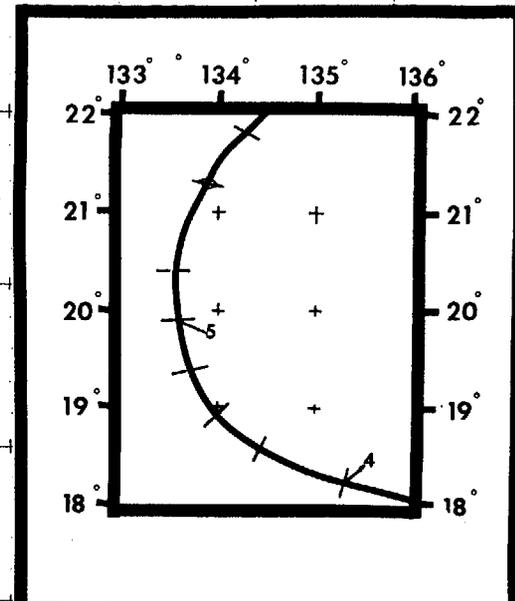
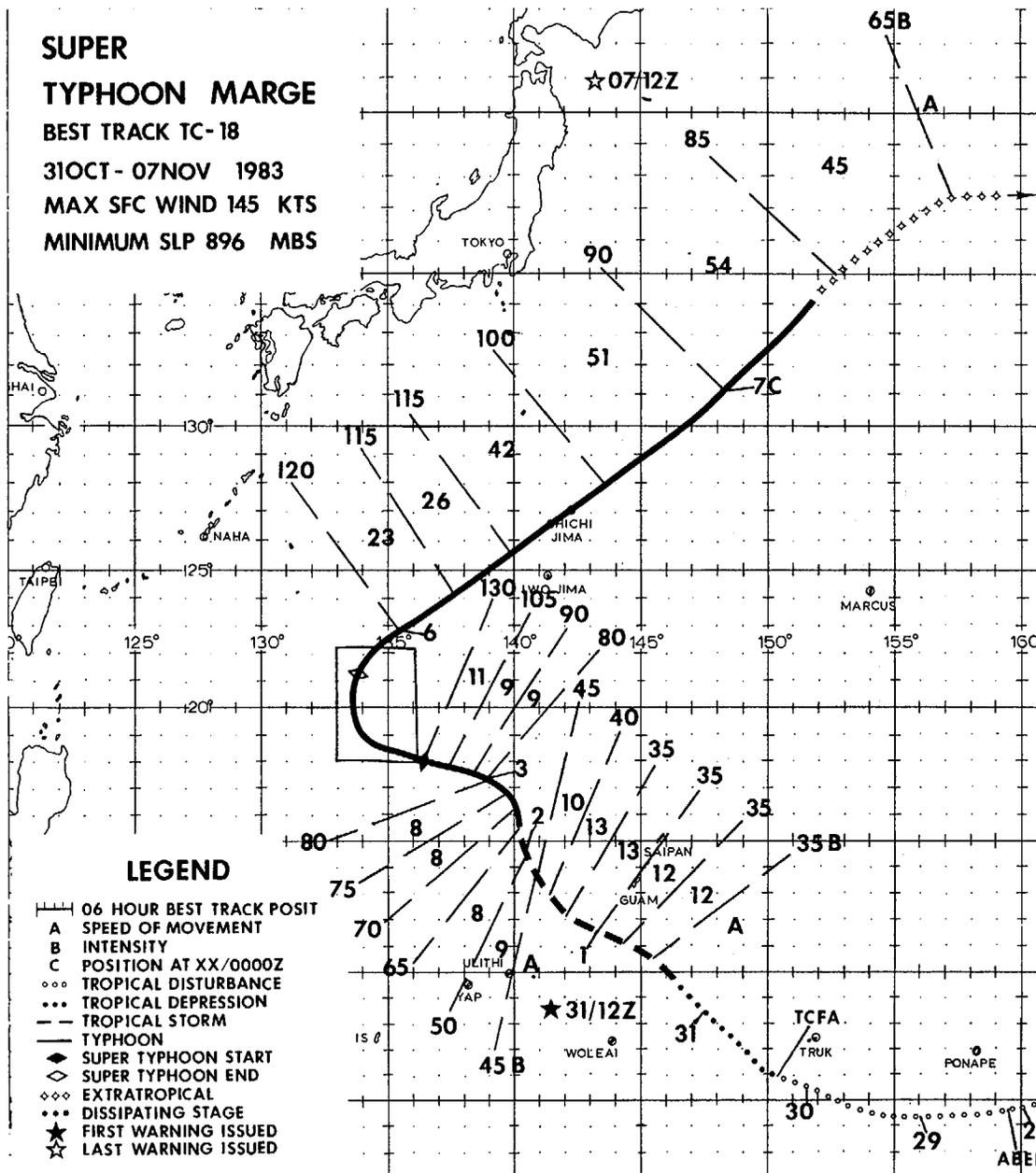


**SUPER
TYPHOON MARGE**
BEST TRACK TC-18
31OCT - 07NOV 1983
MAX SFC WIND 145 KTS
MINIMUM SLP 896 MBS



DTG	SPEED	INTENSITY
0400Z	9	140
0406Z	8	145
0412Z	6	140
0418Z	6	135
0500Z	6	130
0506Z	6	130
0512Z	9	125
0518Z	8	120
	13	

LEGEND

- 06 HOUR BEST TRACK POSIT
- A SPEED OF MOVEMENT
- B INTENSITY
- C POSITION AT XX/0000Z
- ... TROPICAL DISTURBANCE
- ... TROPICAL DEPRESSION
- TROPICAL STORM
- TYPHOON
- ◆ SUPER TYPHOON START
- ◇ SUPER TYPHOON END
- ◇◇◇ EXTRATROPICAL
- ◇◇◇ DISSIPATING STAGE
- ★ FIRST WARNING ISSUED
- ☆ LAST WARNING ISSUED

SUPER TYPHOON MARGE (18W)

The tropical disturbance which developed into the fourth super typhoon of the season was initially detected on 26 October as an area of unorganized convection associated with a weak surface circulation near 7N 172E. Synoptic data at the time indicated that surface winds associated with the disturbance were weak, 5-10 kt (3-5 m/s) and MSLP was 1012 mb. This disturbance organized slowly over the next four days as it moved westward along the monsoon trough axis. During this period, an upper-level anticyclone formed in close proximity to the low-level circulation. This development was accompanied by a drop in MSLP to 1008 mb and a concurrent increase in the convective activity associated with the circulation. This led to the issuance of a TCFA on the 30th at 1035Z.

During the 24 hour period following the issuance of the TCFA, satellite imagery showed that the convective activity associated with the circulation was undergoing further consolidation and that outflow channels were developing to the northeast and southwest. Synoptic data and Dvorak satellite analysis indicated maximum sustained winds of 25 to 35 kt (13-18 m/s), prompting the issuance of the first warning at 311200Z.

At this point, Marge was located 180 nm (333 km) south of Guam. The subtropical ridge in this area was expected to weaken in response to the passage of an intense mid-latitude trough. Forecasts issued during this period projected that Marge would react to the passage of this trough, moving slowly

northwestward, then recurving to the northeast. Marge moved northwestward as expected, but did not recurve. By the time Marge arrived in a position to recurve in advance of the trough, the trough had already passed to the north and Marge came under the influence of low-level easterly flow associated with a high upstream of the trough. This resulted in Marge resuming a northwestward track prior to subsequent recurvature in advance of another mid-latitude trough.

Premature adoption of the recurvature scenario greatly affected the accuracy of the intensity forecasts. Marge achieved typhoon intensity on 2 October at 0600Z. This was not far from the forecast intensity for this time. However, two days later, on the 4th, Marge was a 145 kt (75 m/s) super typhoon. Since, by the 4th, Marge was initially expected to be weakening after recurvature, unusually large intensity errors occurred.

Shorter range intensity forecasts met with greater success. Use of an objective aid for the prediction of explosive deepening (Dunnavan, 1981) resulted in fairly accurate 24 hour intensity forecasts verifying at maximum intensity. At 0600Z on the 3rd, this technique predicted that Marge would undergo explosive deepening. Within 24 hours of this prediction, Marge's intensity increased from 90 kt (46 m/s) to 145 kt (75 m/s). Marge did not recurve initially as forecast and, when recurvature did occur, moved at speeds much higher than anticipated while rapidly

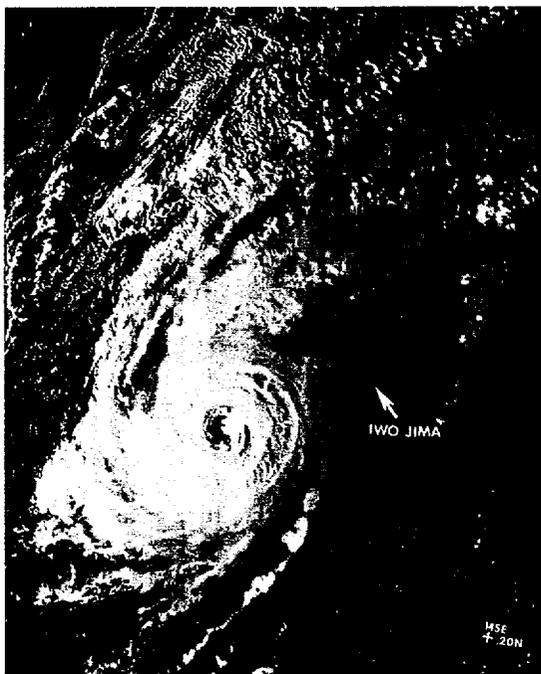


Figure 3-18-1. Marge in the early stages of recurvature. At this point, maximum sustained winds were 115 kt (59 m/s) and speed of movement was 25 kt (46 km/hr) (060611Z November NOAA 7 visual imagery).

evolving into an extratropical system. This resulted in large position errors. Figure 3-18-1 and 3-18-2 give some indication of the rapidity with which Marge underwent extratropical transition. Although there is only 17 hours elapsed time between the two pictures, there is a striking difference in Marge's appearance. In Figure 3-18-1, Marge appears as a well developed typhoon with a circular eye and maximum sustained winds of 115 kt (59 m/s). In Figure 3-18-2, Marge is nearing the end of its transition to an extratropical system while moving northeastward at a speed of 51 kt (95 km/hr).

Marge's high speed of movement during recurvature was phenomenal. At 051200Z, the forecast called for recurvature with acceleration to a maximum speed of 35 knots. This forecast predicted that Marge would more than quadruple its speed of forward motion since the storm was only moving at 8 kt (15 km/hr) at the time. However, this forecast fell far short of the 54 kt (100 km/hr) speed actually attained by Marge.

Marge's high speed of movement following recurvature contributed to the deformation of the wind field associated with the storm. Marge became very asymmetric, with winds in its southeast semicircle much higher than winds in the northwest semicircle. This was due to the addition of its speed of translation to the circulation wind field on the southeastern side and the corresponding decrease in winds on the northwestern side. This made it appear that Marge's circulation weakened more slowly than it actually did since the measure of the intensity of a system is the maximum surface wind, without regard to symmetry.

The asymmetric nature of Marge's wind field proved beneficial to the crew of the Colombian Navy Sailing Ship ARC Gloria. Gloria was fortunate enough to encounter the weak northwestern portion of Marge's circulation. Even so, Gloria reported seas to 30 ft (9 m) and winds gusting to 90 kt (46 m/s) as Marge passed to the southeast. The high winds and heavy seas encountered by Gloria resulted in the injury of three crewmen, the loss of a motor boat and five sails, and minor structural damage.

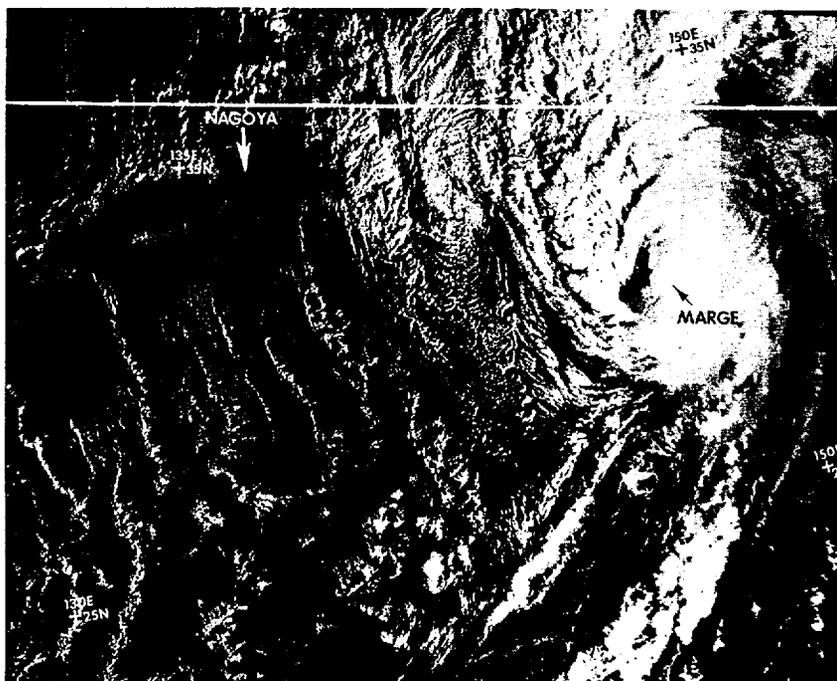


Figure 3-18-2. Marge just prior to completing transition to an extratropical system. Maximum sustained winds were 90 kt (46 m/s) and speed of movement was 51 kt (95 km/hr) (062254Z November NOAA 8 visual imagery).