

Satellite movie shows US tornado outbreak from space

April 28 2014



This NOAA GOES-East satellite image from Monday, Apr. 28, 2014 at 13:01 UTC/9:01 a.m. EDT shows the same storm system that generated the severe weather outbreak yesterday, has moved to the east. Credit: NASA/NOAA GOES Project

NASA has just released an animation of visible and infrared satellite data from NOAA's GOES-East satellite that shows the development and

movement of the weather system that spawned tornadoes affecting seven central and southern U.S. states on April 27-28, 2014. NASA's Aqua satellite captured infrared data on the system that revealed powerful storms, high into the troposphere.

This storm system generated reports of tornadoes from Nebraska, Kansas, Iowa, Oklahoma, Arkansas, Louisiana, and Mississippi.

Coupled with local weather observations, soundings, and computer models, data from satellites like NOAA's Geostationary Operational Environmental Satellite or GOES-East (also known as GOES-13) gives forecasters information about developing weather situations. In real-time, the NOAA's GOES-East [satellite](#) data in animated form showed forecasters how the area of severe weather was developing and moving.

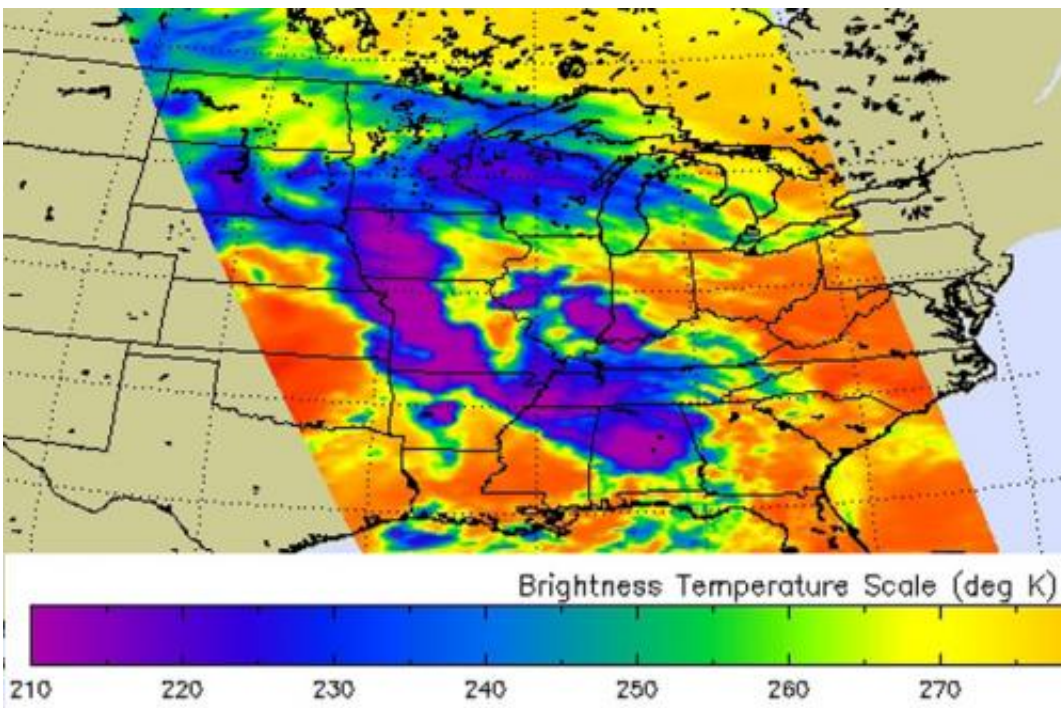
NOAA's GOES-East satellite sits in a fixed orbit in space capturing visible and [infrared imagery](#) of weather over the eastern U.S. and Atlantic Ocean. The GOES-East satellite is operated by the National Oceanic and Atmospheric Administration. NASA/NOAA's GOES Project at the NASA Goddard Space Flight Center in Greenbelt, Md. created the animation of GOES-East satellite data that covered the period during the tornado outbreak.

The GOES-East animation of visible and infrared imagery runs 31 seconds. The animation begins on April 27 at 00:15 UTC (April 26 at 8:15 p.m. EDT) and runs through April 28 at 14:15 UTC/10:15 a.m. EDT. By 14:45 UTC/10:45 a.m. EDT on April 27 the animation shows the squall line of thunderstorms developing.

To create the video and imagery, NASA/NOAA's GOES Project takes the cloud data from NOAA's GOES-East satellite and overlays it on a true-color image of land and ocean created by data from the Moderate Resolution Imaging Spectroradiometer (MODIS) instrument that flies

aboard NASA's Aqua and Terra satellites. Together, those data created the entire picture of the storm system and show its movement.

A NASA satellite also captured an image of the storm, collecting [infrared data](#) on it as it passed overhead on April 27. At NASA's Jet Propulsion Laboratory (JPL) in Pasadena, Calif. a false-colored image was created of the storm system using data gathered by the Atmospheric Infrared Sounder (AIRS) instrument that flies aboard NASA's Aqua satellite on April 27 at 18:59 UTC (1:59 p.m. CDT). The AIRS image showed very cold cloud top temperatures indicating that the thunderstorms had strong uplift that pushed cloud tops to the top of the troposphere. Some of those thunderstorms had cloud tops as cold as 200 kelvin (-99.6 F/-73.1C). Temperatures drop to just under 220 degrees kelvin at the top of the troposphere (and where the tropopause begins).

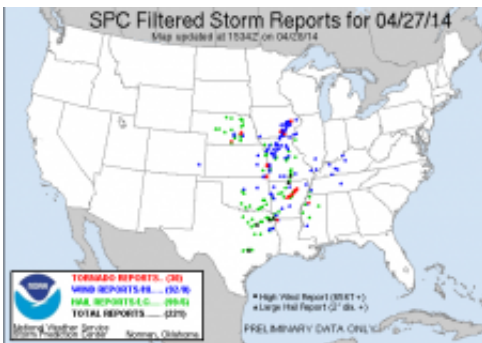


This false-colored infrared image from the AIRS instrument aboard NASA's Aqua satellite shows the cold cloud top temperatures associated with the severe thunderstorms that brought severe weather to seven states on Apr. 27. Credit:

NASA/JPL, Ed Olsen

"AIRS data shows spatial extent of strong convection [rapidly rising air that condenses and forms clouds] in the slow-moving severe storm system that spawned tornadoes in Arkansas, Oklahoma and Iowa," said Ed Olsen, creator of the AIRS image at NASA JPL. The AIRS image showed the thunderstorms with coldest cloud top temperatures stretched from eastern Nebraska, through western Iowa, western Missouri, northern Arkansas and southeast into northern Mississippi and Alabama.

According to the Examiner.com, the National Weather Service's Storm Prediction Center counted 31 tornadoes on Sunday, April 27, however, that number is being refined as reports are analyzed.



This image from NOAA's Storm Prediction Center shows preliminary reports of the severe weather outbreak from April 27, 2014. Credit: NOAA/SPC

CBS News reported that one tornado touched down 10 miles west of Little Rock, Arkansas around 7 p.m. CDT (at around 22:02 UTC in the GOES animation) and stayed on the ground for about 80 miles passing near several suburbs north of the city. That tornado was reported to be

one-half mile wide.

The same system that spawned these tornadoes is expected to bring the possibility for severe weather further east on April 28 from Cincinnati, Ohio to New Orleans, La. For more information about current risks for severe weather, visit NOAA's Storm Prediction Center at:

<http://www.spc.noaa.gov>.

GOES satellites provide the kind of continuous monitoring necessary for intensive data analysis. Geostationary describes an orbit in which a satellite is always in the same position with respect to the rotating Earth. This allows GOES to hover continuously over one position on Earth's surface, appearing stationary. As a result, GOES provide a constant vigil for the atmospheric "triggers" for [severe weather](#) conditions such as tornadoes, flash floods, hail storms and hurricanes.

Provided by NASA's Goddard Space Flight Center

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