

## ARCHIVE: Major Storm Surge Events, South Eastern Gulf of Carpentaria, 1887-1987

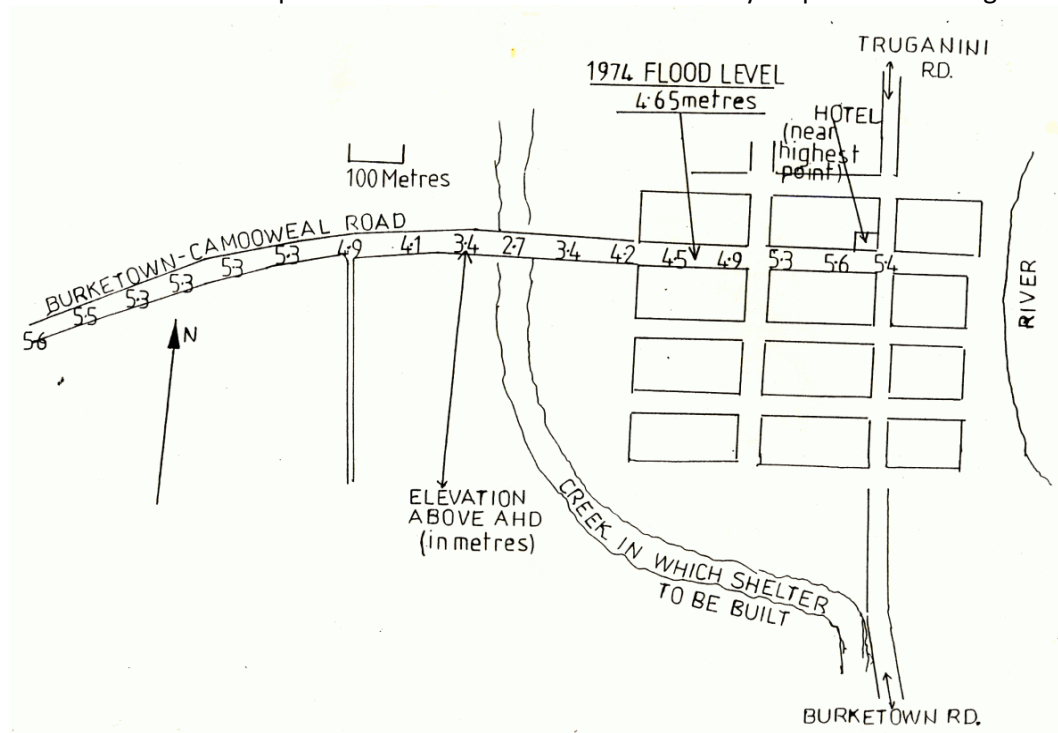
*The 1887 cyclone, David (1976), Jason (1987) and The 1948 Bentinck Island cyclone*

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### *The 1887 cyclone 5 Mar 1887*

From all reports the storm surge from the disastrous 1887 cyclone flooded almost all of Burketown. Only the highest part of town, which we understand to be near the hotel, escaped the waters from the Gulf. A copy of a 1918 report to the Queensland Parliament from the Department of Harbours and Rivers Engineer is held in this office. This report refers to the sea rising to 5.5 metres above the highest spring tide level at the Albert River Heads during the 1887 event. This level is about 8 metres above Australian Height Datum (AHD). Seven people out of a population of 138 died in the cyclone. Storm force winds commenced at 11 am from the SE and backed to the E and the NE increasing in violence until 10 pm when virtually the whole of Burketown was devastated. The storm surge arrived at 7pm. From a 1979 Main Roads survey map the high point is near the hotel at Burketown at 5.6 metres above AHD. A plan of the town drawn from this survey map is shown in Figure 1.

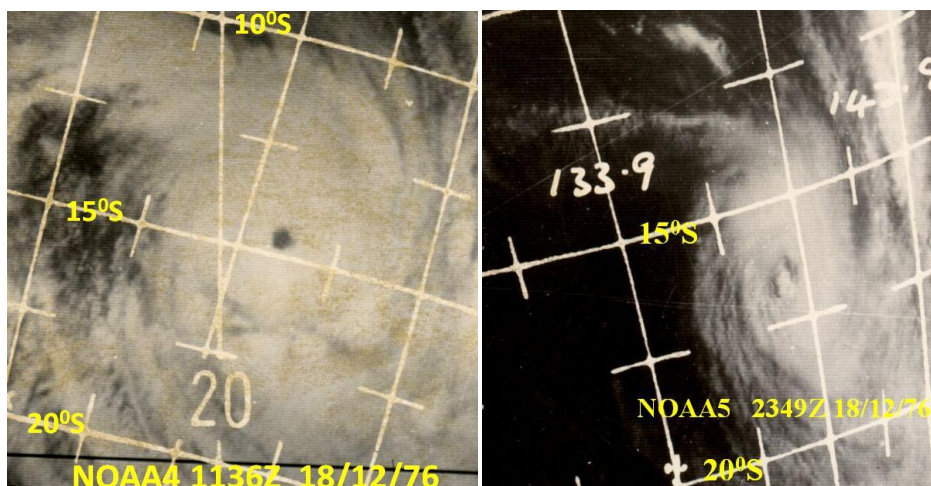


**Figure 1** A plan of Burketown with Department of Main Roads surveyed elevations shown. Tropical cyclone *Ted* 19 December 1976

The last significant storm surge near Burketown was associated with tropical cyclone *Ted* just before Christmas in 1976. Reportedly the surge from this event extended 20 km inland where it piled mangroves and logs 2 to 3 metres high and badly damaged the Truganini wharf just out of town. Right in Burketown our observer reported that the tide "came higher than any normal flood". We understand that normally under flood conditions the low point on the Burketown- Camooweal Road (2.7 metres AHD in Figure 1) is covered by water. We have assumed that the surge from *Ted* also covered the road at this point.

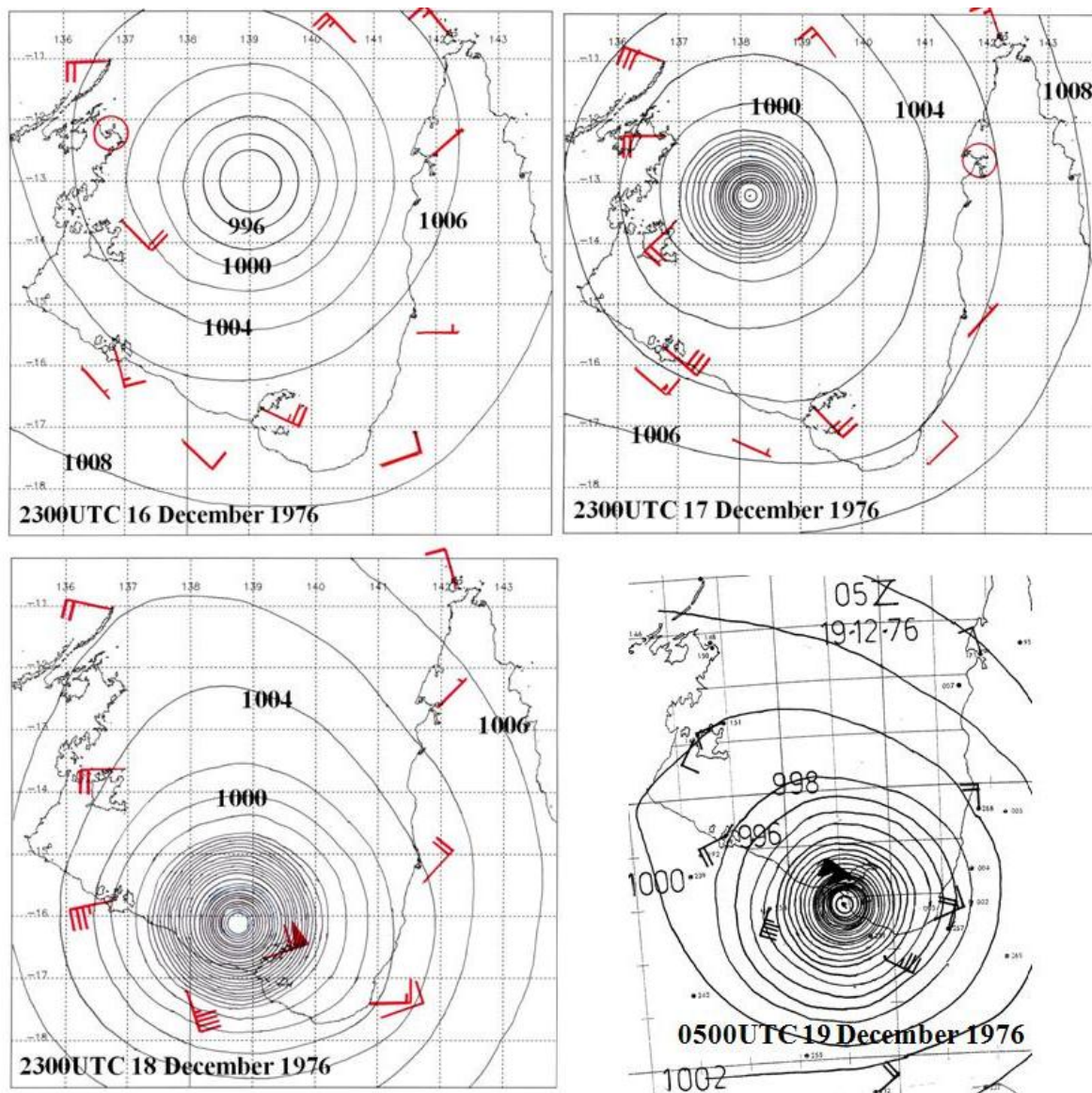
*Ted* passed directly over Burketown during the evening of 19 December 1976 and the town experienced the calm winds inside the eye between 7.15 pm and 8.50 pm. Immediately before the period of calm the wind was blowing from a north-northeast direction. The strongest winds occur in tropical cyclones just outside the calm eye and north-northeasterly winds blow at right angles to the open coast near Burketown. Such intense winds normal to the coast generate the larger storm surges and the major contribution to the inundation around Burketown would have developed around 7pm that evening. Our records show that the high tide at Karumba (the standard tide port for the southeast Gulf region) that evening was at 7pm. The nearest secondary tide port is Sweers Island which lies 40 km off the open coast north of Burketown. High tide at Sweers Island occurs 20 minutes before Karumba so the inundation near Burketown would have been developing just after high tide. The predicted high tide at Karumba that evening was 3.3 metres which is one of the smaller peak tides to be experienced there. The highest tides in the southeast Gulf coincide with maximum lunar declination when they average 3.7 metres at Karumba. The highest tide expected at Karumba under average meteorological conditions is 4.75 metres. Obviously the tide adds to the storm surge effect so the inundation accompanying *Ted* could have been worse if it coincided with one of these higher tides.

Meteorological factors also make *Ted* a somewhat less than extreme storm surge event. *Ted* passed to the west of Mornington Island before making landfall near Bayley Point. It then moved southeastwards towards Burketown. Fortunately this was a track which reduced its efficiency in generating storm surge. Additionally satellite photographs indicated it was weakened as it approached landfall (Figure 2). It is not unusual for tropical cyclones in the Gulf of Carpentaria to intensify right up to the time of landfall. It largely depends on the type of weather systems in the upper atmosphere passing across Central Australia at the time. Additionally some of these cyclones have approached the Southern Gulf Coast from the north-northeast. This direction of approach would produce the worst storm surge in the Burketown region.



**Figure 2** Satellite imagery of *Ted* with a clear compact eye some 18 hours before reaching Burketown (left frame) only to have a ragged eye shortly before landfall (right frame).

Data by J. Callaghan 22 August 2011



**Figure 3** Mean sea level analysis with some wind observations for the period 2300UTC 16 December 1976 to 0500UTC 19 December 1976.

*Ted* crossed the coast near Mornington Island (Figure 3) and passed directly over Burketown where a central pressure of 950 hPa was recorded (Figures 4 and 5). Damage in its path was almost total. Mornington Islands 700 inhabitants were rendered homeless with 95% of its buildings damaged and Burketown was similarly affected. A large storm surge accompanied the cyclone and it extended 20 km inland near Burketown where logs were piled 2-3 m high and a small wharf was destroyed. Tides at Karumba were 2 metres above normal and badly damaged the wharf and prawn processing installations. Magowra Station (SW of Normanton) reported that the sea came 30 km inland. Extensive flooding and wind damage occurred in stations inland from Burketown. The hurricane force winds extended a long way inland, for example Cowan Downs near the Burke and Wills Roadhouse had out buildings unroofed, windows blown out of the main building, telephone posts bent to ground level and trees 4 feet in diameter snapped. Livestock losses caused by drowning and low temperatures were estimated to be 250,000.



Figure 4 Track of Ted through the Gulf Country with detail of damage.

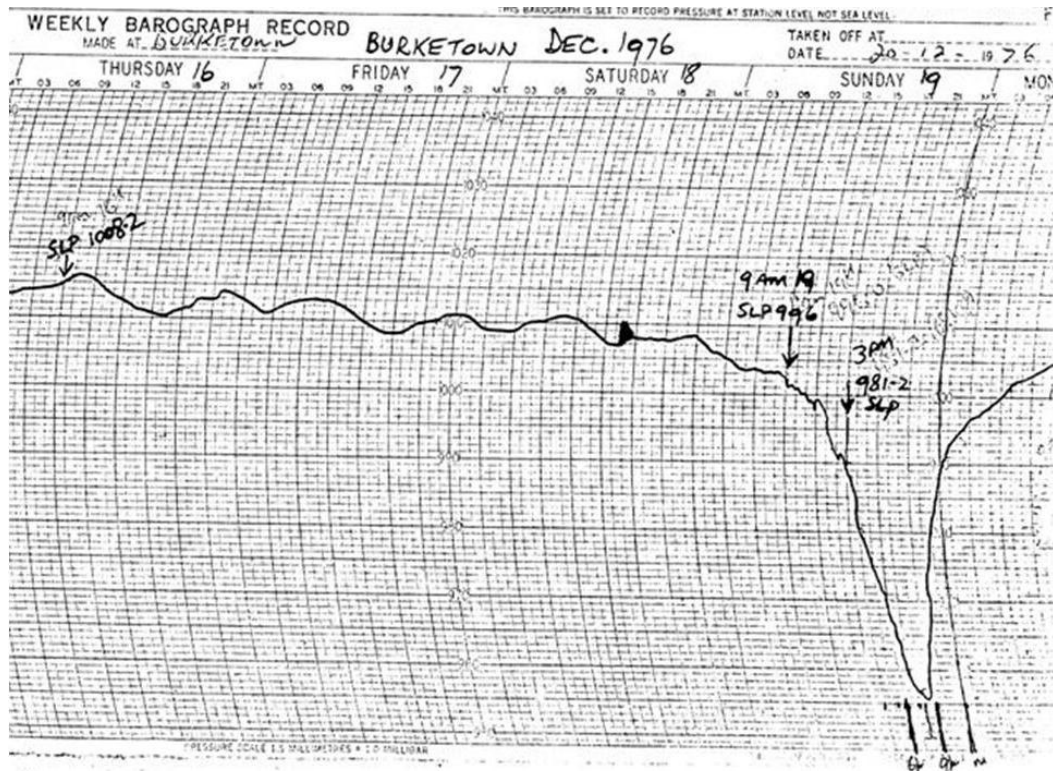
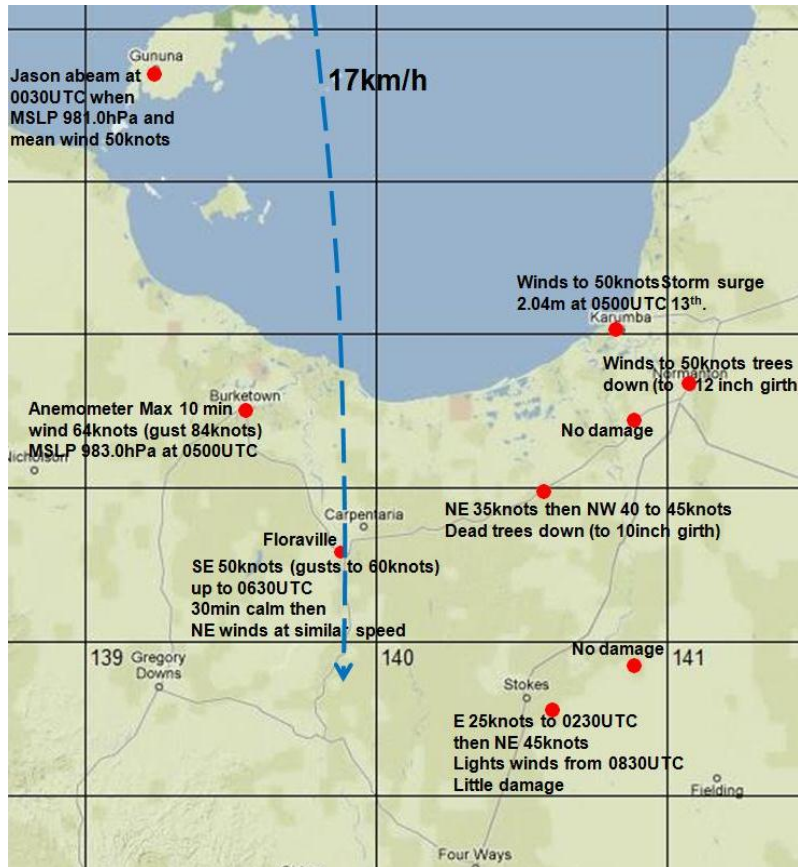


Figure 5 Barograph at Burketown.

**Tropical cyclone Jason, 6-14 February 1987**

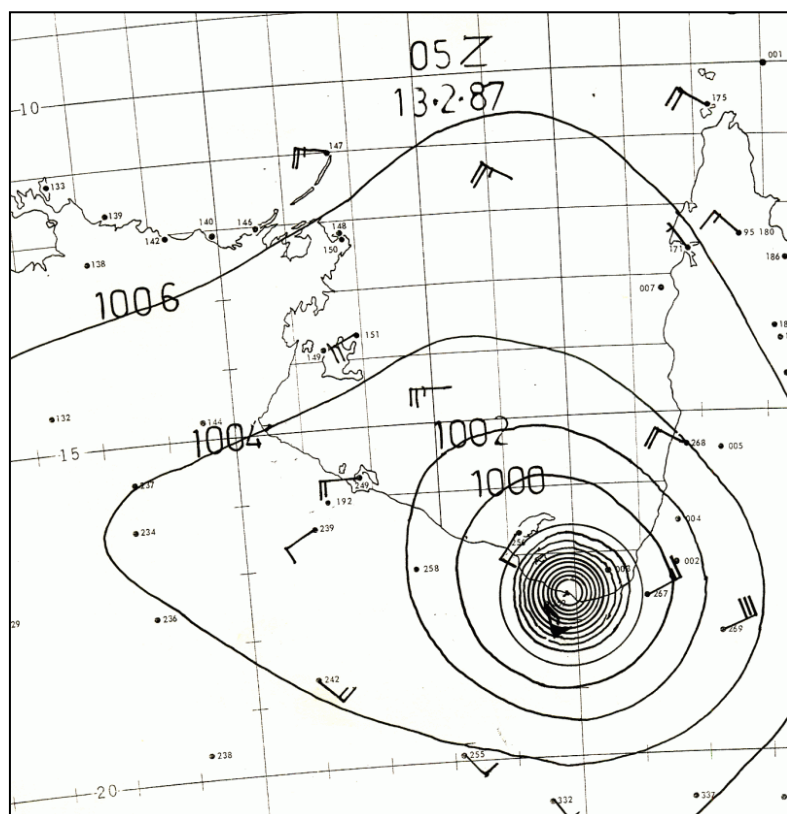
Jason 13 Feb crossed the Qld coast about 40 km ENE of Burketown (Figures 6 and 7)). An anemometer at Burketown (Figure 8) recorded a 10 minute average wind of 64 knots with gusts to 85 knots (from the SSE).



The cyclone was moving S at 17 km/hr (6 knots) so that winds on the eastern side of the cyclone were stronger. Lowest pressure at Burketown (Figure 8) was 983 hPa at 3pm 13th (at the time of the strongest winds). The bar dropped to 981 hPa (10 min max wind 50 knots) at Mornington Island. There was structural damage at Burketown and Mornington Island and tree damage throughout the SE Gulf Country. A 2.04 metre storm surge was measured at Karumba at 0500 UTC 13th. The maximum storm tide was 4.7 metres (lowest astronomical tide datum) at 0700 UTC which was 0.11 metres above highest astronomical tide.

**Figure 6** Track of Jason through the Gulf Country with details of impact.

**Figure 7** Mean sea level analysis with some wind observations for 0500UTC 13 February 1987



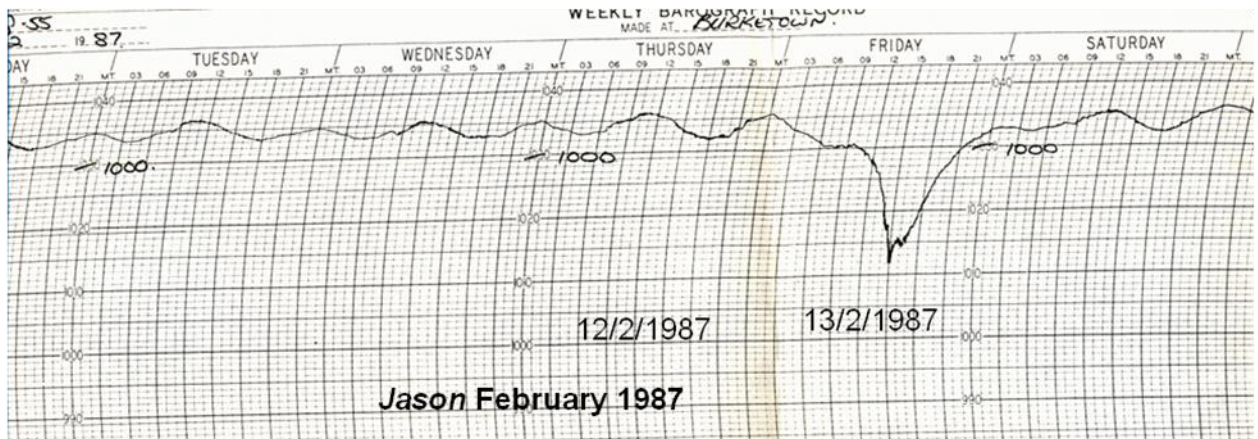
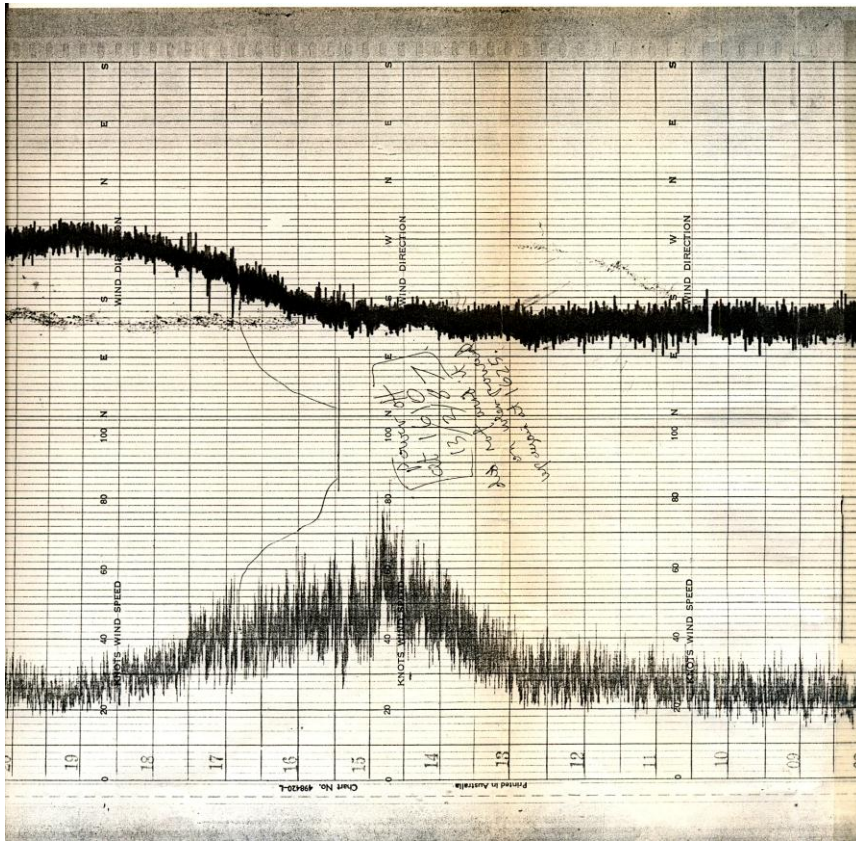
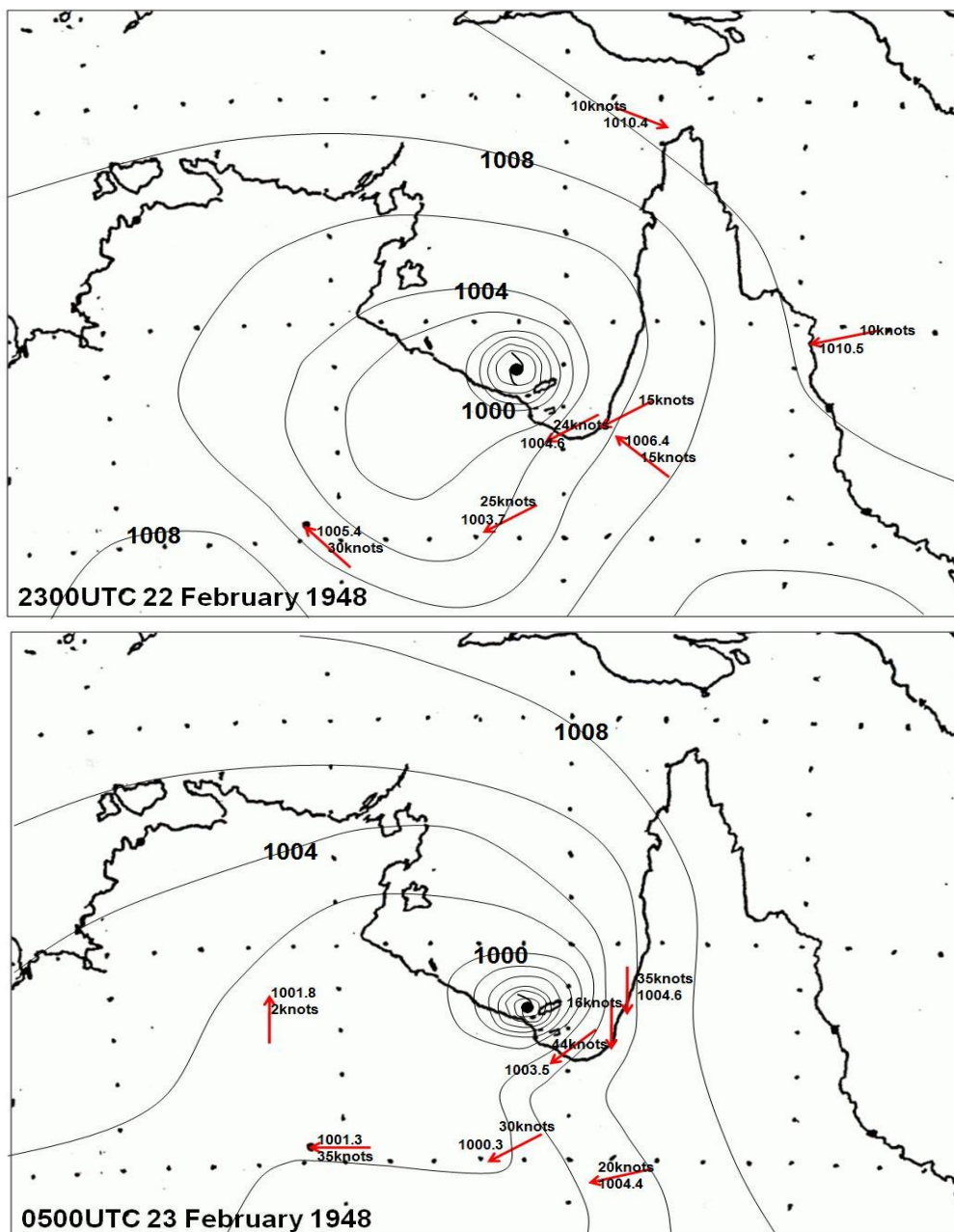


Figure 8 Anemometer and barograph charts for Jason at Burketown.

### ***The 1948 Bentinck Island cyclone***

This cyclone moved from the Groote Eylandt area and made landfall just to the west of Mornington Island (Figure 9). Aborigines described a storm surge covering all but the highest parts of Bentinck Island. The water deeply covered places where they were accustomed to live and where they obtained their water. This caused wells and springs to go salty and eventually the inhabitants were forced to abandon the Island. It was later estimated that on Mornington Island the rise in sea water was 12 feet above the highest normal tide mark. On Mornington Island the surge caused large eucalypts to die and had caused a change in vegetation to salt loving species in some areas. It was assessed that the water on Bentinck Island also rose 12 feet above high water. After landfall, the town of Borroloola was badly damaged. The hotel was wrecked and a number of other buildings were destroyed.



**Figure 9** Mean sea level analysis with some wind observations for the period 2300UTC 22 February 1948 to 0500UTC 23 February 1948. Reliable pressure analyses down to 1000hPa.