

Severe Weather

General

Severe weather affects the entire Commonwealth and can be expected any time of the year. Severe weather for Perry County is considered to include: blizzards and/or heavy snowfall, heavy fog, hail, heavy precipitation (rain), high winds, ice storms, unseasonable temperature extremes, hurricanes, and severe thunderstorms. (Tornados will be discussed in a separate appendix.)

Snowstorms occur approximately five times per year. These storms are more prevalent in the northern and western regions of Pennsylvania and include ice and high wind. They are frequently seen in Perry County.

Hurricanes, tropical storms, and windstorms occur in Perry County in the spring and summer. Most hurricanes that approach Perry County are downgraded to tropical storms or tropical depressions by the time they reach central Pennsylvania. Heavy rain and flooding produced by a hurricane, tropical storm, or tropical depression will have the greatest impact on the County.

Extreme temperatures can be devastating to any area. Extreme heat can cause sunburn, heat cramps, heat exhaustion, and heat/sun stroke. Likewise, extreme cold can cause hypothermia and frost bite.

History

Perry County, as well as the entire Commonwealth, is vulnerable to a wide range of natural disasters. Typically, these disasters are caused by severe weather. A summary of disaster declarations since 1966 from severe weather that affected Perry County can be seen below.

**Table C.17
Disaster Declarations or Proclamations Affecting Perry County
Presidential & Gubernatorial**

Winter Storms	Blizzards	Hurricanes/ Tropical Storms	Floods	Droughts
Jan-66	Feb-78	Agnes, June 1972	Agnes, June 1972	Jul-91
Feb-72	Mar-93	Windstorm, April 1975	Eloise, September 1975	Jul-99
Jan-78	–	Floyd, September 1999	Oct-76	Feb-02
Jan-94	–	Hurricane Isabel/Henri, September 2003	Jan-96	–
Jan-96	–	Tropical Depression Ivan, September 2004	Sep-96	–
Feb-03	–	Hurricane Katrina, September 2005	Jun-06	–

Feb-07	--	Tropical Depression Ernesto, September 2006	--	--
Apr-07	--	Tropical Storm Lee – September 2011	--	--

Sources: - Commonwealth of Pennsylvania
2010 Standard All-Hazard Mitigation Plan
- PEMA

Winter Storms

Perry County is vulnerable to an array of winter weather. This weather has the ability to close businesses, close schools, and block or damage roadways in the County. Perry County has been included in several statewide emergency declarations because of significant snow and ice accumulation and the resulting floods, which are common secondary effects. According to the National Weather Service, Perry County sees an average of 40 inches of snow per year.

The following chart defines various winter weather conditions:

**Table C.18
Severe Winter Weather**

Heavy Snow Storm	Four inches or more of snow in a six-hour period, or six inches or more in a 12-hour period.
Sleet Storm	Significant accumulation of solid ice pellets causing slippery surfaces.
Ice Storm	Significant accumulation of rain freezing on trees, power lines, causing slippery surfaces and damage.
Blizzard	35 - 44 mph winds, 32-11° Fahrenheit temperatures, blowing snow, and frequent one-quarter-mile visibility over an extended period of time.
Severe Blizzard	44+ mph winds, temperatures of 10° Fahrenheit or lower, a high density of blowing snow with visibility generally measured in feet for an extended period of time.
Heavy Snow Storm	Four inches or more of snow in a six-hour period, or six inches or more in a 12-hour period.

Source: National Climactic Data Center

The history of winter weather in Perry County since late 1994 is reflected below. Since 2000, Perry County has experienced 30 instances of severe winter weather. Of those incidents, 16 were heavy snow storms. .

**Table C.19
Perry County Severe Winter Weather
1994-2012**

Date	Type	Date	Type
11/27/1994	Freezing Rain And Sleet	3/4/2001	Heavy Snow
12/14/1994	Freezing Drizzle	1/6/2002	Heavy Snow
1/1/1995	Snow Drought	12/5/2002	Heavy Snow
1/6/1995	Ice Storm	12/10/2002	Ice Storm
2/3/1995	Heavy Snow	12/25/2002	Heavy Snow

2/15/1995	Freezing Rain	2/6/2003	Heavy Snow
2/26/1995	Light Snow	2/16/2003	Heavy Snow
2/26/1995	Freezing Rain Sleet And Light	12/5/2003	Heavy Snow
2/27/1995	Freezing Rain	2/3/2004	Heavy Snow
3/8/1995	Snow	2/6/2004	Ice Storm
6/1/1995	Snow Drought	3/19/2004	Heavy Snow
11/14/1995	Winter Storm	2/24/2005	Heavy Snow
12/19/1995	Winter Storm	3/1/2005	Heavy Snow
1/12/1996	Heavy Snow	12/9/2005	Heavy Snow
11/28/1996	Heavy Snow	12/16/2005	Winter Storm
2/13/1997	Winter Storm	2/13/2007	Winter Storm
1/15/1998	Ice Storm	3/16/2007	Heavy Snow
1/2/1999	Winter Storm	2/1/2008	Winter Storm
1/8/1999	Winter Storm	2/12/2008	Ice Storm
1/14/1999	Winter Storm	1/27/2009	Winter Storm
3/14/1999	Heavy Snow	12/19/2009	Winter Storm
1/25/2000	Heavy Snow	2/5/2010	Winter Storm
1/30/2000	Heavy Snow	2/9/2010	Winter Storm
2/13/2000	Ice Storm	2/1/2011	Winter Storm
2/18/2000	Winter Storm	10/29/2011	Heavy Snow
12/13/2000	Winter Storm		

Source: National Climatic Data Center

Spring and Summer Storms

Every year, Perry County experiences severe spring and summer storms with associated lightning and tornados. (Tornados will be addressed in a separate profile.) These storms have an immediate impact, as well as longer lasting secondary effects. Over the past 30 years, these storms have caused significant damage. A table of regional severe storms since 1963 is presented here.

**Table C.20
Perry County Severe Storms
1963-2012**

Date	Type	Property Damage	Date	Type	Property Damage
5/10/1963	Thunderstorm/Wind	0	7/18/2003	Hail	0
7/24/1967	Thunderstorm/Wind	0	7/21/2003	Thunderstorm/Wind	0
6/27/1978	Thunderstorm/Wind	0	7/22/2003	Thunderstorm/Wind	0
8/10/1980	Thunderstorm/Wind	0	7/22/2003	Hail	15K
7/12/1985	Thunderstorm/Wind	0	7/22/2003	Hail	0
7/12/1985	Thunderstorm/Wind	0	8/10/2003	Hail	0
6/11/1986	Thunderstorm/Wind	0	11/13/2003	High Wind	50K
8/5/1986	Thunderstorm/Wind	0	5/15/2004	Thunderstorm/Wind	0
6/7/1988	Thunderstorm/Wind	0	5/15/2004	Thunderstorm/Wind	0
11/20/1989	Thunderstorm/Wind	0	5/18/2004	Thunderstorm/Wind	0
6/30/1990	Thunderstorm/Wind	0	6/1/2004	Thunderstorm/Wind	0
7/5/1990	Thunderstorm/Wind	0	6/17/2004	Thunderstorm/Wind	0
4/9/1991	Thunderstorm/Wind	0	8/4/2004	Thunderstorm/Wind	0
5/6/1991	Thunderstorm/Wind	0	9/17/2004	Thunderstorm/Wind	0

**Perry County
Multi-Jurisdictional Hazard Mitigation Plan**

**Appendix C
Hazard Profiles**

5/29/1991	Thunderstorm/Wind	0	9/17/2004	Thunderstorm/Wind	0
9/16/1991	Thunderstorm/Wind	0	6/6/2005	Thunderstorm/Wind	0
9/16/1991	Thunderstorm/Wind	0	6/6/2005	Thunderstorm/Wind	0
7/6/1994	Thunderstorm/Wind	0	7/5/2005	Thunderstorm/Wind	0
8/25/1994	Thunderstorm/Wind	0	8/13/2005	Thunderstorm/Wind	0
8/27/1994	Thunderstorm/Wind	0	5/30/2006	Thunderstorm/Wind	0
4/9/1995	Thunderstorm/Wind	0	5/30/2006	Thunderstorm/Wind	0
4/9/1995	Thunderstorm/Wind	0	6/22/2006	Thunderstorm/Wind	0
5/24/1995	Thunderstorm/Wind	0	6/22/2006	Thunderstorm/Wind	0
5/29/1995	Thunderstorm/Wind	0	6/22/2006	Thunderstorm/Wind	0
6/7/1995	Thunderstorm/Wind	0	6/29/2006	Thunderstorm/Wind	0
6/11/1995	Thunderstorm/Wind	0	6/29/2006	Thunderstorm/Wind	0
7/6/1995	Thunderstorm/Wind	0	7/9/2006	Hail	0
7/6/1995	Thunderstorm/Wind	0	5/12/2007	Thunderstorm/Wind	0
7/16/1995	Thunderstorm/Wind	0	6/8/2007	Thunderstorm/Wind	0
10/5/1995	Thunderstorm/Wind	0	6/12/2007	Thunderstorm/Wind	0
11/11/1995	Thunderstorm/Wind	0	6/13/2007	Thunderstorm/Wind	0
4/26/1996	Thunderstorm/Wind	0	6/13/2007	Hail	0
4/26/1996	Thunderstorm/Wind	30K	6/19/2007	Thunderstorm/Wind	0
5/11/1996	Thunderstorm/Wind	0	6/27/2007	Thunderstorm/Wind	0
6/12/1996	Thunderstorm/Wind	0	7/5/2007	Thunderstorm/Wind	0
6/20/1996	Thunderstorm/Wind	0	7/5/2007	Thunderstorm/Wind	0
7/30/1996	Thunderstorm/Wind	0	6/10/2008	Thunderstorm/Wind	0
9/6/1996	Thunderstorm/Wind	0	6/16/2008	Thunderstorm/Wind	0
9/6/1996	Thunderstorm/Wind	0	6/27/2008	Thunderstorm/Wind	40K
10/18/1996	Thunderstorm/Wind	0	7/20/2008	Thunderstorm/Wind	10K
5/6/1997	Thunderstorm/Wind	0	7/23/2008	Thunderstorm/Wind	0
7/18/1997	Thunderstorm/Wind	0	8/7/2008	Thunderstorm/Wind	5K
5/29/1998	Thunderstorm/Wind	0	8/7/2008	Hail	0
6/16/1998	Thunderstorm/Wind	0	12/31/2008	High Wind	0
6/30/1998	Thunderstorm/Wind	0	2/12/2009	High Wind	5K
9/7/1998	Thunderstorm/Wind	0	6/9/2009	Hail	0
6/2/1999	Thunderstorm/Wind	10K	6/9/2009	Hail	0
7/9/1999	Thunderstorm/Wind	15K	6/9/2009	Hail	0
7/30/1999	Thunderstorm/Wind	10K	6/26/2009	Thunderstorm/Wind	5K
8/14/1999	Thunderstorm/Wind	10K	7/11/2009	Thunderstorm/Wind	5K
9/29/1999	High Wind	100K	8/9/2009	Thunderstorm/Wind	5K
1/10/2000	High Wind	0	8/18/2009	Thunderstorm/Wind	5K
4/9/2000	High Wind	15K	8/19/2009	Thunderstorm/Wind	5K
5/10/2000	Hail	0	8/20/2009	Thunderstorm/Wind	5K
5/13/2000	Thunderstorm/Wind	0	4/8/2010	Thunderstorm/Wind	5K
6/2/2000	Thunderstorm/Wind	3K	4/8/2010	Thunderstorm/Wind	5K
6/21/2000	Thunderstorm/Wind	5K	4/16/2010	Thunderstorm/Wind	0
12/12/2000	High Wind	500K	4/25/10	Hail	0
2/10/2001	High Wind	150K	7/12/2010	Thunderstorm/Wind	5K
4/9/2001	Thunderstorm/Wind	0	7/12/2010	Hail	0
6/12/2001	Thunderstorm/Wind	0	7/12/2010	Hail	0
6/12/2001	Thunderstorm/Wind	0	7/21/2010	Thunderstorm/Wind	5K
6/20/2001	Thunderstorm/Wind	0	4/27/2011	Thunderstorm/Wind	5K
7/1/2001	Thunderstorm/Wind	0	4/28/2011	Thunderstorm/Wind	5K
7/5/2001	Thunderstorm/Wind	0	6/12/2011	Hail	0
8/28/2001	Thunderstorm/Wind	0	7/18/2011	Thunderstorm/Wind	5K
8/30/2001	Thunderstorm/Wind	0	8/1/2011	Thunderstorm/Wind	2K

8/31/2001	Thunderstorm/Wind	0	8/21/2011	Hail	0
10/16/2001	Thunderstorm/Wind	0	5/27/2012	Thunderstorm/Wind	5K
3/9/2002	High Wind	50K	5/27/2012	Thunderstorm/Wind	5K
3/21/2002	High Wind	25K	6/29/2012	Thunderstorm/Wind	5K
4/28/2002	Thunderstorm/Wind	0	7/7/2012	Thunderstorm/Wind	5K
5/12/2002	Thunderstorm/Wind	0	7/7/2012	Thunderstorm/Wind	5K
5/31/2002	Thunderstorm/Wind	0	7/7/2012	Hail	0
6/18/2002	Hail	0	7/18/2012	Hail	0
8/2/2002	Hail	0	7/19/12	Hail	0
2/23/2003	High Wind	0	10/29/2012	High Wind	0

Source: National Climatic Data Center

Extreme Temperatures

Temperatures are generally a regional problem and not necessarily confined to Perry County. Ordinarily, those affected are the elderly or fixed income individuals within the area. Extreme temperatures can result in unmanageable heating or cooling bills or personal injury, such as heat exhaustion or hypothermia. These instances can stretch the capacity of local emergency management services.

**Table C.21
Perry County Extreme Temperature Incidents
1994-2012**

Date	Type
6/13/1994	Heat Waves
7/5/1994	Heat Wave
11/1/1994	Unseasonably Warm
1/1/1995	Unseasonably Warm
1/14/1995	Record Warmth
2/6/1995	Extreme Cold
7/1/1995	Excessive Heat
7/13/1995	Heat Wave
7/29/1995	Heat Wave
8/1/1995	Unseasonably Warm and Dry
8/12/1995	Heat Wave
8/29/1995	Heat Wave
7/5/1999	Excessive Heat
7/17/2006	Heat
7/31/2006	Heat
8/1/2006	Heat

Source: National Climatic Data Center

Vulnerability

Perry County is fortunate in its location among the mountain ranges in the Appalachian Mountain region. This location has helped protect the county from tornadoes and hurricanes that have affected the counties and state around Perry County. There has been one tornado recorded in Perry County, with no loss of life and little property damage. Hurricanes seldom reach Perry County as more than rainstorms, although there has been reported high winds and flooding associated with these storms. Severe thunderstorms are a more prominent threat to the county. Thunderstorms can produce tornadoes, and tornado like effects, which create disruption of utilities and property damage. As discussed previously, high winds have caused serious property damage.

Winter Storms

Perry County is vulnerable to severe winter weather. The economic impacts from snow removal, road and infrastructure repair, etc. impart a great strain on the budgets and material resources of local municipalities. Along with municipalities, other vulnerable entities in the County include business and utility companies. Drivers experience automobile accidents while homeowners experience property damage. Municipalities are burdened with snow and ice removal, businesses are constantly losing income from closures, and utility companies are tasked with repairing the damage done to critical infrastructure (fallen power lines, water main breaks, etc.).

Perry County has received both Governor and Federal disaster declarations as a result of winter storms, with the latest being in 2010. Snow or ice storms have affected Perry County thirty-one (31) times since 1994.

Because of the mountainous areas and the large percentage of rural population, severe snowstorms can cause major problems in Perry County. Many areas are subject to isolation and loss of telephone and electrical service can cause added complications. Heavy snows have caused rural roads to be closed for days at a time, and in some cases as long as a week.

Routes 22, 22/322 and 11/15 are major traffic carriers through Perry County. Closure of any or all of these major arteries would require evacuation of stranded motorists, and opening of mass care centers.

Township roads are normally closed as a result of a lack of equipment or snowfall accumulating faster than their limited equipment and manpower can keep up. Drifting snow only adds to their inability to keep roads open.

The major emergency needs of residents and special needs groups are for emergency service response, medical attention, fuel and electricity. Being a rural area, farming is an important part of the county economy and lifestyle. Road closures and heavy snow present specific problems to the farming community including their ability to get milk off the farm for sale, feeding of livestock, and removing of manure from within the barns.

Spring and Summer Storms

Perry County is vulnerable to spring and summer storms. Hurricanes, tropical storms, and tropical depressions can also occur in this region. The difference between these types of storms is shown below. The chance of wind damage in the County increases as housing and commercial development continues. These storms can be expected from the spring to early fall months (hurricane season officially runs from June - November).

**Table C.22
Storm Categories**

Type of Storm	Maximum Sustained Winds (mph)	Estimated Damage
Tropical Depression	Less than 39 mph	
Tropical Storm	39 - 73 mph	
Saffir-Simpson Scale		
Category 1 Hurricane	74 - 95 mph	Minimal damage to vegetation
Category 2 Hurricane	96 - 110 mph	Moderate damage to structures
Category 3 Hurricane	111 - 130 mph	Extensive damage to small structures
Category 4 Hurricane	131 - 155 mph	Extreme structural damage
Category 5 Hurricane	Greater than 155 mph	Catastrophic structural failure possible

Probability

The frequency of windstorms and tornadoes in the county is expected to remain constant. Hurricanes, like other natural hazards will continue, and the effects from heavy rainfall associated with these storms pose a hazard to the county.

As population increases and development continues in Perry County, the number of residents and properties vulnerable to the effects of these storms is expected to increase. The increased dependence on various modes of transportation and need for public utilities makes the disruption of these services more significant than in years past.

Increased technology with regard to identifying these storms much earlier than in the past by the National Weather Service has resulted in more warnings and improved accuracy of potential effected areas of the county.

Perry County has experienced heavy windstorms that caused power failures and required residents to be evacuated and provided with housing, food, and medical supplies. The Red Cross provided necessary assistance.

In April 1975, Perry County experienced high winds.

Perry County has experienced one know tornado and two hurricanes to date.

In October 1983, a high windstorm classified as a “straight wind” by the National Weather bureau, started in the Shermansdale area and proceeded east for approximately four miles. One home was destroyed and several received damage. Sheds, barns, vehicles and other property were destroyed. It is estimated that a quarter of a million dollars in damages resulted from this windstorm.

Extreme Temperatures

Extreme temperatures are usually a regional problem. In relatively rural communities, such as Perry County, crop damage can occur. This can be the result of excessive heat or unseasonably cold conditions.

History

Table C.23 provides a history of Perry County averages and records.

**Table C.23
Perry County Averages and Records**

Month	Avg. High	Avg. Low	Mean	Avg. Precipitation	Record High	Record Low
January	37°F	19°F	28°F	2.86 in.	74°F (1950)	-14°F (1968)
February	41°F	21°F	31°F	2.68 in.	77°F (1985)	-16°F (1961)
March	51°F	29°F	40°F	3.52 in.	88°F (1986)	1°F (1989)
April	63°F	38°F	51°F	3.20 in.	96°F (1976)	17°F (1982)
May	72°F	48°F	60°F	4.02 in.	96°F (1962)	29°F (1978)
June	80°F	57°F	69°F	4.00 in.	104°F (1952)	38°F (1972)
July	85°F	62°F	74°F	3.48 in.	106°F (1966)	45°F (1979)
August	82°F	61°F	71°F	3.35 in.	103°F (1955)	39°F (1949)
September	75°F	53°F	64°F	3.74 in.	103°F (1953)	29°F (1963)
October	64°F	41°F	52°F	3.26 in.	93°F (1962)	20°F (1969)
November	52°F	33°F	43°F	3.45 in.	84°F (1950)	10°F (1976)
December	41°F	24°F	33°F	3.20 in.	75°F (1984)	-16°F (1960)

Vulnerability

The elderly and youth populations are the most vulnerable to severe weather, due to their mobility challenges, disabilities, fixed income, etc.

Maximum Threat

Severe weather comes in many forms. Most often, instances of severe weather are regional events affecting large areas. The maximum threat to Perry County is damage to property, facilities, and infrastructure as a result of severe weather.

Secondary Effect

Flooding and power outages are major secondary effects of severe weather. Heavy rain and melting snow can lead to large amounts of ground water that cannot be contained by streams and rivers. If the flooding is extreme, it may lead to dam failures. Power outages can be caused by heavy winds, strong storms, and large amounts of snow or ice melt that weigh on power lines, as well as from strains placed on power grids as they surge to meet demand. Transportation accidents are likely to increase as weather conditions deteriorate.

Flooding and traffic accidents increase the likelihood of a hazardous materials spill. Subsidence caused by flooding and extreme temperatures can damage vital lifelines such as gas and water pipelines. Essential services may experience limited disruptions and threaten the health and safety of at-risk populations in the affected area. Prolonged severe weather conditions can also have a major impact on the economic and financial condition of the County, as shortages in supplies and inflation of prices occurs.