Winter Weather Awareness

Winter storms and cold temperatures can be extremely dangerous. The National Weather Service (NWS) along with the Missouri State Emergency Management Agency (SEMA), the Department of Health and Senior Services, the Missouri Highway Patrol, and the State Fire Marshall, urge people to review the hazards and safety rules of winter weather so they are prepared for the upcoming winter season.

We cannot stop winter storms and extreme cold, but we can save lives by being prepared. The NWS will transmit winter weather safety information on the NOAA Weather Wire Service and over NOAA Weather Radio during this day and during the week. SEMA will send out information to local emergency managers and public safety directors across the state.

Record Low Temperatures		
City	Temperature	Date
Columbia	-26	February 12, 1899
Kansas City	-23	December 22,23 1989
Springfield	-29	February 12, 1899
St. Louis	-22	January 5, 1894

Extreme Cold

Extreme cold temperatures are a big danger during winter months in Missouri. Prolonged exposure to the cold can cause frostbite, hypothermia, or in extreme cases death. In fact, excessive cold is one of the leading weather-related causes of death across the country. Infants and the elderly are most susceptible to extreme cold. Freezing temperatures also cause damage to crops and property.

Cold related Deaths in Missouri*

*** Source: Missouri Department of Health and Senior Services (DHSS). For more information on cold weather safety, statistics, etc, visit the DHSS website.**

Year	97-98	98-99	99-00	00-01	01-02
Deaths	7	7	12	19	11
Year	02-03	03-04	04-05	05-06	06-07
Deaths	16	24	19	20	23

Since the DHSS surveillance program began in 1979, there have been **439** hypothermia related deaths in Missouri.

Frostbite occurs when the skin becomes cold enough to actually freeze. A loss of feeling and a white or pale appearance in extremities, such as fingers, toes, ear lobes, or the nose are symptoms of frostbite.

Hypothermia (Low Body Temperature) can occur during long periods of exposure when the body temperature drops below 95 degrees F. A person will become disoriented, confused, and shiver uncontrollably, eventually leading to drowsiness and apparent exhaustion. In severe cases, death is possible.

Wind Chill

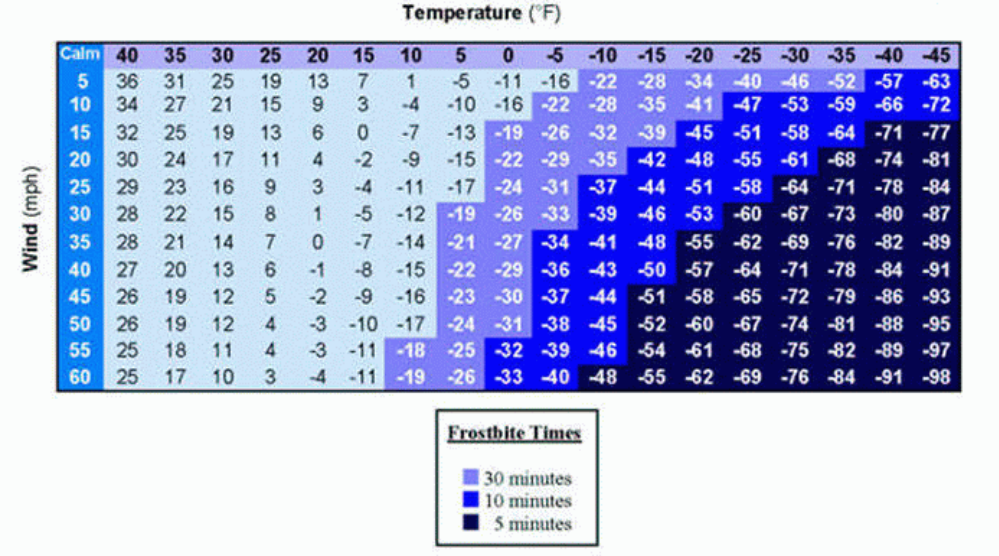
Wind Chill is the term used to describe the rate of heat loss on the human body resulting from the combined effect of low temperature and wind. As winds increase, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually internal body temperature. While exposure to low wind chills can be life threatening to both humans and animals alike, the only effect that wind chill has on inanimate objects, such as vehicles, is that is shortens the time it takes the object to cool to the actual air temperature (it cannot cool the object below that temperature). For example, water freezes at 32 degrees F, regardless of what the wind chill temperature is.

The current wind chill temperature index (WCT) formula was developed during 2000 - 2001 and implemented for the winter of 2001-2002. A Joint Action Group for temperature Indices (JAG/TI) consisting of the NWS, Meteorologic Services of Canada (MSC), the academic research community (Indiana University-Purdue University in Indianapolis (IUPUI), University of Delaware, and University of Missouri), and the International Society of Biometeorology, developed the formula. The JAG/TI formula made use of the advances in science, technology, and computer modeling to provide a more accurate, understandable, and useful formula for calculating the dangers from winter winds and freezing temperatures. In addition, clinical trials were conducted and

the results of those trials have been used to verify and improve the accuracy of the new formula.

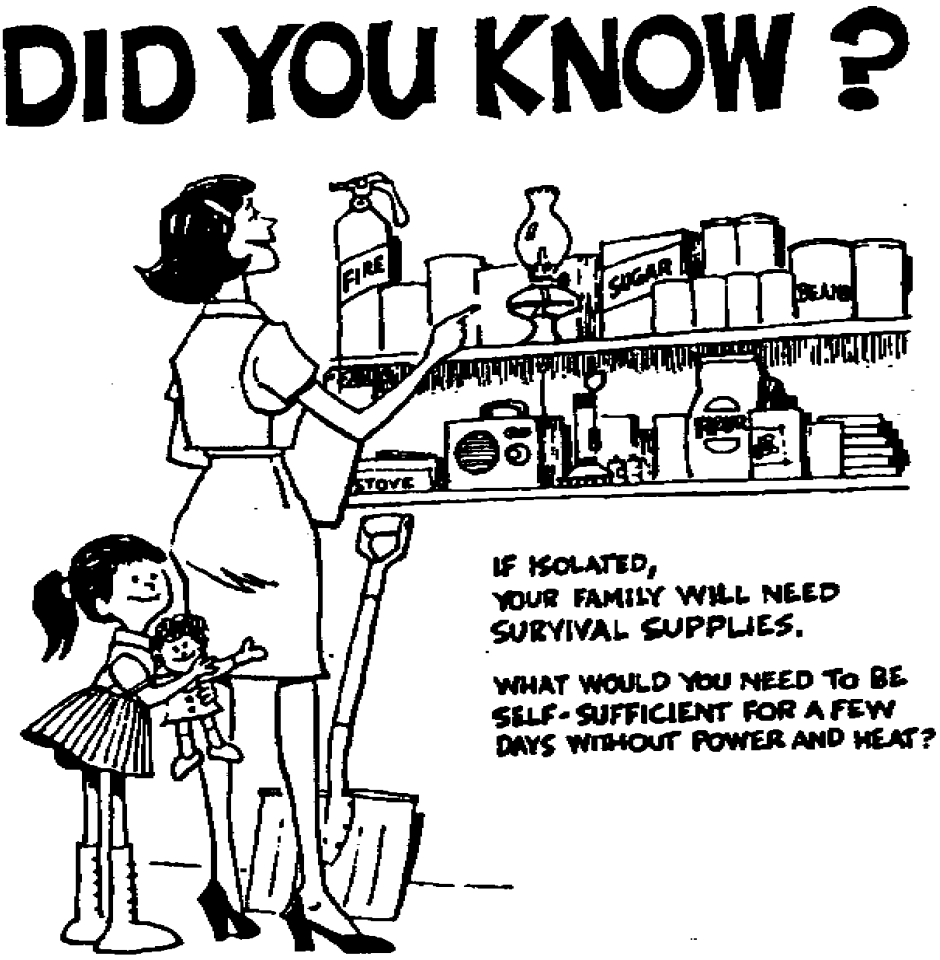
Standardization of the WCT Index among the meteorological community is important, so that an accurate and consistent measure is provided and public safety is ensured. Some of the items incorporated into the WCT include:

- use wind speed calculated at the average height (5 feet) of the human body's face instead
  of 33 feet (the standard anemometer height);
- be based on a human face model;
- incorporate modern heat transfer theory (heat loss from the body to its surroundings,
  during cold and breezy/windy days);
- lower the calm wind threshold to 3 mph;
- use a consistent standard for skin tissue resistance; and
- assume the worst case scenario for solar radiation (clear night sky).



Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Did You Know?



Severe winter weather can strand you in your own home. It is a good idea to keep some extra supplies around during the winter season. Items you may want to have include non-perishable food, medical supplies, batteries, and emergency heating supplies.

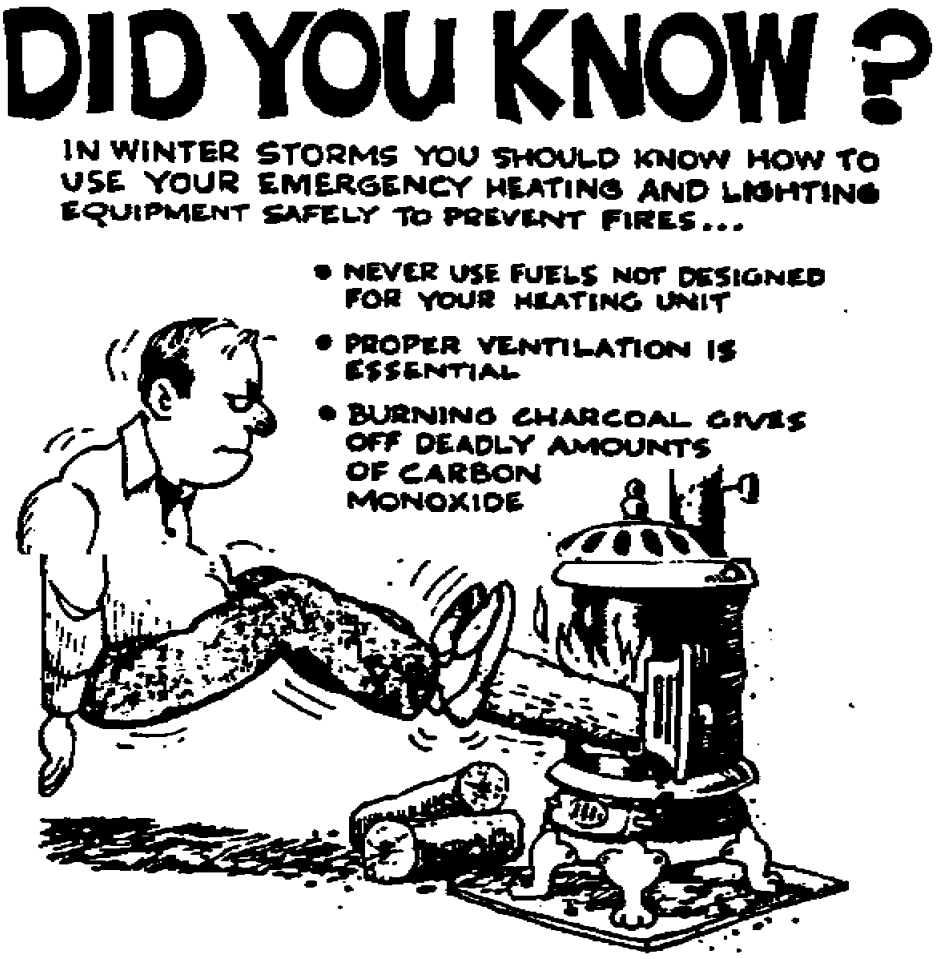
DID YOU KNOW ?

IF YOU DRIVE IN SNOW, ANTICIPATE BEING MAROONED.

A WINTER STORM SURVIVAL KIT MAY SAVE YOUR LIFE.

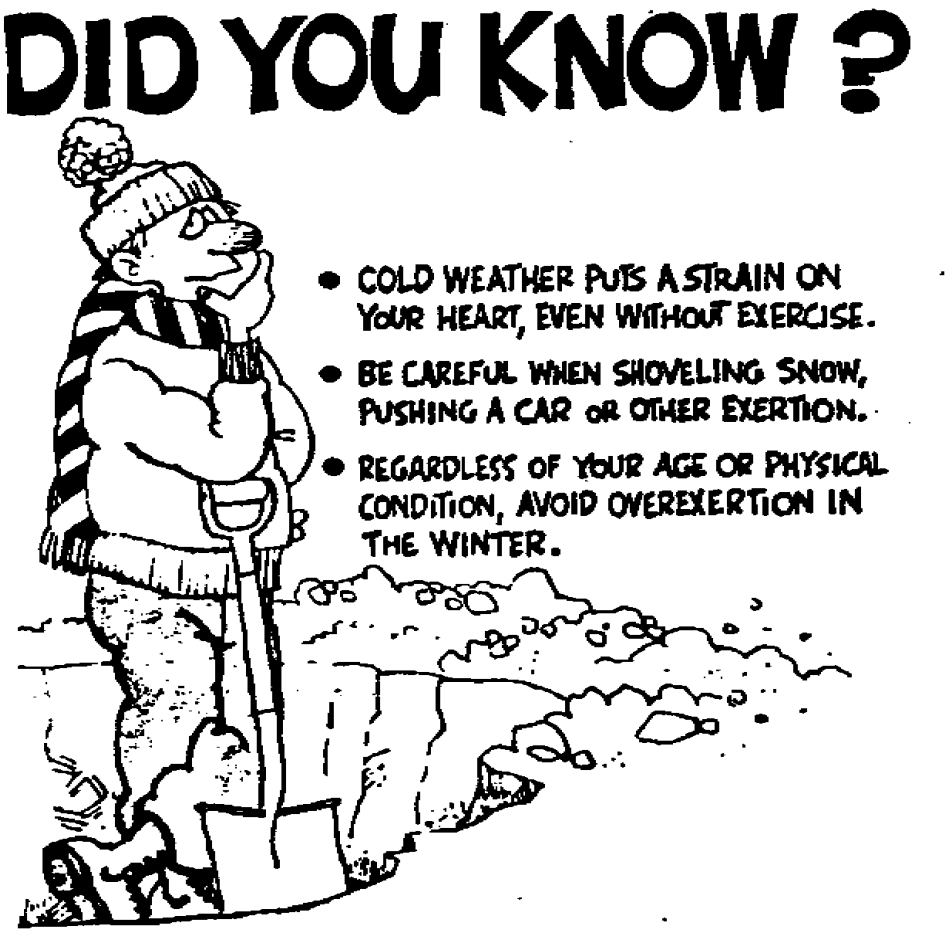
THE WISE AVOID DRIVING DURING WINTER STORMS.

Travel in winter can be extremely dangerous. The best thing to do is cancel any travel if winter weather will occur. However if you must travel, make sure you plan ahead. Make sure other people know your travel plans and know how to contact you. Travel in convoy with other vehicles if possible. Keep a survival kit in you vehicle. This kit should include items which include non-perishable food such as can goods or candy bars, extra clothes and blankets, a battery powered radio, a shovel, and sand. If stranded, the best thing to do in to stay in the vehicle. Tie a bright colored cloth to the antenna so rescuers can find you. Run the engine occasionally for heat making sure to keep the exhaust pipe clear. Open windows occasionally for fresh air.



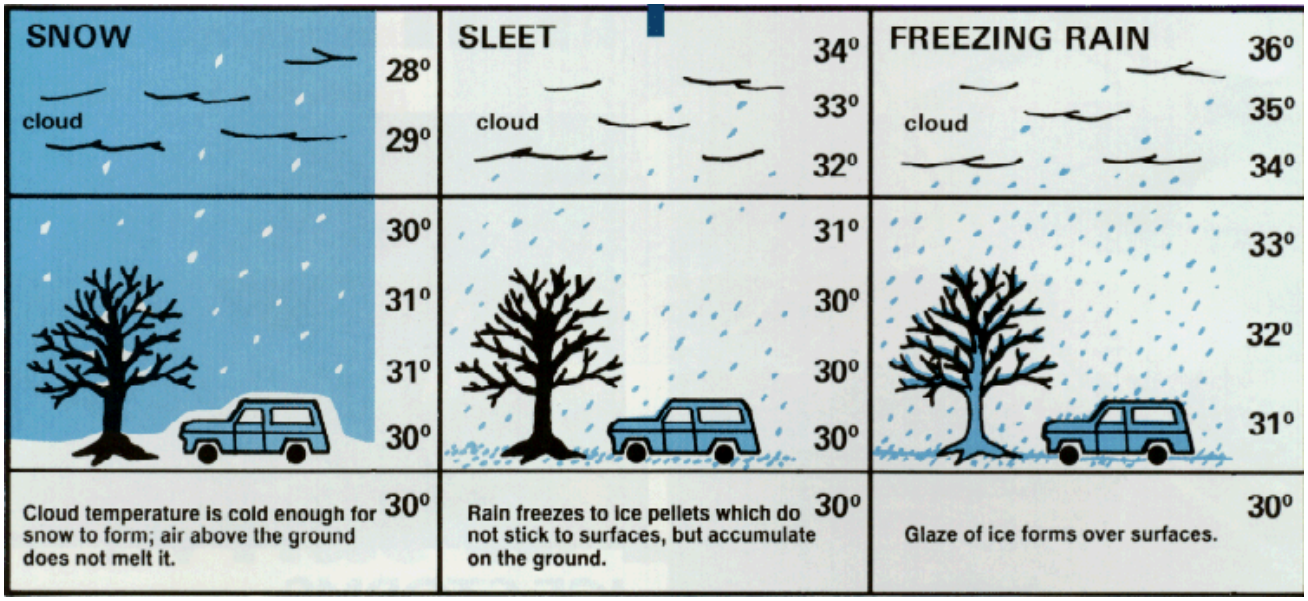
Severe winter storms can cut off your supply of electricity and other winter fuels. Have an alternative heat source available if possible. However, be extremely careful in using fireplaces or wood stoves. Make sure they are properly ventilated to avoid the build up of carbon monoxide, an odorless, colorless, and deadly gas. Do not use charcoal indoors as it gives off large amounts of carbon monoxide. Have you furnace checked before the weather gets cold to make sure it is in good working order.

Portable electric generators like the one pictured above have become very popular. They can be an excellent piece of equipment to have should you lose electric power for an extended period of time. However they must be used safely. The main thing is to make sure the generator is placed **OUTSIDE!** The exhaust from the engine emits deadly carbon monoxide gas. Make sure you read the owners manual carefully and follow all the recommended safety precautions.



Working in cold weather puts a tremendous strain on the body, even for people in good shape. Take frequent breaks and don't overexert yourself. Make sure you dress properly for the conditions. Wear several layers of lightweight clothing. Air is trapped between the layers to help keep the body warm. Protect the extremities, such as the hands, feet and ears as they are the most susceptible to frostbite. Wear a hat as a large percentage of the body's heat is lost through the top of the head

Winter Precipitation



Snow	Sleet	Freezing Rain
Flurries: Light snow falling for short durations. No accumulation or light dusting is all that is expected. **Showers:** Snow falling at varying intensities for brief periods of time. Some accumulation is possible. **Squalls:** Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant. Snow squalls are best known in the Great Lakes region. **Blowing Snow:** Wind driven-snow that reduces visibility and causes significant drifting. Blowing snow may be snow that is falling and/or loose snow on the ground that is picked up by the wind. **Blizzard:** Winds over 35 mph with snow and blowing snow reducing visibility to near zero.	Rain drops 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 motorist.	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 coating or glaze of ice. Even small accumulations of ice can cause a significant hazard.

Winter Weather Safety Rules

Around the Home

- Keep ahead of advancing winter weather by listening to NOAA Weather Radio.
- An ice storm will take down power lines knocking out electricity. Check battery powered equipment before the storm arrives.
- Check your food and stock an extra supply. Include food that requires no cooking in case of power failure. If there are infants or people who need special medication at home, make sure you have a supply of the proper food and medicine. Make sure pets and animals have shelter and a water supply.
- If appropriate, check your supply of heating fuel. Fuel carriers may not be able to reach you due to closed roads.
- Be careful when using fireplace, stoves, or space heaters. Proper ventilation is essential to avoid a deadly build-up of carbon monoxide. Don't use charcoal inside as it gives off large amounts of carbon monoxide. Keep flammable material away from space heaters and do not overload electric circuits.
- Dress for the conditions when outdoors. Wear several layers of light-weight, warn clothing: layers can be removed to prevent perspiring and subsequent chill. Outer garments should be tightly woven, waterproof and hooded. For the hands, mittens, snub at the wrists, offer better protection than fingered gloves.
- Don't kill yourself shoveling snow. It is extremely hard work for anyone in less than prime physical condition. It can bring on a heart attack, a major cause of death during and after winter storms.

Automobiles

- Your automobile can be your best friend or worst enemy during winter storms. Get your car winterized before winter arrives. The following items should be checked; ignition system, cooling system, fuel system, battery, lights, tires, heater, brakes, wipers, defroster, oil, exhaust. Keep water out of your fuel tank by keeping it full.
- If you travel often during winter, carry a winter storm kit in you car. It should include; flashlight, windshield scraper, paper towels, extra clothes, matches/candles, booster cables, compass, maps, sand, chains, blankets, high calorie non-perishable food.
- Winter travel by car is serious business. If the storm exceeds or tests your driving ability, seek available shelter immediately.
- Plan your travel. Try not to travel alone and drive in convoy when possible.
- Drive carefully and defensively. Pump your breaks when trying to stop on snow or ice covered roads.

Winter Safety for Schools

Children can be especially susceptible to the dangers associated with winter weather. Their youthful enthusiasm often takes over when common sense should prevail.

School administrators and principals need to be sensitive to the dangers winter weather can pose to children and be prepared. Winter weather procedures and practices need to be established before the onset of winter cold. The following items should be considered when formulating a winter weather safety plan:

- All schools should have ready access to current weather information. If the school is in a county covered by NOAA Weather Radio, that would be the best source. Commercial media can also be monitored. Arrangements can also be made with local law enforcement agencies to have critical winter weather forecasts relayed to the school.
- All schools need to have a functional plan in regard to closures due to snow, ice, or extreme cold.
- During the winter months, guidelines need to be established regarding outside recess. Temperatures and wind chills need to be monitored and criteria set as to when outside recess will be allowed.
- School bus drivers should receive extra training on driving during winter weather. Snow and ice can often accumulate quickly and unexpectedly on roads creating dangerous driving conditions.
- With many households having two working parents today, it may be necessary for some children to be brought to school early. Schools should make provisions to allow children inside school buildings as early as possible during cold weather.

Winter Weather Products and Criteria

Outlook - The Hazardous Weather Outlook (HWOLSX, FLUS43 KLSX) will contain any and all information pertaining to potential winter storms that may occur in the latter days of the forecast.

Watch - A watch is used when the risk of hazardous winter weather has increased significantly, there is a strong possibility it will reach warning criteria, and falls in the 12 to 48 hour portion of the forecast.

Warning - These products are issued when an event is occurring, is imminent, or has a very high probability of occurrence. Warnings are issued for events that can be life threatening:

Snow: Generally 6 inches in 12 hours. For Southeast Missouri, 4 inches in 12 hours.

Ice: Ice accumulation of 1/4 inch or more.

Wind Chill: Wind chill temperature of -25 degrees F or lower: A **Wind Chill Advisory** is issued for wind chills of -15 to -24.

Winter Storm Warning will be issued when a combination of precipitation types is expected. Each single type of precipitaion may not reach warning criteria, but the combination will create life threatening conditions.

Advisory - These are issued for lesser events that while presenting an inconvenience, do not pose an immediate threat of death, injury, or significant property damage.

Short Term Forecasts - These are issued at frequent intervals to provide information on current weather and expected conditions over the next 1 - 6 hours.

Here are the most common winter weather watches, warnings and advisories that are issued by the National Weather Service in St. Louis.

- **Winter Storm Watch**
- **Blizzard Warning (not too common, but possible)**
- **Winter Storm Warning**
- **Ice Storm Warning**
- **Heavy Snow Warning**
- **Wind Chill Warning**
- **Winter Weather Advisory**
- **Snow Advisory**
- **Freezing Rain Advisory**
- **Wind Chill Advisory**