

Tropical Cyclone Denise 19/05/1975 – 25/05/1975

(i) General

The eleventh and last cyclone of the 1974/75 tropical cyclone season was “Denise” which developed exceptionally late in the season.

“Denise” passed very close to Cocos Island on 23rd May and caused some slight damage mainly to the coconut trees.

(ii) Development

Cyclone “Denise” developed in a pre-existing band of convective cloud located at about 10°S latitude between longitudes 90°E and 115°E. On 19th May from the satellite photographs it was evident that the cloud was beginning to assume cyclonic origination. The only surface indications that a system was located in the vicinity of Christmas island were the changes in wind direction that were reported on 19th, 20th and 21st of May from that station. Pressure changes on these days at Christmas Island were minimal although from the evidence provided by the satellite photographs deepening of the cyclone was occurring slowly. “Denise” reached its peak intensity on 22nd May when its central pressure was estimated to be about 992 mb. “Denise” was thus a system of only low intensity. On 23rd May “Denise” passed within 25 km of Cocos Island. The minimum mean sea level pressure recorded at that station was 1001.9 mb. At the time the cyclone was weakening and that process continued until 25th May when “Denise” dissipated entirely.

While “Denise” operated in the Christmas Island – Cocos island area an easterly stream of moderate intensity persisted on the northern side of the sub-tropical ridge. In the upper air the axis of the ridge at 250 mb was located almost directly above the cyclone.

On 22nd May the value of the first anticyclonically curved isobar outside the system was 1008 mb.

(iii) Features of the Track (fig. 11.1)

During the six days that “Denise” was active it travelled about 2000 km in a generally westerly direction. There were no unusual features to the track. The speed of movement of “Denise” varied between 9 km/h and 19 km/h.

The westerly movement of “Denise” was probably related to the easterly flow which was present at all levels and in which the cyclone was embedded.

(iv) Rainfall

Totals of rain at the two stations near the path of this cyclone were not very great. On 19th May Christmas Island reported 17 mm of rain for the previous 24 hours. On 23rd and 24th May Cocos Island reported 9 mm and 19 mm respectively for the previous 24 hours.

(v) Winds

The maximum wind reported near cyclone “Denise” was 81 km/h noted by ship “Welsh Trident” at 231200 GMT. The vessel was at the time about 160 km to the southwest of the cyclone.

The centre of “Denise” passed very close to Cocos Island on 23rd May. A maximum gust of 100 km/h was recorded on the Dines anemometer trace. This gust occurred about 222305 GMT when the cyclone was some 25 km to the south.

According to the Dvorak method of interpretation of tropical cyclone cloud photographs, mean winds of 75 km/h were probably generated near the centre on 22nd May. The winds tore fronds off some coconut trees on West Island of the Cocos group but no structural damage was sustained by any buildings.

(vi) Sea and Swell

Reports on the sea state were received regularly from both Christmas Island and Cocos Island as “Denise” moved westwards past them. Both stations indicated changes in direction of the moderate swell generated. When the cyclone was close to Cocos Island the sea waves were described as “rough” for a brief period on 23rd May. Ship reports from the periphery of the cyclone were consistent with those received from the island stations.

(vii) Satellite Analysis

Analysis of the satellite photographs using the Dvorak technique showed that “Denise” was a cyclone whose development occurred at a very slow rate. A band of convective cloud had been evident in the vicinity of Christmas Island for some days prior to its beginning to develop on 19th May. Deepening continued for the next three days during which time the cloud system moved under the dense overcast cloud mass and a general cyclonic organisation of the cloud features occurred. On both 21st and 22nd May the central dense overcast was a well defined oval feature over 1° in width. In the photograph from ESSA 8 at 220246 GMT the cyclone was estimated to have a current intensity number of 3.5 in the Dvorak classification.

On 22nd May weakening of the cyclone was apparent as the central overcast became smaller and broken. By 25th May the system had virtually dissipated.

A summary of the data deduced from the satellite photographs is given in Table 11.1

Table 11.2

Data from 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	29444	190207	11.1	107.7	2	1006
	29457	200258	12.3	105.8	2.5	1002
	29469	210155	12.5	104	3	96
	29482	220246	12.2	100.5	3	992
NOAA 4	2358	230056	12.5	96	2.5	996
ESSA 8	29507	240233	12.6	93.9	2	999
	29520	250324	14	90.0	1.5	1003