



Australian Government
Bureau of Meteorology

Tropical Cyclone *Harriet*

28 February - 14 March 2003

Perth Tropical Cyclone Warning Centre
Bureau of Meteorology

A. Summary

Harriet was a small category one cyclone that formed to the south of Christmas Island and, although approached the Pilbara coast, changed direction and did not affect the coastline at any stage. It was captured by an amplifying Indian Ocean trough and accelerated to the southeast off the west coast. Although not affecting the lower west coast directly it did contribute to extreme fire danger ratings over southern WA fanning a large bushfire near Walpole on the south coast.

B. Meteorological Description

Intensity Analysis

A tropical low developed on the 28 February southwest of Christmas Island and tracked steadily to the southeast. At this time TC *Graham* was approaching the WA coastline south of Broome. Development was enhanced by strong monsoonal north-westerlies to the north but constrained by moderate shear. Convection oscillated diurnally and periodically the low level circulation centre was exposed. The Quikscat image at 2300 UTC 2 March showed marginal gales on the northern side of the low but the IR image at the time shows an exposed low level circulation centre. Soon after however at 0300 UTC 3 March, a Dvorak analysis of 3.0 was reached. Operationally the low was named *Harriet* at 1300 WST 4 March.

Harriet only reached category one intensity during its lifetime. Tropical cyclone intensity was confirmed by Quikscat passes on 4 March. However, the following day *Harriet* weakened below cyclone intensity as the LLCC became exposed. On 6 March *Harriet* briefly re-intensified but it wasn't until 7 March that *Harriet* began development as it tracked to the south approaching the upper level ridge. *Harriet* reached peak intensity at 1200 UTC 8 March when the winds to the south of the centre reached 55 knots (note: maximum intensity around circulation estimated at 45 knots owing to 8-10 knot translation speed). Thereafter *Harriet* weakened and an absence of deep convection on the 9th signalled its demise as wind shear increased. *Harriet* is estimated to weaken below cyclone intensity at 1800 UTC 9 March however gales were likely to have continued on eastern quadrants as it accelerated to the south.

Motion

The low was steered to the southeast from the 28 February to 2 March under the influence of a low to mid-level ridge displaced to the north by TC *Graham*. The track became more easterly on 3 - 4 March before recurving to the south on 5 March and then southwest on 6 - 7 March in response to a strengthening mid to upper level ridge to the east. An amplifying Indian Ocean trough approached on 8 March and the pattern became more meridional the next day, by which time *Harriet* was accelerating further southwards and weakening under increasing shear. As the trough neared the remains of *Harriet* was rapidly accelerated to the south-southeast on 10 March.

C. Impact

Harriet did not directly affect the coast, although it did contribute to extreme fire danger ratings over southern WA fanning a large bushfire near Walpole on the south coast.

D. Observations

Harriet did not pass near any observation sites and therefore no observations were recorded.

E. Forecast Performance

A cyclone watch was issued at 1600 WST 5 March for Coral Bay to Karratha, extended eastwards to Whim Creek at 0700 WST 6 March. A cyclone warning was issued at 1000 WST 6 March for Coral Bay to Whim Creek as *Harriet* moved southwards towards the coast. Although forecast tracks indicated that *Harriet* would track to the southwest a conservative forecasting strategy was adopted as the western Pilbara coast could have been on the periphery of gales from the system and as the system was expected to develop further. The warning was eventually cancelled at 1000 WST 7 March by which time *Harriet* was north of NW Cape and moving away from the coastline. As the low accelerated to the southeast on 10 March, concern was expressed for an impact on the southwest of the state although models indicated the low would be sufficiently west not to cause gales on the coast. which turned out to be the case. There was no adverse criticism of the forecasts.

Table 1. Best track summary for *Harriet*, 1 - 11 March 2003.

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

Year	Month	Day	Hour (UTC)	Position Latitude S	Position Longitude E	Max wind 10min knots	Central Pressure hPa	Rad. of Gales nm
2003	03	1	1800	13.4	105.5	25	1000	
2003	03	2	0000	13.8	106.3	30	998	
2003	03	2	0600	14.2	107.2	35	996	
2003	03	2	1200	14.4	108.0	35	995	
2003	03	2	1800	14.6	108.7	35	995	
2003	03	3	0000	14.7	109.5	35	995	
2003	03	3	0600	14.7	110.1	40	992	
2003	03	3	1200	14.7	110.9	40	992	
2003	03	3	1800	14.7	111.5	40	992	
2003	03	4	0000	14.7	112.2	40	992	
2003	03	4	0600	14.8	113.0	40	990	30
2003	03	4	1200	14.8	113.9	40	990	30
2003	03	4	1800	15.1	114.5	40	990	30
2003	03	5	0000	15.9	114.7	40	990	30
2003	03	5	0600	16.2	115.3	40	992	
2003	03	5	1200	16.9	116.0	40	992	
2003	03	5	1800	17.7	116.0	40	992	
2003	03	6	0000	18.4	115.7	40	990	30
2003	03	6	0600	18.7	115.3	40	990	30
2003	03	6	1200	18.8	115.0	40	992	
2003	03	6	1800	18.9	114.7	40	992	
2003	03	7	0000	18.9	114.5	40	992	
2003	03	7	0600	19.0	114.2	40	990	30
2003	03	7	1200	19.2	113.9	40	990	30
2003	03	7	1800	19.3	113.6	40	990	30
2003	03	8	0000	19.4	113.3	45	988	40
2003	03	8	0600	19.8	112.8	45	988	40
2003	03	8	1200	20.3	112.3	50	985	40
2003	03	8	1800	20.9	111.2	50	985	30
2003	03	9	0000	21.5	110.3	45	988	30
2003	03	9	0600	22.4	109.3	40	990	30
2003	03	9	1200	23.7	108.3	40	992	30
2003	03	9	1800	25.1	107.6	35	994	
2003	03	10	0000	26.6	107.2	35	996	
2003	03	10	0600	28.3	107.8	30	998	
2003	03	10	1200	29.9	109.0	30	998	
2003	03	10	1800	32.5	110.8	30	998	
2003	03	11	0000	35.4	113.4	25	1000	

Figure 1. Track of Tropical Cyclone Harriet 2 – 11 March 2003
All times in WST.

