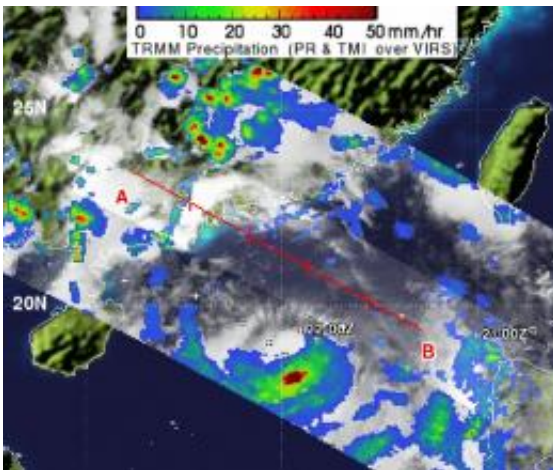


NASA's sighting of hot towers indicated Typhoon Vicente's rapid intensification

July 24 2012



NASA's TRMM satellite captured rainfall data on Typhoon Vicente on July 23, 2012. Vicente had mostly light to moderate rainfall - seen in the yellow, green and blue areas, where rain was falling between 20 and 40 millimeters (.78 to 1.57 inches) per hour. However, some heavy rainfall (falling at 2 inches/50 mm per hour) and hot towering clouds (in red) were seen around the center of circulation. Credit: Credit: SSAI/NASA, Hal Pierce

Rapid intensification of tropical cyclones is still somewhat of a mystery to forecasters, but one marker that NASA scientists confirmed is when "hot towers" appear within a tropical cyclone as they did in Typhoon Vicente before it exploded in strength on July 23. Vicente made landfall in southern China on July 23.

NASA's [Tropical Rainfall](#) Measuring Mission (TRMM) satellite spotted hot towers in Typhoon Vicente, and it rapidly intensified again within six hours on July 23. By the afternoon (Eastern Daylight time) Vicente's winds spun up to 120 knots (138 mph/222 kmh). At that time, Vicente was located about 75 nautical miles (86.3 miles/138.9 km) south of Hong Kong and was headed northwest at 8 knots (9 mph/~14 kmh).

A "hot tower" is a tall cumulonimbus cloud that reaches at least to the top of the troposphere, the lowest layer of the atmosphere. It extends approximately nine miles (14.5 km) high in the tropics. The hot towers in Vicente were over 9.3 miles (15 km) high. These towers are called "hot" because they rise to such altitude due to the large amount of latent heat. Water vapor releases this latent heat as it condenses into liquid. NASA research shows that a tropical cyclone with a hot tower in its eyewall was twice as likely to intensify within six or more hours, than a cyclone that lacked a hot tower. Not only did Vicente intensify, but it was almost explosive intensification where sustained winds went from 70 knots (80.5 mph/129.6 kmh) to 120 knots (138 mph/222 kmh) in six hours.

Vicente made landfall near Macao, China around 2100 UTC (5 p.m. EDT) on July 23, 2012, with maximum sustained winds near 115 knots (132.3 mph/213 kmh). It was about 60 nautical miles (69 miles/111 km) southwest of Hong Kong at landfall, near 21.7 North and 113.3 East. When it made landfall it brought with it very rough seas, where waves were topping 30 feet high (9.1 meters), which likely brought [coastal erosion](#) and low land flooding. According to Reuters news, business across Hong Kong was disrupted from the gale-force winds and heavy rainfall. Flights were delayed and cancelled, schools closed, and CNN reported that 129 people were injured from the storm but there were no fatalities.

On July 24, Vicente was still holding onto typhoon strength, even over

land. At 0300 UTC (11 p.m. EDT/July 23), Typhoon Vicente's [maximum sustained winds](#) were still near 100 knots (115 mph/185 kmh). At that time it had moved inland and was 110 miles (177 km) west of Hong Kong, near 22.3 North and 112.2 East.

By 9 a.m. EDT on July 24, the center of Typhoon Vicente appeared to near Guangxi, with a large area strong bands of thunderstorms extending into the South China Sea, and over Macao and Hunan Island, China. The western-most fringe of Vicente was also reaching northern Vietnam. Vicente continues to move west on radar and northern Vietnam and Laos can expect heavy rainfall today. The Joint [Typhoon](#) Warning Center expects that Vicente will continue moving west and dissipate slowly in [southern China](#).

Beginning this summer and over the next several years, NASA will be sending unmanned aircraft dubbed "severe storm sentinels" above stormy skies to help researchers and forecasters uncover information about hurricane formation and intensity changes. The mission, called Hurricane and Severe Storm Sentinel (HS3) airborne mission will begin in September from Wallops Island, Va. For more information about the mission, visit: www.nasa.gov/HS3

Provided by NASA's Goddard Space Flight Center

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