



Australian Government
Bureau of Meteorology

Tropical Cyclone *Adeline*

1 – 5 April 2005

Perth Tropical Cyclone Warning Centre
Bureau of Meteorology

A. Summary

Tropical cyclone *Adeline* developed west of Christmas Islands and moved to the west southwest passing to the south of Cocos Islands overnight from the 3rd to the 4th. It reached category 3 intensity as it moved steadily on that track passing west of 90°E late on 5 April when it was renamed *Juliet* by La Reunion RSMC. It continued to develop into an intense tropical cyclone before eventually weakening on 13 April.

Warnings were issued for the Cocos Islands where gales were briefly reported and a daily rainfall total of 160mm was registered. Only minor damage was recorded on Cocos Islands.

B. Meteorological Description

Intensity

The monsoon trough became active in late March/early April associated with a Madden Julian Oscillation (MJO) pulse. A discrete low level circulation became evident on 2 April. Initially moderate easterly shear constrained development.

Quikscat at 2338 UTC 2 April showed a considerable area of rain-affected gales in western quadrants. This area included Cocos Islands but observed winds at this time were only 20 knots highlighting the overestimation of the Quikscat solution. Therefore it is debatable whether gales were occurring at this time. Tropical cyclone intensity is estimated to begin by 1200 UTC 3 April. However, the Dvorak analysis using curved band during this time is quite ambiguous. Certainly there was continuing very cold convection near the centre but just when DT increased to 3.0 is open to conjecture. The curvature of the convection on microwave appears to be less than 0.7 wrap. It is possible that gales occurred in some areas of convection prior to this time. Cocos Island pressure did fall to 997 hPa during the day indicating a more intense system than that by the conventional Dvorak analysis.

The cyclone passed to the southeast of Cocos Islands coming to within 70 kilometres at 1600 UTC 3 April. At about this time gales were recorded lasting two hours (see Fig 2.). The maximum observed wind was 43 knots gusting to 59 knots at 1530 UTC 3 April.

Visible imagery on the 4th indicated a small yet tightly wound system and despite some warming in the convection, further intensification occurred. By this time the shear minimum was only just to the south of the system. An eye emerged on microwave imagery. Overnight the system intensified more rapidly and an eye became very well defined by microwave imagery. The eye was indistinct on the concurrent IR image but was temporarily defined some five hours later. It also took some time before the eye was clear on visible imagery. During this time Adeline was in a low shear environment favourable for continued development.

Adeline passed to the west of 90°E at about 1300 UTC 5 April and intensified further reaching category 4 by 0000 UTC 6 April (Perth TCWC estimate). Figure 3 shows a small but intense circulation as it moved west of 90°E. The then renamed *Juliet* went on to become a long lived intense cyclone eventually weakening on the 12-13 April as it moved near 28°S 68°S having recurved to the southeast.

Motion

The low was steered to the southwest and then to the west under the influence of a weak mid-level ridge to the south. This ridge strengthened on the 4 and 5 April once an upper level trough had passed to the east ensuring steady westward motion.

C. Impact

There was some minor damage and many fallen trees on Cocos Islands.

D. Observations

Cocos Islands recorded a period of gales with a maximum wind gust of 109 km/h (59 knots) at 2330 WST 3 April.

Cocos Island recorded a daily rainfall total of 160 mm.

Table 1 Best track summary for TC *Adeline 2* -5 April 2005.

Note: Add 8 hours to convert to WST. Refer to best track database for complete track details.

Year	Month	Day	Hour	Latitude	Longitude	Max Wind Knots	Central Pressure hPa	Radius Gales nm
2005	4	2	0000	9.8	101.2	20	1005	
2005	4	2	0600	9.8	100.7	20	1004	
2005	4	2	1200	10.1	100.2	20	1002	
2005	4	2	1800	10.7	99.6	25	1000	
2005	4	3	0000	11.2	99.0	30	997	
2005	4	3	0600	11.9	98.2	30	995	
2005	4	3	1200	12.5	97.5	35	992	35
2005	4	3	1800	12.8	96.6	40	990	35
2005	4	4	0000	13.1	95.8	50	985	55
2005	4	4	0600	13.3	94.7	50	985	60
2005	4	4	1200	13.4	93.9	55	980	70
2005	4	4	1800	13.3	92.9	65	970	70
2005	4	5	0000	13.3	91.9	70	965	70
2005	4	5	0600	13.1	90.9	70	965	70
2005	4	5	1200	13.0	90.1	75	960	70

Figure 1. Track of Tropical Cyclone *Adeline 2* – 5 April 2005.

All times in WST.

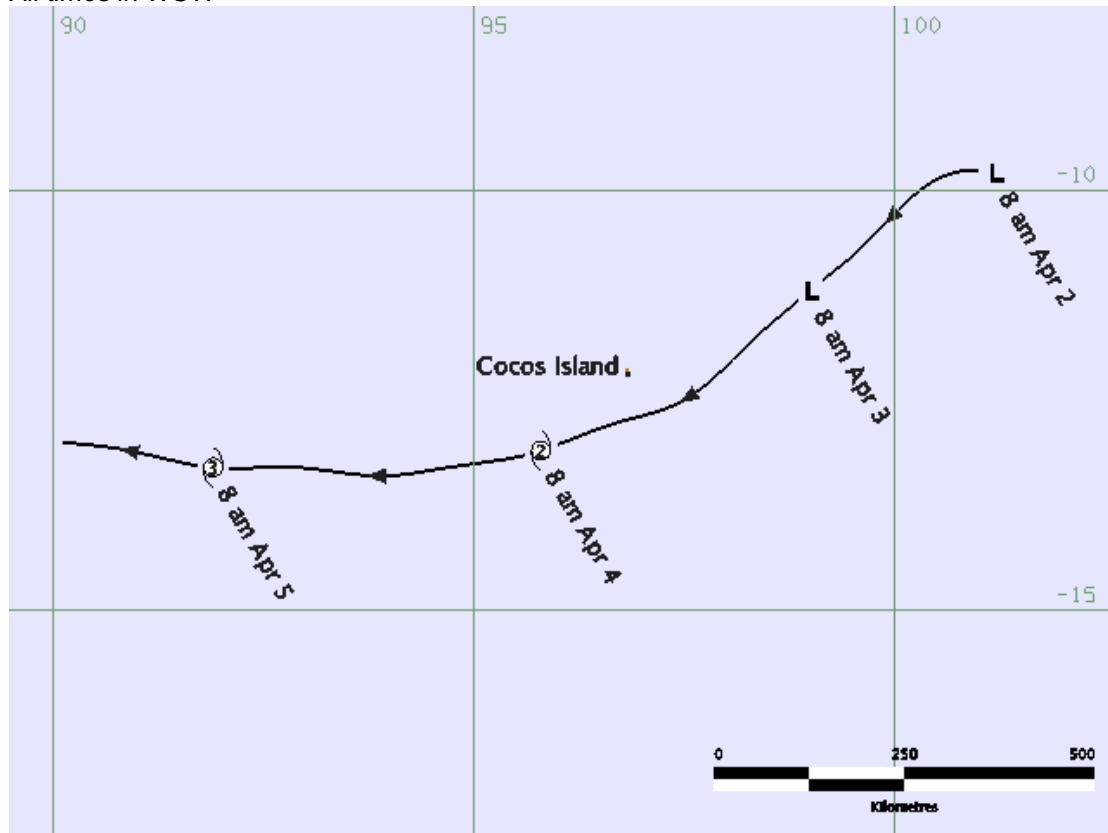


Figure 2. Wind and pressure observations at Cocos Islands 3-4 April 2005 during TC *Adeline*.

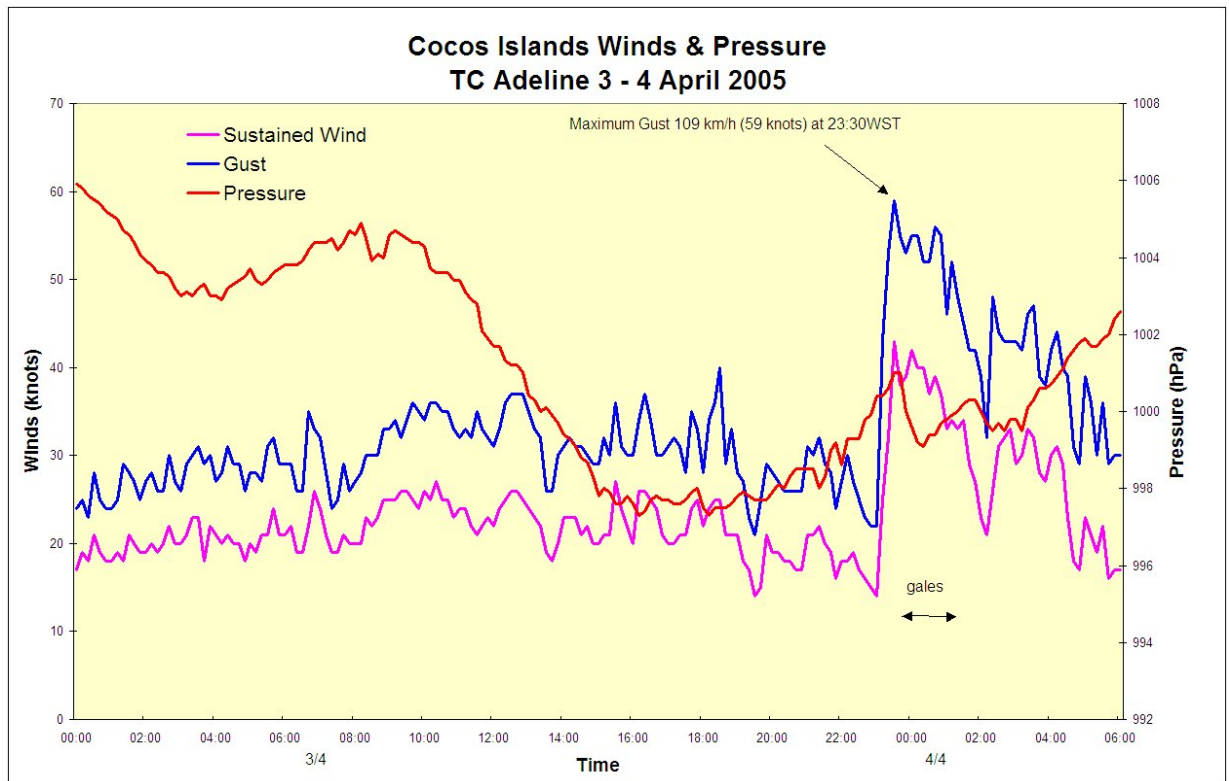


Figure 3. SSMI 85 GHz microwave image at 1455 UTC 5 April showing a small but intense circulation just west of 90°E.

Image courtesy of US NRL: <http://www.nrlmry.navy.mil/>

