

Tropical Cyclone Jean 10/01/1973 - 17/01/1973

(i) General

Cyclone “Jean”, the second cyclone of the season, spent its entire life over the ocean. At its closest approach the cyclone came within 500 km of the West Australian Coast.

Although there are no confirmatory surface observations, satellite evidence indicates that “Jean” was a severe storm with maximum winds of about 160 km/h near the centre on 13th and 14th January.

(ii) Development

Satellite photographs on 10th January indicated a weak tropical low of 1005 mb about 1000 km northwest of Broome. During the next 24 hours the disturbance moved southwards and deepened slightly. On the morning of 12th January the first tropical cyclone warning for “Jean” was issued. Deepening continued with the cyclone reaching a pressure estimated to be below 965 mb by 13th January. This intensity was maintained for about 24 hours after which the cyclone began to fill. No ship reports from the vicinity are available but the satellite photographs suggest that the system dissipated completely on 17th January over tropical waters.

Prior to the appearance of a low on the surface on 10th January an area of cloud in the ITCZ could be tracked moving eastward at about 12°S from near Christmas Island. By 9th January this cloud mass was located in the area in which the cyclone was formed. The main cloud band associated with the ITCZ appeared to retreat northwards becoming separated from the disturbance.

The value of the first anticyclonically curved isobar near the mature cyclone was 1008 mb on 13th January.

(iii) Features of the Track (fig. 2.1)

“Jean” was active in the Region for seven days and in that time travelled about 2800 km. Apart from the early southerly movement during the cyclone’s development the track displays no unusual features.

Moving southward on 10th January the system travelled at about 20 km/h. This speed was maintained the next day but the direction of movement gradually became southwest. On the morning of 12th January when the cyclone was first named it curved to the west. On 13th January the cyclone again slowed moving at about 15 km/h until 16th January when it had almost filled. A weak low was still present at 0229 GMT on 17th January. This was located about 120 km northwest of the previous day’s position.

The change in direction of movement of the centre to the west on 12th January coincided with the rapid movement of a ridge of high pressure eastwards over Western Australia early on 12th January. The system recurved to the southwest during 14th January at the same time as the ridge of high pressure moved further eastward.

(iv) Rainfall

For the whole of its life “Jean” remained over the ocean, and no rainfall reports near the centre are available. At 0001 GMT on 14th January the ship “Malaysia” was about 25 Km east of the storm centre but no rain was reported although overcast conditions prevailed. No indication of rain was included in subsequent reports from that ship.

At the time “Jean” was operating a broad low level convergence zone over the southern tropics of Western Australia brought widespread rain and thunderstorms to that region. Satellite photographs confirm that this system was a separate entity.

(v) Winds

No reports of winds exceeding gale force were received. However at the height of the storm, on 13th and 14th January, winds of the order of 150 km/h were probably generated near the centre where the pressure was estimated from satellite data to be below 965 mb.

(vi) Sea and Swell

During the mature stage of cyclone “Jean” no ship reports were available near the cyclone centre. Details of seas and swell are thus related to wind estimates based on satellite picture interpretation. As “Jean” was a severe storm rough seas and a heavy to very heavy swell were probably experienced within 500 km of the centre from 12th to 15th January.

As “Jean” approached North West Cape prior to 12th January the swell reported by the oil rig “Big John” gradually increased from the north to 3 m. This swell was maintained for 24 hours to 9 am on 13th January after which the swell began to decrease. This is consistent with the cyclone’s moving westward from 12th January.

(vii) Damage

No damage was reported. However owing to the evacuation of personnel, man-hours were lost on the off-shore oil rigs drilling on the Northwest Shelf, “Big John”, “Ocean Digger”, “Glomar Tasman” and “Navigator”.

(viii) Satellite Photograph Analysis

“Jean” was tracked using photographs from ESSA 8 and NOAA 2 received daily. The Data from selected satellite photographs is shown in Table 2.1. From 2nd January the ITCZ was apparent in the vicinity of latitude 11°S between longitudes 100°E and 130°E. One amorphous cloud mass can be tracked from 8th to

10th January moving from near Christmas Island to a location some 1000 km northwest of Broome by 091245 GMT (NOAA 2).

On later photographs NOAA 2 100133 GMT, ESSA 8 100215 GMT and NOAA 2 101341 GMT this cloud mass appeared in virtually the same position. It was, however, gradually becoming more cyclonically organised and, at the same time, becoming detached from the main ITCZ cloud band which was by 10th January well north of 10°S although a dip persisted at about longitude 117°E. By 110033 GMT (NOAA 2) this connection appeared to be quite tenuous. On the same photograph the well aligned convective cloud elements and the anticyclonic cirrus outflow indicated a disturbance of intensity T2 in Dvorak's classification. This was confirmed by a later photograph from ESSA 8 at 110118 GMT.

The night NOAA 2 photograph of orbit 1099 was of such extremely poor quality in the critical region that it offered little help in determining the current position and intensity. However the photographs from NOAA 2 at 120128 GMT and ESSA 8 at 120203 GMT showed that considerable development had occurred. An indistinct eye was visible embedded by about ¾ ° and some banding was evident. These features lead to a Dvorak classification of T4.

Subsequently the system intensified further displaying T5 characteristics in the ESSA 8 photograph of 130254 GMT and T5.5 in the NOAA 2 photograph of 131431 GMT.

The ESSA 8 photograph of 140151 GMT indicated that weakening had occurred as the eye no longer visible and the Central Dense Overcast (CDO) was considerably smaller. Gradual weakening continued for the next three days at the end of which the system had largely dissipated.

Table 2.1 Data from the Satellite Photographs

Satellite Name	Orbit Number	Date/Time (GMT)	Estimated posn. of centre °S	Estimated posn. of centre °E	Final T No.	Min. Sea Level Pressure (mb)
ESSA 8	18660	100215	12.2	114.8	1	-
	18672	110118	14.5	115.0	2	1001
	18685	120203	17.8	113.0	4	982
	18698	130254	19.0	108.0	5	964
	18710	140151	21.0	150.0	4.5	964
	18723	150242	23.4	101.0	3.5	982
	18736	160327	25.2	99.7	3	992
	18748	170229	24.0	98.5	2	1001