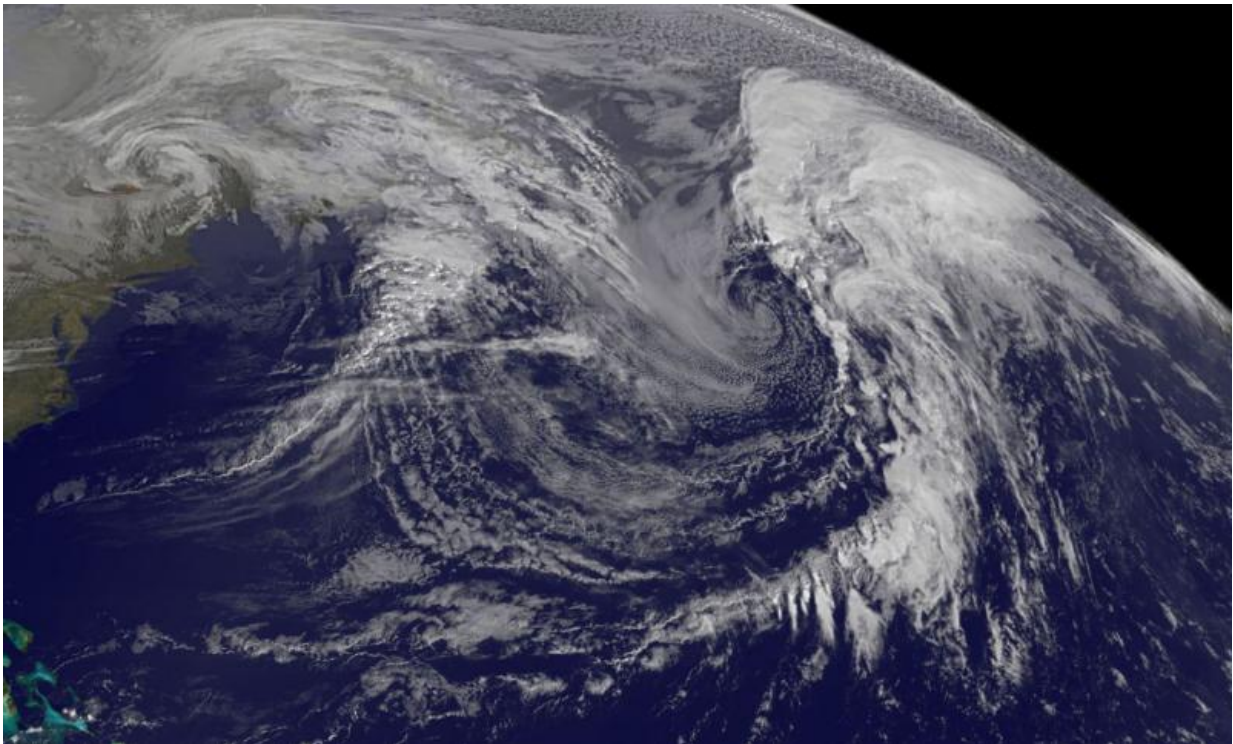


Former Tropical Cyclone Kate examined by GPM, RapidScat and GOES-East

November 13 2015, by Harold F. Pierce



On Nov. 13 at 1145 UTC (7:45 a.m. EST), the NOAA's GOES-East satellite saw the low pressure system formerly known as extra-tropical storm Kate was in the Northern Atlantic Ocean, far to the south of Greenland. Credit: NASA/NOAA GOES Project

NASA and NOAA recently got three different views of former tropical cyclone Kate from space. The Global Precipitation Measurement

mission or GPM core satellite saw heavy rainfall as Kate was transitioning into an extra-tropical cyclone on Nov. 11. The next day, NASA's RapidScat saw the system's tropical-storm force winds, and on Nov. 13, NOAA's GOES-East satellite spotted the former tropical storm in the Northern Atlantic.

Kate became the twelfth named tropical cyclone of the of the 2015 Atlantic hurricane season when it formed near the southeastern Bahamas on Sunday November 8, 2015. Kate re-curved toward the northeast and moved harmlessly over the open waters of the Atlantic. Kate's intensity peaked on November 11, 2015 with winds of about 65 knots making it a category one hurricane on the Saffir-Simpson Hurricane.

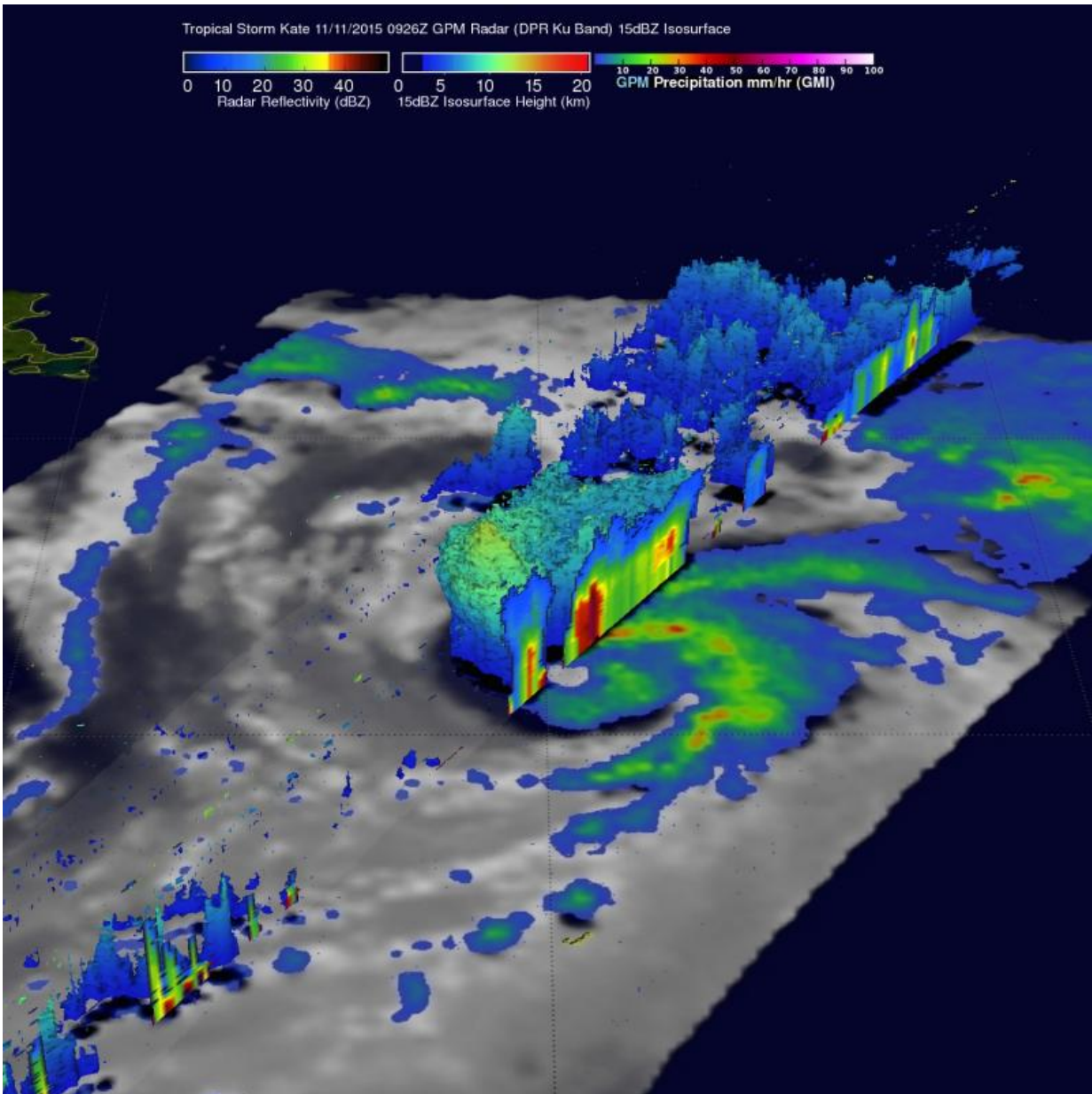
The GPM core observatory satellite flew above Kate on November 11, 2015 at 0926 UTC (4:26 a.m. EST) capturing data. Kate's maximum sustained winds were estimated at about 60 knots (69 mph) at that time making it a strong [tropical storm](#). GPM's Dual-Frequency Precipitation Radar (DPR) sliced through Kate's western side and found that intense storms within feeder bands there were dropping rain at a rate of over 80 mm (3.1 inches) per hour. A 3-D cross section by GPM's Radar (DPR Ku Band) through Kate's weak eye showed intense storms swirling around the northern side of the tropical cyclone. GPM is managed by both NASA and the Japan Aerospace Exploration Agency.

Kate merged with a baroclinic zone over the north Atlantic and became an extra-tropical cyclone on November 12, 2015. A baroclinic zone is a region in which a temperature gradient exists on a constant pressure surface. Baroclinic zones are favored areas for strengthening and weakening system.

On Nov. 12, the RapidScat instrument that flies aboard the International Space Station measured the surface winds associated with the low pressure area. RapidScat showed that strongest winds were in the

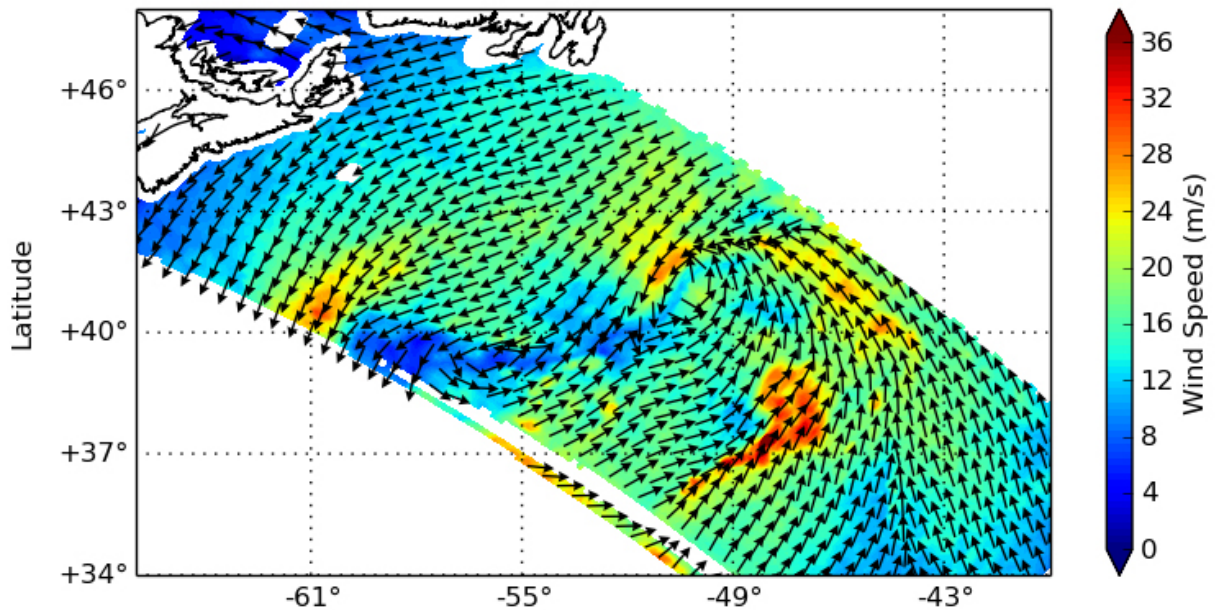
northwestern and southeastern quadrants near 32 meters per second (71.5 mph/115.2 kph). Winds around the southwestern quadrant were weakest, while the northeastern side of the storm averaged wind speeds around 20 meters per second (44.7 mph/72 kph).

On Nov. 13 at 1145 UTC (7:45 a.m. EST), the NOAA's GOES-East satellite saw the low pressure system formerly known as extra-tropical storm Kate was in the Northern Atlantic Ocean, far to the south of Greenland. An image of the storm was created by the NASA/NOAA GOES Project at NASA's Goddard Space Flight Center in Greenbelt, Maryland. The image showed the low pressure center near 41 degrees north latitude and 47 degrees west longitude, and clouds associated with the cold front stretched south and west of the center toward the Bahamas. The low pressure center and associated cold front continued tracking to the east, across the Atlantic.



On Nov. 11, GPM found that intense storms within feeder bands there were dropping rain at a rate of over 80 mm (3.1 inches) per hour. A 3-D cross section by GPM's Radar (DPR Ku Band) through Kate's weak eye shows intense storms swirling around the northern side of the tropical cyclone. Credit: NASA/JAXA/SSAI, Hal Pierce

RapidScat subset from 2015-11-12 12:31:00Z to 2015-11-12 14:04:00Z



On Nov. 12, RapidScat showed that strongest winds in former tropical storm Kate were in the northwestern and southeastern quadrants near 32 meters per second (71.5 mph/115.2 kph). Credit: NASA JPL, Doug Tyler

Provided by NASA's Goddard Space Flight Center

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