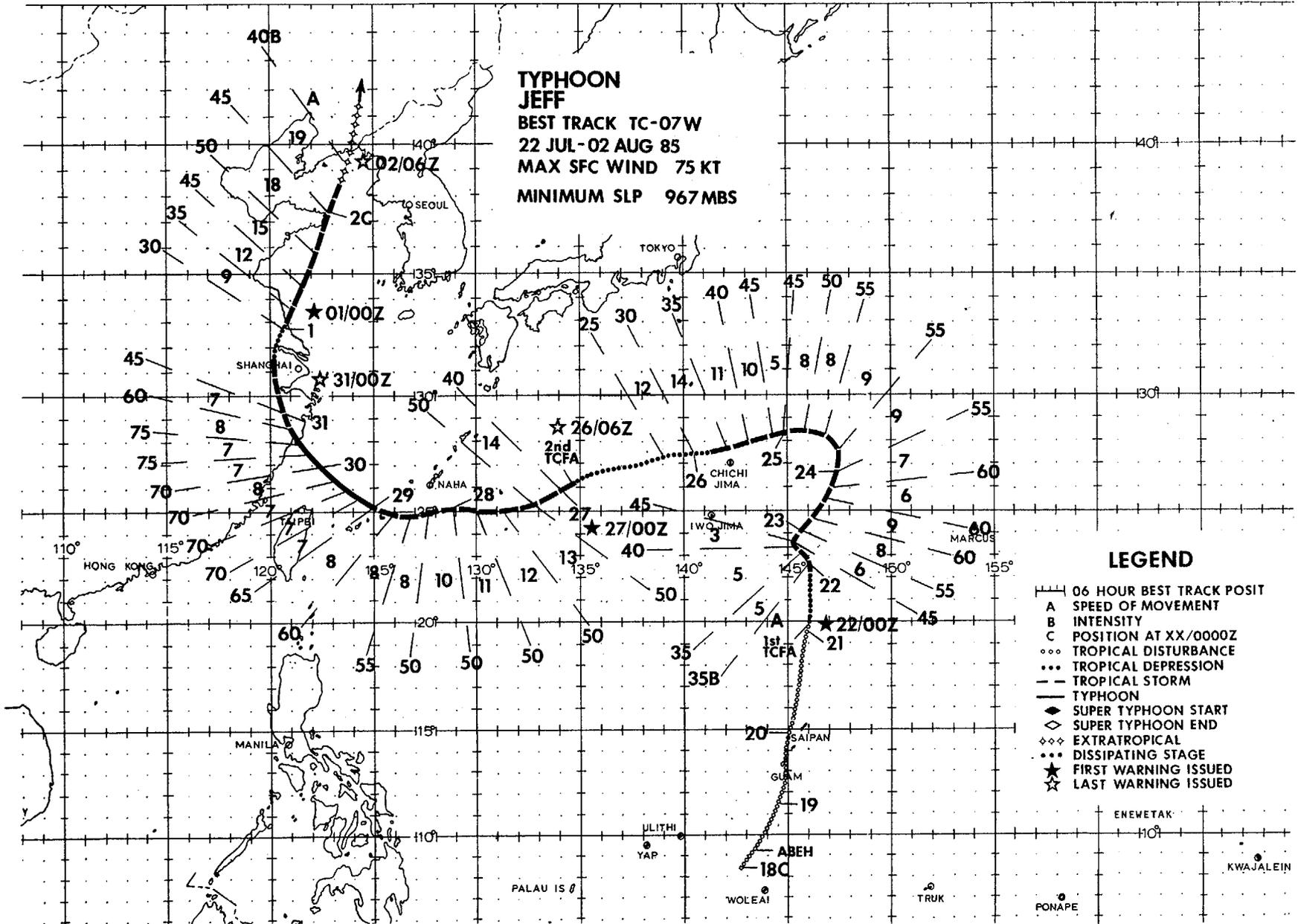


110° 115° 120° 125° 130° 135° 140° 145° 150° 155° 160° 165°

**TYPHOON  
JEFF**  
BEST TRACK TC-07W  
22 JUL -02 AUG 85  
MAX SFC WIND 75 KT  
MINIMUM SLP 967 MBS



38

**LEGEND**

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

ENEWETAK  
KWAJALEIN  
TRUK  
PONAPE

## TYPHOON JEFF (07W)

Typhoon Jeff was the longest-lived tropical cyclone of the 1985 season. It required a total of forty-one warnings and was finalled by JTWC on three separate occasions. During its twelve day life span, Jeff peaked in intensity three times: once east of the island of Iwo Jima; once west of Okinawa, Japan; and the third time over the Yellow Sea. Jeff, as it turned out, would be the only tropical cyclone to develop during July, a month that normally produces five cyclones.

After Typhoon Irma became extratropical on 1 July, tropical activity in the western North Pacific decreased. One significant tropical disturbance developed east of the Philippines on 4 July and moved into the South China Sea on the 6th before dissipating east of Hong Kong (WMO 45005) on 8 July. This disturbance was the subject of a TCFA from the 4th through the 7th. After this disturbance dissipated, the tropics stayed inactive until Typhoon Jeff developed a week later.

The low-level circulation which was to mature into Typhoon Jeff, was spawned in the monsoon trough south of Guam on 18 July in a broad area of disorganized cloudiness that stretched along ten degrees north latitude. Consolidating slowly, the system drifted northward across the island of Guam and through the northern Marianas, bringing little more than increased rainshower activity. Three days after genesis, the development of persistent central convection and better cloud organization prompted a TCFA, valid at 210200Z. Aircraft reconnaissance into the disturbance a few hours later was unable to locate a surface circulation, but instead found a broad trough with 10 to 15 kt (5 to 8 m/s) surface winds and a MSLP of 1006 mb. Early the next morning, a second aircraft reconnaissance mission found a tropical depression with a 1002 mb central pressure. As a result, the first warning was issued at 220000Z. For the next two days Jeff continued to intensify, reaching a peak of 60 kt (31 m/s) on the 23rd.

Up to this point, the steering flow had remained weak. Initially, Jeff's movement had been to the northwest, but then changed to the northeast in response to the approach of a mid-latitude trough from the northwest. Forecasting recurvature into the mid-latitude westerlies ahead of the trough was the most attractive possibility, especially since the tropical cyclone was already at 25N latitude and had been steadily tracking northeastward for nearly 24-hours. In contrast to the persistent northeasterly movement, both numerical forecast aids (NICM and OTCM) consistently indicated a northwesterly track. Because of the major difference between what was actually happening and the guidance provided by the aids, the possibility of a return to a westerly or northwesterly track was still considered. The "less" likely alternative forecast scenario, i.e. northwestward movement, was repeatedly

mentioned in the Prognostic Reasoning Messages (WDPAL PGTW), but the official forecast was for recurvature. Unfortunately, the "more" likely recurvature scenario to the northeast did not last long.

Late on the 23rd as the trough approached, vertical wind shear from the west increased over the system. It soon became apparent that Jeff was weakening and the persistent central convection was shearing away to the east (Figure 3-07-1). The mid-latitude trough passed to the east on the 24th, leaving behind Jeff's exposed low-level circulation.

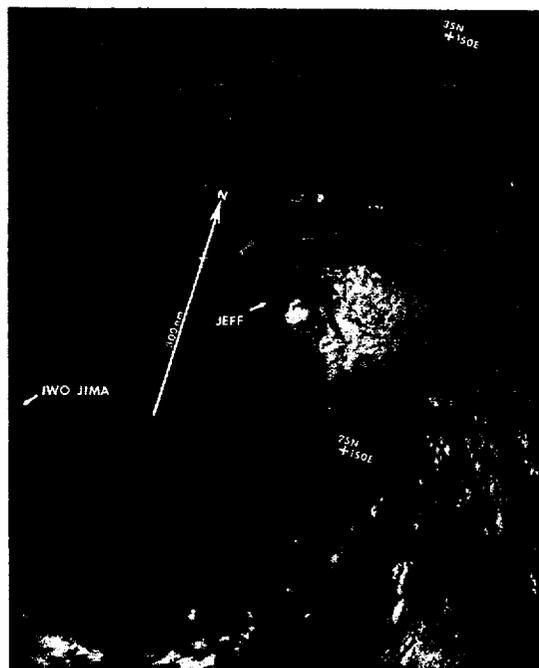


Figure 3-07-1. The low-level center of Tropical Storm Jeff located near the western edge of the central dense overcast. Strong upper-level westerly winds are shearing away the central convection to the east and will soon expose the low-level circulation center [240318Z July NOAA visual imagery].

The residual low-level vortex then began to move westward, embedded in the southeastern portion of the low- to mid-level anticyclone which was centered over northern Honshu. Without any regeneration of the central convection on the 25th or the 26th, Jeff

continued to weaken. By 260600Z the maximum surface winds had dropped below 30 kt (15 m/s). Despite the fact that a well-defined low-level circulation was still present, the lack of persistent central convection and the systems rapid movement to the west-southwest made further development seem unlikely (Figure 3-07-2). As a consequence, the final warning was issued at 260600Z, with the caveat that "the system will be closely monitored for indications of possible regeneration." That was precisely what happened! Almost immediately after Jeff was finalled, convection began to redevelop about the low-level center since the shearing influence of the trough was absent.

Throughout the night of the 26th Jeff regenerated, and JTWC immediately alerted Kadena AB (WMO 47931) and other customers on Okinawa of the change. Weather satellite reconnaissance revealed a dramatic increase in central convection when warnings were again issued on Jeff, as a 35 kt (18 m/s) Tropical Storm, at 270000Z (Figure 3-07-3). Because Jeff was less than 24-hours from affecting Okinawa, Kadena AB went to Condition of Readiness III as a precaution. As Jeff neared Okinawa it slowed, passing about 75 nm south of Okinawa at 280530Z. The warnings verified well. Maximum sustained winds at Kadena AB were 25 kt (13 m/s), with a peak gust to

39 kt (20 m/s) at 280208Z. Naha (WMO 47930) had a peak gust of 47 kt (24 m/s) at 280355Z. Eighteen hours after passing south of Okinawa, Jeff attained typhoon intensity. By that time, the Typhoon had turned to the west-northwest as it started to move around the western side of the subtropical ridge. Further intensification to a peak of 75 kt (39 m/s) occurred as Typhoon Jeff approached, and made land-fall on, the coast of mainland China approximately 180 nm (333 km) south of Shanghai (WMO 58367) (Figure 3-07-4). Once onshore, surface frictional effects caused a rapid decrease in maximum winds. The persistent central convection began to fall apart and, once again, the system was finalled, although "movement back off the coast and regeneration in the Yellow Sea" remained a distinct possibility (Figure 3-07-5).

Indeed, Jeff was not finished yet. Warning number 36 was issued at 0000Z on 1 August as meteorological satellite reconnaissance reported significantly increased convection over water. The track was now to the north-northeast around the western edge of the subtropical ridge. Acceleration was gradual as Jeff redeveloped maximum surface winds of 50 kt (26 m/s) by 1800Z on 1 August. Strong south-westerly winds aloft hindered the system's attempt to further intensify and achieve vertical alignment

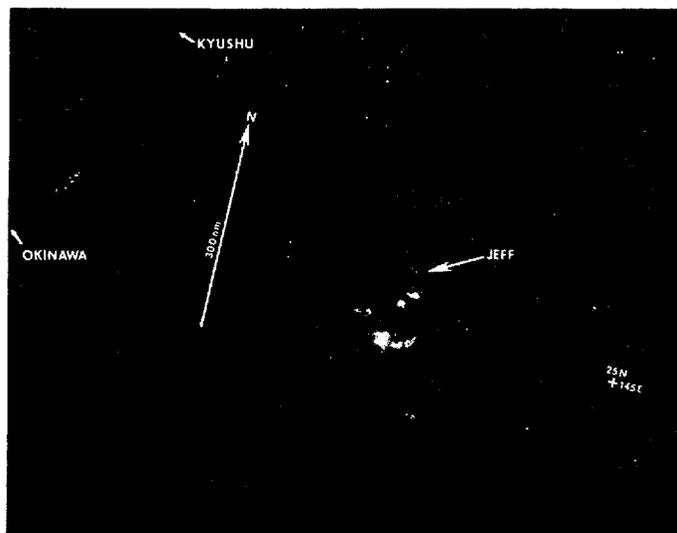
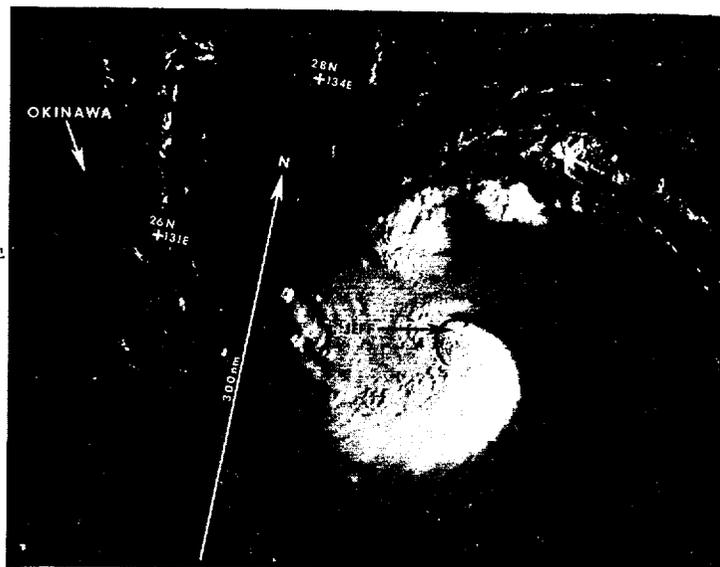


Figure 3-07-2. The nearly convection free low-level circulation of Jeff as it was finalled for the first time (260508Z July NOAA visual imagery).

Figure 3-07-3. Typhoon Jeff just after its dramatic regeneration during the night (270048Z July DMSP visual imagery).



between the low-level cyclone and anticyclone aloft. Then, at 0600Z on 2 August Jeff was finalled for the third and last time after completing extratropical transition in the northern Yellow Sea.

In retrospect, eastern China bore the brunt of Typhoon Jeff. The provinces of Shanghai and coastal Zhejiang were battered. News reports indi-

cated at least 180 people were killed, 1400 injured and tens of thousands left homeless. In addition, 1400 watercraft, mostly fishing boats, were lost or badly damaged. Some 75,000 acres (30,352 hectares) of crops were destroyed and another 400,000 acres (161,878 hectares) badly damaged, by the typhoon. China's irrigation network was severely disrupted by flooding.

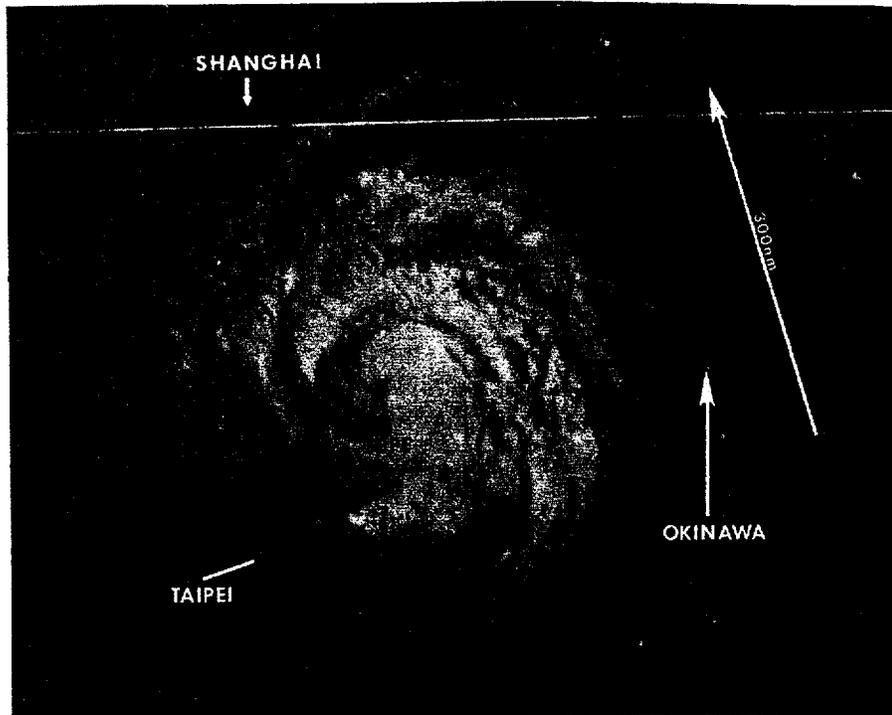


Figure 3-07-4. Typhoon Jeff near maximum intensity less than 18-hours from making landfall over eastern mainland China. During the hours immediately preceding landfall, a small banding eye formed (292303Z July NOAA visual imagery).

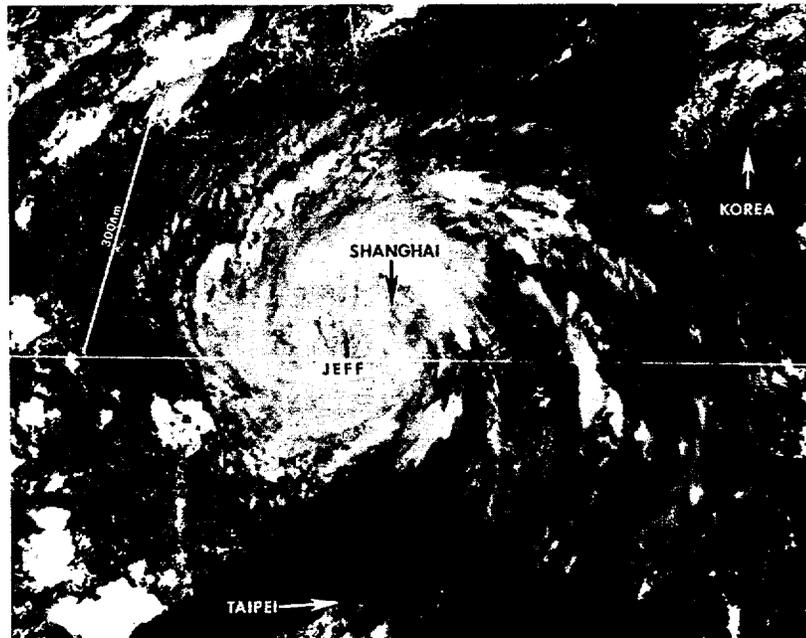


Figure 3-07-5. Jeff over mainland China after being finalled for the second time. Jeff spent nearly 36 hours over mainland China before moving back over open water and reintensifying (310556Z July NOAA visual imagery).