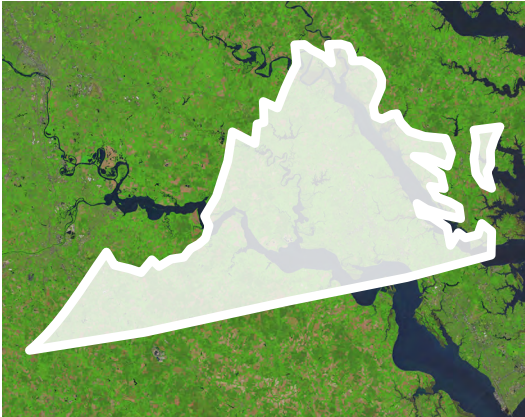


WHAT IS GEOSCIENCE?

Geoscience is the study of the Earth and the complex geologic, marine, atmospheric, and hydrologic processes that sustain life and the economy. Understanding the Earth's surface and subsurface, its resources, history, and hazards allows us to develop solutions to critical economic, environmental, health, and safety challenges.



Satellite image: NASA/USGS Landsat Program. State outline (not to scale): Matt Battison.

By the numbers: VIRGINIA

- 8,782 geoscience employees (excludes self-employed)¹
- 298 million gallons/day: total groundwater withdrawal³
- \$1.25 billion: value of nonfuel mineral production in 2017⁴
- 64 total disaster declarations, including 17 severe storm, 15 flood, and 13 hurricane disasters (1953-2017)⁶
- \$18.8 million: NSF GEO grants awarded in 2017¹⁴

WORKFORCE IN VIRGINIA

- 8,782 geoscience employees (excludes self-employed) in 2017¹
- \$77,129: average median geoscience employee salary¹
- 20 academic geoscience departments²

WATER USE IN VIRGINIA

- 298 million gallons/day: total groundwater withdrawal³
- 6.43 billion gallons/day: total surface water withdrawal³
- 697 million gallons/day: public supply water withdrawal³
- 52 million gallons/day: water withdrawal for irrigation³
- 370 million gallons/day: industrial fresh water withdrawal³
- 81% of the population is served by public water supplies³

ENERGY AND MINERALS IN VIRGINIA

- \$1.25 billion: value of nonfuel mineral production in 2017⁴
- Stone (crushed), cement (portland), sand and gravel (construction): top three nonfuel minerals in order of value produced in 2017⁴
- 12.9 million short tons: coal produced in 2016⁵
- 1.62 million megawatt hours: hydroelectricity produced in 2017⁵
- 3.19 million megawatt hours: wood-derived fuels produced in 2017⁵

NATURAL HAZARDS IN VIRGINIA

- 64 total disaster declarations, including 17 severe storm, 15 flood, and 13 hurricane disasters (1953-2017)⁶
- \$19 million: individual assistance grants (2005-2017)⁶
- \$72 million: mitigation grants (2005-2017)⁶
- \$439 million: preparedness grants (2005-2017)⁶
- \$267 million: public assistance grants (2005-2017)⁶
- 64 weather and/or climate events, each with costs exceeding \$1 billion (inflation adjusted) (1980-2017)⁷

¹ U.S. Bureau of Labor Statistics, Occupational Employment Statistics, May 2017
² American Geosciences Institute, Directory of Geoscience Departments, 53rd Edition (2018)
³ U.S. Geological Survey, Estimated Use of Water in the United States in 2015

⁴ U.S. Geological Survey, Mineral Commodity Summaries 2018
⁵ U.S. Energy Information Administration
⁶ FEMA Data Visualization: Summary of Disaster Declarations and Grants (accessed May 2, 2018)
⁷ NOAA National Centers for Environmental Information, U.S. Billion-Dollar Weather and Climate Disasters from 1980 to 2018 (accessed April 6, 2018)

AGI is a network of 52 member societies, representing more than 260,000 geoscientists.

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U.S. GEOLOGICAL SURVEY (USGS)

- \$1.15 billion: total USGS budget in FY 2018 (5.8% increase from FY 2017)⁸
- The National Cooperative Geologic Mapping Program funds geologic mapping projects with federal (FEDMAP), state (STATEMAP), and university (EDMAP) partners
- \$2.89 million: STATEMAP funding to the Virginia Division of Geology and Mineral Resources (1993-2016)⁹
- College of William and Mary, Radford University, and Virginia Wesleyan College have participated in EDMAP⁹
- USGS streamgages collect real-time or recent streamflow, groundwater, and water-quality data throughout Virginia

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

- \$20.7 billion: total NASA budget in FY 2018 (5.5% increase from FY 2017)¹⁰
- \$1.9 billion: total NASA Earth Science budget in FY 2018 (0% change from FY 2017)¹⁰
- Gravity Recovery and Climate Experiment (GRACE) satellites measure groundwater changes in Virginia
- Soil Moisture Active Passive (SMAP) satellite measures soil moisture in Virginia

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

- \$5.9 billion: total NOAA budget in FY 2018 (4.1% increase from FY 2017)¹¹
- Next-generation geostationary (GOES) and polar orbiting (JPSS) satellites provide weather forecasting over Virginia
- Deep Space Climate Observatory (DISCOVER) satellite monitors radiation and air quality over Virginia
- 15 National Weather Service Automated Surface Observing Systems (ASOS) stations in Virginia¹²
- 138 National Weather Service Cooperative Observer Program (COOP) sites in Virginia¹²

NATIONAL SCIENCE FOUNDATION (NSF)

- \$7.8 billion: total NSF budget in FY 2018 (4% increase from FY 2017)¹³
- \$1.4 billion: total NSF Geosciences Directorate (GEO) awards in FY 2017 (7.2% increase from FY 2016)¹⁴
- 71 NSF GEO awards in Virginia totaling \$18.8 million in 2017¹⁴
- \$4.6 million: NSF GEO grants awarded to Virginia Polytechnic Institute and State University in 2017¹⁴

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

- \$8.1 billion: total EPA budget in FY 2018 (0% change from FY 2017)¹⁵
- 31 active Superfund sites in Virginia in 2018¹⁶
- \$13.7 million: Drinking Water State Revolving Fund (DWSRF) grants in Virginia in 2017¹⁷

FEDERAL FACILITIES IN VIRGINIA

- USGS National Center, Reston
- USGS Library, Reston
- USGS National Minerals Information Center, Reston
- USGS Water Science Center, Richmond
- NSF Headquarters, Alexandria
- NSF National Radio Astronomy Observatory, Charlottesville
- NASA Langley Research Center, Hampton

YOUR STATE SOURCE FOR GEOSCIENCE INFORMATION

Virginia Division of Geology and Mineral Resources

900 Natural Resources Drive, Suite 400

Charlottesville, VA 22903

<https://www.dmme.virginia.gov/DGMR/divisiongeology-mineralresources.shtml>

434-951-6341

8 U.S. Department of the Interior, FY 2019 Budget in Brief

9 U.S. Geological Survey, National Cooperative Geologic Mapping Program

10 National Aeronautics and Space Administration, FY 2019 Budget Estimates

11 National Oceanic and Atmospheric Administration, FY 2019 Bluebook

12 NOAA In Your State and Territory

13 U.S. House of Representatives, FY 2018 Omnibus Spending Bill (Division B) – Commerce, Justice, Science, and Related Agencies Appropriations Act, 2018

14 National Science Foundation, Budget Information System

15 U.S. House of Representatives, FY 2018 Omnibus Spending Bill (Division G) – Department of the Interior, Environment, and Related Agencies Appropriations Act, 2018

16 U.S. Environmental Protection Agency, Superfund Sites

17 U.S. Environmental Protection Agency, Drinking Water State Revolving Fund National Information Management System Reports

AGI's Geoscience Policy and Critical Issues programs support well-informed public policy and decision making by providing information and facilitating dialogue between the geoscience community and decision makers at all levels.

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