



Australian Government

Bureau of Meteorology

FLOODING IN NORTH QUEENSLAND

February to March 2004

Introduction

Heavy rainfall in north Queensland during February and March resulted in large-scale flooding in the area. Floods occurred in the Tully, Murray, Johnstone, Mulgrave, Russell and Barron Rivers between 5th February and 15th February and again during 15th March to 23rd March.

Rainfall Totals

5 February to 15 February

This rainfall event produced some very high hourly totals, but was of relatively brief duration. The highest totals were recorded between February 5 and February 7, with around 200 – 300 mm of rainfall recorded at some stations.

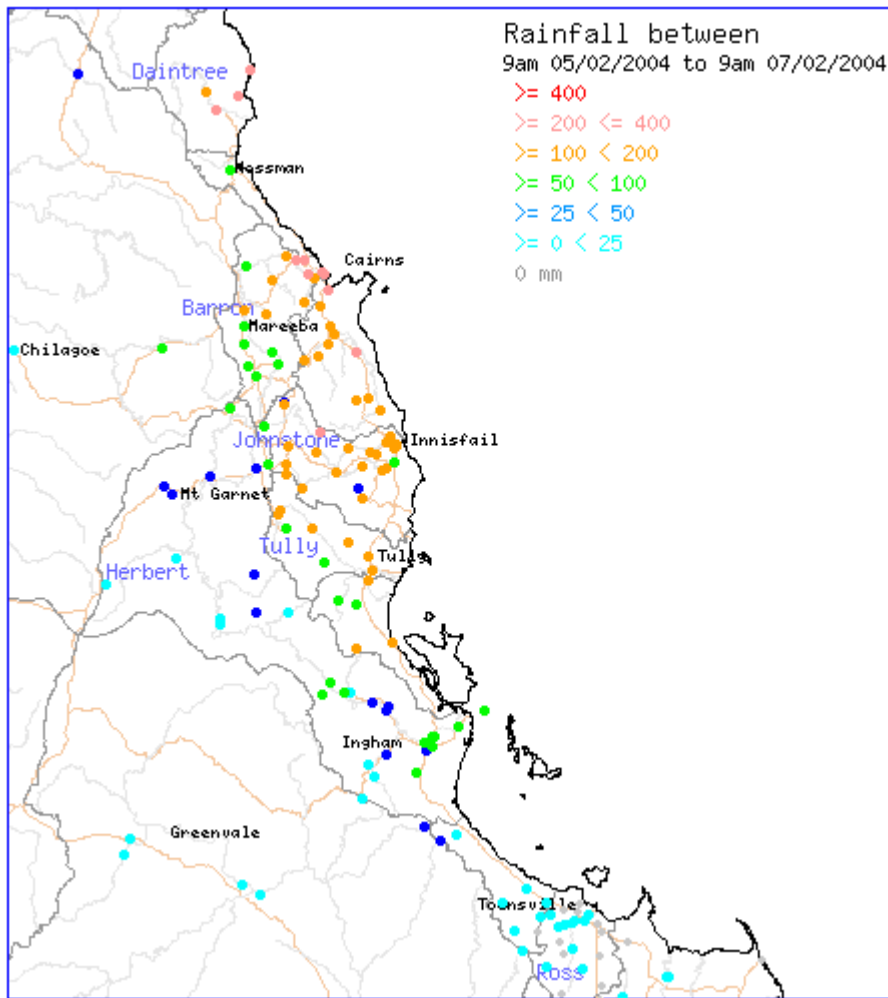
Many stations recorded rainfall intensities of over 50 mm/hr during the heaviest period of rain.

Table 1: Rainfall Totals For Selected North Queensland Stations

Station	24 Hours to 9am (mm)			Total (mm)
	5/2	6/2	7/2	
Poverty Hill *	134	40	13	187
Cardwell	137	109	8	254
Upper Murray *	177	79	8	264
Tully *	210	77	39	326
Malanda *	166	47	69	282
Topaz	222	125	94	441
Saddle Mountain *	76	200	37	313
Cairns	148	152	54	354

* Denotes automatic station

Figure 1: Rainfall Between 05/02/2004 To 07/02/2004



15 March to 20 March

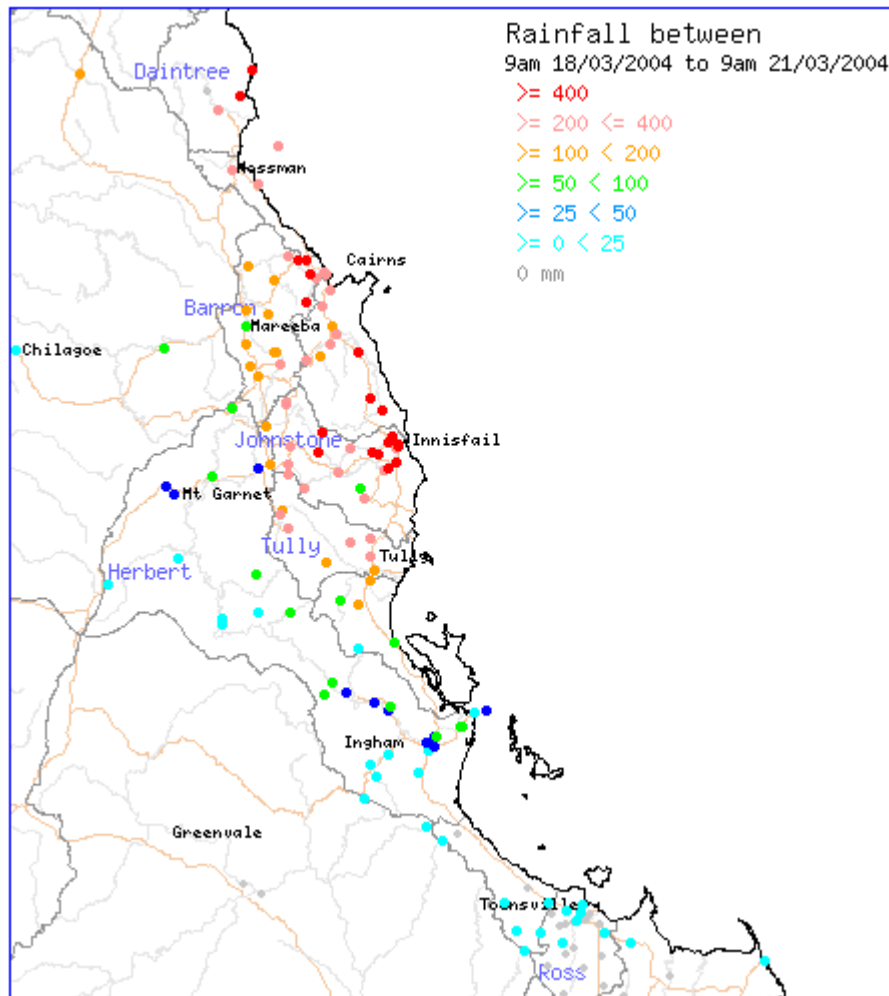
Rainfall totals during the March event were considerably higher than during February, as the rainfall was sustained over a much longer period. The most intense period of rainfall was in the three days between March 18 and March 20, with up to 600 mm recorded at some stations.

Table 2: Rainfall Totals For Selected North Queensland Stations

Station	24 Hours to 9am (mm)			Total (mm)
	18/3	19/3	20/3	
Murray Flats*	140	25	110	275
Tully *	99	54	198	351
Malanda	86	93	136	315
Topaz *	140	188	299	627
Greenhaven *	110	86	165	361
Innisfail	85	132	270	487
Copperlode *	163	258	222	643
Saddle Mountain *	163	201	231	595

* Denotes automatic station

Figure 2: Rainfall Between 18/03/2004 To 21/03/2004



River Levels

February Floods

River levels initially began to rise in the Johnstone, Tully and Murray Rivers early on the morning of Thursday February 5. As the rainfall contracted north throughout Thursday, flooding eased in the Johnstone River with Innisfail not reaching minor flood level.

Throughout Thursday February 5, river levels continued to rise in the Tully and Murray. By midnight on Saturday February 7, the rainfall had eased and the river level had peaked at both Euramo on the Tully River and Murray Flats on the Murray River. In both cases minor flooding occurred but river levels were below the Bruce Highway crossings at both locations.

There was little rainfall in north Queensland between Saturday February 7 and Monday February 9, and river levels fell rapidly during this period. However, Tropical Cyclone Fritz arrived off the Cape York coast on Tuesday February 10, and brought renewed rainfall to streams between Cairns and Townsville.

River levels in the Herbert River began rising on Wednesday February 11, and caused minor flooding at Ingham on Thursday February 12. Once again, the rainfall moved north as Fritz continued to travel into the Gulf of Carpentaria, and river levels began rising in the Tully and Murray Rivers early on Thursday morning.

By the morning of Friday February 13, the rainfall had eased, and the Tully and Murray Rivers were both close to their peaks. The Tully River at Euramo reached 8.17 metres on Thursday February 12 at 11:00 pm. The Murray River at Murray Flats reached 7.93 metres on Thursday February 12 at 11:00 pm. This caused moderate flooding at both locations, with river levels well above the height of the Bruce Highway crossing at both locations.

The graph below shows the water level at Euramo in green, the water level at Murray Flats in blue, and the rainfall at Euramo in red.

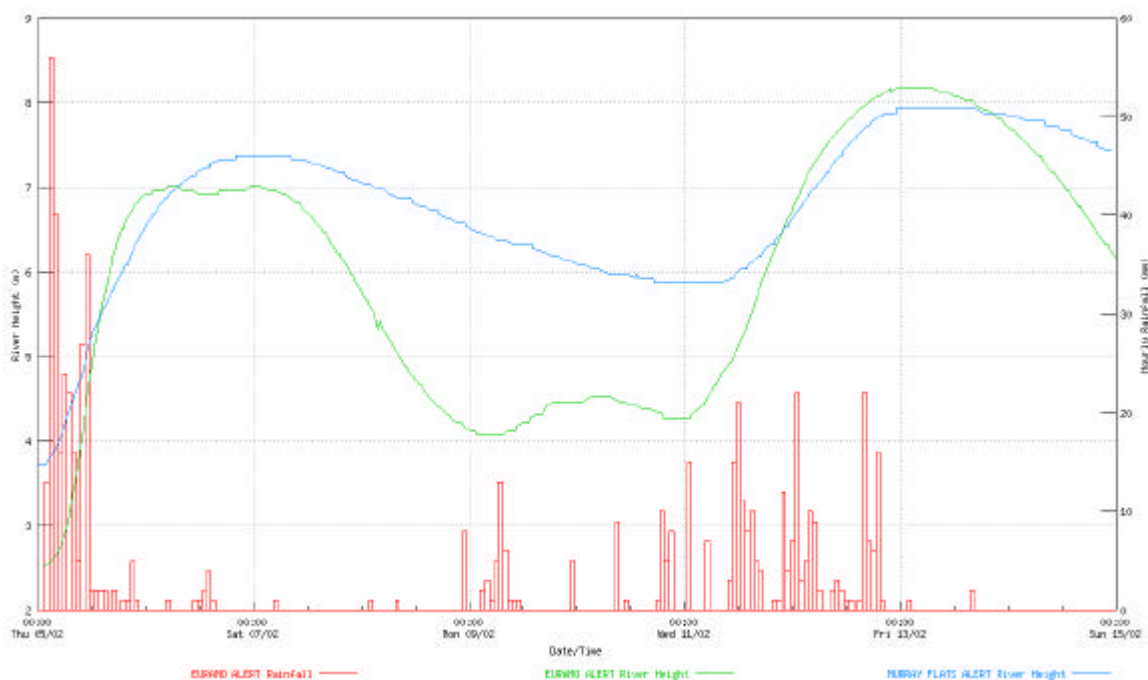


Figure 3: Tully And Murray Rivers February 2004

The diagram below shows the effect of the February 2004 flood at Euramo. While the flood was above the level of the Bruce Highway Bridge, it was still well below the level of houses in Euramo. It was also some 1.2 metres below the level of the highest flood on record at Euramo.

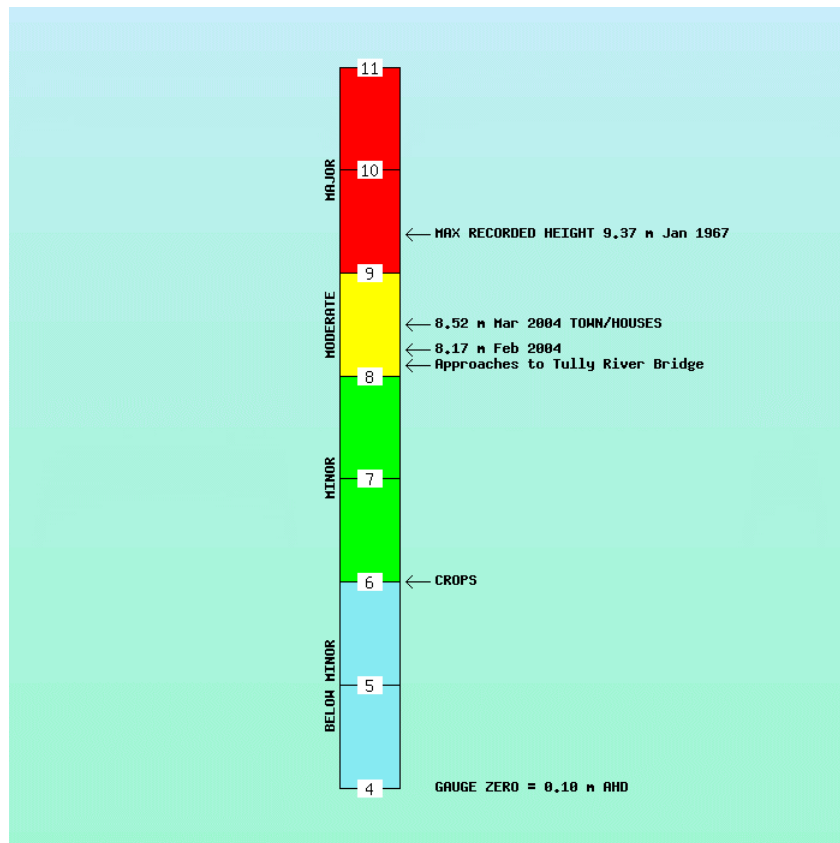


Figure 4: Flood Effects At Euramo

March Floods

The Tully and Murray Rivers were again the first to be affected by rainfall on Monday March 15. River levels rose rapidly on Monday and Tuesday causing minor flooding at Euramo and Murray Flats. The rain eased briefly on Tuesday March 16 and the river levels at both locations steadied, however renewed rain occurred on Wednesday afternoon, which resulted in renewed river level rises.

On the morning of Thursday March 18, the rainfall intensified along the entire north tropical coast between Cooktown and Ingham as a tropical low that would eventually develop into Tropical Cyclone Grace moved south-east along the coast. River levels began rising in the Daintree, Barron, Mulgrave, Russell and Johnstone Rivers.

Rainfall continued through into the early hours of Saturday February 20, dumping over a metre of rainfall in coastal areas between Daintree and Gordonvale in 10 days. After the rainfall had eased, river levels continued to rise in some cases until Sunday February 21. Flooding had eased in most of the rivers by Tuesday March 23.

The table below shows the river level peaks that were recorded at significant locations.

Table 3: River Level Peaks Between March 18 And March 23

River	Location	Time	Height (m)	Flood Classification
Daintree	Daintree	18/03/2004 21:00	8.50	Moderate
Barron	Kamerunga Bridge	20/03/2004 01:36	6.44	Minor
Mulgrave	Gordonvale	19/03/2004 22:34	15.84	Major
Russell	Bucklands	20/03/2004 10:47	8.45	Major
Johnstone	Innisfail Wharf	20/03/2004 03:30	5.63	Moderate
Tully	Euramo	20/03/2004 19:38	8.52	Moderate
Murray	Murray Flats	21/03/2004 05:06	7.53	Moderate

The flooding in the Mulgrave-Russell River system was highest since the floods of February 1999. Flooding in the Mulgrave River overtopped the Bruce Highway bridge at Gordonvale, isolating Cairns and resulted in damage to roads and property in the area.

The diagram below shows the river level at Peets Bridge and Gordonvale on the Mulgrave River in green and blue, and the rainfall at Peets Bridge in red.

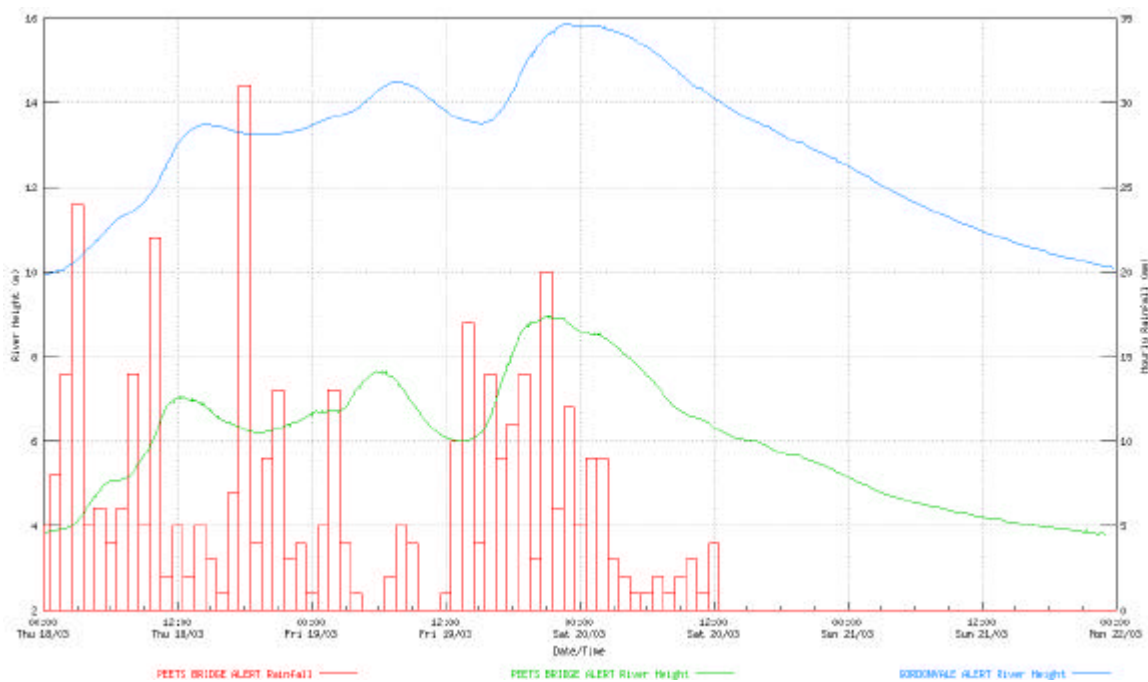


Figure 5: Mulgrave River March 2004

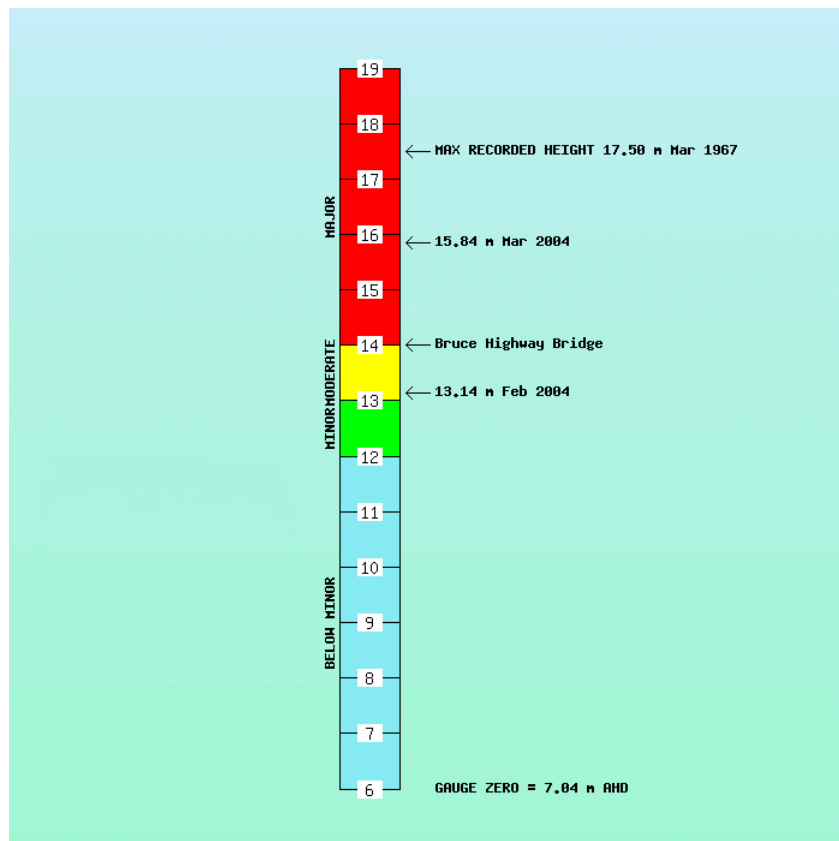


Figure 6: Flood Effects At Gordonvale

Warning Services

February Floods

The table below documents the number of flood warnings issued for north Queensland rivers between 5 February and 15 February.

Table 4: Flood Warnings Issued During February

Title	First Warning	Last Warning	No.
Tully and Murray Rivers	05/02/2004 09:27	15/02/2004 09:00	17
Johnstone River	05/02/2004 08:22	05/02/2004 15:56	3
Barron River	06/02/2004 12:39	07/02/2004 06:27	3
Herbert River	11/03/2004 09:30	14/02/2004 09:41	10
Coastal Rivers From Cooktown To Townsville	11/02/2004 16:53	13/02/2004 05:58	8
Coastal Rivers From Townsville To Mackay	12/02/2004 22:35	13/02/2004 05:58	2

Some flood warnings contained river height predictions for significant locations. Predictions were issued for Gairloch (Ingham), Euramo and Innisfail during February. The table below shows the accuracy of the river height predictions.

Table 5: River Height Predictions Issued During February

Location	Issued	Predicted		Actual	
		Height	Time	Height	Time
Gairloch	12/02/2004 06:03	11.00	Early a'noon 12/02		
	12/02/2004 09:25	10.00	Afternoon 12/02		
	12/02/2004 12:37	10.00	Afternoon 12/02		
				9.74	12/02/2004 15:41
Euramo	05/02/2004 09:27	7.50	Evening 05/02		
	05/02/2004 16:01	7.00	Evening 05/02		
				7.02	06/02/2004 05:11
	11/02/2004 15:49	7.00	Evening 11/02		
	12/02/2004 06:12	8.20	Afternoon 12/02		
	12/02/2004 12:38	8.20	Afternoon 12/02		
	12/02/2004 19:44	8.20	Early morning 13/02		
				8.25	13/02/2004 07:00
Innisfail	05/02/2004 08:22	5.00	Evening 05/02		
	05/02/2004 09:39	5.00	Evening 05/02		
				3.60	06/02/2004 09:30

Predictions made for February flood were fairly accurate. The greatest error occurred in the initial prediction made for Euramo on 11/02/2004. Extremely heavy rainfall overnight exacerbated the flooding to the extent that the prediction was upgraded from 7.00 metres to 8.20 metres. In general predictions were virtually correct when made 6 to 12 hours before the actual flood peak.

In addition to the flood warnings, river height bulletins were being automatically generated and posted at three hourly intervals. During the period 5 February to 15 February, 128 river height bulletins were issued for the Herbert, Tully, Johnstone, Barron and Daintree Rivers.

March Floods

The table below documents the number of flood warnings issued for north Queensland rivers between 15 March to 20 March.

Table 6: Flood Warnings Issued During March

Title	First Warning	Last Warning	No.
Tully and Murray Rivers	15/03/2004 08:50	20/03/2004 15:51	16
Coastal Rivers From Cooktown To Townsville	18/03/2004 14:12	20/03/2004 09:41	5
Mulgrave-Russell Rivers	19/03/2004 07:38	20/03/2004 15:31	6
Barron River	19/03/2004 07:49	20/03/2004 15:21	6
Johnstone River	19/03/2004 07:57	20/03/2004 15:37	6

River height predictions were also issued for Euramo and Innisfail.

Table 7: River Height Predictions Issued During March

Location	Issued	Predicted		Actual	
		Height	Time	Height	Time
Euramo	15/03/2004 08:50	7.50	Night 15/03		
	15/03/2004 11:07	7.50	Night 15/03		
	15/03/2004 16:02	8.50	Midday 16/03		
	15/03/2004 21:16	8.50	Midday 16/03		
				8.10	16/03/2004 12:00
Innisfail	19/03/2004 21:29	5.60	3am 20/03		
	20/03/2004 00:13	5.60	3am 20/03		
				5.63	20/03/2004 03:30

In addition to the flood warnings, river height bulletins were being automatically generated and posted at three hourly intervals. During the period 15 March to 20 March, 90 river height bulletins were issued up to 8 times per day for the Herbert, Tully, Johnstone, Barron and Daintree Rivers.