

Winter Storms - What Are Winter Storms, and What Causes Them?

A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. People can become trapped at home, without utilities or other services. Heavy snowfall and blizzards can trap motorists in their cars. Attempting to walk for help in a blizzard can be a deadly decision.

Winter storms can make driving and walking extremely hazardous. **The aftermath of a winter storm can have an impact on a community or region for days, weeks, or even months.** Storm effects such as extremely cold temperatures and snow accumulation, and sometimes coastal flooding, can cause hazardous conditions and hidden problems for people in the affected area.

What Are Winter Storms, and What Causes Them?

A winter storm can range from a moderate snow over a few hours to blizzard conditions with blinding wind-driven snow that lasts several days. Some winter storms may be large enough to affect several states, while others may affect only a single community. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow, which can severely reduce visibility.

Winter storms can be defined differently in various parts of the country. Heavy snow in the south can be a dusting in the mountains. Check with your local emergency management office, National Weather Service (NWS) office, or [local American Red Cross](#) for terms and definitions specific to your area. **Sleet** is raindrops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects; however, it can accumulate like snow and cause a hazard to motorists. **Freezing rain** is rain that falls onto a surface with a temperature below freezing; this causes it to freeze to surfaces, such as trees, cars, and roads, forming a glaze of ice. Even small accumulations of ice can cause a significant hazard. An **ice storm** occurs when freezing rain falls and freezes immediately on impact; communications and power can be disrupted for days, and even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Learn about winter storm risk in your area. Contact your local emergency management office, National Weather Service office, or American Red Cross chapter for more information.

Awareness Information

Know what winter storm and blizzard WATCHES and WARNINGS mean.

- [A National Weather Service \(NWS\) WATCH](#) is a message indicating that conditions favor the occurrence of a certain type of hazardous weather. For example, a severe thunderstorm watch means that a severe thunderstorm is expected in the next six hours or so within an area approximately 120 to 150 miles wide and 300 to 400 miles long (36,000 to 60,000 square miles). The NWS Storm Prediction Center issues such watches. Local NWS forecast offices issue other watches (flash flood, winter weather, etc.) 12 to 36 hours in advance of a possible hazardous- weather or flooding event. Each local forecast office usually covers a state or a portion of a state.
- **An NWS WARNING** indicates that a hazardous event is occurring or is imminent in about 30 minutes to an hour. Local NWS forecast offices issue warnings on a county-by-county basis.
- **A winter storm WATCH** means a winter storm is possible in your area.
- **A winter storm WARNING** means a winter storm is occurring, or will soon occur, in your area.
- **A blizzard WARNING** means sustained winds or frequent gusts to 35 miles per hour or greater and considerable falling or blowing snow (reducing visibility to less than a quarter mile) are expected to prevail for a period of three hours or longer.

Winter storms are considered deceptive killers because most deaths are indirectly related to the storm.

The leading cause of death during winter storms is from automobile or other transportation accidents. Exhaustion and heart attacks caused by overexertion are the two most likely causes of winter storm-related deaths. **Elderly people account for the largest percentage of hypothermia victims.** Many older Americans literally "freeze to death" in their own homes after being exposed to dangerously cold indoor temperatures, **or are asphyxiated because of improper use of fuels such as charcoal briquettes, which produce carbon monoxide.**

House fires occur more frequently in the winter due to lack of proper safety precautions when using alternate heating sources (**unattended fires, disposal of ashes too soon, improperly placed space heaters, etc.**). Fire during winter storms presents a great danger because water supplies may freeze and it may be difficult for firefighting equipment to get to the fire.

Plan for a Winter Storm

Develop a Family Disaster Plan. Please see the ["Family Disaster Plan"](#) section for general family planning information. Develop a winter storm-specific plan. **Learn about your area's winter storm risk.** Different areas have different risks associated with winter storms. Contact your local Red Cross chapter, emergency management office, or local National Weather Service office about your area's winter storm risk.

If you are at risk from winter storms:

- **Understand the hazards of wind chill, which combines the cooling effect of wind and cold temperatures on exposed skin.** As the wind increases, heat is carried away from a person's body at an accelerated rate, driving down the body temperature. "Wind chill" is a calculation of how cold it feels when the effects of wind speed and temperature are combined. A strong wind combined with a temperature of just below freezing can have the same effect as a still air temperature about 35 degrees colder.
- **Service snow removal equipment before winter storm season.** Equipment should be available for use if needed. Maintain it in good working order.
- **Keep your car's gas tank full for emergency use and to keep the fuel line from freezing.**
- **Get training.** Take an American Red Cross first aid course to learn how to treat exposure to the cold, frostbite, and hypothermia.
- **Discuss with your family what to do if a winter storm WATCH or WARNING is issued.** Designate one household member as the winter storm preparedness leader. Have him or her discuss what to do if a winter storm watch or warning is issued. Have another household member state what he or she would do if caught outside or in a vehicle during a winter storm. Everyone should know what to do in case all family members are not together. Discussing winter storms ahead of time helps reduce fear and lets everyone know how to respond during a winter storm.

Assemble a Disaster Supplies Kit

Please see the section ["Disaster Supplies Kit"](#) for general supplies kit information. Winter Storm-specific supplies should include the following:

- **A warm coat, gloves or mittens, hat and water-resistant boots for each member of the family.**
- **Extra blankets and warm clothing.**
- **Non clumping kitty litter. Kitty litter will generate temporary traction. Rock salt will melt ice on walkways but can damage vegetation and concrete. Other, less damaging, ice melting products are available from building supply stores.**
- **Disaster Supplies Kit basics.**

What to Tell Children

- **The best way to stay safe in a snowstorm is to stay inside.** Long periods of exposure to severe cold increases the risk of frostbite or hypothermia. Also, it is easy to become disoriented in blowing snow.
- **If you go outside to play after a snowstorm, dress in many layers and wear a hat and mittens.** Many layers of thin clothing are warmer than single layers of thick clothing. One of the best ways to stay warm is to wear a hat; most body heat is lost through the top of the head. Keep hands and feet warm too. Mittens are warmer than gloves. Covering the mouth with a scarf protects lungs from extremely cold air.

- **Come inside often for warm-up breaks.** Long periods of exposure severe cold increases the risk of frostbite or hypothermia.
- **If you start to shiver a lot or get very tired, or if your nose, fingers, toes, or earlobes start to feel numb or turn very pale, come inside right away and tell an adult.** These are signs of hypothermia and frostbite. If you experience these symptoms, you will need immediate attention to prevent further risk.

How to Protect Your Property

- **Make sure your home is properly insulated. If necessary, insulate walls and attic.** This will help you to conserve electricity and reduce your home's power demands for heat. Caulk and weather-strip doors and windowsills to keep cold air out, allowing the inside temperature to stay warmer longer.
- **Install storm windows or cover windows with plastic from the inside.** This will provide an extra layer of insulation, keeping more cold air out.
- **To keep pipes from freezing:**
 - Wrap pipes in insulation or layers of old newspapers.
 - Cover the newspapers with plastic to keep out moisture.
 - Let faucets drip a little to avoid freezing.
 - Know how to shut off water valves.
- **If the pipes freeze, remove any insulation or layers of newspapers and wrap pipes in rags. Completely open all faucets and pour hot water over the pipes, starting where they were most exposed to the cold (or where the cold was most likely to penetrate).** A hand-held hair dryer, used with caution to prevent overheating, also works well.
- **Consider storing sufficient heating fuel.** Regular fuel sources may be cut off. Be cautious of fire hazards when storing any type of fuel.
- Before winter, be sure you **install and check smoke alarms.**
- **Consider keeping safe emergency heating equipment:**
 - Fireplace with ample supply of wood.
 - Small, well-vented wood, coal, or camp stove with fuel.
 - Portable space heater or kerosene heater. **Check with your local fire department on the legality of using kerosene heaters in your community.** Use only the correct fuel for your unit and follow the manufacturer's instructions. Refuel outdoors only, and only when cool. **Keep your kerosene heater at least three feet away from furniture and other flammable objects.**
- When using alternative heat from a fireplace, wood stove, space heater, etc., **use fire safeguards and ventilate properly.** Fire hazard is greatly increased in the winter because alternate heating sources are used without following proper safety precautions.
- **Install snow fences in rural areas to reduce drifting in roads and paths, which could block access to homes, barns, and animals' feed and water.**
- **If you live in a flood-prone area, consider purchasing flood insurance to cover possible flood damage that may occur during the spring thaw.** Homeowners' policies do not cover damage from floods. Ask your insurance agent about the National Flood Insurance Program if you are at risk.

Media and Community Ideas

- **Sponsor a "Winter Weather Awareness Day" or week just before winter storm season.** This is a good way to get emergency management officials and local Red Cross representatives involved.
- **Publish a special section in your local newspaper with emergency information about winter storms.** Place special emphasis on what people should do if they are caught out in the open or in a vehicle.
- **Inform your community about the different National Weather Service announcements** - winter storm watch, winter storm warning, ice storm warning, heavy snow warning, blizzard warning, severe blizzard warning, and high wind warning.
- **Conduct a series of presentations at the beginning of the winter storm season.** Include information on alternative heat sources and home insulation.
- **Interview local physicians about the dangers of hypothermia and other winter health conditions.** Include discussions of exhaustion and heart attacks caused by overexertion.
- **Advise people of the dangers of winter driving,** and warn them driving in winter storms can be a risk to their lives. Produce a series of announcements on what to do if you are stuck in your car during a blizzard.

What to Do Before a Winter Storm

- **Use a NOAA Weather Radio with a tone-alert feature to keep you informed of watches and warnings issued in your area.** The tone alert feature will automatically alert you when a watch or warning is issued.
- **Contact your local emergency management office or American Red Cross for information on designated public shelters in case you lose power or heat.**

What to Do During a Winter Storm WATCH

- **Listen to a NOAA Weather Radio, or local radio or television stations for updated information.** Local authorities will provide you with the best information for your particular situation.
- **Be aware of changing weather conditions.** Severe weather can happen quickly. Temperatures may drop rapidly, winds may increase or snow may fall at heavier rates. What is happening where you are may not agree with local forecasts.
- **Move animals to sheltered areas.** Have a water supply available. Most animal deaths in winter storms are from dehydration.
- **Avoid unnecessary travel.** Your safest place during a winter storm is indoors. About 70 percent of winter deaths related to ice and snow occur in automobiles.

What to Do During a Winter Storm WARNING or a Blizzard WARNING

- **Stay indoors and dress warmly during the storm.** Wearing layers of loose-fitting, lightweight, warm clothing will keep you warmer than one bulky sweater. Remove layers to avoid overheating, perspiration and subsequent chill.
- **Listen to a battery-powered radio or television for updated emergency information.** If the power goes out, you will still have access to important information.
- **Eat regularly.** Food provides the body with energy for producing its own heat.
- **Keep the body replenished with fluids to prevent dehydration.** Drink liquids such as warm broth or juices. Avoid caffeine and alcohol. Caffeine, a stimulant, accelerates the symptoms of hypothermia. Alcohol, such as brandy, is a depressant and hastens the effects of cold on the body. Alcohol also slows circulation and can make you less aware of the effects of cold. Both caffeine and alcohol can cause dehydration.
- **Conserve fuel.** Winter storms can last for several days. Great demand may be placed on electric, gas, and other fuel distribution systems (fuel oil, propane, etc.). Suppliers of propane and fuel oil may not be able to replenish depleted supplies during severe weather. Electric and gas services may be temporarily disrupted when many people demand large amounts at the same time. Lower the thermostat to 65°F during the day and 55°F at night. Close off unused rooms, and stuff towels or rags in cracks under doors. Cover windows at night.

If you must go outside, protect yourself from winter storm hazards

- **Wear layered clothing, mittens or gloves, and a hat.** Layering clothes will keep you warmer than a single heavy coat. Outer garments should be tightly woven and water repellent. Mittens or gloves and a hat will prevent loss of body heat. Mittens are warmer than gloves because fingers maintain more warmth when they touch each other. Half of your body heat loss is from the head.
- **Cover your mouth to protect your lungs from extremely cold air.** Avoid taking deep breaths; minimize talking.
- **Watch for signs of hypothermia and frostbite.** Frostbite is a severe reaction to cold exposure that can cause permanent harm to people. A loss of feeling and a white or pale appearance in fingers, toes, nose, or earlobes are symptoms of frostbite. Hypothermia is a condition brought on when the body temperature drops to less than 95°F. Symptoms of hypothermia include uncontrollable shivering, slow speech, memory lapses, frequent stumbling, drowsiness, and exhaustion. Hypothermia is not always fatal, but for those who survive there are likely to be lasting kidney, liver, and pancreas problems.

- **If frostbite or hypothermia is suspected,** begin warming the person slowly and seek immediate medical assistance. Warm the person's trunk first. Using your own body heat will help. Arms and legs should be warmed last because stimulation of the limbs can drive cold blood toward the heart and lead to heart failure. Put the person in dry clothing and wrap their entire body in a blanket. Never give frostbite or hypothermia victim alcohol or something with caffeine in it, like coffee or tea. Caffeine, a stimulant, can cause the heart to beat faster and hasten the effect the cold has on the body. Alcohol, a depressant, can slow the heart and also hasten the ill effects of the cold.
- **Keep dry.** Change wet clothing frequently to prevent a loss of body heat. Wet clothing loses much of its insulating value and transmits heat rapidly away from the body.
- **Stretch before you go out.** If you go out to shovel snow, do a few stretching exercises to warm up your body. This will reduce your chances of muscle injury.
- **Avoid overexertion, such as shoveling heavy snow, pushing a car or walking in deep snow.** The strain from the cold and the hard labor may cause a heart attack. Sweating could lead to a chill and hypothermia.
- **Walk carefully on snowy, icy sidewalks.** Slips and falls occur frequently in winter weather, resulting in painful and sometimes disabling injury.

If you must go out during a winter storm, use public transportation if possible. About 70 percent of winter deaths related to ice and snow occur in automobiles.

Winter Driving

- **Have your car(s) winterized before the winter storm season.** Keeping your car(s) in good condition will decrease your chance of being stranded in cold weather. Have a mechanic check your battery, antifreeze, wipers and windshield washer fluid, ignition system, thermostat, lights, flashing hazard lights, exhaust system, heater, brakes, defroster, and oil level. If necessary, replace existing oil with a winter grade oil. Install good winter tires. Make sure the tires have adequate tread. All-weather radials are usually adequate for most winter conditions. However, some jurisdictions require that to drive on their roads, vehicles must be equipped with chains or snow tires with studs.
- **If you have a cell phone or two-way radio available for your use, keep the battery charged and keep it with you whenever traveling in winter weather.** If you should become stranded, you will be able to call for help, advising rescuers of your location.
- **Keep a windshield scraper and small broom in your car for ice and snow removal.**

- **Put together a separate disaster supplies kit for the trunk of each car used by members of your household.** You should also bring a thermos of warm broth if you are on the road during a winter storm. If you should become stranded during a winter storm, these items will make you more comfortable until the storm passes. The kit should include the following:
 - Several blankets or sleeping bags.
 - Rain gear and extra sets of dry clothing, mittens, socks, and a wool cap.
 - Extra newspapers for insulation.
 - Plastic bags for sanitation.
 - Canned fruit, nuts, and high energy "munchies." Non-electric can opener if necessary.
 - Several bottles of water. Eating snow will lower your body temperature. If necessary, melt it first.
 - Cans of broth or soup.
 - A small shovel, a pocket knife, and small tools, such as pliers, a wrench, and screwdriver.
 - A small sack of sand for generating traction under wheels, a set of tire chains or traction mats.
 - Jumper cables.
 - A first aid kit and necessary medications.
 - A flashlight with extra batteries.
 - A candle in a metal can or other fireproof container. While candles are generally not recommended in disaster situations, having one in your car can be a source of heat and light if you are stranded.
 - Matches.
 - Cards, games, and puzzles.
 - A brightly colored cloth to tie to the antenna.
- **Keep your car's gas tank full for emergency use and to keep the fuel line from freezing.**
- **Plan long trips carefully.** Traveling during winter weather can be hazardous. Listen to the radio or call the state highway patrol for the latest road conditions. Plan to travel during daylight and, if possible, take at least one other person.
- **Let someone know your destination, your route, and when you expect to arrive.** If your car gets stuck along the way, help can be sent along your predetermined route.
- **Be aware of sleet, freezing rain, freezing drizzle, and dense fog, which can make driving very hazardous.** The leading cause of death during winter storms is from automobile or other transportation accidents. During winter weather conditions, multiple vehicle accidents are more likely to occur, resulting in injury and death. Avoid driving during sleet, freezing rain, freezing drizzle, and dense fog - these serious conditions are often underestimated.

If you do get stuck:

- **Stay with your vehicle.** Do not leave the vehicle to search for assistance unless help is visible within 100 yards. Disorientation and confusion come very quickly in blowing snow. Avoid traveling during winter storms. If you must travel and do become stranded, it is better to stay in the vehicle and wait for help.
- **Display a trouble sign to indicate you need help.** Hang a brightly colored cloth (preferably red) on the radio antenna and raise the hood (after snow stops falling).
- **Occasionally run engine to keep warm.** Carbon monoxide can build up inside a standing vehicle while the engine is running, even if the exhaust pipe is clear. Experience has shown that running the heater for 10 minutes every hour is enough to keep occupants warm and will reduce the risk of carbon monoxide poisoning and conserve fuel. Turn on the engine for about 10 minutes each hour (or 5 minutes every half hour). Use the heater while the engine is running. Keep the exhaust pipe clear of snow and slightly open a downwind window for ventilation.
- **Leave the overhead light on when the engine is running so that you can be seen.**
- **Do minor exercises to keep up circulation.** Clap hands and move arms and legs occasionally. Try not to stay in one position for too long.
- **If more than one person is in the car, take turns sleeping.** One of the first signs of hypothermia is sleepiness. If you are not awakened periodically to increase body temperature and circulation, you can freeze to death.
- **Huddle together for warmth.**
- **Use newspapers, maps, and even the removable car mats for added insulation.** Layering items will help trap more body heat.
- **Keep a window that is away from the blowing wind slightly open to let in air.**
- **Watch for signs of frostbite and hypothermia.** Severe cold can cause numbness, making you unaware of possible danger. Keep fingers and toes moving for circulation, huddle together, and drink warm broth to reduce risk of further injury.
- **Drink fluids to avoid dehydration.** Bulky winter clothing can cause you to sweat, but cold dry air will help the sweat evaporate, making you unaware of possible dehydration. When individuals are dehydrated, they are more susceptible to the effects of cold and heart attacks. Melt snow before using it for drinking water. Eating snow lowers your body temperature, increasing risk from hypothermia.
- **Avoid overexertion.** Cold weather puts an added strain on the heart. Unaccustomed exercise such as shoveling snow or pushing a car can bring on a heart attack or make other medical conditions worse.

What to Do After a Winter Storm

- **Continue listening to local radio or television stations or a NOAA Weather Radio for updated information and instructions.** Access may be limited to some parts of the community, or roads may be blocked.
- **Help a neighbor who may require special assistance - infants, elderly people, and people with disabilities.** Elderly people and people with disabilities may require additional assistance. People who care for them or who have large families may need additional assistance in emergency situations.
- **Avoid driving and other travel until conditions have improved.** Roads may be blocked by snow or emergency vehicles.
- **Avoid overexertion.** Heart attacks from shoveling heavy snow are a leading cause of deaths during winter.
- **Follow forecasts and be prepared when venturing outside.** Major winter storms are often followed by even colder conditions.