

The severity of the storm along the coast is indicated by a loss of 45 lives at sea, and a property damage approximating \$2,000,000, mostly to shipping, shore structures, power and communication lines, and to crops. Unprecedented September rains accompanied the storm along the southern California coast.

*Fog.*—Fog occurrence in September changed but little from that of the preceding month over the eastern part of the northern routes, but lessened materially over the western part. The most frequent open ocean fogs occurred between about latitudes 45° and 50° N., longitudes 150° to 175° W., with about 7 to 10 days with fog reported in each included 5° square. East of 155° W., fog occurred on 1 to 4 days between the 50th parallel and the Gulf of Alaska. Along the immediate American coast, 14 days were reported with fog off Washington; 7 off Oregon; 11 off California; and 3 off Lower California.

#### TYPHOONS AND DEPRESSIONS OVER THE FAR EAST, SEPTEMBER 1939

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[Weather Bureau, Manila, P. I.]

*Depression, September 12-16, 1939.*—A depression, apparently of minor importance, formed about 300 miles south of Guam, moved northwest, then west-northwest and disappeared about 600 miles east-northeast of San Bernardino Strait.

*Typhoon, September 17-19, 1939.*—This disturbance formed over the China Sea somewhere southeast of the Paracel Reefs and seems to have moved in a northwesterly direction toward the southwestern part of Tong King Gulf. It probably was weak in the beginning of its progress and intensified as it approached the continent. Because of the war situation, there were no ship's observations available and its approach to the coast of Indochina, with typhoon intensity, was known only from a special typhoon warning broadcasted from Phulien. It entered Indochina about 150 miles northwest of Tourane.

*Typhoon, September 18-24, 1939.*—Forming as a depression about 250 miles west of Guam, this storm moved west-northwest and northwest to the ocean regions about 600 miles east of Aparri, reaching this position on the morning of September 21, already intensified to typhoon strength. It recurved to the northeast during the forenoon hours of the same day and continued along this

course to the regions east of northern Japan, after moving almost parallel and quite close to the coast line of that country. No trace of the typhoon could be found on September 25.

The upper winds at Guam were from the southwest quadrant beginning September 16, weak at first, and then increasing to values over 50 kilometers per hour (the highest being 64 kilometers per hour, at the morning ascent of September 19). This current began to weaken after September 20. During these days when the depression was forming, southern Philippine stations and Menado, Celebes Island, had winds from the northwest and northeast quadrants mostly, with southwest winds only at isolated levels. The velocities hardly ever reached 40 kilometers per hour and were below 20 kilometers per hour most of the time. At the same time strong southwest and west winds were reported from Thailand, due to the China Sea typhoon of September 17 to 19, mentioned above. The distribution of upper winds, as outlined above, indicates that the air in the southwestern sector of this typhoon (in the Pacific) was attracted toward the center of the disturbance rather than forced toward the center from remote regions.

*Typhoon, September 27-October 1, 1939.*—Pressure was relatively low over the China Sea after September 26, with some indications of circulation. No definite center appeared, however, until September 29, when it seemed certain that there was a depression or typhoon central near Maccles Field Reefs. This disturbance moved west-northwest, intensified, and entered the continent close to and south of Tourane on September 30. Only slight traces of the typhoon could be found on the weather maps of October 1.

The Paracel Island station reported pressure of 750 mm. (999.9 mb.) at 2 p. m. September 29 (Manila time) with east-northeast winds, force 5. Tourane, the afternoon of the following day, had north-northwest winds, force 9, with pressure at 751.8 mm. (1,002.3 mb.).

During the formation and course of this typhoon, Hong Kong had upper winds from the east quadrant, with velocities as high as 85 kilometers per hour (the morning ascent of September 30). Thailand stations had southwest quadrant winds predominating, with velocities often above 50 kilometers per hour, the maximum value being 110 kilometers per hour (from Bandon, morning ascent of September 30).