

2. State Profile

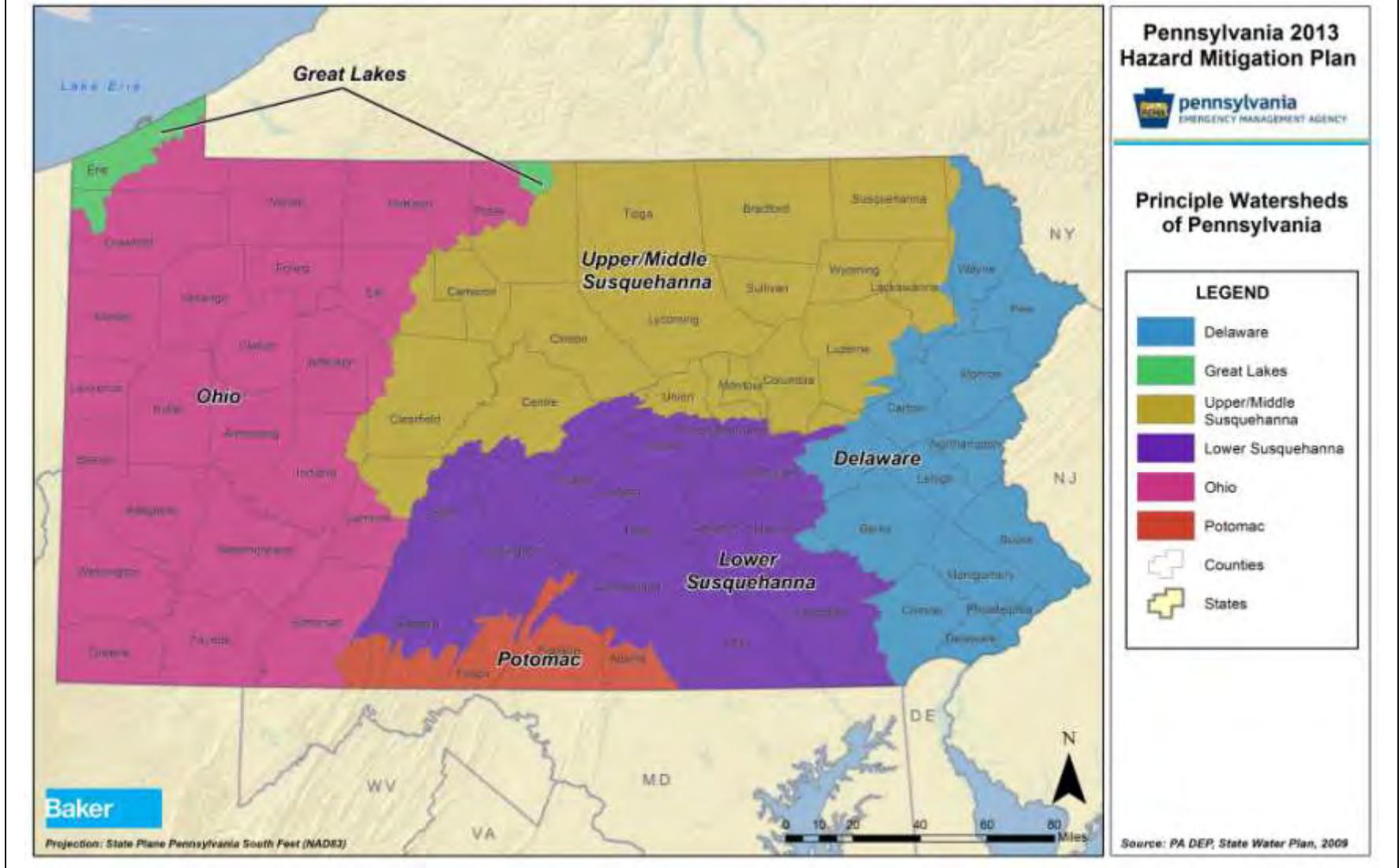
2.1. *Geography and Environment*

The Commonwealth of Pennsylvania consists of approximately 46,058 square miles, 44,820 square miles of which are land area. It is the 33rd largest of the 50 states. Pennsylvania covers an area defined approximately within 39.7 degrees to 42.3 degrees North Latitude and 74.4 degrees to 80.5 West Longitude.

Pennsylvania is bordered to the north by New York and Lake Erie. In the south, Pennsylvania shares a border with Maryland, New Jersey, Delaware, and West Virginia. It is bordered on the east by New Jersey and part of New York. The western border of the state is shared by West Virginia and Ohio.

The Commonwealth's eastern border is located approximately 60 miles inland from the Atlantic Ocean and the Northwestern corner of the Commonwealth borders Lake Erie. Pennsylvania has two tidal coasts: 57 miles of shoreline along the Delaware Estuary and 51 miles of coastline along Lake Erie (PADEP, 2010). Major rivers in the Commonwealth are the Allegheny River, Susquehanna River, Delaware River, and the Ohio River. Topographically, the Commonwealth is drained by the headwaters and main stems of four principal drainages: the Delaware River, Susquehanna River, the Ohio and Potomac. The Genesee and Erie watersheds drain to the Great Lakes. These principle watersheds are shown in Figure 2.1-1.

Figure 2.1-1 Major Watersheds in Pennsylvania (PA DEP, 2009).



Pennsylvania topography varies from mountains to valleys to coastal plains as the Commonwealth contains topographic sections of the Coastal Plain, Piedmont, Ridge and Valley and Appalachian Plateau and Central Lowlands Physiographic provinces (Figure 2.1-2). The Allegheny Mountains are the primary mountain range in the state, stretching diagonally from the southwest to the northeast.

The geology of the Commonwealth is determined by these physiographic provinces. The provinces have distinct geology which can include sandstone, siltstone, clay, quartzite, etc. Karst geology is also present in the Commonwealth and can cause land subsidence and sinkholes. Karst geology is discussed in more detail in Section 4.3.13.

The various physiographic provinces of Pennsylvania also exhibit distinctive climatic characteristics based on region and elevation. In addition, Pennsylvania's climate is affected by Lake Erie and the Atlantic Ocean. The effect of the provinces on climate is described below.

Atlantic Coastal Plain and Piedmont Provinces

The Appalachian Mountains to the west and the Atlantic Ocean to the east moderate the climate of the Atlantic Coastal Plain and Piedmont provinces. Warm summers and mild winters are characteristic of this climatic zone. Daily temperatures reach 90°F or above on an average of 20 or more days during the summer season, and the area occasionally experiences uncomfortable warm periods of light winds and high relative humidity.

During the winter months, there are on average 100 or more days that have minimum temperatures at or below the freezing point. Minimum temperatures of 0°F or lower generally occur one or two times per year. The freeze-free season averages 170 to 200 days.

Precipitation is fairly evenly distributed throughout the year; maximum amounts occur during the late summer months. Annual precipitation averages 43 inches, and mean seasonal snowfall is 28 inches, the lowest for the state. Fields are normally snow covered about one third of the time during the winter season.

Ridge and Valley Province

The Ridge and Valley province has many of the characteristics of a mountain-type climate. Mountain and valley influences cause greater temperature extremes and an increase in daily ranges. The freeze-free season is generally between 140 and 180 days.

Maximum temperatures in most years are not excessively high; temperatures equal to or above 90°F occur on an average of only 18 days during the summer season. Temperatures above 100°F are seldom recorded. Minimum temperatures during January, February, and March are commonly below freezing, but are seldom below 0°F.

The average annual precipitation is 44 inches, similar to that of the Atlantic Coastal Plain and Piedmont provinces. A larger percentage of this precipitation falls in the form of snow, which averages 42 inches during the winter season.

Appalachian Plateaus Province

The Appalachian Plateaus province is fairly typical of a continental-type climate having changeable temperatures and more frequent precipitation than other parts of Pennsylvania. Latitude and elevation make the northern part of the province the coldest area of the state. Daily temperature ranges exceed those of other areas, averaging between 20°F and 30°F.

Because of the rugged topography, the freeze-free season is variable, ranging from 130 days in the north to 180 days in the south. Daily high temperatures reach 90°F or above on an average of 10 days during the summer season, but temperatures rarely exceed 100°F. During the winter months, there are normally about 145 days when temperatures dip to or below the freezing point. Low temperatures equal to or below 0°F generally occur eight days per season. In northern sections, subzero temperatures occur twice as often.

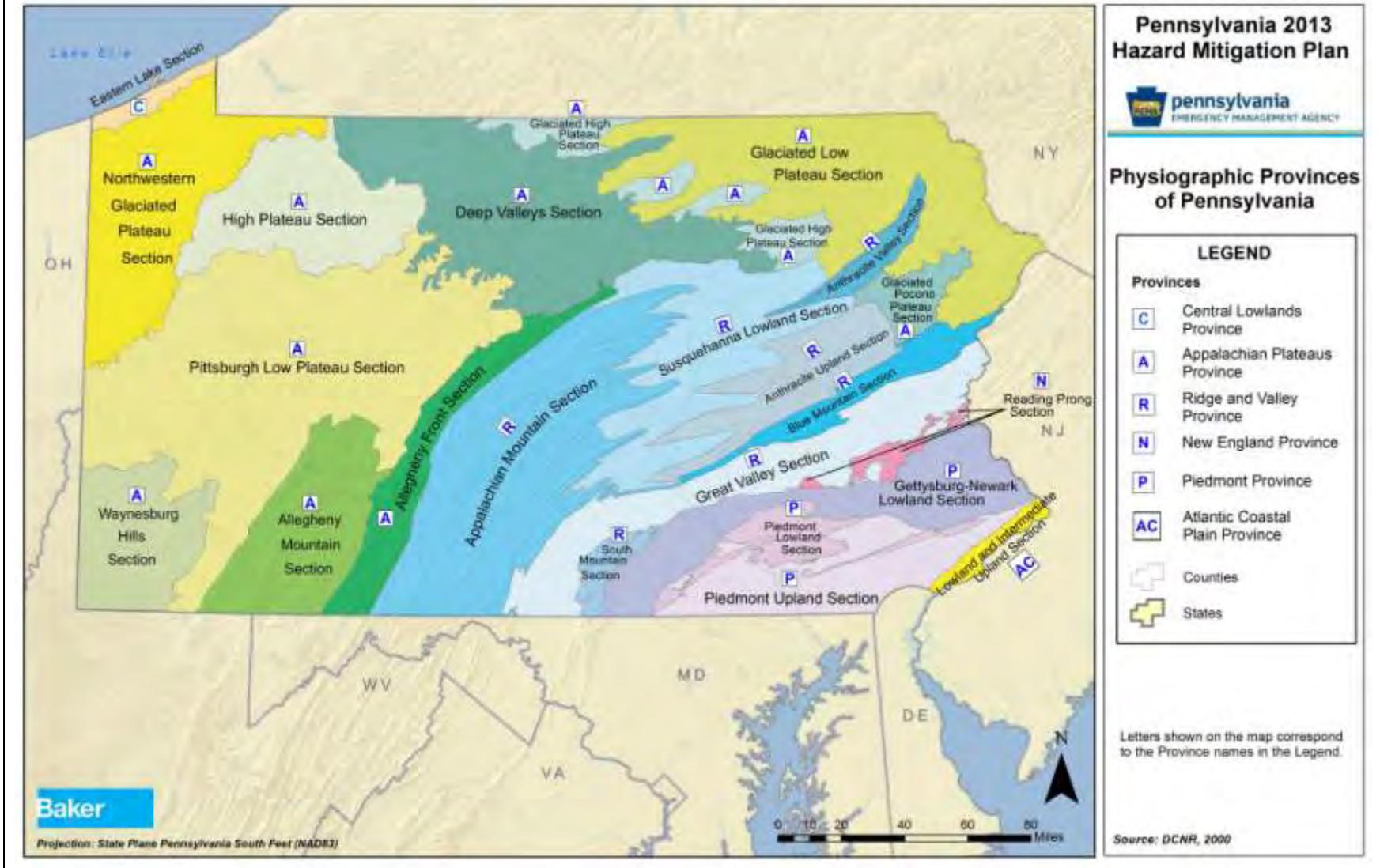
Mean annual precipitation is 40 inches, and seasonal snowfall is normally about 50 inches. The greatest amounts occur in the northern regions, where some areas average more than 80 inches annually. Fields are usually snow covered three fourths of the time during the winter season.

Central Lowland Province

The influence of Lake Erie is profoundly evident in the climate of the Central Lowland province. The lake has a moderating effect on temperatures, and the freeze-free season is normally extended to about 200 days. Temperatures above 90°F or below 0°F are extremely rare. The lake also reduces daily temperature ranges to less than 20°F in most months.

Temperature differences between the air and water produce cloudiness and frequent snowfalls during the winter months. The lake also acts as an important moisture source for the region. At Erie, mean annual snowfall averages about 60 inches, and annual precipitation averages close to 40 inches. Just inland of the lake, snowfall averages about 80 inches per year due to the added effect of Orographic influences.

Figure 2.1-2 Physiographic Provinces of Pennsylvania (DCNR, 2000).



2.2. State Facts

Before the area which is now present-day Pennsylvania was settled by the Europeans, it was first inhabited by groups of Native Americans. The largest tribes inhabiting the area were the Delaware, the Susquehannock, the Shawnee, and the Iroquois Confederacy. By the 1600's, early settlers in the area were the Dutch and the Swedes who held trading posts in the region. In 1664, the English claimed some of the land area of present-day Pennsylvania which led to conflicts with the Dutch who also held claims to some of the land. It was in 1681 that the Commonwealth of Pennsylvania was formally founded by William Penn (Pennsylvania General Assembly, 2010).

Throughout history, agriculture has been a leading industry in Pennsylvania. Primary crops were wheat, corn, rye, hemp, and flax. Although the number of farms and total farm acreage in the Commonwealth has declined since 1900, farm production has increased dramatically to meet consumer needs thanks to improved farming technologies. Today, Pennsylvania ranks 20th overall in agricultural production (USDA, 2007). In 2008 Pennsylvania ranked 3rd in the nation for total certified and exempt organic farm sales. (USDA 2010)

Industries such as iron and steel production were once prominent in Pennsylvania. Furthermore, textiles, leathermaking, lumbering, oil and coal production, shipbuilding, publishing, and tobacco and paper manufacturing also prospered in the 1800s and early 1900s in Pennsylvania. With the decline of some of those industries, new sectors arose which now contribute to the state's employment including wholesale and retail trade, food processing, health care and social administration, and educational, professional, scientific, and technical services.

Tourism is also a growing industry in Pennsylvania. The Commonwealth contains abundant natural resources and scenic landscapes which provide outdoor recreation opportunities such as fishing, camping, boating, bird-watching, hunting, hiking, swimming, and skiing. Additionally, Pennsylvania contains 117 state parks and several of the best museums in the country including the Philadelphia Museum of Art and the Carnegie Museums in Pittsburgh.

2.3. Population and Demographics

Pennsylvania contains 67 counties and 2,566 municipalities. The state's capital is Harrisburg. According to the 2010 U.S. Census, the population of Pennsylvania is 12,702,379 which ranks 6th among states in terms of total population. Table 2.3-1 depicts the 2010 Census county populations while Figure 2.3-1 shows population estimates for 2012. Population trends are described in Section 4.4.

Table 2.3-1 Summary of 2010 census populations for each county in Pennsylvania.

| COUNTY | 2010 CENSUS POPULATION | COUNTY | 2010 CENSUS POPULATION |
|------------|------------------------|-----------------|------------------------|
| Adams | 101,407 | Lackawanna | 214,437 |
| Allegheny | 1,223,348 | Lancaster | 519,445 |
| Armstrong | 68,941 | Lawrence | 91,108 |
| Beaver | 170,539 | Lebanon | 133,568 |
| Bedford | 49,762 | Lehigh | 349,497 |
| Berks | 411,442 | Luzerne | 320,918 |
| Blair | 127,089 | Lycoming | 116,111 |
| Bradford | 62,622 | McKean | 43,450 |
| Bucks | 625,249 | Mercer | 116,638 |
| Butler | 183,862 | Mifflin | 46,682 |
| Cambria | 143,679 | Monroe | 169,842 |
| Cameron | 5,085 | Montgomery | 799,874 |
| Carbon | 65,249 | Montour | 18,267 |
| Centre | 153,990 | Northampton | 297,735 |
| Chester | 498,886 | Northumberland | 94,528 |
| Clarion | 39,988 | Perry | 45,969 |
| Clearfield | 81,642 | Philadelphia | 1,526,006 |
| Clinton | 39,238 | Pike | 57,369 |
| Columbia | 67,295 | Potter | 17,457 |
| Crawford | 88,765 | Schuylkill | 148,289 |
| Cumberland | 235,406 | Snyder | 39,702 |
| Dauphin | 268,100 | Somerset | 77,742 |
| Delaware | 558,979 | Sullivan | 6,428 |
| Elk | 31,946 | Susquehanna | 43,356 |
| Erie | 280,566 | Tioga | 41,981 |
| Fayette | 136,606 | Union | 44,947 |
| Forest | 7,716 | Venango | 54,984 |
| Franklin | 149,618 | Warren | 41,815 |
| Fulton | 14,845 | Washington | 207,820 |
| Greene | 38,686 | Wayne | 52,822 |
| Huntingdon | 45,913 | Westmoreland | 365,169 |
| Indiana | 88,880 | Wyoming | 28,276 |
| Jefferson | 45,200 | York | 434,972 |
| Juniata | 24,636 | PA TOTAL | 12,702,379 |

The most populous county in the Commonwealth is Philadelphia County, which is conterminous with the City of Philadelphia, with a 2010 Census population of 1,526,006. Cameron County, with a population of 5,085, is the least populated county according to the 2010 Census. Populations are most dense in and around cities. Philadelphia, whose county and city jurisdictional boundaries are the same, is the largest city in the Commonwealth. The second most populous city is Pittsburgh, with a 2010 Census population of 305,702. Figure 2.3-3 shows population density throughout the Commonwealth based on the Census 2007-2011 five year estimates.

Population density has a strong correlation with hazard vulnerability and loss. For example, urban areas like Philadelphia and Pittsburgh naturally have larger populations and number of structures; therefore they naturally will experience greater loss during hazard events.

The age of populations can also correlate with vulnerability to hazards. Elderly populations and children may be more susceptible to hazards such as extreme temperature and pandemics. Table 2.3-2 depicts age distribution and median age of the population of each Pennsylvania County. The median age of residents of the Commonwealth of Pennsylvania is 39.7 with 22.1 percent of the population under 18 years of age and 15.4 percent 65 years or older. According to the Pennsylvania Department of Community and Economic Development (DCED) 2010 State Land Use and Growth Management Report, the age 65 and older population will make up nearly 23% of the state’s population by the year 2030.

| COUNTY | Age Under 5 | Age 5 – 17 | Age 65+ | Median Age |
|---------------|--------------------|-------------------|----------------|-------------------|
| Adams | 5,644 | 17,106 | 15,534 | 40.8 |
| Allegheny | 63,271 | 180,657 | 205,694 | 41.2 |
| Armstrong | 3,646 | 10,727 | 12,665 | 4 |
| Beaver | 8,887 | 26,283 | 31,564 | 43.9 |
| Bedford | 2,590 | 8,274 | 9,374 | 4 |
| Berks | 25,422 | 72,756 | 58,968 | 39.1 |
| Blair | 7,314 | 19,755 | 22,321 | 42.0 |
| Bradford | 3,754 | 10,600 | 10,854 | 42.8 |
| Bucks | 34,332 | 110,363 | 89,499 | 41.5 |
| Butler | 10,144 | 31,399 | 13,736 | 40.9 |
| Cambria | 7,307 | 21,147 | 27,122 | 43.4 |
| Cameron | 213 | 793 | 1,078 | 47.4 |
| Carbon | 3,474 | 10,162 | 11,418 | 43.4 |
| Centre | 6,660 | 17,697 | 17,043 | 28.4 |
| Chester | 31,184 | 92,361 | 62,856 | 39.0 |
| Clarion | 2,072 | 5,860 | 6,550 | 39.3 |
| Clearfield | 4,162 | 12,805 | 14,294 | 42.5 |
| Clinton | 2,163 | 5,915 | 6,387 | 38.9 |

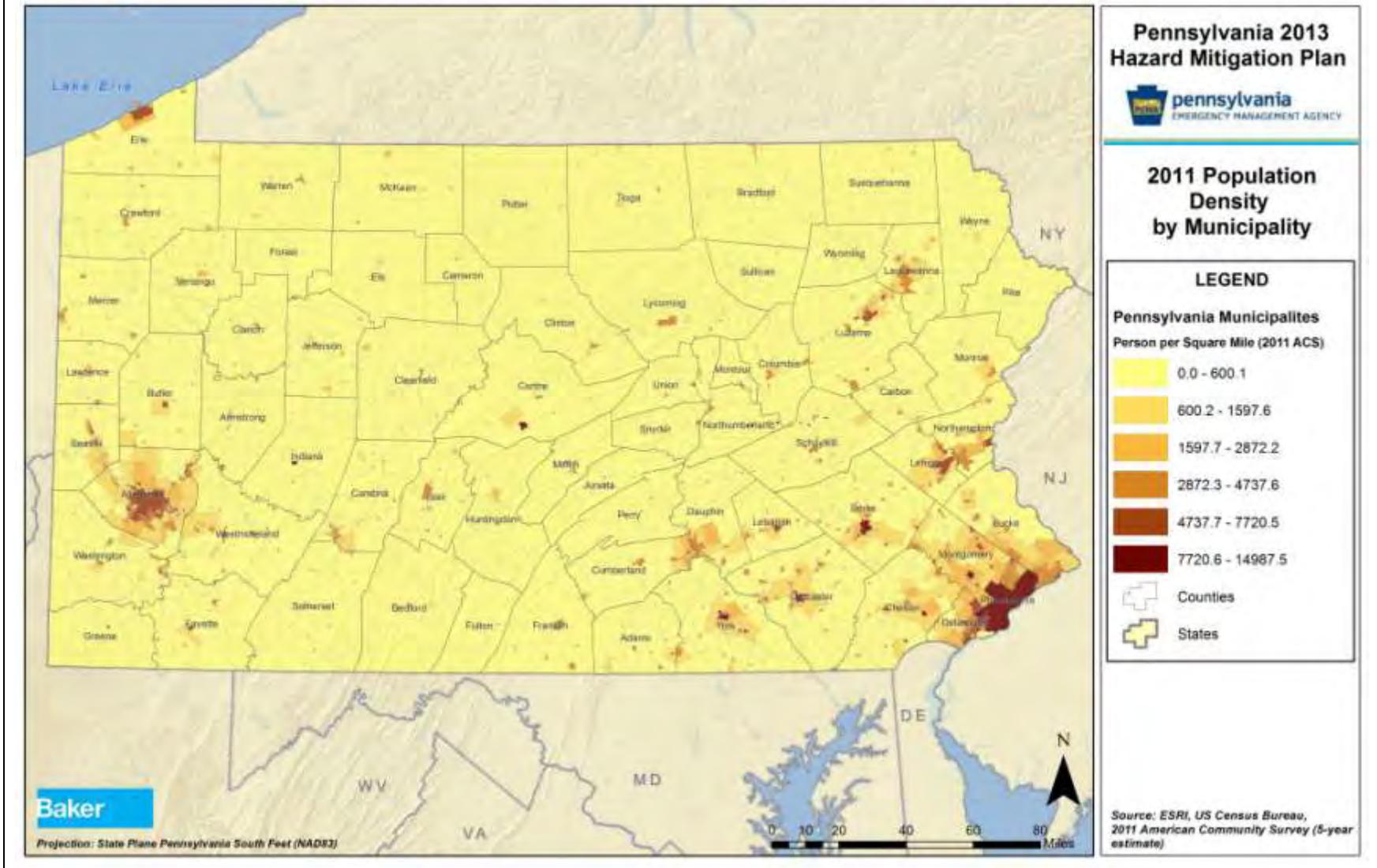
| COUNTY | Age Under 5 | Age 5 – 17 | Age 65+ | Median Age |
|----------------|--------------------|-------------------|----------------|-------------------|
| Columbia | 3,167 | 9,441 | 10,675 | 39.3 |
| Crawford | 5,083 | 14,982 | 14,586 | 41.3 |
| Cumberland | 12,544 | 35,954 | 36,102 | 40.1 |
| Dauphin | 16,680 | 45,338 | 36,559 | 39.1 |
| Delaware | 33,653 | 96,978 | 79,644 | 38.7 |
| Elk | 1,544 | 5,241 | 6,067 | 44.4 |
| Erie | 16,717 | 47,385 | 40,561 | 38.5 |
| Fayette | 6,893 | 21,308 | 24,806 | 43.1 |
| Forest | 193 | 819 | 1,377 | 42.4 |
| Franklin | 9,821 | 25,639 | 24,258 | 40.1 |
| Fulton | 922 | 2,518 | 2,519 | 41.6 |
| Greene | 1,910 | 5,769 | 5,887 | 41.1 |
| Huntingdon | 2,425 | 6,737 | 7,250 | 40.8 |
| Indiana | 4,435 | 12,468 | 13,744 | 38.1 |
| Jefferson | 2,594 | 7,214 | 8,214 | 42.9 |
| Juniata | 1,521 | 4,318 | 4,057 | 40.6 |
| Lackawanna | 11,559 | 32,501 | 38,083 | 42.0 |
| Lancaster | 35,267 | 93,730 | 75,674 | 37.9 |
| Lawrence | 4,896 | 14,664 | 17,106 | 43.3 |
| Lebanon | 8,343 | 22,280 | 22,336 | 40.8 |
| Lehigh | 21,542 | 60,785 | 51,069 | 39.2 |
| Luzerne | 16,455 | 48,352 | 57,593 | 42.5 |
| Lycoming | 6,541 | 18,012 | 18,968 | 40.9 |
| McKean | 2,321 | 7,007 | 7,357 | 41.3 |
| Mercer | 6,000 | 19,418 | 21,447 | 42.6 |
| Mifflin | 2,965 | 7,915 | 8,491 | 42.4 |
| Monroe | 8,762 | 32,286 | 21,210 | 39.7 |
| Montgomery | 46,946 | 135,992 | 119,243 | 40.4 |
| Montour | 978 | 2,978 | 3,338 | 43.7 |
| Northampton | 16,164 | 49,103 | 45,949 | 40.5 |
| Northumberland | 5,217 | 14,024 | 17,401 | 42.9 |
| Perry | 2,730 | 7,952 | 6,146 | 40.9 |
| Philadelphia | 100,524 | 245,449 | 185,513 | 33.5 |
| Pike | 2,842 | 10,783 | 8,980 | 42.7 |
| Potter | 1,005 | 2,949 | 3,359 | 44.4 |
| Schuylkill | 7,673 | 22,195 | 26,942 | 42.9 |
| Snyder | 2,380 | 6,529 | 5,983 | 38.7 |
| Somerset | 3,662 | 11,655 | 14,496 | 44.2 |

| COUNTY | Age Under 5 | Age 5 – 17 | Age 65+ | Median Age |
|-----------------|--------------------|-------------------|------------------|-------------------|
| Sullivan | 258 | 804 | 1,564 | 49.4 |
| Susquehanna | 2,171 | 7,151 | 7,696 | 44.6 |
| Tioga | 2,218 | 6,493 | 7,437 | 42.0 |
| Union | 2,164 | 6,107 | 6,666 | 38.2 |
| Venango | 3,090 | 8,921 | 9,750 | 44.1 |
| Warren | 2,092 | 6,683 | 7,741 | 44.7 |
| Washington | 10,662 | 32,387 | 36,182 | 43.3 |
| Wayne | 2,275 | 8,037 | 9,948 | 45.2 |
| Westmoreland | 17,638 | 55,739 | 68,388 | 44.8 |
| Wyoming | 1,517 | 4,696 | 4,462 | 41.5 |
| York | 26,609 | 75,332 | 59,969 | 39.8 |
| PA TOTAL | 727,677 | 2,075,678 | 1,944,573 | 39.7 |

There are an estimated 5,579,275 housing units in the state, ninety percent of which are occupied with the remaining ten percent being vacant. The median value of an owner occupied home in the state is 163,200 (U.S. Census, 2007-2011).

The median income for households in Pennsylvania is \$51,651. This is almost equal to the national median household income of \$52,762. However, 12.6% of the Commonwealth's residents live in poverty compared to the national average of 14.3% for the United States (U.S. Census, 2007-2011). While lower than the national average, the impact of disasters tends to be worse in low-income populations. Those living in poverty have fewer resources for evacuation during an event and less available funds for mitigation or other protective measures. Eighty-three percent of the Pennsylvania population is White, 11 percent is Black or African American, and just over three percent is American Indian, Alaska Native, Asian, Native Hawaiian, Pacific Islander or some other race (U.S. Census, 2012).

Figure 2.3-3 Pennsylvania 2007-2011 Population Density (ESRI, 2011).



2.4. Land Use and Development

The Commonwealth of Pennsylvania has a variety of land uses ranging from agriculture to industrial. Residential land uses are concentrated in high densities in urban areas and are generally low-density and more spread out throughout the rest of the Commonwealth. Agriculture is also a prominent land use; there are almost eight million acres of farmland and over 63,000 farms throughout the Commonwealth. Over 425,000 acres of this farmland (~5.4%) is permanently preserved, thus protecting it from development and helping to maintain the rural character of the Commonwealth (Center for Rural Pennsylvania, 2013).

When Pennsylvania was first settled, land was predominantly forest-covered. In fact, the name *Pennsylvania* translates to “Penn’s woods.” Although much of the state’s original forest is gone, forest is still a primary land cover in the Commonwealth (Figure 2.4-1). The Allegheny National Forest is located in northwestern Pennsylvania and covers more than 500,000 acres.

Land cover significantly affects hazard vulnerability. For example, counties with a large percentage of forest cover, such as those that contain the Allegheny National Forest are more susceptible to wildfire hazards and also some invasive species. Additionally, human encroachment on wooded areas can leave more people vulnerable to wildfires if they do not appropriately plan for fire defensible space around their homes. Figure 2.4-1 displays areas the overall land cover in the Commonwealth. As urbanization occurs, areas that were once covered with trees and grass are being replaced by impervious surfaces of roads, roofs, and parking lots. This urbanization reduces infiltration of rainwater thus increasing the amount of stormwater runoff and the potential for flash flooding (USGS, 2005). This increase in stormwater runoff has a particular impact on communities built in karst areas, as more stormwater accelerates the natural percolation process that causes subsidence and sinkholes. Changes in ground cover can also exacerbate natural hazards like landslides since removing natural vegetation can cause unstable slopes. Development trends, including urbanization, are discussed in more detail in Section 4.4.

Pennsylvania land use and development is often defined by the Commonwealth’s transportation system. Roads, rail lines, airports, and ports are important for the transportation of people, goods, and services and development typically occurs around transportation hubs. Pennsylvania has a widespread highway network of over 120,000 miles which includes major interstate highways such as Interstate 80, the Pennsylvania Turnpike, Interstate 90, Interstate 79 and Interstate 81 (Figure 2.4-2). The Commonwealth has over 22,000 state-owned bridges and approximately 6,400 bridges on locally-owned roads. Pennsylvania contains over 5,000 miles of railway and 130 public-use airports, six of which are international airports (AirNav, 2010). Furthermore, there are three major ports in Pennsylvania: Philadelphia, Pittsburgh, and Erie.

The Department of Community and Economic Development completes growth management and land use reports in order to promote proactive land use planning in the Commonwealth. This report is completed every five years and evaluates contemporary land use issues, historic and projected trends, and development patterns at the state and regional level. According to their 2010 State Land Use and Growth Management Report, the pace of development was

greater than population growth in Pennsylvania until the nationwide recession in 2008. During the 1990s, the total number of acres developed in Pennsylvania increased by 53.6 percent, from approximately 1,193,420 acres to 1,832,704 acres, while Pennsylvania's population grew by only 3.4%. Between 2007 and 2009 new residential building permits declined 46%, while subdivision and land development activities were down 83% from 2008 to 2010.

As a percentage of total land area, Pennsylvania's developed land area (urban or built-up land use/land cover classification) increased by 131.4% between the 1992–2005 inventory period. Between 1990 and 2007, Pennsylvania's population grew by 4.6 percent versus its housing growth rate of 10.9 percent (PAGC 2010). This housing growth rate is an important factor that was considered and is why building numbers and its replacement values were analyzed for all-hazards.

Pennsylvania has over 83,000 miles of streams and rivers within its borders, as seen in Figure 2.4-3. Every county in the Commonwealth has at least 100 miles of streams, and each county averages 1,239 linear miles of waterways. In general, counties within the Delaware River watershed have fewer miles of streams. It is important to note that fewer stream miles does not always mean reduced risk to flooding and flooding related hazards. In urban areas, streams were often historically filled in or piped into sewer systems. Hindering the natural flow of a stream can interrupt the ability of the natural environment to accommodate flood water and poor fill can lead to building collapses. Regardless of the mileage, Pennsylvania has an overall high volume of streams statewide, contributing to Pennsylvania's long and expensive flooding history.

Figure 2.4-1 Map of land cover throughout Pennsylvania (PASDA 2007).

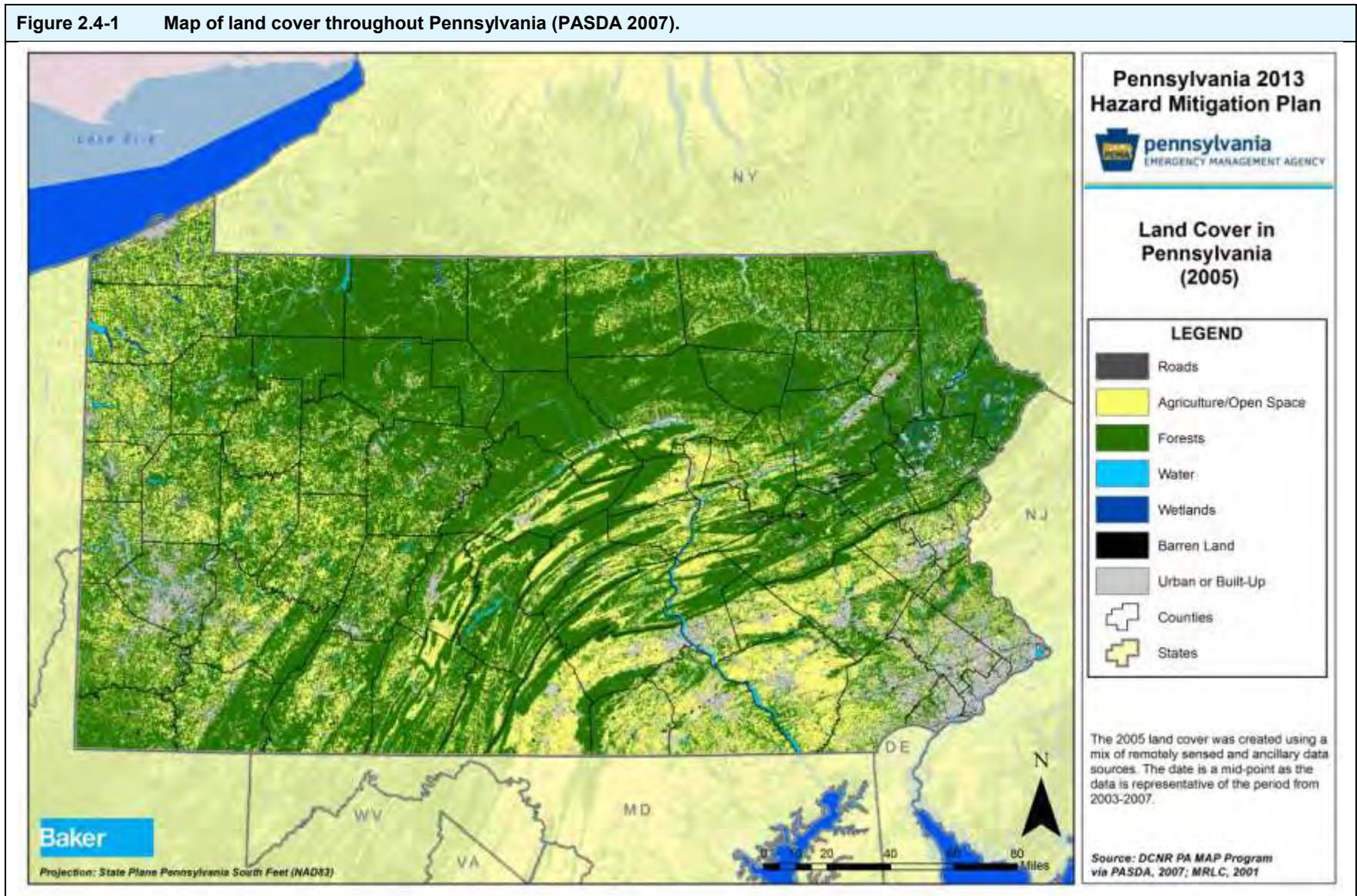
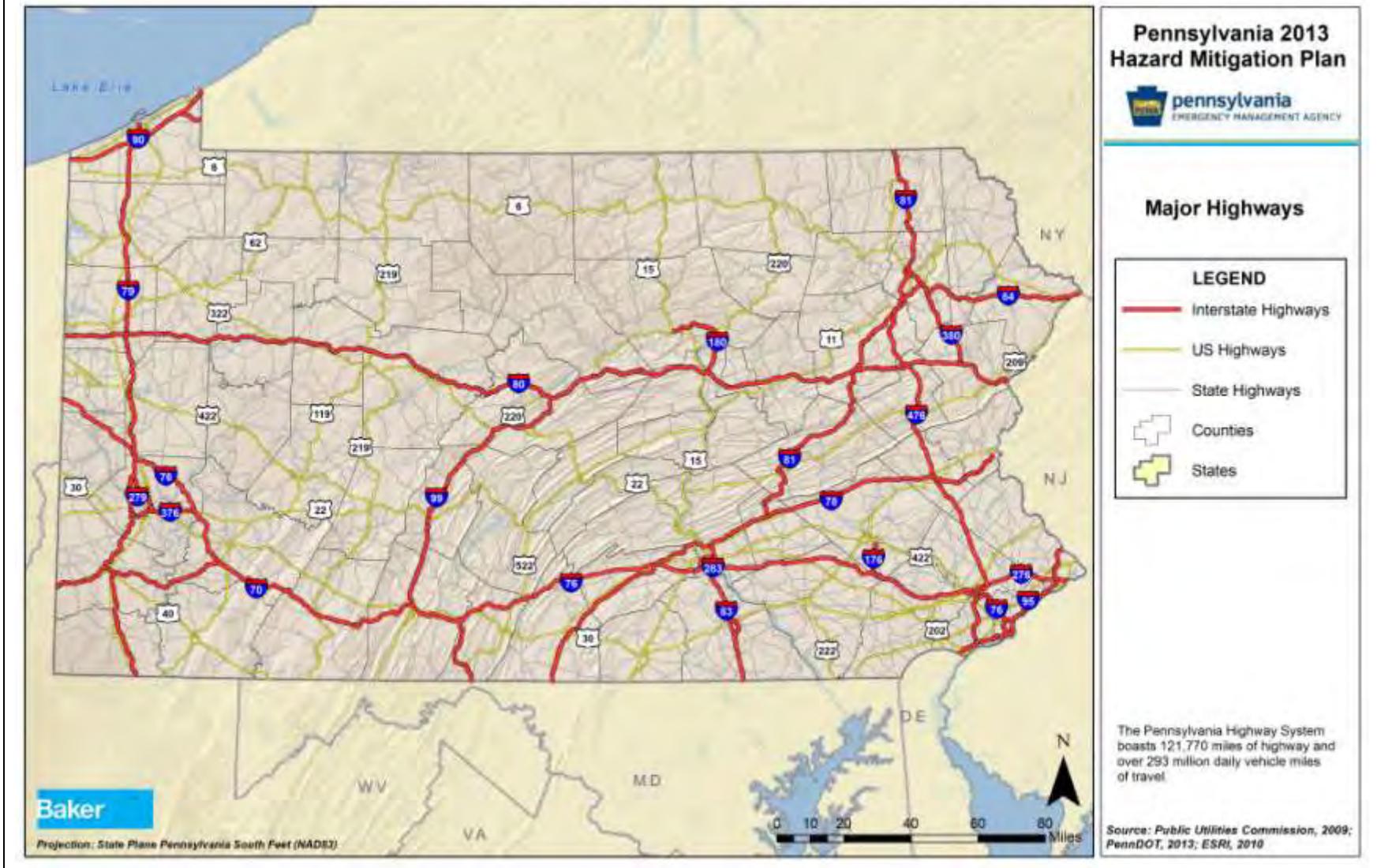


Figure 2.4-2 Major Highways in Pennsylvania (PennDOT, 2013).



2.5. Data Sources

To complete the Commonwealth's risk assessment, data was collected from a variety of sources. Overall, analysis was based on collecting the best data currently available. Information for the 2007 and 2010 plans were reviewed and incorporated as appropriate. State-wide data sets were used to do spatial analysis that could more robustly address risk than just researching disasters in the 3 years in the years between plans.

The assessment began with a review of all the local hazard mitigation plans available in the Commonwealth. Hazards covered in county and university hazard mitigation plans are summarized in Section 4.1. County plan risk analysis also informs hazard based risk analysis throughout Section 4.3. Since the local level plans use varying levels of detail and data sources, state-wide data sources were sought from the SPT and research. Sources included national, commonwealth and county databases, published materials, Geographic Information System (GIS) data and raw data from a number of commonwealth and federal agencies. Potential losses for local and state risk assessments within this SSAHMP were obtained using the best available data for each hazard. For some hazards, the measure of vulnerability and potential losses did not change from the 2010 SSAHMP. Data sources used for this update are covered in the Standard Operating Guide, so that local plans may begin to use the same data sources as the state plan and analysis throughout the Commonwealth will become more standardized (see Appendix D for full list).

In order to assess the vulnerability of different jurisdictions to the hazards, data on past occurrences of damaging hazard events was gathered. So that one could compare the distribution of events between different hazards, the same data sources were used when possible in creating hazard profile maps. For a number of historic natural-hazard events, the National Climatic Data Center (NCDC) database was utilized. NCDC is a division of the US Department of Commerce's National Oceanic and Atmospheric Administration (NOAA). Information on hazard events is compiled by NCDC from data gathered by the National Weather Service (NWS), another division of NOAA. NCDC then presents it on their website in various formats. The data used for this plan came from the US Storm Events database, which "documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce" (NOAA, 2006). Since the 2010 plan, NCDC slightly altered their reporting system and its capabilities. Previously, the data was accessible via an online user interface that pre-aggregated like hazards with similar descriptions (for example: strong winds, thunderstorm winds, TSTRM WIND were grouped). Now, however, NCDC only releases data from 1996 via the online interface. Instead, NCDC now releases information from 1950-present in the form of a downloadable database. Events were summarized by grouping like hazard descriptions together by the project team, so the total number of events may be different than seen in the 2010 SSAHMP. However, every effort was made to properly categorize events in the database. The NCDC database was downloaded in June 2013.

While the NCDC data was entirely comprised of natural hazards information, PEMA provided additional database information that focused more on the human-made hazards through the Pennsylvania Emergency Incident Reporting System (PEIRS). PEIRS is the principal crisis

management software that PEMA uses to provide up-to-date information as an event unfolds through the response and recovery phases for PEMA staff and partners. PEIRS establishes standard reporting criteria, consolidates reporting requirements, and identifies PEMA as the single point of contact for an incident that requires immediate reporting. PEIRS provides reporting criteria for county emergency management coordinators, communications centers, 911 centers, commercial and industrial facilities, volunteer agencies and Commonwealth and federal agencies. This criterion is used to report emergency incidents which may affect the safety, health, or welfare of citizens of the Commonwealth, result in major property damage, preclude the operation or use of essential public facilities, and require multijurisdictional response to the emergency incident. When applicable, PEIRS incident data spanning 1/1/2001 - 6/1/2009 was used in the plan update. Although PEIRS data proved valuable, primarily in the human-made hazards section, data limitations exist in that the reporting system is not mandatory, which could lead to under-reporting. PEIRS information was used in the following hazard profile sections; Civil Disturbance, Terrorism, Urban Fire and Explosion, and Utility Interruption.

After June 2009, PEMA moved to a new reporting system, WebEOC. WebEOC was PEMA's main incident reporting platform from June 2009-Fall 2012. Like PEIRS, WebEOC was used to report emergency incidents, but WebEOC categories are not as robust as those under PEIRS. As a result, these incident reports had limited use in the 2013 SSAHMP; WebEOC data has been incorporated into the Civil Disturbance profile. Since Fall 2012, PEMA has been migrating to Knowledge Center Incident Management Software; at this time, incidents managed by Knowledge Center are not available for inclusion in this plan.

As previously stated, an attempt was made to provide consistency in reporting information. Population data used throughout this plan was based off of the 2010 US Census and the 2011 American Community Survey. These two different Census products were used concurrently because the 2010 (and future Decennial) Census data no longer includes the "long form" – the detailed report of economics, housing, travel, and work patterns. This data is now only released in the American Community Survey. Additionally, the American Community Survey data is only released to the Census block group level rather than the block; this has implications in the Level 2 HAZUS analysis completed for this plan update (See Section 4.1). Where specified in this SSAHMP, particularly in Sections 4.3.5.8 & 4.4, projected population estimates for the years 2010 - 2040 were obtained from the Pennsylvania Department of Environmental Protection (DEP).

Additionally, with so many hazards having an impact on agricultural yields, this SSAHMP uses the USDA Census of Agriculture to estimate losses and identify vulnerable counties. The USDA conducts this Census every 5 years. While the USDA is done collecting the data for its 2012 reporting year, this data is not yet available for use. As a result, this SSAHMP uses the 2007 Census, as was the case in the 2010 SSAHMP.

As expected with the number and diversity of hazards being profiled, the sources of data used within this SSAHMP vary from hazard to hazard. Natural hazards tended to have more available information than human-made hazards. However, when available, GIS data was used for the

majority of identifying hazard vulnerability and determining potential loss estimation. This information is presented in map and table format. GIS data was obtained from all levels of government; from the local government by obtaining building points along the Lake Erie shoreline for coastal erosion analysis; from the Commonwealth by obtaining critical facility locations and dams; and from the federal government by obtaining the most current flood and levee data, just to name a few. A complete list of data sources used primarily for mapping and analysis is listed in *Appendix D – Data Sources List*. All other sources referenced in the body of the plan are listed in *Appendix A – Bibliography*. It should be noted that numerous GIS datasets were obtained from the Pennsylvania Spatial Data Access (PASDA) website (<http://www.pasda.psu.edu/>). PASDA is the official public access geospatial information clearinghouse for the Commonwealth of Pennsylvania. PASDA was developed by the Pennsylvania State University as a service to the citizens, governments, and businesses of the Commonwealth. PASDA is a cooperative project of the Governor's Office of Administration, Office for Information Technology, Geospatial Technologies Office and the Penn State Institutes of Energy and the Environment of the Pennsylvania State University.

Although the advancement in quality and availability of GIS data has been positive in recent years, data limitations still remain. Perhaps most conspicuously, there is still no inundation areas available in GIS format, so identifying critical facilities within those areas was not feasible. Similar scenarios exist for levees, where only partial levee Protection Areas have been digitized in GIS format, so additional methods of analysis were performed to cover all areas in proximity to a levee. However, the number of levee protected areas digitized between 2010 and 2013 grew. Also, landslide inventory maps from the late 1970s and early 1980s exist for parts of Pennsylvania that depict exact locations of past landslide occurrences, however without those locations digitized in GIS format, other alternatives to identify vulnerable areas were done on a broader scale. Nevertheless, as time advances, the voids of incomplete data sets found in this plan will hopefully be filled. For instance there are several actions focused on gathering better data for future updates in Section 6.2.4, including Action 1-7a that focuses on improving access to dam inundation maps. Until that time, the techniques used to identify vulnerability and determine potential loss estimates in this SSAHMP were performed with the best available datasets. It should be noted that information contained in the datasets is subject to change and it is acknowledged that additional datasets not included in the 2013 SSAHMP may be available. Nonetheless, every effort was made to use the best available, most current information to conduct the risk assessment and vulnerability analysis for Pennsylvania.

The data selection for completing state facility vulnerability assessment and loss estimation is described in detail in Section 4.1, so that the information on data selection is next to information on the methodology used for vulnerability assessment and loss estimation.