Association of American State Geologists

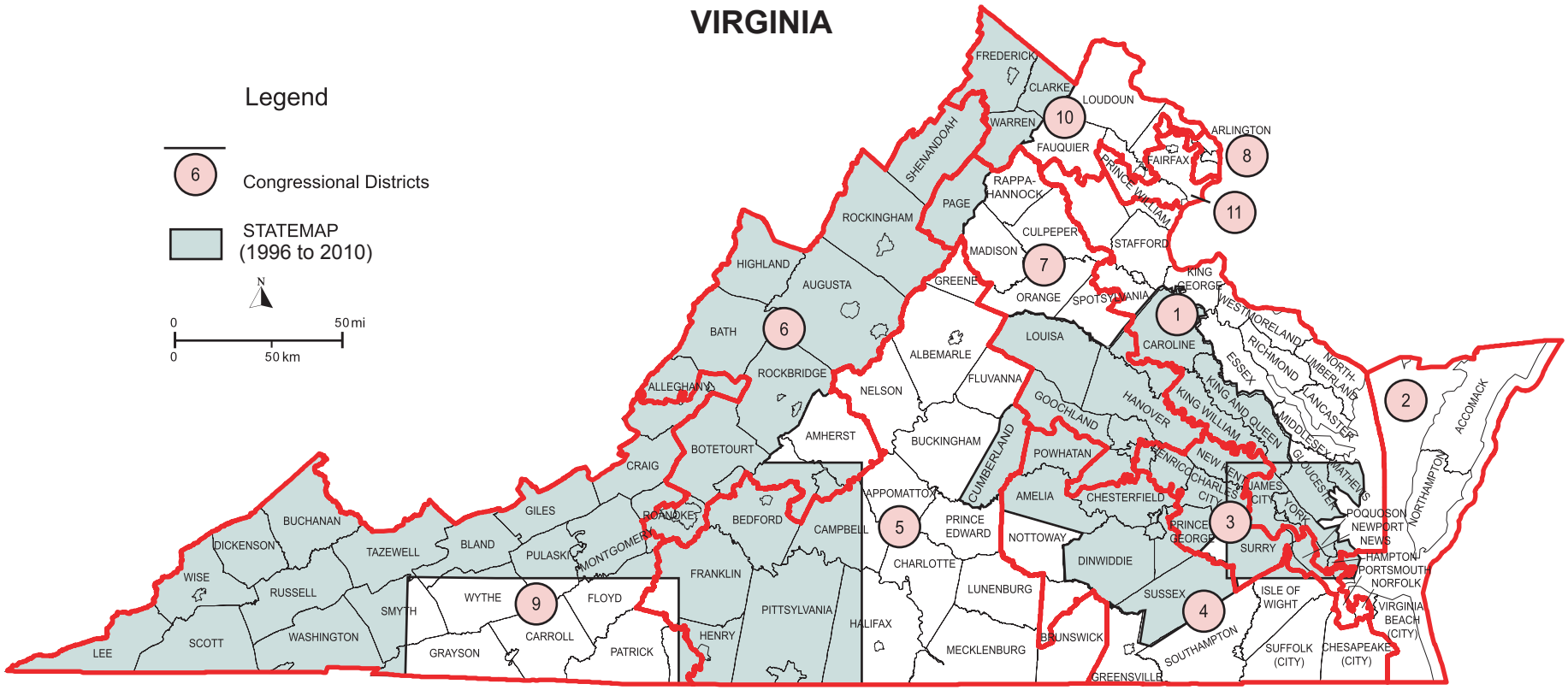
Virginia Department of Mines Minerals and Energy

United States Geological Survey

USGS science for a changing world

National Cooperative Geologic Mapping Program

STATEMAP Component: States compete for federal matching funds for geologic mapping



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Fiscal Year	State Dollars	Federal Dollars	Total Project Dollars
1996	$20,702	$20,702	$ 41,404
1997	49,345	49,345	98,690
1998	50,000	50,000	100,000
1999	45,728	45,728	91,456
2000	48,258	48,258	96,516
2001	22,899	22,899	45,798
2002	31,628	31,628	63,256
2003	95,955	95,955	191,910
2004	171,151	171,151	342,302
2005	227,186	227,186	454,372
2006	209,394	209,394	418,788
2007	253,271	215,340	468,611
2008	218,007	217,989	435,996
2009	176,410	176,410	352,820
2010	207,815	207,815	415,630
TOTALS	$1,827,749	$1,789,800	$3,409,734

Geologic Maps

Geologic maps show the distribution of bedrock and unconsolidated sediments using colors, lines, and symbols. These maps contain an explanation that describes the composition and age of the rocks. The locations of important features such as mines, prospects, faults, and springs are also shown on geologic maps. Geologic maps provide basic information for land development and conservation projects. Larger projects such as mines, dams, roads, bridges, and commercial buildings require detailed analysis because of monetary, health, and safety concerns. Smaller projects such as water wells and waste disposal systems also benefit from an understanding of the local geology. Geologic maps are frequently used for:

- Mineral resource location
- Evaluation of geologic hazards (landslides, earthquakes, land subsidence)
- Planning transportation and utility routes
- Site selection for public facilities (landfills, waste-treatment facilities, waste-disposal sites, schools)
- Land-use planning and evaluation of land-use proposals
- Regulatory decisions
- Environmental assessment and protection planning (underground storage tanks, landfills, aquifer contamination)
- Development and protection of groundwater
- Natural-resource assessment, exploration, development, and management

I-81 Corridor Project

Interstate Highway 81 (I-81) extends along the Appalachian Valley for 325 miles in western Virginia. It is the longest interstate in Virginia and has 90 interchanges, including intersections with interstates I-66, I-64, and I-77. Since its completion in the 1960s, I-81 has become the “main street” of western Virginia, serving as a corridor for travel, commerce, and development. The Shenandoah and James rivers begin in the north and north-central parts of the Valley. Water from these rivers eventually flows into the Chesapeake Bay.

Water resource location, economic product development, geologic hazard identification**,** natural resource protection, and road and infrastructure development are important issues along the I-81 corridor. Some of these issues are at a critical stage. The need to protect natural resources including rivers, forests, groundwater supplies, and mineral resources increases as development expands.

A digital geologic map of the entire corridor will be a final product and provide a valuable resource for the region.

Richmond Metropolitan Statistical Area Project

The Richmond Metropolitan Statistical area (MSA) encompasses 16 counties in the Piedmont and Coastal Plain of Central Virginia. The cities of Richmond, Petersburg, Colonial Heights, and Hopewell are located along interstates I-95, I-64, and I-85. Several U.S. Highways connect these cities with smaller communities both inside and outside of the MSA. The Richmond MSA contains significant portions of three river basins. The lower portions of the York and James rivers flow through the area and into the Chesapeake Bay. The headwaters of the Chowan River ultimately flow into the Albemarle-Pamlico estuary.

The population of the Richmond MSA is expected to grow approximately 35% by 2030. Almost all of this growth is expected to occur outside of existing city boundaries. As a result, the Richmond MSA will need geologic information to locate water resources and aggregate, minimize the impact of geologic hazards, decrease the cost of road and infrastructure development, and enhance natural resource protection.

This project targets areas of dense development, high growth, and geologic resource or hazard potential. Approximately 45 quadrangles will be mapped. A digital geologic map of these areas will be a final product and will provide a valuable resource for the region.

Statement of Outcome from a Recent STATEMAP Project

The Virginia Department of Transportation (VDOT) recently completed geotechnical site evaluations of Interstate 81 north of Christiansburg and Lexington, Virginia to prepare for the addition of several miles of truck climbing lanes. The topography in these areas is steep and the road widening will require significant cut and fill. The local geology is complex because of faults that parallel the interstate. VDOT was concerned that fault blocks of different rock materials and fault-related fractures would affect the stability of road cuts. VDOT used geologic maps of the Ironto, Lexington, and Brownsburg quadrangles, completed through STATEMAP, to develop drilling plans for the projects. These maps allowed them to identify the areas in greatest need of geotechnical evaluation. As a result, they were able to reduce the total number of holes and increase data density in areas of greatest concern. VDOT also use our maps in conjunction drill data to design road cuts and manage rock material during construction.