



Tornadoes



What causes tornadoes?

Research has revealed that tornadoes usually form under certain types of atmospheric conditions. Some of these conditions include a change in wind direction and speed. Those conditions can be predicted, but not perfectly. When forecasters see those conditions, they can predict that tornadoes are likely to occur. However, it is not yet possible to predict in advance exactly when and where they will develop, how strong they will be, or precisely what path they will follow.

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 tilts the rotating air from horizontal to vertical. This area of rotation, 2-6 miles wide, now extends through much of the storm. Moments later, the tornado develops in this area.

Facts about tornadoes

- Tornadoes can occur anywhere, but they are most frequent during the Spring in the central United States. In Southern states, peak tornado occurrence is in March through May, while peak months in the northern states are during the summer.
- An average of 80 deaths and over 1500 injuries result from tornadoes every year.
- Each year, there are an average of 800-1000 tornadoes reported nationwide, resulting in about \$850 million in damages.
- The damage paths of a tornado can be in excess of one mile wide and 50 miles long.
- The average width is 75 yards; the average track length is 1-4 miles; the average time that it is on the ground is 5 minutes; and the average forward speed is 25 mph.
- Softball-size hail and damaging "straight-line" winds also can occur.
- A tornado can be identified by a dark, often greenish sky, a wall cloud, and a loud roar - similar to a freight train.
- Because of investments in research, observing systems such as the Doppler radar and interactive computer systems, and forecasting technology, the lead time for tornadoes has nearly doubled from a national average of 5 minutes in the early 1990s to nearly 10 minutes today.
- Tornadoes are most likely to occur between 3 and 9 p.m., but have been known to occur at all hours of the day or night.
- The average tornado moves from southwest to northeast, but they are known to move in any direction. The average speed is 30 mph, but they have been known to travel from nearly stationary to 70 mph.

Terms associated with tornadoes

- A **tornado** is defined as a violently rotating column of air extending from a thunderstorm to the ground.
- A **tornado watch** is issued when conditions are conducive to the development of tornadoes.
- A **tornado warning** is when severe weather is imminent. It means that a tornado has been sighted in your area.
- **Tornadogenesis** refers to the process of how tornadoes are formed.

5 Deadliest U.S. Tornadoes

1. Tri-State (MO/IL/IN) – Mar. 18, 1925 – 689 deaths
2. Natchez, MS – May 6, 1840 – 317 deaths
3. St. Louis, MO – May 27, 1896 – 255 deaths
4. Tupelo, MS – Apr. 5, 1936 – 216 deaths
5. Gainesville, GA – Apr. 6 1936 – 203 deaths

5 Costliest U.S. Tornadoes

1. Omaha, NE – May 6, 1975 – \$1.132 billion damages
2. Wichita Falls, TX – Apr. 10, 1979 - \$840 million damages
3. Lubbock, TX – May 11, 1970 - \$530 million damages
4. Topeka, KS – June 8, 1966 - \$470 million damages
5. Windsor Locks, CT – Oct. 3, 1979 - \$420 million damages

Types of tornadoes and measurements

Tornadoes are measured using the Fujita scale, which ranks tornadoes from F0, the weakest, to F5, the strongest.

Weak (F0-F1)

- 69% of all tornadoes
- less than 5% of tornado deaths
- lifetime of 1-10+ minutes
- winds of less than 110 mph

Strong (F2-F3)

- 29% of all tornadoes
- nearly 30% of all tornado deaths
- may last 20 minutes or longer
- winds of between 110-205 mph

Violent (F4-F5)

- Only 2% of all tornadoes
- 70% of all tornado deaths
- lifetime can exceed one hour.
- winds of over 205 mph.

Protecting yourself, your family, and your property

Before:

- **Develop** a **plan** that can be implemented in the event of a tornado.
- Go through **drills** to prepare for a tornado.
- **Know** the **area** you live so that you will be able to follow nearby storm movement from weather bulletins.
- **Listen** to the radio and television weather updates.

During:

- If **indoors**, move to a pre-designated area, such as the **BASEMENT**.
- If underground shelter isn't available, move to an **interior room** or **hallway** on the **lowest floor** and get under a sturdy piece of furniture.
- Stay **away** from the **windows**.
- Get **out** of **automobiles**.
- **Don't** try to **outrun** a tornado; instead seek cover.
- **Mobile homes**, even those that are secured, should be **abandoned**.

After:

- First, make sure that the **tornado** or tornadoes are truly **gone**.
- **Stay tuned** to weather **reports** to get the latest emergency information.
- **Help injured** or trapped persons, and call 911 immediately if there are life-threatening injuries.
- Stay **away** from downed **power lines** and be sure to report them to your utility company.
- To prevent accidental fires, use **flashlights**, not candles, to see if power is on or off after tornado (more people die from candle-related fires after a disaster strikes than from the disaster itself).

SAFEROOMS

A saferoom is a small windowless room that has been strengthened to resist the effects of wind pressures and the impact from windborne debris generated by severe weather.

It is a system composed of a foundation, anchorage to the foundation, a floor, walls, a roof, connections, and a door with hinges and latching mechanism.

The system can be compared to a chain that is no stronger than its weakest link. In other words the weakest component determines the overall strength and effectiveness of the saferoom.

Properly built safe rooms can provide protection against winds of up to 250 miles per hour and against flying objects travelling as fast as 100 miles per hour.

Where can more information about tornadoes be found?

- <http://www.noaa.gov/tornadoes.html>
- <http://www.weather.com/encyclopedia/tornado/form.html>
- <http://www.fema.gov/library/tornadof.html>

The **Congressional Wind Hazards Caucus** is co-chaired by Representative Dennis Moore (D-KS) and Representative Walter Jones (R-NC). The goal of the caucus is to seek government funding to support a National Wind Hazard Reduction Program that would focus on increasing public safety and decreasing the economic losses associated with tropical storms, thunderstorms, and tornadoes.