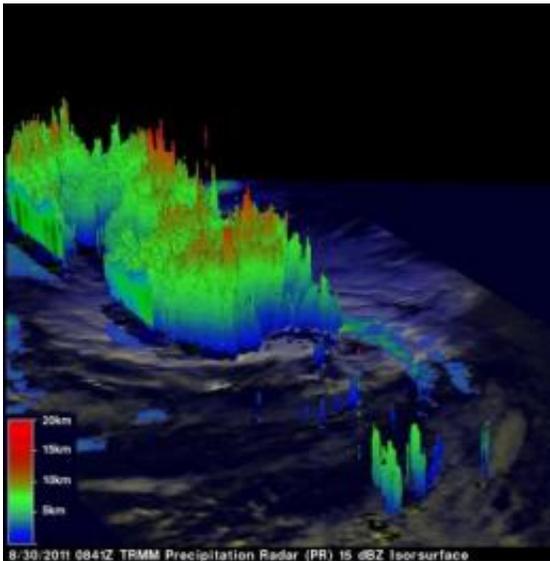


TRMM satellite sees heavy rain, towering clouds in Tropical Storm Katia

August 31 2011



This image from 4:41 am EDT on Aug. 30, 2011 shows a 3D image of the storm looking west courtesy of the TRMM PR. TRMM showed the presence of some deeper convective towers (shown in red), within the storm. Towers closest to the center of the storm (the nearest) reach about 12.5 km, while those in the outer rain band (farthest way) reach up to 15 km. Credit: SSAI/NASA, Hal Pierce

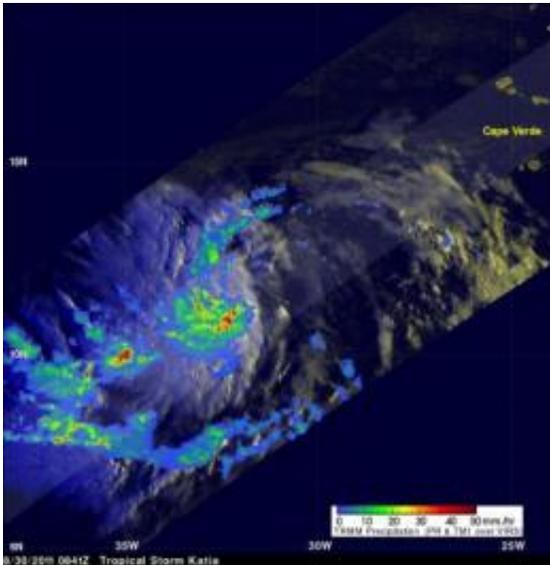
While parts of the East Coast and New England are still recovering from Hurricane Irene, a new storm is brewing in the Atlantic, Tropical Storm Katia. The TRMM satellite looked "under the hood" of the storm and saw heavy rainfall rates and towering clouds providing a clue that she was going to strengthen and may become a hurricane later today.

Katia began as an area of low pressure that had moved away from the coast of Africa south of the [Cape Verde Islands](#) in the central eastern Atlantic. This area of low pressure became the twelfth [tropical depression](#) of the season (TD #12) early on the morning of August 29th about 640 km (~400 miles) south-southwest of the Cape Verde Islands and about 1400 km (~870 miles) off the coast of Africa. Storms forming in this region are known as "Cape Verde" storms. They tend to be larger and stronger than average because of the open ocean and occur most often in August and September during the height of the [hurricane season](#). Irene was a Cape Verde storm.

About a day after forming, TD #12 became a little better organized and was upgraded to a tropical storm and given the name Katia. Katia is new on the rotating list of names for tropical storms and hurricanes; it replaces the name Katrina, which was retired after the 2005 hurricane season.

The [Tropical Rainfall](#) Measuring Mission satellite (or TRMM) flew over TD #12 and captured images early on the morning of August 30th just before it was upgraded to a tropical storm. The images were taken at 8:41 UTC (4:41 a.m. EDT) August 03, 2011 as TD #12 was moving west northwestward away from the Cape Verde Islands and into the central Atlantic.

The first image TRMM captured showed the horizontal pattern of the [rain](#) intensity within the storm. Creating the image was complicated as two products were used to create the image. Rain rates in the center swath are based on the TRMM Precipitation Radar (PR), and those in the outer swath on the [TRMM Microwave Imager](#) (TMI). The rain rates were then overlaid on visible and infrared (IR) data from the TRMM Visible Infrared Scanner (VIRS).



This TRMM image is from 4:41 a.m. EDT, Aug. 30, as TD #12 was moving away from the Cape Verde Islands. TRMM revealed a sizeable area of moderate rain (shown in green) with embedded areas of heavier rain (shown in red). Within this rain there is evidence of banding (curvature), revealing the presence of a cyclonic circulation. Nearly all of the rain is located south and west of the estimated center. Credit: SSAI/NASA, Hal Pierce

TRMM revealed a sizeable area of moderate rain with embedded areas of heavier rain (2 inches/50 mm per hour). Within this rain there was evidence of banding (curvature) that revealed the presence of a cyclonic circulation. However, nearly all of the rain was located south and west of the estimated center. This is due in part to the system not yet being fully developed but also because it was feeling the effects of some northeasterly wind shear.

The second image was taken at the same time and showed a 3-D perspective of the storm. It was created using TRMM's Precipitation Radar. That image revealed some deeper convective hot towers (hot because they release a lot of latent heat), within the storm. Towers closest to the center of the storm (the nearest) reach about 12.5 km 7.7

miles), while those in the outer rain band (farthest way) reach up to 15 km (9.3 miles). These towers are associated with the areas of heavier rain in the previous image and can be a sign of future strengthening when located near the center as they indicate areas within the storm where heat is being released. Shortly after these images were taken, the system became a [tropical storm](#) with sustained winds estimated at 35 knots (~40 mph) by the National Hurricane Center (NHC).

At 11 a.m. EDT on August 31, Katia's maximum sustained winds were 65 mph (100 kmh) and expected to strengthen. She was centered near latitude 14.2 north and longitude 40.8 west, about 1100 miles (1765 km) west of the southernmost Cape Verde Islands. Katia is moving toward the west-northwest near 21 mph (33 kmh) and is expected to slow in the next two days. Estimated minimum central pressure is 994 millibars.

Katia is expected to continue on its current west-northwest track passing north of the Leeward Islands. It is also forecast to become a hurricane and possibly a major hurricane as it encounters warmer waters and reduced wind shear.

Provided by NASA's Goddard Space Flight Center

Citation: TRMM satellite sees heavy rain, towering clouds in Tropical Storm Katia (2011, August 31) retrieved 19 September 2024 from <https://phys.org/news/2011-08-trmm-satellite-heavy-towering-clouds.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--