

TYPHOON CLARA (29W)

Typhoon Clara was the last significant tropical cyclone to develop during the month of November. It developed into a textbook, late-season recurver and was noteworthy due to its effect on Super Typhoon Bill.

Clara began as a large, low-latitude disturbance in the eastern Caroline Islands. It was located by surface synoptic data before it was identified in satellite imagery. This disturbance first appeared late on 11 November as a weak circulation near 4N 164E and received first mention as a suspect area in the 120600Z Significant Tropical Weather Advisory (ABEH PGTW). By 130000Z, a very broad area of convection was associated with the circulation. The circulation's development was aided by the presence of a disturbance in the Southern Hemisphere near the Solomons which strengthened the westerly flow south of the circulation. These westerlies combined with the northeast trades to the north to supply the excess low-level vorticity needed for continued development. The upper-level

pattern was also favorable with anticyclones over Super Typhoon Bill and over the Solomons providing divergence aloft over the developing system. This cross-equatorial interaction at both the surface and 200 mb level was instrumental in the development of Typhoon Clara.

The area continued to consolidate throughout the day and at 131600Z the ABEH was reissued upgrading the system's potential for development to "fair". Analysis of satellite imagery at this time yielded an intensity estimate of 25 kt (13 m/s) with a forecast to intensify. An aircraft investigation was requested for later in the day and with continued development evident, a TCFA was issued at 132030Z. AT 140454Z aircraft reconnaissance found a surface center with 15 to 25 kt (8 to 13 m/s) winds; consequently warning number one was issued at 140600Z. Figure 3-29-1 shows Clara fifteen hours later as a 30 kt (15 m/s) tropical depression.

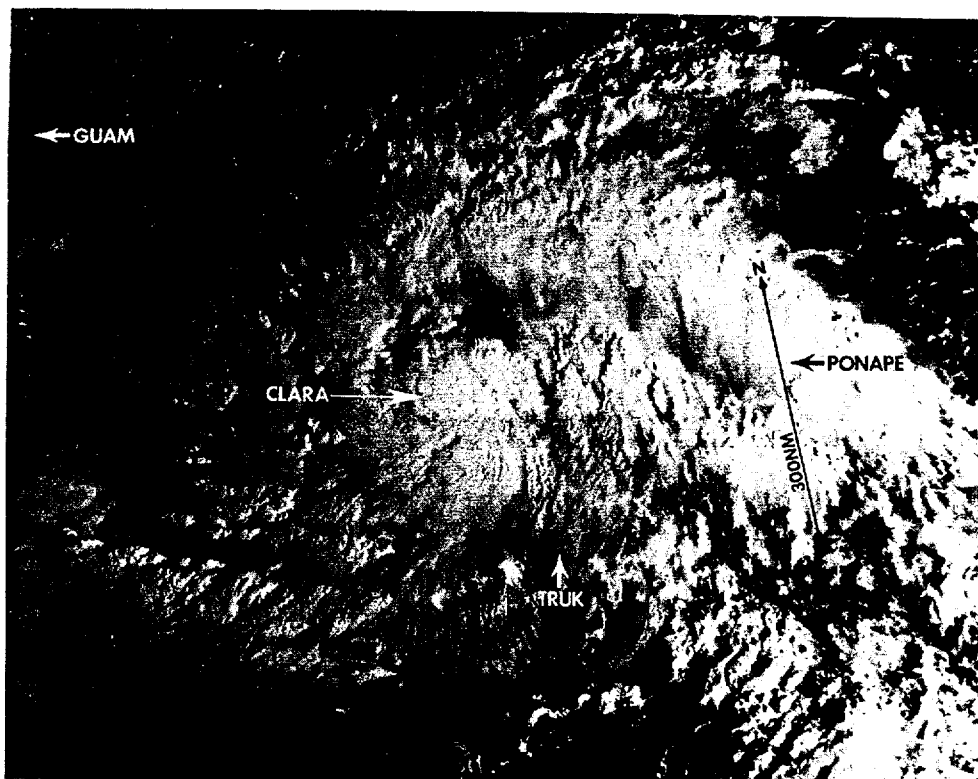


Figure 3-29-1. Clara at Tropical Depression intensity during its consolidation stage. Maximum surface winds at this time were near 30 kt (15 m/s). This system was upgraded to Tropical Storm Clara less than nine hours later (142113Z November NOAA visual imagery).

From this point on, Clara was a well-behaved and well forecast system. As Clara intensified it developed into a large circulation. As early as 151200Z, Clara controlled as much inflow as Bill, and by late on the 16th was clearly the dominant of the two storms. Progress along its track was typical of a well-behaved fast moving typhoon, and anticipated well in advance by JTWC. Typhoon Clara recurved just east of 132E. As Clara recurved, it passed within 500 nm (926 km) of the weakening Super Typhoon Bill. This proximity to Bill disrupted Clara's outflow and resulted in a slight weakening late on the 18th and into the 19th. However, Bill's effect on Clara was considerably less than the major course and intensity changes that Clara inflicted on Bill. Late on the 19th, as Clara recurved to the northeast and opened on Bill, it

reintensified to 105 kt (54 m/s). This was just 5 kt (3m/s) less than the peak intensity of 110 kt (57 m/s) recorded prior to recurvature.

Figure 3-29-2 shows Clara after it had completed recurvature and was about to begin extratropical transition with a frontal system to the northeast. This transition was of the complex variety in which the typhoon merges with an existing front and becomes a wave on the front. This wave then propagates along the front and usually accelerates to the northeast. In this process the typhoon loses all of its convection and tropical characteristics but still retains a strong low-level wind field. In Clara's case, the transition was rapid and complete by 211200Z. The extratropical low was still discernable on satellite imagery as a frontal wave 30 hours later.

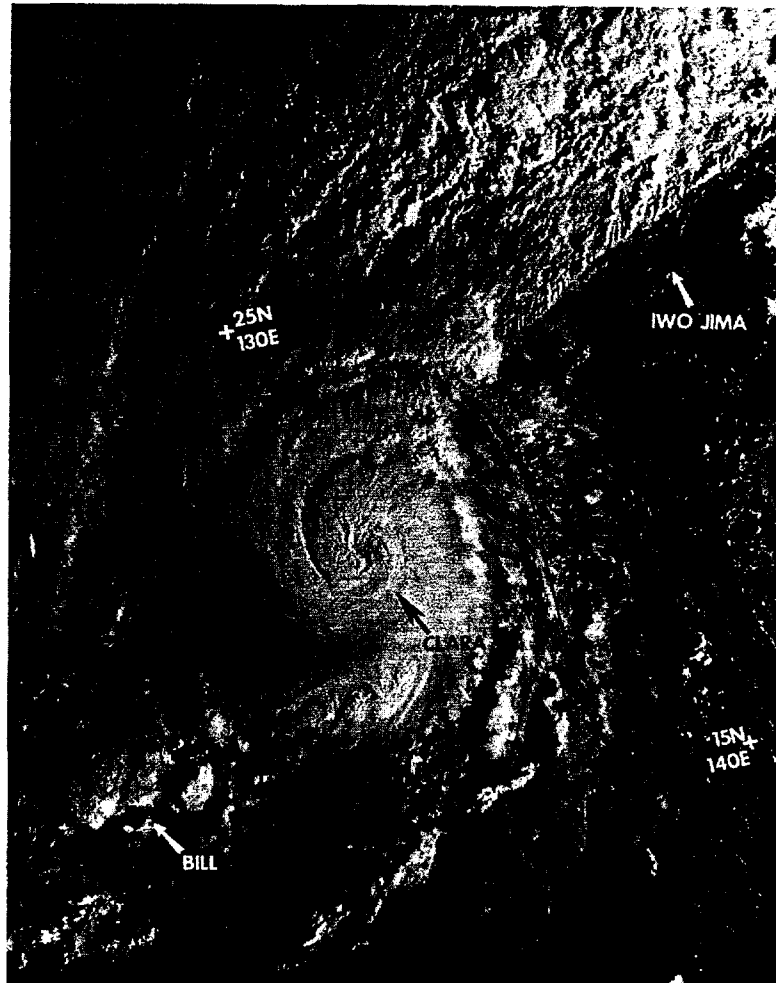


Figure 3-29-2. Typhoon Clara just after completing recurvature and about to begin extratropical transition with the frontal system to the northeast. Even this close to the weakening Super Typhoon Bill, Clara showed little indication of interaction (192234Z November NOAA visual imagery).

As Clara accelerated to the east-northeast, it passed to the north of Iwo-Jima (WMO 47981) which put the island in the dangerous semicircle of the typhoon. Sustained winds of 40 kt (21 m/s) with gusts to 63 kt (32 m/s) were reported during Clara's passage. However, no known damage was sustained on the island.

In summary, Clara was one of the classic typhoons of 1984. Forming at low-latitudes as a very broad disturbance,

Clara slowly consolidated and deepened into a 110 kt (55 m/s) system. Moving rapidly across the western Pacific, Clara recurved and, in textbook fashion, transitioned into an extratropical low while accelerating to the east-northeast. During Clara's entire lifetime, Super Typhoon Bill was active in the same portion of the ocean. Even though they were at times close to each other, Bill had no noticeable effect on Clara's track and only minor influence on Clara's intensity.