Australian Government
Bureau of Meteorology

Tropical Cyclone *Iggy*
23 January – 3 February 2012

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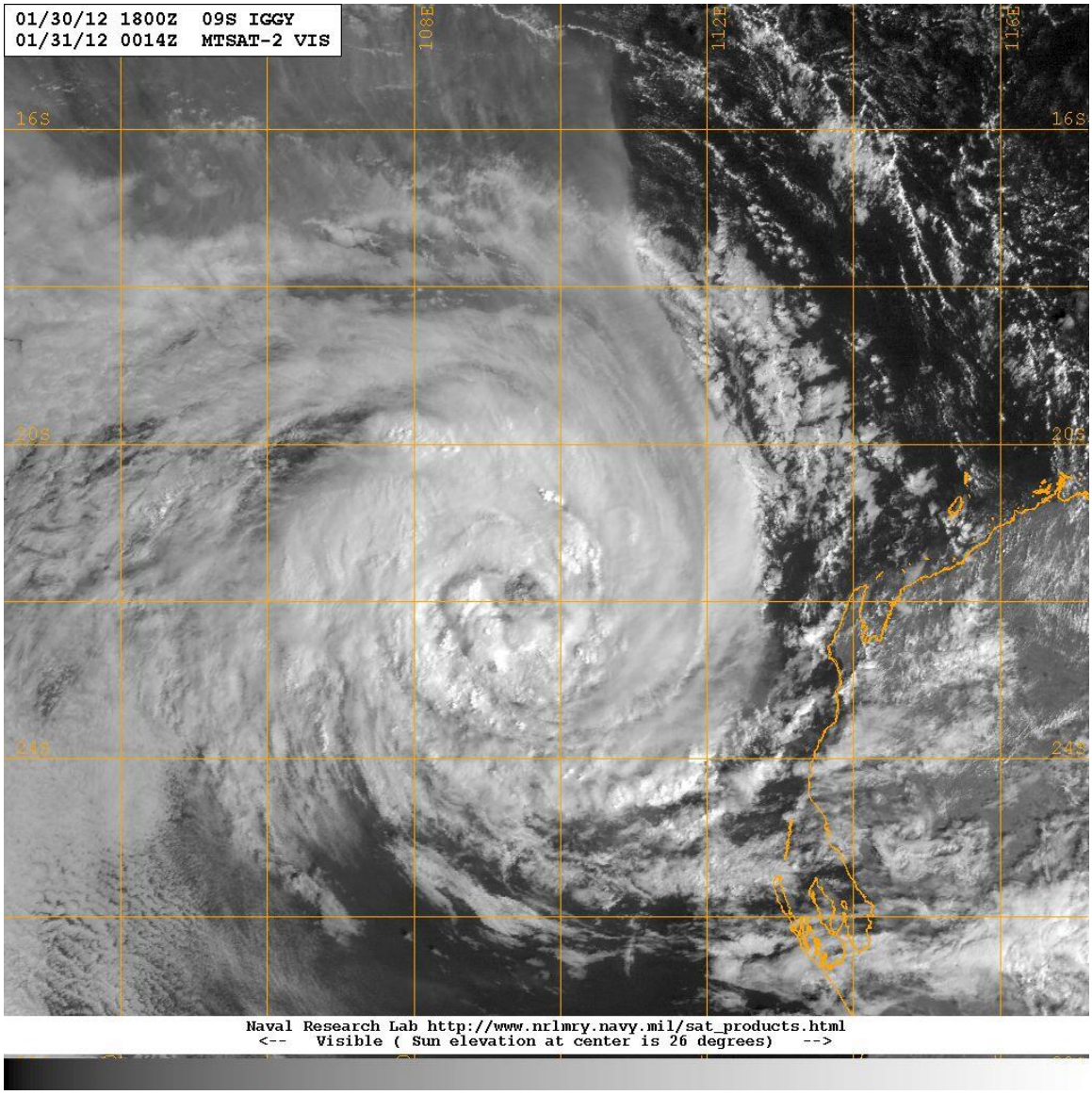
(image courtesy of NOAA NRL: http://www.nrlmry.navy.mil/))



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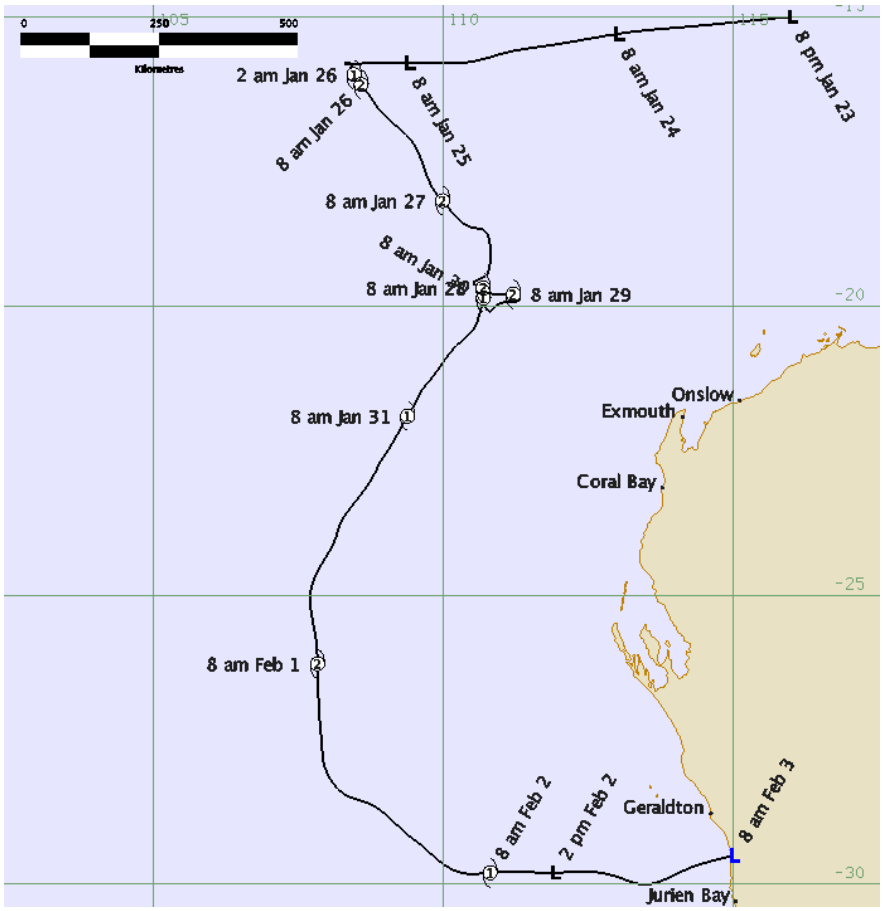
Summary

A deep and well organised monsoon trough combined with an active phase of the Madden-Julian Oscillation (MJO) to produce a tropical low pressure system near 15° S 116° E late on 23 January. Initially the tropical low moved west before turning south southeast and intensifying into a tropical cyclone on 25 January. During the period 25 – 30 January *Iggy* was under a weak steering flow and it drifted slowly south, then east and then west, well offshore from the Western Australian coastline. *Iggy* was also under the influence of easterly wind shear and satellite imagery showed an exposed low-level centre with deep convection displaced over the western half of the tropical cyclone. During 30 and 31 January *Iggy* turned to the south and accelerated. *Iggy* became symmetric and reached a 10-minute mean wind peak intensity of 60 knots (kn) (111 kilometres per hour (km/h)) at 1200 UTC 31 January well to the west of the upper west coast of Western Australia.

The tropical cyclone continued to track south and weakened quickly as it moved over cooler Sea Surface Temperatures (SSTs) and increased wind shear. During 1 February *Iggy* turned southeast toward the Western Australian coastline. *Iggy* weakened below tropical cyclone strength by 0600 UTC 2 February. The remnant low pressure system caused near gale force winds along the Central West coast and heavy rainfall between Perth and Lancelin.

A pronounced tidal surge was recorded at most towns from Onslow to Perth as *Iggy* moved south along the west coast. The peak was 80 centimetres (cm) recorded at Geraldton and 70 cm at Fremantle on 2 February with no apparent damage reported from any locations.

Figure 1. Best track of Tropical Cyclone *Iggy* (23 Janaury – 3 February 2012)



Meteorological Description

Intensity analysis

During 23 January a tropical low pressure system became evident in the satellite imagery which initially moved to the west and slowly developed. Early microwave and visible (VIS) imagery showed low level cloud bands with deep convection located on the western side of the tropical low. By 1800 UTC 25 Janaury a Dvorak Data-T number (DT) of 3.0 was reached and the tropical low became a tropical cyclone. Oceansat-2 Scatterometer (OSCAT) and Advanced Scatterometer (ASCAT) passes earlier on 25 Janaury revealed 35 kn (65 km/h) winds in the northwest quadrant. The 0134 UTC 26 January ASCAT pass showed 35 knot winds extending slightly more than half way around the tropical cyclone and an extensive area of 50 kn (93 km/h) winds in northern quadrants (refer Figure 2).

Microwave imagery showed that through 26 – 29 January *Iggy* was under the influence of easterly wind shear. A comma shaped band of deep convection was present over the western half of the tropical cyclone with an exposed but well developed low-level cloud centre (refer Fig. 3). *Iggy*'s 10-minute mean wind intensity remained at 50 - 55 kn (93 – 102 km/h) through this period. Most objective and subjective intensity estimates agreed reasonably well with the exception of Cooperative Institute for Meteorological Satellite Studies Advanced Dvorak Technique (CIMSS ADT) for the period 1200 UTC 28 January to 0000 UTC 29 January which was as high as around 72 kn (133 km/h) 10-minute mean winds. It is a known limitation that in tropical cyclones affected by shear the ADT method may overestimate the intensity and it is likely that occurred during this period.

During the period 27 – 30 January *Iggy* moved very slowly, remaining in the same general area. SST analyses show that by 30 January cooling of the ocean temperatures had occurred in this area (refer Figure 4). It is likely that this contributed to the weakening trend evident from around 0000 UTC 29 January until 0000 UTC 31 January. As *Iggy* moved south away from the area of upwelling of cooler SSTs the cloud features showed marked improvement in curved band development. *Iggy* became symmetrical under lighter wind shear and enhanced infrared (EIR) satellite imagery showed an eye through the period 1030 UTC to 1530 UTC 31 January (refer Figure 5). *Iggy* reached a 10-minute mean wind peak intensity of 60 kn (111 km/h) at 1200 UTC 31 January. From 0000 UTC 1 February *Iggy* began to weaken rapidly as it moved further south over cooler SSTs and experienced increased wind shear. *Iggy* eventually weakened below tropical cyclone strength at 0000 UTC 2 February, approximately 400 km to the west of the Western Australian coastline.

Motion

Initially *Iggy* was located to the north of the mid-level ridge and was steered to the west. During 25 January the ridge weakened significantly and retreated to the southeast. As a result *Iggy* began to move slowly to the southeast influenced by the well developed northwesterly monsoon to the north. During the period 28 - 30 January *Iggy* was under a weak steering regime and thus halted its southward movement and became near stationary, drifting first east and then west.

During 30 and 31 January *Iggy* was steered more rapidly southwards under the influence of an amplifying trough to the west and a ridge which had developed to the east. On 1 February *Iggy* moved south and then southeast as it became captured in a northwesterly steering regime between the trough to the west and a mid-level high to the northeast.

Structure

Iggy was influenced by easterly wind shear for much of it's lifetime with satellite imagery consistently showing an exposed low-level centre to the east of deep convection. This persisted until around 30 January when imagery showed the *Iggy* had become more symmetric. An eye developed in EIR imagery during the evening of 31 January and the tropical cyclone reached peak intensity around then.

Scatterometery data showed that initially the gale radius was large in the northern quadrants and smaller in the southern quadrants with a well developed monsoon to the north of the tropical cyclone. By 28 January the gale radii had

contracted slightly to a more symmetric 120 nm (222 km) in most quadrants. Initially the radius to maximum winds (RMW) was around 60 nm (111 km), this contracted to around 20 nm (37 km) at its peak intensity.

Impact

TC *Iggy* did not have any direct impacts on the Western Australian coast line. However a pronounced tidal surge was recorded at most towns from Onslow to Perth as *Iggy* moved southwards down the west coast. The peak tidal surge recorded was 80 cm at Geraldton and 70 cm was recorded at Fremantle on 2 February. No apparent damage was reported from any locations.

Forecast Performance

The first Tropical Cyclone Advice for *Iggy* was issued at 0100 UTC 26 January for the coastal area between Whim Creek and Coral Bay. At 0100 UTC 27 January the Watch was extended east to Port Hedland. At 1300 UTC 27 January a Warning was declared between Mardie and Ningaloo. At 0100 UTC 28 January the Warning was extended south to Coral Bay and the Watch was extended south to Cape Cuvier and contracted west to Whim Creek.

The Watch/Warning areas were gradually contracted east and extended south as appropriate. By 0100 UTC 30 January it had become obvious that *Iggy* was not going to affect the Western Australian coastline and all Tropical Cyclone Advices were cancelled.

Until 0000 UTC 28 January model guidance was divided between depicting *Iggy* crossing the Pilbara coast or turning away to the west and not impacting the coast. From 0000 UTC 29 January most guidance indicated that *Iggy* would not cross the Pilbara coastline and this was reflected in forecast policy from 30 January.

Table 1. Best track summary for Tropical Cyclone *Iggy*

Refer to the Australian Tropical Cyclone database for complete listing of parameters.

Year	Month	Day	Hour UTC	Pos. Lat. S	Pos. Long. E	Position Accuracy nm	Max wind 10min knots	Max gust knots	Central Pressure hPa	Rad. of Gales nm (NE/SE/ SW/NW)	Rad. of storm force winds nm (NE/SE/ SW/NW)	Radius Max. Wind nm
2012	1	23	12	15.0	116.0	60	25	45	1002			
2012	1	23	18	15.1	114.5	60	25	45	1002			
2012	1	24	00	15.3	113.0	60	25	45	1001			
2012	1	24	06	15.5	112.0	60	30	45	998			
2012	1	24	12	15.6	111.0	60	30	45	998			
2012	1	24	18	15.8	110.2	60	30	45	997			
2012	1	25	00	15.8	109.4	30	30	45	993			
2012	1	25	06	15.8	108.3	30	35	50	990	0/0/0/120		60
2012	1	25	12	15.8	108.4	30	35	50	988	0/0/0/120		50
2012	1	25	18	16.0	108.45	20	40	55	985	120/0/120/120		40
2012	1	26	00	16.2	108.6	25	50	70	978	90/30/60/160	60/0/0/90	40
2012	1	26	06	16.6	108.9	30	50	70	978	120/30/90/120	60/0/0/0	60
2012	1	26	12	17.0	109.3	30	50	70	976	180/30/120/120	60/0/0/60	60
2012	1	26	18	17.6	109.7	30	50	70	975	180/30/120/180	60/0/0/60	60
2012	1	27	00	18.2	110.0	30	50	70	980	180/60/60/180	60/0/0/60	60
2012	1	27	06	18.7	110.5	30	50	70	979	180/60/90/180	60/0/060	60
2012	1	27	12	19.1	110.8	30	50	70	978	200/60/90/150	60/0/0/60	30

2012	1	27	18	19.5	110.6	30	50	70	979	200/60/90/150	60/0/0/60	30
2012	1	28	00	19.7	110.7	30	55	80	977	120	60/0/0/60	30
2012	1	28	06	19.9	110.7	30	55	80	976	120	60	30
2012	1	28	12	20.0	110.9	30	55	80	974	120	60	30
2012	1	28	18	19.9	111.1	30	55	80	975	120	60	30
2012	1	29	00	19.8	111.2	30	55	80	977	120	60	30
2012	1	29	06	19.8	111.2	30	50	70	976	120	60	30
2012	1	29	12	19.8	111.1	30	50	70	975	120	40	30
2012	1	29	18	19.8	111.0	25	50	70	979	120	40	30
2012	1	30	00	19.9	110.7	10	50	70	983	90/60/60/90	40	30
2012	1	30	06	20.1	110.6	10	50	70	983	90/60/60/90	40	30
2012	1	30	12	20.7	110.2	15	50	70	990	120	40	30
2012	1	30	18	21.2	109.8	15	45	65	990	120		30
2012	1	31	00	21.9	109.4	10	45	65	984	120/120/60/60		30
2012	1	31	06	22.7	108.9	15	50	70	980	120	60	30
2012	1	31	12	23.9	108.2	15	60	85	977	120	60	20
2012	1	31	18	24.9	107.7	20	60	85	976	120	60	20
2012	2	1	00	26.2	107.8	20	55	80	978	60/120/120/60	40	20
2012	2	1	06	27.5	107.9	20	50	70	981	60/120/120/60	40	20
2012	2	1	12	28.5	108.5	20	45	65	985	120		30
2012	2	1	18	29.1	109.4	20	40	55	988	120		30
2012	2	2	00	29.8	110.8	30	35	50	989	60/90/90/0		40
2012	2	2	06	29.8	111.9	30	30	45	991			
2012	2	2	12	29.9	113.1	30	25	45	995			
2012	2	2	18	29.8	114.1	30	25	45	994			

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2012	2	3	00	29.5	115.0	20	45	997				

Figure 2. ASCAT pass 0134 UTC 26 January 2012.

(image courtesy of NOAA US NOAA http://manati.orbit.nesdis.noaa.gov/datasets/OSCATData.php/))

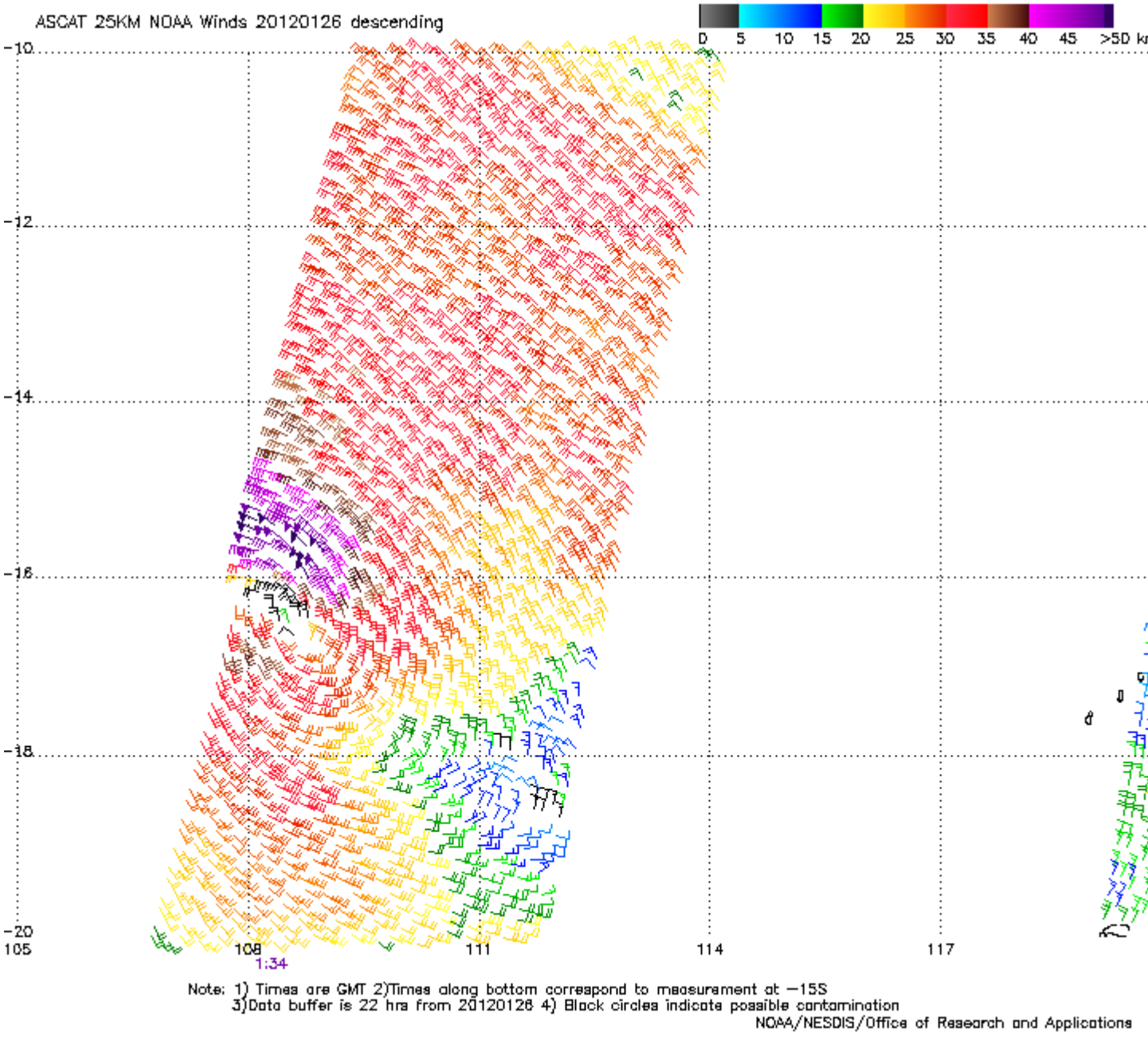

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Figure 3. 85 GHz Tropical Rainfall Measuring Mission (TRMM) colour composite microwave image 1429 UTC 29 January 2012.

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

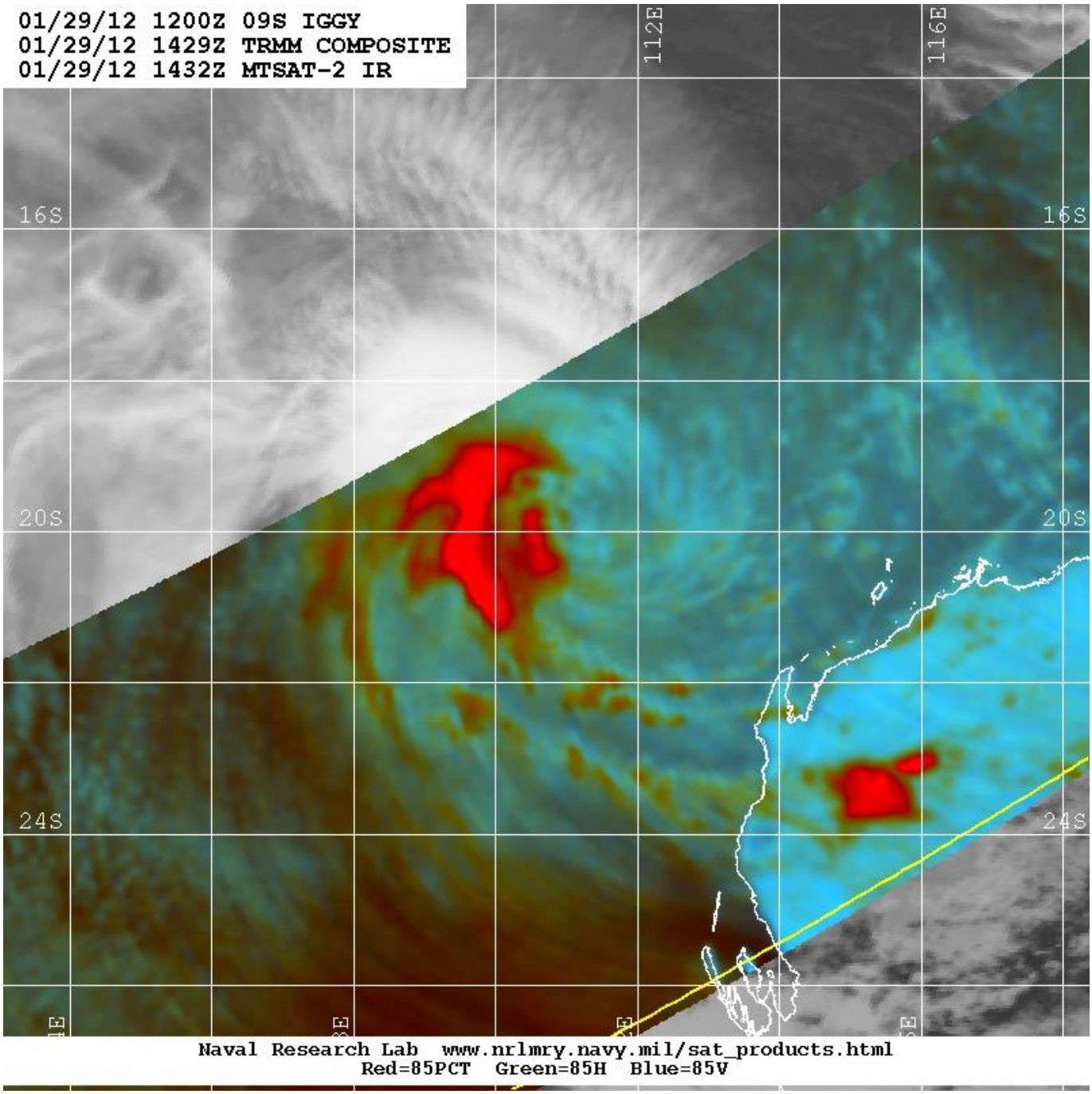

Figure 4. Satellite-derived Sea Surface Temperature image from NOAA 30 Janaury 2012.

(image courtesy of NOAA Physical Oceanography Division (PHOD) of AOML: http:// http://www.aoml.noaa.gov/phod/cyclone/data/)

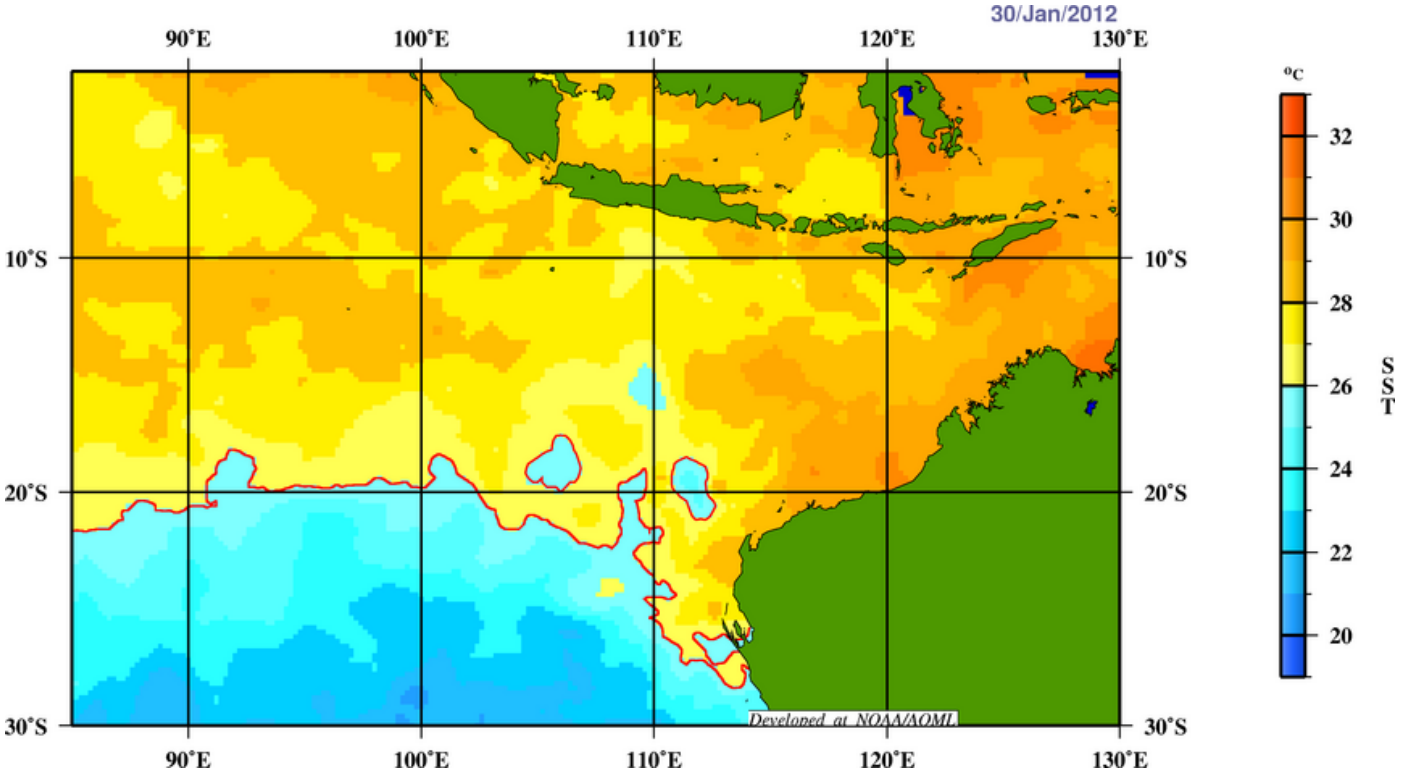

Figure 5. Enhanced infrared satellite image from NOAA16 1316 UTC 31 Janaury 2012.

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

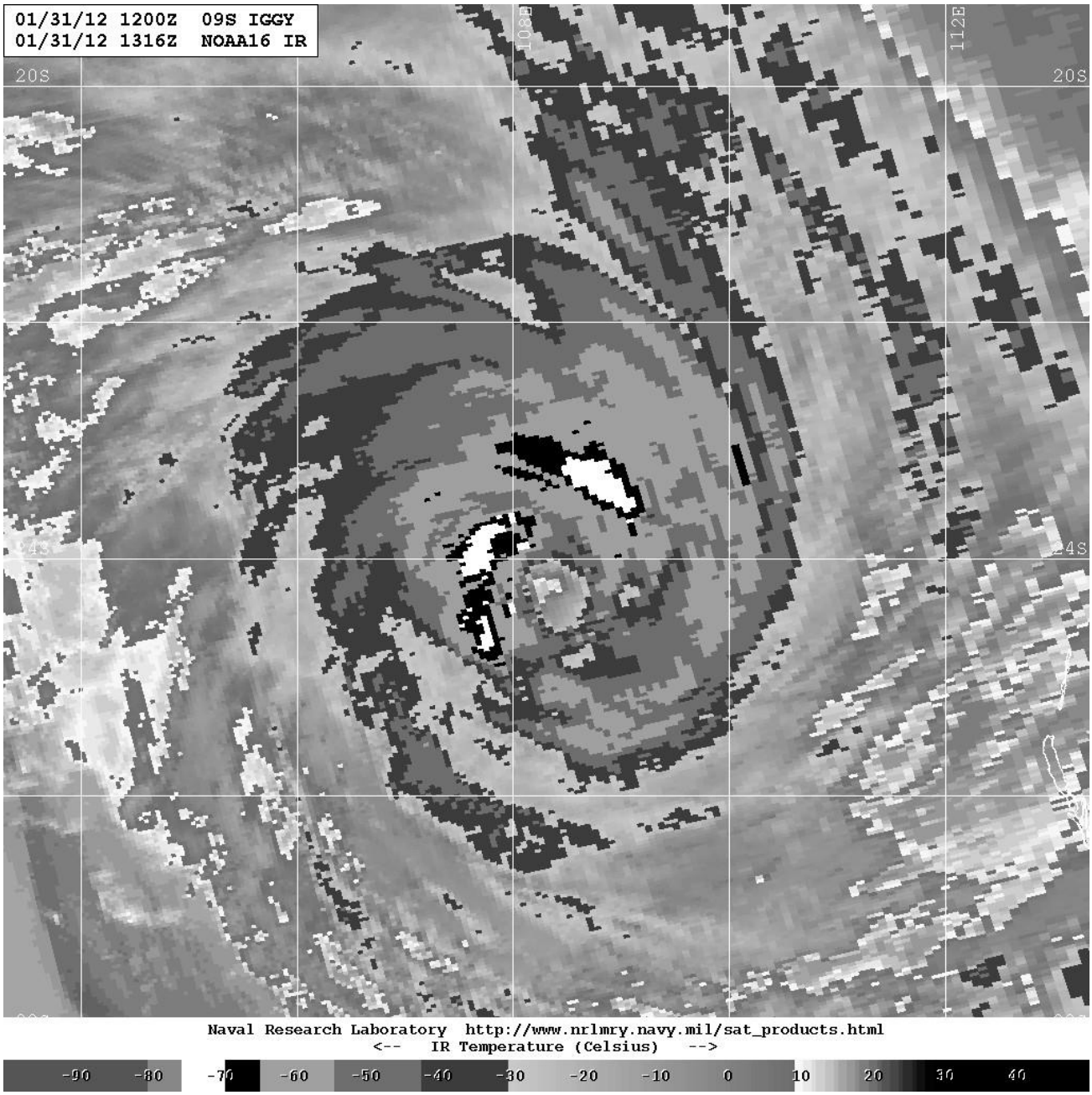

Figure 6. Comparison of objective and subjective intensity analysis techniques for Tropical Cyclone *Iggy*.