Australian Government
Bureau of Meteorology

Tropical Cyclone *Dominic*

24 – 27 January 2009

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A. Summary

A low moved off the Kimberley coast during 24 January. This system moved steadily west and intensified into Tropical Cyclone *Dominic* by 0900 WDT 26 January. *Dominic* turned southwest and reached category 2 intensity before crossing the west Pilbara coast near Onslow at 0600 WDT 27 January. Wind gusts to 133 km/h (72 knots) were recorded at Onslow Airport and there was some minor structural damage and power lines brought down. *Dominic* weakened quickly over land although the remains of the system caused heavy rainfall and flooding in many parts of southern Western Australia. The Gascoyne River inundated many parts of Carnarvon. A train was derailed east of Kalgoorlie on 30 January apparently because of flowing water. Flash flooding was also reported in the Wheatbelt including York and Quairading.

B. Meteorological Description

Intensity analysis
Despite this being a quiet phase of the Madden Julian Oscialltion in the northwest region, a well developed surface circulation moved off the Kimberley coast during 24 January. Initially the system was hampered by strong east southeasterly shear. By 0300 WDT 25 January the shear decreased to 5 to 10 knots and the system intensified quickly over water.

During 25 January several well developed spiral bands around a low level centre were evident on satellite and microwave images. Overnight on 25 January the system continued to intensify and by 0900 WDT 26 January the system attained cyclone strength. It was just prior to this that the system began a southwest motion.

Dominic reached peak intensity of 55 knots just after 1500 WDT 26 January (see Fig. 2). By 2100 WDT 26 January strong northerly shear developed over the system and *Dominic* began to show signs of weakening on satellite imagery. As *Dominic* crossed the Pilbara coast near Onslow early on 27 January convection became confined to mainly western quadrants and then the southwestern quadrant.

As *Dominic* weakened from 0300 WDT 27 January the FT assigned was 2.5, despite this discretion was used and the CI was held 1 higher at 3.5. This was due to storm force winds being observed at both Varanus Island and then at Onslow Airport as the system crossed the coast.

Deep convection quickly became detached from the low level centre once *Dominic* had crossed the coast and the system weakened below cyclone strength by 2100 WDT 27 January. The remnants of the system went on to cause heavy rainfall further south over the next day.

Motion

Initially the low was steered to the west as it was located to the north of the mid-level ridge. During 26 January the system turned towards the south west and moved generally south until it dissipated on 27 January.

Structure

As *Dominic* was under an area of light shear the system was almost symmetrical with convection in nearly all quadrants at peak intensity. It was also a small system with the largest radius of gales extending to 80 nm in the southwest quadrant.

C. Impact

There was some minor structural damage and power lines were brought down as *Dominic* crossed the coast near Onslow. The remains of *Dominic* caused heavy rainfall and flooding from the Gascoyne River down through to southern parts of Western Australia. The Gascoyne river inundated low-lying parts of Carnarvon and crop growers sustained significant crop damage and soil erosion. A train was derailed east of Kalgoorlie on 30 January apparently because of flowing water. Flash flooding was also reported in the Wheatbelt including York and Quairading.

D. Observations

Wind

Varanus Island reported gale force winds for a period of 15 hours between 0920 26 January and 0030 27 January with a 1 hour period of storm force winds between 1550 and 1700 WDT 26 January.

Thevenard Island reported gale force winds for a period of 9 and 1/2 hours between 2340 26 January and 0900 27 January with a 2 and 1/2 hour period of storm force winds between 0400 and 0630 WDT 27 January.

Onslow Airport reported gale force winds for a period of 6 and 1/2 hours between 0310 and 0950 WDT 27 January with a 1 and 1/2 hour period of storm force winds between 0640 and 0800 WDT 27 January.

Rainfall

The highest rainfall recorded was at Thevenard Island 242.8 mm to 9 am 27 January and Onslow Airport 238.4 mm to 9 am 27 January. (Refer Fig. 3)

Pressure

The minimum pressure recorded at Varanus Island and Thevenard Island was 988.2 hPa, and at Onslow was 989.3 hPa.

E. Forecast Performance

Based on unfavourable environmental conditions initially the outlook for cyclogenesis was forecast to be low 3 days prior to development. Environmental conditions were not expected to improve and the system was expected to remain weak as it moved north of the Pilbara coast. However, by 25 January conditions were more favourable for cyclogenesis and a flash warning was issued for the coastal areas from Wickham to Exmouth at 1100 WDT 25 January. This area was extended east to Whim Creek at 2200 WDT 25 January. At 0100 WDT 27 January this area was decreased to Karratha to Exmouth with *Dominic* crossing the coast near Onslow at 0600 27 January. All Advices were cancelled by 1600 WDT 27 January as the system weakened over land.

Table 1. Best track summary for *Dominic,* January 2009.
Note: Add 9 hours to convert to WDT. Refer to best track database for complete track details.

Year	Month	Day	Hour (UTC)	Position Latitude S	Position Longitude E	Position Accuracy nm	Max wind 10min knots	Max gust knots	Central Pressure hPa	Rad. of Gales nm	Rad. of storm force winds nm	Radius Max. Wind (RMW)
2009	1	24	00	17.3	123.3	25	15	40	1002			
2009	1	24	06	17.6	122.6	25	20	45	1002			
2009	1	24	12	17.8	121.6	25	25	45	1000			
2009	1	24	18	18.0	120.5	25	25	45	1002			
2009	1	25	00	18.5	118.8	20	25	45	1003			
2009	1	25	06	18.6	117.8	20	25	45	1003			
2009	1	25	12	18.6	116.6	15	25	45	1003			
2009	1	25	18	18.6	116.5	10	25	45	1001			
2009	1	26	00	19.3	116.0	10	35	50	995	55		20
2009	1	26	06	20.2	115.5	10	50	70	984	57.5	30	20
2009	1	26	12	20.7	115.3	10	55	75	976	57.5	30	15
2009	1	26	18	21.2	115.1	10	55	75	976	50	20	10
2009	1	27	00	22.0	115.4	15	50	70	980	37.5	15	10
2009	1	27	06	22.5	115.5	20	40	55	987	37.5		10
2009	1	27	12	24.1	116.0	30	30	45	997			
2009	1	27	18	25.2	116.2	30	25	45	999			

Table 2. Verification statistics: Track and Intensity.

Parameter	**0 hr**	**6 hr**	**12 hr**	**18 hr**	**24 hr**	**36 hr**	**48 hr**
Count	11	11	11	10	9	7	4
Distance (km)	18	50	82	115	151	243	419
Mean Wind (knots)	5	5	9	9	6	6	27

Figure 1. Track of Tropical Cyclone *Dominic* 24-27 January 2009, all times in WDT.

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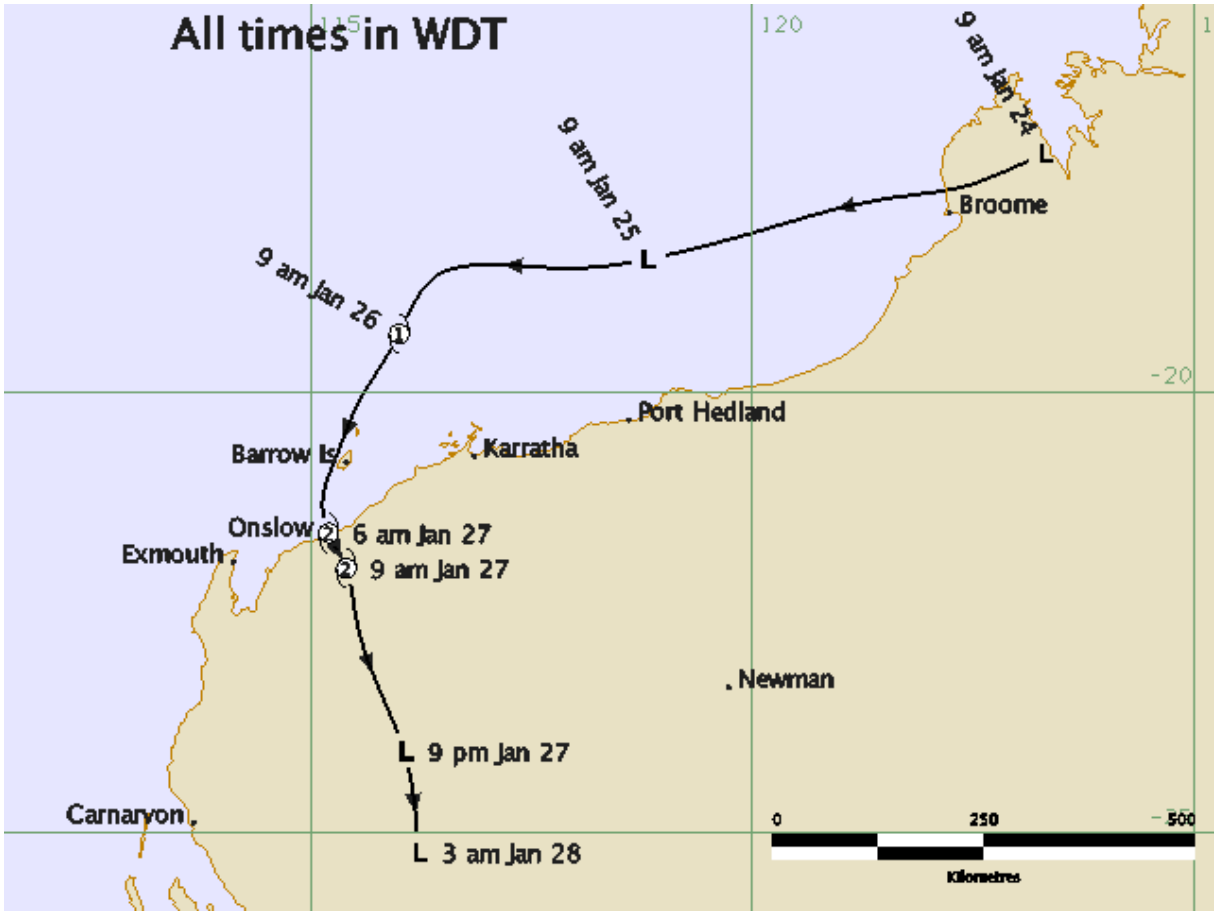

Figure 2. Microwave (SSMIS 91GHz) image at 1508 WDT 27 January 2009.
(image courtesy of US NRL: http://www.nrlmry.navy.mil/)

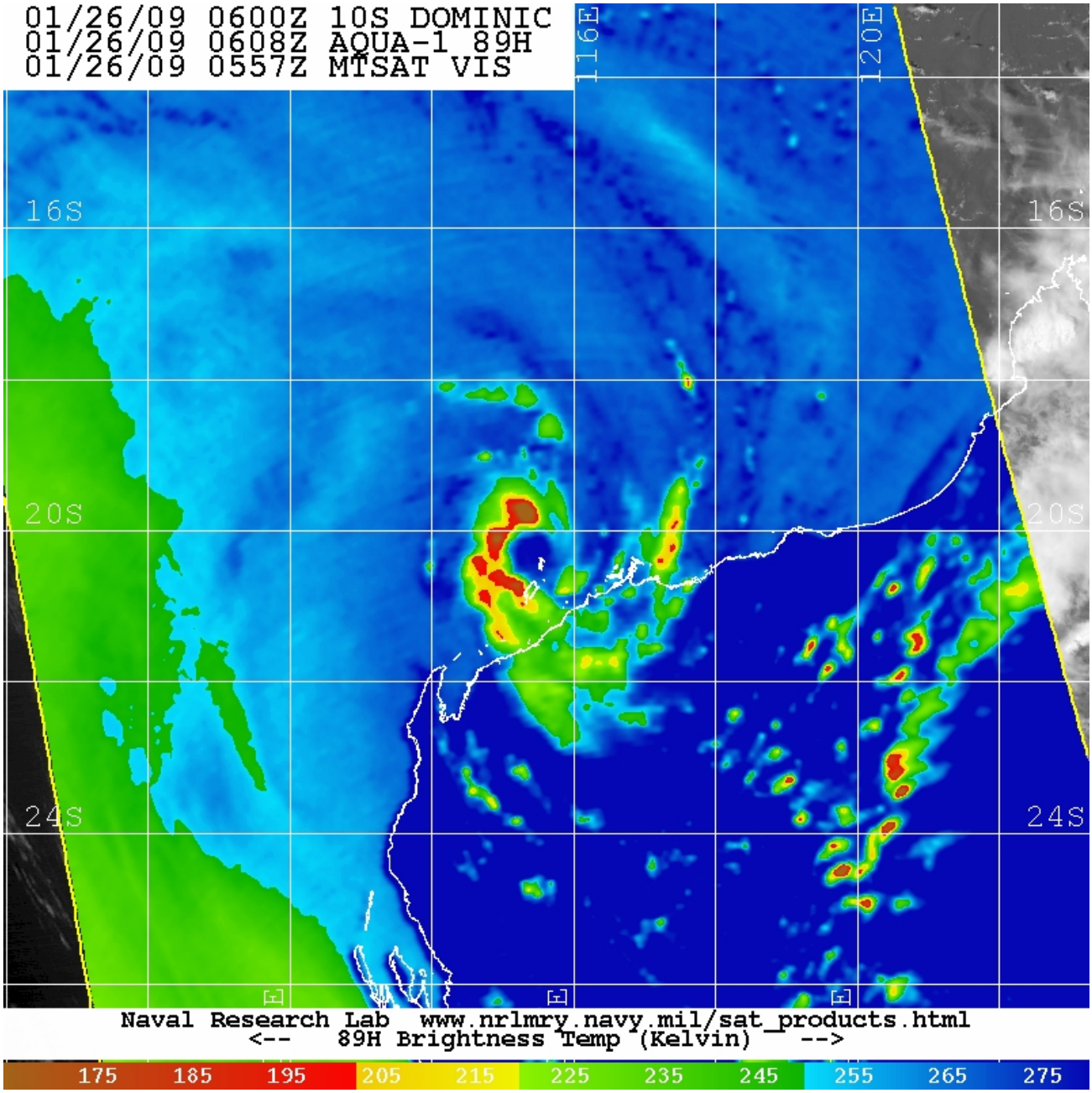

Figure 3. Rainfall map for the week ending 30 January 2009. (Image from the National Climate Centre, Bureau of Meteorology)

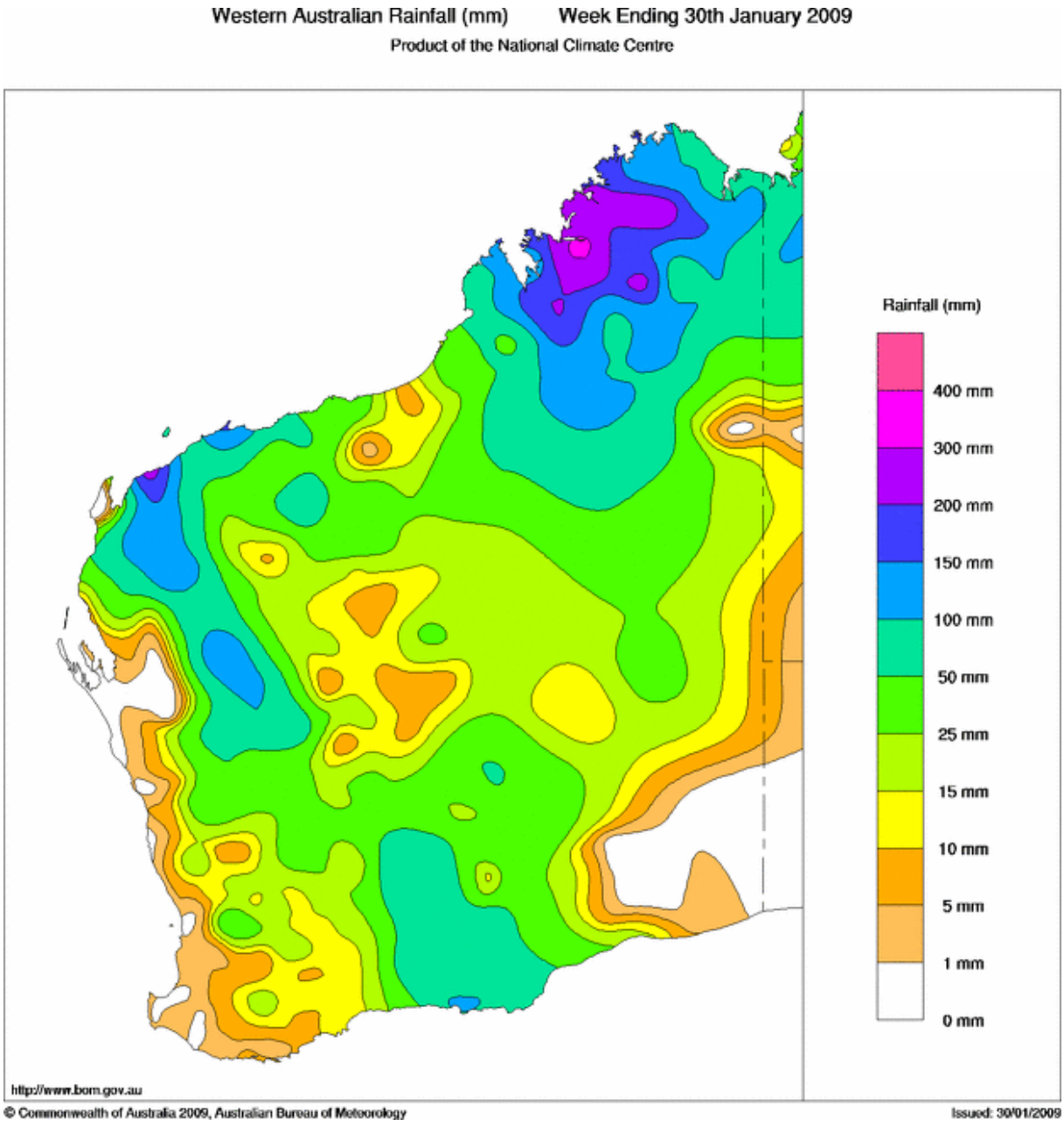

Figure 4. Flooding of the Gascoyne River, Carnarvon, Janury 2009. Photo courtesy of Peter Brooks, Shire of Carnarvon.

Figure 5. Flooding of the Gascoyne River, Carnarvon, January 2009. Photo courtesy of Peter Brooks, Shire of Carnarvon.