

Tornado

General

Tornados typically occur in Pennsylvania during the spring and summer months. In the past 125 years, about 250 tornados were reported in 58 of the 67 counties in Pennsylvania. The National Weather Service estimates the Commonwealth will experience 10 tornados annually. Tornados are measured by wind speeds on the Fujita Scale.

As stated by the National Climatic Data Center, “wind speeds in tornados range from values below that of hurricane speeds to more than 300 miles per hour.” The NCDC continues, “The maximum winds in tornados are often confined to extremely small areas, and vary tremendously over short distances.” This is the reason that one house will be completely demolished by a tornado, yet the house next to it might be untouched. Additionally, the forward motion of tornados can range from speeds between 0 and 50 miles per hour.

Fujita Scale
F0: 40-72 mph: Gale Tornado. Light Damage: Some damage to chimneys; breaks twigs and branches off trees; pushes over shallow-rooted trees; damages signboards; some windows broken; hurricane wind speed begins at 73 mph.
F1: 73-112 mph: Moderate Tornado. Moderate damage: Peels surfaces off roofs; mobile homes pushed off foundations or overturned; outbuildings demolished; moving autos pushed off the roads; trees snapped or broken.
F2: 113-157 mph: Significant Tornado. Considerable damage: Roofs torn off frame houses; mobile homes demolished; frame houses with weak foundations lifted and moved; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F3: 158-206 mph: Severe Tornado. Severe damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forests uprooted; heavy cars lifted off the ground and thrown; weak pavement blown off roads.
F4: 207-260 mph: Devastating Tornado. Devastating damage: Well constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and disintegrated; large missiles generated; trees in forest uprooted and carried some distance away.
F5: 261-318 mph: Incredible Tornado. Incredible damage: Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 300 ft (100 m); trees debarked; incredible phenomena will occur.
F6: 319+ mph: The maximum wind speeds of tornadoes are not expected to reach the F6 wind speeds.
Data Source: National Climatic Data Center

History

Juniata County has witnessed three tornados since 2003. Of these, the most significant was in 2003, when a Category 1 storm hit the County, resulting in \$20,000 in property damages.

Juniata County Tornado History	
Date	Magnitude
7/21/2003	F1
9/17/2004	F1
9/17/2004	F1

Source: National Climatic Data Center

Vulnerability

Tornados are most common in the southeastern and southwestern parts of the Commonwealth; however, they have the potential to affect any part of the state if the right mix of weather conditions exists.

Recent tornados have affected nearby Lebanon, Cumberland, Luzerne, and Dauphin Counties. Juniata County typically experiences a lower incidence of tornados than these areas. The most recent tornado occurred in Halifax, PA, approximately 39 miles from Juniata County, on December 1, 2006. It resulted in one loss of life,

approximately 70 damaged homes, and a total of \$2M in damage. Tornados can usually be expected June-July. Factors that impact the amount of damage caused by a tornado are its strength, the time of day, and the area of impact. Usually, these distinct funnel clouds are localized phenomena impacting a small area. However, the high winds of tornados make them one of the most destructive of all natural hazards.



F-3 Tornado, Campbelltown, PA, July 14, 2004

Probability

The probability of a tornado striking Juniata County is moderate. However, according to the National Climatic Data Center, three tornados hit the County since 2003. Each tornado was classified as an F1. Only the 2003 tornado was recorded as causing significant damage.

Maximum Threat

While it is difficult to pinpoint the exact locations at greatest risk from a tornado, low-lying areas and flat fields are susceptible to touchdowns, while most damage will likely occur in densely populated areas. The maximum threat to Juniata County is to property, facilities, and infrastructure in the more heavily populated regions of the County.

Secondary Effect

Tornados typically have limited secondary effects. The most common is power failure, as severe wind conditions dismantle power sources. Significant structural damage to property, facilities, or infrastructure could cause small segments of the population to temporarily displace. Hazardous material spills can occur if a tornado damages a holding tank or causes a traffic accident. Limited disruptions of critical emergency services may be experienced by non-affected portions of the County. Economic and financial impact can range from nominal to major, based on the severity of damage.