



GALLATIN COUNTY EMERGENCY MANAGEMENT

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Winter Storms...The Deceptive Killers

WINTER'S IMPACT

STORMS WITH STRONG WINDS

Sometimes winter storms are accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines. Storms near the coast can cause coastal flooding and beach erosion as well as sink ships at sea. In the West and Alaska, winds descending off the mountains can gust to 100 mph or more damaging roofs and other structures.

EXTREME COLD

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. Infants and elderly people are most susceptible. What constitutes extreme cold and its effect varies across different areas of the United States. In areas unaccustomed to winter weather, near freezing temperatures are considered "extreme cold." Freezing temperatures can cause severe damage to citrus fruit crops and other vegetation. Pipes may freeze and burst in homes that are poorly insulated or without heat. In the north, below zero temperatures may be considered as "extreme cold." Long cold spells can cause rivers to freeze, disrupting shipping. Ice jams may form and lead to flooding.

ICE STORMS

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

HEAVY SNOW STORMS

Heavy snow immobilize a region and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse buildings and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. In the mountains, heavy snow can lead to avalanches. The cost of snow removal, repairing damages, and loss of business can have large economic impacts on cities and towns.

PREPAREDNESS • MITIGATION • RESPONSE • RECOVERY

SNOW

Flurries - Light snow falling for short durations. No accumulation or light dusting is 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 picked up by the wind.

Blizzard – Winds over 35 mph with snow and blowing snow reducing visibility to near zero.

SLEET

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 causes a hazard to motorist.

FREEZING RAIN

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 REGIONS

From the Mid-Atlantic Coast to New England... The classic storm is called a Nor' easter. A low pressure area off the Carolina coast strengthens and moves north. Wind-driven waves batter the coast from Virginia to Maine, causing flooding and severe beach erosion. The storm taps the Atlantic's moisture-supply and dumps heavy snow over a densely populated region. The snow and wind may combine into blizzard conditions and form deep drifts paralyzing the region. Ice storms are also a problem. Mountains, such as the Appalachians, act as a barrier to cold air trapping it in the valleys and adjacent low elevations. Warm air and moisture moves over the cold, trapped air. Rain falls from the warm layer onto a cold surface below becoming ice.

Along the Gulf Coast and Southwest... This region is generally unaccustomed to snow, ice, and freezing temperatures. Once in a while, cold air penetrates south across Texas and Florida, into the Gulf of Mexico. Temperatures fall below freezing killing tender vegetation, such as flowering plants and the citrus fruit crop. Wet snow and ice rapidly accumulate on trees with leaves, causing the branches to snap under the load. Motorist are generally unaccustomed to driving on slick roads and traffic accidents increase. Some buildings are poorly insulated or lack heat altogether. Local

municipalities may not have available snow removal equipment or treatments, such as sand or salt, for icy roads.

In the Midwest and Plains... Storms tend to develop over southeast Colorado in the lee of the Rockies. These storms move east or northeast and use both the southward plunge of cold air from Canada and the northward flow of moisture from the Gulf of Mexico to produce heavy snow and sometimes blizzard conditions. Other storms affecting the Midwest and Plains intensity in the lee of the Canadian Rockies and move southeast. Arctic air is drawn from the north and moves south across the Plains and Great Lakes. Wind and cold sometimes combine to cause wind chill temperatures as low as 70°F below zero. The wind crosses the lakes, tapping its moisture and forming snow squalls and narrow heavy snow bands. This is called “lake-effect snow.”

From the Rockies to the West Coast... Strong storms crossing the North Pacific sometimes slam into the coast from California to Washington. The vast Pacific provides an unlimited source of moisture for the storm. If cold enough, snow falls over Washington and Oregon and sometimes even in California. As the moisture rises into the mountains, heavy snow closes the mountain passes and can cause avalanches. The cold air from the north has to filter through mountain canyons into the basins and valleys to the south. If the cold air is deep enough, it can spill over the mountain ridge. As the air funnels through canyons and over ridges, wind speeds can reach 100 mph, damaging roofs and taking down power and telephone lines. Combining these winds with snow results in a blizzard.

In Alaska... Wind-driven waves from intense storms crossing the Bering Sea produce coastal flooding and can drive large chunks of sea ice inland destroying buildings near the shore. High winds, especially across Alaska’s Arctic coast, can combine with loose snow to produce blinding blizzard and wind chill temperatures to 90°F below zero! Extreme cold (-40°F to -60°F) and ice fog may last a week at a time. Heavy snow can impact the interior and is common along the southern coast. With only brief glimpses of the winter sun across the southern horizon, the snow accumulates through the winter months. In the mountains, it builds glaciers, but the heavy snow accumulations can also cause avalanches or collapse roofs of buildings. A quick thaw means certain flooding. Ice jams on rivers can also cause substantial flooding.

WINTER STORM FACTS:

What Makes a Winter Storm?

COLD AIR: below freezing temperatures in the clouds and near the ground are necessary to make snow and/or ice.

MOISTURE: to form clouds and precipitation. Air blowing across a body of water, such as a large lake or the ocean, is an excellent source of moisture.

LIFT: something to raise the moist air to form the clouds and cause precipitation. An example of lift is warm air colliding with cold air and being forced to rise over the cold dome. The boundary between the warm and cold air masses is called a front. Another example of lift is air flowing up a mountain side.

PREPAREDNESS • MITIGATION • RESPONSE • RECOVERY

WINTER STORMS ARE CONSIDERED DECEPTIVE KILLERS BECAUSE MOST DEATHS ARE INDIRECTLY RELATED TO THE STORM

- People die in traffic accidents on icy roads.
- People die of heart attacks while shoveling snow.
- People die of hypothermia from prolonged exposure to cold.

WINTER DEATHS

Everyone is potentially at risk during winter storms. The actual threat to you depends on your specific situation. Recent observations indicate the following:

Related to ice and snow:

- About 70% occur in automobiles.
- About 25% are people caught out in the storm.
- Majority are males over 40 years old.

Related to exposure to cold:

- 50% are people over 60 years old.
- Over 75% are males.
- About 20% occur in the home.

COLD

WIND CHILL – The wind chill is based on the rate of heat loss from exposed skin caused by combined effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature. Animals are also affected by wind chill.

FROSTBITE – Frostbite is damage to body tissue caused by that tissue being frozen. Frostbite causes a loss of feeling and a white or pale appearance in extremities, such as fingers, toes, ear lobes, or the tip of the nose. If symptoms are detected, get medical help immediately! If you must wait for help, slowly warm affected areas. However, if the person is also showing signs of hypothermia, warm the body core before the extremities.

HYPOTHERMIA: LOW BODY TEMPERATURE – Warning signs – uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion. Detection – Take the person's temperature. If below 95°F (45°C), immediately seek medical care!

If medical care is not available, begin warming the person slowly. Warm the body core first. If needed, use your own body heat to help. Get the person into dry clothing, and wrap them in a warm blanket covering the head and neck. Do not give the person alcohol, drugs, coffee, or any hot beverage or food; warm broth is better. Do not warm extremities (arms and legs) first! This drives the cold blood toward the heart and can lead to heart failure.

PREPAREDNESS • MITIGATION • RESPONSE • RECOVERY

WHEN CAUGHT IN A WINTER STORM...

OUTSIDE

Find shelter:

- try to stay dry.
- cover all exposed parts of the body.

No shelter:

- prepare a lean-to, wind-break, or snow cave for protection from wind.
- build a fire for heat and to attract attention.
- place rocks around the fire to absorb and reflect heat

Do not eat snow. It will lower your body temperature. Melt it first.

IN A CAR OR TRUCK

Stay in vehicle.