

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.

WORKFORCE IN PENNSYLVANIA

- 16,480 geoscience employees (excludes self-employed) in 2017¹
- \$78,198: average median geoscience employee salary¹
- 41 academic geoscience departments²

WATER USE IN PENNSYLVANIA

- 628 million gallons/day: total groundwater withdrawal³
- 5.41 billion gallons/day: total surface water withdrawal³
- 1.39 billion gallons/day: public supply water withdrawal³
- 34 million gallons/day: water withdrawal for irrigation³
- 645 million gallons/day: industrial fresh water withdrawal³
- 73% of the population is served by public water supplies³

By the numbers: PENNSYLVANIA

- 16,480 geoscience employees (excludes self-employed)¹
- 628 million gallons/day: total groundwater withdrawal³
- \$1.85 billion: value of nonfuel mineral production in 2017⁴
- 59 total disaster declarations, including 26 flood, 16 severe storm, and 8 hurricane disasters (1953-2017)⁶
- \$9.1 million: NSF GEO grants awarded in 2017¹⁴

ENERGY AND MINERALS IN PENNSYLVANIA

- \$1.85 billion: value of nonfuel mineral production in 2017⁴
- Stone (crushed), cement (portland), and lime: top three nonfuel minerals in order of value produced in 2017⁴
- 45.7 million short tons: coal produced in 2016⁵
- 5.46 trillion cubic feet: natural gas produced in 2017⁵
- 6.48 million barrels: crude oil produced in 2017⁵
- 3.38 million megawatt hours: wind produced in 2017⁵

NATURAL HAZARDS IN PENNSYLVANIA

- 59 total disaster declarations, including 26 flood, 16 severe storm, and 8 hurricane disasters (1953-2017)⁶
- \$170 million: individual assistance grants (2005-2017)⁶
- \$137 million: mitigation grants (2005-2017)⁶
- \$840 million: preparedness grants (2005-2017)⁶
- \$394 million: public assistance grants (2005-2017)⁶
- 60 weather and/or climate events, each with costs exceeding \$1 billion (inflation adjusted) (1980-2017)⁷

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)

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*

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

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Geoscience, Pennsylvania, and Federal Agencies

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
- \$2.8 million: Pennsylvania STATEMAP funding (1993-2016)⁹
- Lehigh University, Pennsylvania State University, and the University of Pittsburgh have participated in EDMAP⁹
- USGS streamgages collect real-time or recent streamflow, groundwater, and water-quality data in Pennsylvania

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 Pennsylvania
- Soil Moisture Active Passive (SMAP) satellite measures soil moisture in Pennsylvania

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 Pennsylvania
- Deep Space Climate Observatory (DISCOVER) satellite monitors radiation and air quality over Pennsylvania
- 24 National Weather Service Automated Surface Observing Systems (ASOS) stations in Pennsylvania¹²
- 214 National Weather Service Cooperative Observer Program (COOP) sites in Pennsylvania¹²

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
- 53 NSF GEO awards in Pennsylvania totaling \$9.1 million in 2017¹⁴
- \$5.6 million: NSF GEO grants awarded to Pennsylvania State University, University Park in 2017¹⁴

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

- \$8.1 billion: total EPA budget in FY 2018 (0% change from FY 2017)¹⁵
- 94 active Superfund sites in Pennsylvania in 2018¹⁶
- \$26.4 million: Drinking Water State Revolving Fund (DWSRF) grants in Pennsylvania in 2017¹⁷
- \$200,000: Brownfield cleanup grants awarded to Pennsylvania in 2018¹⁸

FEDERAL FACILITIES IN PENNSYLVANIA

- USGS Pennsylvania Water Science Center, New Cumberland
- USGS Leetown Science Center Laboratory, Wellsboro

YOUR STATE SOURCE FOR GEOSCIENCE INFORMATION

Department of Conservation and Natural Resources
Bureau of Topographic and Geologic Survey
3240 Schoolhouse Road
Middletown, PA 17057-3534
<http://www.dcnr.pa.gov/about/Pages/Topographic-and-Geologic-Survey.aspx>
717-702-2017

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*

¹⁸ U.S. Environmental Protection Agency, *Brownfields Grant Fact Sheet Search*

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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