



Severe Weather Tips

In this guide, you'll find information related to:

- Thunderstorms and lightning
- Severe thunderstorm watches and warnings
- Steps to follow after the watch has been issued
- Facts about tornadoes
- Tornado watches and warnings
- Tornado danger signs
- What to do during a tornado
- Fujita tornado scale
- How to select a shelter that protects against strong winds
- Floods and flash floods

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Thunderstorms and Lightning

- Know the dangers signs associated with thunderstorms:
- Dark, towering, or threatening clouds
- Lightning and thunder in the distance
- Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall.
- "Heat lightning" is actually lightning from a thunderstorm too far away for thunder to be heard. However, the storm may be moving in your direction!

Lightning Hazards

- Every thunderstorm produces lightning. In the United States, an average of 300 people are injured and 80 people are killed each year by lightning.
- Most lightning deaths and injuries occur when people are caught outdoors in the summer months during the afternoon and evening.
- Your chances of being struck by lightning are estimated to be 1 in 600,000, but could be reduced even further by following safety precautions.
- Lightning strike victims carry no electrical charge and should be attended to immediately.

Estimating the Distance from a Thunderstorm

- Light travels faster than sound — lightning can be seen long before the resulting thunder can be heard.
- Estimate the number of miles you are from a thunderstorm by counting the number of seconds between a flash of lightning and the next clap of thunder — then divide this number by five (*Source: Federal Emergency Management Agency*).

The danger from lightning exists if you can *hear* thunder!



Severe Thunderstorm Watches and Warnings

- *Severe thunderstorm watches* are issued by the National Weather Service Office when the following weather conditions are likely to develop:
 - Damaging winds 58 miles per hour or greater
 - Hail 3/4 inches in diameter or greater
 - Heavy rain
- *Severe thunderstorm warnings* are issued when a potentially damaging thunderstorm has been sighted or indicated by weather radar.
- Straight-line winds in excess of 100 miles per hour may occur.
- Tornadoes and flash flooding can spawn from thunderstorms.
- Lightning hazards exist during thunderstorms, tornadoes and hurricanes.

Steps to Follow After the Watch Has Been Issued

Indoors

- Bring inside any lightweight outdoor objects that could blow away or cause damage or injury.
- Secure windows and doors.
- Listen to the radio or television for the latest storm updates.
- Have a battery-operated radio available in case of a power outage.
 - Note: There are reasonably priced portable radios available that have hand-cranks to generate electrical energy in the event the batteries have low power.
- Do not handle any electrical equipment (including the telephone), as lightning could follow the wire.
- Avoid water faucets and sinks — metal pipes have the capability to transmit electricity.

Outdoors

- Seek shelter in a building or vehicle.
- If no structure is available:
 - In open spaces — take a position low to the ground and crouch with hands on knees (keep in mind the potential for flooding in low-lying areas).
 - In the woods — locate an area protected by a low clump of trees and crouch with hands on knees — never stand underneath a single large tree in the open.
- Do not stand near fences, telephone lines or poles, power lines or poles, towers, isolated trees, clotheslines, metal pipes, rails, or other metallic paths which could carry lightning to you from some distance.
 - Avoid bodies of water
- If you are isolated in a level field and the hair on the back of your neck stands on end, it is an indication that lightning is about to strike — take action immediately!
- Remove all metal objects from your body (rings, watches, keys).
- Get into a crouched position, with your hands on your knees and feet together.
- Do *not* lie flat on the ground!



In the Car

- Dangers
 - Turning on the wipers when it is lightly raining will smear the dirt on the windshield, thus reducing visibility.
 - Roads become slick when the rain mixes with the oil and dirt on the pavement.
 - Hydroplaning
 - Skid potential

- Defensive Driving Measures
 - Drive slowly.
 - Reduce speed on curves and keep at least a two-second traveling distance between the vehicle in front and your vehicle.
 - Start your wipers and use the windshield washer fluid to clean the windshield before pulling out on the road when it has started to rain.
 - Puddles can hide hazards that will puncture the tires, break axles, or flood the engine.
 - Drive slowly through puddles and gently keep pressure on the brakes to protect the brake lining from getting wet.
 - Test the brakes after you have cleared the water.
 - Know what type of brakes the vehicle has and adjust your braking style accordingly.
 - Pump the brakes (do *not* use with antilock braking system).
 - Press the brake pedal until the brakes are about to lock, then let up and press the pedal again.
 - Antilock Braking System (ABS):
 - This system automatically activates when the braking force exceeds the adhesion between the tires and the road surface
 - A rapid pulsation will be felt through the brake pedal
 - Do *not* pump the ABS brakes—this increases the stopping distance

Hail

- Thunderstorms may produce hail as small as a pea or as large as a softball.
- Hailstorms occur more frequently during the late spring and early summer.
 - Seek cover immediately in a hailstorm.

Facts About Tornadoes

- Tornadoes may occur at any time of the day or night, during any month of the year.
- Most tornadoes occur in the months of April, May, June, and July — in the late afternoon and evening hours (3pm–7pm).
- Tornadoes normally travel from the southwest and have an average speed of 30 miles per hour.
- Some tornadoes will take very erratic paths, with 70 mile per hour winds.
- On the average, tornadoes are on the ground less than ten minutes, and travel approximately five miles (although there have been exceptions).
- Tornadoes can have a width ranging from 200–400 yards on the ground.
- The winds of a tornado generally rotate counterclockwise.
- Tornadoes generally occur when the temperatures are between 70°–75° with high relative humidity.
- Destruction associated with tornadoes is the result of the combined action of strong rotary winds, flying debris, and the partial vacuum at the tornado's center.



Tornado Watches and Warnings

- When weather conditions are such that tornadoes are likely to develop, the National Weather Service Office will issue a *tornado watch*.
 - Remind all staff members where the designated tornado shelters are located.
 - Watch the sky and stay tuned to NOAA Weather Radio, commercial radio, or television for information.
 - A *tornado warning* is issued when a tornado has been sighted or indicated by radar.
- Take shelter immediately.
- Turn on a battery-operated radio for weather updates.

Tornado Danger Signs

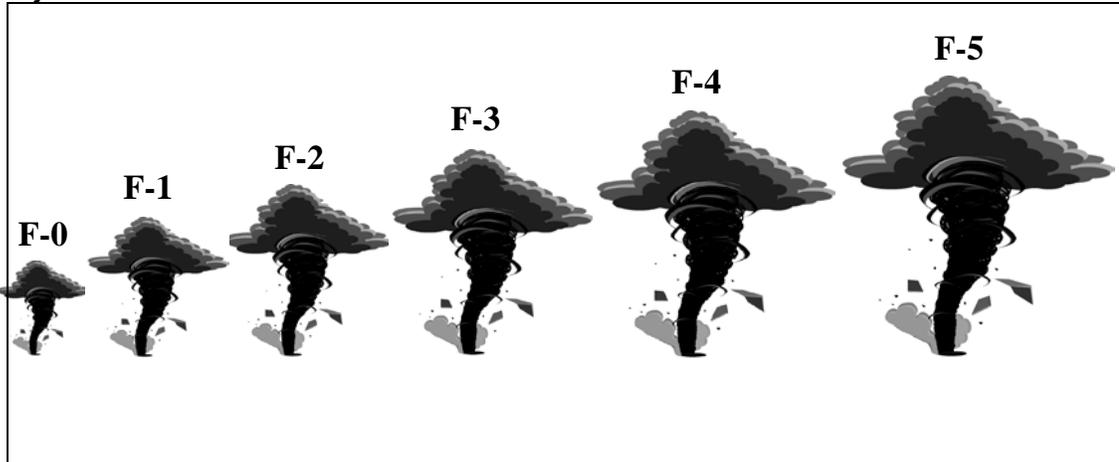
- Large hail is produced by powerful thunderstorms, which may spawn tornadoes.
- Before a tornado hits, the wind may die down and the air may become very still.
- A cloud of debris may precede the approaching tornado funnel.
- A funnel cloud will appear like a visible extension of the cloud base.
- One or more of the clouds may turn greenish in color (because of the hail) and a dark funnel will descend.

What to Do During a Tornado

- Go to the basement or storm cellar.
- If there is not a basement, seek shelter in an interior room (a closet or interior hallway) on the lowest level.
- Stay away from windows and open spaces.
- Leave a mobile home or office immediately and seek a designated shelter nearby.
- Use a ditch, ravine, or culvert if no shelter is available nearby.

If you are in a vehicle, get out and take shelter in a nearby building.

Fujita Tornado Scale



F-0	40 – 72 mph	chimney damage, tree branches broken
F-1	73 – 112 mph	mobile homes pushed off foundation or overturned
F-2	113– 157 mph	considerable damage, mobile homes demolished, trees uprooted
F-3	158– 205 mph	roofs and walls torn down, trains overturned, cars thrown
F-4	206– 260 mph	well-constructed walls leveled
F-5	261– 318 mph	homes lifted off foundation and carried considerable distances, autos thrown as far as 100 meters

Source: FEMA: Preparing for a Disaster, Tornado Fact Sheet <<http://www.fema.gov>>

How to Select a Shelter that Protects Against Strong Winds Survey

- Prior to conducting the initial systematic survey of the building, consult the nearest National Weather Service Office to determine the type of severe weather history for your geographic area.
- Obtain building floor plans and check them against the actual building — *never* assume they match.
- Determine the magnetic north with a compass — record this on each floor of the floor plan.
- *Magnetic* north and the north denoted by the architect may not be the same.
- Never identify a shelter by using *just* a floor plan — always physically check it out.

Exterior Survey

- Look for objects that can be used as potential missiles — such as automobiles, debris, or nearby buildings on the south and west sides of the building.
- Note if there is mechanical equipment on the roof.
- Note changes in roof level.
- Be aware of any electrical service entrances.
- Look for portions of the buildings that are higher than the rest — such as chimneys.
- Look at the building from the south and the west; identify any building entrances and sites of construction.



Interior Locations — Not Designed to Protect Against the Effects of a Tornado

- Predict the parts of the roof most likely to be damaged, such as:
 - Long spans
 - Roof sections with overhangs
 - South and west sides of the building (windward sides)
 - Roofs sections on load bearing walls
- Exterior walls most likely to be damaged or destroyed (ranked from highest to lowest):
 - South wall
 - West wall
 - East wall
 - North wall
- Halls become wind tunnels when exterior doors exit to the following direction (ranked in order of severity):
 - South
 - West
 - East
 - North
- Identify locations where glass may face the storm direction.
 - Glass will blow *in* on the south, west, and sometimes on the east sides of the building.
- Load-bearing walls will collapse, causing the floor above to fall.

Interior Locations to Consider as Shelters

- The lowest floor in the building.
- Interior spaces that do not have walls on the outside of the building.
- Locate several areas within the building that contain short ceiling spans.
- Identify the structural frames — are they steel, concrete, or wood?
- The amount of space a person will need in a shelter depends on the age of the individual and the degree of mobility they have.
- Small children: 4 sq. ft. per person
- Adults: 6 sq. ft. per person
 - Nursing home and/or hospital patients will require more room.

Double-check All Good Locations

- Is the location opposite a doorway or opening into a room that faces a room with a south or west exterior wall? Does the wall contain glass?
- Does the interior location contain glass (such as display cases, transom glass, door sidelights)?
- Does the interior location contain a skylight?
- Does the interior location contain interior doors that swing?
- Is the interior location within the falling radius of a chimney or higher roof areas?

Before Identifying the Location

- Determine what portion of the space is usable — how much permanent equipment or furniture is really located there, thus reducing the available space.
- Is the location accessible to the building's staff during normal working hours, and after hours for any staff member working late? Do only a few employees have keys to this location (because of security for the building, records, equipment, or money)?
- Make sure the first aid and medical supplies are located within one of the identified spaces.
- Would protection increase, and time needed to take shelter decrease, if lower square foot per person ratios were used?



- Test the severe weather plan often and evaluate the results.
- Publish the plan and distribute it to the building staff.
- Post the shelter area locations in the building.
- Identify and provide National Weather Service training to building “spotters.”
- Establish a clear warning mechanism for the building.
- Avoid taking paths from relatively safe locations to identified “shelters” through less protected areas.

Floods and Flash Floods

Flooding may be caused by slow-moving thunderstorms or by thunderstorms repeatedly moving over the same areas.

Before a Flood Occurs

- Know the flood warning signs and your community alert signals.
- Assemble a flash flood disaster supply kit that includes:
 - Flashlight and extra batteries
 - Portable battery-operated radio and extra batteries
 - First aid kit
 - Emergency food and water
 - Non-electric can opener

During a Flood Watch

- Listen to a battery-operated radio for storm information.
- Know how to turn off all utilities at the main switch.
- Be prepared to evacuate.
- In a car:
 - If you come to a flooded area, turn around and go another way.
 - If your car stalls, abandon it immediately and move to higher ground.

After a Flood Watch

- Inspect foundations for cracks or other damage.
- Stay out of the building if flood water remains around the building.
- If it is necessary to enter the building, *use extreme caution*.
 - Wear sturdy shoes and use battery-powered lanterns or flashlights.
 - Watch out for fire, structural, and electrical hazards.
 - Avoid coming in contact with floodwater – wash your hands if they get wet because water is going to be contaminated.

Note: Please refer to the Federal Emergency Management Agency website for additional information <http://www.fema.gov/> and the National Oceanic and Atmospheric Administration <http://www.noaa.gov/>.