

E 95 100 105 110 115 120 125 130 135 E

N 30

TYPHOON FRED
 BEST TRACK TC-12W
 08 AUG- 18 AUG 91
 MAX SFC WIND 95KT
 MINIMUM SLP 949MB

25

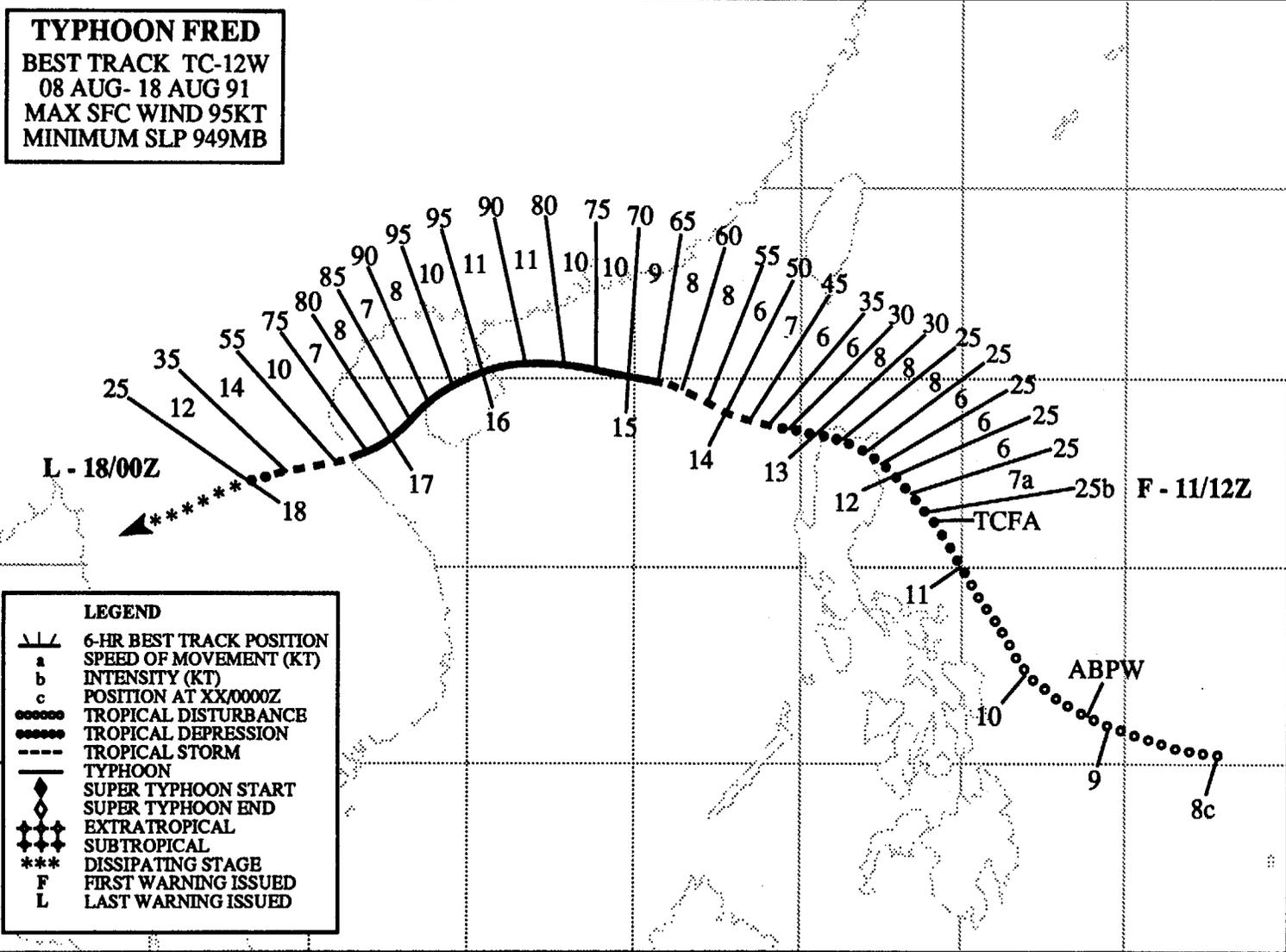
20

15

10

N 5

78



LEGEND

- /—/— 6-HR BEST TRACK POSITION
- a SPEED OF MOVEMENT (KT)
- b INTENSITY (KT)
- c POSITION AT XX/0000Z
- TROPICAL DISTURBANCE
- TROPICAL DEPRESSION
- TROPICAL STORM
- TYPHOON
- ◆ SUPER TYPHOON START
- ◇ SUPER TYPHOON END
- ✦ EXTRATROPICAL
- ✧ SUBTROPICAL
- *** DISSIPATING STAGE
- F FIRST WARNING ISSUED
- L LAST WARNING ISSUED

TYPHOON FRED (12W)

I. HIGHLIGHTS

Typhoon Fred was a part of two, three-storm outbreaks that occurred in mid-August. The first involved Typhoon Ellie (11W) and Tropical Depression 13W, and the second involved Ellie (11W) and Typhoon Gladys (14W). Fred skirted the northern coasts of Luzon and Hainan Island before dissipating over Southeast Asia. From the onset, JTWC correctly predicted that Fred would track generally to the west, and as a result, forecast track errors were very low, in fact, the lowest for any tropical cyclone of the year.

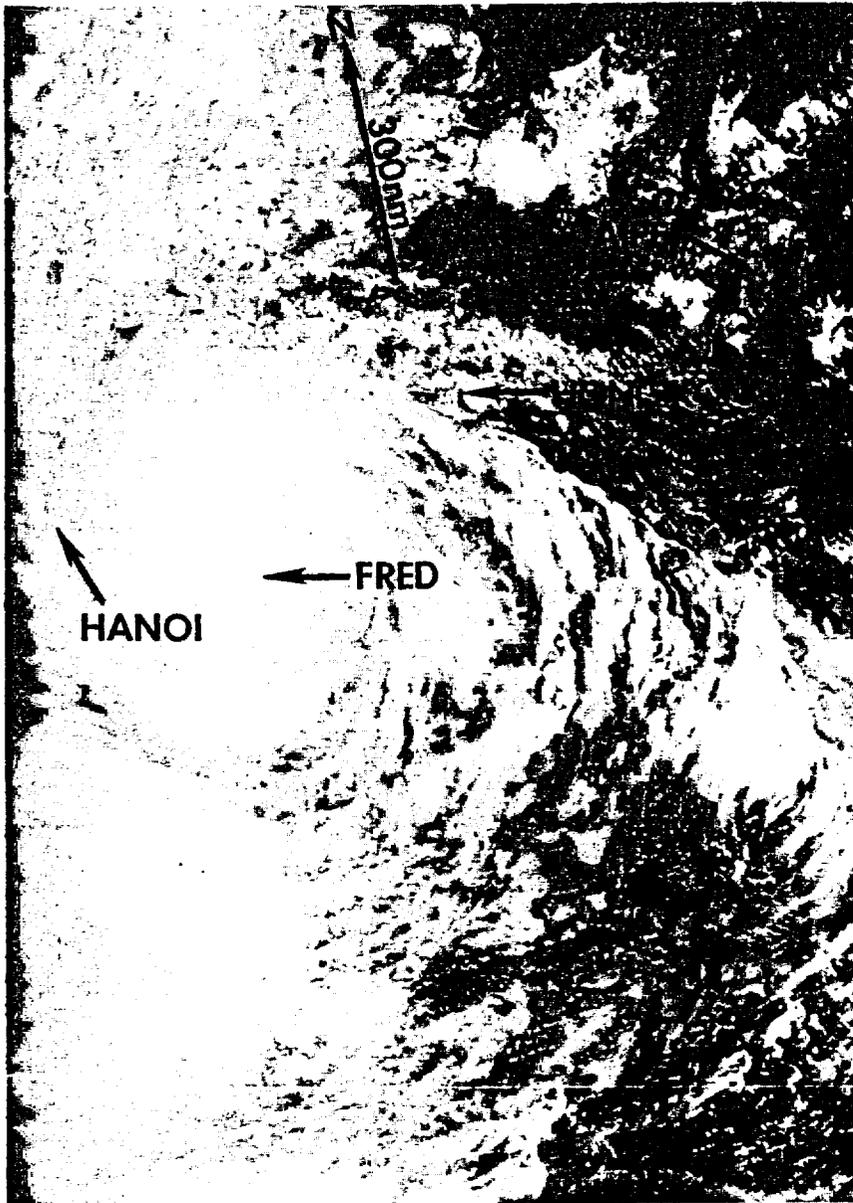


Figure 3-12-1. Typhoon Fred at minimal typhoon intensity, 120 nm (220 km) south of Hong Kong (150030Z August DMSP visual imagery).

II. TRACK AND INTENSITY

Fred originated as a broad, poorly organized circulation in the monsoon trough east of the central Philippine Islands on 8 August, and was first mentioned on the Significant Tropical Weather Advisory at 090600Z. A Tropical Cyclone Formation Alert was issued at 110900Z when animated satellite imagery revealed cyclonic motion of deep convective elements around a common center. The first warning on Tropical Depression 12W closely followed the alert, and was issued at 111200Z, when the "spin up" observed earlier from the satellite was supported by synoptic reports. After crossing northern Luzon, Fred headed west-northwestward, steered by a subtropical ridge which extended from the northern Philippine Sea southwestward into southern China. Intensifying as it moved west-northwestward, the tropical cyclone became a tropical storm at 131200Z and reached typhoon intensity at 141800Z (Figure 3-12-1), with the presentation of a visible eye in satellite imagery. On 15 August, the narrow ridge over southern China persisted and Typhoon Fred

passed to the south of Hong Kong, heading for Hainan Dao. After passing along the northwest coast of Hainan Dao on 16 August with estimated maximum sustained winds of 95 kt (49 m/sec), the typhoon weakened and took an unanticipated southwestward track across the Gulf of Tonkin. Fred continued to track west-southwestward, and the final warning was issued at 180000Z as the low was dissipating over the mountainous terrain of Southeast Asia.

II. FORECAST PERFORMANCE

JTWC forecast performance on Typhoon Fred was noteworthy. Overall, mean forecast track errors were 65, 109, and 131 nm (120, 200 and 240 km) at 24, 48 and 72 hours, respectively. In comparison, the Persistence-Climatology model, CLIPER, had errors of 93, 195 and 339 nm (170, 360 and 630 km) for the same period. The early intensity forecasts correctly indicated that Fred would attain typhoon intensity in the South China Sea.

IV. IMPACT

Heavy rains fell on Luzon as Fred crossed the northern part of the island and triggered lahars or mudslides of volcanic ash and debris in the river valleys near Mount Pinatubo. Over 100 homes were destroyed and thousands of people were forced to evacuate areas near the volcano. A 20,000 ton oil exploration barge capsized and sank 65 nm (120 km) east of Hong Kong on 15 August. Of the 195 crew members on board the 420 foot long **Derrick Barge 29**, 22 perished, including 4 divers who were trapped in a saturation diving chamber beneath the barge. At-sea rescues of the 173 survivors were accomplished by helicopter and tugboat. In the Chinese island province of Hainan, at least 16 died during Fred's passage.