



**Australian Government**  
**Bureau of Meteorology**

## **Tropical Cyclone *Phoebe***

1 – 4 September 2004

Perth Tropical Cyclone Warning Centre  
Bureau of Meteorology

### **A. Summary**

Tropical cyclone *Phoebe* was an out of season cyclone forming out of an active monsoon band, coincident with a burst in the MJO. It was a weak category one cyclone moving south southeastwards along 90-93°E before weakening near 10°S on 4 September.

### **B. Meteorological Description**

#### *Intensity*

A low developed near 3°S 88°E on 30 August within an unseasonally active monsoon band, coincident with a burst in the Madden Julian Oscillation (MJO). The low moved to the southeast over the next few days passing into the Perth TCWC area of responsibility on 1 September. The system remained under more than 20 knots of north northeasterly shear throughout its lifetime. From 31 August an area of deep convection developed to the west southwest of the low level circulation centre (LLCC). This convection was to be persistent for the following four days, although the LLCC remained exposed for almost all of that time.

The intensity estimates based on Dvorak sheared pattern is dependent on the definition on low level cloud lines and the distance between the centre and the deep convection. As a result intensity is inherently subjective, especially when the critical distance varies and the deep convection is susceptible to diurnal variations.

For most of the system's lifetime, the persistent deep convection to the west southwest of the low was typically within 3/4 of a degree. On 31 August and 1 September, although the centre was within 3/4 degree of the deep convection for most of the time the low level centre was not well defined. It is possible that gales were occurring under the deep convection but only in one quadrant, failing to satisfy the Australian tropical cyclone criterion that gales are required to extend more than halfway around the LLCC. Tropical cyclone intensity was estimated at 0000 UTC 2 September when the LLCC was close to the deep convection and Quikscat identified gale force winds extending across the western quadrants as shown in the RSS solution in Fig. 2 (Note: the high 50+ knot wind barbs southwest of the centre are incorrect solutions as confirmed by alternate solutions).

Maximum intensity was reached late on 2 September when the low level centre moved briefly under the edge of the deep convection although it is likely that gales did not extend to the northeast of the centre.

*Phoebe* showed weakening signs on 3 September but convection again flared near the centre later in the day. On September convection subsided and the low level centre became less well defined. Although convection again developed by 1200 UTC, from this point on convection fluctuated diurnally suggesting continued weakening. Also by this stage *Phoebe* was moving over cooler waters on the order of 25°C having originated over SST of over 27°C.

#### *Motion*

*Phoebe* moved to the south southeast until it weakened on 4 September when the LLCC tracked westwards as a strong low-level ridge built to the south.

#### *Structure*

*Phoebe* remained sheared throughout its lifetime with deep convection predominantly southwest of the low level circulation centre (LLCC). As a result gales were primarily constrained to the southwest of the centre extending to southern and northern sectors at times.

### **C. Impact**

*Phoebe* remained over open waters throughout its lifetime and there were no known impacts.

### **D. Observations**

Nil.

Table 1 Best track summary for Tropical Cyclone *Phoebe* 30 August – 5 September 2004.

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

Year	Month	Day	Hour	Latitude	Longitude	Max Wind Knots	Central Pressure hPa	Radius Gales nm
2004	8	30	0600	2.8	87.7	20	1005	
2004	8	30	1200	3.1	87.8	25	1004	
2004	8	30	1800	3.4	87.8	30	1002	
2004	8	31	0000	3.7	87.9	30	1002	
2004	8	31	0600	4.0	88.0	30	1000	
2004	8	31	1200	4.5	88.7	30	1000	
2004	8	31	1800	5.0	89.4	30	1000	
2004	9	1	0000	5.3	90.0	30	1000	
2004	9	1	0600	5.5	90.4	30	998	
2004	9	1	1200	6.2	90.5	30	998	
2004	9	1	1800	7.1	90.8	30	995	
2004	9	2	0000	8.0	91.2	35	992	35
2004	9	2	0600	8.3	91.7	40	992	35
2004	9	2	1200	8.9	91.8	45	990	35
2004	9	2	1800	9.0	92.3	45	990	35
2004	9	3	0000	9.1	92.8	45	990	35
2004	9	3	0600	9.4	92.9	40	992	35
2004	9	3	1200	9.5	93.0	40	992	55
2004	9	3	1800	9.5	93.1	40	992	55
2004	9	4	0000	9.6	93.2	35	992	45
2004	9	4	0600	9.8	92.9	35	995	35
2004	9	4	1200	9.7	92.7	30	998	
2004	9	4	1800	9.6	92.6	30	998	
2004	9	5	0000	9.5	92.5	30	998	
2004	9	5	0600	9.7	92.3	25	1000	
2004	9	5	1200	9.9	91.7	25	1000	

Figure 1. Track of Tropical Cyclone *Phoebe* 30 August – 6 September 2004.  
All times in WST.

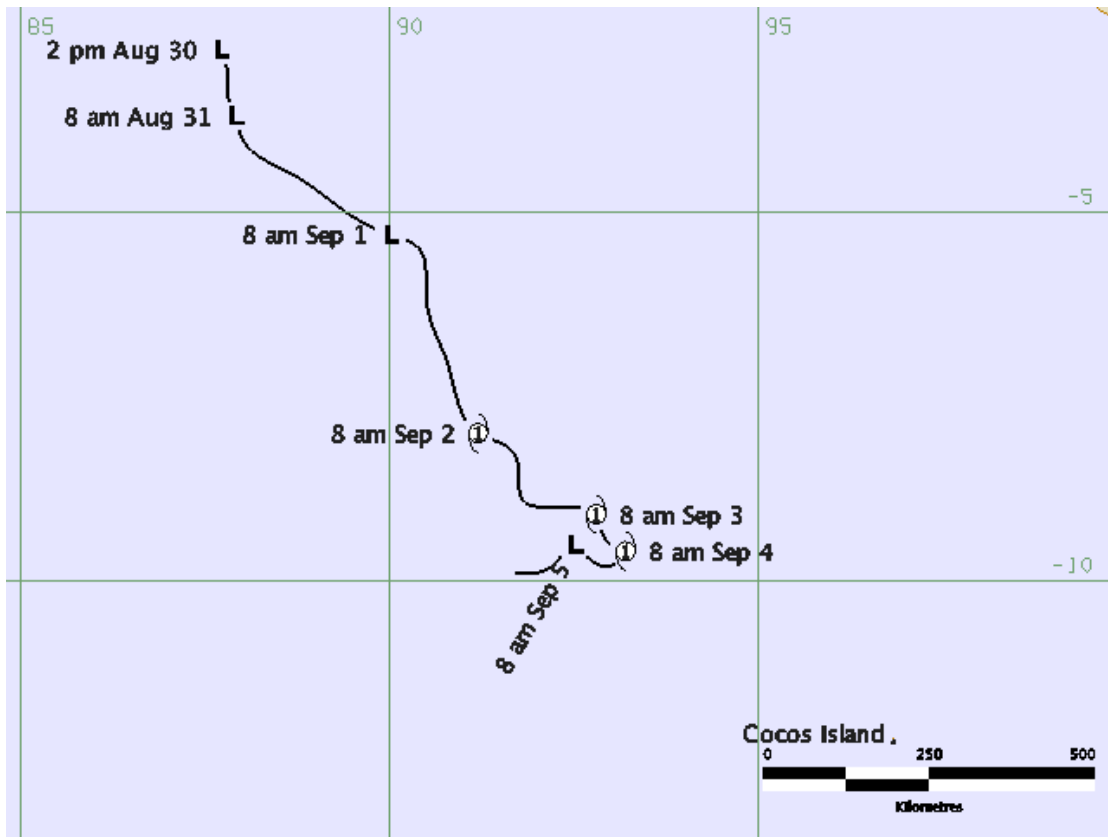


Figure 2. Quikscat (RSS) at 2350 UTC 1 September 2004.  
Courtesy RSS ([www.All times in WST](http://www.All times in WST)).

