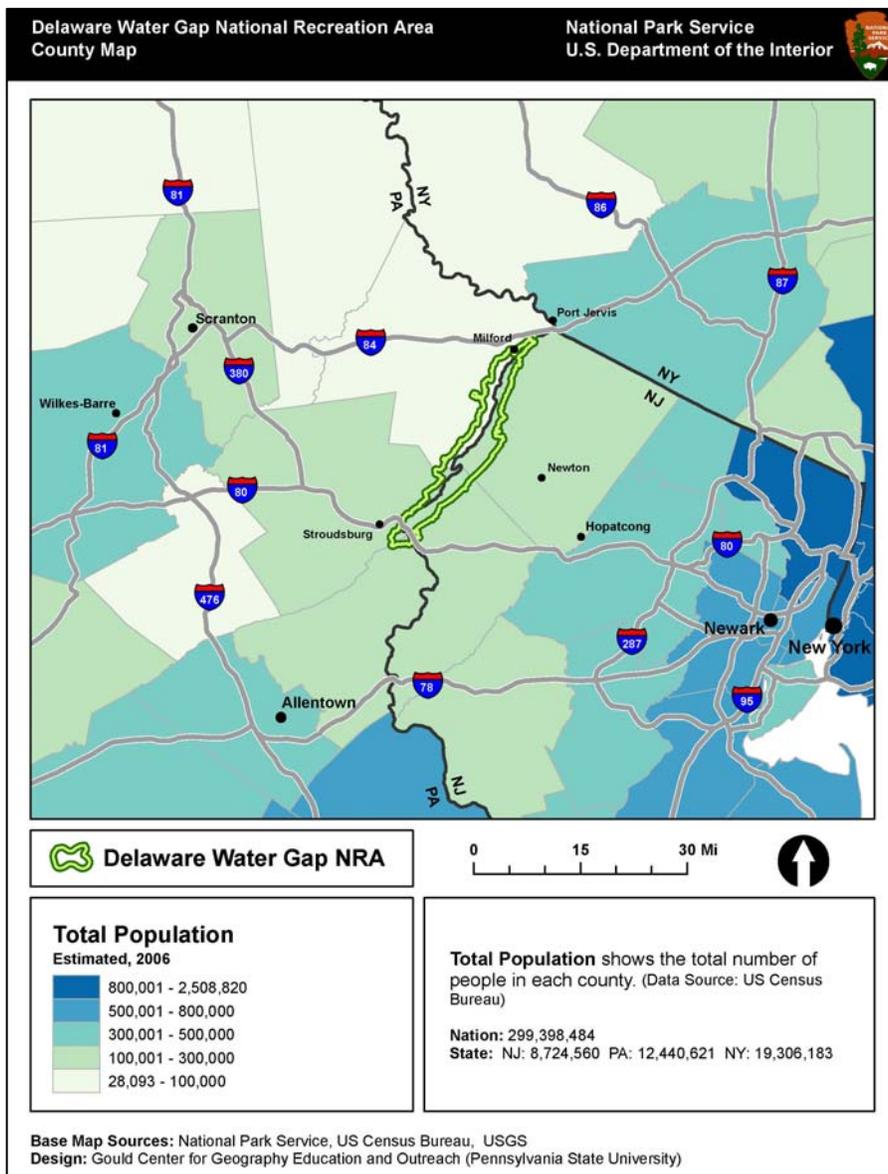




Socioeconomic Indicator Mapping, Eastern Rivers and Mountains Network

Natural Resource Report NPS/ERMN/NRR—2009/073



ON THE COVER

Estimated total population, 2006, Delaware Water Gap NRA. Base Map Sources: NPS, U.S. Census Bureau, USGS; Design: Gould Center for Geography Education and Outreach (PSU), 05/07/08.

Socioeconomic Indicator Mapping, Eastern Rivers and Mountains Network

Natural Resource Report NPS/ERMN/NRR—2009/073

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January 2009

U.S. Department of the Interior

National Park Service

Natural Resource Program Center

Fort Collins, Colorado

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Introduction

The management of park resources requires attention to human behavior and activities. One approach to understanding social, cultural, and economic conditions and trends is to use socioeconomic indicators. Socioeconomic indicators are regularly collected economic or social statistics that describe or predict the general state of our society. An integrated set of socioeconomic indicators can be effective in presenting the “basic facts” about the people of the region.

The purpose of this atlas is to provide park managers, planners, community leaders, and others with a better understanding of changing human activities and socioeconomic conditions in the region surrounding national park units of the Eastern Rivers and Mountains Network. These changes outside a park’s boundary can create complex park management challenges. Information about regional trends and conditions is needed in order to manage and conserve park resources—both natural and cultural—more effectively. This atlas provides such information in a series of maps at two scales.

The maps in this atlas combine contextual information (such as boundary lines, roads, and key towns) with thematic information (such as demographic or economic statistics). This combination of contextual and thematic information helps the reader observe general trends inherent in the distribution of data. For example, a map that shows population change for each county in the park region may reveal that all of the highest growth is concentrated in counties south of the park.

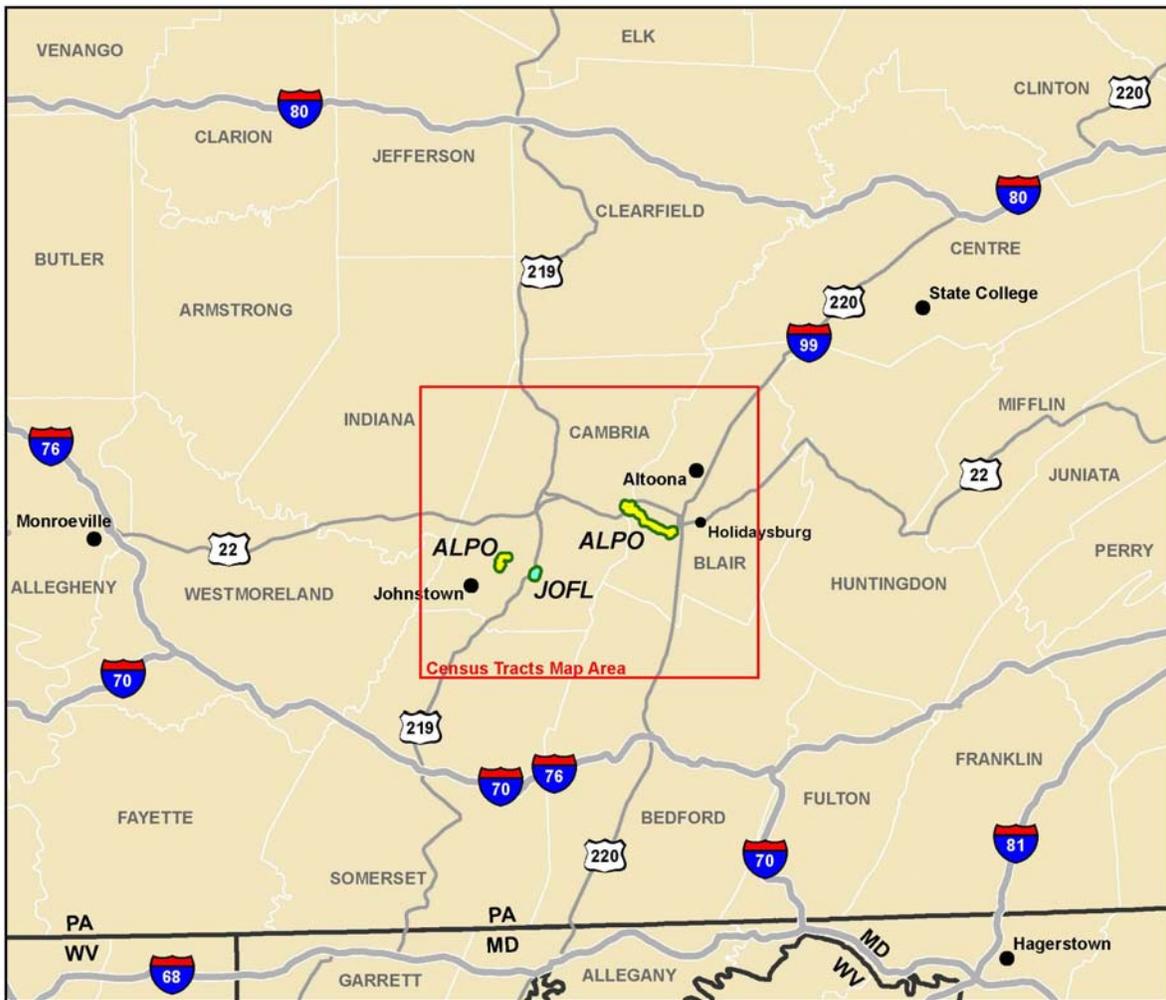
Data distributions on census tract maps, that show local detail, may be compared with county maps that show patterns for the wider region. Consistent map design allows readers to make useful comparisons among two or more maps.

The indicators in this atlas are not simply a collection of various statistics displayed in maps but an integrated set of indicators organized around broad areas of human activity that are of particular relevance to park management. The integrated set of indicators displayed in this atlas encompasses general categories of population, economy, land use, and recreation.

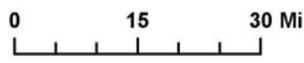
This document includes maps of socioeconomic indicators chosen by the Eastern Rivers and Mountains Network staff in collaboration with resource managers at Delaware Water Gap National Recreation Area, and Cindy Brewer and Erin Greb of The Pennsylvania State University, from a list of 67 indicators used in a similar atlas effort lead by Jean McKendry in 2004 for 15 national parks. The indicators in this document were determined to be most relevant to Eastern Rivers and Mountains Network natural resource management.

Allegheny Portage Railroad National Historic Site and Johnstown Flood National Memorial

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Allegheny Portage Railroad NHS
 Johnstown Flood NM

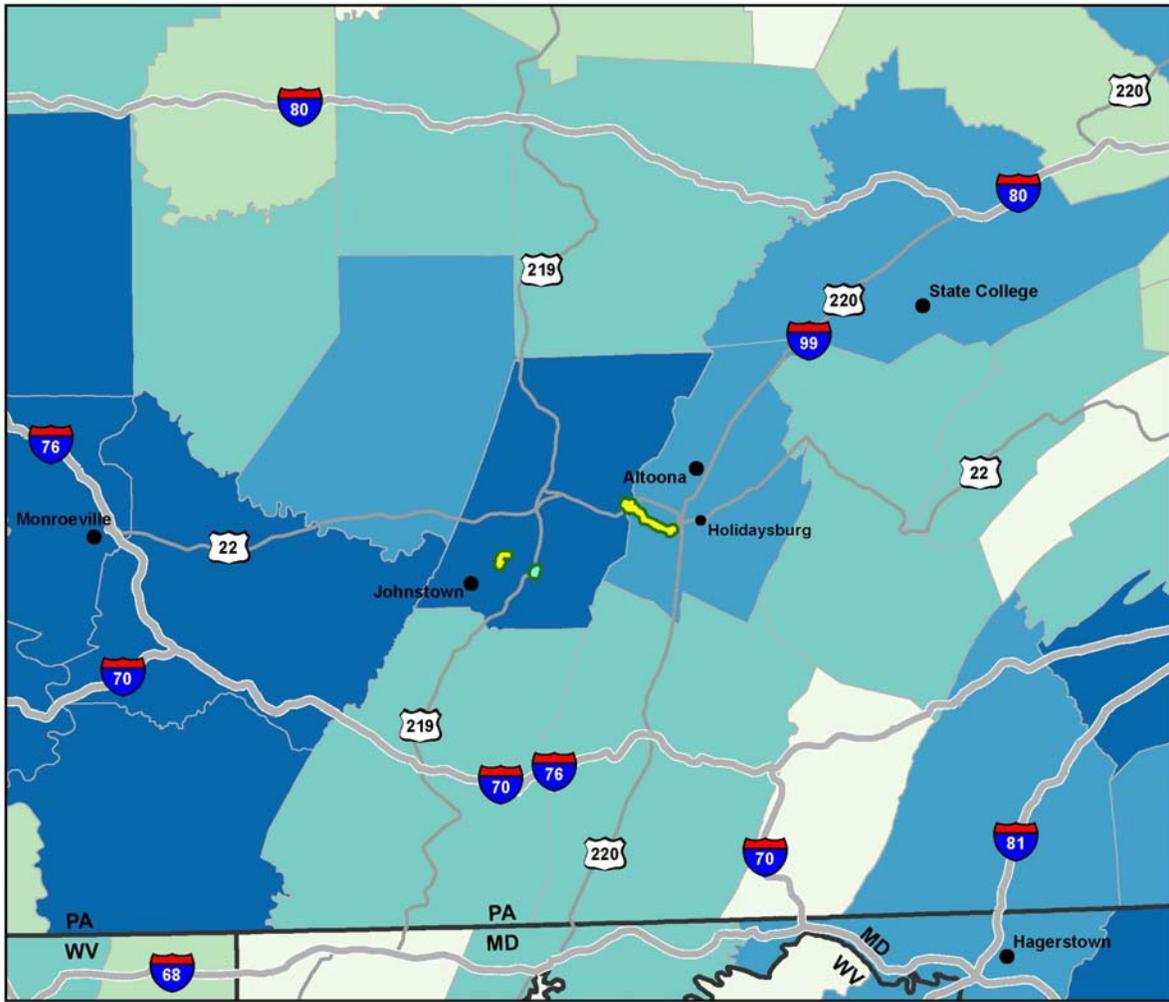


Classification Methods
 The quantile classification method is used for most of the socioeconomic data maps. In this classification scheme, equal numbers of counties or census tracts are placed in each class. The quantile classification method is used to show the ranking of data while producing distinct mapping patterns.

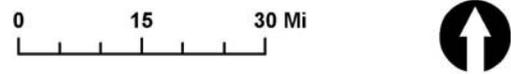
Explanation of Map Scales
 In order to show data at a fine aggregation unit, census tracts were used when possible. When data were not available by census tract for the atlas, county data were collected. This map shows the counties for which data were collected at the smaller scale, with the census tract map area shown for reference.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 1. Location Map.



Allegheny Portage Railroad NHS
 Johnstown Flood NM



Total Population
Estimated, 2006

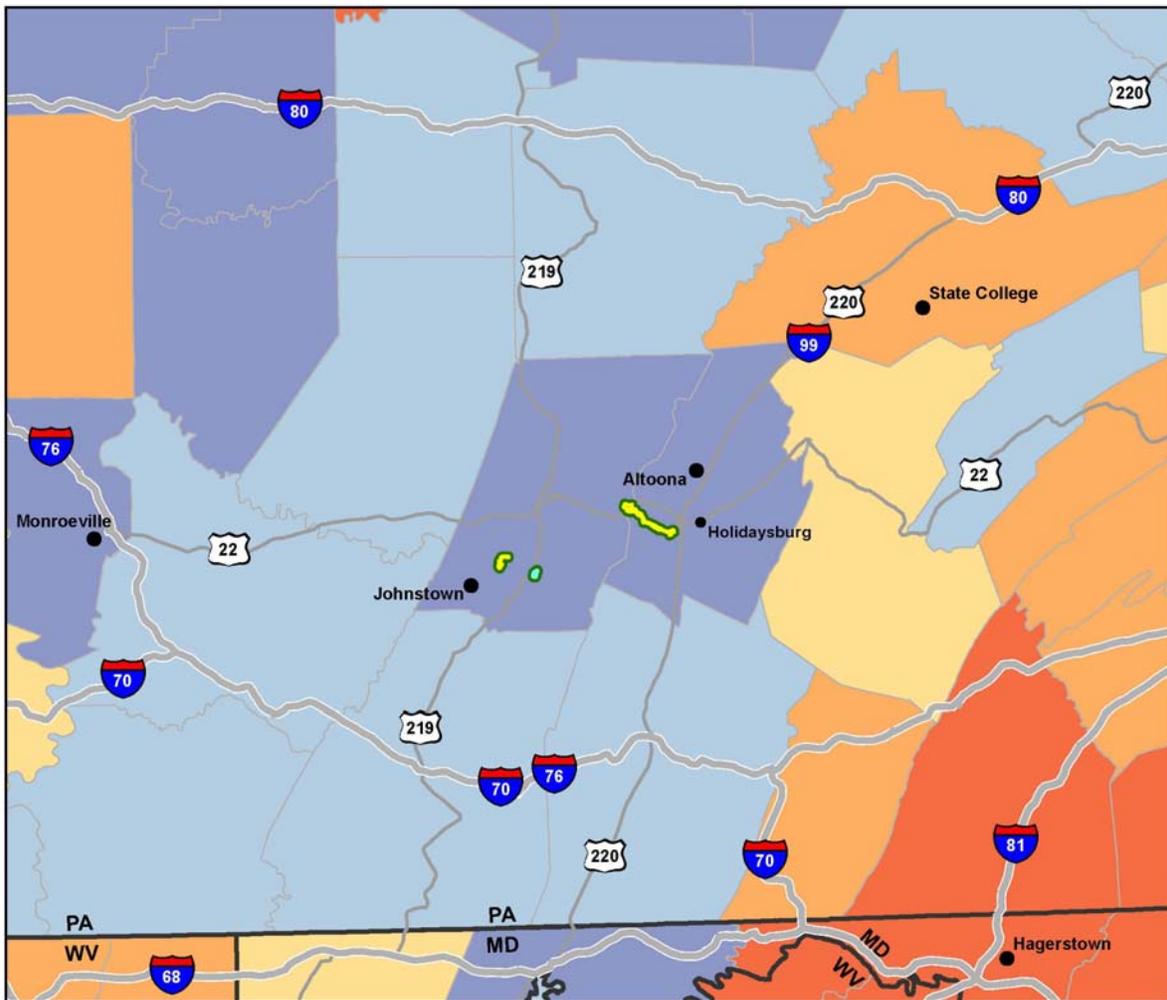
	145,001 - 1,223,411
	85,001 - 145,000
	45,001 - 85,000
	30,001 - 45,000
	5,489 - 30,000

Total Population shows the total number of people in each county. (Data Source: US Census Bureau)

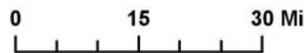
Nation: 299,398,484
State: PA: 12,440,621 MD: 5,615,727 WV: 1,818,470

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 2. Estimated Total Population, 2006.

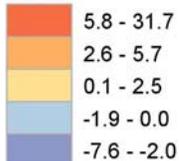


Allegheny Portage Railroad NHS
 Johnstown Flood NM



Recent Population Change

Percent Change, 2000 to 2006

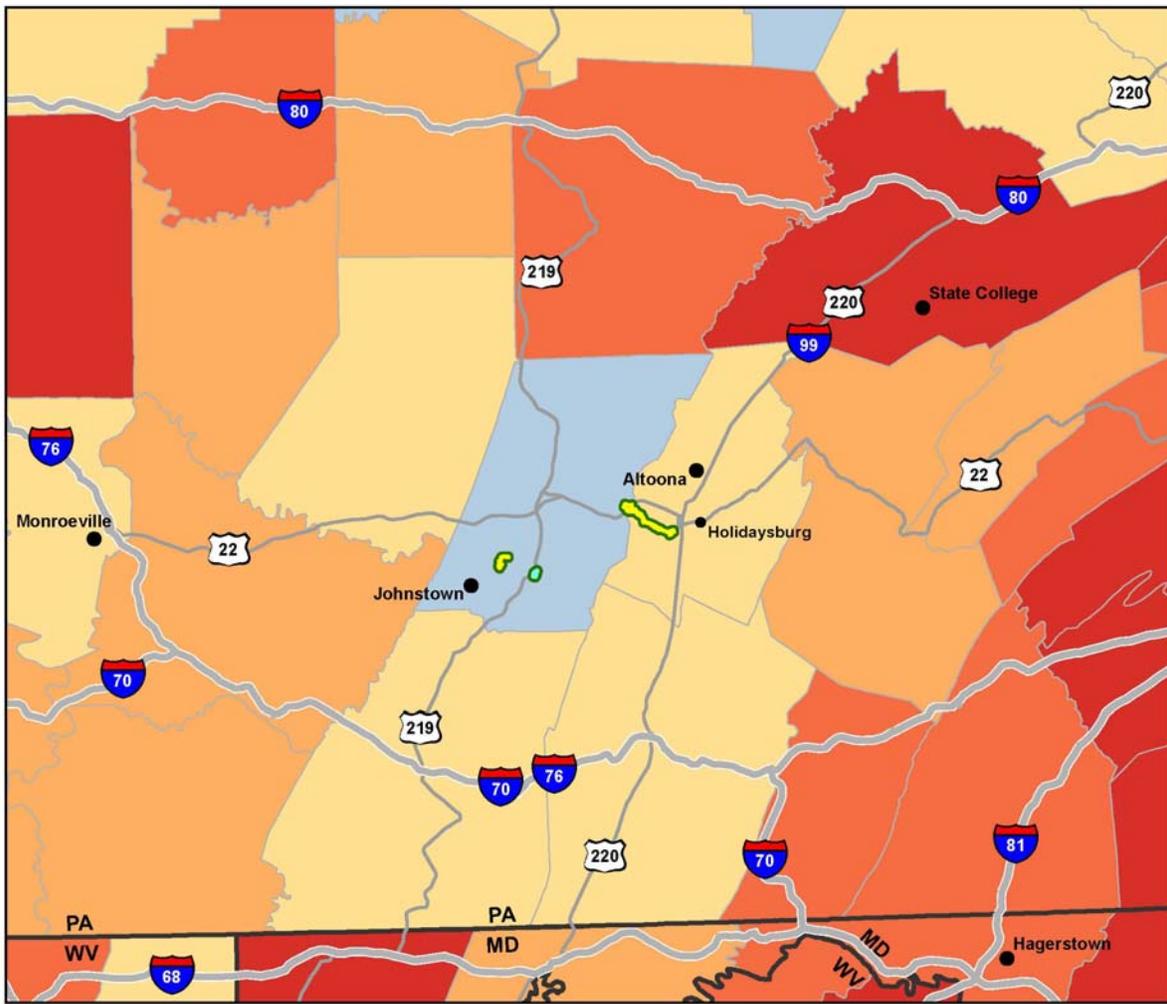


Recent Population Change shows the percent increase or decrease in the county population from 2000 to 2006. (Data Source: US Census Bureau)

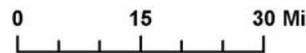
Nation: 6.4%
State: PA: 1.3% MD: 6.0% WV: 0.6%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 3. Recent Population Change, 2000-2006.



Allegheny Portage Railroad NHS
 Johnstown Flood NM



Projected Population Change

Percent Change, 2006 to 2030

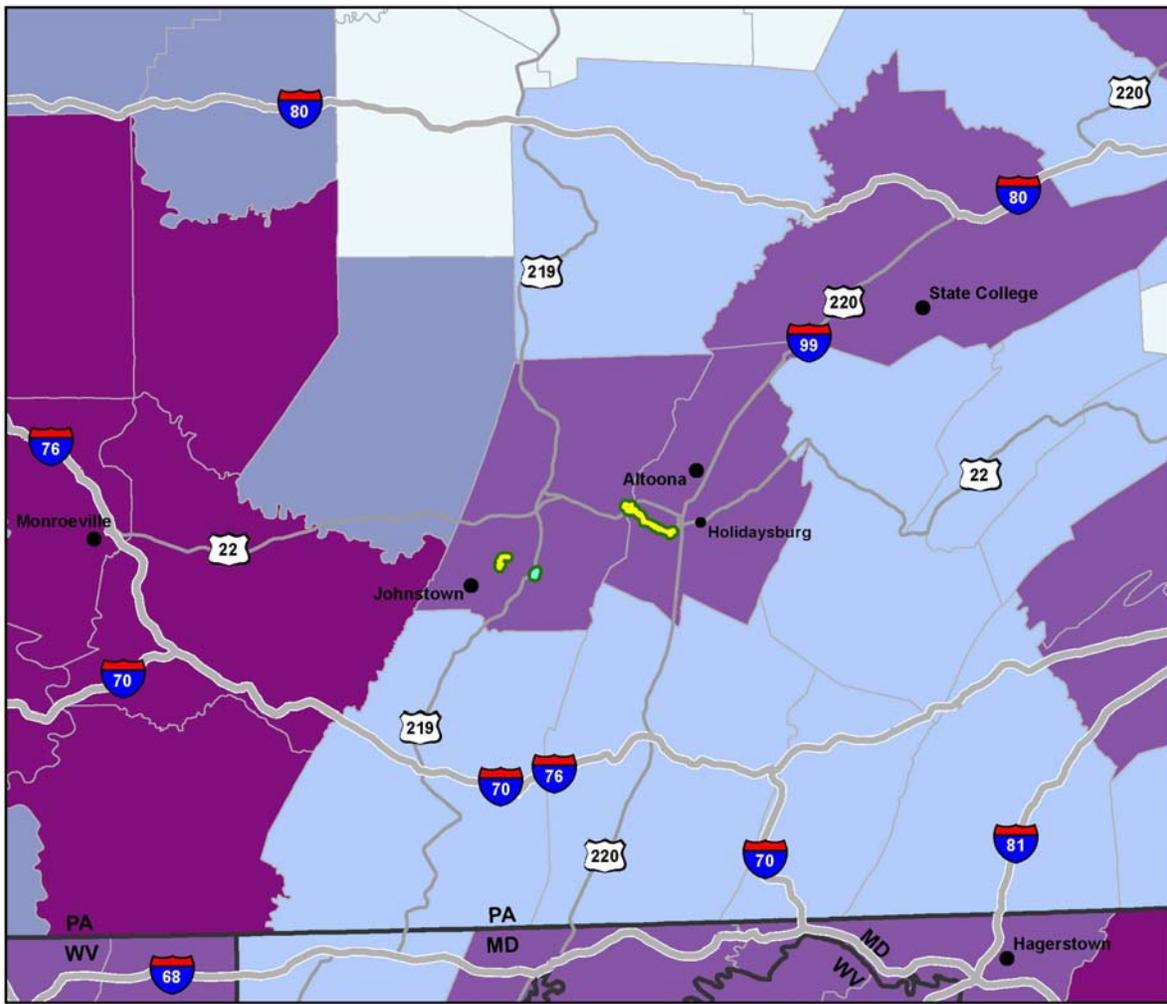


Projected Population Change shows the projected percent increase or decrease in the county population from 2006 to 2030.
(Data Source: US Census Bureau; Woods and Poole)

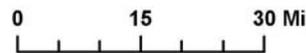
Nation: 26.4%
State: PA: 12.2% MD: 34.4% WV: 7.7%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 4. Projected Population Change, 2006-2030.



Allegheny Portage Railroad NHS
 Johnstown Flood NM



Urbanization

County is ...

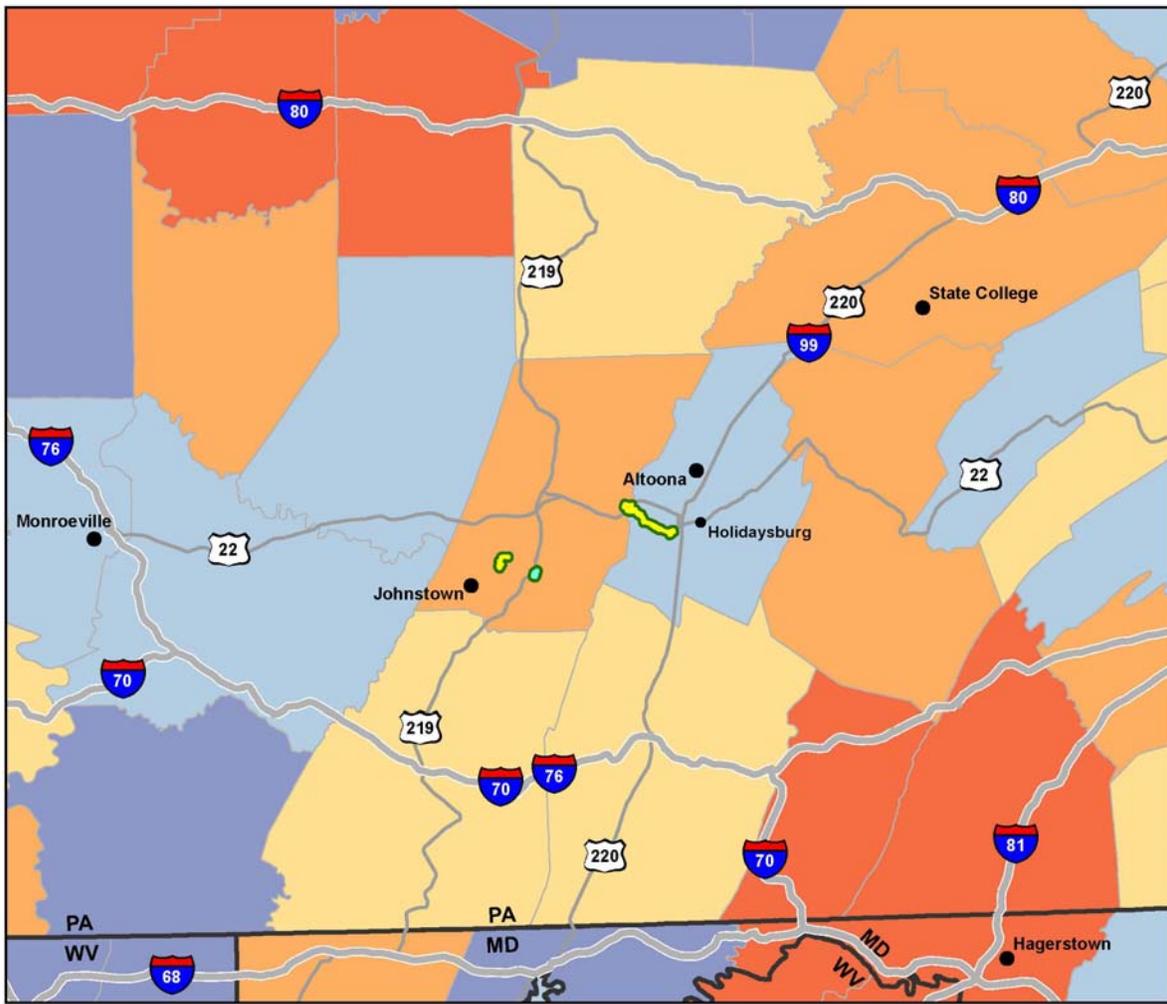
- In large metro area, over 1 million residents
- In small metro area, under 1 million residents
- Micropolitan or noncore adjacent to large metro
- Micropolitan or noncore adjacent to small metro
- Micropolitan or noncore not adjacent to metro area

Urbanization influence is classified based on the county population, size of the largest city or town in the county, and proximity to micropolitan areas.

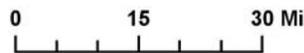
(Data Source: USDA Economic Research Service;
<http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>)

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 5. Urbanization, 2003.

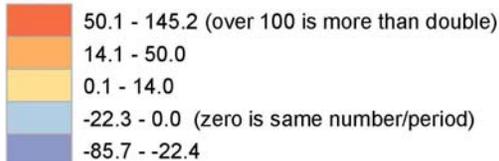


Allegheny Portage Railroad NHS
 Johnstown Flood NM



Change in Home Building Permits

Percent Change, 1993-1995 to 2003-2005



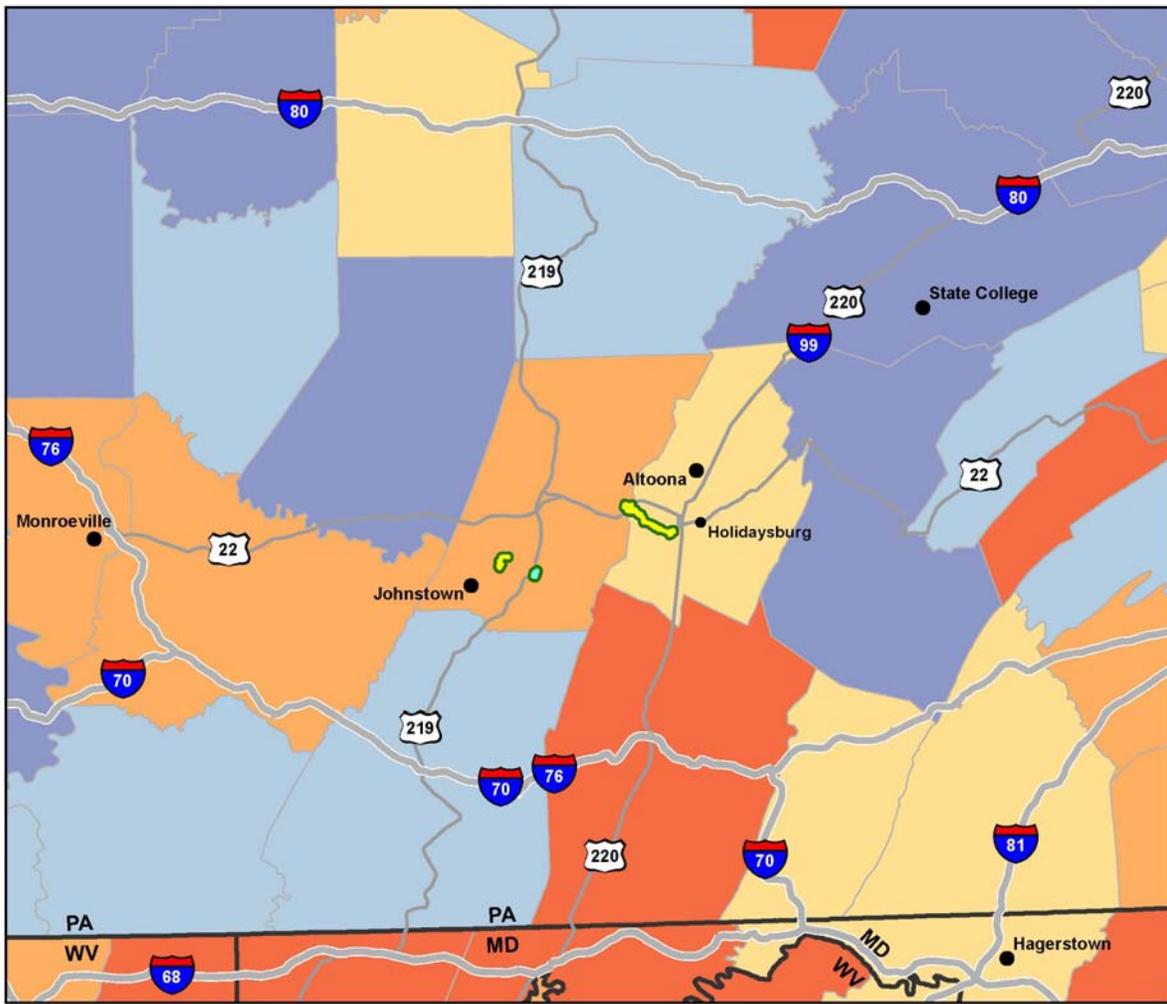
Change in Home Building Permits shows the

percent change in the average number of privately-owned building permits acquired between 1993-1995 and 2003-2005 by county. (Data Source: US Census Bureau)

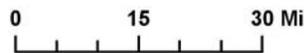
Nation: 56.7%
State: PA: 21.4% MD: 2.3% WV: 67.5%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 6. Change in Home Building Permits, 1993-1995 to 2003-2005.

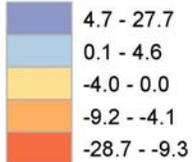


Allegheny Portage Railroad NHS
 Johnstown Flood NM



Change in Farmland

Percent Change in Acreage, 1997-2002

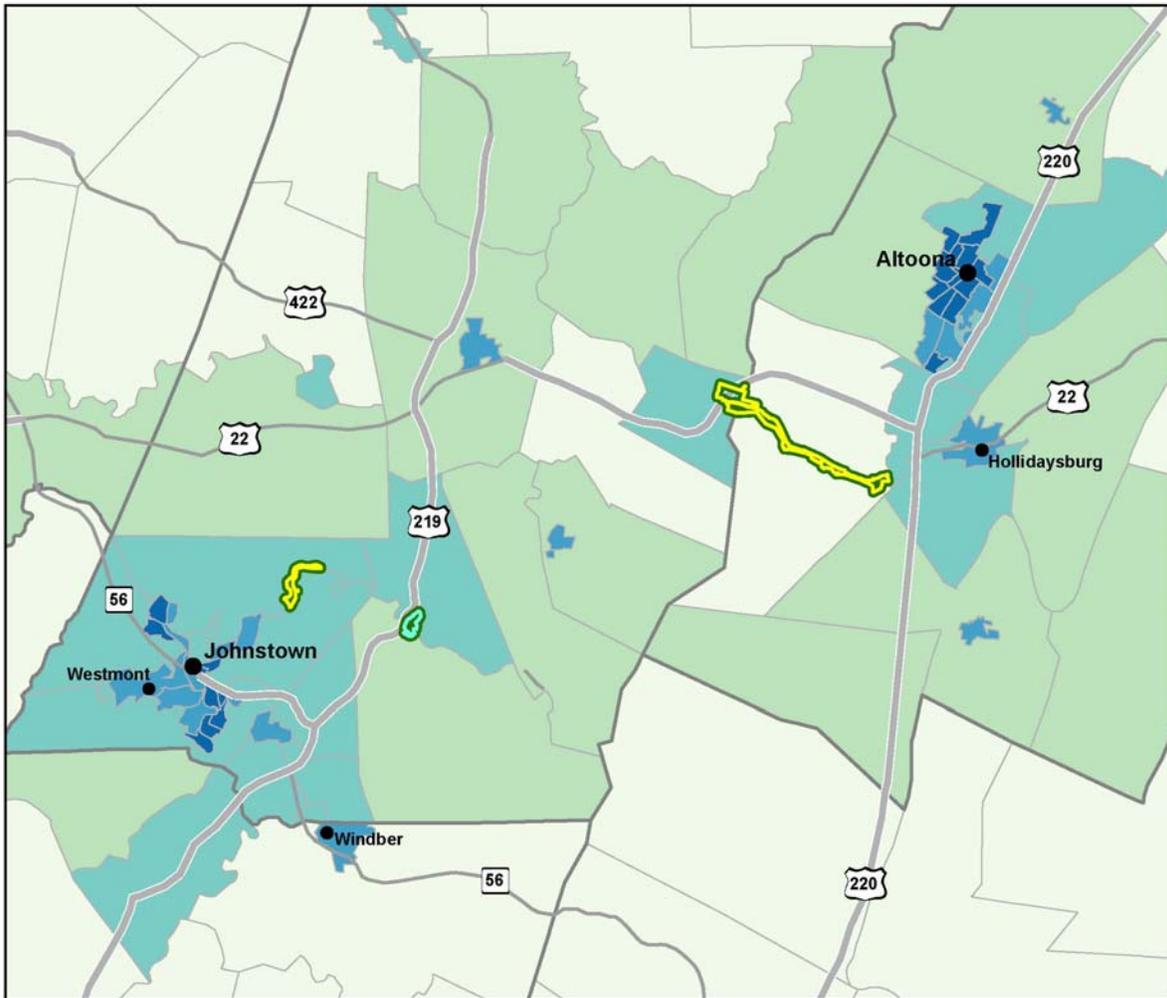


Change in Farmland shows the percent change in acreage from 1997 to 2002 by county. (Data Source: USDA-NASS)

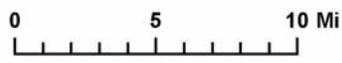
Nation: -1.7%
State: PA: -1.0% MD: -5.3% WV: -3.1%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 7. Change in Farmland, 1997-2002.



 Allegheny Portage Railroad NHS
 Johnstown Flood NM



Population Density
People per Square Mile, 2000

	4,401 - 8,643
	1,801 - 4,400
	201 - 1,800
	101 - 200
	35 - 100

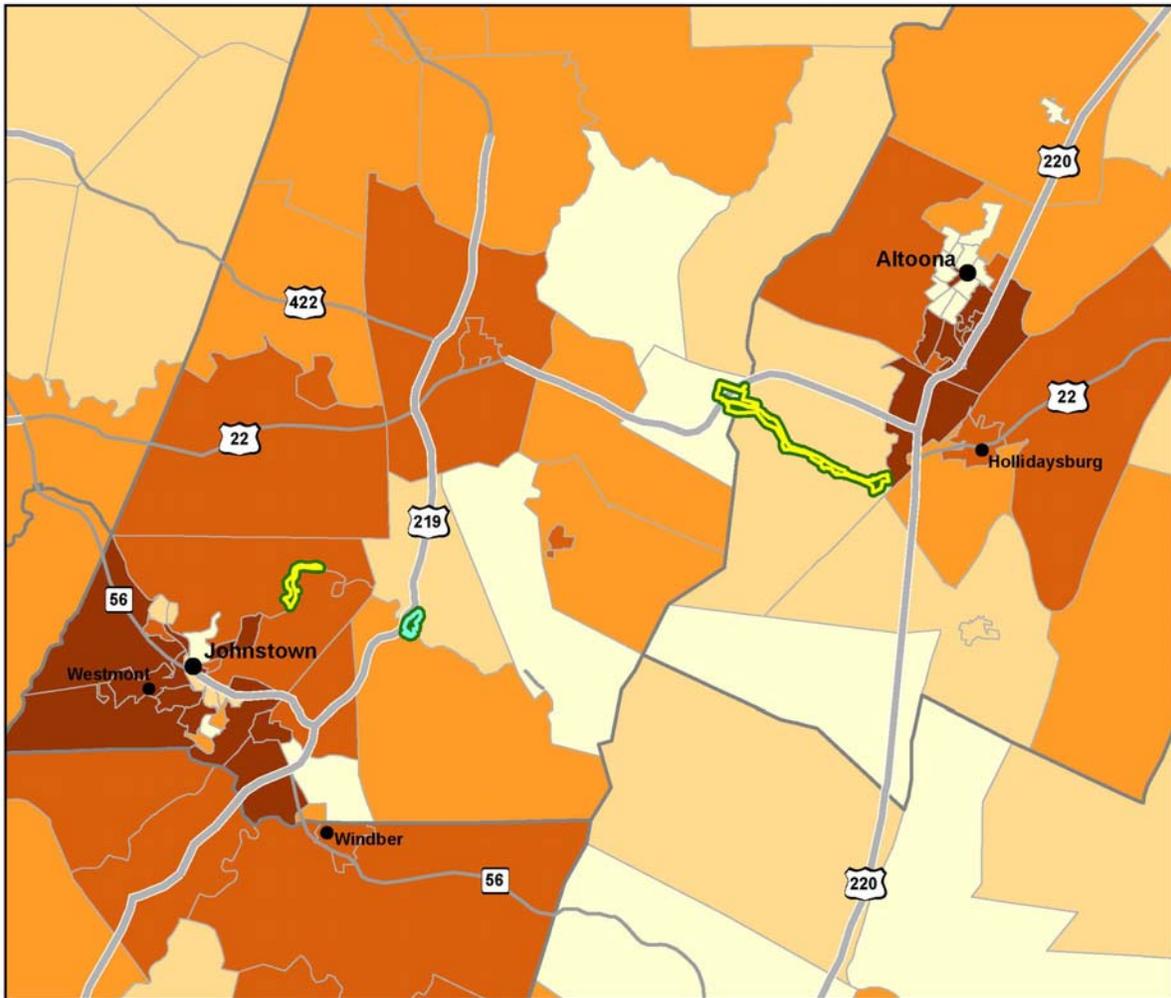
Population density is calculated by dividing the total number of people by the number of square miles in each census tract. (Data Source: US Census Bureau)

Nation: 80
State: PA: 274 MD: 542 WV: 75

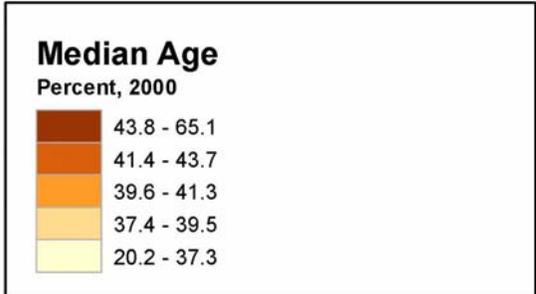
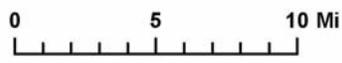
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 8. Population Density, 2000.



 Allegheny Portage Railroad NHS
 Johnstown Flood NM



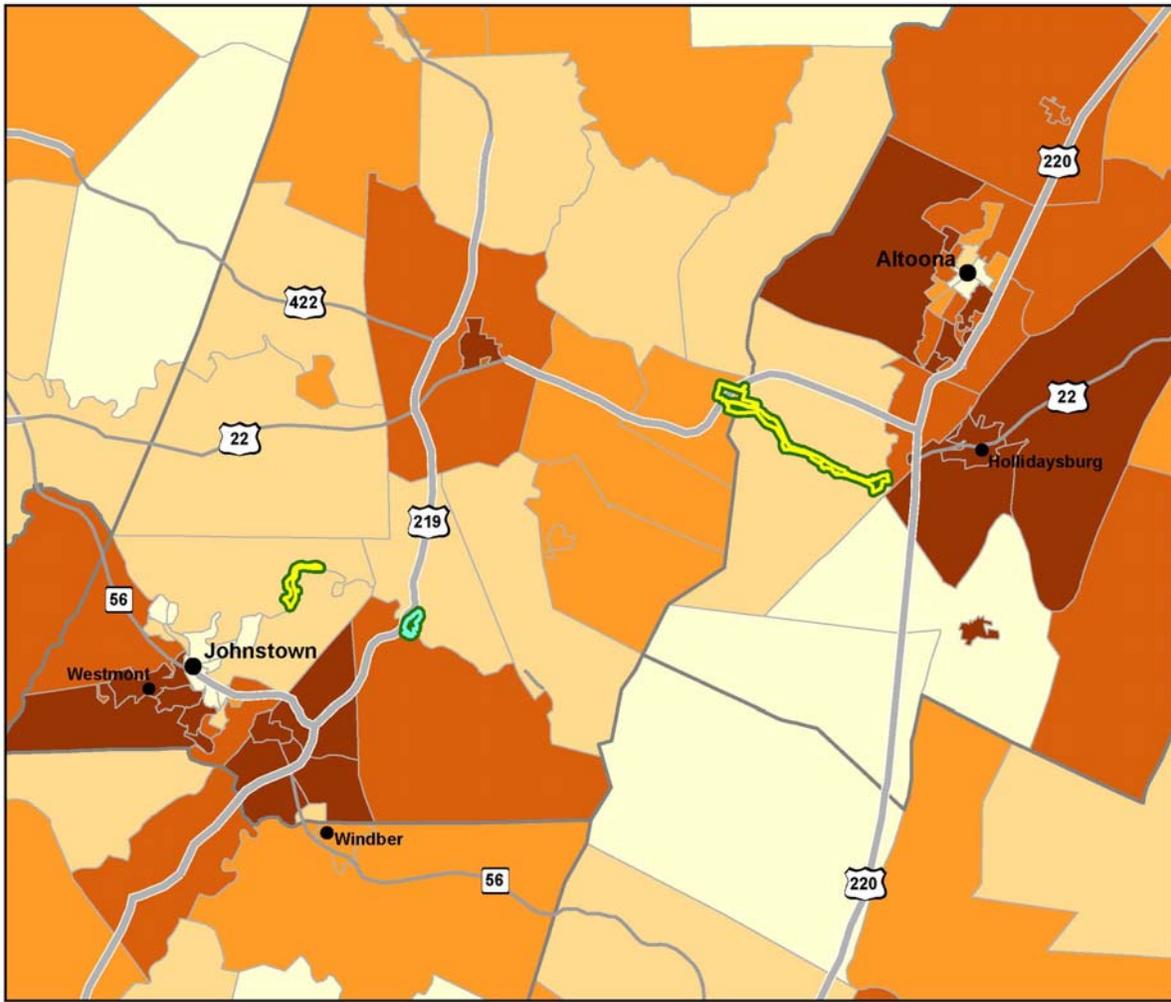
Median Age is the age value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 35.3
State: PA: 38.0 MD: 36.0 WV: 38.9

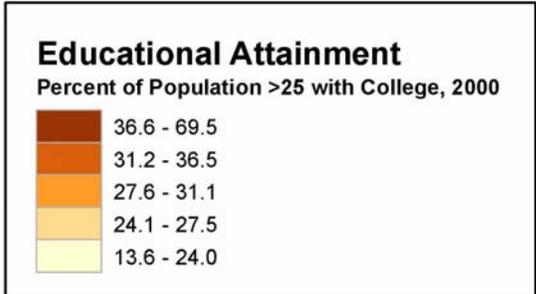
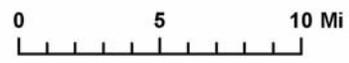
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 9. Median Age, 2000.



 Allegheny Portage Railroad NHS
 Johnstown Flood NM



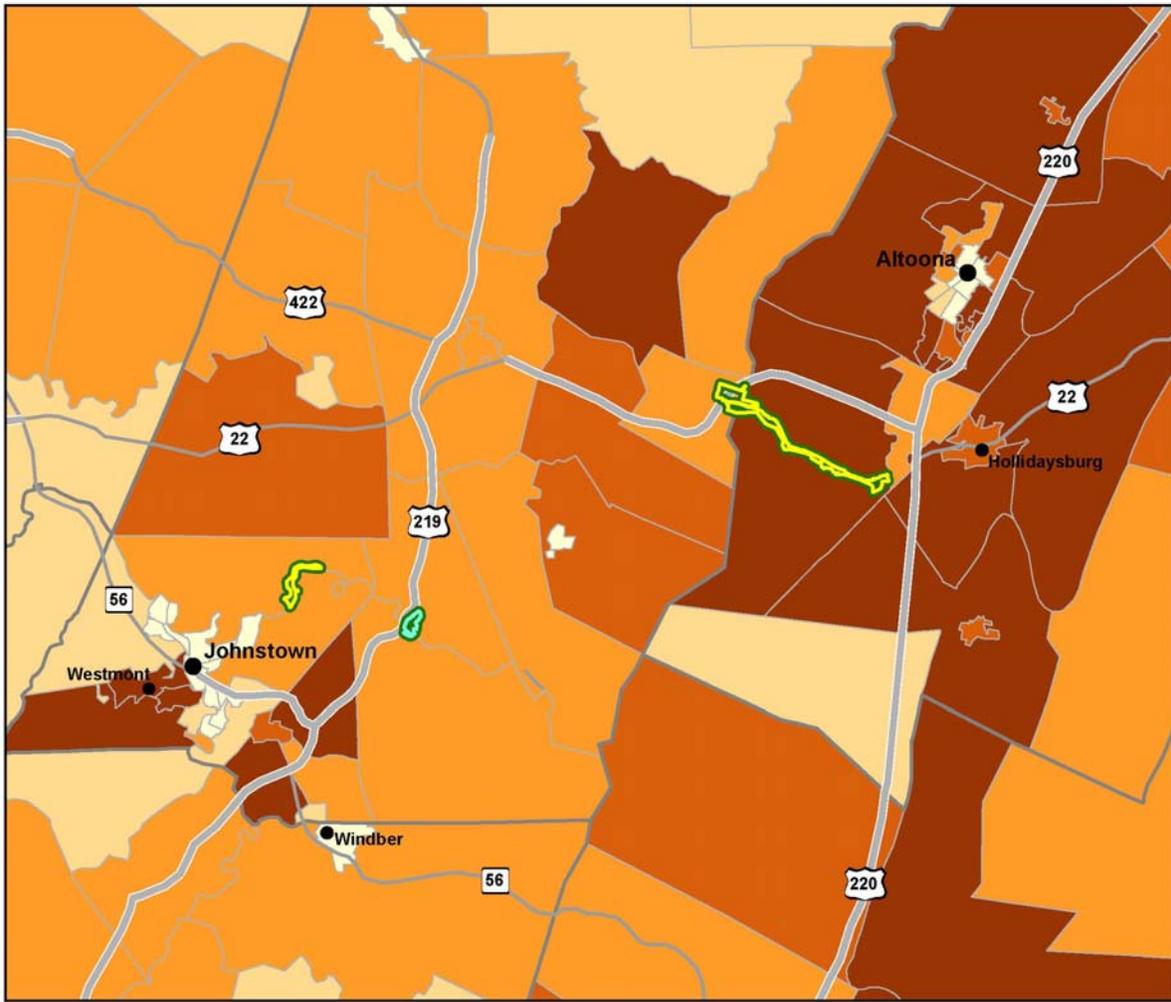
Educational Attainment shows the percent of the population age 25 and over with some college or a college degree. (Data Source: US Census Bureau)

Nation: 51.8%
State: PA: 43.8% MD: 57.1% WV: 35.8%

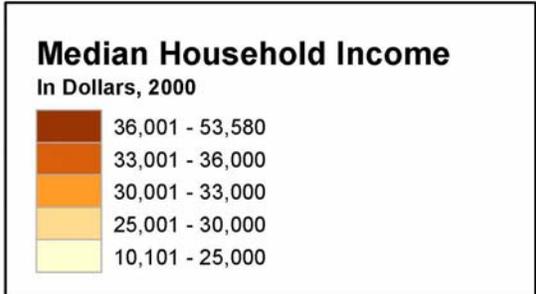
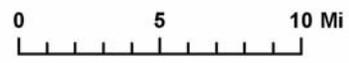
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 10. Educational Attainment, 2000.



 Allegheny Portage Railroad NHS
 Johnstown Flood NM



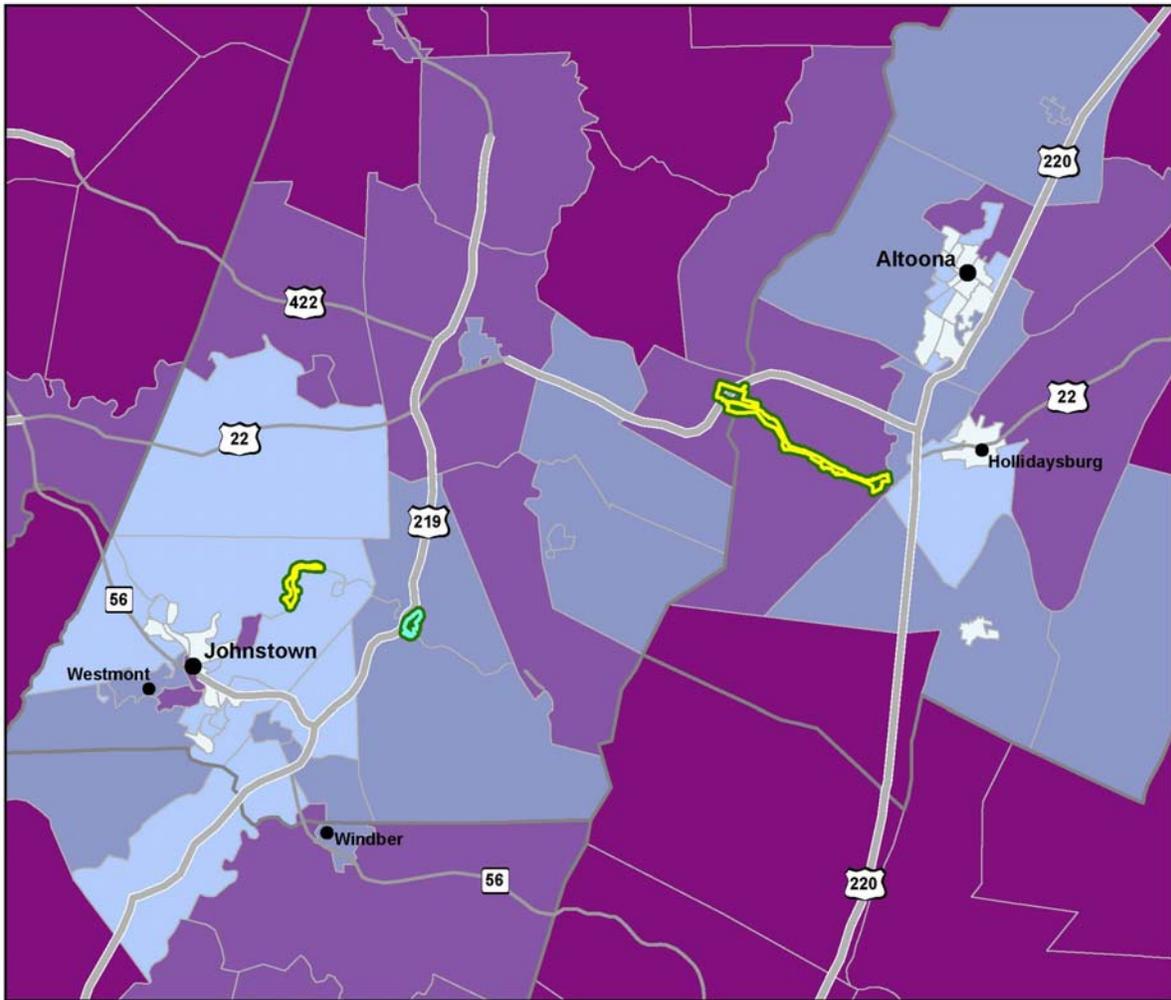
Median Household Income is the income value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 41,994
State: PA: 40,106 MD: 52,868 WV: 29,696

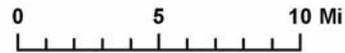
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 11. Median Household Income, 2000.



 Allegheny Portage Railroad NHS
 Johnstown Flood NM



Seasonal Housing

Percent of Total Housing Units, 2000



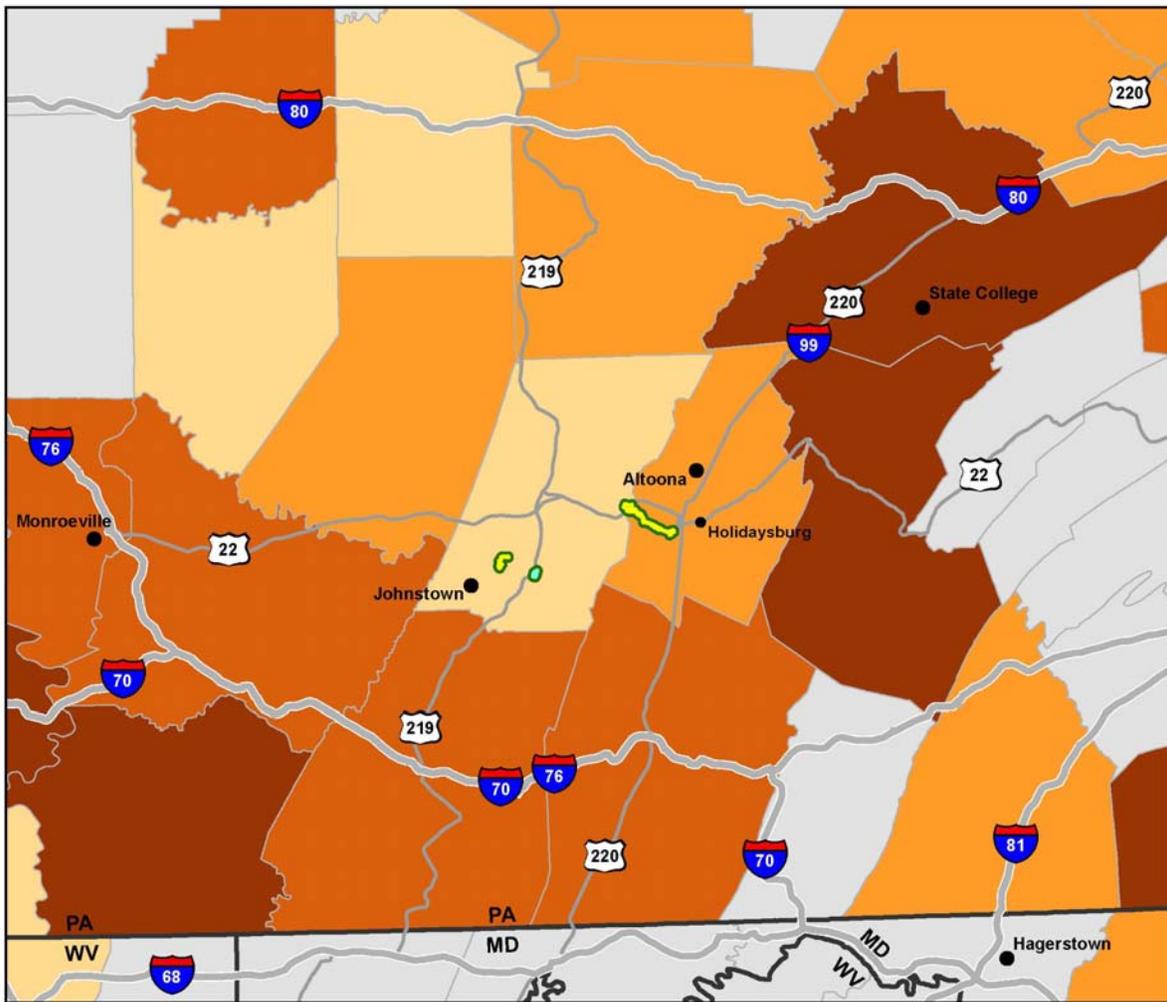
Seasonal Housing shows the percent of total housing units that are for seasonal use as nonpermanent residences by tract. (Data Source: US Census Bureau)

Nation: 3.1%
State: PA: 2.8% MD: 1.8% WV: 3.9%

Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 12. Seasonal Housing, 2000.



Allegheny Portage Railroad NHS
 Johnstown Flood NM

0 15 30 Mi



Tourism Revenue
Percent of Service Related Sectors

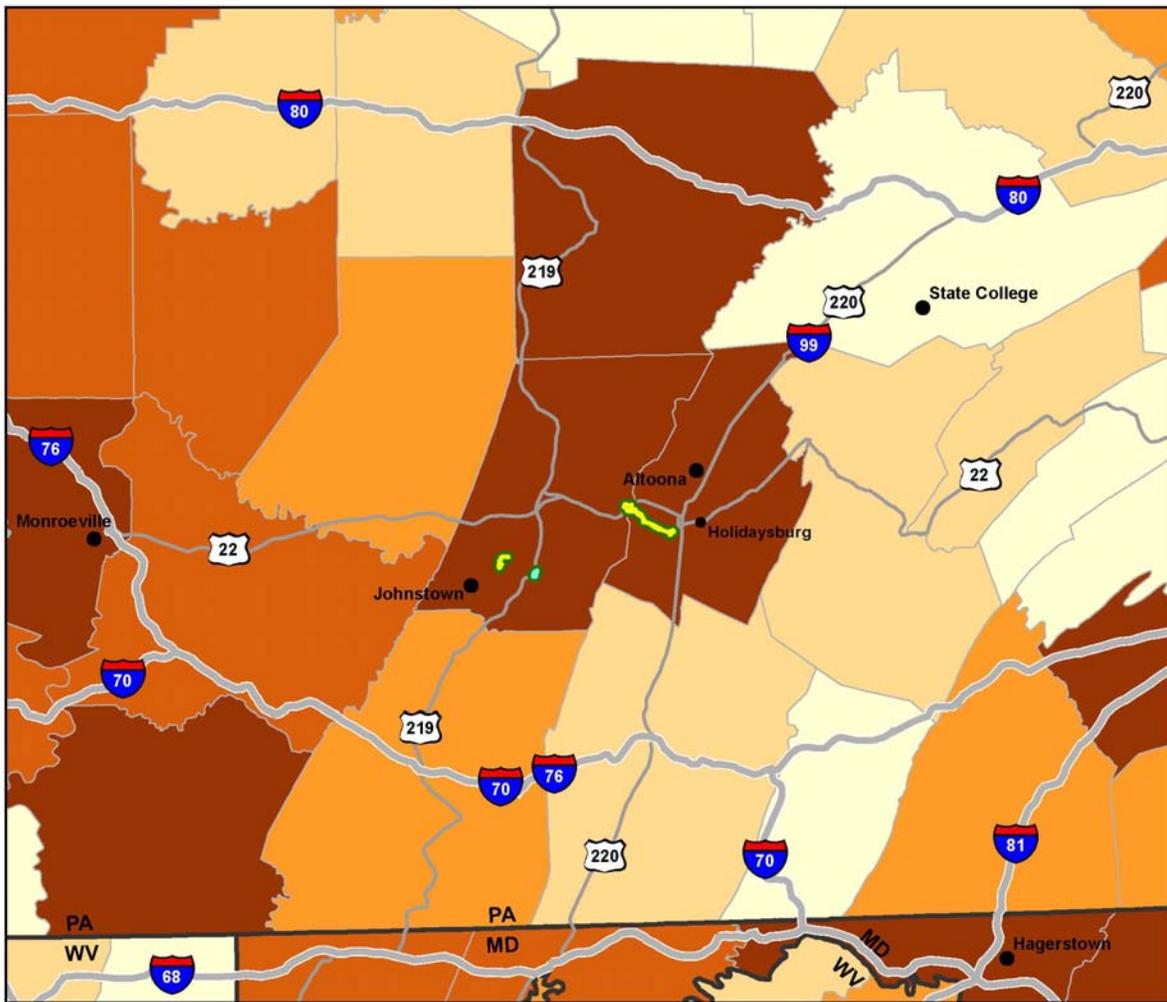
	8.0 - 15.7
	5.4 - 7.9
	3.8 - 5.3
	2.6 - 3.7
	Tourism revenue not reported

Tourism Revenue shows the percent of the total county revenue from service related sectors coming from tourism industries.
(Data Source: US Census Bureau)

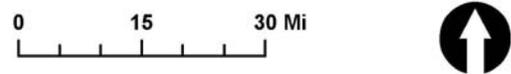
Nation: 10.6%
State: PA: 7.3% MD: 7.4% WV: 10.6%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 13. Tourism Revenue, 2002.



Allegheny Portage Railroad NHS
 Johnstown Flood NM



Employment by Industry 1
Percent in Sales and Service

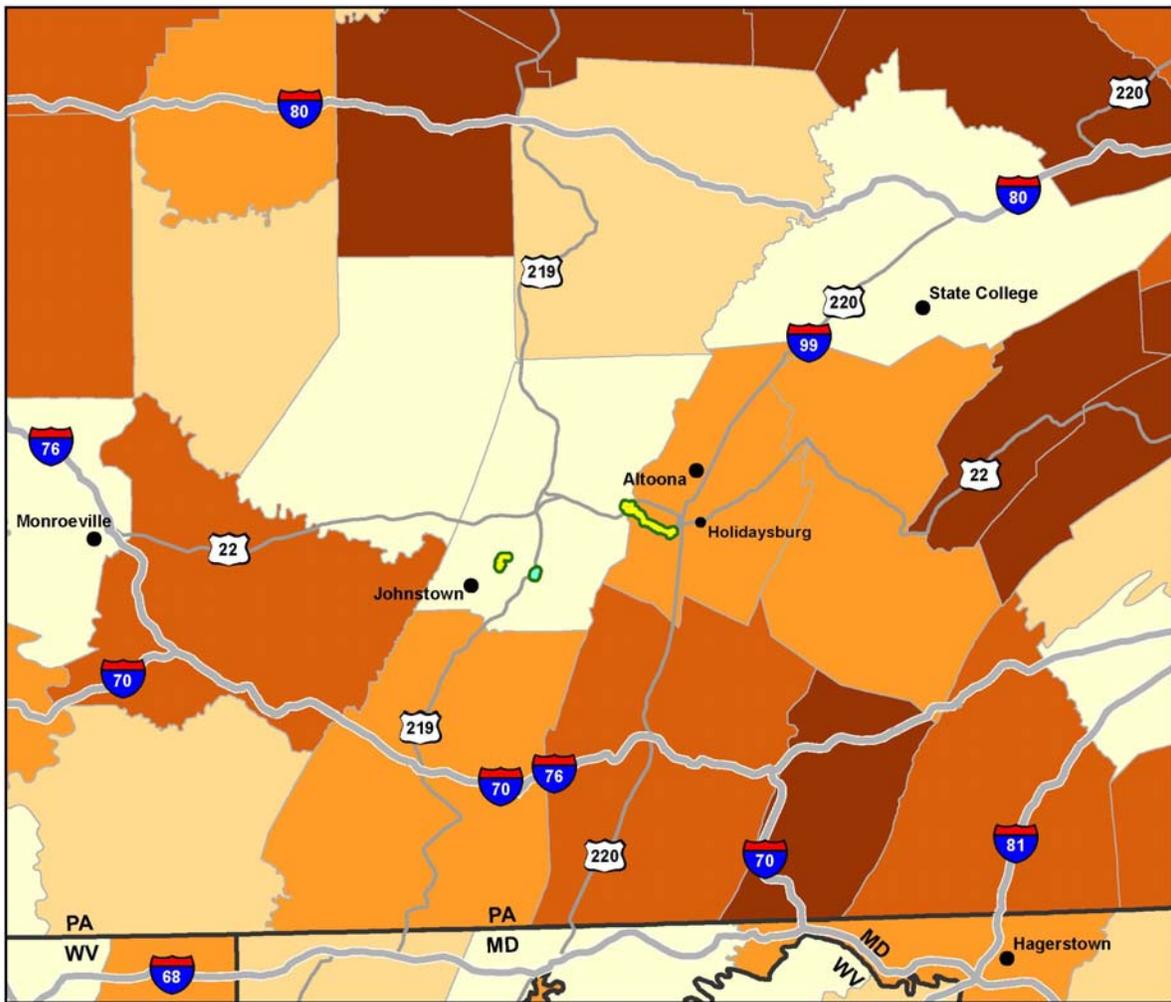
	66.9 - 78.0
	61.3 - 66.8
	58.1 - 61.2
	54.6 - 58.0
	35.3 - 54.5

Employment by Industry 1 shows the percent of total county employees that work in sales and service. (Data Source: Woods and Poole)

Nation: 66.9%
State: PA: 69.2% MD: 69.9% WV: 63.1%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 14. Employment by Industry 1 (Sales and Service), 2001.



Allegheny Portage Railroad NHS
 Johnstown Flood NM

0 15 30 Mi



Employment by Industry 2

Percent in Construction and Manufacturing

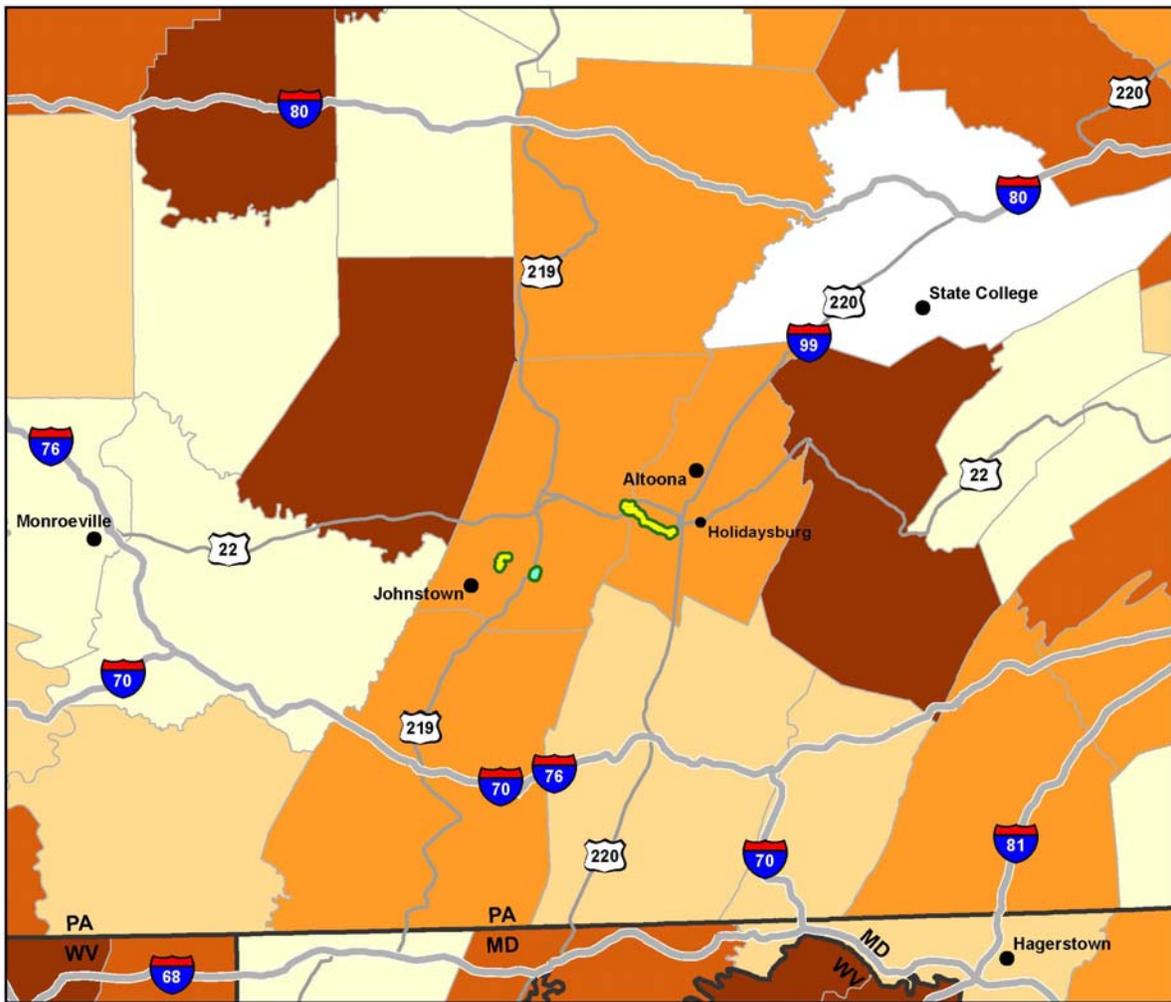


Employment by Industry 2 shows the percent of total county employees that work in construction and manufacturing. (Data Source: Woods and Poole)

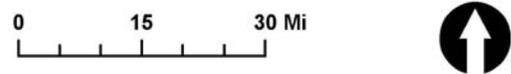
Nation: 15.3%
State: PA: 16.7% MD: 11.6% WV: 13.7%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 15. Employment by Industry 2 (Construction and Manufacturing), 2001.



Allegheny Portage Railroad NHS
 Johnstown Flood NM



Employment by Industry 3
Percent in Government

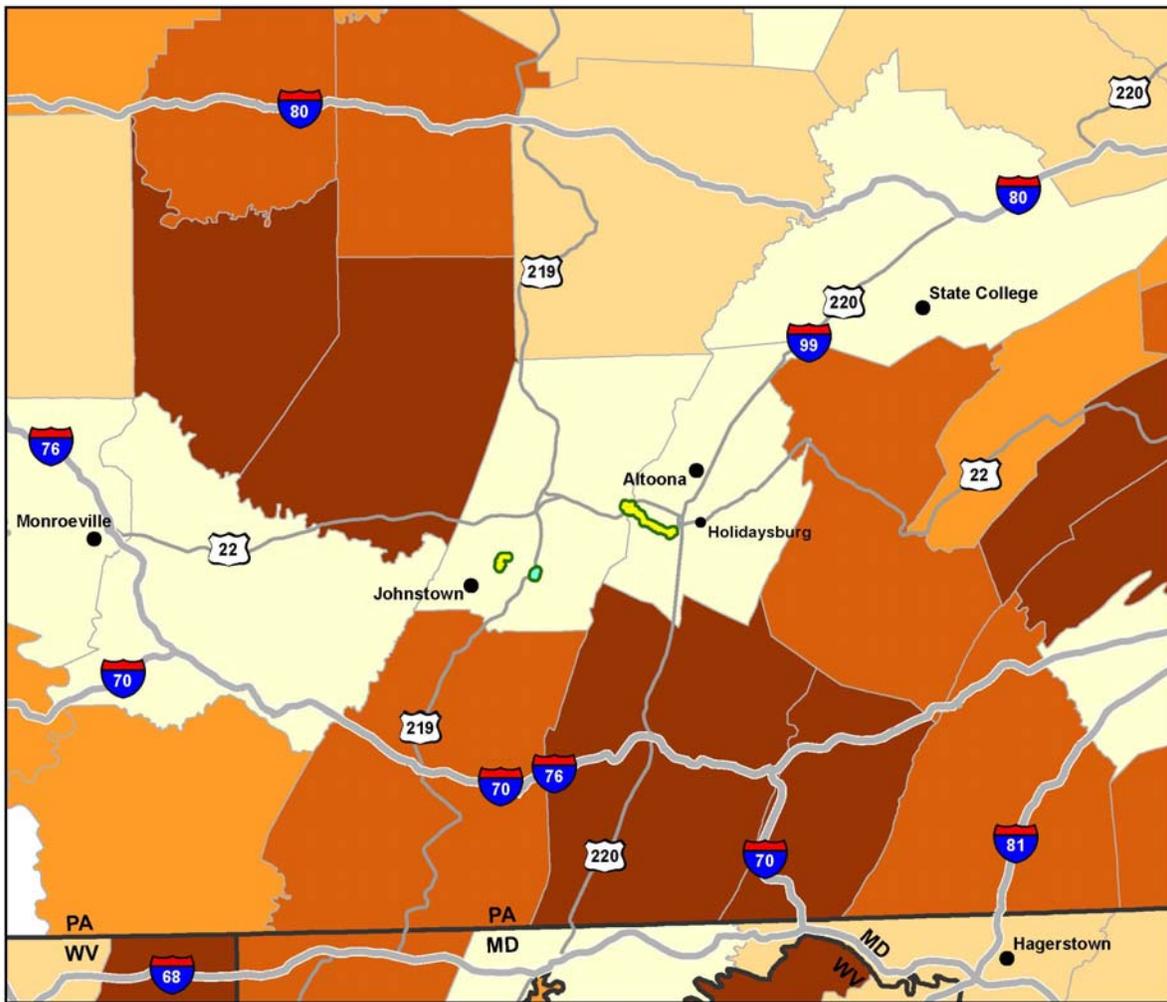
	17.6 - 40.1
	14.3 - 17.5
	11.9 - 14.2
	10.5 - 11.8
	8.0 - 10.4

Employment by Industry 3 shows the percent of total county employees that work in government. (Data Source: Woods and Poole)

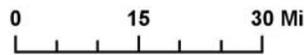
Nation: 14.2%
State: PA: 11.6% MD: 16.7% WV: 17.0%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

ALPO-JOFL Figure 16. Employment by Industry 3 (Government), 2001.



Allegheny Portage Railroad NHS
 Johnstown Flood NM



Employment by Industry 4

Percent in Agriculture



Employment by Industry 4 shows the percent of total county employees that work in agriculture and natural resources. (Data Source: Woods and Poole)

Nation: 3.6%
State: PA: 2.5% MD: 1.8% WV: 6.2%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

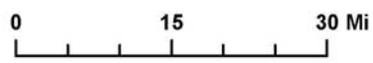
ALPO-JOFL Figure 17. Employment by Industry 4 (Agriculture and Natural Resources), 2001.

Gauley River National Recreation Area, New River Gorge National River, and Bluestone National Scenic River

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GARI-NERI-BLUE Figure 11. Median Household Income, 2000.	35
GARI-NERI-BLUE Figure 12. Seasonal Housing, 2000.	36
GARI-NERI-BLUE Figure 13. Tourism Revenue, 2002.	37
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GARI-NERI-BLUE Figure 15. Employment by Industry 2 (Construction and Manufacturing), 2001.	39
GARI-NERI-BLUE Figure 16. Employment by Industry 3 (Government), 2001.	40
GARI-NERI-BLUE Figure 17. Employment by Industry 4 (Agriculture and Natural Resources), 2001.	41



- Gauley River National Recreation Area
- New River Gorge National River
- Bluestone National Scenic River

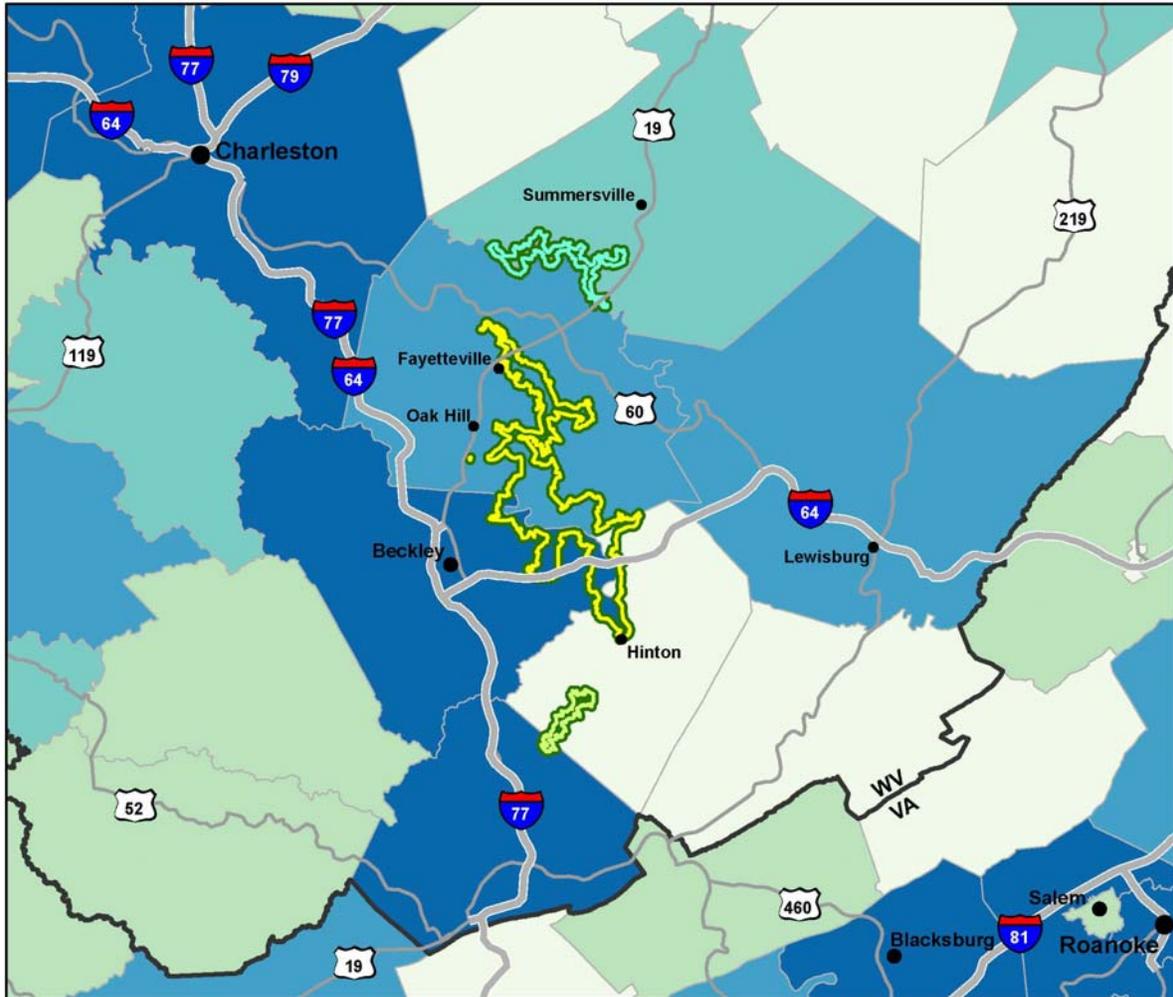


Classification Methods
The quantile classification method is used for most of the socioeconomic data maps. In this classification scheme, equal numbers of counties or census tracts are placed in each class. The quantile classification method is used to show the ranking of data while producing distinct mapping patterns.

Explanation of Map Scales
In order to show data at a fine aggregation unit, census tracts were used when possible. When data were not available by census tract for the atlas, county data were collected. This map shows the counties for which data were collected at the smaller scale, with the census tract map area shown for reference.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 1. Location Map.



- Gauley River National Recreation Area
- New River Gorge National River
- Bluestone National Scenic River



Total Population
Estimated, 2006

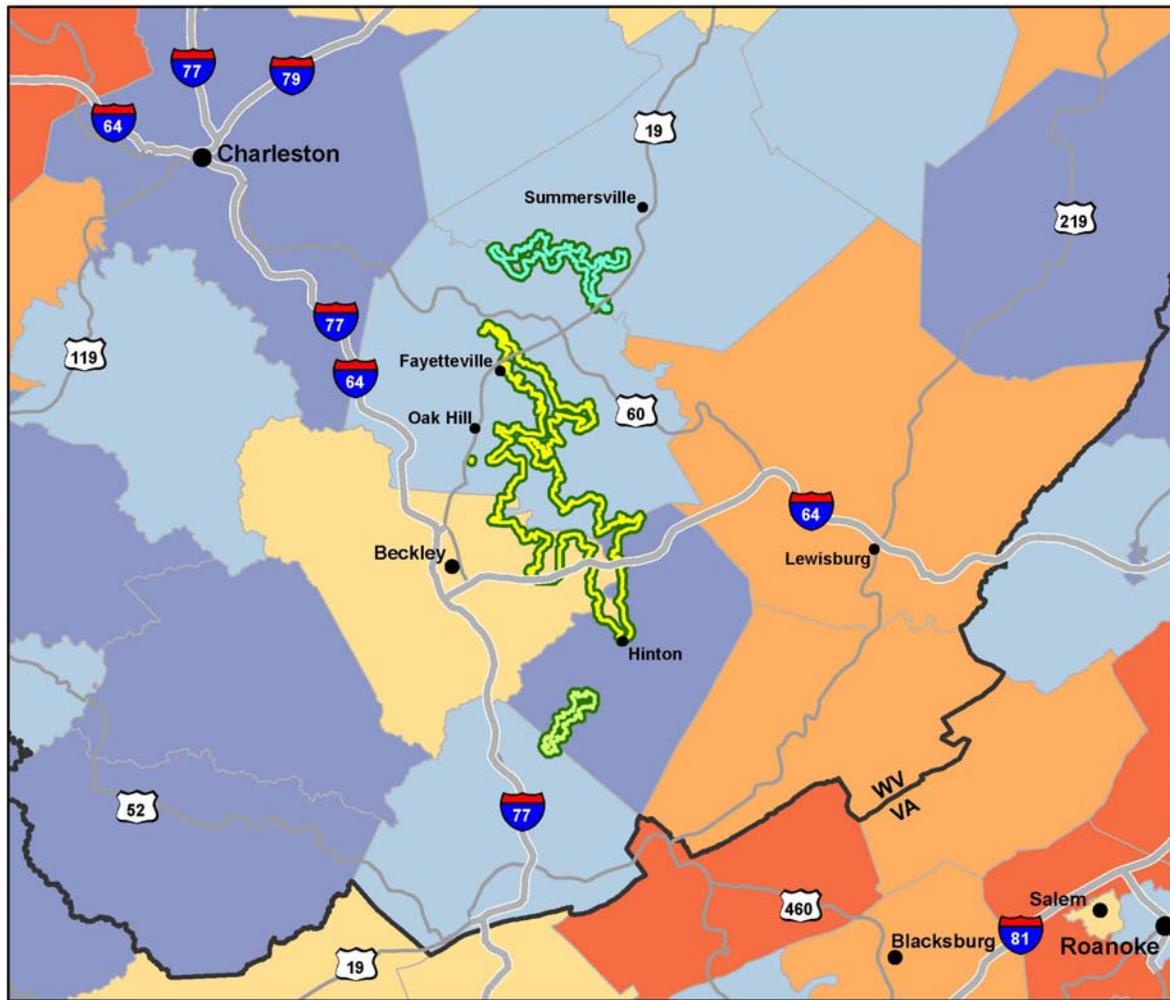
	50,001 - 192,419
	30,001 - 50,000
	25,001 - 30,000
	15,001 - 25,000
	4,814 - 15,000

Total Population shows the total number of people in each county. (Data Source: US Census Bureau)

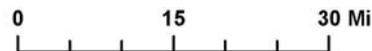
Nation: 299,398,484
 State: WV: 1,818,470 VA: 7,642,884

Base Map Sources: National Park Service, US Census Bureau, USGS
 Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 2. Estimated Total Population, 2006.

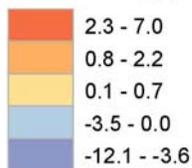


- Gauley River National Recreation Area
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Recent Population Change

Percent Change, 2000 to 2006

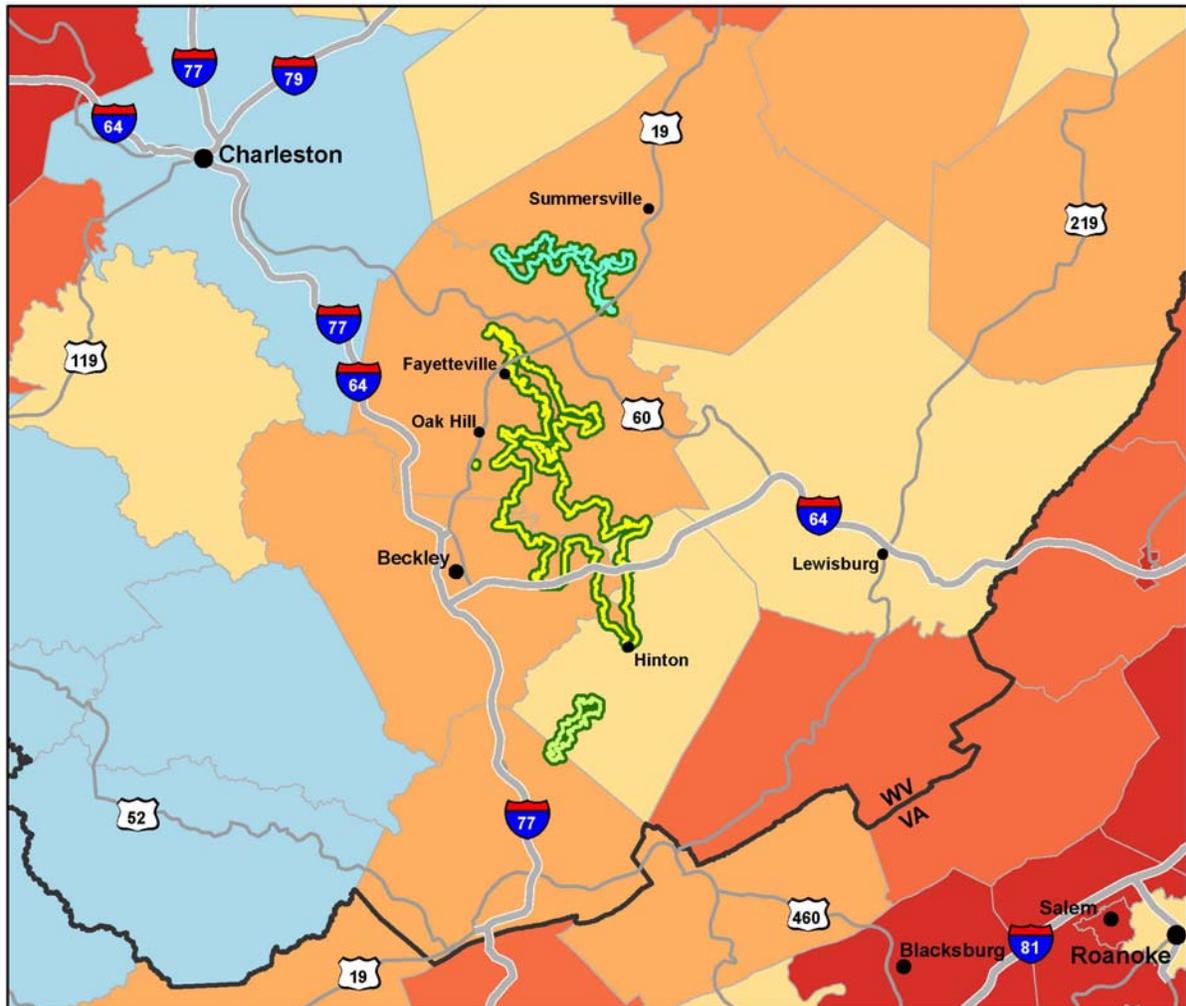


Recent Population Change shows the percent increase or decrease in the county population from 2000 to 2006. (Data Source: US Census Bureau)

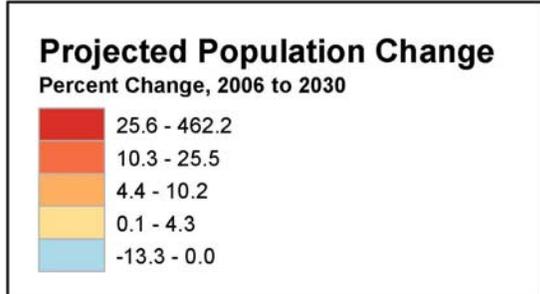
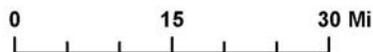
Nation: 6.4%
State: WV: 0.6% VA: 8.0%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 3. Recent Population Change, 2000-2006.



- Gauley River National Recreation Area
- New River Gorge National River
- Bluestone National Scenic River

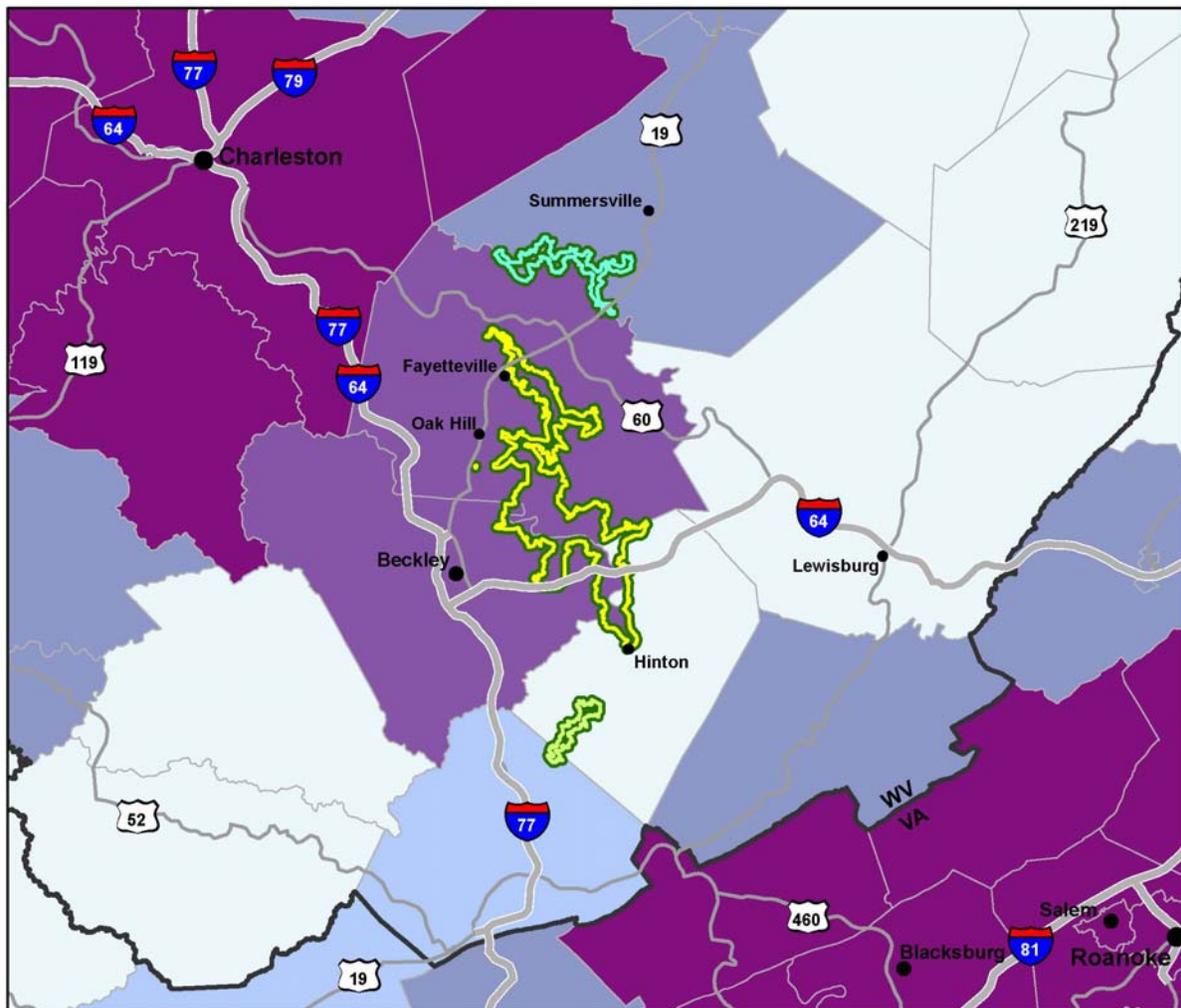


Projected Population Change shows the projected percent increase or decrease in the county population from 2006 to 2030.
(Data Source: US Census Bureau; Woods and Poole)

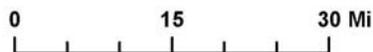
Nation: 26.4%
State: WV: 7.7% VA: 34.2%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 4. Projected Population Change, 2006-2030.



- Gauley River National Recreation Area
- New River Gorge National River
- Bluestone National Scenic River



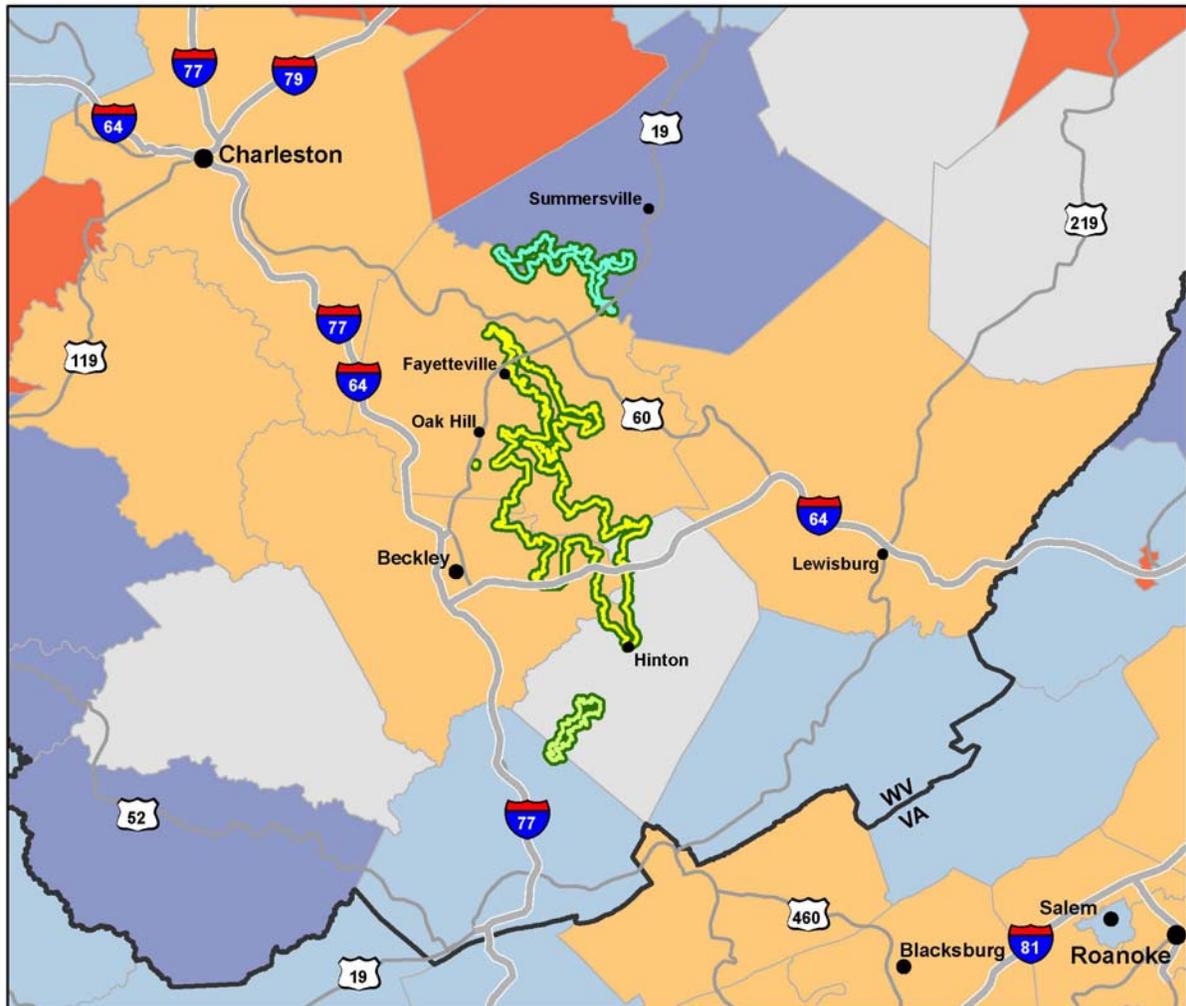
Urbanization
County is ...

	In small metro area, over 1 million residents
	Micropolitan or noncore adjacent to metro area
	Noncore adjacent to small metro
	Micropolitan non adjacent to metro area
	Noncore not adjacent to any metro area

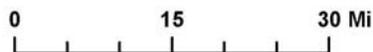
Urbanization influence is classified based on the county population, size of the largest city or town in the county, and proximity to metropolitan and micropolitan areas.
(Data Source: USDA Economic Research Service; <http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>)

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 5. Urbanization, 2003.



- Gauley River National Recreation Area
- New River Gorge National River
- Bluestone National Scenic River



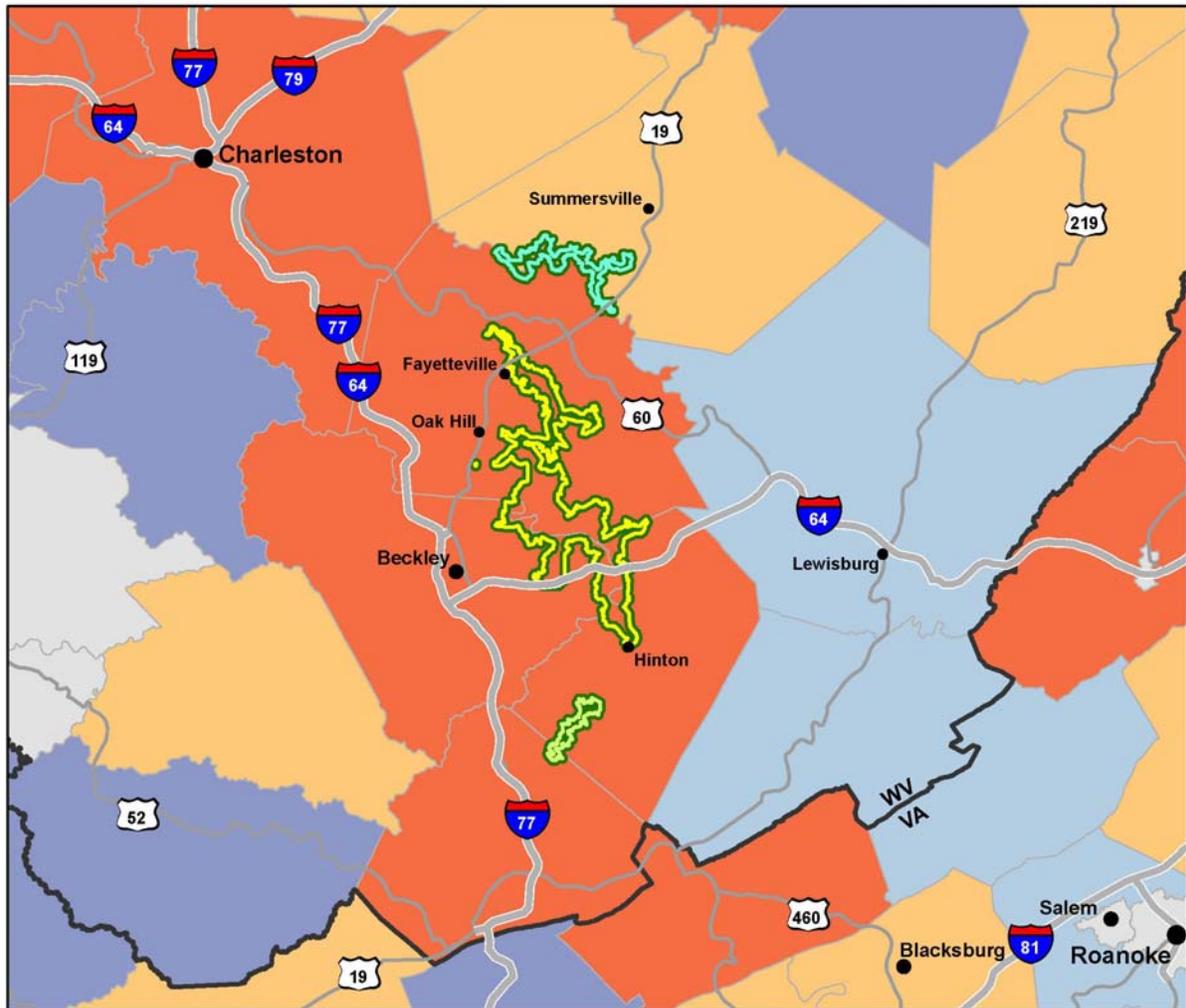
Change in Home Building Permits
Percent Change, 1993-1995 to 2003-2005

	100.1 - 3050.0 (> 100 is more than double)
	0.1 - 100.0
	-39.9 - 0.0 (zero is same number / period)
	-78.9 - -40.0
	No data

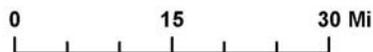
Change in Home Building Permits shows the percent change in the average number of privately-owned home building permits acquired between 1993-1995 and 2003-2005.
(Data Source: US Census Bureau)
Nation: 56.7%
State: WV: 67.5% VA: 33.9%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 6. Change in Home Building Permits, 1993-1995 to 2003-2005.



- Gauley River National Recreation Area
- New River Gorge National River
- Bluestone National Scenic River



Change in Farmland
Percent Change in Acreage, 1997-2002

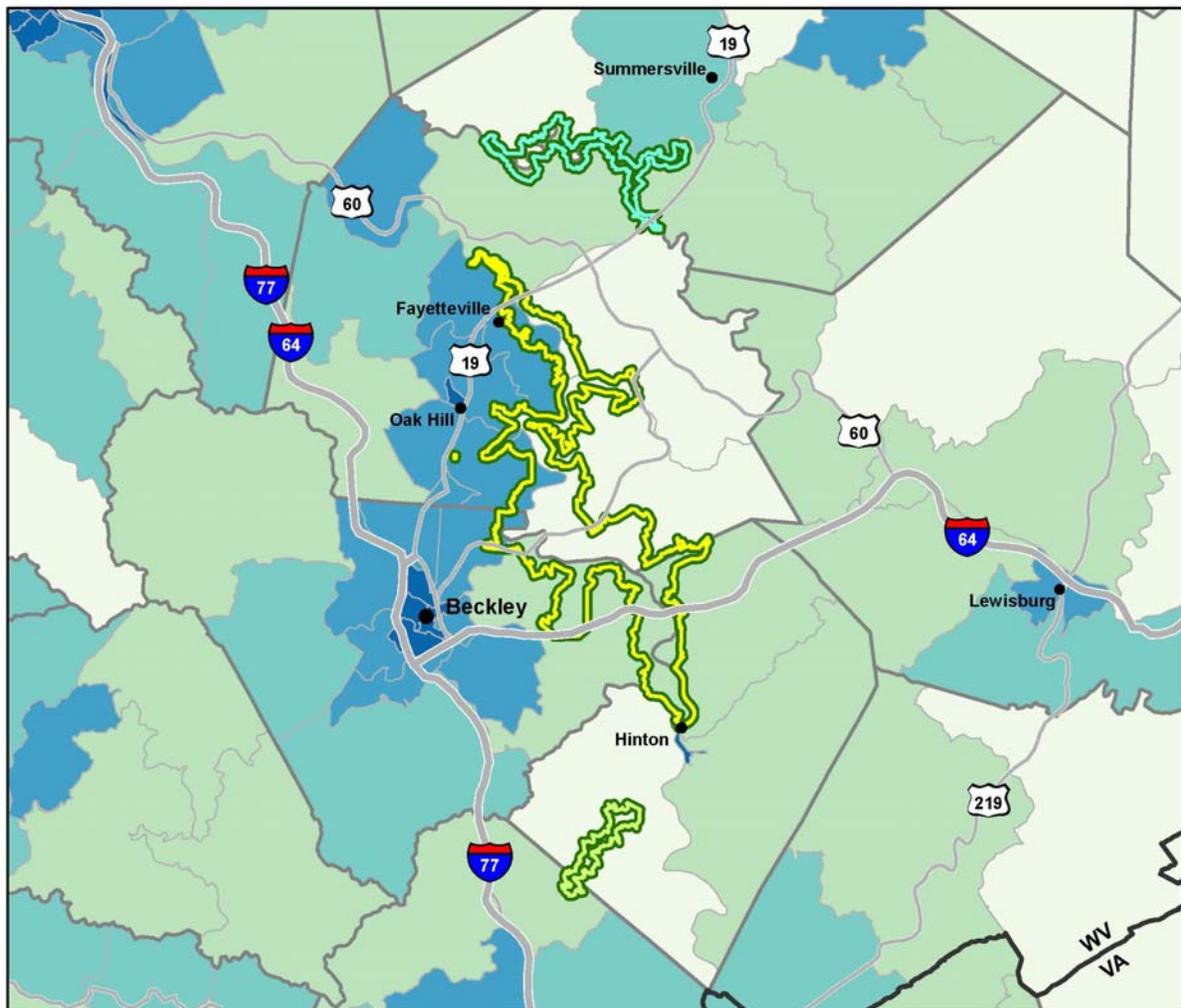
	2.6 - 50.2
	0.1 - 2.5
	-6.6 - 0.0
	-14.8 - -6.7
	No acreage

Change in Farmland shows the percent change in acreage from 1997 to 2002 by county. (Data Source: USDA-NASS)

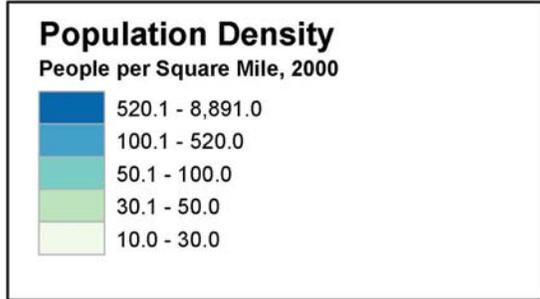
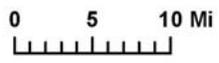
Nation: -1.7%
State: WV: -3.1% VA: -1.5%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 7. Change in Farmland, 1997-2002.



- Gauley River National Recreation Area
- New River Gorge National River
- Bluestone National Scenic River



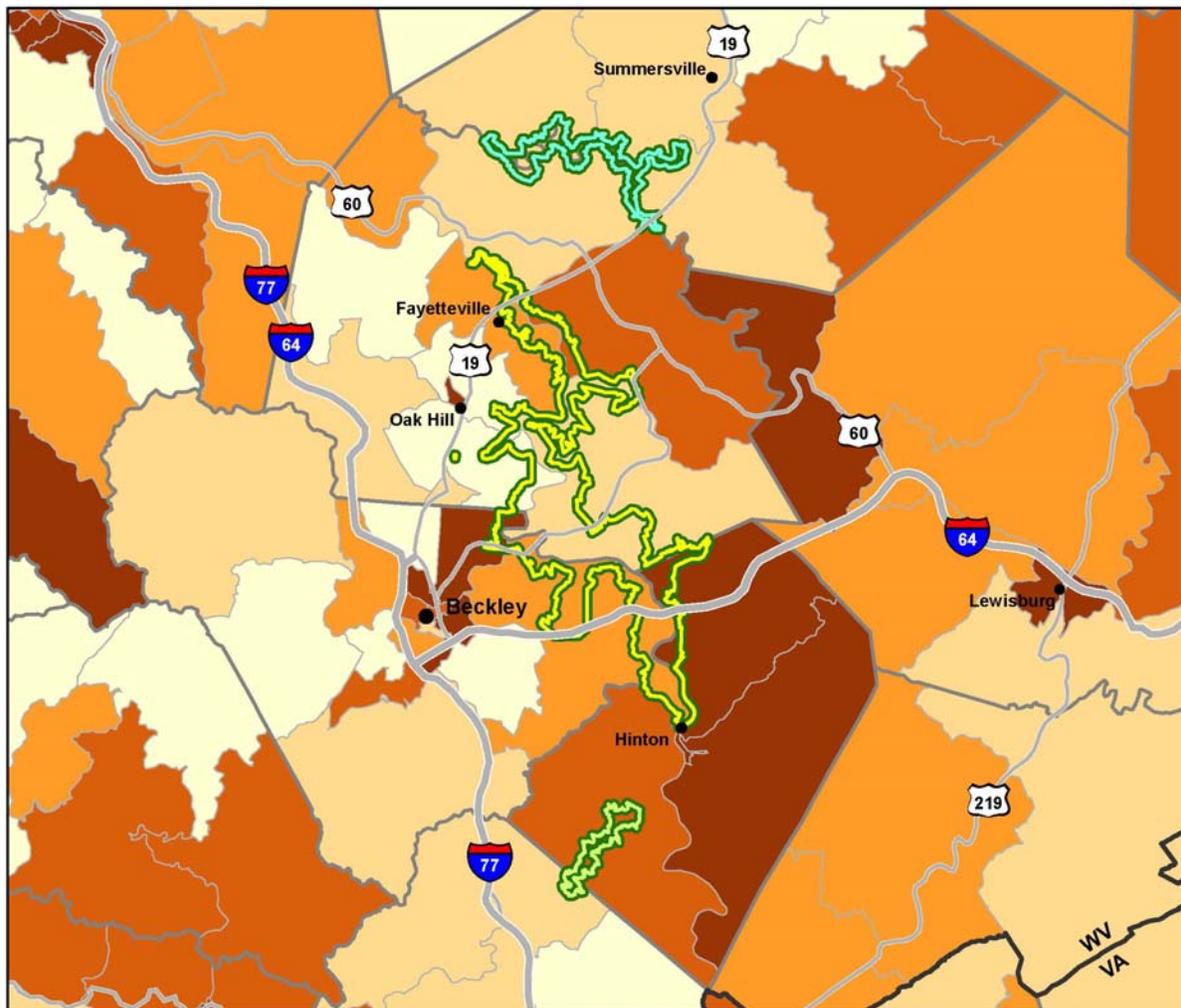
Population density is calculated by dividing the total number of people by the number of square miles in each census tract. (Data Source: US Census Bureau)

Nation: 80
State: WV: 75 VA: 179

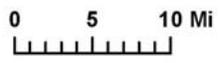
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 8. Population Density, 2000.



- Gauley River National Recreation Area
- New River Gorge National River
- Bluestone National Scenic River



Median Age
2000

	42.3 - 48.6
	40.9 - 42.2
	39.7 - 40.8
	38.7 - 39.6
	33.9 - 38.6

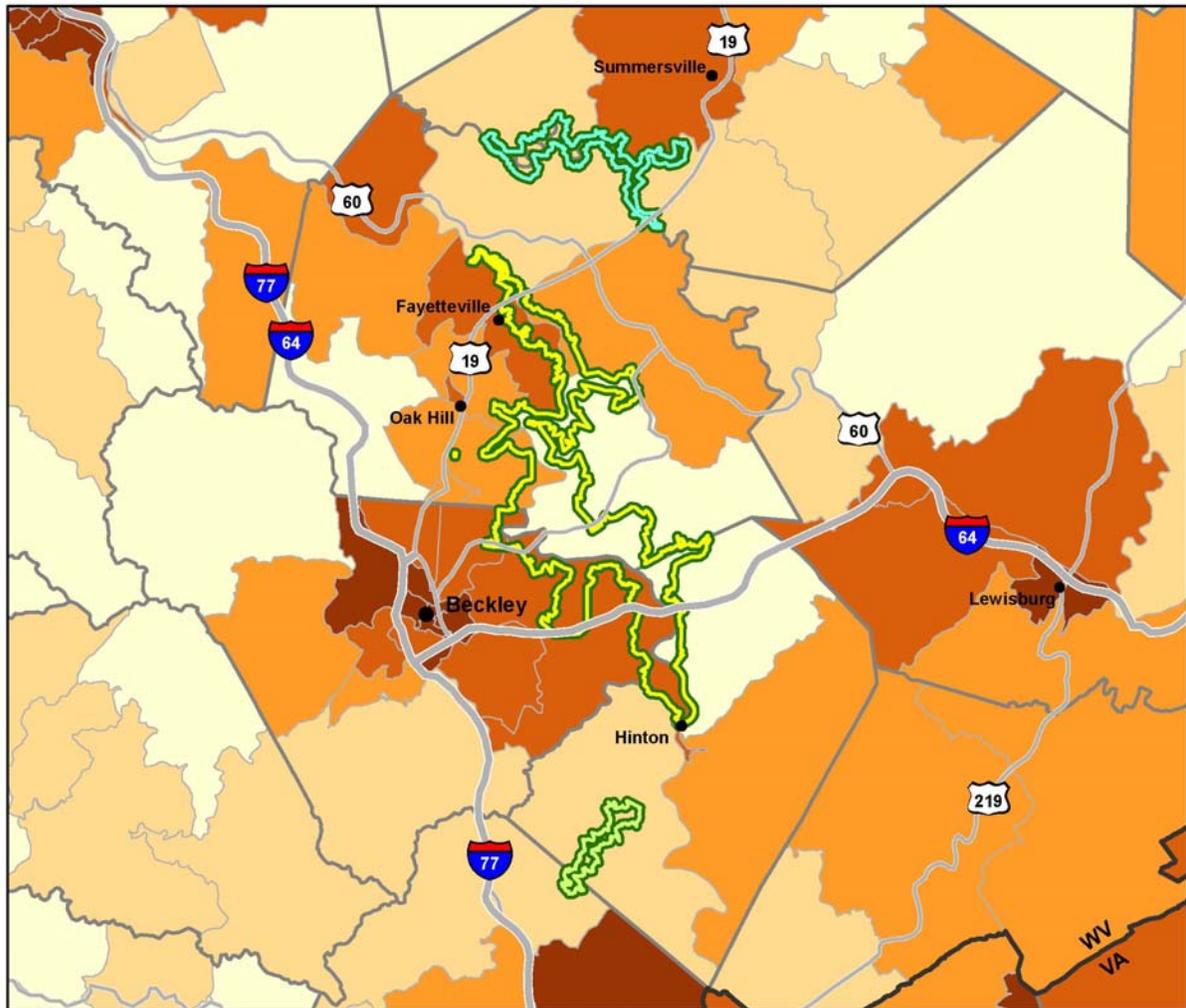
Median Age is the age value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 35.3
State: WV: 38.9 VA: 35.7

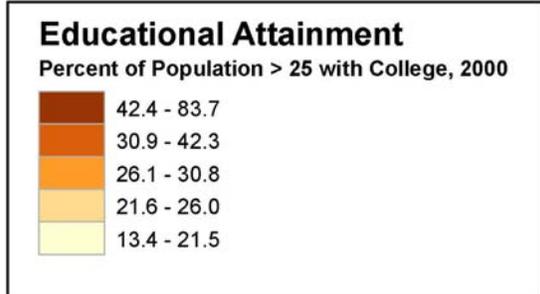
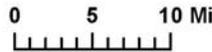
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 9. Median Age, 2000.



- Gauley River National Recreation Area
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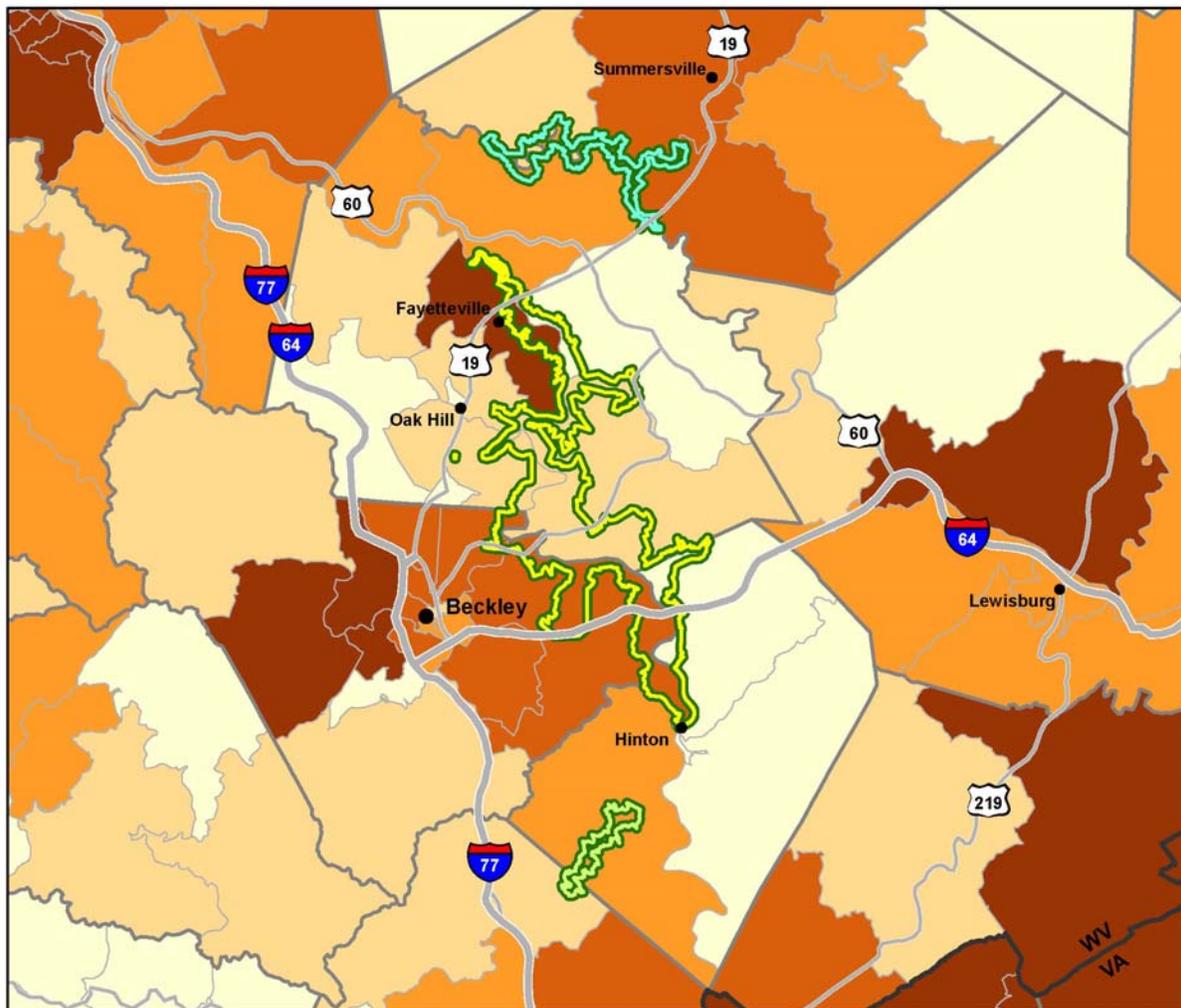
Educational Attainment shows the percent of the population age 25 and over with some college or a college degree. (Data Source: US Census Bureau)

Nation: 51.8%
State: WV: 35.8% VA: 55.5%

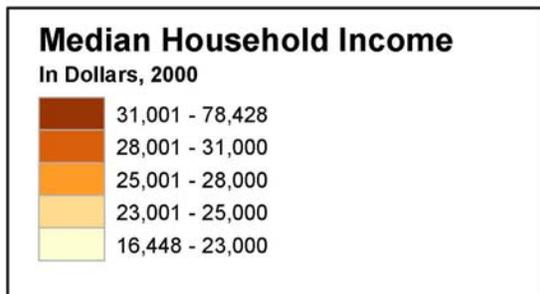
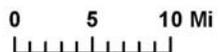
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 10. Educational Attainment, 2000.



- Gauley River National Recreation Area
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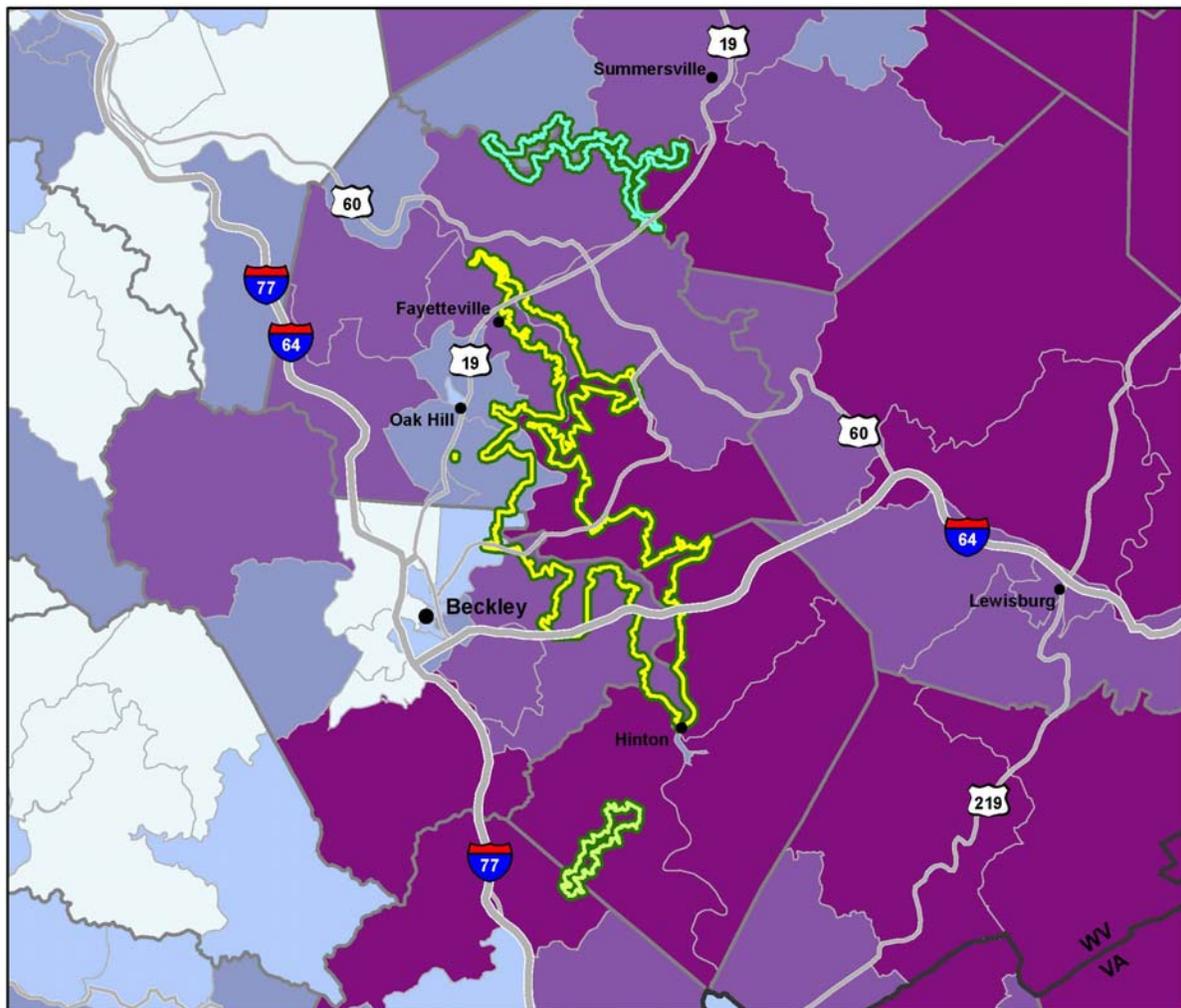
Median Household Income is the income value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 41,994
State: WV: 29,696 VA: 46,677

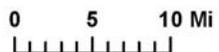
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 11. Median Household Income, 2000.



-  Gauley River National Recreation Area
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-  Bluestone National Scenic River



Seasonal Housing
Percent of Total Housing Units

	4.39 - 29.59
	1.72 - 4.38
	0.82 - 1.71
	0.49 - 0.81
	0.00 - 0.48

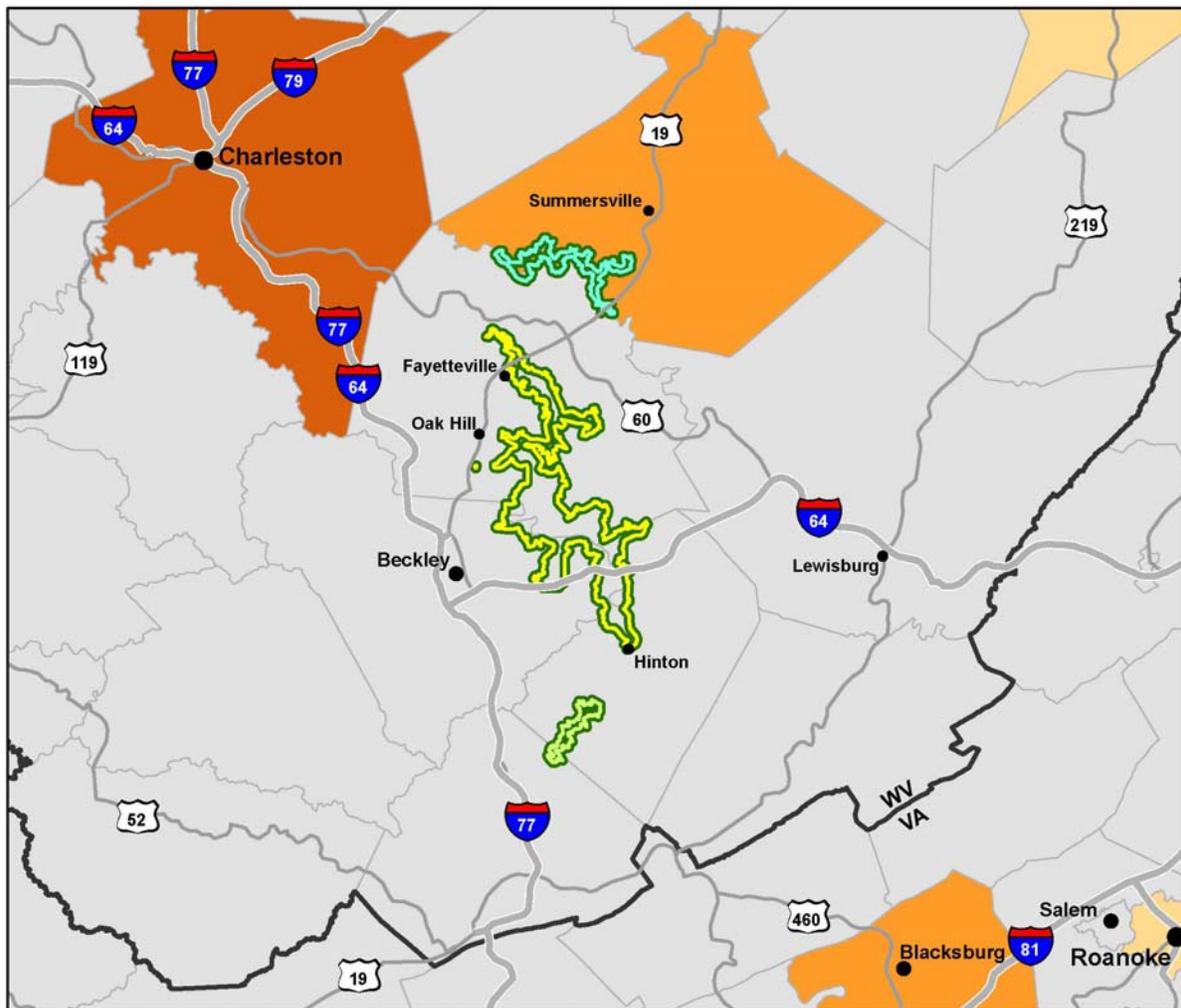
Seasonal Housing shows the percent of total housing units that are for seasonal use as nonpermanent residences by tract.
(Data Source: US Census Bureau)

Nation: 3.1%
State: WV: 3.9% VA: 1.9%

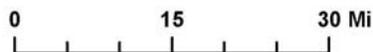
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 12. Seasonal Housing, 2000.



- Gauley River National Recreation Area
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Tourism Revenue
Percent of Service Related Sectors

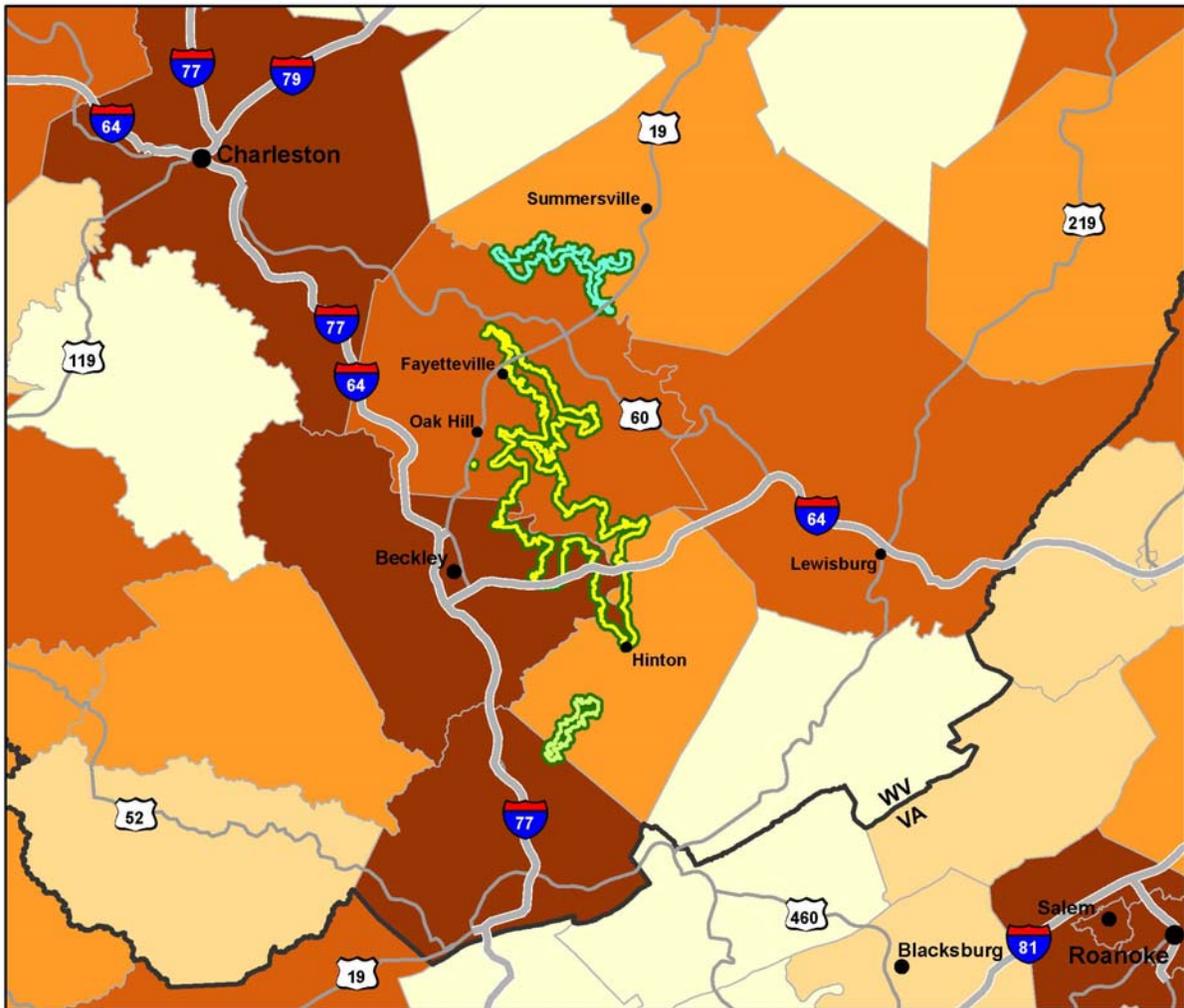
	6.9
	5.3 - 5.7
	3.4
	Tourism revenue not reported

Tourism Revenue shows the percent of the total county revenue from service related sectors that comes from tourism industries.
(Data Source: US Census Bureau)

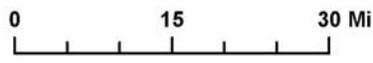
Nation: 10.6%
State: WV: 10.6% VA: 8.7%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 13. Tourism Revenue, 2002.



- Gauley River National Recreation Area
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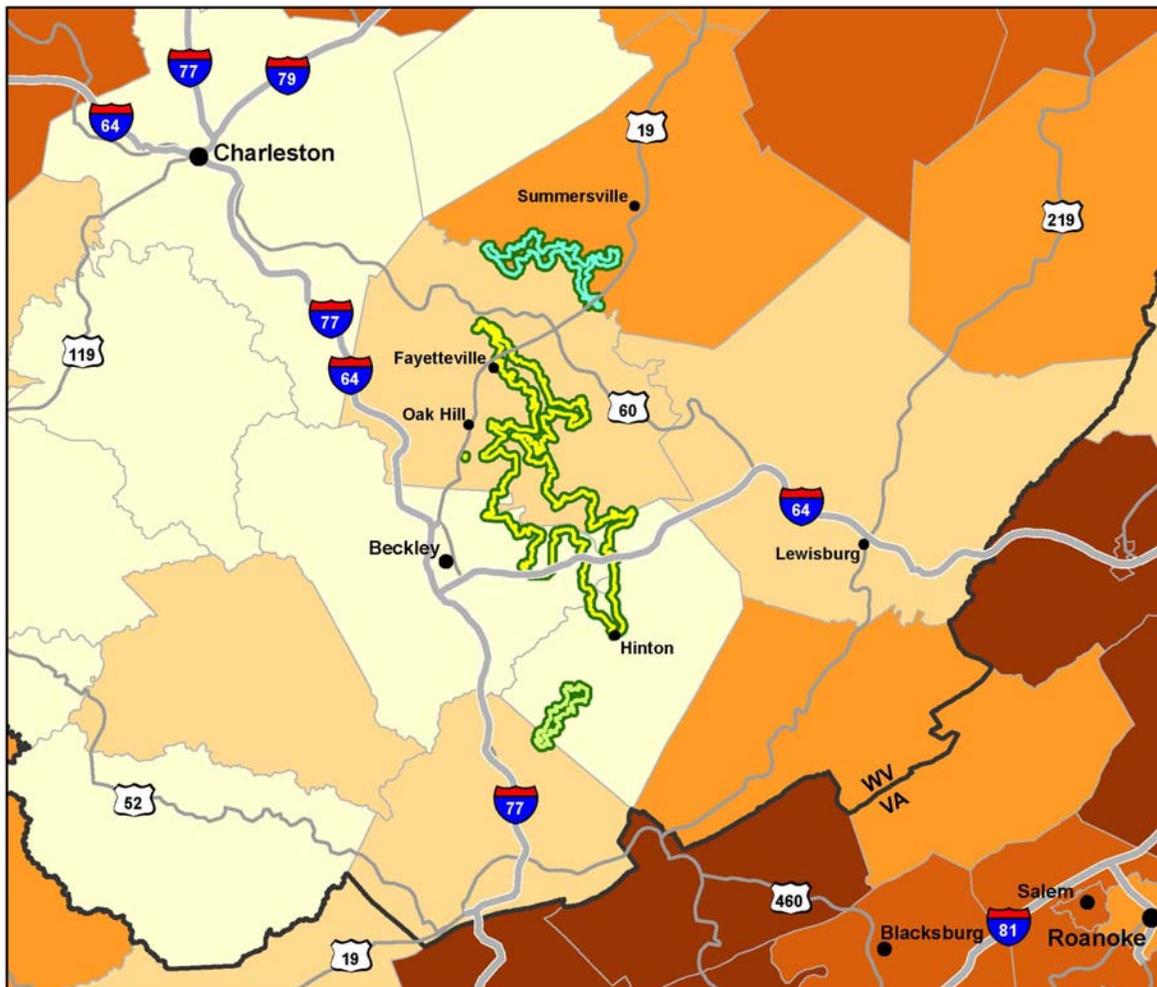


Employment by Industry 1 shows the percent of total county employees that work in sales and service. (Data Source: Woods and Poole)

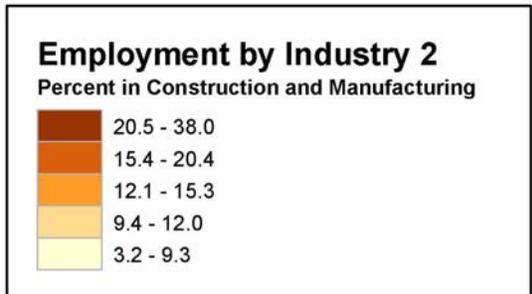
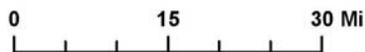
Nation: 66.9%
State: WV: 63.1% VA: 64.4%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 14. Employment by Industry 1 (Sales and Service), 2001.



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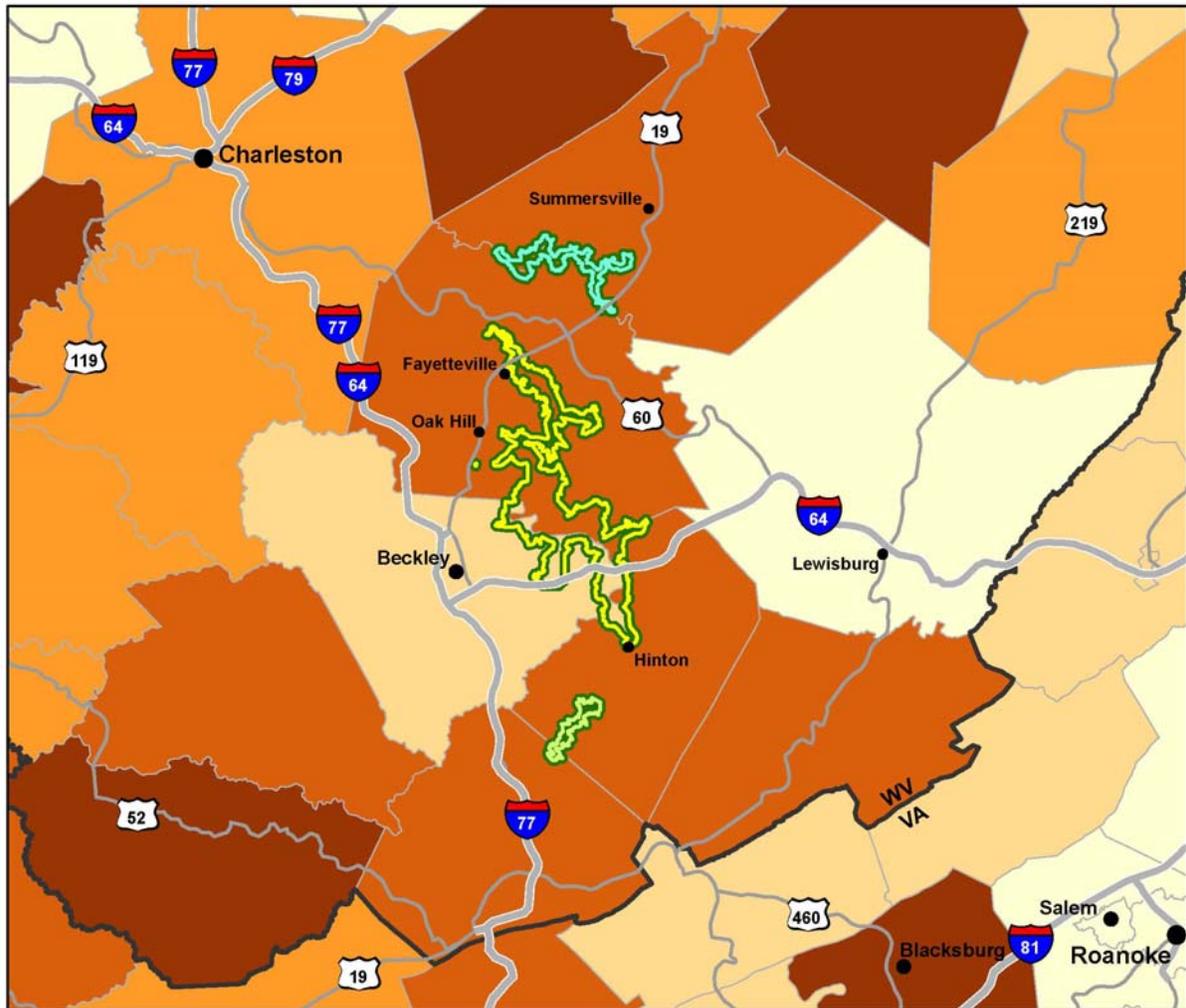


Employment by Industry 2 shows the percent of total county employees that work in construction and manufacturing. (Data Source: Woods and Poole)

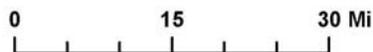
Nation: 15.3%
State: WV: 13.7% VA: 14.2%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 15. Employment by Industry 2 (Construction and Manufacturing), 2001.



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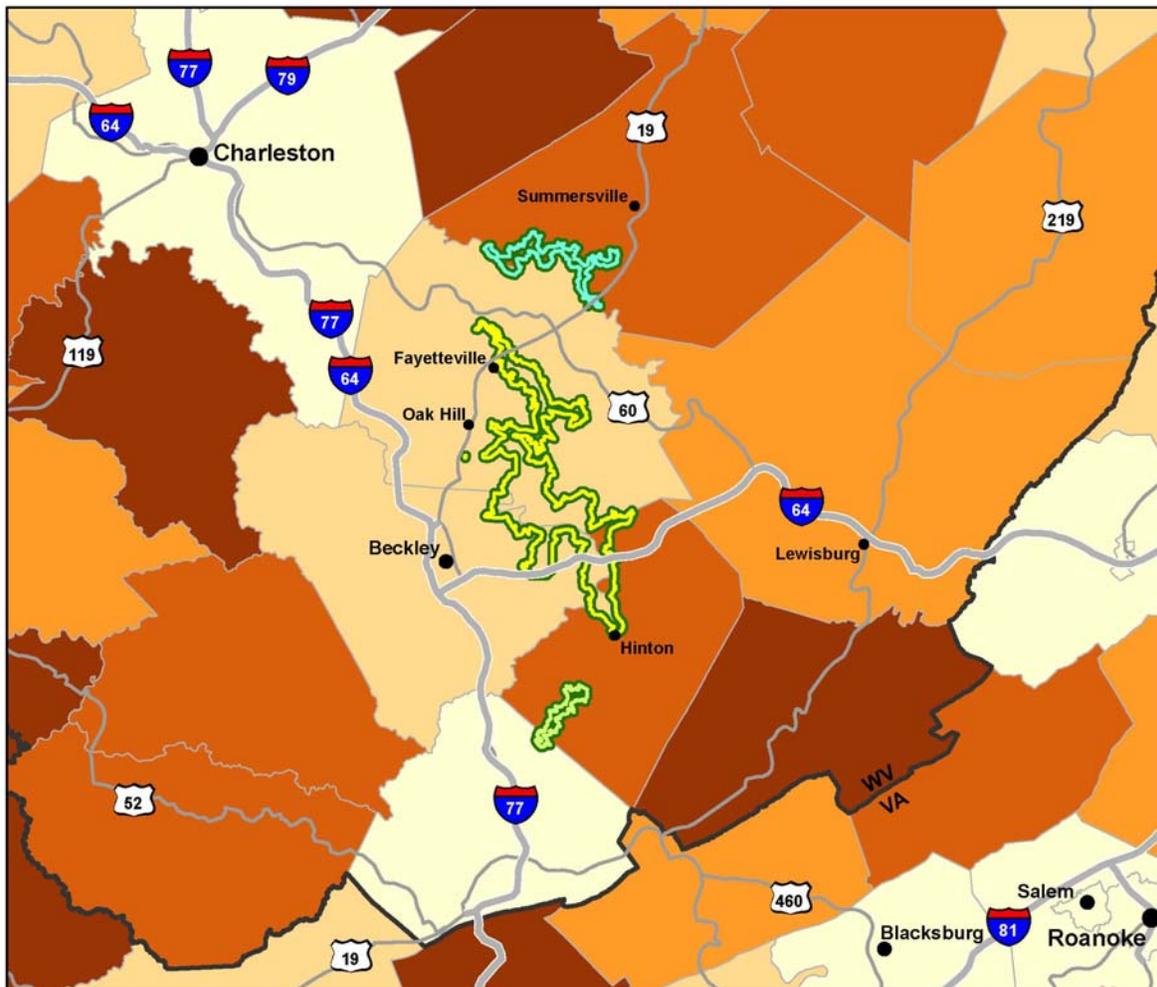


Employment by Industry 3 shows the percent of total county employees that work in government. (Data Source: Woods and Poole)

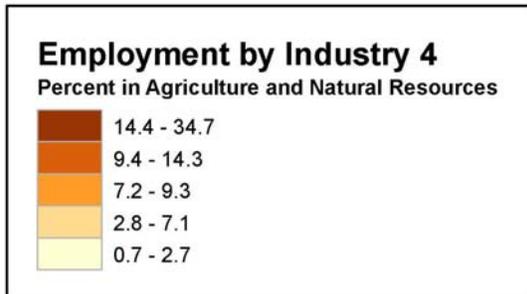
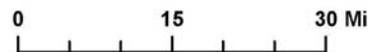
Nation: 14.2%
State: WV: 17.0% VA: 18.7%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

GARI-NERI-BLUE Figure 16. Employment by Industry 3 (Government), 2001.



- Gauley River National Recreation Area
- New River Gorge National River
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Employment by Industry 4 shows the percent of total county employees that work in agriculture and natural resources. (Data Source: Woods and Poole)

Nation: 3.6%
State: WV: 6.2% VA: 2.8%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

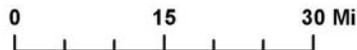
GARI-NERI-BLUE Figure 17. Employment by Industry 4 (Agriculture and Natural Resources), 2001.

Delaware Water Gap National Recreation Area

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DEWA Figure 17. Employment by Industry 4 (Agriculture and Natural Resources), 2001.	61



Delaware Water Gap NRA



Classification Methods

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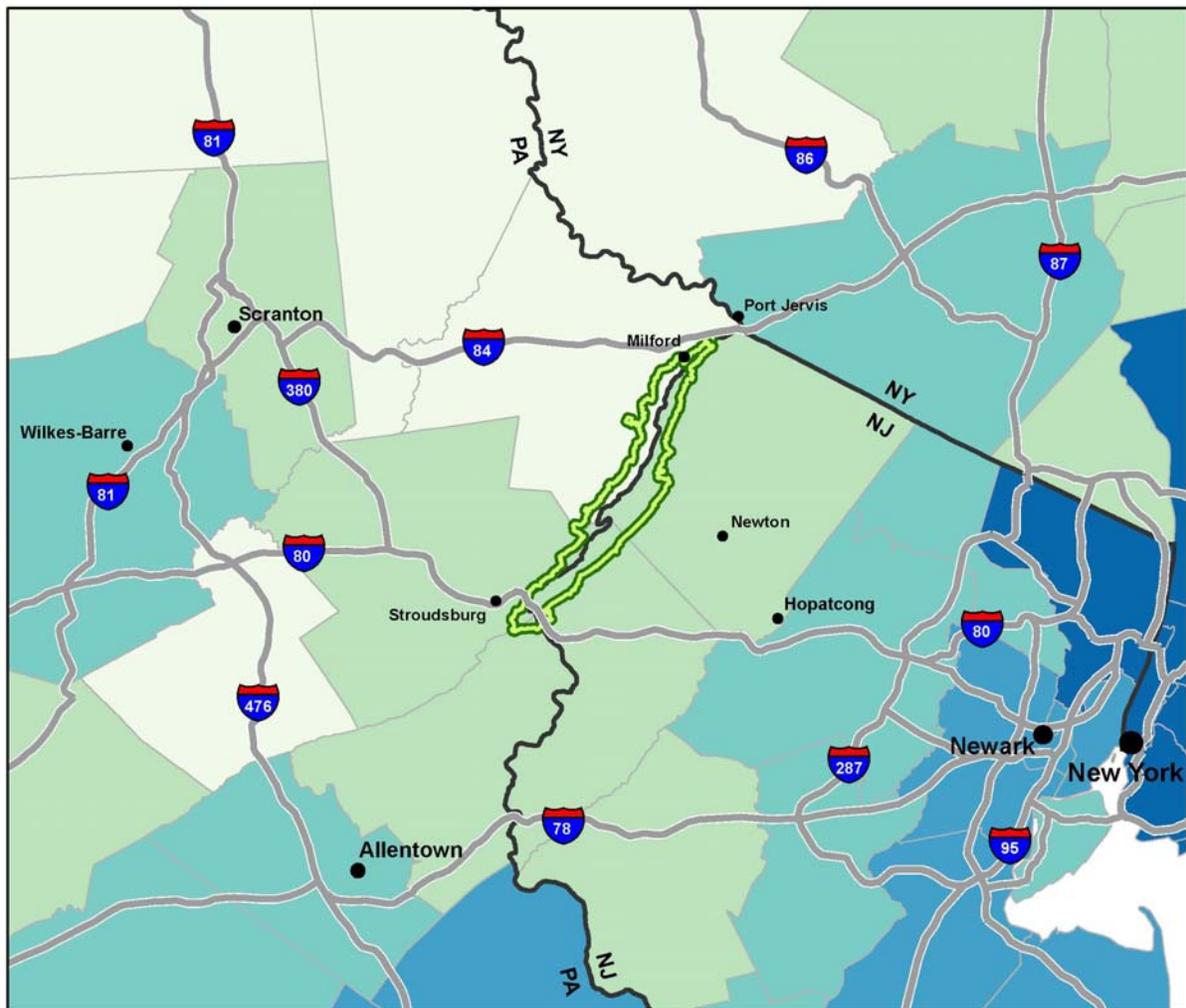
Explanation of Map Scales

In order to show data at a fine aggregation unit, census tracts were used when possible. When data were not available by census tract for the atlas, county data were collected. This map shows the counties for which data were collected at the smaller scale, with the census tract map area shown for reference.

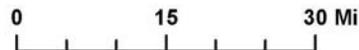
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 1. Location Map.

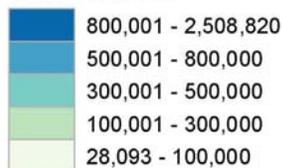


Delaware Water Gap NRA



Total Population

Estimated, 2006



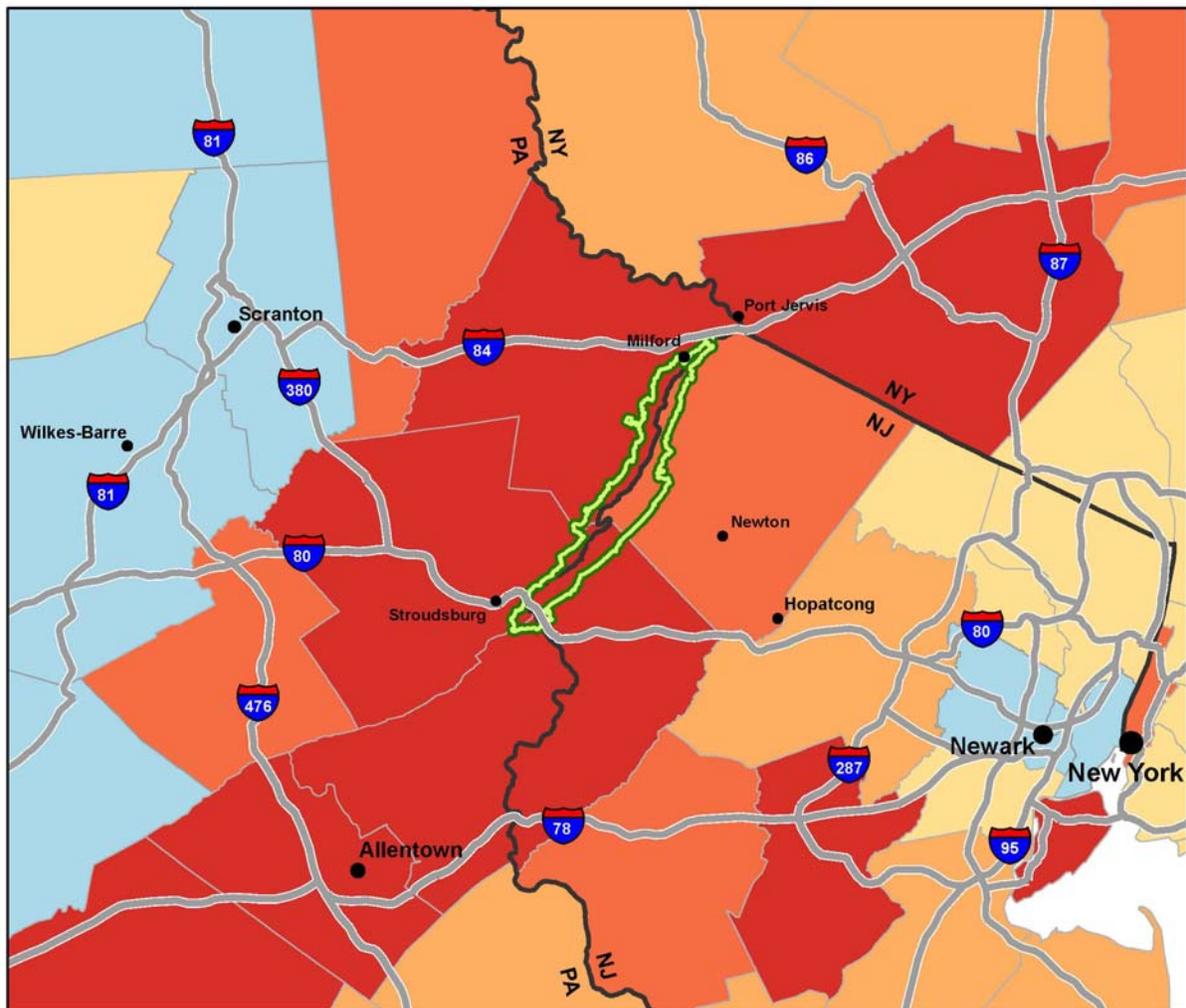
Total Population shows the total number of people in each county. (Data Source: US Census Bureau)

Nation: 299,398,484
State: NJ: 8,724,560 PA: 12,440,621 NY: 19,306,183

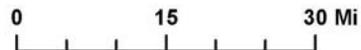
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 2. Estimated Total Population, 2006.

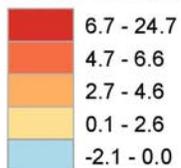


Delaware Water Gap NRA



Recent Population Change

Percent Change, 2000 to 2006



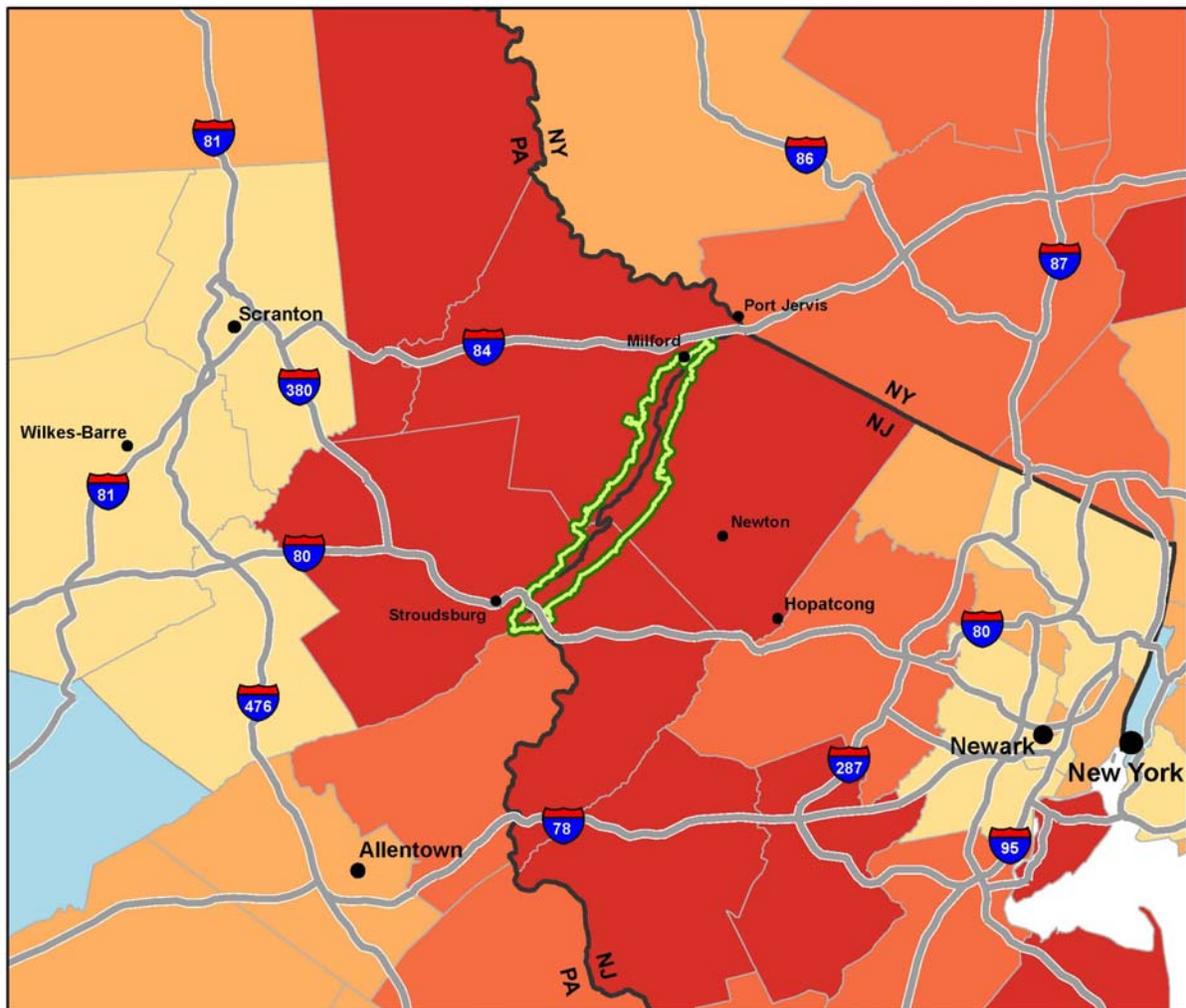
Recent Population Change shows the percent increase or decrease in the county population from 2000 to 2006. (Data Source: US Census Bureau)

Nation: 6.4%
State: NJ: 3.7% PA: 1.3% NY: 1.7%

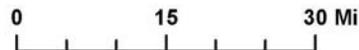
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 3. Recent Population Change, 2000-2006.

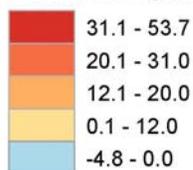


Delaware Water Gap NRA



Projected Population Change

Percent Change, 2006 to 2030

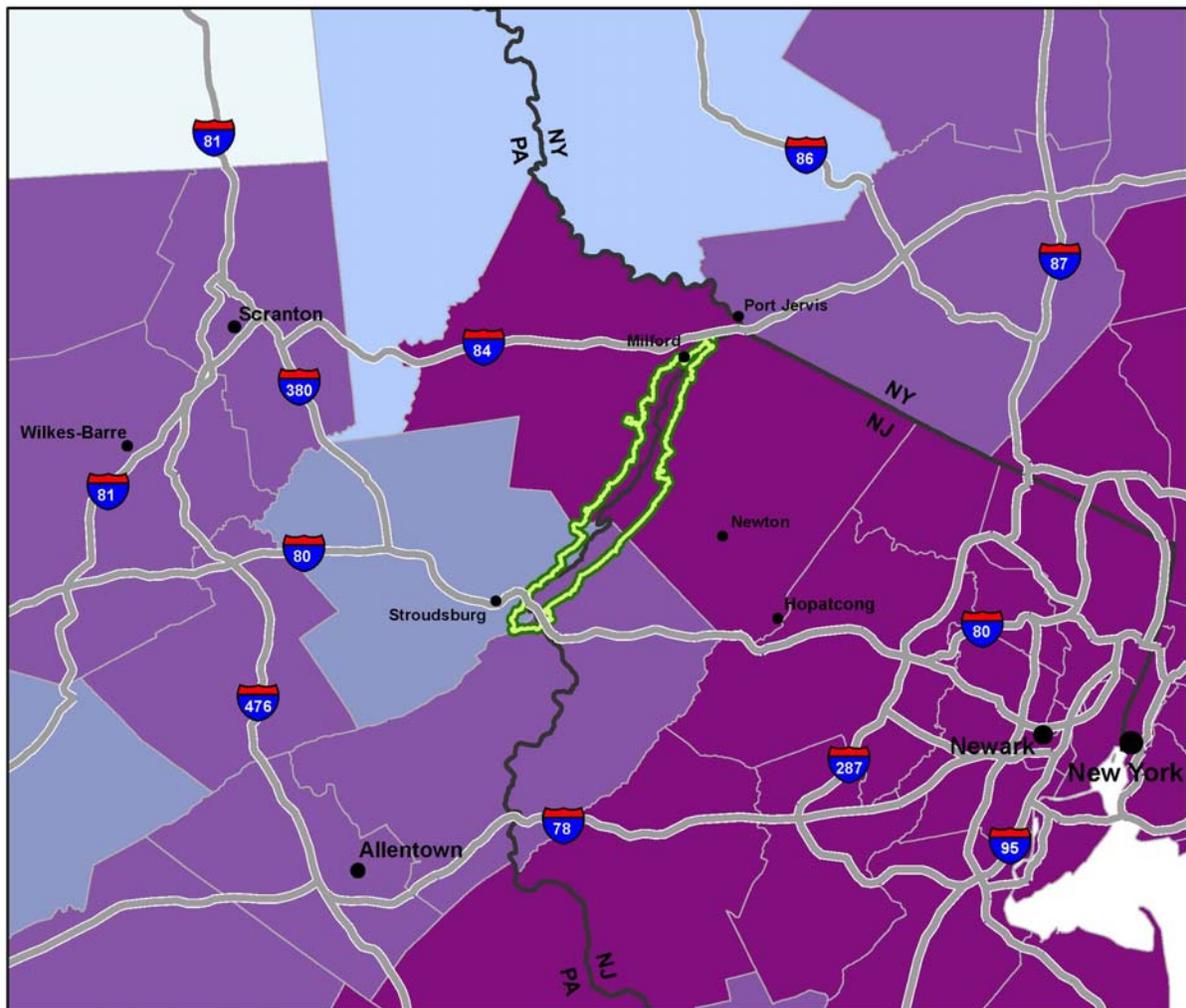


Projected Population Change shows the projected percent increase or decrease in the county population from 2006 to 2030. (Data Source: US Census Bureau; Woods and Poole)

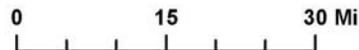
Nation: 26.4%
State: NJ: 22.2% PA: 12.2% NY: 10.5%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 4. Projected Population Change, 2006-2030.



Delaware Water Gap NRA



Urbanization

County is...

-  In large metro area, over 1 million residents
-  In small metro area, under 1 million residents
-  Micropolitan or noncore adjacent to metro area
-  Noncore adjacent to small metro, with own town
-  Noncore adjacent to small metro, with no own town

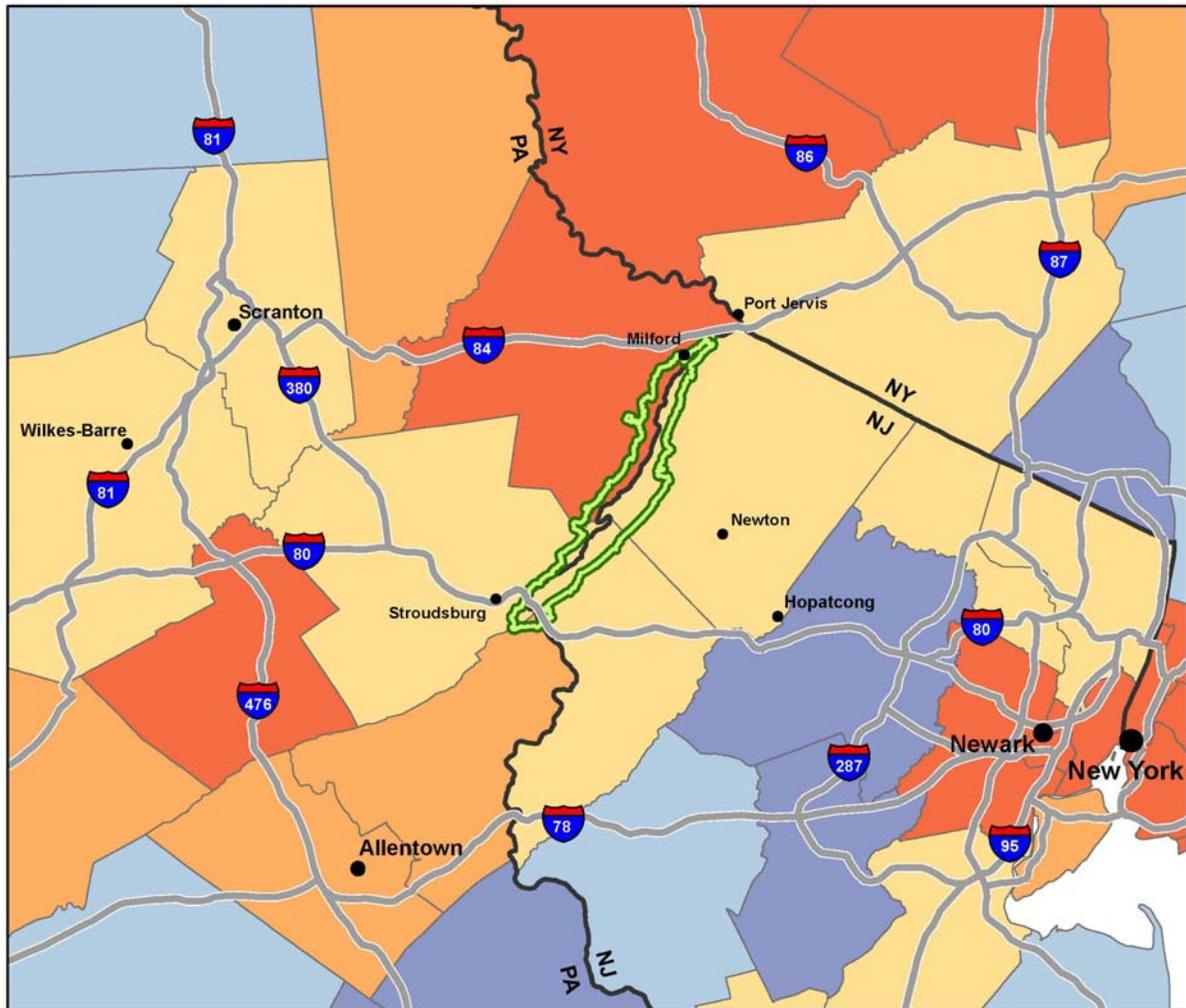
Urbanization influence is classified based on the county population, size of the largest city or town in the county, and proximity to metropolitan and micropolitan areas.

(Data Source: USDA Economic Research Service;
<http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>)

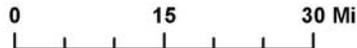
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 5. Urbanization, 2003.

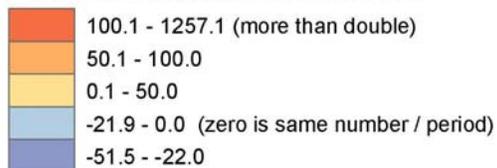


Delaware Water Gap NRA



Change in Home Building Permits

Percent Change, 1993-1995 to 2003-2005



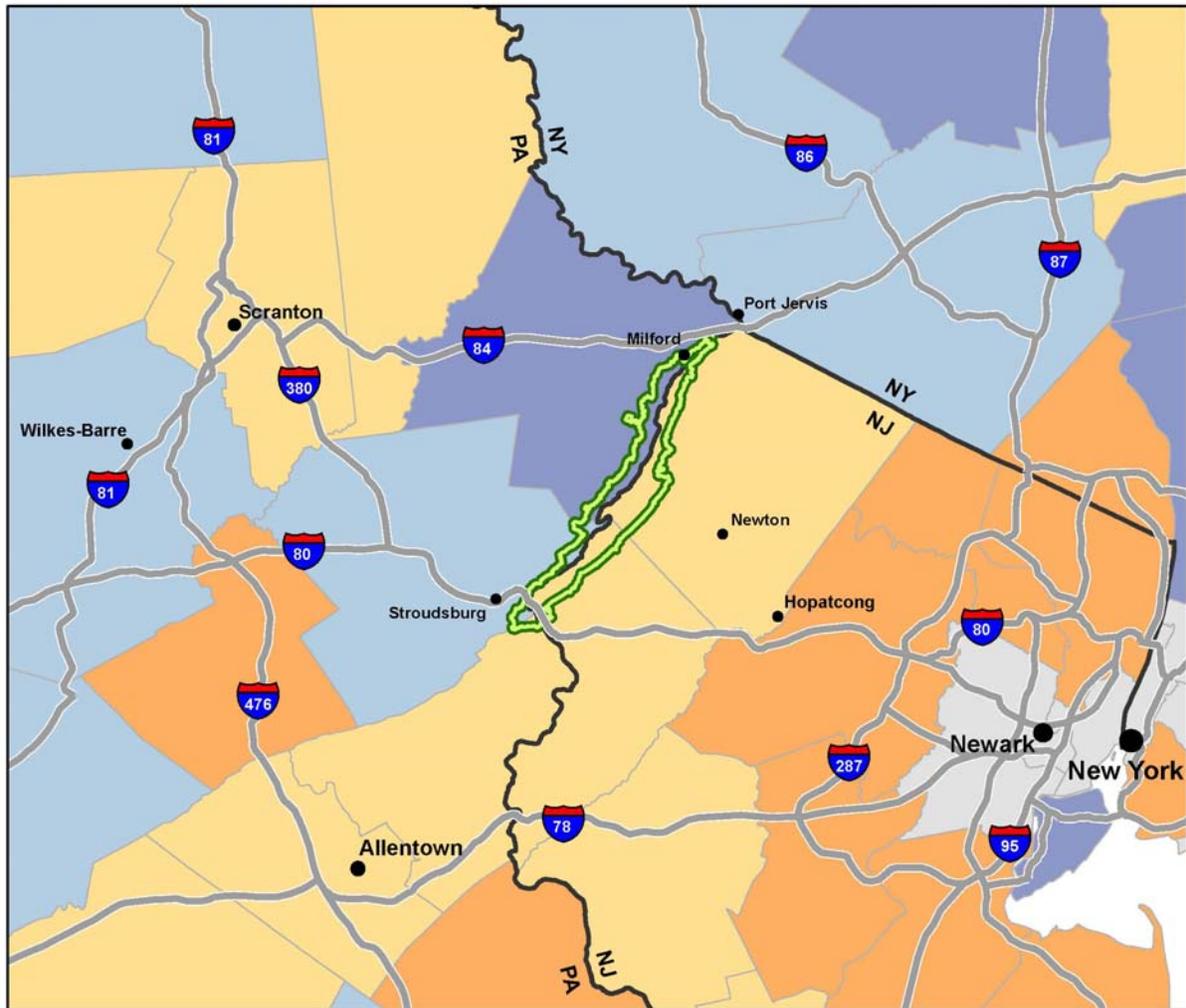
Change in Building Permits shows the percent change in the average number of privately-owned home building permits acquired between 1993-95 and 2003-05 by county. (Data Source: US Census Bureau)

Nation: 56.7%
State: NJ: 49.1% PA: 21.4% NY: 88.1%

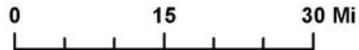
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 6. Change in Home Building Permits, 1993-1995 to 2003-2005.

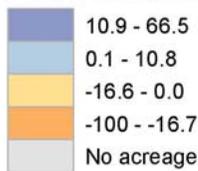


Delaware Water Gap NRA



Change in Farmland

Percent Change in Acreage, 1997-2002



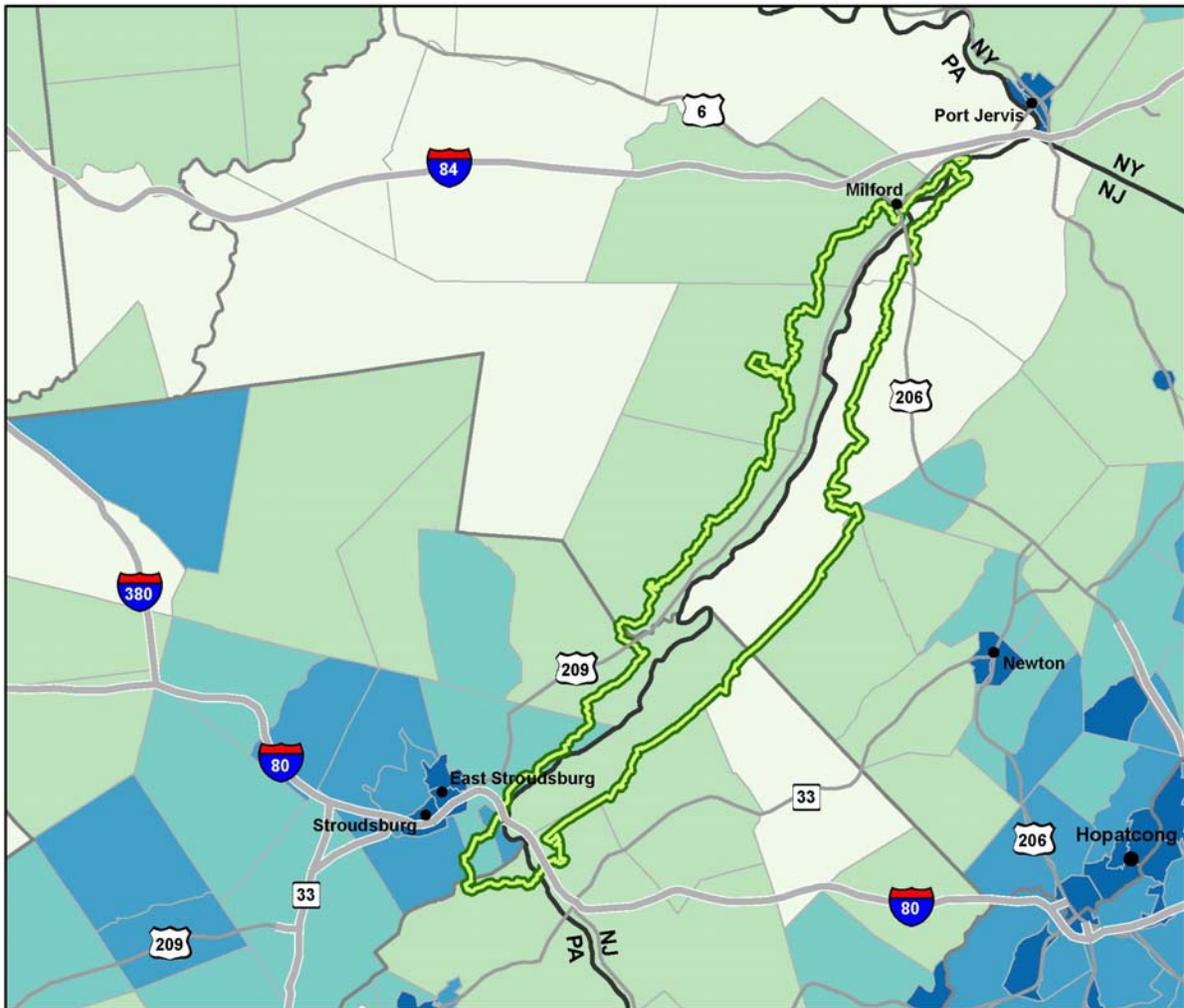
Change in Farmland shows the percent change in acreage from 1997 to 2002 by county.
(Data Source: USDA-NASS)

Nation: -1.7%
State: NJ: -6.0% PA: -1.0% NY: -1.6%

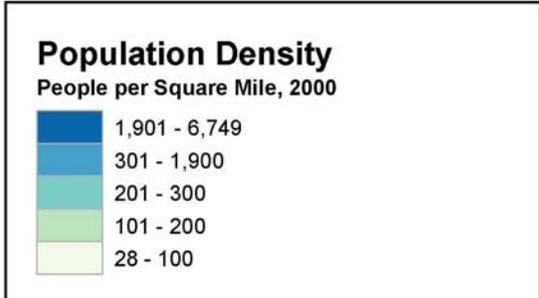
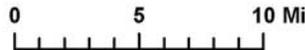
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 7. Change in Farmland, 1997-2002.



 Delaware Water Gap NRA



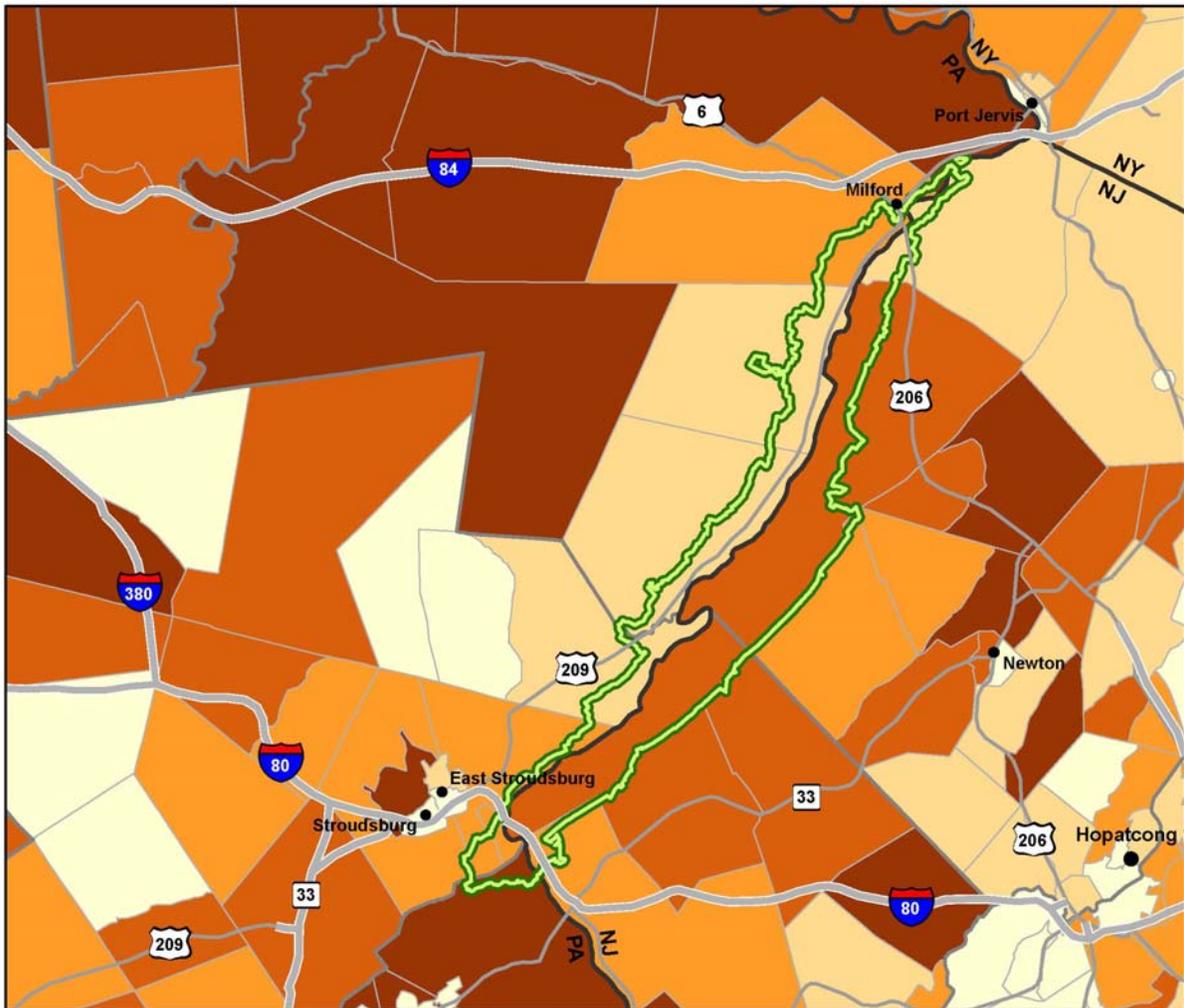
Population density is calculated by dividing the total number of people by the number of square miles in each census tract. (Data Source: US Census Bureau)

Nation: 80
State: NJ: 1,134 PA: 274 NY: 401

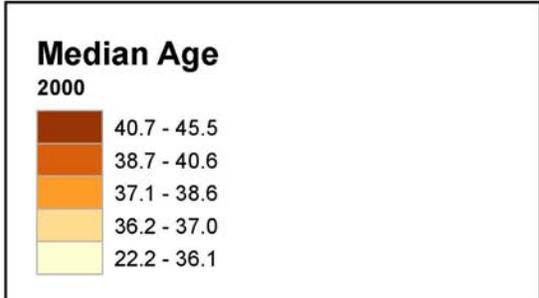
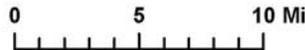
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 8. Population Density, 2000.



 Delaware Water Gap NRA



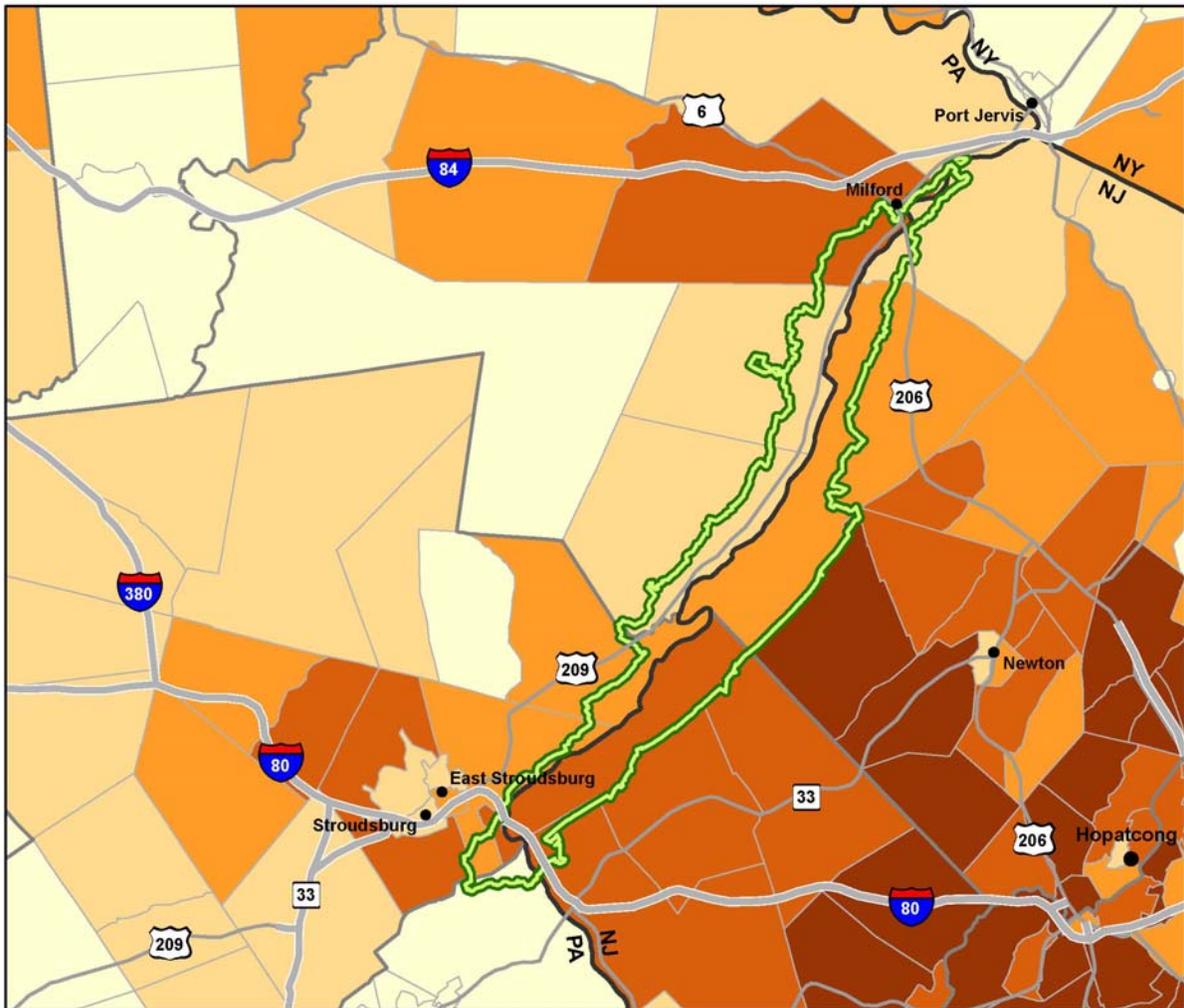
Median Age is the age value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 35.3
State: NJ: 36.7 PA: 38.0 NY: 35.9

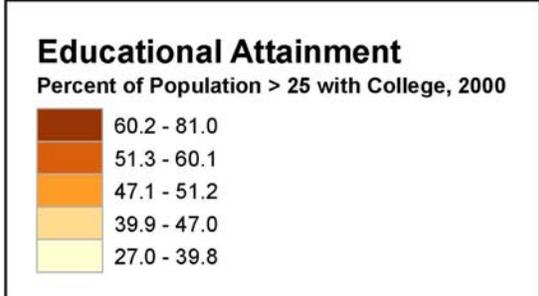
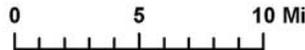
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 9. Median Age, 2000.



 Delaware Water Gap NRA



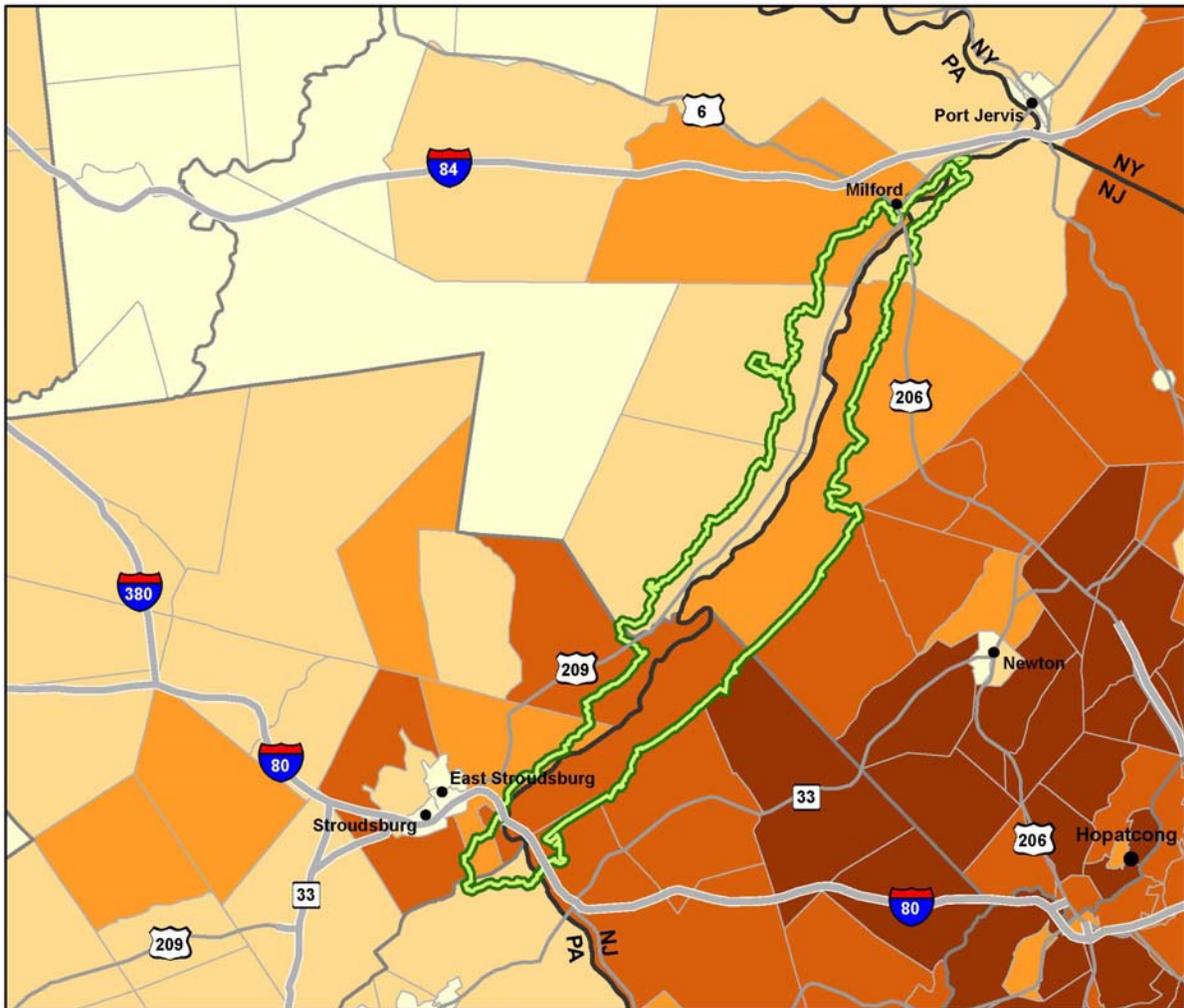
Educational Attainment shows the percent of the population age 25 and over with some college or a college degree. (Data Source: US Census Bureau)

Nation: 51.8%
State: NJ: 52.7% PA: 43.8% NY: 51.3%

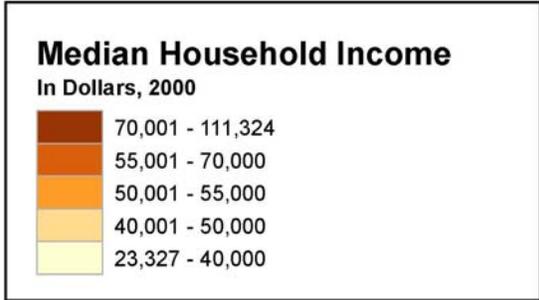
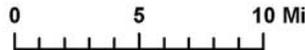
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 10. Educational Attainment, 2000.



 Delaware Water Gap NRA



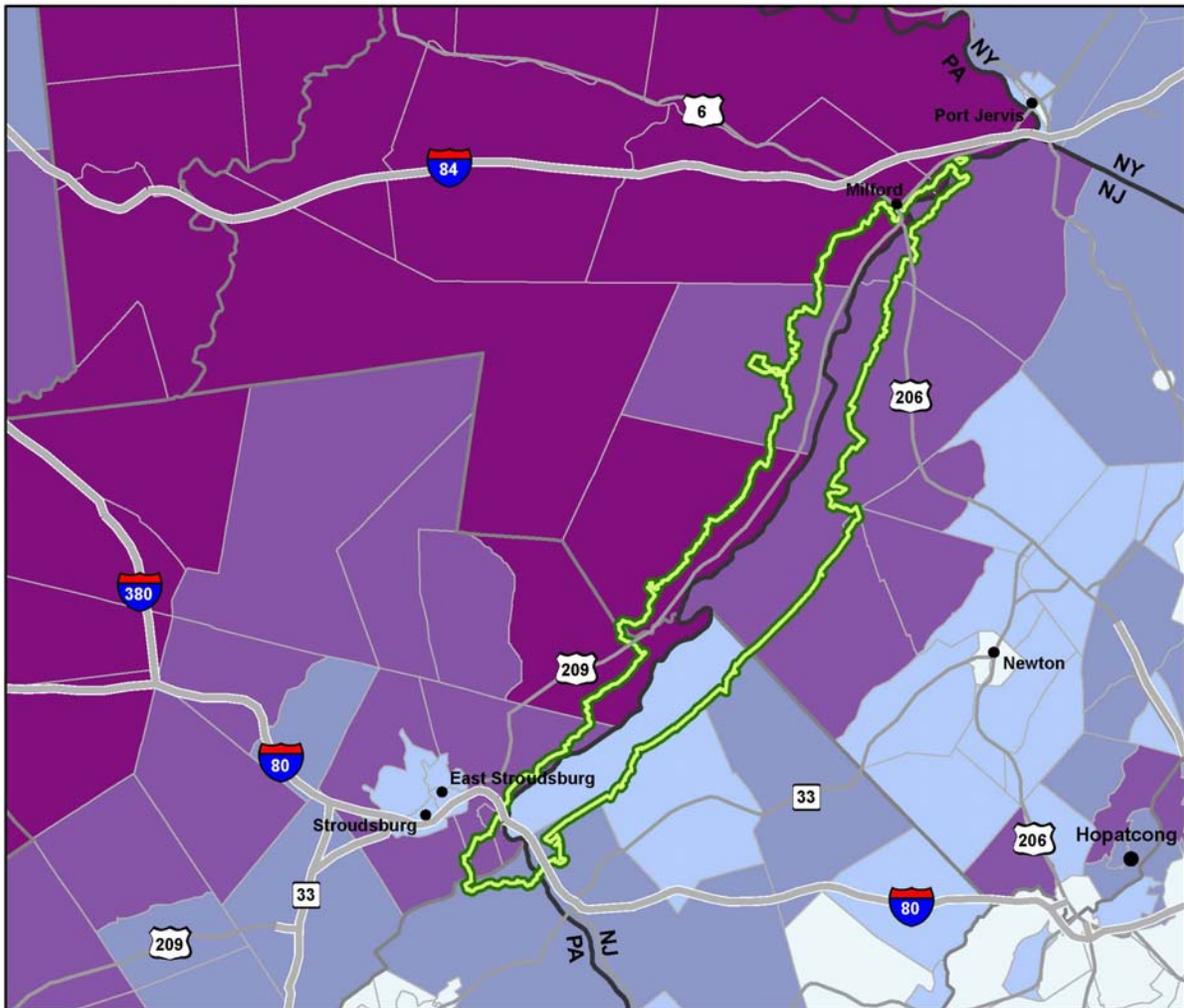
Median Household Income is the income value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 41,994
State: NJ: 55,146 PA: 40,106 NY: 43,393

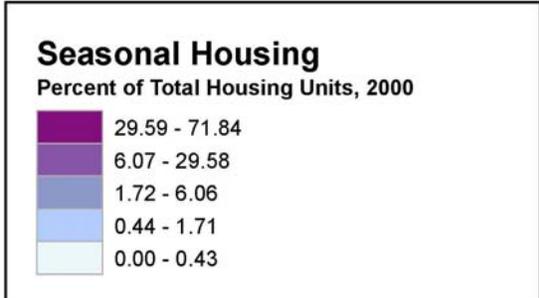
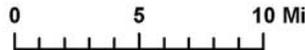
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 11. Median Household Income, 2000.



 Delaware Water Gap NRA



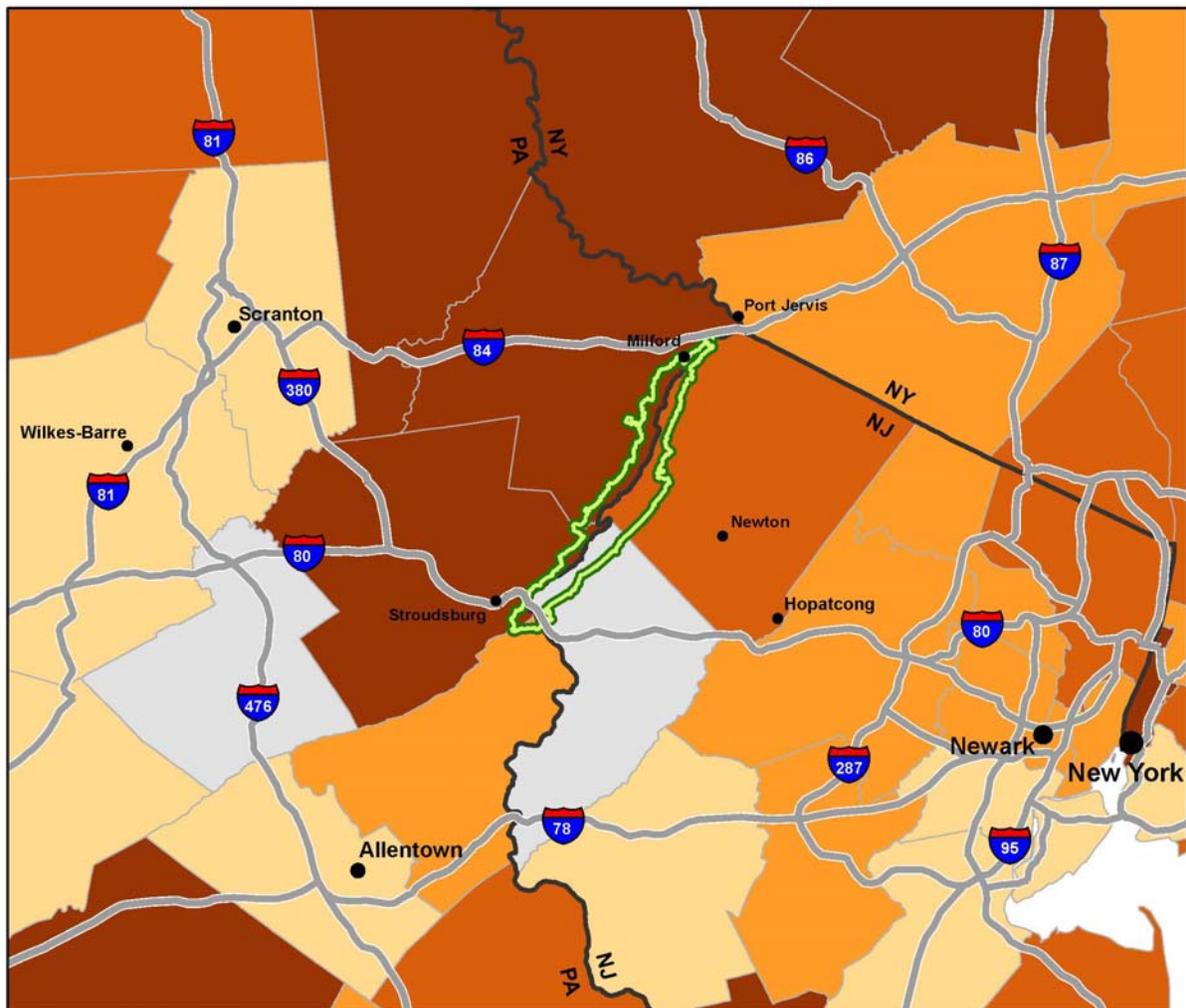
Seasonal Housing shows the percent of total housing units that are for seasonal use as nonpermanent residences by tract. (Data Source: US Census Bureau)

Nation: 3.1%
State: NJ: 3.3% PA: 2.8% NY: 3.1%

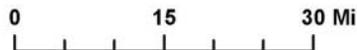
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 12. Seasonal Housing, 2000.

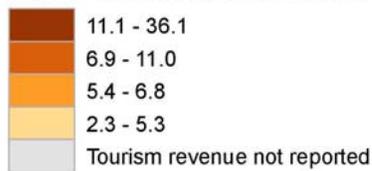


Delaware Water Gap NRA



Tourism Revenue

Percent of Service Related Sectors



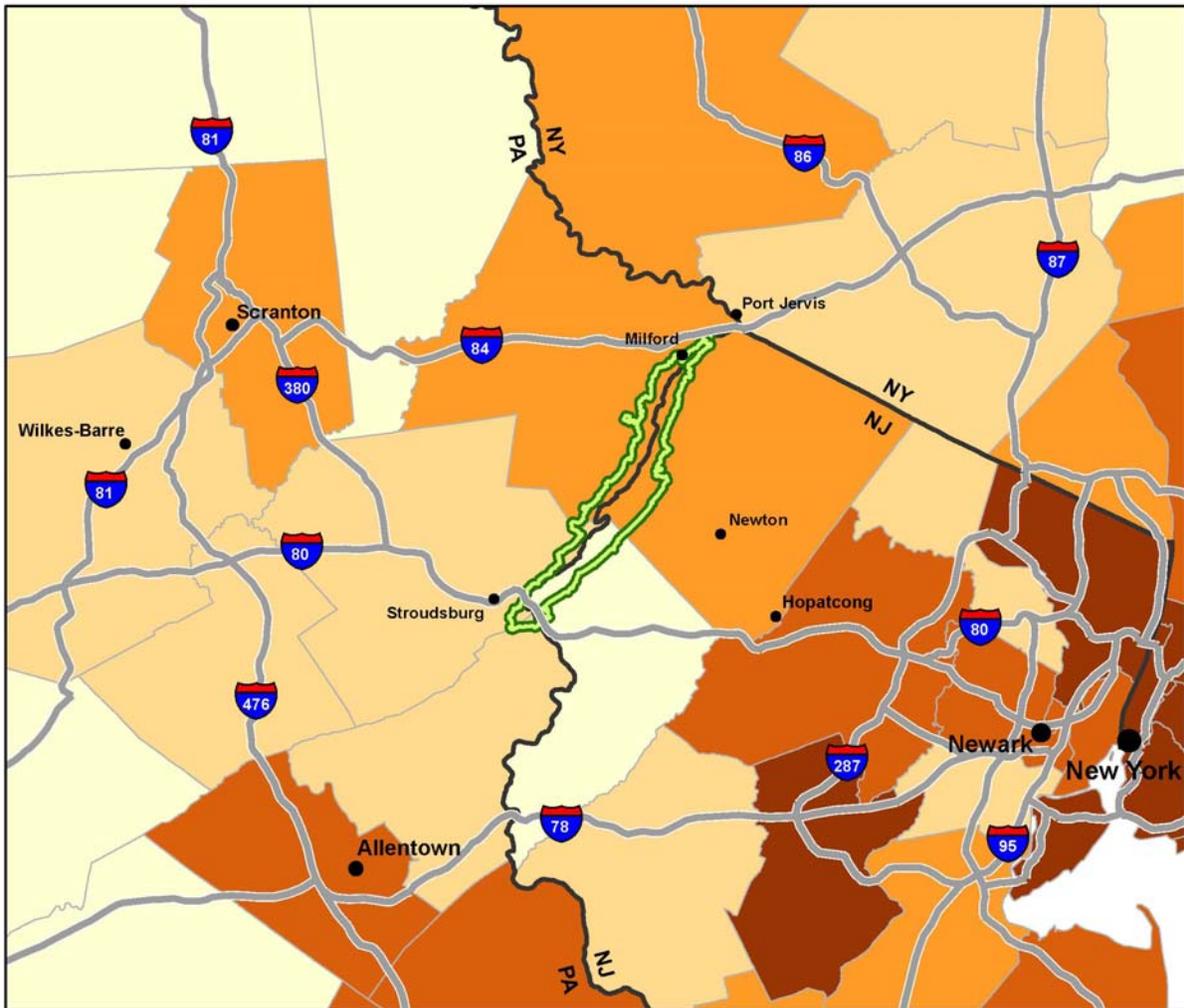
Tourism Revenue shows the percent of the total county revenue from service related sectors that comes from tourism industries.
(Data Source: US Census Bureau)

Nation: 10.6%
State: NJ: 11.6% PA: 7.3% NY: 10.4%

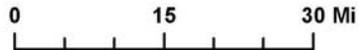
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 13. Tourism Revenue, 2002.

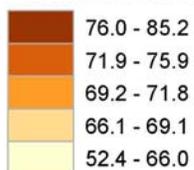


Delaware Water Gap NRA



Employment by Industry 1

Percent in Sales and Service



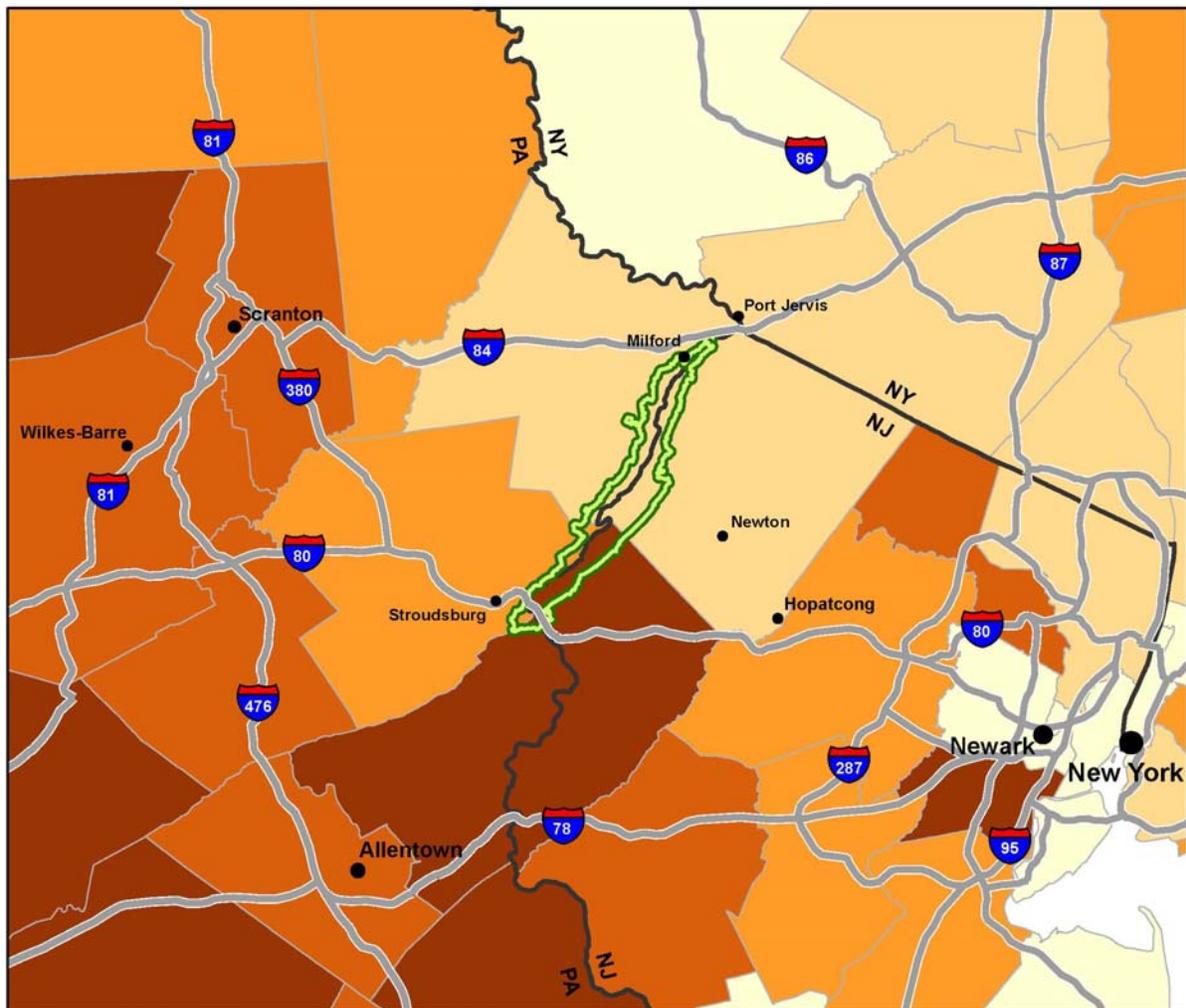
Employment by Industry 1 shows the percent of total county employees that work in sales and service. (Data Source: Woods and Poole)

Nation: 66.9%
State: NJ: 72.7% PA: 69.2% NY: 72.9%

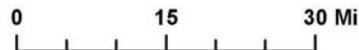
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 14. Employment by Industry 1 (Sales and Service), 2001.

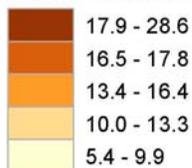


Delaware Water Gap NRA



Employment by Industry 2

Percent in Construction and Manufacturing



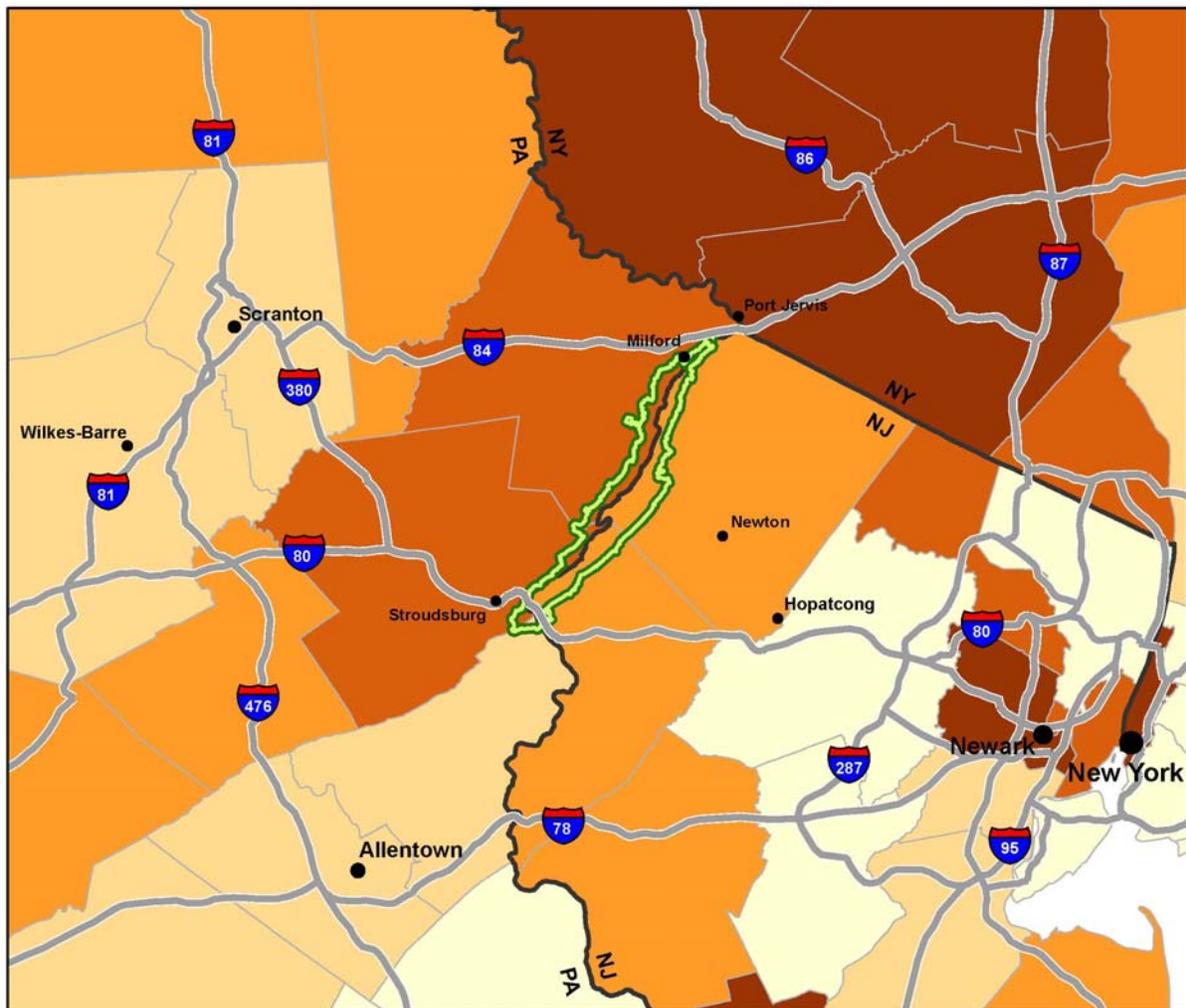
Employment by Industry 2 shows the percent of total county employees that work in construction and manufacturing. (Data Source: Woods and Poole)

Nation: 15.3%
State: NJ: 12.9% PA: 16.7% NY: 11.4%

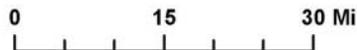
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 15. Employment by Industry 2 (Construction and Manufacturing), 2001.

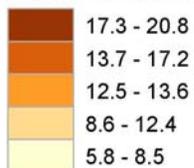


Delaware Water Gap NRA



Employment by Industry 3

Percent in Government



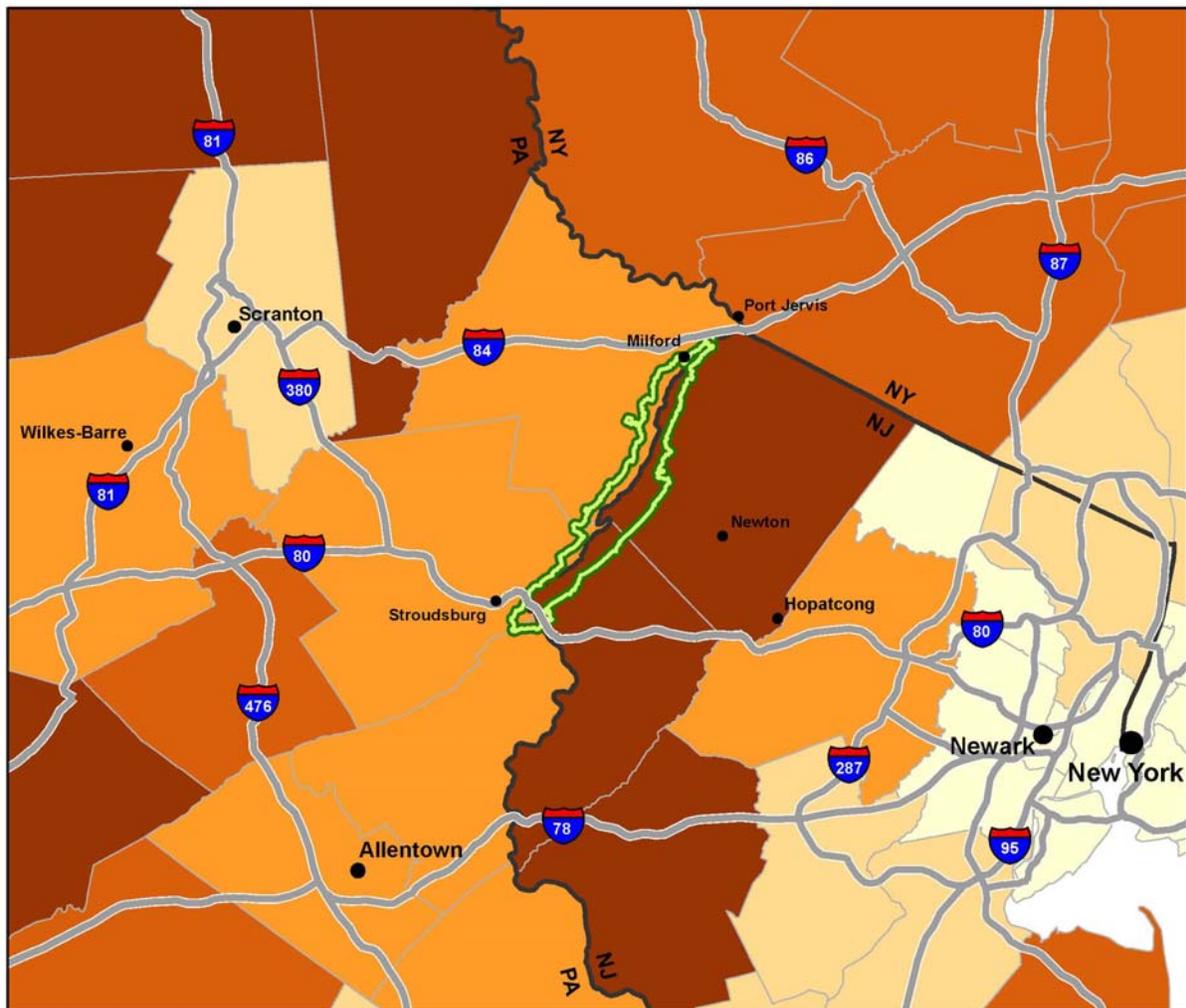
Employment by Industry 3 shows the percent of total county employees that work in government. (Data Source: Woods and Poole)

Nation: 14.2%
State: NJ: 13.1% PA: 11.6% NY: 14.4%

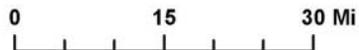
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

DEWA Figure 16. Employment by Industry 3 (Government), 2001.

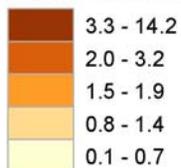


Delaware Water Gap NRA



Employment by Industry 4

Percent in Agriculture and Natural Resources



Employment by Industry 4 shows the percent of total county employees that work in agriculture and natural resources. (Data Source: Woods and Poole)

Nation: 3.6%
State: NJ: 1.3% NY: 1.4% PA: 2.5%

Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

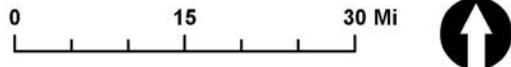
DEWA Figure 17. Employment by Industry 4 (Agriculture and Natural Resources), 2001.

Fort Necessity National Battlefield Friendship Hill National Historic Site

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 Fort Necessity NB
 Friendship Hill NHS

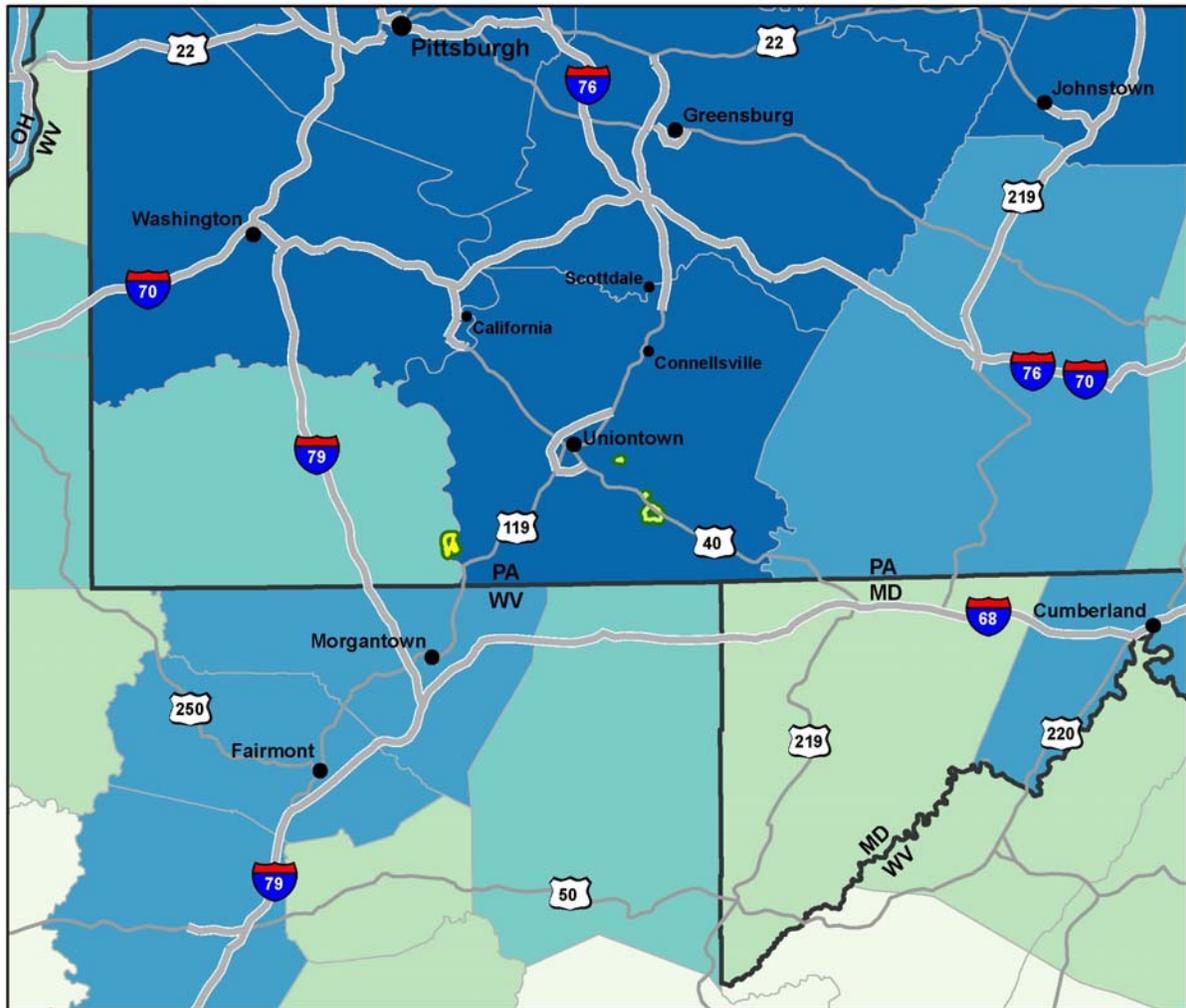


Classification Methods
 The quantile classification method is used for most of the socioeconomic data maps. In this classification scheme, equal numbers of counties or census tracts are placed in each class. The quantile classification method is used to show the ranking of data while producing distinct mapping patterns.

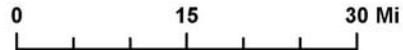
Explanation of Map Scales
 In order to show data at a fine aggregation unit, census tracts were used when possible. When data were not available by census tract for the atlas, county data were collected. This map shows the counties for which data were collected at the smaller scale, with the census tract map area shown for reference.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 1. Location Map.

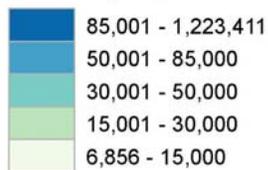


-  Fort Necessity NB
-  Friendship Hill NHS



Total Population

Estimated, 2006



Total Population shows the total number of people in each county. (Data Source: US Census Bureau)

Nation: 299,398,484
State: PA: 12,440,621 WV: 1,818,470
 MD: 5,615,727 OH: 11,478,006

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 2. Estimated Total Population, 2006.



- Fort Necessity NB
- Friendship Hill NHS

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Recent Population Change

Percent Change, 2000 to 2006

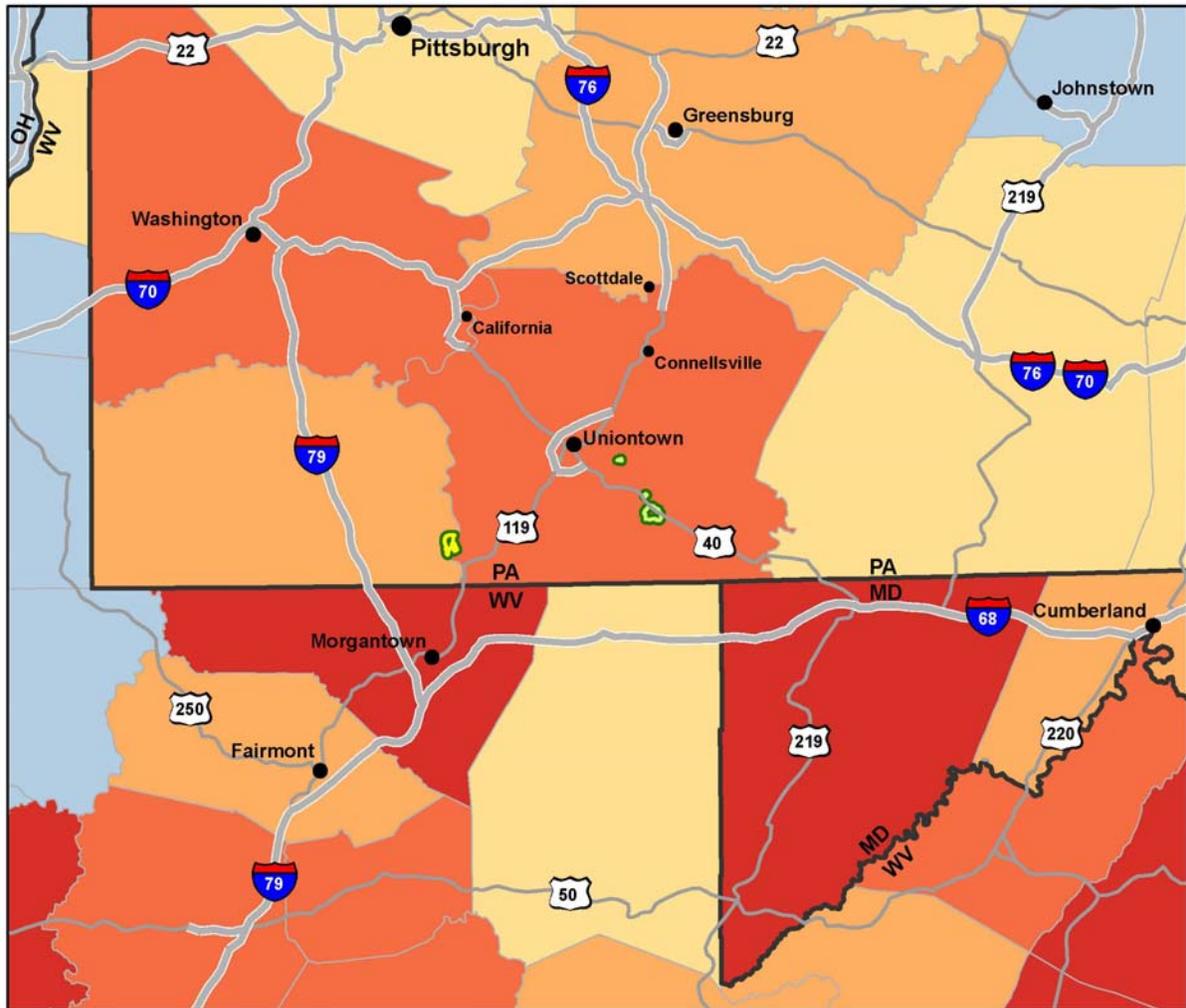
	1.6 - 10.6
	0.1 - 1.5
	-2.6 - 0.0
	-4.7 - -2.7
	-6.1 - -4.8

Recent Population Change shows the percent increase or decrease in the county population from 2000 to 2006. (Data Source: US Census Bureau)

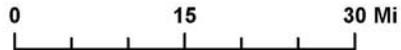
Nation: 6.4%
State: PA: 1.3% WV: 0.6% MD: 6.0% OH: 1.1%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 3. Recent Population Change, 2000-2006

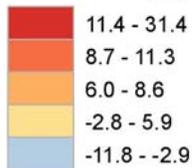


- Fort Necessity NB
- Friendship Hill NHS



Projected Population Change

Percent Change, 2006 to 2030

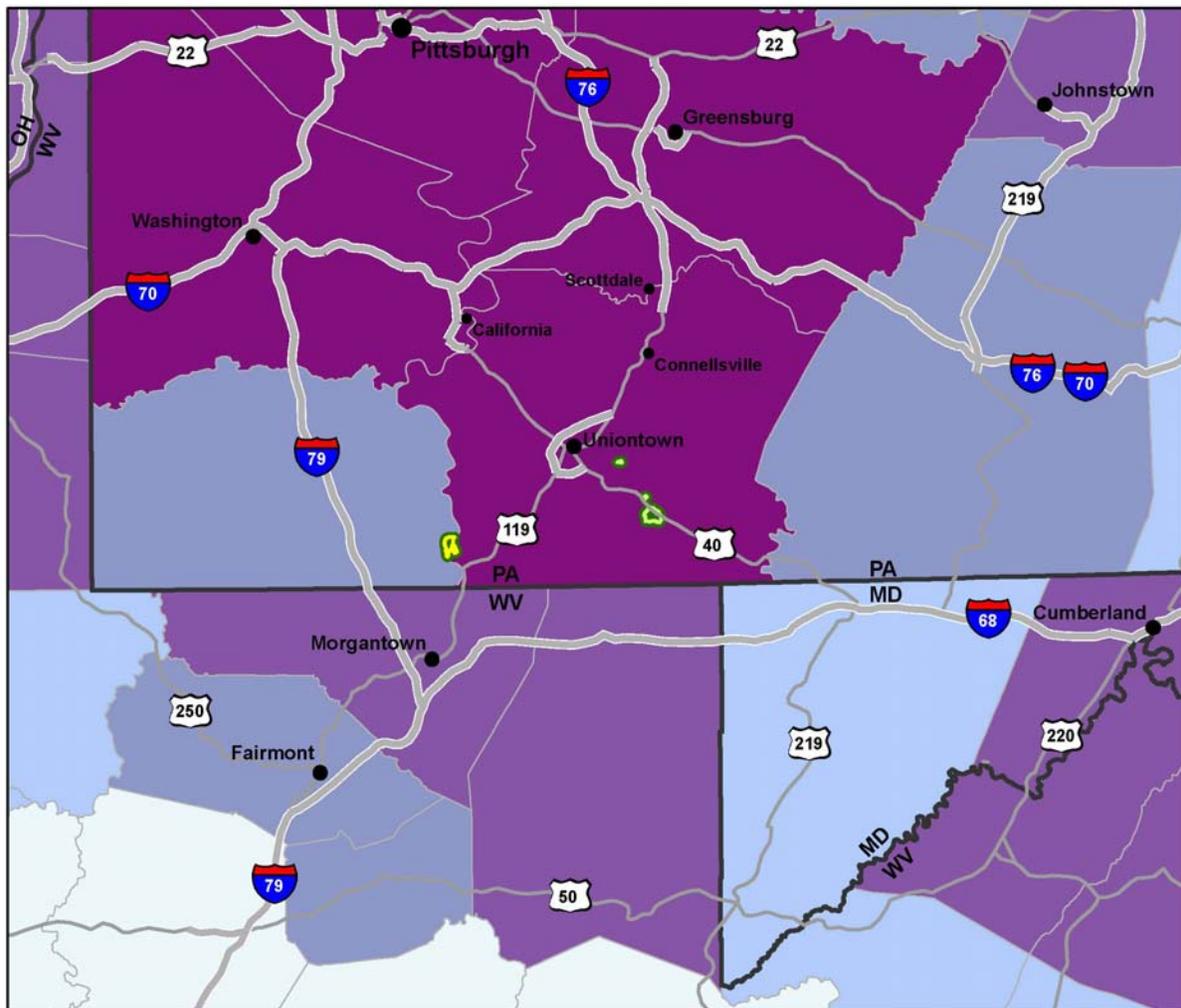


Projected Population Change shows the projected percent increase or decrease in the county population from 2006 to 2030.
(Data Source: US Census Bureau; Woods and Poole)

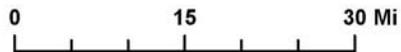
Nation: 26.4%
State: PA: 12.2% WV: 7.7% MD: 34.4% OH: 10.7%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 4. Projected Population Change, 2006-2030.



- Fort Necessity NB
- Friendship Hill NHS



Urbanization

County is...

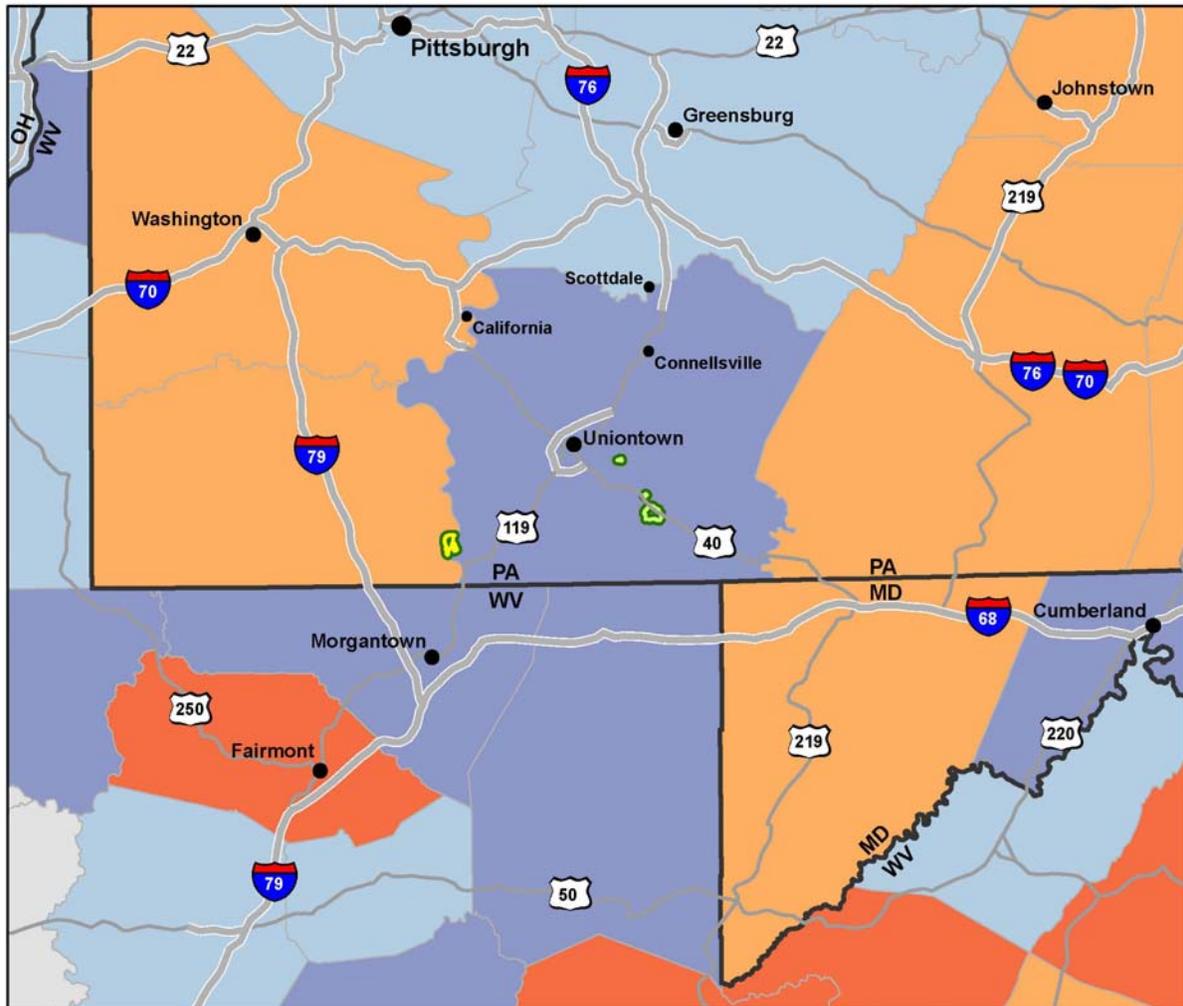
- In large metro area, over 1 million residents
- In small metro area, under 1 million residents
- Micropolitan or noncore adjacent to metro area
- Noncore adjacent to small metro
- Noncore not adjacent to any metro area

Urbanization influence is classified based on the county population, size of the largest city or town in the county, and proximity to metropolitan and micropolitan areas.
(Data Source: USDA Economic Research Service; <http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>)

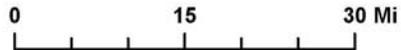
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

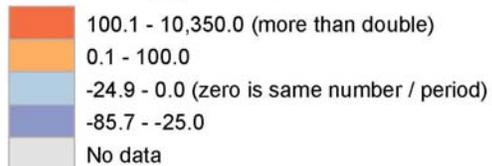
FONE-FRHI Figure 5. Urbanization, 2003.



Fort Necessity NB
 Friendship Hill NHS



Change in Home Building Permits
Percent Change, 1993-1995 to 2003-2005

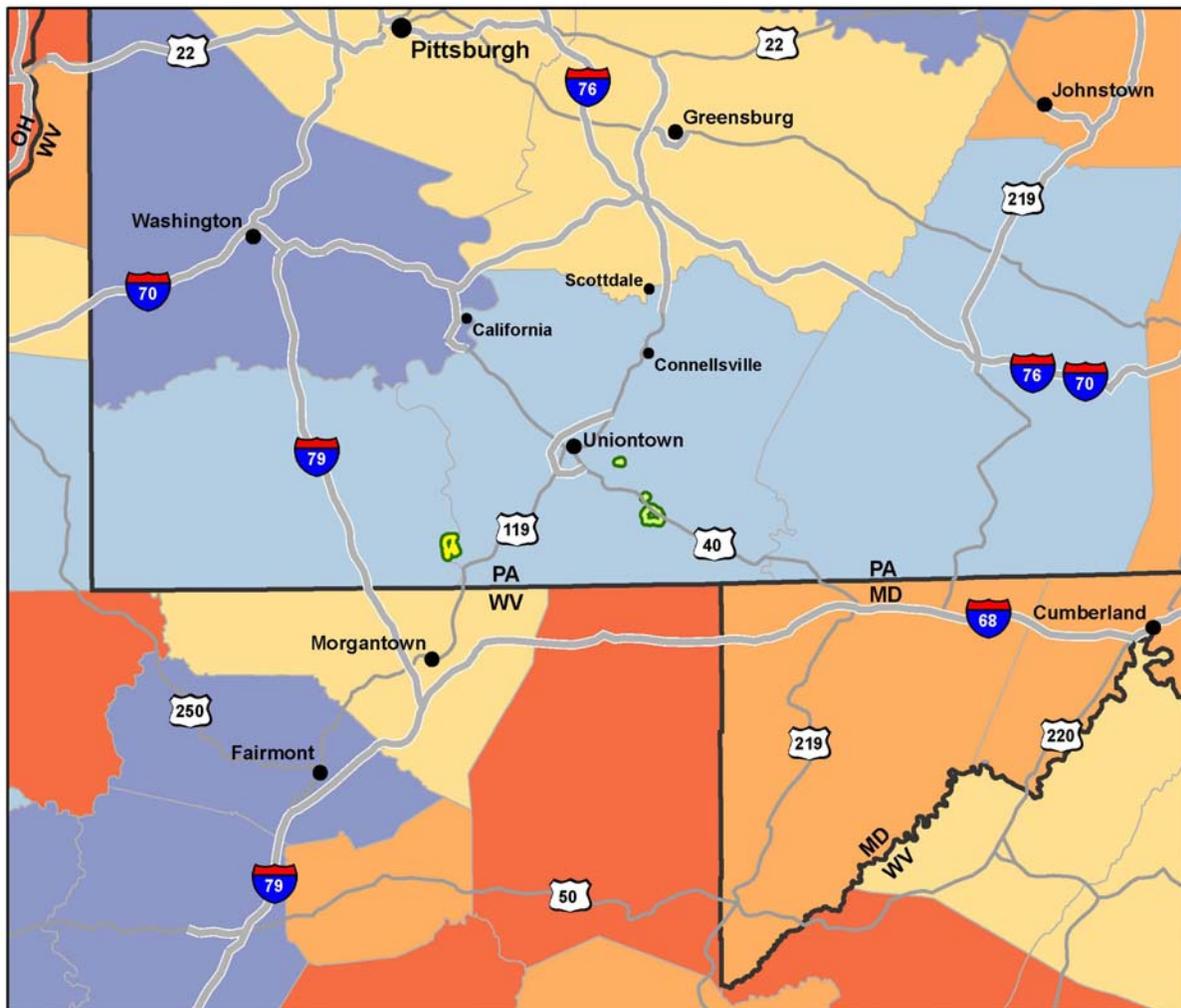


Change in Home Building Permits shows the percent change in the average number of privately-owned building permits acquired between 1993-1995 and 2003-2005 by county. (Data Source: US Census Bureau)
Nation: 56.7%
State: PA: 21.4% WV: 67.5% MD: 2.3% OH: 11.9%

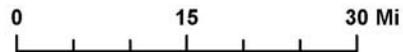
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 6. Change in Home Building Permits, 1993-1995 to 2003-2005.

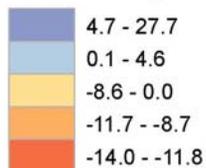


- Fort Necessity NB
- Friendship Hill NHS



Change in Farmland

Percent Change in Acreage, 1997-2002

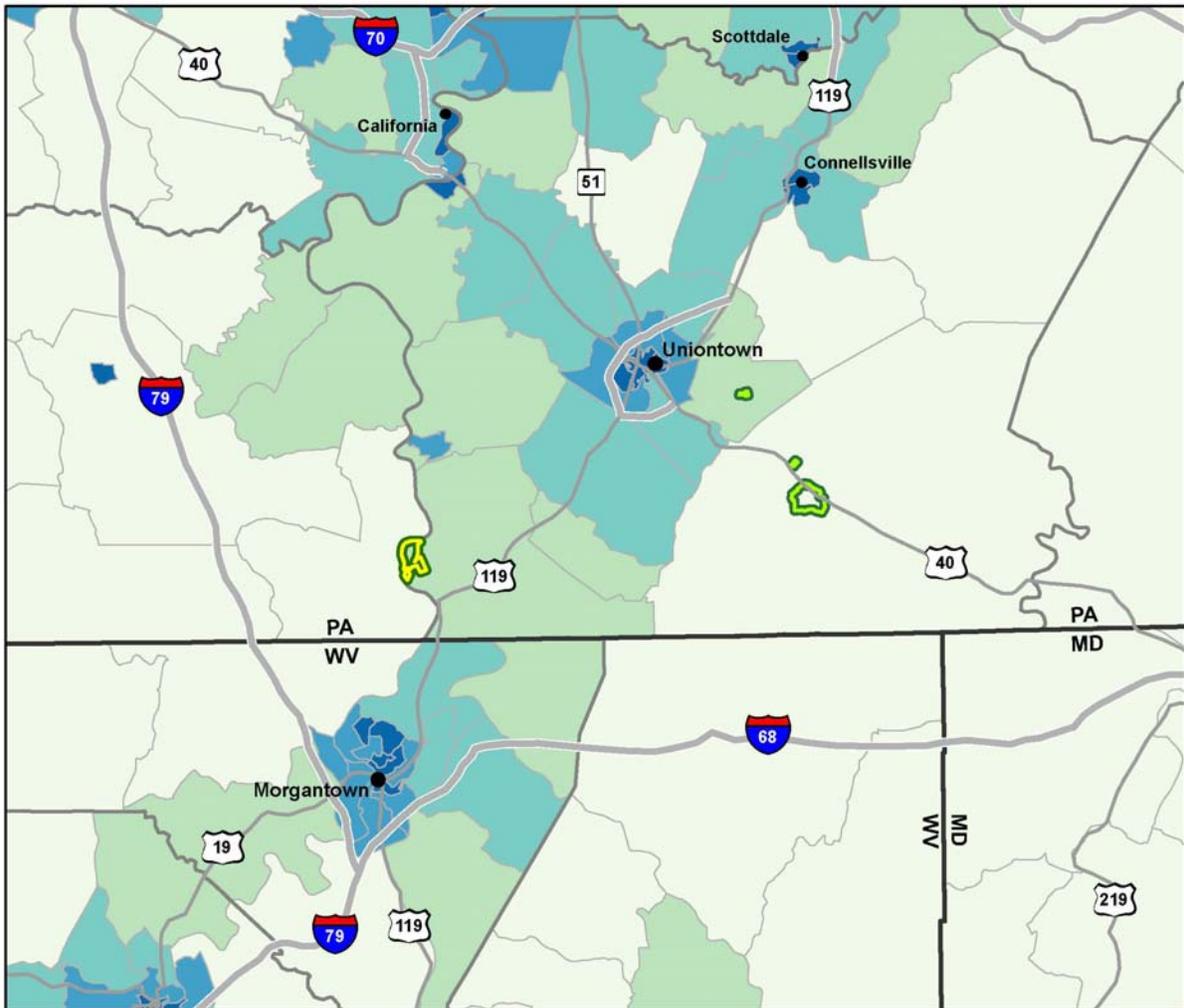


Change in Farmland shows the percent change in acreage from 1997 to 2002 by county. (Data Source: USDA-NASS)

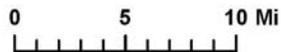
Nation: -1.7%
State: PA: -1.0% WV: -3.1% MD: -5.3% OH: -1.0%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 7. Change in Farmland, 1997-2002.



 Fort Necessity NB
 Friendship Hill NHS



Population Density
People per Square Mile, 2000

	2,501 - 9,654
	501 - 2,500
	201 - 500
	101 - 200
	22 - 100

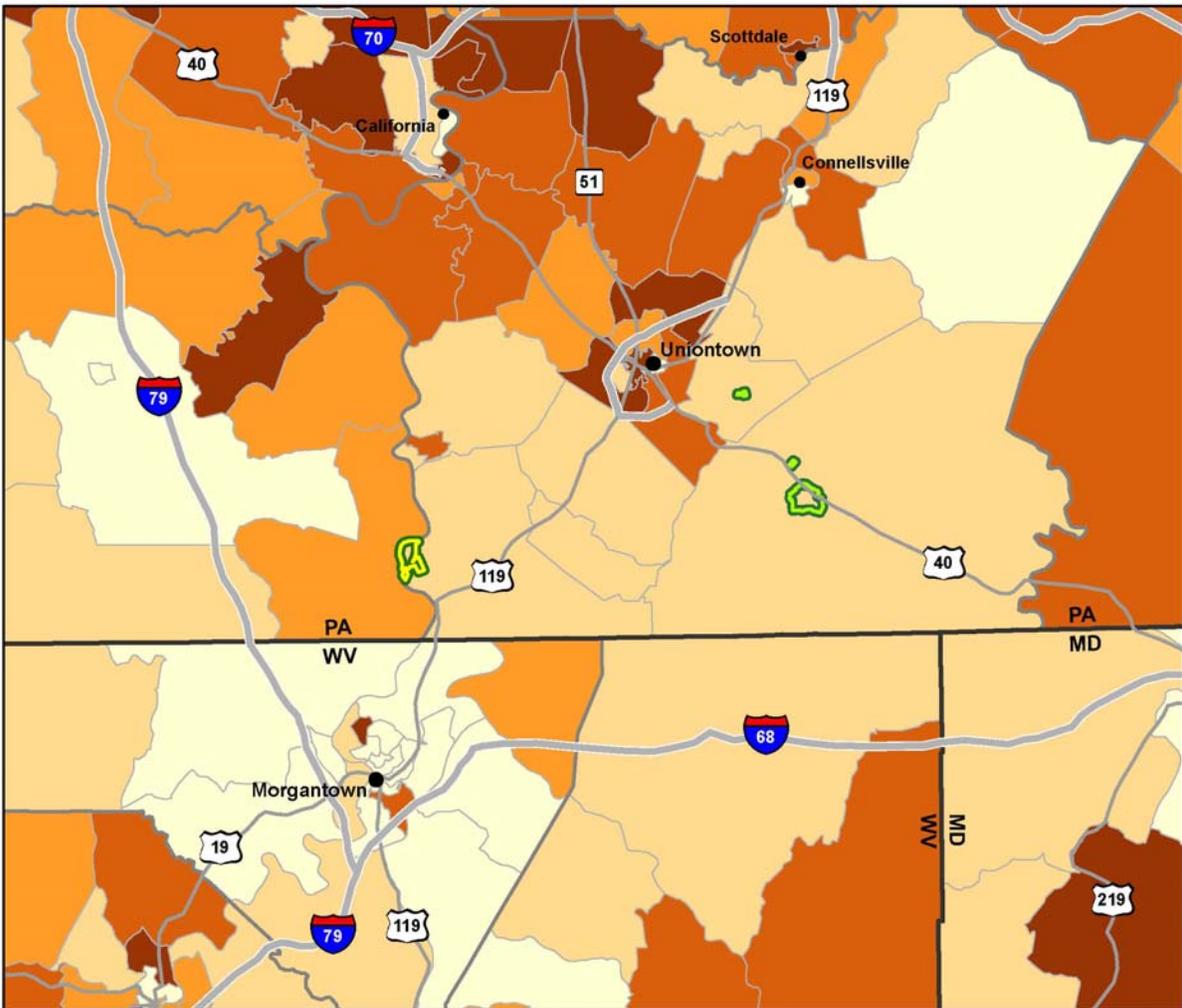
Population density is calculated by dividing the total number of people by the number of square miles in each census tract. (Data Source: US Census Bureau)

Nation: 80
State: PA: 274 WV: 75 MD: 542 OH: 277

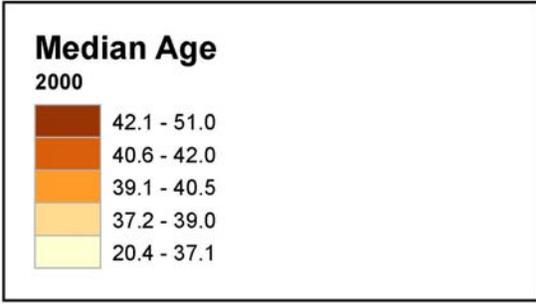
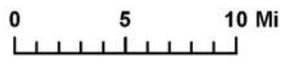
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 8. Population Density, 2000.



 Fort Necessity NB
 Friendship Hill NHS



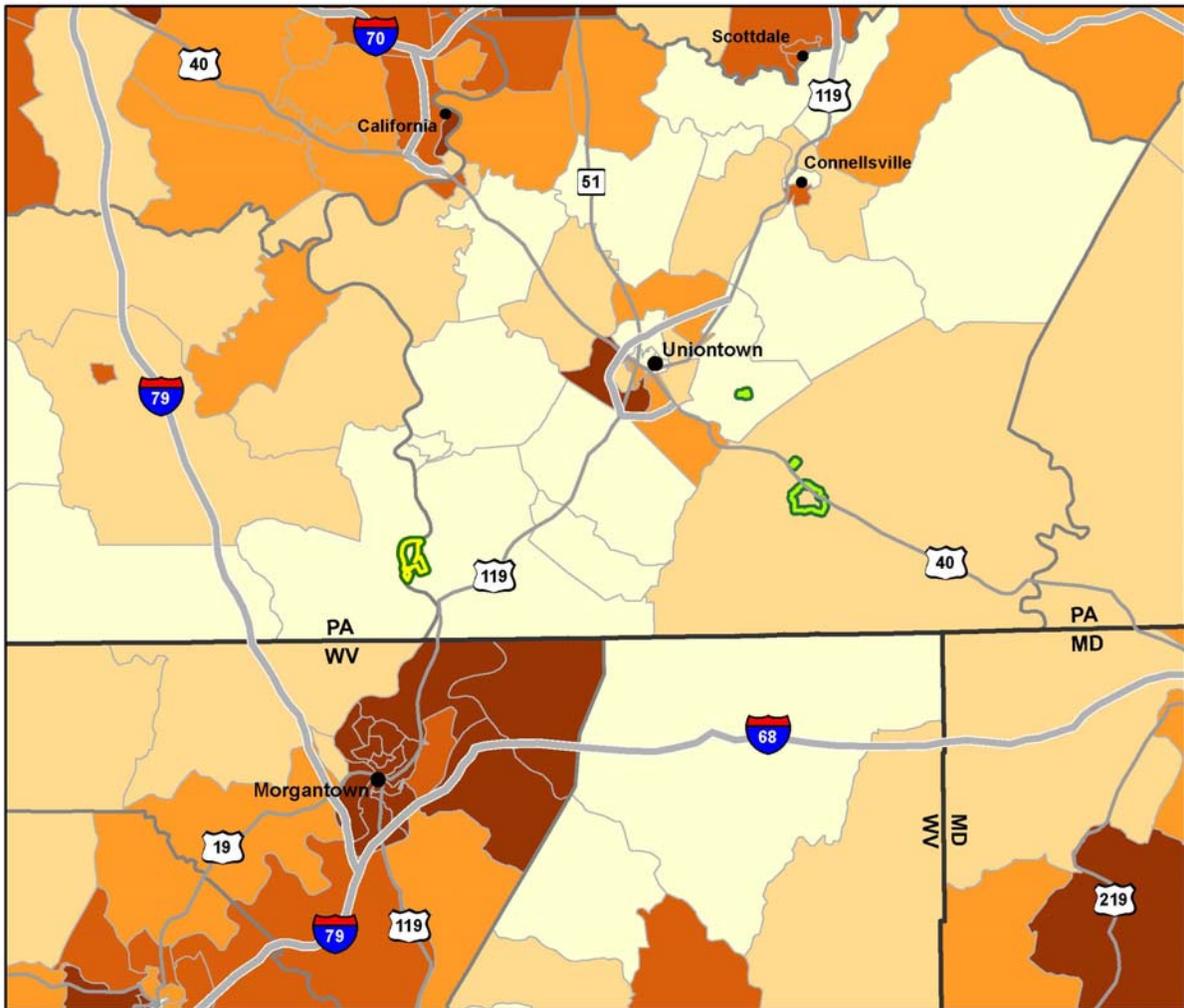
Median Age is the age value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 35.3
State: PA: 38.0 WV: 38.9 MD: 36.0 OH: 36.2

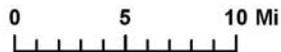
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 9. Median Age, 2000.



Fort Necessity NB
 Friendship Hill NHS



Educational Attainment
Percent of Population > 25 with College, 2000

	46.9 - 83.2
	36.6 - 46.8
	31.1 - 36.5
	25.9 - 31.0
	18.3 - 25.8

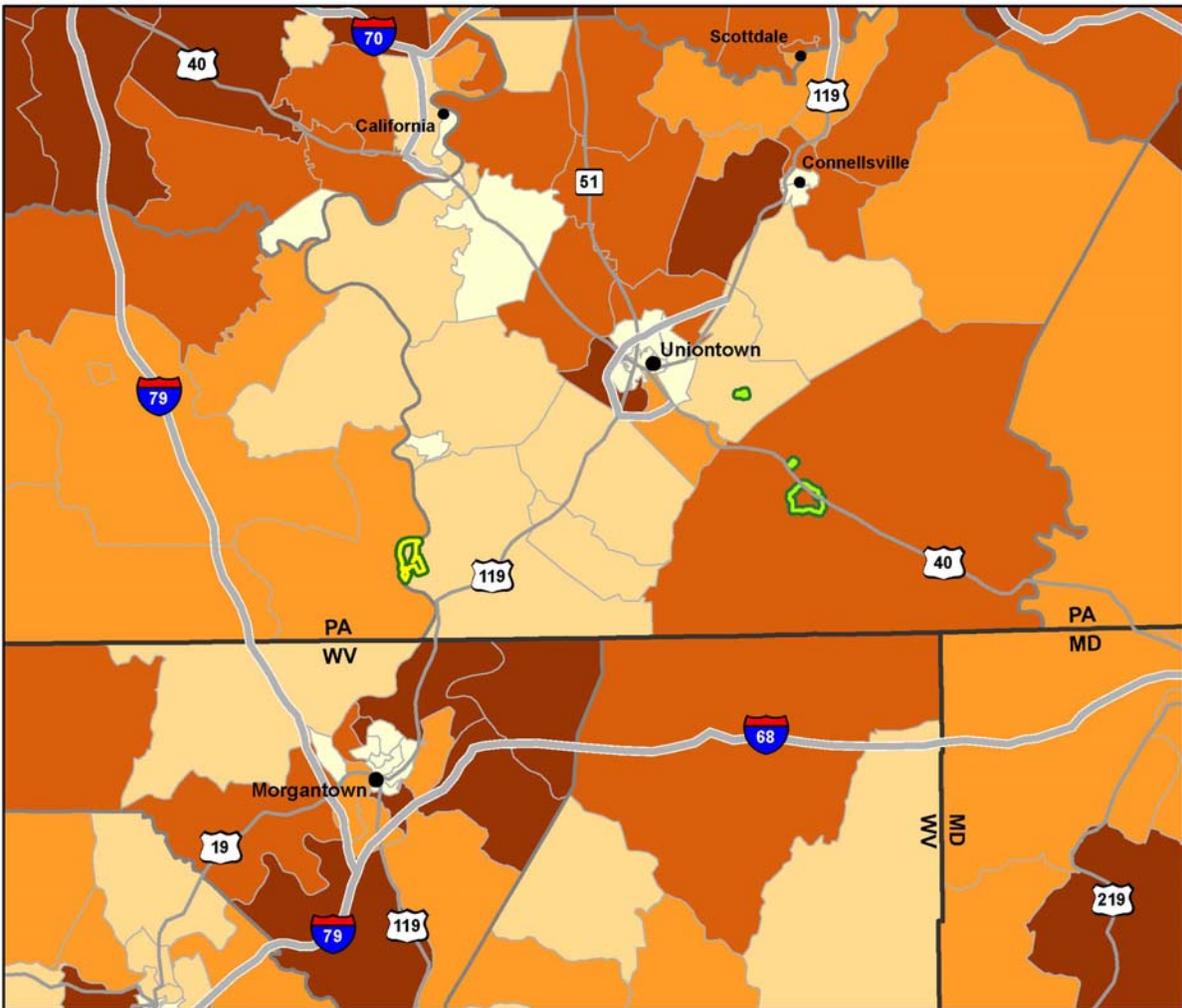
Educational Attainment shows the percent of the population age 25 and over with some college or a college degree. (Data Source: US Census Bureau)

Nation: 51.8%
State: PA: 43.8% WV: 35.8% MD: 57.1% OH: 46.9%

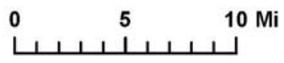
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 10. Educational Attainment, 2000.



Fort Necessity NB
 Friendship Hill NHS



Median Household Income
In Dollars, 2000

	36,001 - 51,991
	32,001 - 36,000
	28,001 - 32,000
	25,001 - 28,000
	9,475 - 25,000

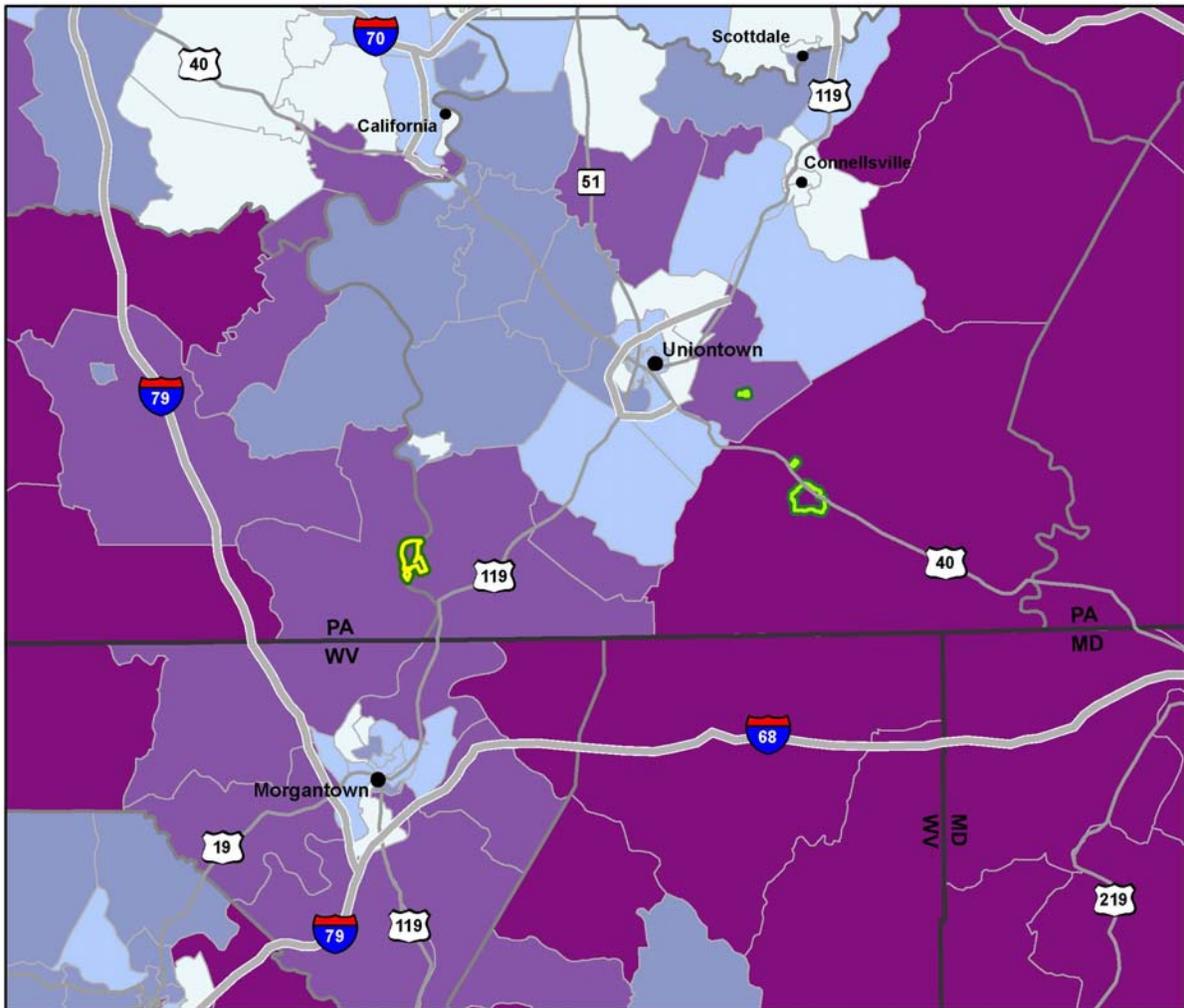
Median Household Income is the income value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 41,994
State: PA:40,106 WV:29,696 MD:52,868 OH:40,956

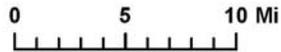
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 11. Median Household Income, 2000.



Fort Necessity NB
 Friendship Hill NHS



Seasonal Housing
Percent of Total Housing Units, 2000

	1.77 - 60.03
	0.76 - 1.76
	0.47 - 0.75
	0.27 - 0.46
	0.00 - 0.26

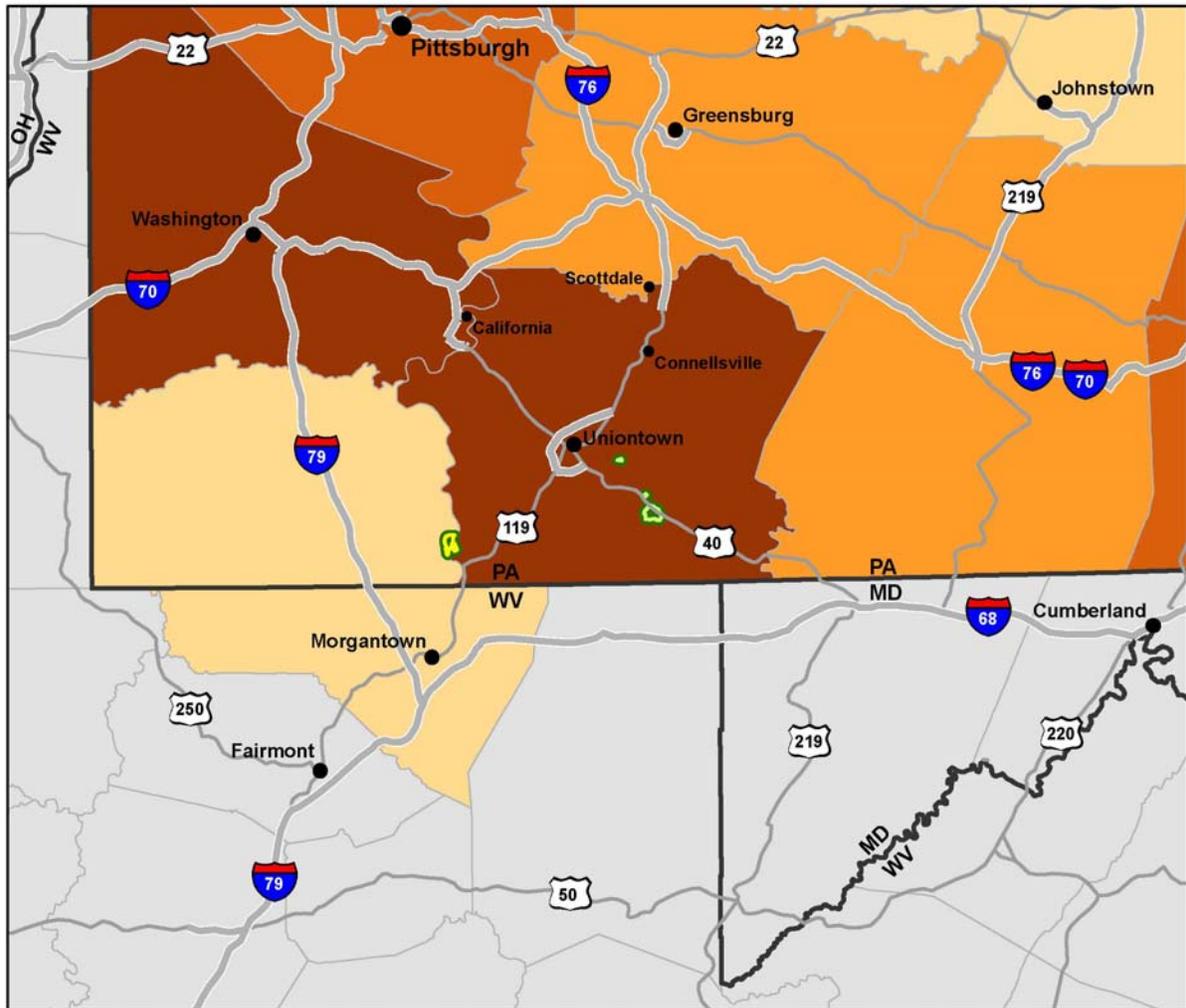
Seasonal Housing shows the percent of total housing units that are for seasonal use as nonpermanent residences by tract. (Data Source: US Census Bureau)

Nation: 3.1%
State: PA: 2.8% WV: 3.9% MD: 1.8% OH: 1.0%

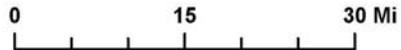
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 12. Seasonal Housing, 2000.

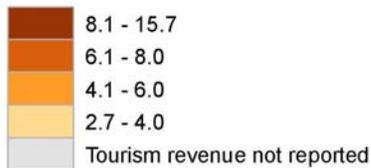


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- Friendship Hill NHS



Tourism Revenue

Percent of Service Related Sectors

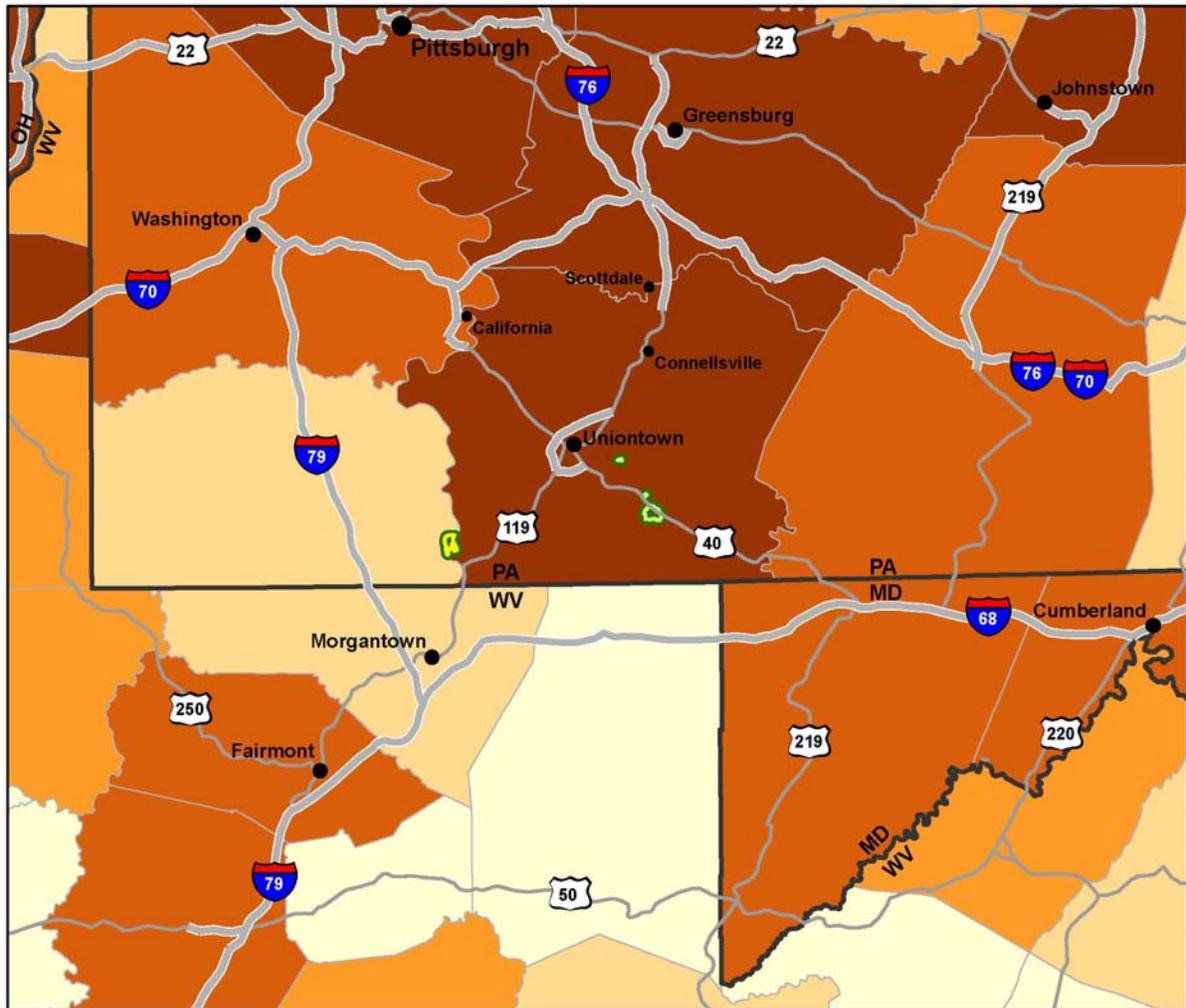


Tourism Revenue shows the percent of the total county revenue from service related sectors that comes from tourism industries.
(Data Source: US Census Bureau)

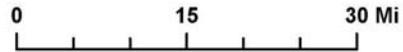
Nation 10.6%
State: PA: 7.3% WV: 10.6% MD: 7.4% OH: 6.8%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 13. Tourism Revenue, 2002.

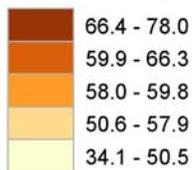


- Fort Necessity NB
- Friendship Hill NHS



Employment by Industry 1

Percent in Sales and Service



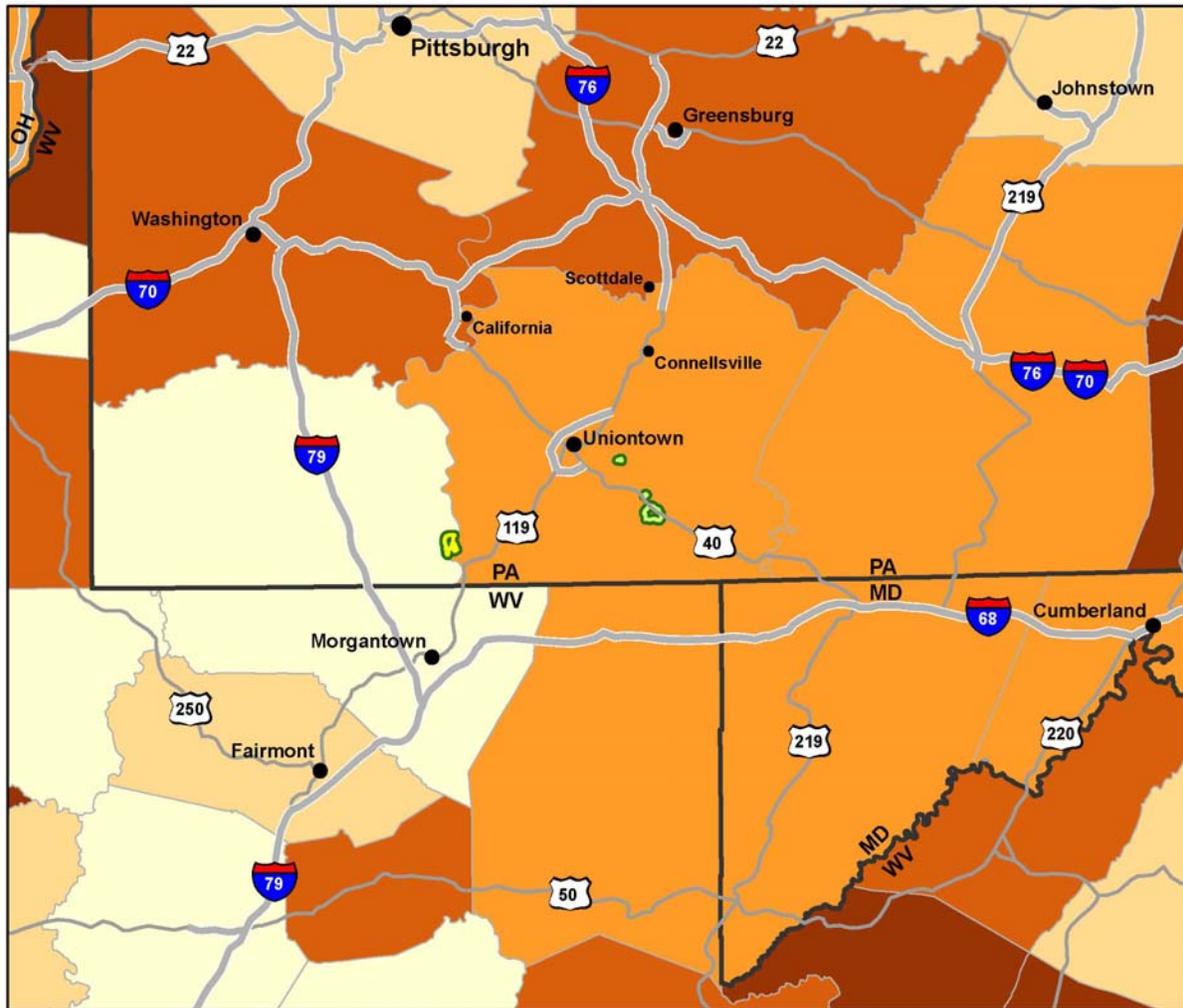
Employment by Industry 1 shows the percent of total county employees that work in sales and service. (Data Source: Woods and Poole)

Nation: 66.9%
State: PA: 69.2% WV: 63.1% MD: 69.9% OH: 65.5%

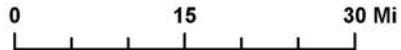
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 14. Employment by Industry 1 (Sales and Service), 2001.



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Employment by Industry 2
Percent in Construction and Manufacturing

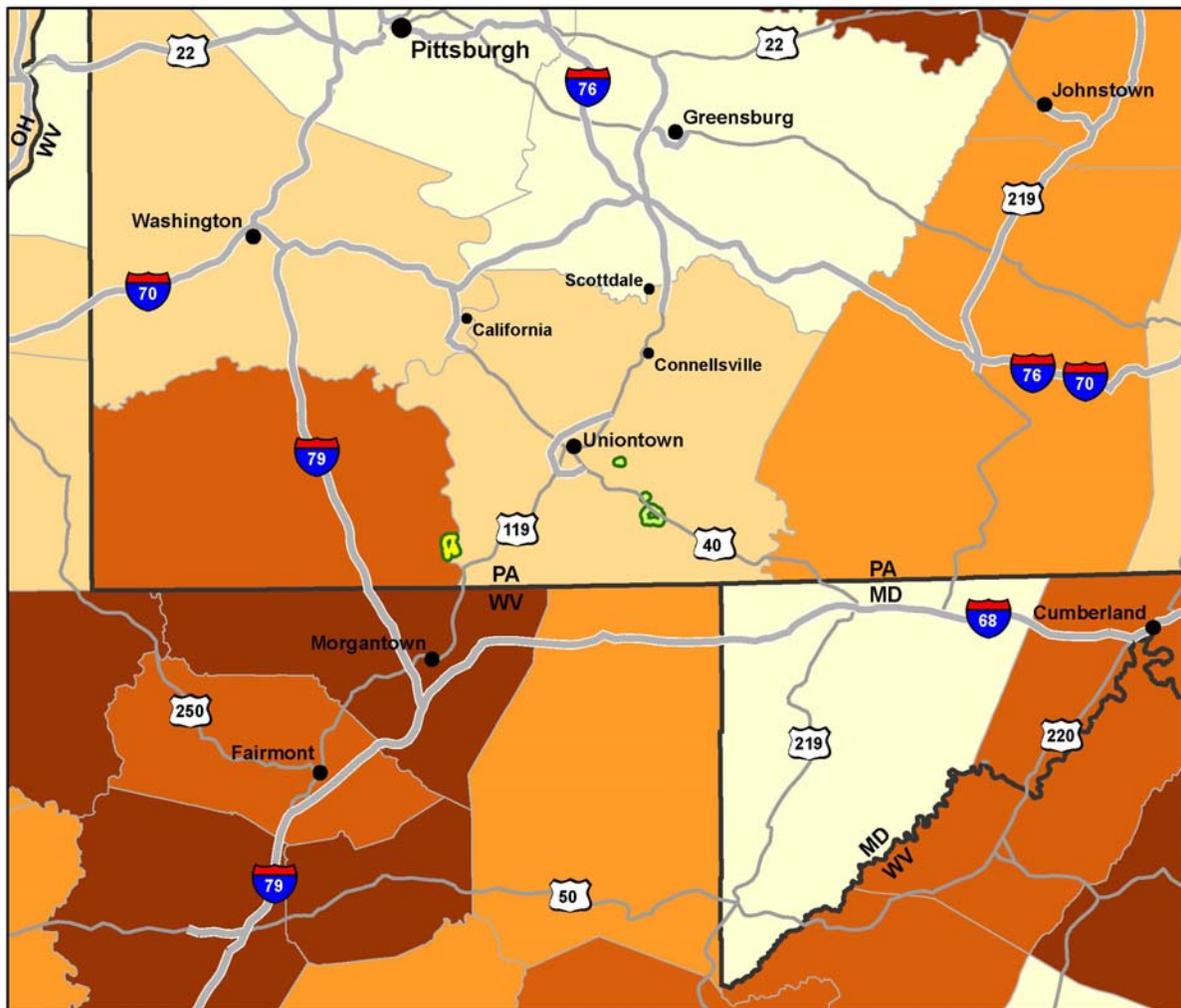


Employment by Industry 2 shows the percent of total county employees that work in construction and manufacturing. (Data Source: Woods and Poole)

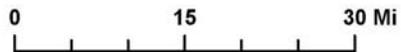
Nation: 15.3%
State: PA: 16.7% WV: 13.7% MD: 11.6% OH: 19.1%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 15. Employment by Industry 2 (Construction and Manufacturing), 2001.

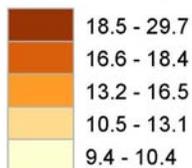


-  Fort Necessity NB
-  Friendship Hill NHS



Employment by Industry 3

Percent in Government



Employment by Industry 3 shows the percent of total county employees that work in government. (Data Source: Woods and Poole)

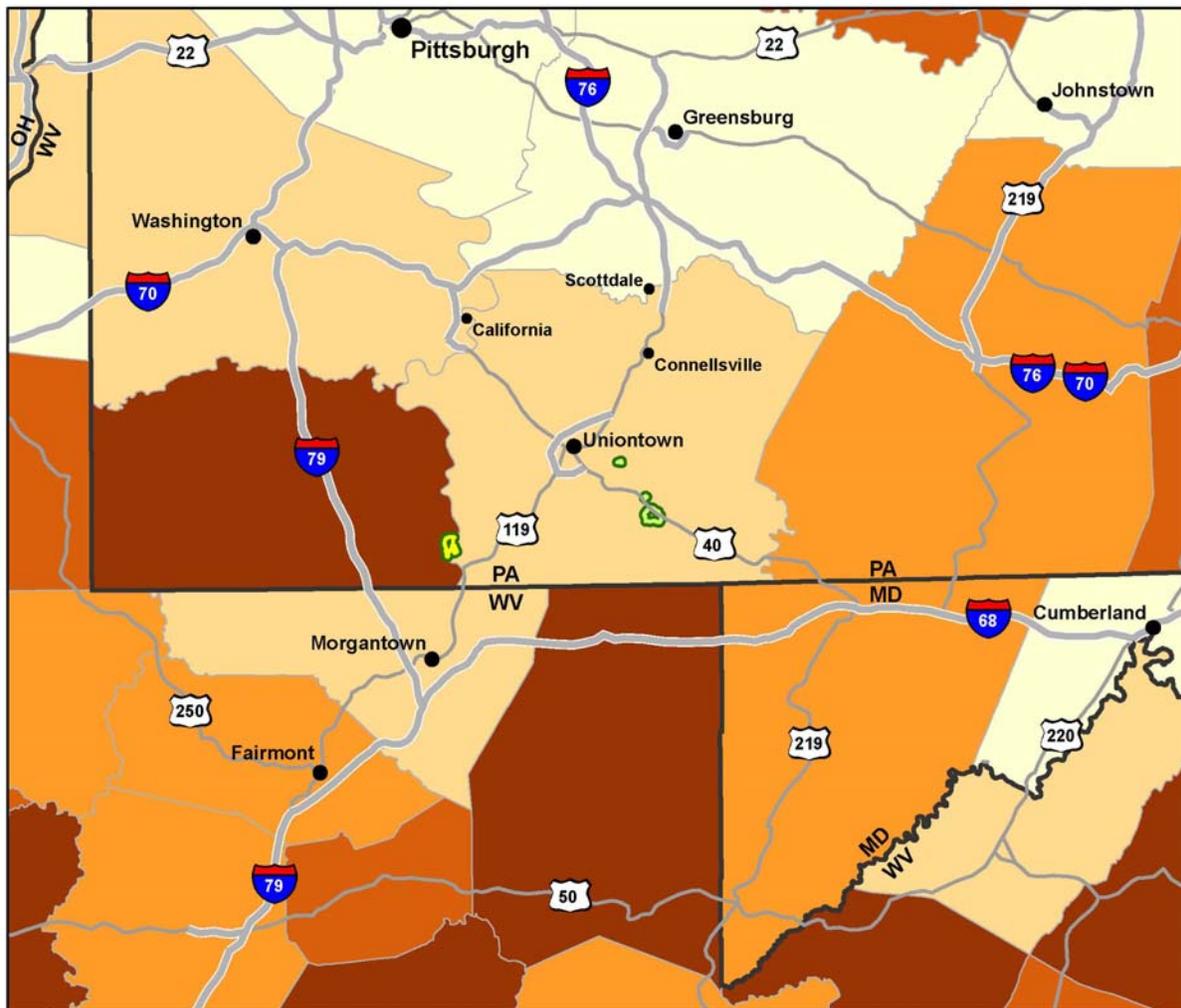
Nation: 14.2%

State: PA: 11.6% WV: 17.0% MD: 16.7% OH: 12.7%

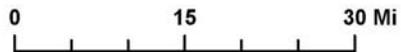
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

FONE-FRHI Figure 16. Employment by Industry 3 (Government), 2001.

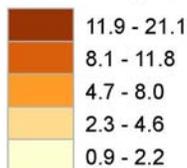


-  Fort Necessity NB
-  Friendship Hill NHS



Employment by Industry 4

Percent in Agriculture and Natural Resources



Employment by Industry 4 shows the percent of total county employees that work in agriculture and natural resources. (Data Source: Woods and Poole)

Nation: 3.6%

State: PA: 2.5% WV: 6.2% MD: 1.8% OH: 2.8%

Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

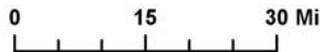
FONE-FRHI Figure 17. Employment by Industry 4 (Agriculture and Natural Resources), 2001.

Upper Delaware Scenic and Recreational River

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 **Upper Delaware Scenic and Recreational River**

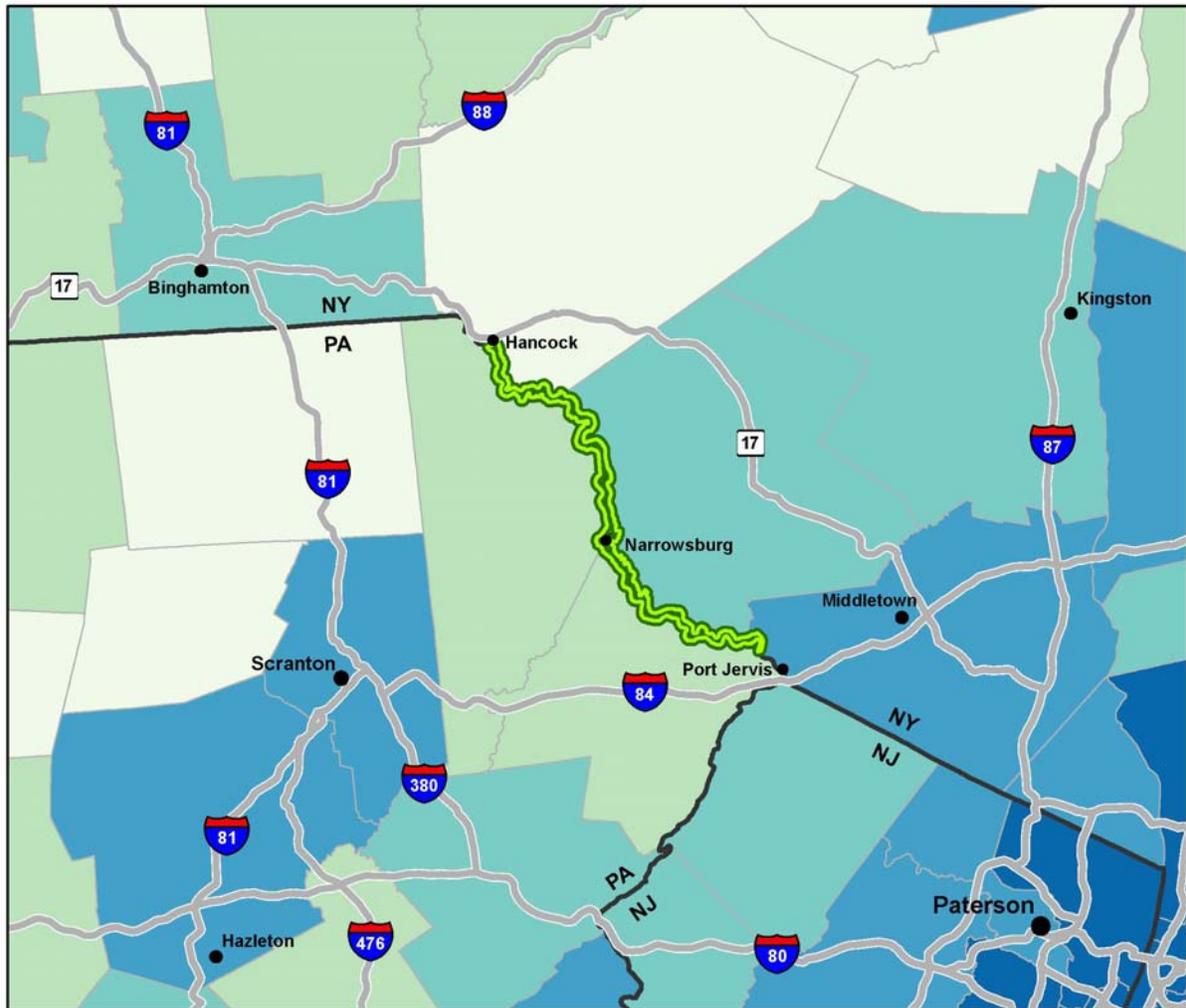


Classification Methods
The quantile classification method is used for most of the socioeconomic data maps. In this classification scheme, equal numbers of counties or census tracts are placed in each class. The quantile classification method is used to show the ranking of data while producing distinct mapping patterns.

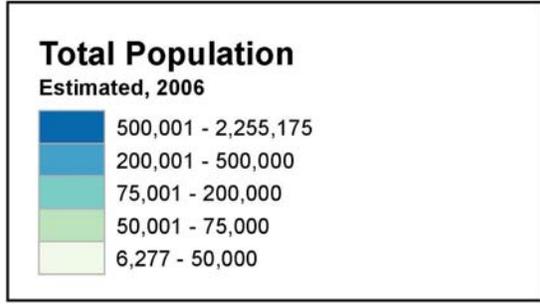
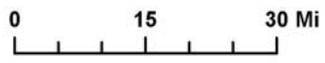
Explanation of Map Scales
In order to show data at a fine aggregation unit, census tracts were used when possible. When data were not available by census tract for the atlas, county data were collected. This map shows the counties for which data were collected at the smaller scale, with the census tract map area shown for reference.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 1. Location Map.



 Upper Delaware Scenic and Recreational River

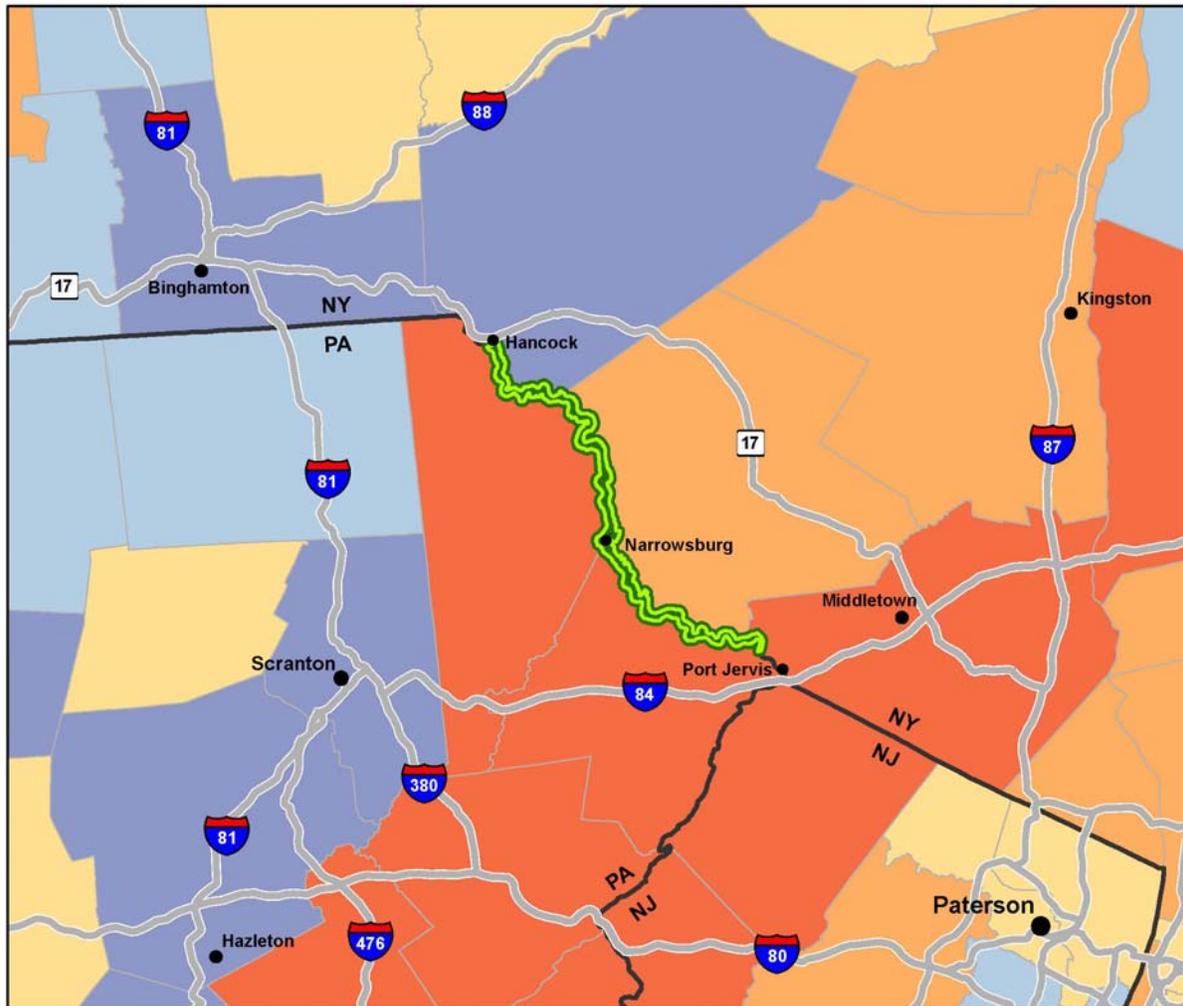


Total Population shows the total number of people in each county. (Data Source: US Census Bureau)

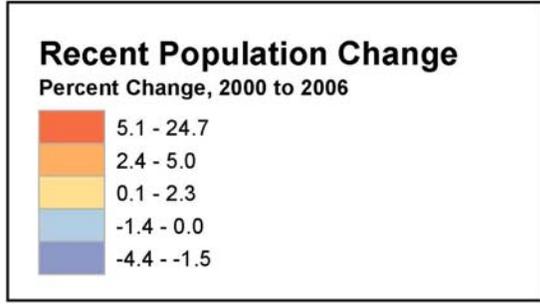
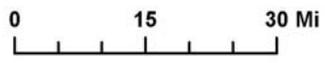
Nation: 299,398,484
State: NY: 19,306,183 PA: 12,440,621 NJ: 8,724,560

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 2. Estimated Total Population, 2006.



 Upper Delaware Scenic and Recreational River

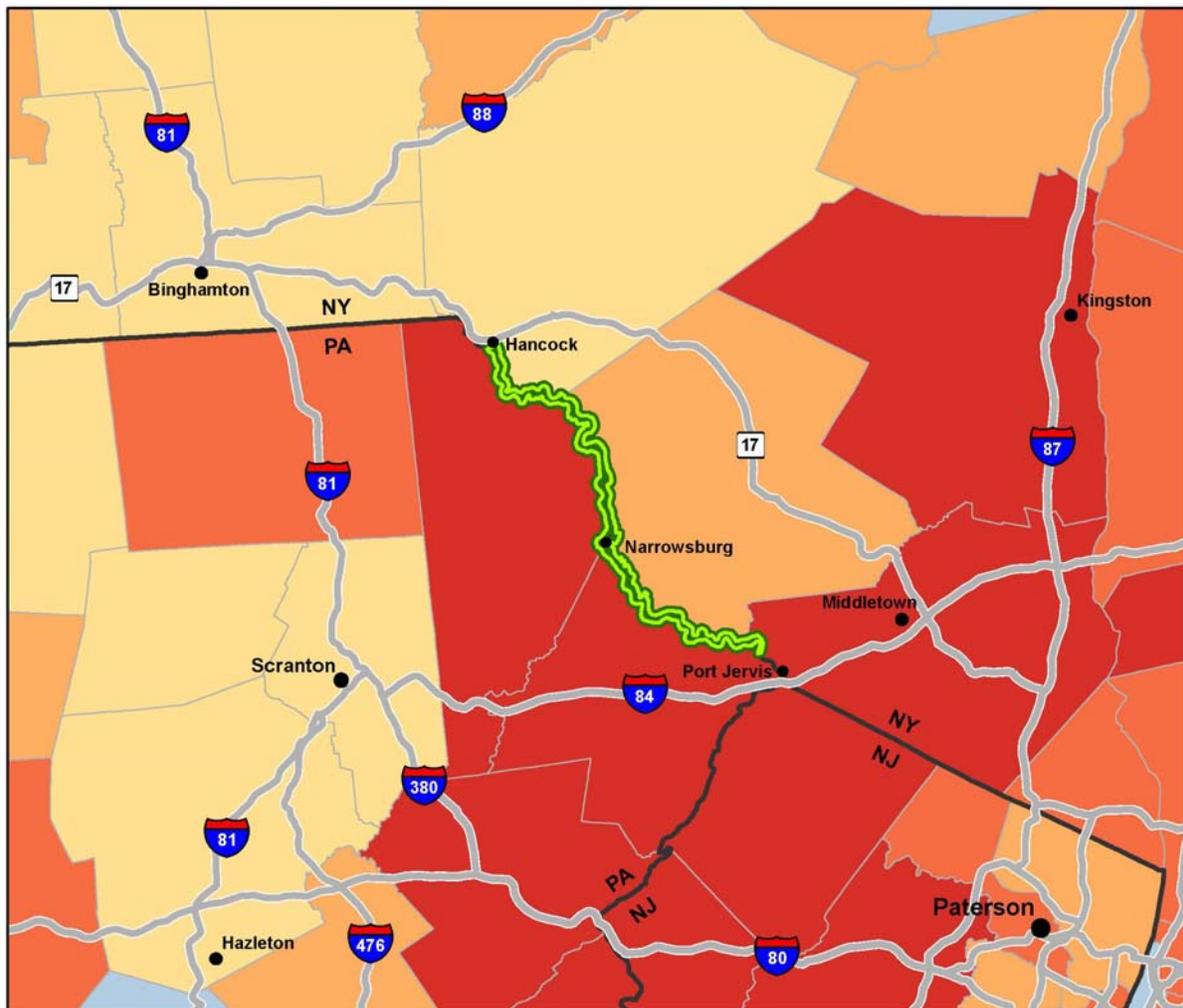


Recent Population Change shows the percent increase or decrease in the county population from 2000 to 2006. (Data Source: US Census Bureau)

Nation: 6.4%
State: NY: 1.7% PA: 1.3% NJ: 3.7%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 3. Recent Population Change, 2000-2006.



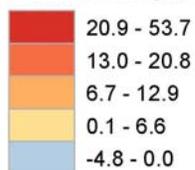
 Upper Delaware Scenic and Recreational River

0 15 30 Mi



Projected Population Change

Percent Change, 2006 to 2030



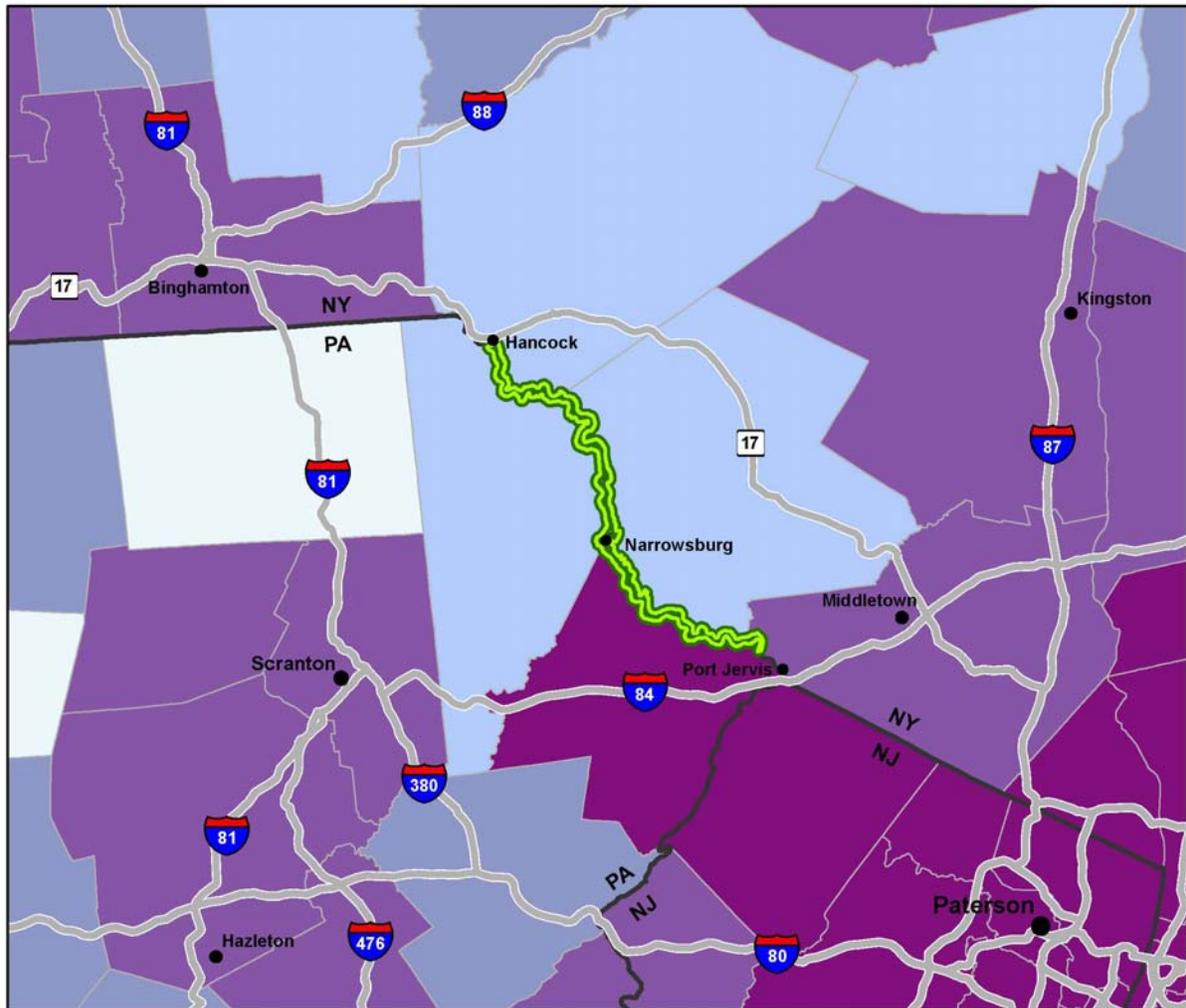
Projected Population Change shows the projected percent increase or decrease in the county population from 2006 to 2030. (Data Source: US Census Bureau; Woods and Poole)

Nation: 26.4%
State: NY: 10.5% PA: 12.2% NJ: 22.2%

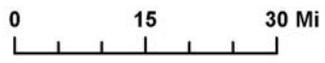
Base Map Sources: National Park Service, US Census Bureau, USGS

Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 4. Projected Population Change, 2006-2030.



 Upper Delaware Scenic and Recreational River



Urbanization
County is...

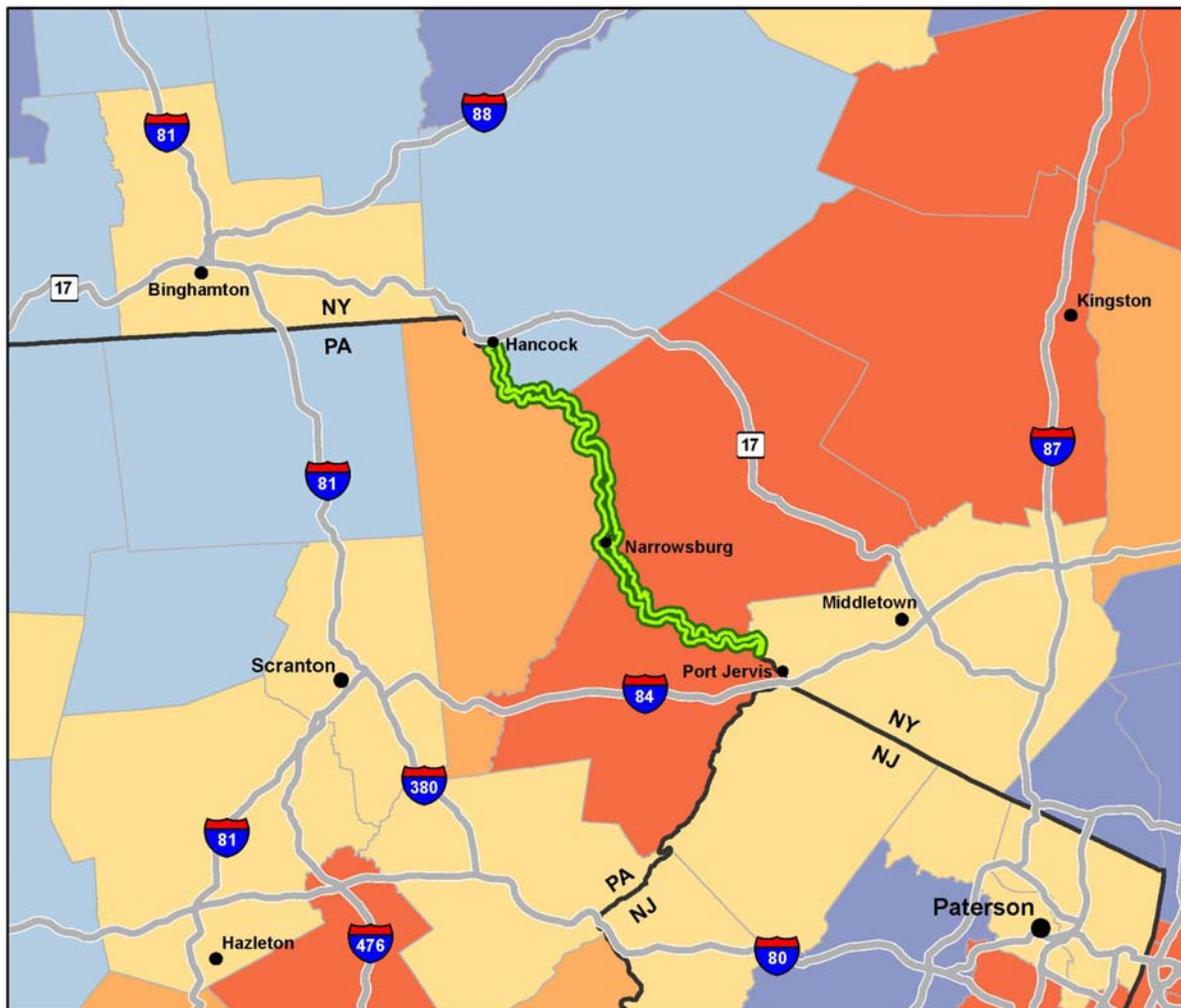
	In large metro area, over 1 million residents
	In small metro area, under 1 million residents
	Micropolitan or noncore adjacent to metro area
	Noncore adjacent to small metro with own town
	Noncore adjacent to small metro, with no own town

Urbanization influence is classified based on the county population, size of the largest city or town in the county, and proximity to metropolitan and micropolitan areas.

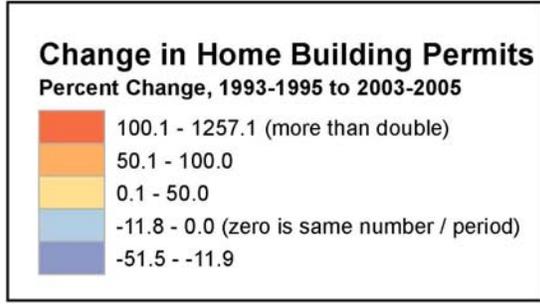
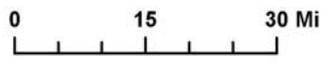
(Data Source: USDA Economic Research Service; <http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>)

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 5. Urbanization, 2003.



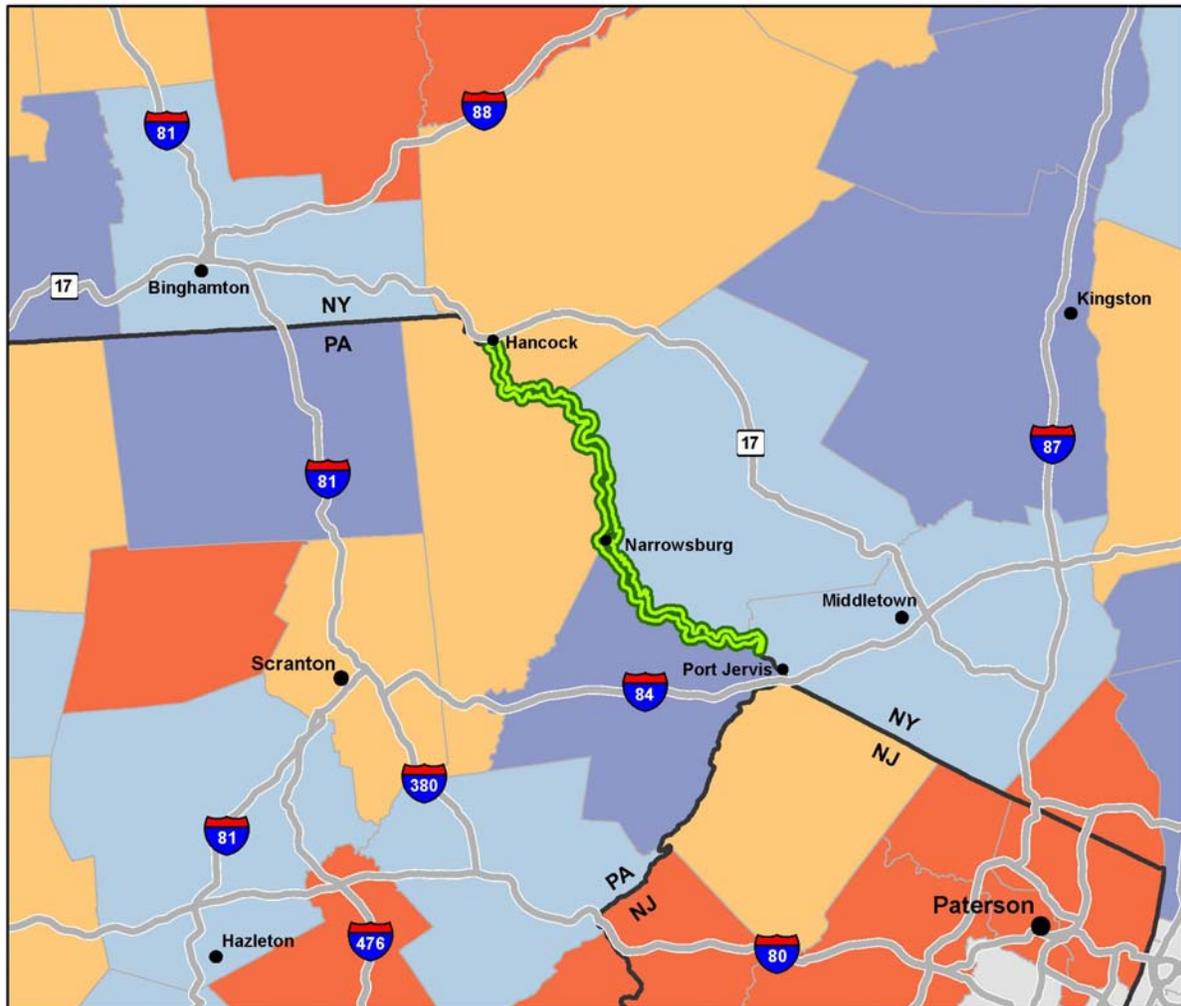
 Upper Delaware Scenic and Recreational River



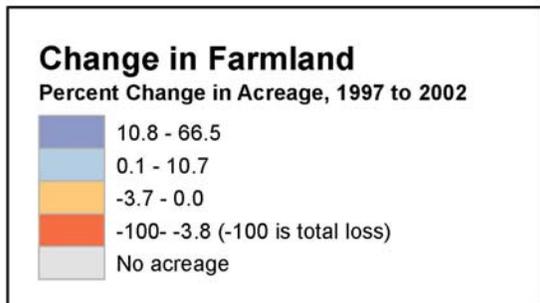
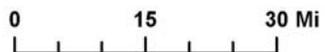
Change in Home Building Permits shows the percent change in the average number of privately-owned home building permits acquired between 1993-1995 and 2003-2005 by county. (Data Source: US Census Bureau)
Nation: 56.7%
State: NY: 88.1% PA: 21.4% NJ: 49.1%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 6. Change in Home Building Permits, 1993-1995 to 2003-2005.



 Upper Delaware Scenic and Recreational River

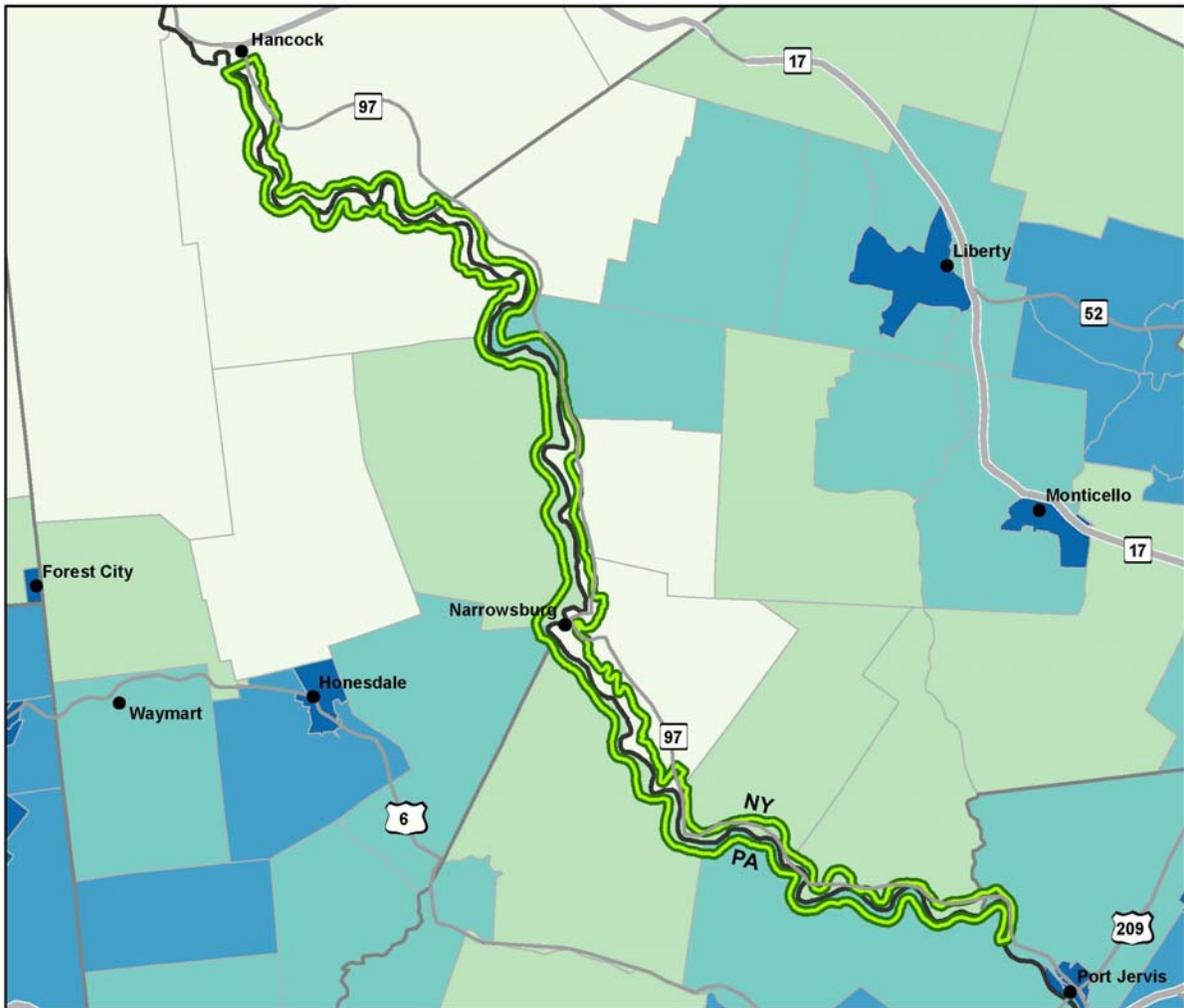


Change in Farmland shows the percent change in acreage from 1997 to 2002 by county. (Data Source: USDA-NASS)

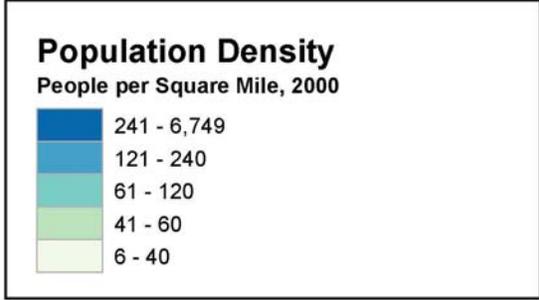
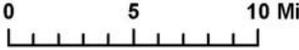
Nation: -1.7%
State: NY: -1.6% PA: -1.0% NJ: -6.0%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 7. Change in Farmland, 1997-2002.



 Upper Delaware Scenic and Recreational River



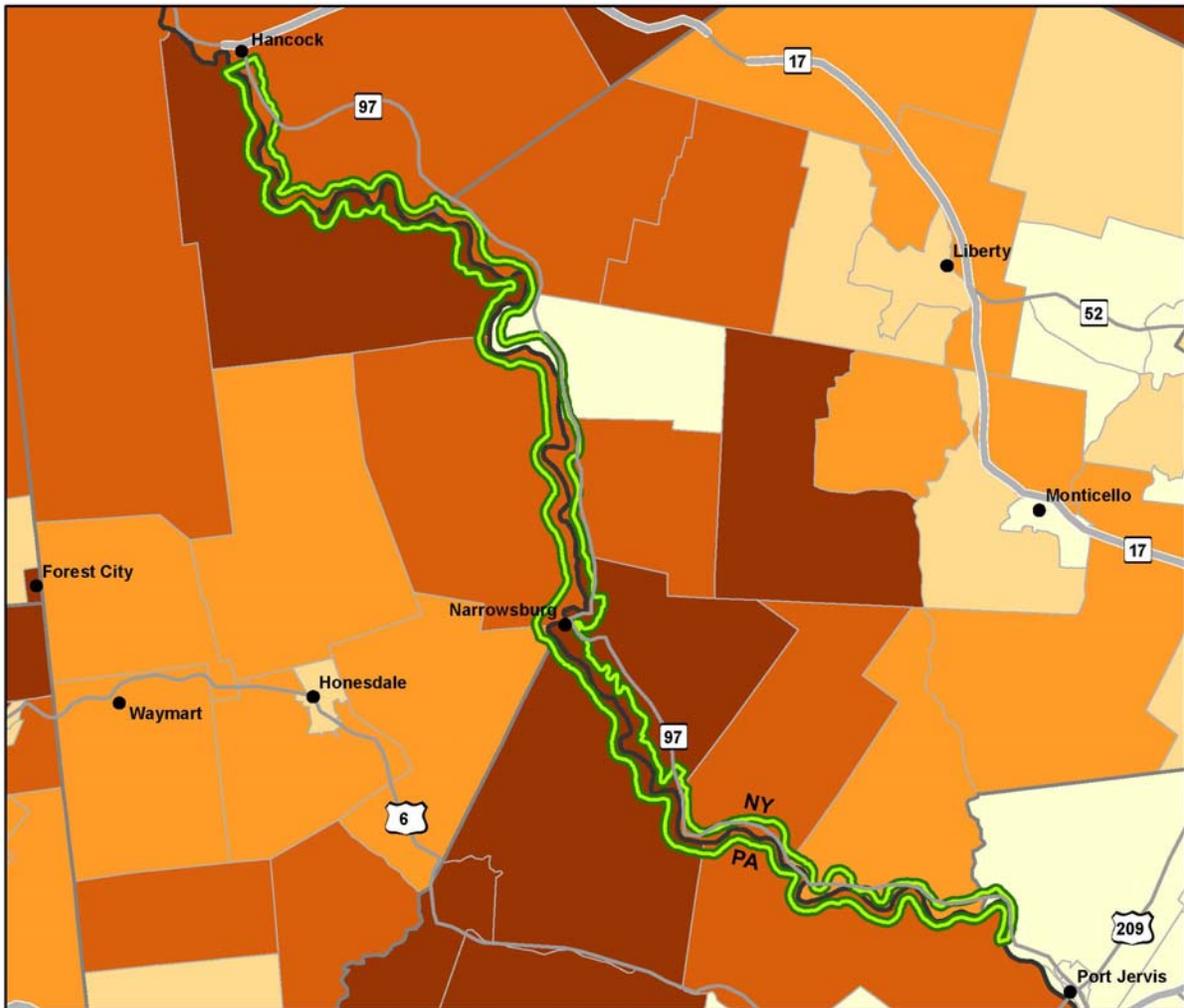
Population density is calculated by dividing total number of people by the number of square miles in each census tract. (Data Source: US Census Bureau)

Nation: 80
State: NY: 401 PA: 274 NJ: 1,134

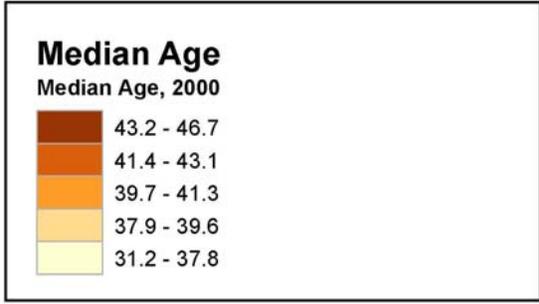
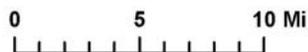
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 8. Population Density, 2000.



 **Upper Delaware Scenic and Recreational River**



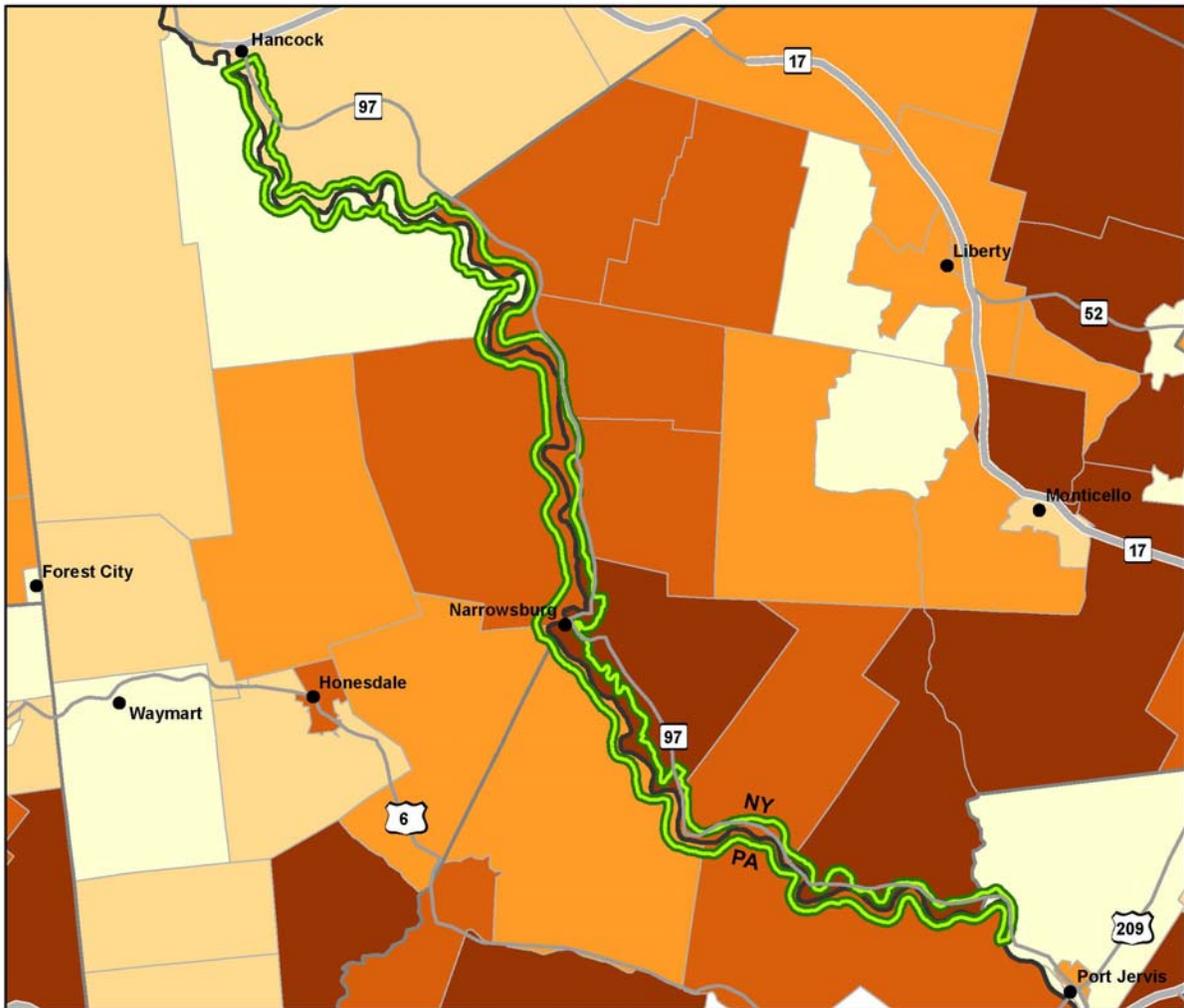
Median Age is the age value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 35.3
State: NY: 35.9 PA: 38.0 NJ: 36.7

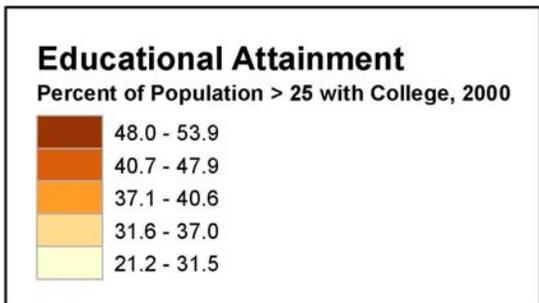
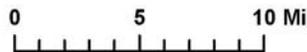
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 9. Median Age, 2000.



 Upper Delaware Scenic and Recreational River



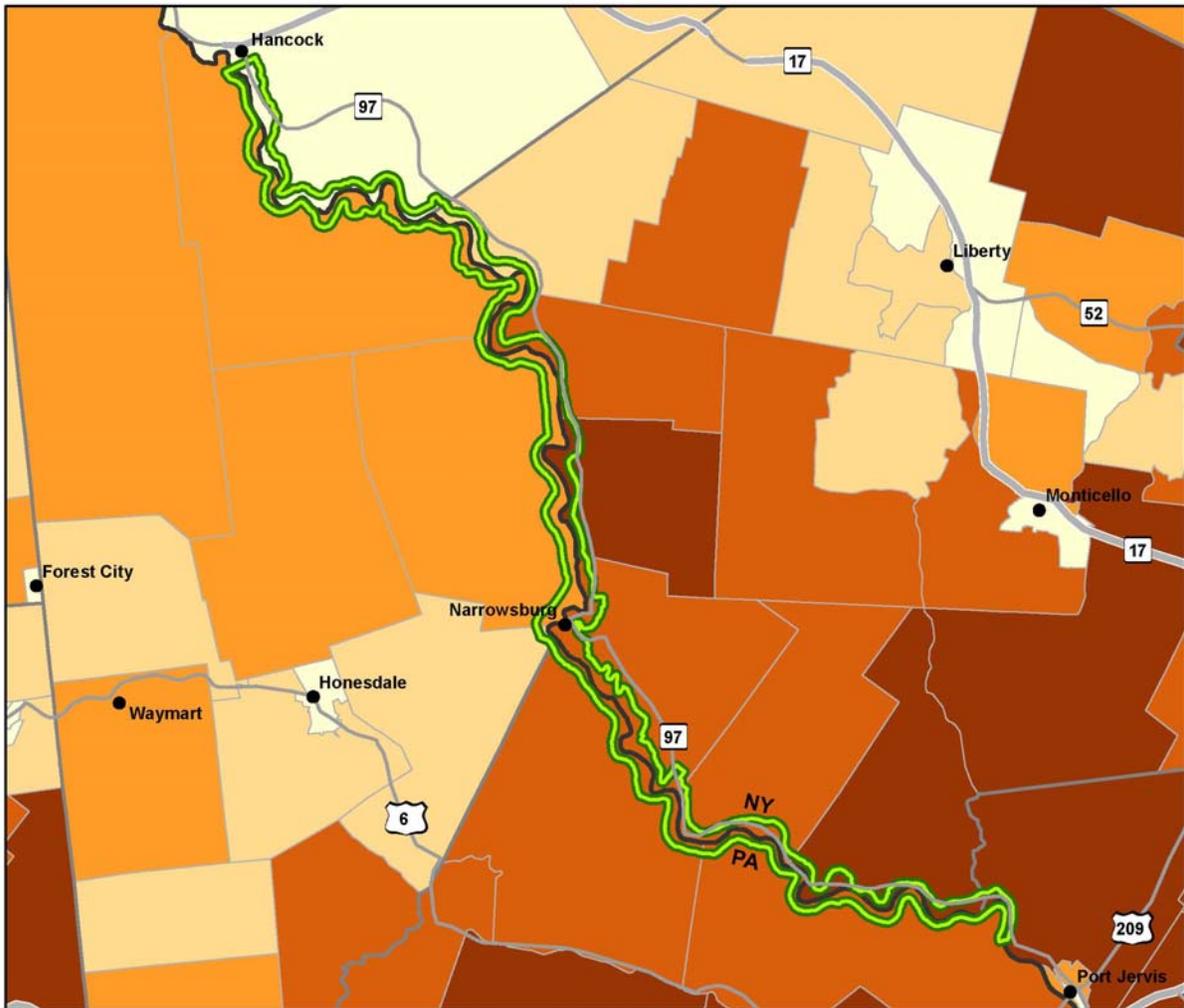
Educational Attainment shows the percent of the population age 25 and over with some college or a college degree. (Data Source: US Census Bureau)

Nation: 51.8%
State: NY: 51.3% PA: 43.8% NJ: 52.7%

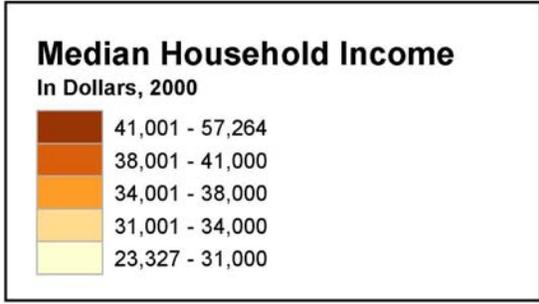
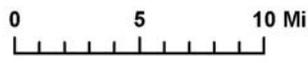
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 10. Educational Attainment, 2000.



 Upper Delaware Scenic and Recreational River



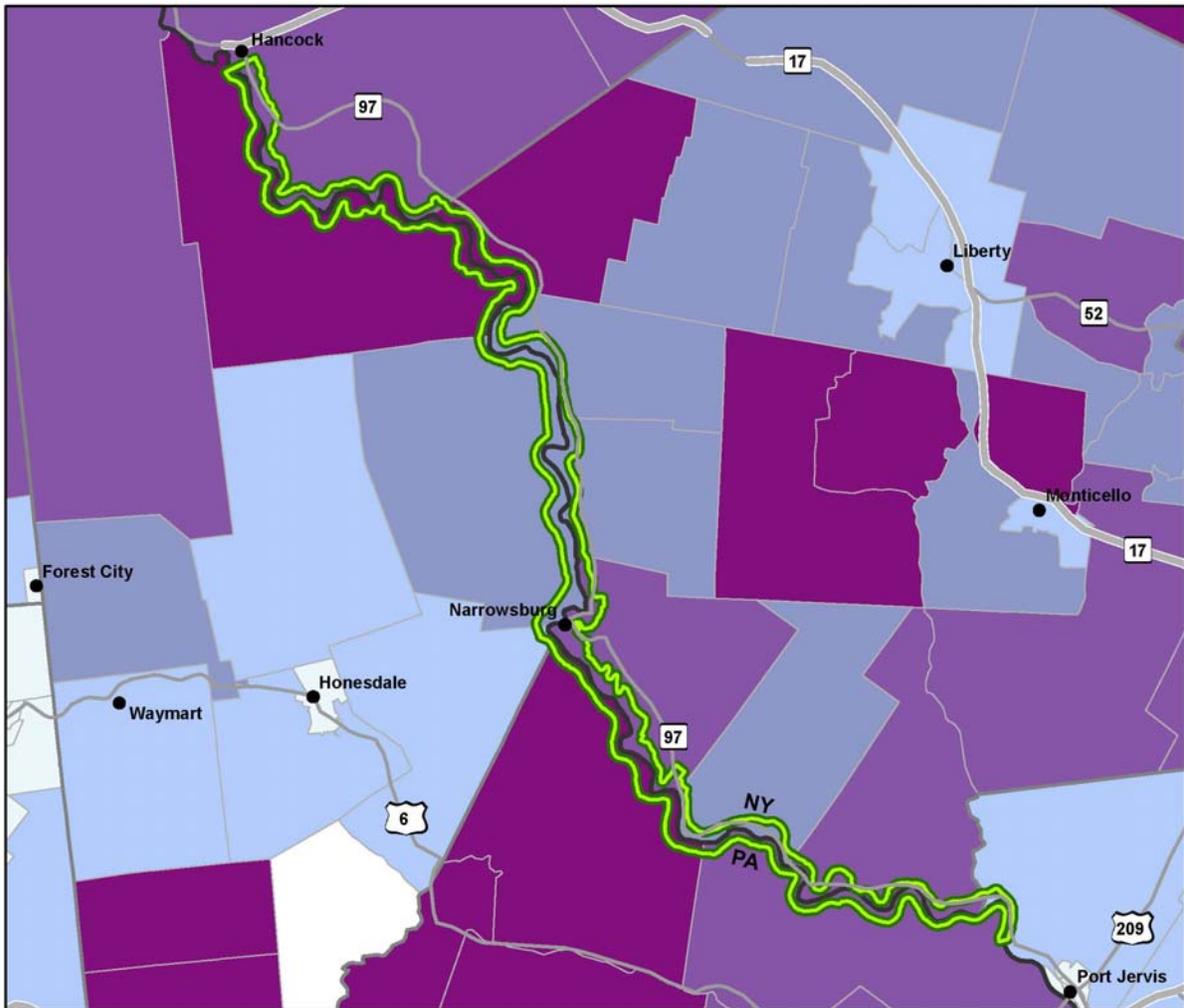
Median Household Income is the income value that falls in the exact middle of all values for each census tract. (Data Source: US Census Bureau)

Nation: 41,994
State: NY: 43,393 PA: 40,106 NJ: 55,146

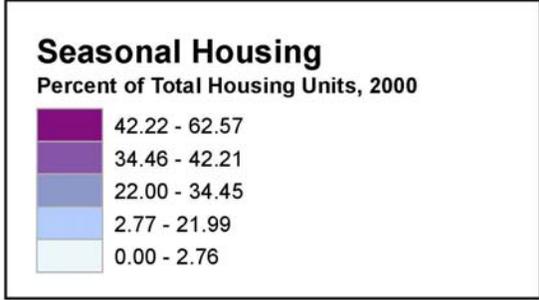
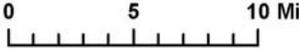
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 11. Median Household Income, 2000.



 **Upper Delaware Scenic and Recreational River**



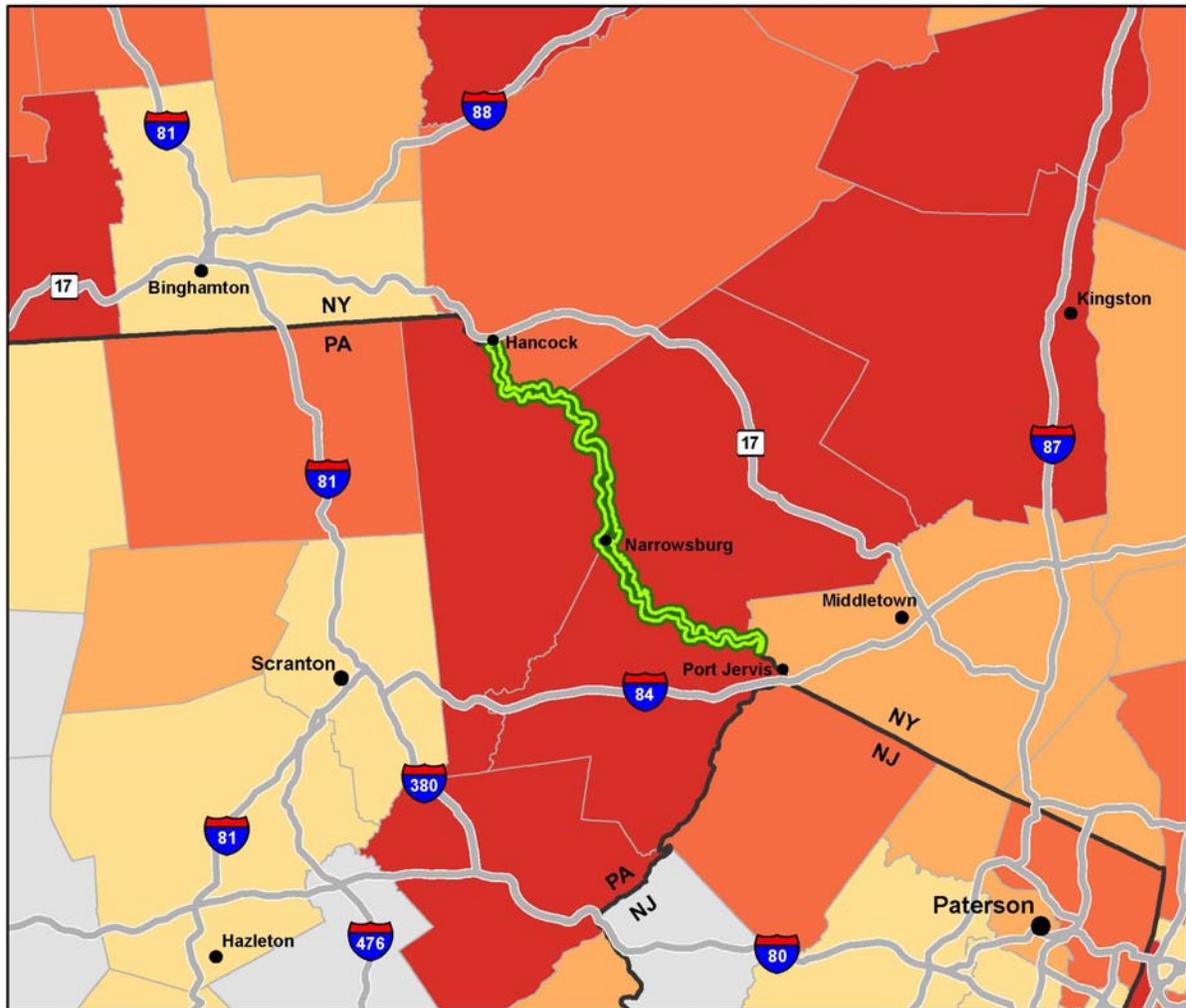
Seasonal Housing shows the percent of total housing units for seasonal use as nonpermanent residences by tract. (Data Source: US Census Bureau)

Nation: 3.1%
State: NY: 3.1% PA: 2.8% NJ: 3.3%

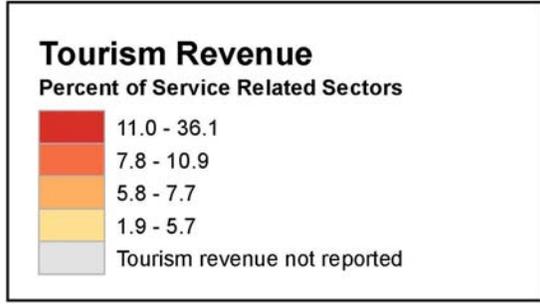
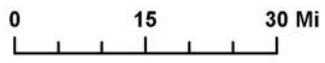
Census tracts average about 4,000 inhabitants and are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions.

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 12. Seasonal Housing, 2000.



 Upper Delaware Scenic and Recreational River

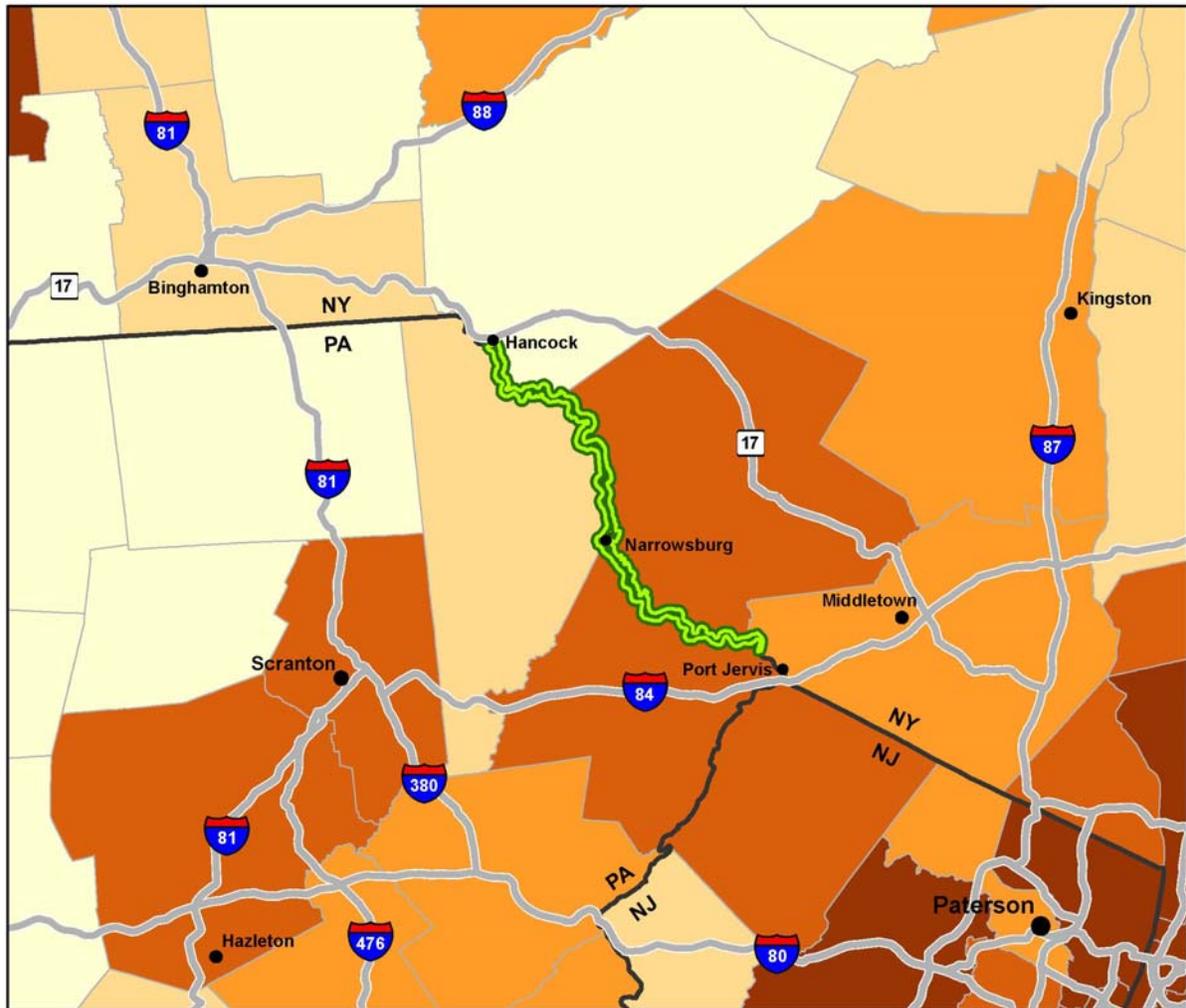


Tourism Revenue shows the percent of the total county revenue from service related sectors that comes from tourism industries.
(Data Source: US Census Bureau)

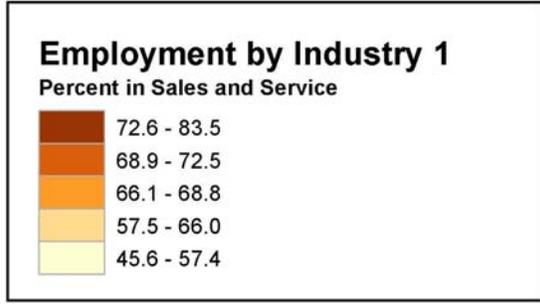
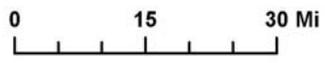
Nation: 10.6%
State: NY: 10.4% PA: 7.3% NJ: 11.6%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 13. Tourism Revenue, 2002.



 **Upper Delaware Scenic and Recreational River**

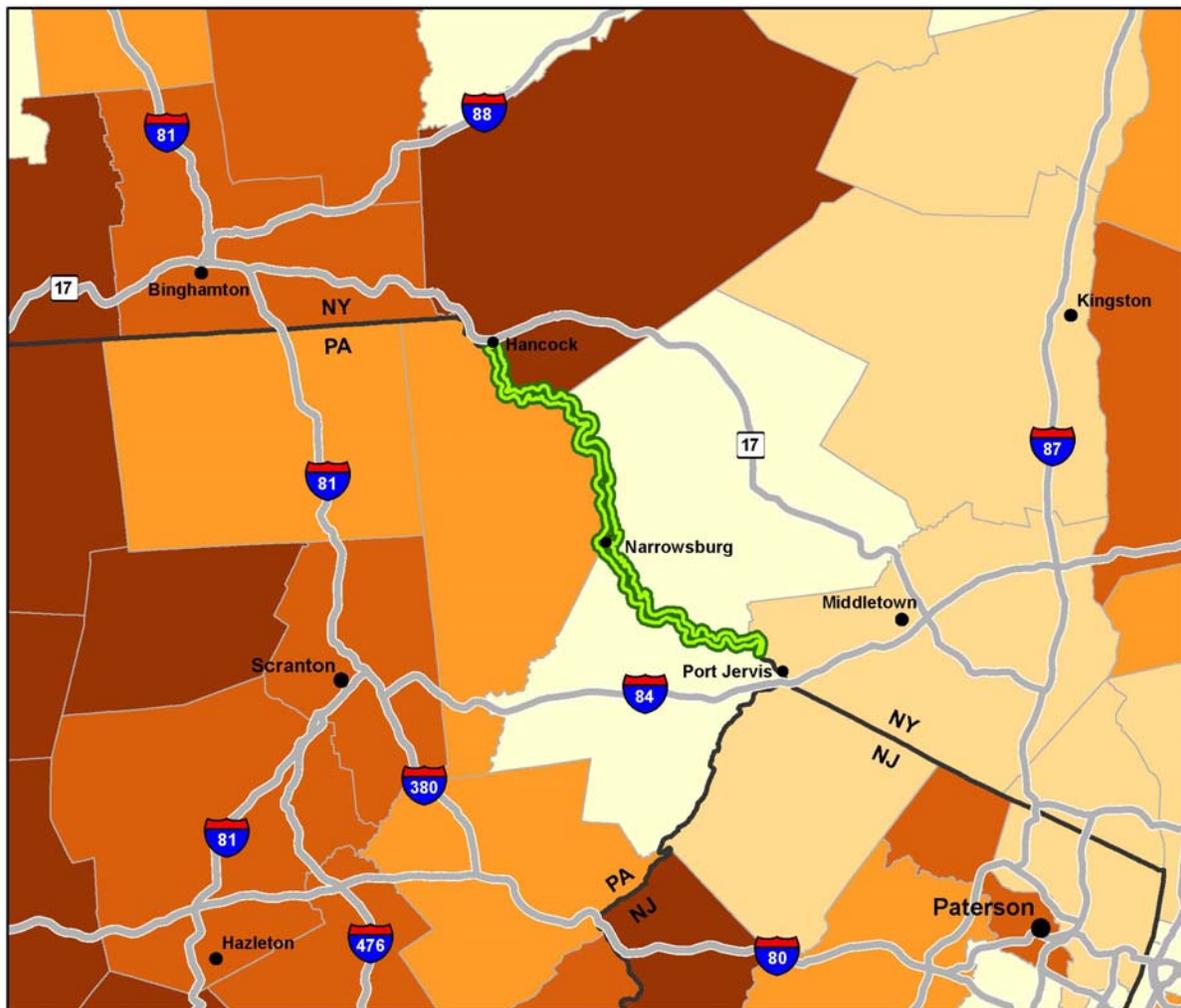


Employment by Industry 1 shows the percent of total county employees that work in sales and service. (Data Source: Woods and Poole)

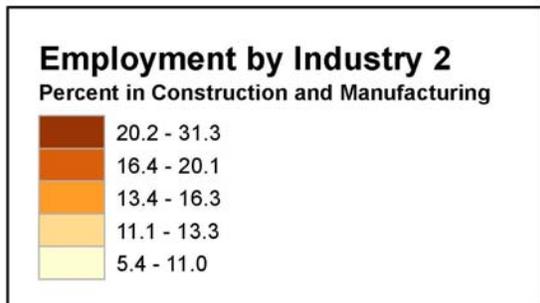
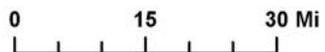
Nation: 66.9%
State: NY: 72.9% PA: 69.2% NJ: 72.7%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 14. Employment by Industry 1 (Sales and Service, 2001).



 **Upper Delaware Scenic and Recreational River**

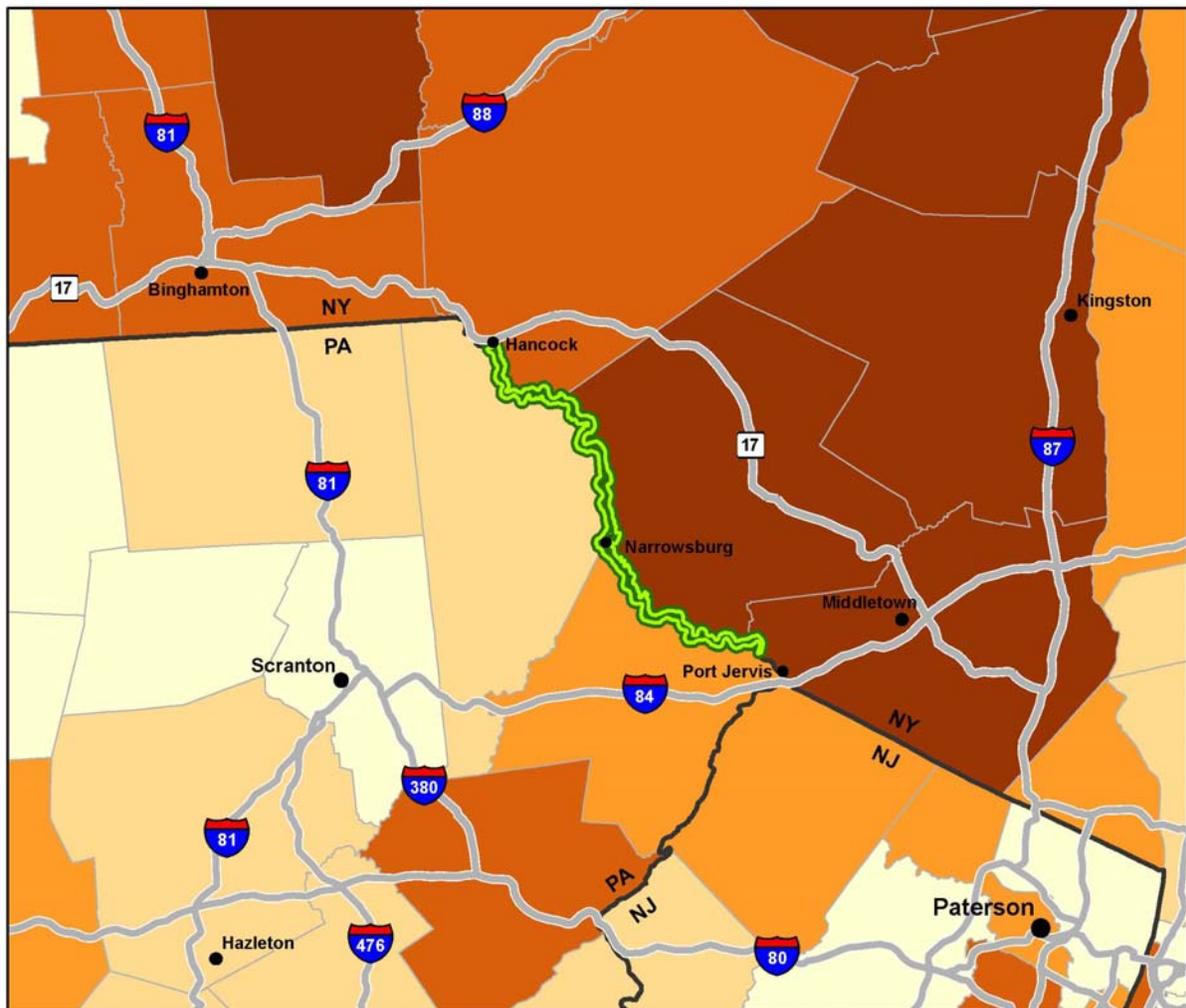


Employment by Industry 2 shows the percent of total county employees that work in construction and manufacturing. (Data Source: Woods and Poole)

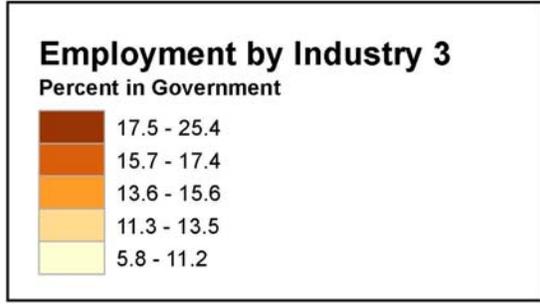
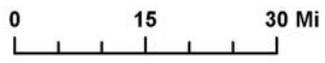
Nation: 15.3%
State: NY: 11.4% PA: 16.7% NJ: 12.9%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 15. Employment by Industry 2 (Construction and Manufacturing), 2001.



 **Upper Delaware Scenic and Recreational River**

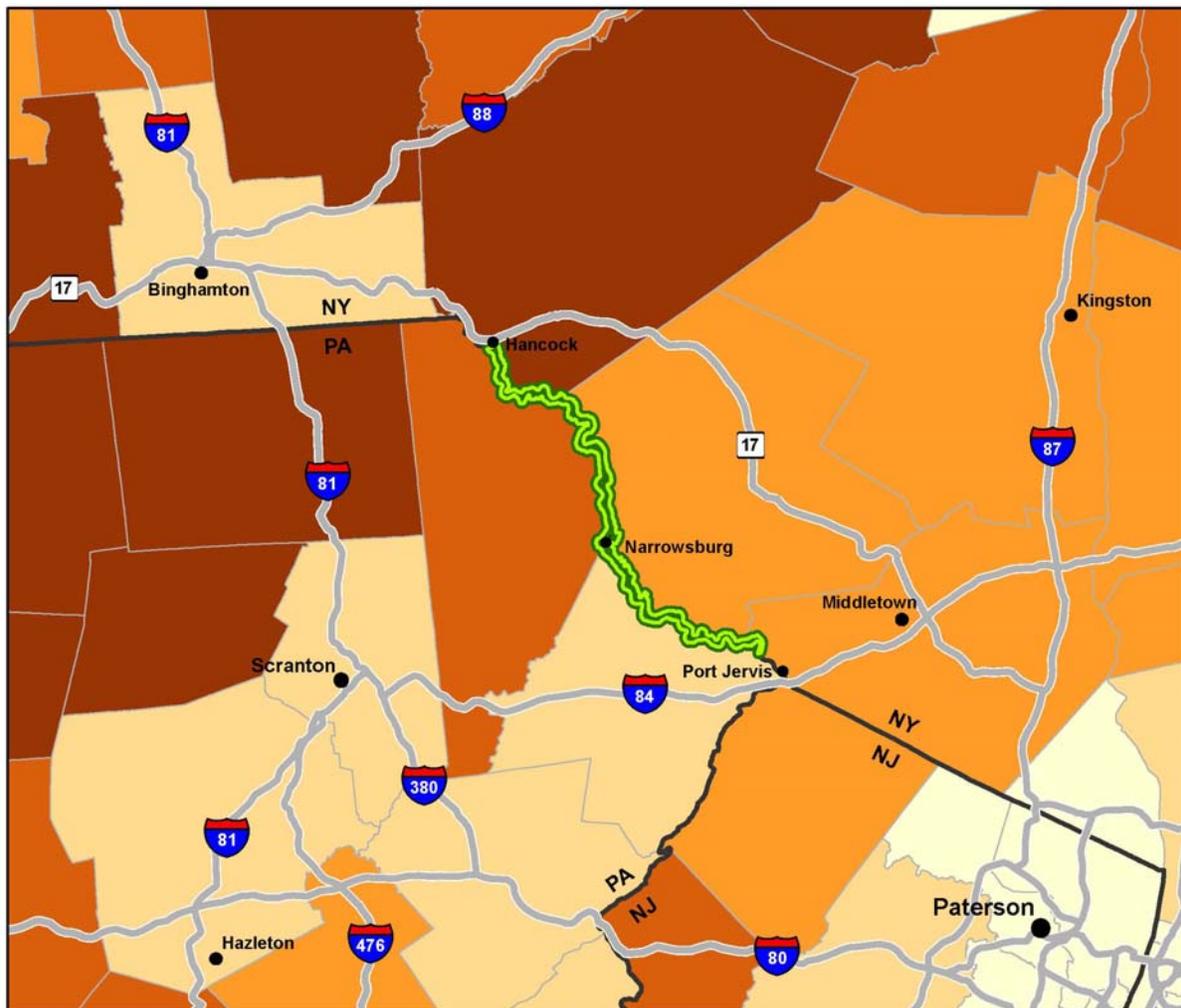


Employment by Industry 3 shows the percent of total county employees that work in government. (Data Source: Woods and Poole)

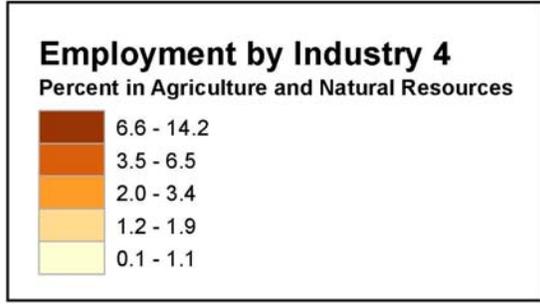
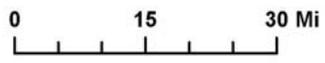
Nation: 14.2%
State: NY: 14.4% PA: 11.6% NJ: 13.1%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 16. Employment by Industry 3 (Government), 2001.



 **Upper Delaware Scenic and Recreational River**



Employment by Industry 4 shows the percent of total county employees that work in agriculture and natural resources. (Data Source: Woods and Poole)

Nation: 3.6%
State: NY: 1.4% PA: 2.5% NJ: 1.3%

Base Map Sources: National Park Service, US Census Bureau, USGS
Design: Gould Center for Geography Education and Outreach (Pennsylvania State University)

UPDE Figure 17. Employment by Industry 4 (Agriculture and Natural Resources), 2001.

Data Sources

<http://factfinder.census.gov>

Population Density, 2000
Median Age, 2000
Educational Attainment, 2000
Median Household Income, 2000
Seasonal Housing, 2000

<http://www.census.gov/const/www.permitsindex.html>

Change in Home Building Permits, 1993-1995 to 2003-2005

<http://www.census.gov/econ/census02>

Tourism Revenue, 2002

<http://www.census.gov/popest/datasets.html>

Estimated Total Population, 2006
Recent Population Change, 2000-2006
Projected Population Change, 2005-2030

<http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>

Urbanization, 2003

http://www.nass.usda.gov/Census/Create_Census_US_CNTY.jsp

Change in Farmland, 1997-2002

<http://www.woodsandpoole.com>

Projected Population Change, 2006-2030
Employment by Industry 1 (Sales and Service), 2001
Employment by Industry 2 (Construction and Manufacturing), 2001
Employment by Industry 3 (Government), 2001
Employment by Industry 4 (Agriculture and Natural Resources), 2001

Appendix A: Create ArcMap Templates

(This section is already completed, provided as a pair of templates on the provided CD**)**

This section describes how to prepare the ArcMap project files. By the end of this section, you should have a basic template for creating presentable choropleth maps using the layout frame in ArcMap. You should have two ArcMap files – one for counties, and the other for census tracts.

Add Template Elements

A.1. Create Layout Guides

1) Go to File > Document Properties > Data Source Options, and click on “Store relative path names to data sources.” This will allow you to move the ArcMap project and its files from one location to another or between computers.

2) Click on the button for the layout view in the bottom left of the data frame.



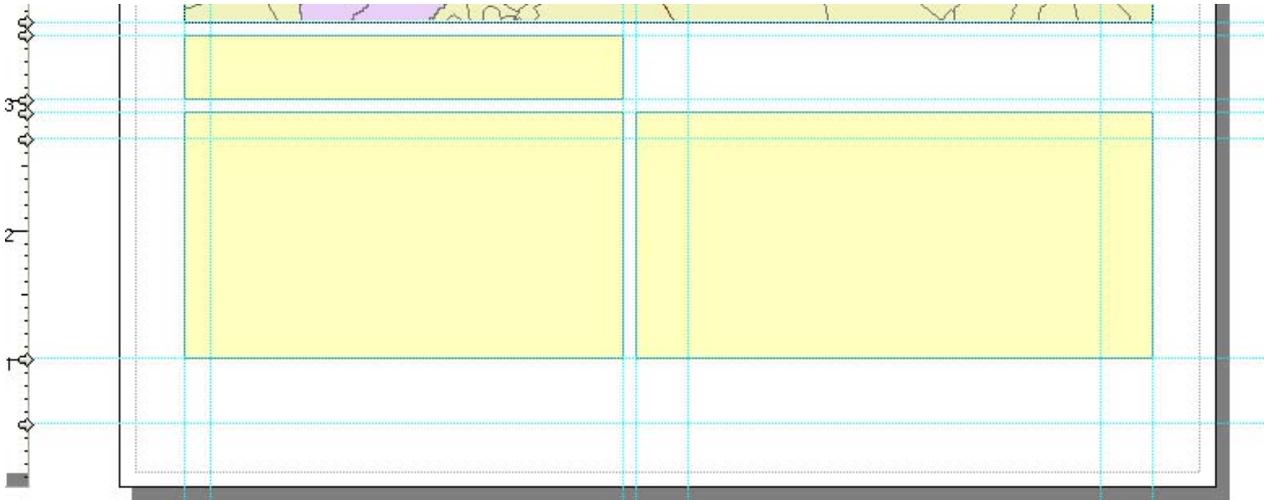
3) Click on the rulers on the left and top of the page to put guides at the following increments. Once you click, you can move the guides and the exact location on the ruler appears.

Side	Top
10.5 inches	0.5 inches
10.0	0.7
3.6	3.9
3.5	4.0
3.0	4.4
2.9	7.6
2.7	8.0
1.0	
0.5	

4) Click on the map frame and move the sides of the frame so that it fits within the guides at 0.5 and 8.0 on top, and 10.0 and 3.6 on the side.

A.2. Add Legend Frames

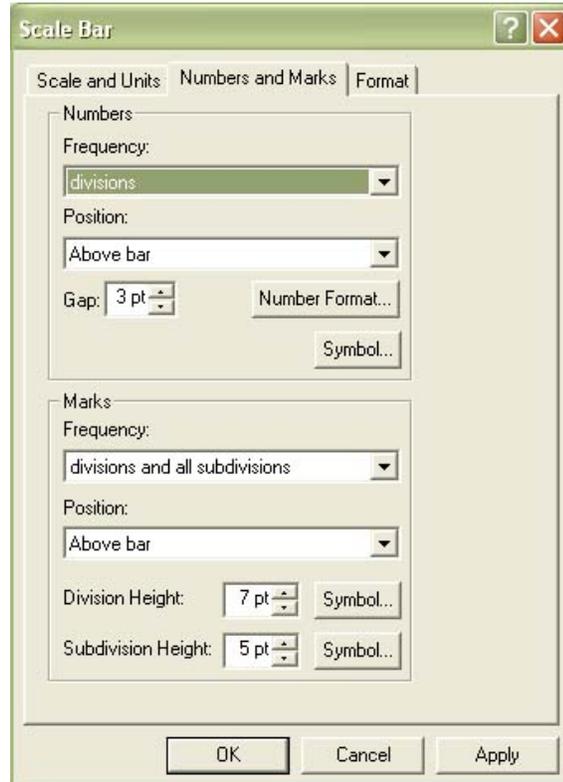
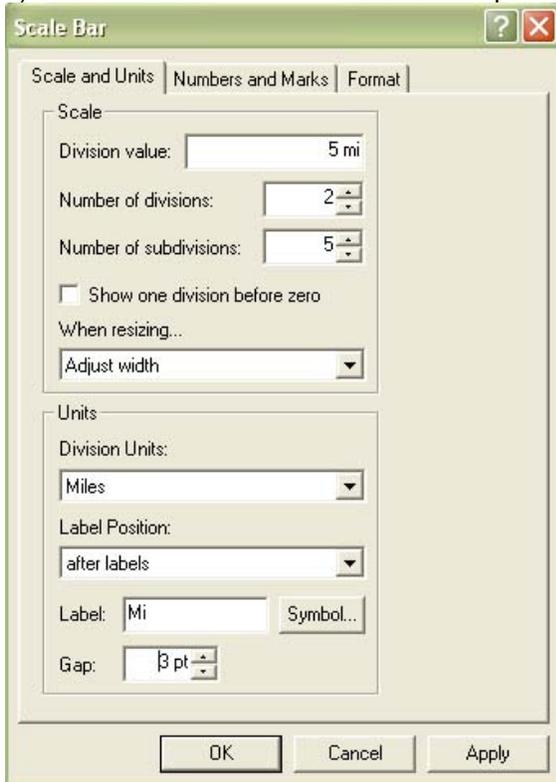
1) Click the New Rectangle button next to the New Text button. Draw rectangles so they are in line with the guides as you see below:

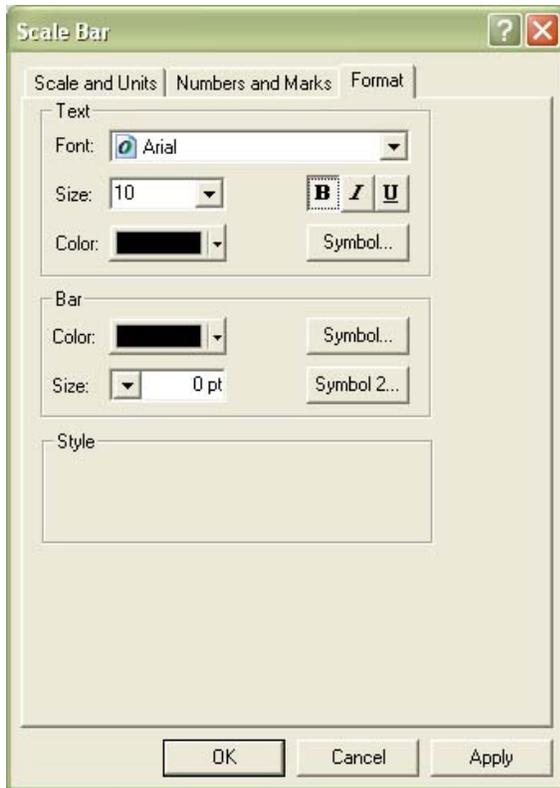


2) Double-click on each box and change the Fill Color to No Color, the Outline Color to Black, and the Outline Width to 1.00.

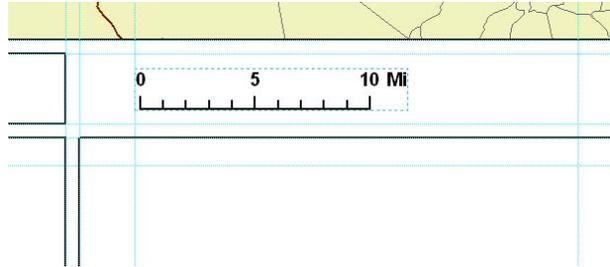
A.3. Add Scale Bar

- 1) Go to the Menu Tab “Insert” and select “Scale Bar.”
- 2) Choose “Scale Line 1” and click on Properties.



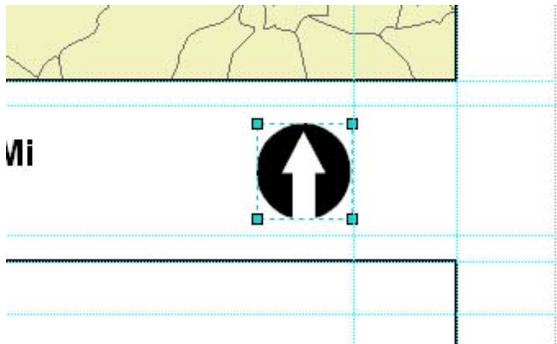


3) After choosing the formatting in the properties window, nudge the scale into the following position on the layout below the map:



A.4. Add North Arrow

- 1) Go to the Menu Tab "Insert" and select "North Arrow".
- 2) Choose ESRI North 47.
- 3) Click on Properties and set the size to 33.
- 4) Nudge the north arrow into the following position on the layout:

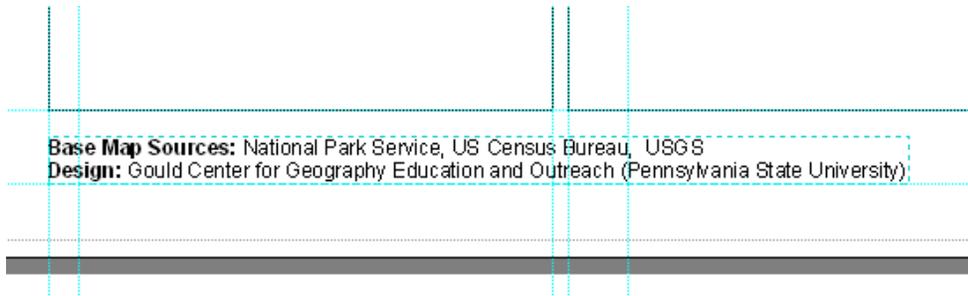


A.5. Add Sources

1) Click on the New Text button and click on the bottom of the layout. Double-click on the text box and enter the following in the text block:

<BOL>Base Map Sources:</BOL> National Park Service, US Census Bureau, USGS
<BOL>Design:</BOL> Gould Center for Geography Education and Outreach (Pennsylvania State University)

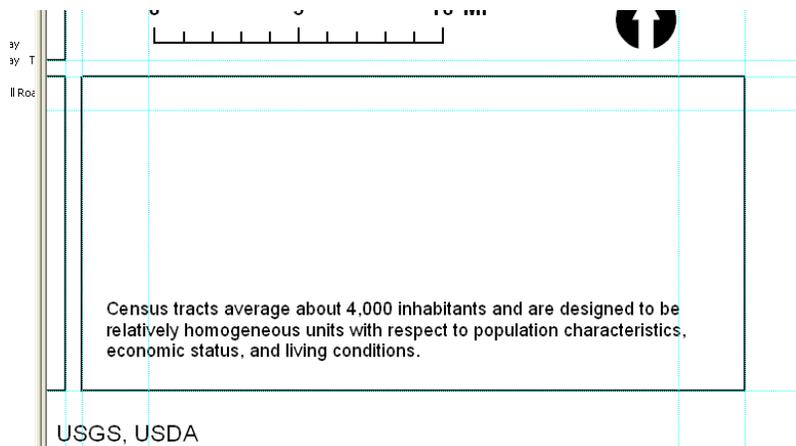
2) Position the text as follows:



A.6. Add Title

1) Title the map: Delaware Water Gap National Recreation Area (or the park name) and on the next line type “Census Tract Map.”

2) Add the following in the lower right legend box in the following position:



3) Save the file as template_tracts.mxd within the main folder named after the park (DEWA...).

4) Change “Census Tract Map” to read “County Map” in the title.

5) Save this file as template_counties.mxd

Appendix B. Data collection and definitions for Socioeconomic Indicator Mapping, Version 2.0 (May 2008).

Data Representation

Scale and Aggregation

In order to show data at a fine aggregation unit, census tracts were used when possible. Census tracts are defined by the U.S. Census Bureau as “small, relatively permanent statistical subdivisions of a county... Census tracts usually have between 2,500 and 8,000 persons and, when first delineated, are designed to be homogeneous with respect to population characteristics, economic status, and living conditions. Census tracts do not cross county boundaries. The spatial size of census tracts varies widely depending on the density of settlement. Census tract boundaries are delineated with the intention of being maintained over a long time so that statistical comparisons can be made from census to census. However, physical changes in street patterns caused by highway construction, new development, etc., may require occasional revisions; census tracts occasionally are split due to large population growth, or combined as a result of substantial population decline” (http://www.census.gov/geo/www/cen_tract.html).

When data were not available by census tract for the atlas, county data were collected.

Classification Methods

For most of the maps, the quantile classification method is used. In this classification scheme, equal numbers of counties or census tracts are placed in each class. The quantile classification method is used to show the ranking of data while producing distinct mapping patterns. When appropriate, the class breaks are rounded to make the legend more readable, while keeping the number of enumeration units in each class as equal as possible. When values fall above and below zero, nested quantiles are used; all classes above zero have an equal number of counties/tracts, and classes below zero have a different number.

When the quantile scheme is not appropriate, other methods are used. For example, Urbanization by county is grouped placing counties with similar urbanization “codes” together.

In an effort to better understand human activities outside national park boundaries, Jean McKendry, of the University of Idaho, in cooperation with Gary E. Machlis, Visiting Senior Scientist with the National Park Service, and Cindy Brewer of the Pennsylvania State University, produced socioeconomic atlases for 15 national parks around the country. These atlases were distributed to the participating parks and their staffs in 2004, and can be viewed by NPS staff through the NatureBib webserver. For more information, send an email to jeanm@uidaho.edu.

The Standard Mapping Procedure instructs the user to download GIS data from the internet and create maps of socioeconomic indicators chosen from a list of 67 used in the atlases produced through 2004. The indicators in the Standard Mapping Procedure were determined to be most relevant to Eastern Rivers and Mountains Network natural resource management. McKendry’s data descriptions in this Data Collections and Methods document are summaries derived from the federal sources.

Data Collection and Definitions for Socioeconomic Indicator Mapping: Counties

Total Population

Collected from <http://factfinder.census.gov>

Population Estimates Program

2006 Population Estimates: T1 (Population Estimates)

T001001(Total Population: July 1, 2006)

These data reflect the total estimated population for each county. “Persons enumerated in the census were counted as inhabitants of their usual place of residence, which generally means the place where a person lives and sleeps most of the time. This place is not necessarily the same as the legal residence, voting residence, or domicile. In the vast majority of cases, however, the use of these different bases of classification would produce substantially the same statistics, although appreciable differences may exist for a few areas” (McKendry).

Recent Population Change

Collected from <http://factfinder.census.gov>

Population Estimates Program

2006 Population Estimates: T1 (Population Estimates)

T001001(Total Population: July 1, 2006)

T001007(Total Population: July 1, 2000)

$$= (T001001 - T001007) * 100 / T001007$$

This value is the percent change in the population from July 1, 2000 to July 1, 2006.

Projected Population Change

Collected from <http://factfinder.census.gov>

Population Estimates Program

2006 Population Estimates: T1 (Population Estimates)

and

Purchased from Woods & Poole (<http://woodsandpoole.com/>)

Estimated 2006 population by the U.S. Census Bureau (T001001 (Total Population: July 1, 2006))

standardized by

2030 Projected Total Population by Woods and Poole

For an explanation of Woods & Poole’s projection methods see page 11 in the Woods and Poole Technical Documentation manual. See also page 3 of <http://www.woodsandpoole.com/pdfs/TECH06.pdf>.

Urbanization

Collected from <http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>

The Economic Research Service classifies counties according to their level of urbanization. The classification consists of twelve mutually-exclusive codes:

METROPOLITAN COUNTIES

- 1) In large metro area of greater than 1 million residents
- 2) In small metro area of less than 1 million residents

NONMETROPOLITAN COUNTIES

- 3) Micropolitan adjacent to large metro
- 4) Noncore adjacent to large metro
- 5) Micropolitan adjacent to small metro
- 6) Noncore adjacent to small metro with own town
- 7) Noncore adjacent to small metro, with no own town
- 8) Micropolitan not adjacent to a metro area
- 9) Noncore adjacent to micro with own town
- 10) Noncore adjacent to micro with no own town
- 11) Noncore not adjacent to metro or micro with own town
- 12) Noncore not adjacent to metro or micro with no own town

“The 2003 urban influence codes form a classification scheme that distinguishes metropolitan counties by size and nonmetropolitan counties by size of the largest city or town and proximity to metro and micro areas. The standard Office of Management and Budget (OMB) metro and nonmetro categories have been subdivided into two metro and 10 nonmetro categories, resulting in a 12-part county codification. This scheme was originally developed in 1993. This scheme allows researchers to break county data into finer residential groups, beyond metro and nonmetro, particularly for the analysis of trends in nonmetro areas that are related to population density and metro influence” (<http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>).

Change in Building Permits

Data purchased from U.S. Census Bureau: Manufacturing, Mining, and Construction Statistics (<http://www.census.gov/const/www/permitsindex.html>).

The file shows the number of permits acquired per county for 1993-1995 and 2003-2005, the difference between the two sets of years, and the percent change.

“The issuing of building permits for privately-owned housing units does not necessarily imply that a community is growing, since any community will experience an ongoing replacement of aging houses and buildings. Also, a catastrophic event such as a major storm or fire can generate a short-term surge in the number of building permits issued.” Thus a better indicator of growth is the percent change between the average number of permits issued for two sets of years.

“Changes in local codes or enforcement can also affect the number of building permits issued. This measure includes data about new housing units intended for occupancy and maintained by the occupants. It excludes hotels, motels, and group residential structures such as nursing homes and college dormitories. All public housing and nonresidential buildings are also excluded” (McKendry).

Change in Farmland

Collected from http://www.nass.usda.gov/Census/Create_Census_US_CNTY.jsp

Land in Farms (acres, 2002)

Land in Farms (acres, 1997)

$$= (2002\text{acres}-1997\text{acres})*100/1997\text{acres}$$

This value is the percent change in acres of farmland from 1997 to 2002. “Farmland consists primarily of agricultural land used for crops, pasture, or grazing. Also included is woodland and wasteland not actually under cultivation or used for pasture or grazing, provided it was part of the farm operator’s total operation. Farmland includes acres in the Conservation Reserve, Wetlands Reserve Programs, or other governmental programs. Farmland includes land owned and operated as well as land rented from others. Land used rent-free is included as land rented from others. All grazing land, except land used under government permits on a per-head basis, is included as farmland provided it is part of a farm or ranch. Land under the exclusive use of a grazing association is reported by the grazing association and included as farmland. All land in American Indian reservations used for growing crops or grazing livestock is included as farmland. Land in reservations not reported by individual American Indians or non-Native Americans is reported in the name of the cooperative group that used the land” (McKendry).

Tourism Revenue

Collected from <http://www.census.gov/econ/census02/>

2002 data by NAICS

“Recreation and Tourism is composed of the arts, entertainment, and recreation sector and the accommodation subsector, both a part of the North American Industry Classification System (NAICS). The arts, entertainment, and recreation sector includes museums, historical sites, gambling and recreation industries, golf courses and country clubs, fitness and recreational sports centers, and all other amusement industries. The accommodation subsector is comprised of establishments including hotels, motels, bed and breakfasts, RV parks, recreational camps, and vacation camps” (McKendry).

Employment (Sales and Service; Construction and Manufacturing; Government; Agriculture and Natural Resources)

Purchased from Woods & Poole (<http://woodsandpoole.com/>)

The file shows the total number of employees for 2003 and the number of employees from several sectors (farming, mining...). The last eight columns show the totals and the percent of the total for the following categories:

- Agricultural and Natural Resources
- Construction and Manufacturing
- Sales and Service
- Government

“Economic activity is categorized as belonging to one of four industry categories: agriculture/natural resources, construction/manufacturing, sales/services, and government. Individual workers, regardless of their specific job responsibilities, are classified according to the category their overall company or organization belongs to. Thus, while accounting is considered a “service” activity, an accountant for a mining company would be counted as working in “agriculture/natural resources.” “Government” includes all federal government workers and all state/local employees, such as teachers, police, firefighters, etc. Even though government jobs may involve construction, natural resource management, or provision of services, they are still counted as belonging to the “government” category” (McKendry).

Data Collection and Definitions for Socioeconomic Indicator Mapping: Census Tracts

Population Density

Collected from <http://factfinder.census.gov>

Decennial Census

Census 2000 Summary File 1 (SF 1) 100-Percent Data: P1 (Total Population)

P001001 (Total Population: Total)

standardized by

AREALAND (Area (Land) (square meters))

“Population density is measured as the average number of people per square mile. This number is calculated by dividing the total number of people by the total area per [census tract]. In [census tracts] with federal lands, excluding these areas from the calculation of population density would result in a higher population density” (McKendry).

Median Age

Collected from <http://factfinder.census.gov>

Decennial Census

Census 2000 Summary File 1 (SF 1) 100-Percent Data: P13 (Median Age by Sex)

P013001 (Total population: Median age; Both sexes)

These data reflect the median age of the total population.

Educational Attainment

Collected from <http://factfinder.census.gov>

Decennial Census

Census 2000 Summary File 3 (SF 3) - Sample Data: P37 (Sex by Educational Attainment)

Sum of the following

P037012 (Population 25 years and over: Male; Some college; less than 1 year)
P037013 (Population 25 years and over: Male; Some college; 1 or more years; no degree)
P037014 (Population 25 years and over: Male; Associate degree)
P037015 (Population 25 years and over: Male; Bachelor's degree)
P037016 (Population 25 years and over: Male; Master's degree)
P037017 (Population 25 years and over: Male; Professional school degree)
P037018 (Population 25 years and over: Male; Doctorate degree)
P037029 (Population 25 years and over: Female; Some college; less than 1 year)
P037030 (Population 25 years and over: Female; Some college; 1 or more years; no degree)
P037031 (Population 25 years and over: Female; Associate degree)
P037032 (Population 25 years and over: Female; Bachelor's degree)
P037033 (Population 25 years and over: Female; Master's degree)
P037034 (Population 25 years and over: Female; Professional school degree)
P037035 (Population 25 years and over: Female; Doctorate degree)

standardized by

P037001 (Population 25 years and over: Total)

The resulting data reflect the percent of the total population 25 years and over with some college or college degree. "For Census 2000, persons are classified according to the highest level of school completed or the highest degree received" (McKendry).

Median Household Income

Collected from <http://factfinder.census.gov>

Decennial Census

Census 2000 Summary File 3 (SF 3) - Sample Data: P53 (Median Household Income)

P053001 (Households: Median household income in 1999)

These data reflect the median household income of all households. "A household includes all the persons who occupy a housing unit. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters" (http://quickfacts.census.gov/qfd/meta/long_HSD310200.htm).

Seasonal Housing

Collected from <http://factfinder.census.gov>

Decennial Census

Census 2000 Summary File 1 (SF 1) 100-Percent Data: H3 (Occupancy Status), H5 (Vacancy Status)

H005005 (Vacant housing units: For seasonal; recreational; or occasional use)

standardized by

H003001 (Housing units: Total)

The resulting data reflect the percent of total housing units that are used for seasonal, recreational, or occasional use. "A housing unit is a house, apartment, mobile home or trailer, group of rooms, or single room occupied or, if vacant, intended for occupancy as separate living quarters. Seasonal, recreational, or occasional use refers to vacant units used, or intended for use, only in certain seasons or for weekend or other occasional use throughout the year. A housing unit is vacant if no one is living in it at the time of enumeration, unless its occupants are only temporarily absent. Units temporarily occupied at the time of enumeration entirely by persons who have a usual residence elsewhere are also classified as vacant" (McKendry).

Appendix C. Socioeconomic Indicator Mapping, Standard Mapping Procedure, Version 2.0.

Table of Contents

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1. Download GIS Data from the Internet	118
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4. Create Data Layers and Map Socioeconomic Themes	130
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In an effort to better understand human activities outside national park boundaries, Jean McKendry, of the University of Idaho, in cooperation with Gary E. Machlis, Visiting Senior Scientist with the National Park Service, and Cindy Brewer of the Pennsylvania State University, produced socioeconomic atlases for 15 national parks around the country. These atlases were distributed to the participating parks and their staffs in 2004, and can be viewed by NPS staff through the NatureBib webserver. For more information, send an email to jeanm@uidaho.edu.

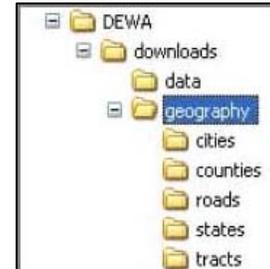
This Standard Mapping Procedure instructs the user to download GIS data from the internet and create maps of socioeconomic indicators chosen from a list of 67 used in the atlases produced through 2004. The indicators in this document were determined to be most relevant to Eastern Rivers and Mountains Network natural resource management. This document was developed using the Delaware Water Gap National Recreation Area as an example.

1. Download GIS Data from the Internet

This section will show you how to download GIS data for the base map, such as state, county, and census tract boundaries, from public websites. You will also see where to gather data that you will join to the county and tract attribute tables, such as population characteristics and environmental data.

1.1. Create Folders

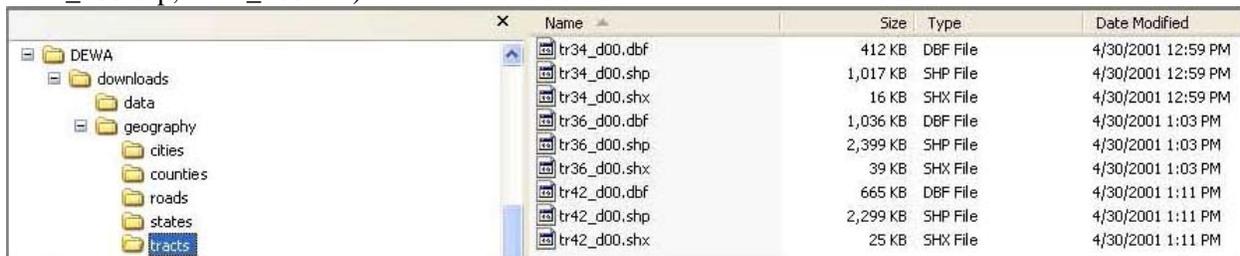
- 1) Create a folder and name it using the four letter code for the park (for example, Delaware Water Gap NRA is named DEWA, or FONE_FRHI if there are two parks being mapped).
- 2) Inside of this folder, create another folder and name it “downloads”.
- 3) Inside “downloads,” create two more folders (name them “data” and “geography”).
- 4) Within the “geography” folder, create five more folders (“cities,” “counties,” “roads,” “states,” and “tracts”).



1.2. Boundaries

1.2.1. Census Tracts

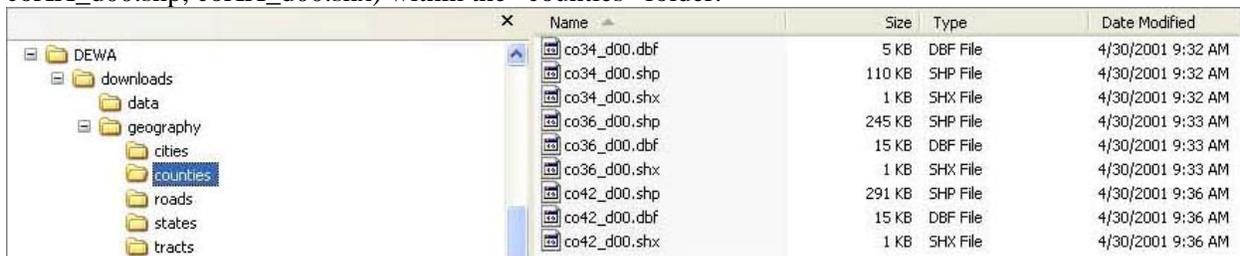
- 1) Go to http://www.census.gov/geo/www/cob/bdy_files.html.
- 2) Click on “2000” next to “Census Tracts”.
- 3) Scroll down to “Census 2000: Census Tracts in ArcView Shapefile (.shp) format”.
- 4) Click on the .zip file link next to the states that are in proximity to the park.
- 5) Open each .zip file, unzip the files, and place the three files for each state (trXX_d00.dbf, trXX_d00.shp, trXX_d00.shx) within the “tracts” folder.



Name	Size	Type	Date Modified
tr34_d00.dbf	412 KB	DBF File	4/30/2001 12:59 PM
tr34_d00.shp	1,017 KB	SHP File	4/30/2001 12:59 PM
tr34_d00.shx	16 KB	SHX File	4/30/2001 12:59 PM
tr36_d00.dbf	1,036 KB	DBF File	4/30/2001 1:03 PM
tr36_d00.shp	2,399 KB	SHP File	4/30/2001 1:03 PM
tr36_d00.shx	39 KB	SHX File	4/30/2001 1:03 PM
tr42_d00.dbf	665 KB	DBF File	4/30/2001 1:11 PM
tr42_d00.shp	2,299 KB	SHP File	4/30/2001 1:11 PM
tr42_d00.shx	25 KB	SHX File	4/30/2001 1:11 PM

1.2.2. Counties

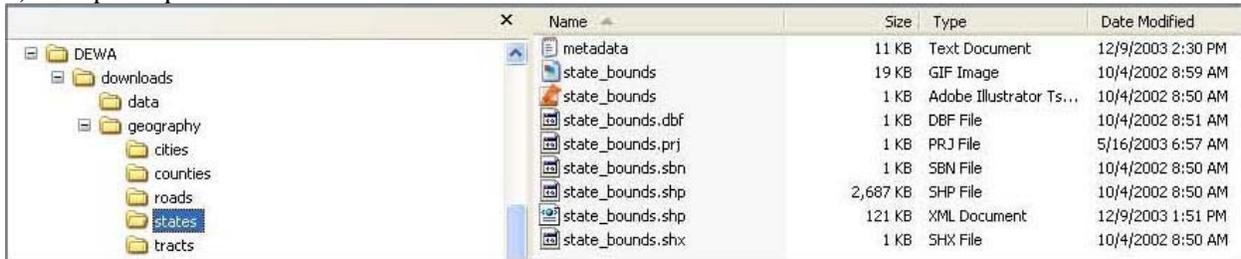
- 1) Go back to http://www.census.gov/geo/www/cob/bdy_files.html.
- 2) Click on “2000” next to “County and County Equivalent Areas”.
- 3) Scroll down to “Census 2000: County and County Equivalent Areas in ArcView Shapefile (.shp) format”.
- 4) Click on the .zip file link next to the states that are in proximity to the park.
- 5) Open each .zip file, unzip the files, and place the three files for each state (coXX_d00.dbf, coXX_d00.shp, coXX_d00.shx) within the “counties” folder.



Name	Size	Type	Date Modified
co34_d00.dbf	5 KB	DBF File	4/30/2001 9:32 AM
co34_d00.shp	110 KB	SHP File	4/30/2001 9:32 AM
co34_d00.shx	1 KB	SHX File	4/30/2001 9:32 AM
co36_d00.shp	245 KB	SHP File	4/30/2001 9:33 AM
co36_d00.dbf	15 KB	DBF File	4/30/2001 9:33 AM
co36_d00.shx	1 KB	SHX File	4/30/2001 9:33 AM
co42_d00.shp	291 KB	SHP File	4/30/2001 9:36 AM
co42_d00.dbf	15 KB	DBF File	4/30/2001 9:36 AM
co42_d00.shx	1 KB	SHX File	4/30/2001 9:36 AM

1.2.3. States

- 1) Go to http://coastalmap.marine.usgs.gov/GISdata/basemaps/boundaries/state_bounds/state_bounds.zip.
- 2) Unzip and place files within the “states” folder.

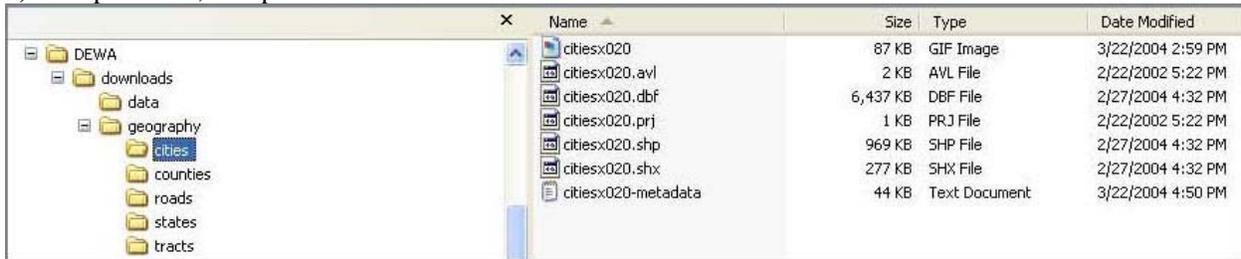


Name	Size	Type	Date Modified
metadata	11 KB	Text Document	12/9/2003 2:30 PM
state_bounds	19 KB	GIF Image	10/4/2002 8:59 AM
state_bounds	1 KB	Adobe Illustrator Ts...	10/4/2002 8:50 AM
state_bounds.dbf	1 KB	DBF File	10/4/2002 8:51 AM
state_bounds.prj	1 KB	PRJ File	5/16/2003 6:57 AM
state_bounds.sbn	1 KB	SBN File	10/4/2002 8:50 AM
state_bounds.shp	2,687 KB	SHP File	10/4/2002 8:50 AM
state_bounds.shp	121 KB	XML Document	12/9/2003 1:51 PM
state_bounds.shx	1 KB	SHX File	10/4/2002 8:50 AM

1.3. Features

1.3.1. Cities

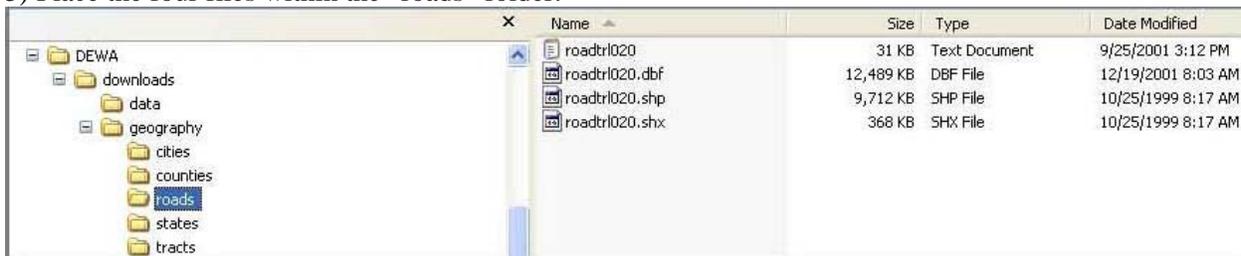
- 1) Go to <http://kai.er.usgs.gov/regional/contusa/eastcoast/atlanticcoast/data.html>, click on “zip file” next to “U.S. Cities and Towns”.
- 2) Open the .zip file”.
- 3) Unzip the file, and place the seven files within the “cities” folder.



Name	Size	Type	Date Modified
citiesx020	87 KB	GIF Image	3/22/2004 2:59 PM
citiesx020.avl	2 KB	AVL File	2/22/2002 5:22 PM
citiesx020.dbf	6,437 KB	DBF File	2/27/2004 4:32 PM
citiesx020.prj	1 KB	PRJ File	2/22/2002 5:22 PM
citiesx020.shp	969 KB	SHP File	2/27/2004 4:32 PM
citiesx020.shx	277 KB	SHX File	2/27/2004 4:32 PM
citiesx020-metadata	44 KB	Text Document	3/22/2004 4:50 PM

1.3.2. Roads

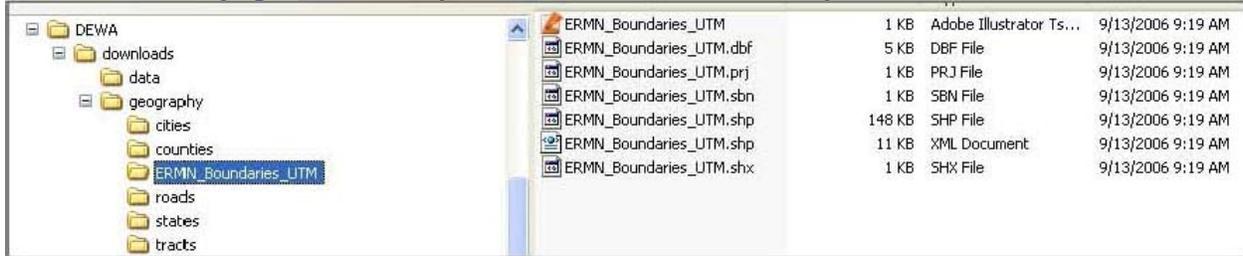
- 1) Go to <http://nationalatlas.gov/atlasftp.html>.
- 2) Click on “Transportation” to expand the menu.
- 3) Next to “Roads”, click on the shapefile link, “roadtrl020.tar.gz”.
- 4) Open and unzip the .gz file, and then open and extract the .tar files.
- 5) Place the four files within the “roads” folder.



Name	Size	Type	Date Modified
roadtrl020	31 KB	Text Document	9/25/2001 3:12 PM
roadtrl020.dbf	12,489 KB	DBF File	12/19/2001 8:03 AM
roadtrl020.shp	9,712 KB	SHP File	10/25/1999 8:17 AM
roadtrl020.shx	368 KB	SHX File	10/25/1999 8:17 AM

1.3.3. National Park Service Data

Supplied on CD is the park boundary file (“ERMN_Boundaries_UTM”). Please contact Matt_Marshall@nps.gov for a CD if you have not received one already.



1.4. Census Data Tables

Before you download the county and census tract socioeconomic data, examine which counties are surrounding the park. Take note of the counties that are of interest – you should have on average three counties serving as a buffer around the park for the county map. See Example 1 below for DEWA and the surrounding counties. The final census tract map will be a larger scale, so tract data for some of the counties will not be collected. See Example 2 for the level of detail for the census tract map.



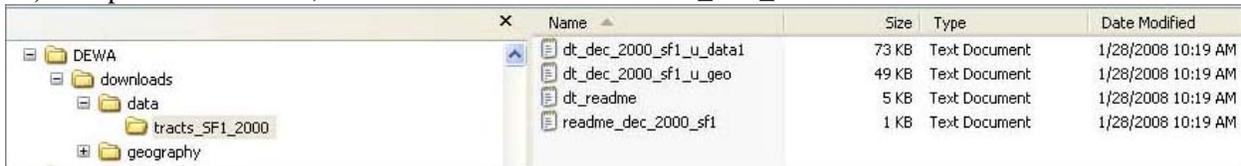
Example 1: Collect data for all counties at this scale.



Example 2: Census tract data collected only for counties located in the red box.

1.4.1. Tract Level 2000 Census Data – SF1

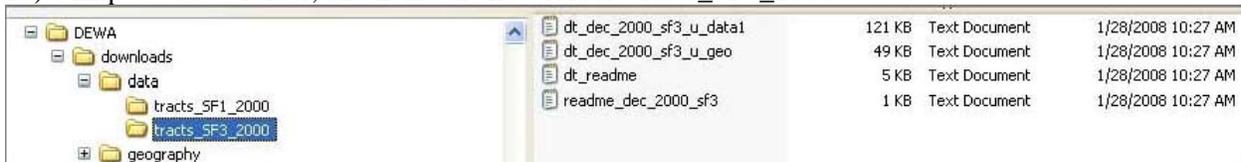
- 1) Go to <http://factfinder.census.gov>.
- 2) Click on “get data” under Decennial Census.
- 3) Next to “Census 2000 Summary File 1 (SF 1) 100-Percent Data,” click on “Detailed Tables”.
- 4) Choose a selection method: “Geo within Geo”.
- 5) Show me all: “Census Tracts”.
- 6) Within: “County”.
- 7) Select a state and then a county.
- 8) Select one or more geographic areas and click “Add”: Add all census tracts.
- 9) Repeat steps 7 and 8 for the counties within all states that are in proximity to the park.
- 10) Double check that you have all of the counties that you need data for in the Add box.
- 11) Click on “Next”.
- 12) Select and add the following tables: P1 (Total Population), P13 (Median Age by Sex), H3 (Occupancy Status), and H5 (Vacancy Status).
- 13) Click on “Show Result”.
- 14) Under “Options,” choose to Show Geographic Identifiers.
- 15) Under “Print/Download” select “Download”.
- 16) In pop-up window, under “Database compatible...” choose “comma delimited (.txt)” and click OK.
- 17) Unzip to “data” folder, and name the new folder “tracts_SF1_2000”.



Name	Size	Type	Date Modified
dt_dec_2000_sf1_u_data1	73 KB	Text Document	1/28/2008 10:19 AM
dt_dec_2000_sf1_u_geo	49 KB	Text Document	1/28/2008 10:19 AM
dt_readme	5 KB	Text Document	1/28/2008 10:19 AM
readme_dec_2000_sf1	1 KB	Text Document	1/28/2008 10:19 AM

1.4.2. Tract Level 2000 Census Data – SF3

- 1) Go back to <http://factfinder.census.gov>.
- 2) Click on “get data” under Decennial Census.
- 3) Next to “Census 2000 Summary File 3 (SF 3) - Sample Data,” click on “Detailed Tables”.
- 4) The previously selected geographies (tracts) should still be selected. If not, repeat the selection steps above.
- 5) Click on “Next”.
- 6) Select and add the following tables: P37 (Sex by Educational Attainment) and P53 (Median Household Income).
- 7) Click on “Show Result”.
- 8) Under “Print/Download” select “Download”.
- 9) In the pop-up window, under “Database compatible...” choose “comma delimited (.txt)” and click OK.
- 10) Unzip to “data” folder, and name the new folder “tracts_SF3_2000”.

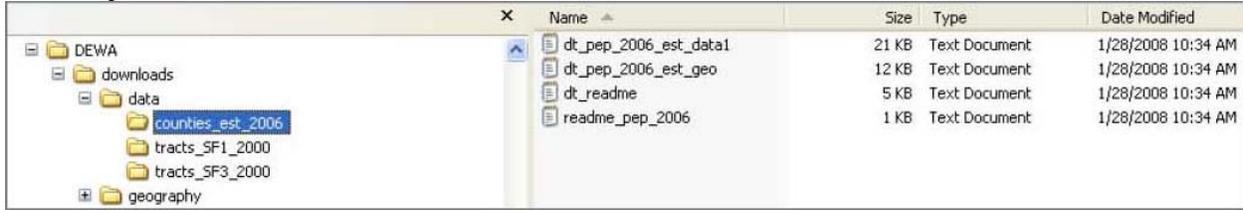


Name	Size	Type	Date Modified
dt_dec_2000_sf3_u_data1	121 KB	Text Document	1/28/2008 10:27 AM
dt_dec_2000_sf3_u_geo	49 KB	Text Document	1/28/2008 10:27 AM
dt_readme	5 KB	Text Document	1/28/2008 10:27 AM
readme_dec_2000_sf3	1 KB	Text Document	1/28/2008 10:27 AM

1.4.3. County Level 2006 Census Data

- 1) Go back to <http://factfinder.census.gov>.
- 2) Click on “get data” under Population Estimates Program.
- 3) Next to “2006 Population Estimates,” click on “Detailed Tables”.
- 4) Choose a selection method: “Geo within Geo”.
- 5) Show me all: “Counties”.

- 6) Within: “State”.
- 7) Select the first state.
- 8) Select All Counties click “Add”.
- 9) Repeat steps 7 and 8 for counties within the states that are in proximity to the park.
- 10) Click on “Next”.
- 11) Select and add the following table: T1 (Population Estimates).
- 12) Click on “Show Result”.
- 13) Under “Print/Download” select “Download”.
- 14) In pop-up window, under “Database compatible...” choose “comma delimited (.txt)” and click OK.
- 15) Unzip to “data” folder, and name the new folder “counties_est_2006”.



1.4.4. County Level 2002 Economic Census Data (2007 data will be available in 2009 or 2010)

- 1) Go to <http://www.census.gov/econ/census02/>.
- 2) Under “Drill Down Tables: 2002,” click on More next to “2002 data by NAICS”. You will collect data from the arts, entertainment, and recreation sectors as well as the accommodation subsector, in order to show the tourism revenue for each county.
- 3) In the upper right corner, select the first state and click on Go.
- 4) You now need to create an Excel spreadsheet and record a selection of these values. Set the spreadsheet up like the example below, with FIPS codes in the first column and the county name in the second column. Record for each county the values for “Sales, receipts or shipments (\$1,000)”.
- 5) Perform this task for each county for sectors 56, 62, 71, 72, and 81. For each county you will also want to record the values of 72’s subsector 721, Accommodation (click more next to 72 to find this).
- 6) $TOT_TOUR = E2 + H2$; $TOT_ALL = SUM(C2:G2)$; $TOUR_PERC = I2 * 100 / J2$.
- 7) Override the value for TOUR_PERC with the value -99 if any of the cells in the row are blank.
- 8) Save this file as tourism_2002.xls in a folder named tourism_2002 within the “data” folder.
- 9) Save again as tourism_2002.csv.

	A	B	C	D	E	F	G	H	I	J	K
	GEO_ID	NAME	SEC_56	SEC_62	SEC_71	SEC_72	SEC_81	SEC_721	TOT_TOUR	TOT_ALL	TOUR_PERC
2	34003	BERGEN	2558913	5553282	660553	1474003	1256658	287736			
3	34013	ESSEX	1345136	4994392	322917	1000271	922764	165080			
4	34017	HUDSON	1080948	1836623	109036	612792	520379	121656			
5	34019	HUNTERDON	217804	442813	30317	118939	101828	11068			
6	34021	MERCER	563982	2026528	146672	553731	894541	553731			
7	34023	MIDDLESEX	2054098	3023895	174340	974839	1153423	212706			
8	34025	MONMOUTH	954708	2938701	320904	899102	567653	96700			
9	34027	MORRIS	1832278	2618283	143577	854711	792233	207417			
10	34031	PASSAIC	802309	1888545	212184	440449	343458	19245			
11	34035	SOMERSET	1268909	1398781	124212	576442	421444	135379			
12	34037	SUSSEX	132411	370677	63018	129858	91507	16515			
13	34039	UNION	1168097	2274449	126457	555283	566149	93439			
14	34041	WARREN	100935	335941		98870	82187	10148			
15	36005	BRONX	479454	6648523	461827	490582	534945	26550			
16	36025	DELAWARE	19632	118938	7780	43780	29439	12862			
17	36027	DUTCHESS	344403	1280105	73566	323127	226764	67466			
18	36047	KINGS	1410811	10936571	279387	1020122	1179842	63522			
19	36061	NEW YORK	11049612	20836778	7476533	10714578	13689315	4075886			

1.5. Non-Census Data Tables

1.5.1. County Level 2003 Urbanization Data

- 1) Go to <http://www.ers.usda.gov/Data/UrbanInfluenceCodes/>.
- 2) Click on “Download the 1993 and 2003 codes in an Excel file”.
- 3) Save Excel file to the “data” folder and place within a new folder named “urbanization_2003”.
- 4) Save again as urbaninfluencecodes.csv.

1.5.2. County Level 2002 Farmland Data (2007 data will be available in February 2009)

- 1) Go to http://www.nass.usda.gov/Census/Create_Census_US_CNTY.jsp.
- 2) Select Data Table: Table 8.
- 3) Select Data Items: Choose Land in Farms (acres, 2002).
- 4) Select the states that are in proximity to the park. Choose All Counties, Add, and Get Data.
- 5) Scroll to the bottom of the page and click to get the GIS version of the data.
- 6) Click on Download GIS (only .txt).
- 7) Unzip to the “data” folder and name the folder “farmland_2002.” Rename the text file farmland2002.txt.
- 8) Now go back to step 3 and Choose Land in Farms (acres, 1997), and unzip this file to the “farmland_2002” folder. Rename the text file farmland1997.txt.

1.6. Other Data Tables (purchased from U.S. Census Bureau or Woods and Poole)

1.6.1. Building Permit Data

The raw data from the Census is on the provided CD in a folder named “permits_2006”.

1.6.2. Population Projection Data

The raw data from Woods and Poole is located on the CEDDS 2006 CD. Formatted data (2030pop.csv) is on the provided CD in a folder named “projectedpop_2030”.

1.6.3. Employment by Industry Data

The raw data from Woods and Poole is located on the CEDDS 2006 CD. Formatted data (employment2003.csv) is on the provided CD in a folder named “employment_2003”.

Please contact Matt_Marshall@nps.gov for a CD with this data if you have not received one already.



2. Create a File Geodatabase

This section describes how to create a new file geodatabase. By the end of this section, you should have a file geodatabase with feature classes and feature datasets. Python will be used to perform calculations and create data tables using the raw data files that you downloaded. Two tables will be created, for counties and census tract data, and added to the file Geodatabase that you created. You will also define the projection for feature classes and project the files appropriately.

2.1. ArcCatalog File Geodatabase Creation

2.1.1. Create new file geodatabase

- 1) Open ArcCatalog. In the catalog file tree, right click on the folder for the park.
- 2) Choose New > File Geodatabase, and name it [PARK].gdb.

2.1.2. Merge shapefiles

- 1) From ArcCatalog, open ArcToolbox, and navigate to Data Management Tools>General>Merge.
- 2) Input datasets: select the tract shapefiles.
- 3) Output dataset: navigate to the tracts folder, and name the file “tracts.shp”.
- 4) Now merge the county shapefiles.
- 5) Input features/datasets: select the county shapefiles.
- 6) Output features/datasets: navigate to the counties folder, and name the file “counties.shp”.

2.1.3. Create Datasets/Define Projections

- 1) With [PARK].gdb selected in the catalog file tree, right-click on the contents window and choose New > Feature Dataset... .
- 2) Name the dataset “boundaries”.
- 3) Define the projection as Geographic Coordinate Systems > North America > North American Datum 1983. Accept other defaults and choose Finish.
- 4) Right-click on the boundaries feature dataset and choose Import > Feature Class (multiple).
- 5) Import counties.shp, tracts.shp and state_bounds.shp into the new Feature Dataset. Click OK.
- 6) Now import the other downloaded shapefiles as individual feature classes into the File Geodatabase. First, input citiesx020.shp, naming the output feature class “cities”.
- 7) Click on the SQL button under Expression. Double-click on STATE, then =, then click on Get Unique Values. Select the states that you will be mapping and create an equation in this format:

```
"STATE" = 'NJ' OR "STATE" = 'NY' OR "STATE" = 'PA'
```

- 8) Import ERMN_Boundaries_UTM. Name the Output Feature Class “DEWA” (or the name of your park). SQL Expression should look like

```
"NAME" = 'Delaware Water Gap NRA', substituting your park name(s).
```

- 9) Import roadtr1020.shp. Name the Output Feature Class “roads” SQL Expression should look like

```
"STATE" = 'NJ' OR "STATE" = 'NY' OR "STATE" = 'PA'
```

- 10) Define the projection for these feature classes as “North American Datum 1983” if they come with an “unknown” description for the coordinate system. (Go to Data Management Tools > Projections and Transformations > Define Projection.)

2.2. Python Scripting

2.2.1. Place the entire scripts folder inside of [PARK] folder

1) On the provided CD there will be a folder named “scripts” which holds a variety of files, including the Python script that you will run. Place this entire folder within the [PARK] folder (not within the .gdb folder)



2) Open the file named “config”. On the 8th line of code, change `gdb = DEWA.gdb` to the name of your gdb file. Save.

3) Double-click on `reload_data.py`. The script will run, creating the two data tables that you will join to the feature classes in ArcMap. Make sure that the script has no errors and that the two tables were created (you can view them from within ArcCatalog.) The script should look something like the following example:

```
C:\Python24\python.exe
DEBUG Reading config file C:\_PROJECTS\Recent Projects\DEWA\scripts\config.in
i
DEBUG Removing old temporary database temp.sqlite3.db
DEBUG Connecting to temporary database temp.sqlite3.db
INFO Initializing ArcGIS geoprocessor
DEBUG Geodatabase file is C:\_PROJECTS\Recent Projects\DEWA\DEWA.gdb
INFO Reloading county data
DEBUG Creating temporary table county_data
INFO Reading county FIPS codes
INFO Defining FIPS codes using ArcGIS table C:\_PROJECTS\Recent Projects\DEWA\DEWA.gdb/boundaries/counties
DEBUG Read 156 rows from ArcGIS table C:\_PROJECTS\Recent Projects\DEWA\DEWA.gdb/boundaries/counties, found 150 unique FIPS codes
DEBUG Inserted 150 county FIPS codes
INFO Reading Estimated 2006 Census data for county
DEBUG Data file is C:\_PROJECTS\Recent Projects\DEWA\downloads\data\counties_est_2006\dt_pep_2006_est_data1.txt
DEBUG Processed 150 county Estimated 2006 Census records
INFO Reading 2002 Tourism data for county
DEBUG Data file is C:\_PROJECTS\Recent Projects\DEWA\downloads\data\tourism_2002\tourism_2002.csv
DEBUG Processed 44 county 2002 Tourism records
INFO Reading 2003 Urbanization data for county
DEBUG Data file is C:\_PROJECTS\Recent Projects\DEWA\downloads\data\urbanization_2003\urbaninfluencecodes.csv
DEBUG Processed 3142 county 2003 Urbanization records
INFO Reading Farmland data for county
DEBUG Data file for 1997 is C:\_PROJECTS\Recent Projects\DEWA\downloads\data\farmland_2002\CensusGIS584.txt
DEBUG Processed 153 county 1997 Farmland records
DEBUG Data file for 2002 is C:\_PROJECTS\Recent Projects\DEWA\downloads\data\farmland_2002\CensusGIS582.txt
DEBUG Processed 153 county 2002 Farmland records
DEBUG Calculating change in farmland
INFO Reading Building Permit data for county
DEBUG Reading data file C:\_PROJECTS\Recent Projects\DEWA\downloads\data\permits_2006\co1993a.txt
DEBUG Reading data file C:\_PROJECTS\Recent Projects\DEWA\downloads\data\permits_2006\co1994a.txt
DEBUG Reading data file C:\_PROJECTS\Recent Projects\DEWA\downloads\data\permits_2006\co1995a.txt
DEBUG Reading data file C:\_PROJECTS\Recent Projects\DEWA\downloads\data\permits_2006\co2003a.txt
DEBUG Reading data file C:\_PROJECTS\Recent Projects\DEWA\downloads\data\permits_2006\co2004a.txt
DEBUG Reading data file C:\_PROJECTS\Recent Projects\DEWA\downloads\data\permits_2006\co2005a.txt
DEBUG Calculating change in average building permits
INFO Reading Projected Population data for county
DEBUG Data file is C:\_PROJECTS\Recent Projects\DEWA\downloads\data\projectedpop_2030\2030pop.csv
DEBUG Processed 4448 county Projected Population records
DEBUG Calculating change in projected population
INFO Reading 2003 Employment data for county
DEBUG Data file is C:\_PROJECTS\Recent Projects\DEWA\downloads\data\employment_2003\employment2003.csv
DEBUG Processed 4448 county 2003 Employment records
INFO Deleting ArcGIS table county_data
INFO Creating ArcGIS table county_data
DEBUG Creating column FIPS (text) in ArcGIS table county_data
DEBUG Creating column POP2000 (long) in ArcGIS table county_data
DEBUG Creating column POP2006 (long) in ArcGIS table county_data
DEBUG Creating column POP2000_2006 (double) in ArcGIS table county_data
DEBUG Creating column TOT_TOUR (long) in ArcGIS table county_data
DEBUG Creating column TOT_ALL (long) in ArcGIS table county_data
DEBUG Creating column TOUR_PERC (double) in ArcGIS table county_data
DEBUG Creating column CODE2003 (long) in ArcGIS table county_data
DEBUG Creating column CODE1993 (long) in ArcGIS table county_data
DEBUG Creating column FARMS1997 (long) in ArcGIS table county_data
DEBUG Creating column FARMS2002 (long) in ArcGIS table county_data
DEBUG Creating column FARMCHNG (double) in ArcGIS table county_data
DEBUG Creating column BLDGS1993 (long) in ArcGIS table county_data
DEBUG Creating column BLDGS1994 (long) in ArcGIS table county_data
DEBUG Creating column BLDGS1995 (long) in ArcGIS table county_data
DEBUG Creating column BLDGS2003 (long) in ArcGIS table county_data
DEBUG Creating column BLDGS2004 (long) in ArcGIS table county_data
DEBUG Creating column BLDGS2005 (long) in ArcGIS table county_data
DEBUG Creating column BLDGAUG1993_1995 (double) in ArcGIS table county_data
```

```

DEBUG      Creating column TOT2000_2000 (double) in ArcGIS table county_data
DEBUG      Creating column TOT_TOUR (long) in ArcGIS table county_data
DEBUG      Creating column TOT_ALL (long) in ArcGIS table county_data
DEBUG      Creating column TOUR_PERC (double) in ArcGIS table county_data
DEBUG      Creating column CODE2003 (long) in ArcGIS table county_data
DEBUG      Creating column CODE1993 (long) in ArcGIS table county_data
DEBUG      Creating column FARMS1997 (long) in ArcGIS table county_data
DEBUG      Creating column FARMS2002 (long) in ArcGIS table county_data
DEBUG      Creating column FARMCHNG (double) in ArcGIS table county_data
DEBUG      Creating column BLDGS1993 (long) in ArcGIS table county_data
DEBUG      Creating column BLDGS1994 (long) in ArcGIS table county_data
DEBUG      Creating column BLDGS1995 (long) in ArcGIS table county_data
DEBUG      Creating column BLDGS2003 (long) in ArcGIS table county_data
DEBUG      Creating column BLDGS2004 (long) in ArcGIS table county_data
DEBUG      Creating column BLDGS2005 (long) in ArcGIS table county_data
DEBUG      Creating column BLDGAUG1993_1995 (double) in ArcGIS table county_data
DEBUG      Creating column BLDGAUG2003_2005 (double) in ArcGIS table county_data
DEBUG      Creating column BLDGAUGCHNG (double) in ArcGIS table county_data
DEBUG      Creating column POP2030 (double) in ArcGIS table county_data
DEBUG      Creating column POP2006_2030 (double) in ArcGIS table county_data
DEBUG      Creating column TOTAL2003 (double) in ArcGIS table county_data
DEBUG      Creating column AGNAT (double) in ArcGIS table county_data
DEBUG      Creating column CONMAN (double) in ArcGIS table county_data
DEBUG      Creating column SALSER (double) in ArcGIS table county_data
DEBUG      Creating column GOV (double) in ArcGIS table county_data
DEBUG      Creating column AGMATPCT (double) in ArcGIS table county_data
DEBUG      Creating column CONMANPCT (double) in ArcGIS table county_data
DEBUG      Creating column SALSERPCT (double) in ArcGIS table county_data
DEBUG      Creating column GOVPCT (double) in ArcGIS table county_data
DEBUG      Inserting values into ArcGIS table county_data
DEBUG      Inserted 150 rows into ArcGIS table county_data
INFO      ----- Reloading tract data -----
DEBUG      Creating temporary table tract_data
INFO      Reading tract FIPS codes
INFO      Defining FIPS codes using ArcGIS table C:\_PROJECTS\Recent Projects\DEWA
A\DEWA.gdb/boundaries/tracts
DEBUG      Read 10002 rows from ArcGIS table C:\_PROJECTS\Recent Projects\DEWA\DEWA
A.gdb/boundaries/tracts, found 9977 unique FIPS codes
DEBUG      Inserted 9977 tract FIPS codes
INFO      Reading 2000 Census SF1 data for tract
DEBUG      Data file is C:\_PROJECTS\Recent Projects\DEWA\downloads\data\tracts_SF
1_2000\dt_dec_2000_sf1_u_data1.txt
DEBUG      Updated 428 tract 2000 Census SF1 records
INFO      Reading 2000 Census SF3 data for tract
DEBUG      Data file is C:\_PROJECTS\Recent Projects\DEWA\downloads\data\tracts_SF
3_2000\dt_dec_2000_sf3_u_data1.txt
DEBUG      Updated 428 tract 2000 Census SF3 records
INFO      Creating ArcGIS table tract_data
DEBUG      Creating column FIPS (text) in ArcGIS table tract_data
DEBUG      Creating column SQMILES (double) in ArcGIS table tract_data
DEBUG      Creating column POPDEN (double) in ArcGIS table tract_data
DEBUG      Creating column MEDAGE (double) in ArcGIS table tract_data
DEBUG      Creating column SEASON (double) in ArcGIS table tract_data
DEBUG      Creating column EDTOTAL (long) in ArcGIS table tract_data
DEBUG      Creating column EDPERC (double) in ArcGIS table tract_data
DEBUG      Creating column MEDINC (long) in ArcGIS table tract_data
DEBUG      Inserting values into ArcGIS table tract_data
DEBUG      Inserted 9977 rows into ArcGIS table tract_data
INFO      Done
INFO      Press the Enter key to exit.

```

If there are errors, check to make sure that the data that you downloaded is in the correct folders and named appropriately. If anything changed in the data since this script was written in January 2008, you may need to edit the script. Within the ERMN folder there are scripts titled county_data and tract_data. Right-click on the file you are having problems with and click on Edit with IDLE. Correct anything that is making the script fail and resave the script. Contact the ERMN Data Manager (Matt Marshall) if you are having difficulties with the script that you are unable to solve on your own.

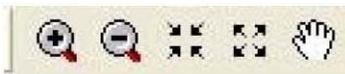
3. Customize Templates for County and Tract Files

If you do not have the ArcMap templates for the county maps and the census tract maps, contact Matt Marshall or see Appendix A for instructions on their specifications.

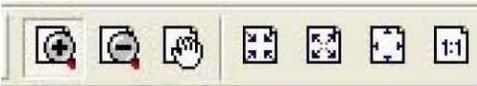
3.1. Tract Level Project

3.1.1. Set Zoom Level

- 1) Open template_tracts.mxd, found on the provided CD. Resave the file as XXXX_tracts.mxd (use your park name).
- 2) Right-click on Layers, go to Properties, Coordinate System > Predefined > Projected > UTM > NAD 1983 > ...17N.
- 3) Right-click on the data frame (there should be a blank area labeled “Layers”) and click on Add Data.
- 4) From the Geodatabase that you created, add the following feature datasets and feature classes:
 - Boundaries (includes all boundary feature classes)
 - cities
 - [PARK]
 - roads
 - tract_data table
- 5) Use the main zoom tool to change the view within the data frame. You want to zoom in to the tracts at a scale of around 1:400,000, centering the park(s) in the data frame.



This main palette zooms and pans the map within the data frame; layout and data frame outline stay the same.



This layout palette zooms and pans the layout; map data does not change within the data frame.

3.1.2. Change Title

- 1) Change the title of the map in the upper left region of the title bar.
- 2) Save XXXX_tracts.mxd

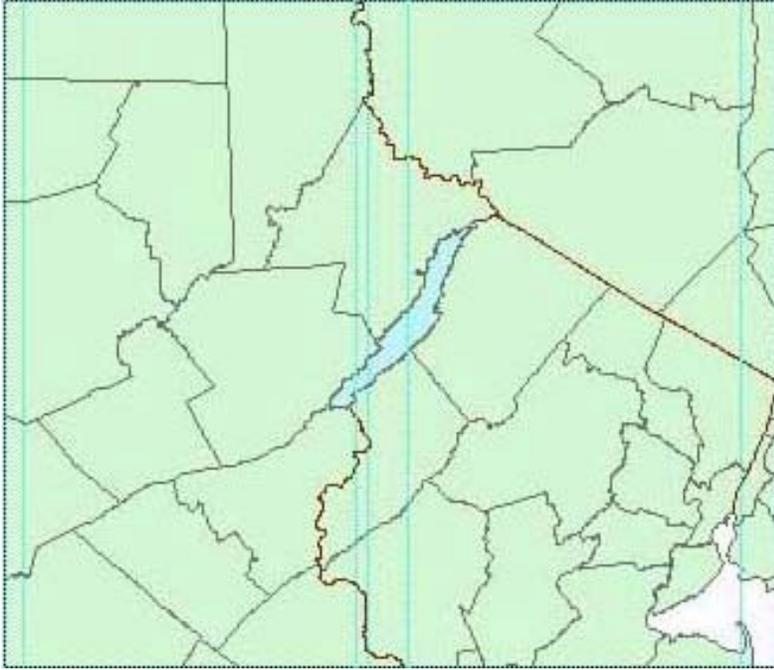
3.2. County Level Project

3.2.1. Set Zoom Level

- 1) Open template_counties.mxd. Resave the file as XXXX_counties.mxd (use your park name).
- 2) Right-click on Layers, go to Properties, Coordinate System > Predefined > Projected > UTM > NAD 1983 > ...17N.
- 3) Right-click on the data frame (there should be a blank area labeled “Layers”) and click on Add Data.
- 4) From the Geodatabase that you created, add the following feature datasets and feature classes:
 - boundaries (includes all boundary feature classes)
 - cities
 - [PARK]
 - roads
 - county_data table

5) Use the main zoom tool to change the view within the layout frame. You want to zoom in to the counties so that on average there are about three counties on all sides of the park.

This is an example of what the zoom level should be like for Delaware Water Gap NRA:



3.2.2. Change Title

- 1) Change the title of the map in the upper left region of the title bar.
- 2) Save XXXX_counties.mxd.

4. Create Data Layers and Map Socioeconomic Themes

By the end of this section, you should have a group layer for each of the socioeconomic themes joined to a data table, allowing you to create choropleth maps. This section shows how to create presentable choropleth maps within the ArcMap layout view. You will mostly be using the quantile classification scheme and pulling colors from colorbrewer.org.

4.1. Customize Census Tract Map Layers

4.1.1. Organize Layers

- 1) Open the census tract map project.
- 2) Rename and arrange the layers in the table of contents as follows:
 - Cities (turn off for now)
 - Roads (turn off for now)
 - [PARK]
 - State Boundaries
 - County Boundaries
 - tracts

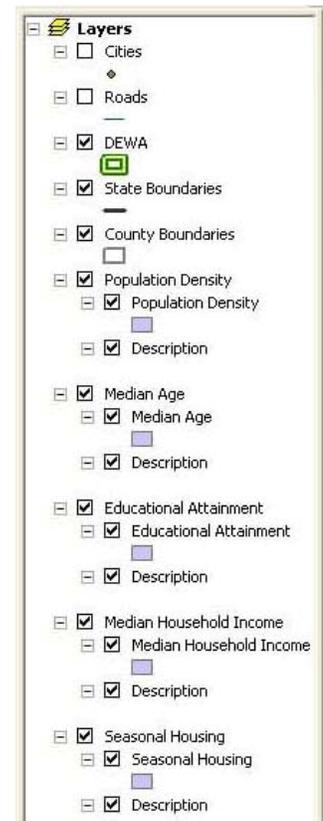
4.1.2. Clip Census Tracts

- 1) Using the Select Features tool, click and drag within the Data Frame to select all of the data in view.
- 2) Right click on the tracts layer; Selection > Create Layer from Selected Features (this selection layer only has the tracts that we are interested in mapping).
- 3) From within ArcMap, open ArcToolbox (click on the red toolbox icon).
- 4) Navigate to Analysis Tools > Extract > Clip.
- 5) Input Features: Click on the arrow and select the tracts layer.
- 6) Clip Features: Click on the arrow and select the tracts selection layer. Accept the default name of the Output Feature Class and click OK.
- 7) Remove the original tracts layer as well as the selection layer, only leaving the layer displaying the clipped feature class.

4.1.3. Create Group Layers

- 1) Right-click on Layers and select New Group Layer. Rename the new group layer Population Density. Move the group layer directly above the clipped tract layer. Click and drag the clipped tract layer into this new group layer, renaming it Population Density.
- 2) Now copy the tract layer and paste, renaming the layer Population Density Description. Move this new layer within the Population Density group layer. Click on the color box and change the fill color and outline color to No Color.
- 3) Copy this entire group layer and paste (right-click on Layers) four times, moving the group layers under the county boundaries layer. Rename these layers as follows:
 - Median Age
 - Educational Attainment
 - Median Household Income
 - Seasonal Housing

The layers should look something like the image to the right.

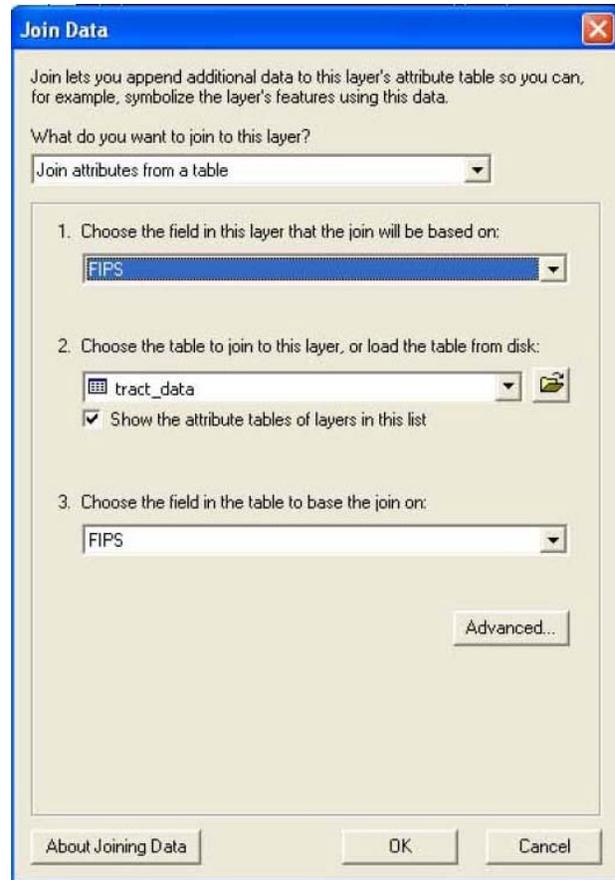


4.1.4. Join tract table to tract layers

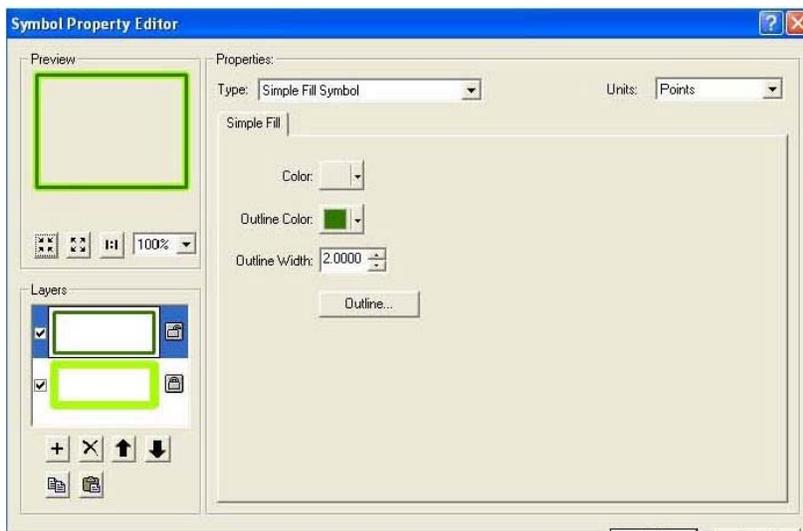
- 1) Right-click on the tracts layer in the Population Density group layer > Joins and Relates > Join... .
- 2) Select the options as shown at right, joining the tract feature class to the tract_data table.
- 3) Choose Yes to automatically create an index.
- 4) Repeat this for each group layer, joining by the FIPS field. You do not need to join the blank description layers to the table.

4.1.5. Park Layer

- 1) Click on the color box for the park in the layer list, and then click on Properties (see screen shot below).
- 2) Click on Color and choose No Color.
- 3) Click on the Outline Color, then More Colors, and type
40R / 115G / 0B
Outline width 4.5
- 4) In the bottom left part of the Symbol Property Editor window, click on the Plus sign. Make this outline a lighter shade of green - 170R / 255G / 0B, and width 1.5. Click OK.
- 5) In the Symbol Selector palette, click on Save
Symbol Name: Park
Category: NPS



*****For two or more parks, go to the Layer Properties > Symbology, and Show Categories. Value Field: NAME, Add All Values. Create unique symbolization for each park.**



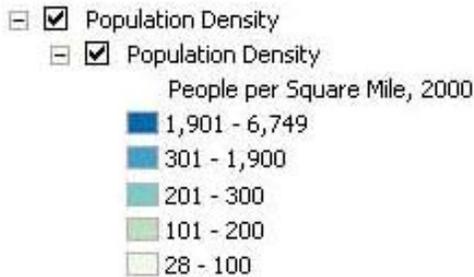
5.1.6. State and County Boundaries

- 1) Click on the line under State Boundaries.
- 2) Choose Gray 80% and 2.00 width.
- 3) Save as...
Symbol Name: State Boundaries
Category: NPS
- 4) Click on the box for Counties.
- 5) Choose no fill and Gray 50% with 1.50 width for the outline.
- 6) Save as... Counties; NPS.
(These saved color styles can be modified by navigating to Tools > Styles > Style Manager.)

4.1.7. Classification and Choropleth Mapping

- 1) Double-click on the Population Density tract layer within the group layer.
- 2) Under the Symbology Tab, click on Quantities.
- 3) For the Value under Fields, choose tract_data.POPDEN.
- 4) Click on Classify... Choose Quantile for the classification method. Click OK.
- 5) Round the numbers off by clicking on the Range and type in the rounded value for the highest number in the range. Leave the last number the same – you want to show the true highest value.
- 6) Right-click in the range column and choose Reverse Sorting.
- 7) Right-click again and choose Format Labels. Change to zero decimal places and check Show Thousands Separators.
- 8) Go to <http://www.personal.psu.edu/cab38/ColorBrewer/ColorBrewer.html>. Navigate to “5-class sequential GnBu.” Click on RGB to see the exact color values. Now in ArcMap, double-click on the color boxes to change the colors to match the ColorBrewer colors, and save the colors assigning the category as NPS.

Symbol Name	Fill Color	Outline Color	Outline Width
seq_GnBu_1	8R 104G 172B	Gray30%	0.40
seq_GnBu_2	67R 162G 202B	Gray30%	0.40
seq_GnBu_3	123R 204G 196B	Gray30%	0.40
seq_GnBu_4	186R 228G 188B	Gray30%	0.40
seq_GnBu_5	240R 249G 232B	Gray30%	0.40



Rename as appears to the left, and check to make sure that your colors and formatting appear correctly. The darker colors should correspond with the higher numbers for all categories.

- 9) Double-click on Population Density’s Description layer.
- 10) Click on Description... and enter the description and also the national and state rates (see completed DEWA file to copy and paste). For example, Delaware Water Gap NRA uses the following description here. (You will need to calculate the national and state rates for all layers.) (Note the code to stylize the type. Use Ctrl-Enter to go to the next line.)

<FNT name="Arial" size="12"><BOL>Population density</BOL> is calculated by dividing the total number of people by the number of square miles in each census tract. </FNT><FNT name="Arial" size="10">(Data Source: U.S. Census Bureau)

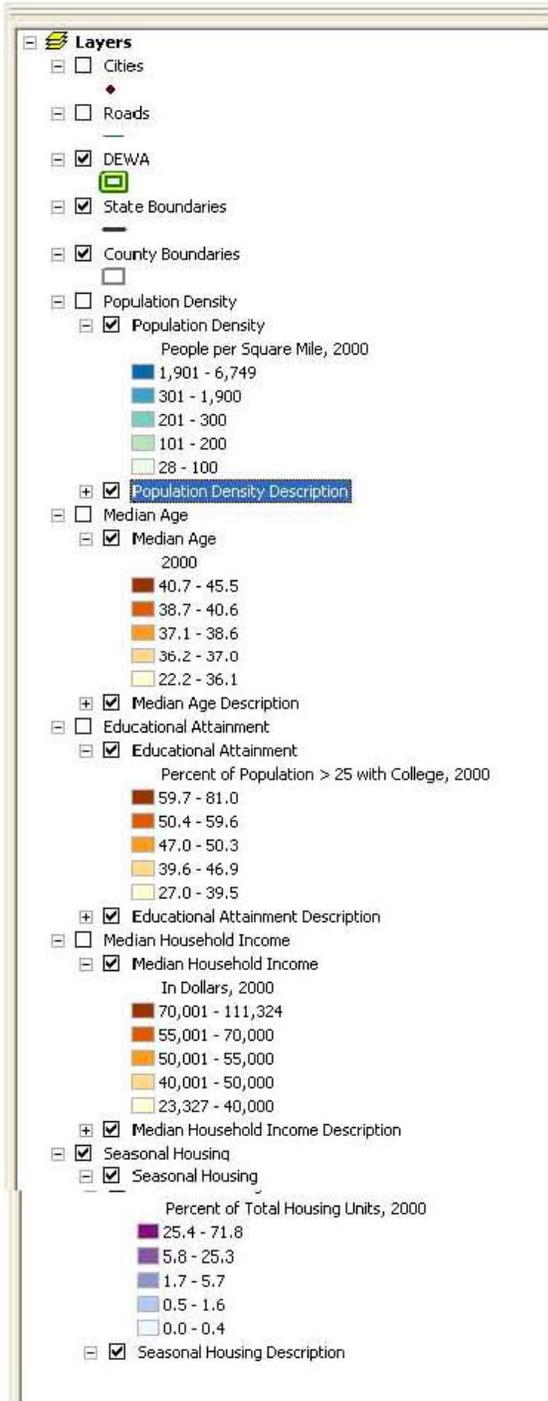
<BOL>National rate:</BOL> 80
 <BOL>State rates:</BOL> NJ: 965 NY: 348 PA: 267</FNT>

- 11) Using ColorBrewer and quantile classification, repeat these steps for all other layers. Round the values to zero, one, or two decimal places, depending on the value in the table. For example, round 2467.000000 to 2,467; round 23.400000 to 23.4.; and round 1.230000 to 1.23.

The layer list looks something like the following screenshot after these steps are completed. The description fields should all be filled in with information for each topic.

Note that similar themes (Educational Attainment and Income, for example) can have similar color schemes.

Use your own judgment for rounding numbers, when appropriate.



4.2. Customize County Map Layers

4.2.1. Organize Layers

- 1) Open the county map project.
- 2) Rename and arrange the layers in the table of contents as follows (remove the tracts layer):
 - Cities (turn off for now)
 - Roads (turn off for now)
 - [PARK]
 - State Boundaries
 - counties

4.2.2. Clip Counties

- 1) Using the Select Features tool, click and drag within the Data Frame to select all of the data in view.
- 2) Right click on the counties layer; Selection > Create Layer from Selected Features (this selection layer only has the counties that we are interested in mapping.)
- 3) From within ArcMap, open ArcToolbox (click on the red toolbox icon).
- 4) Navigate to Analysis Tools > Extract > Clip.
- 5) Input Features: Click on the arrow and select the counties layer.
- 6) Clip Features: Click on the arrow and select the counties selection layer. Accept the default name of the Output Feature Class and click OK.
- 7) Remove the original counties layer as well as the selection layer, only leaving the layer displaying the clipped feature class.

4.2.3. Create Group Layers

- 1) Right-click on Layers and select New Group Layer. Rename the new group layer Total Population. Move the group layer directly above the clipped counties layer. Click and drag the clipped counties layer into this new group layer, renaming it Total Population.
- 2) Now copy the counties layer and paste, renaming the layer Total Population Description. Move this new layer within the Total Population group layer. Click on the color box and change the fill color and outline color to No Color.
- 3) Copy this entire group layer and paste (right-click on Layers) ten times, moving the group layers under the state boundaries layer. Rename these layers as follows:
 - Recent Population Change
 - Projected Population Change
 - Urbanization
 - Change in Building Permits
 - Change in Farmland
 - Tourism Revenue
 - Employment (Sales and Service)
 - Employment (Construction and Manufacturing)
 - Employment (Government)
 - Employment (Agriculture and Natural Resources)

4.2.4. Join county table to county layers

- 1) Right-click on the counties layer in the Total Population group layer > Joins and Relates > Join... .
- 2) Join the counties feature class to the county_data table.
- 3) Choose Yes to automatically create an index.
- 4) Repeat this for each group layer, joining by the FIPS field. You do not need to join the blank description layers to the table.

4.2.5. Park Layer

Give the park the same color as in the tract file.

4.2.6. State Boundaries

Apply the same color/width as in the tract file.

4.2.7. Classification, Layering

Use the same process as in the tract file to create group layers, round quantile classes when appropriate, and describe the various themes. For the diverging data, where the percent change is above and below zero, you will want to use a diverging color scheme with shades of two hues. Sometimes you will want to “force” the break to show values above and below zero. Likewise, you will not use quantiles for categorical data (Farmland, Urbanization). Refer to the original Urbanization file for legend class assignments.

The county layer list should look something like the following after these steps are completed. The description fields should all be filled in with information for each topic.

Layers

- Cities
- Roads
- DEWA
- State Boundaries
- Total Population
 - Total Population
 - Estimated, 2006
 - 800,001 - 2,508,820
 - 500,001 - 800,000
 - 300,001 - 500,000
 - 100,001 - 300,000
 - 28,093 - 100,000
 - Total Population Description
- Recent Population Change
 - Recent Population Change
 - Percent Change, 2000 to 2006
 - 7.2 - 24.7
 - 4.7 - 7.1
 - 2.7 - 4.6
 - 0.1 - 2.6
 - 1.8 - 0.0
 - Recent Population Change Description
- Projected Population Change
 - Projected Population Change
 - Percent Change, 2006 to 2030
 - 31.2 - 53.7
 - 20.1 - 31.1
 - 13.5 - 20.0
 - 0.1 - 13.4
 - 4.8 - 0.0
 - Projected Population Change Description
- Urbanization
 - Urbanization
 - County is within a...
 - Large metro area, over 1 million residents
 - Small metro area, under 1 million residents
 - Micropolitan or noncore adjacent to metro area
 - Noncore adjacent to small metro with own town
 - Noncore adjacent to small metro, with no own town
 - Urbanization Description
- Change in Building Permits
 - Change in Building Permits
 - Percent Change, 1993-1995 to 2--3-2005
 - 100.1 - 1,257.1
 - 50.1 - 100.0
 - 0.1 - 50.0
 - 20.9 - 0.0
 - 51.5 - -21.0
 - Change in Building Permits Description

Legend

- Change in Farmland
 - Change in Farmland
 - Percent Change in Acreage, 1997-2002
 - 10.9 - 66.5
 - 0.5 - 10.8
 - 16.6 - 0.4
 - 100 - -16.7
 - No acreage
 - Change in Farmland Description
- Tourism Revenue
 - Tourism Revenue
 - Percent of Service Related Sectors
 - 11.1 - 36.1
 - 6.9 - 11.0
 - 5.4 - 6.8
 - 2.3 - 5.3
 - Tourism revenue not reported
 - Tourism Revenue Description
 - Percent in Sales and Service
 - 76.0 - 85.2
 - 71.9 - 75.9
 - 69.2 - 71.8
 - 66.3 - 69.1
 - 52.4 - 66.2
 - Employment (Sales and Service) Description
- Employment (Construction and Manufacturing)
 - Employment by Industry
 - Percent in Construction and Manufacturing
 - 17.8 - 28.6
 - 15.5 - 17.7
 - 12.9 - 15.4
 - 9.9 - 12.8
 - 5.4 - 9.8
 - Employment (Construction and Manufacturing) Description
- Employment (Government)
 - Employment by Industry
 - Percent in Government
 - 2.4 - 7.1
 - 1.6 - 2.3
 - 1.3 - 1.5
 - 1.2
 - 0.8 - 1.1
 - Employment (Government) Description
- Employment (Agriculture and Natural Resources)
 - Employment by Industry
 - county_data.AGNATPCT
 - 3.0 - 14.2
 - 2.0 - 2.9
 - 1.4 - 1.9
 - 0.7 - 1.3
 - 0.1 - 0.6
 - Employment (Agriculture and Natural Resources) Description

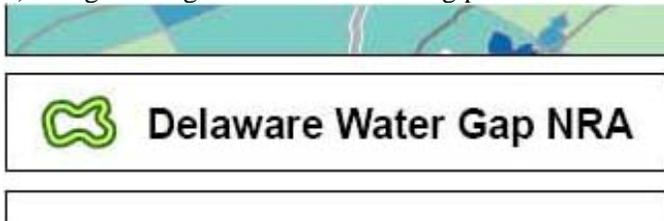
5. Add Legends, Marginalia to Layout

This section shows how to create and add legends and descriptions to the layout. By the end of the section you should have a legend that turns on and off in response to the layer selections and corresponds with the map in the layout frame.

5.1. Tract Level Project

5.1.1. Adding the Park Legend

- 1) Rename the park layer with the full name of the park.
- 2) Menu > Insert > Legend.
- 3) Legend Items: choose the park layer. Use the arrows to move layers back and forth. Click next.
- 4) Legend Title: none
- 5) Click on Next and then Finish.
- 6) Now double-click on the legend, click on the park layer under Legend Items.
- 7) Click on Style..., Properties, Label Symbol, and type in Arial 15 Bold. Click OK.
- 8) Nudge the legend into the following position:

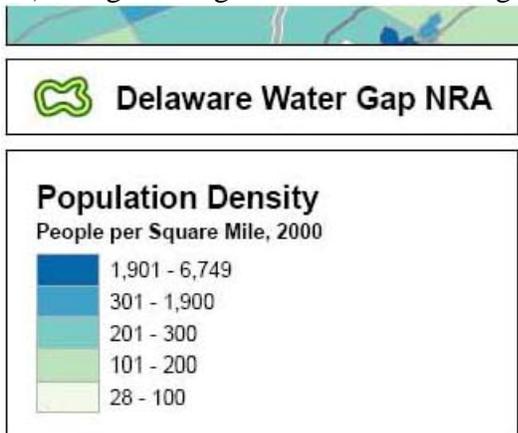


5.1.2. Adding the Data Legends

- 1) Menu > Insert > Legend.
- 2) Legend Items: choose the layers with the map data attached (the first sublayer in each group layer).
- 3) Legend Title: none
- 4) Click on Next until the last screen.
- 5) Enter:
 - Columns: 200
 - Patches (Vertically): 0
 - Finish.
- 6) Double-click on the legend. Under the "Legend" tab, change the Layer Name and Group value to 2.
- 7) Under the Items tab, highlight all layers and click on Style... Choose Horizontal with Layer Name, Heading, and Label. Click OK.
- 8) Now click on the first legend item, Style..., Properties...:
 - Layer Name Symbol: Arial 15 Bold (Save as "Layer Name")
 - Heading Symbol: Arial 10 Bold (Save as "Heading")
 - Label Symbol: Arial 10 (Save as "Label")

***After choosing the symbol properties, save the legend style for future reference.
***Urbanization: Label Symbol: Arial 8
- 9) Now apply this style to all parts of the legend. If you have all of the layers turned on now, you'll see that the legends all line up vertically. In the "Items" tab, under Legend Items, select all except the first layer, and check the box for Place in New Column. Also, uncheck "Add a new item to the legend when a new layer is added to the map."

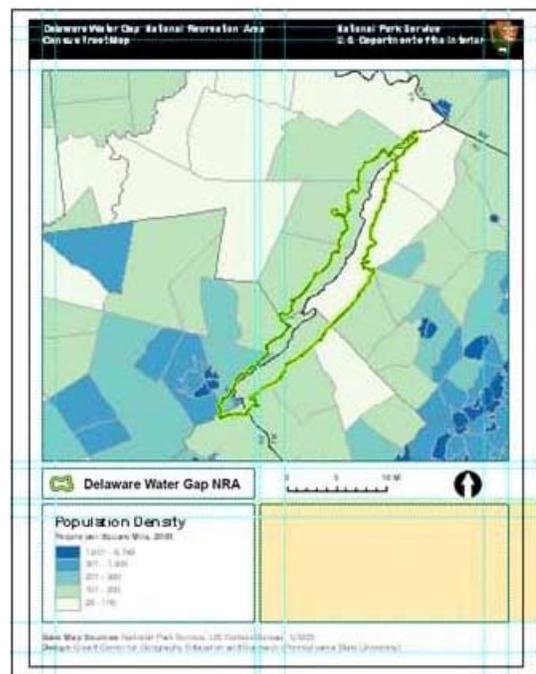
10) Nudge the legend into the following position:



11) Now you will need to draw a white box over the legends that appear to the right – double click on the box to change the color. You will now need to reorder the legend, white box, and frames so that the items appear properly masked by the box.

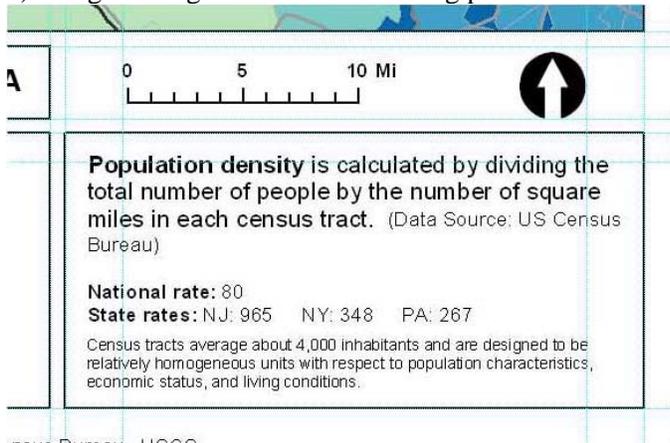
12) Right click on the box. Order > Send to Back. Now select and right-click the legend, and choose Order > Send to Back.

At right is an example of what the layout should look like at this time. The white box is colored in for example purposes only – this should be all white.



5.1.3. Adding the Descriptions

- 1) Menu > Insert > Legend.
- 2) Legend Items: choose the description layers.
- 3) Legend Title: none.
- 4) Click on Next until the last screen.
- 5) Enter:
Columns: 200
Finish.
- 6) Double-Click on the legend. Highlight all layers and click on Style... Choose Horizontal Single Symbol Description Only. Click OK.
- 7) Under Legend Items, select all except the first layer, and check the box for Place in New Column.
- 8) Nudge the legend into the following position:



Now when you turn layers on and off, the map should match both the data legend and the description. If they don't, check the legend properties and make sure that the layers are in the same order on both the layers list and in the properties window.

5.2. County Level Project

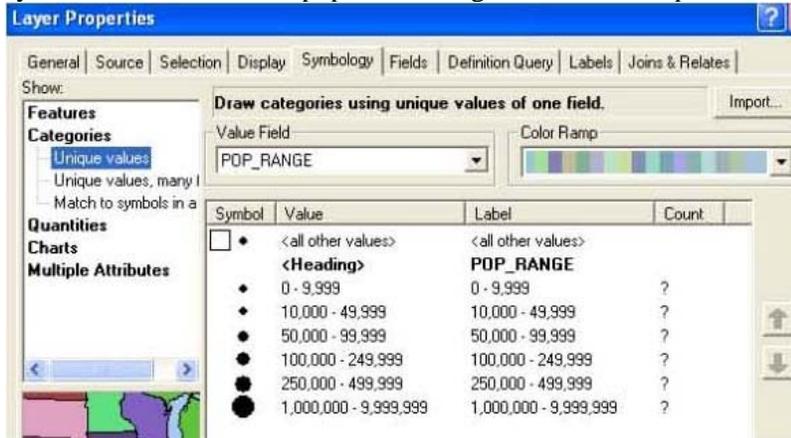
Follow the same steps from the Tract Level Project to place the park legend, the data legend, and the descriptions.

6. Label Features

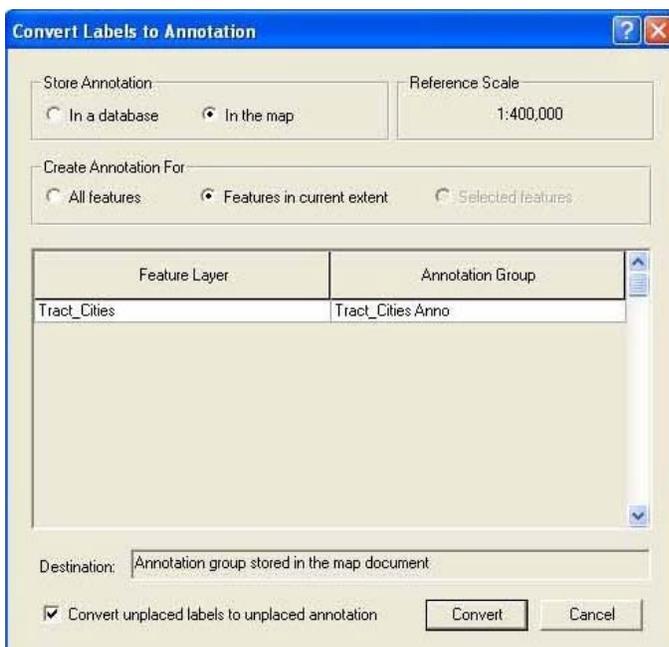
6.1. Tract Level Project

6.1.1. Label Cities

- 1) Turn on the cities layer. Using the Select Features tool, select all cities within view. Right click on the cities layer > Selection > Create Layer from Selected Features.
- 2) Open the cities selection attribute table. Sort the table by population, and highlight the top five cities. Right-click on Cities Selection > Data > Export Data. Export as a feature class within the geodatabase and name it Tract Cities. Add the feature class as a layer to the map, and remove the other cities layers.
- 3) Double click on the Tract Cities layer. In the Layer Properties box, look at the Symbology tab. Click on Categories > Unique Values. Value Field: POP_RANGE; Add All Values. Create a set of proportional symbols for the different population ranges like the example below, (Min: 4 pt, Max: 12 pt).



- 4) Now look at the Labels tab. Toggle on “Label features in this layer” and choose Label Field: NAME.
- 5) Choose Arial 8 Bold for the Text Symbol style.
- 6) Right click on the Cities layer and choose Convert Labels to Annotation. Choose the following:



- 7) Double-click on the data view – you will get a hatched outline to the map, and are now “Focus Data Frame” mode.
- 8) Increase the font size for cities to correspond to the size of the city dot (Min: 7.5 pt, Max: 12 pt).
- 9) Move the city labels to the best location (use your own judgment). These labels are attached to the map, so even if the map moves, the labels move as well. To get out of the Focus Data Frame mode, click outside of the data frame.

6.1.2. Label Roads

1) Turn on the Roads layer. Open the attribute table and bring up the Select by Attributes window.



Export data as a feature class into a new layer from the selection and rename it Tract Roads.

2) Double click on the Tract Roads layer to bring up the layer properties. In the Symbology Tab, choose Categories.

3) Value Field: FEATURE; click on Add All Values; OK.

4) Apply the following to the road symbols:

*Limited Access Highway &
Lim. Acc. Hwy. Toll Road:*

Type: Cartographic Line Symbol
Color: 30% Gray
Width: 3.0 pt

Add a new layer (see right – click on “+” sign) and click on the down arrow. Apply the following to this layer:

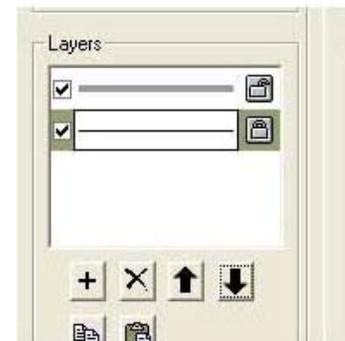
Type: Cartographic Line Style
Color: White
Width: 4.0 pt

Save the Style and click OK.

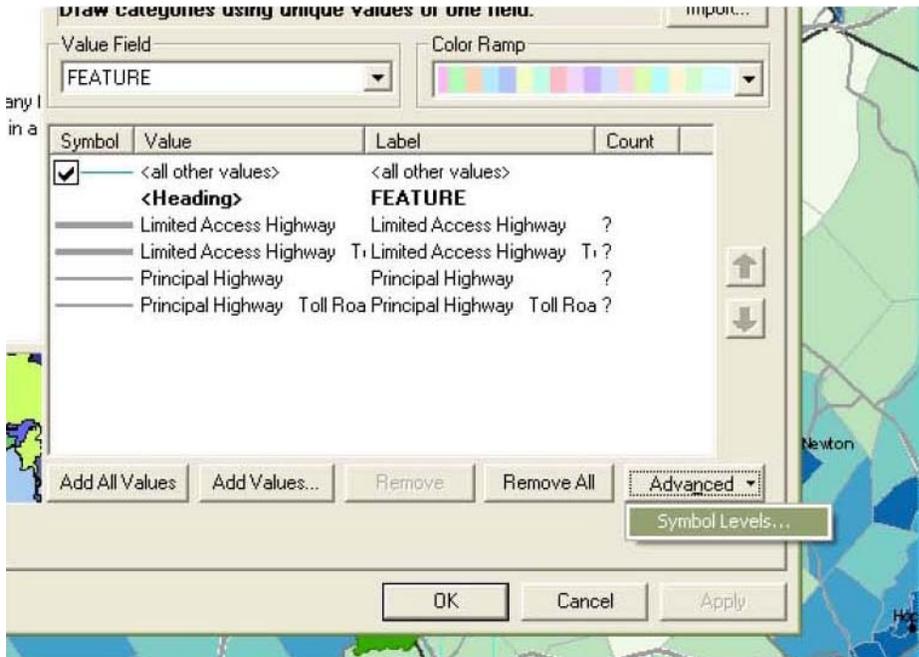
*Principal Highway &
Prin. Hwy. Toll Road:*

Type: Cartographic Line Style
Color: 40% Gray
Width: 1.5 pt

Save the Style and click OK.

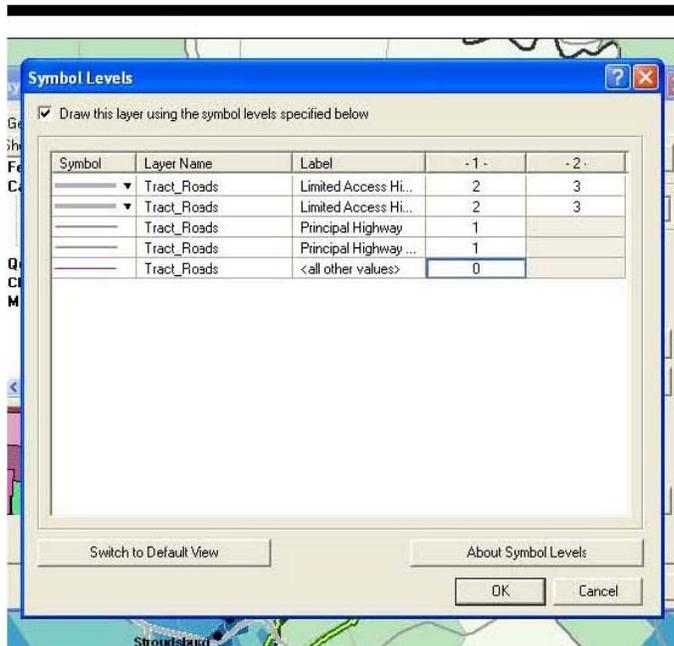


5) Double-click on the Roads layer, and click on Advanced > Symbol Levels...

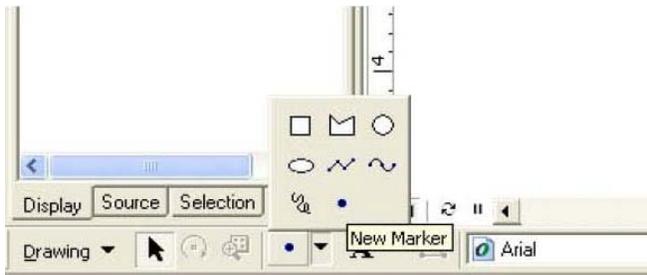


6) Click on “Draw this layer using the symbol levels...” and then Switch to Advanced View.

7) Apply the following: (This orders the roads so that the white “shadow: of the Limited Access Highways and Toll Roads are on the same level, above the Principal Highways.)



8) Using ArcMap symbols and annotation, add road shield symbols and labels for all roads on the map. Remember to add these within the Focus Data Frame mode. To get a symbol, click on New Marker in the drawing toolbar and click on the map.



9) Double-click on the symbol and click on Change Symbol.

10) Scroll down to the Interstate HWY 1 symbol. Change the size to 30.00. Click on the “A” in the drawing toolbar, and click in the data frame. Type the highway number and change the symbol to White/Arial 8 Bold. Using shift, select the shield and the number. You can copy and paste this shield where needed and change the number appropriately.

11) Use this technique to label the U.S. (size 23) and State (size 18) routes as well, using Black for the number symbols.

6.1.3. Label States

1) Focus the Data Frame. Add labels along state boundaries as follows, using the text (Arial 10 Bold) and Rotate tool (found in the Drawing Toolbar, lower left part of screen).



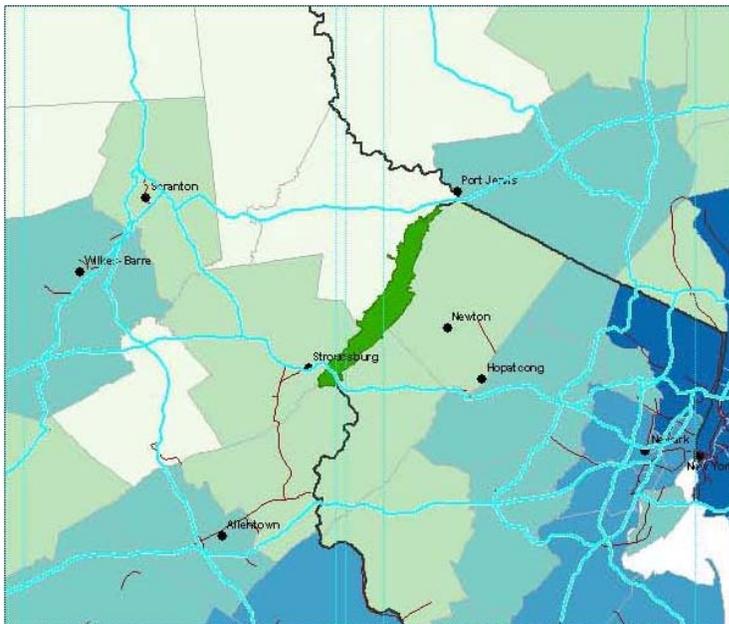
6.2. County Level Project

6.2.1. Label Cities

- 1) Turn on the cities layer. Using the Select Features tool, select all cities within view. Right click on the cities layer > Selection > Create Layer from Selected Features.
- 2) Open the cities selection attribute table. Sort the table by population. Highlight the largest cities that are shown on the tract map, as well as a few more in the area not shown in the tract layout (use your own judgment based on population or importance of cities).
- 3) Right-click on Cities Selection > Data > Export Data. Export as a feature class within the geodatabase and name it County Cities. Add the feature class as a layer to the map, and remove the other cities layers.
- 4) Double click on the County Cities layer. In the Layer Properties box, look at the Symbology tab. Click on Categories > Unique Values. Value Field: POP_RANGE; Add All Values. Create a set of proportional symbols for the different population ranges (Min: 4 pt, Max: 12 pt).
- 5) Now look at the Labels tab. Toggle on “Label features in this layer” and choose Label Field: NAME.
- 6) Choose Arial 8 Bold for the Text Symbol style.
- 7) Right click on the Cities layer and choose Convert Labels to Annotation. (Store Annotation in the Map, Create Annotation for Features in current extend, Convert.)
- 8) Double-click on the data view – you will get a hatched outline to the map, and are now in “Focus Data Frame” mode. Change the font sizes appropriately and move the city labels to the best location (use your own judgment). To get out of the Focus Data Frame mode, click outside of the data frame.
- 9) Double click on the Tract Cities layer. In the Layer Properties box, look at the Symbology tab. Click on Categories > Unique Values. Value Field: POP_RANGE; Add All Values. Create a set of proportional symbols for the different population ranges like the example below, (Min: 4 pt, Max: 12 pt).

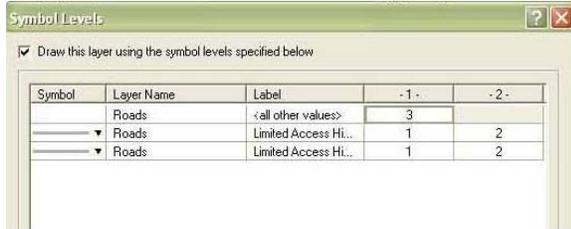
6.2.2. Label Roads

- 1) Turn on the Roads layer. Open the attribute table and bring up the Select by Attributes window. Select Limited Access Highways and Lim Acc Toll Roads. Create a new layer from the selection. In this new layer, select by hand in the map the highways that connect well (no “dead ends”) and best represent the area you are mapping.



Export data as a feature class into a new layer from the selection and rename it County Roads.

- 2) Stylize the roads as in the tracts file for the Limited Access Roads.
- 3) Double-click on the Roads layer, and click on Advanced Symbol Levels... and apply the following:



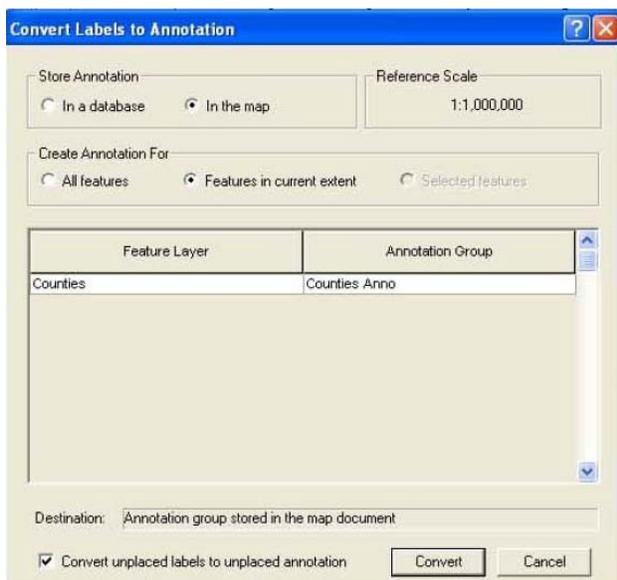
- 4) Using ArcMap symbols and annotation, add road shield symbols and labels for all roads on the map.

6.2.3. Add Base Map Layers (Census Tract Map Inset Box, County Labels)

- 1) Add a new group layer and name it “Base Map.” Place this group layer between the State Boundaries and Total Population layers.
- 2) Add two copies of the counties feature class to Base Map.
- 3) Apply the following color properties to the layers:
 - First counties layer: no fill or outline (rename as Inset Box)
 - Second counties layer fill: 239R, 228G, 190B
 - Second counties layer outline: White, 0.40 point (rename as Counties)
- 4) Bring up the Layer Properties window for Counties. Select the Labels tab.
 - Check on “Label features in this layer”
 - Label Field: NAME
 - Arial 8 Bold, 60% Gray

Click on “Symbol” and then Properties. Now go to the Formatted Text tab and change the Text Case to All Caps.

- 5) Right-click on the Counties layer, and choose Convert Labels to Annotation. Select the following:



You can now select each county label and move it to the best location.

- 6) Create a New Annotation Group (go to the lower left corner of the screen, and click on Drawing).
 Annotation Group Name: Inset Box
 Associated Layer: Inset Box
- 7) Go to Drawing, and make sure that Inset Box is the active annotation target. Now double-click on the map area with the Select Elements tool (arrow). This is called Focusing the Data Frame. Whatever you add to the layout while in this mode will stay attached to the layer and map as it is moved and layers are turned on and off.

Draw a box in the map to outline the area shown in the tracts file. Apply these Color Properties to the box:

- Fill: None;
- Outline: Red; 1.0pt.

- 8) Still working in the Focused Data Frame, type the label “Census Tracts Map Area” and position it to label the inset box.

Now you can turn on and off the Inset Box and County layers by checking those specific layers. Checking off Base Map will keep the labels, while removing the single-color counties from the map.

6.2.4. Add State Labels

- 1) Create a New Annotation Group called State Labels, Associated Layer: State Boundaries.
- 2) Double-click on the map to Focus the Data Frame.
- 3) Add labels as follows, using the text (Arial 10 Bold) and Rotate tool (found in the Drawing Toolbar, lower left part of screen).



Congratulations! You should have a complete project now. Export individual maps as PDF's to share and print.

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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National Park Service
U.S. Department of the Interior



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