

Tornadoes



Photo above courtesy of NOAA.

A tornado is a violent windstorm characterized by a twisting, funnel shaped cloud with whirling winds of up to 300 miles per hour. They are spawned by thunderstorms and occasionally by hurricanes, and may occur singularly or in multiples. Tornadoes develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. Water-based tornadoes — called *waterspouts* — can and have formed over the water bodies surrounding the Cape.

Most vortices remain suspended in the atmosphere, but when they do touch down they become a destructive force — spinning like a top and sounding like a roaring train or airplane. Tornadoes move at an average speed of 30 mph and generally move from the southwest to northeast. Their direction of travel can be erratic and may change suddenly. These short-lived storms are the most violent of all atmospheric

phenomena and the most destructive over a small area.

TORNADOES IN NEW ENGLAND

On average the United States experiences 100,000 thunderstorms each year and approximately 1,000 tornadoes develop from these storms. Damage from tornadoes results from high wind velocity and wind blown debris. Over 80% of tornadoes strike between noon and midnight. New England “Tornado season” is marked from March through August, although tornadoes may occur at any time of the year. Normally, a tornado will stay on the ground for no more than 20 minutes. Injuries and deaths most often

occur when buildings collapse. The tornadoes experienced in recent history in New England have been generated by severe summer storms. Fortunately for us on Cape Cod, we are not susceptible to the major tornadoes of the Midwest and Great Plains states, but we are vulnerable and have experience deadly tornadoes.

The most devastating tornado ever to occur in New England was the Worcester Tornado of July 9, 1953. The tornado hit Worcester at 5:08 p.m. Within one minute more than 90 people were dead and over 1,300 injured. Damage estimates were placed in excess of \$52 million. Another damaging tornado occurred in Windsor Locks, Connecticut at about 3 p.m. on October 3, 1979. This twister lasted only about 45-60 seconds, but managed to kill 3 people, injure over 300, destroy 40 homes and cause \$300 million in property damage.

The most recent killer tornado to strike New England occurred on May 29, 1995, in Great Barrington, Massachusetts. This tornado, with winds

FUJITA DAMAGE SCALE (F-SCALE)

F-scale	Type of Tornado	Intensity	Estimated Wind Speeds	Description of Damage
F0	Gale Tornado	Weak	40-72 mph	Some damage to chimneys; breaks branches off trees; push over shallow-rooted trees; damage sign boards.
F1	Moderate Tornado	Weak	73-112 mph	The lower limit (73 mph) is beginning of hurricane wind speed; peels shingles off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads.
F2	Significant Tornado	Strong	113-157 mph	Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F3	Severe Tornado	Strong	158-206 mph	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	Devastating Tornado	Violent	207-260 mph	Well-constructed houses leveled; structure with weak foundation blown off some distance; cars thrown and large missiles generated.
F5	Incredible Tornado	Violent	261-318 mph	Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobiles-sized missiles fly through the air in the excess of 100 m; trees debarked; incredible phenomena will occur.



Photo above courtesy of NOAA.

in excess of 200 mph, killed 3 people, injured 23 and caused an estimated \$25 million in damage.

THE FUJITA DAMAGE SCALE

Dr. Theodore Fujita, from the University of Chicago, devised a scale to classify the strength of a tornado. Since the F-Scale is based on tornado damage (primarily to buildings), there is some ambiguity in the scale. For example, a tornado that moves over open country will tend to receive a lower rating than a tornado that strikes a populated area. Since buildings have a wide variation in age, quality of design, and quality of building materials, more uncertainties are thrown into the mix. Tornadoes over open country will probably encounter varying type of vegetation, leading to uncertainties in these cases.

TERMS TO KNOW

Tornado Watch: Conditions are right for a tornado.

Tornado Warning: A tornado has been sighted or is visible on radar. A location of the sighting is normally given along with its projected movement.

TAKE PROTECTIVE MEASURES

For Tornado Watches

When conditions are right for a tornado, there are a few things you should do:

1. Stay tuned to a local weather station or listen to your NOAA Weather Radio.
2. Secure any loose objects outdoors, or move them inside.
3. Survey local structures for the most suitable shelter.
4. Keep watching the sky to the south and southwest. If you see any funnel shaped clouds, report them immediately to the nearest law-enforcement agency and take cover.

For Tornado Warnings

TAKE SHELTER IMMEDIATELY! Do not leave shelter, until you are sure no further danger exists. Remember that there is no guaranteed safe place during a tornado.

WHAT TO DO IF YOU ARE CAUGHT...

...In a motor vehicle

The least desirable place to be during a tornado is in a motor vehicle. Never try to outrun a tornado in your car. Stop your vehicle and get out. Seek shelter elsewhere. Do not get under or next to your vehicle. A ditch or ground depression will help, if a tornado shelter is not nearby.

...At school

Follow the school disaster plan. Stay away from auditoriums, gymnasiums, and other areas with wide, free-span roofs. Go into center hallways and stay away from windows.

...In open country

Move away from the tornado's projected path at right angles. Seek shelter in a ditch, ravine, or culvert. Even a low spot in the ground will give you some protection. Stay away from trees and remember to protect your head.

...In a home or condo

The best place to go is the innermost hallway on the lowest floor. An interior closet is relatively safe. An interior bathroom is even better. The walls are close together and the bathtub, sink, and toilet help support debris in case the house collapses. AVOID WINDOWS. Since flying debris does most of the killing, the worst kind of flying debris is broken glass. DO NOT open any windows when a tornado approaches to equalize pressure. If a tornado actually gets close enough for the pressure drop to be experienced the strong winds have probably already caused the most significant damage. Opening windows, in fact, may actually increase damage.

...In a mobile or manufactured home

One of the least desirable places to be during a tornado is in a mobile or manufactured home. If a tornado approaches, seek other shelter immediately. Go to a tornado shelter on foot, if possible. Do not drive your car. Do not get under your mobile home. If no other shelter is available, lie down in a ditch or a ground depression.

Sources:

www.nesec.org;

<http://hometown.aol.com/hurctrack/HurcTrack.index.html>.



Photo above courtesy of MEMA.