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edited by Lynn Elsey

The Improbable Typhoon

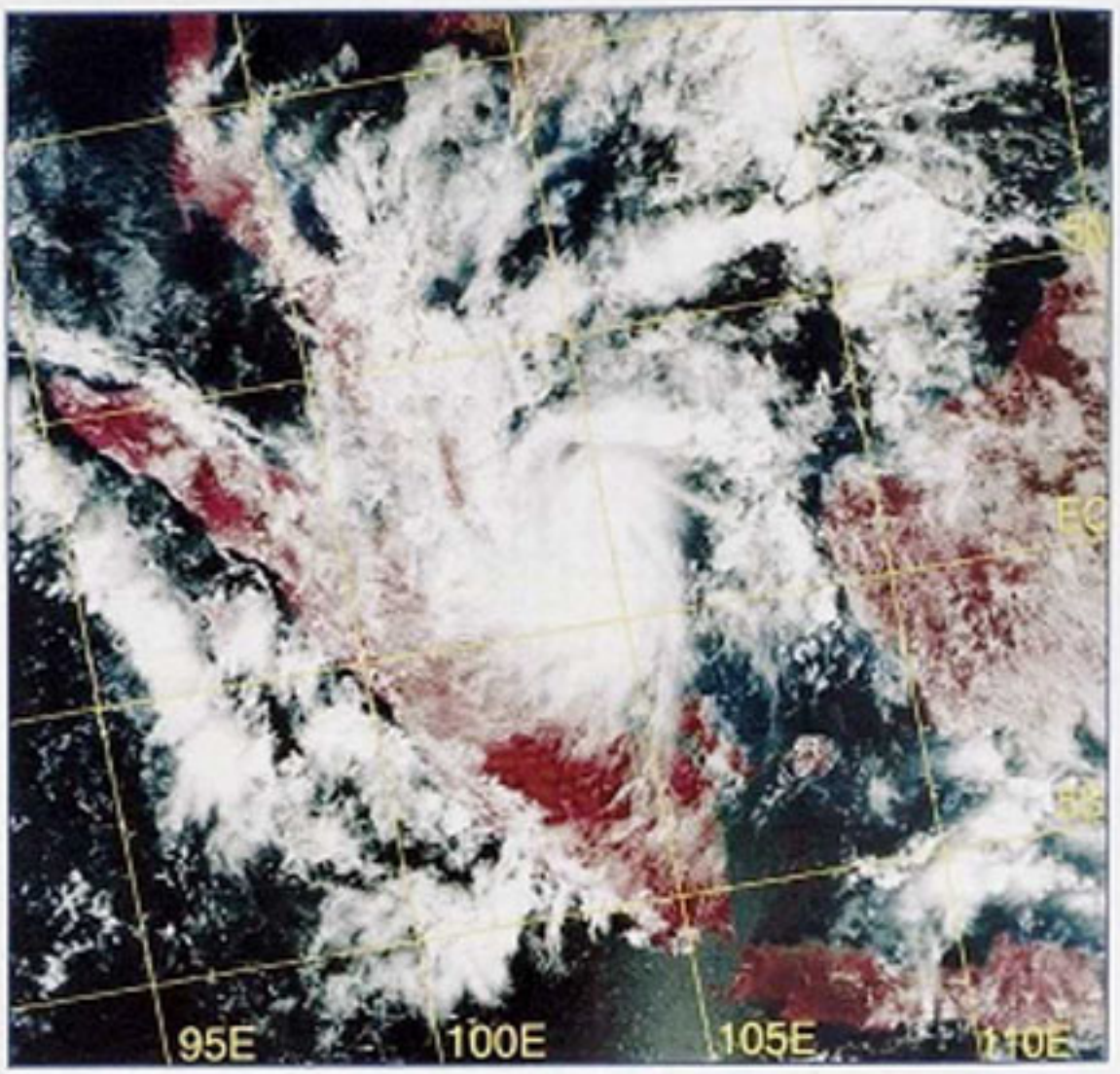
Historical evidence, textbooks, and sailors' lore maintain that typhoons never occur near the equator. Typhoon Varmei proved them all wrong. The unexpected tropical cyclone of December 29, 2001, damaged two U.S. Navy ships in the South China Sea, and caused flooding in the southern Malay Peninsula.

Researchers from the Naval Postgraduate School in Monterey, California, recently confirmed that the tropical storm occurred 150 km north of the equator, the first recorded cyclone within 300 km of the equator.

To better understand this breach of typhoon etiquette, C. P. Chang, a meteorologist at the Naval Postgraduate School, and two visiting meteorologists from Taiwan, C. H. Liu and H. C. Kuo, analyzed detailed wind speed and direction data from NASA's *QuikSCAT* satellite along with data from several weather models. Their results show that not only did Varmei appear in an unusual location, but it had an unusual start.

Typhoons normally get their spin from the Coriolis effect, a result of the Earth's rotation. In the Northern Hemisphere, the result is positive and creates counterclockwise wind rotation. In the Southern Hemisphere, the result is negative, causing a clockwise rotation. At the equator, the Coriolis effect is null and cannot create sufficient spin.

According to Chang, "Typhoon Varmei happened because of two interacting systems, a weak circulation that formed over Borneo and drifted into the southern tip of the South China Sea and remained there, and a strong and persistent northeast wind surge that turned as it crossed the equator and created a large background rotation."



The strong surge of winds coming from the north, captured by NASA's *QuikSCAT* scatterometer, helped create Typhoon Varmei on December 26, 2001.

Improbable but possible: Chang calculates that the odds of such an event occurring are once in every 100 to 400 years.