

FACT SHEET Tropical cyclone Larry

Summary

On Monday 20 March 2006 severe tropical cyclone Larry crossed the Queensland coast near Innisfail (see figure 1). The Bureau of Meteorology had issued Top Priority cyclone advices for coastal communities between Cape Tribulation and Ingham.

- Category 5 cyclone with predicted central pressure of 915hPa forecast by the Bureau of Meteorology.
- Very large significant wave heights recorded at a number of north Queensland locations (table 1).
- 2.3m storm surge recorded at Clump Point.
- Reports of only minor erosion damage to beaches.
- Storm tide flooding recorded in the Clump Point-Mission Beach area.

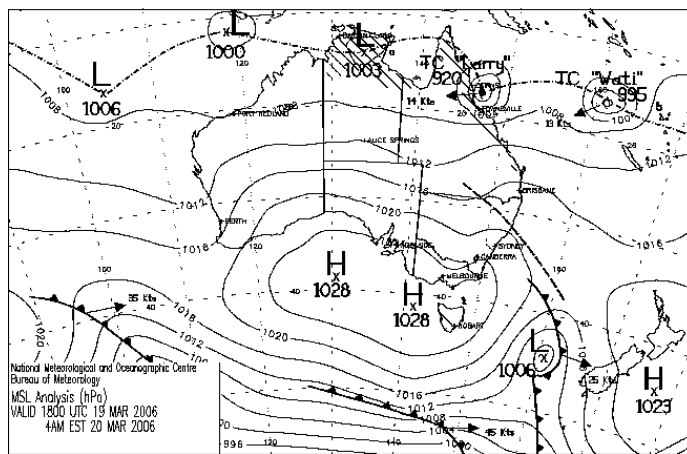


Figure 1 – TC Larry, 20 March 2006 (courtesy of BoM, copyright Commonwealth of Australia reproduced with permission)

Wave recording

The EPA operates a network of wave monitoring stations along the Queensland coastline. Sites at Mackay, Townsville and Cairns were monitored during this event (figure 2).

Peak wave conditions recorded at these stations are shown table 1.

Table 1 – Recorded significant wave heights*

Site	Hsig (m)	Time / Date	Rank
Mackay	3.2	21/03/2006 21:00	13
Townsville	2.9	20/03/2006 08:00	3
Cairns	1.4	20/03/2006 09:00	12

* See glossary

Table 2 shows the maximum individual wave heights (Hmax) recorded at these stations during the event.

Table 2 – Maximum recorded individual wave heights*

Site	Hmax (m)	Time / Date	Rank
Mackay	6.8	19/03/2006 19:00	5
Townsville	5.3	20/03/2006 08:00	3
Cairns	2.7	20/03/2006 10:00	14

* See glossary

Plots of wave heights and periods from the Mackay, Townsville and Cairns wave recording stations are shown in figures 3–5. Peak wave directions are also shown for Mackay. The peak maximum individual wave height (6.8m Hmax at Mackay) during this event is the fifth largest recorded by the EPA at this site since recordings commenced there in November 1977.

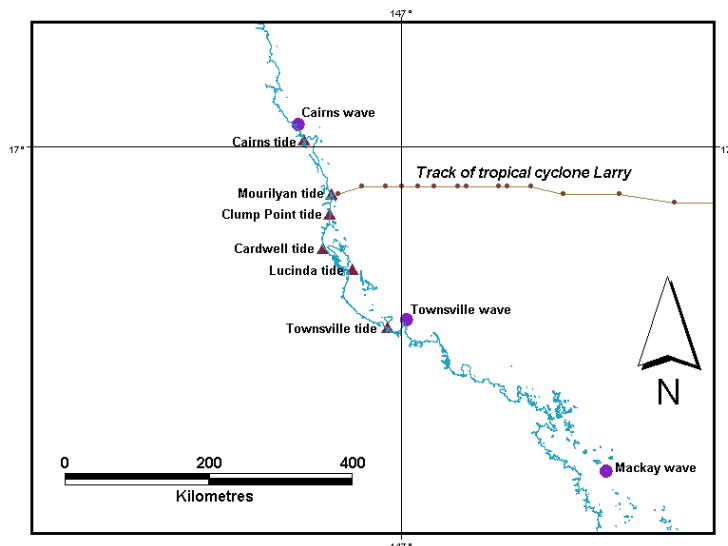


Figure 2 – Wave and tide sites

Tide recording

The EPA operates a storm tide system (comprising 22 tide gauges along the Queensland coastline). This allows real-time access to tide data via the public telephone network during events to monitor the effects of coastal flooding from tidal surge.

For this event, tide data was obtained from the Townsville, Lucinda, Cardwell, Clump Point, Mourilyan and Cairns gauges (see figure 2). Plots of the records from these sites are shown in figures 6–11.

Table 3 shows a list of the maximum surge values recorded at each of the above storm tide gauges.

Table 3 – Recorded surge heights

Site	Date & time	Surge (m)	Exceeded HAT
Townsville	20/03/2006 10:00	0.77	No
Lucinda	20/03/2006 08:00	0.86	No
Cardwell	20/03/2006 08:10	1.76	Equal
Clump Point	20/03/2006 07:00	2.30	Yes
Mourilyan	20/03/2006 07:30	1.34	No
Cairns	20/03/2006 09:00	0.51	No

EPA Web Sites

During the event, the following EPA wave and tide web sites were updated at regular intervals:

www.epa.qld.gov.au/waves

www.epa.qld.gov.au/tides

Glossary

Hsig The significant wave height (in metres), defined as the average of the highest one third of the zero up-crossing wave heights in a 26.6-minute wave record. This wave height closely approximates the value a person would observe by eye.

Significant wave heights are the values reported by the Bureau of Meteorology in their forecasts.

Hmax The maximum zero up-crossing wave height (in metres) in a 26.6-minute record.

Tz The average of the zero up-crossing wave periods (in seconds) in a wave record.

Tp Wave period at the peak spectral energy (in seconds). This is an indication of the wave period of those waves that are producing the most energy in a wave record. Depending on the value of T_p , waves could either be caused by local wind fields (sea) or have come from distant storms and have moved away from their source of generation (swell).

Direction The direction that peak wave period (T_p) waves are coming from (in ° Magnetic). In other words, where the waves with the most wave energy in a wave record are coming from.

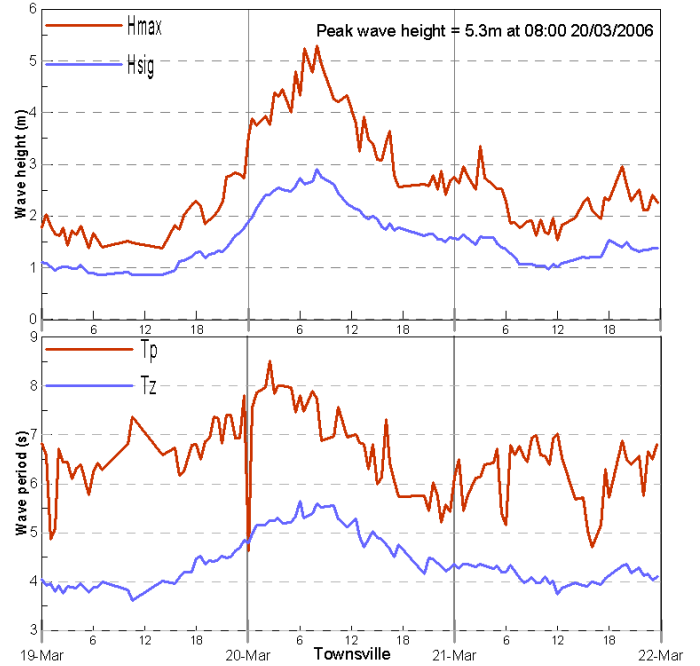


Figure 4 - Townsville wave data 19-21 March 2006

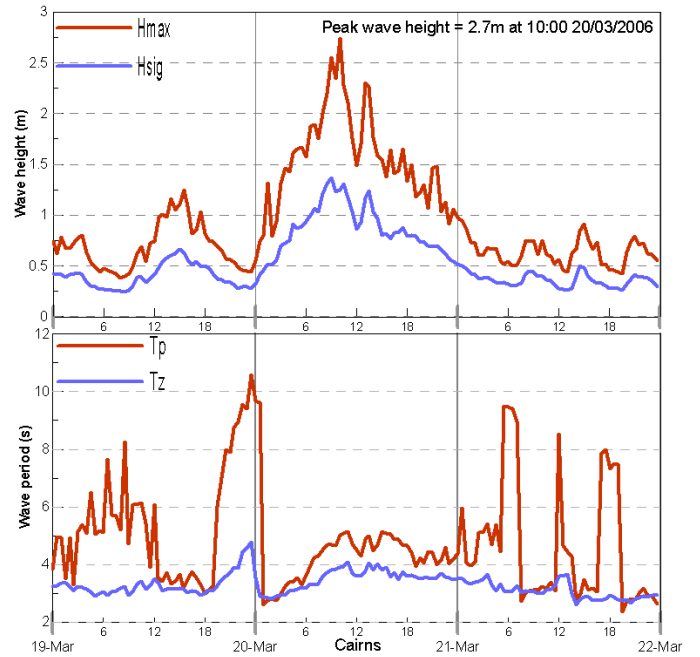


Figure 5 - Cairns wave data 19-21 March 2006

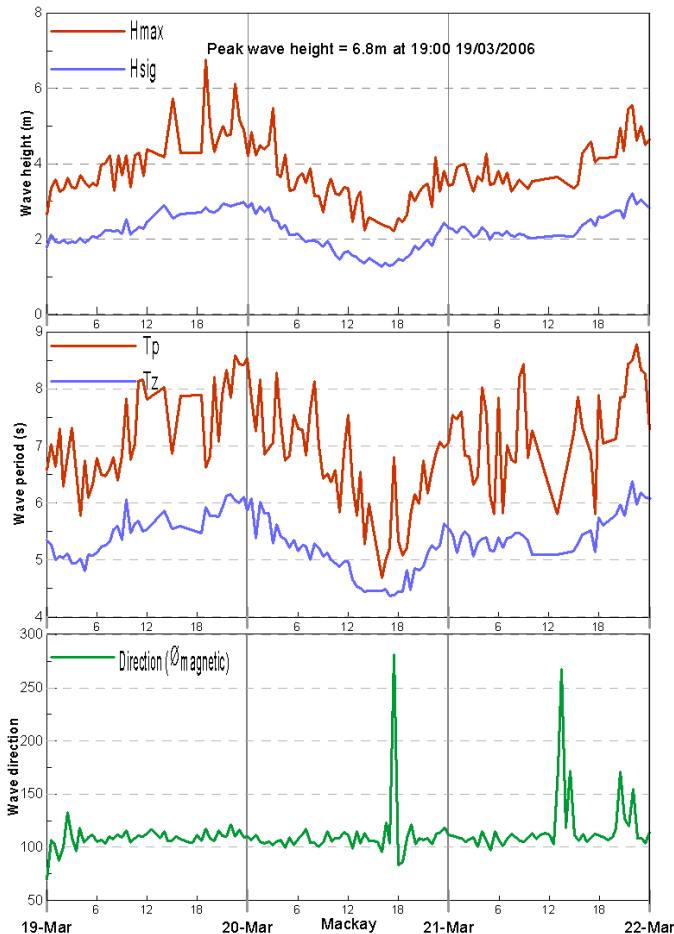


Figure 3 - Mackay wave data 19-21 March 2006

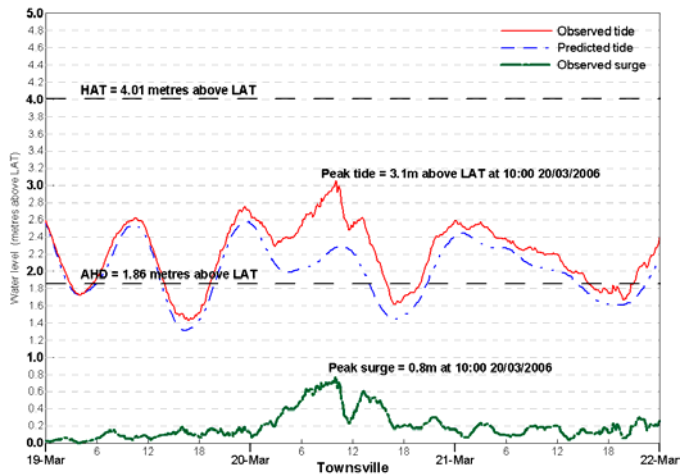


Figure 6 – Tides at Townsville 19–21 March 2006

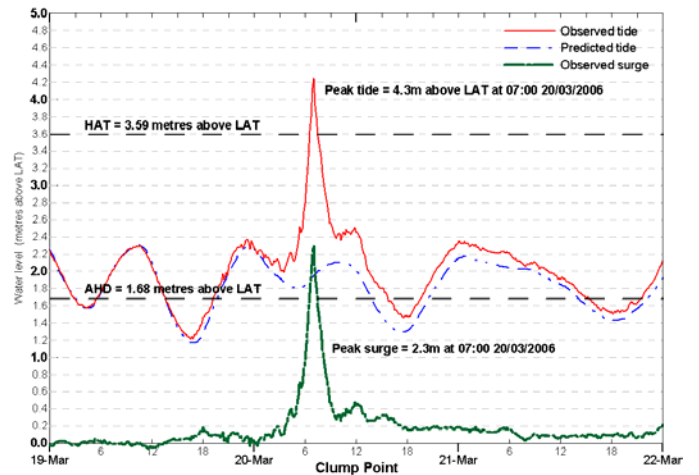


Figure 9 – Tides at Clump Point 19–21 March 2006

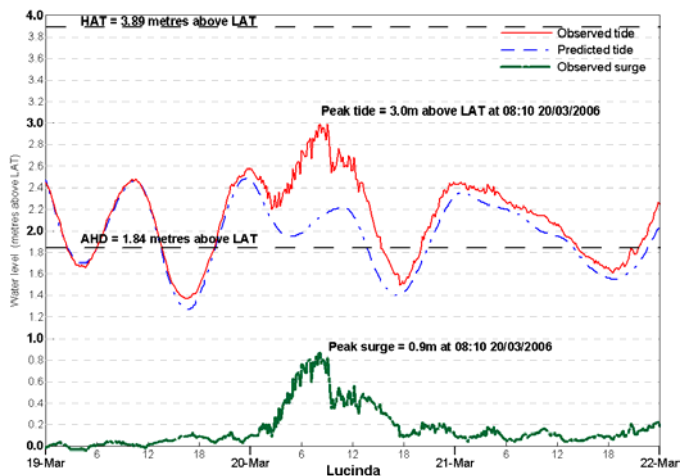


Figure 7 – Tides at Lucinda 19–21 March 2006

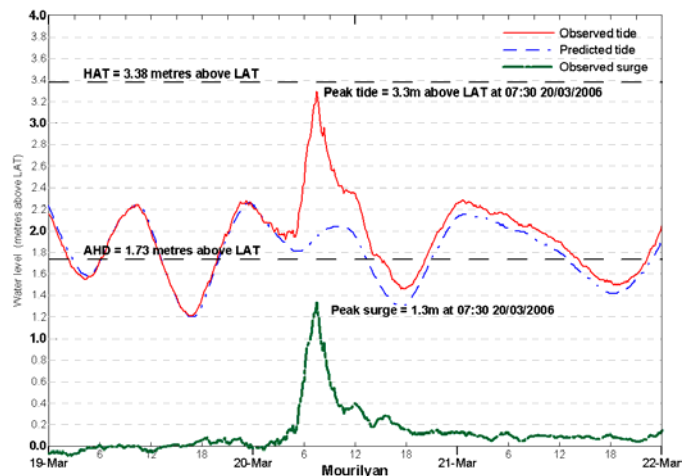


Figure 10 – Tides at Mourilyan 19–21 March 2006

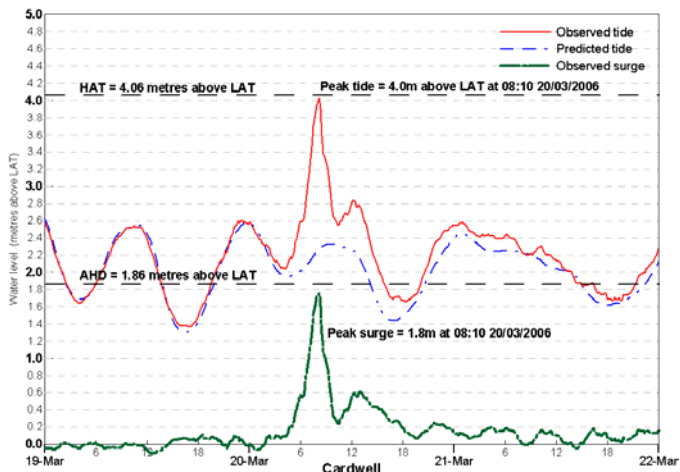


Figure 8 – Tides at Cardwell 19–21 March 2006

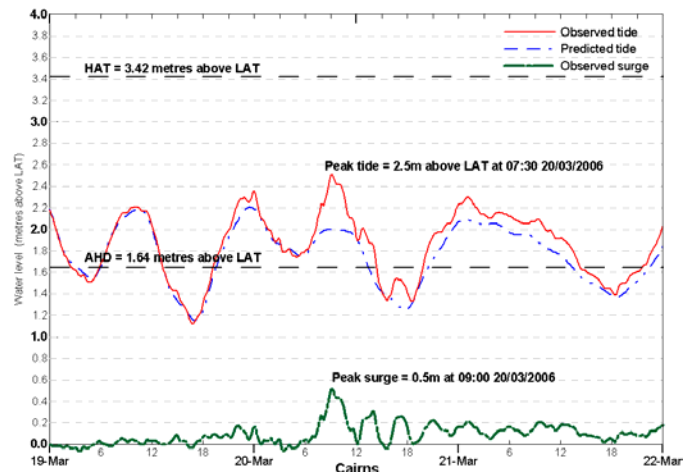


Figure 11 – Tides at Cairns 19–21 March 2006



Figure 12 – Extensive tree damage at Kurrimine Beach