

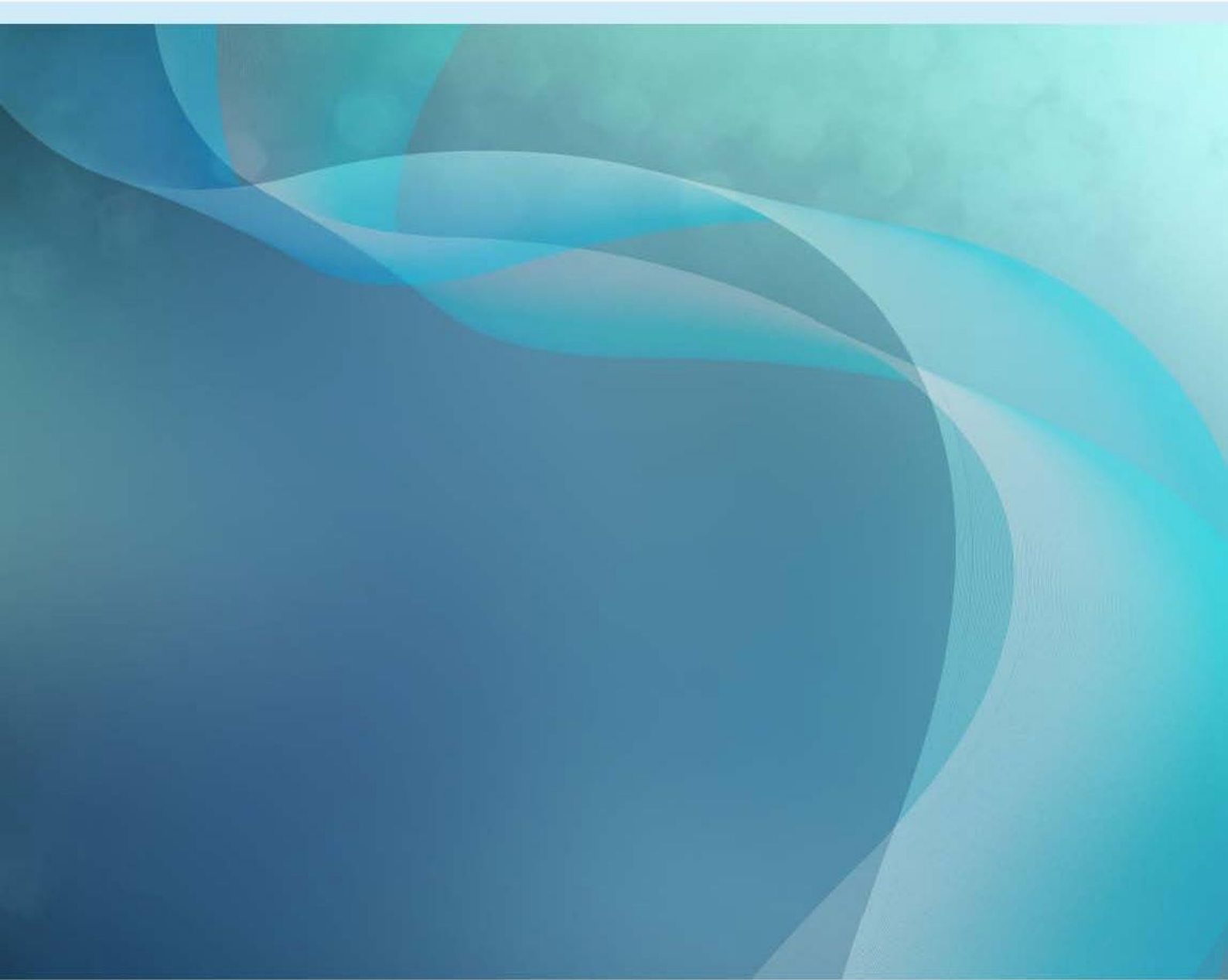


Australian Government
Bureau of Meteorology

Tropical Cyclone *Mitchell*

26 – 31 December 2012

November 2015



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1 Summary

A weak tropical low became evident in an active monsoon trough to the north of Western Australia late on 26 December. The tropical low initially drifted west and then moved in a south southwest direction reaching tropical cyclone intensity on 29 December. *Mitchell* quickly reached a peak intensity of 45 knots (kn) (83 kilometres per hour (km/h)) at 0600 Universal Time Coordinated (1400 AWST=UTC + 8 hours) 29 December which was maintained through until 0600 UTC 29 December. *Mitchell* continued on a southerly track and weakened below tropical cyclone strength by 0600 UTC 30 December well offshore. *Mitchell* did not impact the Australian mainland.

1.1 Intensity analysis

A weak tropical low became evident in an active monsoon trough to the north of Western Australia late on 26 December with a Dvorak Data T-number (DT) 1.0 assigned around 0600 UTC 27 December. Convection slowly became more organised and a DT of 3.0 was reached at 1800 UTC 28 December. However the 0141 UTC 29 December Advanced Scatterometer (ASCAT) pass (refer Figure 2) showed winds in the 30 – 35 kn (55 – 65 km/h) range and *Mitchell* wasn't deemed to have reached cyclone strength until 0000 UTC 29 December. The tropical cyclone quickly reached a 10-minute mean wind peak intensity of 45 kn (83 km/h) at 0600 UTC 29 December (refer Figure 3) which was maintained through to 0000 UTC 30 December. A mid-level trough amplified to the west of *Mitchell* and the tropical cyclone began to weaken rapidly under increased vertical wind shear. The deep cold convection became confined to the southeast quadrant and *Mitchell* weakened to below tropical cyclone strength by 1200 UTC 30 December when gales persisted only in the southeast quadrant.

Figure 5 is a plot of subjective and objective intensity estimates available during *Mitchell*. Most methods were in reasonable agreement during the intensifying phase. The objective Dvorak methods were the only estimates to maintain the intensity through the period 1200 UTC 29 December to 0000 UTC 30 December. This trend was reflected in the 0122 UTC 30 December ASCAT pass (refer Figure 4) which showed 40 – 45 kn (74 – 83 km/h) winds maintained in three quadrants. All methods weakened *Mitchell* quickly from 0000 UTC 30 December.

1.2 Structure

Mitchell initially had a gale radius of 60 nautical miles (nm) (111 km) in all quadrants except the northwest which was reduced to 30 nm (56 km). As *Mitchell* intensified the gale radius increased to 90 nm (167 km) in the northern quadrants and 120 nm (222 km) in the southern quadrants. The radius to maximum winds (RMW) was initially 45 nm (83 km) and decreased to 20 nm (37 km) at its smallest.

1.3 Motion

Mitchell was steered initially west southwest while it was located north of a mid-level ridge. During 29 December a trough amplified in the Indian Ocean and *Mitchell* was steered south between the trough and the ridge located over Western Australia.

2 Impact

Mitchell did not impact the Australian mainland.

3 Observations

No observations were recorded during *Mitchell*.

4 Forecast Performance

The accuracy statistics obtained by comparing the forecast positions against the best track positions for *Mitchell* are

	0	06	12	18	24	36
Absolute error (km)	60	70	65	62	88	93
RMS error (km)	66	71	75	75	106	93

Figure 6 is a plot of the accuracy figures for *Mitchell* compared to the five year mean.

TABLE 1. Best track summary for Tropical Cyclone *Mitchell*

Refer to the Australian Tropical Cyclone database for complete listing of parameters. AWST is UTC + 8 hours.

Year	Month	Day	Hour UTC	Pos. Lat S	Pos. Long. E	Pos. Acc. n mi	Max Wind 10 min kn	Max gust kn	Cent. Pres. hPa	Rad. of gales (NE/SE/SW/NW)	Rad. of storm (NE/SE/SW/NW)	RMW n mi
2012	12	26	0000									
2012	12	26	0600									
2012	12	26	1200	13.4	116.2	45	20	45	1004			
2012	12	26	1800	13.5	115.1	45	20	45	1004			
2012	12	27	0000	13.5	114.0	45	20	45	1004			
2012	12	27	0600	14.0	113.6	45	20	45	1003			
2012	12	27	1200	14.4	113.2	45	25	45	1001			
2012	12	27	1800	14.8	112.9	45	25	45	1001			
2012	12	28	0000	15.1	112.7	30	25	45	1001			
2012	12	28	0600	15.4	112.4	30	25	45	1001			
2012	12	28	1200	15.5	111.4	30	30	45	1000			
2012	12	28	1800	16.3	111.1	30	30	45	1000			
2012	12	29	0000	17.2	110.9	20	35	50	997	60/60/60/30		45
2012	12	29	0600	18.0	110.8	20	45	65	991	60/60/60/30		45
2012	12	29	1200	18.9	110.6	20	45	65	988	90/120/120/90		20
2012	12	29	1800	20.1	110.4	20	45	65	988	90/120/120/90		20

Year	Month	Day	Hour UTC	Pos. Lat S	Pos. Long. E	Pos. Acc. n mi	Max Wind 10 min kn	Max gust kn	Cent . Pres. s. hPa	Rad. of gales (NE/SE/ SW/NW)	Rad. of storm (NE/SE/ SW/NW)	RMW n mi
2012	12	30	0000	21.3	110.2	15	45	65	989	90/120/90/90		20
2012	12	30	0600	22.6	110.1	20	40	55	992	90/120/90/90		60
2012	12	30	1200	23.9	109.8	20	35	50	998	0/60/0/0		60
2012	12	30	1800	25.4	108.9	20	25	45	1004			
2012	12	01	0000	26.8	108.1	20	25	45	1004			
2012	12	01	0600	28.5	108.0	20	25	45	1004			
2012	12	01	1200	30.2	108.7	45	25	45	1004			

Figure 1. Best track of *Mitchell* 26 -31 December 2012 (times in WST, UTC+8).

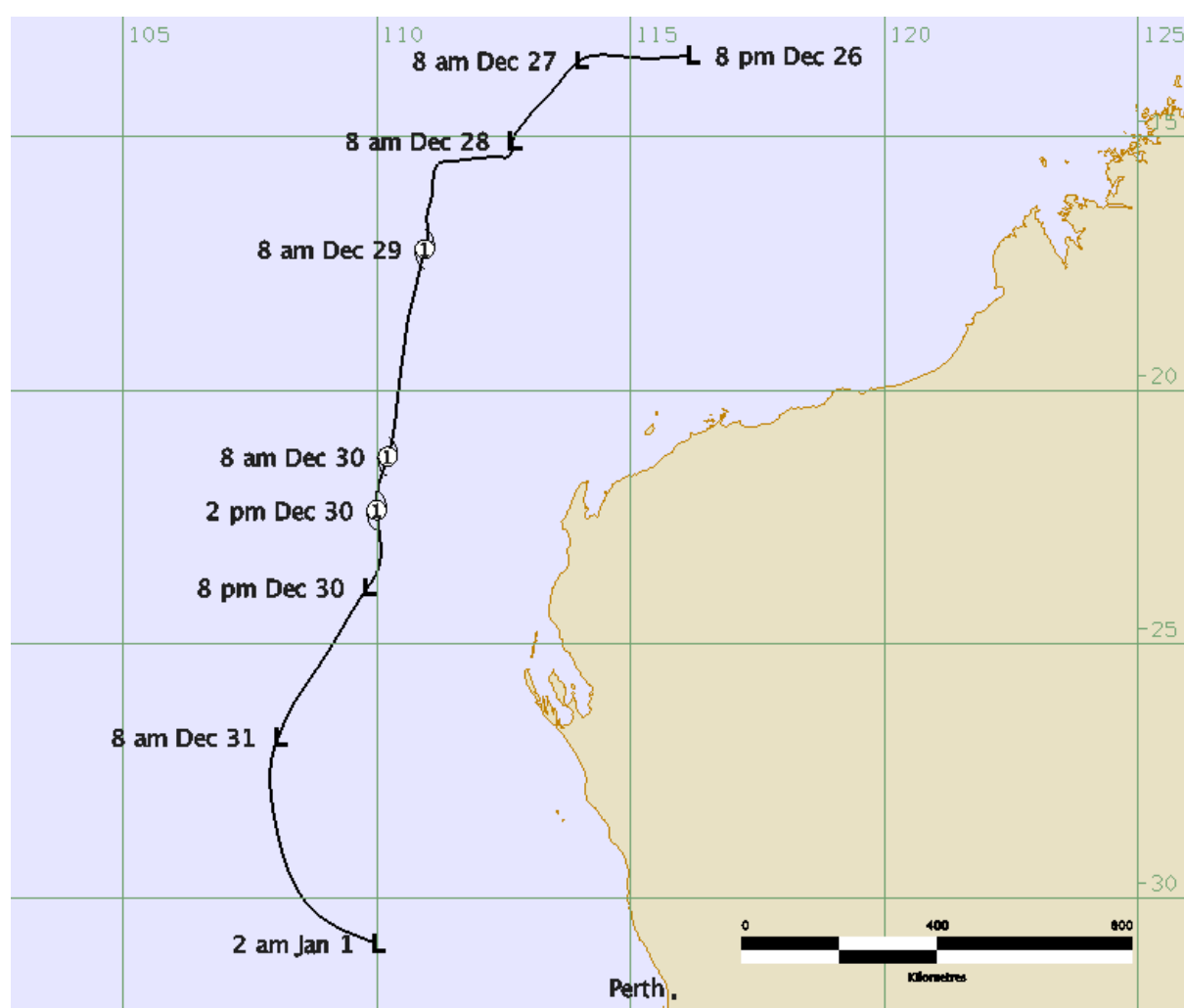


Figure 2. 0141 UTC 29 December 2013 ASCAT pass over *Mitchell* during the early stages of its lifecycle.

(image courtesy of NOAA NRL: <http://www.nrlmry.navy.mil/>)

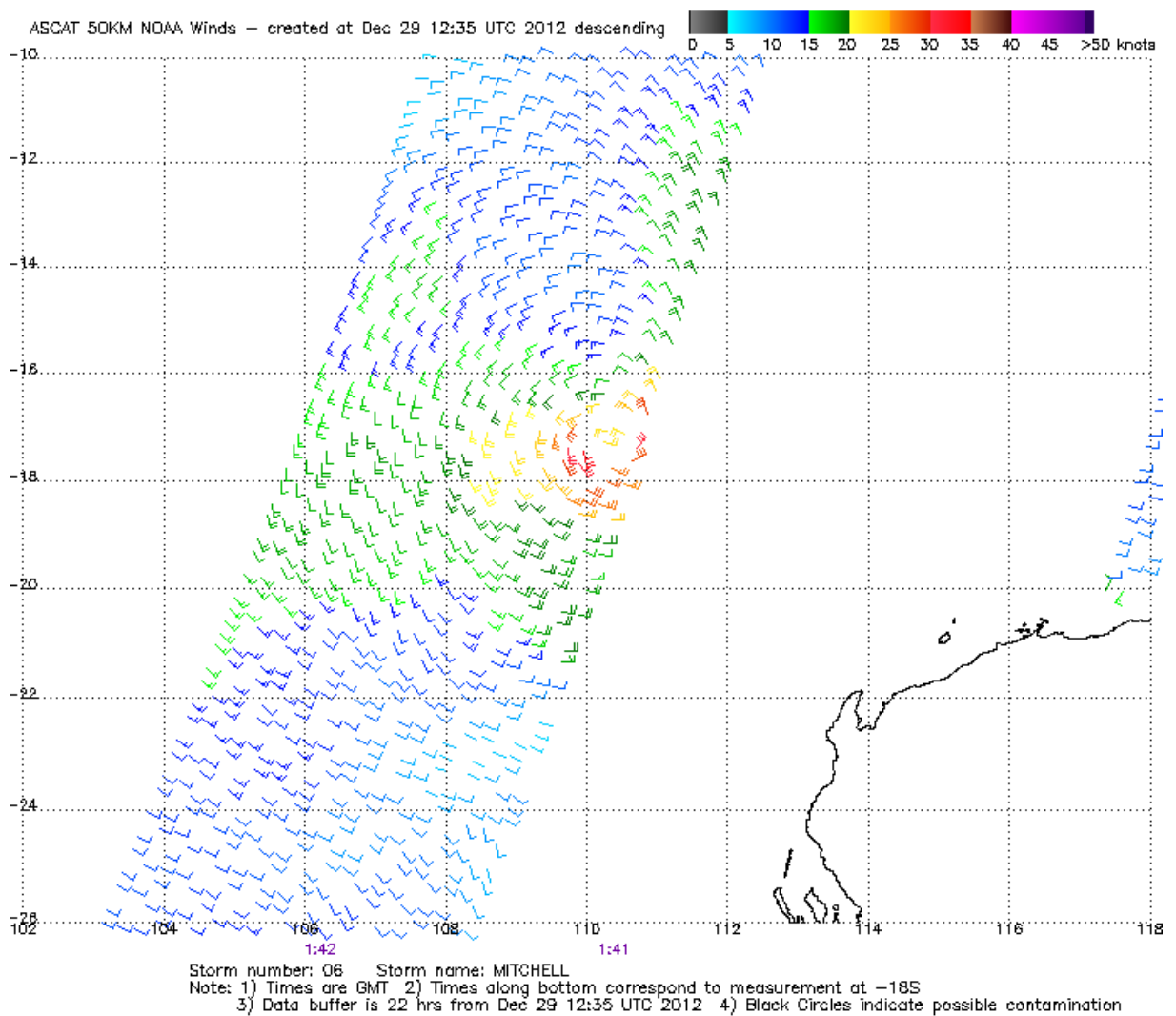


Figure 3. Visible image from MTSAT2 at 0430 UTC 29 December around the time *Mitchell* reached peak intensity.

(image courtesy of NOAA NRL: <http://www.nrlmry.navy.mil/>)

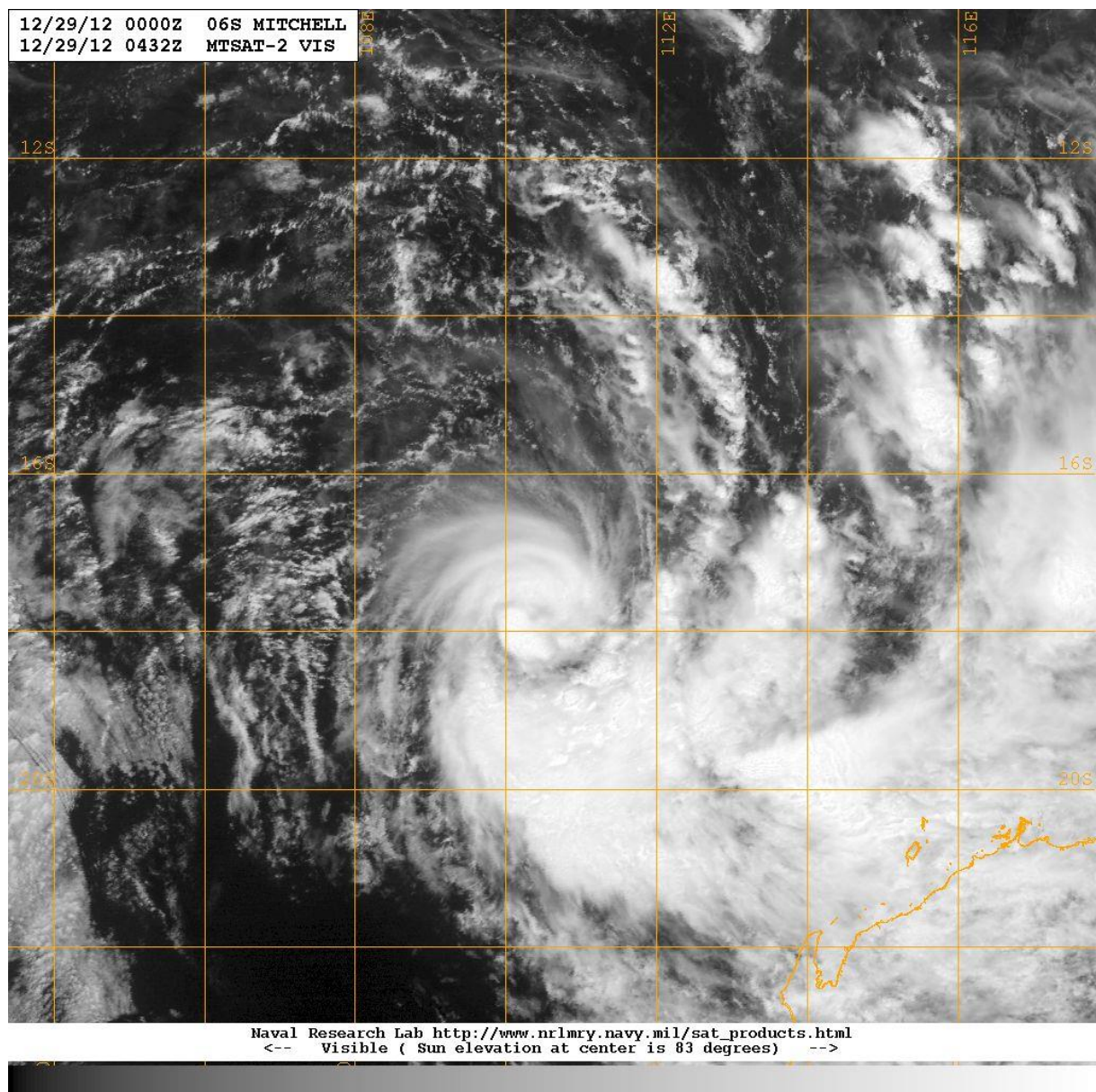


Figure 4. 0122 UTC 30 December ASCAT pass.

(image courtesy of NOAA NRL: <http://www.nrlmry.navy.mil/>)

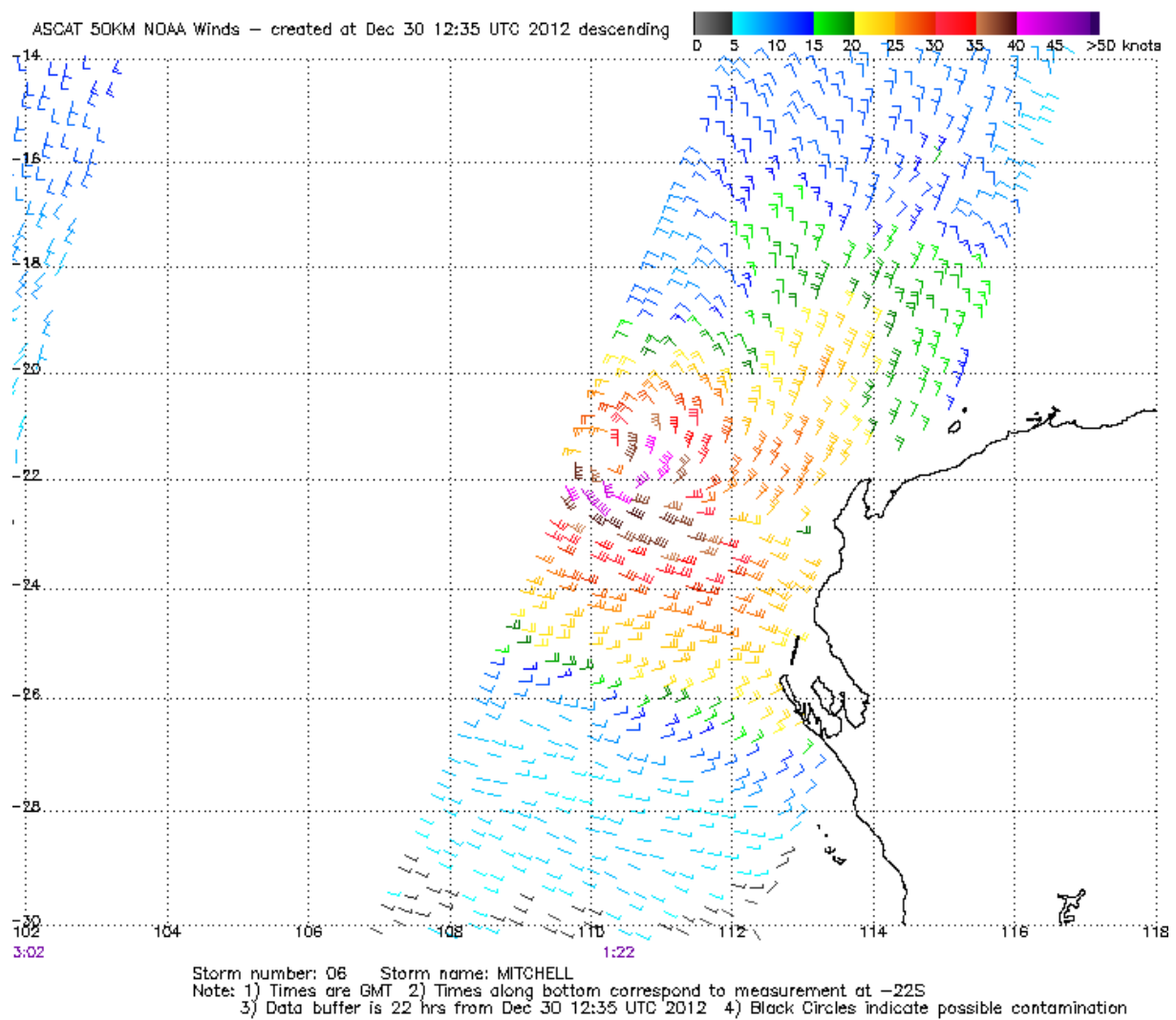


Figure 5. Comparison of objective and subjective intensity analysis techniques.

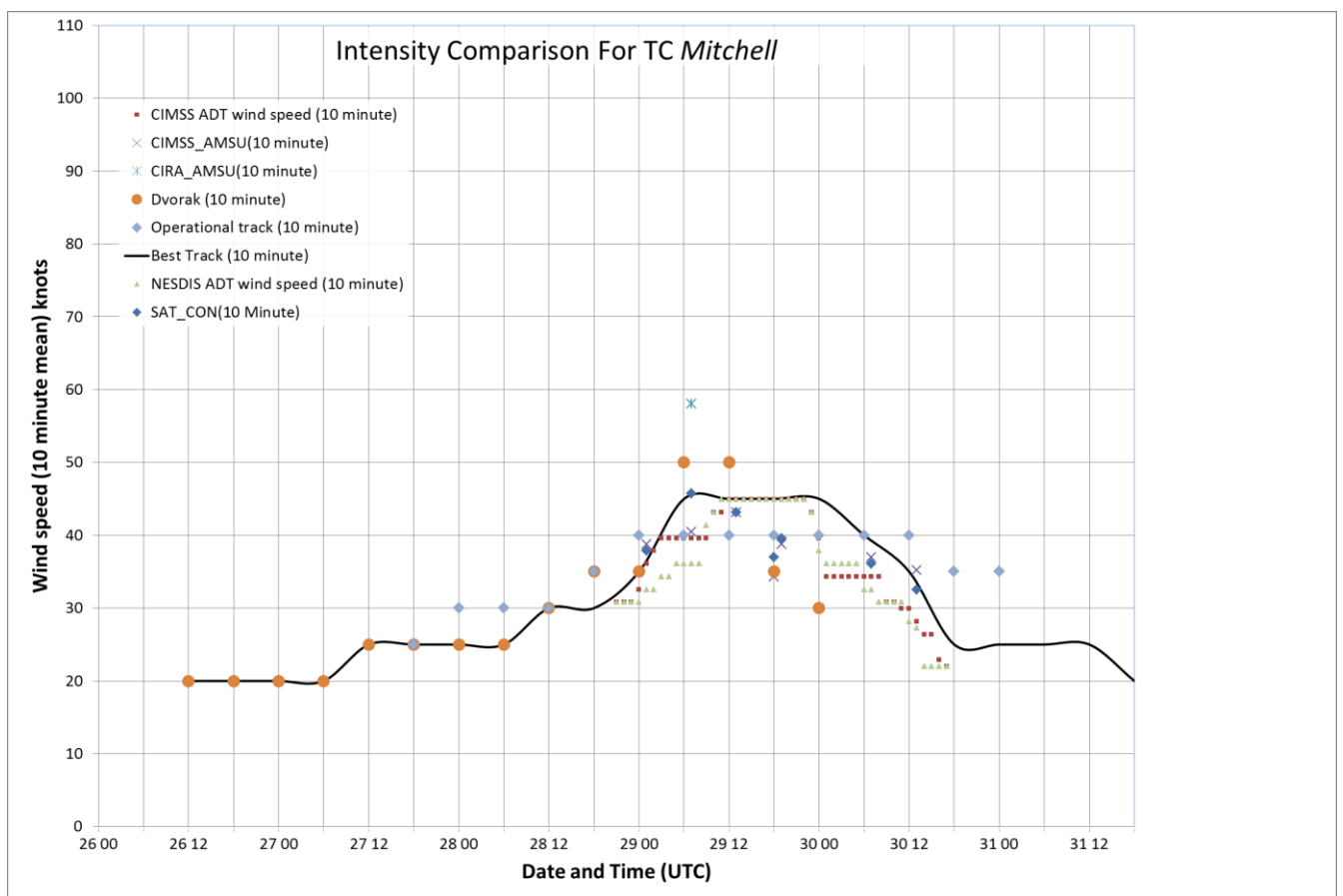


Figure 6 Accuracy statistics for *Mitchell*.

