

Tornado

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A tornado is a type of violent windstorm in which a rapidly rotating column of air extends from the base of a thunderstorm to the ground. Like a hurricane, a tornado is a type of cyclone. A cyclone is a low-pressure area with winds spiraling around the center. A low-pressure area is a region in which warm, light air is rising into the atmosphere.

Tornadoes can be various sizes, shapes, and colors. They can occur in most parts of the world, except in the polar regions. Most tornadoes, however, occur in the United States, where they are sometimes called twisters. Every year, there are about 1,000 tornadoes in the United States, especially in the Midwest. Most of them occur between March and June. But they can form at any time of the year.

How Tornadoes Form

Tornadoes typically develop within a large-scale low-pressure system. Winds circling this "low" bring warm humid air from one direction and colder dry air from another direction. In the Northern Hemisphere, winds circling counterclockwise bring warm humid air from the south to the eastern side of the low and colder dry air from the north to the western side of the low. Sometimes hot and dry air enters the low-pressure system from the southwest.

As these streams of air meet, they can form thunderstorms. If the temperature conditions are just right and strong jet stream winds are blowing, massive thunderstorms that extend 50,000 feet (15,240 meters) or more into the atmosphere can develop. Under certain conditions, these massive thunderstorms develop a rotation, and smaller rotations, or tornadoes, may form within the larger rotation.

These types of conditions occur most frequently in "tornado alley." Tornado alley is an area that runs northeastward from northern Texas into Illinois. About half of all tornadoes in the United States are reported in eight states. These are Texas, Oklahoma, Arkansas, Kansas, Missouri, Nebraska, Iowa, and Illinois.

Characteristics of Tornadoes

Most tornadoes begin as a funnel-shaped cloud extending from the base of a thundercloud. At times, this funnel reaches the ground. At other times, it simply dangles from the base of the thundercloud. In general, if the funnel extends more than halfway down from the thundercloud, the circulating air of the tornado has already reached the ground. The only clue to its presence may be dust swirling on the ground.

Tornadoes occur individually or in small groups. Sometimes outbreaks of many tornadoes—called tornado clusters or swarms—may occur within a short period of time. For example, On April 10–11, 2001, 79 tornadoes struck the Midwest and Great Plains region of the United States. On May 22–

25, 2008, more than 200 tornadoes hit ten states in the West, the Midwest, and the South. Meteorologists have noted an increase in the frequency of tornado clusters since the 1970s. This means that if a day does have a tornado, there is a much greater chance of having multiple tornadoes. This is despite the fact that the number of days with tornado activity has fallen slightly over the same span of time. The cause for this increase in tornado clusters remains unclear.

The rotating winds of tornadoes may range from about 40 miles (64 kilometers) per hour to more than 300 miles (480 kilometers) per hour. The extremely high winds of some tornadoes can cause enormous destruction. They flatten everything in their path and tear apart buildings with explosive force.

Most tornadoes travel along the ground in a northeasterly direction. They travel at speeds averaging about 30 miles (48 kilometers) per hour. Some may remain almost stationary for periods of time. Others race along at more than 50 miles (80 kilometers) per hour.

Tornadoes can be various colors. If they are illuminated by the sun, they appear to be white like other clouds. When filled with soil and debris, they appear to be shades of black, dark brown, gray, or even red. A fully developed tornado, with its twisting funnel and its hissing and roaring sound, is very frightening.

A tornado that forms over water is called a **waterspout**. Most waterspouts are weaker than land tornadoes. They often form in fair weather. **Dust devils** are similar to fair-weather waterspouts, but they form over very dry ground, usually in desert areas.

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