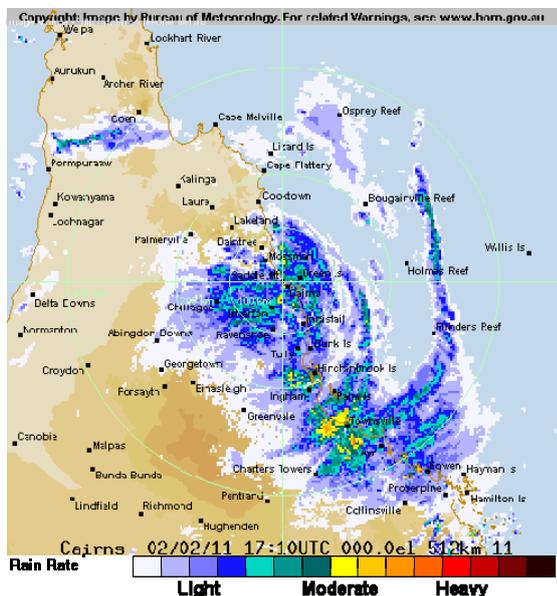
Figure 2.5 Radar Images of Severe Tropical Cyclone Yasi crossing the coast.



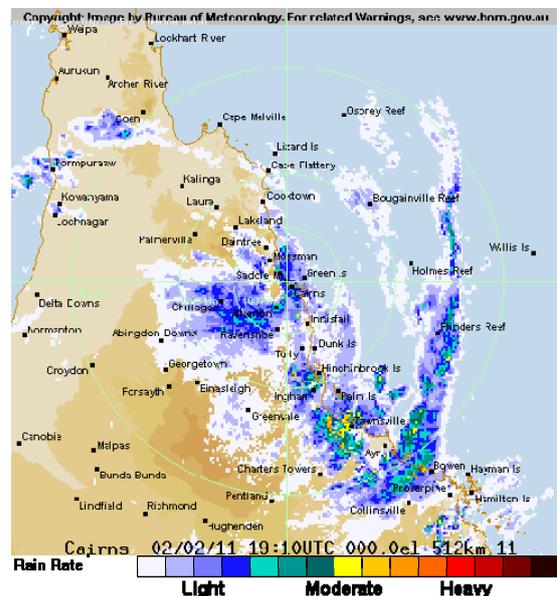
a. Cairns Radar: 11:10pm EST 2 February 2011, about 1 hour before coastal crossing of the cyclone eye.



b. Cairns Radar: 1:10am EST 3 February 2011, just following coastal crossing of the cyclone eye.

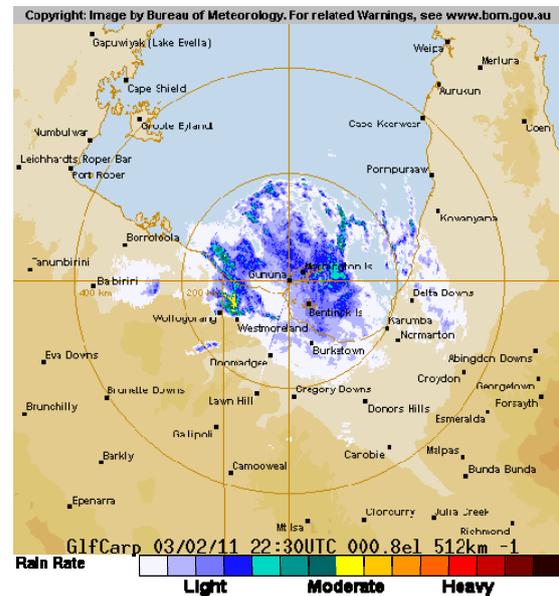
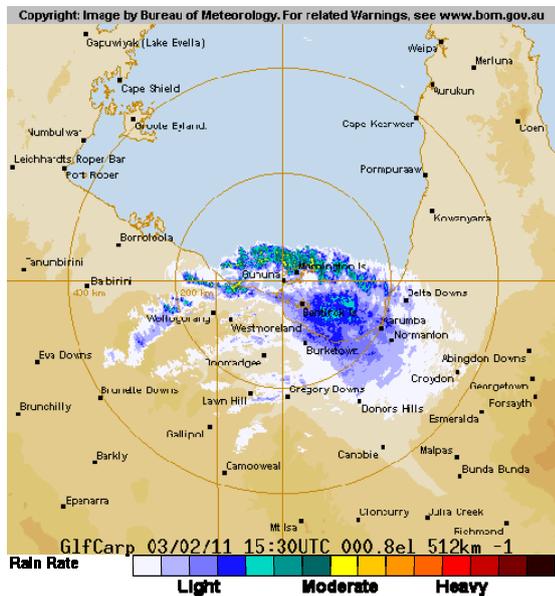


c. Cairns Radar: 3:10am EST 3 February 2011.



d. Cairns Radar: 5:10am EST 3 February 2011.

Figure 2.6 Radar Images of Tropical Cyclone Yasi weakening as it moves inland to the south of the Gulf of Carpentaria.



a. Mornington Island Radar: 3:30pm EST 3 February 2011, as TC Yasi moves across the Flinders River catchment.

b. Mornington Island Radar: 10:30pm EST 3 February 2011, as TC Yasi weakens to a tropical low near Mt Isa.

3. Hydrology

As Yasi tracked steadily westward across northern Queensland the system typically produced heavy rainfall over a catchment area for no more than 24 hours and very intense rainfall for a period of around 6 hours. This assisted to minimise the period and severity of river flooding associated with the system, however major flooding still occurred in the Johnstone, Herbert, Haughton and Bohle River catchments with isolated major flooding in the Gregory River at Gregory Downs in the Nicholson River catchment.

A new river height record was set at Sellheim Alert at Macrossan Bridge on the Burdekin River, though this station opened in 2002 and river heights exceeding 20 metres have been recorded at Sellheim TM a co-located station, prior to this time. River heights records were also set at Giru Alert on the Haughton River, Gairloch Alert on the Herbert River and Bluewater Alert on Bluewater Creek.

Several others sites also recorded peak river height levels that rank in the top 10 highest river levels on record for that location.

This chapter provides a technical summary and analysis of the hydrology of the river flooding associated with Severe Tropical Cyclone Yasi.

3.1 Peak River Heights

Peak river heights recorded across northern Queensland during the 3rd and 8th February 2011, resulting from heavy rainfall associated with Severe Tropical Cyclone Yasi, are shown in Figure 3.1.1. A comparison and ranking of the recorded peak heights with historical peak heights is shown in Table 3.1.1. A location where major flooding was recorded is displayed in red.

Figure 3.1.1 Peak height map 1st to 8th February 2011.

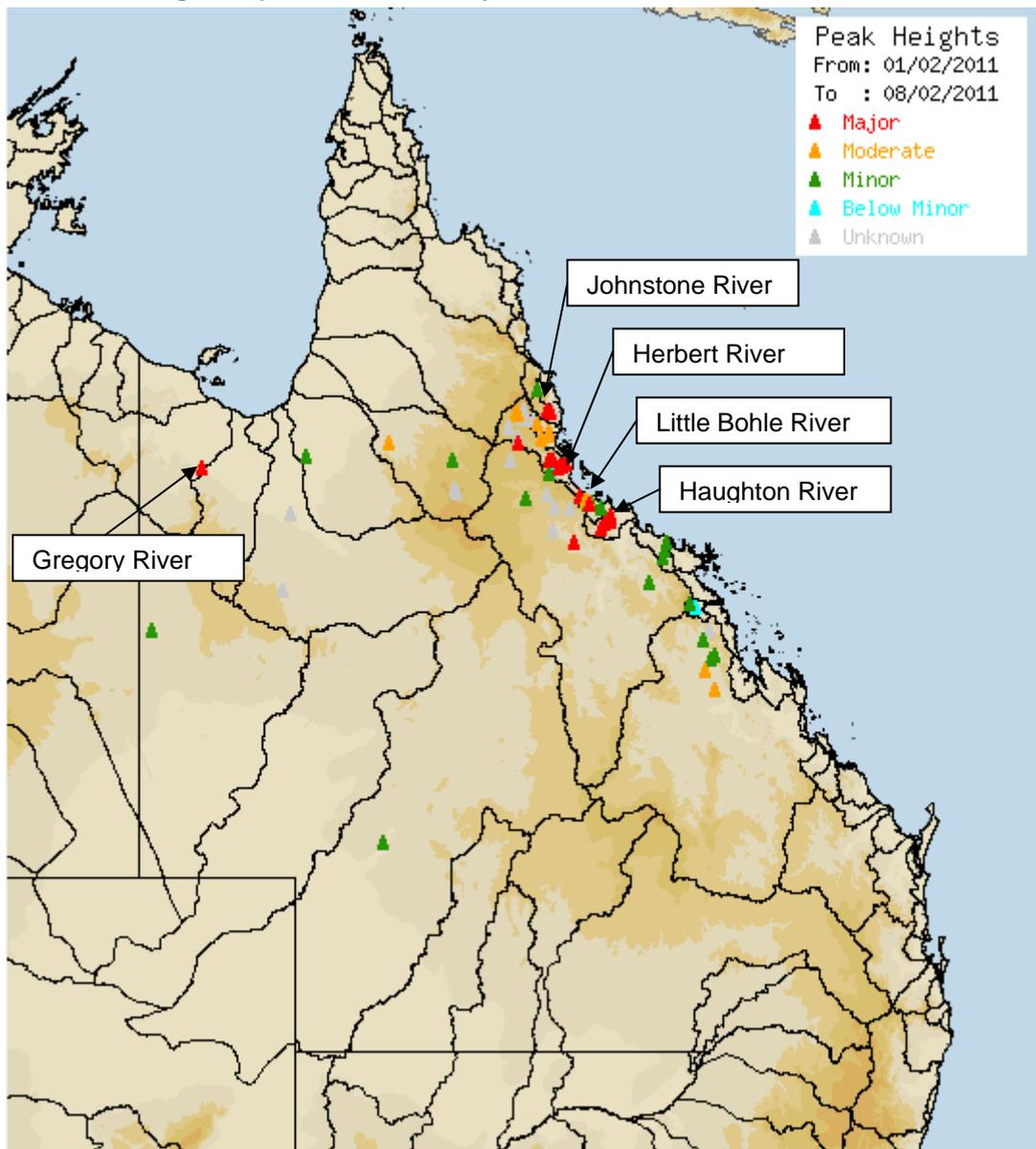


Table 3.1.1 Historical peak height comparison

Gauging Station	Jan-Feb 2010 Peaks	Flood Classification	Start of Record	Ranking	Highest Since	Highest on Record
Johnstone River						
Corsis Alert	6.54m on 03/02/2011 at 2:22am	Major	1990	6 th	February 2009	8.68m January 1994
Central Mill Alert	9.30m on 03/02/2011 at 4:00am	Major	1997	2 nd	February 2009	10.42m February 2009
Tully/Murray Rivers						
Euramo TM	8.50m on 04/02/2011 at 5:10am	Moderate	1973	24 th	January 2011	9.20m April 1982
Upper Murray Alert	8.72m on the 03/21/2011 at 5:40am	Moderate	2002	Equal 6 th	January 2011	9.57m February 2009
Murray Flats AL	7.71m on 04/02/2011 at 9:00pm	Moderate	2002	11 th	January 2011	8.71m February 2009
Herbert River						
Abergowrie Alert	13.15m on 03/02/2011 at 12:15pm	Major	1992	6 th	December 2010	15.93m February 2009
Abergowrie Bridge Alert	15.04m on 03/02/2011 at 2:00pm	Major	2001	4 th	December 2010	17.24m February 2009
Ingham Pump Station Alert	13.95m on 03/02/3011 at 7:45pm	Major	1994	4 th	December 2010	15.10m January 1998
Gairloch Alert	12.64m on 03/02/2011 at 6:50pm	Major	2001	New Record	December 2010	
Halifax Alert	5.47m on 03/02/2011 at 9:00pm	Major	1998	3 rd	December 2010	5.67m February 2009
Burdekin River						
Sellheim Alert	18.47m on 04/02/2011 at 10:25am	Major	2002	New Record	February 2010	
Townsville Area						
Little Bohle River Alert	3.79m on 03/02/2011 at 6:58am	Minor	2002	6 th	February 2008	6.21m February 2007
Bohle River Alert	7.03m on 03/02/2011 at 8:40am	Major	2002	5 th	December 2010	8.30m February 2007
Mt Bohle Alert	6.41m on 03/02/2011 at 10:00am	Moderate	2002	3 rd	January 2010	7.55m February 2007
Louisa Creek	5.13m on 03/02/2011 at 1:38am	Minor	2002	Equal 12 th	January 2010	5.73m February 2008
Bluewater AL	8.00m on 03/02/2011 at 6:00am	Major	2002	New Record	January 2010	

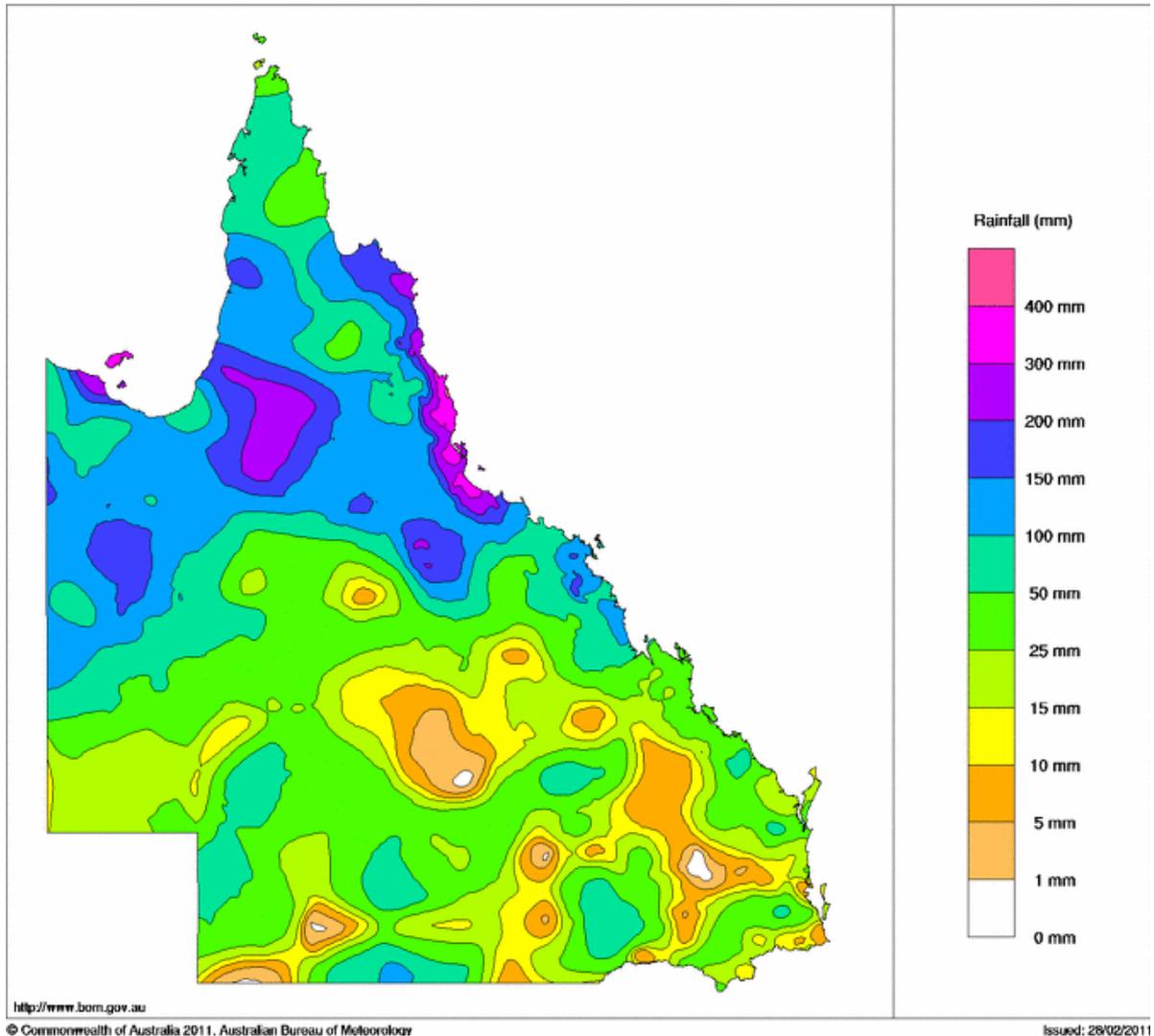
Table 3.1.1 (cont) Historical peak height comparison

Gauging Station	Jan-Feb 2010 Peaks	Flood Classification	Start of Record	Ranking	Highest Since	Highest on Record
Haughton River						
Mount Piccaninny Alert	7.63m on 03/02/2011 at 9:00am	Major	1994	5 th	December 2010	10.51m February 2008
Major Creek Alert	10.37m on 03/02/2011 at 9:10pm	Major	2002	3 rd	December 2010	11.32m February 2008
Powerline Alert	9.00m on 03/02/2011 at 12:37pm	Major	1994	Equal 9 th	December 2010	12.12m February 2008
Giru Alert	3.09m on 03/02/2011 at 12:51pm	Major	1994	New Record	December 2010	
Don River						
Mt Dangar Alert	2.95m on 03/02/2011 at 4:49am	Minor	1990	49 th	January 2011	9.40m February 2008
Reeves Alert	3.81m on 03/02/2011 at 6:30am	Minor	1980	41 st	January 2011	10.38m January 1980
Bowen Pump Station Alert	3.35m on 03/02/2011 at 9:00am	Minor	1970	45 th	January 2011	7.25m January 1970
Connors, Isaac, Mackenzie Rivers						
Mount Bridget TM	9.46m on 03/02/2011 at 10:30am	Minor	1967	55 th	January 2011	20.18m March 1988
Cardowan	10.00 on 03/02/2011 at 3:30pm	Minor	1953	Equal 59 th	January 2011	19.10m March 1988
Funnel Creek TM	7.15m on 03/02/2011 at 5:40pm	Minor	1968	65 th	January 2011	14.59m December 1990
Pink Lagoon TM	12.92 on 05/02/2011 at 7:00am	Moderate	1967	37 th	2 February 2011	16.43m March 1988
Yatton TM	14.49m on 06/02/2011 at 8:00pm	Moderate	1963	34 th	4 February 2011	19.62m March 1988
Gulf Rivers						
Einasleigh TM	9.78m on 05/02/2011 at 2:20am	Minor	1968	22 nd	January 2011	17.53m January 1974
Rockfields TM	7.55m on 05/02/2011 at 11:30am	Moderate	1967	19 th	January 2011	12.75m January 1974
Yappar River TM	2.40m on 08/02/2011 at 7:00am	Minor	1974	17 th	January 2011	7.05m 1974
	2.35m on 10/02/2011 at 7:00am	Minor	1974	19 th	January 2011	7.05m 1974
Glenore Weir TM	11.28m on 11/02/2011 at 7:00am	Minor	1974	25 th	March 2010	18.28m January 1974
Normanton	3.40m on 09/02/2011 at 2:00pm	Minor	1974	11 th	January 2011	8.80m January 1974
Gregory Downs TM	12.55m on 07/02/2011 at 10:00am	Major	1969	5 th	January 2011	13.91m January 2004
Kowanyama Airport	3.10 on 09/02/2011 at 8:30am	Moderate	1999	30 th	December 2010	4.40m February 2008

3.2 Rainfall Maps

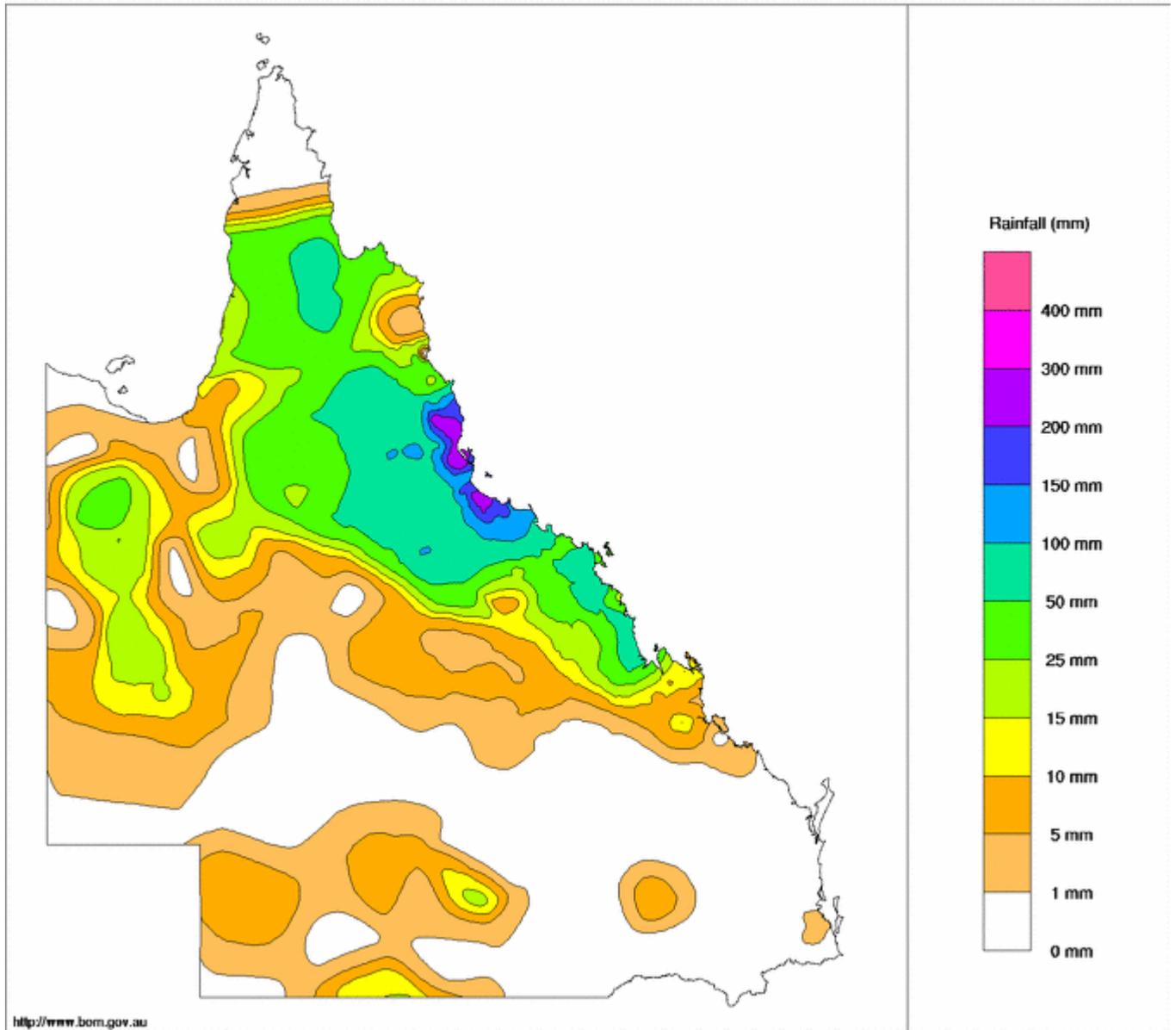
The heaviest rainfall associated with Severe Tropical Cyclone Yasi occurred about Queensland’s North Tropical Coast between Townsville and Cairns with the largest falls over the Herbert, Tully/Murray, the Upper Burdekin, Johnstone and Haughton River Catchments. Heavy falls were also recorded over the Gilbert and Norman River Catchments as Yasi tracked westward inland. Rainfall for the week ending the 8th of February is shown in Figure 3.2.1.

Figure 3.2.1 Rainfall map of Queensland for the week ending the 8th February 2011.



The heaviest 24-hour rainfalls occurred to 9am on the 3rd February on the North Tropical Coast as Yasi crossed the coast. See Figure 3.2.2 showing daily rainfall totals for the 3rd February 2011.

Figure 3.2.2 Daily rainfall map of Queensland for the 3rd February 2011.



3.3 Rainfall Intensity

The most intense rainfall associated with Severe Tropical Cyclone Yasi was recorded during the 24 hours to 9am on 3rd February on Queensland's North Tropical Coast.

The largest 24-hour rainfall totals to 9am on the 3rd February 2011 are listed in Table 3.3.1

Table 3.3.1 Highest daily rainfalls recorded to 9am on the 3rd February 2011.

Station Number	Station Name	River Catchment	24-Hour Rainfall (mm)
532074	South Mission Beach Alert	Tully	471
032191	Hawkins Creek	Herbert	464
032184	Zattas Alert	Herbert	407
532064	Bulgun Creek Alert	Tully	373
532085	Keelbottom TM	Burdekin	362
533071	Upper Major Creek Alert	Haughton	324
531026	Japoonvale TM	Johnstone	343
033307	Woolshed AWS	Black River	314

South Mission Beach Alert ceased to report rainfall between 1:00am and 9:00am on the 3rd February 2011, coincident with the passage of the eye of Severe Tropical Cyclone Yasi passing overhead. Similarly data from Zattas Alert was also interrupted during this time so hourly data from these two sites is unavailable for the entire 24-hour period to 9am on the 3rd February.

However, data from Keelbottom TM in the Burdekin River catchment, Japoonvale TM in the Johnstone River catchment and Bulgun Creek TM in the Tully River catchment remained uninterrupted and the hourly hyetograph from each site is shown in Figures 3.3.1 and 3.3.2.

It is clear from these diagrams that heavy rainfall generally fell between 11:00pm on the 2nd February and 4:00am on the 3rd February about the coast and around midnight to 5:00am on the 3rd February over the ranges in the Upper Burdekin River catchment.

Intensity Frequency Duration data for Keelbottom TM, Japoonvale TM and Bulgun Creek TM are shown in Figures 3.3.3. The most statistically significant short duration rainfall occurred at Keelbottom TM on Keelbottom Creek in the Burdekin River catchment for the 3 hour to 24 hour durations. The recorded rainfall amounts for these durations were all greater than 1% Annual Exceedence Probability (100 year Average Recurrence Interval).

The most significant rainfall intensities for Japoonvale AL, in the Johnstone River catchment, associated with Severe Tropical Cyclone Yasi occurred on the 3rd February 2011 in the 2 hour and 3 hour duration periods. Rainfall intensities equalled the 2-5% Annual Exceedence Probability (20-50 year Average Recurrence Interval).

Note: A flood frequency analysis would be required to assess the probability of flood levels reached at each location. The frequency analysis in this report is for rainfall only.

Figure 3.3.1. Hourly hyetographs for Bulgun Creek Alert.

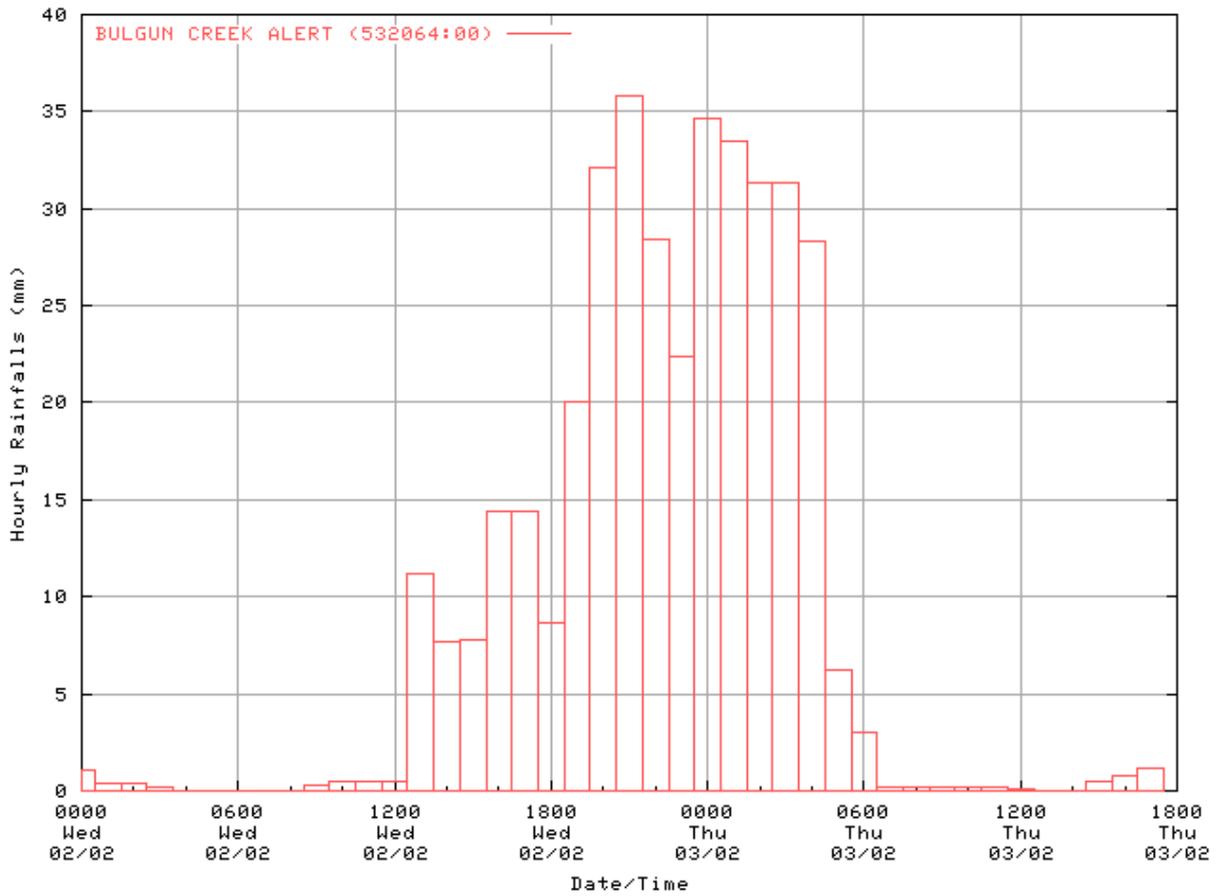


Figure 3.3.2. Hourly Hyetographs for Keelbottom TM and Japoonvale TM.

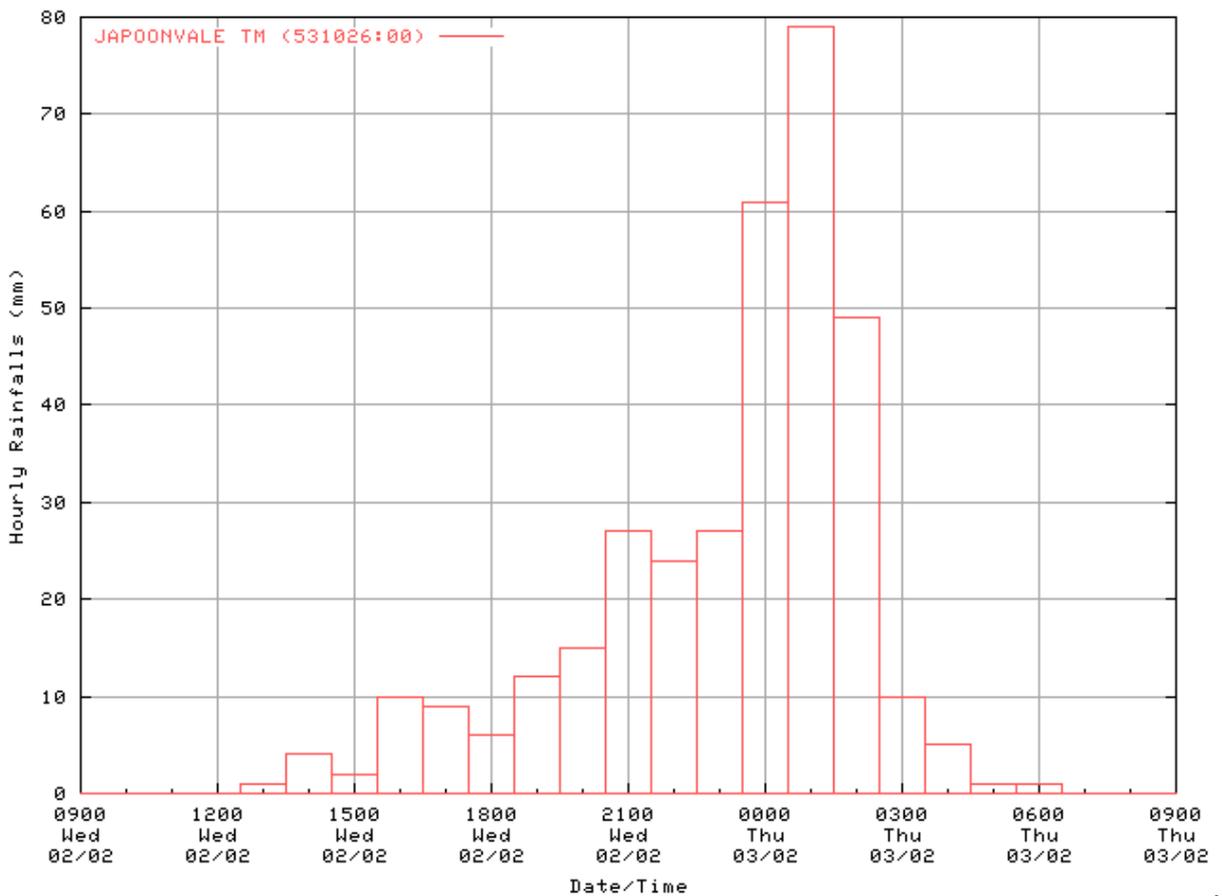
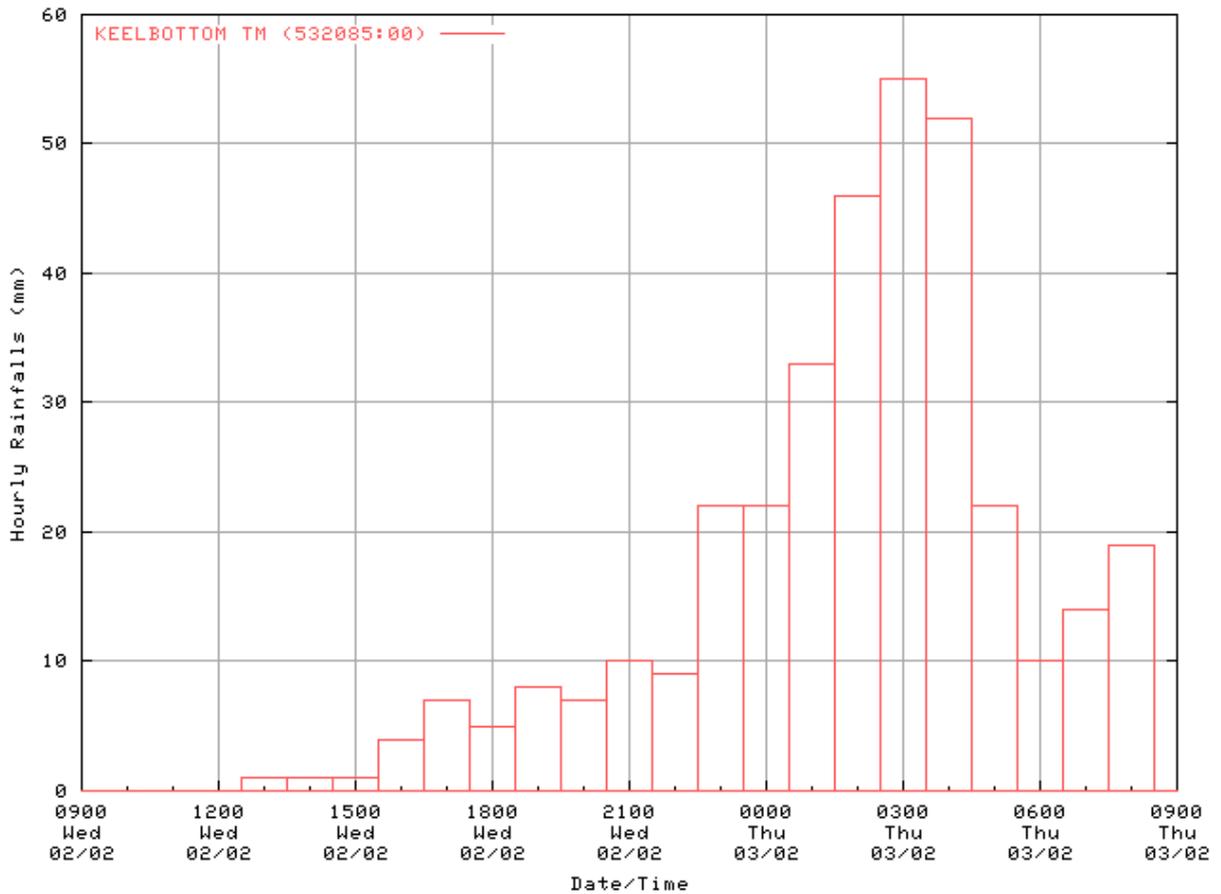
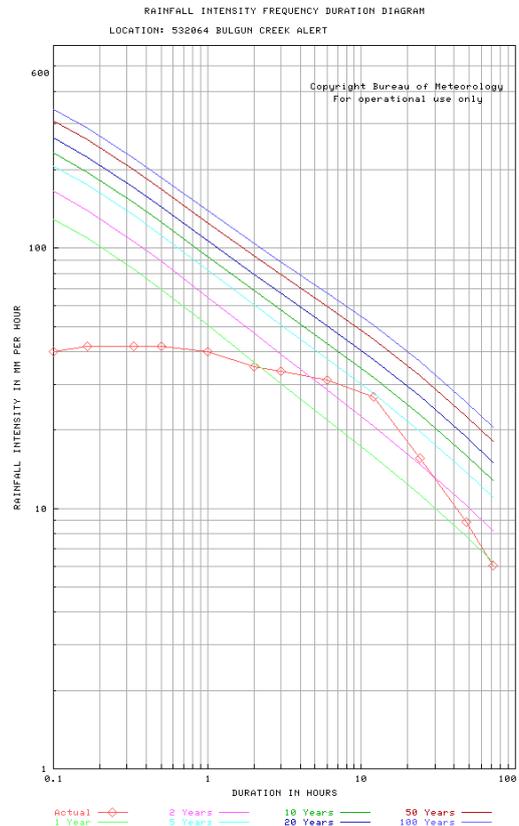


Figure 3.3.3 Rainfall IFD Analysis – Bulgun Creek Alert and Keelbottom TM.

RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS		
LOCATION: 532064 BULGUN CREEK ALERT		
Analysis of the rainfall for the 120 hours to 09:00 Mon Feb 7 2011		
Rain (mm)	Period Ending	ARI (years)
4	5 mins ending at 20:55:00 02/02/2011	< 1
4	6 mins ending at 20:56:00 02/02/2011	< 1
7	10 mins ending at 20:55:00 02/02/2011	< 1
14	20 mins ending at 23:55:00 02/02/2011	< 1
21	30 mins ending at 00:05:00 03/02/2011	< 1
40	60 mins ending at 00:25:00 03/02/2011	< 1
70	2 hours ending at 01:30:00 03/02/2011	< 1
101	3 hours ending at 02:30:00 03/02/2011	1-2
187	6 hours ending at 01:15:00 03/02/2011	2-5
321	12 hours ending at 03:55:00 03/02/2011	2-5
373	24 hours ending at 08:25:00 03/02/2011	2-5
426	48 hours ending at 12:05:00 04/02/2011	1-2
436	72 hours ending at 06:55:00 05/02/2011	< 1



RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS		
LOCATION: 532085 KEELBOTTOM TM		
Analysis of the rainfall for the 120 hours to 09:00 Mon Feb 7 2011		
Rain (mm)	Period Ending	ARI (years)
8	5 mins ending at 03:45:00 03/02/2011	< 1
8	6 mins ending at 03:46:00 03/02/2011	< 1
13	10 mins ending at 03:45:00 03/02/2011	< 1
24	20 mins ending at 03:45:00 03/02/2011	1-2
34	30 mins ending at 03:55:00 03/02/2011	2
55	60 mins ending at 04:25:00 03/02/2011	2-5
107	2 hours ending at 04:00:00 03/02/2011	20-50
153	3 hours ending at 03:55:00 03/02/2011	> 100
242	6 hours ending at 04:30:00 03/02/2011	> 100
327	12 hours ending at 10:25:00 03/02/2011	> 100
443	24 hours ending at 16:30:00 03/02/2011	> 100
501	48 hours ending at 14:40:00 04/02/2011	20-50
508	72 hours ending at 10:00:00 05/02/2011	10-20

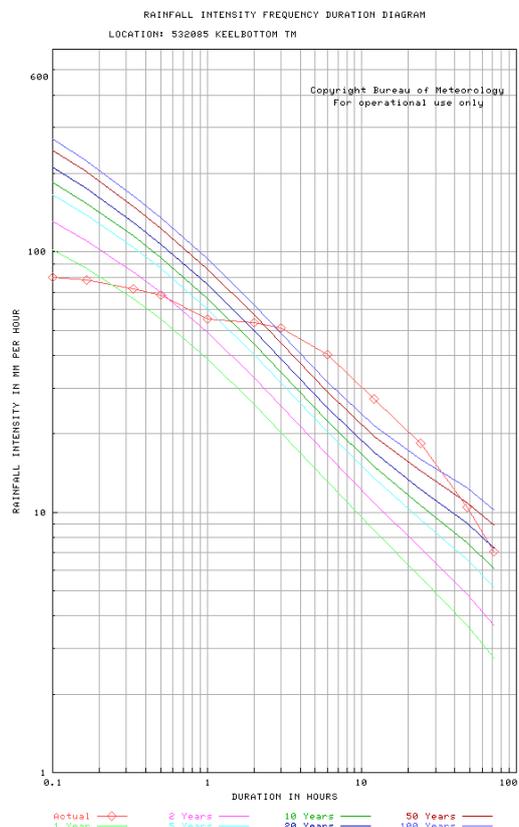
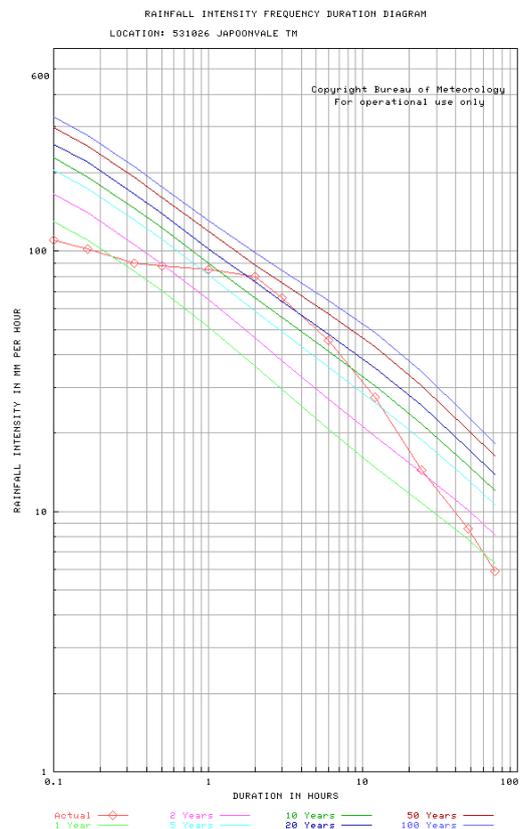


Figure 3.3.3 (con't) Rainfall IFD Analysis for Japoonvale TM - Johnstone River.

RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS		
LOCATION: 531026 JAPOONVALE TM		
Analysis of the rainfall for the 120 hours to 09:00 Mon Feb 7 2011		
Rain (mm)	Period Ending	ARI (years)
10	5 mins ending at 23:40:00 02/02/2011	< 1
11	6 mins ending at 23:41:00 02/02/2011	< 1
17	10 mins ending at 23:45:00 02/02/2011	< 1
30	20 mins ending at 23:55:00 02/02/2011	1-2
44	30 mins ending at 01:15:00 03/02/2011	2
85	60 mins ending at 01:15:00 03/02/2011	5-10
160	2 hours ending at 01:30:00 03/02/2011	20-50
199	3 hours ending at 01:30:00 03/02/2011	20-50
272	6 hours ending at 01:40:00 03/02/2011	10-20
330	12 hours ending at 03:10:00 03/02/2011	5-10
345	24 hours ending at 05:05:00 03/02/2011	2-5
413	48 hours ending at 13:40:00 04/02/2011	1-2
425	72 hours ending at 00:00:00 05/02/2011	< 1



3.4 Rainfall Totals

Significant daily rainfall totals associated with Severe Tropical Cyclone Yasi are provided below in Tables 3.4.1 to 3.4.4. The highest 24 hour rainfall of 471mm was recorded at 9am on the 3rd of February at South Mission Beach Alert in the Tully River catchment (Refer to Table 3.4.1). Hawkins Creek in the Herbert River catchment recorded a 24-hour rainfall total of 464mm to 9am on the 3rd of February. The Burdekin, Haughton, Johnstone and Black River catchments recorded 24-hour rainfall totals above 300mm to 9am on the 3rd February.

The abbreviations used in the following tables include:

- AL - ALERT Radio Telemetry
- TM - Telephone Telemetry
- AWS - Automatic Weather Station
- SYN - Bureau Synoptic Station

Note: * signifies automatic station, N/A signifies missing data. Multiple day totals are shaded.

Refer to the complete list of [maps of the relevant river catchments and flood warning stations](#) for the rainfall locations used in Tables 3.4.1 to 3.4.4.

Table 3.4.1 Significant rainfall totals – North Tropical Coast Rivers

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Herbert				
Herberton AL *	100	10	0	110
Herberton	136			136
Ravenshoe	227	17		244
Ravenshoe AL *	178	7	14	199
Mt Garnet	100	1		101
Wooroora TM *	181	7	3	191
Ben Avon AL *	146	7	3	156
Upper Rudd Creek AL *	85	18	0	103
Gunnawarra AL *	12	1	0	13
Gleneagle AL *	144	9	1	154
Murray Springs AL *	48	5	2	55
Yourka AL *	45	8	0	53
Kirrama AL *	59	8	5	72
Blencoe Falls TM *	144	7	2	153
Nash's Crossing AL *	80	51	22	153
Zattas AL *	407	71	22	500
Abergowrie AL *	162	45	26	233
Abergowrie Bridge AL *	214	49	9	272
Hawkins Creek	464	48	10	522
Michael Creek AL *	158	48	89	295
Running Creek TM *	122	18		140
Upper Stone	174	57	38	269
Peacock Siding AL *	44	41	37	122
Ingham Pump Station TM *	151	111	6	268
Ingham Pump Station AL *	106	104	6	216
Gairloch	212	148	13	373
Gairloch AL *	135	93	9	237
Cardwell Range	240	90	23	353
Cardwell Gap AL *	236	90	18	344
Halifax	201			201
Halifax AL *	159	49	1	209
Lucinda	254	62		316
Numerical Average	160	43	14	211
Maximum Rainfall	464	148	89	522

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Tully				
Maalan Road AL *	293	30	9	332
Koombooloomba AL *	276	11	3	290
Bolinda Estate AL *	112	0	0	112
Jarra Creek AL *	268	41	23	332
Davidson Creek AL *	147	23	8	178
Tully Sugar Mill	245	38	13	296
Bulgun Creek AL *	373	51	11	435

South Mission Beach AL *	471	58	17	546
Euramo TM *	145	41	22	208
Upper Murray AL *	314	30	10	354
Upper Murray TM *	218	4		222
Bilyana AL *	175	36		211
Numerical Average	253	30	12	293
Maximum Rainfall	471	58	23	546

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Johnstone				
Malanda AL *	88	27	4	119
Glen Allyn TM *	103		13	116
Mckell Road AL *	122	30	4	156
Topaz AL *	150	31	19	200
Bartle View AL *	130	33	11	174
Greenhaven	250			250
Greenhaven AL *	230	25	9	264
Millaa Millaa AL *	127	13	8	148
Crawfords Lookout AL *	203	113	7	323
Nerada AL *	166	190	21	377
Tung Oil AL *	178	71	2	251
Mcavoy Bridge AL *	225	155	4	384
Saltwater Creek AL *	249	176	3	428
Sutties Creek AL *	302	18	26	346
Menavale AL *	243	63	8	314
Central Mill TM *	180	131	5	316
Central Mill AL *	223	134	3	360
Mourilyan Mill AL *	215	127	3	345
South Johnstone AWS *	193	166	6	365
Sweeney Creek U/s AL *	122	176	2	300
Marco Street AL *	191	85	1	277
Innisfail SYN	52	160	3	215
Innisfail Wharf AL *	193	161	2	356
Japoonvale TM *	343			343
Numerical Average	187	99	7	280
Maximum Rainfall	343	190	26	428

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Mulgrave-Russell				
Goldsborough Valley AL *	120	109	59	288
The Fisheries TM *	71	1		72
The Fisheries AL *	74	47	36	157
Peets Bridge TM *	72	71	74	217
Peets Bridge AL *	98	77	80	255
Gordonvale AL *	87	81	88	256
Simmonds Creek TM *	44	107	37	188
Mt Sophia	104	231	22	357
Bucklands TM *	176	103	3	282
The Boulders TM *	142	219		361
Babinda	202	96		298

Clyde Road AL *	202	111	10	323
Numerical Average	116	104	45	255
Maximum Rainfall	202	231	88	361

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Barron				
Leslie Ck TM *	75	27	6	108
Atherton	87	35	14	136
Boar Pocket AL *	73	42		115
Bones Knob AL *	89	24	3	116
Tinaroo Falls Dam	65	19		84
Tinaroo Dam AL *	48	31	6	85
Walkamin	40	16	7	63
Mareeba Airport AWS *	18	21	7	46
Mareeba TM *	16	21	11	48
Mareeba AL *	15	18	9	42
Bilwon AL *	13	31	55	99
Bolton Road AL *	18	68	14	100
Mona Mona AL *	18	34	86	138
Flaggy Creek AL *	20	64	91	175
Myola AL *	19	132	33	184
Kamerunga Br AL *	17	118	13	148
Saddle Mountain AL *	10	79	17	106
Brinsmead AL *	17	115	9	141
Cairns Airport AL *	23	253	5	281
Hills Creek TM *	48	172		220
Cairns	26	210	34	270
Mossman South	7	66		73
Numerical Average	35	73	23	126
Maximum Rainfall	89	253	91	281

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Daintree/Endeavour				
Port Douglas		39	150	189
O'donoghue Rd TM *	7	93	231	331
Whyanbeel Ck TM *	7	65	181	253
Bairds TM *	17	41	191	249
China Camp TM *	19	157	6	182
Flaggy TM *	2	20	87	109
Beesbike TM *	16	12	148	176
Cooktown AWS *	2	1	102	105
Numerical Average	10	54	137	199
Maximum Rainfall	19	157	231	331

Table 3.4.2 Significant rainfall totals – Central Queensland Coast Rivers

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Carmila TM *	36	26	26	88
Mt Christian TM *	34	16	5	55
Sarina	37	14	14	65
Pioneer				
Septimus TM *	0	0	0	0
Greenmount AL *	42	5	3	50
Plevna AL *	133	97	1	231
Ridgeland AL *	177	71	10	258
Teemurra Dam AL *	101	25	3	129
Whiteford's TM *	44	14	0	58
Whiteford's AL *	47	12	0	59
Hannaville AL *	74	47	3	124
Sarich's AL *	61	4	1	66
Clarke Range AL *	184	54	5	243
Clarke Range2 AL *	291	58	4	353
Eungella AL *	228	58	16	302
Finch Hatton AL *	107	64	5	176
Gargett AL *	89	7	3	99
Dow's Creek AL *	91	2	3	96
Mirani	62	21	4	87
Dumbleton Rocks AL *	37	2	2	41
Bakers Creek AL *	27	52	1	80
Homebush TM *	60	7	4	71
Forbes Road TM *	51	30	2	83
Mt Jukes	88	22	12	122
Stafford Crossing TM *	55	13	1	69
Numerical Average	86	29	5	120
Maximum Rainfall	291	97	26	353

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Proserpine				
Hecate	110	18	5	133
Crystal Brook	59	5	23	87
Proserpine AWS *	53	20	5	78
Lower Gregory TM *	50	20	0	70
Jochheims TM *	59	10	10	79
Cannonvale Wtp	58	38		96
Numerical Average	65	19	8	90
Maximum Rainfall	110	38	23	133

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Don				
Upper Don AL *	96	10	4	110
Boundary Creek AL *	47	8	8	63
Emu Creek AL *	60	10	4	74
Ida Creek AL *	50	5	6	61
Moss Vale AL *	30	2	8	40
Mt Dangar AL *	20	10	14	44
Roma Peak	79	8	4	91
Roma Peak AL *	65	6	4	75
Reeves AL *	56	10	13	79
Koonandah TM *	65	0	1	66
Guthalungra TM *	111	3	0	114
Numerical Average	62	7	6	74
Maximum Rainfall	111	10	14	114

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Burdekin				
Glen Harding	124			124
Lucky Springs	73			73
Greenvale Township	69	17		86
Wando Vale		91		91
Mt Fullstop TM *	71	1	9	81
Mt Bradley TM *	199	18	11	228
Laroonia TM *	148	150	1	299
Paluma AL *	188			188
Paluma	280	310	17	607
Paluma Dam AL *	261	0		261
Hillgrove	90	18	2	110
Toomba	100	32		132
Gainsford TM *	122	117	0	239
Keelbottom TM *	362	137	9	508
Charters Towers SYN	85	16	6	107
Sellheim AL *	98		7	105
Ravenswood AL *	90	7	15	112
Pentland TM *	33	45	1	79
Balfes Creek	72	68		140
Old Racecourse TM *	87	31		118
Eungella Dam AL *	183	14	0	197
Sutherland AL *	82	4	1	87
Expedition Pass AL *	92	2	4	98
Upper Bogie AL *	58	9	6	73
Mt Pleasant AL *	65	8	14	87
Eton Vale AL *	75	2	1	78
Strathbogie AL *	78	2	0	80
Millaroo AL *	94	1		95
Landers Creek AL *	124	2	4	130
Clare AL *	125	0	8	133
Ayr AL *	135	1	2	138

Inkerman Bridge AL *	114	0	8	122
Brandon AL *	134	0	2	136
Rita Island AL *	106	1	3	110
Groper Creek AL *	111	0	1	112
Home Hill		114		114
Alva Beach AWS *	96	0	0	96
Numerical Average	121	37	5	151
Maximum Rainfall	362	310	17	607

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Haughton				
Mingela AL *	184	17	3	204
Upper Reid AL *	70	7	6	83
Cameron Hill AL *	52	3	0	55
Four Mile AL *	57	4	2	63
Mt Piccaninny TM *	140	2	11	153
Mt Piccaninny AL *	148	3	11	162
Donnington Airpark AL *	83	3	1	87
Upper Major Creek AL *	324	84	12	420
Major Creek AL *	157	5	8	170
Major Creek TM *	118	3	8	129
Powerline TM *	138	2	3	143
Powerline AL *	130	2	2	134
Giru North	143	4		147
Giru AL *	52	2	2	56
Upper Barrattas AL *	116	2	13	131
Northcote TM *	136	0	2	138
East Barrattas AL *	129	0	2	131
Numerical Average	128	8	5	142
Maximum Rainfall	324	84	13	420

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Ross/Bohle				
Cungulla AL *	112	3	10	125
Alligator Creek AL *	140	4	5	149
Stuart AL *	167	0	1	168
Stuart Creek AL *	154	11	24	189
Calcium AL *	231	7	4	242
Nettlefield AL *	167	21	0	188
Woodlands AL *	223	29	6	258
Brabons AL *	144	24	15	183
Mcdonalds AL *	253	5	0	258
Cormacks AL *	54	7	0	61
Gleesons Mill AL *	159	25	18	202
The Pinnacles AL *	180	26	17	223
Black Weir (Riverway) AL *	76	28	17	121
Kirwan AL *	165	30	17	212
Aplin Weir AL *	77	20	12	109

Rooneys Bridge AL *	156	13	8	177
Mysterton AL *	139	18	11	168
Louisa Creek AL *	163	31	16	210
Cluden AL *	163	13	20	196
North Ward AL *	171	21	18	210
South Townsville AL *	136	9	10	155
Mt Margaret AL *	225	32	37	294
Deeragun AL *	202	26	26	254
Little Bohle River AL *	214	31	23	268
Bohle River AL *	188	29	17	234
Bohle River TM *	197	30	17	244
Dalrymple Rd AL *	179	31	28	238
Mt Bohle AL *	184	19	48	251
Townsville Airport AL *	85	5		90
Bushland Beach AL *	218	23	5	246
Nelly Bay AL *	142	10	13	165
Nelly Bay	185	10		195
Picnic Bay AL *	136	13	13	162
Numerical Average	163	18	15	195
Maximum Rainfall	253	32	48	294

Station Name	24 hours to 9am on Feb			Total
	3	4	5	
Black R to Crystal Ck				
Upper Black River AL *	256	65	11	332
Black River TM *	179	39	6	224
Upper Bluewater AL *	239	94	8	341
Toolakea AL *	267	50	6	323
Toomulla AL *	165	60	32	257
Bluewater TM *	192	49	15	256
Woolshed AWS *	314	59		373
Paradise Lagoon AL *	154	82	9	245
Numerical Average	221	62	12	294
Maximum Rainfall		94	32	373

Table 3.4.3 Significant rainfall totals – Connors and Isaac Rivers.

Station Name	24 hours to 9am on Feb		Total
	3	4	
Moranbah SYN	19	8	27
Isaac River Bridge TM *	16	12	28
Mt Spencer TM *	10	38	48
Deverill TM *	15	5	20
Carfax	19	7	26
Mt Bridget TM *	49	26	75
Cardowan	36	18	54
Doraville	73	47	120
Blue Mountain	78	34	112
Prospect Ck TM *	59	52	111

Funnel Creek TM *	62	30	92
Braeside TM *	40	20	60
Nebo TM *	38	29	67
Cockenzie TM *	12	13	25
Bee Ck TM *	37	10	47
Pink Lagoon TM *	21	5	26
Yatton TM *	24	13	37
Coolmaringa TM *	4	0	4
Numerical Average	34	20	54
Maximum Rainfall	78	52	120

Table 3.4.4 Significant rainfall totals – Gulf Rivers.

Station Name	24 hr Rainfall to 9am on February				Total
	3	4	5	6	
Nicholson/Gregory					
Westmoreland		5	37	45	87
Herbert Vale		8	98		106
Lawn Hill Gorge		3	58	7	67
Riversleigh TM *	34	6	31	7	78
Gregory Downs TM *	0	15	7	48	70
Century Mine AWS *	1	1	46	8	57
Escott Station				75	75
Burketown SYN		10		76	86
Burketown AWS *	2	7	6	69	84
Numerical Average	9	7	40	42	79
Maximum Rainfall	34	15	98	76	106

Station Name	24 hr Rainfall to 9am on February				Total
	3	4	5	6	
Leichhardt					
Mount Isa Mine	14	53	67	3	137
Mount Isa AWS *	19	40	58	3	120
Doughboy Ck TM *	0	52	12	8	72
Miranda Creek TM *	0	49	23	2	74
Kamilaroi		40	15		55
Gunpowder TM *	1	30	2		33
Lorraine		43	3	11	57
Nardoo		50	15	17	82
Augustus Downs		42		47	89
The 16m Waterhole TM *	0	24	5	33	62
Floraville TM *	0	6	28	56	90
Numerical Average	5	39	23	20	79
Maximum Rainfall	19	53	67	56	137

Station Name	24 hr Rainfall to 9am on February				Total
	3	4	5	6	
Flinders					
Strathtay	49	18	11		78
Glendower TM *	17	20	13	0	50

Mt Pleasant	20	20	4		44
Devoncourt	5	60	53	4	122
Cloncurry		68		28	96
Cloncurry AWS *	0	66	20	9	95
Cloncurry TM *	0	73	37	12	122
Fort Constantine		62	35		97
Lands End	17	54			71
Carsland		81		47	128
Landsborough Highway TM *	2	65	16	0	83
Etta Plains TM *	9	43	0	0	52
Canobie TM *	2	96	1	1	100
Cowan Downs		62			62
Walkers Bend TM *	3	67	1	0	71
Numerical Average	11	57	17	10	85
Maximum Rainfall	49	96	53	47	128

Station Name	24 hr Rainfall to 9am on February				Total
	3	4	5	6	
Norman					
Yappar River	5	122	1	5	133
Croydon SYN	36	142	17	0	195
Glenore Weir TM *	5	1		10	16
Normanton AWS *	10	41	4	5	61
Numerical Average	14	77	7	5	101
Maximum Rainfall	36	142	17	10	195

Station Name	24 hr Rainfall to 9am on February				Total
	3	4	5	6	
Gilbert					
Gilberton	52	32	15		99
Green Hills	28	64	21	55	168
Rockfields TM *	27	43		2	72
Kidston Dam Tw TM *	74	60	36		170
Einisleigh TM *	33	24	19	1	77
Mt Surprise TM *	58	17	27	0	102
Forsayth	40	44	1	22	107
Prestwood	45	74	16	24	159
Routh River TM *	55	35	2	10	102
Roseglen TM *	28	31	5	34	98
Georgetown Airport *		41	24	36	101
Miranda Downs	12	92	24	30	158
Numerical Average	41	46	17	21	118
Maximum Rainfall	74	92	36	55	170

Station Name	24 hr Rainfall to 9am on February				Total
	3	4	5	6	
Western Cape Rivers					
Dorunda TM *	18	37	33	0	88
Koolatah Station	40	0	17	2	60
Chillagoe	81	1			82
Rookwood TM *	47	8	27	0	82
Palmerville AWS *	20	2	13	0	36

Mcleod River TM *	25	4	30	0	59
Ok Bridge TM *	44	0	4	0	48
Palmer River TM *	24	18		0	42
Pinnacle	55				55
Koolatah TM *	53	3	5	1	62
Kowanyama AP	20	19	14	52	105
Balurga Station	41		20		61
Weipa AWS *	0		64	15	79
Scherger AWS *	0		17	52	69
Numerical Average	33	9	22	11	66
Maximum Rainfall	81	37	64	52	105

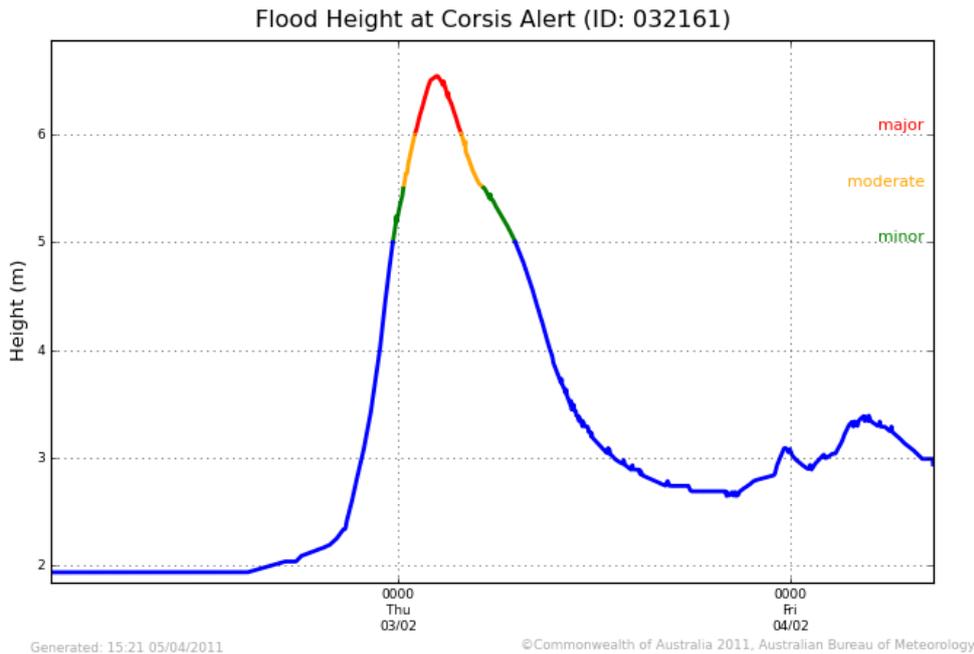
Station Name	24 hr Rainfall to 9am on February				Total
	3	4	5	6	
Eastern Cape Rivers					
Laura River TM *	6	44	7	1	58
Battle Camp TM *	14	2	34	0	50
Kalpower Crossing TM *	29	20	2	0	51
Hann River TM *	42	22	15	0	79
Musgrave SYN	63	6	9	11	89
Lotus	43	76	7	2	128
Numerical Average	33	28	12	2	76
Maximum Rainfall	63	76	34	11	128

3.5 Flood hydrographs associated with Severe TC Yasi.

Figures 3.5.1 through to 3.5.8 shows a series of recorded hydrographs at selected locations as Severe Tropical Cyclone Yasi crossed the North Tropical Queensland coast.

Figure 3.5.1 Flood hydrographs - Johnstone River.

South Johnstone River at Corsis Alert



South Johnstone River at Central Mill Alert

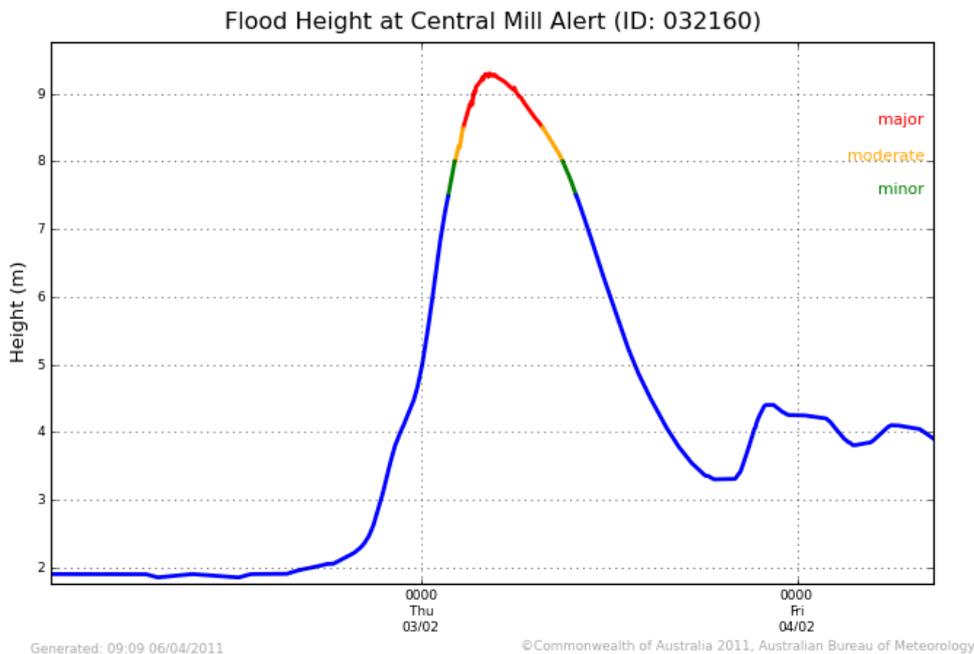
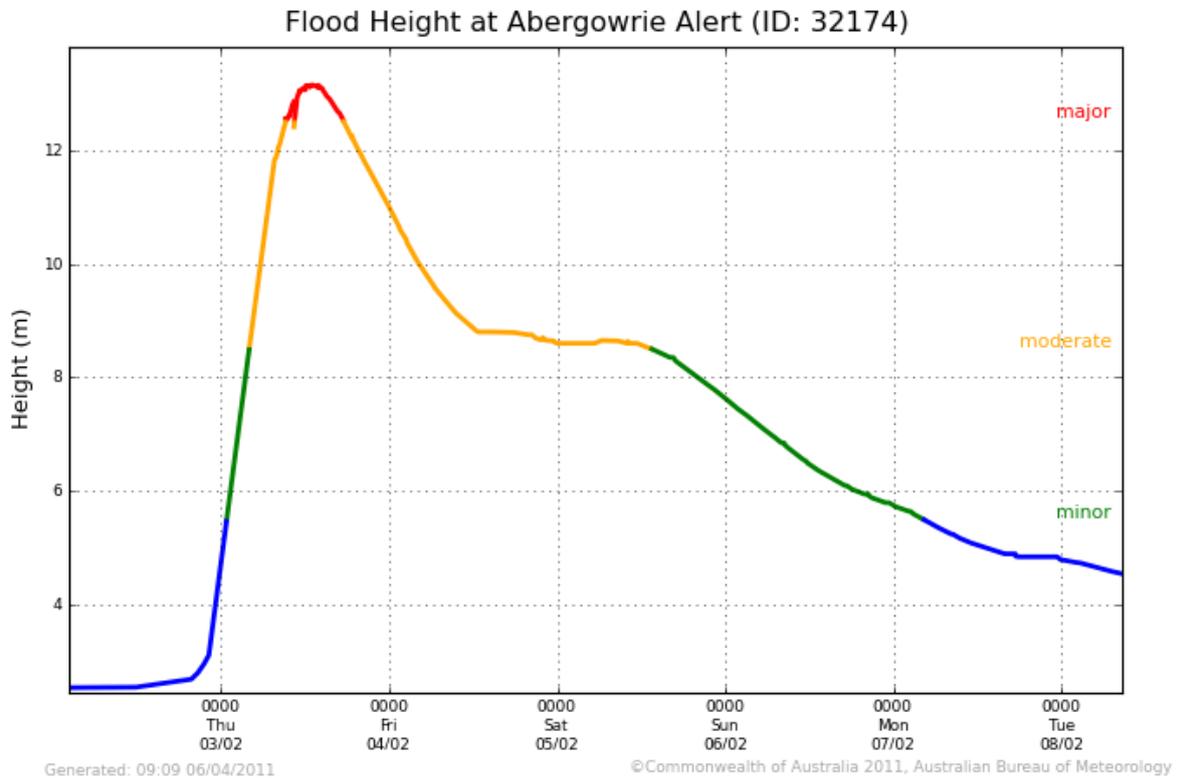
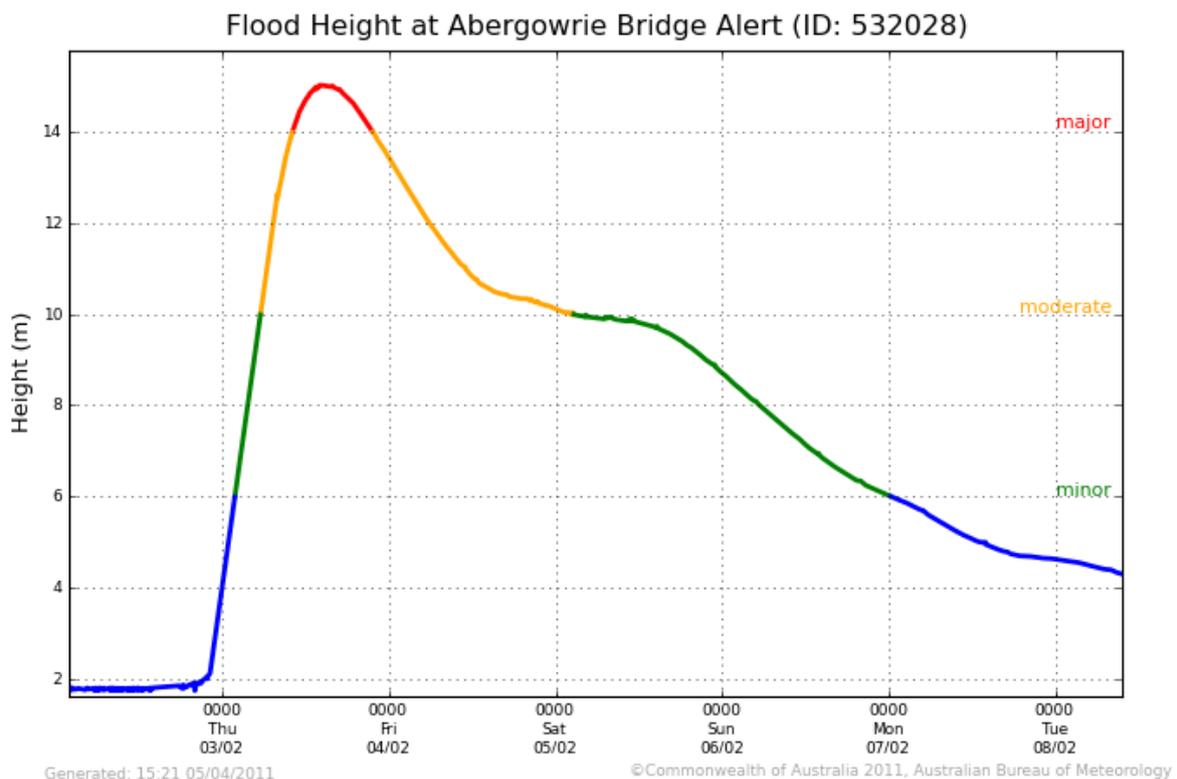


Figure 3.5.2 Flood hydrographs – Herbert River.

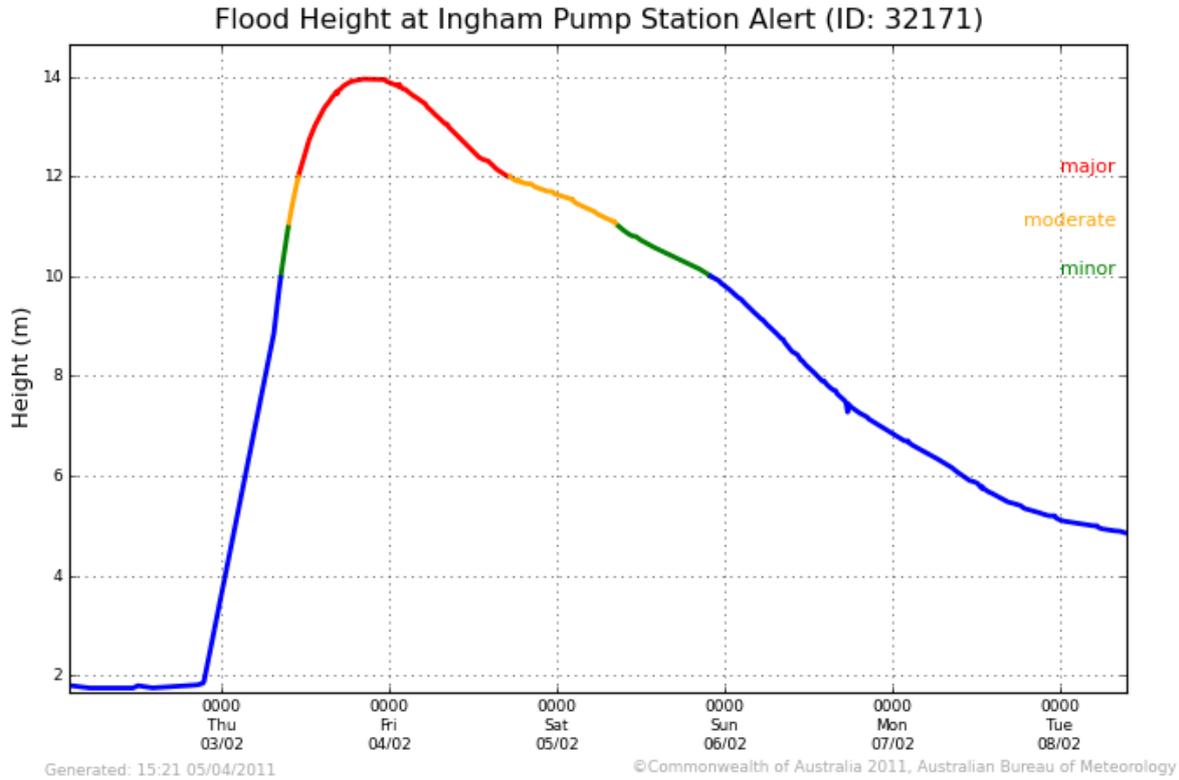
Herbert River at Abergowrie Alert



Herbert River at Abergowrie Bridge Alert



Herbert River at Ingham Pump Station Alert



Herbert River at Gairloch Alert

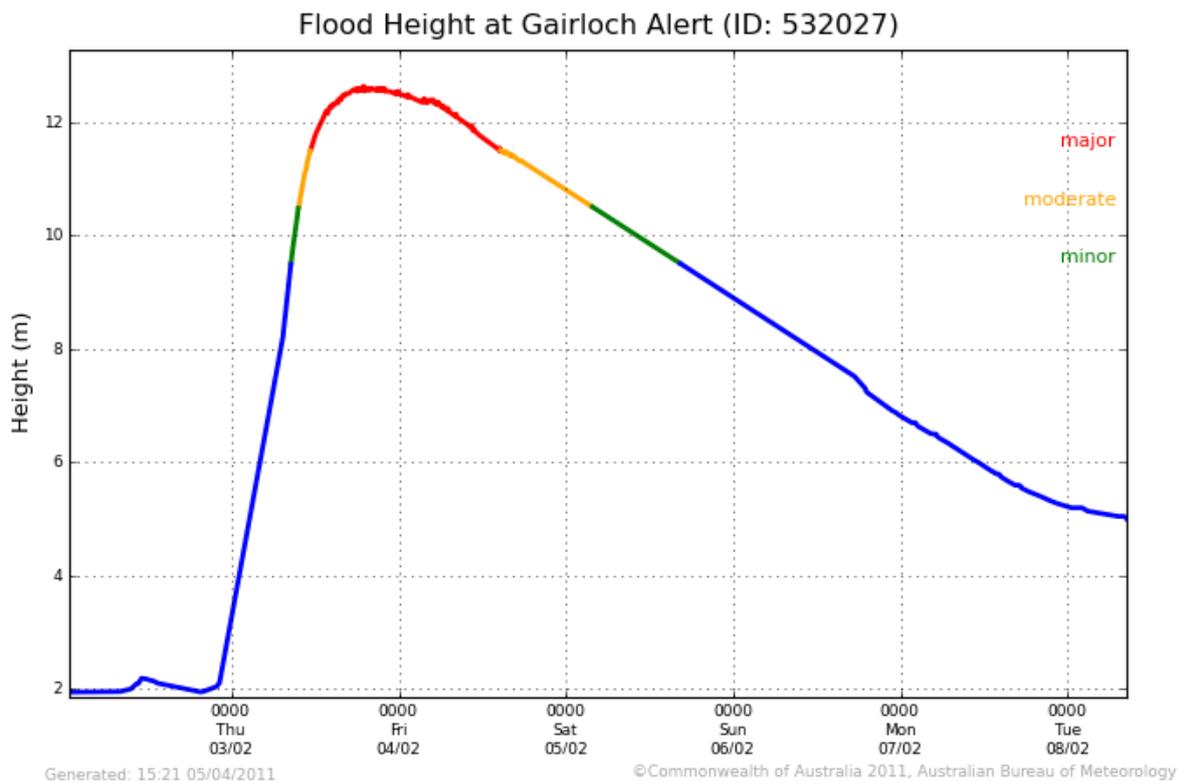


Figure 3.5.3 Flood hydrographs - Burdekin River.

Burdekin River at Sellheim Alert

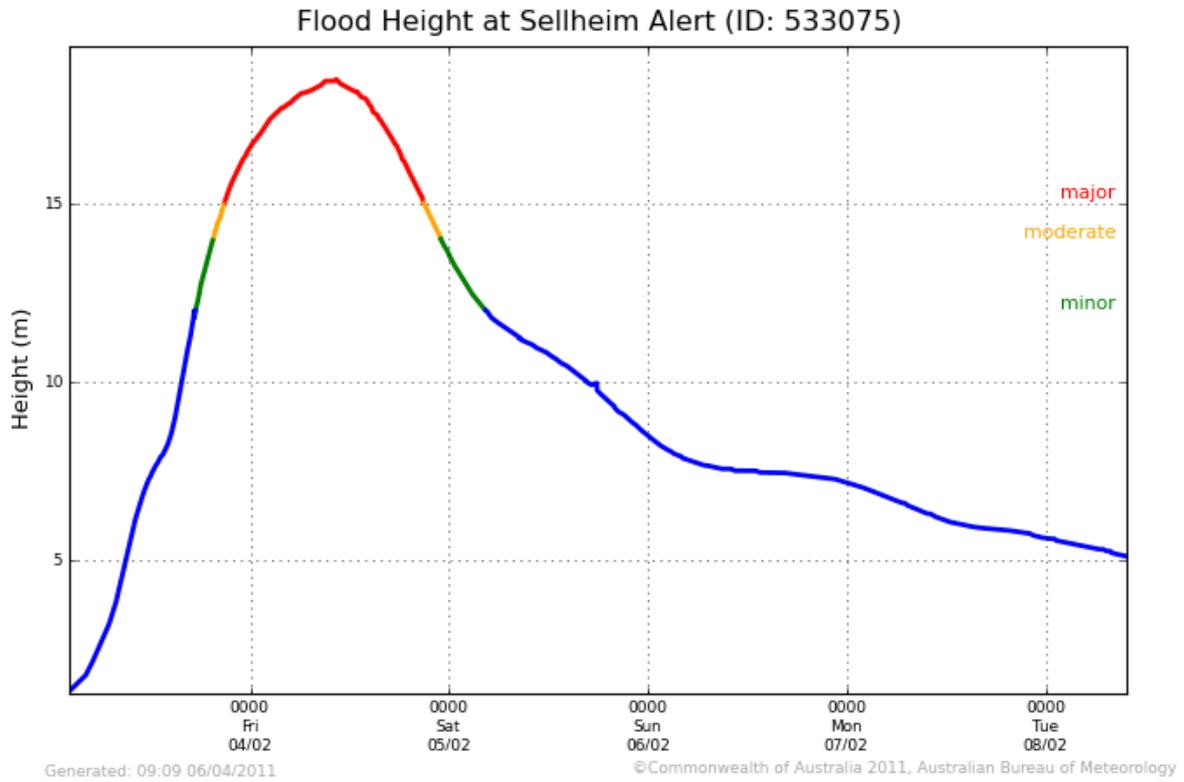
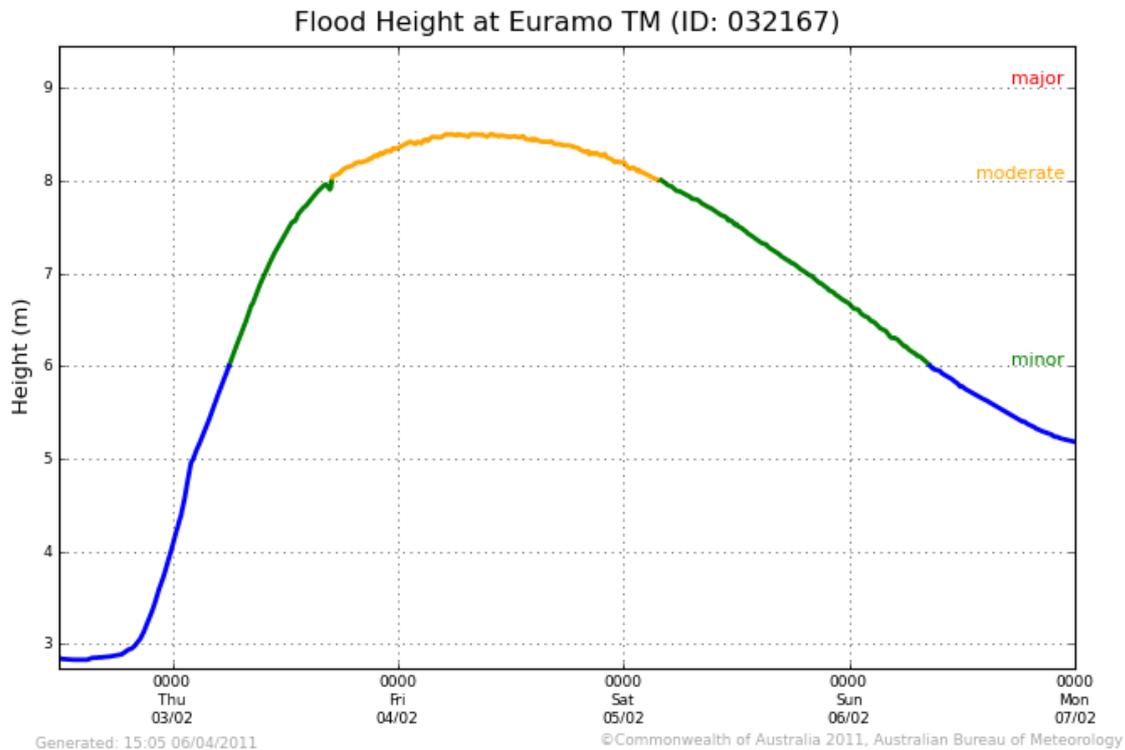


Figure 3.5.4 Flood hydrographs – Tully & Murray Rivers.

Tully River at Euramo



Murray River at Murray Flats Alert

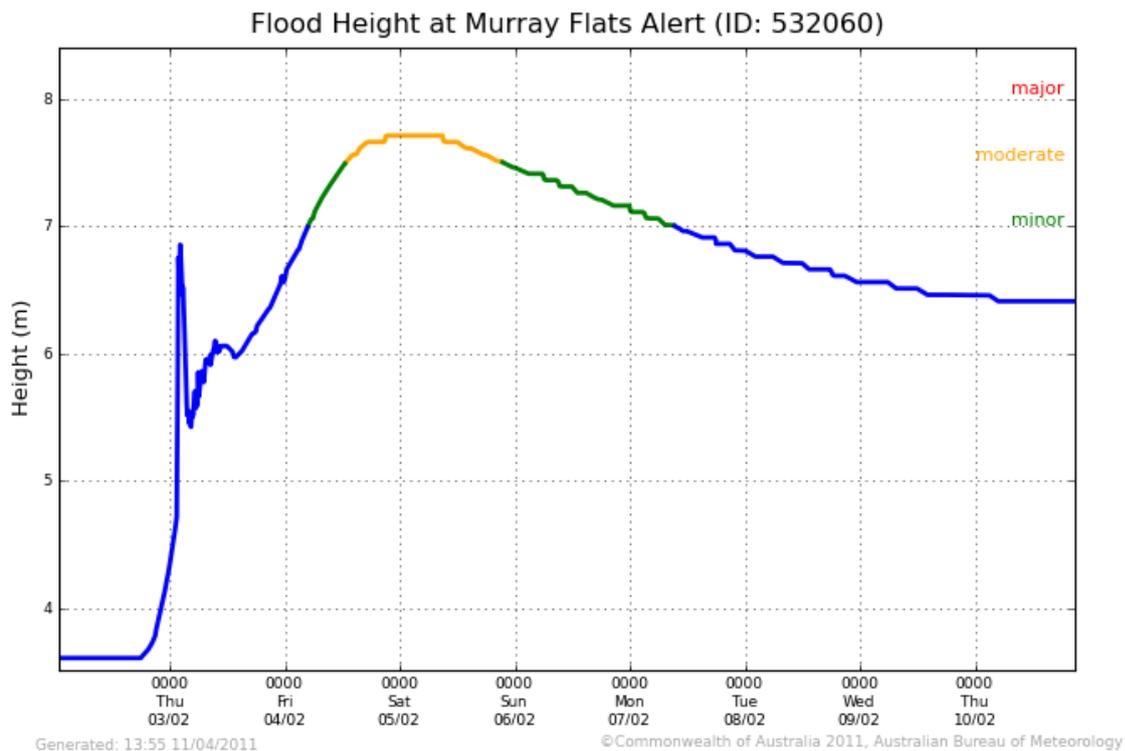
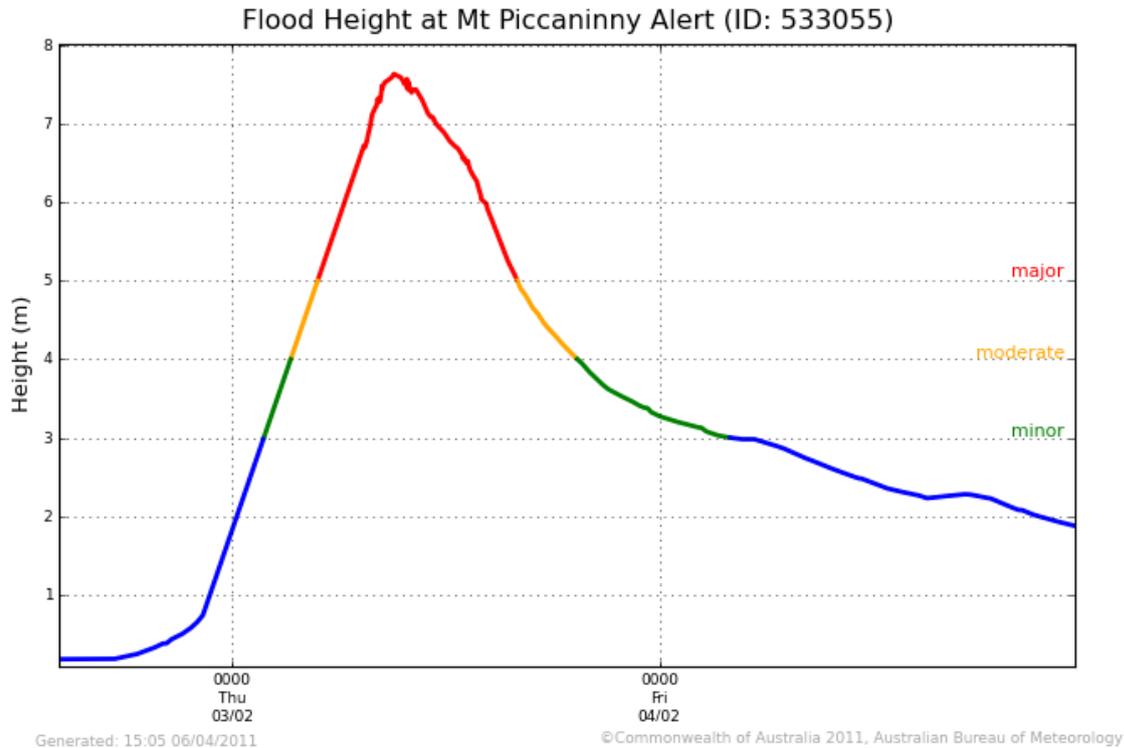
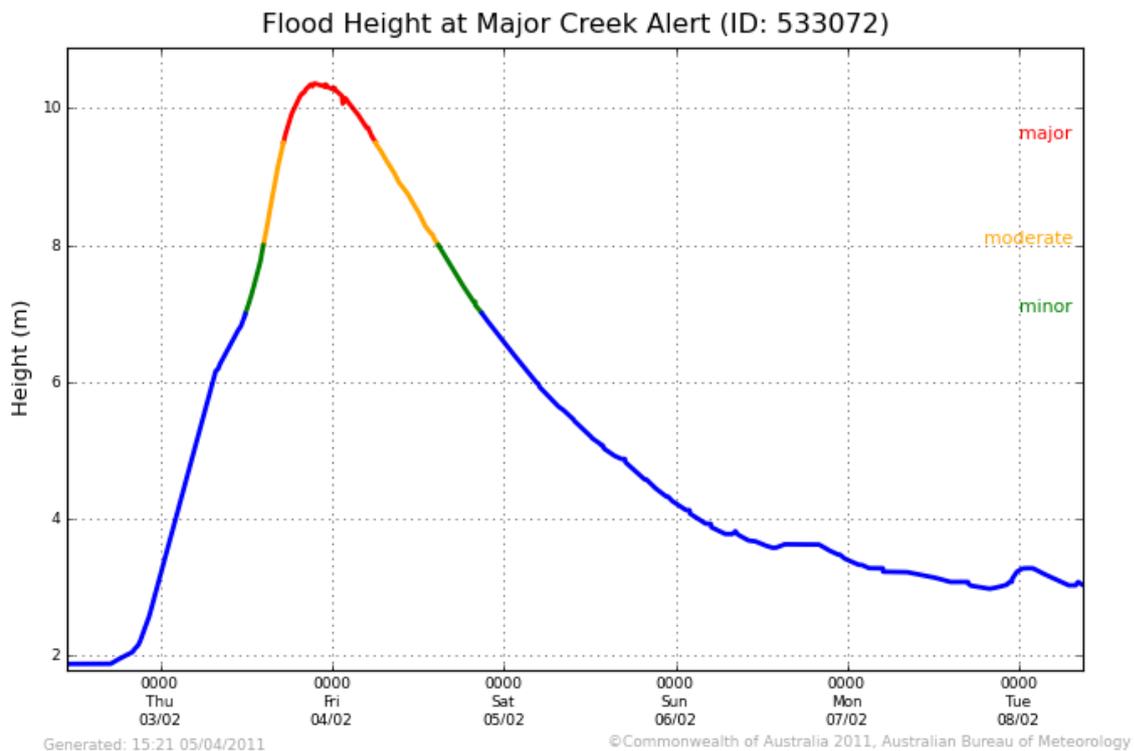


Figure 3.5.5 Flood hydrographs - Houghton River.

Houghton River at Mount Piccaninny

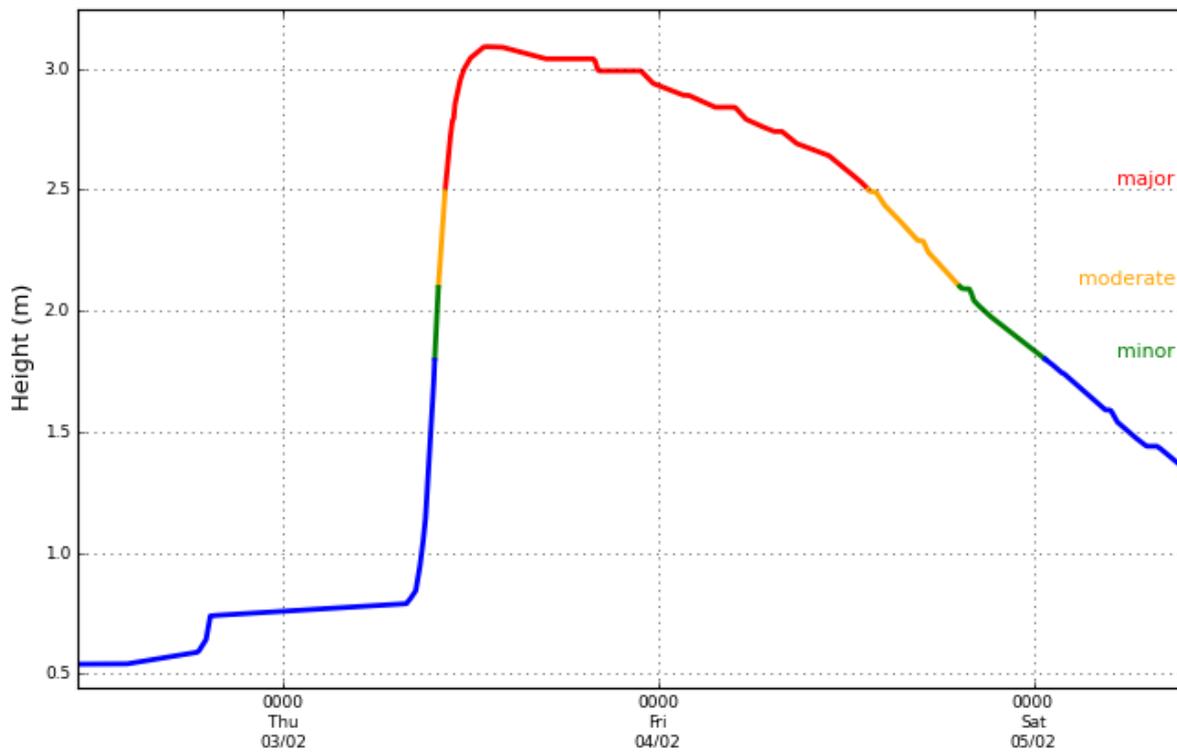


Major Creek at Major Creek



Haughton River at Giru

Flood Height at Giru Alert (ID: 533051)

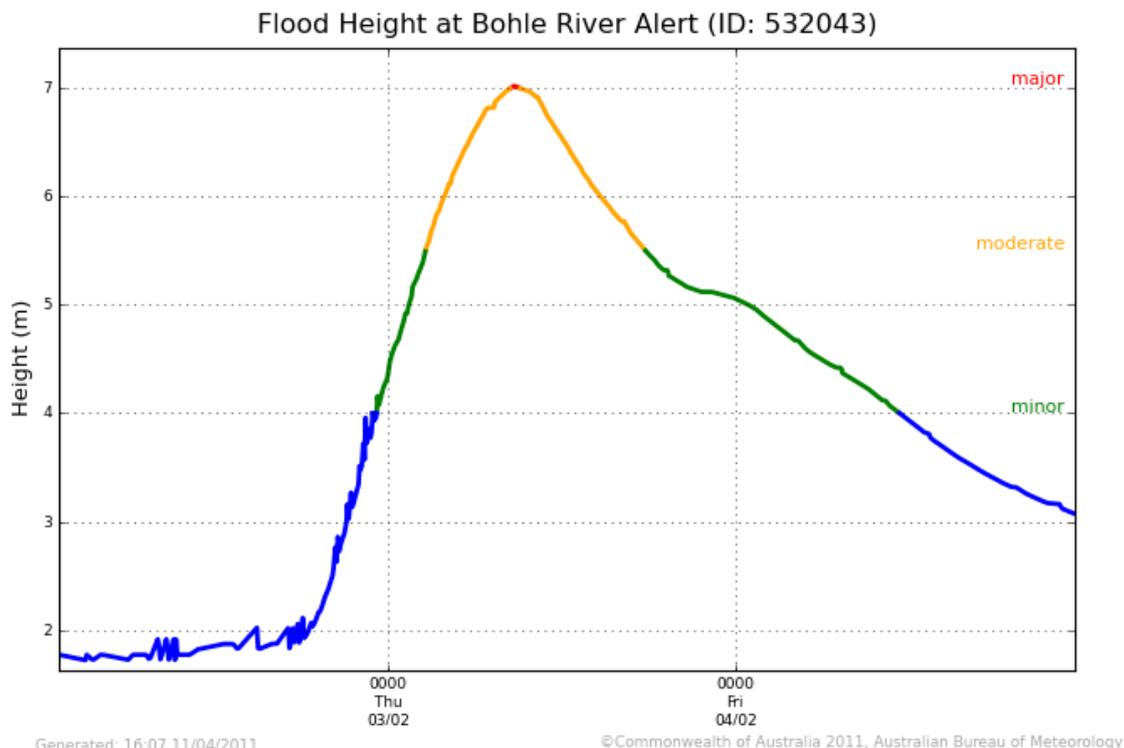


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Figure 3.5.6 Flood hydrographs – Bohle River and Bluewater Creek.

Bohle River at Bohle River Alert



Bluewater Creek at Bluewater Alert

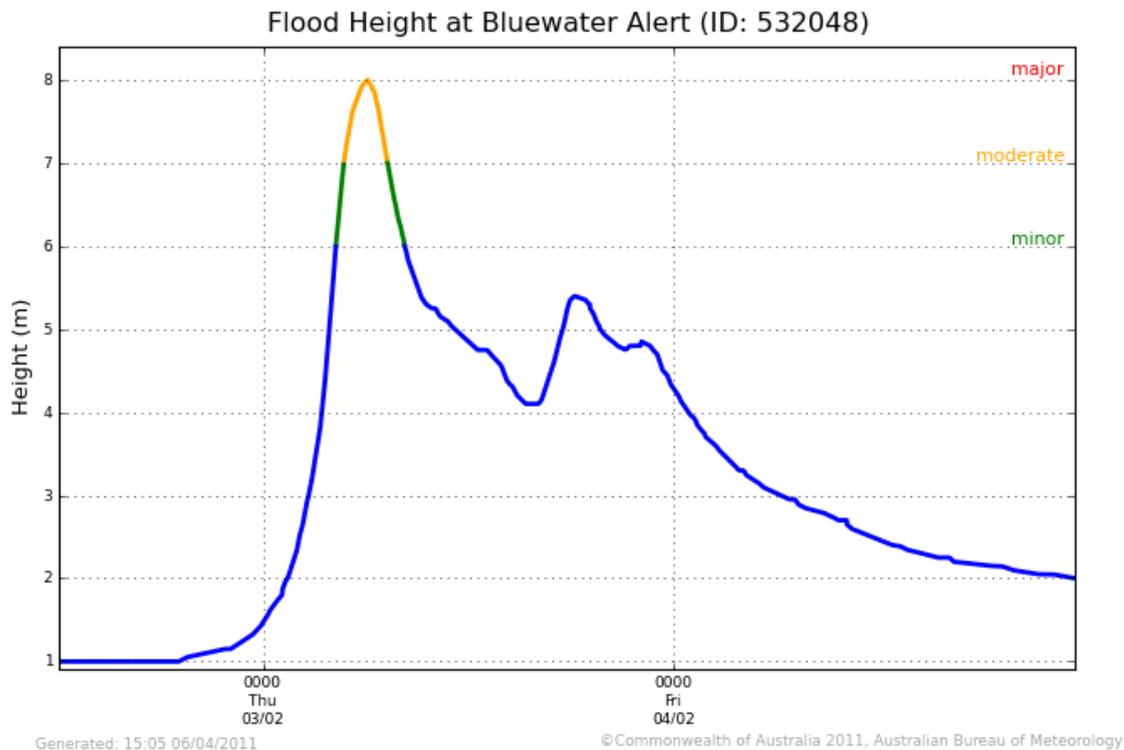
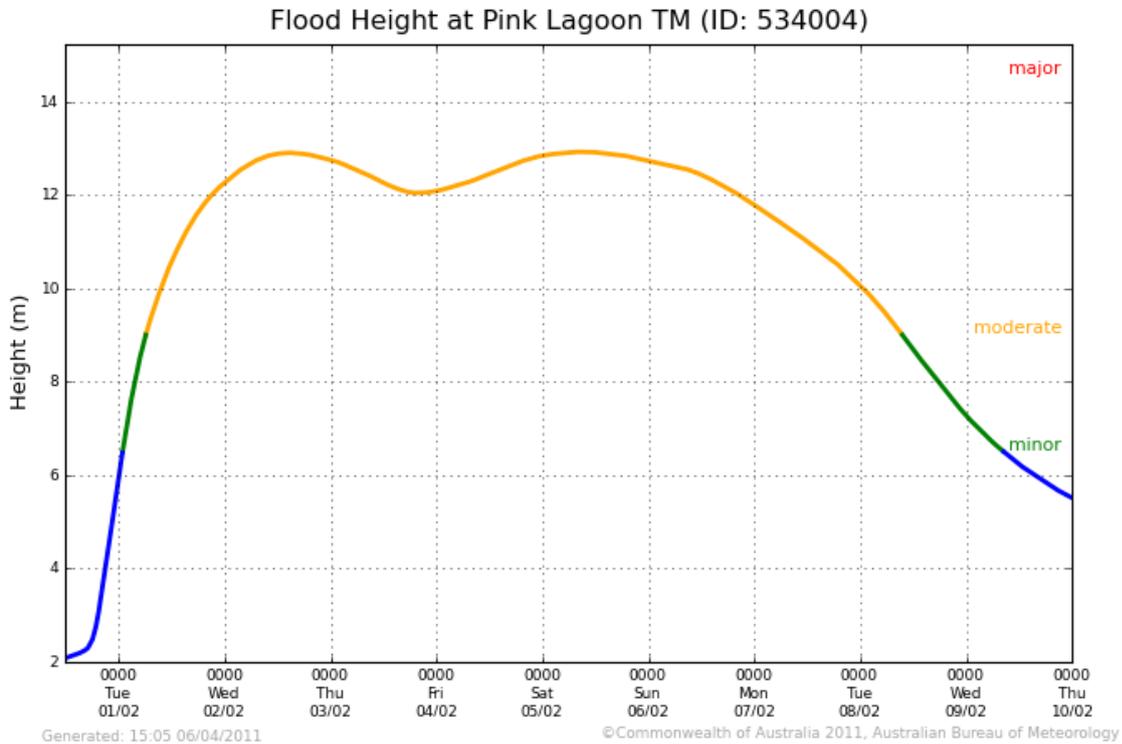


Figure 3.5.7 Flood hydrographs – Connors & Isaac Rivers

Connors River at Pink Lagoon TM



Isaac River at Yatton TM

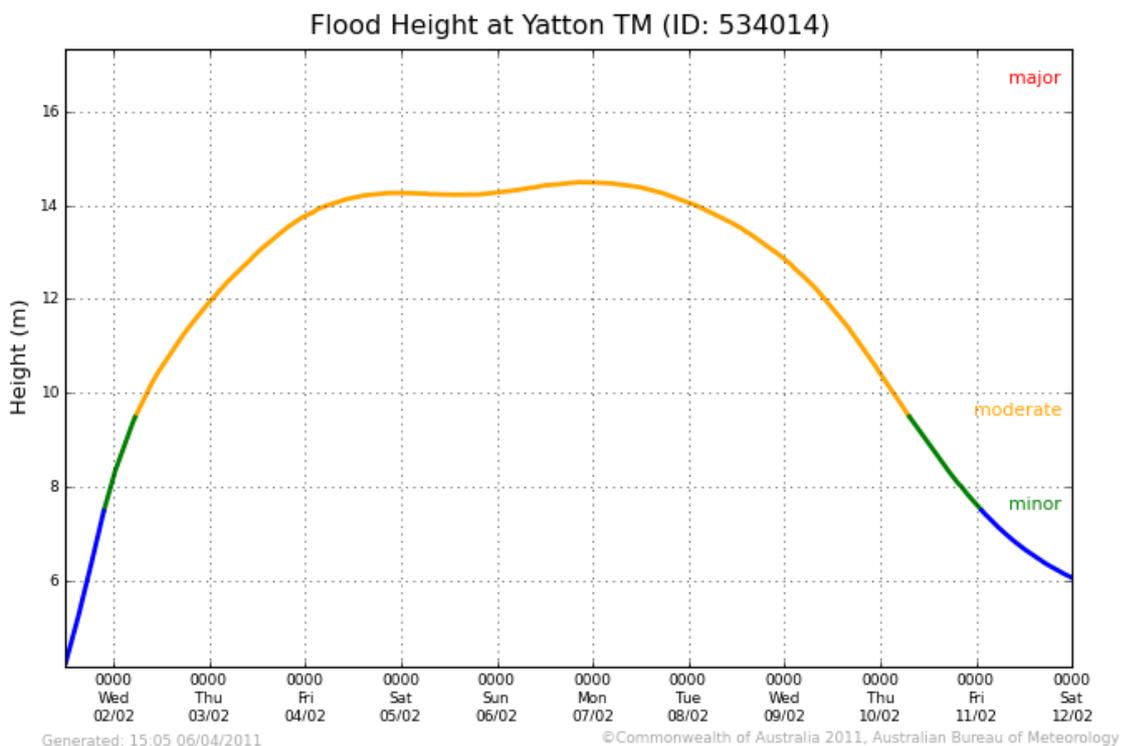
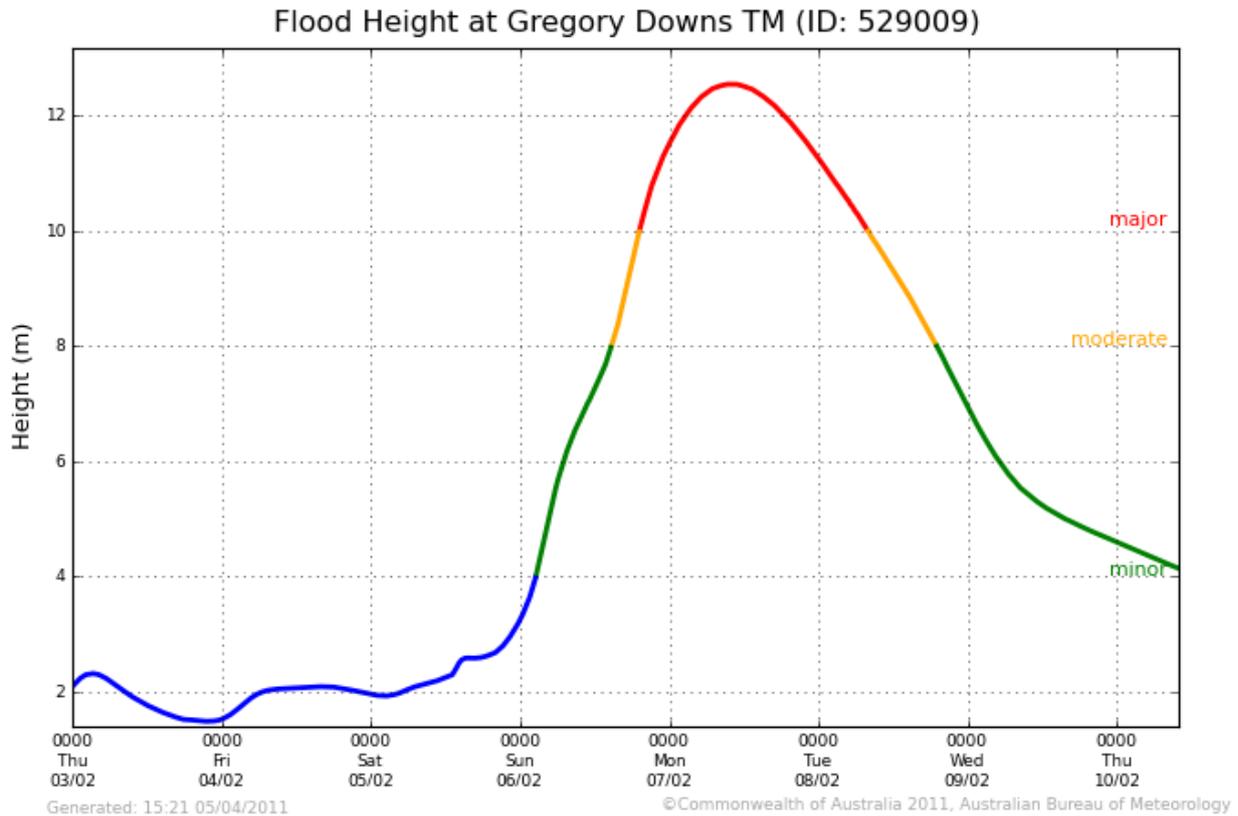


Figure 3.5.8 Flood hydrographs – Gregory River.

Gregory River at Gregory Downs TM



4. Warning Services

Severe Tropical Cyclone Yasi crossed the North Tropical Queensland coast between midnight and 1am on the 3rd of February and by 10pm was located near Mt Isa in northwest Queensland, by which time the system had weakened to a tropical low. The rapid movement of Yasi limited intense rainfall over an area to around 6 hours. This assisted to reduce the severity and extent of river flooding. However, short term intense rainfall was sufficient to produce major flooding in the Herbert, Burdekin, Johnstone, Bohle and Haughton Rivers and Bluewater Creek about the east coast, and also along the Gregory River in the Gulf Country.

A total of 94 Flood Warnings were issued following rainfall associated with Severe Tropical Cyclone Yasi, of which 30 were Major Flood Warnings. These warnings contained a total of 24 river height predictions across 6 locations throughout the flood warning catchments.

Table 4.1 Flood Warnings and Predictions issued following rainfall associated with TC Yasi.

River Basin	Number of Warnings	Number of Major Warnings	Number of Predictions	Prediction Location	First Warning	Last Warning
Qld Flood Summary	Continuous through February.					
Coastal Rivers Cooktown to Townsville	14				10:10AM Wed 02/02/2011	8:25AM Sat 05/02/2011
Coastal Rivers Townsville to Mackay	12				10:10AM Wed 02/02/2011	2:06PM Fri 04/02/2011
Johnstone	3	2	-	-	12:46AM Thur 03/02/2011	8:59AM Thur 03/02/2011
Herbert	14	13	6	Gairloch	2:42AM Thur 03/02/2011	10:39AM Sun 06/02/2011
Burdekin	9	4	1	Macrossan Bridge	6:49AM Thur 03/02/2011	8:07AM Mon 07/02/2011
Tully/Murray	10	0	5	Euramo	1:10AM Thur 03/02/2011	9:06AM Sun 06/02/2011
Haughton	8	7	3	Giru	3:04AM Thur 03/02/2011	2:10PM Fri 04/02/2011
Fitzroy	10	-	3	Yatton	9:12AM Wed 02/02/2011	9:01AM Thur 10/02/2011
Gulf	14	4	6	Burketown	12:21PM Wed 02/02/2011	9:22AM Thur 10/02/2011
TOTAL	94					

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Last updated: 16 March 2009