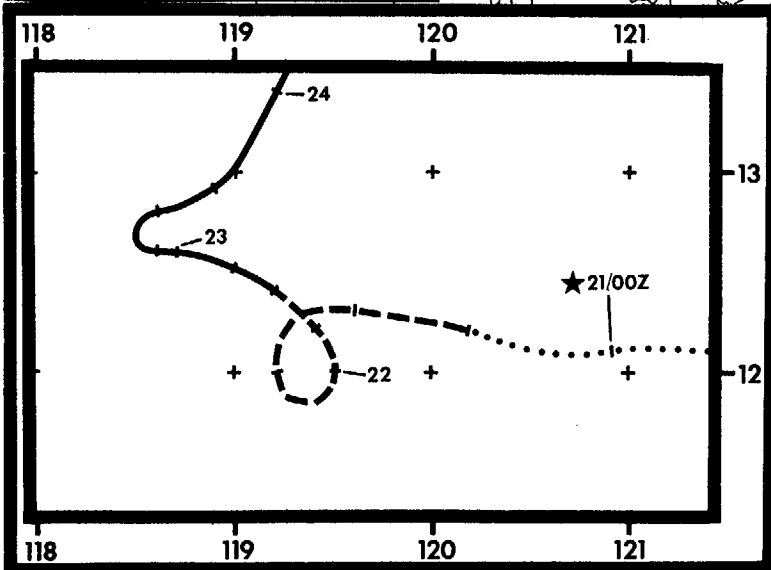
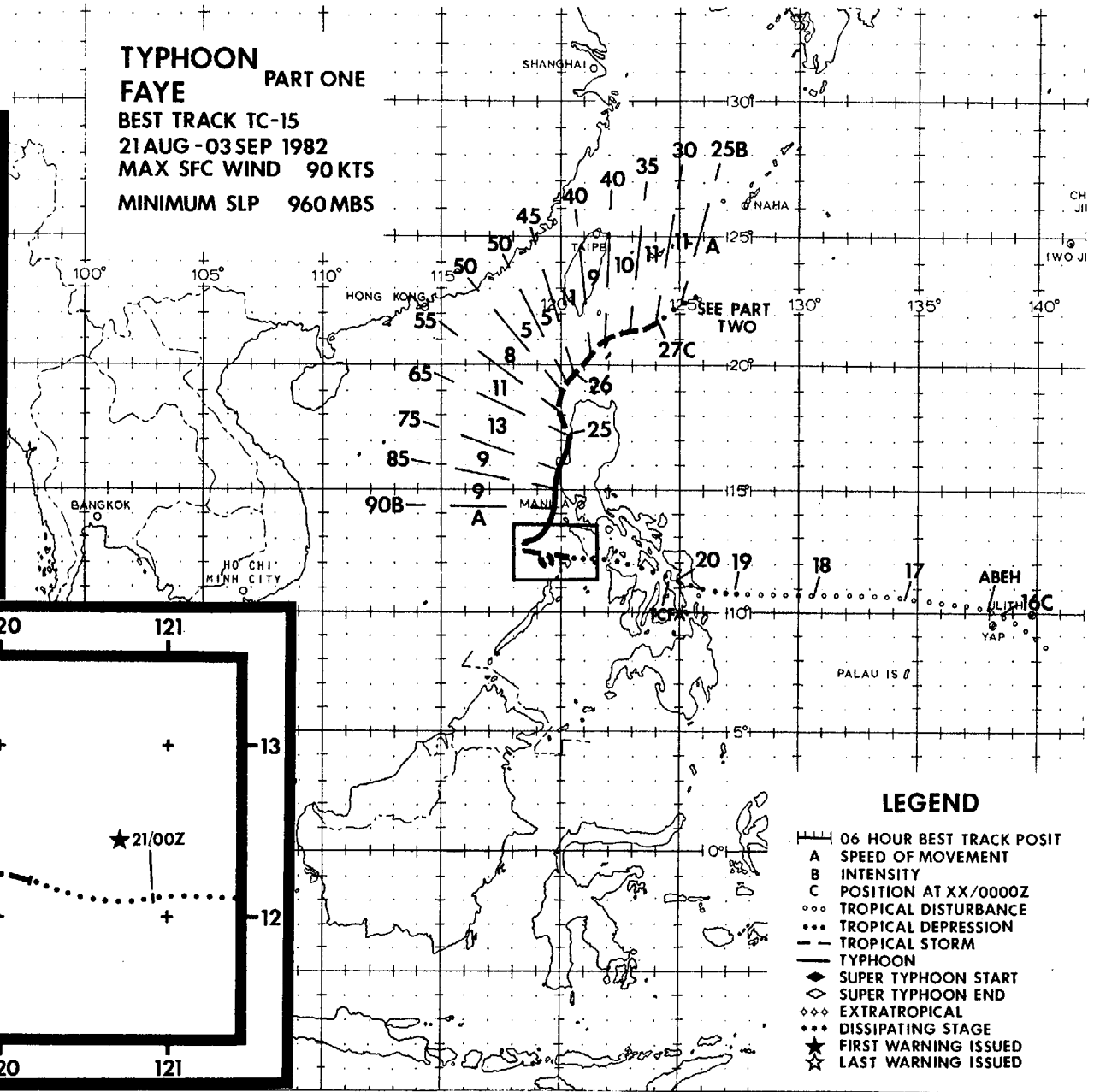


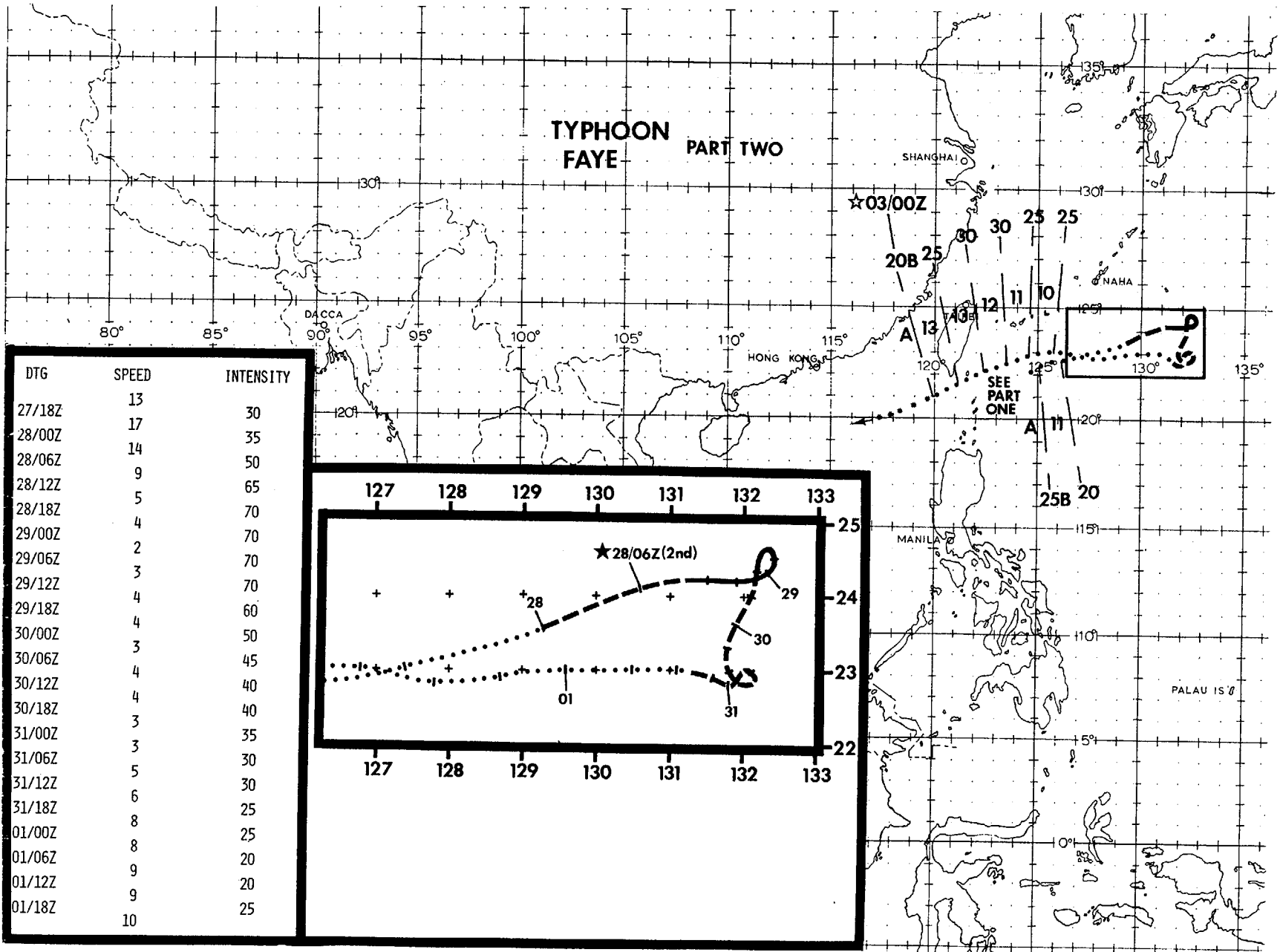
TYPHOON FAYE PART ONE
BEST TRACK TC-15
21AUG-03SEP 1982
MAX SFC WIND 90 KTS
MINIMUM SLP 960 MBS

DTG	SPEED	INTENSITY
21/00Z	9	30
21/06Z	7	35
21/12Z	6	35
21/18Z	5	40
22/00Z	3	45
22/06Z	2	55
22/12Z	3	65
22/18Z	3	70
23/00Z	3	75
23/06Z	1	80
23/12Z	2	85
23/18Z	3	85
24/00Z	6	85
24/00Z	7	85

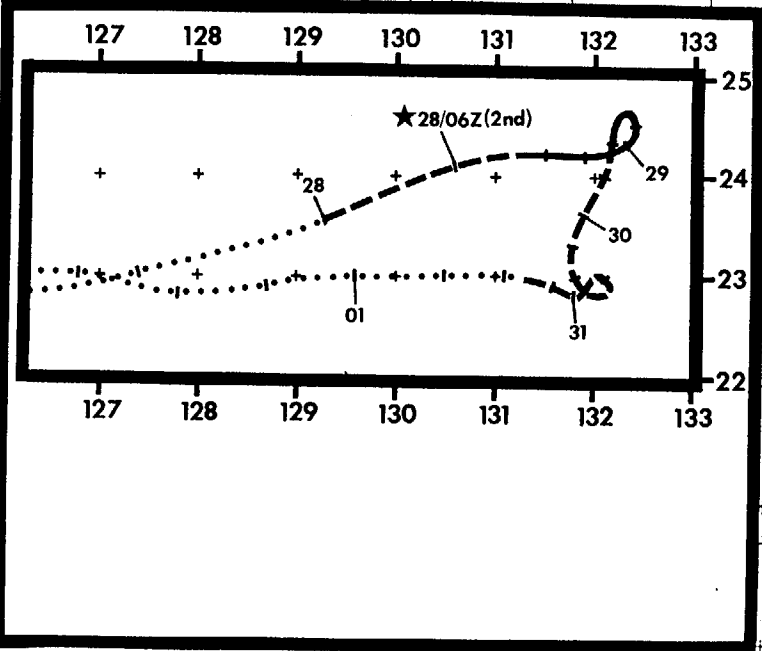


- LEGEND**
- 06 HOUR BEST TRACK POSIT
 - A SPEED OF MOVEMENT
 - B INTENSITY
 - C POSITION AT XX/0000Z
 - TROPICAL DISTURBANCE
 - TROPICAL DEPRESSION
 - - - TROPICAL STORM
 - TYPHOON
 - ◇ SUPER TYPHOON START
 - ◇ SUPER TYPHOON END
 - ◇◇ EXTRATROPICAL
 - DISSIPATING STAGE
 - ★ FIRST WARNING ISSUED
 - ☆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

TYPHOON FAYE PART TWO



DTG	SPEED	INTENSITY
27/18Z	13	30
28/00Z	17	35
28/06Z	14	50
28/12Z	9	65
28/18Z	5	70
29/00Z	2	70
29/06Z	3	70
29/12Z	4	70
29/18Z	4	60
30/00Z	3	50
30/06Z	3	50
30/12Z	4	45
30/18Z	4	40
31/00Z	3	40
31/06Z	3	35
31/12Z	5	30
01/00Z	6	30
01/06Z	8	25
01/12Z	8	25
01/18Z	9	20
01/00Z	9	20
01/18Z	10	25



TYPHOON FAYE (15)

Typhoon Faye (15) proved to be one of the more difficult tropical cyclones to forecast during the 1982 season (Figure 3-15-1). With forecast errors of 142, 384, and 629 nm (263, 711, and 1182 km) for 24, 48, and 72 hours, respectively, the forecast history for Typhoon Faye is a good example of what can happen when there is confusion in understanding the effect that the large-scale flow field and other larger tropical cyclones can have on a very small but intense cyclone. In this report the life history of Typhoon Faye is depicted in table form with seven segments (Table 3-15-1).

For each segment, key events along with the basic forecast philosophy and prognostic reasoning are described. A brief post-analysis description is then presented in order to compare the actual events of the tropical cyclone and the synoptic situation. In this presentation it will be evident how a basically sound and logical forecast can go astray when all the "facts" are not completely understood. Furthermore, an attempt has been made in this table to describe for the reader the basic forecast/thought process at the JTWC. Figures 3-15-2 to 3-15-7 depict several events along Typhoon Faye's track.

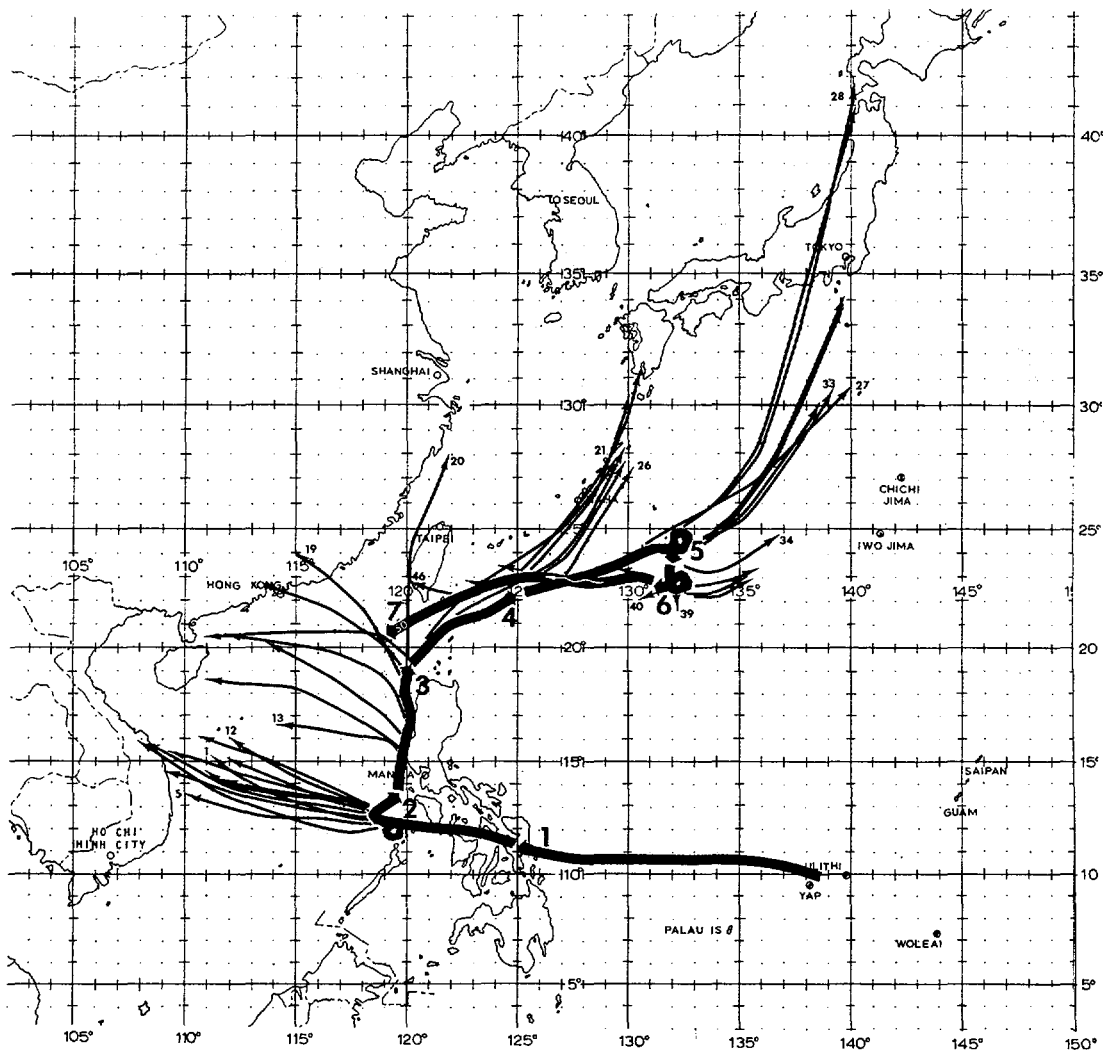


Figure 3-15-1. JTWC Windshield-wiper Chart. This chart depicts the forecast track for each warning issued for Faye. Ideally, in a well-handled forecast situation, there is not a "windshield-wiper" (back and forth) effect but a superposition of one forecast track upon another. Forecast segments will be described in Table 3-15-1.

TABLE 3-15-1

Segment	Time Period (Warnings) *Events	Prognostic Reasoning	Post-analysis Discussion
1	<p>16/00Z - 20/00Z Aug (none)</p> <p>*Weak disturbance moves westward in the Philippine Sea toward the southern Philippines</p> <p>*Monitoring disturbance for indication of convective development</p>	<p>Although an exposed low-level circulation could be identified on satellite imagery as well as on synoptic data, little development was expected due to the proximity of the Philippines and the dominance of the flow pattern around Typhoon Ellis (14) near Guam.</p>	<p>Little difference from prog reasoning. An upper-level anticyclone did develop over the area when an upper trough moved between the system and Ellis; however, convection remained unorganized due to orographic influences from the Philippines.</p>
2	<p>20/00Z - 24/00Z Aug (#1 - #12)</p> <p>*System organizes in the South China Sea</p> <p>*Tropical Cyclone Formation Alert at 200203Z</p> <p>*1st warning at 210000Z in South China Sea</p> <p>*Upgrading to tropical storm status at 210600Z</p> <p>*Upgrading to typhoon status at 221200Z</p>	<p><u>Movement:</u> Subtropical ridge in the vicinity of Hong Kong was forecast by the FNOC models to persist and strengthen during the forecast period. This would cause the system to slowly increase its forward speed toward the west-northwest. All objective aids predicted a west to northwest movement.</p> <p><u>Intensification:</u> Dominance of both the upper- and lower-level flow by Ellis in the Philippine Sea, as well as slight northerly shear from the 200 mb ridge over China, was expected to prevent much intensification.</p>	<p><u>Movement:</u> The dominance of Ellis, as well as the slow encroachment of a frontal zone from central China, prevented much building of the ridge over Hong Kong resulting in weak steering flow near Faye - especially in the lower layers. Faye showed little trend in movement until a frontal/shear zone reached southeastern China on 23-24 Aug (height falls were seen at 500 and 700 mb throughout region).</p> <p><u>Intensification:</u> Although the adverse vertical shear had an effect on the cyclone, it resulted in a small, restricted system rather than a weak one. A small TUTT cell which was analyzed near Hai-nan Island on 22 Aug appeared to aid Faye's upper-level outflow toward the northeast.</p>
3	<p>24/00Z - 25/18Z Aug (#13 - #19)</p> <p>*System continues northward</p> <p>*System reaches greatest strength (90 kt (46 m/sec)) at 240600Z</p> <p>*System reaches Luzon at 241800Z with significant damage to Wallace Air Station at 242200Z with gusts up to 100 kt (51 m/sec)</p> <p>*Downgrading to tropical storm status at 250000Z</p>	<p><u>Movement:</u> A persistent northward movement was expected during the initial 24 hours with a more climatological northwestward track in the outlook period. Although the daily analysis indicated that the subtropical ridge over China was moving north and weakening, FNOC prog series continued to call for a gradual strengthening of the ridge with time. Further support of this prognosis was seen in the expected quick movement of Ellis toward the north. Since Ellis was dominating the subtropical regions between 20-30N, its acceleration to the north and out of the subtropics, would allow for the eventual reintensification of the ridge. Finally, a forecast of westward movement continued to be predicted because of two primary reasons: the hesitation to break from the forecast philosophy maintained through the first 19 forecasts and the almost total lack of climatological tracks eastward of the South China Sea.</p> <p><u>Intensification:</u> Little change from the forecast reasoning in Segment 2. Although northeasterly vertical shear from Ellis continued to dominate, it was now generally thought that Faye would remain strong in spite of the adverse synoptic environment. Only after Faye made landfall on Luzon was a gradual weakening trend predicted.</p>	<p><u>Movement:</u> In spite of predictions to the contrary by the FNOC prog series, the ridge over southern China continued to retreat northward and weaken as strong troughing dominated the region between Ellis and Faye. This resulted in an almost due northward movement of Faye. Toward the end of this period, low- to mid-level westerly flow began to strengthen in the Luzon Strait while Ellis slowed its forward speed to 7 kt (13 km/hr) just east of Okinawa.</p> <p><u>Intensification:</u> Faye continued to intensify until its circulation pattern began to interact with the mountainous terrain of western Luzon. Once landfall was made at 241800Z, a steady deterioration was observed as Faye had trouble maintaining good vertical alignment. The cause of this poor alignment appeared to come equally from the orographic effects of Luzon and the strong vertical shear north of Luzon initiated by Ellis's outflow pattern.</p>

Segment	Time Period (Warnings) *Events	Prognostic Reasoning	Post-analysis Discussion
4	25/18Z - 27/06Z Aug (#20 - #26) *System begins to move northeastward at 251800Z *Initial final warning at 270600Z	<u>Movement:</u> Once Faye began to move northeastward at 11 kt (20 km/hr) along the low-level flow induced by Ellis, it was assumed that it would continue this motion until it reached Japan as FNOC prog series maintained a trough in this region throughout the period. <u>Intensification:</u> It was believed that if Faye could maintain its vortex, slow reintensification was possible once the strong shear from Ellis subsided. This scenario was abandoned for gradual dissipation when aircraft missions continued to show a weakening trend.	<u>Movement:</u> Initial northeast movement was well predicted; however, toward the end of the period the low-level flow began to split in the vicinity of Faye with a portion of the flow moving northward into the trough and the other portion moving east-southeastward toward the newly developed Tropical Storm Gordon (16). Faye began to follow this more eastward track near the end of the period. <u>Intensification:</u> Upper-level shear from the remains of Ellis continued to hamper Faye's efforts to reintensify. This adverse environmental effect reduced Faye to an exposed low-level circulation with only a few isolated convective cells.
5	27/06Z - 29/18Z Aug (#27 - #33) *System continues on a east-northeastward track *System reintensifies to tropical storm status at 280000Z *JTWC resumes warning status at 280600Z *System intensifies to typhoon strength at 280900Z *System weakens to tropical storm strength at 291500Z	<u>Movement:</u> After Ellis moved north of Japan, the long wave trough was positioned over western Japan and the Sea of Japan. Since FNOC Progs predicted little change in pattern, a forecast track toward the northeast appeared the most logical. This was also supported by the CYCLOPS steering aids and the dynamic models. The JTWC TAPT technique - which keys on the 200 mb flow - predicted rapid acceleration toward the northeast north of 25N was likely. The direction of movement was predicted along the 500 mb flow. <u>Intensification:</u> Wind intensities were forecast based on persistence in the near term and gradual weakening with increasing latitude in the out-look period.	<u>Movement:</u> Although the upper trough remained over Japan as predicted, Faye perhaps due to its small size, failed to entrain into this flow or move north of 25N. Instead it appeared to be trapped within the low-level trough between Faye and Gordon and after 281800Z it became quasi-stationary. This resulted in very large forecast errors for this period. <u>Intensification:</u> Once Faye moved out of the strong shearing environment, rapid intensification occurred. Faye went from a weak tropical depression to a typhoon in 27 hours. This reintensification was not well predicted nor was its extremely small size (smaller than that observed in the South China Sea). Aircraft at this time measured maximum surface winds of 70 kt (36 m/sec) out to only 10 nm (19 km) from the center and 30 kt (15 m/sec) winds out to 60 nm (111 km).

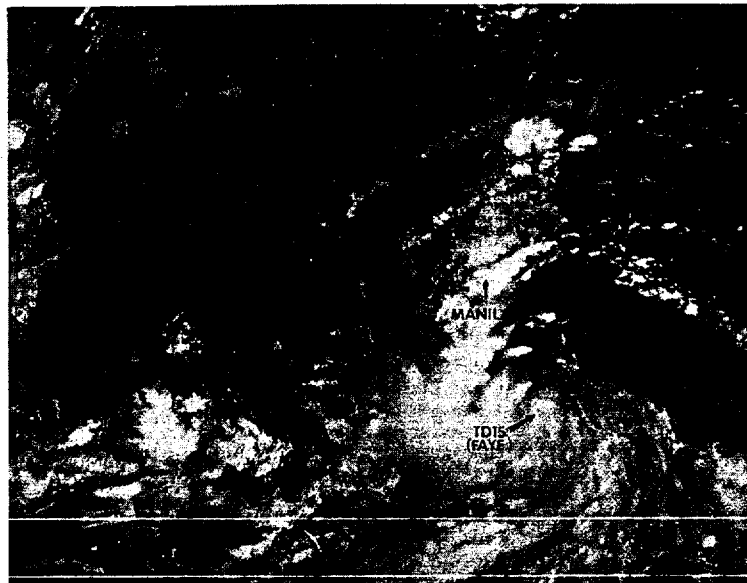


Figure 3-15-2. [Segment 1] Faye, as a tropical depression, crossing the southern Philippines. Although wind speeds were generally less than 25 kt (13 m/sec), widespread damage to property and agriculture was reported by Philippine newspapers due to flooding. 200652Z August (NOAA 7 visual imagery).

Segment	Time Period (Warnings) *Events	Prognostic Reasoning	Post-analysis Discussion
6	29/18Z - 31/06Z Aug (#34 - #39) *System shows little trend in movement and continues to weaken	<u>Movement:</u> Since it was apparent that Faye was not responding to the mid-latitude trough to the north, it was forecast to move eastward with the low-level flow directed toward Typhoon Gordon (16). Initially, movement was expected to be slow since the analysis fields indicated weak steering flow within the trough between Faye and Gordon. Once Gordon moved north, stronger westerlies were expected to accelerate Faye's low-level circulation eastward. <u>Intensification:</u> Dissipation was expected within 24 to 48 hours due to the proximity of Faye to Gordon's strong upper-level outflow pattern.	<u>Movement:</u> During this period, Gordon failed to maintain a steady northward motion. Instead, Gordon slowed its forward speed to 5 kt (9 km/hr). This, in turn, resulted in extremely weak steering flow at all levels around Faye. Toward the end of the period, a ridging pattern began developing over western Japan resulting in a slight increase in northerly and then northeasterly flow. Faye began to move slowly southwestward in response to this flow. <u>Intensification:</u> Although Faye continued to weaken as predicted, the cause was not from Gordon's upper-level wind pattern but from the movement of an upper trough from China to a position over Faye. This resulted in Faye being stripped of its convection, leaving an exposed low-level circulation.
7	31/06Z Aug - 03/06Z Sep (#40 - #50) *System weakens to a tropical depression at 310600Z *System drifts westward for three days as an exposed low-level circulation *Final warning issued by JTWC for Faye at 030000Z *System dissipates in the South China Sea at 030600Z	<u>Movement:</u> With the ridge well established north of the system and over western Japan, a predicted westward movement appeared to be best. <u>Intensification:</u> Aircraft reconnaissance indicated that Faye's central pressure had risen to 999 mb and so each warning during this period predicted dissipation within 24 hours.	<u>Movement:</u> Forecast track was fairly accurate although Faye's increase in forward speed to 13 kt (24 km/hr) was not anticipated. <u>Intensification:</u> Although its wind intensities were only 20-30 kt (10-15 m/sec), Faye managed to survive as a low-level circulation much longer than predicted. Final dissipation did not occur until Faye's exposed low-level circulation became entrained into the monsoon circulation that was to become Typhoon Hope (17) in the South China Sea.

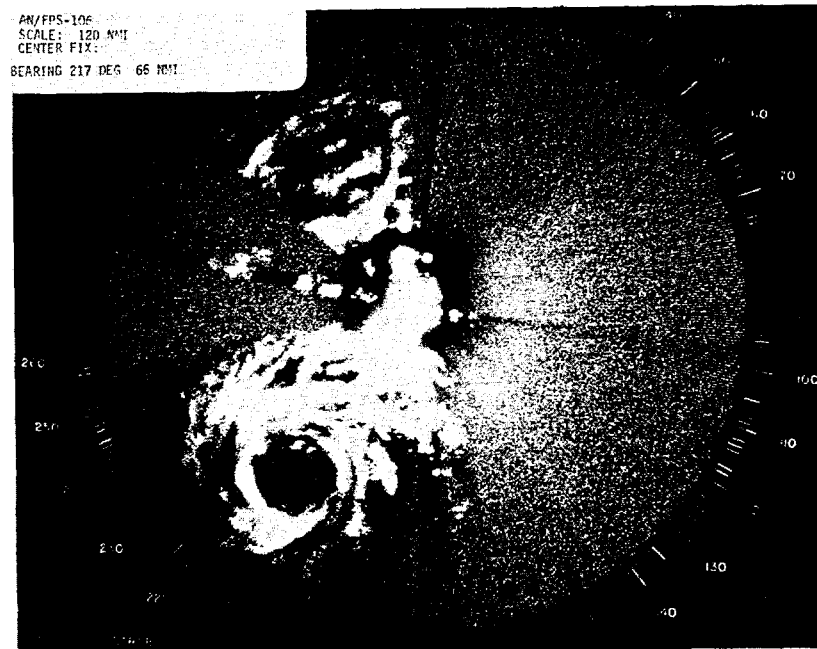


Figure 3-15-3. (Segment 3) The "eye" of Typhoon Faye as seen by radar 66 nm (122 km) southwest of Subic Bay at 240358Z August. (Photograph courtesy of NOCF, Cubi Pt, Republic of the Philippines)

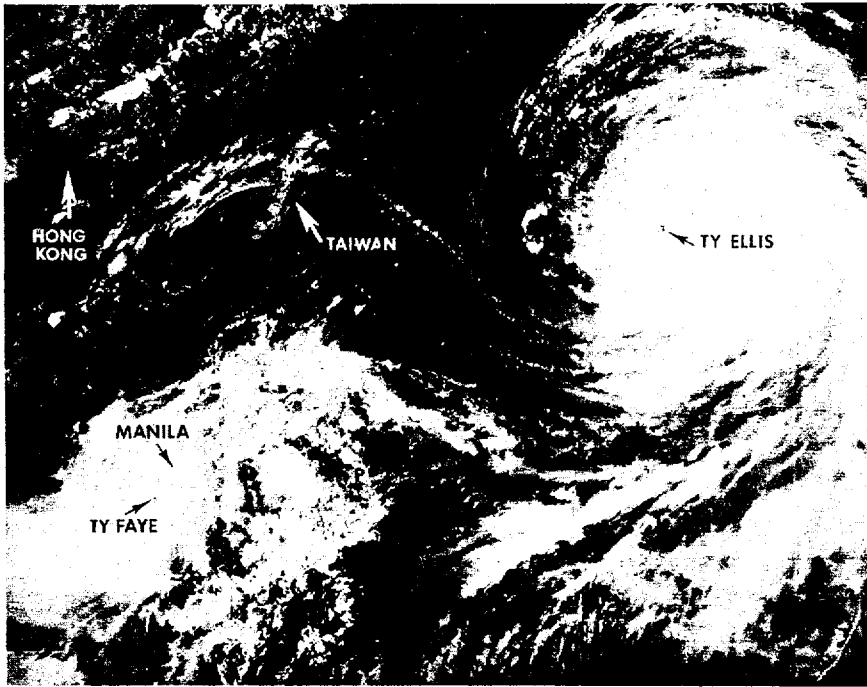


Figure 3-15-4. [Segment 3] Typhoon Faye at full strength, 90 kt (46 m/sec), just south of Luzon. The much larger Typhoon Ellis, 110 kt (57 m/sec), can be seen 925 nm (1713 km) northeast of Faye. 240603Z August (NOAA 7 visual imagery)

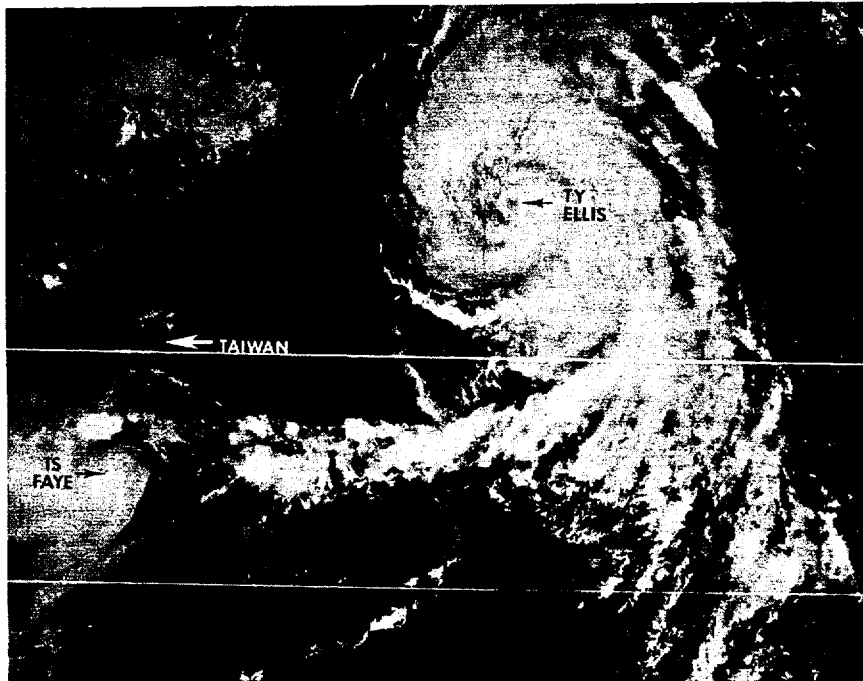


Figure 3-15-5. [Segment 4] Tropical Storm Faye just south of Taiwan weakening rapidly at 260539Z August as it moves under the strong upper-level outflow of Typhoon Ellis. (NOAA 7 visual imagery)

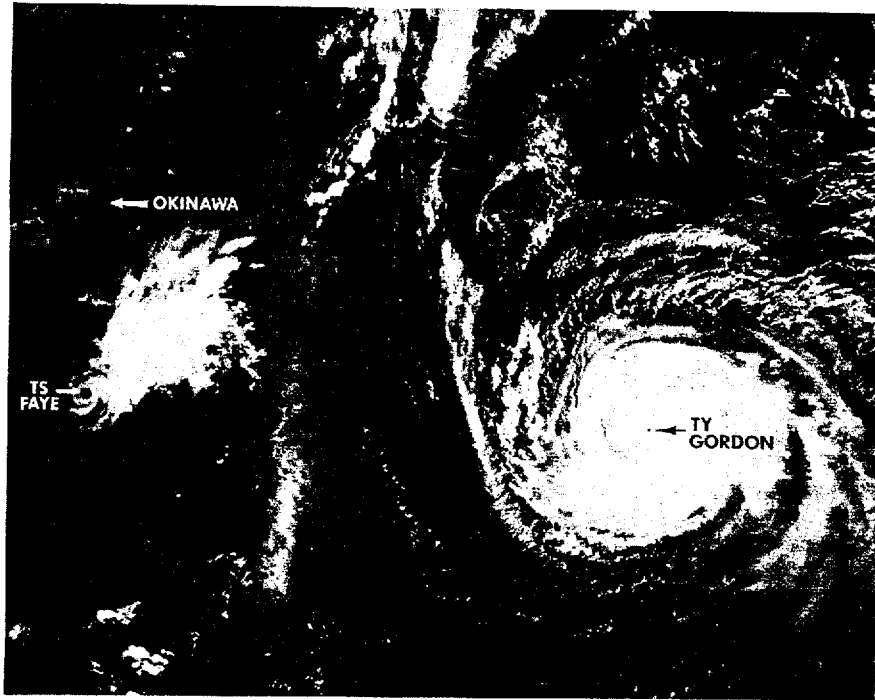


Figure 3-15-6. (Segment 6) Tropical Storm Faye, 50 kt (26 m/sec), once again being dwarfed by another tropical cyclone (Typhoon Gordon, 100 kt (51 m/sec)) at 300451Z August (NOAA 7 visual imagery)

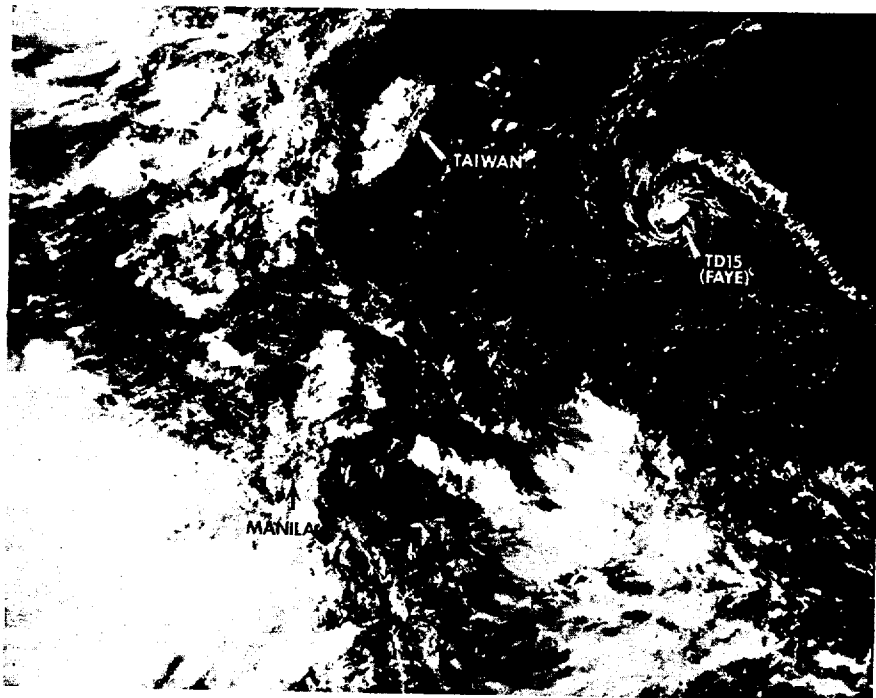


Figure 3-15-7. (Segment 7) An exposed low-level circulation can be seen just east of Taiwan as the remains of Typhoon Faye at 010608Z September. This weak circulation persisted for over three days. (NOAA 7 visual imagery)