

CASE STUDY: Townsville Floods, 1998

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Ex Tropical cyclone *Sid* crossed the Peninsula from the Gulf and intensified to a severe monsoon low near Townsville. Townsville recorded 549 mm of rain in the 24 hr period to 2300 UTC on the 10th. Included in this period was 120.6 mm in one hour and 205.2 mm in two hours. A man was drowned when his car was washed off a creek crossing in Townsville. In Townsville around 100 residences had substantial over floor flooding with hundreds more sustaining property flooding. Numerous cars were damaged by flooding, and up to 50% of the houses in Townsville lost power at some stage. Damages to local Government infrastructure were high. On Magnetic Island a huge landslide caused major damage to a tourist complex. The small communities of Black River and Bluewater suffered extensive damage from flash flooding. Flooding impacted on 48 houses with the majority rendered uninhabitable 14 were totally destroyed with 8 washed away. One hundred houses experienced over floor flooding in Halifax and Ingham. There was also extensive damage to the rural sector.

Wave action and storm surge inflicted severe damage and erosion to coastal areas around Townsville with damage from these effects quoted as reaching \$19 million (1998 dollars). The sea reached a level just below the highest astronomical tide (HAT) at 2221 UTC 10 January and the Townsville wave recording station recorded waves with significant wave heights of 2.93 metres and peak heights of 5.41 metres at 0500 UTC 10th Jan. Seven vessels sunk in Townsville Harbour. The total damage bill was well in excess of \$100 million (1998 dollars).

MSL development

At 0500 UTC 9 January 1998 (top left Figure 1), the low was overland west of Cairns with the dashed line marking the location of the monsoon trough which crossed the coast just to the north of Cooktown. By 1100 UTC, the monsoon trough was near Cairns and rapidly moving southwards to a band of developing strong winds. By 1700 UTC 9 January 1998, the monsoon trough merged with this band of strong winds and the heavy rains began to develop in the zone just south of the monsoon trough. The low then remained very slow moving just to the north of Townsville for the 24 hours after 2300 UTC 9 January 1998. This kept the Townsville area in the zone of heavy rain over this period.

Rainfall

Thus intense record rain fell in the Townsville area during the 24 hour period ending 2300 UTC 10 January 1998. Table 1 shows a rainfall intensity-frequency analyses at the Townsville Meteorological Office during this period. The distribution of the 24 hour rainfall totals in the Townsville area (Figure 2) show rainfall exceeding 200 mm extended over a very large area with the peak total 743mm.

Flooding

Herbert River Flooding

- Nash's Crossing 10.5metres at 8am 10 January Major Flood (record);
- 15.76m Abergowrie 5.20pm 10 January Major Flood;
- 17.2m Abergowrie Bridge 3pm 10 January Major Flood;
- 14.2m Peacock Siding 10 January Major Flood (record);
- 15.65m Ingham 3pm 10 January Major Flood;
- 12.3m Gairloch 3pm 10 January Major Flood;
- 5.42m Halifax 9pm 10 January Major Flood (Record).

Haughton River

- 5.75m Mt Picaninny 2pm 11 January Major Flood;
- 9.72m Powerline 0000am 12 January Major Flood;
- 2.72m Giru 8pm 11 January Major Flood (Record).

Burdekin River

- 20.15m Sellheim 6pm 11 January Major Flood;

Townsville area Flooding

- Record Flash Flood Townsville, one man drowned, 100 houses with substantial over floor flooding, hundreds more suffered property flooding. Numerous cars flooded;
- Bluewater Creek 9.7m 8pm 10 January (2.55m above next highest flood) 40 houses were seriously damaged;
- Black River 9.38m 9.30pm 10 January (1.13m above next highest flood) majority of 48 damaged houses were rendered uninhabitable, 14 were totally destroyed and 8 were washed away;
- Mt Bohle 8.23m 2am 11 January (0.68m above next highest);
- Ross River 2.72m 1.30am 13 January (0.66metres above next highest).

Wave and storm surge damage

Wind observations in Figure 3 show the long fetch of 30 to 30knots mean winds between the edge of the reef and Townsville on 10 January 1998 which resulted in very large waves impacting on Townsville.

Table 1. Rainfall amounts and duration at the Townsville Meteorological Office.

Duration	Rainfall (mm)	Period ending
6 minutes	17	0943 UTC 10 January 1998
12 minutes	33.4	0949 UTC 10 January 1998
18 minutes	49.4	0950 UTC 10 January 1998
30 minutes	75.4	0957 UTC 10 January 1998
1 hour	131	1016 UTC 10 January 1998
2 hours	212	1049 UTC 10 January 1998
3 hours	253	1125 UTC 10 January 1998
6 hours	361	1423 UTC 10 January 1998
12 hours	482	2013 UTC 10 January 1998
24 hours	564	0008 UTC 11 January 1998

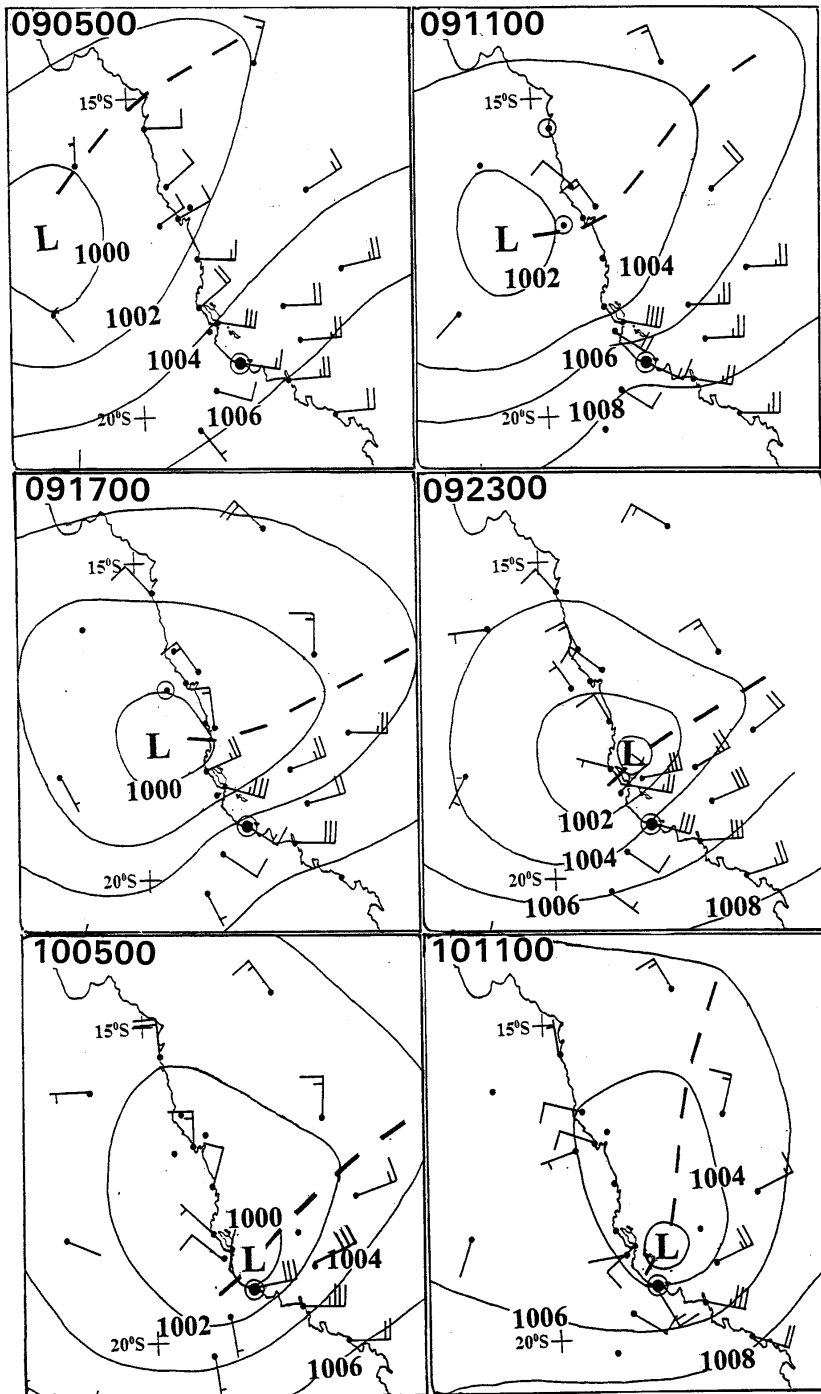


Figure 1 MSL pressure distribution (hPa) and wind observations in the Townsville and Cairns area from 0500 UTC 9 January 1998 (denoted by date time group on panel 090500) to 1100 UTC 10 January 1998 (101100).

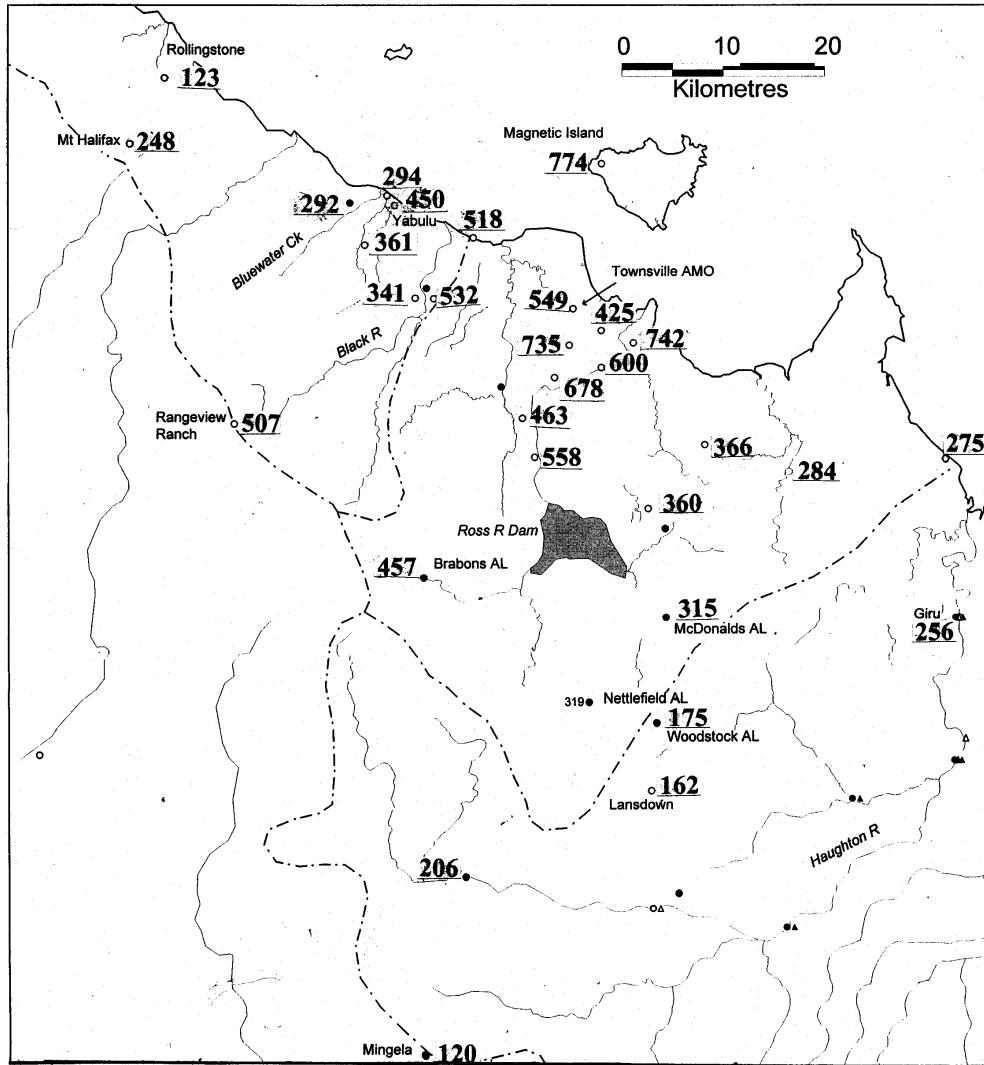


Figure 2 Twenty four 24 hour rainfall distribution (mm) near Townsville in northeast Australia for the period ending 2300 UTC 10 January 1998.

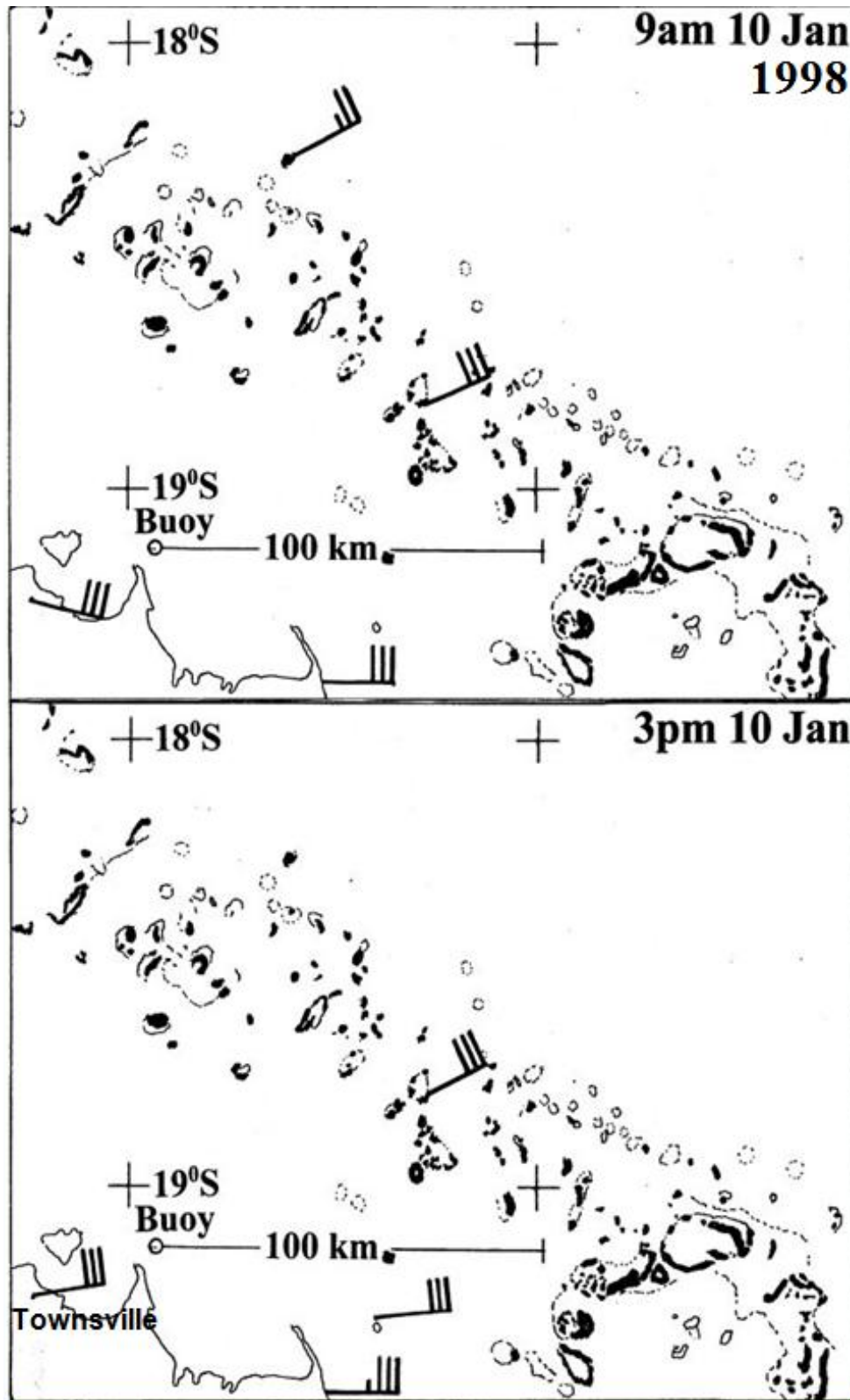


Figure 3. Wind observations showing the long fetch of 30 to 30 knots mean winds between the edge of the reef and Townsville on 10 January 1998.