Wisconsin
Winter Weather Toolkit

Wisconsin
Department of Health Services

Division of Public Health
Bureau of Environmental and Occupational Health
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Acknowledgments

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Introduction

Purpose

The purpose of this winter weather toolkit is to provide information to local governments, health departments, and citizens in Wisconsin about preparing for and responding to winter weather events. The toolkit provides background information, practical guidance and strategies, media releases and talking points, definitions, and useful reference materials on this topic.

The guides in this toolkit may be copied and printed onto local government or health agency letterhead for distribution to residents affected by winter weather. Additional documents may be found in Appendix B: Additional Resources.

Background

Image source: Ready.wi.gov

According to the National Weather Service (NWS), cold temperatures and wind chills cause an average of 28 deaths per year and winter storms cause 39 deaths per year in the United States.[1] Winter weather creates dangerous conditions including icy, snow- and sleet-covered roads; in Wisconsin, these conditions are responsible for an average of 50,000 vehicle accidents and 45 deaths each winter.[2] Although winter is familiar to the residents of Wisconsin, extreme cold, snow, ice, rain and sleet place the entire population at risk; particularly susceptible populations are the elderly, young children, anyone who is socially isolated, and those with low economic status. Therefore, it is imperative that Wisconsin governmental units, citizens, and businesses prepare for the effects of winter weather.

Climate Trends

University of Wisconsin climate scientists have completed studies demonstrating that the state's climate is becoming wetter and more variable. According to the Wisconsin Initiative on Climate Change Impacts (WICCI), a 14% increase in wintertime precipitation occurred statewide from 1950 to 2006. Climate scientists suggest this trend will continue, with wintertime precipitation increasing into the mid-21st century. Trends also indicate that winter temperatures in Wisconsin are warming, increasing the likelihood that winter precipitation occurs as freezing rain rather than snow, making travel conditions more hazardous.[3]

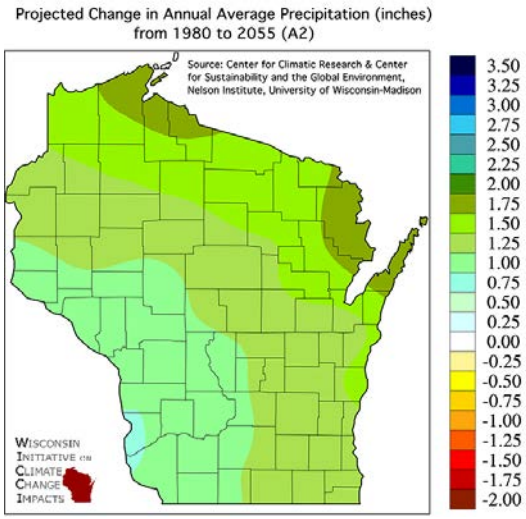


Image Source: WICCI

Health Impacts

The dangers of winter weather require Wisconsin to prepare for freezing temperatures, life-threatening wind chills, and dangerous weather conditions that can cause health impacts including hypothermia, frostbite, trench foot and even death. Emergency planning must consider cold-related needs, such as safe usage of electrical appliances, planning for power outages, prevention of carbon monoxide poisoning, and placement of warming centers. Preparedness efforts must be made in order to maintain the health and safety of Wisconsin residents.

Winter Weather Response and Recovery Guidance

Under the Wisconsin "Home Rule" principle, winter weather preparedness and response are considered local activities. The local or county Emergency Management office, health agency, or police/fire first responders will be the lead agency during a winter weather event. However, when requested, state resources will be provided to assist and support the local response.

Definitions

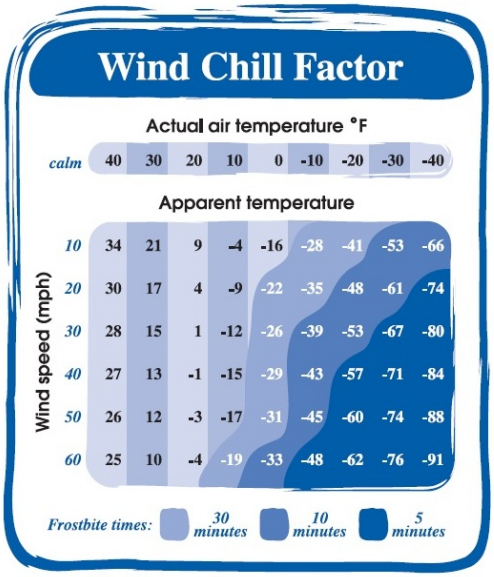
General Terms for all Types of Weather:

- **Outlook:** Conditions are possible in the next 2-5 days.
- **Advisory:** Conditions are expected to cause significant inconveniences and may be hazardous.
- **Watch:** Conditions are possible within the next 36-38 hours.
- **Warning:** Life-threatening severe conditions have begun or will begin within 24 hours.

Winter Weather Event: A winter weather occurrence that affects public safety, transportation, and/or commerce.[4]

Wind Chill: The temperature the body feels, calculated using the actual temperature outdoors and the wind speed. The wind chill is always lower than the actual temperature.

Sleet: Rain that turns to ice pellets before reaching the ground; sleet can cause dangerous, slick outdoor conditions.



National Weather Service (NWS) Wind Chill Chart adapted May 2004 from http://www.nws.noaa.gov/om/windchill/

Freezing Rain: Rain that freezes when it hits the ground; freezing rain can cause dangerous, slick outdoor conditions.

Cold-related Fatality: Death attributed to cold weather events.

Guide 1: Winter Weather Alerts

Advisory Type	Description
Freezing Rain Advisory	Any accumulation of freezing rain is expected in the next 12 to 36 hours (but will remain below ½ inch) for at least 50% of the zone.
Wind Chill Advisory	Wind chill is expected to exceed local wind chill advisory criteria in the next 12 to 36 hours. Wind chill temperatures may reach or exceed -15°F.
Winter Weather Advisory	A winter storm event is expected in the next 12 to 36 hours but will stay below winter weather warning criteria. An advisory is characterized by 4 inches or more of snow in 12 hours or less covering at least 50% of the zone.

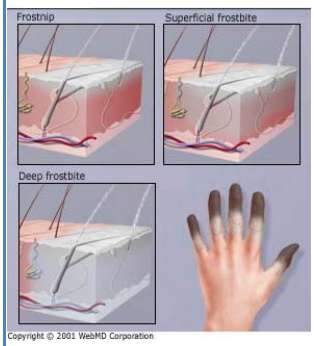
Watch Type	Description
Blizzard Watch	Conditions are favorable for a blizzard event in the next 24 to 72 hours.
Wind Chill Watch	Conditions are favorable for wind chill temperatures to meet or exceed local wind chill warning criteria in the next 24 to 72 hours.
Winter Storm Watch	Conditions are favorable for a winter storm event to meet or exceed local winter storm warning criteria in the next 24 to 72 hours. Storm events can include heavy sleet, snow, ice, and blowing snow.

Warning Type	Description
Blizzard Warning	Blizzard event is imminent or expected in the next 12 to 36 hours. Wind will be greater than or equal to 35 mph, and snow will reduce visibility to ¼ mile for three or more hours.
Ice Storm Warning	Ice storm event is expected in the next 12 to 36 hours. Ice storms are characterized by ½ inch or more of ice covering at least 50% of the zone.
Wind Chill Warning	Wind chill temperatures are expected to meet or exceed local wind chill warning criteria in the next 12 to 36 hours. Temperature may reach or exceed -25°F.
Winter Storm Warning	Winter storm is expected in the next 12 to 36 hours. A warning is characterized by 7 inches or more of snow in 12 hours or less; or 9 inches or more of snow in 24 hours or less covering 50% of the zone.

http://w1.weather.gov/glossary/

Guide 2: Cold-related Health Effects

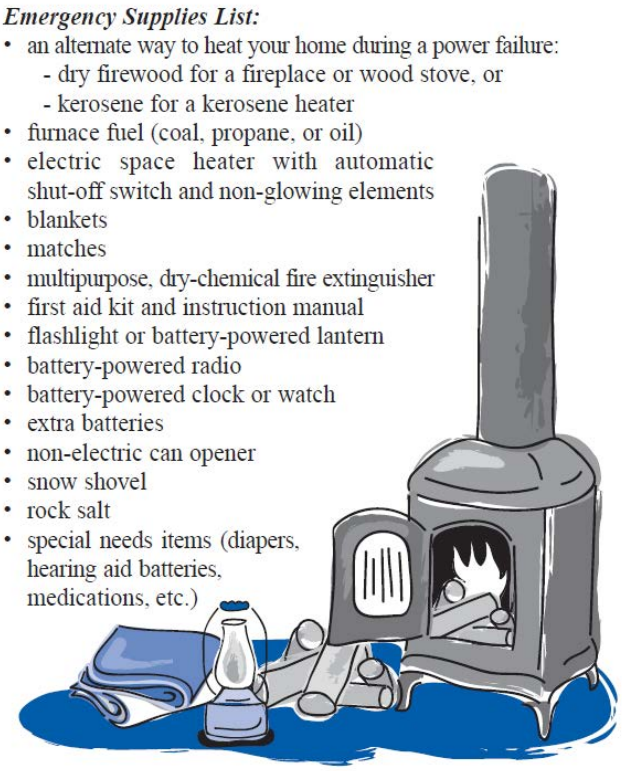
WARNING: The overconsumption of alcohol decreases decision-making capabilities and has been found to increase the likelihood of cold-related health effects.[5]

Medical Condition	Symptom(s)		Causes	Safety Tips
Hypothermia[6]	**Adults:** -Shivering, exhaustion -Confusion -Memory loss -Slurred speech -Drowsiness	**Infants:** -Bright red, cold skin -Very low energy	-Body temperature that is too low	-If the body temperature is below 95°F, seek immediate medical attention. -Move the victim into a warm room. -Remove wet clothing and keep the victim dry. -Warm the center of the body first.
Frostbite[6]  	-Redness or pain -White or grayish-yellow skin area -Numbness		-Freezing of body parts exposed to cold	-Relocate to a warm room. -Do not walk; do not use frostbitten body parts. Seek medical attention. -Warm the area by submerging in warm water or using body heat. -Do not massage or use heating pads, lamps, stoves, or fires to warm the area.
Trench Foot[7]	-Pain, tingling sensation -Swelling -Cold, numbness -Blisters may form after feet are dry		-Feet are wet for an extended period of time	-Clean, dry, and elevate feet. -Warm feet by using warm packs or by soaking in warm water. -Seek medical attention.

Guide 3: Winter Weather Preparation

Prepare your home:

Step 1: Assemble an emergency supply kit.



http://www.bt.cdc.gov/disasters/winter/pdf/extreme-cold-guide.pdf

WARNING: Do not use a gas stove, charcoal or gas grill, or electric generator inside to heat your home as this may cause carbon monoxide poisoning.

Step 2: Stockpile non-perishable food items and a water supply that will last for several days.

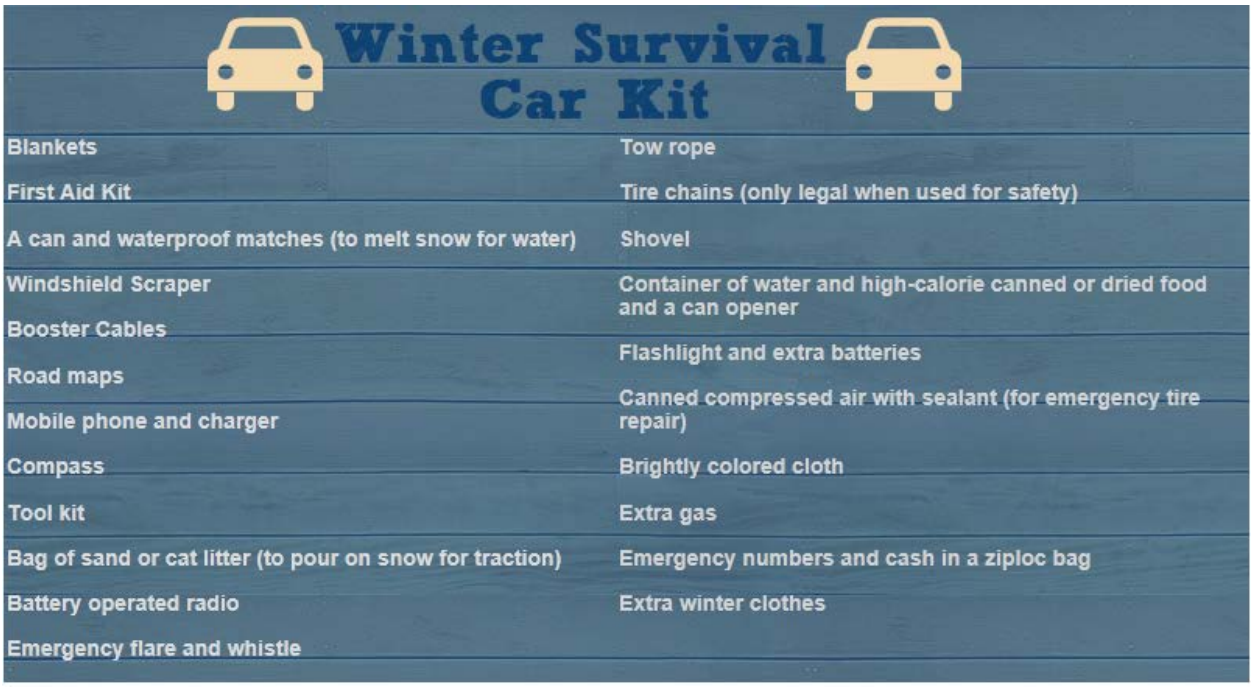
Step 3: Winterize your home by taking the following precautions:

- Install a smoke detector and a battery-operated carbon monoxide detector; before winter begins, test the detectors. Insulate your exterior water lines to prevent freezing pipes; insulate attics and walls; install storm windows and insulated doors.

- Install a thermometer in a frequently visited location and check the indoor temperature regularly.
- Have your chimney, furnace, and other heating utilities inspected by a professional before the winter season begins.

Prepare your car:

Step 1: Assemble an emergency supplies kit and place in the car in a waterproof/plastic tote with lid.



Information Source: CDC

Step 2: Winterize your car by taking the following precautions:

- Have your vehicle regularly serviced following the manufacturer's suggestions.
- Maintain high antifreeze levels and use wintertime windshield wiper fluid. These supplies can be found at your local automotive retail store.
- Replace worn tires.
- If possible, keep your gas tank close to full in order to prevent ice formation.


Be Ready! Winter Weather
Weatherproof your home to protect against the cold.
Install a smoke detector and carbon monoxide detector in your home.
Make sure the batteries are working!
Have your chimney or flue inspected every year.
Insulate walls and attic.
Caulk and weather-strip doors and windows.
Check out more tips on winter weather indoor safety.
Never leave lit candles or other flames unattended.
Bring your pets indoors as temperatures drop!
If power lines are down, call your local utility and emergency services
If power lines fall on your car, warn people not to touch the car or power lines.
Make sure your car is ready for winter travel.
Check antifreeze level and have radiator system serviced.
Replace worn tires and check tire air pressure.
Keep gas tank full to avoid ice in tank and fuel lines.
Make a winter emergency kit to keep in your car.
Prepare yourself for exposure to winter weather.
Dress warmly and limit exposure to the cold to prevent frostbite.
Avoid getting wet to prevent hypothermia.
www.cdc.gov/phpr/infographics.htm

Guide 4: Indoor Safety [8,9]

Indoor Heat Safety

Safely Using Alternative Sources of Heat

Alternative sources of heating produce major risks including fires and carbon monoxide poisoning. When using alternative sources of heat like fireplaces, wood stoves, and space heaters, take the following precautions

WARNING!

Never use electric generators, grills or other gasoline, propane, natural gas or charcoal-burning devices indoors as this may cause carbon monoxide poisoning.

Safety Steps

STEP 1

Install a battery operated carbon monoxide detector and a smoke detector.

Ensure adequate ventilation for a heat source by cracking windows.

STEP 2

Do not plug space heaters into extension cords.

Do not put a space heater on anything that could catch fire. Place it on a noncombustible surface.

STEP 3

Only use the designated fuel for your heat source.

Carbon monoxide is the "silent killer"

Carbon monoxide poisoning occurs when the body is in contact with carbon monoxide, an odorless, colorless gas that is given off by fuel-burning equipment. Carbon monoxide poisoning is life threatening; a carbon monoxide detector is essential for winter weather safety and can be bought at your local home improvement store.

If you suspect a carbon monoxide leak in your house, immediately seek other shelter and call 9-1-1.

Heat

When there is no heat:

Call 9-1-1 or your local law enforcement.

Seek alternative shelter: text SHELTER and your zip code to 43362 for your closest shelter.

Conserve body heat - do not overexert yourself.

Eat well-balanced meals and avoid alcohol or caffeinated beverages.

Dress warmly using hats, mittens, and scarves.

Close off unused rooms and prevent airflow by positioning towels under doors.

Local public health departments can refer to the Partner, Communications, and Alerting (PCA) portal for more information on heating emergencies. https://share.health.wisconsin.gov/ph/pca/default.aspx

FROZEN PIPES

Extremely cold temperatures can damage and freeze pipes. Vulnerable pipes include those found on exterior walls, in unheated rooms, and outside supply lines. Follow these tips to prevent frozen pipes:

If possible, insulate water lines before winter begins.

Keep an emergency water supply that will last for several days.

Keep the temperature in your home constant, night and day.

If you leave for vacation, keep your heat at a minimum of 55° F.

Do not turn faucets completely off - let faucets drip continuously.

Open cabinet doors and inside doors so that pipes are in contact with warm air.

If pipes are frozen, completely open all faucets.

Thaw frozen pipes with a hairdryer or by pouring hot water on the pipes. Do NOT thaw pipes with open flames.

If a pipe bursts, close your main water valve immediately.

Guide 5: Power Outages

What should I do during a power outage? 10

KEEP FOOD AS SAFE AS POSSIBLE

	Keep refrigerator and freezer doors closed as much as possible. Eat perishable foods from refrigerator first.
	Next, use food from freezer.
	Use your non-perishable foods after using food from the refrigerator and freezer.
	If it looks like the power outage will last more than a day, prepare a cooler with ice for your freezer items.
	Keep food in a dry, cool spot and keep it covered at all times.

ELECTRICAL EQUIPMENT

	Turn off and unplug all unnecessary electrical equipment.
	Turn off or disconnect any appliances, equipment, or electronics you were using when the power went out. When power comes back on, surges or spikes can damage equipment.
	Leave one light on so you'll know when the power comes back on.
	Eliminate unnecessary travel, especially by car. Travel lights will be out and roads will be congested.

USING GENERATORS SAFELY

	When using a portable generator, connect the equipment you want to power directly to the outlets on the generator. Do not connect a portable generator to a home's electrical system.
	If you are considering getting a generator, get advice from a professional, such as an electrician. Make sure that the generator you purchase is rated for the power that you think you will need.
	Never use a generator, grill, camp stove, or other gasoline propane, natural gas, or charcoal-burning devices inside a home, garage, basement, crawlspace or any partially enclosed area. Locate unit away from doors, windows, and vents that could allow carbon monoxide to come indoors.
	Install carbon monoxide alarms in central locations in your home.
	If the carbon monoxide alarm sounds, move quickly to a fresh air location outdoors or by an open window or door.

Guide 6: Populations Vulnerable in Winter Weather: What You Can Do to Help

The elderly: Frail older adults may live alone. The elderly have slower metabolism and often do not create as much body heat as middle-aged adults. Also, the elderly do not sense air temperature as well as middle-aged adults; therefore, temperature drops in their homes can go unnoticed. For these reasons, it is necessary to check on elderly neighbors and family often in order to ensure their heating source is working and they maintain a healthy body temperature.

The young: Infants cannot produce enough body heat by shivering and lose heat easier than adults.

- Make sure that infants sleep in a heated room.
- Dress infants in warm clothing.
- In an emergency, your body heat can be used to warm infants.
- Rolling onto infants during sleep is a large risk; take precautions to prevent this.

Image Source: Zimbio

The socially isolated: Check often on neighbors and family that live in an isolated setting. If the heat supply stops, this population will be at extreme risk for indoor and outdoor hazards.

Low economic status: Wisconsin residents that live at or below 60 percent of the state median income may qualify for the Wisconsin Home Energy Assistance Program. Homeless populations are particularly at risk during winter storms and extreme cold. Warming centers are available throughout Wisconsin.

Guide 7: Outdoor Safety

STAY INDOORS!

What to wear: Staying dry is essential to safety during winter weather. If you must work outside, dress properly, change into dry clothes often, and if you get wet, change into dry clothes when you return indoors. Winter clothing suggestions include:

- Scarf, mittens, and a hat
- Several layers of loose-fitting clothing that cover legs and arms
- Outerwear that is wind and water resistant
- Water resistant boots

Avoid exertion: Do not overexert yourself outdoors during extreme cold or a winter storm. Sweating will cool your body. If you are shoveling snow or doing other outdoor chores, take frequent breaks indoors and work slowly. Do not shovel if you have heart disease or high blood pressure, as the cold puts more stress on your cardiovascular system.

Shivering is the first sign it is time to return indoors. Listen to your body and go inside.

Image Source: Back and Neck, CA

Guide 8: Travel in a Winter Storm

Driving in a Winter Storm:

Image Source: Salon

- Travel only if necessary.
- Always dress as if you were going to get stranded. Wear a hat, mittens, scarf, winter coat, and boots.
- Keep an emergency kit inside your car at all times.
- Call 511 for traffic updates and highway closures due to winter weather.
- Avoid driving at night and avoid driving alone.
- If possible, drive only on main highways and avoid country roads.
- Avoid driving in low-visibility conditions and on icy or snow-covered roads, bridges, and overpasses.
- Notify a friend or family member of your destination and expected time of arrival and return.
- If conditions become too hazardous, pull off the road and turn your hazard lights on. Notify emergency services of your location.

What to Do When Stranded:

Image Source: Winter Storm Tips, PHH Insurance

- Stay inside your vehicle, turn your hazard lights on, tie a bright cloth to your antenna, and notify emergency services of your location.
- Remove snow from around your tail pipe to prevent carbon monoxide buildup.
- Run your heat for 10 minutes every hour. Crack your window for ventilation.
- Wrap yourself in extra clothes and blankets.
- Stay awake and move your arms and legs routinely to keep blood flowing.

Guide 9: Talking Points for Winter Weather-related Fatality

If you are approached by the media regarding a reported winter weather-related fatality in your jurisdiction, the following talking points may be used.

1. We were notified by the Medical Examiner/Coroner about a fatality possibly due to winter weather conditions. Our condolences go out to the family.

2. Out of respect for the family, we are unable to share any details.

   or

   On *[insert date],* a *[gender] ["___ years old" or "between the ages of ___ and ___"]* died during the current winter weather conditions.

   or

   We have *not* been notified of any recent fatalities linked to winter weather conditions.

Any of the above can be followed up by these points:

3. Hypothermia can be rapid and fatal. People should remain warm and safe by:

   a. Keeping dry, staying indoors, and wearing appropriate winter clothing.
   b. Checking on family, friends and neighbors who do not have heat, who spend much of their time alone or who are more likely to be affected by the cold.
   c. Making outdoor trips as short as possible.

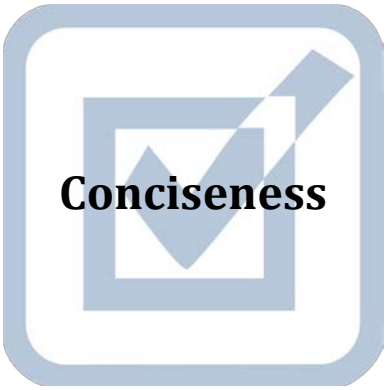
   For more information, visit *[insert relevant website].*

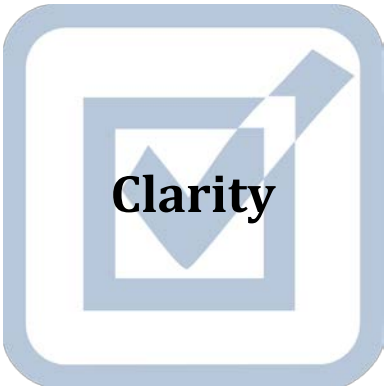
Guide 10: Message Maps about Winter Weather-related Safety

Message mapping is one of the most important risk communication tools that public health agencies can employ. The goal of a message map is to convey important information in a concise and easy-to-understand fashion.

General guidelines to follow when creating a message map include:

- Stick to three key messages or one key message with three parts for each underlying concern or specific question.
- Keep key messages brief. The reader should ideally spend less than 10 seconds per line.
- Develop messages that are easily understood by the target audience. (For communications with the general public, use a 6th to 8th grade readability level.)
- Place messages within a message set. The most important messages should occupy the first and last positions.
- Develop key messages that cite credible third parties.
- Use graphics and other visual aids to enhance key messages.
- Keep a positive tone. Messages should be solution oriented and constructive. Try to balance negative messages with positive ones.
- Avoid unnecessary uses of the words no, not, never, nothing, and none.[11]





The following is a message map that could be used when addressing the general public about winter weather-related safety.

Main Message: "Since November/December/January/February __, there have been __ winter weather-related fatalities in Wisconsin. To help you and your loved ones stay safe this winter…"

Key Messages (3 key messages)	Supporting Information (3 items of supporting information for each key message)
Message 1: *Check on your neighbors to make sure they are OK, especially the elderly and those living alone.*	**Supporting Information 1** *The elderly are less likely to sense and respond to low temperatures.* **Supporting Information 2** *Those living alone can be isolated and unaware of the dangers posed by winter weather.* **Supporting Information 3** *When regularly checking with your neighbors, look for signs of cold-related illness.*
Message 2: *If you must be outside during a winter storm, be alert for signs of hypothermia.*	**Supporting Information 1** *Symptoms include shivering, exhaustion, confusion, memory loss, and slurred speech.* **Supporting Information 2** *Protect yourself by wearing several layers of loose-fitting clothes underneath a wind and water resistant outer layer.* **Supporting Information 3** *Call 9-1-1 or seek medical attention if you or someone you know develops hypothermia.*
Message 3: *Warming centers and shelters are available throughout Wisconsin.*	**Supporting Information 1** *Warming centers are designated buildings with heat where the public can seek relief from the cold.* **Supporting Information 2** *Call 2-1-1 to find the warming center closest to you.* **Supporting Information 3** *Text SHELTER and your zip code to 43362 to find the nearest shelter.*

Appendix A: References

1. National Weather Service Weather Forecast Office, Milwaukee/Sullvian, WI. USA Severe-Weather Fatality Statistics. (http://www.crh.noaa.gov/mkx/?n=taw-part10-usa_fatality_stats)

2. National Weather Service Weather Forecast Office, Milwaukee/Sullivan, WI. Winter Weather.(http://www.crh.noaa.gov/mkx/?n=wwa-statement1)

3. Climate projections noted in this toolkit come from: Wisconsin's Changing Climate: Impacts and Adaptation. 2011. Wisconsin Initiative on Climate Change Impacts. Nelson Institute for Environmental Studies. UW-Madison and Wisconsin Department of Natural Resources, Madison, WI.

4. National Weather Service. Glossary. (http://w1.weather.gov/glossary/)

5. Mäkkinen TM, et al. 2009. Occurrence of frostbite in the general population – work-related and individual factors. Scand J Work Environ Health. 35(5): 384-93.

6. Centers for Disease Control and Prevention. Winter Weather. (http://www.bt.cdc.gov/disasters/winter/)

7. Centers for Disease Control and Prevention. Trench foot or immersion foot. (http://www.bt.cdc.gov/disasters/trenchfoot.asp)

8. Minnesota Department of Health Fact Sheet: Disaster Quick Tips: Carbon Monoxide. (http://www.health.state.mn.us/divs/eh/emergency/natural/floods/co/carbonmonoxidetip.pdf)

9. American Red Cross. Preventing and thawing frozen pipes. (http://www.redcross.org/prepare/disaster/winter-storm/preventing-thawing-frozen-pipes')

10. American Red Cross. Power Outage Checklist. (http://www.redcross.org/images/MEDIA_CustomProductCatalog/m4340180_PowerOutage.pdf)

11. Covello VT. Message mapping. Accessed March 7, 2014 at: http://www.orau.gov/cdcynergy/erc/content/activeinformation/resources/Covello_message_mapping.pdf

Appendix B: Additional Resources

Wisconsin Department of Health Services (DHS): Winter Weather
http://www.dhs.wisconsin.gov/Health/InjuryPrevention/WeatherRelated/WinterCold/

Wisconsin Emergency Management, "Ready Wisconsin": Winter Weather
http://ready.wi.gov/winter/winter_weather_facts.asp

American Red Cross: Winter Weather
http://www.redcross.org/prepare/disaster/winter-storm

FEMA
http://www.fema.gov/

FEMA Spanish Language Portal
http://www.fema.gov/es/

Centers for Disease Control and Prevention (CDC): Winter Weather
http://emergency.cdc.gov/disasters/winter/

List of Wisconsin Local Health Departments
http://www.dhs.wisconsin.gov/localhealth/

List of Wisconsin Tribal Health Directors
http://www.dhs.wisconsin.gov/localhealth/

Wisconsin Home Energy Assistance Program Website
http://www.homeenergyplus.wi.gov/