

WHAT IS GEOSCIENCE?

Geoscientists study the Earth's systems — the complex geologic, marine, atmospheric, and hydrologic processes that sustain life and the economy. Geoscience expertise enables us to develop solutions to critical economic, environmental, health, and safety challenges.



Satellite image: NASA/USGS Landsat Program. State outline: Matt Battison.

By the numbers: SOUTH DAKOTA

- \$360 million: value of nonfuel mineral production in 2016⁶
- 1,600: **geoscience employees** (non-federal/self-employed)¹
- 840: **jobs** in extractive industries in 2015²
- 25 severe storm disaster declarations since 1953⁷
- 14 fire disaster declarations since 1953⁷
- \$11.6 million: NSF grants awarded in South Dakota in 2016¹⁷
- \$520,000: NSF GEO grants awarded in South Dakota in 2016¹⁷

WORKFORCE IN SOUTH DAKOTA

- 1,600: **geoscience employees** (non-federal/self-employed) in 2015¹
- \$59,900: average median geoscience employee salary¹
- 840: **jobs** in extractive industries in 2015²
- 6: academic geoscience departments³

WATER IN SOUTH DAKOTA

- 340 million gallons/day: total groundwater withdrawal⁴
- 290 million gallons/day: total surface water withdrawal⁴
- 125 million gallons/day: public supply water withdrawal⁴
- 360 million gallons/day: water withdrawal for irrigation⁴
- 91% of the population is served by public water supplies⁴
- 24 USGS stream gages in **South Dakota**⁵

ENERGY AND MINERALS PRODUCTION IN SOUTH DAKOTA

- \$360 million: value of nonfuel mineral production in 2016⁶
- 1.7 million barrels: crude oil produced in 2015²
- 15.4 billion cubic feet: natural gas produced in 2014²
- 2.5 million megawatt hours: wind power produced in 2015²
- 4.8 million megawatt hours: hydroelectricity produced in 2015²

NATURAL HAZARDS IN SOUTH DAKOTA

FEMA statistics for South Dakota

- 25 severe storm disaster declarations since 1953⁷
- 16 flooding disaster declarations since 1953⁷
- 14 fire disaster declarations since 1953⁷
- \$12 million: individual assistance grants since 2005⁷
- \$67 million: mitigation grants since 2005⁷
- \$110 million: preparedness grants since 2005⁷
- \$260 million: public assistance grants since 2005⁷
- 22 weather and/or climate events, each with costs exceeding \$1 billion (inflation adjusted) 1980-2016⁸

¹ Data Derived from Bureau of Labor Statistics Occupational Employment Statistics (2015)

² U.S. DOI Extractive Industries Transparency Initiative

³ American Geosciences Institute Directory of Geoscience Departments (2016)

⁴ USGS Estimated Use of Water in the United States in 2010

⁵ USGS WaterWatch Total Streamgage Stations (March 10, 2017)

⁶ USGS Mineral Commodity Summaries (2017)

⁷ FEMA Summary of Disaster Declarations and Grants (2016)

⁸ NOAA Billion-Dollar Weather and Climate Disasters: Mapping

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U.S. GEOLOGICAL SURVEY (USGS) GEOLOGIC MAPPING

- \$1.06 billion: total FY 2016 USGS budget; 1.6% up from FY 2015⁹
- The USGS National Cooperative Geologic Mapping Program (NCGMP) funds geologic mapping projects by states (STATEMAP) and universities (EDMAP)
- **South Dakota School of Mines and Technology** participated in EDMAP¹⁰

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

- \$5.6 billion: total FY 2016 NASA Science budget; 6.6% up from FY 2015¹¹
- \$1.9 billion: total FY 2016 NASA Earth Science budget; 7.7% up from FY 2015¹²
- GRACE satellites measure groundwater changes in all of **South Dakota**¹³
- SMAP satellite measures soil moisture in all of **South Dakota**¹³
- PACE satellite measures cloud coverage over all of **South Dakota**¹³

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

- \$5.8 billion: total FY 2016 NOAA budget; 5.9% up from FY 2015¹⁴
- GOES satellites provide state-of-the-art weather forecasting over **South Dakota**¹⁵
- DISCOVR satellite monitors radiation and air quality over **South Dakota**¹⁵
- 172 National Weather Service Cooperative Observer Program (COOP) sites in **South Dakota**¹⁶

⁹ DOI Budget and Performance

¹⁰ USGS National Cooperative Geologic Mapping Program

¹¹ NASA Budget Documents, Strategic Plans and Performance Reports

¹² American Institute of Physics FY2016 Appropriations

¹³ Gravity Recovery and Climate Experiment (GRACE); Soil Moisture Active Passive (SMAP); Plankton, Aerosol, Cloud, ocean Ecosystem (PACE); Global Precipitation Measurement (GPM)

¹⁴ NOAA Total Budget

¹⁵ Geostationary Operational Environmental Satellite (GOES) & Deep Space Climate Observatory (DISCOVR)

¹⁶ NOAA in Your State

NATIONAL SCIENCE FOUNDATION (NSF)

- \$7.46 billion: total FY 2016 NSF budget; 1.6% up from FY 2015¹⁷
- \$1.28 billion: total FY 2016 NSF Geosciences Directorate (GEO) awards; 1.6% up from FY 2015¹⁷
- 46 NSF grants in **South Dakota** totaling \$11.6 million in 2016¹⁷
- 3 NSF GEO grants in **South Dakota** totaling \$520,000 in 2016¹⁷
- \$4.6 million: NSF grants to **University of South Dakota** in 2016¹⁷

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

- \$8.14 billion: total FY 2016 EPA budget; 0% up from FY 2015¹⁸
- 2 active/proposed superfund sites¹⁹
- \$194 million: federal grants for Drinking Water State Revolving Fund (DWSRF) in **South Dakota** (1997-2016)²⁰
- \$8 million: annual value of federal DWSRF grants in **South Dakota** in 2016²⁰

MAJOR FEDERAL FACILITIES IN SOUTH DAKOTA

- USGS Earth Resources Observation and Science Center, Sioux Falls
- USGS South Dakota Water Science Center, Rapid City
- USGS South Dakota Field Research Station, Yankton

YOUR STATE SOURCE FOR GEOSCIENCE INFORMATION

South Dakota Department of Environment and Natural Resources

Geological Survey Program

414 East Clark Street
Vermillion, SD 57069

<http://www.sdgs.usd.edu/>

(605) 677-5227

¹⁷ NSF Budget Internet Information System

¹⁸ EPA Budget and Spending

¹⁹ EPA Search for Superfund Sites Where You Live (March 2017)

²⁰ EPA 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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