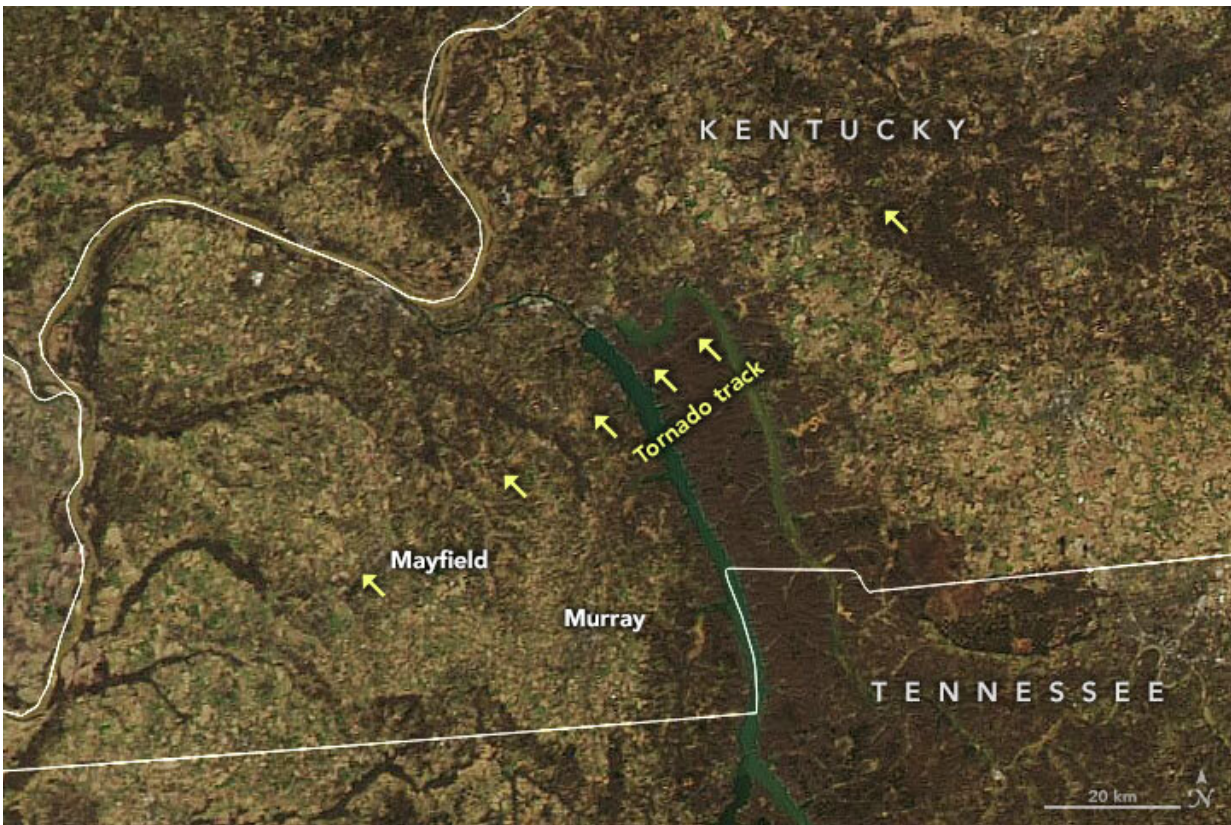


Satellite data used to assess tornado damage, understand storms

December 20 2021



The path of the December tornado that tore through Kentucky can be seen from the MODIS instrument on NASA's Aqua satellite. Credit: NASA Earth Observatory/Joshua Stevens, Michael Carlowicz

As people across the Midwestern U.S. take stock of the devastation from

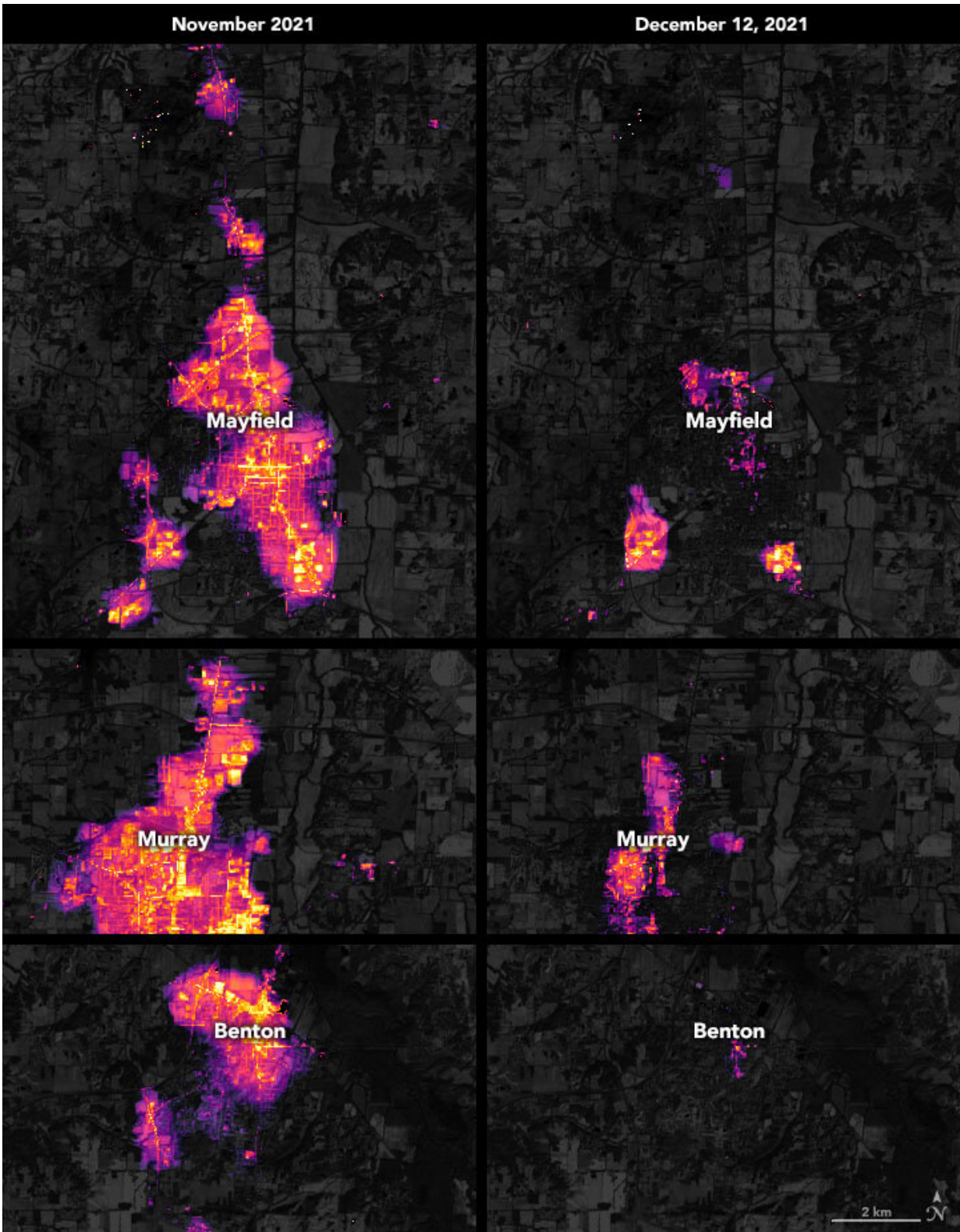
a Dec. 10 trail of tornados that blew across the region, data and images from NASA Earth-observing satellites aid first responders and recovery agencies in assessing the damage and help researchers understand the nature of these unusually powerful storms.

One natural-color image shows the tornado track [across western Kentucky](#), which suffered some of the worst damage. The image was captured Dec. 12 by the Moderate Resolution Imaging Spectroradiometer on NASA's Aqua satellite. Researchers also are using satellite [data](#) to study the supercell thunderstorms that spawned these tornados.

The scale of power outages in the region is also evident from images as seen here, [comparing lights seen from space before and after the storm](#).

Scientists from the Universities Space Research Association (USRA) and NASA's Goddard Space Flight Center (GSFC) in Greenbelt, Maryland, processed night lights data from the Visible Infrared Imaging Radiometer Suite (VIIRS) on the NASA-National Oceanic and Atmospheric Administration (NOAA) Suomi-NPP satellite. Those data were overlaid on base maps derived the NASA-U.S. Geological Survey Landsat 8 satellite.

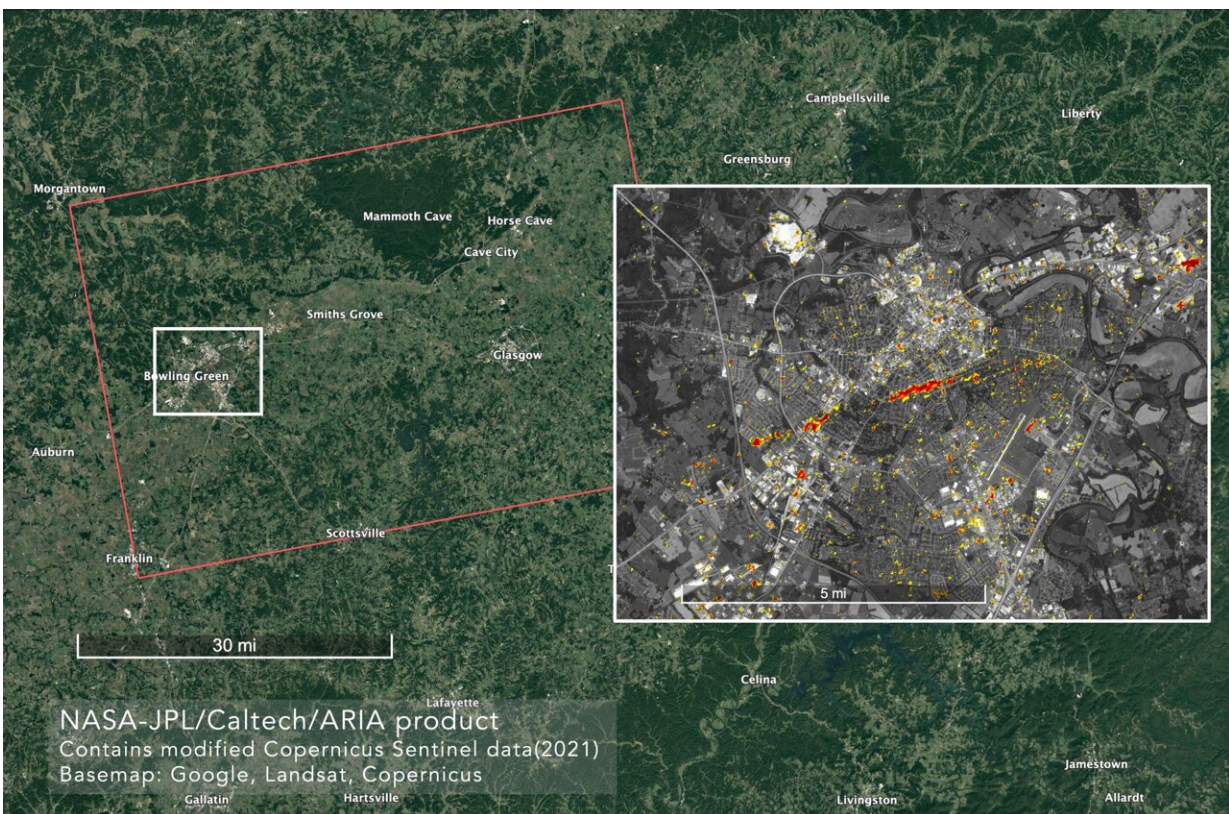
NASA researchers also are using [satellite data](#) to map damage in the affected areas. The Advanced Rapid Imaging and Analysis team at NASA's Jet Propulsion Laboratory (JPL) in Southern California, has created damage proxy maps, [such as the one for Bowling Green, Kentucky](#). The team processes and analyzes synthetic aperture radar data from ESA's (European Space Agency) Copernicus-1 [satellite](#) and interprets the changes in the landscape to estimate the severity of damage—indicated from yellow to red.



Night lights imagery from space shows the extent of power outages following the

deadly tornados in the U.S. Midwest Credit: NASA Earth Observatory/Joshua Stevens, Michael Carlowicz

These images and similar data are openly available to disaster response teams and the public on the [NASA Disasters Mapping Portal](#) and the [ARIA Share website](#).



Damage proxy map shows the effects of the tornado around Bowling Green, Kentucky. Credit: ARIA Team, NASA JPL. Copyright contains modified Copernicus Sentinel data [2021] processed by the ESA

More information: For more information about NASA's coverage of extreme weather, see [earthobservatory.nasa.gov/imag ... n-north-america-2021](https://earthobservatory.nasa.gov/imag...n-north-america-2021)

For more information about NASA's Disasters program, see appliedsciences.nasa.gov/what-we-do/disasters

Provided by NASA's Goddard Space Flight Center

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