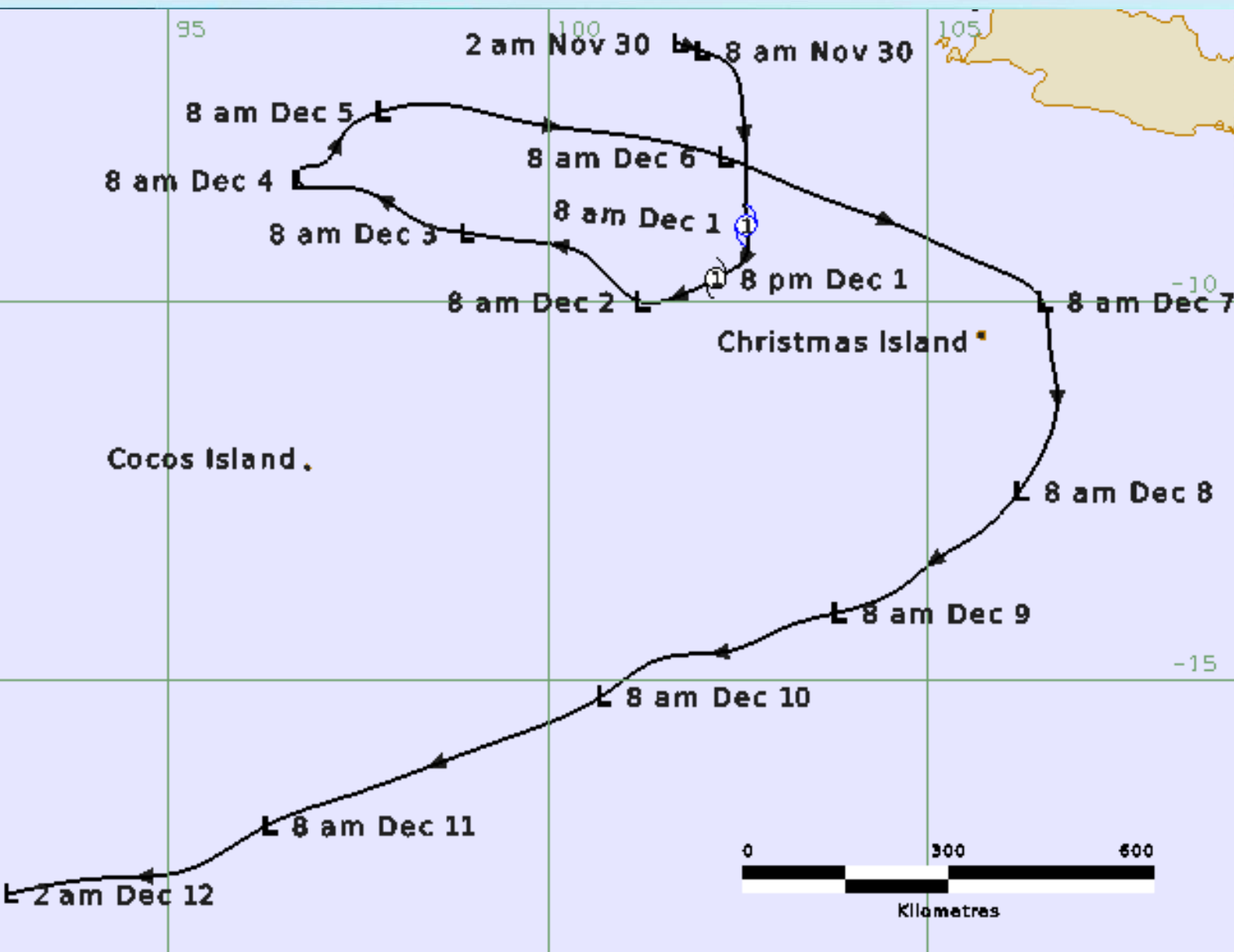




Tropical Cyclone Teratai

30 November – 12 December 2021

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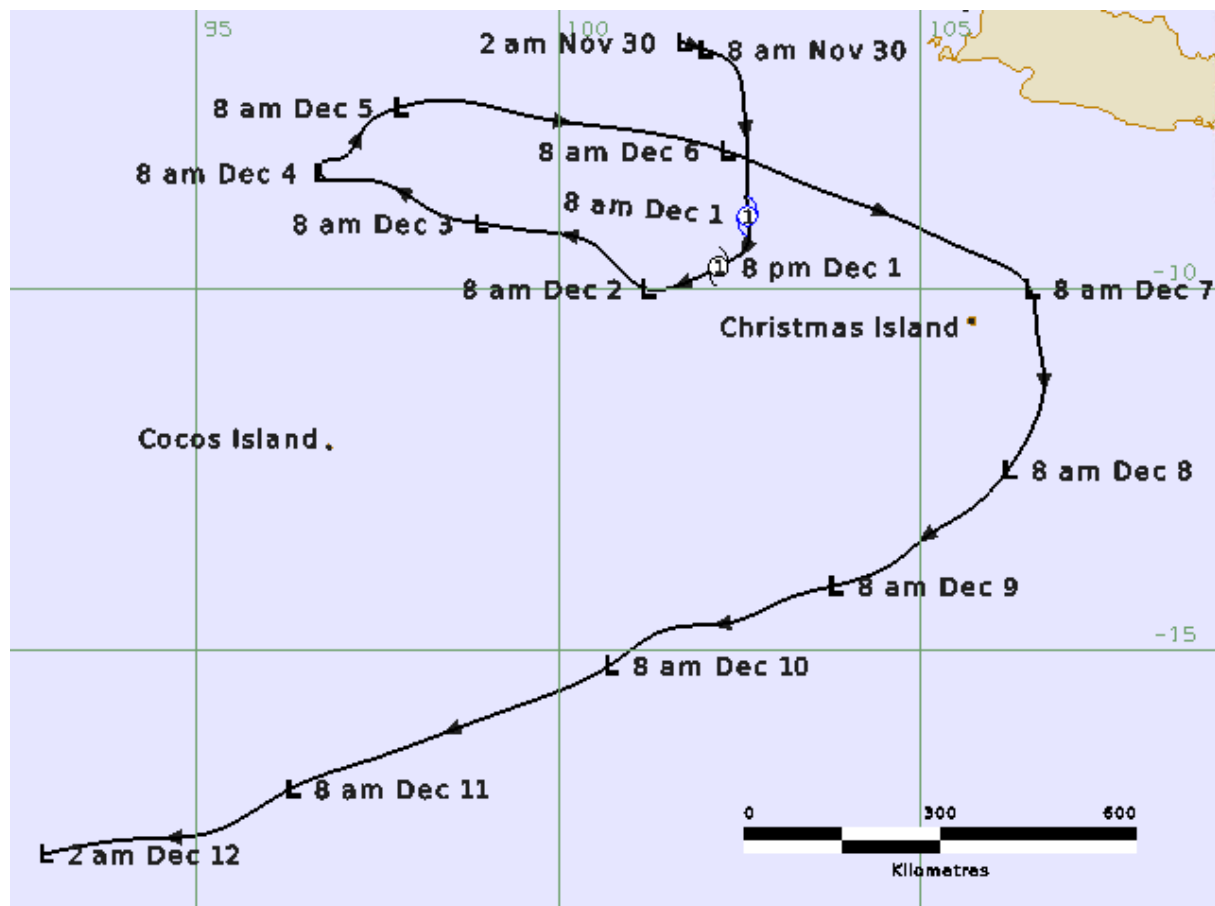
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1 Summary

Tropical Cyclone (TC) *Teratai* was a small Indian Ocean tropical cyclone that formed in the Indonesian Area of Responsibility (AOR) and briefly reached category one intensity on 1 December. It weakened later that day and continued as a tropical low. It moved into the Australian region on 7 December to the east of Christmas Island causing gales at times in some quadrants but insufficient to regain tropical cyclone intensity. It weakened as it tracked to the southwest over open waters until finally dissipating on 12 December

There were no known impacts from this event.

FIGURE 1 Best track of Tropical Cyclone *Teratai* 30 November – 12 December 2021 (times in AWST, UTC+8).



2 Meteorological Description

2.1 Intensity analysis

A low formed in the monsoon trough on 28 November southwest of Sumatra and well to the northwest of Christmas Island. Deep convection developed during 29 November and microwave imagery indicated increasing curvature to the west of the centre, extending to northern side later in the day.

An Advanced Scatterometer (ASCAT) pass (ASCAT-B at 1502 UTC) supported by Advanced Microwave Scanning Radiometer (AMSR2) pass at 1901 UTC indicated gales in the northeast quadrant. Tropical cyclone intensity is estimated at 0000 UTC 1 December. At this time a Special Sensor Microwave Imager/Sounder (SSMIS) 89 GHz microwave image shown in Fig. 2 revealed a tight inner core, while the Dvorak intensity increased to 3.0. This was followed by ASCAT passes (ASCAT-B at 0205UTC shown in Fig. 3 and ASCAT-C at 0257 UTC) that showed gales around the circulation.

Deep convection remained near the centre until about 1400 UTC 1 December then quite abruptly weakened and the Hai Yang 2C (HY-2B) scatterometer pass 2230 UTC showed gales contracting to southern quadrants.

The first visible images on 2 December indicated a very exposed low level circulation centre moving southwest reaching 10°S at 0000 UTC but then moving to the northwest outside the Australian region.

The circulation then meandered as a weak system for several days before redeveloping on 6 December associated with an enhanced monsoonal flow north of the centre and increased convection west of the centre. An ASCAT-C pass at 0255UTC 6 December showed an area of 30 kn winds to the north. Gales emerged in the northeast quadrant on the ASCAT-C pass at 0233UTC 7 December coincident with a brief burst of convection near the centre. By this stage the system had entered the Australian region passing to the east of Christmas Island.

2.2 Structure

TC *Teratai* was a very small circulation. Satellite derived surface winds from ASCAT and AMSR2 indicated gales only extending to 40 nautical miles (nm). The radius of maximum winds was estimated at 20 nm when it was at cyclone intensity.

2.3 Motion

In the early stages off northern Australia, the circulation moved south. By 2 December after weakening below TC intensity as a shallower system in depth, the system turned to the west then northwest in response to a ridge to the south. By 5 December, in response to an increasing monsoon flow, the low turned to the east then southeast eventually turning south on 7 December then to the southwest once more on 8 December as a weakening system.

FIGURE 2. SSMIS Microwave at 2350 UTC 30 November, when *Teratai* reached TC intensity.

Images courtesy NRL: <https://www.nrlmry.navy.mil/TC.html>

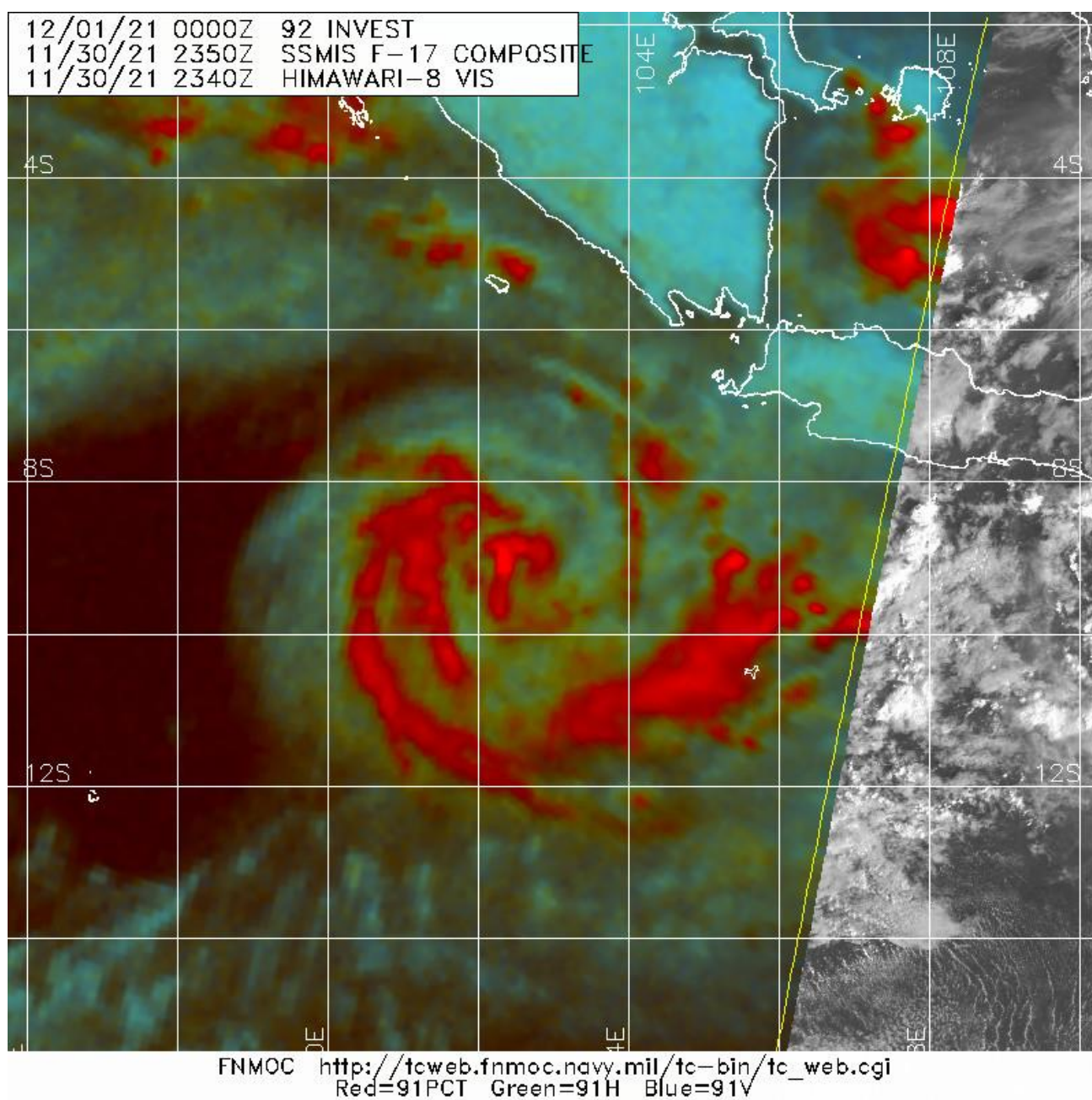
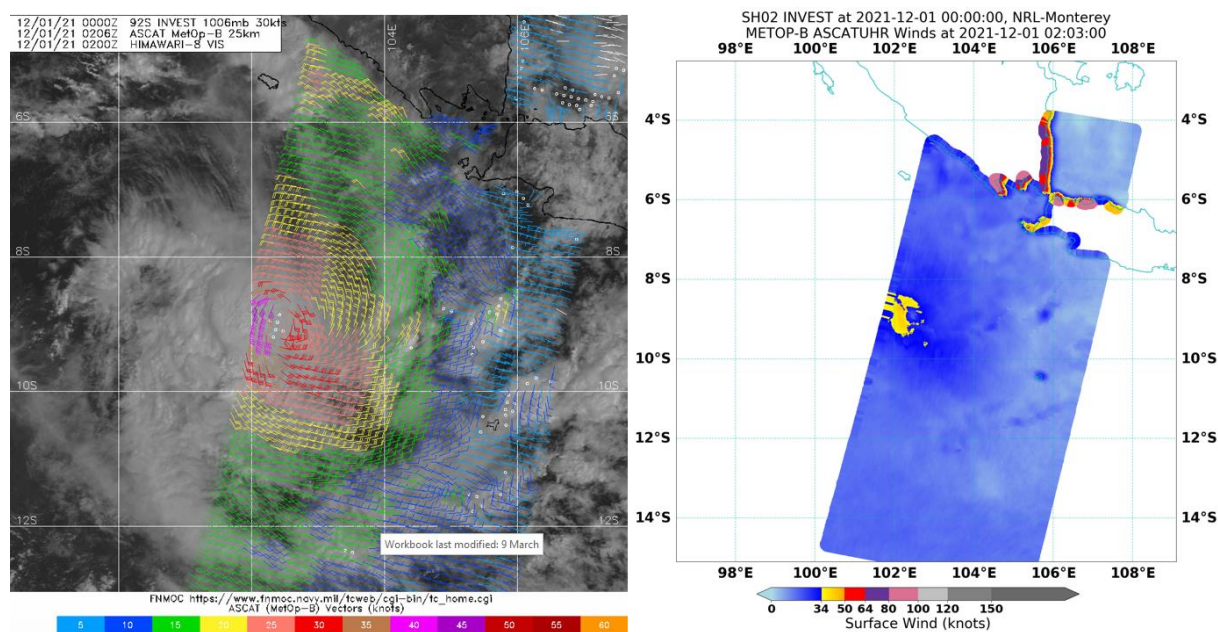


FIGURE 3. Surface wind distribution from ASCAT-b 0203 UTC 1 December. Surface winds left, and high-resolution wind speeds right. Images courtesy NRL: <https://www.nrlmry.navy.mil/TC.html>.



3 Impact and Observations

There were no significant observations or known impacts during this event.

TABLE 1. Best track summary for Tropical Cyclone *Teratai* 29 November to 2 December 2021.

Refer to the Australian Tropical Cyclone database for complete listing of parameters and track. Note: UTC is AWST - 8 hours.

Year	Month	Day	Hour UTC	Pos. Lat. S	Pos. Long. E	Pos. Acc. nm	Max Wind 10min kn	Max gust kn	Cent. Press. hPa	Rad. of gales (NE/SE/SW/NW)	Rad. of storm (NE/SE/SW/NW)	RMW n mi
2021	11	29	18	6.6	101.7	30	25	45	1006	-	-	-
2021	11	30	00	6.7	102.0	30	25	45	1006	-	-	-
2021	11	30	06	6.9	102.4	25	30	45	1002	-	-	-
2021	11	30	12	7.5	102.5	20	30	45	1000	-	-	-
2021	11	30	18	8.3	102.6	20	40*	50	999	40/0/0/0	-	-
2021	12	01	00	9.0	102.6	20	40	55	998	40/0/50/40	-	20
2021	12	01	06	9.4	102.6	20	40	55	986	0/50/50/40	-	20
2021	12	01	12	9.7	102.2	20	40	55	998	0/50/50/40	-	20
2021	12	01	18	9.9	101.8	20	35*	50	1000	0/50/70/0	-	-
2021	12	02	00	10.0	101.2	15	35*	50	1000	0/0/70/0	-	-
2021	12	02	06	9.8	100.9	15	30	45	1000	-	-	-

4 Forecast Performance

Teratai developed while it was located in the Indonesian AOR. Official tropical cyclone forecasts were issued from 06 to 18 UTC 1 December for ocean wind warnings as the system approached the Australian region but ceased when the system was downgraded. There were too few forecasts to make conclusions on the performance although figures are presented below for reference.

Non-tropical cyclone ocean wind warnings were issued for sector winds later in the track but those are not evaluated.

	00	06	12	18	24	36	48	72	96	120
Position Absolute error (km)	4	22	34	48	68	142	191	199	237	540
Intensity Absolute error (kn)	5	5	3	5	7	10	7	2	5	5
Sample Size	3	3	3	3	3	3	3	3	3	3