CASE STUDY: Tropical Cyclone Ada, 1970

By Mr Jeff Callaghan
Retired Senior Severe Weather Forecaster, Bureau of Meteorology, Brisbane

Ada was an extremely small cyclone with gales extending only about 55 km from the centre. At 1100 UTC on 17 January 1970 the Mackay radar showed that *Ada* had an eye 28 km in diameter. The eye retained this diameter for several hours and then contracted to a diameter of 18 km by 1700 UTC. Over the period of contraction, the eye came only 13 km closer to the radar, suggesting that the contraction was real and not a manifestation of less attenuation of the radar signal, or the radar beam being directed at a significantly lower part of the eye. In Figure 1 the rapid formation of an incomplete radar eye to a circular radar eye between 1237UTC 17 January 1970 (left) to 1330UTC 17 January 1970 is shown. Satellite imagery prior to this was rather innocuous (Bureau of Meteorology 1973) and no warnings had been issued for this system during 16 January 1970. Stimulus for issuing warnings for *Ada* came when it passed near Marion Reef AWS at 1400UTC 16 January 1970 and a fifty knot mean wind was reported. A large scale mean sea level analyses sequence is shown in Figure 2 which illustrates is small size and the rapid intensification near the coast.

At 1700 UTC 17 January 1970 *Ada* was located over the Whitsunday Islands, the major island tourist destination in Australia. Notice the comparatively high pressure less than 100 km away (Figure 3) and the small area of gales.

At 1500 UTC on 17 January 1970 the radar centre of *Ada* was 9 km east of Hayman Island and the radar eye diameter was 22 km. The cyclone was 126 km away from the radar which was set at zero elevation with the centre of the radar beam directed at 1 km elevation at that range. Without instrumentation, observers at Hayman Island estimated that the wind was around 50 m/s at 1430 UTC and this wind strength was maintained for at least 2 hours. There, the lowest pressure was 976 hPa at 1500 UTC at a time when the island was 2 km inside the radar eye and close to the radius of maximum winds. Around 1730 UTC the centre of *Ada* came closest (about 8 km) to Dent Island whose lowest pressure was 965 hPa and the eye diameter was 20 km. On the mainland the coastal town of Airlie Beach recorded a minimum pressure of 962 hPa. The radar centre was 5 km from the town at 1930 UTC when it had an eye diameter of 22 km. The radar eye diameter was at a minimum of 20 km between 1630 UTC and 1830 UTC and from the above data it appears that the cyclone reached a minimum central pressure of around 960 hPa during this period.

As no instrumented wind observations were available in the vicinity of *Ada* the effects of the wind must be examined to gauge its intensity. In 1970 the coastal area which *Ada* passed through contained no large urban centre and was mostly farming or forest country (see Figure 4). After its passage, the trees that were not blown over were stripped of all foliage and bark. Even today pilots maintain you can still see the track from the new growth tree effects. The eye passed over nearby South Molle Island where almost all accommodation cabins were destroyed and one lady was killed in her cabin and her companion badly injured. The then state of the art Daydream Island resort (West Molle in Figure 4) was virtually destroyed (see Courier Mail photo in Figure 5). On Hayman Island two thirds of the accommodation cabins were unroofed with extensive damage to buildings. The cyclone's left front maximum wind zone passed directly over the Palm Bay resort on Long Island

just before reaching the mainland. This resort was almost totally demolished, only isolated huts remained intact. Shute Harbour is the point of embarkation for the Whitsunday Island and in those days consisted of a modern motel and a few houses. The eye passed directly over these and afterwards it looked like a city dump with the motel and houses torn apart. The main coastal centre in the region is Airlie Beach and from an Army Engineering Report the town was wrecked with 85% of the houses destroyed. As *Ada* weakened overland it passed to the south of Proserpine where 40 % of the buildings were unroofed or damaged. In all fourteen lives were lost with the passage of *Ada*.

We have interviewed Post Master General Department (forerunner of Telstra) Officers who were employee in the restoration of telephone lines in both Townsville post *Althea* and the Whitsunday area post *Ada.* They assertively stated that the tree damage associated with *Ada* was much worse than that caused by *Althea*. Given that Townsville experienced wind gust in excess of 106 knots we conclude that gusts with *Ada* may have reached 120knots or more and therefore reached category 4 intensity.

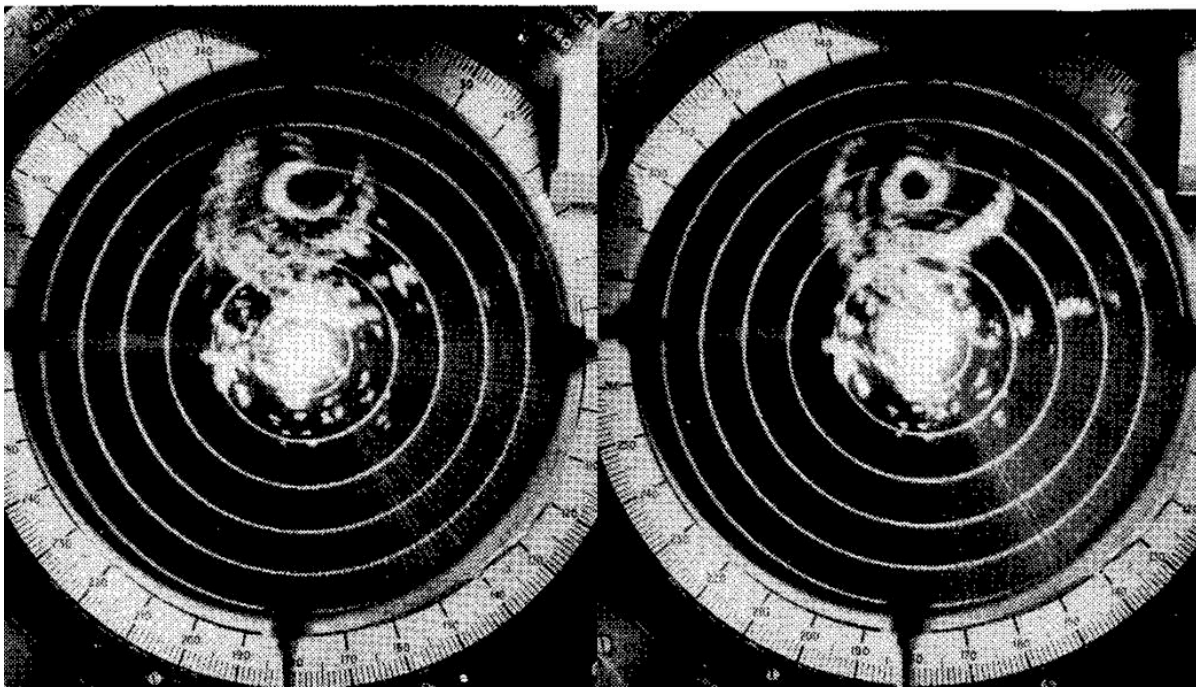

Figure 1 Radar eye rapidly forming from 1237UTC 17 January 1970 (left) to 1330UTC 17 January 1970 (right)

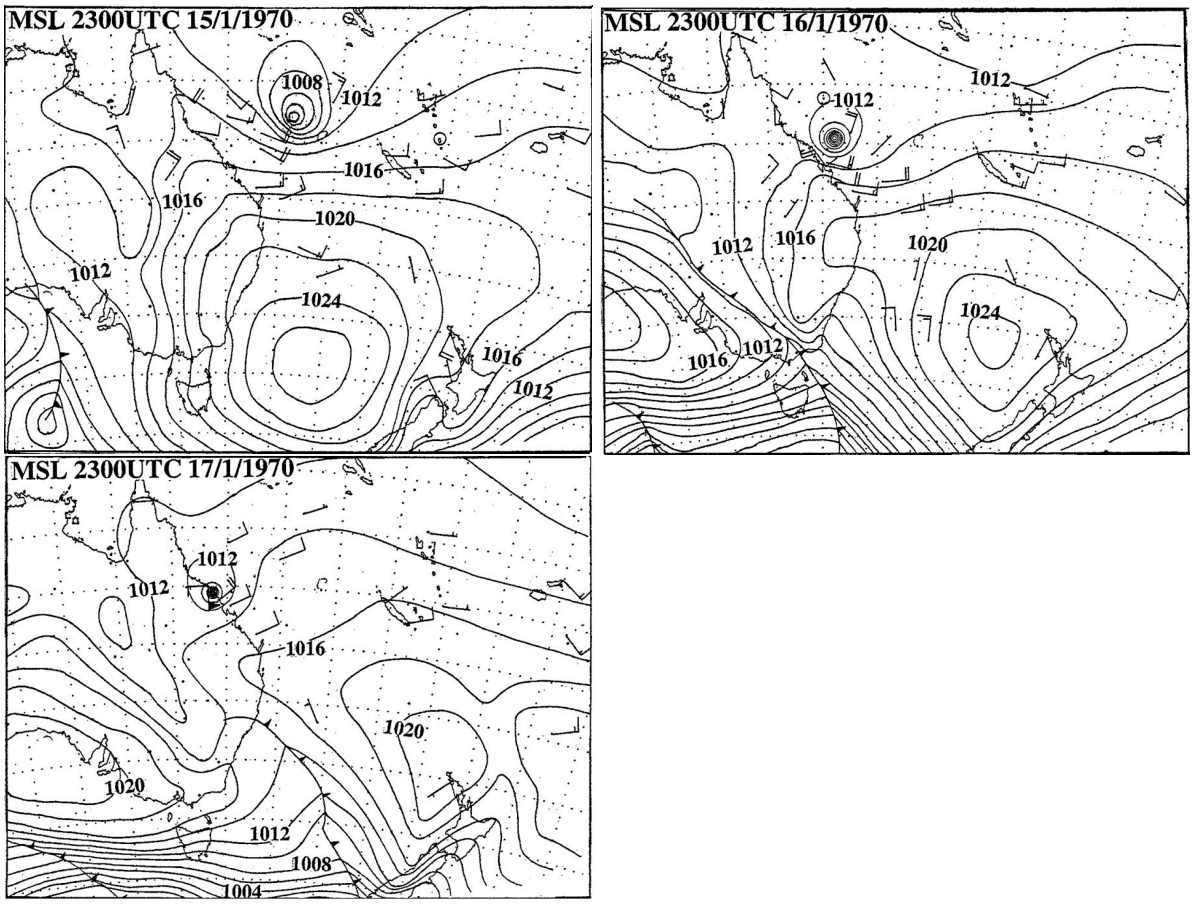

Figure 2 Mean sea level analyses of *Ada* approaching land fall

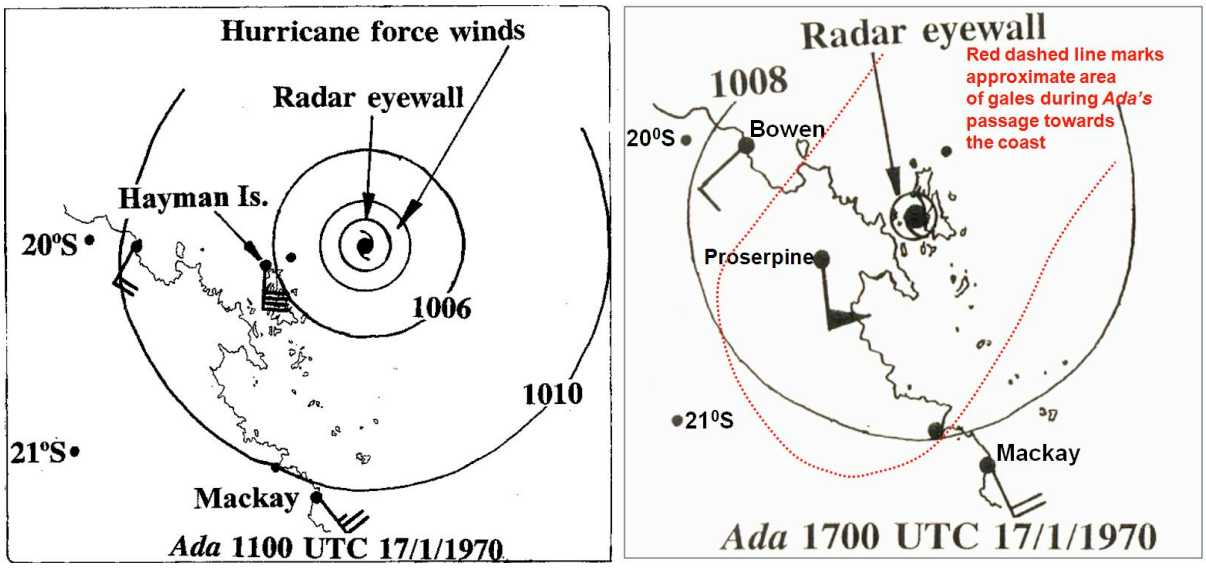

Figure 3 Mean sea level analyses of *Ada* moving into the Whitsunday Islands.

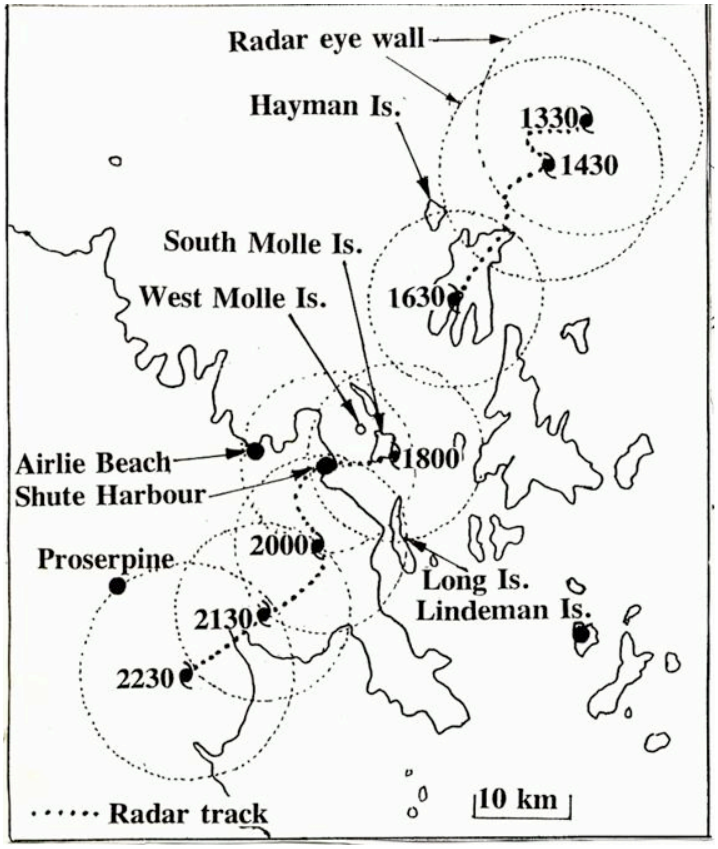

Figure 4 Radar track of *Ada* through the Whitsunday islands showing the eye size as determined from Mackay radar imagery.

Figure 5 Photograph of West Molle Island after *Ada* from the Courier Mail with their following caption "Most of the resort on Daydream Island was destroyed, as the picture shows, when a deadly cyclone with a prosaic name hit the Whitsundays."