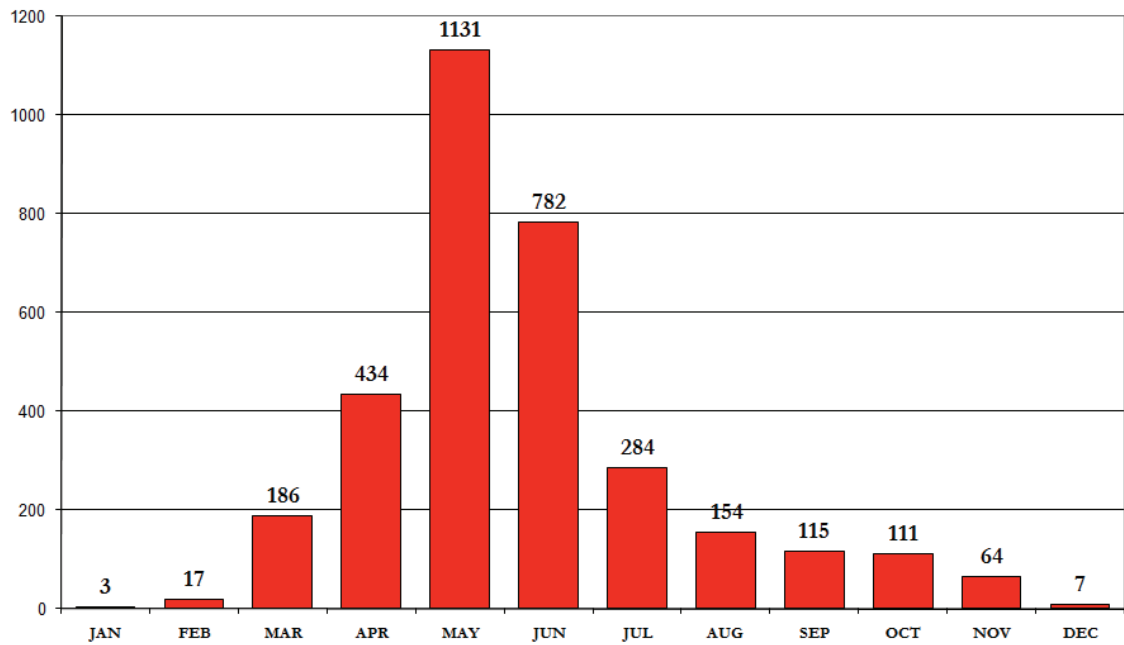




### Kansas Tornadoes 1950 - 2008



This is a photo of a tornado in the decay stage. This, too, was photographed near the town of Cordell, Okla.

- Photo courtesy NOAA Photo Library

# Frequently asked questions about tornadoes

**Q: Does hail always come before the tornado? Rain? Lightning? Utter silence?**

A: Not necessarily, for any of those. Rain, wind, lightning, and hail characteristics vary from storm to storm, from one hour to the next, and even with the direction the storm is moving with respect to the observer. While large hail can indicate the presence of an unusually dangerous thunderstorm, and can happen before a tornado, don't depend on it. Hail, or any particular pattern of rain, lightning or calmness, is not a reliable predictor of tornado threat.

**Q: How long does a tornado last?**

A: Tornadoes can last from several seconds to more than an hour. The longest-lived tornado in history is really unknown, because so many of the long-lived tornadoes reported from the early-mid 1900s and before are believed to be tornado series instead. Most tornadoes last less than 10 minutes.

**Q: I heard the Oklahoma City tornado was almost "F6." Is that a real level on the original F-scale? Is there such a thing as EF-6?**

A: For the original F-Scale, Fujita plotted hypothetical winds higher than F5; but as mentioned in the previous answer above, they were only guesses. Even if the winds measured by portable Doppler radar (32 meters above ground level, roughly 302 miles

per hour) had been over 318 miles per hour, the tornado still would have been rated "only" F5, since that is the most intense possible damage level. On the Enhanced F-scale, there is no such thing as "EF6" or higher. Damage — no matter how "incredible" or how strong the wind — maxes out at EF-5.

**Q: Big fat tornadoes are the strongest ones, right?**

A: Not necessarily. There is a statistical trend (as documented by the National Severe Storms Laboratory's Harold Brooks) toward wide tornadoes having higher damage ratings. This could be related to greater tornado strength, more opportunity for targets to damage, or some blend of both. However, the size or shape of any particular tornado does not say anything conclusive about its strength. Some small "rope" tornadoes still can cause violent damage of EF4 or EF5; and some very large tornadoes over a quarter-mile wide have produced only weak damage equivalent to EF0 to EF1.

**Q: How can a tornado destroy one house and leave the next one almost unscratched?**

A: Most of the time, this happens either with multiple-vortex tornadoes or very small, intense single-vortex tornadoes. The winds in most of a multi-vortex tornado may only be strong enough to do minor damage to a particular house. But one of the

smaller embedded sub-vortices, perhaps only a few dozen feet across, may strike the house next door with winds over 200 miles per hour, causing complete destruction. Also, there can be great differences in construction from one building to the next, so that even in the same wind speed, one may be flattened while the other is barely nicked. For example, a flimsy, unanchored mobile home may be obliterated while all surrounding objects suffer little or no damage.

**Q: How do tornadoes do some weird things, like drive straw into trees, strip road pavement and drive splinters into bricks?**

A: The list of bizarre things attributed to tornadoes is almost endless. Much of it is folklore; but there are some weird scenes in tornado damage. Asphalt pavement may strip when tornado winds sandblast the edges with gravel and other small detritus, eroding the edges and causing chunks to peel loose from the road base. Storm chasers and damage surveyors have observed this phenomenon often after the passage of a violent tornado. With a specially designed cannon, wind engineers at Texas Tech University have fired boards and other objects at over 100 miles per hour into various types of construction materials, duplicating some of the kinds of "bizarre" effects, such as wood splinters embedded in bricks. Intense winds can bend

a tree or other objects, creating cracks in which debris (e.g., hay straw) becomes lodged before the tree straightens and the crack tightens shut again. All bizarre damage effects have a physical cause inside the roiling maelstrom of tornado winds. We don't fully understand what some of those causes are yet, however; because much of it is almost impossible to simulate in a lab.

**Q: Do mobile homes attract tornadoes?**

A: Of course not. It may seem that way, considering most tornado deaths occur in them, and that some of the most graphic reports of tornado damage come from mobile home communities. The reason for this is that mobile homes are, in general, much easier for a tornado to damage and destroy than well-built houses and office buildings. A brief, relatively weak tornado which may have gone undetected in the wilderness — or misclassified as severe straight-line thunderstorm winds while doing minor damage to sturdy houses — can blow a mobile home apart. Historically, mobile home parks have been reliable indicators, not attractors, of tornadoes.

**Q: Long ago, I was told to open windows to equalize pressure. Now I have heard that's a bad thing to do. Which is right?**

A: Opening the windows is absolutely useless, a waste of precious time, and can be very

dangerous. Don't do it. You may be injured by flying glass trying to do it. And if the tornado hits your home, it will blast the windows open anyway.

**Q: I've seen a video of people running under a bridge to ride out a tornado. Is that safe?**

A: Absolutely not! Stopping under a bridge to take shelter from a tornado is a very dangerous idea, for several reasons:

- Deadly flying debris can still be blasted into the spaces between bridge and grade — and impaled in any people hiding there.
- Even when strongly gripping the girders (if they exist), people may be blown loose, out from under the bridge and into the open — possibly well up into the tornado itself. Chances for survival are not good if that happens.

- The bridge itself may fail, peeling apart and creating large flying objects, or even collapsing down onto people underneath. The structural integrity of many bridges in tornado winds is unknown — even for those which may look sturdy.
- Whether or not the tornado hits, parking on traffic lanes is illegal and dangerous to yourself and others. It creates a potentially deadly hazard for others, who may plow into your vehicle at full highway speeds in the rain, hail, and/or dust. Also, it can trap people in the storm's path against their will, or block emergency vehicles from saving lives.

The people in that infamous video were extremely fortunate not to have been hurt or killed. They were actually not inside the tornado vortex itself, but instead in a surface inflow jet — a small belt of intense wind flowing into the base of the tornado a few dozen yards to their south. Even then, flying debris could have caused serious injury or death. More recently, on May 3, 1999, two people were killed and several others injured outdoors in Newcastle and Moore, Okla., when a violent tornado blew them out from under bridges on I-44 and I-35. Another person was killed that night in his truck, which was parked under a bridge.

**Q: How many tornadoes hit the US yearly?**

A: About one thousand. The actual average is unknown, because tornado spotting and reporting methods have changed so much in the last several decades that the officially recorded tornado climatologies are believed to be incomplete. Also, in the course of recording thousands of tornadoes, errors are bound to occur. Events can be missed or mis-classified; and some non-damaging tornadoes in remote areas could still be unreported.

**Q: How many people are killed every year by tornadoes?**

A: On average, tornadoes kill about 60 people per year — most from flying or falling (crushing) debris.

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