CASE STUDY: The Bathhurst Bay Hurricane, March 1899

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The Bathurst Bay hurricane of Sunday 5 March 1899 is the worst known natural disaster, in terms of loss of human lives, in Australian European history. In all more than 307 lives were lost from the effects of a severe tropical cyclone. Detailed accounts of this event can be found in Outridge (1899), Whittingham (1958, 1959 and 1963) and Holthouse (1986).

Impact

The search steamer *White Star* reached Hannah Islands (see location Map Figure 1) on Friday 10 March and searched the area. They found that between Hannah Islands and Bewick Island everything in the shape of trees and grass had been swept clean and marked the impact zone of the hurricane. In the salvage operations it was found that all the boats discovered close to the shore had their masts carried away just above the decks . From this it would appear that the boats had been rolled over and over along the bottom. The force of the waves must have been tremendous to turn the boats over and over and it is fortunate that the bottom of the sea at that place was composed of mud, otherwise the boats would have been chafed to pieces. Walking along the shore southwest from Cape Melville there was much evidence of damage. About 2 miles from the Cape the wreckage was most plentiful and in some cases a quarter of a mile inland from the seashore.

Losses

5 large vessels totally lost – 2 wrecked but refloated – 1 dismasted; 35 diving boats totally lost; 19 swimming boats totally lost; 12 diving boats refloated; 307 lives lost from the Pearling fleet.
Some aboriginals from a camp near Cape Melville (see location map in Figure 1) were assisiting shipwrecked men out of the water. It was stated Outridge that "A change of wind or a sudden gust swept down around the hills and blew the natives into the water. They struggled hard but were unable to reach land and were drowned." It would more likely be the effects of a large wave running up the beach and then retreating back out to sea. It was also stated in Outridge that that there were no bush natives near Cape Melville or Bathurst Bay at the time of the disaster. Therefore some reports of large numbers of aboriginals being swept out to sea may be inaccurate. However there may have been some casualties in the surrounding country due to fallen trees.

Storm surge

Constable J.M. Kenny in charge of the Eight Mile Police Station Cooktown went to Barrow Point (see Figure 1) to investigate a crime and the account from Outridge was as follows:
Shortly after the wind shifted to northeasterly at 5am (Sunday 5 March) an immense tidal wave swept inshore and reached waist deep on the ridge with the camp on it . Kenny estimated that the camp was 40 feet above sea level and a half a mile from the beach. Here the wave stretched between two and three miles inland. Later they found dead fish of all kinds were piled up including porpoises , sharks , dugong, sea snakes land birds and wallabies were found hundreds of yards inland.

From Whittingham 1959
"At Flinders island searchers found thirteen dead porpoises fifty feet up a cliff hurled there by wind and waves."

Height of the surge

Many numerical simulations of storm surge have been carried out for 914 hPa cyclones striking the Bathurst Bay area. These results were obtained using the Australian Real-Time System for forecasting tropical cyclone storm surges (Hubbert et al 1991). However, no large surge was produced by the model. The bathymetry in the region is not conducive to large storm surges and from Figure 1 it can be seen that the area is extremely close to the Great Barrier Reef (20 to 40 km). On the eastern side of the Reef there is a rapidly shelving ocean floor.

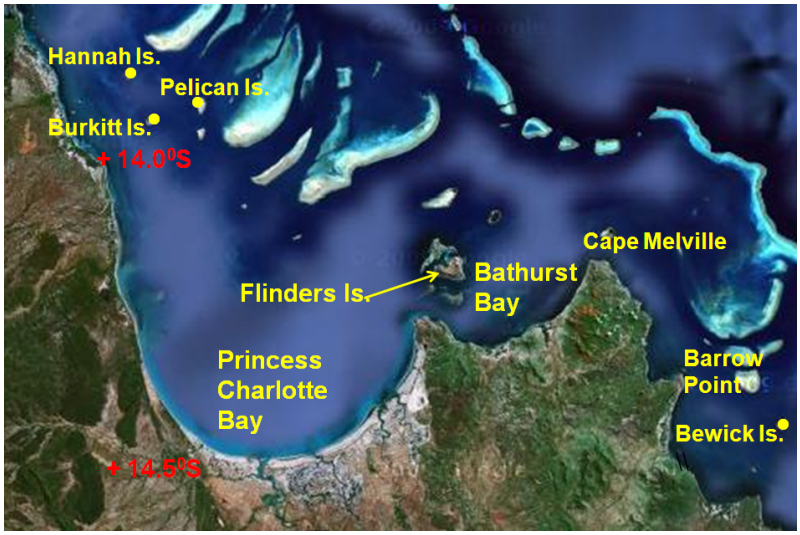

Figure 1 Location Map.

Antecedent Weather

Queensland Government Meteorologist, Clement Wragge, analyzed a tropical disturbance which he code-named *Mahina*. The reasons for his suspicions of a disturbance in the Coral Sea would have come from the observations of monsoon northwesterly winds on Cape York and southeast winds further south (Figure 2) signifying the location of the monsoon trough south of Cape York. Additionally lightning to the east of Thursday Island (just off Cape York) was very active and continuous to the east on the 2 and 3 March and again on the evening of the 4th although now much closer. With hindsight we place the position of *Mahina* much closer to the coast in Figure 2 for reasons given below. Clement Wragge in his explanation of the name *Mahina* stated "*Mahina* is a girl's name, culled from fair Tahiti with is coral strand, waving palm groves and mountain peaks, the loveliest of all the lovely islands in the wide Pacific, and mothers will agree that no infant daughter can bear a softer or prettier name."

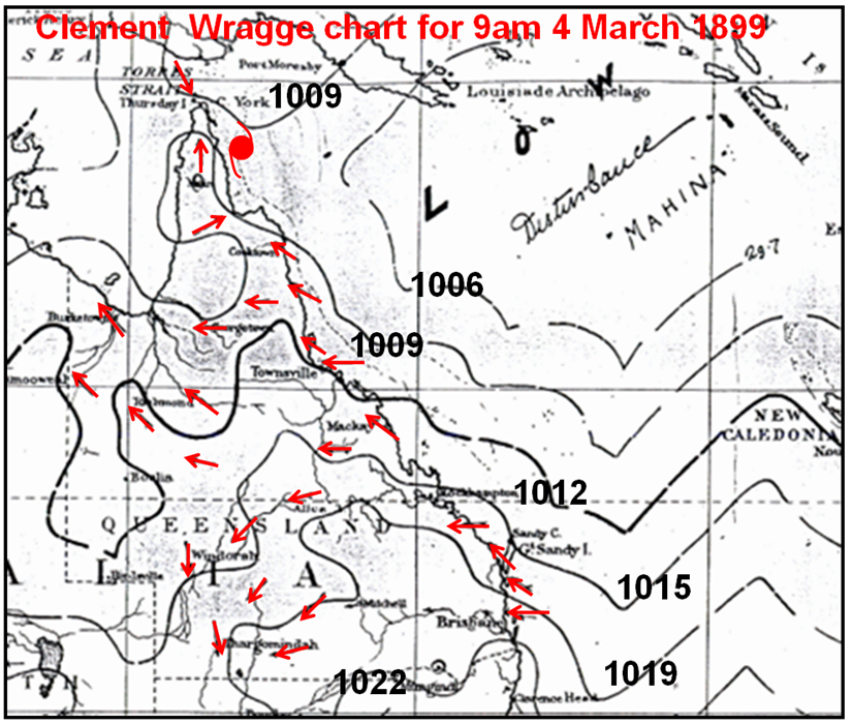

Figure 2 Clement Wragge's isobaric chart for 9am Saturday 4 March 1899 with wind direction from weather observations highlighted in red for clarity. The possible actual location of the disturbance *Mahina* is denoted by the red cyclone symbol.

Possible track of *Mahina*

In reconstructing the track of *Mahina* we took note of the observations from the vessels northwest of Princess Charlotte compared with those at Bathurst Bay and the recollections of Constable Kenny at Barrow Point.

Northwest of Princess Charlotte Bay

Schooners *Tarawa* 124tons with 15 luggers 4 totally wrecked others damaged –no lives lost.
Schooner *Meg Merrilees* 143 tonswith 14 luggers – 4 luggers totally lost. 9 men drowned.
Schooner *Olive* 92 tons 14 luggers one sunk but raised later.
Schooner Aladdin 102 tons with 14 luggers (one lost).

Observation
Meg Merrilees anchored a mile to the east of Pelican Island on Saturday afternoon:
7pm Saturday moderate easterly change to southeasterly and increased in force, working to the southwest at midnight and from then to daylight working from west to northwest and blowing with hurricane force all the time. AT 3am large waves stuck it and washed away the whole boat . The schooner dragged her annchors for 10 miles until grouded at 6am.

Olive anchored at 6pm Saturday to the north of Burkitt Island:
The gale started from the southeast and at 10pm the bar was 1002hPa and fell rapidly to 985hPa. The wind then changed and blew hurricane force from the southwest and at daylight veered around to the west still blowing stiffly and finally died away at 10am from the northwest. It dragged both anchors round to the southeast side of the island.

Bathurst Bay

- Schooner *Sagitta* 84 tons 10 luggers. Sagitta lost with crew of twenty. 4 luggers totally lost 6 luggers wrecked but refloated. 55 lives lost

- Schooner *Silvery Wave* 98tons 11 luggers totally lost. 4 luggers lost but refloated. - she possesed excelllent ground tackle and may have been the cause of her loss as the boats that survived were dragged into deeper water by the southeasterlies ahead of the hurricane. Had she drifted out to sea in the southerlies she may have been saved. When the wind changed to northwesterly she was in 3 fathoms of water and had no chance as there was a clear 20 mile fetch to the northwest. 110 lives lost.
- The small schooner yacht 25 tons *Admiral* foundered . 5 lives lost.
- The Channel Rock Lightship owned by the Queensland Government was anshored 2 milesnorthwest of Cape Melville. 1 lugger totally lost. 9 lives lost
- The Schooner *Crest of the wave* 112tons. Survived. 10 luggers totally lost- 2 luggers wrecked but reloated. 88 lives lost
- 19 swimming boats, cutters and small luggers totally lost with 30 lives lost.

Observations
The Schooner *Crest of the wave* anchored in Bathurst bay on the lee side of Cape Melville:
At sunset light rain southeast winds bar 1002hPa- between 11pm and midnight the wind began to increase and the bar began to fall. The wind continuing to rapidly increase in force from the southeast. The anchors began to drag and the full length of chain was given out and she reached six fathoms. The other anchor was let go but the vessel continued to drive before the increasing gale. The bar dropped to 914hPa at 4.40am with a lulll of 10 to 15 minutes when the wind suddenly came from the nortwest with such terrific force that the schooner was thrown on her beam ends.

Summary
It can be argued that the cyclone was approaching Bathurst Bay from the north. To simulate this movement the positions leading up to the storm surge are plotted in Figure 3. The concentric circles surrounding the cyclone positions are arbitrary isobars to help to indicate the cyclonic flow around the cyclone.

The latitude position at midnight was derived from the fact that the wind reported from two schooners near Pelican Island and veered from south-easterly to south-westerly around this time and the wind from the reports appeared to be stronger earlier in the night at Pelican Island than it was at Bathurst Bay. The *Crest of the Wave* in Bathurst Bay reported that the wind only began to increase between 11pm and midnight whereas *Olive* near Pelican Island reported that the gales began at 10pm.

This northerly track would also be more likely to bring large waves into Bathurst Bay and Barrow Point as from Figures 1 and 3 there is more open water northwest of Cape Melville inside the reef and the largest breaks in the reef are north of Cape Melville. Indeed in Outridge (1899) it was stated that when the winds turned northwesterly in Bathurst Bay large waves hit the fleet due to the large stretch of open water to the northwest and this caused most of the damage. The cyclone then tracked towards the Gulf where Burketown reported SE winds averaging 60 knots on the 7 March 1899.

Central Pressure of *Mahina*.
Ian Townsend, an Australian Broadcasting Commission journalist in Brisbane spent 12 months researching *Mahina* following which he wrote a critically aclaimed novel (*The Devils Eye*) based around the events of Tropical Cyclone *Mahina*. The official central pressure of *Mahina* was always thought to be 27 inches (914 hPa) as this is what was reported by Captain Porter on *The Crest of the Wave* who kept measurements of the ships barometer through the event. He survived the event and his pearling schooner experienced the eye whilst anchored in Bathurst Bay. The Outridge Report was

compiled a short time after the event and in it there is an account of Captain Porter stating that the glass fell to 27 inches just before they experienced the eye. But this account was not actually written by Porter. He apparently supplied these to someone else.

Ian Townsend, however, has uncovered a letter written by Captain Porter and in this letter he states that the barometer dropped to 26 inches during Mahina. Porter wrote the letter to his parents in Auckland a short while after the event and they sent it to the NZ Herald where it was published in full (copies of this arcticle are available).

Ian Townsend has also uncovered an account in the Courier Mail (Brisbane's main daily newspaper) some days after the event where a Captain Craig who was in charge of a steamer that picked up Captain Porter in Townsville and transported him to Brisbane following Mahina. Captain Craig states that Capt Porter told him that the glass fell to 26 inches but Captain Craig found it hard to believe that any pressure could get that low as the lowest he had ever heard of was 27.3 inches in a typhoon in the South China Sea (Craig apparently had spent much time in the South China Sea as a mariner). So there appears to be two accounts now of Captain Porter reporting that the barometer had fallen to 26 inches (880 hPa) and one of which was written by Porter himself.

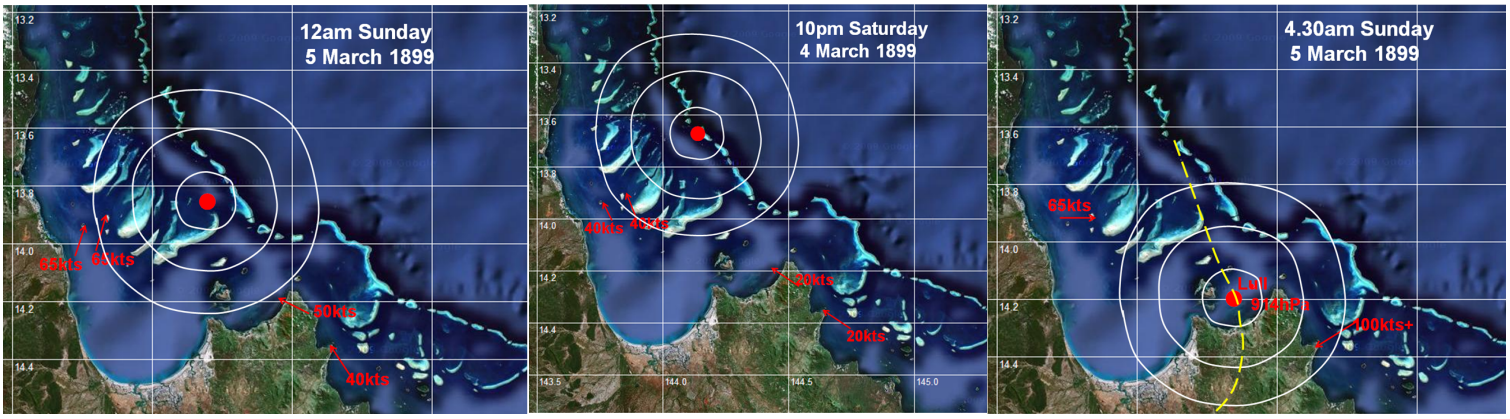

Figure 4 Arbitrary isobars and positions of *Mahina* from 10pm 4 march 1899 to 4.40am 5 March 1899.

REFERENCES

Outridge (1899) The Pearling Disaster 1899. A Memorial. Queensland: Outridge Printing Co. 398 Queen Steet Brisbane 1899.

Holthouse, H. 1986: "Cyclone". Angus and Robertson 193 pages.
Hubbert, G. D.,Holland,G.J.,Leslie,L.M. and Manton, M.M. 1991: A Real-Time System for Forecasting Tropical Cyclone Storm Surges. Weather and Forecasting, American Met. Soc. Vol. 6, pp 86-97.
Whittingham, H.E. 1958: The Bathurst Bay Hurricane and associated storm surge. Aust. Met. Mag., 23, 14-36.
Whittingham, H.E. 1959: Storm surges along the Queensland Coast. Aust. Met. Mag., 27, 40-41.
Whittingham, H.E. 1963: The Bathurst Bay Hurricane. Aust. Met. Mag., 42, 57.