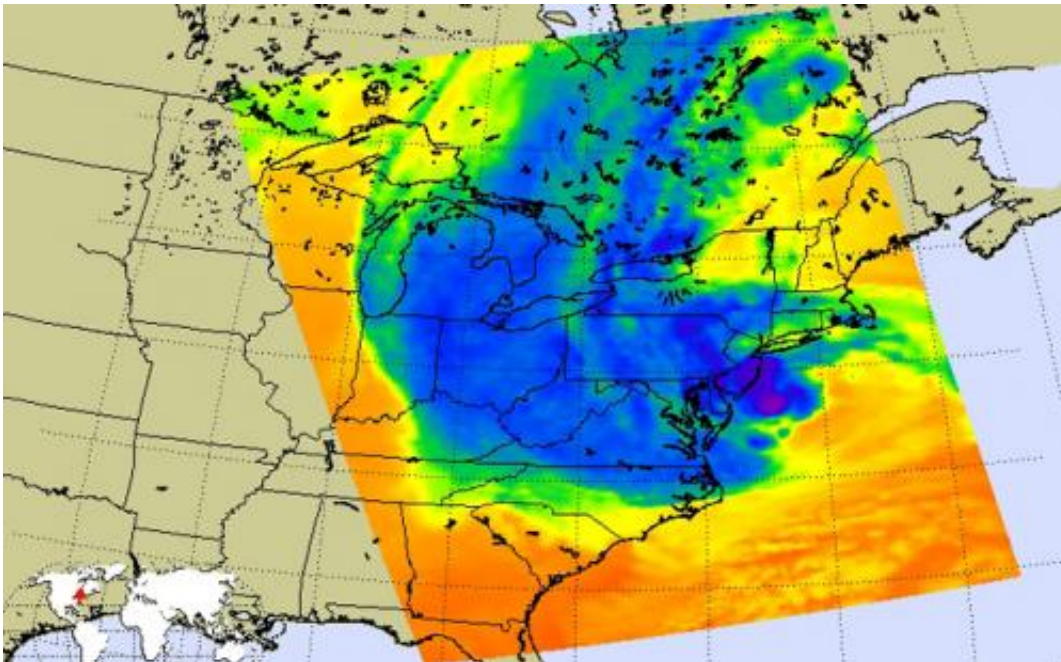


NASA Examines Hurricane Sandy as it Affects the Eastern U.S.

October 30 2012



NASA's Atmospheric Infrared Sounder (AIRS) instrument on NASA's Aqua spacecraft captured this infrared image of Hurricane Sandy, another weather front to the west and cold air coming down from Canada at 2:17 p.m. EDT Oct. 29. The hurricane center is the darkest purple area in the Atlantic just to the east of the New Jersey coast, reflecting Sandy's areas of heaviest rainfall. Image credit: NASA/JPL-Caltech

On Monday, Oct. 29, Hurricane Sandy was ravaging the Mid-Atlantic with heavy rains and tropical storm force winds as it closed in for landfall. Earlier, NASA's CloudSat satellite passed over Hurricane Sandy

and its radar dissected the storm get a profile or sideways look at the storm. NASA's Aqua satellite provided an infrared view of the cloud tops and NOAA's GOES-13 satellite showed the extent of the storm. The National Hurricane Center reported at 11 a.m. EDT on Oct. 29 that Hurricane Sandy is "expected to bring life-threatening storm surge and coastal hurricane winds plus heavy Appalachian snows."

To understand the structure, extent and behavior of Sandy, NASA's CloudSat passed over Sandy at 1832 UTC (10:32 a.m. EDT) on Saturday, Oct. 27, 2012, when the storm was about 335.5 miles (540 km) southeast of Charleston, S.C. CloudSat data was used to create a profile image of Hurricane Sandy by Shigeru Suzuki at NASA's Jet Propulsion Laboratory, Pasadena, Calif.

At the time of the image Sandy's maximum sustained winds were near 75 mph and Sandy had a minimum pressure of 961 millibars making the storm a Category 1 hurricane. Hurricane Sandy was moving slowly to the northeast at 11 mph almost parallel to the southeast United States coast and directly traversing the Gulf Stream.

CloudSat passed over Sandy just west of the hurricane's inner core. Light to moderate precipitation associated with parts of the outer bands of Hurricane Sandy were moving on shore into parts of North Carolina where CloudSat intersected the system. CloudSat showed heavier showers and thunderstorms further south and east of the Atlantic coastline over the open water.

"The CloudSat signal tends to attenuate or dampen in these areas of heavier convection when rain drops become larger than 3 mm (0.11 inch) in diameter," said Natalie Tourville, a researcher who works with CloudSat data at the Cooperative Institute for Research in the Atmosphere at Colorado State University, Fort Collins, Colo. "The cloud shield associated with Hurricane Sandy extended well over 1,000 km

from the storm center covering parts of eastern Kentucky and Tennessee and Virginia and West Virginia with mid and high level cloudiness areas of cirrus and altocumulus," she said.

Sandy Pounding the Mid-Atlantic on Oct. 29

On Oct. 29 at 1 a.m. EDT the National Hurricane Center (NHC) noted that the center of Hurricane Sandy was located near latitude 37.5 north and longitude 71.5 west. This was about 260 miles (415 km) south-southeast of New York City, and 205 miles (330 km) southeast of Atlantic City, N.J. Sandy was moving north-northwest at 18 mph. Maximum sustained winds have increased to 90 mph (140 kph).

According to the National Hurricane Center, hurricane-force winds extend outward up to 175 miles (280 km) from the center and tropical-storm-force winds extend outward up to 485 miles (780 km). Sustained tropical-storm-force winds are occurring along the coasts of southern New Jersey, Delaware, and eastern Virginia, and extend as far inland as the central and southern Chesapeake Bay.

The minimum central pressure estimated from hurricane hunter Aircraft data is 943 millibars, which dropped from 946 millibars at 8 a.m. EDT. A drop in atmospheric pressure indicates intensification.

NHC noted that surge-related flooding depends on the relative timing of the surge and the tidal cycle and can vary greatly over short distances. Because of Sandy's large wind field, elevated water levels could span multiple tide cycles resulting in repeated and extended periods of coastal and bayside flooding. Dangerous surf conditions will continue from Florida through New England for the next couple of days.

NOAA's GOES-13 Satellite Shows Sandy's Extent

[NOAA](#)'s GOES-13 satellite captured a visible image of Hurricane Sandy battering the U.S. East coast on Monday, Oct. 29 at 9:10 a.m. EDT that showed the immense extent of the storm. The image was created by the NASA GOES Project at NASA's Goddard Space Flight Center, Greenbelt, Md. Tropical Storm force winds extend almost 500 miles from the center making it almost 1,000 miles in diameter.

Other watches and warnings for gale, storm and high winds are in force to the north of the tropical storm warning area and issued by the National Weather Service. Hurricane local statements have also been issued for those areas under tropical storm warning.

NASA's Aqua Satellite Infrared Data Shows Sandy's Strength

Infrared satellite imagery provides temperature data to forecasters that identify the cloud heights and strength of different parts of a storm. Basically, the higher the cloud top is, the colder the temperature, and the stronger the storm. Strongest storms have the potential for the heaviest rainfall rates.

To measure those cloud top temperatures, NASA uses the Atmospheric Infrared Sounder (AIRS) instrument aboard NASA's Aqua satellite. The AIRS instrument captured infrared imagery of Hurricane Sandy on Monday, Oct. 29 at 0711 UTC (3:11 a.m. EDT) that showed some strong thunderstorms and the extent of Sandy's reach from the Carolinas into the Ohio Valley and eastern Canada. The thunderstorms in the purple areas were reaching high into the troposphere where cloud top temperatures are as cold as -63 Fahrenheit (-52 Celsius).

Winds from Hurricane Sandy

At 11 a.m. EDT on Oct. 29, the National Hurricane Center said that Hurricane-force winds are expected along the U.S. East Coast between Chincoteague, Va. and Chatham, Mass. This includes the Tidal Potomac from Cobb Island to Smith Point, the middle and upper Chesapeake Bay, Delaware Bay and the coasts of the northern Delmarva Peninsula, New Jersey, the New York City area, Long Island, Connecticut and Rhode Island.

Tropical-storm-force winds are expected north of Chatham to Merrimack River Mass., the lower Chesapeake Bay and south of Chincoteague, Va. to Duck, N.C., the northern endpoint of the [Tropical Storm](#) Warning.

Rain and Snow Expected from Sandy

Hurricane Sandy is expected to bring heavy rainfall to the Mid-Atlantic and northeastern U.S., and snowfall to the mountain areas.

The National Hurricane Center bulletin on Oct. 29 at 8 a.m. EDT, noted that rainfall totals of 3 to 6 inches are expected over far northeastern N.C. with isolated maximum totals of 8 inches possible. Rainfall amounts of 4 to 8 inches are expected over portions of the Mid-Atlantic States, including the Delmarva Peninsula with isolated maximum amounts of 12 inches possible. Rainfall amounts of 1 to 3 inches with isolated maximum amounts of 5 inches are possible from the southern tier of New York state northeastward through New England.

Snowfall is another expectation from Sandy as Arctic air sits to the west. Blizzard warnings are posted from western Maryland to southwestern Virginia today. Snow accumulations of 2 to 3 feet are expected in the mountains of W.Va. with locally higher totals today through Wed., Oct. 31. Between 1 to 2 feet of snow is expected in the mountains of southwestern Va. to the Ky. Border with 12 to 18 inches of snow in the

mountains near the N.C. and Tenn. border and in the mountains of Western Md.

Provided by NASA

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