

Tornadoes...

Although tornadoes occur in many parts of the world, they are found most frequently in the United States. In an average year, 1,200 tornadoes cause 70 fatalities and 1,500 injuries nationwide. You can find statistical information on tornadoes at www.spc.noaa.gov.

Tornado Facts

- A tornado is a violently rotating column of air extending from a thunderstorm to the ground.
- Tornadoes may appear nearly transparent until dust and debris are picked up or a cloud forms within the funnel. The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction.
- The average forward speed is 30 mph but may vary from nearly stationary to 70 mph.
- The strongest tornadoes have rotating winds of more than 250 mph.
- Tornadoes can accompany tropical storms and hurricanes as they move onto land.
- Waterspouts are tornadoes which form over warm water. They can move onshore and cause damage to coastal areas.

When and Where Tornadoes Occur

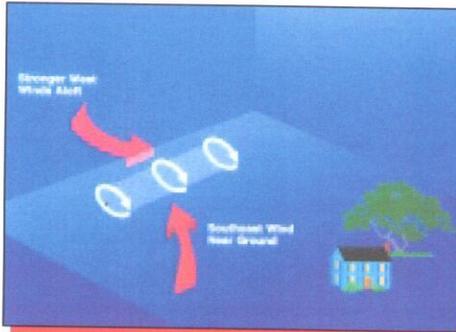
- Tornadoes can occur at any time of the year.
- Tornadoes have occurred in every state, but they are most frequent east of the Rocky Mountains during the spring and summer months.
- In the southern states, peak tornado occurrence is March through May, while peak months in the northern states are during the late spring and summer.
- Tornadoes are most likely to occur between 3 and 9 p.m. but can happen at any time.



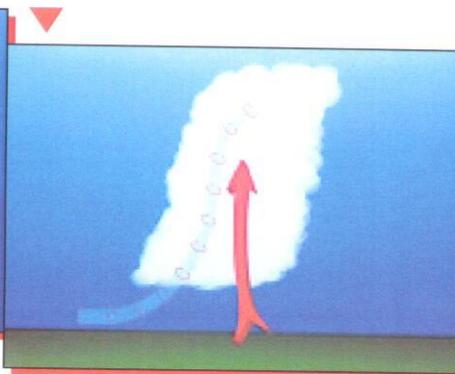
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How Tornadoes Form

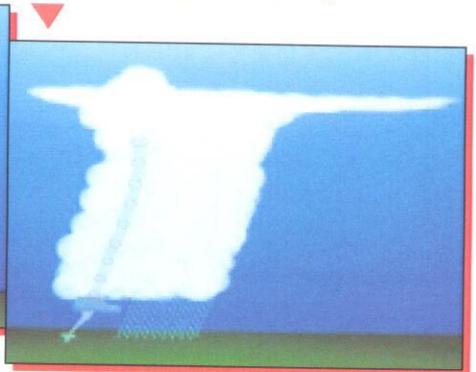
Before thunderstorms develop, a change in wind direction and an increase in wind speed with increasing height creates an invisible, horizontal spinning effect in the lower atmosphere.



Rising air within the thunderstorm updraft tilts the rotating air from horizontal to vertical.



An area of rotation, 2-6 miles wide, now extends through much of the storm. Most tornadoes form within this area of strong rotation.



NOAA

Tornadoes Take Many Shapes and Sizes

Weak Tornadoes

- 88% of all tornadoes
- Less than 5% of tornado deaths
- Lifetime 1 – 10+ minutes
- Winds less than 110 mph



Charles Doswell III

Strong Tornadoes

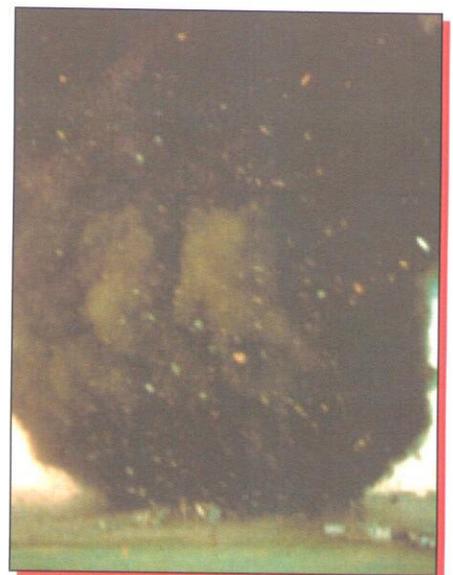
- 11% of all tornadoes
- Nearly 30% of all tornado deaths
- May last 20 minutes or longer
- Winds 110-205 mph



Mary Hurley

Violent Tornadoes

- Less than 1% of all tornadoes
- 70% of all tornado deaths
- Lifetime can exceed 1 hour
- Winds greater than 205 mph

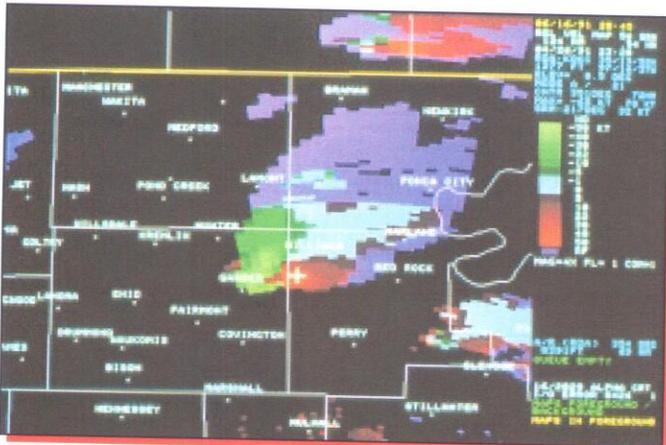


Peter Willing

Weather Radar Watches the Sky

The National Weather Service has strategically located Doppler radars across the country that can detect air movement toward or away from a radar. Early detection of increasing rotation aloft within a thunderstorm can allow life-saving warnings to be issued before the tornado forms. In the figure below left, Weather Service Doppler radar detected strong

rotation within the storm where red colors (winds moving away from the radar) and green (winds blowing toward the radar) are close together. The photograph at below right shows a violent tornado in northern Oklahoma at the same time the radar image was taken.



Doppler Radial Velocity



Jim Ladue

Tornado Myths and Truths

MYTH: Areas near lakes, rivers, and mountains are safe from tornadoes.

TRUTH: No place is safe from tornadoes. A tornado near Yellowstone National Park left a path of destruction up and down a 10,000 foot mountain.

MYTH: The low pressure with a tornado causes buildings to “explode” as the tornado passes overhead.

TRUTH: Violent winds and debris slamming into buildings cause most structural damage.

MYTH: Windows should be opened before a tornado approaches to equalize pressure and minimize damage.

TRUTH: Leave the windows alone. The most important action is to immediately go to a safe shelter.

MYTH: If you are driving and a tornado is sighted, you should turn and drive at right angles to the storm.

TRUTH: The best thing to do is to seek the best available shelter. Many people are injured or killed when remaining in their vehicles.

MYTH: People caught in the open should seek shelter under highway overpasses.

TRUTH: Take shelter in a sturdy reinforced building if at all possible. Overpasses, ditches, and culverts may provide limited protection from a tornado, but your risk will be greatly reduced by moving inside a strong building.

*Frequently asked questions about tornadoes can be found on the Internet at
www.spc.noaa.gov/faq/tornado/index.html.*