

Section 11 – Winter Storm

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Hazard Profile

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. Winter storms that threaten Central Texas usually begin as powerful cold fronts that push south from central Canada.

Most of the precipitation seen in the Lower Colorado River Basin from severe winter storms takes the form of ice or sleet. Freezing rain occurs when rain developing in a relatively warm (above freezing) layer of air falls through a layer of air that is below freezing (25-32° F). The rain is “super cooled” as it falls through the cold layer near the surface of the earth. When cooled but still liquid raindrops strike the ground or an object already below freezing, they freeze on contact. The resulting coating of ice is commonly known as glaze.



A heavy accumulation of ice can topple power and telephone lines, television towers, and trees. Highways become impossible to travel on and even stepping outdoors can be extremely risky. The severity of an ice storm and amount of damage caused by the storm depends on the amount of rain and thus the amount of icing, wind strength, and

storm location. Urban areas tend to suffer more damage than rural areas because of the concentration of utilities and transportation systems, all of which may be affected to a great degree by icing.

Table 11-1. Winter Weather Alerts

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| 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). |
| 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. |

Location and Spatial Extent

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

Historical Occurrences

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 usually not severe across the entire study area. Because it cannot be predicted where a winter storm event may cause damage or disruption, all buildings and facilities are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only winter storm events that have been reported have been factored into this risk assessment. It is likely that a high number of occurrences have gone unreported over the past 50+ years.

Table 11-2. Historical Winter Storm Impact by Jurisdiction (NCDC, 1950-2008)

| JURISDICTION | NUMBER OF STORMS | TYPES OF EVENTS | DEATHS | INJURIES | PROPERTY DAMAGE (2008 DOLLARS) |
|-------------------|------------------|---|-----------|-----------|--------------------------------|
| Bastrop County | 4 | WINTER STORM | 0 | 0 | 2,082,049 |
| Blanco County | 8 | WINTER STORM | 0 | 0 | 10,223,443 |
| Brown County | 10 | WINTER STORM, ICE STORM, HEAVY SNOW, MIXED WINTER WEATHER | 0 | 5 | 7,679,942 |
| Burnet County | 7 | WINTER STORM, HEAVY SNOW | 0 | 0 | 2,193,092 |
| Colorado County | 3 | ICE STORM | 3 | 0 | 1,267,800 |
| Fayette County | 5 | WINTER STORM | 0 | 0 | 3,438,948 |
| Lampasas County | 17 | WINTER STORM, ICE STORM, HEAVY SNOW, MIXED WINTER WEATHER | 10 | 0 | 90,923,232 |
| Lee County | 6 | WINTER STORM | 0 | 0 | 2,082,049 |
| Llano County | 7 | WINTER STORM, HEAVY SNOW | 0 | 0 | 2,193,092 |
| Mason County | 6 | WINTER STORM, ICE STORM, HEAVY SNOW | 0 | 0 | 5,150 |
| Matagorda County | 2 | ICE STORM, HEAVY SNOW | 3 | 0 | 0 |
| McCulloch County | 12 | WINTER STORM, ICE STORM, HEAVY SNOW, WINTER WEATHER | 0 | 5 | 73,850,866 |
| Mills County | 13 | WINTER STORM, ICE STORM, HEAVY SNOW, MIXED WINTER WEATHER | 10 | 0 | 90,907,782 |
| San Saba County | 6 | WINTER STORM, ICE STORM, WINTER WEATHER | 0 | 5 | 73,846,746 |
| Travis County | 9 | WINTER STORM | 0 | 0 | 10,223,443 |
| Wharton County | 3 | ICE STORM, HEAVY SNOW | 3 | 0 | 1,030 |
| Williamson County | 7 | WINTER STORM | 0 | 0 | 2,082,049 |
| TOTALS | 125 | N/A | 29 | 15 | 373,000,713 |

Source: NCDC

Probability of Future Events

A heavy accumulation of ice can topple power and telephone lines, television towers, and trees. Highways become impossible to travel on, and even stepping outdoors can be extremely risky. Utility disruptions from winter storms can severely impact the delivery of services. Water pipes can freeze and crack in sub-freezing temperatures. Ice can build up on power lines and cause them to break under the weight or ice on trees can cause tree limbs to fall on the lines. These events can disrupt electric service for long periods. Warning time for winter storms is generally six to twelve hours.

Vulnerability Assessment

The severity of winter storm impact is generally minor. Winter storms can cause injuries and completely shut down facilities for more than one week, and cause more than ten percent of affected properties to be destroyed or suffer major damage.

Table 11-3 shows potential annualized property losses for each jurisdiction based on past reports of property damages in each jurisdiction (NCDC, 1950-2008) and exposure values extracted from HAZUS-MH MR3. “Negligible” indicates that the annualized expected property losses are less than \$5,000.

Table 11-3. Potential Annualized Losses by Jurisdiction (Winter Storm)

| JURISDICTION | TOTAL EXPOSURE | ANNUALIZED LOSS (\$) | PERCENT LOSS RATIO |
|-----------------|----------------|----------------------|--------------------|
| Bastrop County | 3,091,607,000 | 34,701 | 0.00% |
| Blanco County | 628,637,000 | 170,391 | 0.03% |
| Brown County | 2,276,120,000 | 128,607 | 0.01% |
| Burnet County | 2,124,059,000 | 36,552 | 0.00% |
| Colorado County | 1,252,338,000 | 23,478 | 0.00% |
| Fayette County | 1,542,593,000 | 57,316 | 0.00% |
| Lampasas County | 984,168,000 | 1,547,618 | 0.16% |

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| JURISDICTION | TOTAL EXPOSURE | ANNUALIZED LOSS (\$) | PERCENT LOSS RATIO |
|------------------------------|-----------------------|----------------------|--------------------|
| Lee County | 868,660,000 | 34,701 | 0.00% |
| Llano County | 1,490,823,000 | 36,552 | 0.00% |
| Mason County | 267,480,000 | Negligible | 0.00% |
| Matagorda County | 2,184,807,000 | Negligible | 0.00% |
| McCulloch County | 462,487,000 | 1,231,463 | 0.27% |
| Mills County | 332,198,000 | 1,547,332 | 0.47% |
| San Saba County | 373,409,000 | 1,231,387 | 0.33% |
| Travis County | 62,028,606,000 | 170,391 | 0.00% |
| Wharton County | 2,290,384 | Negligible | 0.00% |
| Williamson County | 18650,064,000 | 34,701 | 0.00% |
| TOTALS FOR STUDY AREA | 98,560,346,384 | 6,285,190 | N/A |

Sources: HAZUS-MH MR3 (total exposure) and NCDC (annualized losses)