

**TYPHOON  
DOYLE**  
BEST TRACK TC-30W

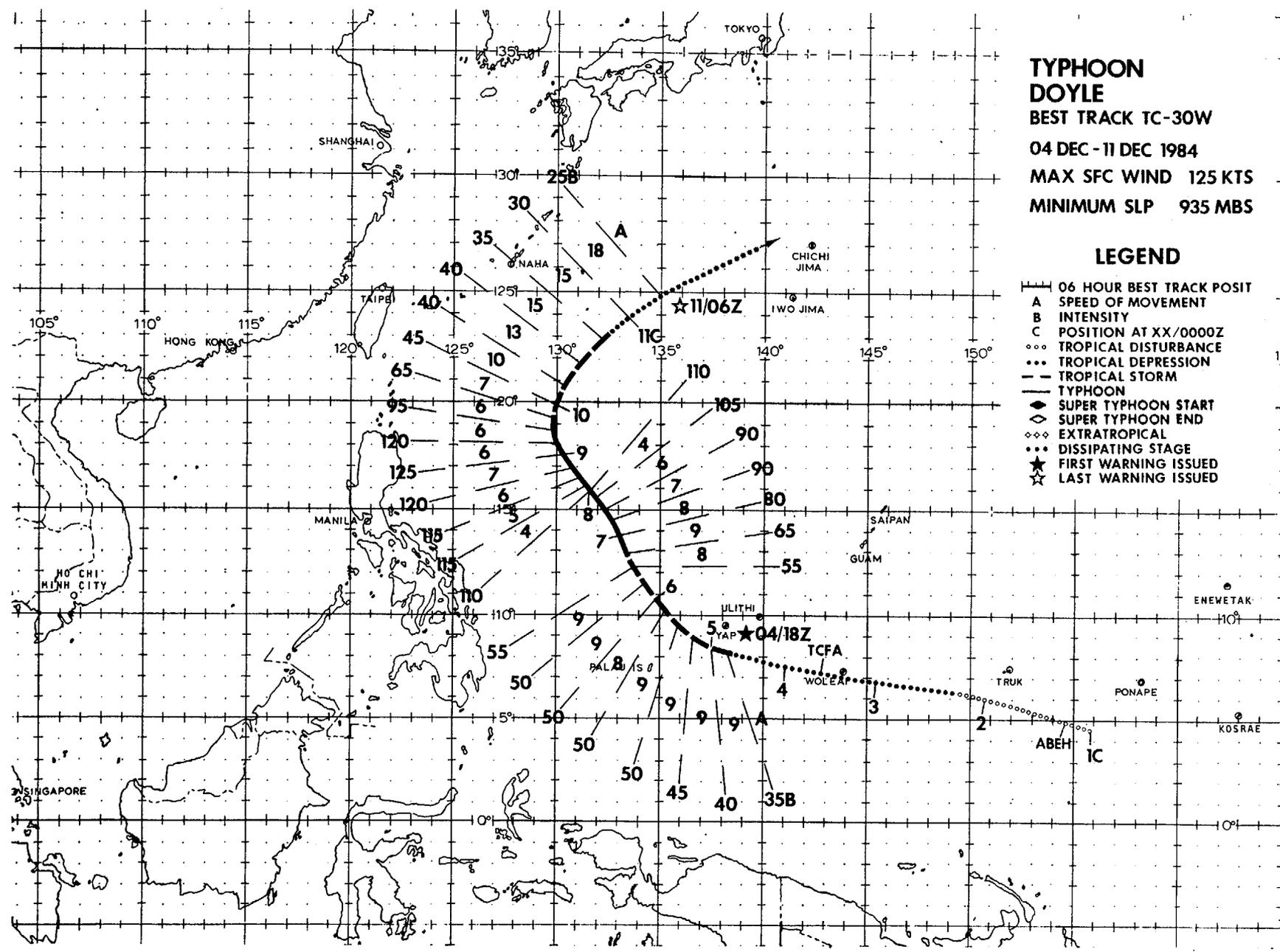
04 DEC - 11 DEC 1984

MAX SFC WIND 125 KTS

MINIMUM SLP 935 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



TYPHOON DOYLE (30W)

Typhoon Doyle was the final tropical cyclone of the 1984 season and the only one to develop during the month of December. Doyle followed a typical recurvature track and remained over open water throughout its lifetime.

The tropical disturbance that was to become Doyle first appeared as an area of convective activity near 5N 156E at 0000Z on the 1st of December. It was mentioned as a new suspect area on the 010600Z Significant Tropical Weather Advisory (ABEH PGTW) and was given a "poor" potential for significant tropical cyclone development.

During the next 36 hours the disturbance moved west-northwest and gradually increased in intensity and organization. During this time satellite imagery showed the disturbance was developing good upper-level support in the form of anticyclonic outflow. With the potential for significant tropical cyclone development now considered to be "fair", the ABEH was reissued at 021800Z.

Aircraft reconnaissance early on the 3rd was unable to locate a surface circulation, but did find a trough with an MSLP of 1004 mb. The system continued to show signs of increased organization prompting the issuance of a TCFA at 031100Z. On the afternoon of the 4th, aircraft reconnaissance indicated that the MSLP had dropped to 1001 mb and that 25 kt (13 m/s) surface winds were now associated with the disturbance. Again no low-level circulation center could be found. Since continued slow development was evident on satellite imagery, the TCFA was reissued at 041100Z. At this time imagery showed several spiralling convective bands were present indicating that the formation of a significant tropical cyclone was imminent. Also present at this time was a Southern Hemisphere low-level circulation in the Coral Sea east of Cape York. This vortex contributed to the development of Doyle by increasing the westerly low-level flow to its south.

Satellite imagery at 041600Z indicated that the system now had some intense

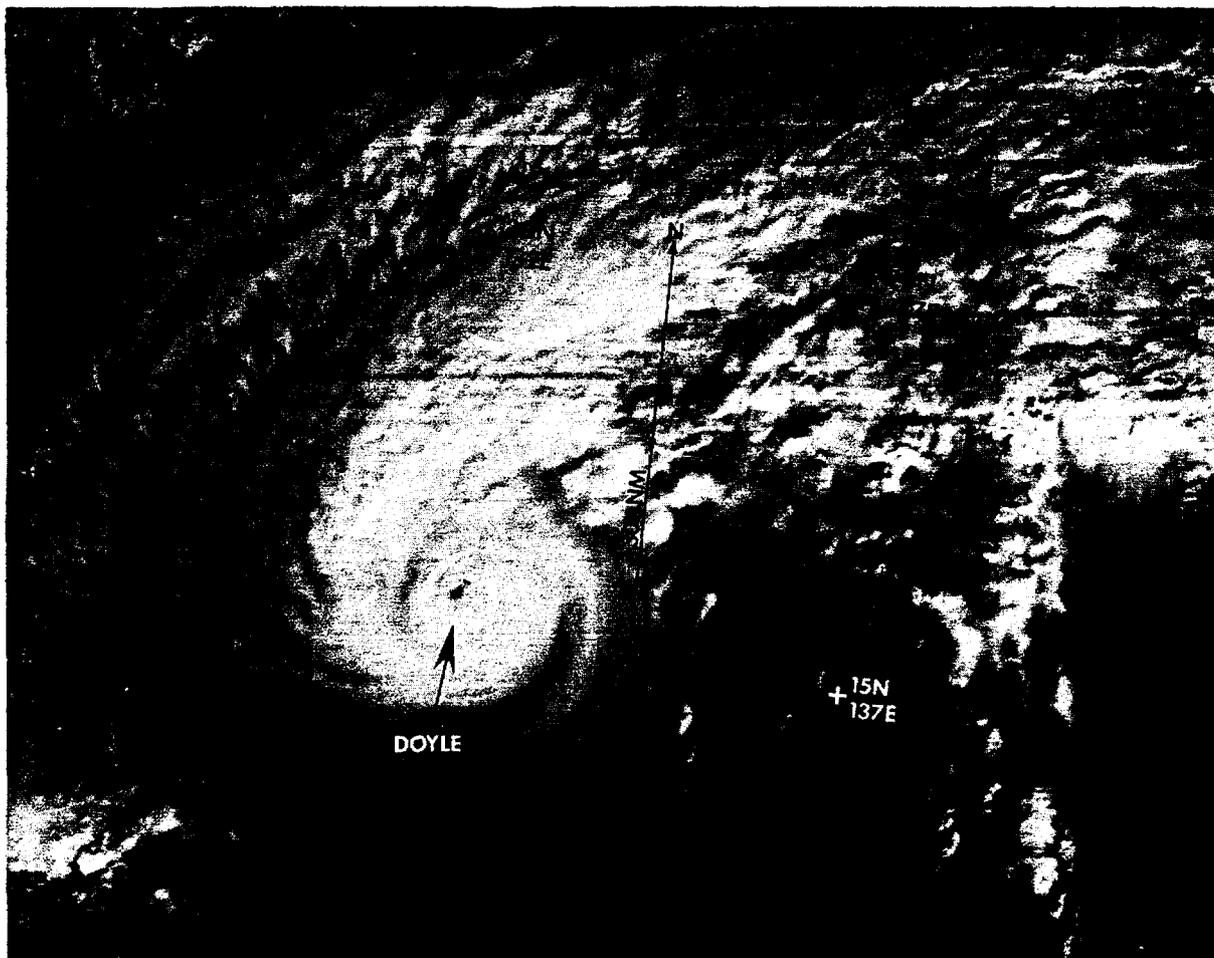


Figure 3-30-1. Typhoon Doyle one day before attaining maximum intensity (080106Z December DMSP visual imagery).

convection near the center of the developing circulation and that two intensifying convective bands were present. With Dvorak intensity analysis of this imagery indicating that 35 kt (18 m/s) surface winds were present, the initial warning on Doyle was issued at 041800Z.

An investigative flight into Doyle several hours later was finally able to locate the storm's center at 050129Z observing 40 kt (21 m/s) surface winds and measuring a central pressure of 994 mb. The surface center was very small - measuring a mere 5 nm (9 km) in diameter, with the maximum winds located 5 nm (9 km) from the center and decreasing rapidly outward. The small size of the surface center may have been a factor in the inability of previous reconnaissance flights to locate it.

During the next 48 hours, Doyle slowly intensified. Aircraft reconnaissance confirmed this slow development until the mission late on 6 December, when the central pressure was measured at 973 mb, a drop of 18 mb in just 12 hours. Maximum sustained surface winds of 90 kt (46 m/s) were observed on the north side of the storm where the easterly trades were enhancing Doyle's circulation. Doyle was upgraded to typhoon strength at 070000Z based on this information. Accompanying this intensification was a change in movement to a more northwesterly track.

The plotted values of equivalent potential temperatures versus the MSLP for the 30 hours prior to 070000Z December indicated the strong possibility of rapid deepening during the next 36 hours (Dunnavan, 1981). This indication was incorporated in the 070000Z December warning with some modification. The warnings prior to 070000Z had indicated no significant increase in intensity was likely due to the presence of the northwest monsoon flow to the north of the storm. Since that situation was still present, intensification to more than 120 kt (62 m/s) was not forecast. At this time the area north of Doyle was marked by the presence of stratocumulus clouds indicating the stability of the atmosphere in that region.

At 072047Z the MSLP had decreased to 935 mb, a fall of 43 mb in 24 hours (Figure 3-30-1). Maximum sustained winds reported by the ARWO at this time were 110 kt (57 m/s). After 072047Z, Doyle's central sea-level pressure began to rise - reaching 993 mb at 092037Z December (a rise of 58 mb in 48 hours). An unusual feature of Typhoon Doyle was the way the maximum surface winds lagged the occurrence of its MSLP. According to the best track intensities, which are based on all available data, Typhoon Doyle reached a maximum intensity of 125 kt (64 m/s) at 090000Z some 27 hours after the lowest minimum sea-level pressure was recorded!

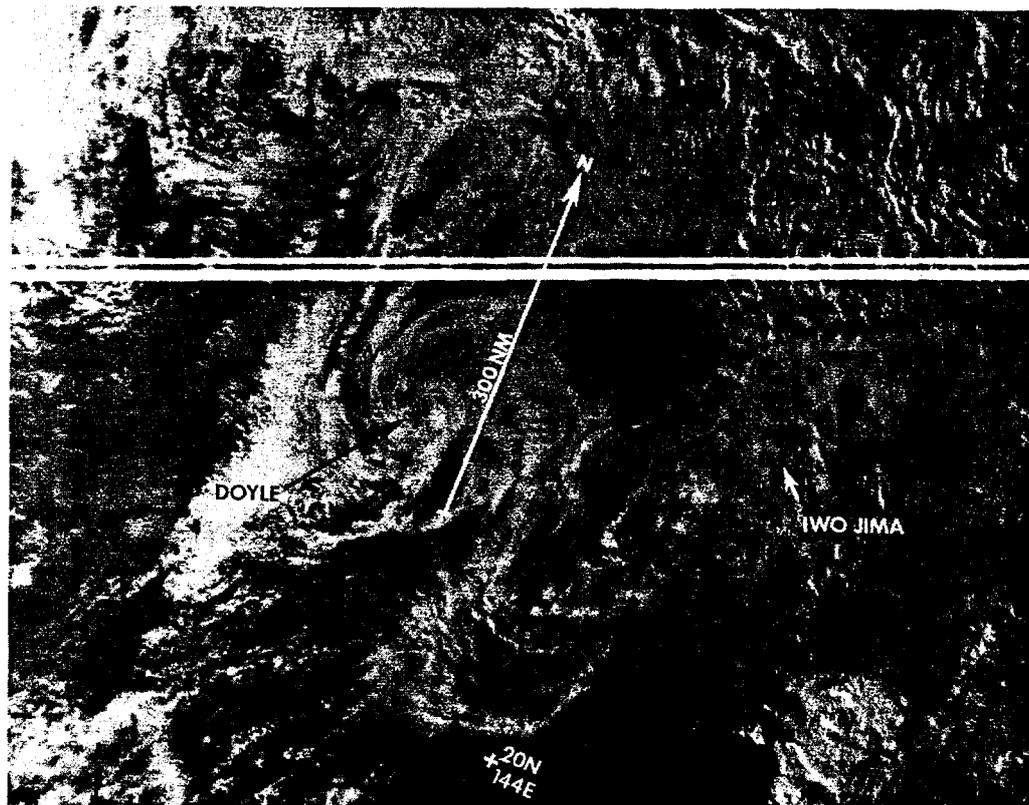


Figure 3-30-2. The exposed low-level circulation of Doyle at the time of the final warning (110601Z December NOAA visual imagery).

Between 091200Z and 100000Z, Doyle turned to the north and rapidly weakened from 95 kt (49 m/s) to 45 kt (23 m/s). Satellite imagery during this time showed a dramatic decrease in the intensity and extent of Doyle's convection. After 100000Z Doyle weakened more gradually while accelerating to the northeast. The final

warning was issued at 110600Z as the nearly convection-free low-level circulation center dissipated as a significant tropical cyclone (Figure 3-30-2).

There were no reports of damages from Typhoon Doyle as it remained over open water throughout its lifetime.