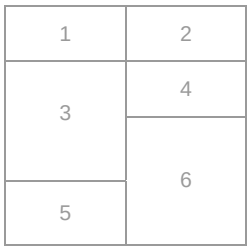
Australian Government
Bureau of Meteorology

Queensland North Tropical Coast Floods

March 2008



1. Water on Bruce Highway at Gordonvale
2. Barron Falls in Flood
3. Barron River at Kamerunga Bridge
4. Copperlode Dam
5. Houses isolated by floodwaters at Babinda.
6. Barron Falls in Flood.

All photos care of www.cairns.com.au and Cairns Post.

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 DNRW 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

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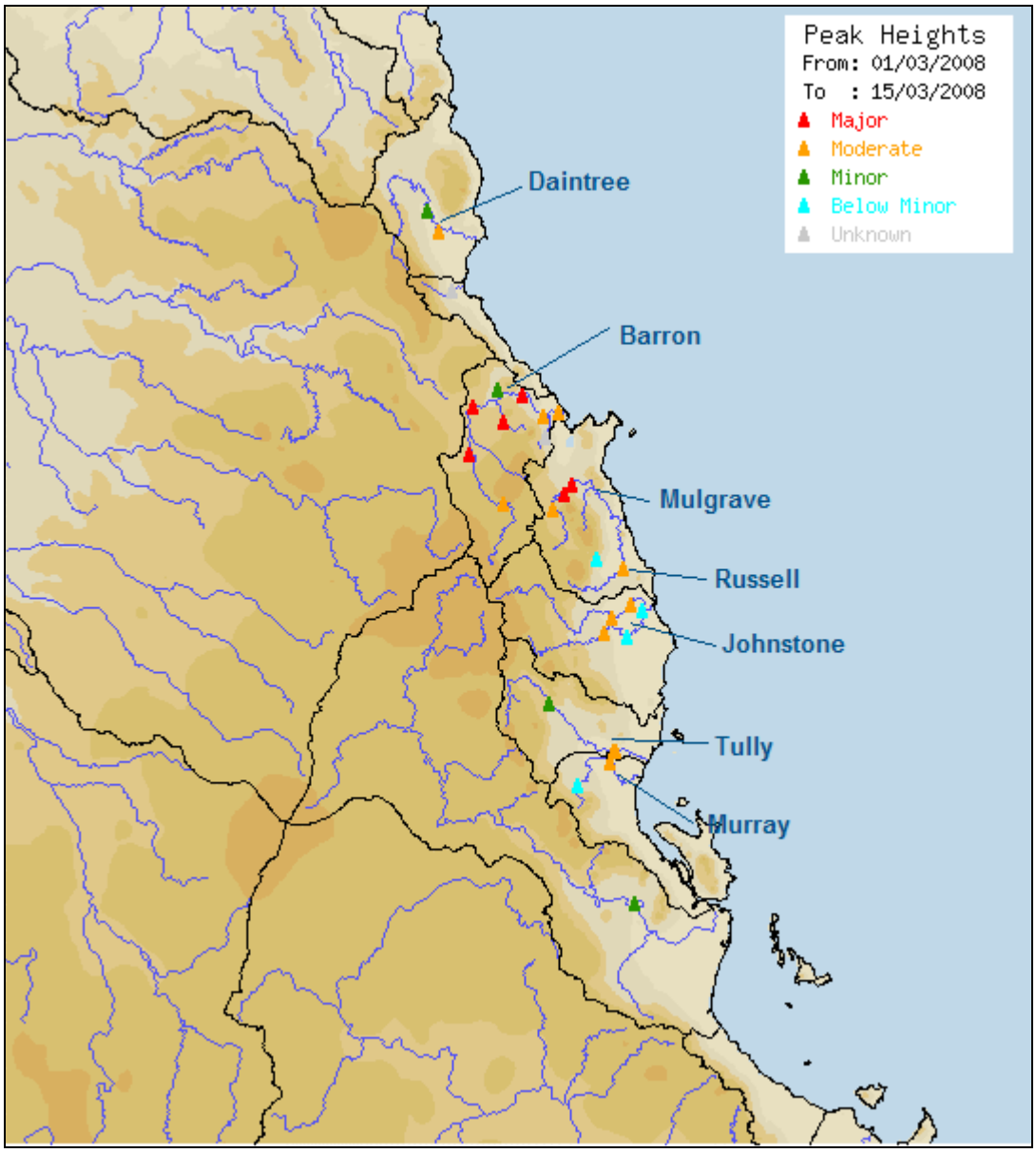
1. Introduction

Heavy rainfall occurred along the North Tropical Coast of Queensland between the 2nd and 6th of March and then again between the 12th and 15th of March. Both events resulted from strong ridging along the coast producing a moist onshore southeast airflow. The rainfall caused moderate to major flooding in coastal and adjacent streams in particular the Barron River, Johnstone River, Mulgrave and Russell Rivers, Tully River, Murray River and the Herbert River.

This report provides a summary and analysis of the meteorology and hydrology of these events.

Figure 1.1 Peak Flood Height Map for Queensland's North Tropical Coast March 1st to 15th, 2008



2. Meteorological Summary

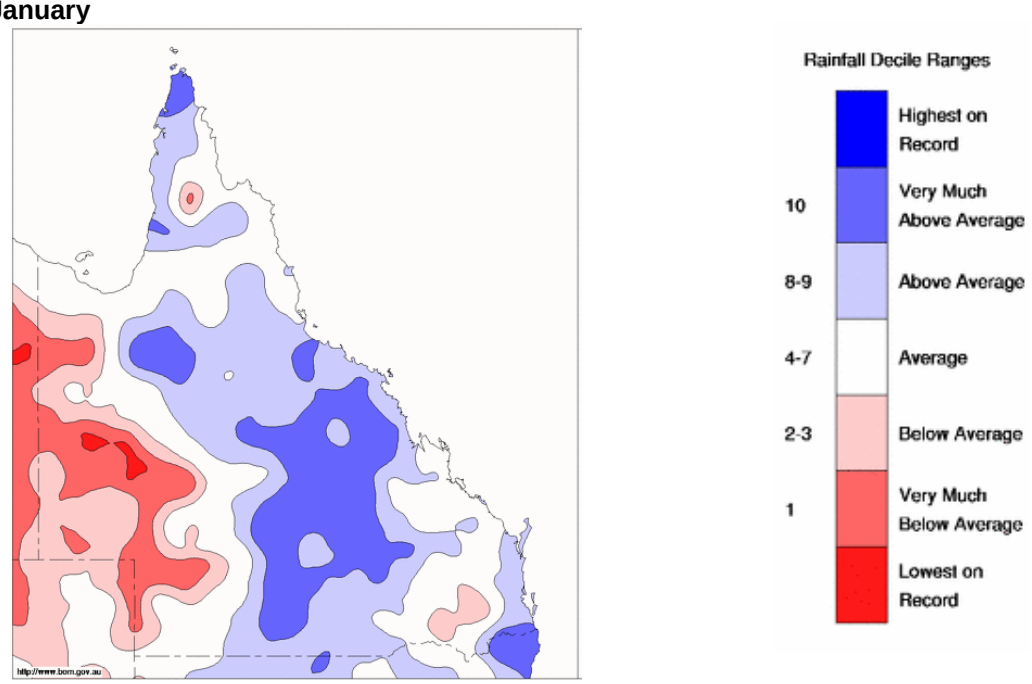
Despite an active wet season across northern Australia during January and February, the North Tropical Coast of Queensland generally received only average wet season rainfall. Figure 2.1 shows the monthly rainfall decile maps for Queensland for January and February 2008.

However, the month of March saw a change to this with two heavy rainfall events. The first occurred between the 2nd and 6th of March as a strong southeast wind flow developed across the North Tropical Coast and interacted with a low in the upper levels. The second occurred between the 13th and 16th of March as a southeast wind surge extended along the coast and interacted with cold air in the upper levels. Both events produced intense rainfall over the North Tropical Coast region.

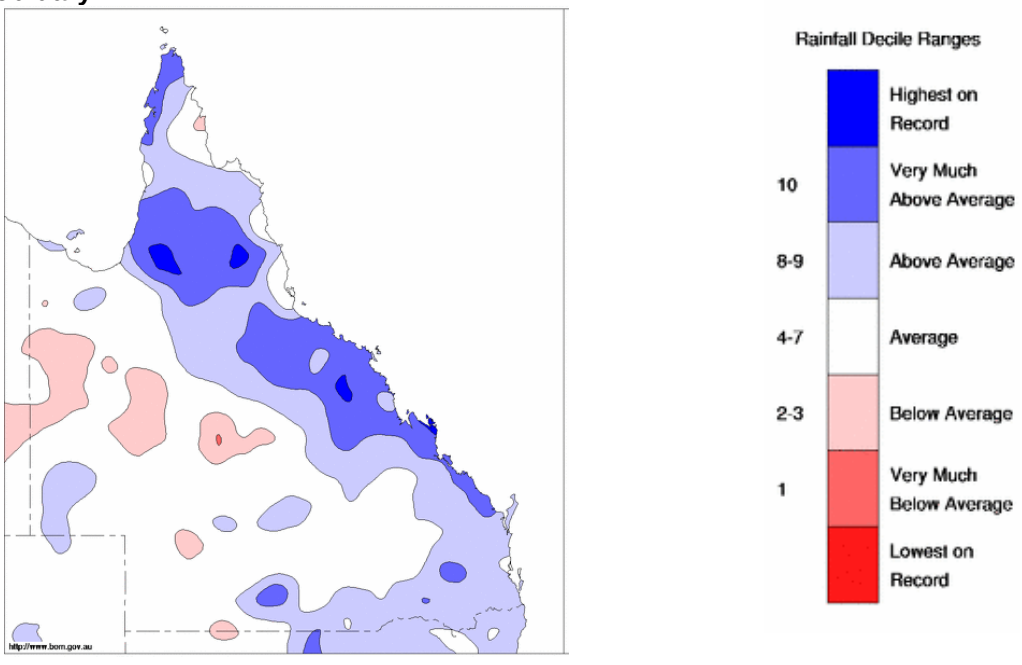
This chapter presents a discussion and analysis of the meteorological conditions that led to flood producing rainfalls to areas between Lucinda and Daintree.

Figure 2.1 Monthly Rainfall Decile Maps for Queensland for January and February 2008.

January



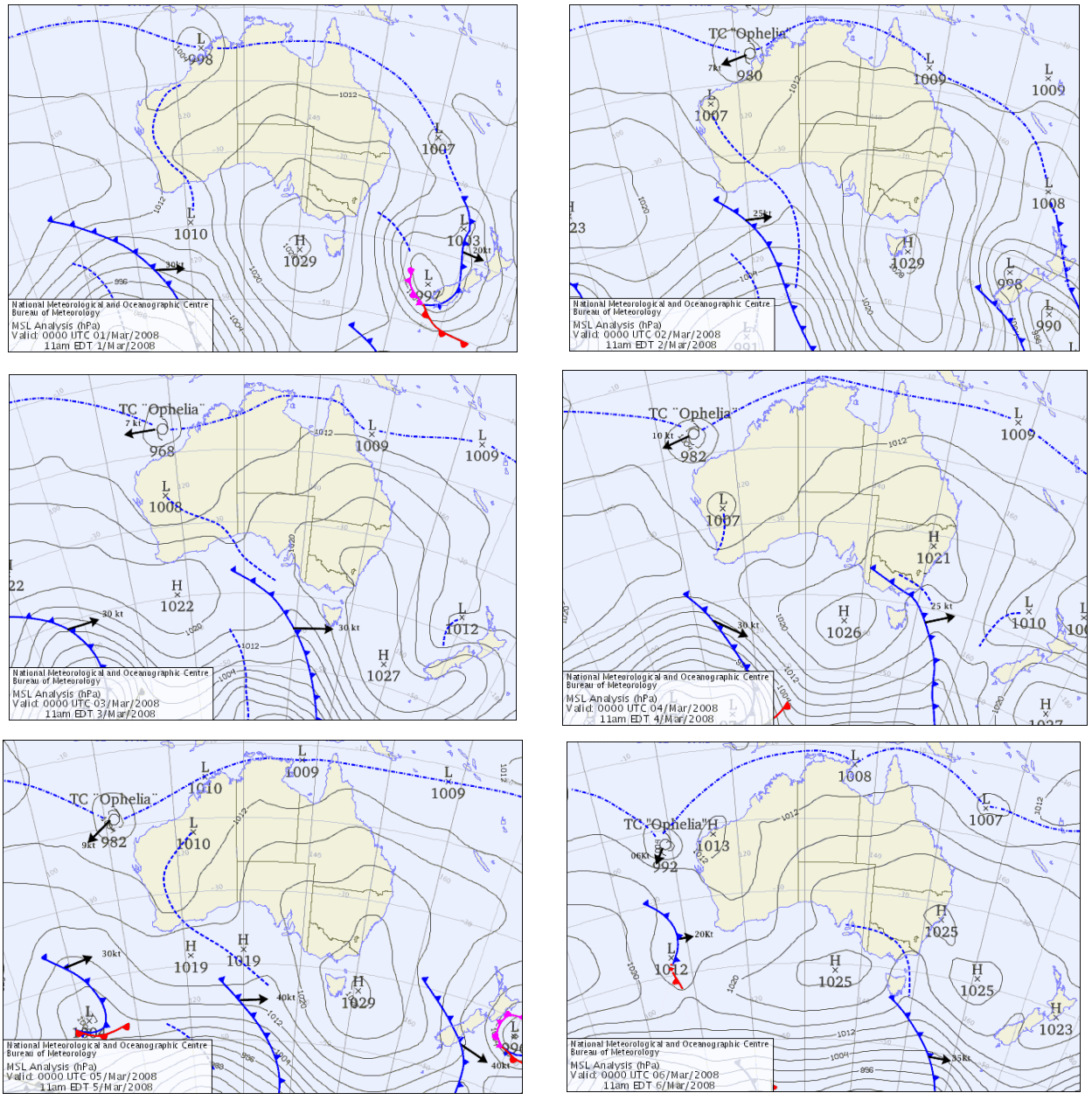
February



2.1 Meteorological Analysis

A sequence of Mean Sea Level Pressure Charts at 10am EST from the 1st to the 6th of March 2008 is shown at Figure 2.1.1. At 10am on the 1st of March a high pressure system to the south of Australia extended a ridge along the east coast of Queensland. The ridge was strengthened by 10am EST on the 2nd as the high moved eastward of Tasmania directing moist onshore southeast winds onto the North Tropical Coast and producing extensive shower activity over the region. The largest 24-hour rainfalls to 9am on the 2nd of March were over the Johnstone and Tully River catchments with average falls of 60 to 80 millimetres. The largest fall recorded was 154mm at Murray Flats Alert.

Figure 2.1.1 Mean Sea Level Pressure Charts for Australia at 10 am EST from the 1st to the 6th of March 2008.



The passage of a frontal trough through the Great Australian Bight on the 3rd of March caused the high over the Tasman Sea to weaken, however ridging and the strength of the onshore flow on the North Tropical Coast remained unchanged resulting in further stream shower activity and large 24-hour rainfall totals. Heaviest 24-hour rainfalls for this event however occurred to 9am on the 5th March. Note from Figure 2.1.1 that the Mean Sea Level pressure analysis at 10am EST on the 5th of March shows that the high-pressure system over the Tasman Sea had again strengthened. Winds from Cairns airport at 9am on the 5th of March indicate a

strengthening of the southeast winds with winds just above the surface increasing significantly from 43 kilometres per hour at 3am to 72 kilometres per hour at 9am. See Table 2.1.2, which details the vertical wind profile at Cairns Airport at 3am and 9am on the 5th of March 2008, and highlights these strengthening southeast winds in the low levels.

Table 2.1.2 Winds at Cairns Airport at 3am and 9am on the 5th of March 2008.

Height (Metres)	3am on the 5th (Direction/Speed Km/hr)	9am on the 5th (Direction/Speed Km/hr)
5500	70/30	-
4000	95/19	-
3000	60/28	115/39
2000	85/43	120/46
1500	85/44	120/48
1000	95/43	134/63
500	100/43	145/72

An analysis of the vertical wind profile between 1500 metres and 5500 metres at 9am on the 4th of March, as shown in Figure 2.1.3, indicates an upper low to the northeast of Daintree Village and areas to the north of the low where winds back with height (shaded region in Figure 2.1.3), indicative of warm air advection and the ascent of air. Note also that winds through this area are mostly directed from the north to northwest.

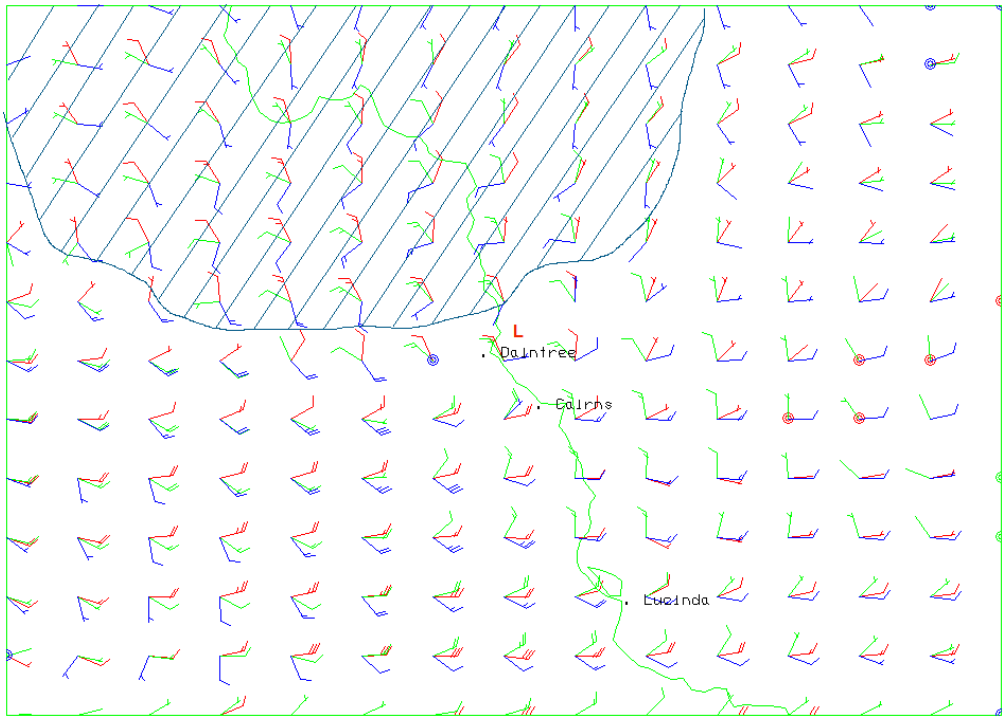
By 10pm on the 4th of March the upper low had moved westward to be positioned over land, producing a wind profile along the coast that has winds turning anti-clockwise with height associated with large-scale ascent of air. Studies by Bonell, Callaghan and Connor (2005) revealed that this is a typical wind structure that will produce intense rainfall over Queensland. The studies also found that where winds were onshore at low levels and turned anti-clockwise through 90 degrees or less between 1500 metres and 5500 metres, the most intense rainfalls are recorded. Note the shaded area in Figure 2.1.3, for 10pm on the 4th of March, where winds are backing with height, and low level winds, particularly south of the low centre are onshore from the east turning back to the northeast at 5500 metres.

By 9am on the 5th of March, winds near the surface had strengthened, as was shown in Table 2.1.2, increasing the warm air advection over the region and producing even more favourable conditions for heavy rainfall.

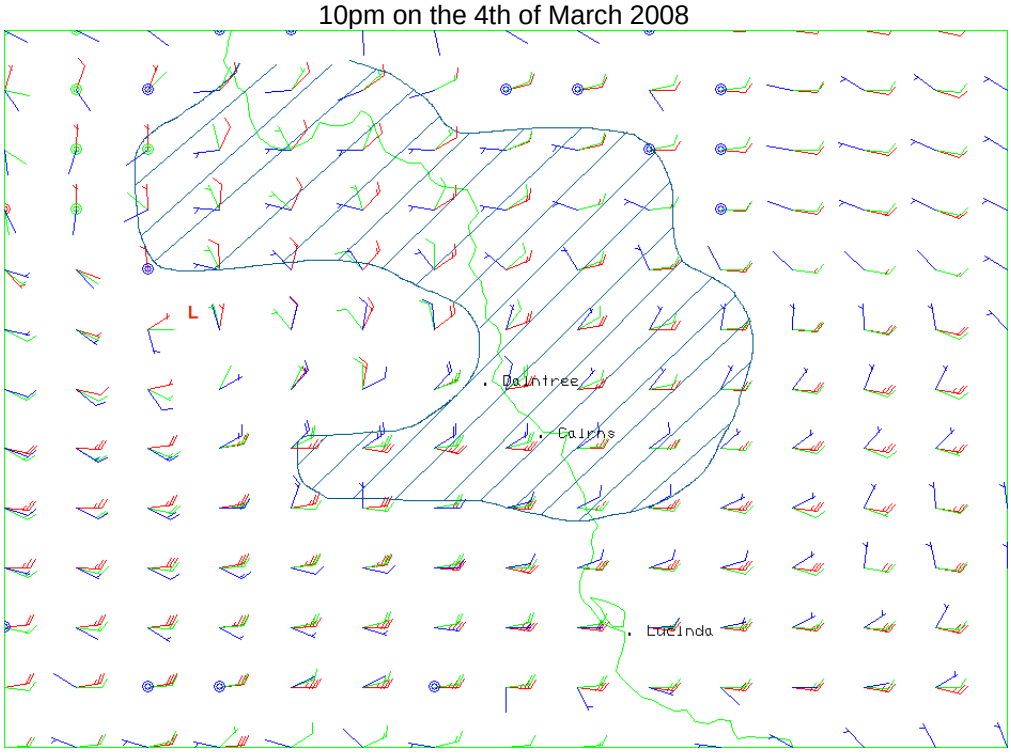
Figure 2.1.3 Analysis of the vertical wind profile over the North Tropical Coast from 10am on the 4th of March to 10am on the 5th March 2008.

Winds at 1500 metres (red), 3000 metres (green) and 5500 metres (blue). Areas of Warm Air Advection are shaded. **L** marks the low centre.

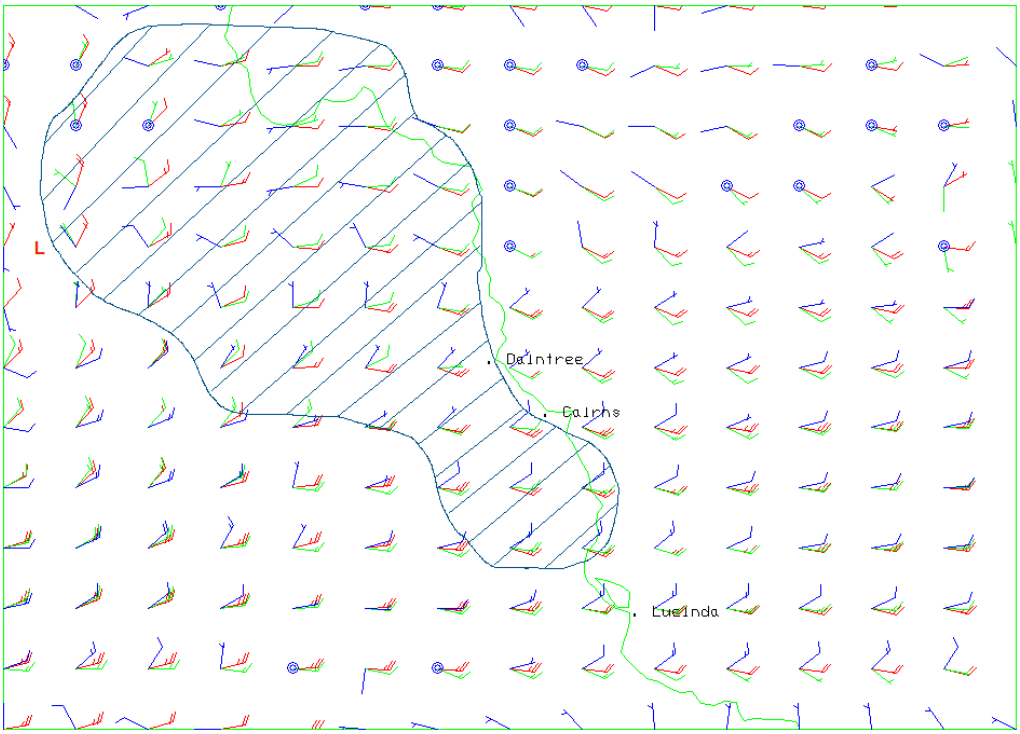
10am on the 4th of March 2008



10pm on the 4th of March 2008



10am on the 5th of March 2008

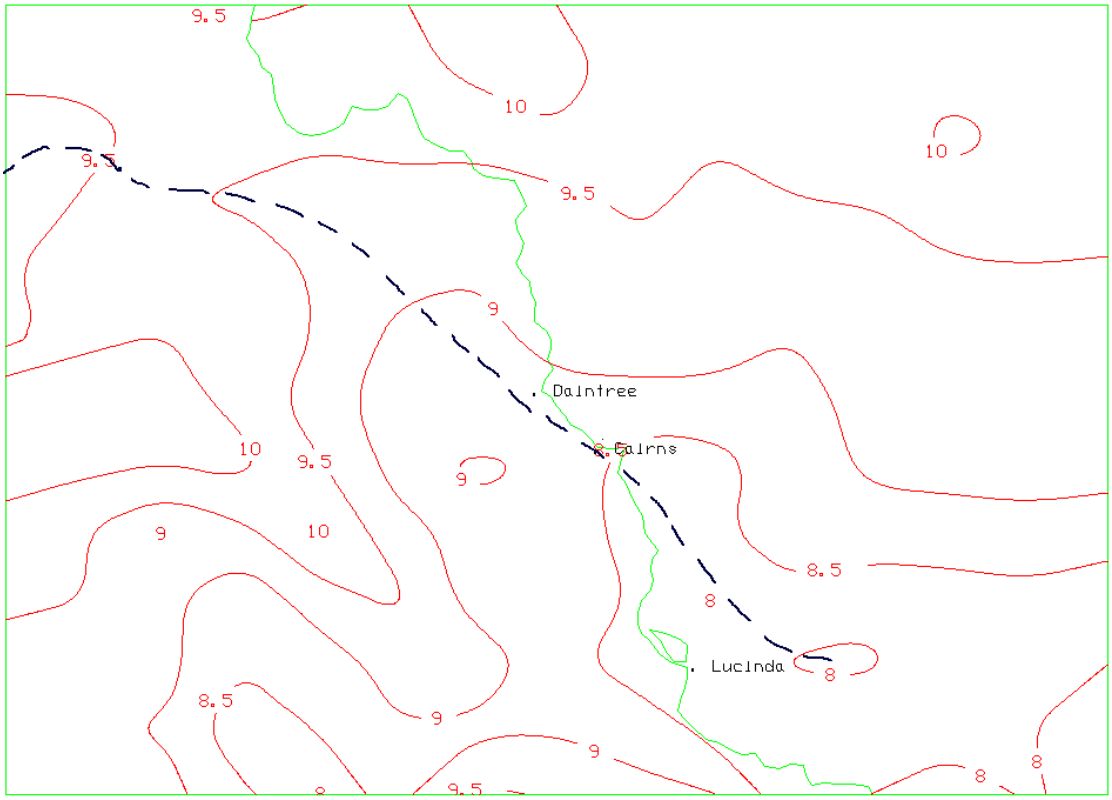


Another factor contributing to the intense rainfall occurring between 9am on the 4th of March and 9am on the 5th of March was cooler air at 3000 metres. A temperature analysis at 3000 metres above the surface, from 10am on the 4th of March to 10am on the 5th of March is shown in Figure 2.1.4. Note the thermal trough extending through the region (marked by the dashed line). This has assisted to further destabilise the air and contribute to producing heavy rain.

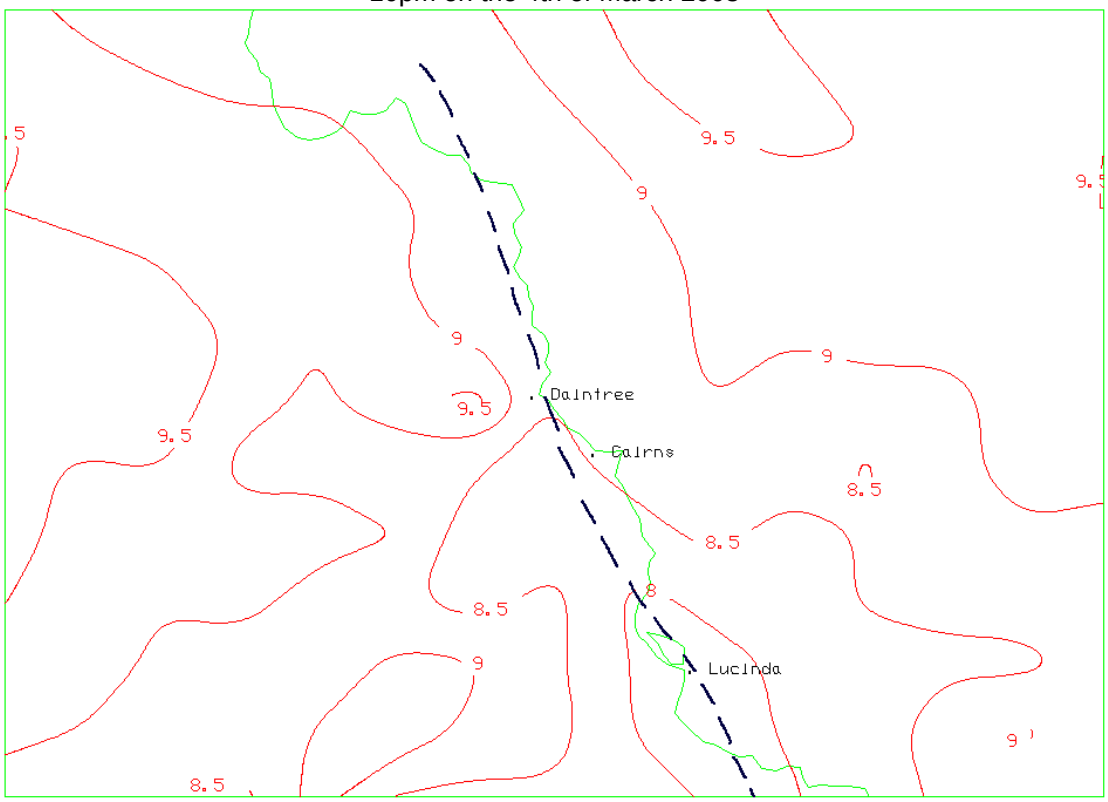
Highest falls recorded to 9am on the 5th of March include 382 millimetres at O'Donoghue Road Alert, 365 millimetres at Topaz Alert, 355 millimetres at Bolinda Estate Alert and 336 millimetres at Copperlode Dam Alert. Table 2.1.5 lists hourly rainfall totals for Topaz Alert, Bolinda Estate Alert and Copperlode Dam Alert for the 24 hours ending at 9am on the 5th of March 2008. See Section 3, Table 3.1.1 for a complete summary of the North Tropical Coast 24-hour rainfall totals recorded at 9am from the 2nd of March to the 6th of March 2008.

Figure 2.1.4 Analysis of temperatures at 3000 metres over the North Tropical Coast from 10am on the 4th of March to 10am on the 5th of March.

10am on the 4th of March 2008



10pm on the 4th of March 2008



10am on the 5th of March 2008

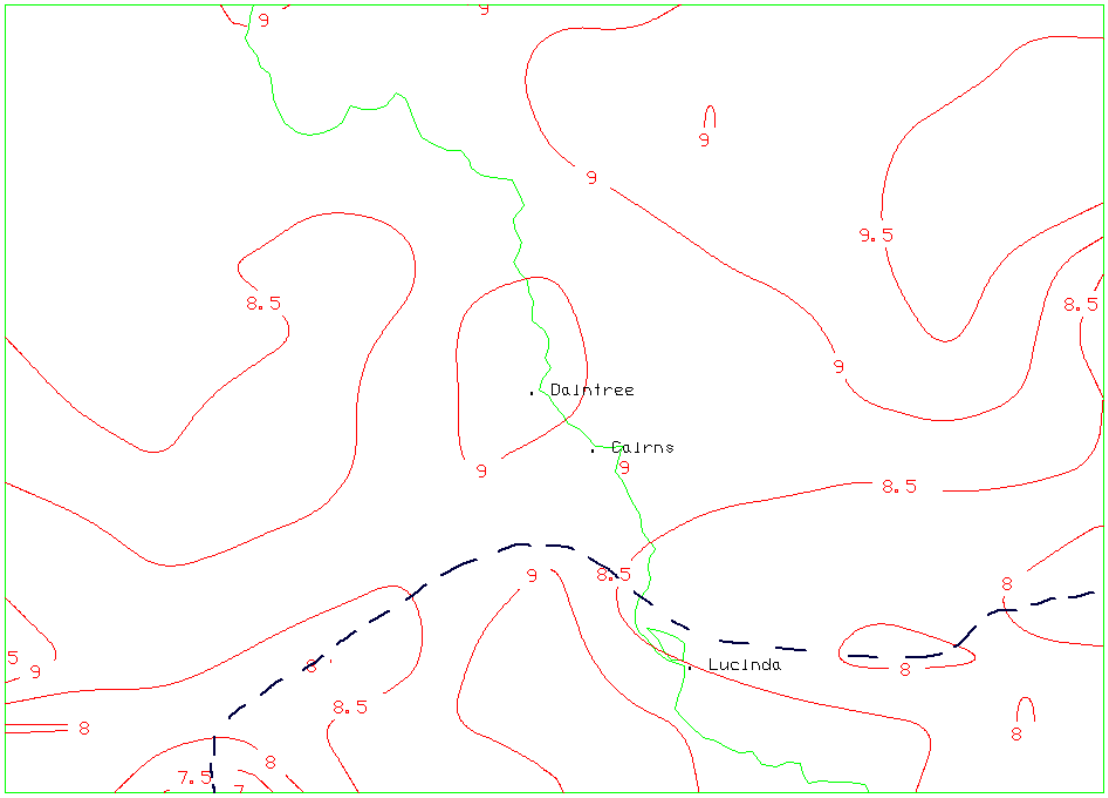


Table 2.1.5 Hourly Rainfall totals for Topaz Alert, Bolinda Estate Alert and Copperlode Dam Alert for the 24 hours ending at 9am on the 5th of March 2008.

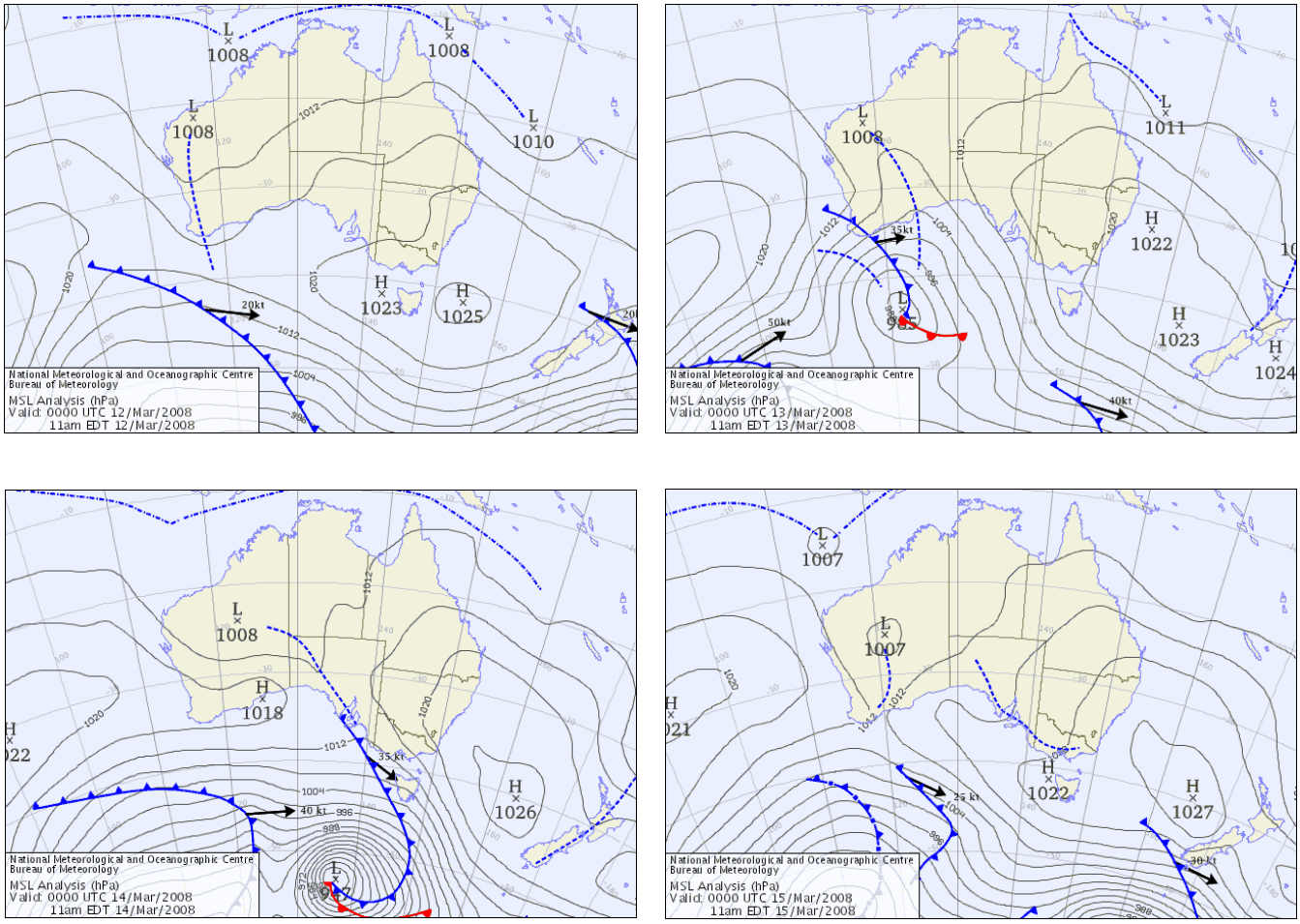
Bold indicates the hour of most intense rain.

Time (Local)	Topaz Alert	Bolinda Estate Alert	Copperlode Dam Alert
10am 4 Mar 2008	8	13	3
11am 4 Mar 2008	16	11	4
Midday 4 Mar 2008	24	15	5
1pm 4 Mar 2008	19	28	6
2pm 4 Mar 2008	15	17	2
3pm 4 Mar 2008	18	24	7
4pm 4 Mar 2008	15	23	**40**
5pm 4 Mar 2008	6	17	35
6pm 4 Mar 2008	12	17	34
7pm 4 Mar 2008	**34**	33	20
8pm 4 Mar 2008	5	26	16
9pm 4 Mar 2008	19	17	17
10pm 4 Mar 2008	11	16	15
11pm 4 Mar 2008	2	9	19
Midnight 5 Mar 2008	4	9	9
1am 5 Mar 2008	11	8	4
2am 5 Mar 2008	19	**36**	10
3am 5 Mar 2008	30	6	13
4am 5 Mar 2008	24	8	8
5am 5 Mar 2008	28	9	6
6am 5 Mar 2008	16	5	12
7am 5 Mar 2008	12	2	19
8am 5 Mar 2008	11	4	17
9am 5 Mar 2008	6	2	15

See http://www.bom.gov.au/hydro/flood/qld/brochures/river_maps.shtml for locations on network map.

The second heavy rainfall event for the month of March occurred between the 13th and 16th of March. A sequence of Mean Sea Level Pressure Charts from 10 am EST on the 12th of March to 10am EST on the 15th of March 2008 is shown in Figure 2.1.6. A high over the Tasman Sea extends a ridge along the Queensland east coast. This ridge strengthens during the 12th and 13th of March directing a moist onshore airflow to the North Tropical Coast.

Figure 2.1.6 Mean Sea Level Pressure Charts for Australia at 10 am EST from the 12th to the 15th of March 2008.



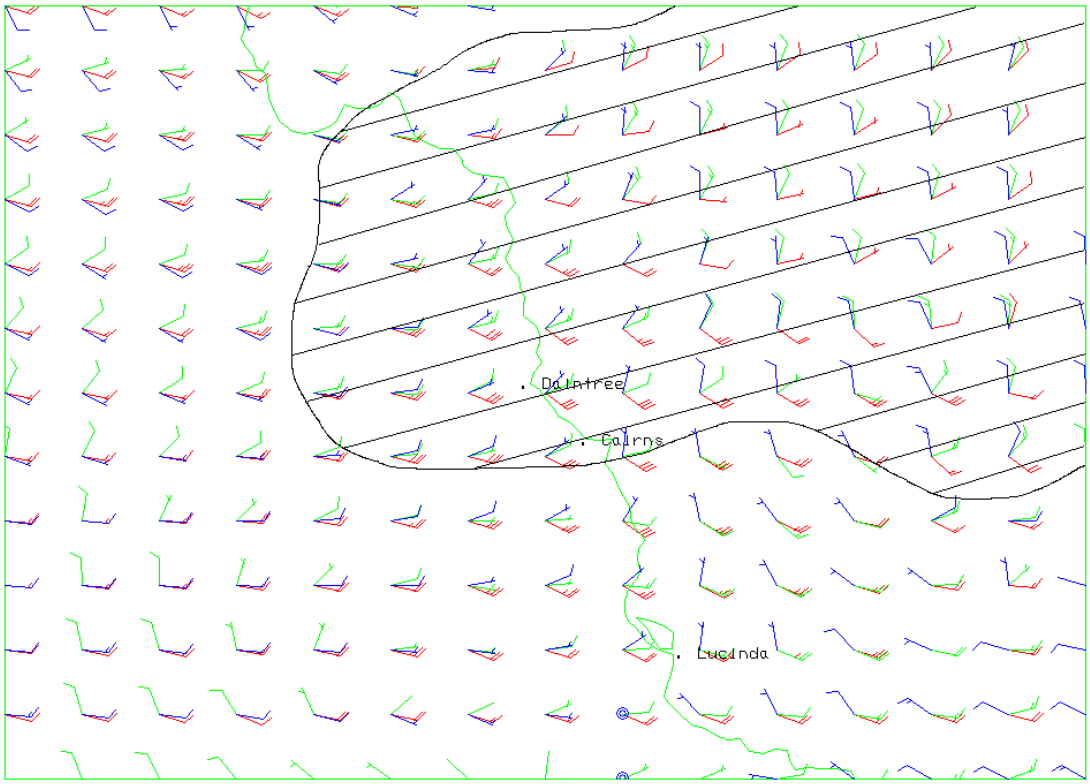
An analysis of the vertical wind profile from 1500 metres to 5500 metres is shown in Figure 2.1.7 and reveals a widespread area where winds turn anti-clockwise with height at 10am on the 12th of March, indicative of warm air advection and the ascent of air. Note however, that by 10pm on the 12th of March, most of this warm air advection had dissipated. However, it was over the period from 3pm to 11pm on the 12th of March that peak rainfall intensities were recorded.

Wind observations from Cairns Airport are shown in Table 2.1.8, and reveal a backing with height profile (winds turning anti-clockwise with height) from the surface to at least 3000 metres (no 4000m winds were recorded) at 9am on the 12th of March and from the surface to 2000 metres at 9pm on the 12th of March. So, although the vertical wind profile analysis in Figure 2.1.7 does not indicate a deep layer of warm air advection, wind observations reveal that it existed in the lower layers, thus providing some ascent of air in the lower levels.

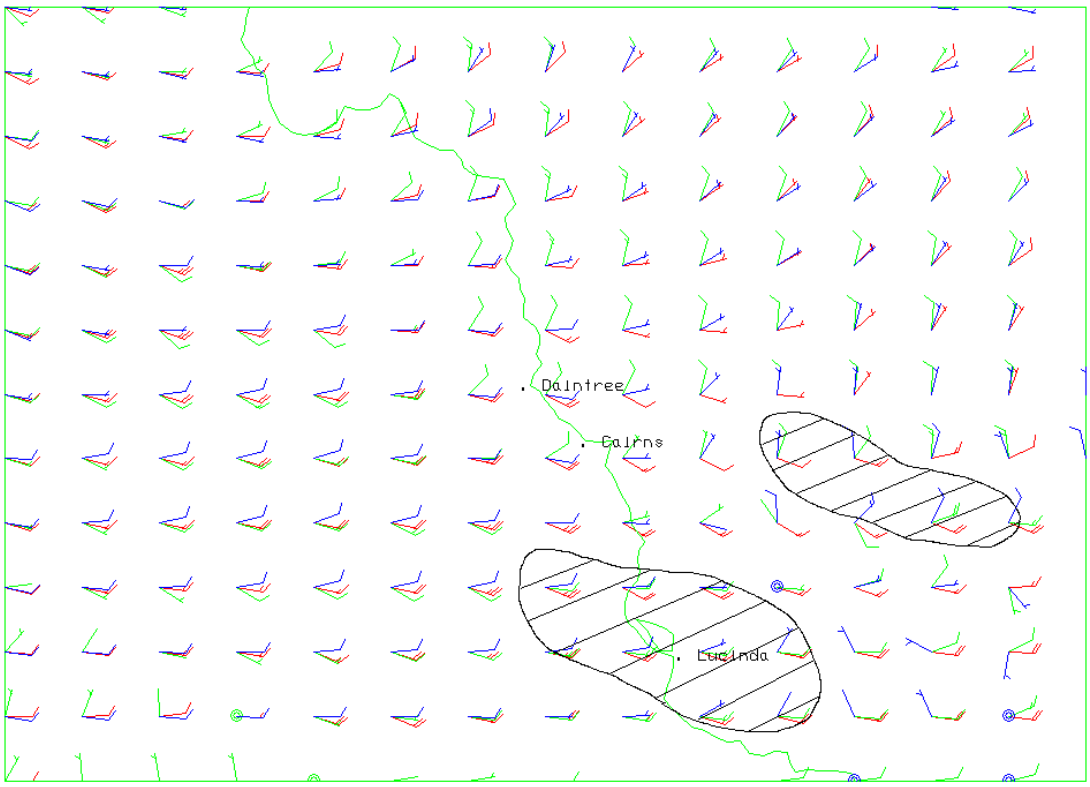
Analysis of the vertical wind profile at 10am on the 13th of March shows further dissipation of warm air advection, revealing only one small area to the far northern part of the North Tropical Coast. This is also evident in the Cairns Airport upper wind observations at 9am on the 13th of March, shown in Table 2.1.8, which indicate backing with height and weak warm air advection in the layer below 1500 metres only.

Figure 2.1.7 Analysis of the vertical wind profile over the North Tropical Coast from 10am on the 12th of March to 10am on the 13th March 2008.

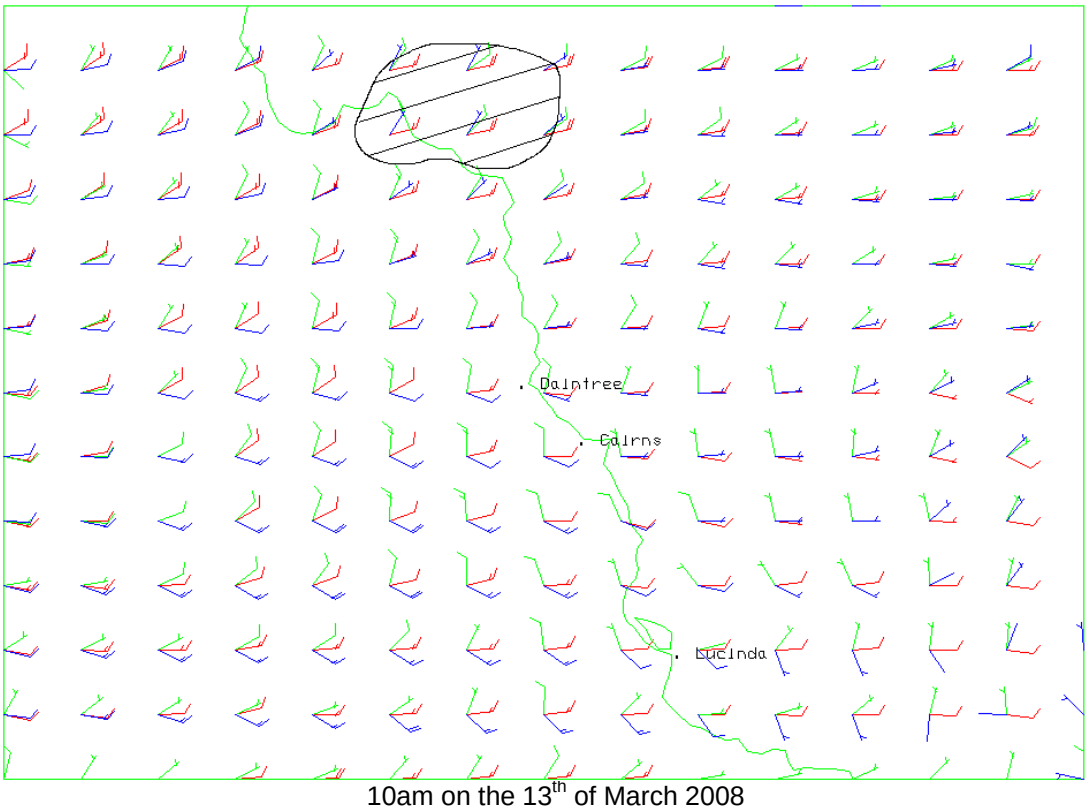
Winds at 1500 metres (red), 3000 metres (green) and 5500 metres (blue). Areas of Warm Air Advection are shaded.



10am on the 12th of March 2008



10pm on the 12th of March 2008



10am on the 13th of March 2008

Figure 2.1.8. Winds at Cairns Airport at 9am and 9pm on the 12th of March and 3am on the 13th of March 2008.

Height (Metres)	9am on the 12th (Direction/Speed Km/hr)	9pm on the 12th (Direction/Speed Km/hr)	3am on the 13th (Direction/Speed Km/hr)
5500	120/15	-	110/37
4000	-	-	35/37
3000	110/44	-	020/33
2000	120/55	130/44	025/26
1500	135/70	130/41	005/22
1000	145/55	145/26	65/18
500	150/55	160/26	80/15

Despite the weak backing with height vertical wind profile over the region, more than 150 millimetres of rain fell over areas of the Barron, Mulgrave-Russell and Johnstone River catchments in the 24-hour period to 9am on the 13th of March.

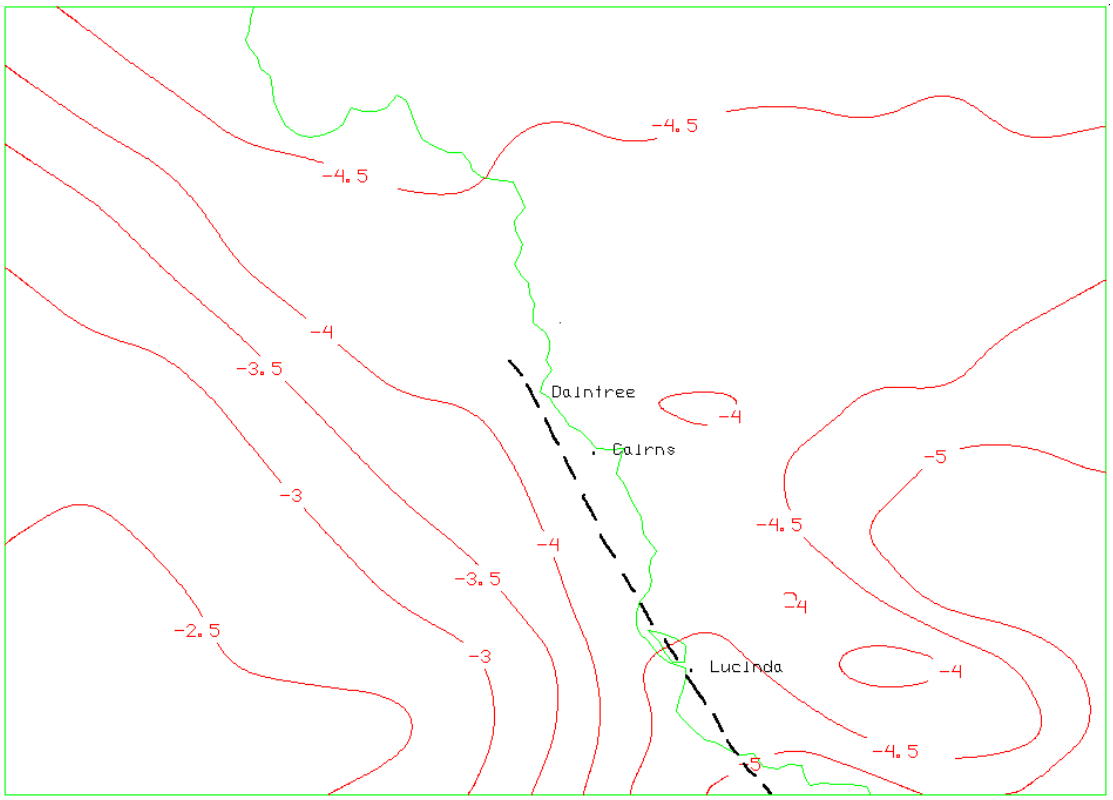
An analysis of atmospheric temperature in layers above the surface suggests that this can be attributed to the influence of cold air at 5500 metres. The temperature analysis at 5500 metres, from 10am on the 12th of March to 10pm on the 14th of March is shown in Figure 2.1.9 and reveals a thermal trough over the region for

most of the period. Note that temperatures generally cooled 1°C or more between 10am on the 12th of March and 10pm on the 12th March, coincident with the time of peak rainfall intensities. See Figure 2.1.10, which shows hourly rainfall data from Gordonvale Alert and The Boulders TM from 9am on the 12th to 9am on the 13th of March.

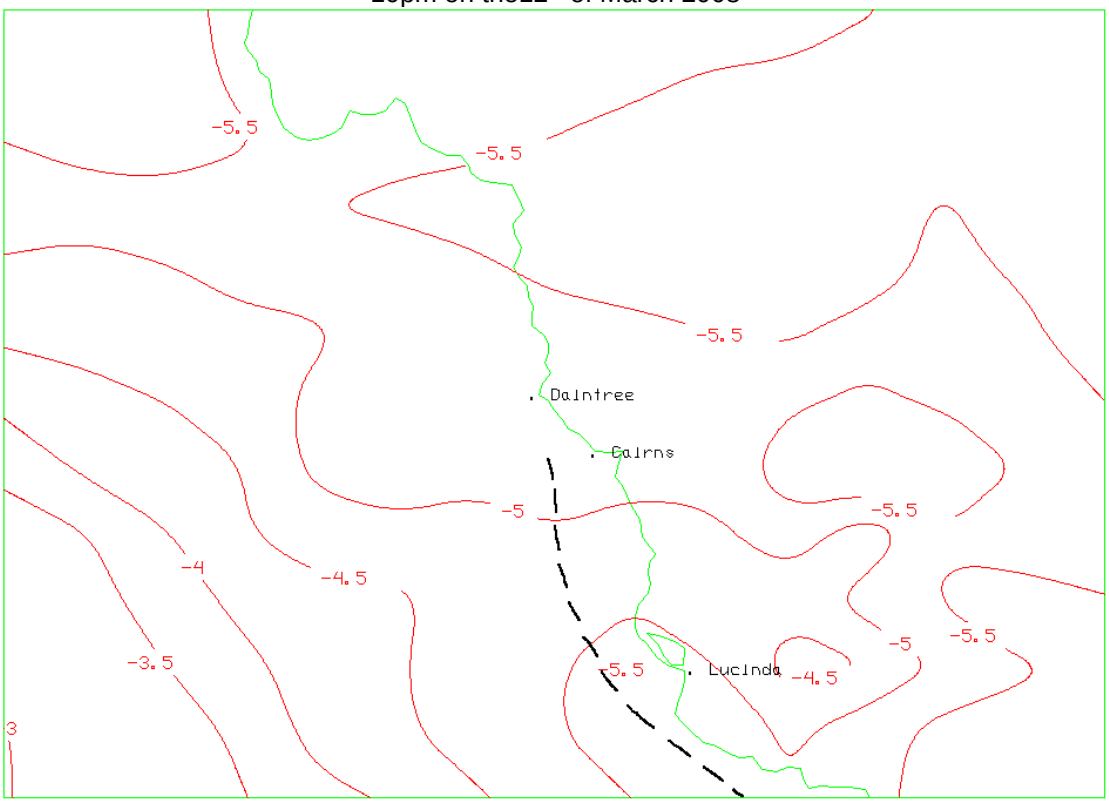
Note that the thermal trough remained over the region at 10am on the 14th of March and contributed to the heavy rainfall over the Johnstone River catchment between 9am and midday on the 14th of March. Warmer air then moved through during the day of the 14th. This is evident in the temperature analysis at 5500 metres at 10pm on the 14th of March, which shows increased temperatures of generally 0.5 to 1°C, across the region. Consequently, the heavy rain eased. See Section 3.4 for a complete summary of the North Tropical Coast 24-hour rainfall totals recorded at 9am from the 13th to the 16th of March 2008.

Figure 2.1.9 Analysis of temperatures at 5500 metres above the North Tropical Coast from 10am on the 12th of March to 10pm on the 14th of March 2008.

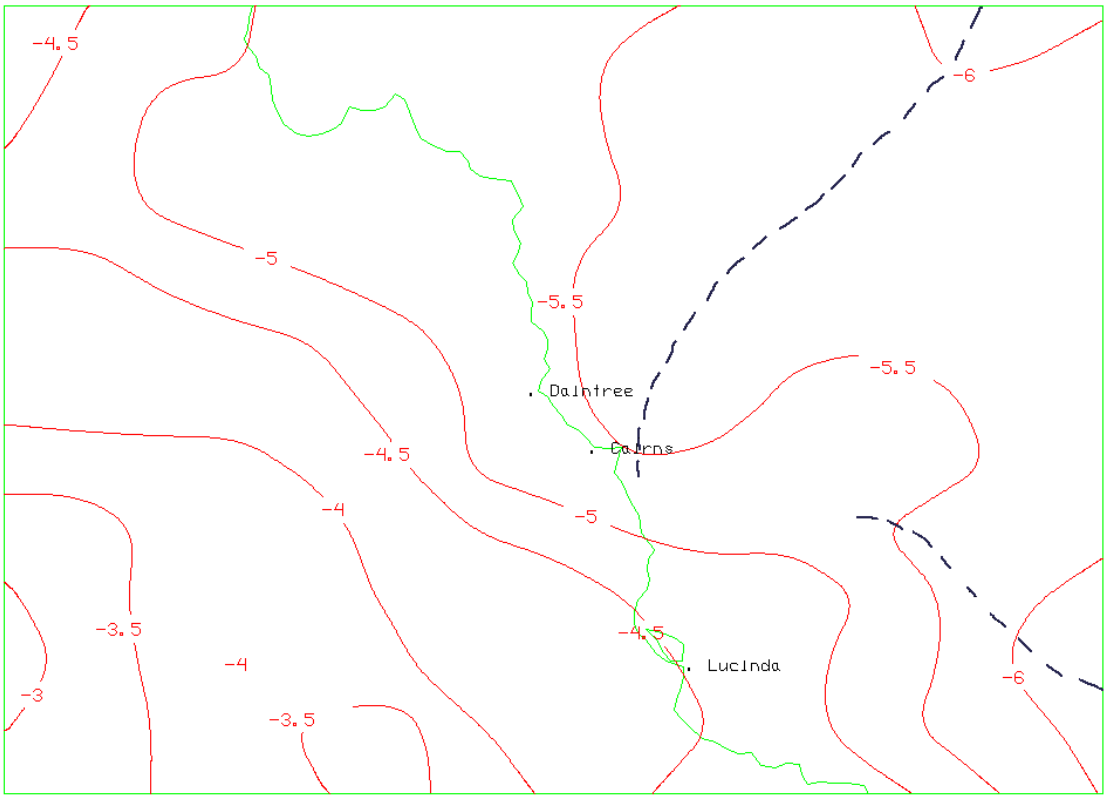
10am on the 12th of March 2008



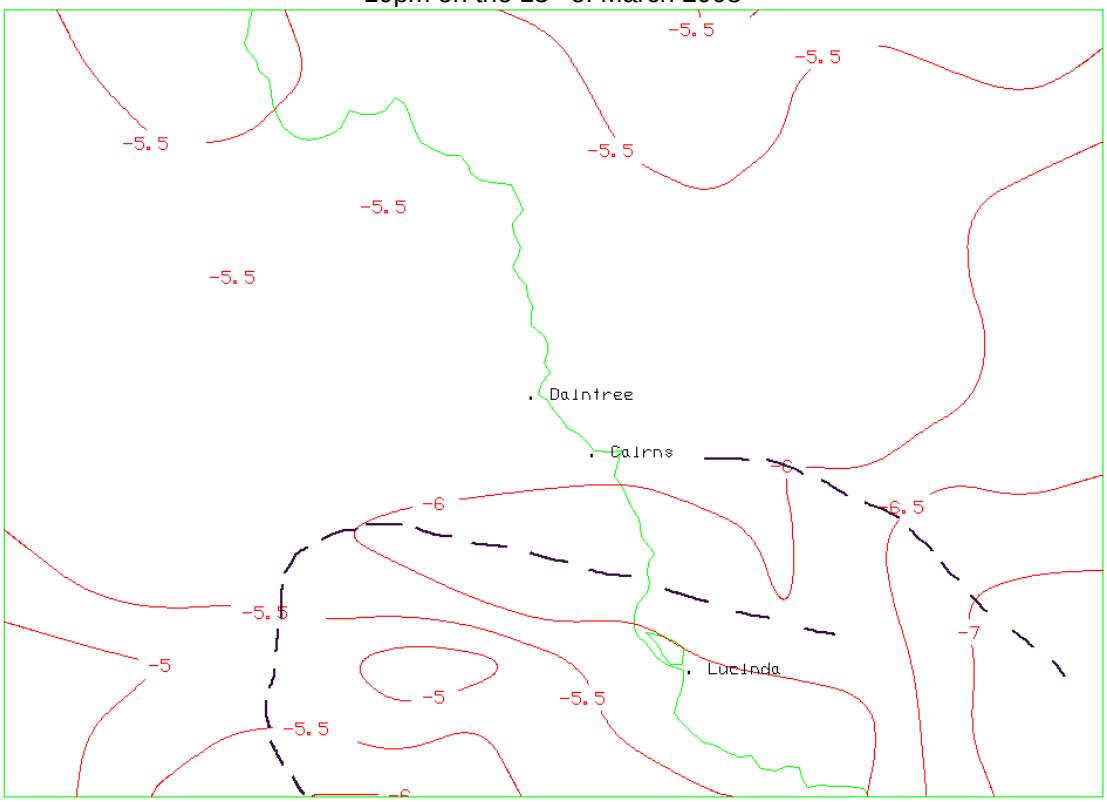
10pm on the12th of March 2008



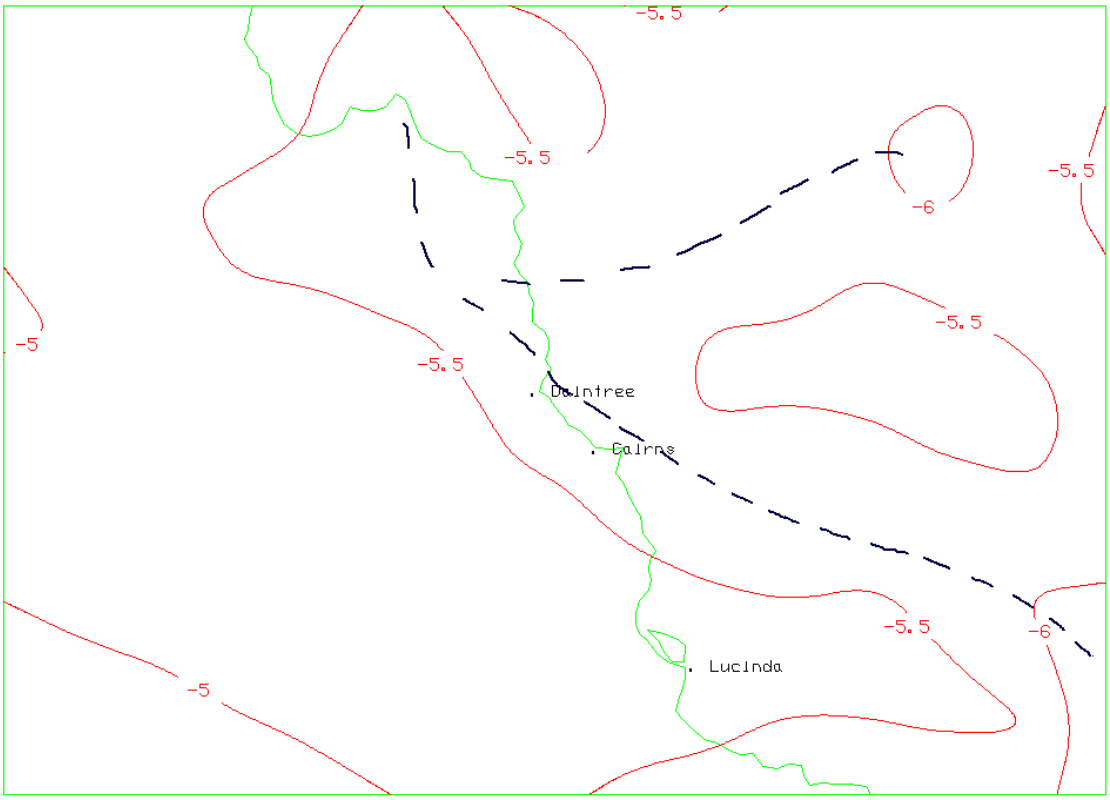
10am on the 13th of March 2008



10pm on the 13th of March 2008



10am on the 14th of March 2008



10pm on the 14th of March 2008

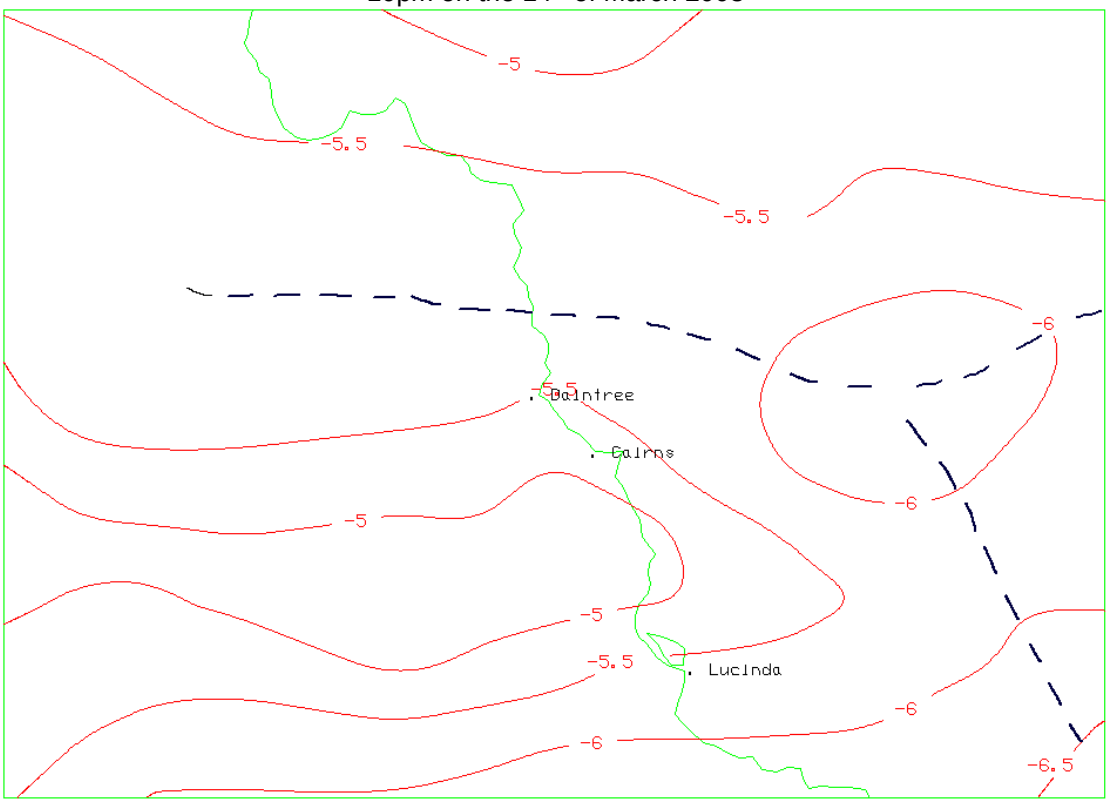


Table 2.1.10 Hourly Rainfall totals for Gordonvale Alert and The Boulders TM for the 24 hours ending at 9am on the 13th of March 2008.

Bold indicates the hour of most intense rain.

Time (Local)	Gordonvale Alert	The Boulders TM
10am 12 Mar 2008	0	1
11am 12 Mar 2008	0	1
Midday 12 Mar 2008	1	3
1pm 12 Mar 2008	1	2
2pm 12 Mar 2008	4	5
3pm 12 Mar 2008	17	2
4pm 12 Mar 2008	20	25
5pm 12 Mar 2008	8	14
6pm 12 Mar 2008	27	19
7pm 12 Mar 2008	**33**	**31**
8pm 12 Mar 2008	29	22
9pm 12 Mar 2008	15	17
10pm 12 Mar 2008	15	11
11pm 12 Mar 2008	8	11
Midnight 13 Mar 2008	6	21
1am 13 Mar 2008	9	3
2am 13 Mar 2008	0	7
3am 13 Mar 2008	1	5
4am 13 Mar 2008	1	2
5am 13 Mar 2008	1	1
6am 13 Mar 2008	3	0
7am 13 Mar 2008	6	0
8am 13 Mar 2008	0	0
9am 13 Mar 2008	0	0

See http://www.bom.gov.au/hydro/flood/qld/brochures/river_maps.shtml for locations on network map.

2.2 Radar Imagery Analysis

Volumetric radar data from the Cairns and Townsville radars was available to monitor and analyse this flood producing rainfall event.

Imagery from the Cairns and Townsville radars show extensive and persistent stream shower activity throughout the period from the 2nd to the 6th of March 2008. However, the more intense rainfall can be attributed to areas of rain with embedded thunderstorms. The first occurrence of this was on the 2nd of March, where at 5am a large area of rain and thunderstorms developed over the Johnstone and Tully River catchments. Falls averaged between 60 and 90 millimetres with larger falls of 154 millimetres at Murray Flats Alert on the Murray River and 146 millimetres at Euramo Alert on the Tully River.

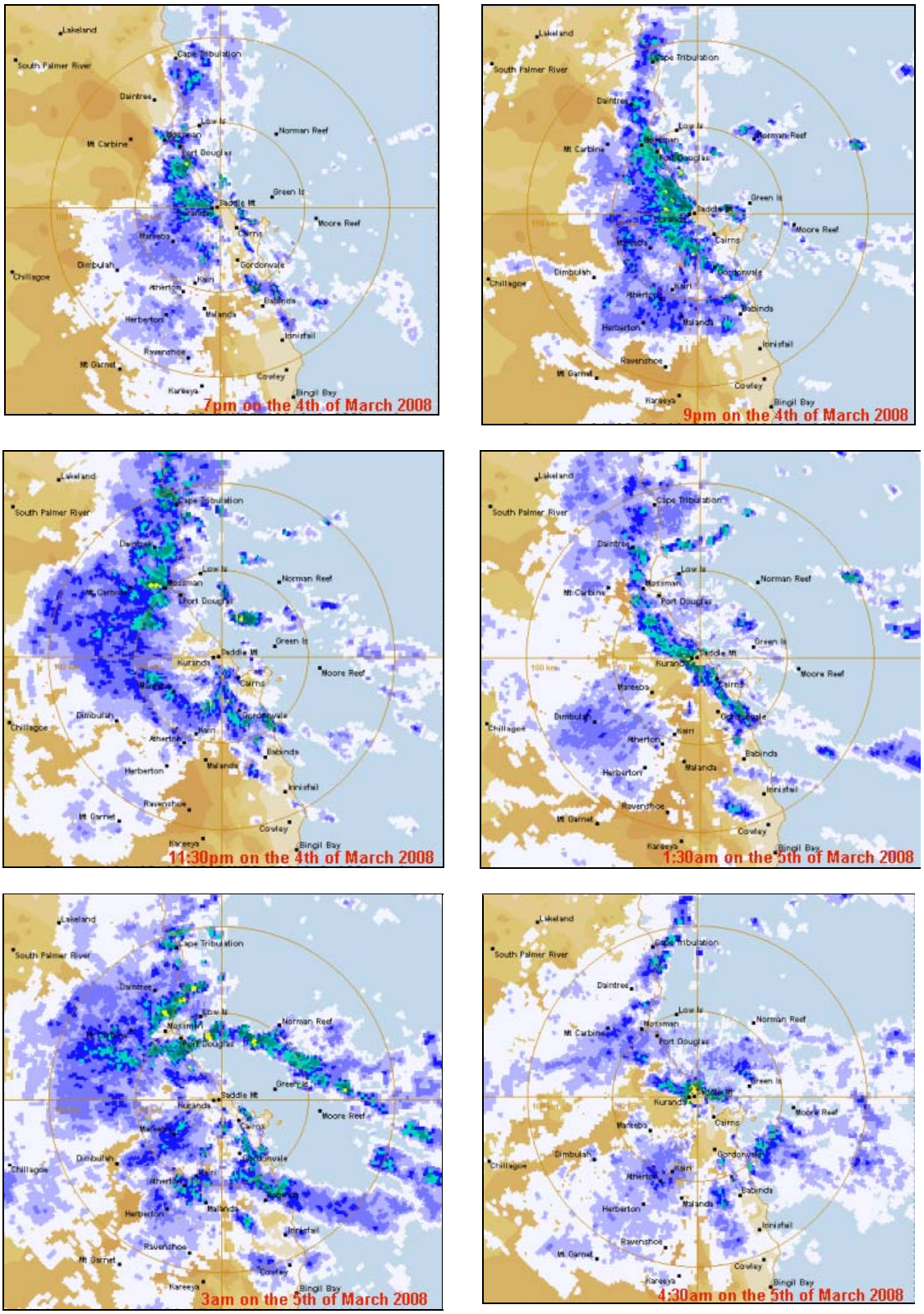
During the period from 9am on the 2nd of March to 9m on the 3rd of March, the largest falls occurred again over the Tully and Johnstone River Catchments extending northwards over the Mulgrave-Russell River Catchment. During this time, stream showers persisted along the length of the North Tropical Coast with a larger rain band northeast to southwest orientated, forming around 9am on the 2nd of March about the coast between Babinda and Innisfail and extending inland to around Tully. This rain band persisted for more than two hours before tracking northward along the coast to be positioned over Cairns at 2:30 pm. The line then slowly dissipated over the following three hours. Falls averaged around 100 millimetres in the 24-hour period to 9am on the 3rd of March, with the heaviest falls occurring at Bulgun Creek Alert, 221 millimetres and Menavale Alert, 174 millimetres most of which occurred between 9am and 2pm on the 2nd of March.

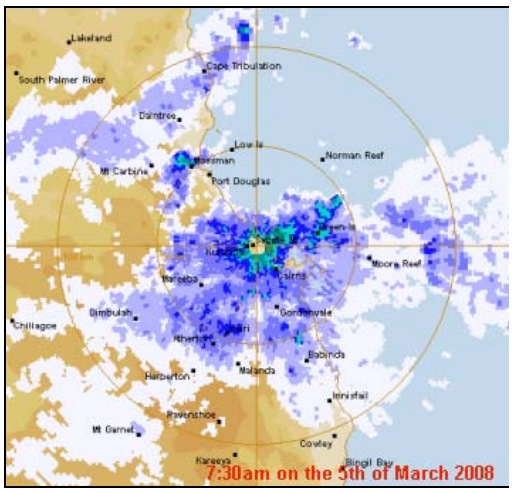
Heavy rainfall also occurred around Cooktown in the 24-hour period to 9am on the 3rd of March. This mostly resulted from heavier stream showers moving onto the coast from 1am on the 3rd of March. The showers spread to a broad area of rain and persisted over the region until around 7:30 am, producing an average of 100 millimetres of rain to the area. The highest fall was Cooktown Airport with 158mm in the 24 hours to 9am on the 3rd of March.

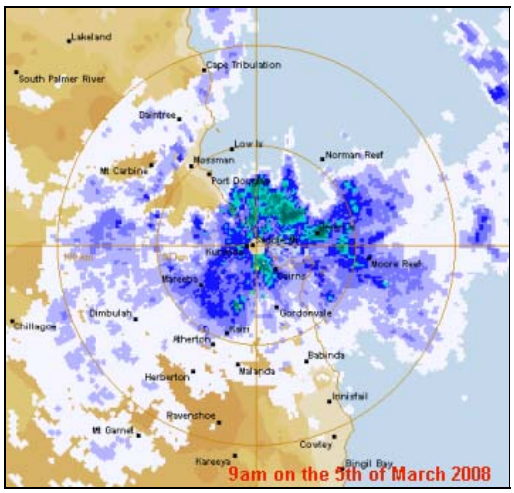
More heavy rain fell in the 24-hour period to 9am on the 4th of March with most catchments in the North Tropical Coast region receiving average falls greater than 80 millimetres. The heaviest falls occurred over the Mulgrave-Russell River Catchment where Mt Sophia recorded 208 millimetres in the 24 hours to 9am on the 4th of March. Radar imagery showed a large area of heavy showers developing off the coast east of Cairns at 10am on the 3rd of March. These showers tracked westward to impact on the coast chiefly south of Cairns around midday on the 3rd of March before forming a structured line that extended from Cairns to Tully by 4pm on the 3rd of March. The line tracked westward inland before moving northward to be north of Cairns by 9pm with the heavier rain then over the Daintree River Catchment. A second rainband developed along the coast near Innisfail by 2am on the 4th of March and tracked northward up the coast to be north of Cairns by 9am. These two bands of rain brought about the most intense rainfall for the 24-hour period and contributed significantly to the large rainfall totals for the region in the 24-hour period to 9am on the 4th of March.

Heaviest rainfalls for the event were recorded in the 24 hours to 9am on the 5th of March. The Mulgrave-Russell, Johnstone and Tully River catchments all received average falls greater than 140 millimetres, however further north over the Barron, Mossman and Daintree River catchments average falls were over 200 millimetres. The highest falls for the period included 355 millimetres at Bolinda Estate Alert, 365 millimetres at Topaz and 382 millimetres at O'Donoghue Road TM. An analysis of the radar imagery for the 4th and 5th of March reveals that an extensive rain band, with embedded thunderstorms developed across the region by 5pm on the 4th of March and persisted throughout the period, dissipating around midday on the 5th of March. See Figure 2.2.1 for a sequence of radar images from 7pm on the 4th of March to 9am on the 5th of March, which show the rainband that brought the heaviest rainfall to the North Tropical Coast for this event.

Figure 2.2.1. Radar Imagery of the extensive rainband that brought the heaviest falls to the North Tropical Coast on the 4th and 5th of March.







Heavy rainfall on the North Tropical Coast during the 13th and 15th of March was also attributed to extensive stream shower activity which at times spread into areas of rain with embedded thunderstorms. This is evident from imagery from the Cairns and Townsville radars. The first major rain band moved onto the coast between Cairns and Innisfail by midday on the 12th of March. By 2pm the band had extended north of Cairns and tracked westward to the hinterland. The line also extended southward to Cardwell and Ingham finally dissipating over the area by 5am on the 13th of March. This organised rain band produced average rainfalls greater than 90 millimetres over the Barron, Mulgrave-Russell and Johnstone River Catchments in the 24-hour period to 9am on the 13th of March, with heavier falls of 210 millimetres at Meringa and 204 millimetres at Gordonvale Alert.

Heavy falls were again recorded over the Johnstone and Tully River Catchments in the 24 hours to 9am on the 14th with average rainfall for the region in excess of 80 millimetres. Highest falls recorded include 227 millimetres at Bulgun Creek and 225 millimetres at Tully Sugar Mill. An inspection of radar imagery for this period identifies a structured band of heavier showers orientated west to east along a line from Tully to Innisfail by 4pm on the 13th of March. This line persisted in this area until 5am on the 14th of March before pushing northward through Cairns and dissipating. Stream showers continued over the area during the 15th and 16th of March before gradually clearing.

3 Hydrology

Heavy rainfall occurred on the North Tropical Coast of Queensland between the 2nd and 6th of March 2008 and again between the 13th and 16th of March 2008. This caused major flooding in the Barron and Mulgrave Rivers and moderate flooding in the Daintree, Russell, Johnstone, Tully and Murray Rivers.

The heaviest 5 day average rainfall totals from the 1st to the 6th of March occurred over the Tully, Mossman and Daintree River catchments recording over 400 millimetres, followed closely by the Barron, Mulgrave-Russell and Johnstone River catchments recording over 340 millimetres. The highest total recorded for the period was at Cape Tribulation where 719 millimetres of rain fell. Highest 24-hour rainfall totals recorded at 9am on the 5th of March include 382 millimetres at O'Donoghue Road TM and 365 millimetres at Topaz Alert.

There were no record floods during March on the North Tropical Coast but the Barron River flood was the largest flood since February 2000. The Mulgrave, Russell, Tully and Murray River floods were similar to previous years and were consistent with the seasonal flooding that occurs with an active monsoon.

This chapter provides a technical summary and analysis of the hydrology of the event.

Table 3.1 Peak Height Comparison to Records

Gauging Station	Mar 2008 Peak (metres)	Start of Record	Ranking	Highest Since	Highest on Record
Mulgrave River at Peets Bridge Alert	8.30	1974	22nd	Mar 2006 (2 years)	9.03m March 2006
Mulgrave River at Gordonvale Alert	15.49	1920	8th	Mar 2004 (4 years)	17.50m Mar 1967
Barron River at Mareeba	9.93	1921	5th	Feb 2000 (8 years)	12.40m Feb 2000
Barron River at Bilwon	12.43	1996	3rd	Feb 2000 (8 years)	15.00m Feb 2000
Clohesy River at Bolton Road	9.63	1997	3rd	Feb 2000 (8 years)	11.80m Feb 2000
Barron River at Myola	10.11	1911	8th	Feb 2000 (8 years)	15.37m Mar 1911
Barron River at Kamerunga	7.94	1967	7th	Feb 2000 (8 years)	9.80m Mar 1977
Tully River at Euramo	8.64	1967	26th	Feb 2007 (1 Year)	9.37m 1967

3.1 Rainfall Maps

Figure 3.1.1 Rainfall Map of North Queensland for the 7 Days to the 6th of March 2008

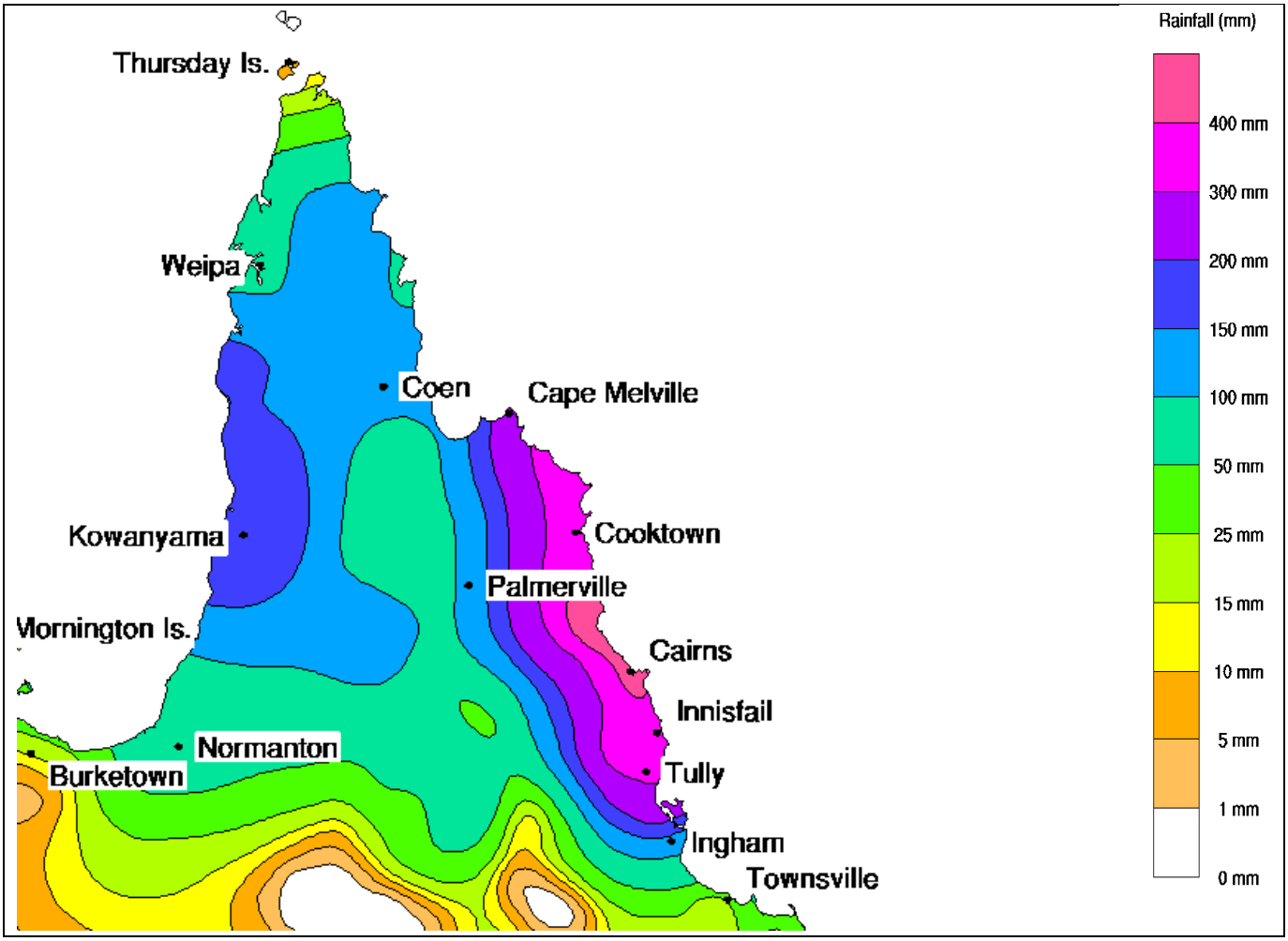


Figure 3.1.2 Rainfall Map for the Barron and Mulgrave Rivers for the 96 hours from 9am on 2nd of March to 9am on the 6th of March 2008.

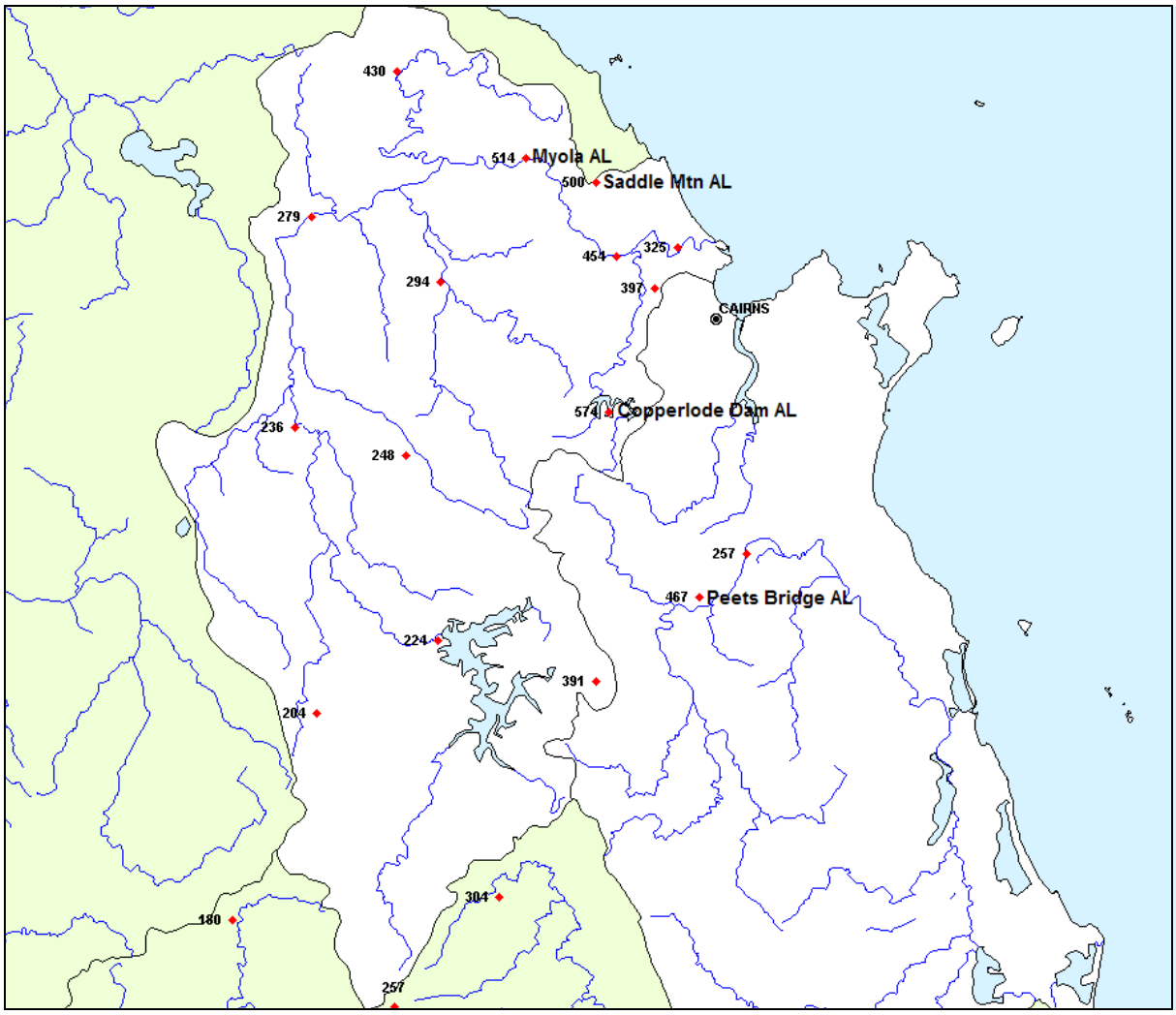


Figure 3.1.3 Rainfall Map for the Johnstone River for the 96 hours from 9am on 2nd of March to 9am on the 6th of March 2008.

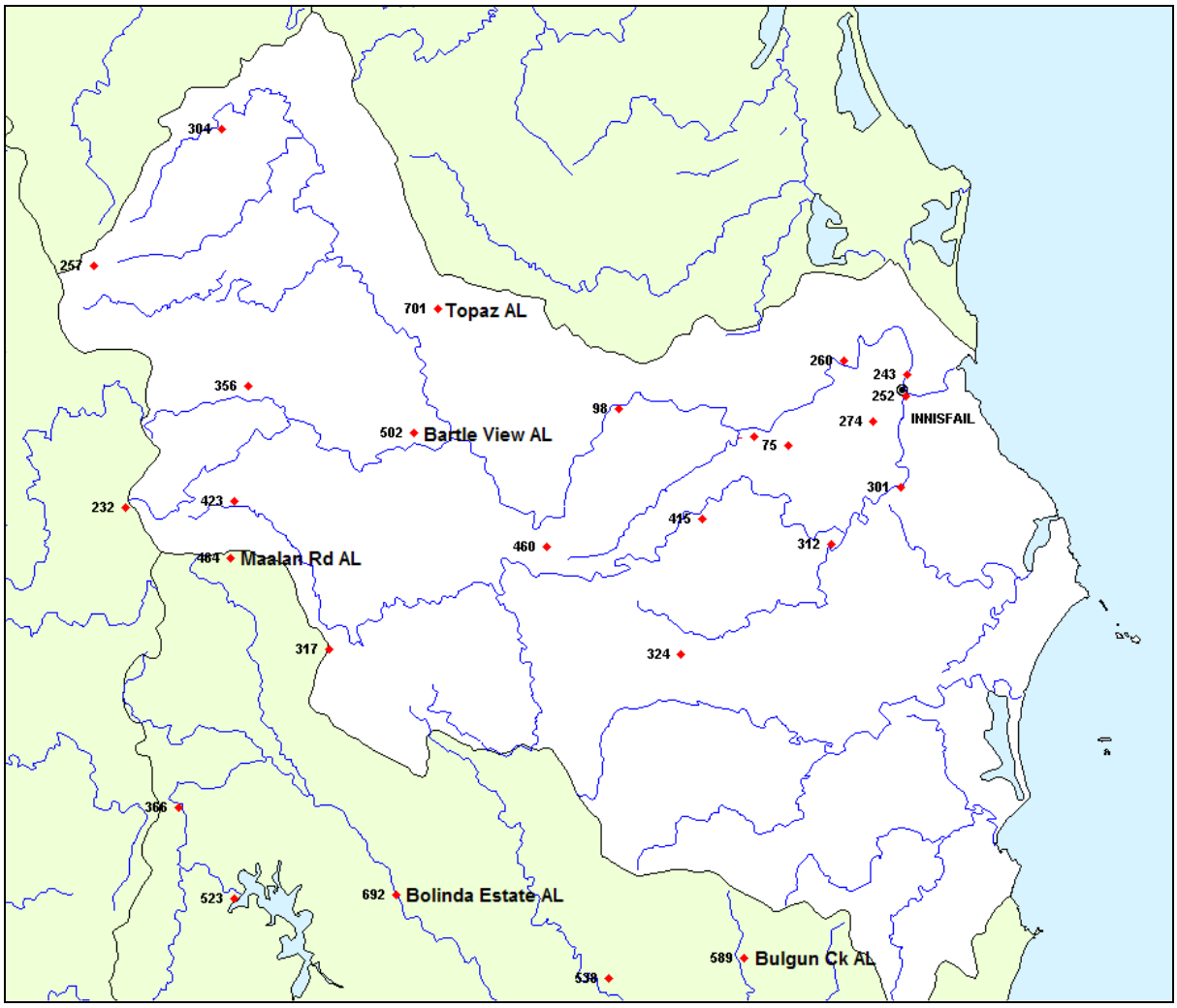


Figure 3.1.4. Rainfall Map for the Tully and Murray Rivers for the 96 hours from 9am on 2nd of March to 9am on the 6th of March 2008.

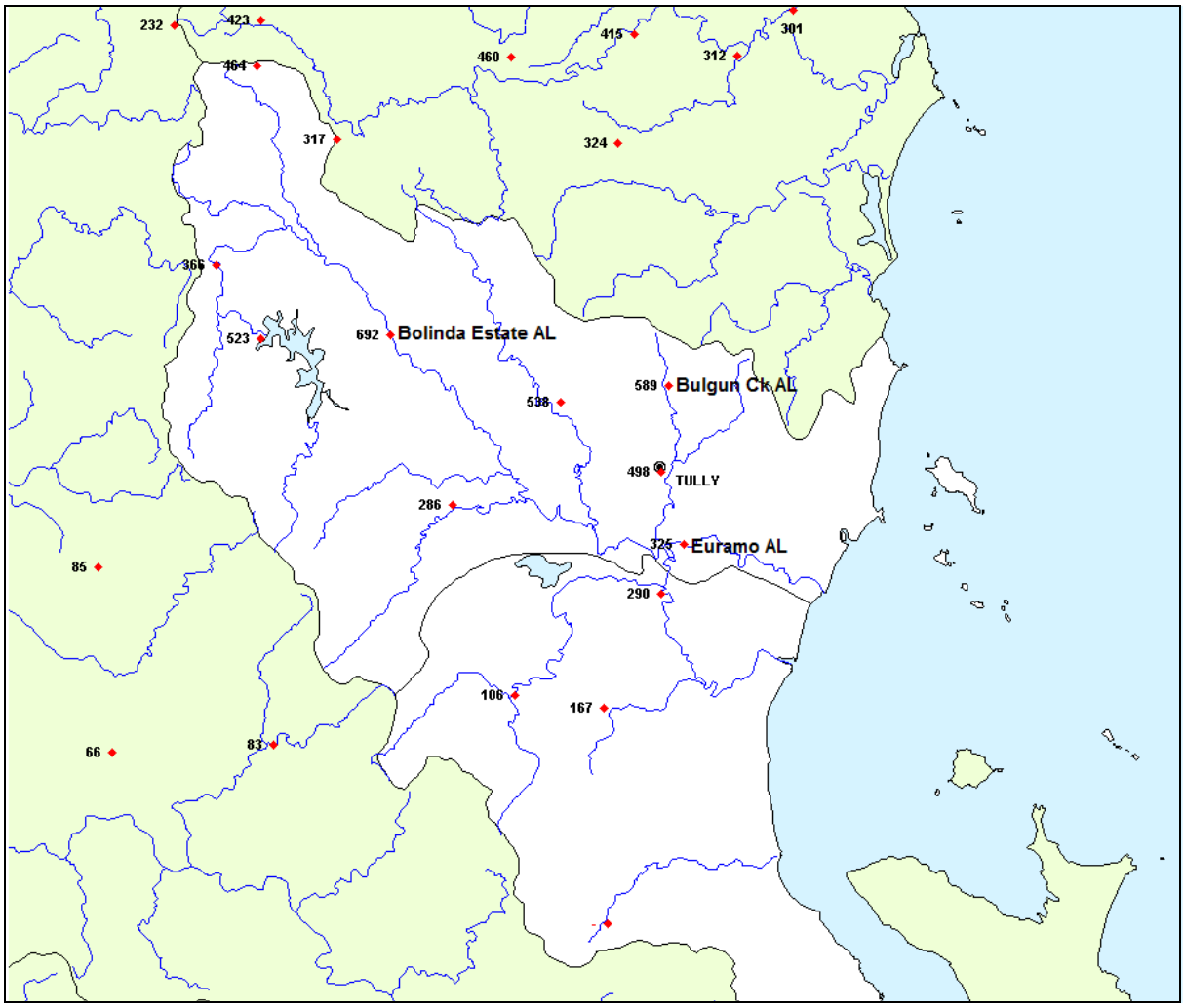


Figure 3.1.5 Rainfall Map for the Barron and Mulgrave Rivers from 9am on 13th of March to 9am on the 16th of March 2008.

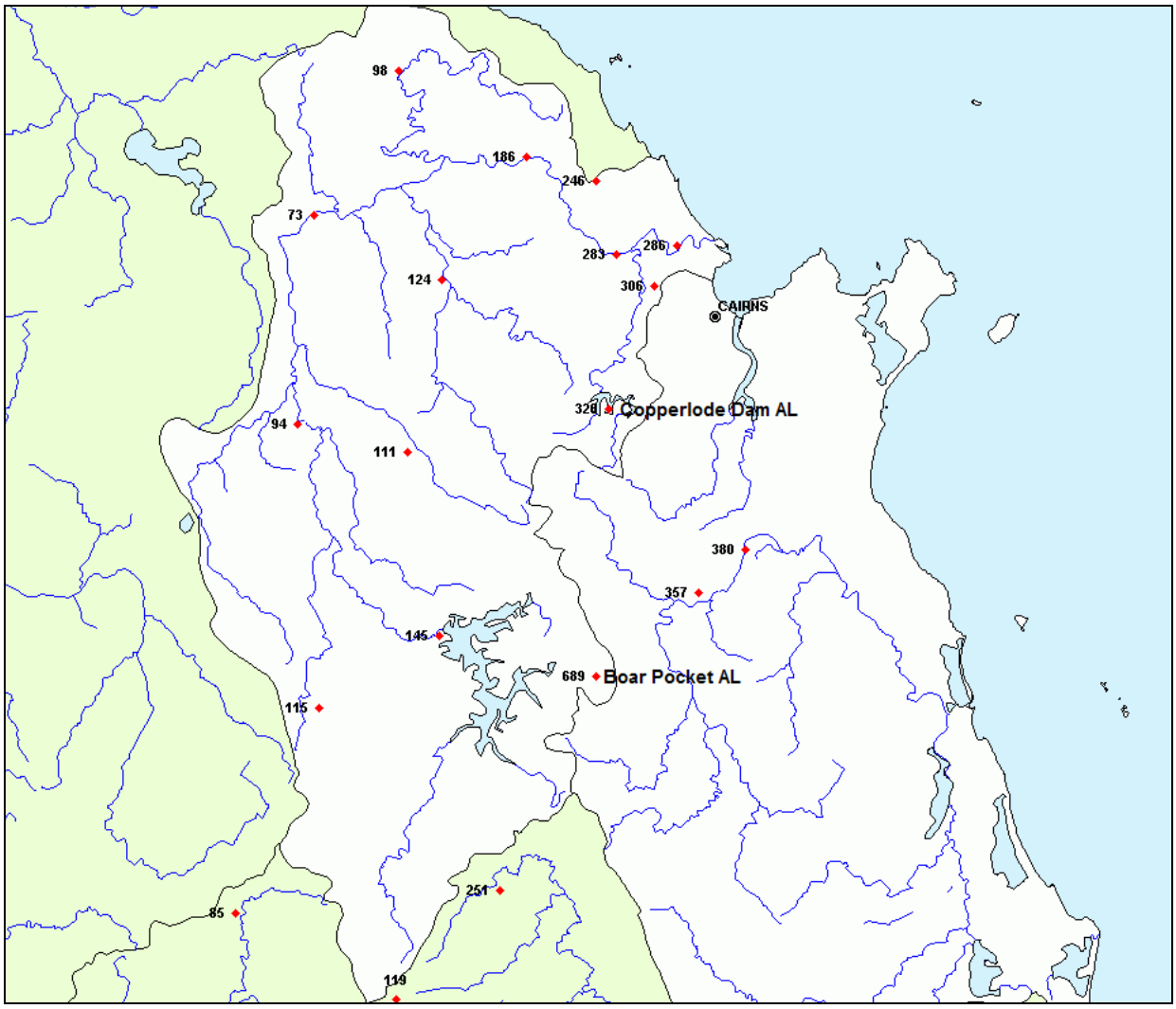


Figure 3.1.6 Rainfall Map for the Johnstone River from 9am on 13th of March to 9am on the 16th of March 2008.

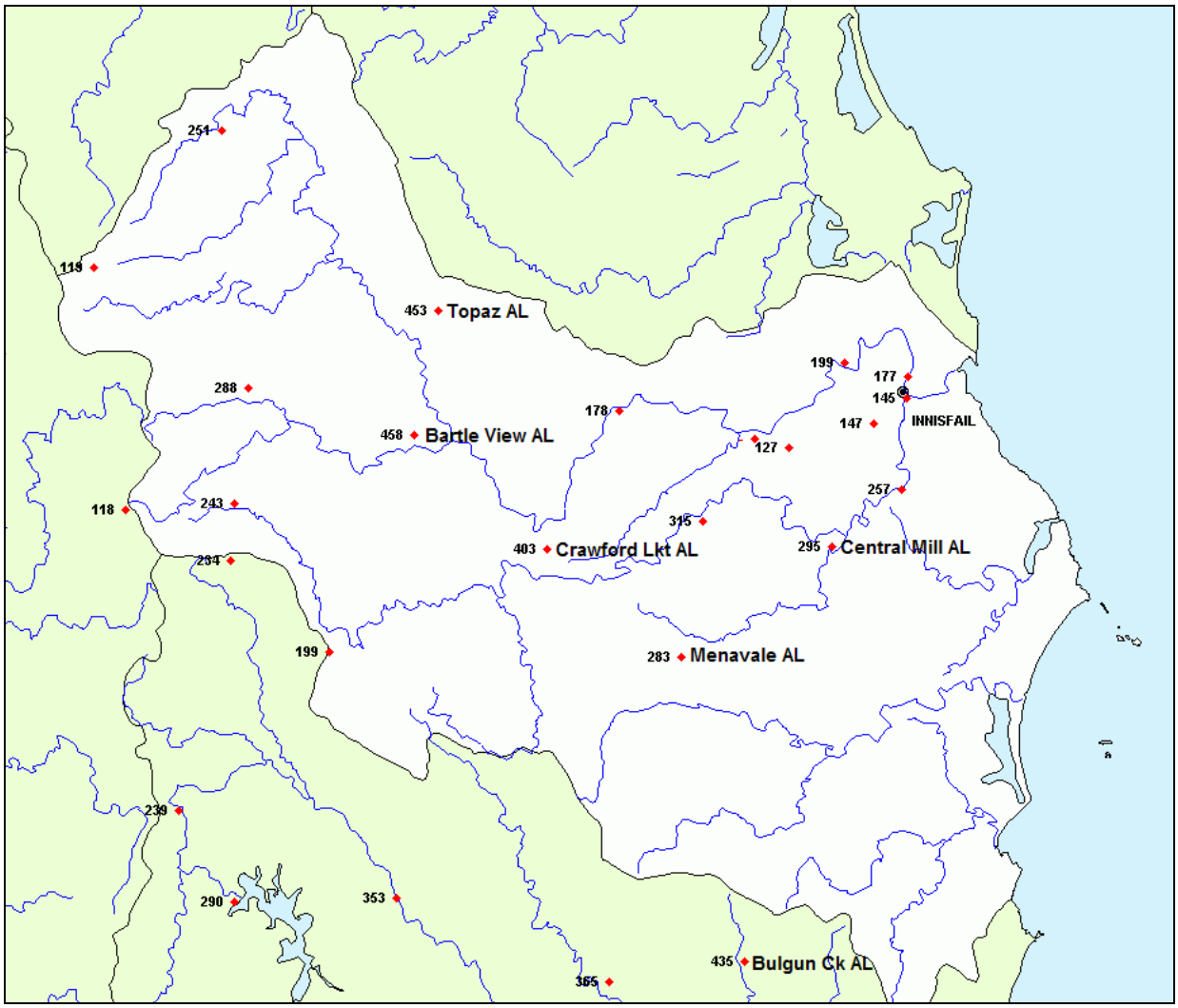


Figure 3.1.7 Rainfall Map for the Tully and Murray River from 9am on 13th of March to 9am on the 16th of March 2008.

3.2 Rainfall Intensity

The most intense rainfall during March occurred in the Barron, Mulgrave, Mossman, Tully and Johnstone River catchments. Some key stations from these catchments have been chosen for Intensity Frequency Duration (IFD) analysis and the results can be found in Figures 3.2.1 to 3.2.4.

Generally the observed rainfall intensities were not remarkable or rare. The most statistically significant observed rainfall intensities were only around the 10-20 year Average Recurrence Interval design rainfall intensities and usually for longer durations between 24 and 72 hours. The shorter duration intensities were less than the 5 year ARI design intensities but fell onto catchments that had been saturated over the previous few days and weeks.

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 3.2.1 Hourly Hyetographs for Copperlode Dam and Myola for 48 hours to 12pm on the 5th of Mach 2008.

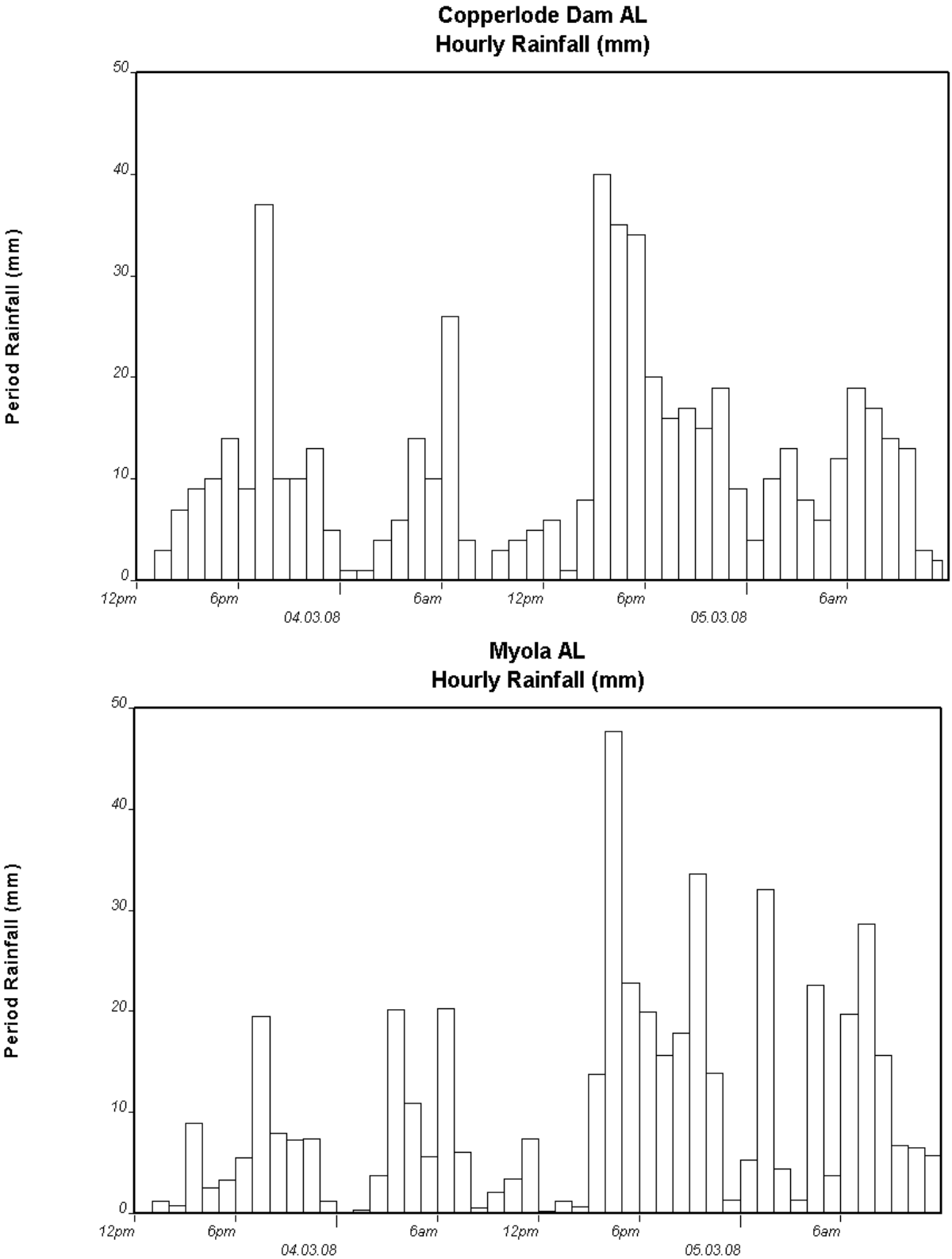


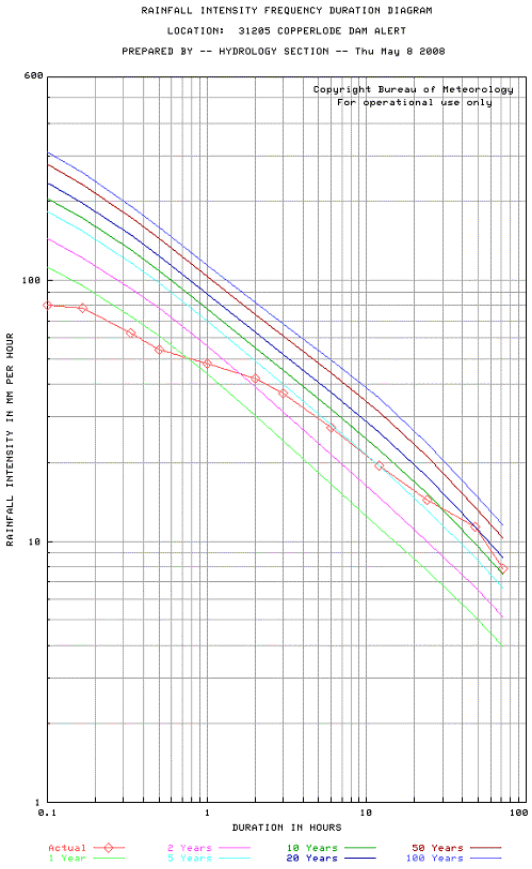
Figure 3.2.2 Intensity Frequency Duration Rainfall Analysis for Copperlode and Myola (Barron)

RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS

LOCATION: 31205 COPPERLODE DAM ALERT

Analysis of the rainfall for the 377 hours to Mon Mar 17 03:25:43 2008

Rain (mm)	Period Ending	ARI (years)
7	5 mins ending at 18:28:01 04/03/2008	< 1
8	6 mins ending at 15:39:09 04/03/2008	< 1
13	10 mins ending at 15:43:09 04/03/2008	< 1
21	20 mins ending at 15:51:49 04/03/2008	< 1
27	30 mins ending at 17:04:29 04/03/2008	< 1
48	60 mins ending at 17:34:13 04/03/2008	1-2
84	2 hours ending at 17:33:25 04/03/2008	2-5
111	3 hours ending at 17:54:45 04/03/2008	2-5
163	6 hours ending at 21:07:33 04/03/2008	2-5
234	12 hours ending at 02:54:45 05/03/2008	5
345	24 hours ending at 10:05:25 05/03/2008	5-10
547	48 hours ending at 12:35:17 05/03/2008	20
565	72 hours ending at 12:35:17 05/03/2008	10-20



RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS

LOCATION: 531040 MYOLA ALERT

Analysis of the rainfall for the 380 hours to Mon Mar 17 07:32:07 2008

Rain (mm)	Period Ending	ARI (years)
8	5 mins ending at 21:34:51 04/03/2008	< 1
10	6 mins ending at 21:35:07 04/03/2008	< 1
14	10 mins ending at 21:37:47 04/03/2008	< 1
25	20 mins ending at 21:47:43 04/03/2008	1-2
30	30 mins ending at 21:54:47 04/03/2008	1
48	60 mins ending at 17:04:55 04/03/2008	1-2
70	2 hours ending at 18:04:55 04/03/2008	1-2
94	3 hours ending at 18:38:23 04/03/2008	2-5
158	6 hours ending at 22:04:55 04/03/2008	2-5
228	12 hours ending at 03:05:23 05/03/2008	5-10
346	24 hours ending at 13:20:55 05/03/2008	5-10
493	48 hours ending at 13:20:55 05/03/2008	10-20
510	72 hours ending at 13:32:23 05/03/2008	5-10

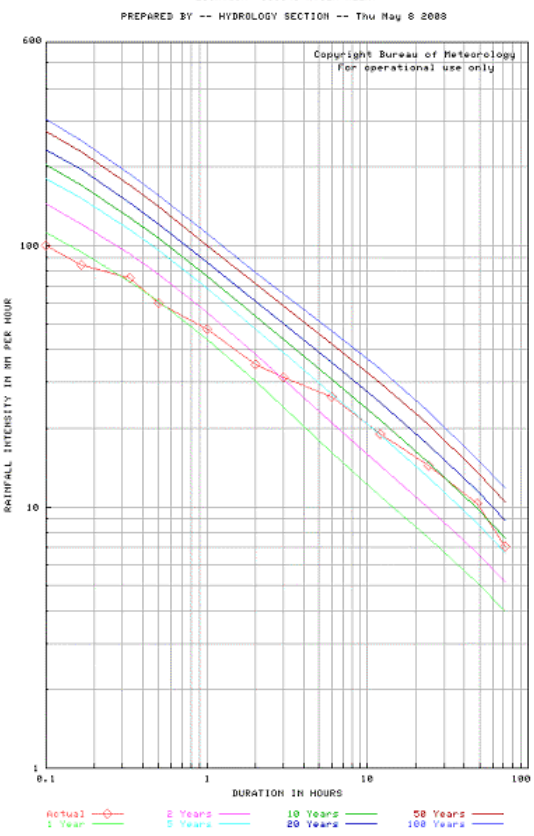


Figure 3.2.3 Hourly Hyetographs for Peets Bridge and Bolinda Estate for 48 hours to 12pm on the 5th of March 2008.

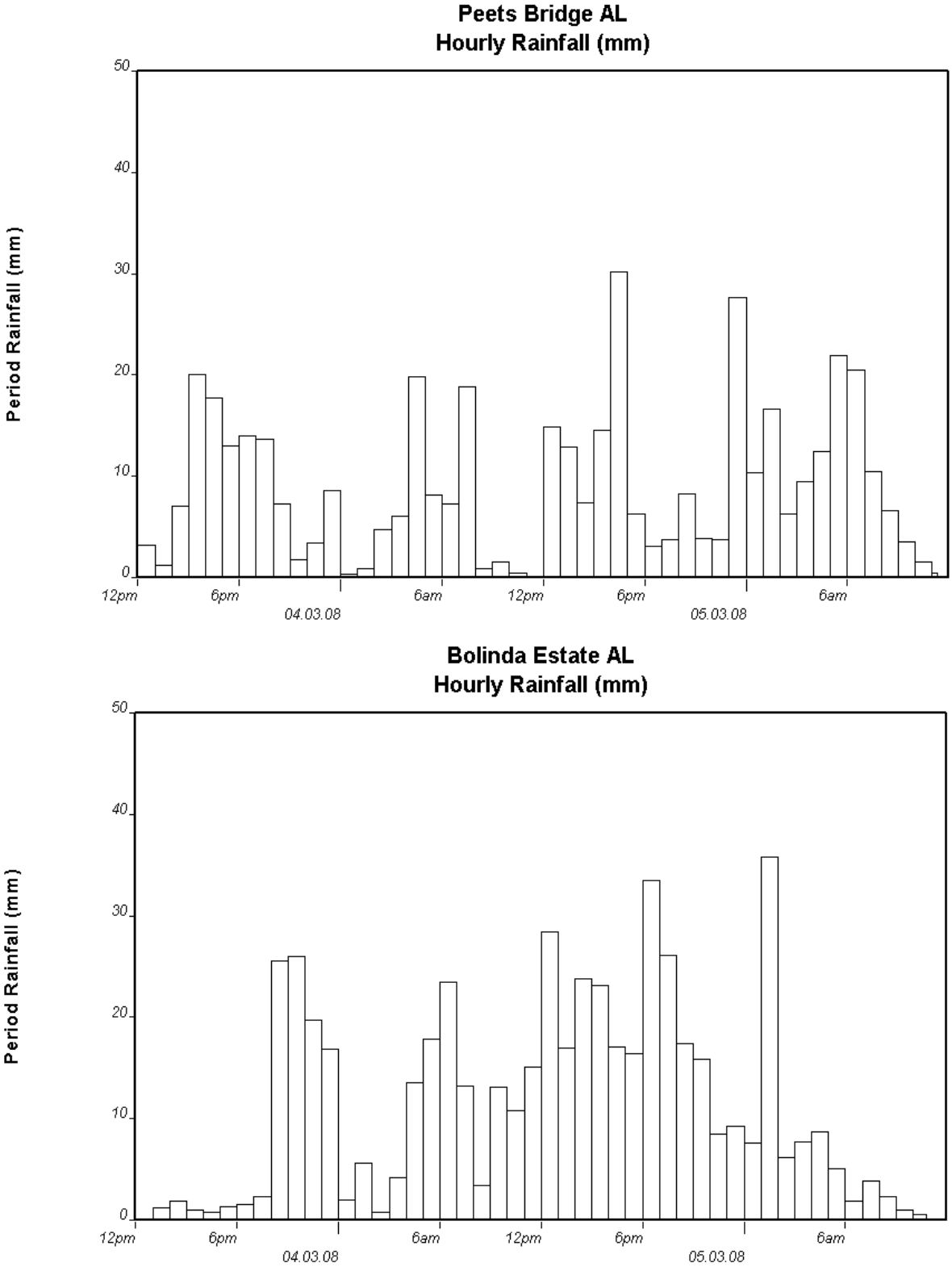


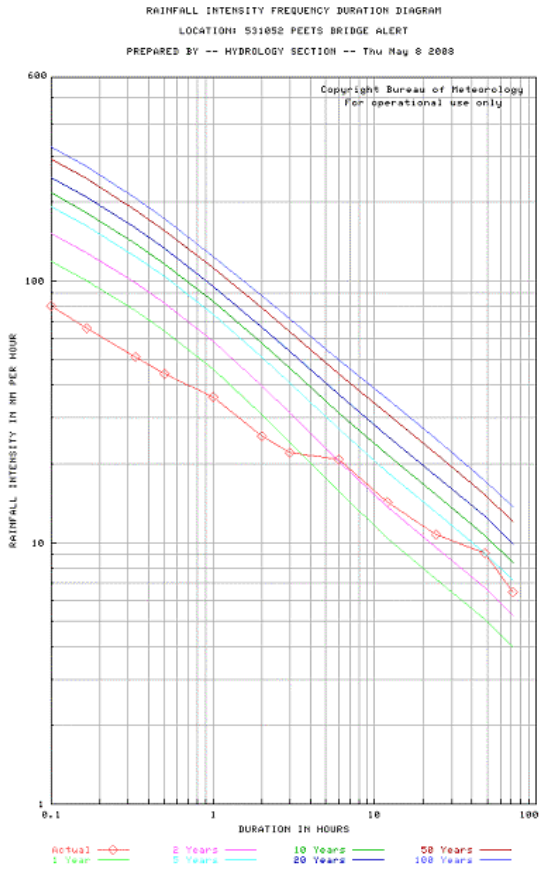
Figure 3.2.4 Intensity Frequency Duration Rainfall Analysis for Peets Bridge (Mulgrave) and Bolinda Estate (Tully)

RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS

LOCATION: 531052 PEETS BRIDGE ALERT

Analysis of the rainfall for the 380 hours to Mon Mar 17 06:31:20 2008

Rainfall (mm)	Period Ending	ARI (years)
7	5 mins ending at 12:58:09 04/03/2008	< 1
8	6 mins ending at 12:59:09 04/03/2008	< 1
11	10 mins ending at 12:58:23 04/03/2008	< 1
17	20 mins ending at 13:07:47 04/03/2008	< 1
22	30 mins ending at 13:17:47 04/03/2008	< 1
36	60 mins ending at 16:45:47 04/03/2008	< 1
51	2 hours ending at 16:42:28 12/03/2008	< 1
66	3 hours ending at 18:13:50 12/03/2008	< 1
125	6 hours ending at 21:09:24 12/03/2008	2-5
171	12 hours ending at 01:49:33 13/03/2008	2-5
258	24 hours ending at 12:21:09 05/03/2008	2-5
437	48 hours ending at 12:14:15 05/03/2008	5
463	72 hours ending at 12:21:09 05/03/2008	2-5

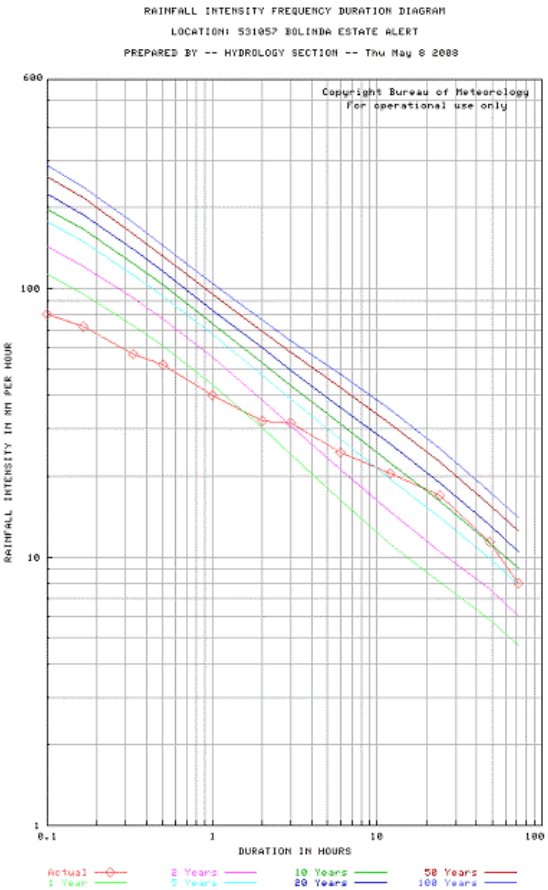


RAINFALL INTENSITY FREQUENCY DURATION ANALYSIS

LOCATION: 531057 BOLINDA ESTATE ALERT

Analysis of the rainfall for the 336 hours to Mon Mar 17 08:46:45 2008

Rainfall (mm)	Period Ending	ARI (years)
8	5 mins ending at 01:57:56 13/03/2008	< 1
8	6 mins ending at 01:57:56 13/03/2008	< 1
12	10 mins ending at 08:35:16 14/03/2008	< 1
19	20 mins ending at 08:45:16 14/03/2008	< 1
26	30 mins ending at 08:53:39 14/03/2008	< 1
40	60 mins ending at 19:26:42 04/03/2008	< 1
64	2 hours ending at 19:35:24 04/03/2008	1-2
95	3 hours ending at 02:29:38 13/03/2008	2-5
147	6 hours ending at 19:37:45 04/03/2008	2-5
245	12 hours ending at 21:56:44 04/03/2008	5-10
406	24 hours ending at 04:33:47 05/03/2008	10-20
545	48 hours ending at 08:46:51 05/03/2008	10-20
575	72 hours ending at 08:46:51 06/03/2008	5-10



3.3 Rainfall Totals - 2nd to 6th of March 2008.

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.

Table 3.3.1 Rainfall totals for the Daintree River for the 2nd to the 6th of March 2008.

Station Name	*24 Hour Rainfall to 9am on the*					Total
	2	3	4	5	6	
DAINTREE						
Daintree R						
Bairds TM		22	127	182	41	**372**
Daintree Village	21	30	106	266		**423**
Cape Tribulation	14	32	162	278	233	**719**
Whyanbeel Creek TM		11	95	340	37	**483**
Numerical Average	**18**	**24**	**123**	**267**	**104**	**499**
Maximum	**21**	**32**	**162**	**340**	**233**	**719**

Table 3.3.2 Rainfall totals for the Mossman River for the 2nd to the 6th of March 2008.

Station Name	*24 Hour Rainfall to 9am on the*					Total
	2	3	4	5	6	
MOSSMAN						
Mossman South	69	10	121	302	41	**543**
O'Donoghue Road TM	64	9	120	382	34	**609**
Numerical Average	**67**	**10**	**121**	**342**	**38**	**576**
Maximum	**69**	**10**	**121**	**382**	**41**	**609**

Table 3.3.3 Rainfall totals for the Barron River for the 2nd to the 6th of March 2008.

Station Name	*24 Hour Rainfall to 9am on the*					Total
	2	3	4	5	6	
BARRON						
Barron R						
Kairi	2	10	43	194	10	**259**
Bones Knob AL	0	6	36	149	13	**204**
Tinaroo Falls Dam	1	9	27	199	56	**292**
Tinaroo Dam TM	0	3	23	189	9	**224**
Tinaroo Dam AL	0	3	23	189	9	**224**
Walkamin DPI		3	27	186	12	**228**
Mareeba Airport	2	1	24	152	19	**198**
Mareeba TM	2	2	36	177	24	**241**
Mareeba AL	1	2	37	174	23	**237**
Emerald Crest AL	0	2	40	188	18	**248**
Bilwon AL	5	3	37	208	31	**284**
Bolton Road AL	8	5	64	204	21	**302**
Mona Mona AL	21	12	77	298	43	**451**
Myola AL	30	16	134	336	28	**544**
Kuranda	29	19	139	267	39	**493**

Kamerunga Bridge AL	39	13	134	282	25	**493**
Saddle Mountain AL	38	20	156	295	29	**538**
Copperlode Dam AL	17	17	194	336	27	**591**
Brinsmead AL	40	11	125	241	20	**437**
Cairns Airport	48	28	108	167	21	**372**
Cairns Airport AL	41	28	114	161	22	**366**
Cairns	48	29	141	113	15	**346**
Tamarind Gardens	22		201	264	14	**501**
Boar Pocket AL	205	20	84	274	13	**596**
Numerical Average	**26**	**11**	**84**	**218**	**23**	**361**
Maximum	**205**	**29**	**201**	**336**	**56**	**596**

Table 3.3.4 Rainfall totals for the Mulgrave - Russell Rivers for the 2nd to the 6th of March 2008.

Station Name	*24 Hour Rainfall to 9am on the*					Total
	2	3	4	5	6	
MULGRAVE - RUSSELL						
The Fisheries TM	3	19	70	210	7	**309**
Peets Bridge AL	27	26	179	253	9	**494**
Gordonvale AL (1)	24	32	144	81**		
Meringa			177	212	12	**401**
Simmonds Creek TM	25	27	155	130	9	**346**
Mt Sophia	65	58	208	209	24	**564**
The Boulders TM	99	106	119	140	27	**491**
Numerical Average	**41**	**45**	**150**	**176**	**13**	**434**
Maximum	**99**	**106**	**208**	**253**	**27**	**564**

1. The automatic rainfall gauge at Gordonvale stopped accumulating at around 10pm on 4/3/2008. The total for the 5th is a partial total and no data is available for the 6th.

Table 3.3.5 Rainfall totals for the Johnstone River for the 2nd to the 6th of March 2008.

Station Name	*24 Hour Rainfall to 9am on the*					Total
	2	3	4	5	6	
JOHNSTONE						
Malanda AL	5	36	69	187	12	**309**
McKell Road AL	5	26	44	177	10	**262**
Topaz AL	51	111	197	365	28	**752**
Bartle View AL	40	122	128	228	24	**542**
Greenhaven	33	74	81	262	11	**461**
Greenhaven AL	31	67	83	262	11	**454**
Millaa Millaa AL	27	55	68	216	17	**383**
Crawfords Lookout AL	69	155	89	197	19	**529**
Sutties Creek AL	23	74	65	172	6	**340**
Fisher Creek TM	83	128	84	123	7	**425**
Nerada AL	5	15	34	42	7	**103**
Tung Oil TM	79	124	3	93	10	**309**
McAvoy Bridge AL	94	124	64	66	6	**354**
Daradgee	74	127	57	53	14	**325**
Saltwater Creek AL	89	124	60	52	7	**332**
Menavale AL	89	174	68	50	32	**413**
Corsis AL	73	144	85	167	19	**488**
Central Mill TM	82	102	50	111	4	**349**
Central Mill AL	110	119	59	129	5	**422**
Mourilyan Mill AL	127	147	69	82	3	**428**
South Johnstone	112	126	53	112	9	**412**

Sweeney Creek U/S AL	100	141	75	53	5	**374**
Innisfail	87	133	72	56	6	**354**
Innisfail Wharf AL	83	128	72	49	3	**335**
Japoonvale TM	80	166	106	134	15	**501**
Numerical Average	**66**	**110**	**73**	**138**	**12**	**398**
Maximum	**127**	**174**	**197**	**365**	**32**	**752**

Table 3.3.6 Rainfall totals for the Tully River for the 2nd to the 6th of March 2008.

Station Name	*24 Hour Rainfall to 9am on the*					Total
	2	3	4	5	6	
TULLY						
Maalan Road AL	45	73	82	301	8	**509**
Tully Weir AL	21	76	81	183	26	**387**
Koombooloomba AL	43	103	114	269	37	**566**
Bolinda Estate AL	45	117	190	355	30	**737**
Jarra Creek AL	77	156	140	214	28	**615**
Davidson Creek AL	51	107	37	132	10	**337**
Tully AL	130	167	113	194	24	**628**
Tully Sugar Mill	136	165	115	197	25	**638**
Bulgun Creek AL	108	221	148	197	23	**697**
Euramo AL	146	107	96	108	14	**471**
Upper Murray AL	80	58	9	37	2	**186**
Upper Murray TM	64	54	9	34	2	**163**
Bilyana AL	109	88	27	46	6	**276**
Murray Flats AL	154	108	60	111	11	**444**
Cardwell	79	53	51	28	4	**215**
Numerical Average	**86**	**110**	**85**	**160**	**17**	**458**
Maximum	**154**	**221**	**190**	**355**	**37**	**737**

Table 3.3.7 Rainfall totals for the Herbert River for the 2nd to the 6th of March 2008.

Station Name	*24 Hour Rainfall to 9am on the*					Total
	2	3	4	5	6	
HERBERT						
Herbert R u/s Glen Eagle						
Herberton AL	0	8	20	145	7	**180**
Silver Valley TM	0	23	5	118	4	**150**
Ravenshoe AL	8	33	32	163	4	**240**
Mt Garnet	0	7	8	86	3	**104**
Herbert R d/s Glen Eagle						
Nash's Crossing AL	28	18	28	76	9	**159**
Wallaman AL	26	22	20	66	14	**148**
Zattas AL	37	15	24	64	9	**149**
Abergowrie AL	35	14	20	61	5	**135**
Elphinstone Pocket	65	16	26	54	5	**166**
Abergowrie Bridge AL	51	8	20	40	5	**124**
Hawkins Creek	39	16	23	85	16	**179**
Ingham	37	10	7	55	7	**116**
Gairloch	39	12	21	68	11	**151**
Gairloch AL	33	11	18	59	12	**133**
Cardwell Range	33	1	38	77	7	**156**
Halifax	19	5	27	39	7	**97**
Allingham Forrest Drive	25	5	5	40	5	**80**
Numerical Average	**28**	**13**	**20**	**76**	**8**	**145**
Maximum	**65**	**33**	**38**	**163**	**16**	**240**

3.4 Rainfall Totals - 13th to 16th of March 2008.

Table 3.4.1 Rainfall Totals for the Barron River for the 13th to the 16th of March.

Station Name	*24 Hour Rainfall to 9am on the*				Total
	13	14	15	16	
BARRON					
Barron R					
Atherton	138	8	41	6	**193**
Kairi	136	21	73	15	**245**
Tinaroo Falls Dam	110	7	58	21	**196**
Myola AL	108	2	39	37	**186**
Kuranda	144	49	56		**249**
Kamerunga Bridge AL	142	9	89	43	**283**
Saddle Mountain AL	149	2	47	48	**246**
Copperlode Dam AL	140	9	142	29	**320**
Brinsmead AL	147	15	92	52	**306**
Cairns Airport	168	7	52	58	**285**
Cairns Airport AL	181	5	48	52	**286**
Cairns	169	12	77	41	**299**
Tamarind Gardens	197	27	136	27	**387**
Numerical Average	**148**	**13**	**73**	**36**	**268**
Maximum	**197**	**49**	**142**	**58**	**387**

Table 3.4.2 Rainfall Totals for the Mulgrave-Russell Rivers for the 13th to the 16th of March.

Station Name	*24 Hour Rainfall to 9am on the*				Total
	13	14	15	16	
MULGRAVE - RUSSELL					
Mulgrave -Russell R					
The Fisheries TM	157	10	18	31	**216**
Peets Bridge AL	189	12	123	33	**357**
Gordonvale AL	204	16	128	32	**380**
Simmonds Creek TM	194	12	30		**236**
Mt Sophia	185	100	54		**339**
Bucklands TM	94	104	50		**248**
Numerical Average	**171**	**42**	**67**	**32**	**296**
Maximum	**204**	**104**	**128**	**33**	**380**

Table 3.4.3 Rainfall Totals for the Johnstone River for the 13th to the 16th of March.

Station Name	*24 Hour Rainfall to 9am on the*				Total
	13	14	15	16	
JOHNSTONE					
Johnstone R					
Malanda AL	151	16	75	9	**251**
Topaz AL	166	84	203		**453**
Bartle View AL	154	57	231	16	**458**
Greenhaven	94	47	104	13	**258**
Greenhaven AL	90	43	99	11	**243**
Millaa Millaa AL	96	31	143	18	**288**
Crawfords Lookout AL	134	104	153	12	**403**
Sutties Creek AL	76	52	53	18	**199**
Fisher Creek TM	99	86	84		**269**
Nerada AL	89	22	57	10	**178**

Tung Oil TM	68	72	37	33	**210**
McAvoy Bridge AL	78	58	45	18	**199**
Daradgee	96	75	70	10	**251**
Saltwater Creek AL	61	68	36	12	**177**
Menavale AL	66	81	119	17	**283**
Corsis AL	112	106	76	21	**315**
Central Mill TM	79	139	29	10	**257**
Central Mill AL	90	145	50	10	**295**
Mourilyan Mill AL	52	142	46	17	**257**
South Johnstone	76	155	43	11	**285**
Sweeney Creek U/S AL	43	63	26	15	**147**
Marco Street AL	65	23	26	13	**127**
Innisfail	43	74	26	19	**162**
Innisfail Wharf AL	37	67	25	16	**145**
Japoonvale TM	194	217	62	84	**557**
Numerical Average	**92**	**81**	**77**	**18**	**267**
Maximum	**194**	**217**	**231**	**84**	**557**

Table 3.4.4 Rainfall Totals for the Tully River for the 13th to the 16th of March.

Station Name	*24 Hour Rainfall to 9am on the*				Total
	13	14	15	16	
TULLY					
Tully R					
Maalan Road AL	99	52	66	17	**234**
Tully Weir AL	94	47	77	21	**239**
Koombooloomba AL	88	79	105	18	**290**
Bolinda Estate AL	142	113	74	24	**353**
Jarra Creek AL	154	178	26	7	**365**
Davidson Creek AL	21	175	31	2	**229**
Tully AL	34	222	17	17	**290**
Tully Sugar Mill	34	225	19	18	**296**
Bulgun Creek AL	149	227	43	16	**435**
Upper Murray AL	14	114	53	1	**182**
Upper Murray TM	13	107	44	41	**205**
Bilyana AL	25	94	63	1	**183**
Murray Flats AL	15	139	11	3	**168**
Numerical Average	**68**	**136**	**48**	**14**	**267**
Maximum	**154**	**227**	**105**	**41**	**435**

3.4 Peak Heights

Table 3.4.1 Peak Flood Heights between the 1st and 20th of March 2008.

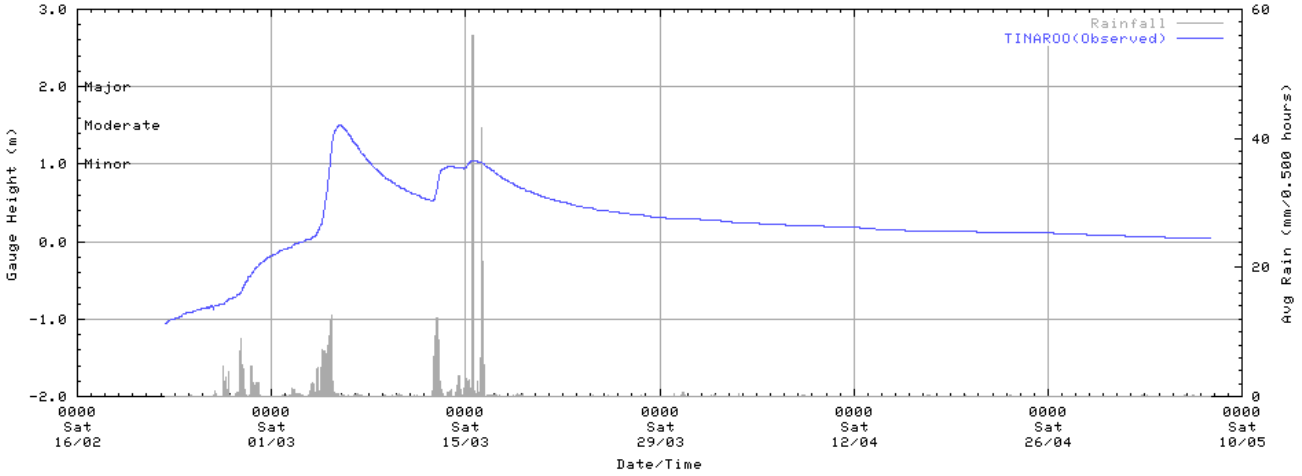
Station No.	Station Name	Date	Height (metres)	Flood Class
HERBERT				
Herbert R d/s Glen Eagle				
32091	ELPHINSTONE PKT	7/03/2008 15:00	7.8	Minor
TULLY				
Tully R				
531057	BOLINDA ESTATE ALERT	4/03/2008 17:13	4.7	Minor
531057	BOLINDA ESTATE ALERT	13/03/2008 4:40	3.2	Minor
531057	BOLINDA ESTATE ALERT	14/03/2008 10:17	3	Minor
32115	EURAMO	3/03/2008 17:00	7.65	Minor
32115	EURAMO	5/03/2008 18:40	8.75	Moderate
32115	EURAMO	15/03/2008 7:00	8.2	Moderate
532059	EURAMO ALERT	3/03/2008 9:13	7.34	Minor
532059	EURAMO ALERT	5/03/2008 19:00	8.64	Moderate
532059	EURAMO ALERT	14/03/2008 22:54	8.09	Moderate
32167	EURAMO TM	3/03/2008 8:50	7.29	Minor
32167	EURAMO TM	5/03/2008 18:50	8.59	Moderate
32167	EURAMO TM	15/03/2008 2:20	8.08	Moderate
532061	UPPER MURRAY ALERT	2/03/2008 15:51	5.42	Below Minor
532061	UPPER MURRAY ALERT	5/03/2008 4:30	5.67	Below Minor
532061	UPPER MURRAY ALERT	14/03/2008 6:44	5.62	Below Minor
32109	UPPER MURRAY TM	2/03/2008 17:00	5.46	Below Minor
32109	UPPER MURRAY TM	5/03/2008 5:00	5.69	Below Minor
32109	UPPER MURRAY TM	14/03/2008 7:00	5.65	Below Minor
532060	MURRAY FLATS ALERT	6/03/2008 4:00	7.89	Moderate
532060	MURRAY FLATS ALERT	15/03/2008 17:20	7.29	Minor
JOHNSTONE				
Johnstone R				
32152	TUNG OIL TM	5/03/2008 7:40	8.09	Moderate
532023	MCAVOY BRIDGE ALERT	5/03/2008 10:00	6.7	Moderate
32161	CORSIS ALERT	4/03/2008 19:42	5.54	Moderate
32161	CORSIS ALERT	5/03/2008 6:20	5.79	Moderate
32155	CENTRAL MILL TM	5/03/2008 8:00	7.34	Below Minor
32163	INNISFAIL WHARF ALERT	5/03/2008 10:15	4.98	Below Minor
MULGRAVE-RUSSELL				
Mulgrave-Russell R				
531046	THE FISHERIES TM	4/03/2008 17:20	5.21	Moderate
531046	THE FISHERIES TM	4/03/2008 23:10	5.62	Moderate
531046	THE FISHERIES TM	5/03/2008 8:00	5.29	Moderate
531052	PEETS BRIDGE ALERT	4/03/2008 19:35	7.7	Moderate
531052	PEETS BRIDGE ALERT	5/03/2008 1:50	8.25	Major
531052	PEETS BRIDGE ALERT	5/03/2008 9:30	8.3	Major
531051	GORDONVALE ALERT	5/03/2008 3:20	15.19	Major
531051	GORDONVALE ALERT	5/03/2008 11:00	15.49	Major
531024	BUCKLANDS TM	4/03/2008 11:40	6.52	Minor
531024	BUCKLANDS TM	5/03/2008 11:00	7.55	Moderate
531022	THE BOULDERS TM	4/03/2008 21:18	4.41	Below Minor
BARRON				
Barron R				
531034	TINAROO DAM ALERT	5/03/2008 21:00	1.5	Moderate
531033	MAREEBA ALERT	5/03/2008 4:00	8.43	Moderate
531033	MAREEBA ALERT	5/03/2008 11:25	9.93	Major
531036	BILWON ALERT	5/03/2008 16:30	12.43	Major

531037	BOLTON ROAD ALERT	4/03/2008 11:05	5.03	Minor
531037	BOLTON ROAD ALERT	4/03/2008 21:17	9.63	Major
531039	FLAGGY CREEK ALERT	4/03/2008 19:35	5.7	Minor
531039	FLAGGY CREEK ALERT	5/03/2008 8:58	5.9	Minor
31173	MYOLA TM	5/03/2008 9:30	10.06	Major
531040	MYOLA ALERT	5/03/2008 2:17	9.71	Moderate
531040	MYOLA ALERT	5/03/2008 9:24	10.11	Major
531048	KAMERUNGA BR ALERT	5/03/2008 9:00	7.94	Moderate
531061	REDLYNCH TM	4/03/2008 17:50	4.67	Unknown
531049	CAIRNS AIRPORT ALERT	5/03/2008 9:35	3.08	Moderate
MOSSMAN				
531063	MOSSMAN TM	5/03/2008 0:30	7.69	Unknown
DAINTREE				
Daintree				
531029	BAIRDS TM	4/03/2008 8:00	9.74	Minor
531029	BAIRDS TM	5/03/2008 11:00	9.93	Minor
31127	DAINTREE VILLAGE	5/03/2008 9:00	7.2	Moderate

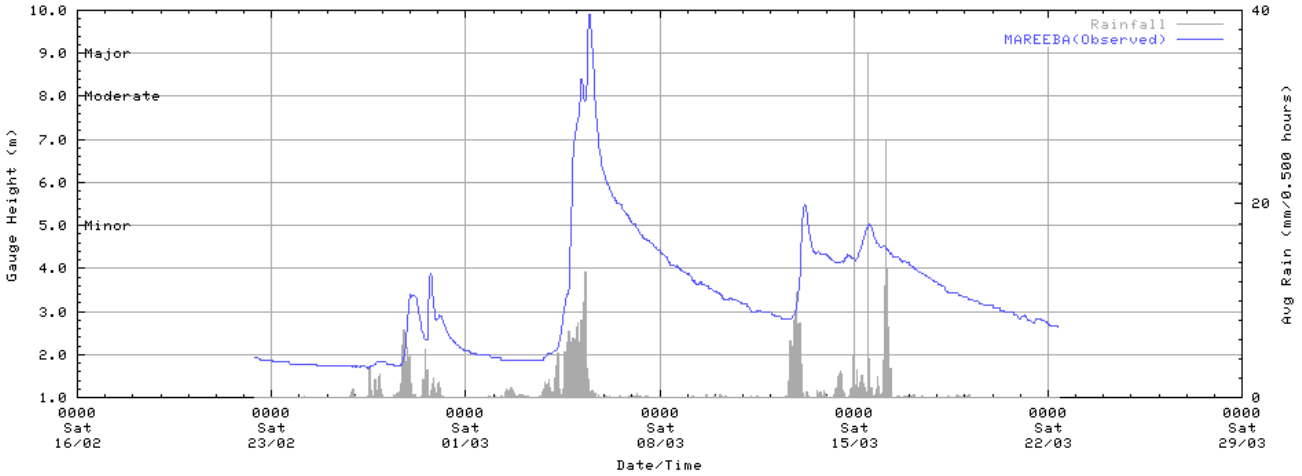
3.5 Flood Hydrographs

Figure 3.5.1 River Heights - Barron River

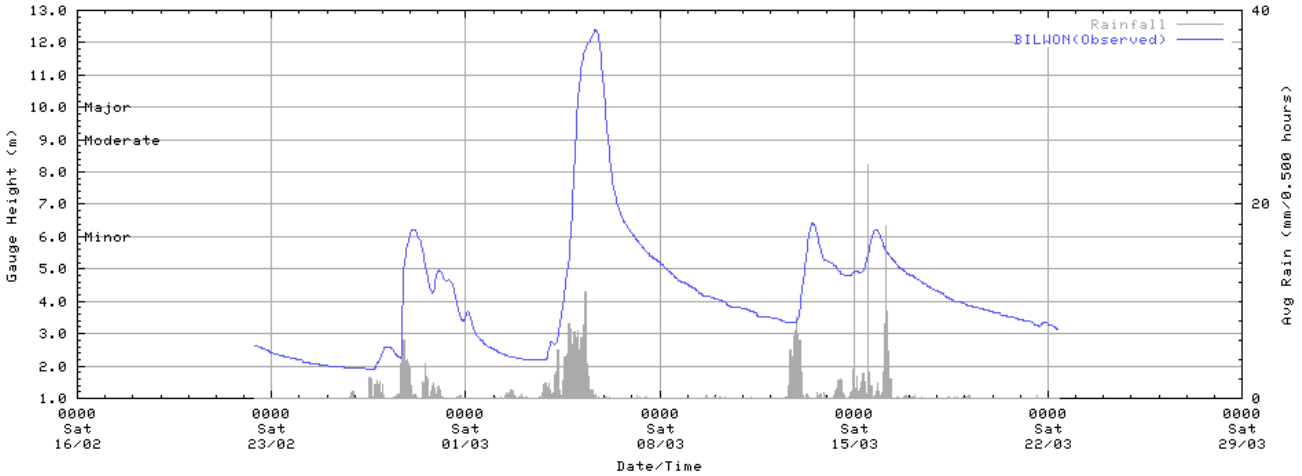
Barron River – Tinaroo Dam



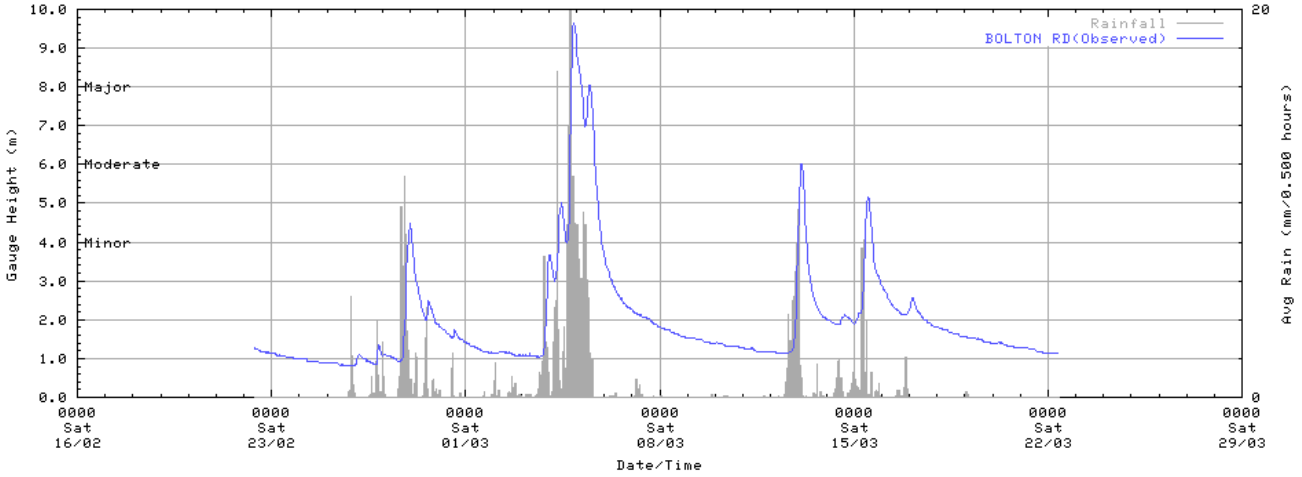
Barron River - Mareeba AL



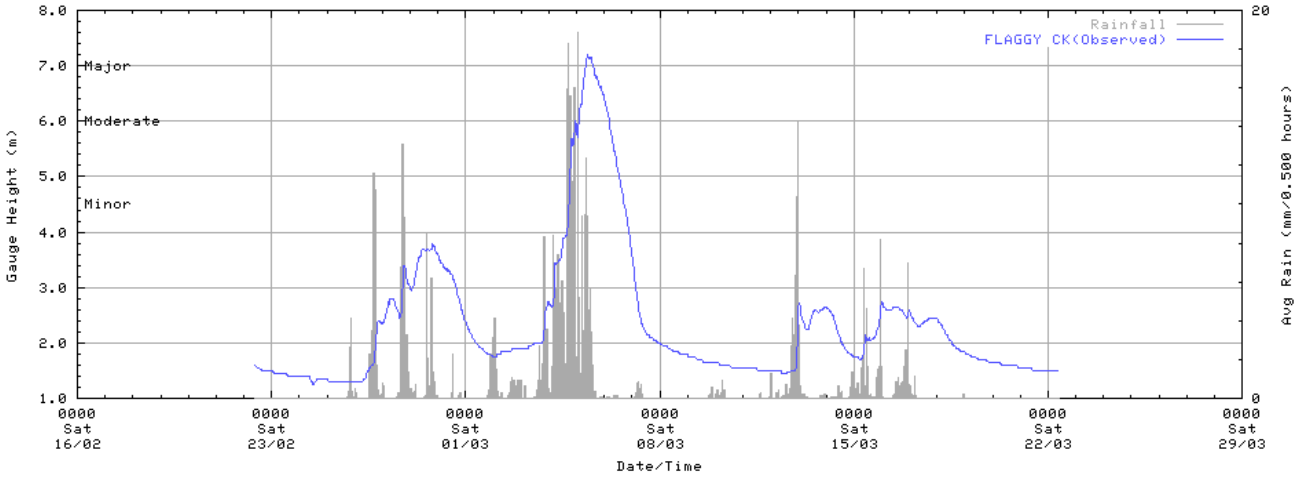
Barron River – Bilwon



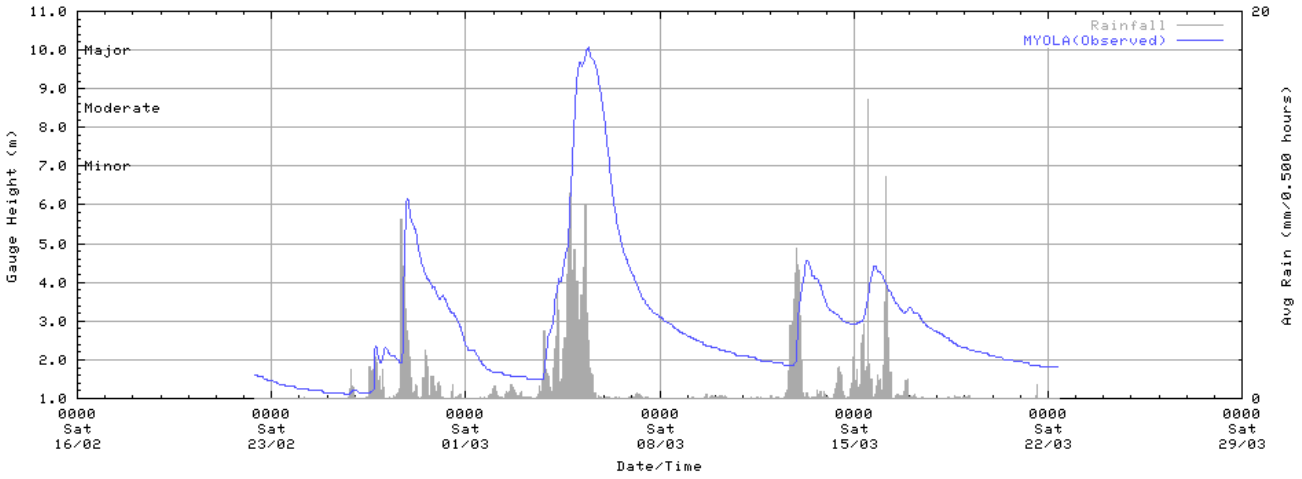
Clohesy River – Bolton Road



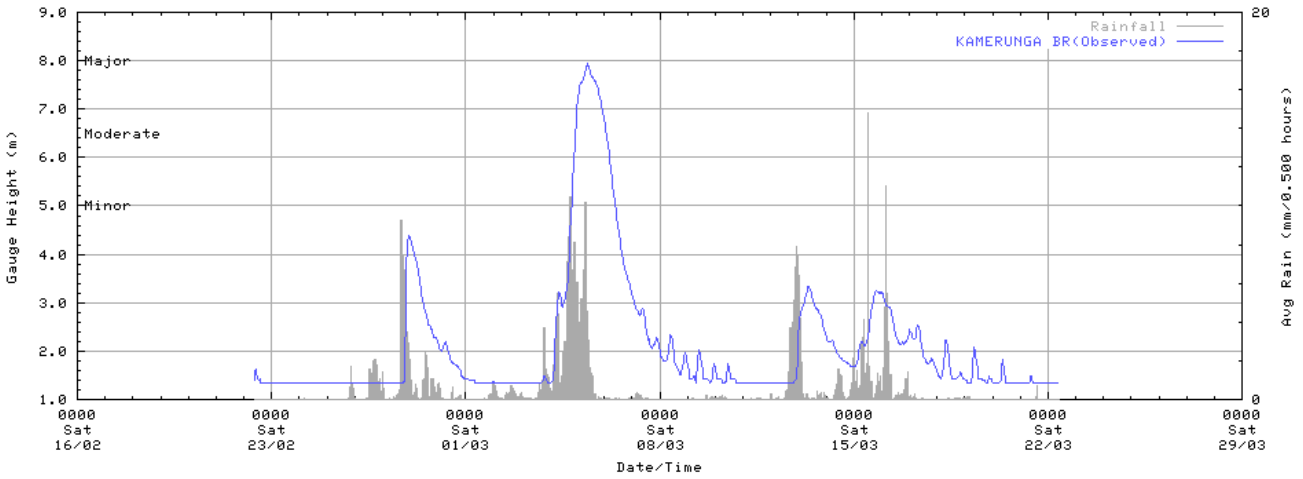
Flaggy Creek – Flaggy Creek



Barron River – Myola



Barron River – Kamerunga bridge



Barron River – Airport

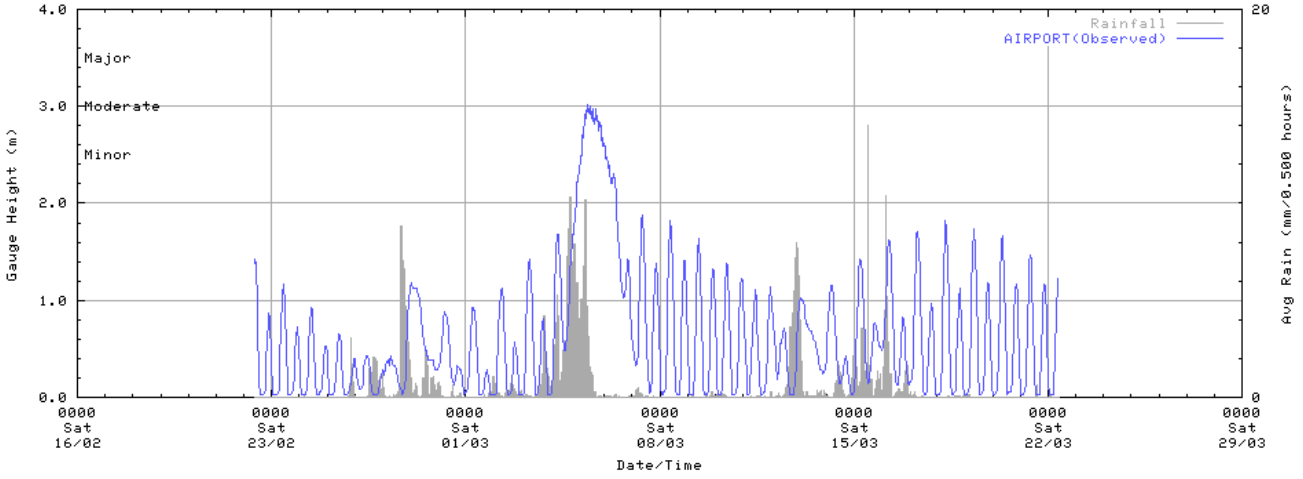
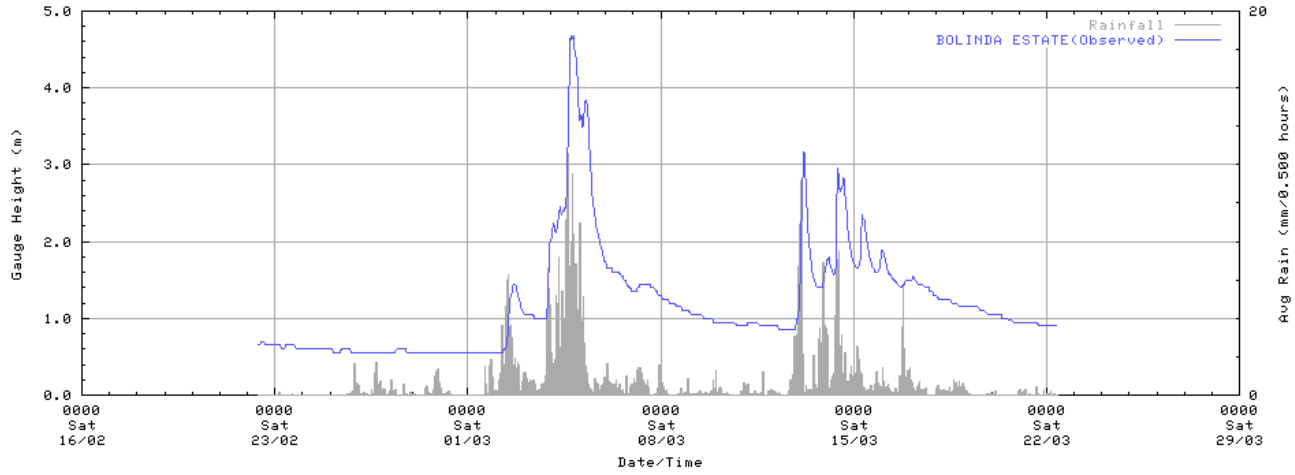
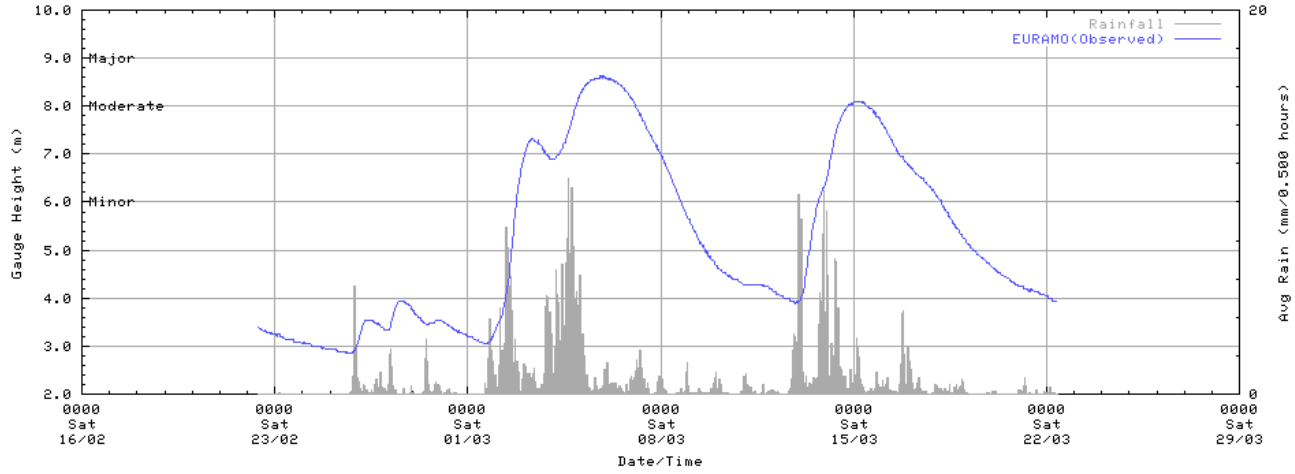


Figure 3.5.2 River Heights - Tully and Murray Rivers

Tully River – Bolinda Estate



Tully River - Euramo



Murray River – Murray Flats

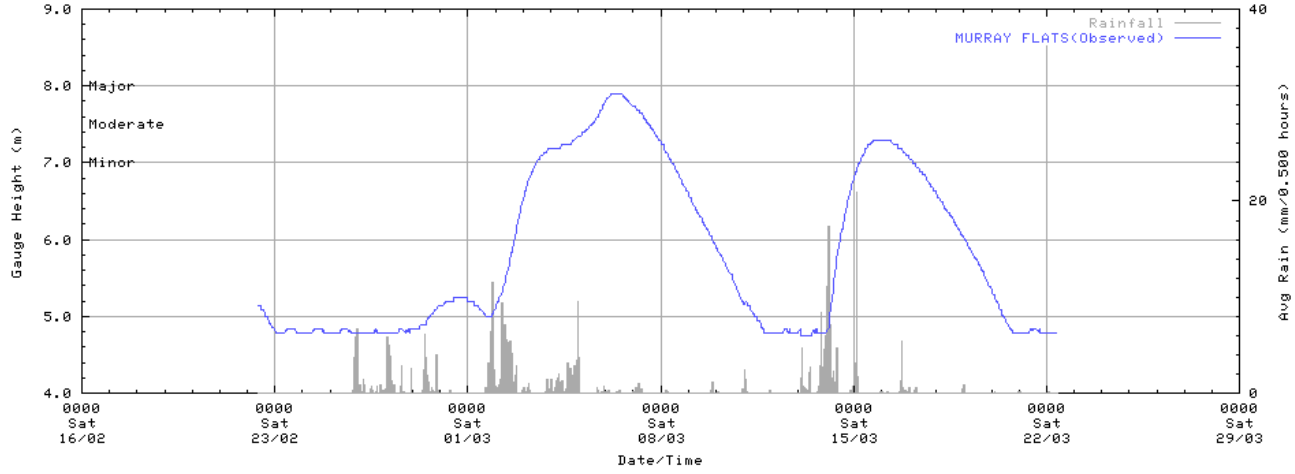
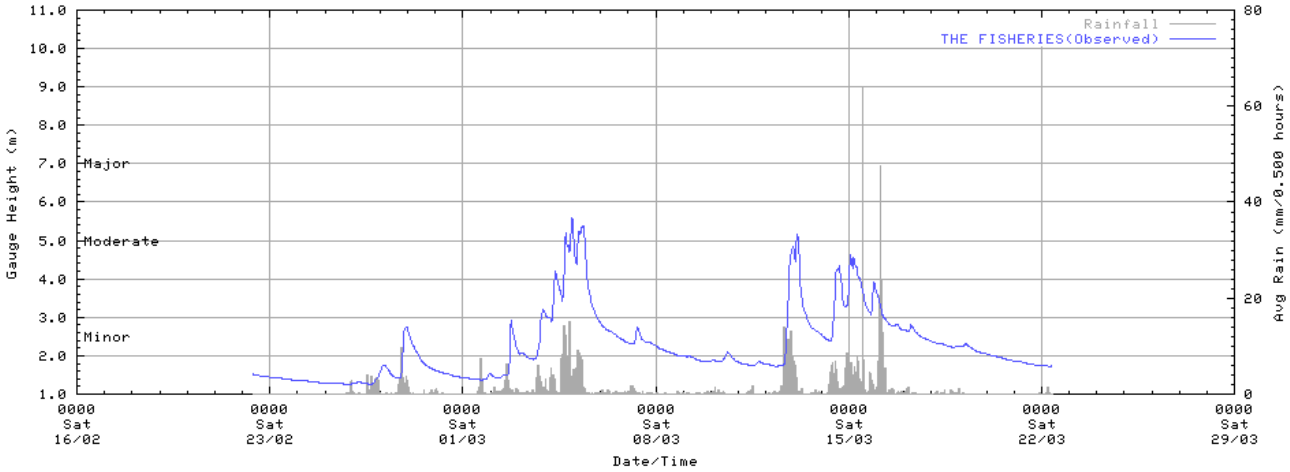
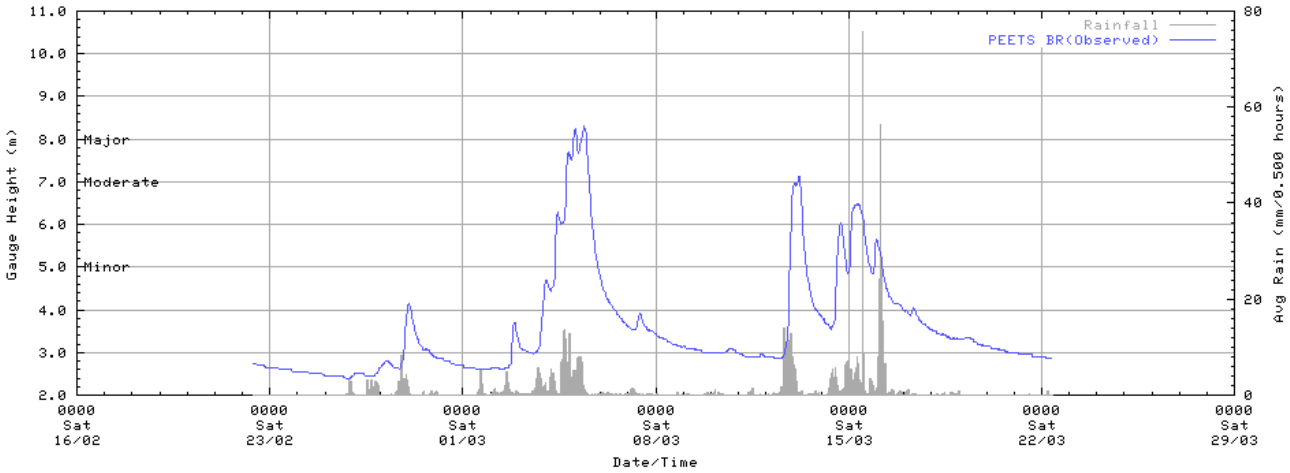


Figure 3.5.3 River Heights - Mulgrave and Russell Rivers

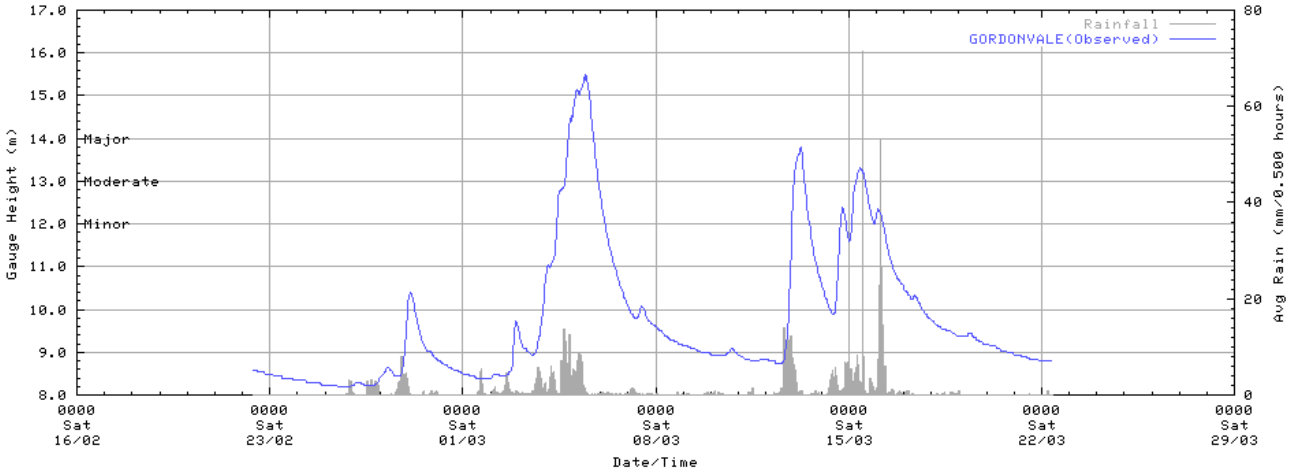
Mulgrave River – The Fisheries



Mulgrave River – Peets Bridge



Mulgrave River - Gordonvale



Russell River - Bucklands

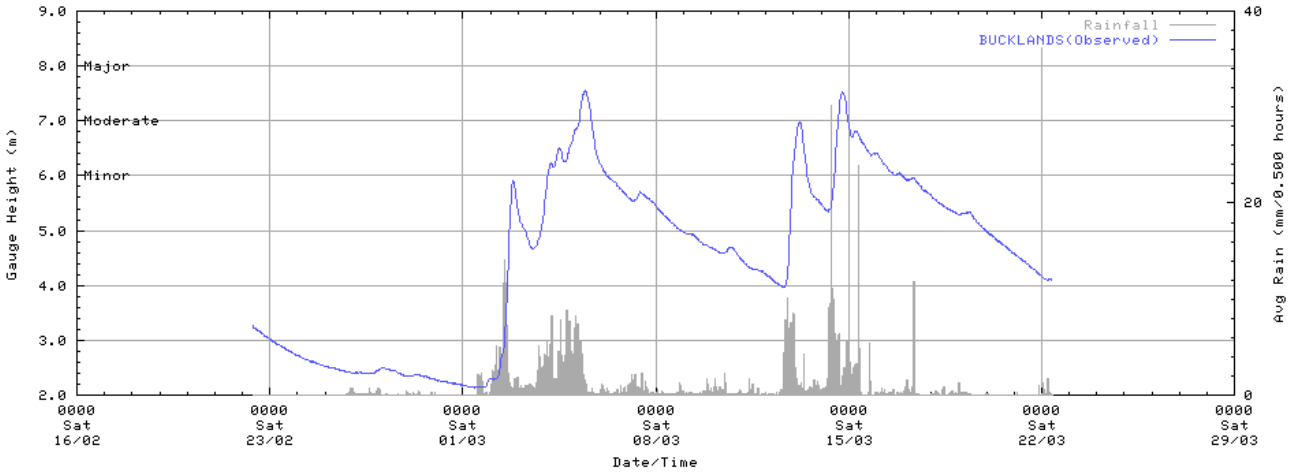
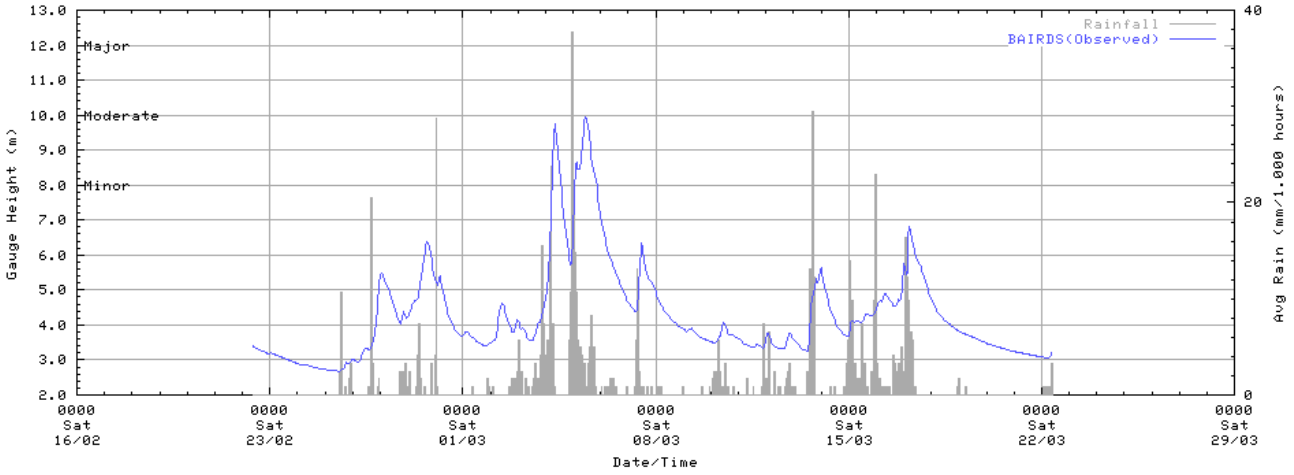
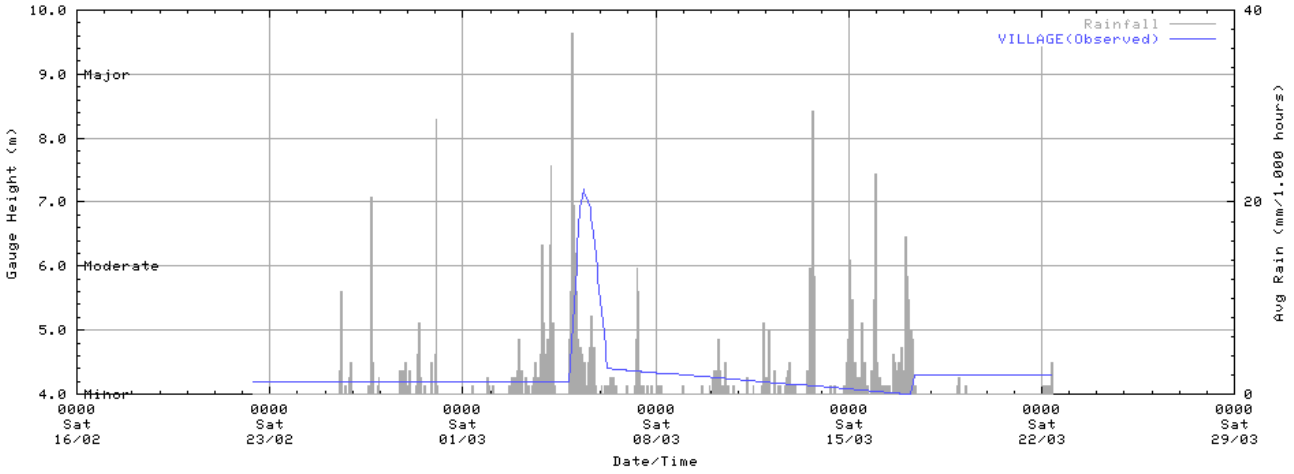


Figure 3.5.4 River Heights - Daintree and Mossman Rivers

Daintree River - Bairds



Daintree River – Daintree Village



Mossman River - Mossman

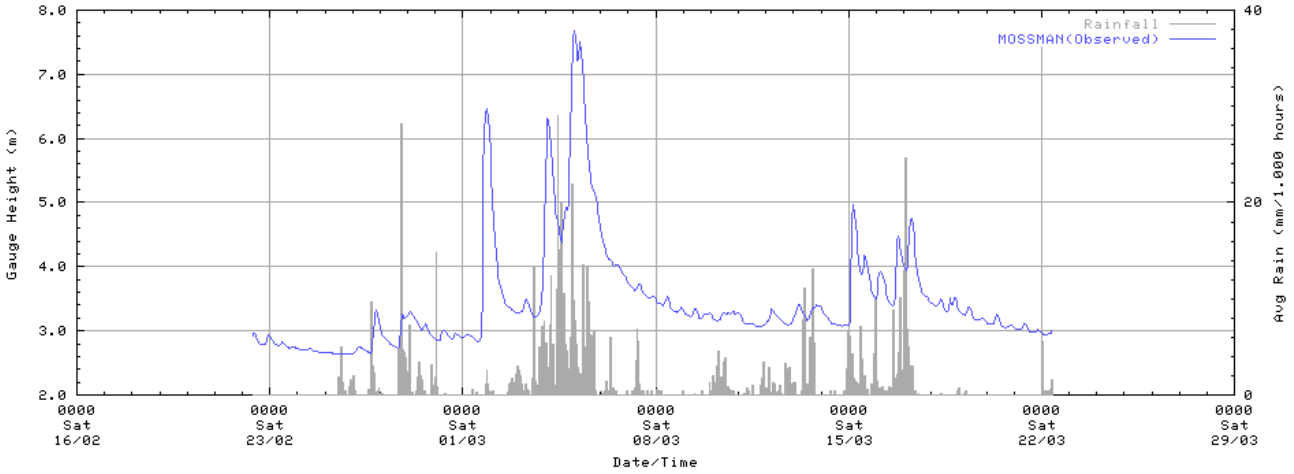
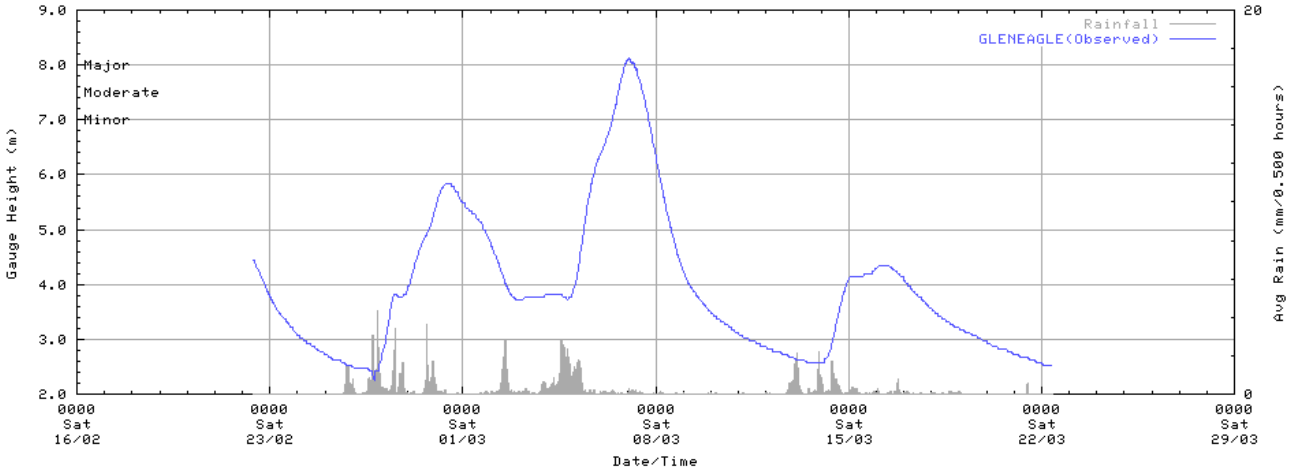
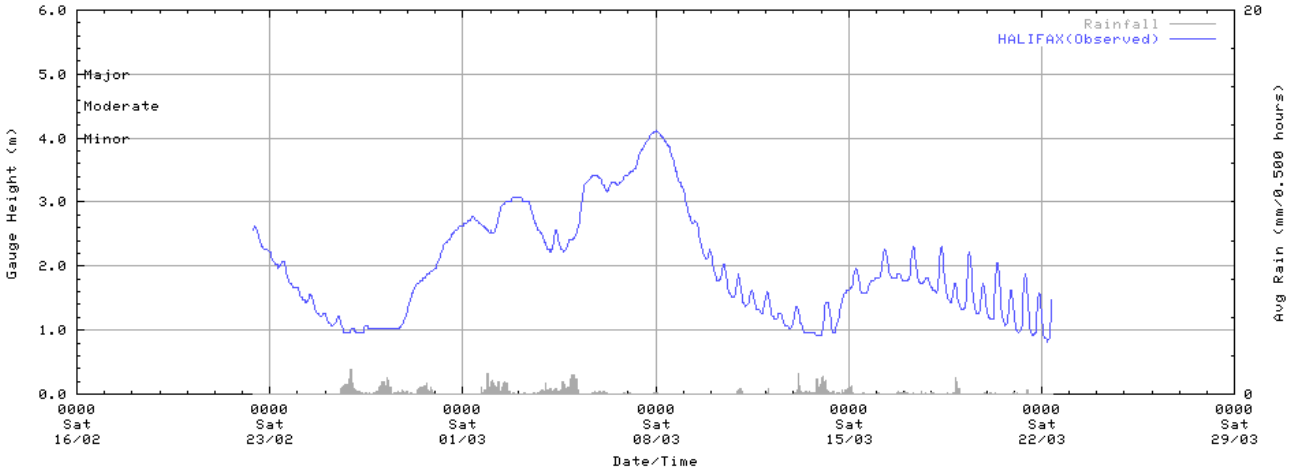


Figure 3.5.4 River Heights - Herbert River

Herbert River - Gleneagle



Herbert River - Halifax



4 Warning Services

Table 4.1 Flood Warnings and Predictions issued between the 4th and 17th of March 2008.

River Basin	Number of Warnings	Number of Major Warnings	Number of Predictions	Number of Locations	First Warning	Last Warning
Queensland Flood Summary	20				9:27am Tue 04/03/08 2:11am Thu 13/03/08	10:09am Sat 08/03/08 9:04am Mon 17/03/08
Coastal Streams Cooktown to Townsville	14	1	0	0	11:45am Sun 02/03/08	9:35am Thu 06/03/08
Daintree	3	1	0	0	6:59am Wed 05/03/08	9:23am Thu 06/03/08
Barron	8	5	4	2	8:04pm Tue 04/03/08	6:59am Thu 06/03/08
Mulgrave-Russell	12	6	1	1	5:29pm Tue 04/03/08 1:52am Thu 13/03/08 8:44am Sat 15/03/08	7:33am Thu 06/03/08 8:38am Thu 13/03/08 6:55pm Sat 15/03/08
Herbert/Tully	27	2	25	3	3:42pm Sun 02/03/08 9:12am Fri 14/03/08	10:06am Sat 08/03/08 8:57am Mon 17/03/08
TOTAL	**84**	**15**	**30**	**6**		

Table 4.2 Severe Weather Warnings for Flash Flooding issued during March 2008.

Severe Weather Warnings for Flash Flooding – Total 4 (Headers and partial body)
TOP PRIORITY FOR IMMEDIATE BROADCAST SEVERE WEATHER WARNING for Flash Flooding. For people in the North Tropical Coast district. Issued at 11:35 am on Tuesday 4 March 2008 Synoptic situation: Moist SE winds near the monsoon trough are bringing heavy rainfall to parts of the North Tropical Coast. TOP PRIORITY FOR IMMEDIATE BROADCAST SEVERE WEATHER WARNING for Flash Flooding. For people in the North Tropical Coast district. Issued at 4:45 pm on Tuesday 4 March 2008 Synoptic situation: Moist SE winds near the monsoon trough are bringing heavy rainfall to parts of the North Tropical Coast. TOP PRIORITY FOR IMMEDIATE BROADCAST SEVERE WEATHER WARNING for Flash Flooding. For people in the North Tropical Coast district. Issued at 11:05 pm on Tuesday 4 March 2008 Synoptic situation: Moist SE winds in conjunction with an upper disturbance are bringing heavy rainfall to parts of the North Tropical Coast. TOP PRIORITY FOR IMMEDIATE BROADCAST SEVERE WEATHER WARNING for Flash Flooding. For people in the North Tropical Coast district. Issued at 4:30 am on Wednesday 5 March 2008 The warning is now cancelled.

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