guarantee that the problem will not re-occur. Sinkhole repair for Vera Cruz Road in Lehigh County cost nearly $80,000, and a new sinkhole opened, just outside the repair area, within six months.

Bruhn et al. (1978) reported in a study of the Pittsburgh coal, that annual costs for remedial measures and repairs were $438,000. This estimate does not include the cost of damage to commercial structures, utilities, or transportation rights-of-way, and the cost of engineering and construction measures undertaken to prevent or minimize subsidence damage.

In a study of damage from active mining in western Pennsylvania, Bruhn et al. (1982) reported that home repair costs (measured in 1981 dollar values) ranged from a few hundred dollars to more than $100,000. The median repair cost was $6,000 to $10,000 per home.

4.3.13.9. State Facility Loss Estimation

Of the 1,263 vulnerable critical facilities, 83 do not have replacement values; these facilities are largely private entities. The estimated replacement cost of all state critical facilities with replacement values located in areas susceptible to natural subsidence and sinkhole hazard zones is $6,262,828,204. Actual losses may be lower because special regulations have been established at the state level for the construction of certain facilities (e.g. sanitary landfills).

4.3.14. Tornado, Windstorm

4.3.14.1. Location and Extent

Both tornado and windstorm events can occur throughout Pennsylvania. Tornado events are usually localized. However, severe thunderstorms may result in conditions favorable to the formation of numerous or long-lived tornadoes. Tornadoes can occur at any time during the day or night, but are most frequent during late afternoon into early evening, the warmest hours of the day, and most likely to occur during the spring and early summer months of March through June. Tornado movement is characterized in two ways: direction and speed of spinning winds and forward movement of the tornado, also known as the storm track. Most tornadoes have wind speeds of 110 mph (175 km/h) or less, are approximately 250 feet (75 m) across, and travel a few miles (several kilometers) before dissipating. Some attain wind speeds of more than 300 mph (480 km/h), stretch more than a mile (1.6 km) across, and stay on the ground for dozens of miles (more than 100 km). Some tornadoes never touch the ground and are short-lived, while others may touch the ground several times.

Straight-line winds and windstorms are experienced on a region-wide scale. While such winds usually accompany tornadoes, straight-lined winds are caused by the movement of air from areas of higher pressure to areas of lower pressure. Stronger winds are the result of greater differences in pressure. Windstorms are generally defined with sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds of 58 mph or greater for any duration. Wind events can vary in spatial size from small microscale events which take place over only a few hundred meters to large-scale synoptic wind events often associated with warm or cold fronts.

4.3.14.2. Range of Magnitude

Each year, tornadoes account for $1.1 billion in damages and cause over 80 deaths nationally (NCAR, 2001). While the extent of tornado damage is usually localized, the vortex of extreme wind associated with a tornado can result in some of the most destructive forces on Earth. Rotational wind speeds can range from 100 mph to more than 250 mph. In addition, the speed of forward motion can range from 0 to 50 mph. Therefore, some estimates place the maximum velocity (combination of ground speed, wind speed and upper winds) of tornadoes at about 300 mph. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Damages and deaths can be especially significant when tornadoes move through populated, developed areas. The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size and duration of the storm. Typically, tornadoes cause the greatest damages to structures of light construction such as mobile homes. The Enhanced Fujita Scale, also known as the “EF-Scale,” measures tornado strength and associated damages. The EF-Scale is an update to the earlier Fujita Scale, also known as the “F-Scale,” which was published in 1971. The EF-Scale provides engineered wind estimates and better damage descriptions. It classifies United States tornadoes into six intensity categories, as shown in Table 4.3.14-1, based upon the estimated maximum winds occurring within the wind vortex. Since its implementation by the National Weather Service in 2007, the EF-Scale has become the definitive metric for estimating wind speeds within tornadoes based upon damage to buildings and structures. F-Scale categories with corresponding EF-Scale wind speeds are also provided since previous tornado occurrences are described based on the F-Scale.

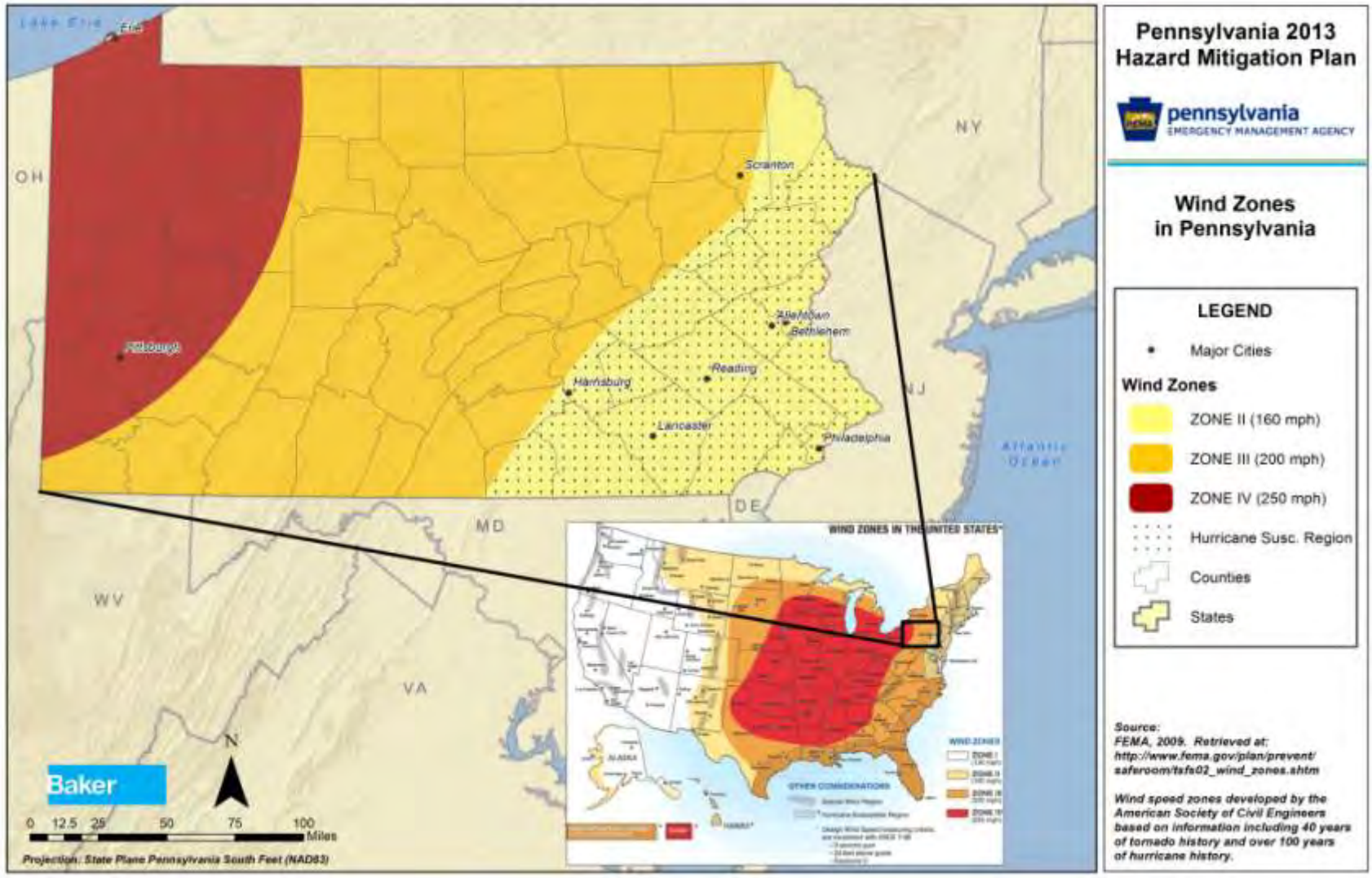
Table 4.3.14-1 Enhanced Fujita Scale (EF-Scale) categories with associated wind speeds and description of damages.			
EF-SCALE NUMBER	**WIND SPEED (mph)**	**F-SCALE NUMBER**	**TYPE OF DAMAGE POSSIBLE**
EF0	65–85	F0-F1	**Minor damage**: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0.
EF1	86-110	F1	**Moderate damage**: Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111–135	F1-F2	**Considerable damage**: Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136–165	F2-F3	**Severe damage**: Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166–200	F3	**Devastating damage**: Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	F3-F6	**Extreme damage**: Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (300 ft); steel reinforced concrete structure badly damaged; high-rise buildings have significant structural deformation.

The impact of tornado hazards is ultimately dependent on the amount of population or property (i.e. buildings, infrastructure, agricultural land, etc…) present in the area in which the tornado occurs. Tornado events are often so severe that property loss or human fatality is typically inevitable if evacuation or proper construction standards are not implemented.

Figure 4.3.14-1 shows wind speed zones developed by the American Society of Civil Engineers based on information including 40 years of tornado history and over 100 years of hurricane history. It identifies worst-case wind speeds that could occur across the United States to be used as the basis for design and evaluation of the structural integrity of shelters and critical facilities. Eastern Pennsylvania falls within Zone II, meaning design wind speeds for shelters and critical facilities should be able to withstand a 3-second gust of up to 160 mph, regardless of whether the gust is the result of a tornado, hurricane, tropical storm, or windstorm event. Central and parts of western Pennsylvania fall within Zone III, meaning design wind speeds for shelters and critical facilities should be able to withstand a 3-second gust of up to 200 mph. Extreme western and northwestern Pennsylvania are located in Zone IV; design wind speeds

for shelters and critical facilities should be able to withstand a 3-second gust of up to 250 mph. Also, it is important to note that eastern and south-central Pennsylvania is within a hurricane-susceptible wind zone. For more information on hurricanes in Pennsylvania, see Section 4.3.7.

Figure 4.3.14-1 Design wind speeds for community shelters across the United States (FEMA 2009).



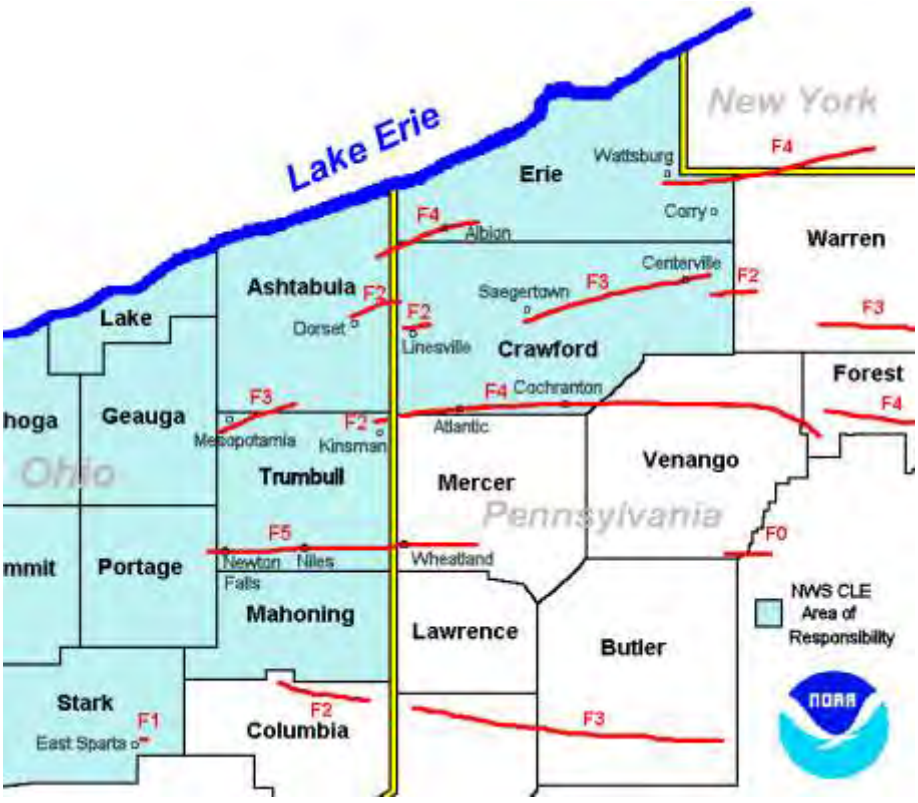
The wind zones identified in Figure 4.3.14-1 represent the strongest wind speeds anticipated throughout Pennsylvania, not the normal or routine wind speeds expected statewide. The May 31, 1985 tornado swarm event discussed in Section 4.3.14.3 marks the worst documented tornado outbreak in Pennsylvania.

The worst-case tornado event on record occurred on July 15, 2004 in Campbelltown, Lebanon County. This F3 tornado, which had estimated wind speeds of 175-200 miles per hour, leveled 32 houses, severely damaged 37 homes, and an additional 50 homes suffered more minor damage. Two people were hospitalized from the tornado, one critically injured. While only on the ground for 10-15 minutes, the NCDC estimates that the tornado caused $18 million in property damage.

4.3.14.3. Past Occurrence

Tornadoes have occurred throughout Pennsylvania. Western and southeastern sections of the Commonwealth have been struck more frequently. On May 31, 1985 a very rare outbreak of 21 tornadoes tracked across northeast Ohio and northwest Pennsylvania, including Erie, Warren, Crawford, Forest, Mercer, Venango, Mercer, and Butler counties, killing 76 people (Figure 4.3.14-2). One of these tornadoes was rated an F6 while six were rated F4s on the old Fujita Scale. The deadliest tornado touched down near Jamestown, PA as an F4 on the old Fujita Scale, killing 23 people and destroying 371 homes. It stayed on the ground for over an hour and produced a 56-mile long damage path.

Figure 4.3.14-2 Map showing tornado tracks during the May 31, 1985 tornado outbreak (NOAA NWS, 2005).



Another storm in May 1985 killed six people, injured sixty, and destroyed campers, manufactured homes, homes and businesses across Lycoming, Union and Northumberland Counties. Figure 4.3.14-3 shows the number of tornado events for each county of the Commonwealth between 1950 and 2013; Figure 4.3.14-4provides a map of tornado touchdowns and tracks across Pennsylvania. Crawford, Erie, Lancaster, Westmoreland, and York Counties have recorded the highest number of tornadoes over this time period. Evaluation of previous versions of the SSAHMP show that while the absolute number of events have changed for individual counties, the basic pattern of vulnerability across the Commonwealth has remained relatively consistent.

Figure 4.3.14-3 Graph showing the number of tornado events across Pennsylvania by county between 1950 and June 2013 (NCDC, 2013).

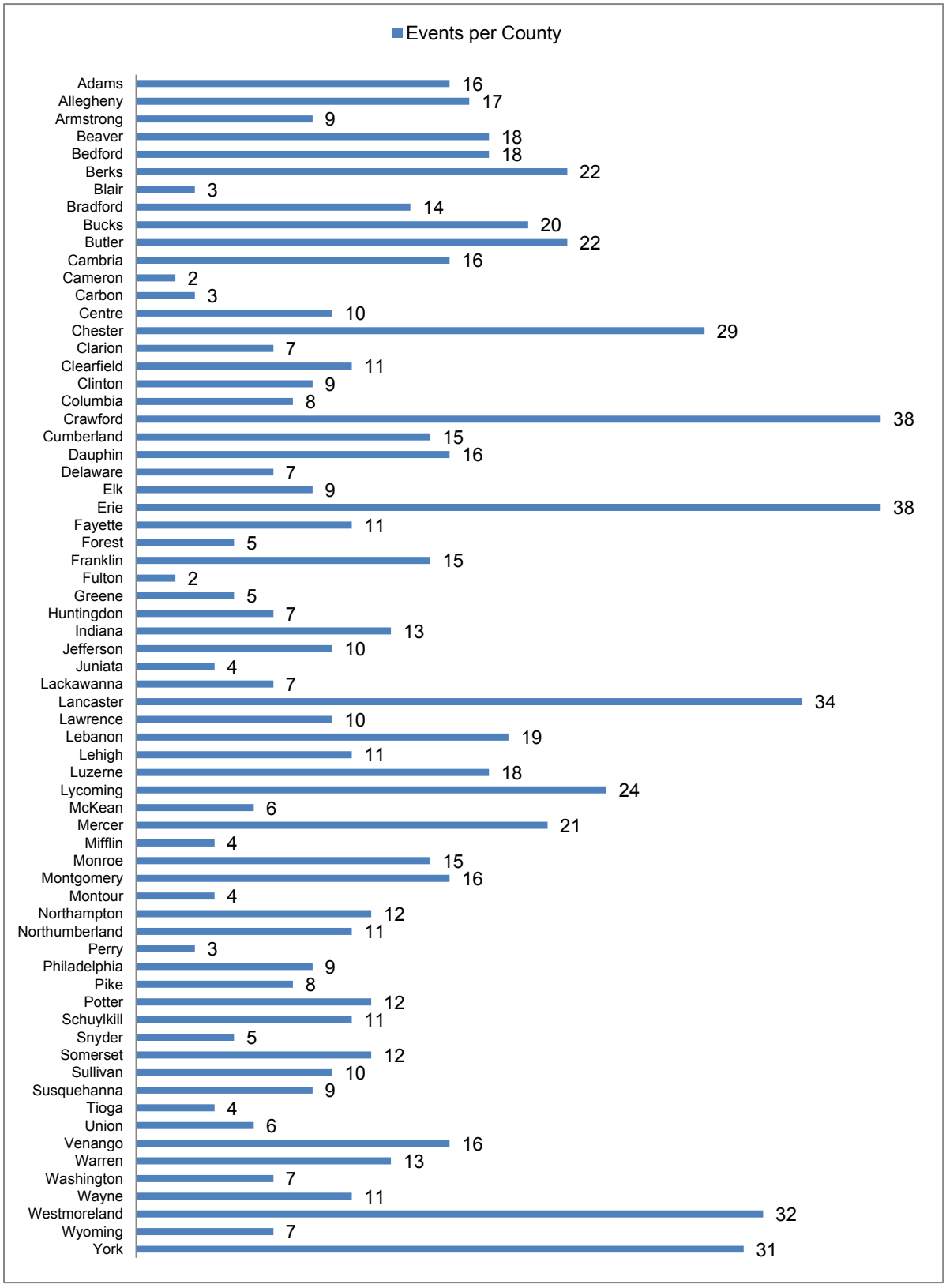
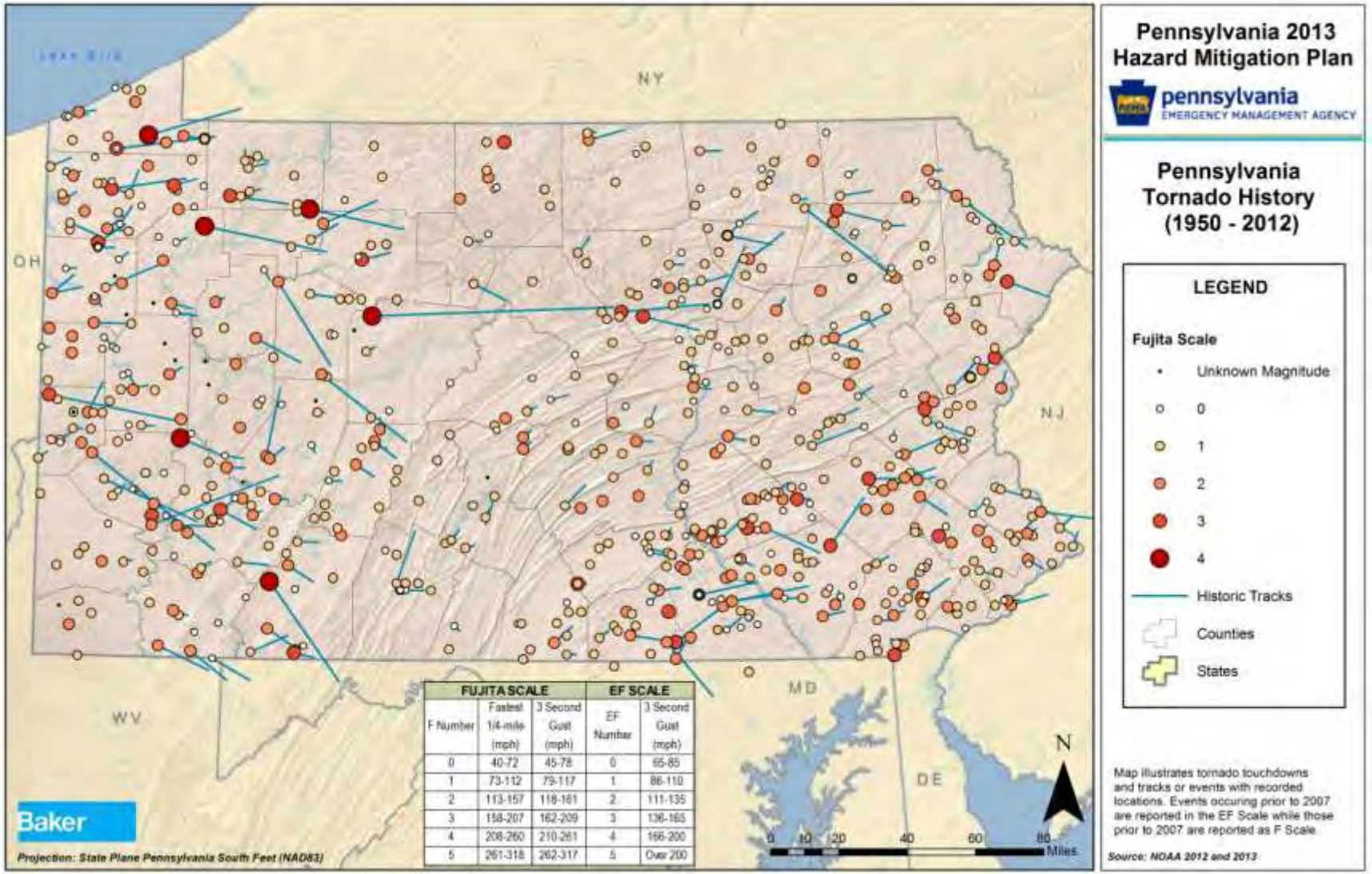


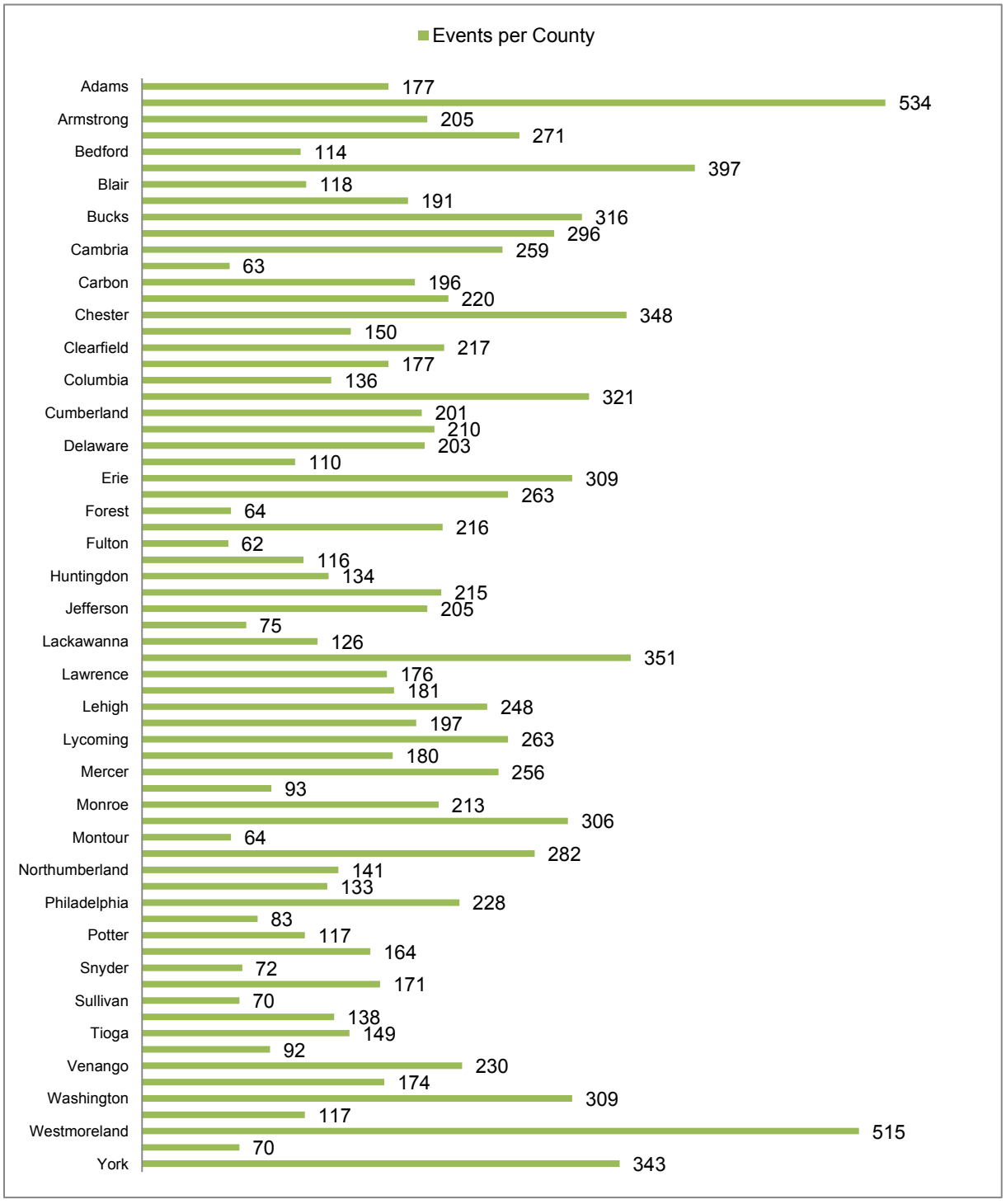
Figure 4.3.14-4 Map showing the number of tornadoes in each county across Pennsylvania between 1950 and 2012 (NOAA SPC, 2013). Note that the F5 tornado which tracked through Ohio and Pennsylvania on May 31, 1985 is not identified in this dataset.



FUJITA SCALE			EF SCALE	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85
1	73-112	79-117	1	86-110
2	113-157	118-161	2	111-135
3	158-207	162-209	3	136-165
4	208-260	210-261	4	166-200
5	261-318	262-317	5	Over 200

Total windstorm events reported for each county in Pennsylvania between 1950 and 2013 are provided in Figure 4.3.14-5. Events may be the result of thunderstorms, hurricanes, tropical storms, winter storms, or nor'easters.

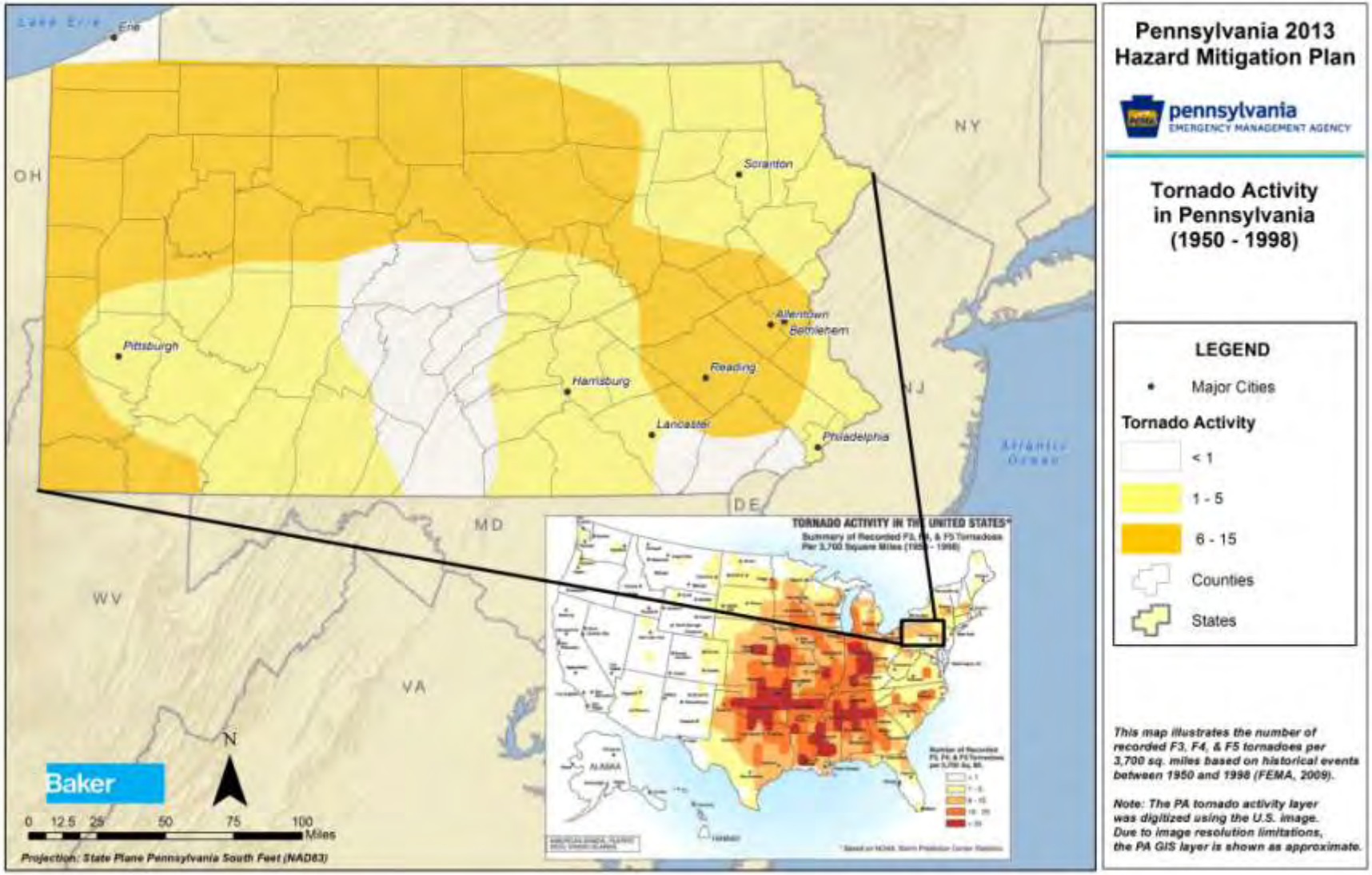
Figure 4.3.14-5 Graph showing the number of windstorm events across Pennsylvania by county between 1950 and June 2013 (NCDC, 2013).



4.3.14.4. Future Occurrence

According to the National Weather Service, the Commonwealth of Pennsylvania has an annual average of ten tornadoes with two related deaths. Based on historical events between 1950 and 1998, there are three zones in Pennsylvania which experience <1, 1 to 5, and 6 to 15 F3, F4, and F5 tornadoes per 3,700 square miles (Figure 4.3.14-7).

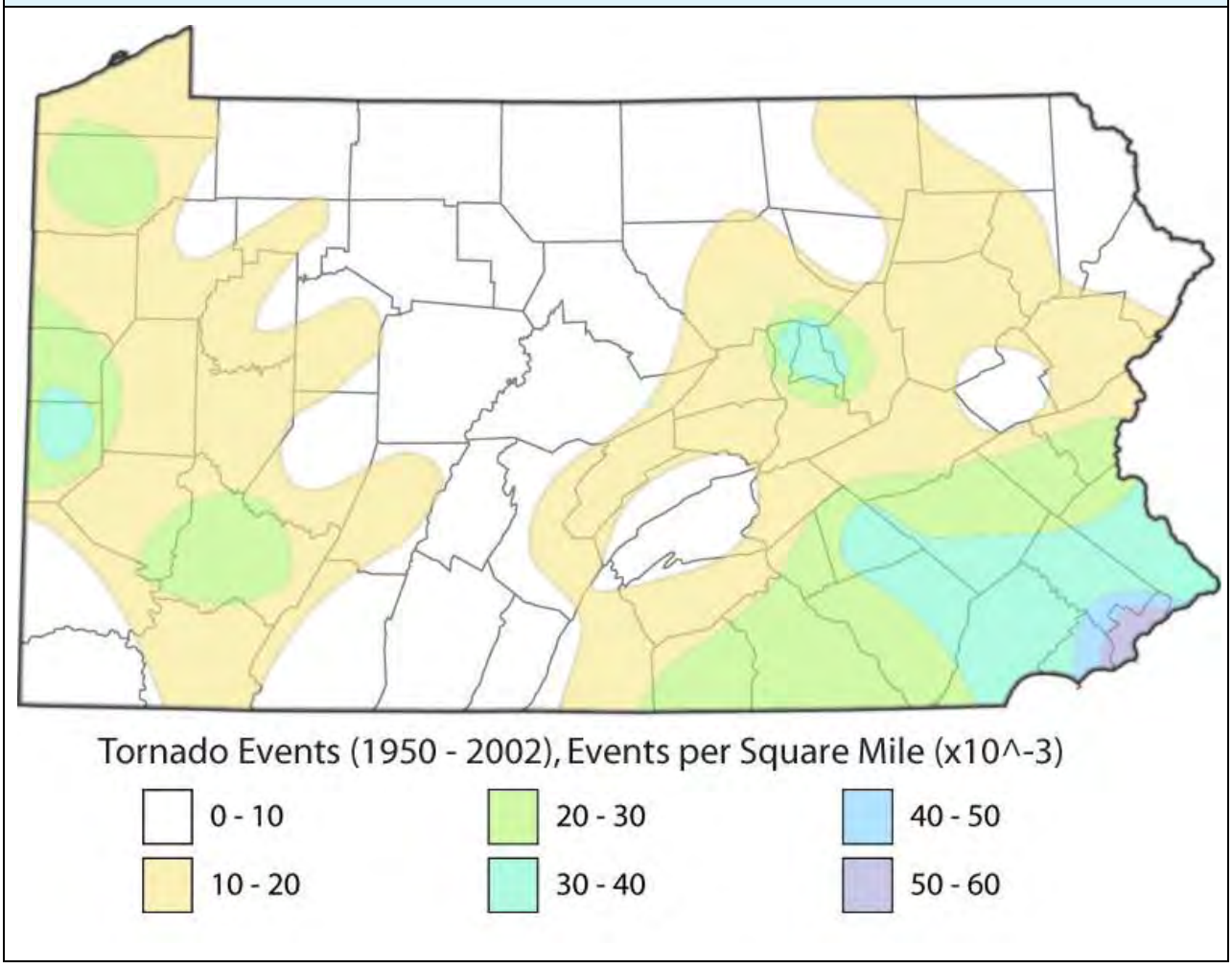
Figure 4.3.14-6 Map showing historical tornado activity in Pennsylvania from 1950-1998.



The 2007 SSAHMP performed an investigation of the time of year and time of day when tornadoes most often occur. Analysis of events between 1950 and 2000 showed that approximately 72% of tornadoes in Pennsylvania occurred between the months of May and August. Approximately 79% of historical tornadoes occurred between noon and 9 p.m. (PEMA, 2007).

Using events collected between 1950 and 2000, Figure 4.3.14-7shows the number of total tornado events per square mile across Pennsylvania from the State Climatologist. It is clear that the southeast and western sections of the Commonwealth experience a higher frequency of events compared to other areas of Pennsylvania. This analysis represents the best available information on tornado density in the Commonwealth.

Figure 4.3.14-7 Total tornado events per square mile in Pennsylvania (Pennsylvania State Climatologist).

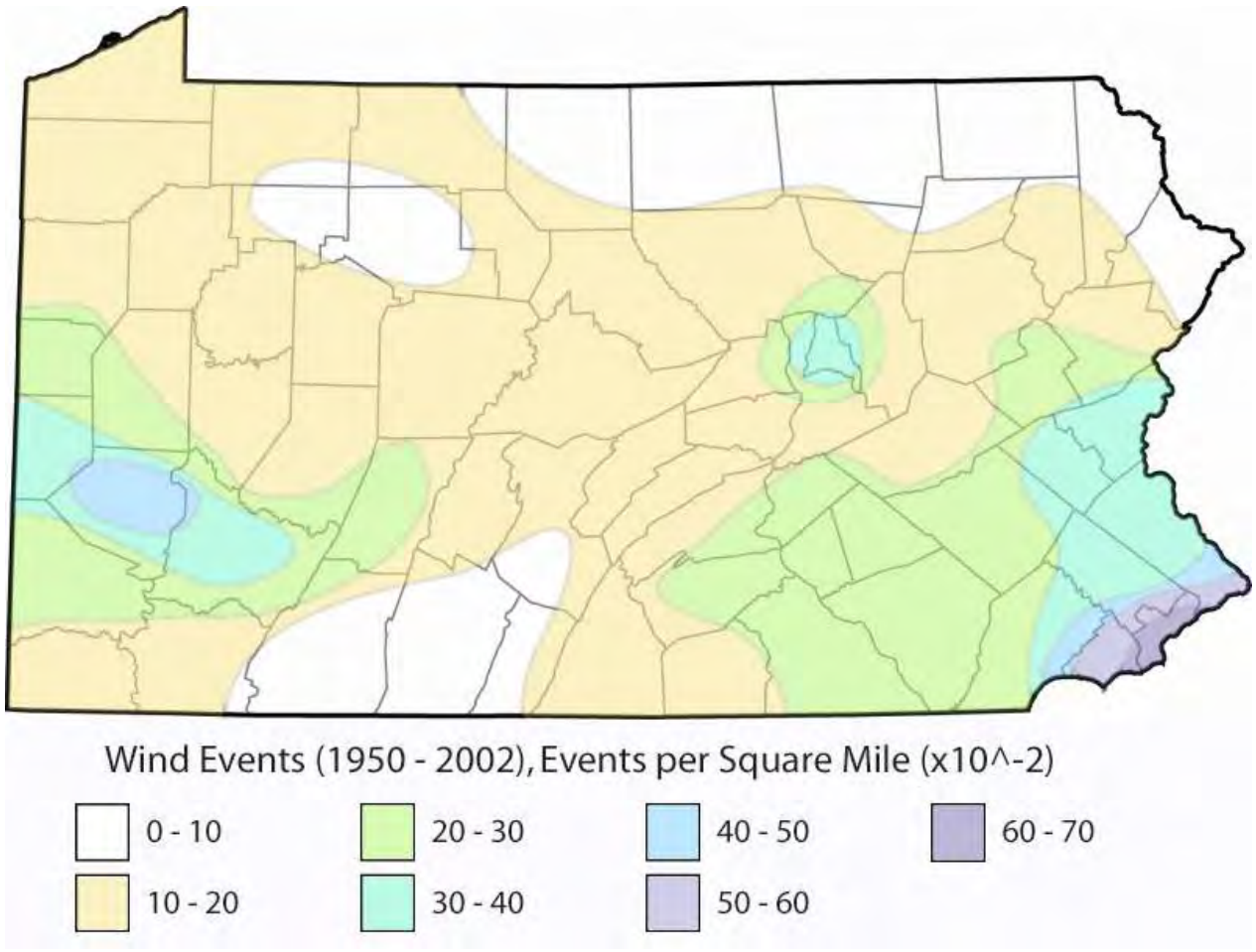


Similarly to tornadoes, an investigation of the time of year and time of day when windstorm events most often occur was performed in the 2007 SSAHMP. Using historical events between 1950 and 2000, the analysis showed that approximately 73% of windstorms in Pennsylvania occurred between the months of May and August. Approximately 74% of windstorms occurred

between 2 p.m. and 9 p.m. (PEMA, 2007). These results are expected, since severe wind events are most often associated with thunderstorm events which are usually experienced during the late afternoon or evening in the late spring and summer months.

Using events collected between 1950 and 2002, Figure 4.3.14-8 shows the number of wind events per square mile across Pennsylvania. It is clear that the southeast and extreme western sections of the Commonwealth experience a higher frequency of events compared to other areas of Pennsylvania.

Figure 4.3.14-8 Wind events per square mile in Pennsylvania (Pennsylvania State Climatologist).



4.3.14.5. Environmental Impacts

Since tornado events are typically localized, environmental impacts are rarely widespread. The impacts of windstorms on the environment typically take place over a larger area. In either case, where these events occur, severe damage to plant species is likely. This includes uprooting or total destruction of trees and an increased threat of wildfire in areas where dead trees are not removed. Hazardous material facilities should meet design requirements for the

wind zones identified in Figure 4.3.14-1 in order to prevent release of hazardous materials into the environment.

4.3.14.6. Jurisdictional Vulnerability Assessment

According to the NCDC, a total of 867 tornados have occurred in Pennsylvania during the years 1950-2013. All 67 Pennsylvania counties have experienced at least one tornado. All counties except Carbon and Philadelphia have identified tornado or windstorm as a hazard of significant concern to their communities, as listed in Table 4.3.14-2. As stated in Section 4.1, the decision by a county to profile a hazard is one indicator of the presence of risk from that hazard. This indicator should be viewed complementary to other analysis in this section. Together this analysis from reputable sources addresses different aspects of risk for a full risk profile.

Of the 39 counties with calculated risk factors for tornado and windstorm hazards, the average risk factor is 2.4. The State calculated risk factor is 2.2, and the Pennsylvania THIRA prioritizes Tornado/Windstorm hazards as a 7of 10. For more details, please see Section 4.1.

Table 4.3.14-2 Counties profiling tornado and windstorm hazards with hazard ranking and risk factor (if available).

COUNTY	PROFILED HAZARD	DID NOT PROFILE HAZARD	RANKING (IF AVAILABLE)	RISK FACTOR (IF AVAILABLE)
Adams	X		High	3.7
Allegheny	X		High	2.9
Armstrong	X		Not Ranked	No RF
Beaver	X		High	2.5
Bedford	X		High	2.8
Berks	X		Not Ranked	No RF
Blair	X		Not Ranked	No RF
Bradford	X		Not Ranked	No RF
Bucks	X		Medium	2.1
Butler	X		Medium	2.3
Cambria	X		Medium	2.2
Cameron	X		Low	1.3
Carbon		X		
Centre	X		Medium	2.4
Chester	X		Not Ranked	No RF
Clarion	X		Not Ranked	No RF
Clearfield	X		Low	1.8
Clinton	X		High	2.9
Columbia	X		High	2.7
Crawford	X		Medium	2.2

Table 4.3.14-2 Counties profiling tornado and windstorm hazards with hazard ranking and risk factor (if available).

COUNTY	PROFILED HAZARD	DID NOT PROFILE HAZARD	RANKING (IF AVAILABLE)	RISK FACTOR (IF AVAILABLE)
Cumberland	X		High	2.7
Dauphin	X		Not Ranked	No RF
Delaware	X		Medium	2.1
Elk	X		Medium	2.4
Erie	X		Medium	2.2
Fayette	X		Medium	2.4
Forest	X		Not Ranked	No RF
Franklin	X		Not Ranked	No RF
Fulton	X		High	3.0
Greene	X		Low	1.8
Huntingdon	X		Not Ranked	No RF
Indiana	X		Medium	2.4
Jefferson	X		High	2.5
Juniata	X		Medium	2.3
Lackawanna	X		Not Ranked	No RF
Lancaster	X		High	2.5
Lawrence	X		Medium	2.4
Lebanon*	X		Not Ranked	11.6
Lehigh	X		Medium	2.1
Luzerne	X		Not Ranked	No RF
Lycoming	X		High	3.7
McKean	X		Medium	2.2
Mercer	X		Medium	2.3
Mifflin	X		Not Ranked	No RF
Monroe	X		Medium	2.2
Montgomery	X		High	2.7
Montour*	X		Not Ranked	5.0
Northampton	X		Medium	2.1
Northumberland	X		Medium	2.2
Perry*	X		Not Ranked	3.3
Philadelphia**		X		
Pike	X		Medium	2.1
Potter	X		Not Ranked	No RF

Table 4.3.14-2 Counties profiling tornado and windstorm hazards with hazard ranking and risk factor (if available).

COUNTY	PROFILED HAZARD	DID NOT PROFILE HAZARD	RANKING (IF AVAILABLE)	RISK FACTOR (IF AVAILABLE)
Schuylkill	X		Not Ranked	No RF
Snyder	X		Medium	2.4
Somerset	X		High	2.6
Sullivan	X		Not Ranked	No RF
Susquehanna	X		Medium	2.1
Tioga	X		Medium	2.4
Union	X		Not Ranked	No RF
Venango	X		High	2.7
Warren	X		Medium	2.1
Washington	X		Not Ranked	No RF
Wayne	X		Not Ranked	No RF
Westmoreland	X		Not Ranked	No RF
Wyoming	X		Not Ranked	No RF
York	X		Medium	2.3

* Lebanon, Montour, and Perry use an alternate weighted ranking where Risk Factor = Frequency x [(0.25 x Critical facilities) + (0.40 x Social) + (0.25 x Economic) + (0.10 x Environmental)]. While this risk factor was used to comparatively rank hazards, the number does not correspond to a high-medium-low rating.

**Philadelphia uses an A, B, C rating system where A is high, B is medium, and C is low.

As stated in Section 4.2.2, jurisdictional and state critical facility vulnerability assessments were completed by spatially overlaying hazards with census tracts and state critical facility layers in GIS. When spatial analysis determined that the hazard would impact a census tracts within a county or the location of state critical facilities these locations where deemed vulnerable to the hazard. Loss estimates were prepared based on the value of the facilities impacted by census tract and by state critical facility. Each hazard uses a methodology that is specific to the type of risk it may cause; Table 4.2.2-2 includes a complete methodology description for vulnerability assessments and loss estimates for each hazard.

Vulnerability for tornados was classified as generating a 5-mile buffer around all historic locations where tornados touched down. To refine the analysis, only tornados with a Fujita Scale of F1 or greater was chosen for analysis. Approximately 78% of all Pennsylvania tornados had a scale of F1 or above. Five miles was chosen as a buffer size based on the available historic tornado path averages in Pennsylvania, as seen on Figure 4.3.14-4. The buffer accounts for the varying changes in direction a tornado may travel. In total, 531 tornados individually received a 5 mile buffer to determine how many critical facilities fell within the

vulnerable zone. Using this criterion, a total of 4,320 vulnerable critical facilities have been identified, as illustrated in Table 4.3.14-3.

Table 4.3.14-3 Number of State Critical Facilities impacted by tornados in each county using a 5 mile buffer of historical tornados (F1 or greater)

COUNTY	NUMBER OF CRITICAL FACILITIES	COUNTY	NUMBER OF CRITICAL FACILITIES
Adams	47	Lackawanna	110
Allegheny	513	Lancaster	132
Armstrong	68	Lawrence	46
Beaver	148	Lebanon	97
Bedford	27	Lehigh	65
Berks	109	Luzerne	157
Blair	42	Lycoming	80
Bradford	38	McKean	14
Bucks	106	Mercer	62
Butler	80	Mifflin	20
Cambria	124	Monroe	27
Cameron	2	Montgomery	189
Carbon	17	Montour	2
Centre	36	Northampton	67
Chester	106	Northumberland	71
Clarion	16	Perry	16
Clearfield	9	Philadelphia	105
Clinton	19	Pike	11
Columbia	63	Potter	10
Crawford	66	Schuylkill	145
Cumberland	61	Snyder	17
Dauphin	175	Somerset	51
Delaware	124	Sullivan	10
Elk	16	Susquehanna	8
Erie	57	Tioga	22
Fayette	83	Union	10
Forest	1	Venango	20
Franklin	33	Warren	24
Fulton	2	Washington	88
Greene	17	Wayne	20
Huntingdon	19	Westmoreland	222
Indiana	33	Wyoming	13
Jefferson	27	York	90
Juniata	15	***Grand Total***	***4320***

The top ten counties containing critical facilities were (in order of total number) Allegheny, Westmoreland, Montgomery, Dauphin, Luzerne, Beaver, Schuylkill, Lancaster, Cambria, and Delaware.

4.3.14.7. State Facility Vulnerability Assessment

Due to the large number of schools, fire departments, and police stations in the Commonwealth, it is unsurprising that those categories of facility have the highest number of critical facilities. Table 4.3.14-4 lists a breakdown of the types of facilities contained within the tornado zones.

Table 4.3.14-4 State Critical Facilities vulnerable to tornados by Critical Facility Type

STATE CRITICAL FACILITY TYPE	NUMBER OF IMPACTED FACILITIES
Agriculture	89
Banking	19
Chemical	4
Commercial Facilities	49
Communications	2
Critical Manufacturing	3
Dams	20
Defense Industrial Base	15
Education	118
Emergency Services	65
Energy	21
Fire Departments (Non-HSIP)	1,687
Government Facilities	34
Healthcare & Public Health	34
Hospital (Non-HSIP)	180
Information Technology	3
Manufacturing	1
National Monuments & Icons	4
Nuclear Reactors, Materials & Waste	6
Police (Non-HSIP)	893
Postal & Shipping	7
School (Non-HSIP)	1,002
Transportation	41
Water	23
Grand Total	***4,320***

4.3.14.8. Jurisdictional Loss Estimation

As stated in Section 4.3.9.6, loss estimates were prepared based on the sum of the number and value of buildings in Census tracts located within five miles of historic F1 or stronger tornado events, aggregated to the county level. The Commonwealth has a total of 6,127,881 potentially

impacted buildings with over $1.5 billion in exposure in all 67 counties. Philadelphia County is the most threatened jurisdiction with 675,707 vulnerable buildings and over $176 billion in possible losses stemming from tornado events.

Although tornados are typically thought of as occurring in rural areas, total buildings impacted were found to occur in more densely populated counties, with Philadelphia having the highest occurrence of impacted buildings, followed by Allegheny, Montgomery, Bucks and Delaware counties. High building numbers correlates to high dollar values of building and content exposure. Table 4.3.14-5 illustrates the number of potentially impacted buildings and their associated dollar value of exposure by county.

Table 4.3.14-5 Potential jurisdictional losses due to tornados.

COUNTY	TOTAL NUMBER OF IMPACTED BUILDINGS	DOLLAR VALUE OF EXPOSURE, BUILDING AND CONTENTS (THOUSANDS $)
Adams	74,459	$17,543,280.00
Allegheny	510,986	$128,832,247.00
Armstrong	53,396	$10,791,837.00
Beaver	109,012	$27,694,713.00
Bedford	16,591	$3,065,491.00
Berks	179,059	$46,491,124.00
Blair	39,409	$7,848,158.00
Bradford	25,817	$4,582,888.00
Bucks	267,285	$90,881,375.00
Butler	88,604	$23,568,630.00
Cambria	84,029	$18,256,351.00
Cameron	6,650	$1,133,012.00
Carbon	26,059	$6,082,874.00
Centre	43,953	$11,729,936.00
Chester	221,399	$76,014,508.00
Clarion	26,926	$5,005,882.00
Clearfield	15,952	$2,986,002.00
Clinton	18,589	$3,379,897.00
Columbia	41,754	$8,971,733.00
Crawford	70,364	$14,090,376.00
Cumberland	135,468	$34,986,303.00
Dauphin	146,980	$35,877,702.00
Delaware	268,476	$83,504,854.00
Elk	20,512	$4,290,248.00
Erie	121,237	$27,388,540.00
Fayette	70,276	$14,302,595.00
Forest	15,328	$2,691,824.00
Franklin	69,319	$15,384,721.00

Table 4.3.14-5 Potential jurisdictional losses due to tornados.

COUNTY	TOTAL NUMBER OF IMPACTED BUILDINGS	DOLLAR VALUE OF EXPOSURE, BUILDING AND CONTENTS (THOUSANDS $)
Fulton	2,296	$390,355.00
Greene	9,361	$1,956,631.00
Huntingdon	20,204	$3,994,349.00
Indiana	44,198	$9,521,816.00
Jefferson	34,940	$6,761,437.00
Juniata	23,325	$4,515,367.00
Lackawanna	83,720	$19,365,384.00
Lancaster	215,321	$55,371,453.00
Lawrence	41,992	$9,429,062.00
Lebanon	71,232	$16,772,592.00
Lehigh	181,344	$48,802,779.00
Luzerne	121,089	$27,486,487.00
Lycoming	73,220	$14,754,682.00
McKean	19,898	$3,947,364.00
Mercer	70,521	$15,051,880.00
Mifflin	22,286	$4,481,044.00
Monroe	77,546	$19,889,679.00
Montgomery	455,042	$151,908,102.00
Montour	13,664	$2,807,833.00
Northampton	162,594	$44,989,493.00
Northumberland	49,766	$10,337,826.00
Perry	50,717	$11,577,861.00
Philadelphia	675,707	$176,337,295.00
Pike	31,375	$7,050,372.00
Potter	17,165	$3,118,001.00
Schuylkill	63,866	$14,179,941.00
Snyder	29,141	$6,495,496.00
Somerset	45,568	$9,308,342.00
Sullivan	14,199	$2,494,683.00
Susquehanna	15,445	$2,847,329.00
Tioga	3,931	$795,829.00
Union	28,011	$6,454,644.00
Venango	26,812	$5,215,311.00
Warren	15,350	$2,947,043.00
Washington	72,283	$16,000,935.00
Wayne	29,552	$6,220,852.00
Westmoreland	211,720	$50,145,162.00
Wyoming	26,495	$5,721,765.00

Table 4.3.14-5 Potential jurisdictional losses due to tornados.		
COUNTY	**TOTAL NUMBER OF IMPACTED BUILDINGS**	**DOLLAR VALUE OF EXPOSURE, BUILDING AND CONTENTS (THOUSANDS $)**
York	209,096	$52,263,528.00
Grand Total	***6,127,881***	***$1,579,087,105.00***

4.3.14.9. State Facility Loss Estimation

State facility loss estimates were calculated by summing the replacement cost of all state critical facilities located within the tornado hazard area defined in section 4.3.14.6. The estimated replacement cost of all state critical facilities located in tornado zones is approximately $32,255,517,320.

4.3.15. Wildfire

4.3.15.1. Location and Extent

Wildfires occur throughout wooded and open vegetation areas of Pennsylvania. They can occur any time of the year, but mostly occur during long, dry hot spells. Any small fire, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness or negligence. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion.

Open fields, grass, dense brush and forest-covered areas are typical sites for wildfire events. Under dry conditions or droughts, wildfires have the potential to burn forests as well as croplands. The greatest potential for wildfires is in the spring months of March, April and May, and, to a lesser extent, the autumn months of October and November. In the spring, bare trees allow sunlight to reach the forest floor, drying fallen leaves and other ground debris. In the fall, dried leaves are also fuel for fires. The percentage of wildfires occurring each month is shown in Figure 4.3.15-1.