Australian Government
Bureau of Meteorology

Severe Tropical Cyclone *Kirsty*

7-14 March 1996

Perth Tropical Cyclone Warning Centre
Bureau of Meteorology

A. Summary

Tropical cyclone *Kirsty* formed from a low level circulation embedded in a deep monsoonal trough over the north Kimberley during 6 and 7 March. The low tracked to the west northwest off the Kimberley coast during the night of 7 March and slowly intensified to reach cyclone status early on 9 March. During the period 8 to early on 10 March *Kirsty* oscillated around 16°S 120°E. It then tracked southeast, intensifying to a Category three cyclone during the afternoon of 10 March as it changed direction to the south and then southsouthwest.

During 11 March *Kirsty* continued a steady south southwest track towards the Pilbara coast and intensified to a Category four cyclone with estimated maximum winds to 95 knots just before crossing the coast near Pardoo, 100 kilometres to the east of Port Hedland at 0600 WST 12 March. Ex-tropical cyclone *Kirsty* then tracked southeast through the northern Goldfields and further weakened by the morning of 14 March in the eastern Goldfields.

Pardoo station and Pardoo roadhouse suffered wind damage, with Pardoo station also recording a lowest pressure of 938 hPa at 0600 WST. Rainfall associated with *Kirsty* caused flooding in the east Pilbara and eastern Gascoyne and northern Goldfields.

B. Meteorological Description

Intensity
During early March the low-level circulation, which had been tropical cyclone *Dennis,* tracked westwards across northern Australia and degenerated into a deep monsoon trough over the northern Kimberley Ranges. Several low centres were apparent in this deep broad trough during 6 and 7 March. In the broadscale there had been good low-level cross-equatorial flow into the monsoon trough during the period from 2 to 7 March. Around 1100 UTC 7 March a low centred between Broome and Derby tracked west northwestward off the coast and slowly intensified.

During 8 and 9 March *Kirsty* oscillated around a point near 10°S 120°E as it was caught in the trough section of a deep anticyclonic involution. The low vertical wind shear here was favourable for further development along with its position midway between an upper easterly jet over Indonesia and a westerly upper jet over southern

Western Australia. During 10 March the middle-level ridge south of *Kirsty* weakened as a trough in the westerlies approached and the cyclone began moving southeast towards the Kimberley coast. At the same time *Ethel* was steered eastwards into the Coral Sea and middle-level ridging developed southwards between the two cyclones. By 0600 UTC 10 March *Kirsty* began moving southwards and six hours later to the south southwest as the strengthening ridge at mid-levels extended from around the east to the south of *Kirsty.* Over this period *Kirsty* reached category three intensity and it was observed on Broome radar with an eye visible at times.

During 11 March *Kirsty* continued on a track towards the south-southwest and intensified to category four. This intensification occurred as the cyclone moved closer to an area developing upper northwesterly winds ahead of another trough in the westerlies. *Kirsty* was estimated to have reached its peak of 95 knots maximum winds prior to making landfall at 2200 UTC 11 March on the Pilbara coast near Pardoo, 100 km to the east of Port Hedland. The new trough in the westerlies eroded the mid-level ridge poleward of *Kirsty* and the cyclone accelerated southeastwards towards the Great Australian Bight after making landfall.

Motion and Structure
The tropical low initially moved west northwest. During the period 8 March to early on 10 March *Kirsty* oscillated around 16°S 120°E as it was caught in a well developed mid-level trough axis between it and tropical cyclone *Ethel* in the Gulf of Carpentaria. As *Ethe*l moved east into the Pacific during 10 March this allowed a mid-level high to the northeast of *Kirsty* to begin to exert influence. During 10 March *Kirsty* began moving southeast towards the Kimberley coast, then tracked south then southsouthwest by late on 10 March as this mid-level high moved south to the east of *Kirsty* and elongated along a north-south axis. During the period 11 - 13 March *Kirsty* steered around the shoulder of this broad ridge before accelerating southeastwards towards the Bight ahead of an approaching frontal system.

C. Impact

Pardoo station and Pardoo roadhouse suffered wind damage, with Pardoo station also recording a lowest pressure of 938 hPa at 0600 WST. *Kirsty* then tracked south past Marble Bar and Newman, causing minor damage, and had weakened to a tropical low early on the morning of 13 March. Rainfall associated with *Kirsty* caused flooding in the east Pilbara and eastern Gascoyne and northern Goldfields.

D. Observations

Wind/Pressure
Minimum pressure reported: Pardoo 938 hPa at 2200UTC 11 April.
There was no report of significant wind associated with TC *Kirsty*.

Rainfall
In a 36 hour period Pardoo reported 167mm of rain and in a 24 hour period Meentheena near Marble Bar reported 122mm of rain.

Table 1. Best track summary for *Kirsty 7 – 14 March 1996*

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
1996	03	7	1000	17.3	122.8	25	1000	
1996	03	7	1300	17.2	122.4	25	1000	
1996	03	7	1600	17.0	122.0	30	998	
1996	03	7	1900	16.9	121.5	30	998	
1996	03	7	2200	16.8	121.1	30	998	
1996	03	8	0100	16.7	120.7	30	998	
1996	03	8	0400	16.7	120.3	30	998	
1996	03	8	0700	16.6	120.1	30	998	
1996	03	8	1000	16.3	120.0	35	995	
1996	03	8	1300	16.0	119.9	35	995	
1996	03	8	1600	15.6	119.8	35	995	
1996	03	8	1900	15.4	120.0	40	990	45
1996	03	8	2200	15.6	120.1	40	990	45
1996	03	9	0100	16.0	120.1	40	990	45
1996	03	9	0400	16.2	119.7	45	985	45
1996	03	9	0700	16.1	119.8	45	985	45
1996	03	9	1000	16.0	119.8	45	985	45
1996	03	9	1300	15.9	119.9	45	985	45
1996	03	9	1600	15.8	120.0	55	980	55
1996	03	9	1900	15.8	120.2	55	980	55
1996	03	9	2200	15.9	120.4	55	980	55
1996	03	10	0100	16.0	120.6	60	975	55
1996	03	10	0400	16.2	120.9	60	975	55
1996	03	10	0700	16.5	121.2	65	970	55
1996	03	10	1000	16.8	121.2	65	970	55
1996	03	10	1300	17.1	121.2	70	965	55
1996	03	10	1600	17.3	121.1	70	965	55
1996	03	10	1900	17.4	120.8	75	960	55
1996	03	10	2200	17.6	120.8	75	960	55
1996	03	11	0100	17.9	120.8	80	955	55
1996	03	11	0400	18.2	120.6	80	955	55
1996	03	11	0700	18.5	120.4	80	955	55
1996	03	11	1000	18.8	120.2	80	955	55
1996	03	11	1300	19.2	120.0	85	950	55
1996	03	11	1600	19.4	119.9	95	940	55
1996	03	11	1900	19.8	119.7	95	935	55
1996	03	11	2200	20.1	119.5	95	935	55
1996	03	12	0100	20.5	119.4	90	945	55
1996	03	12	0400	20.9	119.4	80	955	55
1996	03	12	0700	21.3	119.4	70	965	45
1996	03	12	1000	21.8	119.6	60	975	45
1996	03	12	1300	22.3	119.7	55	980	25
1996	03	12	1600	22.8	119.8	45	985	25
1996	03	12	1900	23.4	120.0	40	990	15

1996	03	12	2200	24.0	120.2	35	995	
1996	03	13	0100	24.6	120.4	35	995	
1996	03	13	0400	25.2	120.6	35	995	
1996	03	13	0700	25.7	120.8	35	995	
1996	03	13	1000	26.2	121.2	35	995	
1996	03	13	1300	26.8	121.8	30	998	
1996	03	13	1600	27.4	122.4	30	998	
1996	03	13	1900	28.1	123.2	30	998	
1996	03	13	2200	28.8	124.2	30	998	
1996	03	14	0100	29.5	125.4	25	1000	

Figure 1. Track of Tropical Cyclone *Kirsty,* 7 – 14 March 1996.
All times in WST.