

## Outline

- I. Virginia's Physiographic Provinces** – 5 physiographic provinces intersect Virginia. These are large areas with distinct geology and physical features.

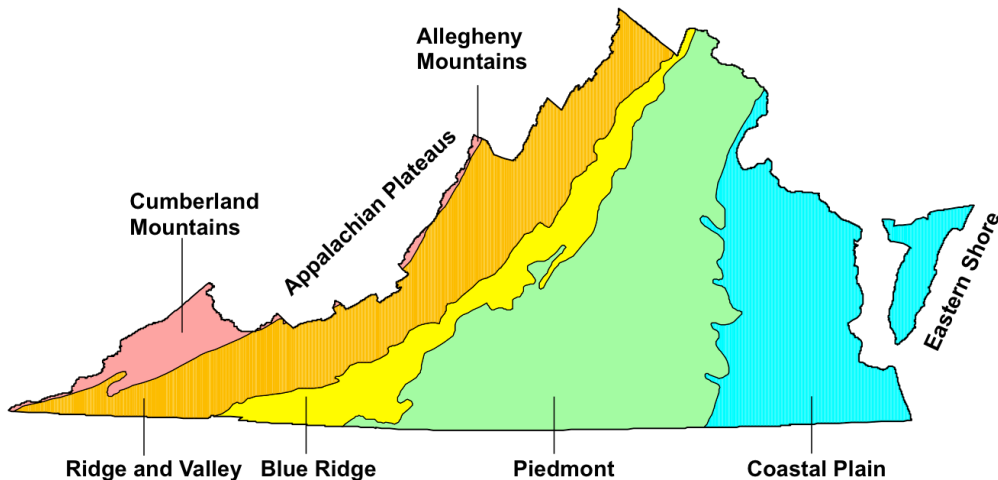


Figure 1. Virginia's Physiographic Provinces. VDCR Natural Heritage Program.

## II. Major factors Contributing to Virginia's Diverse Landscape

- Geology** – Ranges from recent sediments of the Coastal Plain to ancient rocks of the Blue Ridge.
- Soils** – Diverse geology leads to diversity in soils. There are more than 600 different groups of soils occurring in VA. Soil diversity contributes to plant diversity.
- Topography** – Elevation ranges from sea level in Tidewater to 5,729 at the top of Mount Rogers in Grayson County.
- Climate** – Most climate variation in VA is from east to west, not north to south. VA ranges from USDA Plant Hardiness Zone 5 to Zone 8. Climate has changed greatly over time, from a boreal forest 18,000 years ago during the last peak of glaciation to the forests of today, and it continues to change.
- Human impacts** – Humans have impacted the land since 9,000+ years ago when Native Americans started building settlements. Post-European settlement has reduced wetlands, reduced forest cover, increased non-native plants, and introduced exotic pathogens. Today, Virginia is 8% developed lands, 29% agricultural lands, and 63% forested. 20% of the state consists of unfragmented natural lands with high ecological integrity, most occurring in the mountain regions.

## III. Virginia Natural Heritage Program

- Mission is to conserve Virginia's biodiversity through inventory, protection, and stewardship.
- Collects information on 505 natural community types, more than 600 rare plant species, and more than 900 rare animal species.

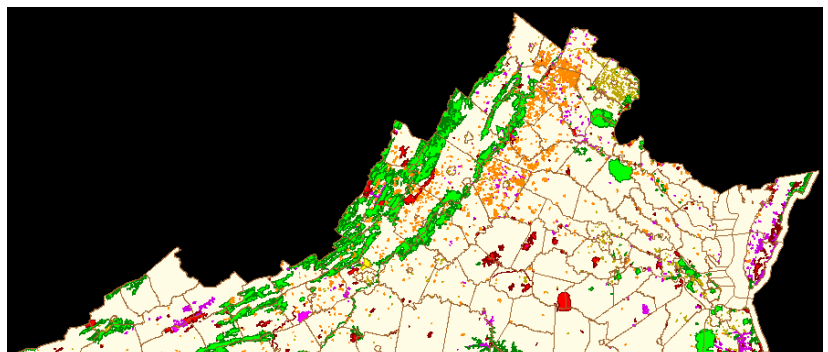


Figure 2. Sample map from Virginia Conservation Lands Database, <http://www.dcr.virginia.gov/natural-heritage/clinfo>

- c. Protects and manages more than 60 Natural Area Preserves.
- d. Maintains a publically-accessible database of conservation lands in Virginia.
- e. Other activities include conducting continued inventory and monitoring of rare species and communities, protecting cave and karst areas, reviewing development projects to assess potential impacts on natural heritage resources, tracking and controlling invasive species, and restoring longleaf pine forests.

#### IV. Ecological Regions and Natural Communities of Virginia

##### a. Appalachian Plateaus

- i. *Cumberland Mountains*. This area is 80% forested, but a large portion is mining reclamation lands, as this is the only area in Virginia where coal is mined. The predominant underlying geology consists of sandstones that form cliffs. The predominant natural community is a very diverse mixed-oak and acidic cove forest with many tree species sharing dominance. Magnolias are a prevalent tree species.
- ii. *Alleghany Mountains*. Only a sliver of this province occurs in Virginia, but that sliver is 96% forested and 80% unfragmented. The predominant natural community is northern hardwood forest with sugar maple, yellow birch, beech, and black cherry. Some patches of red spruce forests occur as well.

- b. **Ridge and Valley**. This province covers 25% of the state. It's geologic history has resulted in long, parallel ridges and valleys with sandstones forming the high ridges and shales, limestones, and dolomites underlying the valleys and lower slopes. The most prevalent vegetation is dry, second-growth chestnut oak forests and heath shrubs. Oak-hickory forests are also common, and northern hardwood and red spruce forests occur at the highest elevations. Karst features are common, leading to sinkholes and caves and also highly fertile soils.

- c. **Blue Ridge**. This province is a narrow mountain range underlain by ancient rocks, some >1 billion years old. It has a high percentage (38%) of unfragmented natural lands, including national park and national forest lands. Includes Virginia's highest elevation areas, Mount Rogers (>5,700 ft) and Whitetop (>5,500 ft.) These higher elevation areas have northern hardwood and red spruce communities, and some Fraser Fir at the highest elevations on Mount Rogers. Lower ridge tops are dominated by northern red oaks (but previously would have had American chestnuts.) Rich oak-hickory forests are a major forest type above 2,500 ft., and they feature a dense herbaceous layer known for wildflowers. Some noteworthy rare or endemic communities include different types of rock barrens and boulderfields, seepage swamps, and the Northern Blue Ridge Mafic Fen found at Big Meadows in Shenandoah National Park.

- d. **Piedmont**. Virginia's largest physiographic province, with rolling hills, complex geology, and a long history of human use. Current land cover is mostly pastures, fields, and second-growth forest woodlots. Bottomland forests and swamps occur along the rivers that cross the Piedmont. The eastern edge of the Piedmont is a 20-mile wide area called the Fall Zone, where the geology changes from hard bedrock to the soft sediments of the Coastal Plain, causing high-gradient sections of the rivers with significant rapids. Dominant forests include oak-heath (on more acidic soils), oak-hickory (on more basic soils), and mesic mixed hardwood (on moist soils in ravines), and hardpan forests (on ridges with an impervious layer of clay.)

- e. **Coastal Plain**. A mostly flat region underlain with sands, gravels, silt, shells, and clay. The uplands have been very altered by humans. The region has the highest percentage of wetlands of any of the provinces at 22%. The bald cypress-water tupelo swamps with very old, large trees are noteworthy as communities that likely closely match their pre-settlement conditions. Longleaf pine forests occurred here, and work is being done to re-establish them in Southeast

Virginia. Major rivers (e.g., James, York, Rappahannock) are tidal throughout the portions that occur in the Coastal Plain province. They have associated wetlands ranging from freshwater marshes and tidal swamp forests in the upper reaches to salt marshes near the Chesapeake Bay. Other wetland communities include acidic seepage swamps and seasonal ponds/vernal pools. There is a large system of barrier islands with pioneer vegetation on beaches, maritime grasslands, secondary dunes, swales, maritime shrub swamps, and maritime swamp forests.

## V. Links and Related Resources

- i. Virginia Biogeography basic training curriculum, <http://www.virginiamasternaturalist.org/virginia-biogeography.html>
- ii. Virginia Natural Heritage Program, <http://www.dcr.virginia.gov/natural-heritage/>
- iii. Project RareQuest, <http://www.virginiamasternaturalist.org/rarequest.html>
- iv. Virginia Conservation Lands Database, <http://www.dcr.virginia.gov/natural-heritage/clinfo>
- v. Natural Communities of Virginia Classification of Ecological Community Groups, <http://www.dcr.virginia.gov/natural-heritage/natural-communities/nctoc>
- vi. Virginia's Natural Area Preserve System, <http://www.dcr.virginia.gov/natural-heritage/document/napbook4web.pdf>

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