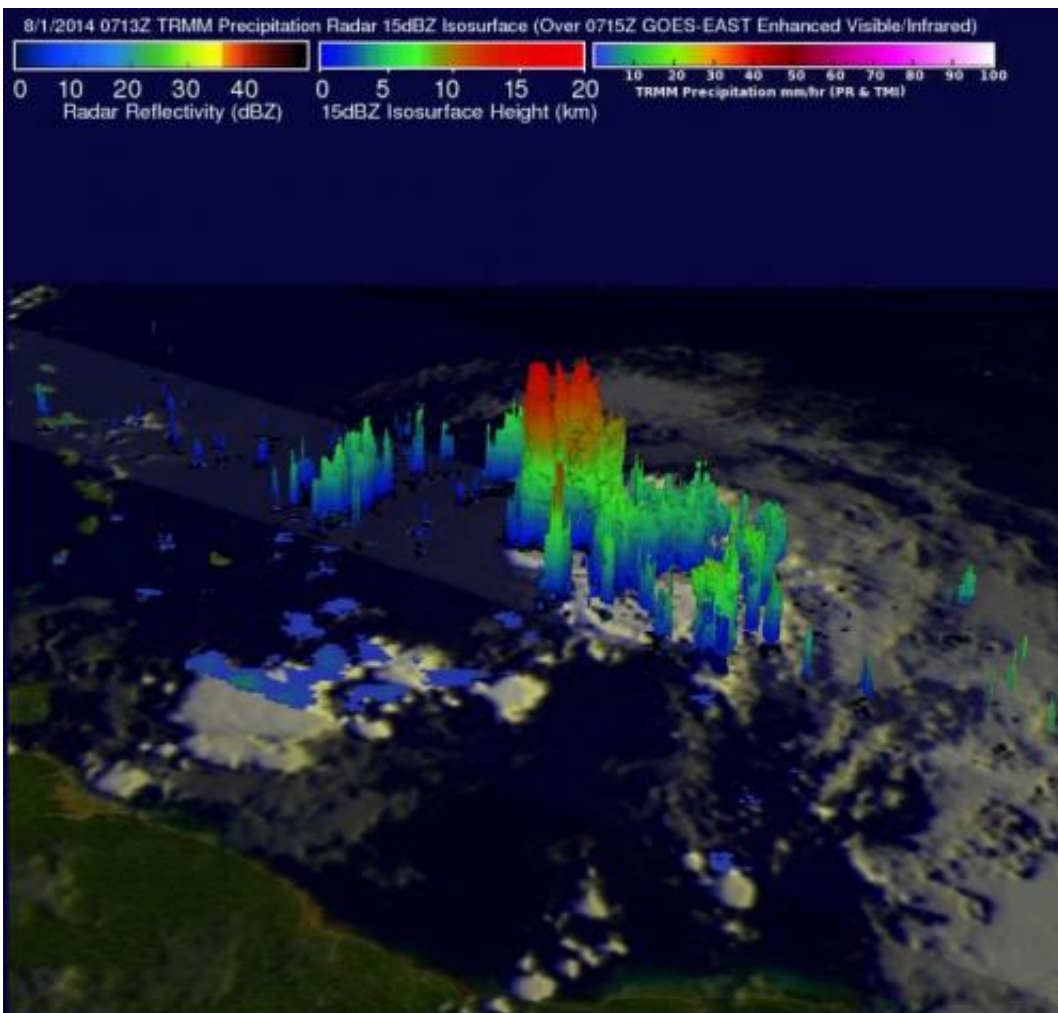


NASA finds heavy rainfall and wind shear in newborn Tropical Storm Bertha

August 1 2014, by Harold F. Pierce



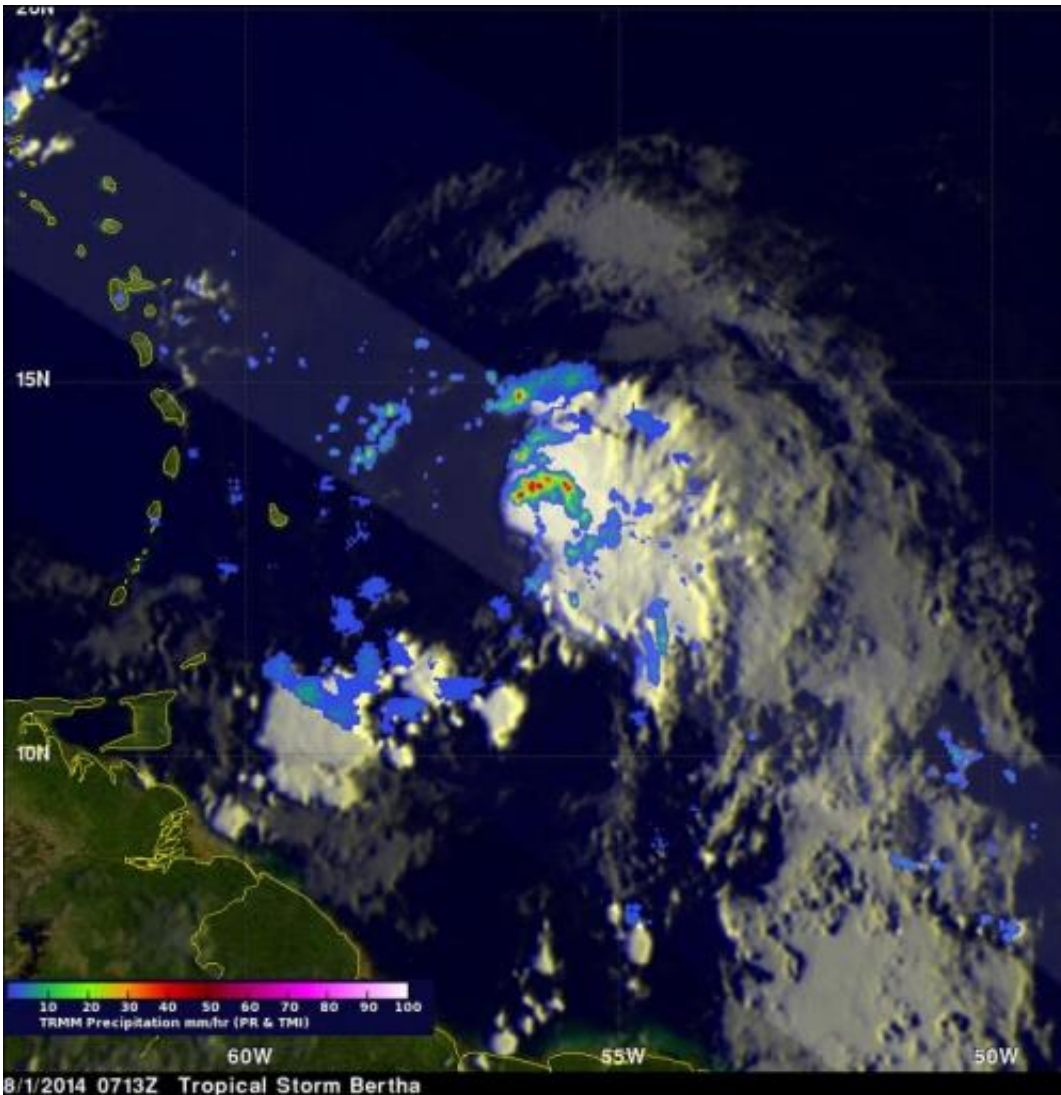
This 3-D view of Tropical Storm Bertha on Aug. 1 was created from TRMM satellite data. It shows (from the south) intense thunderstorms were reaching heights of over 15km (about 9.3 miles). Credit: SSAI/NASA, Hal Pierce

The Tropical Rainfall Measuring Mission satellite known as TRMM found rain was falling heavily in the Atlantic Ocean's second tropical storm of the hurricane season. Bertha was close to the Lesser Antilles, prompting warnings and watches.

The National Hurricane Center (NHC) upgraded a well-defined low pressure center east-southeast of Barbados to Tropical Storm Bertha on July 31, 2014 at 0300 UTC (11 p.m. AST). Bertha's development is inhibited by upper-level shear that may weaken as the [tropical storm](#) moves over the northeastern Caribbean Sea.

Watches and Warnings in effect as of August 1 at 11 a.m. EDT (1500 UTC) include a Tropical Storm Warning for St. Lucia, Dominica, Martinique, Puerto Rico, Vieques, Culebra, the U.S. Virgin Islands and the British Virgin Islands. A Tropical Storm Watch is in effect for the eastern Dominican Republic from Cabo Frances Viejo to Isla Saona.

At 11 a.m. EDT (1500 UTC) the National Hurricane Center noted that the center of Tropical Storm Bertha was located near latitude 14.0 north and longitude 58.9 west, about 70 miles (110 km) southeast of Barbados. It was moving toward the west-northwest near 21 mph (33 kph) and that general motion is expected to continue for the next couple of days. NHC noted that Bertha is expected to move through the central Lesser Antilles during the night (August 1) and approach the Virgin Islands and Puerto Rico on Saturday, August 2. The estimated minimum central pressure is 1008 millibars.



On Aug. 1, rainfall data from TRMM, combined with an infrared image from the GOES-East satellite showed rain was falling at a rate of over 109 mm/4.3 inches (red) per hour northeast of the sheared storm. Credit: SSAI/NASA, Hal Pierce

The TRMM satellite, managed by both NASA and the Japan Aerospace Exploration Agency had an excellent view of tropical storm Bertha on August 1, 2014 at 0713 UTC (3:13 a.m. AST). Rainfall from TRMM's Microwave Imager (TMI) and Precipitation Radar (PR) revealed that rain was falling at a rate of over 109 mm (about 4.3 inches) per hour

northeast of the sheared storm.

The National Hurricane Center noted Bertha is currently experiencing about 15-20 knots of southwesterly vertical wind shear which is pushing the heaviest rainfall northeast of the center. NHC also noted that water vapor imagery showed dry mid-/upper-level air near the storm. The forecast track calls for Bertha to interact with one or two upper-level troughs (elongated areas of low pressure) during the two to three days, which should cause some [vertical wind shear](#) and dry air to continue affecting the storm. Those are two factors that will limit the development and strengthening of the storm.

Radar reflectivity values from TRMM's Precipitation Radar (PR) instrument were used to create a 3-D view of the storm to show the structure of precipitation within Tropical Storm Bertha. The 3-D image showed that intense thunderstorms or "hot towers" were reaching heights of over 15km (about 9.3 miles). This kind of chimney cloud is called a "hot tower" because it releases a huge quantity of latent heat by condensation. The latent heat released in the center of tropical cyclones is usually an indicator of future intensification but vertical shear is expected to be a limiting factor for Bertha.

The NHC expects little change in Bertha's strength over the next two days.

Provided by NASA's Goddard Space Flight Center

Citation: NASA finds heavy rainfall and wind shear in newborn Tropical Storm Bertha (2014, August 1) retrieved 27 April 2024 from <https://phys.org/news/2014-08-nasa-heavy-rainfall-newborn-tropical.html>

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