Why talk about winter storms?
Each year, exposure to cold, vehicle accidents caused by wintry roads, and fires caused by the improper use of heaters injure and kill hundreds of people in the United States. Add these to other winter weather hazards and you have a significant threat to human health and safety.

A major winter storm can last for several days and can include high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. People can become marooned at home without utilities or other services. Heavy snowfall and blizzards can trap motorists in their vehicles and make walking to find help a deadly effort. Storm effects, such as severely cold temperatures, and heavy snow, can cause hazardous conditions and hidden problems. The aftermath of a winter storm can impact a community or region for days, weeks, or even months.

What damages can severe cold cause?
Severe cold can cause much harm; for example, it can damage crops and other vegetation and freeze pipes causing them to burst. Unusually cold temperatures are especially dangerous in areas not accustomed to them because residents are generally unprepared and may not realize the dangers severe cold present.

Exposure to cold can cause frostbite and life-threatening hypothermia.

Frostbite is the freezing of body tissue, and it most frequently affects fingers, toes, earlobes, and the tip of the nose. Frostbite damage ranges from superficial and reversible to deep and permanent. Frostbite can result in tissue loss and even loss of digits and limbs.

Hypothermia begins to occur when a person's body temperature drops to 3° below its normal temperature. On average, a person would begin to suffer hypothermia if his or her temperature dropped to 96° F (35.6° C). Cold temperatures can cause hypothermia in anyone who is not adequately clothed or sheltered in a place with adequate heat. Hypothermia can kill people, and those who survive hypothermia are likely to suffer lasting ill effects. Infants and elderly people are the most susceptible. Elderly people account for the largest percentage of hypothermia victims, many of whom freeze to death in their own homes. Most of these victims are alone and their heating systems are working improperly or not at all. People who are taking certain medications, who have certain medical conditions, or who have been drinking alcohol also are at increased risk for hypothermia.

How can I protect myself in winter storms?
Winter storms are considered deceptive killers because most winter storm deaths are related only indirectly to the storms. Overall, most winter storm deaths result from vehicle or other transportation accidents caused by ice and snow. You should avoid driving when conditions include sleet, freezing rain or drizzle, snow, or dense fog. These are serious conditions that are often underestimated, and they make driving—and even walking outside—very hazardous.

Exhaustion and heart attacks brought on by overexertion are two other common causes of deaths related to winter storms. Cold temperatures compound the strain of physical labor on a person's body. Tasks such as shoveling snow, pushing a vehicle, or even walking in heavy snow can cause a heart attack, particularly in people who are older or not used to high levels of physical activity. Before tackling strenuous tasks in cold temperatures, you should carefully consider your physical condition, the weather factors, and the nature of the task. If you are not sure how much you can safely do, you should avoid all heavy work in cold temperatures**.**

You should also dress to protect yourself from frostbite and hypothermia. When outside in cold temperatures, wear warm, loose-fitting, lightweight clothing in several layers. If you get too warm, you can remove one or more layers and if you get too cold you can add layers, so you can avoid the sweat-chills cycle. Your outer garments should be tightly woven, water repellent, and have a hood. Wear a hat. Half of your body heat can be lost from your head. Mittens, snug at the wrist, are better than gloves. Try to stay dry. If it is extremely cold, cover your mouth to protect your lungs.

If, during severe cold, your home loses power or heat, go to a designated public shelter. For information on designated shelters, contact your local emergency management office or American Red Cross chapter.

Home Safety

Home fires occur more frequently in the winter because people do not take the proper safety precautions when using alternative heating sources. Be sure all heating sources are installed according to local codes and permit requirements. To protect yourself, be sure that you never leave a fire unattended, that you dispose of ashes properly and only after they are completely cold, and that you operate and position space heaters only according to the manufacturer's instructions. Use only space heaters approved by an independent testing laboratory. Fire during winter storms is exceptionally dangerous because conditions may make it difficult for firefighters to get to the fire, and the water needed to fight the fire may be frozen.

In addition, every winter people are killed by carbon monoxide (CO) emitted by fuels they are using to heat their homes. Never operate unvented fuel-burning appliances in any closed room or where people are sleeping. CO poisoning from fuel-burning appliances kills people each year in the United States. Never use gas appliances such as ranges, ovens, or clothes dryers to heat your home. Do not use charcoal grills indoors or in attached garages.

Never use a portable generator in an enclosed or partially enclosed space, including in your home, or in a garage, basement, crawl space, or other partially enclosed area, even with ventilation. Opening doors and windows or using fans will not prevent CO buildup. Locate a portable generator outdoors and away from doors, windows, and vents that could allow CO to come indoors. Portable generators can produce high levels of deadly CO very quickly. In addition to producing toxic engine exhaust, portable generators can cause electric shock or electrocution and fire.

What is the best source of information about winter weather?
Local radio or television stations or NOAA Weather Radio are the best sources of information about winter weather conditions.

NOAA Weather Radio is the prime alerting and critical information delivery system of the National Weather Service (NWS). NOAA Weather Radio broadcasts warnings, watches, forecasts, and other hazard information 24 hours a day over more than 650 stations in the 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific territories.

The NWS encourages people to buy a weather radio equipped with the Specific Area Message Encoder (SAME) feature. This feature automatically alerts you when important information about winter weather and other hazards is issued for your area. Information on NOAA Weather Radio is available from your local NWS office or at www.nws.noaa.gov/nwr.

Outlook, Watch, Warning, Advisory
A **Winter Storm OUTLOOK** means winter storm conditions are possible in the next two to five days. Stay tuned to local media for updates.

A Winter Storm WATCH means winter storm conditions are possible within the next 36 to 48 hours. People in a watch area should review their winter storm plans (Family Disaster Plan, Disaster Supplies Kit) and keep informed about weather conditions.

A **Winter Storm WARNING** means life-threatening, severe winter conditions have begun or will begin within 24 hours. People in a warning area should take precautions **immediately.**

A **Blizzard WARNING** means sustained winds or frequent gusts of 35 miles (56 kilometers) per hour or greater and considerable falling or blowing snow that reduces visibility to less than a quarter mile (0.4 kilometer) are expected to prevail for a period of three hours or longer. People in a warning area should take precautions **immediately.**

A **Winter Weather ADVISORY** means winter weather conditions are expected to cause significant inconveniences and may be hazardous. If you are cautious, these situations should not be life threatening.

Outlooks, watches, warnings, and advisories are issued by the National Weather Service (NWS) and broadcast on NOAA Weather Radio and on local radio and television stations

If you live in an area where severe winter weather is possible, you should:

Talk with members of your household about what to do if a winter storm watch or warning is issued. Discussing winter storms ahead of time helps reduce fear and helps everyone know how to respond during a winter storm.

• **Install smoke alarms.** For new homes, interconnected smoke alarms are required on every level of the home, outside each sleeping area and inside each bedroom. Although this approach is ideal for all homes, as a minimum, existing homes should have smoke alarms on every level and outside each sleeping area. Test and maintain them according to the manufacturer's instructions. (See Smoke Alarms.)

• **Install carbon monoxide (CO) alarms following the manufacturer's instructions. It is especially important to have one near sleeping areas.** Test and maintain them according to the manufacturer's instructions. (See Carbon Monoxide Alarms.)

• **Keep your vehicle's gas tank full** so you can leave right away in an emergency and to keep the fuel line from freezing.

• **Keep a supply of non-clumping kitty litter** to make walkways and steps less slippery. Kitty litter temporarily improves traction on an icy surface. Rock salt melts ice on walkways, but it can damage vegetation and concrete. You may find other, less damaging, ice-melting products at building supplies stores.

• **Keep handy** a warm coat, gloves or mittens, hat, water-resistant boots, and extra blankets and warm clothing for each member of the household.

• **Make sure your home heating sources are installed according to local codes and permit requirements and are clean and in working order.** Many home fires are started by poorly maintained furnaces or stoves, cracked or rusted furnace parts, or chimneys with creosote buildup.

• **Be sure all portable and fixed electric space heaters have been certified by an independent testing laboratory.** Keep blankets, clothing, curtains, furniture, and anything that could get hot and catch fire at least three feet away from all heat sources. Plug heaters directly into the wall socket rather than using an extension cord and unplug them when they are not in use.

• **Use kerosene heaters only if permitted by law in your area.** Refuel kerosene heaters outdoors only after they have cooled. Kerosene has a low flash point. If mistakenly dripped on hot surfaces, it can cause fires. Do not substitute gasoline for kerosene in the heater. Make sure the area is ventilated properly. Follow all of the manufacturer's instructions.

• **Have chimneys and wood stoves inspected annually and cleaned if necessary.** Chimneys and wood stoves build up creosote, which is the residue left behind by burning wood. Creosote is flammable and needs to be professionally removed periodically. Store ashes in a metal container with a tight-fitting lid.

• **Make sure your home is properly insulated.** If necessary, insulate the walls and attic to reduce your home's power demands for heat. Caulk and weather-strip doors and windowsills to keep cold air out.

• **Install storm windows or cover windows with plastic from the inside** to provide an extra layer of insulation to keep cold air out.

• **Protect pipes from freezing by:**
-Wrapping pipes in insulation or layers of newspaper and then covering them with plastic to keep out moisture.
-Letting faucets drip a little.

• **Know how to shut off the main water valve and how to shut off and drain outside faucets.** Outside faucets are often controlled by a valve inside the home. Keep a wrench near the valves.

• **Install heat tape on water pipes.** Put the tape on all exterior water pipes and interior pipes located on outside walls or anywhere else that temperatures could go below freezing. Follow carefully the manufacturer's instructions for installation.

• **If the pipes freeze,** remove any insulation or newspaper and wrap the 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 most likely penetrated. A hand-held hair dryer, used with caution to prevent overheating, also works well.

• **Consider buying emergency heating equipment, such as a wood- or coal-burning stove or an electric or kerosene heater.** If you have a stove, be sure it is properly vented and in good working order and that you dispose of ashes safely. Keep a supply of wood or coal on hand. If you have an electric space heater, either portable or fixed, be sure it is certified by an independent testing laboratory. Plug a heater directly into the wall socket rather than using an extension cord and unplug it when it is not in use. Use a kerosene heater only if permitted by law in your area; check with your local fire department. If you have a kerosene heater, use only the correct fuel for your unit. Properly ventilate the area of use. Refuel the unit outdoors only, and only when the unit is cool. Follow all of the manufacturer's instructions. Keep all heaters at least three feetaway from furniture and other flammable objects.

• **When using fireplaces, stoves, and space heaters, ventilate properly and guard against fire.** Using alternative sources of heat such as these greatly increases your risk for fire and carbon monoxide (CO) poisoning.

• **Consider storing sufficient heating fuel.** Regular fuel sources may be cut off. Be cautious of fire hazards when storing any type of fuel.

• **If you have a fireplace, consider keeping a supply of firewood or coal**. Be sure the fireplace is properly vented and in good working order and that you dispose of ashes safely.

• **Stay indoors and wear warm clothes.** Layers of loose-fitting, lightweight, warm clothing will keep you warmer than a bulky sweater. If you feel too warm, remove layers to avoid sweating; if you feel chilled, add layers.

• **Listen to a local station on battery-powered radio or television or to NOAA Weather Radio for updated emergency 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 juice. 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 (18° C) during the day and to 55° F (13° C) at night. Close off unused rooms, and stuff towels or rags in cracks under the doors. Cover the windows at night.

• **If you must go outside, protect yourself from winter storm hazards:**
-**Wear layered clothing**, **mittens or gloves, and a hat.** Layered clothing 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 the loss of body heat. Mittens are warmer than gloves because your fingers maintain more warmth when they touch each other. Half of your body-heat loss is from your head.

-Cover your mouth to protect your lungs from severely cold air. Avoid taking deep breaths; minimize talking.

-**Watch for signs of hypothermia and frostbite.**

-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 vehicle, 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 injuries.

• **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.

• **Check on relatives, neighbors, and friends, particularly if they are elderly or if they live alone.**

Courtesy of the National Disaster Education Coalition