

WINTER STORM

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Hazard Description

A severe winter storm event is identified as a storm with snow, ice, or freezing rain—all of which can cause significant problems for area residents. Although rare in central and southeast Texas, severe winter weather does occasionally occur. January is the month when snow, sleet or freezing rain is most likely to be observed; yet, winter weather conditions can occur at anytime during the winter and early spring months.

Location

Winter storms vary in location, intensity and duration but are considered rare occurrences in GBRA Basin communities. It is assumed that all of the jurisdictions are uniformly exposed to winter storm events; therefore, all areas of the county are equally exposed.

Extent

Table 13-1 below displays the magnitude of severe winter storms. The wind-chill factor is further described in Figure 13-1. This is an index developed by the National Weather Service, although the chart is not applicable when temperatures are over 50° or winds are calm.

Table 13-1. Extent Scale - Winter Weather Alerts

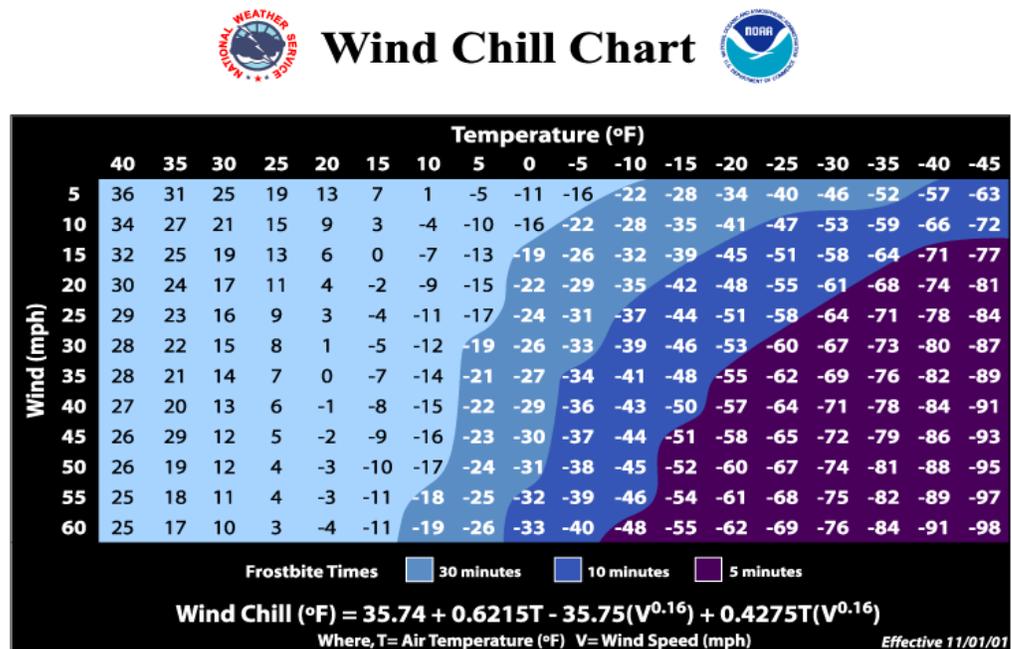
Winter weather advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
Winter storm watch	Severe winter weather conditions may affect your area (freezing rain, sleet or heavy snow may occur separately or in combination).

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Winter storm warning	Severe winter weather conditions are imminent.
Freezing rain or freezing drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard warning	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost/freeze warning	Below freezing temperatures are expected and may cause significant damage to plants, crops and fruit trees.
Wind chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.

Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body, similar to the heat index for extreme heat (Figure 13-1). Since wind can dramatically accelerate heat loss from the body, a blustery 30° day would feel just as cold as a calm day with 0° temperatures. The GBRA Region has never experienced a blizzard, but based on previous occurrences, GBRA counties have been subject to winter storm watches, warnings, freezing rain, sleet, snow and wind chill.

Figure 13-1. Wind Chill Chart



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Historical Occurrences

Table 13-2 shows historical occurrences for the area since 1950 as well as the type of event and the amount of damage provided by the National Climatic Data Center (NCDC). Although there have been relatively few storms, it is likely that a high number of occurrences have gone unreported. Additionally, historical winter storm information, as provided by the NCDC, shows winter storm activity across a multi-county forecast area for each event. In some instances within the GBRA study area, a single record could consist of up to 27 counties including some or all of the ones participating in this risk assessment. Therefore, an appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each participating county impacted by each event. In the case of the City of Cibolo, a percentage was determined for Guadalupe County and a smaller percentage determined for Cibolo.

Table 13-2. Historical Winter Storm Events by Jurisdiction (NCDC, 1950-2009)

JURISDICTION	NUMBER OF REPORTED EVENTS	TYPES OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE (2009 DOLLARS)	CROP DAMAGE (2009 DOLLARS)
Caldwell County	8	Winter Storm	0	0	\$164,631	Negligible
Calhoun County	2	Winter Weather and Heavy Snow	0	0	Negligible	Negligible
DeWitt County	2	Winter Storm and Heavy Snow	0	0	\$51,763	Negligible
Gonzales County	3	Winter Storm	0	0	\$51,763	Negligible
Kendall County	8	Winter Storm	0	0	\$863,434	\$18,775
Refugio County	3	Winter Weather and Heavy Snow	0	0	Negligible	Negligible
Victoria County	6	Winter Weather and Heavy Snow	0	0	Negligible	Negligible
City of Cibolo (Guadalupe County)	11	Winter Storm, Heavy Snow, Wintry Mix, Ice	0	0	Negligible	Negligible
TOTALS¹	43		0	0	\$1,131,591	\$18,775

Probability of Future Events

Because it is likely that more winter storms have occurred than are reported in the NCDC, the probability for winter storms occurring in the GBRA Region is occasional, meaning an event is possible in the next five years.

¹ Totals for the study area may include values less than \$5,000 for dollar amounts and less than 50 for populations (where applicable) that are classified as “negligible” in the table.

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Impact & Vulnerability

Winter storms are associated with freezing or frozen precipitation such as freezing rain, sleet, snow and the combined effects of winter precipitation and strong winds. Wind chill is a function of temperature and wind. Low wind chill is a product of high winds and freezing temperatures. The leading cause of death during winter storms is transportation accidents. Hypothermia and frost bite are other dangers from very cold winter temperatures.

Historical evidence shows that most of the area is susceptible to winter storm activity; however, past reported property damages indicate that, while winter events (typically consisting of snow and ice) do occur, their economic impacts are typically not severe across the entire study area. All buildings and facilities are considered to be exposed to this hazard and could potentially be impacted because it cannot be predicted where a winter storm event may cause damage or disruption. It is important to note that only winter storm events that have been reported have been factored into this risk assessment.

Table 13-3 shows potential annualized property losses for each jurisdiction based on past reports of property and crop damages in each jurisdiction (NCDC, 1950-2009) and exposure values extracted from HAZUS-MH MR4. “Negligible” indicates that the annualized expected property losses are less than \$5,000.

Table 13-3. Potential Annualized Losses by County (Winter Storm)

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED LOSS (AL)	ANNUALIZED LOSS RATIO (ALR)
Caldwell County	\$1,528,875,000	Negligible	0.00%
Calhoun County	\$1,403,343,000	Negligible	0.00%
DeWitt County	\$1,404,274,000	Negligible	0.00%
Gonzales County	\$991,702,000	Negligible	0.00%
Kendall County	\$1,676,308,000	\$14,703	0.00%
Refugio County	\$469,041,000	Negligible	0.00%
Victoria County	\$5,117,120,000	Negligible	0.00%
City of Cibolo (Guadalupe County)	\$221,273,000	Negligible	0.00%
TOTALS FOR STUDY AREA²	\$12,811,936,000	\$19,301	0.00%

² Totals for the study area may include values less than \$5,000 for dollar amounts that are classified as “Negligible” in the table.

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