



Australian Government
Bureau of Meteorology

Severe Tropical Cyclone Orson

17 – 23 April 1989

Perth Tropical Cyclone Warning Centre
Bureau of Meteorology

A. Summary

Orson was one of the most severe of all documented cyclones in the Australian region and, at its most intense, the central pressure of 905 hPa was the lowest on record for an Australian cyclone.

A low originally formed off Darwin on 17 April and moved to the west southwest through the Timor Sea reaching cyclone intensity during 18 April. *Orson* rapidly developed on 19-20 April and reached category 5 intensity late on 20 April. The centre of the cyclone passed just west of the North Rankin A gas platform just after midnight WST 23 April, where a pressure of 905 hPa and 249 km/h wind gusts (reduced to 10 m) level were recorded prior to the destruction of the anemometers by the cyclone. *Orson* maintained intensity until landfall west of Dampier, although fortunately this was near the time of low-tide. *Orson* gradually weakened as it moved over inland WA.

B. Meteorological Description

A tropical low was first located at 0000 UTC 17 April within a convective cloud mass near 10.6°S, 128.5°E. The low moved west-southwest and deepened, reaching cyclone intensity at 0600 UTC 18 April. The cyclone then moved westwards. On 19 April, several ships near the cyclone reported 65 km/h winds and, during this period several Indonesian fishing boats sank and four fishermen were drowned.

The cyclone eye was discernible on satellite imagery from 0000 UTC 20 April until 1200 UTC 22 April, by which time the cyclone was well within range of the Dampier radar. During 20 and 21 April the cyclone began to recurve, shifting southwesterly and then southerly; it steadily intensified. On 22 April, *Orson* moved south towards the Pilbara coast and began to accelerate ahead of an approaching, vigorous cold front to the southwest.

The centre of the cyclone passed a few kilometres west of the North Rankin A gas platform (19.63°S, 116.1°E) at 1630 UTC 22 April, where a pressure of 905 hPa and 249 km/h wind gusts reduced to 10 m level were recorded prior to the destruction of the anemometers by the cyclone. This constitutes the lowest MSL pressure on record for an Australian cyclone. The offshore platform was in the eye of the cyclone for approximately 40 minutes, at which stage the eye diameter was measured by radar to be approximately 40 km. *Orson* crossed the coast at 2045 UTC 22 April. The maximum wind gust at Dampier was 183 km/h. Mardie station, located to the west of the cyclone centre, reported a maximum wind gust of 211 km/h.

A storm surge of 3.1 metres was recorded at Dampier, but as the cyclone crossed near the time of low tide, inundation of coastal areas was minimised. The cyclone moved overland and began weakening. It passed over Pannawonica (about 80 km inland) at approximately 2200 22 April and caused significant structural damage to the town; 70 per cent of homes were damaged.

Orson took on a south southeast and then south-easterly track through the data-sparse inland area of the State during 23 April and was moving at speeds of between 40 and 50 km/h. It ceased generating gales by 0900 UTC 23 April but continued as a discernible low pressure circulation through 24 April when it moved into the Great Australian Bight, slowed and filled.

C. Impact

In all, *Orson* is estimated to have caused approximately US\$16 million (1989 dollars) worth of damage (uninsured losses would be higher). *Orson* caused damage to 70 per cent of homes in Pannawonica. The damage included the partial destruction of the Bureau of Meteorology Weather Watch radar at Dampier which was being used to track the cyclone.

D. Observations

North Rankin platform: minimum pressure 905 hPa (data courtesy of Woodside)

Mardie 211 km/h wind gust.

Dampier 183 km/h wind gust.

Figure 1. Track of Tropical Cyclone Orson, 17 – 24 April 1989

All times in WST.

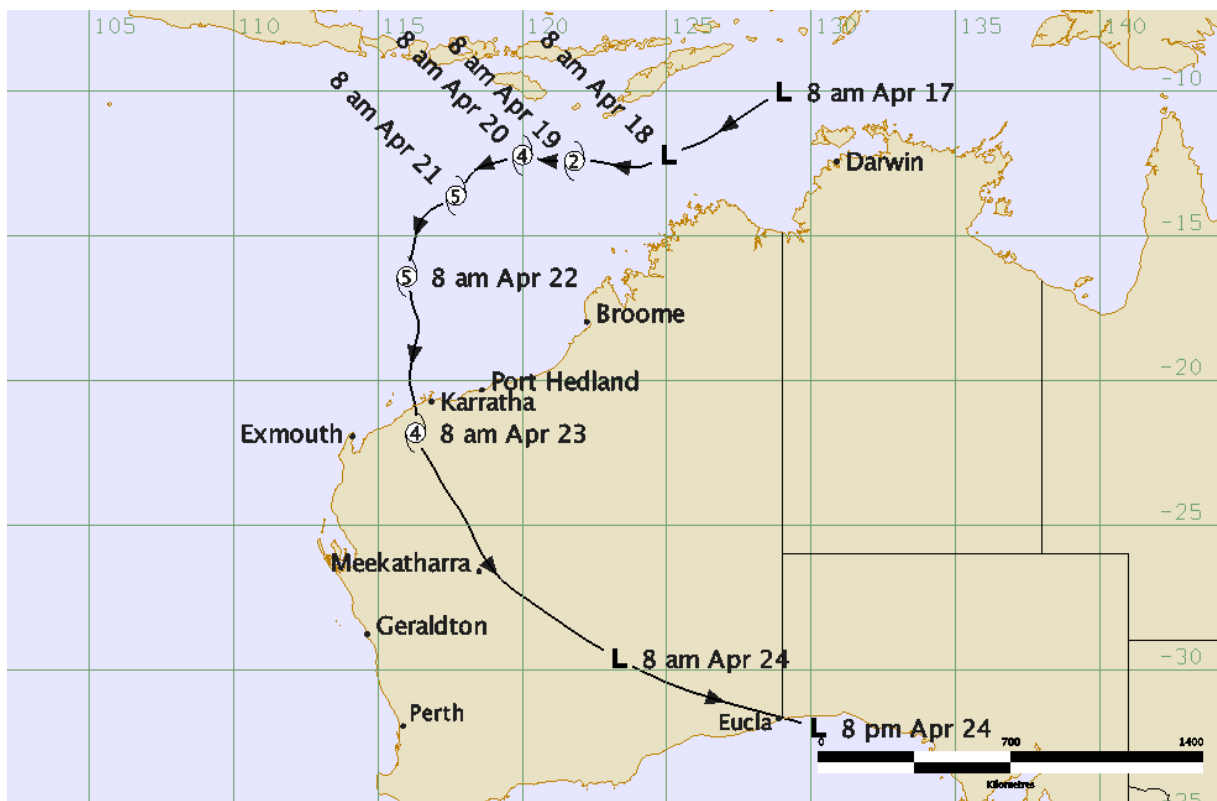


Table 1. Best track summary for TC *Orson*, 17 – 24 April 1989

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
1989	04	17	0000	10.0	129.0	30	1000	
1989	04	17	0600	10.6	128.0	30	999	
1989	04	17	1200	11.2	127.1	30	999	
1989	04	17	1800	11.8	126.1	30	999	
1989	04	18	0000	12.2	125.0	35	998	
1989	04	18	0600	12.6	124.1	45	991	95
1989	04	18	1200	12.5	123.0	50	987	
1989	04	18	1800	12.4	122.3	55	985	155
1989	04	19	0000	12.4	121.8	60	981	155
1989	04	19	0600	12.4	121.4	70	976	175
1989	04	19	1200	12.4	121.0	75	967	185
1989	04	19	1800	12.3	120.4	90	954	
1989	04	20	0000	12.2	120.0	100	945	
1989	04	20	0600	12.4	119.3	105	939	
1989	04	20	1200	12.6	118.6	110	933	
1989	04	20	1800	12.9	118.2	110	929	
1989	04	21	0000	13.6	117.7	120	922	
1989	04	21	0600	14.2	116.7	125	914	255
1989	04	21	1200	15.0	116.3	130	906	
1989	04	21	1800	15.5	116.2	135	905	
1989	04	22	0000	16.4	116.0	135	905	205
1989	04	22	0300	16.8	116.1	135	905	200
1989	04	22	0600	17.4	116.2	135	905	150
1989	04	22	0900	18.0	116.4	135	905	115
1989	04	22	1200	18.7	116.3	135	905	115
1989	04	22	1500	19.2	116.2	135	905	90
1989	04	22	1800	20.0	116.1	130	911	90
1989	04	22	2100	21.0	116.3	120	923	115
1989	04	23	0000	21.8	116.3	95	950	55
1989	04	23	0300	22.8	116.8	65	975	
1989	04	23	0600	23.7	117.3	50	985	
1989	04	23	0900	24.6	117.9	45	989	
1989	04	23	1200	25.6	118.4	40	993	
1989	04	23	1500	26.8	119.2	35	996	
1989	04	23	1800	27.8	120.5	35	997	
1989	04	23	2100	28.7	121.8	35	998	
1989	04	24	0000	29.6	123.3	30	999	
1989	04	24	0300	30.4	124.9	30	1000	
1989	04	24	0600	31.0	126.6	30	1000	
1989	04	24	0900	31.5	128.4	30	1000	
1989	04	24	1200	32.0	130.2	30	1000	