

# Spinning Thunderstorms

*This article is provided courtesy of the American Museum of Natural History.*

On a spring night in 2007, disaster struck a small town in Kansas called Greensburg. Shortly before 10 p.m., a siren went off. A mile-wide tornado was approaching Greensburg. And it wasn't just any tornado. It was a category EF5, the most powerful kind there is.

Its winds were estimated to be more than 200 miles per hour. In less than ten minutes, the town was destroyed and ten people lost their lives.

When the fury had passed, people clambered through the rubble. Cars and trucks had been thrown about. Homes were crushed, or simply ripped from the ground. "I'm in downtown Greensburg. There's really nothing left," said one resident.



*Credit: FEMA Photo by Michael Raphael*

The tornado destroyed much of the town. Many residents needed temporary housing.

## How do tornadoes form?

A tornado is a swirling, funnel-shaped column of wind that gets its start from a thunderstorm. Thunderclouds form when warm, wet air collides with cool, dry air. Then, strong winds form into a wide tube of spinning air. When the tube touches the ground, it becomes a tornado.



*Credit: NOAA*

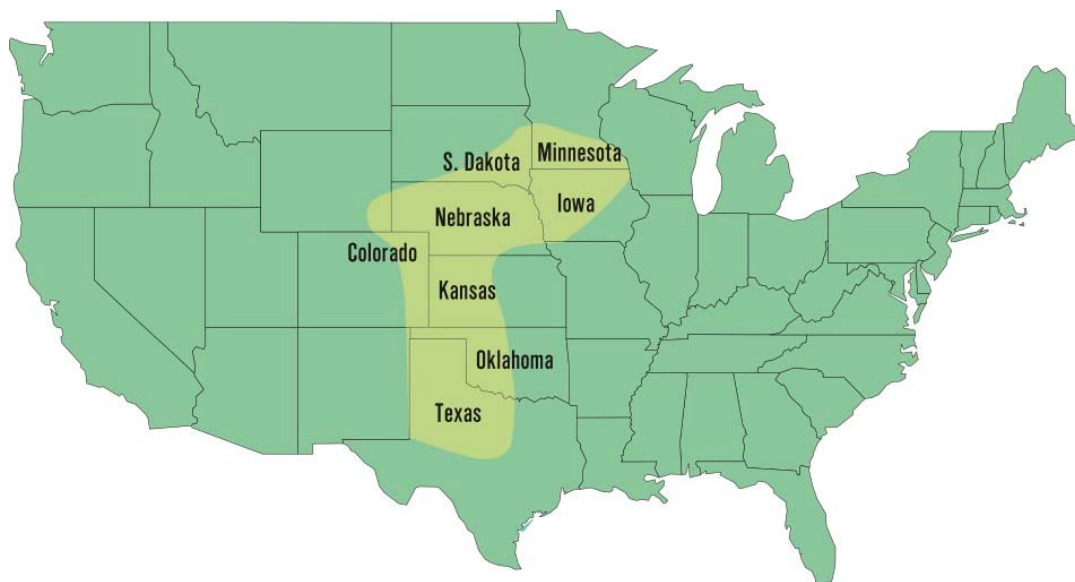
A tornado is a swirling, funnel-shaped column of wind. It stretches from a thunderstorm cloud down to the ground. A tornado gets its start when strong winds at high altitudes set a thunderstorm's winds rotating.



*Credit: The Field Museum*

The 200-plus-mph winds of a tornado can bend a stop sign.

Kansans are used to tornadoes. The people of Greensburg live smack in the middle of "Tornado Alley," an area that spans eight states in the Central United States. This region is a perfect thunderstorm factory. It has just what storms need to get started: cool, dry air from the Arctic mixing with warm, humid air from the Gulf of Mexico. Above the flat Great Plains, far from mountains and coastal weather, thunderstorms can form undisturbed. These conditions spawn more than 600 tornadoes, on average, in "Tornado Alley" every year.



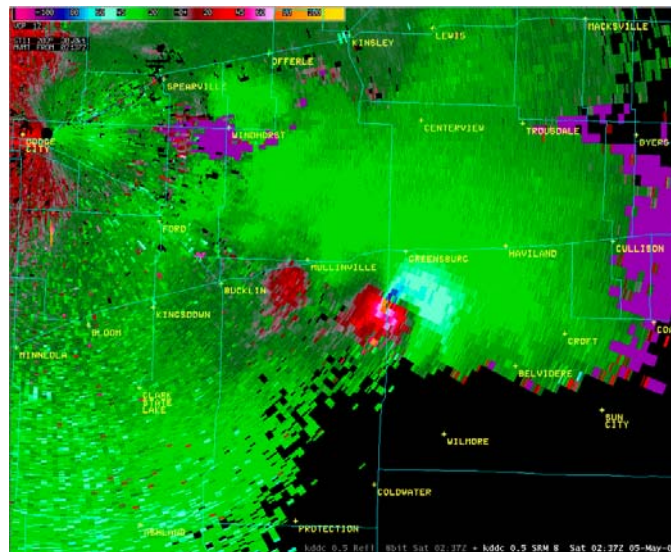
*Credit: The Field Museum*

More than 75% of all tornadoes in the world take place in "Tornado Alley."

## How do scientists predict dangerous storms?

Meteorologists are scientists who study and forecast weather. They use a technology called radar to track storms. Weather radar works by detecting the precipitation (rain, snow, or hail) in approaching storms. The radar unit sends out a radio wave towards the storm. The radio wave bounces off the raindrops, hail or snow that is in the storm, and then returns to the radar unit. The amount of time it takes for the wave to return tells meteorologists how far away the storm is. Most radar units send out about 1,000 radio waves per second. This gives them detailed, up-to-the-minute information about the storm.

Using radar, forecasters can track the formation and path of severe storms like tornadoes. When a tornado takes shape, its winds blow raindrops in a circular pattern. When scientists see that pattern on a radar screen, they know that a tornado is developing. Although tornadoes have fast swirling winds, tornadoes themselves move relatively slowly across the land (18-30 miles per hour). So scientists can make reasonable forecasts about where they are headed. A system of tornado watches and warnings are used to alert the public to danger. A tornado “watch” means thunderstorm conditions exist that could spawn tornadoes. A “warning” means a tornado has touched down and been spotted.



*Credit: NOAA*

Doppler radar map shows the tornado shortly before it leveled most of Greensburg, Kansas.

This system saved many lives in Greensburg. After the tornado sirens shrieked, people had 20 minutes to escape to their basements and storm shelters before the tornado destroyed their town.