

Section 4: Severe Winter Storms

Table of Contents

WHY ARE SEVERE WINTER STORMS A THREAT TO DOUGLAS COUNTY?

History Of Severe Winter Storm Events In Douglas County

Characteristics of Severe Winter Storms

HAZARD ASSESSMENT

Hazard Identification

Vulnerability Assessment

COMMUNITY SEVERE WINTER STORM ISSUES

What Is Susceptible During Severe Winter Weather?

Existing Mitigation Activities

SEVERE WINTER STORM MITIGATION ACTION ITEMS

Why are Severe Winter Storms a Threat to Douglas County?

Severe winter storms pose a significant risk to life and property in Douglas County by creating conditions that disrupt essential regional systems such as public utilities, telecommunications, and transportation routes. Severe winter storms can produce rain, freezing rain, ice, snow, cold temperatures, and wind. Ice storms accompanied by high winds can have destructive impacts, especially to trees, power lines, highway safety and utility services. Severe freezes, where high temperatures remain below freezing for five or more days, occur every three to five years in Douglas County. Severe or prolonged snow events occur less frequently, and are very geographic in nature. The eastern part of Douglas County is affected the most severely, having widespread impacts on people and property in the county.

Historical Severe Winter Storm Events

SNOWSTORMS

From January 1, 1931 to December 31, 2001, there were 82 days where an inch of snow or greater fell in Roseburg and other areas of the Umpqua Valley. All of the snow events occurred between November and April.

Table 4-1a. Mean Snowfall (inches) –Areas in Douglas County, Oregon 1971-2000

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Drain	.39	1.2	.03	0	0	0	0	0	0	0	.2	.74	2.91
Elkton	.44	.22	.1	.05	0	0	0	0	0	0	.03	.31	1.42
Idleyld Park	4.28	4.40	1.65	.47	.02	0	0	0	0	1.5	3.9	8.8	39.1
Riddle	.64	.94	.17	0	0	0	0	0	0	0	.26	.79	2.97
Tokette Falls	8.46	7.81	3.98	.24	0	0	0	0	0	.23	3.77	8.37	34.6
Winchester	.45	.20	.02	0	0	0	0	0	0	0	.03	.31	0.59

Source: Oregon Climate Service

December 24, 1889 to February 13, 1890

The big snow of '90 started the day before Christmas. Snow fell continually for 52 days, leaving between 5 ½ and 7 ½ feet, in the town of Glendale and more in the surrounding mountains. The weather then turned warm and the snow began to melt so fast, the ground became soggy and there was high water and flooding. A severe landslide covered the railroad tracks and dammed up Cow Creek near West Fork below Glendale for many days. Reportedly several Chinese workers perished in the slide and that unstable area of the mountain became known as the Chinaman's slide. Nothing could get through except people on foot, by climbing on the canyon wall high above the slide and mud area.

December 1919

The December 1919 snowstorm was recorded as the third heaviest snowfall-producing storm in Oregon.

January 1950

A total of 28.0 inches of snow fell in Roseburg January 9-15. Riddle was hit even harder with 42.9 inches of snow. There were three severe storms in January 1950, with very little time separating them. Their net effect was a nearly continuous storm. The storm had severe effects on infrastructure, residents, and businesses across the state. Deep snowdrifts closed all highways west of the Cascades. Sleet that turned to freezing rain caused unsafe conditions on highways and damaged trees and power lines.

Table 4-1b. 1950 Snowstorm Accumulation- Areas in Douglas County, Oregon

Location	January 1950 Snowfall
Reedsport	5.0 inches
Riddle	42.9 inches
Roseburg	28.0 inches
Crater Lake	136.0 inches

Source: National Weather Service

Winter 1969

January 21 to February 6, 1969 when strong storms, accompanied by snow, ice, wind, and freezing rain hit Oregon statewide. In the Roseburg area alone, 43.7 inches of snow fell over an 8-day period, including 25.5 inches between January 26th and 27th.

ICESTORMS

Ice storms (sleet and freezing rain), are typically a short-lasting event in Douglas County. In the winter of 1978, freezing rain covered the Umpqua Valley. The build-up of ice caused power failures, brought down trees, and created serious hazards for motorists.

EXTREME COLD WEATHER STORMS

Extreme cold weather snaps are a common, but short lasting hazard in Douglas County. Below, tables 9-1b and 9-1c list historical temperature data since 1971.

Table 4-1b. Average Number of Days: Maximum Temperature 32 degrees F or Less – Areas in Douglas County, Oregon 1971-2000

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Drain	0.2	0.1	0	0	0	0	0	0	0	0	.1	0.7	1.1
Elkton	0	0.1	0	0	0	0	0	0	0	0	0	0.6	0.8
Idleyld Park	0.1	0.1	0	0	0	0	0	0	0	0	0	0.6	0.6

Riddle	0.1	0.1	0	0	0	0	0	0	0	0	0	0.5	0.7
Tokette Falls	0.5	0.2	0	0	0	0	0	0	0	0	0.2	1.2	2.1
Winchester	0.4	0	0	0	0	0	0	0	0	0	0	0.8	1.4

Source: Oregon Climate Service

Table 4-1c. Average Number of Days Minimum Temperature 32 degrees F or Less – Areas in Douglas County, Oregon 1971-2000

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Drain	11.1	7.4	5.5	2.0	0.2	0	0	0	0.1	1.6	3.9	9.1	42.3
Elkton	6.9	4.4	2.2	0.7	0	0	0	0	0.1	0.6	2.0	6.2	22.4
Idleyld Park	16.1	12.4	10.6	5.7	2.1	0.2	0	0	0.8	4.2	8.8	16.0	77.6
Riddle	10.2	6.9	5.4	1.9	0.2	0	0	0	0	1.5	3.9	8.8	39.1
Tokette Falls	21.8	16.8	15.1	7.8	1.3	0	0	0	.7	5.1	13.4	21.2	101.7
Winchester	10.3	7.4	4.8	1.0	0.1	0	0	0	0	0.5	4.0	10.2	37.5

Source: Oregon Climate Service

Characteristics of Severe Winter Storms

Weather Patterns

Severe winter storms affecting Oregon typically originate in the Gulf of Alaska and in the central Pacific Ocean. These storms are most common from October through March. Most of Douglas County has average annual precipitation of between 30 and 70 inches, with parts of the Coastal County receiving over 70 inches.

The National Climatic Data Center has established climate zones in the US for areas that have similar temperature and precipitation characteristics. (Figure 9-1) Oregon's latitude, topography, and nearness to the Pacific Ocean give the state diversified climates. The county's climate generally consists of wet winters and dry summers. Normal distribution of precipitation is about 50% of the annual total from December through February, lesser amounts in the spring and fall, and very little during summer months.

There is an average of only five days per year of measurable snow with snowfall accumulations rarely measuring more than two inches. Very Cold air rarely moves west of the Cascades Range. The Cascades act as a natural barrier, damming cold air east of the range. The only spigot is the Columbia River Gorge, which funnels the cold air into the Portland area. Cold air then begins deepening in the Columbia River valley, eventually becoming deep enough to sink southward into the Willamette and Umpqua valleys. If the cold air east of the Cascades is deep, it will spill through the gaps of the Cascades and flow into the western valleys via the many river drainage

Figure 4-1 Oregon Climate Zones

Zone 1: Coastal Area
Zone 2: Willamette Valley
Zone 3: Southwestern Interior
Zone 4: Northern Cascades
Zone 5: High Plateau
Zone 6: North Central Area
Zone 7: South Central Area
Zone 8: Northeast Area
Zone 9: Southeast Area
 Source: Oregon Climate Service

areas along the western slope. The cold air in western Oregon is now in place. If a storm from the Pacific moves near or over the cold air, freezing rain, sleet, and/or snow will be produced. Nearly every year, minor snowfalls of up to six inches occur in the western interior valleys. However, it is a rare occurrence for snowfalls of over a foot in accumulations.

Snow

Snow is very common in the higher elevations of the Cascades; Diamond Lake reports an average of 6-8 feet of snow per year, while Mount Bailey averages approximately 600 inches per year. However in the lower elevations of the Umpqua Valley, snow is relatively rare. Snowfall events do occur in the Umpqua Valley however. An example of a snowstorm event occurred in January 1969, when 43.7 inches of snow fell over an 8-day period in Roseburg.

Severe snowfall events can result in area-wide or localized loss of life, property, and power, gas, or other service disruptions. The variable character of this hazard is determined by a variety of meteorological factors including snowfall, snowpack, rainfall, temperature, and wind.

Ice

Like snow, ice storms are comprised of cold temperatures and moisture, but subtle changes can result in varying types of ice formation, including freezing rain, sleet, and hail.

Freezing rain can be the most damaging of ice formations. While sleet and hail can create hazards for motorists when it accumulates, freezing rain can cause the most dangerous conditions within a community. Ice buildup can bring down trees, communication towers, and wires creating hazards for property owners, motorists, and pedestrians alike.

Extreme Cold Weather

Extreme cold weather stretches are also rare throughout Douglas County with the exception of very high altitudes. Extreme cold hazards include infrastructure damage to pipes, power lines and roadways. Prolonged low temperatures when combined with power outages could be a hazard to vulnerable populations like the elderly.

Severe Winter Storm Hazard Assessment Hazard Identification

A severe winter storm is generally a prolonged event involving snow or ice. The characteristics of severe winter storms are determined by the amount and extent of snow or ice, air temperature, wind speed, and event duration. If a severe ice storm occurs within Douglas County, there may be prolonged power outages over widespread areas. The probability of such an ice storm is uncertain due to limited historical records. The National Weather Service, Medford Bureau, monitors the stations and provides public warnings on storm, snow, and ice events as

appropriate.

Vulnerability and Risk

A vulnerability assessment that describes the number of lives or amount of property exposed to elements of severe winter storms has not yet been conducted for Douglas County. However, severe winter storms can cause power outages, transportation and economic disruptions, and pose a high risk for injuries and loss of life. The events can also require needed shelter and care for adversely impacted individuals. The county has suffered severe winter storms in the past that brought economic hardship and affected the life safety of county residents.

Factors included in assessing severe winter storm risk include population and property distribution in the hazard area, the frequency of severe winter storm events, and information on trees, utilities, and infrastructure that may be impacted by severe winter storms. When sufficient data is collected for hazard identification and vulnerability assessment, a risk analysis can be completed. Insufficient data currently exists to complete a risk analysis.

Community Winter Storm Issues

What is Susceptible to Winter Storms?

Life and Property Damage

Winter storms have the potential for loss of life. Loss of life can occur indirectly from traffic accidents on icy roads, heart attacks while shoveling snow, and hypothermia from prolonged exposure to the cold.

Property is at risk of damage due to flooding and landslides resulting from heavy snow melt. Trees, power and telephone lines, television and radio antennas can all be impacted by ice, wind, snow, falling trees and limbs. Saturated soil can cause trees to lose their ability to stand and results in damage to houses, cars, utilities, roads and other structures. Heavy snowpack on flat or low-pitched roofs can cause structural damage, or roof collapse in vulnerable buildings. If streets are icy, blocked by downed trees or damaged, it is difficult for emergency personnel to travel, posing a secondary threat to life if police, fire, and medical personnel cannot respond to calls.

Roads and Bridges

Snow and ice events resulting in icy road conditions can lead to major traffic accidents. Roads blocked by fallen trees during a windstorm may have tragic consequences for people who need access to emergency services. The ability to travel after a natural hazard event is a priority issue for county residents, organizations, and providers of essential services such as hospitals and utilities.

Power Lines

Historically, falling trees have been the major cause of power outages resulting in interruption of services and damaged property. In addition, falling trees can bring

electric power lines down, creating the possibility of lethal electric shock. Snow and ice can also damage utility lines and cause prolonged power outages. Rising population growth and new infrastructure in the county creates a higher probability for damage to occur from severe winter storms as more life and property are exposed to risk.

Water Lines

The most frequent water system problem related to cold weather is a break in cast iron mainlines. Breaks most often times occur during severe freeze events, as well as during extreme cooling periods during the months of October, November, and December. Another common problem during severe freeze events is the failure of commercial and residential water lines. Inadequately insulated potable water and fire sprinkler pipes can rupture and cause extensive damage to property.

Severe Winter Storm Tracking and Warning

National Weather Service

The Medford Office of the National Weather Service issues severe winter storm watches and warnings when appropriate to alert government agencies and the public of possible or impending weather events. The watches and warnings are broadcast over NOAA weather radio and are forwarded to the local media for retransmission using the Emergency Alert System.

Winter Storm Mitigation Goals

GOAL A

Protect structures from winter storm damage.

GOAL B

Maintain road system circulation capacity.

GOAL C

Prevent utility damage from falling trees.

GOAL D

Prevent falling trees from becoming a fire hazard.

Severe Winter Storm Mitigation Action Items

The severe winter storm mitigation action items provide direction on specific activities that organizations and residents in Douglas County can undertake to reduce risk and prevent loss from severe winter storm events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

ACTION ITEM 1 – Encourage harvesting of trees along utility and road corridors, preventing potential winter storm damage.

Ideas for Implementation

Douglas County Agencies, State Agencies, Federal Agencies and Utility Operators

shall encourage the harvesting of trees along utility corridors and roads, which will prevent winter storm damage. The Planning Department shall encourage Federal, State, Local Agencies and Utility Operators to harvest trees in the corridors which will prevent winter storm damage, mitigate fire hazards, and could be used in fish enhancement projects.

Coordinating Organization: Douglas County Planning Department.

Timeline: Continue.

Plan Goals Addressed: GOAL A, B, C and D.

ACTION ITEM 2 - Develop partnerships between utility providers and public works agencies to document known hazard areas.

Ideas for Implementation

Coordinate with the Public Works Department about preparedness.

Coordinating Organization: Douglas County Emergency Management.

Timeline: 2 years.

Plan Goals Addressed: Goal B and C.

ACTION ITEM 3 – Encourage right of way coordination, education and management between property owners, utility operators and government agencies.

Ideas for Implementation

Douglas County Agencies, State Agencies, Federal Agencies and Utility Operators shall encourage the cooperation and education for managing right of way corridors with property owners.

Coordinating Organization: Douglas County Emergency Management

Timeline: Continue.

Plan Goals Addressed: GOAL A, B, C and D.

ACTION ITEM 4 - Develop coordinated management strategies for de-icing, snow plowing, and clearing roads of fallen trees and debris.

Ideas for Implementation

Coordinate with the Public Works Department about preparedness.

Coordinating Organization: Douglas County Emergency Management.

Timeline: 2 years.

Plan Goals Addressed: Goal B.

ACTION ITEM 5 – Encourage harvesting of trees that are blown down during a winter storm.

Ideas for Implementation

Douglas County Planning Department shall encourage the harvesting of trees blown down in a winter storm. The Planning Department shall encourage Federal, State, and Local Agencies to harvest trees that have fallen during a winter storm, which will mitigate fire hazards, and could be used in fish enhancement projects.

Coordinating Organization: Douglas County Planning Department.

Timeline: Continue.

Plan Goals Addressed: GOAL A and D.

ACTION ITEM 6 – Distribute information regarding winter storm to the general public efficiently.

Ideas for Implementation

Douglas County Emergency Management Outreach Program.

Coordinating Organization: Douglas County Emergency Management.

Timeline: Continue.

Plan Goals Addressed: GOAL A, B, C, and D.