Cut the cards and photos, scramble them. Participants are to place cards and photos in the appropriate regions of the maps.

The Central Lowlands Province in Pennsylvania is a small section of low relief ridges parallel to Lake Erie. It exists along a glacial escapement adjacent to the lake. Local relief is quite flat, in most places less than 50 feet. Elevation at Lake Erie is 570 feet and rises southward to about 1,000 feet. Presque Isle State Park and Erie Bluffs are outstanding scenic geological features in this section.

The Atlantic Coastal Plain Province is a narrow, flat strip of land with elevations less than 200 feet adjacent to the Delaware River in the easternmost corner of Pennsylvania. It consists of bedrock buried under sand and gravel deposits. Many small tributaries have cut small gorges into the bedrock. It was once home to thousands of acres of fresh water tidal marsh, much of which was filled for industrial and residential development. Philadelphia is located in this province. The area is prone to floods. Neshaminy State Park is located here.

The New England Province has fragmented parts that extend into eastern Pennsylvania as the southern end of the Hudson Highlands from New York and New Jersey. The hills and ridges north and east of Reading are called the Reading Prong and consist of ridges of gneiss and quartzite which project above the softer sedimentary rocks. It occupies sections of Lebanon, Berks, Lehigh and Northampton Counties.

The Piedmont Province located northwest of the Coastal Plain is dominated by gently rolling hills and valleys. It has some of the best farmland in the state (Lancaster and Chester Counties) and some of the most fertile soils in eastern United States. The upland areas contain some of the oldest exposed rocks (Baltimore Gneiss). The lowlands contain limestone, sandstone, shale and a resistant diabase which is best seen at the Gettysburg battlefield. The famous fall line defines the Piedmont from the Coastal Plain. Some of the state parks in this section include Codorus, Marsh Creek and Ridley Creek.

The Appalachian Plateaus Province is the largest province in the state extending from the northeast corner to the entire western part of the state. Most of the rocks are not folded and faulted but remain relatively flat. There are a variety of sections each with their own characteristics. In western Pennsylvania, large bituminous coal fields exist. In glaciated sections, steep canyons developed and erosion created steep gorges. Ricketts Glen State Park contains examples of the escarpment that divides the high plateau. The Grand Canyon of Pennsylvania is in an isolated northern area of deep gorges, some at least 1000 feet deep. The Allegheny Front section includes Blue Knob (3,146 feet) that is an unusual bulge along the ridgeline. The Allegheny Mountain section contains Pennsylvania's highest point, Mount Davis (3,213 feet) near the Maryland border. The Pocono Mountain section is a glaciated part of this province and contains the sedimentary rocks such as sandstones. With elevations from 1,200 feet to 2,300 feet, this section has a few steep hills such as Camelback Mountain. Lackawanna and Promised Land are state parks located here.
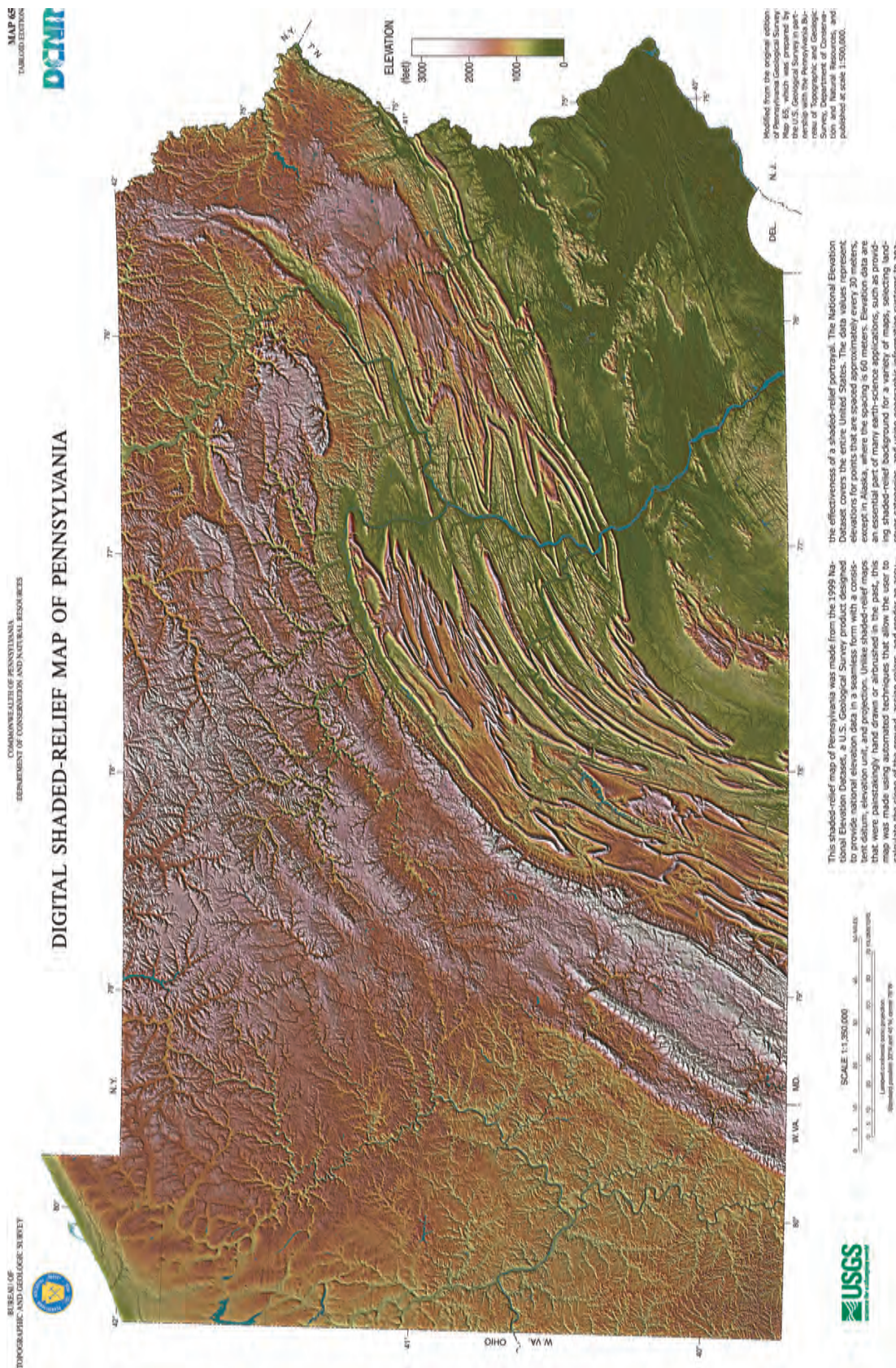
The Ridge and Valley Province provides a roller-coaster ride of valleys and steep ridges. It is the second largest province in the state. The rocks are severely folded and contain numerous anticlines and synclines that plunge and fold due to continent collision. The Great Valley is known by three parts: the Lehigh Valley, the Lebanon Valley and Cumberland Valley. It is characterized by valuable carbonate rocks such as limestones and dolostones which are used for cement and fertilizers. The limetone areas are subject to cave-ins due to sinkholes. Blue Mountain, also known as the Kittatinny Ridge contain many water gaps such as the Delaware Water Gap and wind gaps. The anthracite coal fields are located in the northeastern section of the province. Landslides and acid mine drainage are some of the hazards here. Numerous state parks are located here including Beltzville, Greenwood Furnace, Lehigh Gorge, Jacobsburg, and Kings Gap—to name a few. (The northern tip of the Blue Ridge is included in this section but it was grouped as part of a separate province, creating a seventh province in Pennsylvania).

Activity 3: *Physiographic Region Cards and Photos – Page 2 (2/2)*

Cut the cards and photos, scramble them. Participants are to place cards and photos in the appropriate regions of the maps.

DIGITAL SHADED-RELIEF MAP OF PENNSYLVANIA
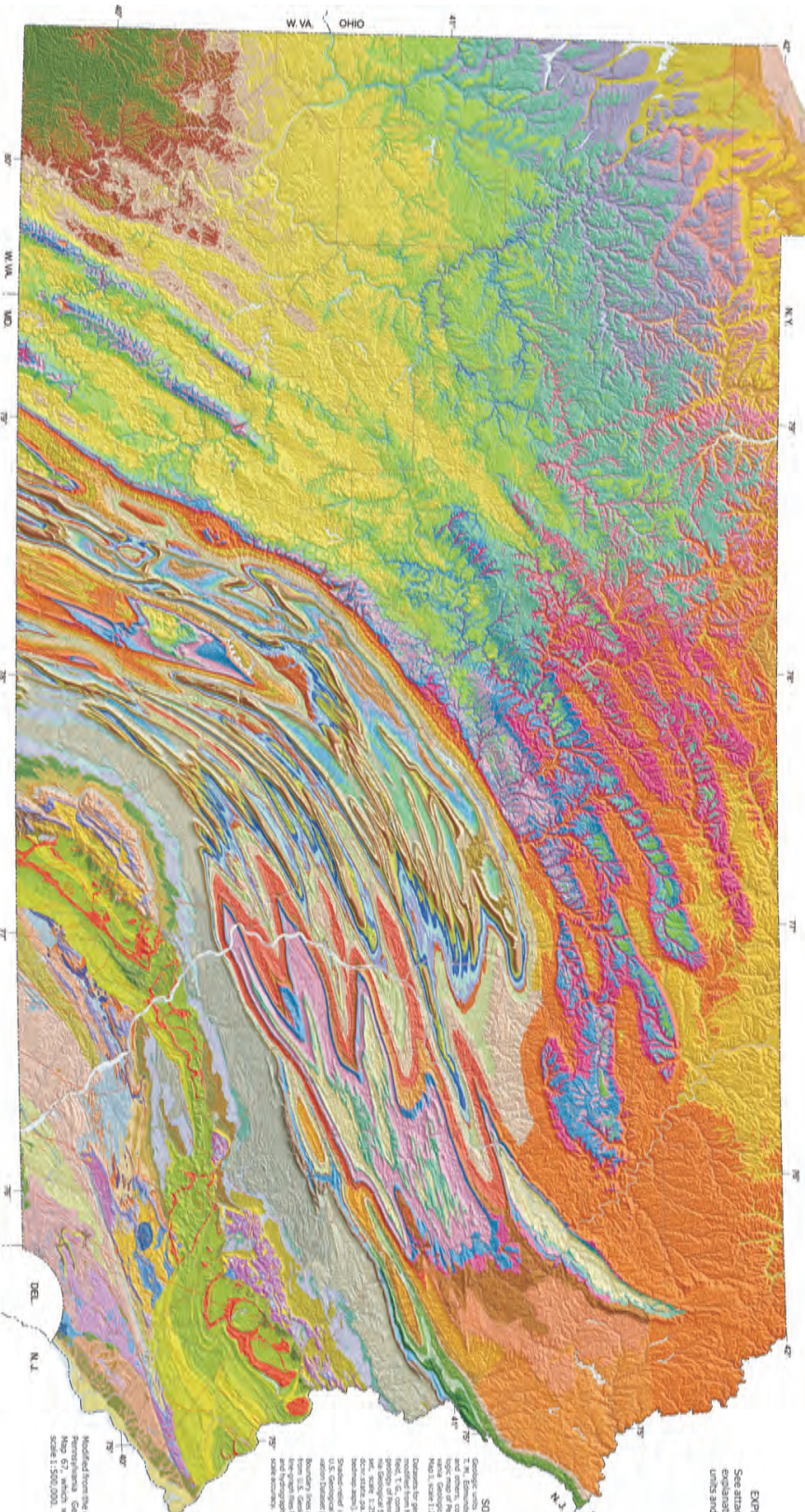
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY

MAP 65
TABLOID EDITION

ELEVATION
(feet)

This shaded-relief map of Pennsylvania was made from the 1999 National Elevation Dataset, a U.S. Geological Survey product designed to provide national elevation data in a seamless form with a consistent datum, elevation unit, and projection. Unlike shaded-relief maps that were painstakingly hand drawn or airbrushed in the past, this map was made using automated techniques that allow the user to calculate the slope of the ground, assign colors, and render an accurate, objective, and yet pleasing three-dimensional picture that has

the effectiveness of a shaded-relief portrayal. The National Elevation Dataset covers the entire United States. The data values represent elevations for points that are spaced approximately every 30 meters, except in Alaska, where the spacing is 60 meters. Elevation data are an essential part of many earth-science applications, such as providing shaded-relief background for a variety of maps, selecting land-cover categories, and using geographic information systems to analyze drainage networks and watershed delineations.

Modified from the original edition of Pennsylvania Geological Survey Map 65, which was prepared by the U.S. Geological Survey in partnership with the Pennsylvania Bureau of Topographic and Geologic Survey, Department of Conservation and Natural Resources, and published at scale 1:500,000.

SCALE 1:1,350,000

Full-size map located in back pocket.

Activity 3: *Geologic Shaded–relief Map*

Full-size map located in back pocket.

LAND-COVER MAP OF PENNSYLVANIA

Full-size map located in back pocket.

52
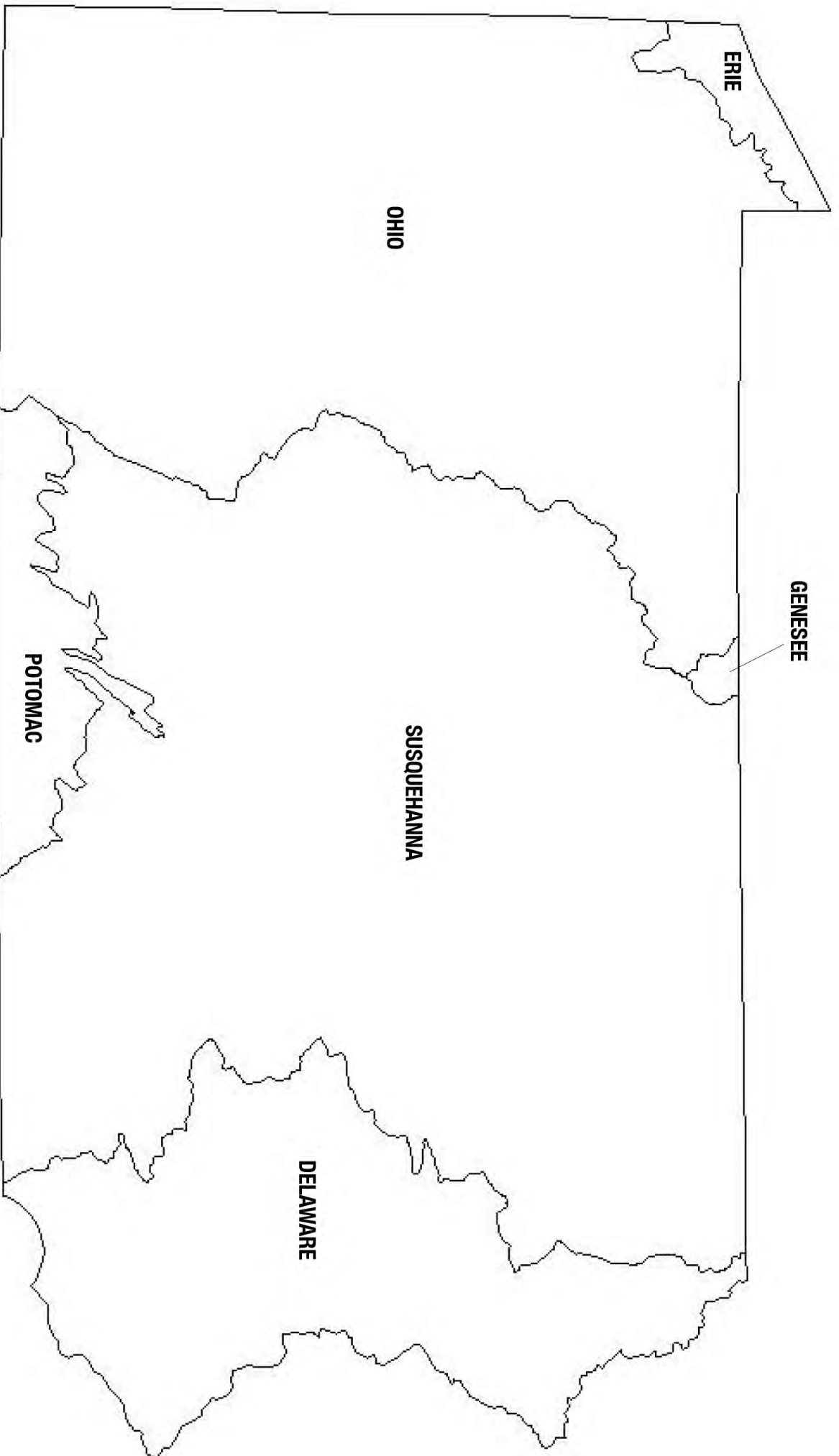
Pennsylvania Watershed Map

ERIE

OHIO

GENESEE

POTOMAC

SUSQUEHANNA

DELAWARE

Counties of Pennsylvania

Municipalities of Pennsylvania
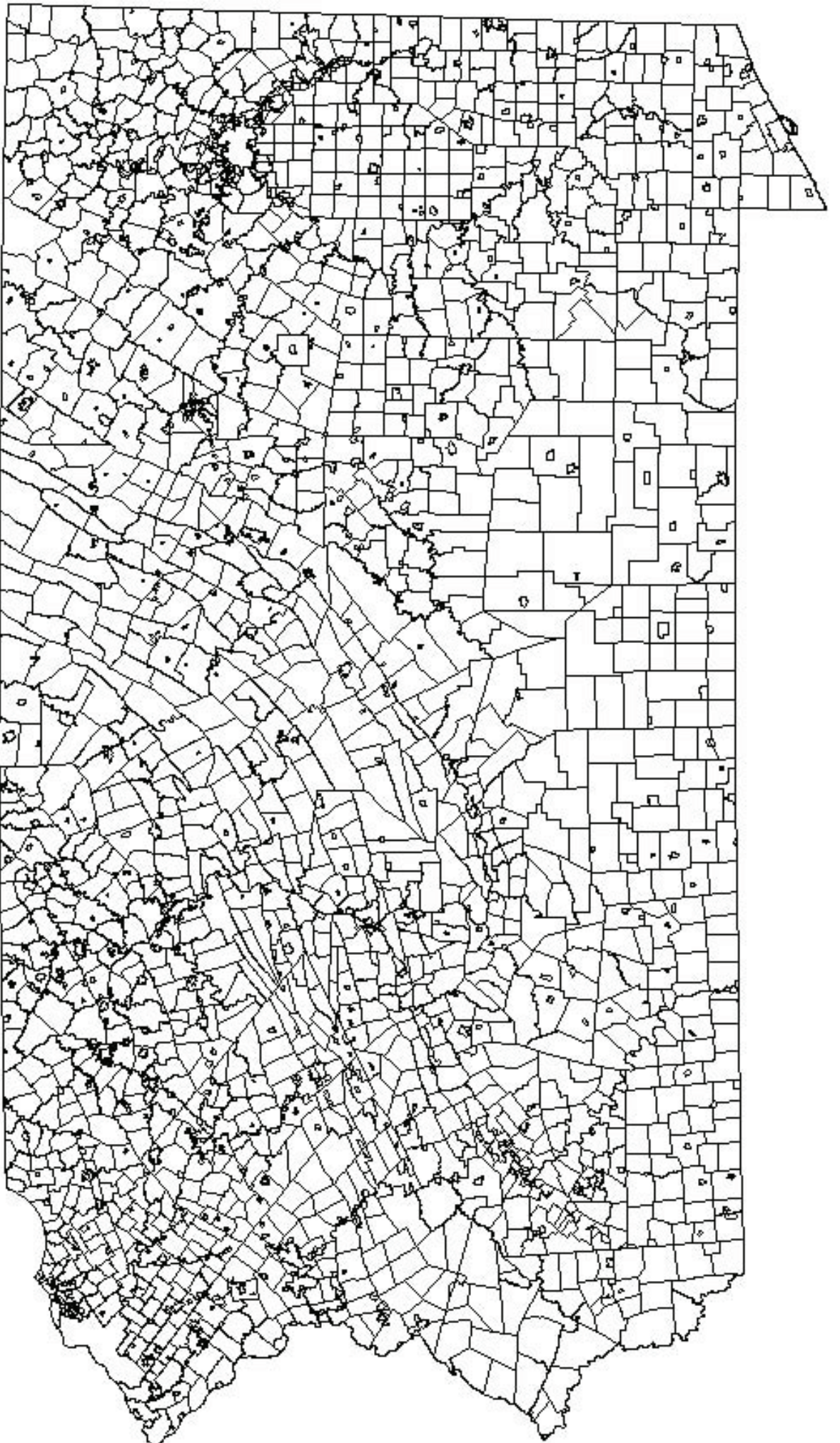
Activity 3: *Percent of Population Change Worksheet*

Team Members _____

How many counties are in Pennsylvania? _____

Top Eight Population Increase

County   Percent   Features

1. _____   _____   _____
2. _____   _____   _____
3. _____   _____   _____
4. _____   _____   _____
5. _____   _____   _____
6. _____   _____   _____
7. _____   _____   _____
8. _____   _____   _____

Top Eight Population Decrease

County   Percent   Features

1. _____   _____   _____
2. _____   _____   _____
3. _____   _____   _____
4. _____   _____   _____
5. _____   _____   _____
6. _____   _____   _____
7. _____   _____   _____
8. _____   _____   _____

No Change in Population

County   Features

1. _____   _____
2. _____   _____
3. _____   _____
4. _____   _____

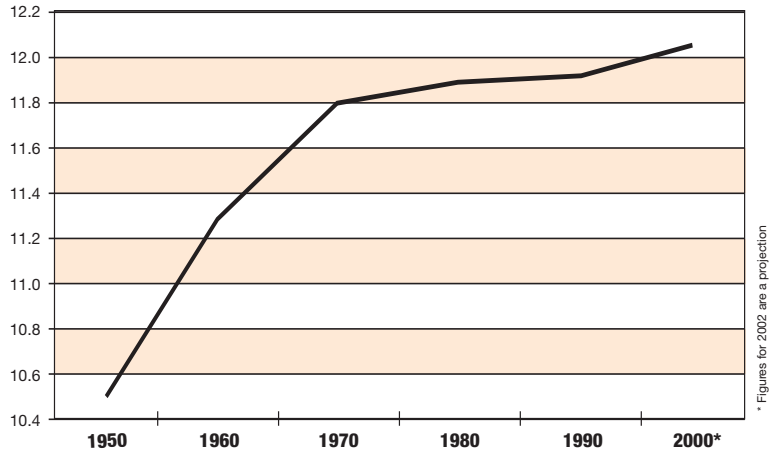**Activity 3:** *Change in Population 2000–2002 – Page 1 (1/2)*

County	Population 7/1/2002 *(Estimated)*	Population 4/1/2000	Change
Adams	94,437	91,292	+3,145
Allegheny	1,269,904	1,281,666	-11,762
Armstrong	71,673	72,392	-719
Beaver	179,351	181,412	-2,061
Bedford	49,944	49,984	-40
Berks	382,108	373,638	+8,470
Blair	127,840	129,144	-1,304
Bradford	62,810	62,761	+49
Bucks	610,440	597,632	+12,808
Butler	178,078	174,083	+3,995
Cambria	150,452	152,598	-2,146
Cameron	5,843	5,974	-131
Carbon	59,688	58,802	+886
Centre	138,524	135,758	+2,766
Chester	450,160	433,501	+16,659
Clarion	41,316	41,765	-449
Clearfield	83,203	83,382	-179
Clinton	37,680	37,914	-234
Columbia	64,134	64,151	-17
Crawford	89,856	90,366	-510
Cumberland	217,743	213,674	+4,069
Dauphin	252,933	251,798	+1,135
Delaware	553,435	550,864	+2,571
Elk	34,454	35,112	-658
Erie	280,370	280,843	-473
Fayette	146,654	148,644	-1,990
Forest	4,888	4,946	-58
Franklin	131,598	129,313	+2,285
Fulton	14,365	14,261	+104
Greene	40,520	40,672	-152
Huntingdon	45,707	45,586	+121
Indiana	88,780	89,605	-825
Jefferson	45,818	45,932	-114
Juniata	22,760	22,821	-61

County	Population 7/1/2002 *(Estimated)*	Population 4/1/2000	Change
Lackawanna	210,711	213,295	-2,584
Lancaster	478,561	470,658	+7,903
Lawrence	94,104	94,643	-539
Lebanon	121,199	120,327	+872
Lehigh	317,533	312,090	+5,443
Luzerne	314,643	319,250	-4,607
Lycoming	119,000	120,044	-1,044
McKean	44,884	45,936	-1,052
Mercer	119,514	120,293	-779
Mifflin	46,435	46,486	-51
Monroe	148,839	138,687	+10,152
Montgomery	766,517	750,097	+16,420
Montour	18,214	18,236	-22
Northampton	273,324	267,069	+6,255
Northumberland	93,371	94,556	-1,185
Perry	43,876	43,602	+274
Philadelphia	1,492,231	1,517,550	-25,319
Pike	50,095	46,302	+3,793
Potter	18,217	18,080	+137
Schuylkill	148,505	150,336	-1,831
Snyder	37,828	37,546	+282
Somerset	79,456	80,023	-567
Sullivan	6,482	6,556	-74
Susquehanna	42,082	42,238	-156
Tioga	41,461	41,373	+88
Union	42,006	41,624	+382
Venango	56,810	57,565	-755
Warren	43,290	43,863	-573
Washington	204,110	202,897	+1,213
Wayne	48,889	47,722	+1,167
Westmoreland	368,428	369,993	-1,565
Wyoming	27,801	28,080	-279
York	389,209	381,751	+7,458

Activity 3: *Population Growth Graphs and Charts*
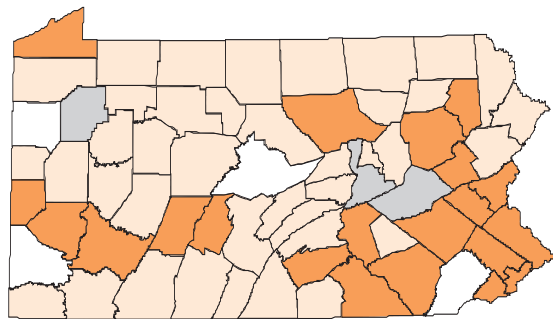
Pennsylvania Population: 1950-2000 (in millions)

* Figures for 2002 are a projection

Pennsylvania Urban vs. Rural Growth: 1950-1990

1950-1960	**1960-1970**	**1970-1980**	**1980-1990**
URBAN 9.4% / RURAL 4.0%	URBAN 4.1% / RURAL 4.4%	URBAN -2.6% / RURAL 8.5%	URBAN -0.4% / RURAL 1.4%

Pennsylvania Population Growth: 1988-1998

.8% to .5% increase

.01% to .08% increase

0% to -1.2% increase (decline)

Pennsylvania Urban and Rural Counties: 1990

Newly Classified Rural County

Classified Rural County (Urban Population less than 50%)

Newly Classified Urban County
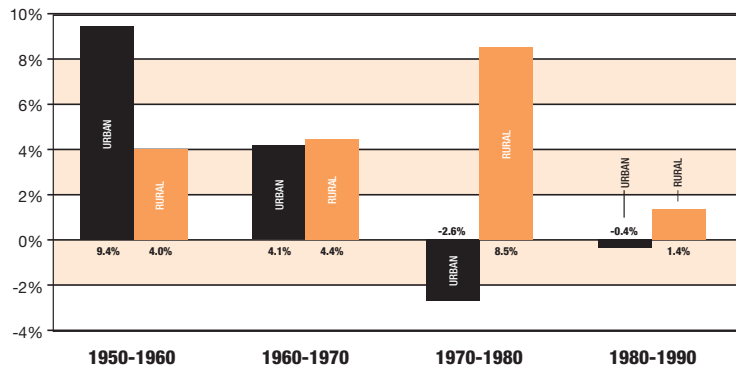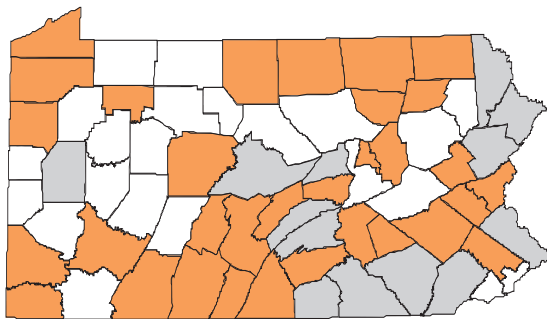
Classified Urban County (Rural Population less than 50%)

1Team Members _____

Trends in Pennsylvania. The charts and graphs show changes that have taken place over the past several decades. Charts and graphs summarize data, providing a snapshot of information that will help you identify changes. With this information, you can better determine the planning goals and objectives for the future of Pennsylvania.

1. Using *Pennsylvania Population: 1950-2000* and *Pennsylvania Urban vs. Rural Growth: 1950-1990,* answer the follwing questions:

1. How has Pennsylvania's population changed since 1950? What is your projection for the future?

2. When was the time of greatest growth?

3. How much has it changed in the last 10 years?

2. Using the *Pennsylvania Population Growth: 1988-1998* and *Pennsylvania Urban and Rural Counties: 1990,* answer the following questions:

1. What is an urban area?

2. Compare the growth of urban and rural populations in 1950–1960 to the growth/decline in urban and rural populations of the 1970–1980, and 1980–1990.

3. When did the greatest change happen of people moving from urban to rural areas?

4. How many counties are newly classified from rural to urban? What happened?

*5. How many counties are newly classified from urban to rural? What happened?*

6. What is happening to rural areas? How could we plan to improve urban areas?

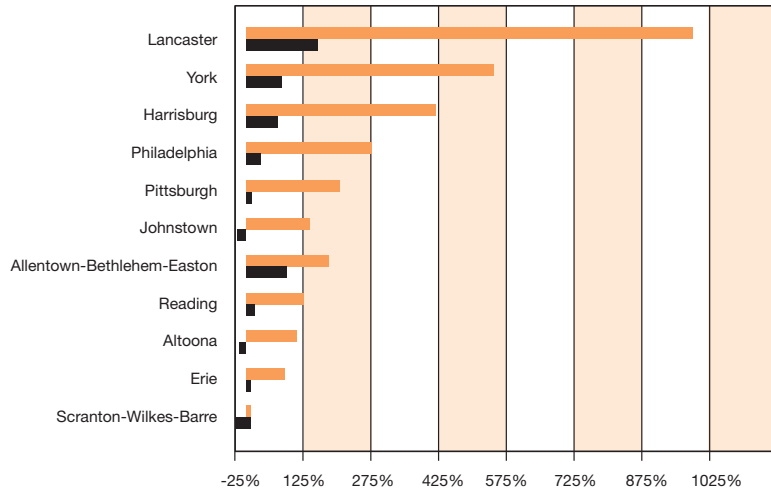*7. How many counties have had the greatest increase? Why?*

8. How many counties have declined in population? Why?
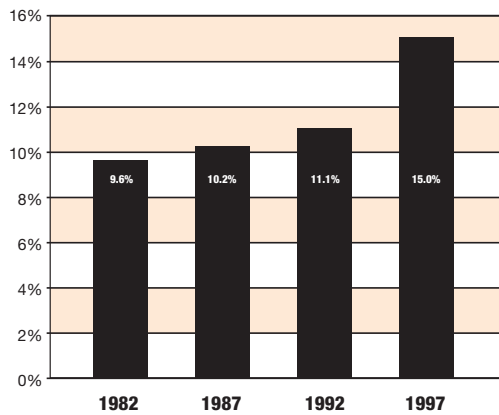
Activity 3: *Developed Land Graphs and Charts*

Pennsylvania Urbanized Development: 1950-1990

City Population   City Land   Suburban Population   Suburban Land
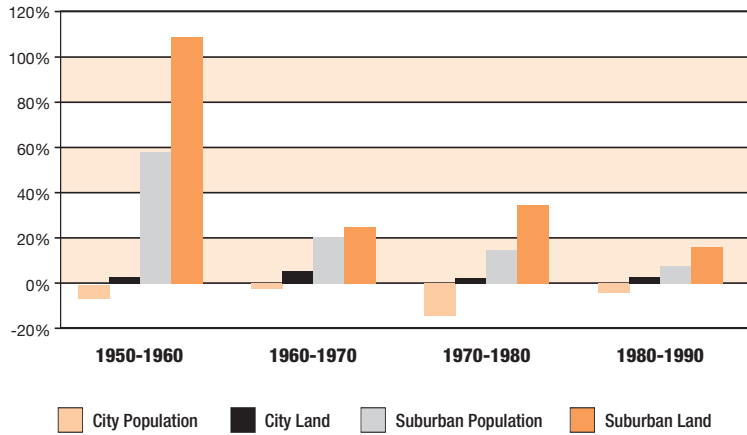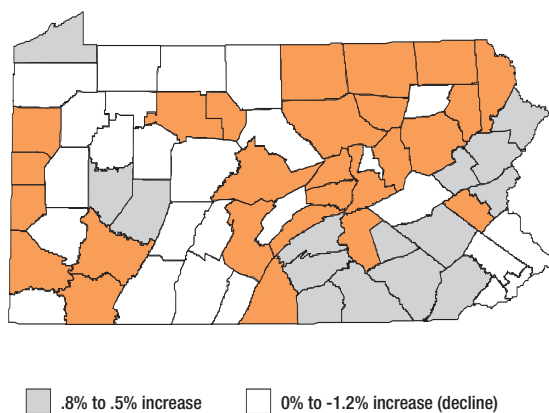
Pennsylvania Population: 1950-2000 (in millions)

Pennsylvania Percent of Land Developed: 1982-1997

Pennsylvania Growth in Developed Land: 1982-1997

.8% to .5% increase   0% to -1.2% increase (decline)

Team Members _____

Trends in Pennsylvania. The charts and graphs show changes that have taken place over the past several decades. Charts and graphs summarize data, providing a snapshot of information that will help you identify changes. With this information, you can better determine the planning goals and objectives for the future of Pennsylvania.

1. Using the *Pennsylvania Urbanized Development: 1950–1990* and *Pennsylvania Population: 1950–2000,* answer the following questions:
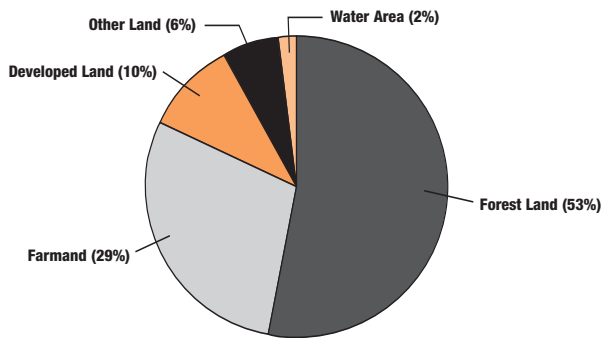
1. Define what is meant by "developed land."

2. How has developed land increased since 1982?

3. When did the greatest development occur?

4. Where did development largely occur? Why in certain areas?

2. Using the *Pennsylvania Percent of Land Developed: 1982–1997* and *Pennsylvania Growth in Developed Land: 1982–1997 charts,* answer the following questions:
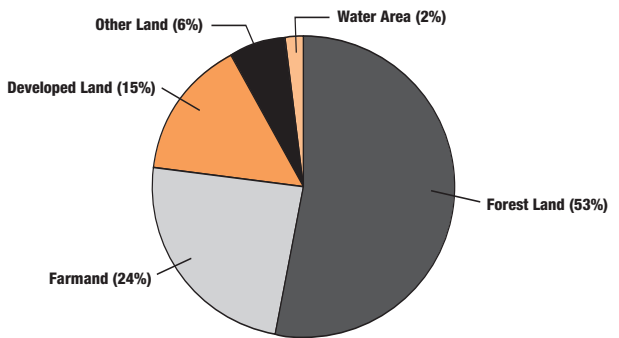
1. What happened between 1950–1960 to city development compared to suburban development?

2. Describe what happened with population growth and land development between 1960 and 1990?

3. What three urbanized areas have the greatest growth in population? How does the population growth compare to the land growth?

4. If Pennsylvania's population has slightly increased less than one percent in the past 20 years, why has there been such an increase in developed land?

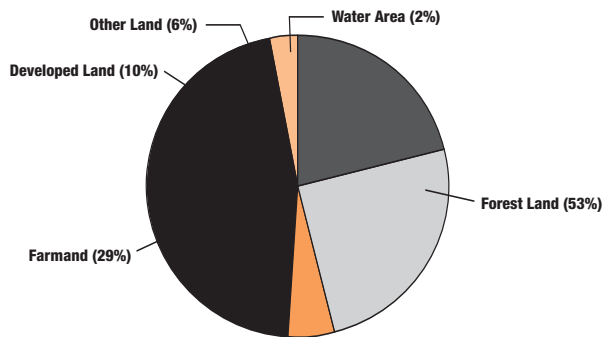**Activity 3:** *Land Cover and Agricultural Lands Graphs and Charts*
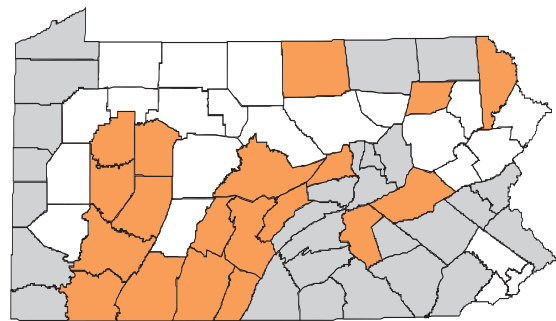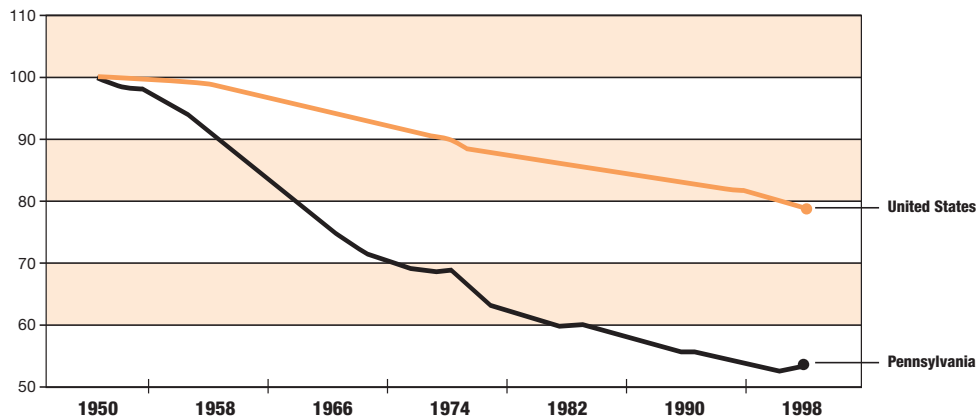
Pennsylvania Land Cover: 1982

Other Land (6%)
Water Area (2%)
Developed Land (10%)
Forest Land (53%)
Farmand (29%)

Pennsylvania Land Cover: 1997

Other Land (6%)
Water Area (2%)
Developed Land (15%)
Forest Land (53%)
Farmand (24%)

United States Land Cover: 1997

Other Land (6%)
Water Area (2%)
Developed Land (10%)
Forest Land (53%)
Farmand (29%)

Pennsylvania Percent of Total Land in Farms: 1997

35% to 100%   0% to 19%
19% to 35%

Farm Acreage Index: 1950-1998 (in millions)

110
100
90
80
70
60
50

1950   1958   1966   1974   1982   1990   1998

United States
Pennsylvania

Team Members_____

Trends in Pennsylvania. The charts and graphs show changes that have taken place over the past several decades. Charts and graphs summarize data, providing a "snapshot" of information that will help you identify changes. With this information, you can better determine the planning goals and objectives for the future of Pennsylvania.

1. Using the *Pennsylvania Land Cover: 1982, Pennsylvania Land Cover: 1997,* and *United States Land Cover: 1997 charts,* answer the follwing questions:

1. What are the categories of land cover?

2. Compare the change in land cover between 1982 and 1997. What land cover increased? What land cover decreased?

3. How many acres of farm land were developed between 1982 and 1997? Why?

4. How does Pennsylvania's developed land compare to the national average?

2. Using the *Farm Acreage Index* and *Pennsylvania Percent of Land in Farms: 1997,* answer the following questions:
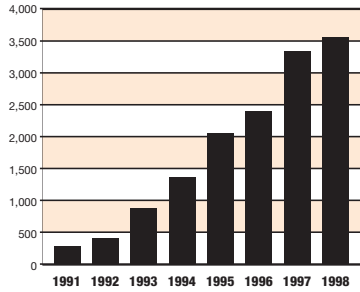
1. What has happened to Pennsylvania farmland since 1950 compared to the national average?
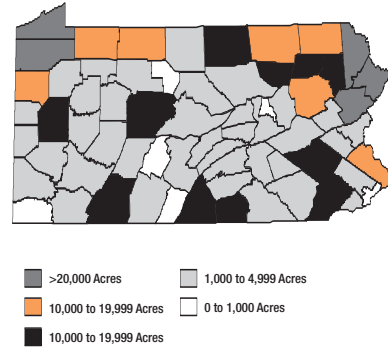
2. Why has farm acreage declined?

3. Where are the farmlands located that will be urbanized in the near future?

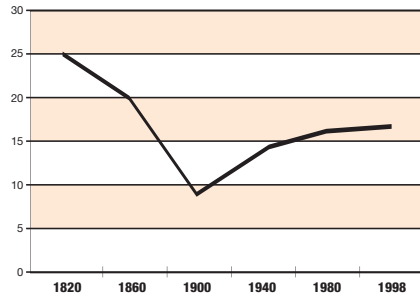**Activity 3:** *Wetlands, Forest and Park Land Graphs and Charts*

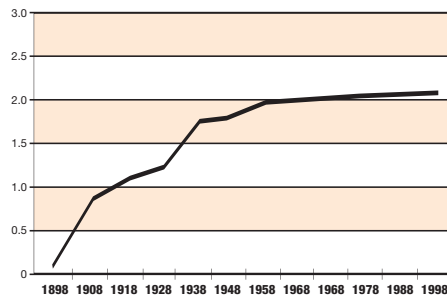### Pennsylvania Cumulative Acres of Wetland Restored: 1991-1998
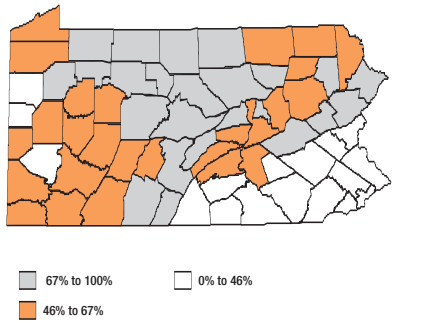

Pennsylvania Acres of Wetland by County: 1990

- >20,000 Acres
- 10,000 to 19,999 Acres
- 10,000 to 19,999 Acres
- 1,000 to 4,999 Acres
- 0 to 1,000 Acres

Pennsylvania Acres of Forest Land: 1820-1998 (in millions)

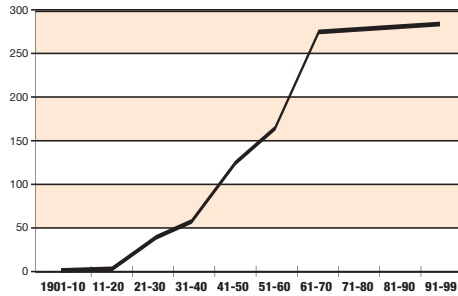### Pennsylvania Acres of State-owned Forest Land: 1898-1998 (in millions)

Pennsylvania Percent of Total Land that is Forest Land: 1989

- 67% to 100%
- 46% to 67%
- 0% to 46%

Pennsylvania Park Land: 1901-1999 (in thousands)

Pennsylvania Percent of Total Land that is State Park Land: 1994

- 1.7% to 9.0%
- 0.3% to 1.7%
- 0.0% to 0.3%

Team Members_____

Trends in Pennsylvania. The charts and graphs show changes that have taken place over the past several decades. Charts and graphs summarize data, providing a snapshot of information that will help you identify changes. With this information, you can better determine the planning goals and objectives for the future of Pennsylvania.

1. Using *Pennsylvania Cumulative Acres of Wetland Restored: 1991-1998* and *Pennsylvania Acres of Wetland by County: 1990*, answer the following questions:

1. Define wetlands. Why are they valuable?

2. What has happened to wetlands since the 1700s?

3. In 1990, which areas of Pennsylvania had the most wetlands?

4. Why are wetland habitats threatened in Pennsylvania?

5. How many acres of wetlands were restored between 1991 and 1998?

2. Using the *Pennsylvania Acres of Forest Land: 1820-1998, Pennsylvania Acres of State-owned Forest Land: 1898-1998*, and *Pennsylvania Percent of Total Land that is Forest Land: 1989*, answer the follwing questions:

1. What happened to forestland in the 1800's?

2. What happened to state-owned forest land since 1898? since 1970?

3. How many acres of Pennsylvania are forested?

4. Which regions are the most and least heavily forested? Why?

3. Using *Pennsylvania Park Land: 1901-1999* and *Pennsylvania Percent of Total Land that is State Park Land: 1994*, answer the follwing questions:
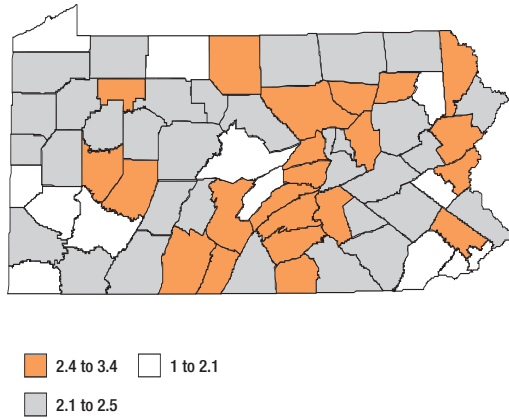
1. When did the greatest growth occur in state parks?

2. What has happened in growth of park land since 1970?

3. How valuable are state parks to Pennsylvania?

Activity 3: *Vehicles, Road Miles and Public Transportation Worksheet Graphs and Charts*
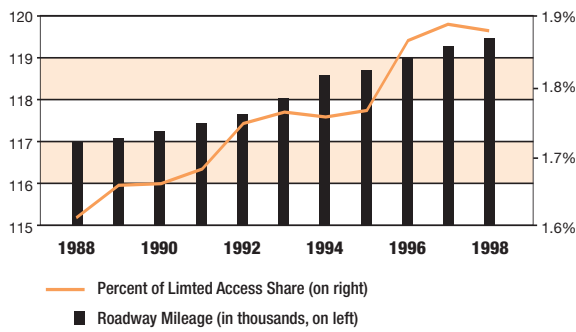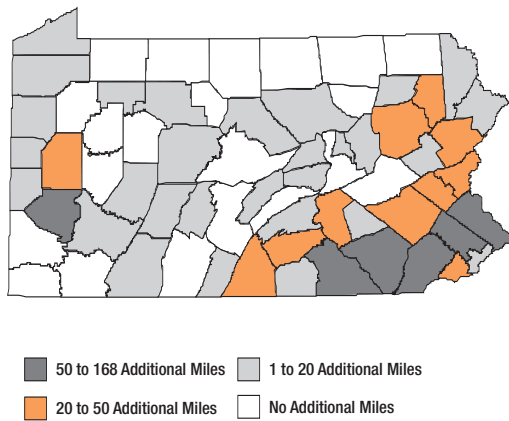
Pennsylvania Vehicle Registrations: 1978-1998
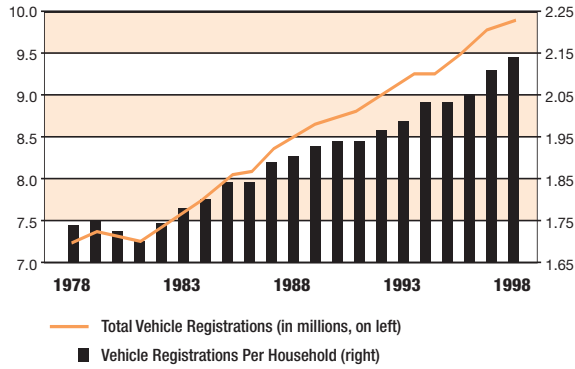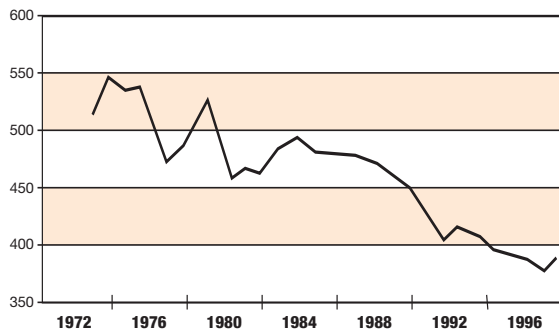

— Total Vehicle Registrations (in millions, on left)

■ Vehicle Registrations Per Household (right)

Pennsylvania Vehicle Registrations Per Household: 1998

- 2.4 to 3.4
- 1 to 2.1
- 2.1 to 2.5

Pennsylvania Road Mileage: 1988-1998

— Percent of Limted Access Share (on right)

■ Roadway Mileage (in thousands, on left)

Pennsylvania Change in Public Road Miles: 1994-1998

- 50 to 168 Additional Miles
- 1 to 20 Additional Miles
- 20 to 50 Additional Miles
- No Additional Miles

Pennsylvania Urban Transit Ridership: 1972-1996
(Number of passenger trips in thousands)

Pennsylvania Access to Public Transportation: 1998

- Have Systems with Annual Ridership of 76 Million to 293 Million Trips
- Have Systems with Annual Ridership of .03 Million to 1 Million Trips
- Have Systems with Annual Ridership of 1 Million to 3.7 Million Trips
- Counties Without a Transit System
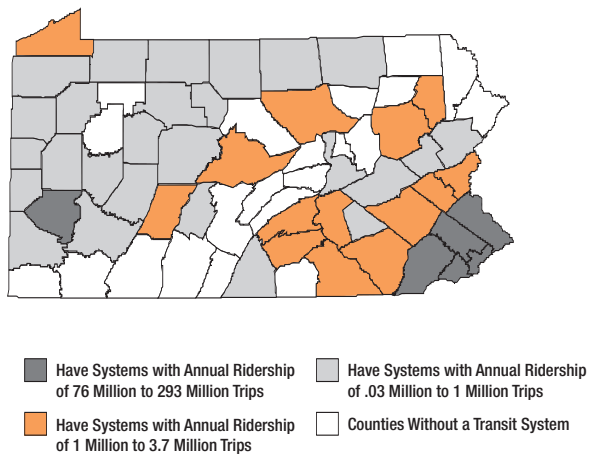
Activity 3: *Vehicles, Road Miles and Public Transportation Worksheet*

Team Members_____

Trends in Pennsylvania. The charts and graphs show changes that have taken place over the past several decades. Charts and graphs summarize data, providing a snapshot of information that will help you identify changes. With this information, you can better determine the planning goals and objectives for the future of Pennsylvania.

1. Using the *Pennsylvania Vehicle Registrations: 1978-1998* and *Pennsylvania Vehicle Registrations Per Household: 1998,* answer the following questions:

1. How has the number of vehicles changed since 1978?

2. How does vehicle registration impact Pennsylvania's land use?

3. What is the average number of vehicles per household in your county?

2. Using the *Pennsylvania Road Mileage: 1988-1998,* and *Pennsylvania Change in Public Road Miles: 1994-1998,* answer the following questions:

1. How have the miles of roads changed from 1988 to 1998?

2. How do road miles equate to land development?

3. Using the *Pennsylvania Urban Transit Ridership: 1972-1996* and *Pennsylvania Access to Public Transportation 1998,* answer the following questions:

1. What happened to the number of urban transit trips from 1972–1996?

2. Why is there a decline in public transportation?

3. How does efficient and desirable public transportation benefit land use in Pennsylvania?

Activity 3: *Answer Key for Percent of Population Change Worksheet*

Top Eight Population Increases

County	Percent
1. Pike	8.2
2. Monroe	7.3
3. Chester	3.8
4. Wayne	2.4
5. Adams	3.4
6. Bucks	2.1
7. Butler	2.3
8. York	2.0

Top Eight Population Decreases

County	Percent
1. Cambria	-1.4
2. Philadelphia	-1.7
3. Allegheny	-0.9
4. Beaver	-1.1
5. Lackawanna	-1.2
6. Schuylkill	-1.2
7. Elk	-1.9
8. Luzerne	-1.4