

### III. Geographic Overview of Virginia's Natural Resources



*A Diverse Commonwealth*

# III. Overview of Virginia's Natural Resources

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# III. Overview of Virginia's Natural Resources

## 3.1 Introduction

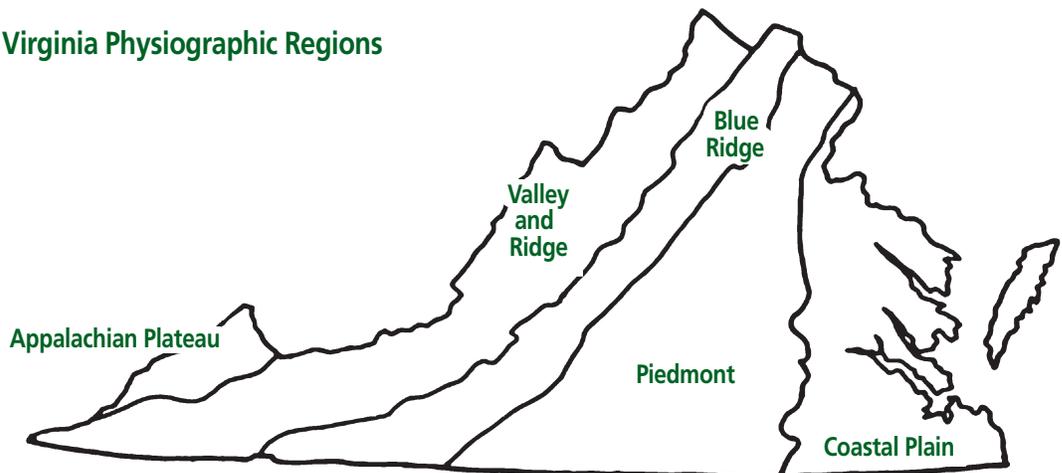
Virginia is a diverse state. Population and economic growth are advancing rapidly in the “Golden Crescent” – the area from Washington D.C. south along the Chesapeake Bay – because it is closely linked to the global economy which currently emphasizes information exchange and government services. The economies of the central and western regions of the state are primarily based on natural resources, characterized by beautiful scenery, ecotourism, and extractive industries like mining, hunting, and fishing. Challenges include: protecting environmental quality, enhancing safe working conditions, and increasing household income. Nevertheless, Virginia communities have a great deal in common. The economic, environmental, and social decisions of one community affect those of all the others. In other words, our destinies are intimately linked.

Virginia can be visualized in five regions: Coastal Plain (Tidewater), Piedmont, Blue Ridge Mountains, Valley and Ridge, and Appalachian Plateau. The majority of the state falls into the first four regions with the Appalachian Plateau making up a very small area. Communities in each of these regions can plan for the future of their people and resources. Community planning is one of the greatest tools that Virginia has in its effort to protect and utilize natural resources. Planning allows cities, towns, and counties to guide their future growth. This helps existing residents and businesses and helps to attract new ones.

There are many ways that community groups can promote the future of their area. Each locality has a Planning and Zoning Commission with many tools to control growth in its city or county. For example, zoning laws and ordinances correspond with a map of the locality that designates some areas for residential housing, business, agriculture or natural areas, such as parks. States, with input from cities, counties, other regulated entities, and private citizens can also set environmental standards for business, individuals, and/or agriculture. Standards help to protect air and water from pollution. Citizens can do anything from simple volunteer work to organizing events or serving on task forces in their community. Businesses can help by taking steps to reduce pollution, training their workforce, or increasing public outreach in a community. Farmers, fishers, foresters, industrial plants, miners, and retail business establishments can help plan for the future.

In conducting future planning, communities should focus on creating sustainable conditions for both people and natural resources. This means finding ways to use natural resources efficiently and effectively, while ensuring that those same or similar resources are available in the future.

### Virginia Physiographic Regions



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## 3.2 Northern Virginia

Northern Virginia lies in the Piedmont and Coastal Plain including part of the Potomac River watershed and parts of the Rappahannock, Chesapeake, and Shenandoah watersheds. It is one of the most urbanized areas in Virginia. In recent years, this region's proximity to Washington D.C., the Chesapeake Bay, and Richmond has spurred paramount population and economic growth. This growth, spawning neighborhoods, shopping centers, factories, and highways, poses major challenges for community planning in the region.

Land use planning is the front wave for guiding growth in the region. Communities use zoning laws to cluster building sites, ordinances to curb noise, pollution, and traffic, and build infrastructure, such as sewers, highways, and landfills, to accommodate businesses and residents. These areas provide legal protection for the natural elements of the region. Communities in Northern Virginia are disposing of waste with two Waste-to-Energy garbage incineration plants and Fairfax County has the largest municipal landfill in Virginia. Northern Virginia is also home to the Mason Neck National Wildlife Refuge and parts of the Potomac and Rappahannock Rivers which have been designated by the Commonwealth as "Scenic Rivers."

The population and economic growth of Northern Virginia have caused problems with air quality in the region: 500,000 people in Virginia are afflicted by health problems related to air pollution, and 65 percent of these problems are reported to come from automobile emissions (van der Leeden). As automobile, household, and industrial emissions increase, communities need to work with state and federal agencies to set standards to ensure the safety of residents and natural resources.



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## 3.3 Coastal Plain Region

The Coastal Plain region (often referred to as the Tidewater region of Virginia) – the areas of the Coastal Plain from the Chesapeake Bay and the Atlantic Ocean, east of Richmond – is a prosperous region of the state. Tidewater is an important ecological part of the state, as well as home to many urban residents, businesses, and productive agriculture. This high concentration of people and industry requires communities to take concrete steps to ensure the sustainability of the region's natural resources.

The most noticeable natural resource in this area is water. Virginia has 115 miles of Atlantic coast, plus 2,400 square miles of the Chesapeake and other bays. The Chesapeake Bay is home to 3,600 species, including 348 finfish, 173 shellfish, and 2,700 plants. Sixteen million people live in the Chesapeake Bay watershed, which stretches north to New York, and west to West Virginia. The region holds the largest fresh groundwater aquifers in the state. The Great Dismal Swamp and Lake Drummond are natural features of the Tidewater Region. These abundant resources make wetland conservation and water quality key issues of community planning in the Tidewater Region. Water quality in the Tidewater Region is impacted by various sources of pollutants:

- *Agriculture* – Crops produced in the Tidewater Region (corn, peanuts, soybeans) are those often grown with high levels of pesticides.
- *Waste* – Solid waste is imported, largely from northeastern states, to Sussex and other counties, for disposal in landfills. These waste sites can threaten water quality, but are safe if managed properly. Hampton Roads is home to a large wastewater treatment plant that sells waste as fertilizer to farmers and gardeners. The Hampton and Portsmouth Waste-to-Energy plants incinerate waste and generate energy at the same time. Also, the Tidewater Region contains several Superfund hazardous waste sites.
- *Air Pollution* – Water quality in the Chesapeake Bay is affected by atmospheric deposition of pollutants.



In addition to water quality, Tidewater communities focus planning efforts on land use to protect natural areas. The region is home to seven National Wildlife Refuges, including the 107,000-acre Great Dismal Swamp. In the 1987 Chesapeake Bay Agreement, states in the Chesapeake Bay basin agreed to conservation and restoration projects to “Save the Bay.” The programs have been particularly successful for birds of prey in the region, specifically the bald eagle and the peregrine falcon.

The region has four major coal-burning power plants (for locations see <http://www.energy.vt.edu/vept/electric/plantlocations.asp>). Though burning fossil fuels releases air pollutants, air pollution can also come from other places via the atmosphere. Tidewater is the region of Virginia most affected by hurricanes. With a high concentration of people and resources, communities in the Tidewater Region of Virginia have diverse interests in community planning.

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## 3.4 Piedmont Region

Central Virginia, the area of the Piedmont over 200 miles wide at the North Carolina border and characterized by rolling hills and a few ridges, is home to diverse populations and natural resources. In some ways, Central Virginia struggles to keep up with the faster growing regions. Community planning must integrate economic growth and environmental protection.

Central Virginia holds the James, Roanoke, and Chowan river basins. The James River drains 24 percent of Virginia's land area, and has eight designated "Scenic River" areas (van der Leeden). The Chowan River and Albemarle Sound also have Designated Scenic River recognition. Several rivers have suffered from pollution in recent years (van der Leeden). Several local organizations and state agencies are actively working to improve water quality.

The region holds five reservoirs: Smith Mountain Lake, Leesville Lake, John H. Kerr Reservoir, Lake Gaston, and Philpott Lake. Lake Gaston in the Roanoke River basin has been connected to Lake Prince, the Norfolk city and Virginia Beach reservoir, to provide municipal water supply to those communities, in addition to local areas. State of the art wastewater treatment plants reprocess a by-product, called "sludge," into compost for farms and gardens.

The region is home to hydroelectric power plants at the dams for Smith Mountain Lake, Leesville Lake, and the John H. Kerr Reservoir. Galax, Virginia, has a Waste-to-Energy plant that incinerates waste to generate energy, and Bremo is home to a thermal power plant. Coal deposits are present in the Richmond and Farmville basins.

The Central region of Virginia faces economic decline with the exodus of textile and paper mills (sometimes to avoid environmental regulations and/or seek cheaper labor) and the decline of tobacco and other agricultural products of the area. Some communities have substituted new programs for old: Amelia county imports solid waste to its municipal landfill, which is second largest in the state; and several counties are home to State Forests, comprising 50,000 acres in the Piedmont region, which produce many seedling trees. As growth continues in surrounding regions, Central Virginia is using community resources, creative ideas, and entrepreneurial incentives to attract new industry and population.



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## 3.5 Mountain Region

The mountainous areas of Virginia are divided into three regions, the Appalachian Plateau, the Valley and Ridge, and the Blue Ridge. All of these regions are part of the Appalachian Mountains, a mountain range that stretches from Georgia to Maine. The section of the Appalachians located in Virginia ranges from the extreme southwest corner of the state through the Shenandoah Valley to Winchester.

Geology sets this part of Virginia apart. Communities hold many resources, but face isolation due to the mountains and slower growth than Northern and Eastern Virginia. There are three major mountain regions in Virginia:

- *Appalachian Plateau* – a rugged section of mountains, varying between 2,700 and 3,000 feet above sea level, in extreme southwestern Virginia;
- *Valley and Ridge* – six river valleys between the plateau east and northward, until it meets the Blue Ridge; and,
- *Blue Ridge* – 1,500 to 5,000 foot ridges and summits that taper eastward to Piedmont. In total, there are over 60 peaks in Virginia, the highest of which are in Smyth, Grayson, and Washington counties.

This geology creates notable areas of scenery and culture. The Shenandoah Valley, a 150-mile part of the Great Valley area, contains a federally protected National Park. Agriculture is concentrated in the Shenandoah Valley, in both crop and livestock production. The George Washington and Jefferson National Forests total 1.7 million acres of mostly forested land in the mountain region. The Appalachian Trail, a National Scenic Trail, spans 554 miles of Virginia ridges (van der Leeden).

Coal deposits are present in most abundance in the Southwest Virginia Coal Field, which includes 1,520 square miles in Buchanan, Dickenson, Wise, Russell, Tazewell, Lee, and Scott counties. According to the U.S. Department of Energy, 156 mines were in operation and produced 33 million tons of coal in 2000. Coal mines, left unmanaged after production, can create mine waste and threaten groundwater. This has been the case in Dumps Creek, Guest River, Black Creek, Straight Creek, Stone Creek, and Puckett Creek watersheds (van der Leeden). The Federal Surface Mining Control and Reclamation Act of 1977 required mine operators to reclaim mined land to its approximate original contour. While coal mining presents environmental challenges, the industry provides many economic benefits to the area in the form of energy produced, tax revenues, exports, and jobs. Mining is the main economic activity

in many rural areas, providing much of the employment available to its residents. It also supports the local government, and brings investment into the area from the outside.

The region is home to three coal-burning plants, one hydroelectric plant, and a pumped storage plant. Harrisonburg and Salem have Waste-to-Energy plants that burn garbage to produce energy. The regional wastewater plant near Harrisonburg composts its sludge into fertilizer to create a soil amendment that is offered to local residents.

The region holds three aquifers and many springs. These freshwater sources are used for both municipal and domestic water supply. Upland streams in the mountain region have been affected by acid rain and other outside pollutants.

