



Australian Government
Bureau of Meteorology

Severe Tropical Cyclone *Chloe*

25 February – 3 March 1984
Perth Tropical Cyclone Warning Centre
Bureau of Meteorology

A. Summary

Tropical Cyclone *Chloe* formed off the northwest Kimberley coast on 27 February and moved along a general southwest track. *Chloe* passed over Cape Leveque north of Broome before intensifying over open waters. *Chloe* crossed the Pilbara coast near Roebourne as a severe tropical cyclone late on 29 February before weakening over the inland Pilbara.

The main structural damage occurred at Roebourne where three houses were destroyed and twelve houses unroofed. The Whim Creek Hotel was unroofed and flooded. The Harding River topped its banks causing flooding at Roebourne.

Chloe was the second cyclone to cross the Western Australian coast in the 1983-84 season and although of similar intensity to *Quenton*, did far more damage as it passed over or near a number of Pilbara towns.

B. Meteorological Description

Chloe formed from a low that developed on 25 February about 400 km north of Derby in a complex trough lying along the Kimberley-Pilbara coast. The low drifted slowly south during development and reached cyclone status at 0900 UTC 26 February. *Chloe* continued on a slow southerly track until 1200 UTC 27 February then turned to the southwest and passed briefly over land near Lombadina on Cape Leveque. Following its passage back over water again, *Chloe* reached severe cyclone status at about 0000 UTC 28 February and peak intensity at 0000 UTC 29 February when the estimated central pressure fell to 955 hPa.

A narrow band of strong to gale force winds was experienced along the Pilbara coast from Wallal to Whim Creek during 28 February. These winds were only partially due to *Chloe* as a pressure surge from a high in the Great Australian Bight caused a rapid strengthening of the easterly gradient after approximately 0400 UTC 28 February. The winds produced areas of dust reducing visibility at times to 200 m in Port Hedland.

Severe cyclone status and the south-westerly track were maintained to landfall which happened at 1400 UTC 29 February very close to Cape Lambert and the eye passed over Roebourne, 12 km inland, between 1330 and 1415 UTC. Roebourne Post Office recorded a minimum pressure of 961 hPa as shown in Fig. 2, and an un-calibrated barograph from Cape Lambert registered a minimum pressure of 964 hPa.

The mining town of Pannawonica experienced calm at 2100 UTC at which time the estimated central pressure had risen to 970 hPa. Cyclone status was lost around 2100 UTC 1 March when *Chloe* was centred 80 km south of Learmonth, some 27 hours after landfall.

Chloe's track appeared to be controlled mainly by an upper-level high centred over the Kimberley region. However, in the decaying stage, a ridge from the Bight high cradled the remnant low just south of Learmonth before it decayed on 3 March. GMS imagery indicated a clearly-defined circulation centre for most of *Chloe's* life and an eye was visible only once at 0600 UTC 29 February.

C. Impact

Flooding occurred at Roebourne where the Harding River topped its banks; however no damage occurred and the floods receded quickly. There was heavy rain over the Gascoyne catchment but no major flooding resulted. The main structural damage occurred at Roebourne where three houses were destroyed, twelve houses unroofed and 26 houses suffered minor damage. One caravan was destroyed and nineteen were damaged. The Whim Creek Hotel was unroofed and flooded. At Warambie station sheep losses were estimated in the thousands, and at Exmouth there was severe mud staining to houses

D. Observations

Wind

Maximum wind gusts at Port Hedland were 183 km/h at the Port Authority Control Tower and 135 km/h at the meteorological office. Cape Lambert recorded a gust of 220 km/h at 1213 UTC 29 February when the mean wind speed was southerly at 170 km/h. At this time the pressure was 965 hPa.

Pressure

Roebourne Post Office recorded a minimum pressure of 961 hPa as shown in Fig. 2, and an un-calibrated barograph from Cape Lambert registered a minimum pressure of 964 hPa.

Table 1. Best track summary for Tropical Cyclone *Chloe*, 25 February - 3 March 1984. Note: Add 8 hours to convert to WST. Refer to best track database for complete track details.

Year	Month	Day	Hour (UTC)	Latitude S	Longitude E	Max Wind knots	Central Pressure hPa	Radius of Gales nm
1984	2	25	2100	14.0	123.7		1002	
1984	2	26	0000	14.1	123.5		1002	
1984	2	26	0300	14.3	123.4		1001	
1984	2	26	0600	14.4	123.3		998	
1984	2	26	0900	14.3	123.2		994	
1984	2	26	1200	14.5	123.2		990	
1984	2	26	1500	14.7	123.3		985	
1984	2	26	1800	15.0	123.4		980	
1984	2	26	2100	15.2	123.5		980	
1984	2	27	0000	15.4	123.4		980	
1984	2	27	0300	15.7	123.3		980	
1984	2	27	0600	16.0	123.3		980	
1984	2	27	0900	16.2	123.3		980	
1984	2	27	1200	16.4	123.1		980	
1984	2	27	1500	16.5	122.8		980	
1984	2	27	1800	16.8	122.3		980	
1984	2	27	2100	17.1	121.9		980	
1984	2	28	0000	17.5	121.4		975	
1984	2	28	0300	17.8	120.9		975	
1984	2	28	0600	18.0	120.5		975	
1984	2	28	0900	18.1	120.3		975	
1984	2	28	1200	18.2	119.8		975	
1984	2	28	1500	18.5	119.5		973	
1984	2	28	1800	18.9	119.0		968	
1984	2	28	2100	19.3	118.7		960	
1984	2	29	0000	19.5	118.3		955	
1984	2	29	0300	19.7	118.1		955	
1984	2	29	0600	19.9	117.9		955	
1984	2	29	0900	20.2	117.6		955	
1984	2	29	1200	20.6	117.4		955	
1984	2	29	1500	21.0	117.1		958	
1984	2	29	1800	21.2	116.8		965	
1984	2	29	2100	21.4	116.5		970	
1984	3	1	0000	21.8	116.1		975	
1984	3	1	0300	21.9	115.8		975	
1984	3	1	0600	22.1	115.5		990	
1984	3	1	0900	22.4	115.2		990	
1984	3	1	1200	22.6	114.8		996	
1984	3	1	1500	22.8	114.6		998	
1984	3	1	1800	22.8	114.2		999	
1984	3	1	2100	22.9	113.9		1000	
1984	3	2	0000	23.0	113.8		999	
1984	3	2	0300	23.0	113.8		999	
1984	3	2	0600	22.9	113.8		999	
1984	3	2	0900	22.9	113.8		999	
1984	3	2	1200	22.9	113.8		1000	

1984	3	2	1500	23.0	113.8		1001	
1984	3	2	1800	23.0	113.9		1001	
1984	3	2	2100	23.0	113.9		1001	
1984	3	3	0000	23.0	113.9		1001	
1984	3	3	0300	23.0	113.9		1001	
1984	3	3	0600	23.1	113.9		1001	
1984	3	3	0900	23.2	114.0		1000	
1984	3	3	1200	23.2	114.2		1002	
1984	3	3	1500	23.2	114.7		1002	

Figure 1. Track of Severe Tropical Cyclone *Chloe*, 25 February - 3 March 1984.
All times in WST.

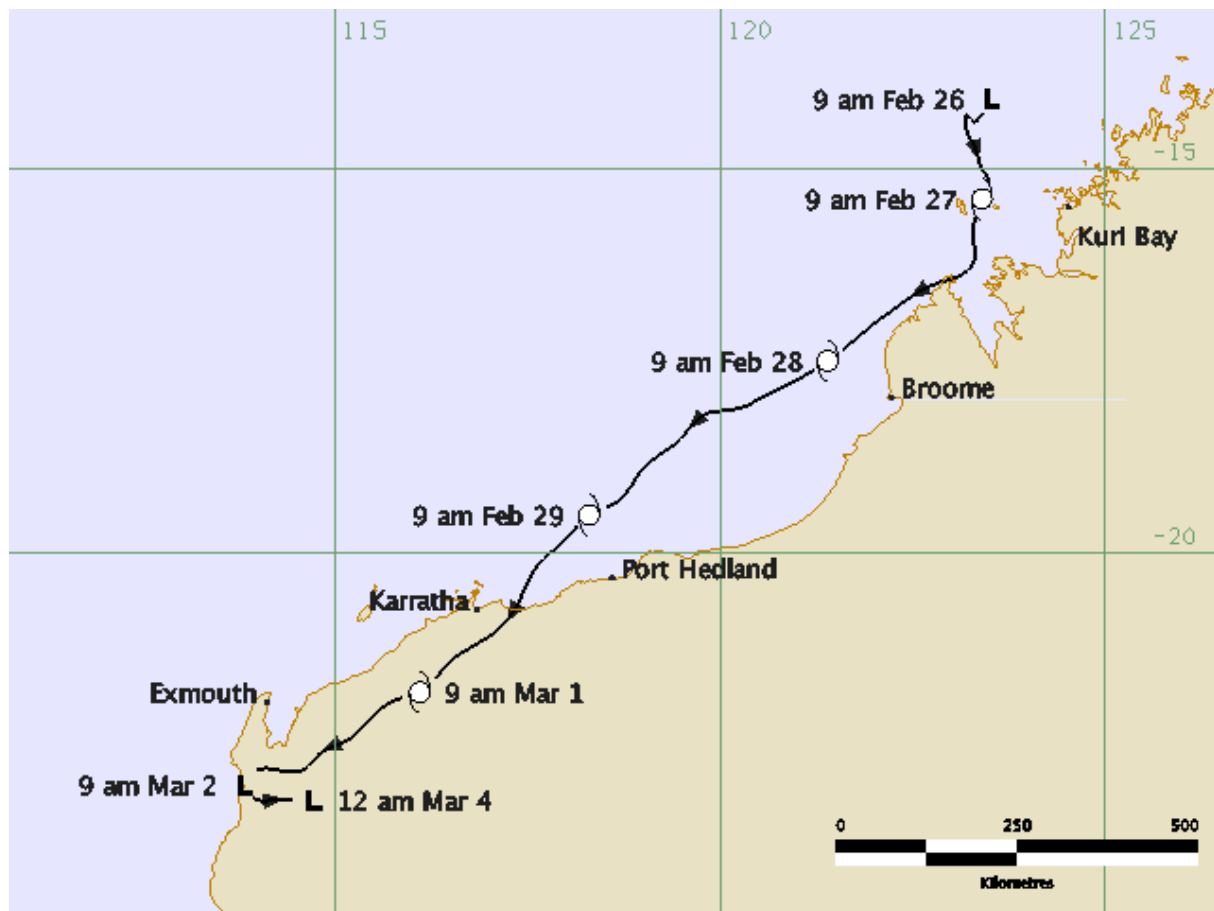


Figure 2. Roebourne barograph trace for 29 February 1984 showing the pressure reduction associated with the passage of Severe Tropical Cyclone *Chloe*. The barograph shows the pressure fell to 961 hPa at 2300 WDST. Note: The bottoming out at 961 hPa was believed to have been related to a mechanical 'stickage' and the minimum pressure may have been about 955 hPa.

