

## Section 15

# Winter Storm Hazard Profile

### Definition

---

A storm with significant snowfall, ice and/or freezing rain; the quantity of precipitation varies by elevation. Heavy snowfall is four or more inches in a 12-hour period, or six or more inches in a 12-hour period, or six or more inches in non-mountainous areas (National Weather Service).

### Description

---

Winter storms with snowfall or freezing rain in Grays Harbor County result from atmospheric conditions due to warm high pressure from the south combining with cold low pressure from the northeast. This type of storm is somewhat uncommon in Grays Harbor County with only an estimated 40% chance of an occurrence every two years (State of Washington Hazard Mitigation Plan Tab 7.1.6 - p. 18).

---

**Table 101**  
**Characteristics of Winter Storms in**  
**Grays Harbor County**

- Temperatures below 32°
  - Snow accumulations two to four or more inches in lower elevations
  - Snow accumulation of six or more inches in higher elevations
  - Rainfall that freezes on cold surfaces as a sheet or glaze of ice
  - Cold, high winds
  - Post storm flooding
  - Coastal erosion
- 

The entire county is vulnerable to winter storms. Winter storms usually last three to five days and snow conditions have immobilized Grays Harbor county in the past causing both property and economic damages. The lowest winter temperatures are associated with easterly winds and it can take up to 36 hours for the temperature to warm up after a winter storm as weather conditions moderate and cloud cover traps daytime warmth.

## History

---

Winter storms with snow and icy conditions presented a challenge to early pioneers. The Henry Coonse diary describes a winter storm the first week of March 1852 with “west wind with hail, snow on ground and ice.” Ten days of very cold weather was reported in December 1856 and also snow and cold in the winter of 1862. Snow and ice was reported in the Grays Harbor region in December 1884 and a snowfall of 40” at Copalis was described in a letter John Porter sent to his father. The Grays Harbor area experienced a severe winter in 1893 with 26” of snow reported on February 1st and 2nd.

In the early 1900’s snow and ice continued to present a challenge to residents. In 1905, there was heavy snow in the Aberdeen area and ice reported on the tidelands of Grays Harbor. The winter of 1916 - 1917 brought cold and snow to the County and in February of 1923 the heaviest snowfall since the 1890’s were recorded. Heavy snow and cold weather was a feature of the winters of 1936 and 1937 with a white Christmas on December 25, 1937. There was a foot of snow at Pacific Beach January of 1949.

The most momentous winter storm in Grays Harbor County began on December 29, 1949 and continued throughout the month of the January 1950. The winter of 1949 and 1950 is the coldest winter on record, with snow sweeping over the entire county New Years Eve continuing throughout the next several days causing enormous damage and disruption. Snow depths ranged up to four or more inches throughout the county. Schools were closed, several Grays Harbor lumber mills were shut down, and ice flows in the south bay pounded the Elk River Bridge at Bay City. There was scattered power outage though out the county and dangerous road conditions.

---

**Table 102**  
**Characteristics of Winter Storms in Grays Harbor County**

| <b>Year</b>           | <b>Features</b>                            |
|-----------------------|--|
| February/March 1852   | Snow and ice                               |
| Winter of 1861/1862   | Snow and very cold                         |
| January 1890          | Very cold                                  |
| January 1893          | Heavy snow                                 |
| December 1909         | 8” of snow                                 |
| January/February 1916 | 3” of snow                                 |
| February 1923         | Heaviest snowfall since 1893               |
| January 1930          | Snow and cold                              |
| January 1937          | Snow, ice, cold                            |
| January 1949          | Snow, coldest recorded January in 56 years |
| January 1950          | Heavy Snow, very cold                      |
| December 1964         | Cold snow                                  |

Source: *Columbia River Chronology Historical Dates, Pacific County Historical Society and Museum and Aberdeen Daily World, various editions.*

Cold weather has attacked Grays Harbor County again, but not on the scale of the 1950 storm. On December 19, 1964, snow fell in February and again in December in 1972, and very cold temperatures were recorded in December 1983. It was cold and wintry in 1989 with a snow storm on March 1st and freezing temperatures in the month of February. Freezing temperatures in November were followed by a temperature of 11° on December 21, 1990. Snow and cold occurred in three years in the 1990's and there was a significant amount of snow along the coast in March in 2002.

---

**Table 103**  
**Significant Winter Storms in Grays Harbor County**  
**1970 to 2004**

| <b>Year</b>   | <b>Features</b>   |
|---------------|---|
| December 1970 | Snow, ice   |
| January 1982  | Snow, very cold, low temperature 17°                            |
| January 1993  | Snow, very cold, low temperature of 18° on two consecutive days |
| November 1996 | Heavy Snow  |
| November 1998 | 2 to 4 inches of snow   |
| March 2002    | 6" of snow along coast  |
| December 2003 | Sleet and 2" of snow  |

Source: *National Weather Service and Aberdeen Daily World, various editions*

---

## **Effect**

---

While snow accumulations during a winter storm tend to differ throughout the county; the most significant problems countywide result from traffic accidents and utility interruptions. Statically, 70% of problems due to winters storms are a result of vehicle accidents due to accumulation of snow and/or glaze ice on roads. Most accidents are caused by snow over frozen rain or above freezing highs that melt snow and then below freezing lows which create a glaze of ice on road surfaces. Most accidents caused by this type of road conditions in Grays Harbor County result in non injury accidents such as "fender benders" and vehicles sliding into ditches. Serious injury accidents can happen, especially if drivers do not pay attention to road conditions or exceed safe speeds. Snow and ice conditions also commonly constrain traffic flow and can result in fatalities.

Snowstorms cause problems on most of the county roads and highways. Highway 101 was closed due to heavy snow in 1996 and Highway 12 was “a mess” during the snowstorm of 1993 according to the E-911 center in Aberdeen. In 2003, the Washington State Patrol responded to 22 accidents in a 24-hour period due to snowy roads. The Olympic Highway and State Route 8 are particularly subject to accidents due to icy conditions and snow in East County.

Utility interruptions have been have been a factor in all historical winter storms in the county. Power outages are usually due to downed or damaged trees or tree branches falling on power lines. Service disruptions have lasted from several hours to in excess of 24 hours. Telephone and other communication system disruptions have also come about; however, less so recently as new technologies have become available.

There have been school delayed opening and/or closures due to snow accumulation or unsafe driving conditions. Occasionally business closures have happened with the greatest economic impact from this type of storm felt chiefly in the tourist industry along the coast. Other problems that can accompany winter storms are structure fires due to dangerous heating sources, loss of heat in homes of elderly and handicapped residents and freezing or broken pipes. Wind chill, a combination of how cold it feels when the effect of temperature and wind speed are combined, is a factor which can cause health problems for children and elderly people caught outdoors for a long period of time.

## **Asset Vulnerability Analysis for Structures and People**

---

Winter storms can affect the entire county; thus, all property and residents would be at risk. The analysis on Table 3 & 4 represents an estimated percentage, high 3% and low 1%, of the total structures and residents in the County which may be damaged by a severe winter storm.

**Table 104**  
**Winter Storm High Estimate**  
**All Districts**

| Land Use                                  | Number of Structures |                          |                           | Value of Structures in Dollars |                               |                 | Number of People |                          |                           |
|---|----------------------|--------------------------|---------------------------|--------------------------------|-------------------------------|-----------------|------------------|--------------------------|---------------------------|
|   | Total Number         | Number Exposed to Hazard | Percent Exposed to Hazard | Total Value                    | Total Value Exposed to Hazard | Percent Exposed | Total People     | Number Exposed to Hazard | Percent Exposed to Hazard |
| Residential                               | 9,121                | 274                      | 3.0%                      | 669,016,094                    | 20,070,483                    | 3.0%            | 19,610           | 588                      | 3.0%                      |
| Manufacturing                             | 75                   | 2                        | 3.0%                      | 134,423,684                    | 4,032,711                     | 3.0%            |                  |                          |                           |
| Transportation, Communication & utilities | 58                   | 2                        | 3.0%                      | 125,200,620                    | 3,756,019                     | 3.0%            |                  |                          |                           |
| Trade                                     | 137                  | 4                        | 3.0%                      | 15,913,420                     | 477,403                       | 3.0%            |                  |                          |                           |
| Services                                  | 260                  | 8                        | 3.0%                      | 251,244,437                    | 7,537,333                     | 3.0%            |                  |                          |                           |
| Cultural, Entertainment & Recreation      | 135                  | 4                        | 3.0%                      | 38,211,295                     | 1,146,339                     | 3.0%            |                  |                          |                           |
| Agriculture                               | 328                  | 10                       | 3.0%                      | 33,757,160                     | 1,012,715                     | 3.0%            |                  |                          |                           |
| Fisheries & Forestry                      | 252                  | 8                        | 3.0%                      | 22,516,555                     | 675,497                       | 3.0%            |                  |                          |                           |
| Structures on Undeveloped Lands           | 341                  | 10                       | 3.0%                      | 41,698,100                     | 1,250,943                     | 3.0%            |                  |                          |                           |
| <b>TOTALS</b>                             | <b>10,708</b>        | <b>321</b>               | <b>3.0%</b>               | <b>1,331,981,365</b>           | <b>39,959,441</b>             | <b>3.0%</b>     | <b>19,610</b>    | <b>588</b>               | <b>3.0%</b>               |

**Table 105**  
**Winter Storm Low Estimate**  
**All Districts**

| Land Use                                  | Number of Structures |                          |                           | Value of Structures in Dollars |                               |                 | Number of People |                          |                           |
|---|----------------------|--------------------------|---------------------------|--------------------------------|-------------------------------|-----------------|------------------|--------------------------|---------------------------|
|   | Total Number         | Number Exposed to Hazard | Percent Exposed to Hazard | Total Value                    | Total Value Exposed to Hazard | Percent Exposed | Total People     | Number Exposed to Hazard | Percent Exposed to Hazard |
| Residential                               | 9,121                | 91                       | 1.0%                      | 669,016,094                    | 6,690,161                     | 1.0%            | 19,610           | 196                      | 1.0%                      |
| Manufacturing                             | 75                   | 1                        | 1.0%                      | 134,423,684                    | 1,344,237                     | 1.0%            |                  |                          |                           |
| Transportation, Communication & utilities | 58                   | 1                        | 1.0%                      | 125,200,620                    | 1,252,006                     | 1.0%            |                  |                          |                           |
| Trade                                     | 137                  | 1                        | 1.0%                      | 15,913,420                     | 159,13                        | 1.0%            |                  |                          |                           |
| Services                                  | 260                  | 3                        | 1.0%                      | 251,244,437                    | 2,512,444                     | 1.0%            |                  |                          |                           |
| Cultural, Entertainment & Recreation      | 135                  | 1                        | 1.0%                      | 38,211,295                     | 382,113                       | 1.0%            |                  |                          |                           |
| Agriculture                               | 328                  | 3                        | 1.0%                      | 33,757,160                     | 337,572                       | 1.0%            |                  |                          |                           |
| Fisheries & Forestry                      | 252                  | 3                        | 1.0%                      | 22,516,555                     | 225,166                       | 1.0%            |                  |                          |                           |
| Structures on Undeveloped Lands           | 341                  | 3                        | 1.0%                      | 41,698,100                     | 416,981                       | 1.0%            |                  |                          |                           |
| <b>TOTALS</b>                             | <b>10,708</b>        | <b>107</b>               | <b>1.0%</b>               | <b>1,331,981,365</b>           | <b>13,319,814</b>             | <b>1.0%</b>     | <b>19,610</b>    | <b>196</b>               | <b>1.0%</b>               |

## **Asset Vulnerability Analysis for County and Critical Facilities**

---

### **County Facilities At-Risk to Winter Storm Hazard**

All county facilities are potentially at-risk to winter storm hazards.

### **Critical Facilities Serving County Government & Residents At-Risk to Winter Storm Hazards**

All critical facilities are potentially at-risk to winter storm hazards.