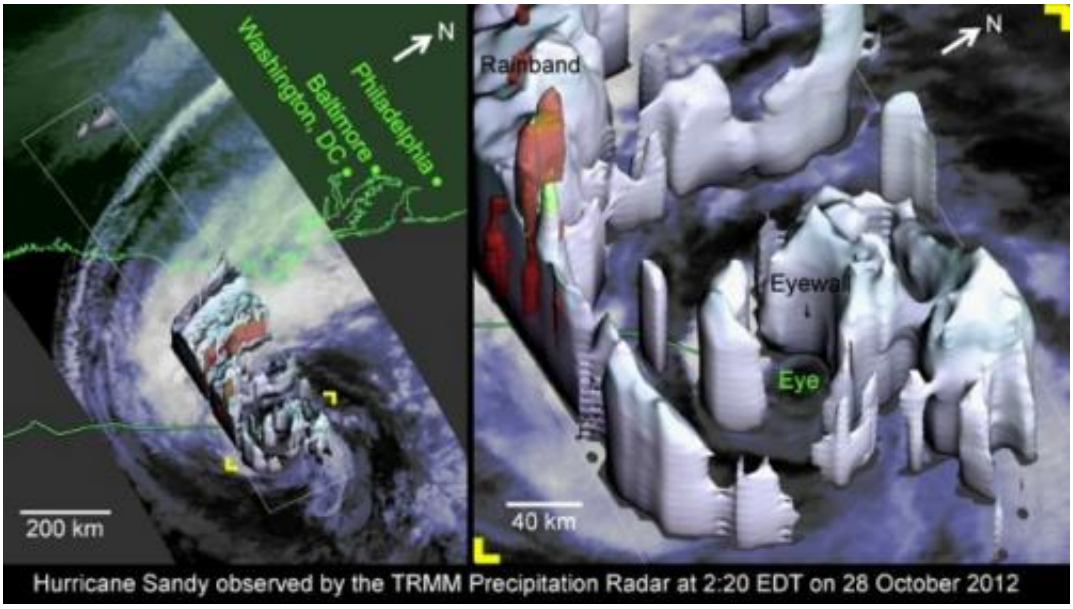
NASA's TRMM Satellite Analyzes Hurricane Sandy in 3-D

October 30 2012



Hurricane Sandy observed by the TRMM Precipitation Radar at 2:20 EDT on 28 October 2012

NASA's Tropical Rainfall Measuring Mission, or TRMM satellite can measure rainfall rates and cloud heights in tropical cyclones, and was used to create an image to look into Hurricane Sandy on Oct. 28, 2012. Owen Kelly of NASA's Goddard Space Flight Center in Greenbelt, Md. created this image of Hurricane Sandy using TRMM data.

At 2:20 p.m. EDT on Sunday, Oct. 28, Hurricane Sandy was a marginal category 1 hurricane and its eyewall is modest, as TRMM reveals, which

gives forecasters and scientists hints about its possible future strength.

The eyewall appeared somewhat compact with its 40 km (24.8 miles) diameter. The eyewall contained only relatively light precipitation, and none of Sandy's eyewall storm cells managed to burst through, or even reach, the tropopause which has about a 10 km (6.2 miles) height at mid-latitudes. Evidence of the weak updrafts in the eyewall comes from the fact that the TRMM radar's reflectivity stayed under 40 dBZ, a commonly cited signal strength at which updrafts can be vigorous enough to form hail and to lift smaller ice particles up through the tropopause and into the stratosphere.

But placed in context, the TRMM-observed properties of Hurricane Sandy's eyewall are evidence of remarkable vigor. Most hurricanes only have well-formed and compact eyewalls at category 3 strength or higher. Sandy was not only barely a category 1 hurricane, but Sandy was also experiencing strong wind shear, Sandy was going over ocean typically too cold to form hurricanes, and Sandy had been limping along as a marginal hurricane for several days.

Kelley said, "With infrared satellite observations used in imagery one can speculate about what the sort of convective (rising air that form the thunderstorms that make up a tropical cyclone) storms are developing under the hurricane's cloud tops, but Sandy was sneaking up the East Coast too far out at sea for land-based radars to provide definitive observations of the rain regions inside of the hurricane's clouds." The radar on the TRMM satellite could provide this missing information during this overflight of Hurricane Sandy.

The TRMM satellite also showed that the super-sized rainband that extended to the west and north of the center did contain vigorous storm cells, as indicated by the red regions of radar reflectivity in excess of 40 dBZ. This rainband is expected to lash the coast well before the

hurricane's center make landfall. Even further west, at the upper left corner of the image, one can see two small storm cells. These storm cells are the southern-most tip of the independent weather system that is coming across the United States and that is expected to merge and possibly reinvigorate the remnants of Hurricane Sandy after Sandy makes landfall.

On Oct. 29 at 5 a.m. EDT the National Hurricane Center noted that the center of Hurricane Sandy was located near latitude 35.9 north and longitude 70.5 west. This was about 410 miles east southeast of Washington, D.C. Sandy was moving north at 15 mph and its winds had increased since Oct. 28. Maximum sustained winds are now near 85 mph. Tropical Storm force winds extend almost 500 miles from the center.

At 8 a.m. EDT on Oct. 29, the National Hurricane Center reported tropical-storm-force winds were occurring along the coasts of southern New Jersey Delaware and eastern Virginia and extend as far inland as the central and southern Chesapeake Bay.

Sandy is forecast to make landfall along the southern new jersey coast tonight. However sandy will severely impact the region well before it comes ashore.

Provided by NASA