**Tornadoes Fact Sheet**

**Tornadoes** are violently rotating columns of air with circulation that reaches the ground. Tornadoes take the form of a funnel cloud and are accompanied by a loud, roaring noise.

Tornadoes:

* Are the most destructive of all the atmospheric phenomena with wind speeds that can be over 300 mph.
* Often strike with little or no advanced warning.
* Are extremely dangerous. One supercell storm can produce a series of tornadoes along the same general front line.

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**Tornado Danger Signs:** Tornadoes may develop from Cumulonimbus (thunderstorm clouds) when warm, moist air is in advance of eastward-moving cold fronts. Watch for skies that turn suddenly dark and greenish (a phenomenon caused by hail) and with increasing wind speeds, and keep a particular lookout for the formation of funnel clouds.

* **Large Hail:** Tornadoes are spawned from powerful thunderstorms that often produce large hail.
* **Calm before the Storm:** Oftenjust prior to tornado touchdowns, the winds may die down and the air may become very still; clear, sunlit skies are not uncommon right after a tornado.
* **Clouds of Debris:** Approaching debris clouds can mark a tornado’s location, even if a funnel is not visible.
* **Funnel Clouds:** A visible rotating extension of the cloud base is a sign that a tornado may develop. Tornadoes are evident when one or more clouds turn a greenish color and a dark funnel descends.
* **Roaring Noise:** High winds can cause a roaring sound often compared with a passing freight train.

**Tornado Scales:** The *Enhanced Fujita Scale* (EF Scale) rates the strength of tornadoes with intensity estimates through after-the-fact examination of the damage they produced using knowledge of the wind forces needed to damage or destroy various buildings and their component parts to estimate wind speeds.

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| **EF Scale\*** | **Wind Estimate****3-second Gust\*** | **Typical Damage** |
| 0 | 65-85 mph | Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged. |
| 1 | 86-110 mph | Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads. |
| 2 | 111-135 mph | Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground. |
| 3 | 136-165mph | Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown. |
| 4 | 166-200 mph | Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated. |
| 5 | Over 200 | Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur. |

\*Source: NOAA http://www.spc.noaa.gov/faq/tornado/ef-scale.html

**Tornado Awareness**: Tornadoes can occur at any time of the year in the United States.

* In southern states, peak tornado occurrence is March through May, while peak months in northern states are June through August, with secondary tornado maximum occurrences in September through November.
* Tornadoes occur at all hours of the day and night but are most likely to occur between 3 and 9 p.m.
* Typically tornadoes move from southwest to northeast, but they have been known to move in any direction.
* The average forward speed of a tornado is 30 mph, but this may vary from nearly stationary to 70 mph.

**Know the Difference: *Tornado Watches and Warnings***

* ***Tornado Watch*:** The National Weather Service’s Storm Prediction Center issues thisannouncement when *conditions are favorable* for the development of tornadoes in and close to the watch area. Watch sizes vary depending on the weather situation and usually are issued for 4 to 8 hours. Watches normally are issued well in advance of the actual occurrence of severe weather. -- *Stay alert* for tornado signs, closely monitor weather information and be prepared to move immediately to shelter if threatening weather approaches.
* ***Tornado Warning*:** The NWS issues a warning when *a tornado is indicated* by radar or sighted by storm spotters. Warnings can be issued without a tornado watch being in effect. Warnings usually are issued for about 30 minutes. -- *Take shelter immediately!*

**Be Prepared: *Plan Ahead to Seek Shelter***

**Know Where to Shelter:**

* Go to lowest level available (basement or cellar).
* Find an inside room with no windows and strong walls.
* If in a mobile home, get out and go to the nearest sturdy building.
* Get under a piece of sturdy furniture, such as a workbench, or heavy table or desk, and hold on to it.
* Use your arms to protect your head and neck, or use a heavy blanket or pillow to help protect your head.

**If in a Vehicle or Outside:**

* Never try to outdrive a tornado in a vehicle because tornadoes can change direction quickly and can lift and toss your vehicle through the air.
* Leave the car immediately, and take shelter in a nearby building. If no building is nearby or you’re caught outside, lie flat in a ditch or depressed area, cover your head and watch for flooding.

**Tornado Frequency Mapping**

**Directions:** On the map for Station #2, complete the steps listed below using the Tornado Strikes data table.

1. Color the areas on the US map **green** that have an average of 0-10 tornadoes per year.
2. Color the areas on the US map **blue** that have an average of 11-20 tornadoes per year.
3. Color the areas on the US map **yellow** that have an average of 21-37 tornadoes per year.
4. Color the areas **red** on the US map that have an average above 38 tornadoes per year.

**Average Annual Tornado Strikes: 1991-2010**

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| --- | --- | --- | --- |
| **State** | **Average Number of Tornadoes** | **State** | **Average Number of Tornadoes** |
| Alabama | 44 | Montana | 10 |
| Alaska | 0 | Nebraska | 57 |
| Arizona | 5 | Nevada | 2 |
| Arkansas | 39 | New Hampshire | 1 |
| California | 11 | New Jersey | 2 |
| Colorado | 53 | New Mexico | 11 |
| Connecticut | 2 | New York | 10 |
| Delaware | 1 | North Carolina | 31 |
| Florida | 66 | North Dakota | 32 |
| Georgia | 30 | Ohio | 19 |
| Hawaii | 1 | Oklahoma | 62 |
| Idaho | 5 | Oregon | 3 |
| Illinois | 54 | Pennsylvania | 16 |
| Indiana | 22 | Rhode Island | 0 |
| Iowa | 51 | South Carolina | 27 |
| Kansas | 96 | South Dakota | 36 |
| Kentucky | 21 | Tennessee | 26 |
| Louisiana | 37 | Texas | 155 |
| Maine | 2 | Utah | 3 |
| Maryland | 10 | Vermont | 1 |
| Massachusetts | 1 | Virginia | 18 |
| Michigan | 16 | Washington | 3 |
| Minnesota | 45 | West Virginia | 2 |
| Mississippi | 43 | Wisconsin | 24 |
| Missouri | 45 | Wyoming | 12 |