

## Flood summary for the Fitzroy River at Rockhampton

- The town of Rockhampton is on the Fitzroy River in the Capricornia district.
- The river heights at Rockhampton are measured on a manual gauge owned by the Bureau of Meteorology (Bureau station number: 039264).
- Rockhampton experienced major flooding in January 2011 that continued for more than 13 days and cut the Bruce Highway which connects North Queensland with Brisbane.
- A detailed map of the flood warning network is available on the Bureau website at [http://www.bom.gov.au/hydro/flood/qld/brochures/river\\_maps.shtml](http://www.bom.gov.au/hydro/flood/qld/brochures/river_maps.shtml)

## Location map

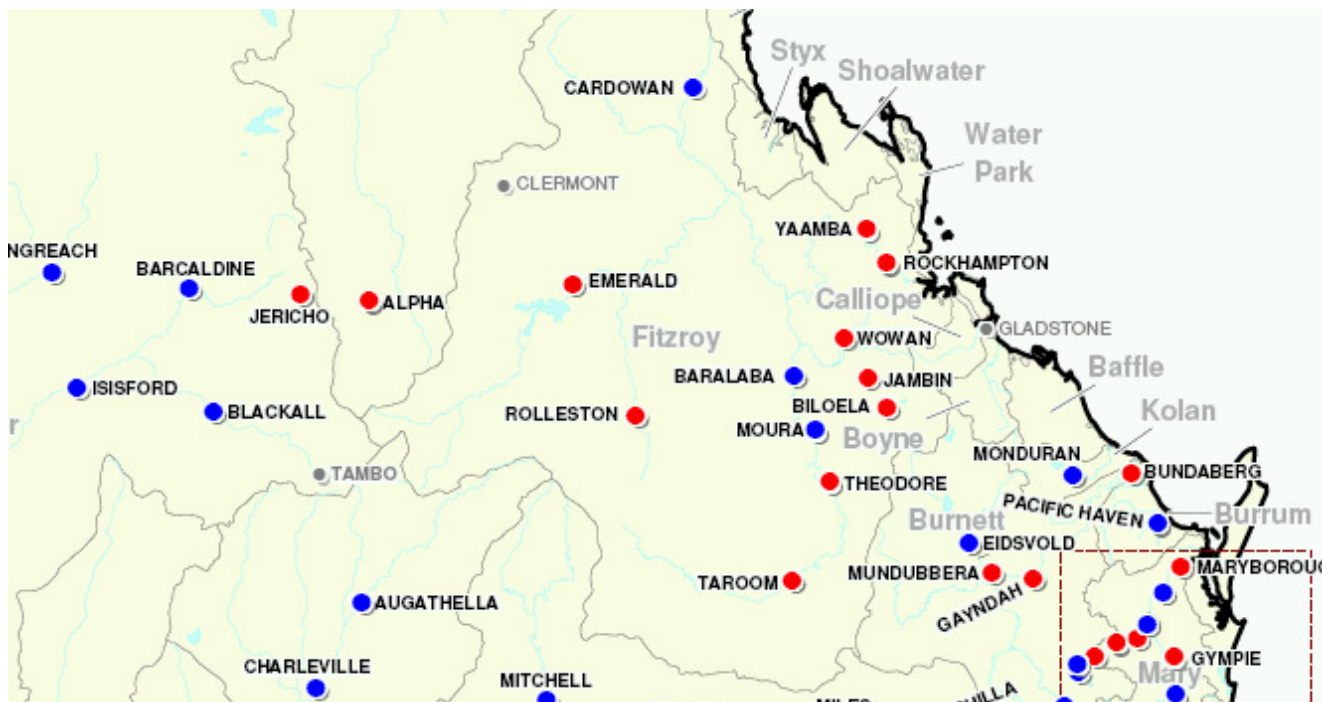
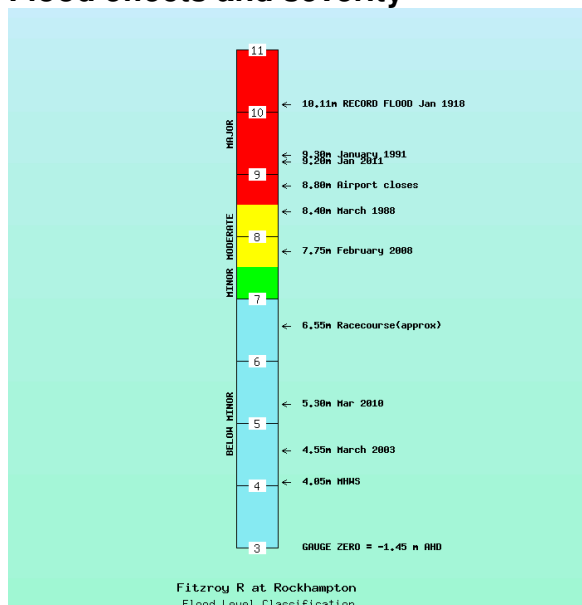


Figure 1. Map showing location of Rockhampton.

Note: Red dots are reported flood inundated towns or cities and blue dots are flood affected towns or cities.

## Flood effects and severity



- **Peaked at 9.2 metres on 04/01/2011.**
- Minor: 7.0 metres  
Moderate: 7.5 metres  
Major: 8.5 metres
- Gauge Zero is -1.488 metres AHD.
- Rockhampton was isolated for several weeks with the main highways to the south and west and the airport flooded (Source: Ninemsn).
- Many properties were flood affected and many residents were evacuated from parts of the town (Source: ABC).
- Above major flood level (8.5 metres) from 01/01/2011 to 14/01/2011.
- Above minor flood level (7.0 metres) from 13/12/2010 to 20/12/2010 and again from 27/12/2010 to 17/01/2011.

Figure 2. Flood level classifications and flood effects for Rockhampton

## Rainfall summary

- Between 200 and 1000 millimetres of rainfall was recorded over the Fitzroy River catchment from the start of December 2010 to the end of January 2011.
- The heaviest rainfall periods during December and January occurred from the 26/12/2010 to 28/12/2010, with falls between 100 and 300 millimetres over a large part of the catchment with some areas receiving over 400mm during this period.

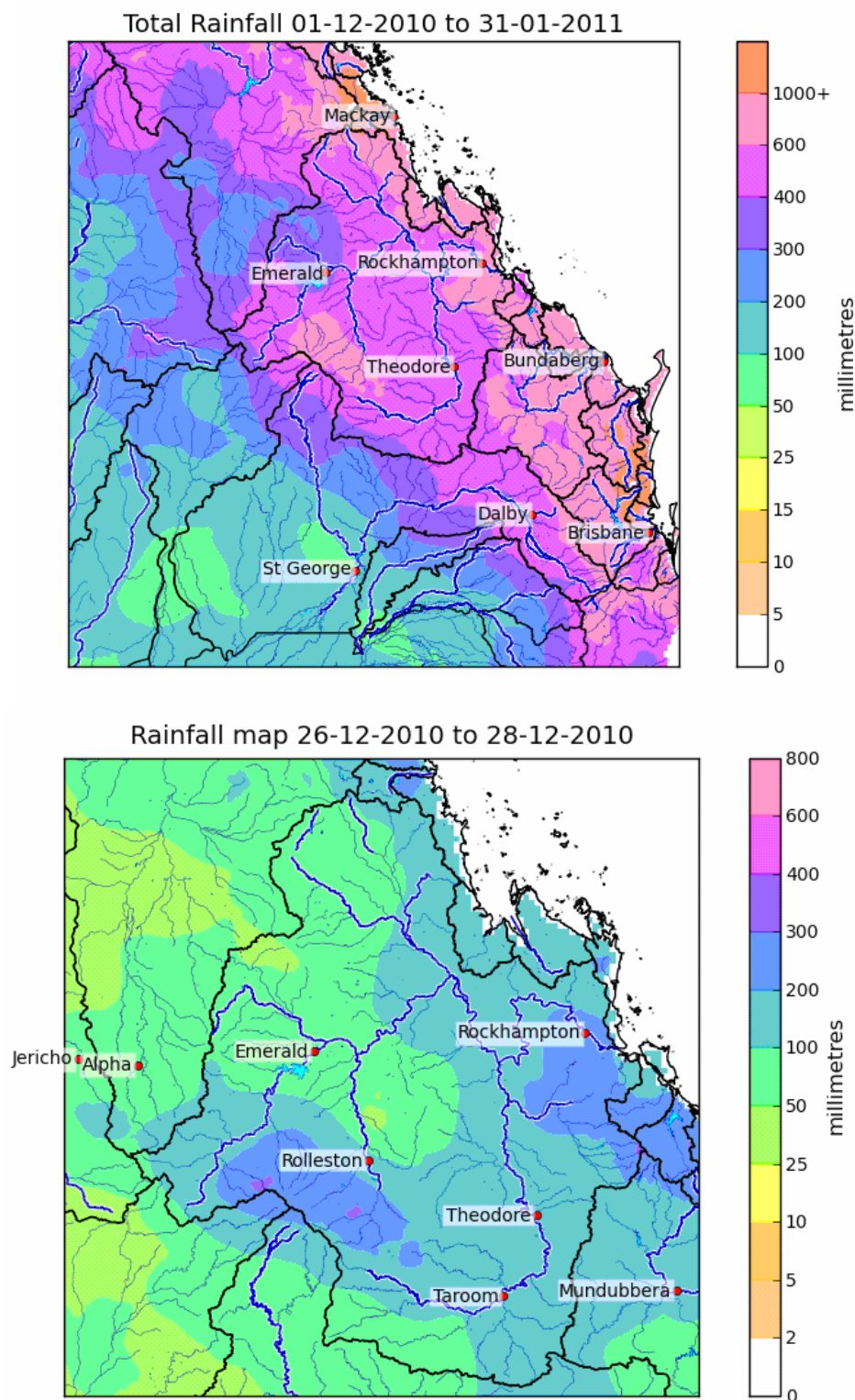


Figure 3. Rainfall map from 01/12/2010 to 31/01/2011 (top) and for the 48 hours to 9 AM on 28/12/2010 (bottom).

## Rainfall Intensity

- Coolmaringa TM on the Mackenzie River and Kingsborough TM on the Don River, both upstream from Rockhampton, have been selected as examples of recorded rainfall intensities across the eastern parts of the Fitzroy River catchment during December 2010 and January 2011. The rainfall intensity data is shown in Table 1.
- The most significant rainfall intensities for December 2010 and January 2011 at these two sites occurred on 3/12/2010, 27/12/2010 and on 28/12/2010 however they were all well above the 1% Annual Exceedence Probability (100 year Average Recurrence Interval).

**Table 1. Recorded maximum rainfall intensities for Coolmaringa TM on the Mackenzie River and Kingsborough TM on the Don River for December 2010 and January 2011.**

Rainfall Duration	Coolmaringa TM			Kingsborough TM		
	Rainfall (mm)	Period ending	ARI (years)	Rainfall (mm)	Period ending	ARI (years)
30 mins	22	10:25 AM 22/12/2010	< 1	45	12:05 PM 27/12/2010	10-20
60 min	33	10:45 AM 22/12/2010	1-2	53	12:15 PM 27/12/2010	5
2 hr	49	5:10 PM 27/12/2010	1-2	63	7:50 PM 27/12/2010	2-5
3 hr	61	5:40 PM 27/12/2010	2-5	78	8:15 PM 27/12/2010	5-10
6 hr	103	9:00 PM 27/12/2010	10-20	93	10:00 PM 27/12/2010	5-10
12hr	117	2:40 AM 28/12/2010	5-10	147	11:10 PM 27/12/2010	20
24hr	167	1:15 PM 03/12/2010	10-20	155	10:55 AM 28/12/2010	5-10
48hr	174	1:15 PM 03/12/2010	5-10	232	10:00 PM 27/12/2010	10-20
72hr	259	12:15 PM 03/12/2010	10-20	265	10:55 AM 28/12/2010	10-20

**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.

## Flood event timeline

**Table 2. Flood timeline for Rockhampton**

Time/Date	Event Description	Gauge Height (metres)	Comment
11:06 AM 04/12/2010	First warning issued		First warning issued with reference to Rockhampton flooding.
2:00 AM 13/12/2010	River level first exceeds the minor flood level.	7.00	Remained above the minor flood level for ~7 days
2:00 PM 14/12/2010	River level first exceeds the moderate flood level	7.50	Remained above the moderate flood level for ~3 days.
5:30 AM 16/12/2010	Moderate flood peak	7.65	
5:30 AM 27/12/2010	River level exceeds the minor flood level again.	7.00	Remained above the minor flood level for ~21 days.
5:00 AM 28/12/2010	River level exceeds the moderate flood level again.	7.50	Remained above the moderate flood level for ~19.5 days.
8:45 AM 01/01/2011	River level first exceeds the major flood level	8.50	Remained above the major flood level for ~13.5 days.
3:15 PM 04/01/2011	Major flood peak	9.20	5 <sup>th</sup> highest flood peak on record for Rockhampton.
5:45 AM 14/01/2011	Final fall below major	8.50	
1:45 AM 16/01/2011	Final fall below moderate	7.00	
10:45 AM 17/01/2011	Final fall below minor	5.00	
7:54 AM 17/01/2011	Final warning issued		

## Flood Heights at Rockhampton

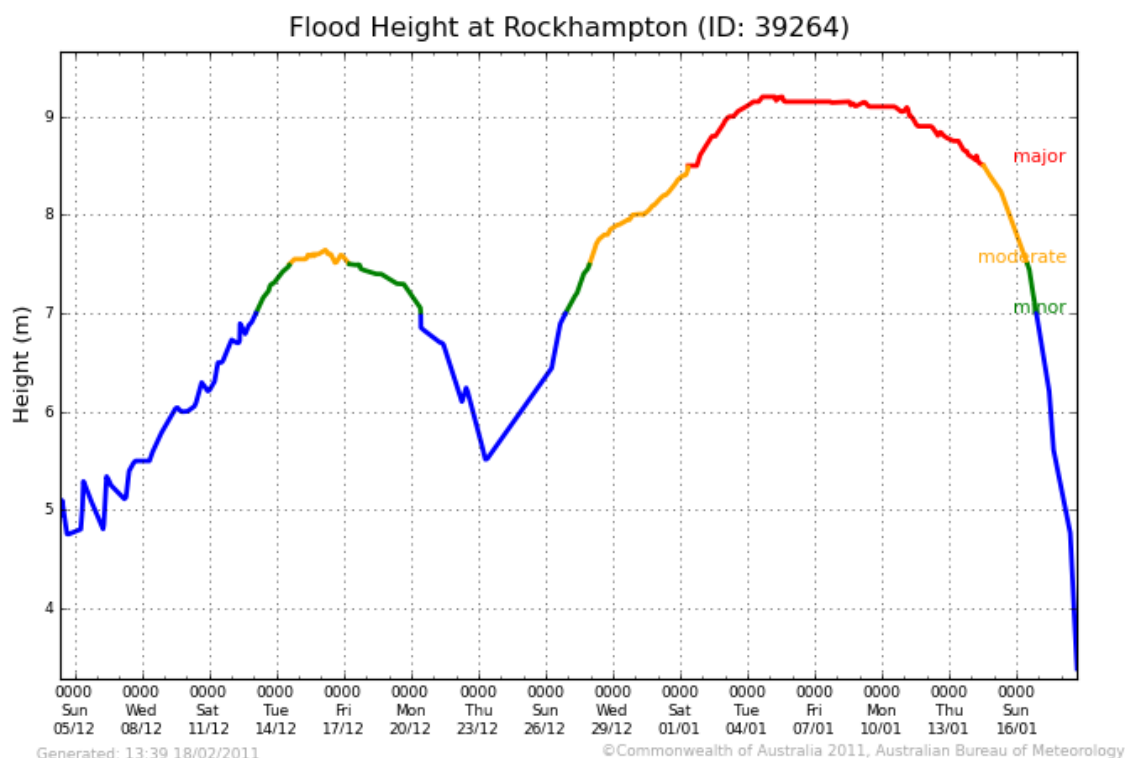


Figure 4. Flood Heights at Rockhampton manual gauge for December 2010 and January 2011

## Comparison with previous floods

- River height records for Rockhampton date back to 1859.
- The 2011 major flood level of 9.2 metres is the fifth highest peak on record (two peaks recorded in 1918).
- The previous time the river level exceeded 9 metres was in January 1991 when the Fitzroy River rose to 9.30 metres.

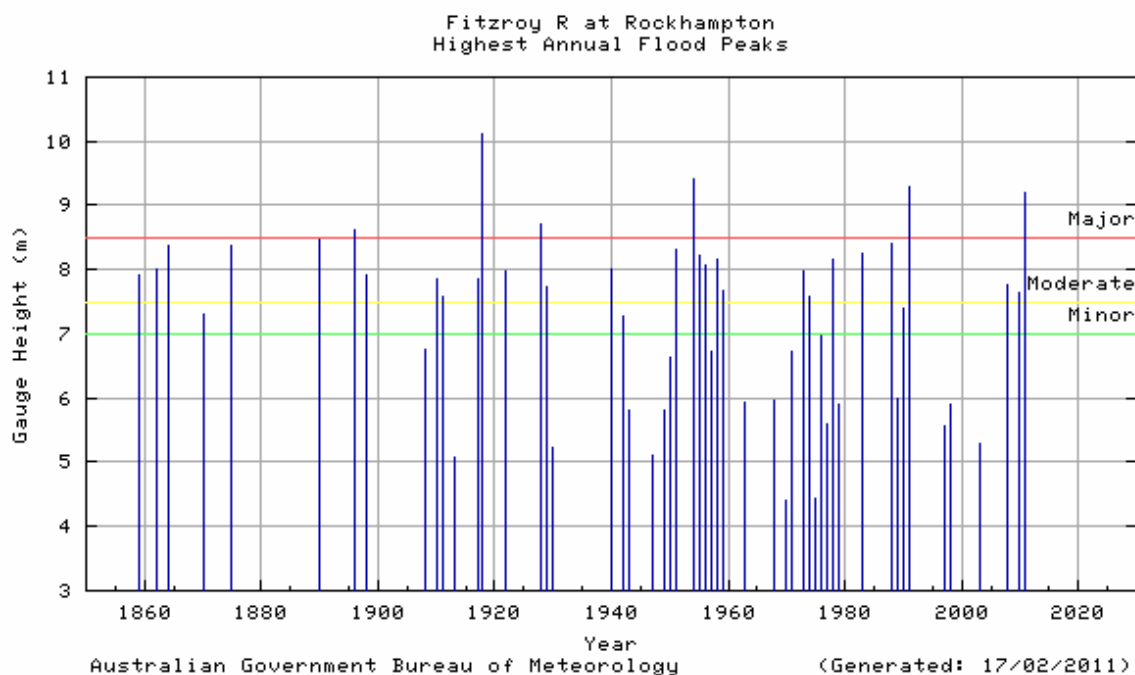


Figure 5. Highest annual flood peaks for the Fitzroy River at Rockhampton

## Warning and Forecast Service

- The first warning issued for the Fitzroy River that included references to expected river height rises at Rockhampton was issued on 04/12/2010. Warnings then continued for the catchment throughout the month, finalising on 17/01/2011 following the major flood peak at Rockhampton.
- This period of warnings included the moderate flood peak at Rockhampton in December and the major flood peak at Rockhampton in January 2011.
- A total of 86 warnings were issued for the Fitzroy River system during December 2010 and January 2011 that referred to river rises and flooding at Rockhampton.

**Table 3. Table of peak height predictions for Rockhampton**

Time of Height Forecast	Forecast	Peak
<b>04/12/2010 First warning issued referencing flooding at Rockhampton.</b>		
11:06 AM on Saturday the 4th of December 2010	Slow river rises will also continue at Rockhampton during next week and possibly reach near the minor flood level of 7 metres by the end of next week.	Rising limb forecasts – reach a level and expected to continue rising
11:11 AM on Sunday the 5th of December 2010	Possibly reach near the minor flood level of 7 metres by next weekend 11-12 December.	
10:25 AM on Monday the 6th of December 2010	Reach the minor flood level of 7 metres by this weekend	
10:13 AM on Tuesday the 7th of December 2010	Exceed the minor flood level of 7 metres during this weekend.	
10:27 AM on Wednesday the 8th of December 2010	Exceed the minor flood level of 7 metres during this weekend and reach 7.8 metres early next week with further rises possible.	
11:19 AM on Monday the 13th of December 2010*	Peak up to 7.8 metres late this week. Levels remaining above 7 metres into next week.	
9:28 AM on Tuesday the 14th of December 2010	Reach up to 7.8 metres late this week. Levels remaining above 7 metres into next week.	
10:53 AM on Wednesday the 15th of December 2010	The Fitzroy River at Rockhampton is expected to peak up to 7.8 metres during the next 24 hours. Once a peak has been observed, river levels will fall very slowly and will remain above the minor flood level of 7 metres until at least 21/12/10.	7.65 metres at 05:30 AM Thur 16/12/2010
10:49 AM on Thursday the 23rd of December 2010	River levels will rise again over the weekend and through next week	Rising limb forecasts – reach a level and expected to continue rising
12:21 PM on Saturday the 25th of December 2010	River levels at Rockhampton will rise again to around the 7 metres mark by late next week.	
5:19 PM on Sunday the 26th of December 2010	Remain around at least the 7 metre minor flood level during this week, with possible higher levels later in the week and during the New Year weekend	
1:25 PM on Monday the 27th of December 2010	Reach at 7.5 metres (moderate) later this week.	
7:06 AM on Tuesday the 28th of December 2010	Reach 8 metres later this week and continue rising. Major flood levels (8.5 metres) possible early next week.	
4:21 PM on Wednesday the 29th of December 2010	Reach 8 metres (moderate) later this week and continue rising. Reach 8.5 metres (major) late in the weekend.	
9:50 AM on Thursday the 30th of December 2010	Reach 9 metres on Sunday morning with further rises. Reach about 9.4 metres by Tuesday with possible further rises.	
8:11 PM on Friday the 31st of December 2010	Reach 9 metres by Monday with further rises. Reach up to 9.4 metres by Wednesday with possible further rises.	
6:41 AM on Monday the 3rd of January 2011	Peak up to 9.4 metres on Wednesday, remaining above 8.5 metres for 1 week after the peak.	9.2 metres at 3:15 PM Tue

6:25 AM on Wednesday the 5th of January 2011	Further small rises above 9.2 metres are expected during today. Remain above 8.5 metres for 1 week after the peak which is expected to last for at least 36 hours.	04/01/2011
6:47 PM on Wednesday the 5th of January 2011	Remain around the current peak level overnight. Remain above 8.5 metres (major) for 1 week after the peak.	

**Note:** This table does not include all forecasts issued during these flood events.