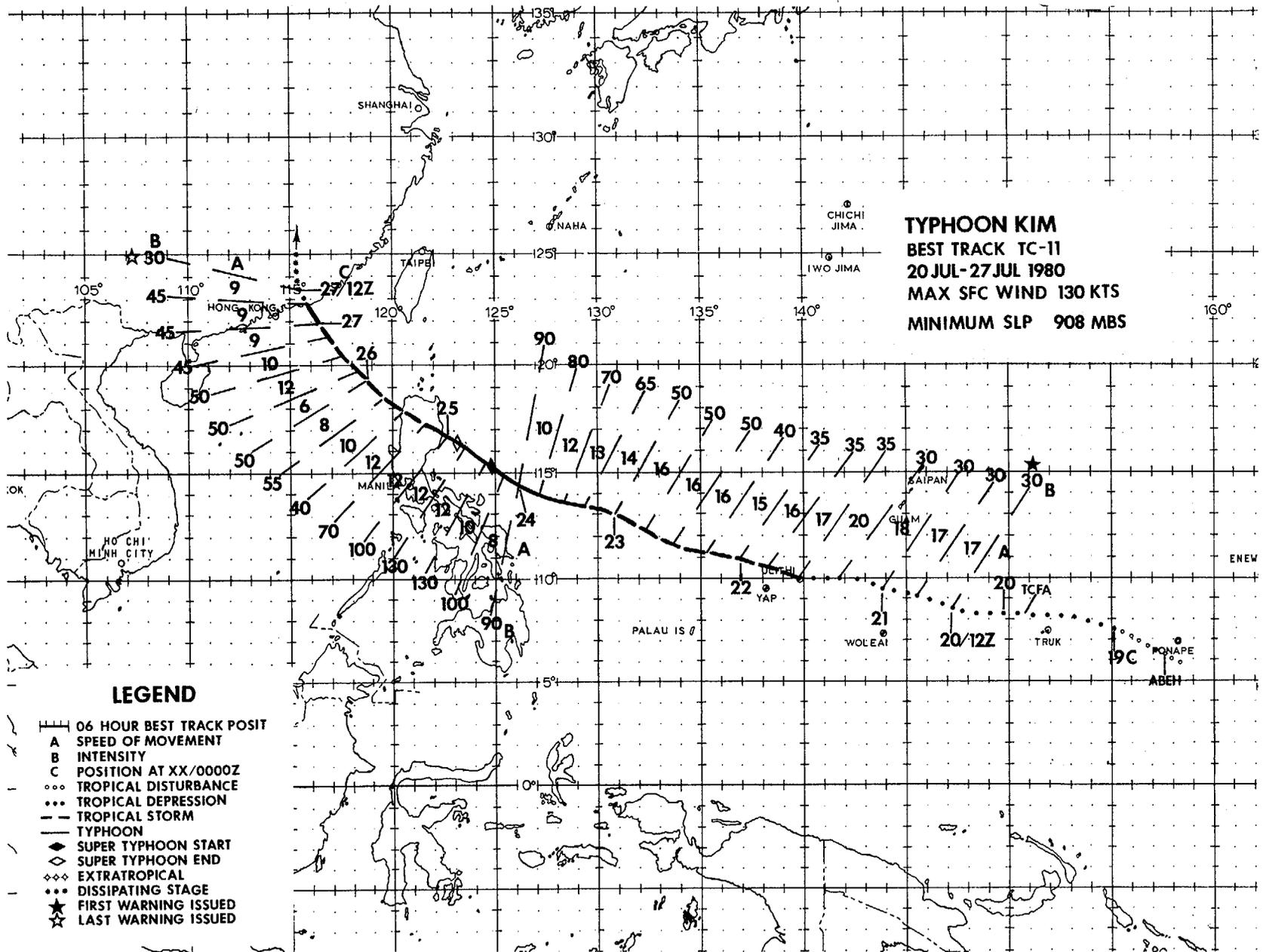


TYPHOON KIM
BEST TRACK TC-11
20 JUL-27 JUL 1980
MAX SFC WIND 130 KTS
MINIMUM SLP 908 MBS



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 KIM (11)

Super Typhoon Kim, one of the most intense typhoons of the 1980 season, slammed onto the eastern coast of Luzon four days after Typhoon Joe had practically immobilized the area. Accounts of the aftermath of Typhoon Kim indicated that an estimated 15 people were killed and 167,000 residents of the Philippines were displaced. Torrential rains caused massive flooding over Luzon as far south as Manila

ment, a Tropical Cyclone Formation Alert (TCFA) was issued at 192040Z. Aircraft reconnaissance data at 200800Z indicated a well-defined closed surface circulation with wind speeds of 25 to 30 kt (12 to 15 m/sec) and a central pressure of 1001 mb approximately 360 nm (667 km) southeast of Guam. Based on this data, the first warning on TD 11 was issued at 201200Z.

Kim, the first super typhoon of the 1980 season, was first detected on satellite imagery on 19 July. The disturbance appeared as an area of enhanced convection embedded in the near-equatorial trough. Further intensification appeared likely as the tropical upper-tropospheric trough (TUTT) was positioned to the northwest of the convective area. Because the disturbance was in a favorable position for continued develop-

ment, a Tropical Cyclone Formation Alert (TCFA) was issued at 192040Z. Aircraft reconnaissance data at 200800Z indicated a well-defined closed surface circulation with wind speeds of 25 to 30 kt (12 to 15 m/sec) and a central pressure of 1001 mb approximately 360 nm (667 km) southeast of Guam. Based on this data, the first warning on TD 11 was issued at 201200Z.

TD 11 initially moved west-northwestward passing approximately 240 nm (444 km) south of Guam before heading directly towards the island of Ulithi. At 211200Z, TD 11 passed directly over Ulithi, which reported a wind maximum of 35 kt (18 m/sec). This information, plus a subsequent aircraft report of a central surface pressure of 997 mb, prompted JTWC to upgrade TD 11 to Tropical Storm Kim at 211800Z. Aircraft data at that time, however, indicated that Kim was poorly align-

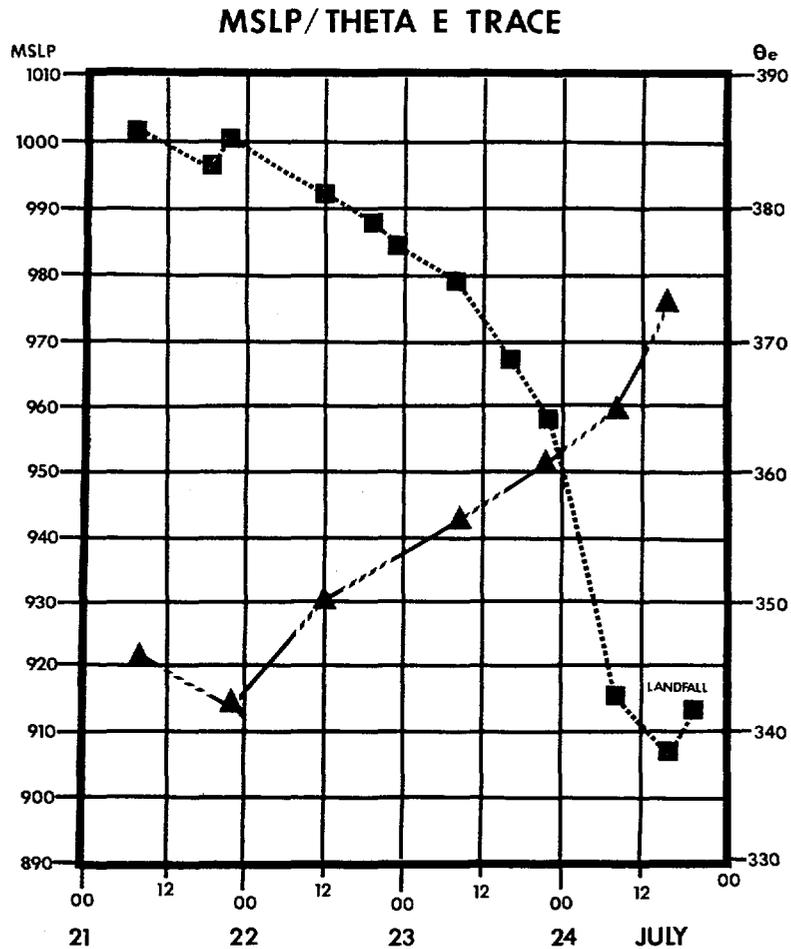


FIGURE 3-11-1. Time cross-section of Kim's minimum sea-level pressure versus 700 mb equivalent potential temperature (THETA E (θ_e)) as derived from aircraft reconnaissance data.

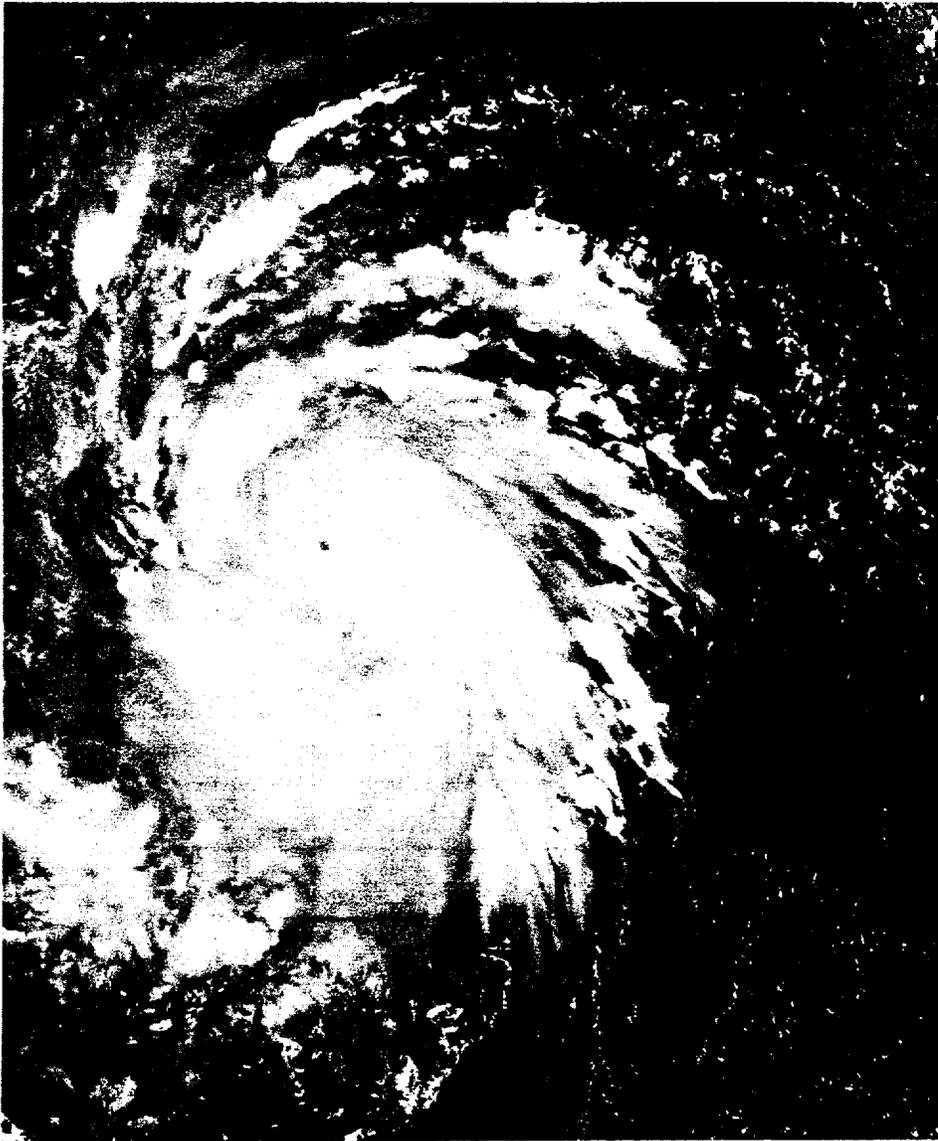


FIGURE 3-11-2. Typhoon Kim at approximately 110 kt (57 m/sec) intensity before she reached super typhoon strength, 24 July 1980, 0125Z. (DMSP imagery)

ned in the vertical, with the 700 mb center well to the southeast of the surface center and the 700 mb wind flow largely disorganized. Therefore, further intensification was slow during the 22nd and 23rd. During this period, Kim followed a path similar to Typhoon Joe across the Philippine Sea, tracking west-northwestward along the southern periphery of the subtropical mid-tropospheric ridge.

At 230600Z, aircraft reconnaissance observed a fairly substantial drop in surface pressure to 979 mb and indications that an eyewall was partially forming. Upon receipt of the data, which signalled the beginnings of a period of more rapid intensification, Kim was upgraded to a typhoon.

During this period of falling pressures and corresponding intensification, an empirically derived forecasting aid (Fig. 3-11-1) proved very valuable to JTWC. This forecasting aid relates surface pressure and 700 mb equivalent potential temperature (θ_e) to future intensification. The hypothesis is that rapid intensification is likely to take place in a tropical cyclone within the next 12 to 36 hours after these two traces intersect. Typhoon Kim's intensification trend verified this study.

At 241603Z, a minimum sea level pressure of 908 mb was measured by dropsonde. This pressure was sufficiently low to qualify Kim as a super typhoon (Fig. 3-11-2). By the next aircraft penetration, however, Kim's central pressure had risen to 918 mb. A

possible reason for this rise in pressure was that Kim was now only eight hours from landfall on the coast of Luzon and the mountainous terrain had begun to disturb Kim's low-level inflow. Shortly afterwards, at about 250000Z, Typhoon Kim moved onto the coast of Luzon (Fig. 3-11-3) with accompanying maximum sustained winds of 100 kt (52 m/sec) and reported wind gusts as high as 125 kt (64 m/sec).

Terrain further weakened Kim as she moved slowly across Luzon before emerging in the South China Sea as an ill-defined tropical storm. JTWC forecasters expected Kim to reintensify as a typhoon over the South China Sea similar to Joe only several days earlier.

Aircraft reconnaissance, however, continued to report that Kim lacked significant organization and that her associated convective tops were significantly lower than previously observed.

A weakness in the mid-tropospheric ridge, thought to have been induced by Typhoon Joe's passage several days earlier, allowed Kim to track more northwest towards Hong Kong, changing little in direction or intensity as she tracked across the South China Sea, Kim finally made landfall on the coast of China 90 nm (167 km) northeast of Hong Kong at about 270600Z. Maximum sustained winds of 45 kt (23 m/sec) and wind gusts to 60 kt (31 m/sec) were reported as Kim moved inland.



FIGURE 3-11-3. Typhoon Kim over the east coast of Luzon, Philippines and the remnants of Typhoon Joe in the vicinity of northern Laos, 25 July 1980, 0246Z. (NOAA 6 imagery)