



Australian Government
Bureau of Meteorology

Severe Tropical Cyclone *Tiffany*

22 January – 2 February 1998

Perth Tropical Cyclone Warning Centre
Bureau of Meteorology

A. Summary

Tropical Cyclone *Tiffany* formed early on 24 January off the northwest Kimberley coast. It occurred during an active monsoon period when Tropical Cyclone *Katrina* intensified in the Coral Sea and Tropical Cyclone *Les* formed in the Gulf of Carpentaria. It developed rapidly into an intense cyclone with a radius of gales between 100 and 130 km and moved generally west or west southwest, remaining offshore from the Pilbara coast at a distance of approximately 200 kilometres.

Tiffany caused strong to near gale-force winds on exposed areas of the Pilbara coast and storm force winds at North Rankin offshore platform during 27 January but had no other effect on coastal WA. *Tiffany* weakened as it continued to move westwards. Winds were estimated to have decreased below gale force by early on 30 January. The low-level centre then moved west northwest and continued to weaken, some 700 km south southeast of Cocos Islands.

B. Meteorological Description

Intensity Analysis

Tiffany formed during an active period of the monsoon with cross-equatorial flow into the Australian region. A strong southeast surge in low levels south of the system also aided with intensification.

According to Dvorak IR analysis *Tiffany* was at its maximum intensity during the overnight period 0000 – 0500 WST 27 January when radar imagery indicated intense convection around the eye wall. Cloud tops warmed during the next 6 hours prior to cooling again during the afternoon and evening of 27 January. Radar observations suggested this period corresponded with weakening of convection near the eye wall followed by a resurgence of convection around the eye wall during the day.

A pressure measurement of 958 hPa was made by a buoy in the eye during the relative minimum of intense convection surrounding the eye at 0900 WST 27 January. The satellite and radar imagery suggested that lower central pressures were possible prior to and following the passage of the cyclone

over the buoy. Objective use of the Dvorak IR eye pattern at maximum intensity gave central pressure estimates near 930 hPa (using Atkinson-Holliday WPR), nine hours prior to the buoy observation. Even taking account of the fact that the cyclone appeared to weaken as it approached the buoy, the derived pressures appear to be too low by 10 to 15 hPa.

Motion

Following intensification *Tiffany* moved on a general west southwest to west track. A major mid-level trough amplified over southeast Australia during 24 January. However the presence of ex-TC *Les* to the east of *Tiffany* prevented the mid-level subtropical ridge from moving northwards and influencing the steering of *Tiffany*. *Les* may have also impaired the formation of a peripheral anticyclone to the east of *Tiffany*. A branch of the SE Australian trough leaning back to the northwest caused a break in the subtropical ridge south of the cyclone centre during 25 January to 27 January. As a result the cyclone experienced weak steering winds on the northern side of the col separating the highs in the subtropical ridge. During this period the average speed of movement was 5 knots. During 27 January the high that had remained near stationary to the southwest of the cyclone extended eastwards to the south of the cyclone and *Tiffany* experienced stronger easterly steering winds. *Tiffany's* speed increased to 9 knots and moved in a more westerly direction. Following weakening during 30 January *Tiffany* moved northwest under the influence of lower level steering winds.

Structure

Tiffany was a small system during its lifetime and intensified rapidly to severe cyclone status in a region of low wind shear. Using observations from two offshore sites the radius of gales was estimated to be 100 to 130 kilometres. Storm force winds occurred within 50 kilometres of the centre and hurricane force winds extended outwards a distance of only 30 kilometres. The gale radius was non-symmetric and expanded outwards as spiral rainbands passed across the observing sites. In the early stages of development the wind profile had an asymmetric distribution towards the southern side due to a surge in pressure to the south. Pressures along 25°S rose up to 5 hPa in the 24 hour period ended 9 am 24 January. This resulted in strong winds in the Port Hedland area well outside the core of strong winds associated with the cyclone centre.

C. Impact

Although gale force to storm force winds were experienced along the Pilbara coast, no known damage or impacts were caused by *Tiffany*.

D. Observations

Buoy: Pressure of 958 hPa at 0900 WST 27 January.

The observed average maximum wind speed: 92 knots (170 km/h) at 1000 WST 27 January.

Table 1. Best track summary for *Tiffany*, 22 January – 2 February 1998.

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
1998	01	22	1000	15.0	124.5	25	1001	
1998	01	22	2200	16.0	125.0	25	1002	
1998	01	23	0400	16.3	124.7	25	1002	
1998	01	23	1000	16.4	124.3	25	1001	
1998	01	23	1600	16.6	123.9	25	1001	
1998	01	23	2200	16.7	123.4	25	1001	
1998	01	24	0400	16.8	123.0	25	1001	
1998	01	24	1000	16.9	122.6	25	1000	
1998	01	24	1600	17.2	122.0	35	995	55
1998	01	24	2200	17.1	121.2	50	985	55
1998	01	25	0400	17.5	120.6	55	980	55
1998	01	25	1000	17.7	119.9	60	975	65
1998	01	25	1600	17.9	119.5	65	970	70
1998	01	25	2200	18.2	119.1	70	965	70
1998	01	26	0400	18.3	118.8	75	960	70
1998	01	26	1000	18.4	118.5	80	955	70
1998	01	26	1300	18.4	118.3	85	950	70
1998	01	26	1600	18.4	118.0	95	940	65
1998	01	26	1900	18.5	117.8	95	940	65
1998	01	26	2200	18.6	117.6	85	950	65
1998	01	27	0100	18.7	117.3	80	955	55
1998	01	27	0400	18.9	117.0	80	955	55
1998	01	27	0700	19.1	116.6	90	945	55
1998	01	27	1000	19.2	116.2	90	945	55
1998	01	27	1300	19.2	115.7	85	950	55
1998	01	27	1600	19.1	115.2	80	955	55
1998	01	27	1900	19.2	114.2	80	955	55
1998	01	27	2200	19.2	114.2	80	955	55
1998	01	28	0400	19.4	113.2	80	955	55
1998	01	28	1000	19.6	112.2	75	960	55
1998	01	28	1600	19.6	111.2	65	970	55
1998	01	28	2200	19.6	110.4	50	985	55
1998	01	29	0400	19.6	109.7	50	985	55
1998	01	29	1000	19.6	109.1	50	985	55
1998	01	29	1600	19.6	108.6	40	990	55
1998	01	29	2200	19.5	108.2	35	995	55
1998	01	30	0400	19.5	107.7	30	997	
1998	01	30	1000	19.6	107.2	25	1000	
1998	01	30	1600	19.6	106.8	25	1000	
1998	01	30	2200	19.6	106.4	25	1002	
1998	01	31	0400	19.5	105.9	25	1002	
1998	01	31	1000	19.4	105.5	25	1002	
1998	01	31	1600	19.2	105.2	25	1002	
1998	01	31	2200	19.0	104.9	20	1004	

1998	02	1	0400	18.7	104.6	20	1004	
1998	02	1	1000	18.6	104.3	20	1004	
1998	02	2	0400	17.7	100.7	0	1006	
1998	02	2	1000	17.6	99.8	0	1006	

Figure 1. Track of Tropical Cyclone *Tiffany*, 23 January – 2 February 1998.
All times in WST.

