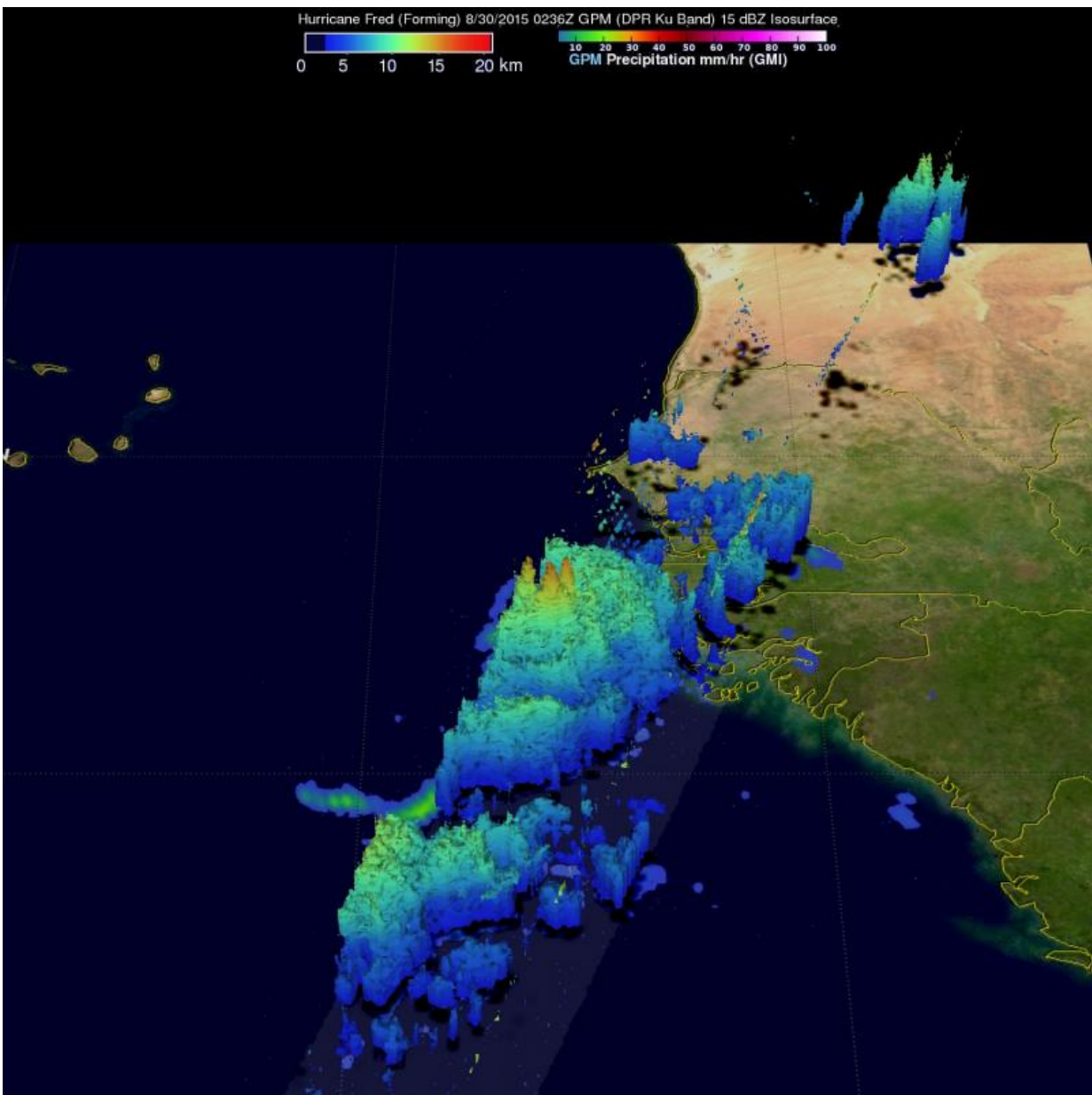


NASA finds 'hot towers' in Fred, now a hurricane

August 31 2015, by Rob Gutro



On Aug. 30 when the GPM satellite examined the developing Fred, it found rain fall occurring at close to 128 mm (5.0 inches) per hour in "hot towers" reaching to 16.2 km (10.0 miles). Credit: NASA/JAXA/SSAI, Hal Pierce

The Global Precipitation Measurement or GPM mission core satellite passed over Fred when it was developing in the Eastern Atlantic early August 30 and saw "hot towers" in the storm, which hinted that the storm was intensifying.

Fred became the first Cape Verdes hurricane of the 2015 Atlantic season when it was upgraded from a tropical storm on August 31, 2015 at 0600 UTC (2 a.m. EDT).

The GPM core observatory satellite flew over on August 30, 2015 at 0236 UTC when Fred was forming from a tropical wave that moved off the African coast. Rainfall was measured by GPM's Dual-Frequency Precipitation Radar (DPR) at the extreme rate of close to 128 mm (5.0 inches) per hour. Rainfall in towering convective thunderstorms at Fred's center of circulation were providing the energy necessary for intensification into a hurricane. Three dimensional reflectivity data from GPM's DPR showed that these "hot towers" had storm top heights reaching to 16.2 km (10.0 miles).

GPM is managed by both NASA and the Japan Aerospace Exploration Agency.

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 9 miles/14.5 km high in the tropics. 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. Those towering thunderstorms have the potential for heavy rain.

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.

Early on August 31, Fred was lashing the Cape Verde Islands in the Eastern Atlantic Ocean. The National Hurricane Center noted hurricane conditions were occurring over portions of the easternmost Cape Verde Islands and are expected to spread northwestward over portions of the northern and northwestern Cape Verde Islands later today. Additionally, storm surge is expected to bring coastal flooding.

The rainfall that GPM saw on August 30 is expected to impact the [islands](#) today, August 31. Fred is expected to produce total rain accumulations of 4 to 6 inches over the Cape Verde Islands, with possible isolated maximum amounts of 10 inches.

At 8 a.m. EDT (1200 UTC), the center of Hurricane Fred was located near latitude 16.1 North, longitude 23.5 West. Fred is moving toward the northwest near 12 mph (19 km/h) and this general motion is expected to continue through Tuesday, September 1, according to NHC. On the forecast track, the center of Fred is expected to pass near or over the northwestern Cape Verde Islands later today, August 31. The estimated minimum central pressure is 989 millibars.

Maximum sustained winds were near 80 mph (130 kph) and by Tuesday, September 1, gradually weakening is forecast to begin. For forecast updates, visit the NHC: <http://www.nhc.noaa.gov>

Provided by NASA's Goddard Space Flight Center

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