4.13 Severe Winter Weather

4.13.1 Description

Severe winter weather includes winter storms, heavy snow, and extreme cold. Winter storms are events that have snow, sleet, ice, or freezing rain as their primary type of precipitation. While the precipitation itself is typically not dangerous, frozen roads and exposure to cold can cause death and injury.

A winter storm forms under the right combination of three causes:

1. Below freezing temperatures in the clouds and near the ground, which are necessary to make snow and ice.
2. Lift, which raises the moist air from the clouds and causes precipitation. Warm air colliding with cold air and being forced to rise over the cold is an example of lift.
3. Moisture is needed to form clouds and precipitation. Air blowing across a body of water is a common source of moisture.

Winter storms are categorized by their type: blizzards, ice storms, lake effect storms, and snow squalls.

- Blizzards are winter storms that are a combination of blowing snow and wind which lead to very low visibility. Heavy snowfalls and severe cold often accompany blizzards, but this is not required. Ground blizzards occur when strong winds pick up snow that has already fallen.
- Ice Storms occur when at least a quarter inch of ice accumulates on exposed surfaces. Roads and sidewalks can become dangerously slick, and trees and powerlines can easily break under the weight of accumulated ice.
- Lake Effect Storms are cold, dry air masses that move over the Great Lakes regions and drop the moisture as snow in areas near the Great Lakes.
- Snow Squalls are brief, intense snow showers accompanied by strong winds. Impacts may be significant.

4.13.2 Location

Winter storms are typically large events that will impact the entire County and have the potential to impact multiple counties.

4.13.3 Extent

The State of Ohio Hazard Mitigation Plan 2019 lists winter storms as one of the three highest threat hazards in Ohio. The average annual snowfall in Clinton County is 19-20 inches. Snowfall typically occurs between November and April. January is the coldest month on average.

4.13.4 History

There have been at least 38 winter storm events and another 82 winter weather events including heavy snow, extreme cold, ice storm, and frost in Clinton County since December 1996. These events caused $505,000 in property damage, $540,000 worth of crop damage, and did not result in any injuries or deaths according to the National Centers for Environmental Information (NCEI).

There have been two emergency declarations related to winter storms covering Clinton County. The public assistance amount for each emergency declaration was divided between all jurisdictions impacted by the events including those outside of Clinton County,

Major Disaster Declaration on April 24, 2008 (EM-3386-OH)
A snow event impacted 17 counties including Clinton County on April 24, 2008. $7,122,145.99 in public assistance was distributed throughout all impacted counties.

Major Disaster Declaration on January 26, 1978 (DR-3055-OH)
A severe blizzard impacted all counties including Clinton County on January 26, 1978. $3,546,669 in public assistance was distributed throughout all impacted counties (**Figure 4.13.1**).

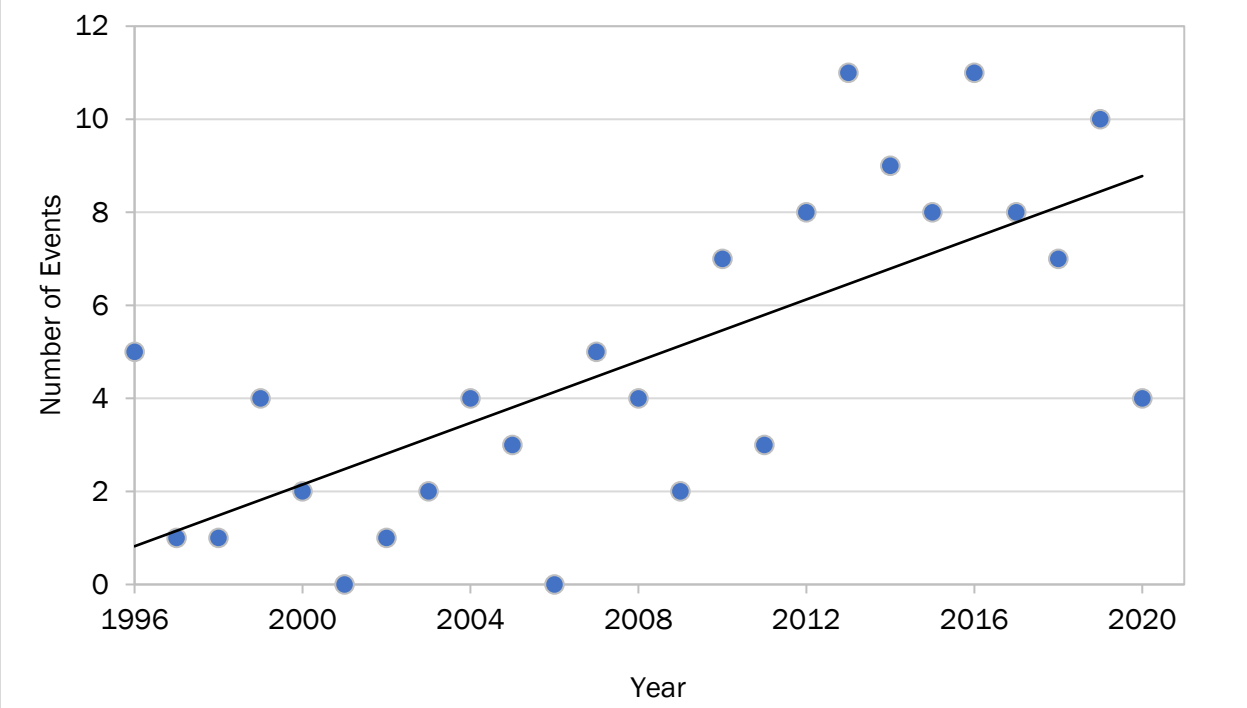
Figure 4.13.1: Blizzard in 1978

4.13.5 Probability

According to the NCEI, there have been a total of 120 winter storm and winter weather events reported in Clinton County from January of 1996 to March 2020, with total losses amounting to $1,045,000 in property damage and crop damage. This amounts to approximately five winter storm events annually with average annual damages of $43,092.78.

Figure 4.13.2 shows the trend of severe winter weather events over time between January 1996 and March 2020. The trend line increases over time showing that winter storm events are becoming more common each year.

Figure 4.13.2: Severe Winter Weather Probability



4.13.6 Vulnerability Assessment

Infrastructure Impact

Winter storms can cause damage to overhead utilities. Wires in particular can collapse under the weight of accumulated snow and ice. Debris can block roadways or damage property as tree limbs can also collapse under the weight of accumulated snow and ice. Water pipes can be frozen under extreme low temperatures that may accompany severe winter storms. Roads and sidewalks can be blocked by the accumulation of snow, as well as being iced over.

Population Impact

All residents of Clinton County are expected to be impacted by severe winter storms. The elderly and children may be more severely impacted by extreme cold.

Property Damage

Property can be damaged by accumulated snow and ice, debris, and falling wires. Extreme low temperatures can also freeze the water in pipes which could cause them to explode. All buildings are in the County are exposed and vulnerable to winter storms. The State of Ohio Hazard Mitigation Plan 2019 estimates annual potential losses due to damage caused by winter storms in Clinton County to be $54,884.65.

Loss of Life

There are no reported direct or indirect deaths from any severe weather event in Clinton County. Likely causes of death are from iced-over and dangerous roads which lead to vehicular accidents, hypothermia from prolonged exposure to cold, and heart attacks from heavy snow shoveling.

Economic Losses

Economic losses can occur from businesses shutting down for potentially long periods of time. Economic activity can be completely halted during winter storms including transportation of goods. Electricity outages may lead to spoiled goods. Since winter storms occur during the winter season, damages to crops are unlikely.

4.13.7 Land Use and Development Trends

Winter storms can occur anywhere. Any development that has occurred since that previous plan and any future development has the potential to be impacted by winter storms. All land uses are equally impacted by severe winter weather.