

Hurricane Sandy

A model for 3D printing

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3D-printed model of Hurricane Sandy in white PLA. As oriented here, north is at top.

Hurricane Sandy (2012), nicknamed Superstorm Sandy, became the second-costliest hurricane in U.S. history, with damages exceeding \$50 billion unadjusted for inflation, an amount surpassed only by Hurricane Katrina in 2005. The storm underwent an unusual transition when it merged with an intense low pressure system, which led to a dramatic increase in size before Sandy made its final landfall in New Jersey late on Oct. 29. Winds of tropical storm force extended from Maine to North Carolina,

making Sandy one of the largest Atlantic tropical storms ever recorded.¹

This model shows Sandy at 1:45 p.m. EDT (1745 UTC) on Oct. 28, about 30 hours before landfall, during a brief period of improved organization. The storm managed to regain hurricane status (Category 1 on the Saffir-Simpson Scale) with maximum sustained winds of 75 mph (120 km/h), and even began to look more like a tropical cyclone in satellite images by developing a central eye-like feature. The storm's center was located at 32.8° N and 71.9° W, or about 270 miles (440 km) southeast of Cape Hatteras, North Carolina.²

The model was developed by processing visible and thermal infrared images acquired by NOAA's GOES 13 satellite.³ As Sandy neared the Atlantic coast on Oct. 29, NASA's Cloudsat satellite overflew the storm, probed its vertical structure with radar, and showed that the maximum height of its cloud tops reached about 12.5 km.⁴ This number was used to establish the highest point of the model, where the storm's vertical scale is exaggerated by 10 times.

Two model files are provided, at different sizes and levels of detail, along with the blended visible/infrared satellite image used to create them and printer settings used to make the print shown above. Further details are provided below.

File	Description
Readme_Sandy.pdf	This file
Sandy.stl	Main model: 195 mm (7.7 in.) per side; scale is 1 mm = 12.06 km (7.49 mi.)
Sandy_small.stl	Half-size model: 97.5 mm (3.8 in.) per side; scale is 1 mm = 24.1 km (15 mi.)
Sandy_Vis_x_IR.jpg	Blended GOES 13 visible and infrared image, source for the model
ZYYX_PLA_process.fff	For ZYYX printers, this XML profile can be imported directly into the Simplify3D printing software. Those with other printer types may find it helpful to review these process settings in a text editor.

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Notes

1. [Service assessment: Hurricane/post-tropical cyclone Sandy, October 22-29, 2012](#). U.S. National Oceanic and Atmospheric Administration's National Weather Service. May 2013.

2. Stewart, S. (Oct. 28, 2012) [Hurricane Sandy intermediate advisory number 25a](#). National Hurricane Center.
3. Reddy, F. (April 30, 2015) *3D printing with CLASS: Making models for education and outreach using satellite weather imagery*. Poster presented at the 2015 NOAA Satellite Conference, Greenbelt, MD.
4. [Cloudsat: Hurricane Sandy](#). (Oct. 29, 2012) Colorado State University.