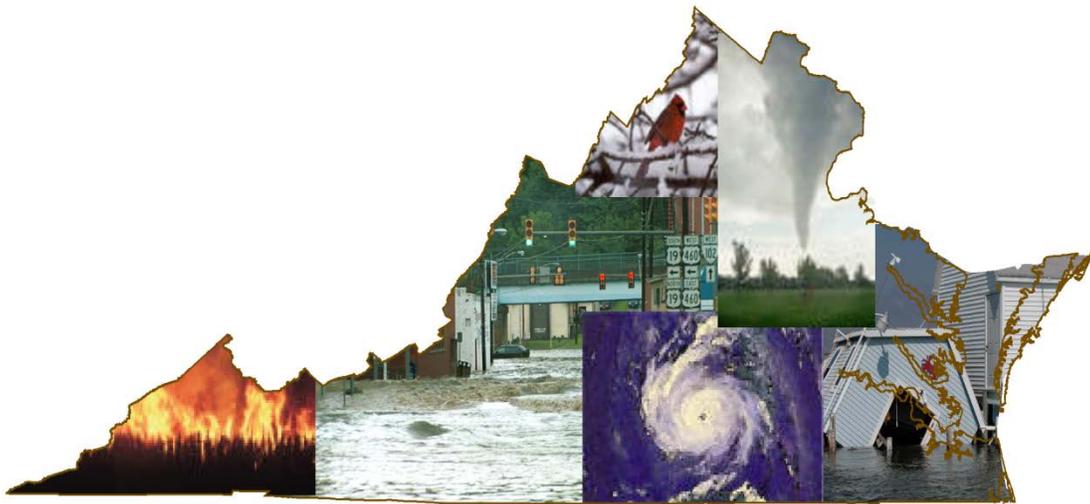


COMMONWEALTH OF VIRGINIA



Hazard Mitigation Plan



Chapter 3 Hazard Identification and Risk Assessment (HIRA)

Section 3.2 – Introduction to Virginia



SECTION 3.2

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Section 3.2: Introduction to Virginia

Virginia is located on the Mid-Atlantic coast of the continental United States. Virginia displays a unique geography including the Appalachian and Blue Ridge Mountains to the west and northwest, piedmont in central and south-central Virginia, and the coastal plain area east of the Interstate-95 corridor. The eastern portion of the state is adjacent to the Chesapeake Bay and Atlantic Ocean, which offer unique economic opportunities as well as emergency management challenges. The shaded relief map in Figure 3.2-1 illustrates the major physiographic features of Virginia.

Several major watersheds are found in the state, as shown in Figure 3.2-2. Most of the streams and rivers in northern and central Virginia flow east towards the Chesapeake Bay. The southeastern and central southern parts of the state drain through North Carolina directly into the Atlantic Ocean. The southwestern portion of the state drains into the Mississippi River and Gulf of Mexico via the Holston, Clinch-Powell, New, and Big Sandy rivers.

The climate of Virginia is moderate with four well-defined seasons. Daytime temperatures usually range from 30° F in the winter to 90° F in the summer, although historic temperature extremes above 100° F, and below 0° F, have been observed with the higher temperatures more common on an annual basis. On average, the coastal region is the warmest due to maritime influences, with temperatures gradually decreasing across the Piedmont towards the west. The climate of the western part of the state, which reaches a maximum elevation of 5729' above sea level at Mount Rogers, is significantly cooler on average throughout the year.

Figure 3.2-3 shows the 95 counties and 39 independent cities that make up the Commonwealth of Virginia. The national capital, Washington, D.C., is located on the Potomac River at Virginia's northern border with Maryland. The State Capitol is located in the City of Richmond. Unlike many other states, cities and counties in Virginia are each independent political jurisdictions. The cities and counties in Virginia are also organized into twenty-one Planning District Commissions (PDCs), as shown in Figure 3.2-4. These commissions provide a platform for regional planning and communication on a variety of subjects, such as land use planning, transportation, and economic development. The PDCs have little governing authority beyond the will of their constituent local governments. Of the 25 local hazard mitigation plans in the Commonwealth of Virginia, 21 were done on a regional basis through PDCs, and one of which was a collaborative effort by two separate PDCs.

The first known residents of the present-day state of Virginia were Native Americans, whose ancestors first arrived in North America thousands of years ago. In the late 1500's and early 1600's, Europeans began to sail across the Atlantic Ocean, exploring and colonizing Virginia.

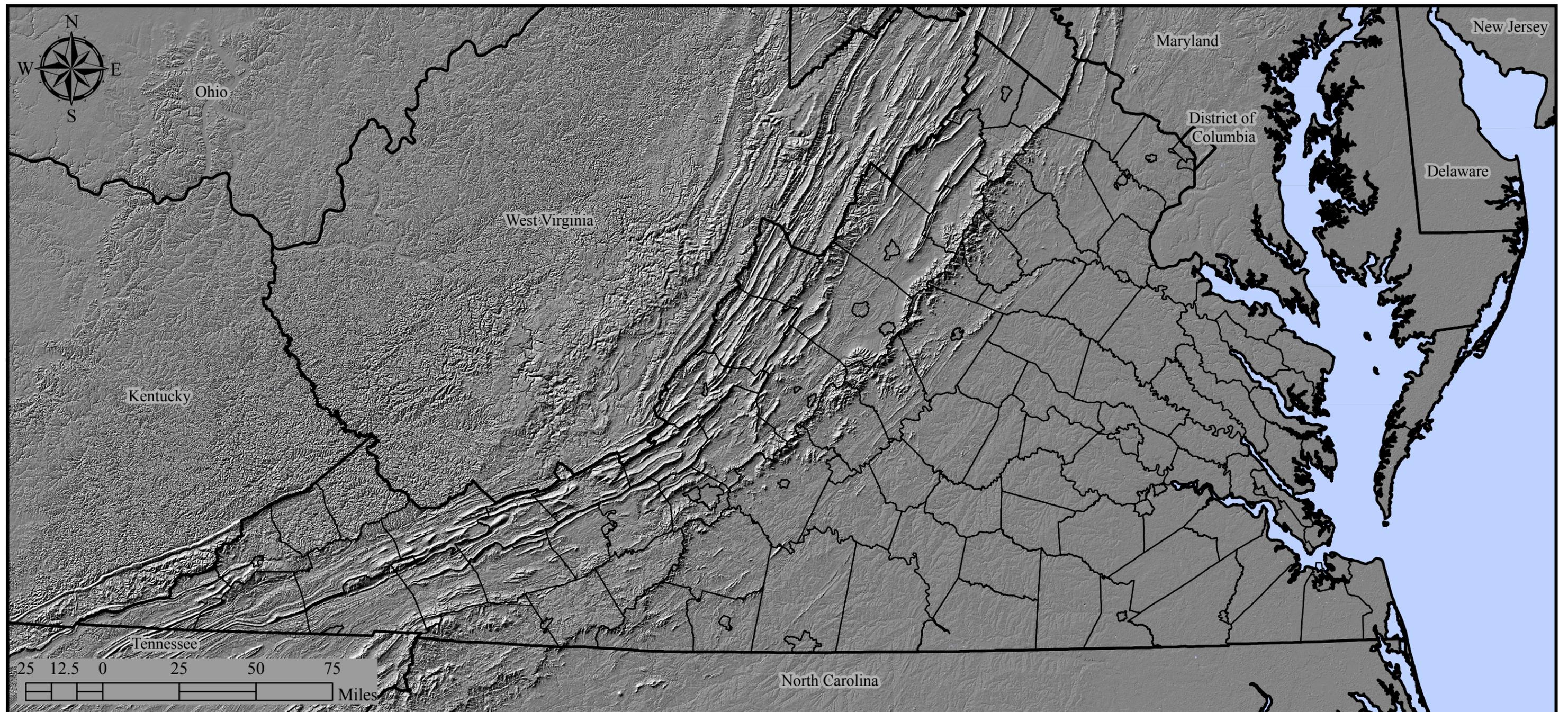




The first lasting English settlement in Virginia, dating to 1607, was located at Jamestown. As colonization of the Americas progressed, Virginia grew into an important center of trade and government. Many Virginians were notable figures in the American Revolution, and many of the early United States Presidents were native Virginians. In 1861 Virginia seceded from the union and Richmond became the capital of the Confederate States of America, and was the site of many battlegrounds in the subsequent Civil War. Following the reunification of the United States, Virginia continued to develop, with many large urban areas in the eastern and northern parts of the state. Today, Virginia's culture reflects a mixture of the old and new, urban and rural.



Figure 3.2-1: Shaded Relief of Virginia



DATA SOURCES:

- USGS National Map Seamless Server
- Shuttle Radar Topography Mission
- VGIN Jurisdictional Boundaries
- ESRI State Boundaries

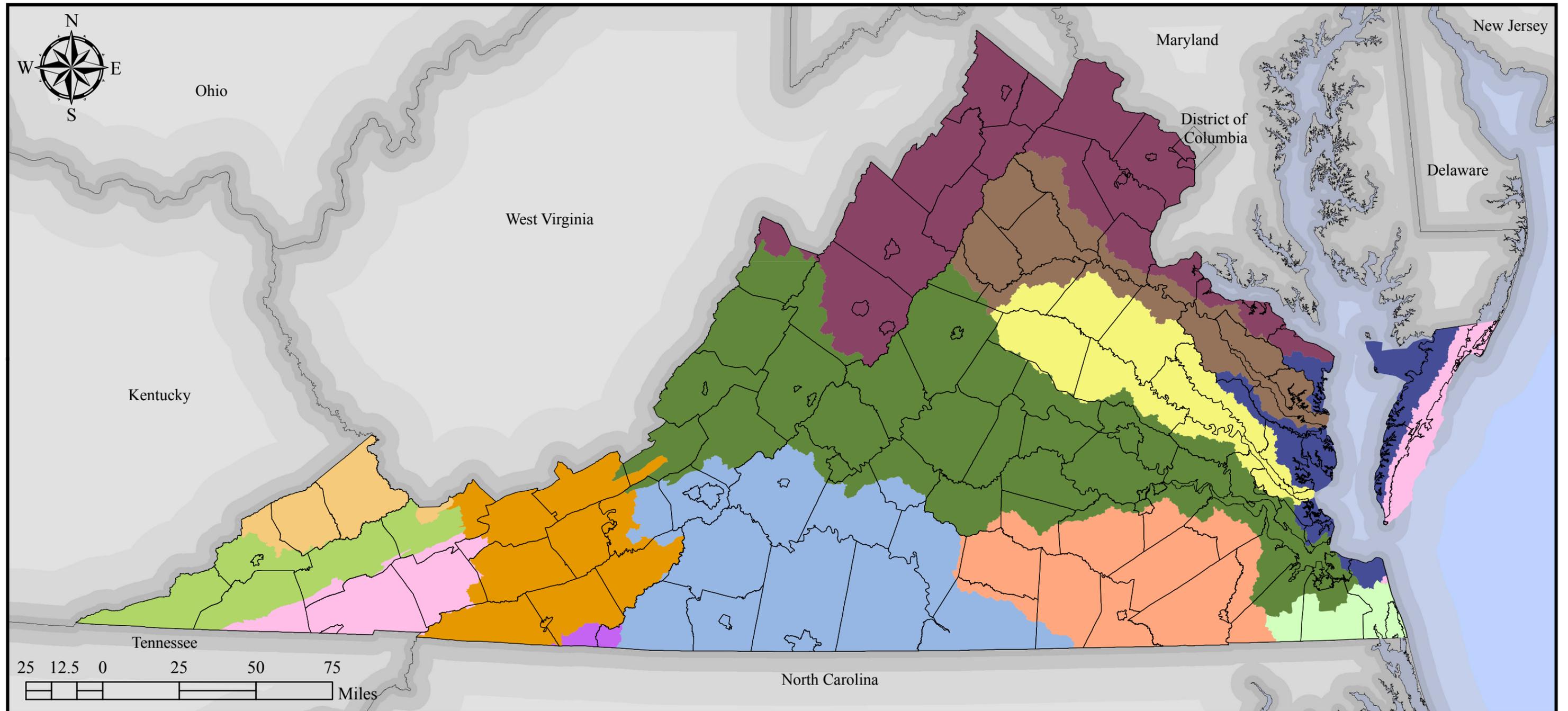
HAZARD IDENTIFICATION:

The Shuttle Radar Topography Mission (SRTM) is a joint project between NASA and NGA (National Geospatial-Intelligence Agency) to map the world in three dimensions. SRTM data is being used to generate a digital topographic map of the Earth's land surface with data points spaced every 1 arc second for the United States of latitude and longitude (approximately 30 meters).

PROJECTION: VA Lambert Conformal Conic
North American Datum 1983

DISCLAIMER: Majority of available hazard data is intended to be used at national or regional scales. The purpose of the data sets are to give general indication of areas that may be susceptible to hazards. In order to identify potential risk in the Commonwealth available data has been used beyond the original intent.

Figure 3.2-2: Watersheds of Virginia



DATA SOURCES:

DCR/NRCS Hydrologic Units
 VGIN Jurisdictional Boundaries
 ESRI State Boundaries

LEGEND:

- | | |
|------------------------|--------------|
| River Basins | James |
| Albemarle & Coastal | New |
| Atlantic Ocean Coastal | Potomac |
| Big Sandy | Rappahannock |
| Chesapeake Bay Coastal | Roanoke |
| Chowan | Yadkin |
| Clinch-Powell | York |
| Holston | |

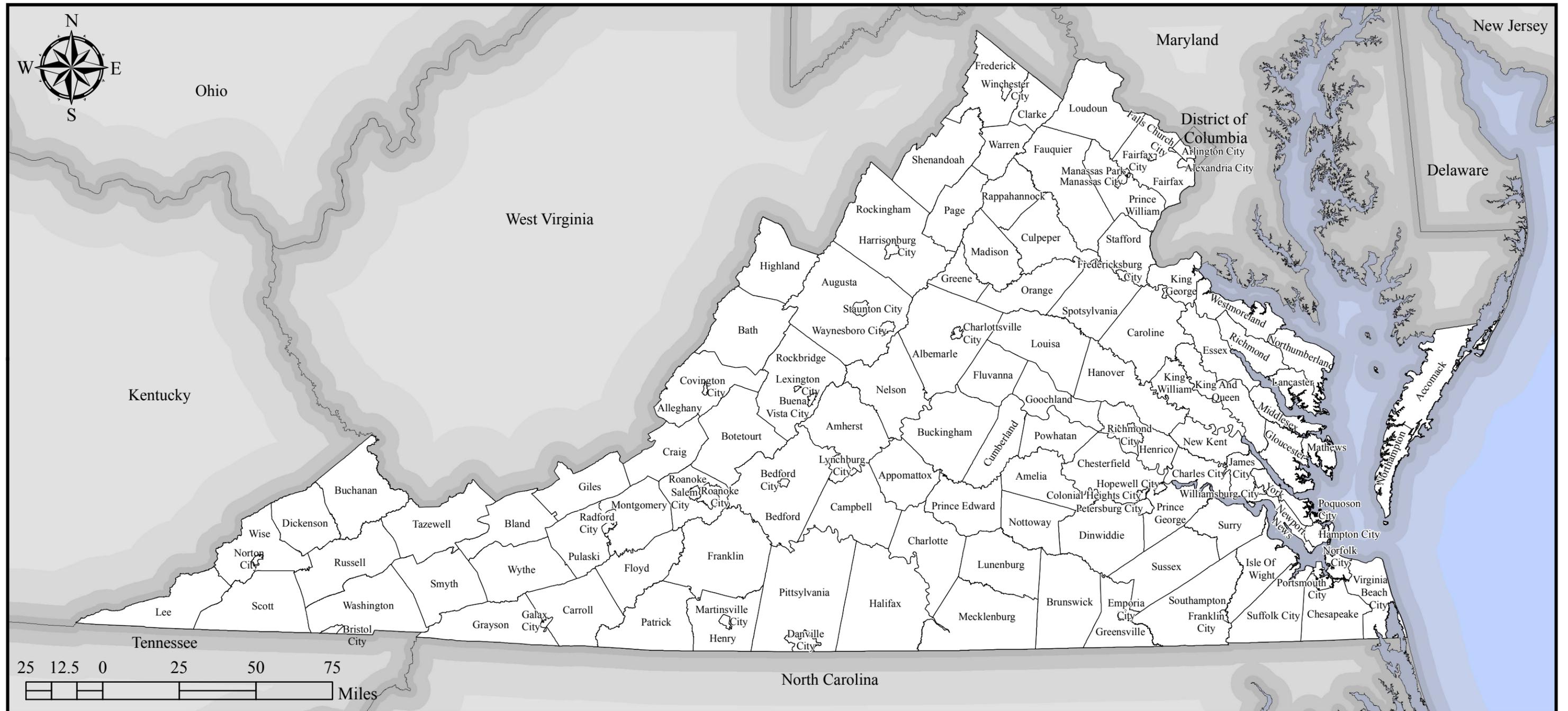
HAZARD IDENTIFICATION:

DCR's soil and water conservation program USDA-NRCS delineated detailed sixth order hydrologic units (HU) for Virginia in 1990 and again in 1995 following the issuance of new hydrologic unit delineation standards in 1992. The HU have been merged together to show the 14 major river basins of Virginia.

PROJECTION: VA Lambert Conformal Conic
 North American Datum 1983

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Figure 3.2-3: Municipalities in Virginia



DATA SOURCES:

VGIN Jurisdictional Boundaries
ESRI State Boundaries

LEGEND:

□ Jurisdictional Boundaries

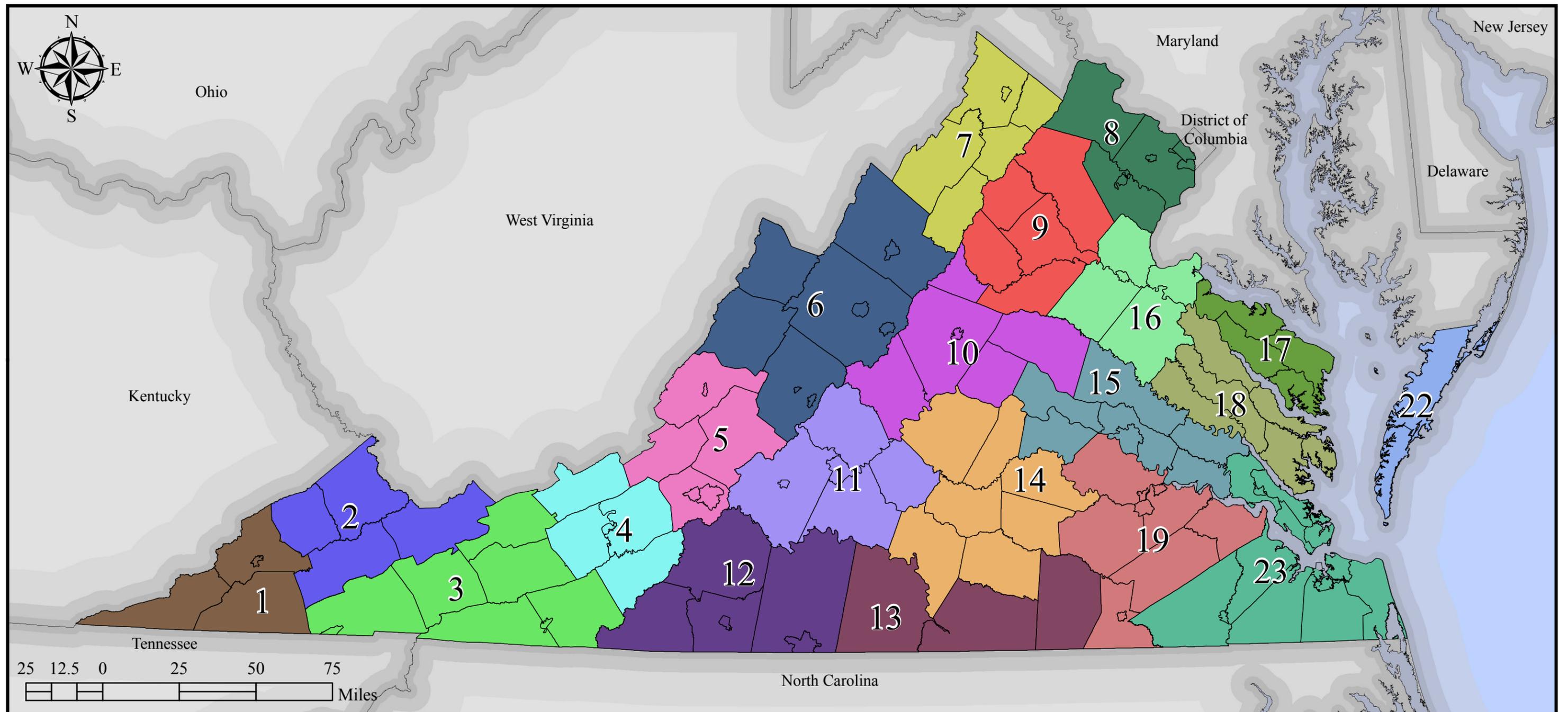
HAZARD IDENTIFICATION:

The Commonwealth of Virginia is divided into 95 counties and 39 independent cities. Under Virginia law, all municipalities incorporated as cities are independent cities and are not part of any county.

PROJECTION: VA Lambert Conformal Conic
North American Datum 1983

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Figure 3.2-4: Planning District Commissions



DATA SOURCES:

- VAPDC Boundaries
- VGIN Jurisdictional Boundaries
- ESRI State Boundaries

LEGEND:

- | | | |
|----------------------------------|--------------------------------|------------------------------|
| 1: Lenowisco PDC | 8: Northern Virginia RC | 15: Richmond Regional PDC |
| 2: Cumberland Plateau PDC | 9: Rappahannock-Rapidan RC | 16: George Washington RC |
| 3: Mount Rogers PDC | 10: Thomas Jefferson PDC | 17: Northern Neck PDC |
| 4: New River Valley PDC | 11: Virginia's Region 2000 LGC | 18: Middle Peninsula PDC |
| 5: Roanoke Valley-Alleghany RC | 12: West Piedmont PDC | 19: Crater PDC |
| 6: Central Shenandoah PDC | 13: Southside PDC | 22: Accomack-Northampton PDC |
| 7: Northern Shenandoah Valley RC | 14: Commonwealth RC | 23: Hampton Roads |

PROJECTION: VA Lambert Conformal Conic
North American Datum 1983

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Demographics

Virginia’s demographics are a major factor in the risk posed by natural hazards. According to the United States Census, the population of Virginia was over 8 million in 2010, making it the 12th most populous state in the nation¹. The majority of these residents live in the eastern part of the state, along the corridor running from Washington, D.C. to Virginia Beach known as the Golden Crescent. A great deal of the state’s economy is driven by activity in urban areas of northern and eastern Virginia; in recent years, Fairfax and Loudon counties in Northern Virginia have routinely been ranked at or near the top in nationwide comparisons of household income. The remainder of the state is largely rural, with several smaller urban areas. Figure 3.2-5 shows the population distribution in the Commonwealth for 2010.

The overall population of Virginia continues to increase annually, although the rate of growth has declined somewhat in the past few years. Approximately half of Virginia’s population growth since 2000 can be attributed to natural increase; that is, population growth that occurs when the birthrate exceeds the death rate. Immigration from other states and foreign countries accounts for the other half of the state’s population growth. More than 70% of Virginians live in the Northern Virginia, Richmond, and Hampton Roads region.

Population trends show uneven change throughout the State. Figure 3.2-6 shows the population changes during the time period 2000 through 2010. Table 3.2-1 shows the top ten jurisdictions, in terms of percent population change, between 2000 and 2010.

Table 3.2-1: Top 10 Jurisdiction with the Highest Growth Rates (2000 – 2010) based on U.S. Census Decennial Population Data

Jurisdiction	2000 Population	2010 Population	% Population Change
Loudoun County	169,599	312,311	84.1%
Prince William County	280,813	402,002	43.2%
King George County	16,803	23,584	40.4%
Stafford County	92,446	128,961	39.5%
James City County	48,102	67,009	39.3%
Manassas Park City	10,290	14,273	38.7%
New Kent County	13,462	18,429	36.9%
Culpeper County	34,262	46,689	36.3%
Spotsylvania County	90,395	122,397	35.4%
Suffolk City	63,677	84,585	32.8%

The U.S. Census Bureau’s Population Division estimates that the population of Virginia will continue increasing, with most growth occurring in the form of urban sprawl. The population of





Fairfax County has exceeded 1 million and is expected to grow over 12% from 2010 through 2030. The jurisdictions listed in Table 3.2-1 will continue to grow as they have in the past. Figure 3.2-7 shows the projected population change for 2010 through 2030. The following jurisdictions are projected to have greater than 50% population growth (2010 – 2030):

- Loudoun County
- Spotsylvania County
- Fluvanna County
- City of Suffolk
- Stafford County
- Powhatan County
- King George County
- New Kent County
- Culpeper County
- James City County
- Prince William County

Population decline appears most in the rural counties of Virginia. Table 3.2-2 shows the 10 counties with the largest population decline for the years 2000 through 2010. In eight of the ten jurisdictions below, population is declining as a result of deaths outnumbering births as well as negative net migration. For the other two jurisdictions, there was a natural increase in population (more births than deaths), but a negative net migration away from the county caused an overall population decline.

Table 3.2-2: Jurisdiction with Declining Populations (2000-2010) based on U.S. Census Decennial Population Data

Jurisdiction	2000 Pop	2010 Pop	% Pop Change
Accomack County	38,305	33,164	-13.4%
Danville City	48,411	43,055	-11.1%
Buchanan County	26,978	24,098	-10.7%
Martinsville City	15,416	13,821	-10.3%
Highland County	2,536	2,321	-8.5%
Grayson County	16,881	15,533	-8.0%
Henry County	57,930	54,151	-6.5%
Bath County	5,048	4,731	-6.3%
Hampton City	146,437	137,436	-6.1%
Alleghany County	17,215	16,250	-5.6%



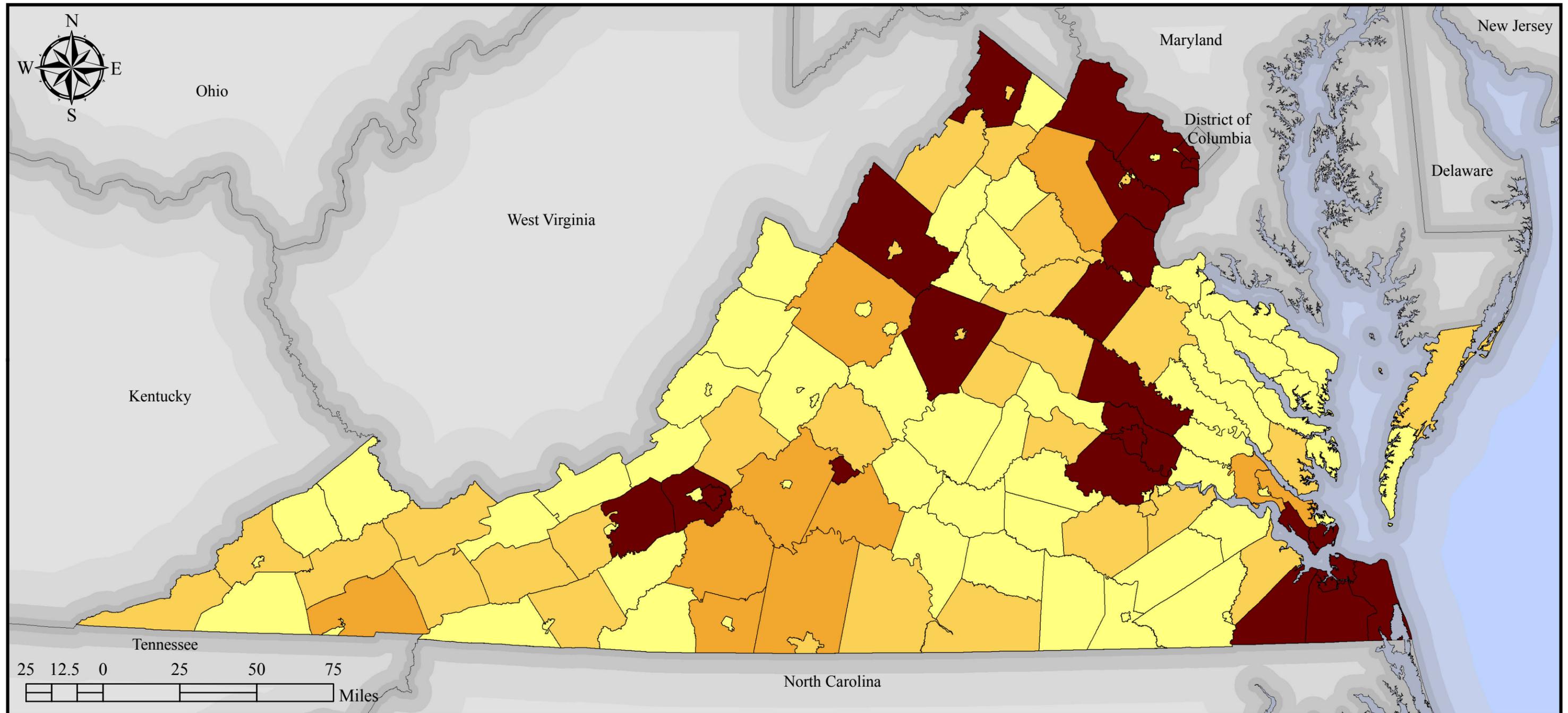


Jurisdictions projected to have a decline in population (greater than 2%) between 2010 and 2030 include:

- Buchanan County
- City of Norton
- Sussex County
- Halifax County
- Grayson County
- City of Martinsville
- City of Roanoke
- Highland County
- Henry County
- City of Petersburg
- Alleghany County
- City of Staunton



Figure 3.2-5: 2010 Population Distribution



DATA SOURCES:

U.S. Census Data
 VGIN Jurisdictional Boundaries
 ESRI State Boundaries

LEGEND:

2010 Population	
	< 25,000
	25,001 - 50,000
	50,001 - 75,000
	75,001 - 200,000
	>200,001

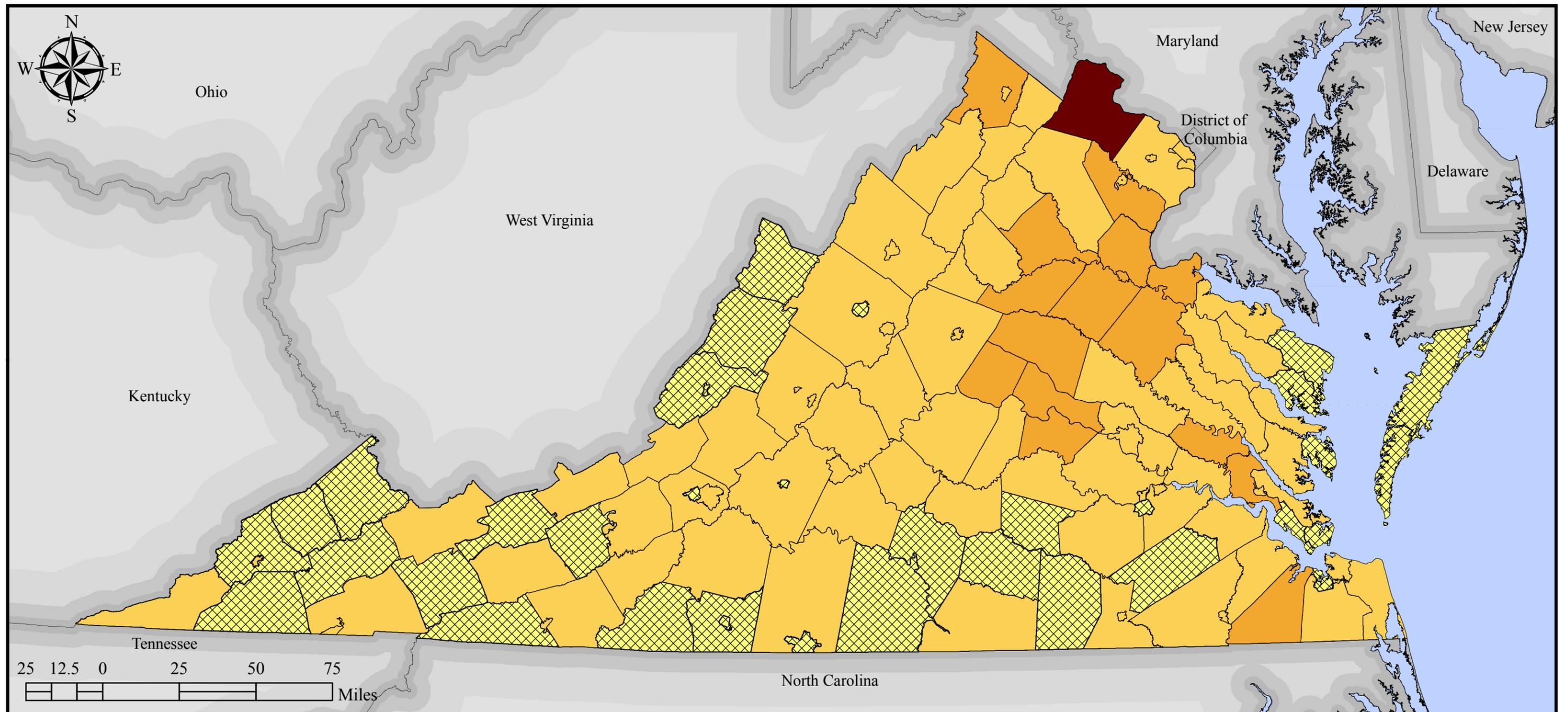
DATA IDENTIFICATION:

Population distribution is from the 2010 U.S. Census.

PROJECTION: *VA Lambert Conformal Conic
 North American Datum 1983*

DISCLAIMER: Majority of available hazard data is intended to be used at national or regional scales. The purpose of the data sets are to give general indication of areas that may be susceptible to hazards. In order to identify potential risk in the Commonwealth available data has been used beyond the original intent.

Figure 3.2-6: Population Change 2000 - 2010



DATA SOURCES:

Virginia Workforce Connection/
U.S. Census Data
VGIN Jurisdictional Boundaries
ESRI State Boundaries

LEGEND:

Percent Population Change

- Population Decline
- 1% - 24%
- 25% - 49%
- 50% - 74%
- > 75%

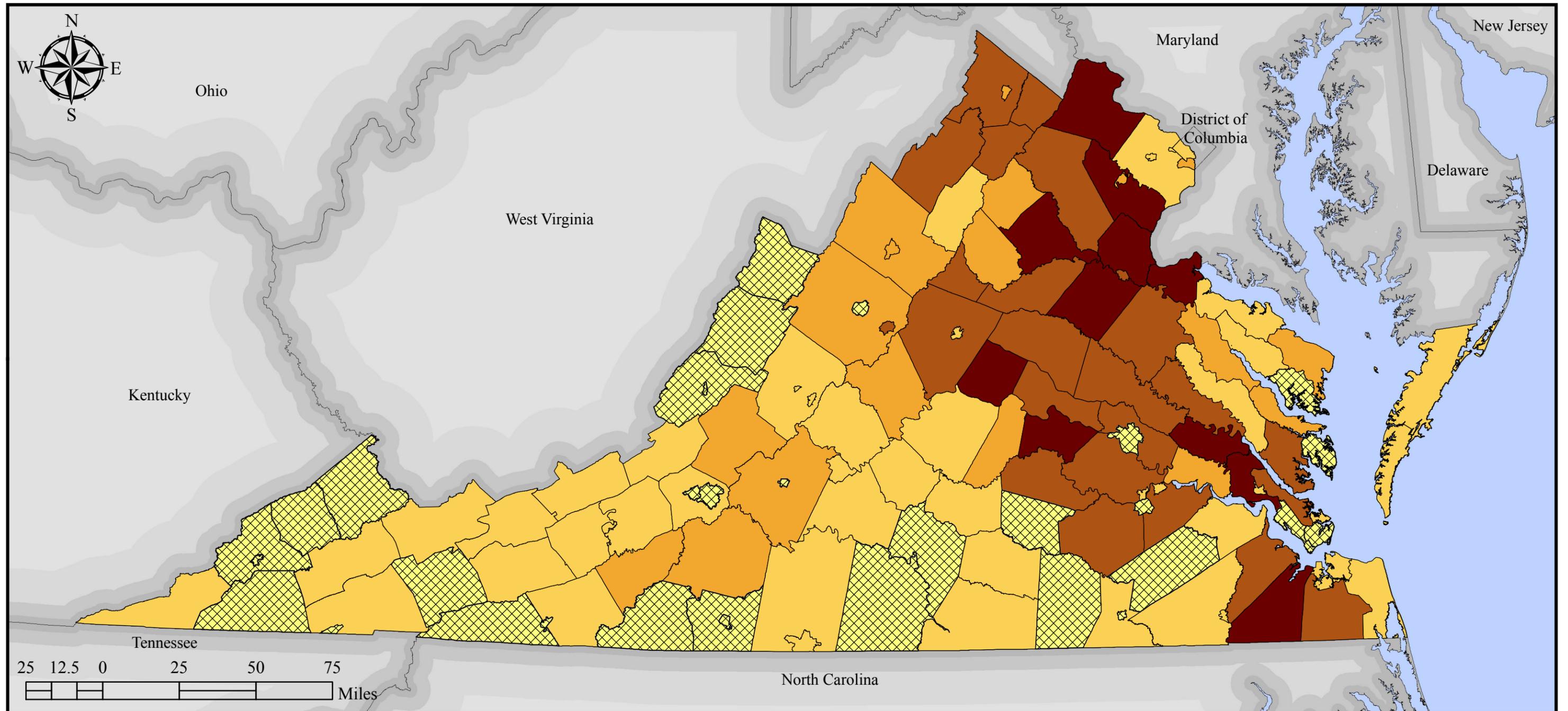
DATA IDENTIFICATION:

Population change is from the the Virginia Workforce Connection's US Census Bureau estimates for the years 2000 and 2010.

PROJECTION: VA Lambert Conformal Conic
North American Datum 1983

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Figure 3.2-7: Population Projections 2010 - 2030



DATA SOURCES:

Virginia Workforce Connection/
State Data Center/U.S. Census Data
VGIN Jurisdictional Boundaries
ESRI State Boundaries

LEGEND:

- Percent Population Change
- Population Decline
 - 1%-14%
 - 15%-24%
 - 25%-49%
 - > 50%

DATA IDENTIFICATION:

Population change is from the the Virginia Workforce Connection's State Data Center projections for the years 2010 and 2030.
The following jurisdictions are projected to experience over 50% growth by 2030:
Culpeper County, Fluvanna County, James City County, King George County, Loudoun County, New Kent County, Powhatan County, Prince William County, Spotsylvania County, Stafford County and Suffolk City.

PROJECTION: VA Lambert Conformal Conic
North American Datum 1983

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Land Use and Development

In evaluating future hazards, it is important to note the land use trends that are present in Virginia. Urbanization is particularly important, and mirrors the trends in population change throughout the state. Data showing land use / land cover changes in the United States is readily available for certain time periods. The Multi-resolution Land Characteristics Consortium (MRLC) has assessed land use / land cover over the entire U.S. based on satellite imagery; this is known as the National Land Cover Database (NLCD). The MRLC has produced a land cover change analysis between 2001 and 2006 (the most recent year of analysis offered), in the form a raster image with pixel values representing the change of one land use to another. Figure 3.2-8 shows the regional trends in development, based on the MRLC’s data. For this figure, “development” means the conversion of any undeveloped land (natural grassland, shrub, forest, or agricultural, etc.) to a developed land use associated with urbanization or human habitation. Table 3.2-3 lists top ten jurisdictions, in terms of development occurring between 2001 and 2006. This aligns with the long-term urbanization trends in Virginia, such as the increasing suburban development in areas adjacent to Washington D.C., Richmond, Hampton Roads, and the I-95 corridor. The land use development changes observed in this analysis also correspond to the projected population growth noted previously.

Table 3.2-3: Development from 2001 to 2006, based on MRLC NLCD

Rank	Jurisdiction	Developed Acres	% of Jurisdiction’s Land Area
1	Loudoun County	10,767	3.2
2	Prince William County	9,815	4.4
3	Chesterfield County	8,139	2.9
4	Henrico County	5,407	3.5
5	Fairfax County	4,180	1.6
6	Spotsylvania County	3,269	1.2
7	Stafford County	2,829	1.6
8	Suffolk City	2,701	1.0
9	James City County	2,314	2.0
10	Chesapeake City	2,150	1.0
11	Virginia Beach City	2,104	1.1
12	Hanover County	2,078	0.7
13	Frederick County	1,925	0.7
14	Isle Of Wight County	1,341	0.6

The MRLC NLCD data also provides an estimate of the land area that reverted from a developed state back to an undeveloped or natural condition between the years 2001 and 2006. However, the NLCD estimate of the total area reverting to an undeveloped condition is less than 100 acres statewide, and would not significantly impact the overall trend in development. Table 3.2-3 only

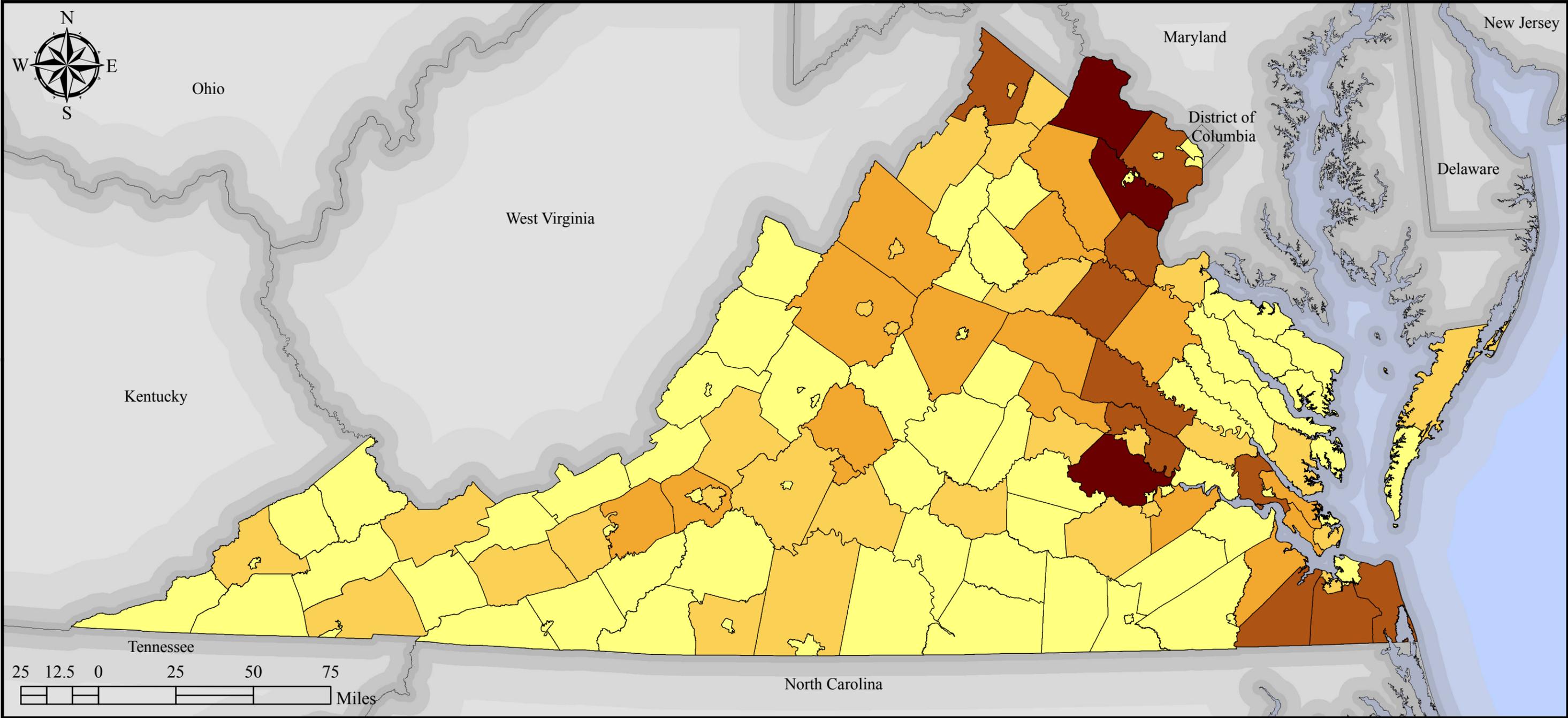




considers land that was developed, regardless of whether other land in the jurisdiction reverted to undeveloped.



Figure 3.2-8: Land Cover Change (Development) 2001 - 2006



DATA SOURCES:

- MRLC NLCD2006
- VGIN Jurisdictional Boundaries
- ESRI State Boundaries

LEGEND:

- Developed Area (square meters)
- 0 - 512,100
 - 512,101 - 1,852,200
 - 1,852,201 - 5,425,200
 - 5,425,201 - 21,881,700
 - 21,881,701 - 43,572,600

HAZARD IDENTIFICATION:

This map shows the total area within each jurisdiction that changed from an undeveloped land use to a developed land use between 2001 and 2006.

This map is based on a summarization of the MRLC's NLCD2006 Supplementary Layer, "NLCD2006 From - To Change Index".

PROJECTION: VA Lambert Conformal Conic
North American Datum 1983

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Local Plan Land Use and Development

The Commonwealth of Virginia requires that every locality develop a comprehensive plan for the purpose of “guiding and accomplishing a coordinated adjusted and harmonious development of the territory” (Code of Virginia §15.2-2223). Localities are required to show long-range recommendations for the development of the area covered by the plan. Comprehensive plans are typically reviewed annually to track progress and set goals for upcoming years.

All of the local hazard mitigation plans include a general overview of land uses and development trends in the region. For this revision of the state plan, each local hazard mitigation plan was reviewed for information on local trends. Table 3.2-4 below shows the main data sources and trends as determined by the local plans. Sixty percent (15 out of 25) of the plans refer to the jurisdictions’ local comprehensive plan(s). Usually the local comprehensive plans were used as a reference for development trends and general land use information. It is important to combine the comprehensive plan data with hazard mitigation, as future development will influence the degree to which citizens are prone to natural hazards. Future revisions of the local hazard mitigation plans should use the corresponding local comprehensive plan information regarding land use and development. This inclusion by the local plans will make the next revision of the state plan stronger in terms of land use and development patterns in the Commonwealth.

Every local plan used some derivative of Census data as its source of population totals. In addition to the U.S. Census Bureau, some plans referenced figures and projections from the Virginia Employment Commission, and the Weldon Cooper Center for Public Service at the University of Virginia. In the local hazard mitigation plans, general demographics were discussed in either textual or tabular form. Some plans included population projections or pointed out areas of high population density and intense land use.





Table 3.2-4: Local hazard mitigation plan review of land use & development data

PDC and/or Jurisdiction Name and Number	Summary of Population Trends and/or Land Use Changes	Uses Comp. Plan Data?		Uses Other Data?	
		Y/N	How?	Y/N	How?
Lenowisco PDC* (1)	City of Norton is urban and suburban. Lee, Scott, and Wise counties are rural, but residential development is anticipated to be on the rise.	No		Yes	Top employers
Cumberland Plateau PDC*(2)	Population has been declining since 1980s.	No		Yes	Natural resource data, Top employers
Mount Rogers PDC (3)	Fifty-eight percent forestland; Mountainous terrain inhibits development except for limited valley areas. Population and population growth is unevenly distributed throughout the region.	No		Yes	Economic overview, top employment sectors
New River Valley PDC (4)	Large percentage of timberland. Montgomery and Floyd County experiencing rapid population increases, while Giles, Pulaski, and City of Radford have experienced population decline.	Yes	Map of future growth areas	Yes	Weldon Cooper Center, Virginia Employment Commission, Top employers, Various geological data sources
Roanoke Valley-Allegheny RC (5)	Mostly rural, except for the Roanoke metropolitan area. Significant portions of mountainous terrain.	No	Suggests that local Comp. plans use the regional hazard mitigation plan.	No	
Central Shenandoah PDC* (6)	Rural with high quality natural resources.	No		No	
Northern Shenandoah Valley RC (7)	Just west of the Washington DC metropolitan area, rapidly developing region. Areas of urban concentration with less concentrated outlying areas as well	Yes	Population projections and development plans, land use	Yes	Major employers, Tax rates, Labor force statistics.





Table 3.2-4: Local hazard mitigation plan review of land use & development data

PDC and/or Jurisdiction Name and Number	Summary of Population Trends and/or Land Use Changes	Uses Comp. Plan Data?		Uses Other Data?	
		Y/N	How?	Y/N	How?
Northern Virginia RC (8)	Very urbanized location around nation's capital. Sprawl continues throughout area. Population expected to continue increasing at record levels.	Yes	Zoning	Yes	Metropolitan Washington Council of Governments, Cooperative Forecast for Population and Job Growth, Virginia Economic Development Partnership, National Land Cover Dataset, Top employers
Rappahannock-Rapidan RC (9)	Mostly rural but significant increases in population and development focused in the areas that are closer to Northern Virginia and Washington DC.	Yes	Land use	Yes	Land cover, UVA Geostat Center, U.S. Census of Agriculture, Major transportation routes, Virginia Employment Commission
Thomas Jefferson PDC (10)	Majority of land is field or forest. All counties in the region experienced population growth from 2000 to 2010. Residential is the primary change of use for most land in the region.	Yes	Current population density, land use and development trends	Yes	Virginia Employment Commission, Labor Market Statistics, Charlottesville Area Association of Realtors and American Community Survey for housing data
Region 2000* (11)	Mostly forest and fields. Businesses centered in a few residential areas.	Yes	Table relates to hazard mitigation	No	
West Piedmont PDC (12)	Mix of urban/suburban and rural land uses. Increase in recreational and business development. Experienced a small population decline since 2000 according to the American Community Survey 2005-2009 estimates.	Yes	Land use maps in the appendix. Description of land use and development trends by jurisdiction.	Yes	Map of physiographic provinces, income and housing characteristics, top employers
Southside PDC (13)	Significant percentage of the region is forested land. Predominant topographic feature is rolling hills. No population data	No		No	





Table 3.2-4: Local hazard mitigation plan review of land use & development data

PDC and/or Jurisdiction Name and Number	Summary of Population Trends and/or Land Use Changes	Uses Comp. Plan Data?		Uses Other Data?	
		Y/N	How?	Y/N	How?
Commonwealth Regional (14)	Majority of land is forested or agricultural. Low intensity residential constitutes less than 0.5% of total land cover in the majority of jurisdictions, despite a 7% population increase from 2000 to 2010.	Yes	Land Use	Yes	National Land Cover Dataset, UVA Geostat Center, Weldon Cooper Center, Virginia Employment Commission, Housing characteristics, Top employers, General economic trends
George Washington RC (16)	Rapid population growth due to proximity to Washington D.C.	No		Yes	Employment estimates and projections from EMSI Complete Employment
Northern Neck PDC (17)	Development trends towards large residential subdivisions, mainly waterfront property. Steep slopes limit inland development	No	Textual description of current and future land uses, but no quantitative data	Yes	Weldon Cooper Center, Virginia Employment Commission Community Profiles
Middle Peninsula PDC (18)	Woodland to residential conversion, increase in waterfront communities. Mostly rural, but within close proximity to metropolitan areas	Yes	Population projections and development trends by jurisdiction.	Yes	Weldon Cooper Center for Public Service for population data
Crater (19) and Richmond Regional (15) PDCs	Variation of urban and rural. Most of the counties are rural, but the region includes Henrico County (suburban) and the City of Richmond. Varied population growth throughout region.	Yes	Individual description of each jurisdiction's land use and development trends	Yes	Income and housing characteristics, Top employers, Virginia Economic Development Partnership
Accomack-Northampton PDC (22)	The plan addresses the problem of coastal erosion and flooding. The region experienced a population decrease from 2000 to 2010. The seafood, poultry, and tourism industry are important to the region.	Yes	Reference to each jurisdiction's Comp. plan. General description of land uses and development trends.	Yes	Top employers





Table 3.2-4: Local hazard mitigation plan review of land use & development data

PDC and/or Jurisdiction Name and Number	Summary of Population Trends and/or Land Use Changes	Uses Comp. Plan Data?		Uses Other Data?	
		Y/N	How?	Y/N	How?
Southside Hampton Roads (23)	Most growth occurring in cities (VA Beach, Suffolk). Norfolk is the most densely developed. Portsmouth is adjacent to the shipyard. Numerous military installations (naval bases and naval air stations)	Yes	Population and demographic characteristics. Very general discussion of development trends	Yes	Virginia Economic Development Partnership, Bureau of Labor Statistics, U.S. Geological Survey, NLCD
Lower Peninsula	The region as a whole has experienced a 4.9% population increase, while the City of Hampton experienced a 6.15% population decline from 2000 to 2010. There was minimal population growth in the City of Newport News.	No	General population growth and development trends, but no data	Yes	Weldon Cooper Center, Virginia Employment Commission, annual building permit data
Southampton County	Population growth expected to be small. Preservation of agricultural land is important to the region.	Yes	Development Trends, specifically residential development	Yes	Age of housing stock, general transportation and utilities information, general employment and industry information
City of Chesapeake*	Dense development in northern portion of city, rural development in southern portion	Yes	Development Trends	Yes	Hampton Roads PDC- Future Population
City of Franklin	Slow and steady population growth. Increased pressure for residential development.	Yes	Intersects future land use map and flood hazard areas.	Yes	Transportation and utilities information, description of employment, and industry history and trends.
City of Poquoson*	Focus on preserving wetlands. Forty percent of land is developed. Only part of city developed due to munitions testing in early 20th century.	Yes	General land use info. Comprehensive Plan expects future land use to be primarily single-family residential, medium to low density.	Yes	Weldon Cooper Center for Public Service, Hampton Roads PDC- Future Population trends; Virginia Employment Commission

*indicates plans that have not been updated since the 2010 state hazard mitigation plan update





Comparison of Statewide Land Use and Local Plan Land Use

Population growth and development trends are important factors when considering the risk or the damage posed by a natural disaster. Development in hazard-prone areas should be undertaken with full knowledge of potential threats.

Overall, the land use information compiled for this plan and in the local plans show similar trends. Northern Virginia is experiencing a large surge in population and development, while South-Central and Southwest Virginia is experiencing relatively low development, and in some extreme cases, population decline. The hazard analysis results in section 3.16 compare the land use data to jurisdictions with high risk as identified by the risk assessment

