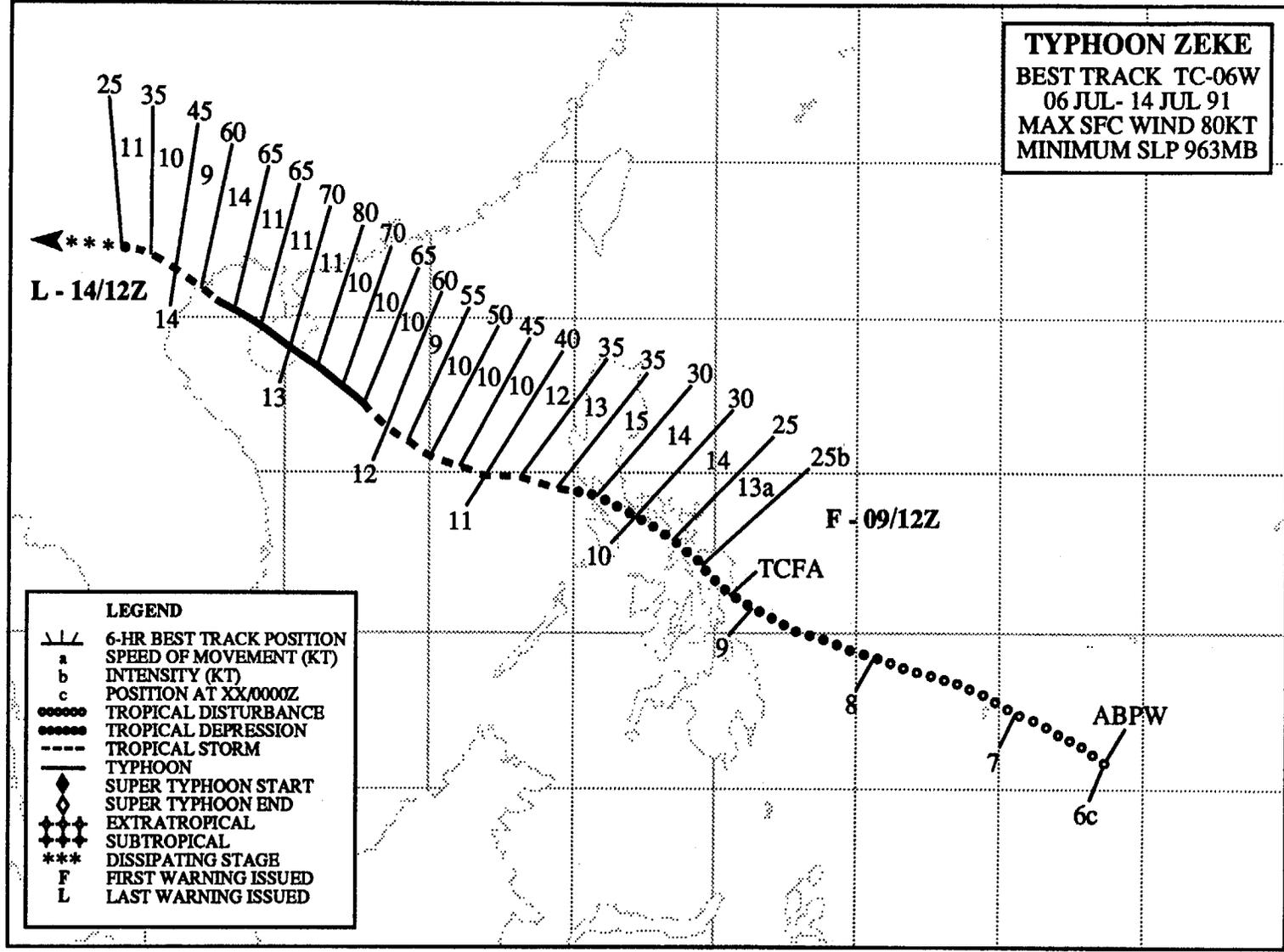


E 100 105 110 115 120 125 130 135 140 145 E

N 30



TYPHOON ZEKE
BEST TRACK TC-06W
06 JUL- 14 JUL 91
MAX SFC WIND 80KT
MINIMUM SLP 963MB

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

54

EQ

TYPHOON ZEKE (06W)

I. HIGHLIGHTS

Starting in the Philippine Sea, Typhoon Zeke (06W) made landfall three times before it dissipated over the mountains of northern Vietnam. Zeke was the first tropical cyclone to develop during the month of July, and initiated a period of nearly continuous warning status on at least one tropical cyclone in the Northwest Pacific through early December.

II. TRACK AND INTENSITY

For the most part, the subtropical ridge provided the primary steering for Zeke's persistent track to the west-northwest. The slight northward jog across the Philippine Islands from the basic track appears related to a surge in the southwesterly monsoonal flow over the South China Sea.

Zeke developed from a tropical disturbance in the monsoon trough southwest of Guam. Increased convection associated with the disturbance was first mentioned on the 060600Z Significant Tropical Weather Advisory. When the cyclonic circulation became evident on animated satellite imagery, a Tropical Cyclone Formation Alert was issued at 090400Z. The first warning on Tropical Depression 06W followed at 091200Z as the deep convection steadily increased around the cyclone's center. Zeke crossed the Republic of the Philippines as a depression and was upgraded to a tropical storm once it moved over open water in the South China Sea on 10 July. Synoptic reports from ships in the South China Sea revealed a highly asymmetric wind distribution around the cyclone center. The radius of 30 kt (15 m/sec) winds extended over 250 nm (465 km) southeast of the center, but less than 100 nm (185 km) to the northwest. This asymmetry appeared related to an adjustment of the monsoon southwesterlies due to the presence of the tropical cyclone, producing a cyclone structure similar to a large monsoon depression. Zeke reached its maximum intensity of 80 kt (40 m/sec) shortly before making landfall on Hainan Dao, but weakened very little crossing the island (Figure 3-06-1). It struck the coast of northern Vietnam, passing close to Hanoi. The final warning was issued at 141200Z as Zeke dissipated inland.

III. FORECAST PERFORMANCE

Although Zeke's final best track was nearly a straight line, the actual forecasts called for recurvature just east of Hainan Dao (Figure 3-06-2). Zeke was expected to turn northward near Hainan based on the NOGAPS prognostic series, which indicated that the subtropical ridge would break down near 110°E longitude. Rather than breaking down, the ridge north of the system strengthened and built westward as the long wave trough near 110°E retrograded allowing the high located near Okinawa to move westward towards Taiwan. Once forecasters recognized the adjustment of the ridge to the north, which prevented Zeke from moving directly northward, the forecasts reverted back to the straight-runner scenario.

IV. IMPACT

Despite passage close by the major population centers of Manila and Hanoi, Zeke's impact appeared to be negligible. No reports of significant damage were received, but damage to agriculture was probably high in Hainan Dao and northern Vietnam.

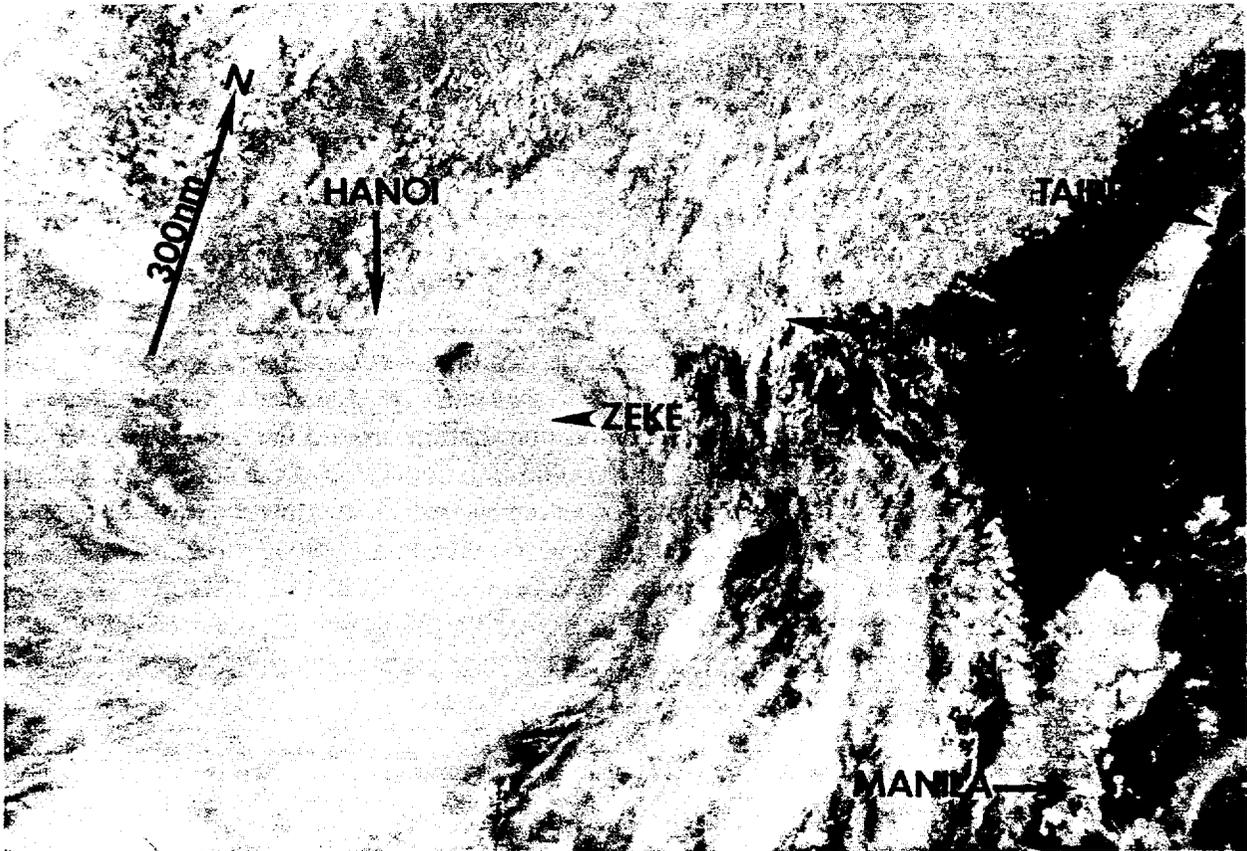


Figure 3-06-1. After crossing Hainan Dao, Typhoon Zeke retains 70 percent of its eyewall as it enters the Gulf of Tonkin (130644Z July NOAA visual imagery).

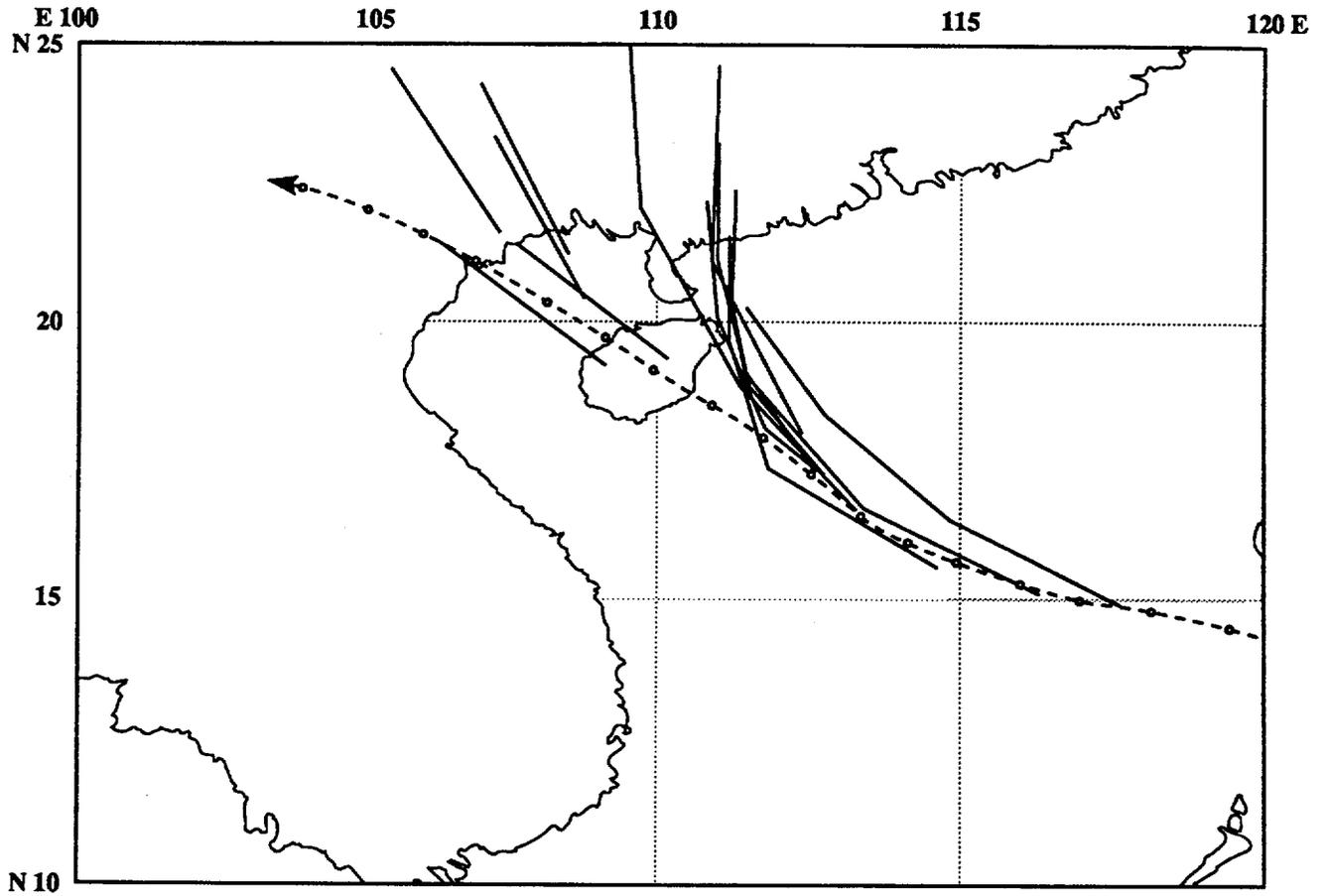


Figure 3-06-2. A comparison of JTWC forecasts issued after 101800Z July to the final best track. Recurvature was anticipated near 110°E longitude, but did not occur.