

## Geoscience and South Dakota



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### 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.

### By the numbers: South Dakota

\$360 million: value of nonfuel mineral production in 2016<sup>6</sup>

1,600: **geoscience employees** (non-federal/self-employed)<sup>1</sup>

840: **jobs** in extractive industries in 2015<sup>2</sup>

25 severe storm disaster declarations since 1953<sup>7</sup>

14 fire disaster declarations since 1953<sup>7</sup>

\$11.6 million: NSF grants awarded in 2016 to **South Dakota**<sup>17</sup>

\$520,000 million: NSF GEO grants in 2016 to **South Dakota**<sup>17</sup>

### 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

### Workforce in South Dakota

- 1,600: **geoscience employees** (non-federal/self-employed) in 2015<sup>1</sup>
- \$59,900: average median geoscience employee salary<sup>1</sup>

- 840: **jobs** in extractive industries in 2015<sup>2</sup>
- 6: academic geoscience departments<sup>3</sup>

## Water in South Dakota

- 340 million gallons/day: total groundwater withdrawal<sup>4</sup>
- 290 million gallons/day: total surface water withdrawal<sup>4</sup>
- 125 million gallons/day: public water supply withdrawal<sup>4</sup>
- 360 million gallons/day: self-supplied industrial fresh water withdrawal<sup>4</sup>
- 91% of the population is served by public water supplies<sup>4</sup>
- 24 USGS stream gages in **South Dakota**<sup>5</sup>

## Energy and Minerals Production in South Dakota

- \$360 million: value of nonfuel mineral production in 2016<sup>6</sup>
- 1.7 million barrels: crude oil produced in 2015<sup>2</sup>
- 15.4 billion cubic feet: natural gas produced in 2014<sup>2</sup>
- 2. 5 million megawatt hours: wind power produced in 2015<sup>2</sup>
- 4.8 million megawatt hours: hydroelectricity produced in 2015<sup>2</sup>

## Natural Hazards in South Dakota

### FEMA statistics for South Dakota

- 25 severe storm disaster declarations since 1953<sup>7</sup>
- 16 flooding disaster declarations since 1953<sup>7</sup>
- 14 fire disaster declarations since 1953<sup>7</sup>
- \$12 million: individual assistance grants since 2005<sup>7</sup>
- \$67 million: mitigation grants since 2005<sup>7</sup>
- \$110 million: preparedness grants since 2005<sup>7</sup>
- \$260 million: public assistance grants since 2005<sup>7</sup>
- 22 weather and/or climate events, each with costs exceeding \$1 billion (inflation adjusted) 1980-2016<sup>8</sup>

## U.S. Geological Survey (USGS) Geologic Mapping

- \$1.06 billion: total USGS budget; 1.6% up from FY 2015<sup>9</sup>
- 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 EDMAP<sup>10</sup>

## National Aeronautics and Space Administration (NASA)

- \$5.6 billion: total NASA Science budget; 6.6% up from FY 2015<sup>11</sup>
- \$1.9 billion: total NASA Earth Science budget; 7.7% up from FY 2015<sup>12</sup>
- GRACE satellites measure groundwater changes in all of **South Dakota**<sup>13</sup>
- SMAP satellite measures soil moisture in all of **South Dakota**<sup>13</sup>
- PACE satellite measures cloud coverage over all of **South Dakota**<sup>13</sup>

## National Oceanic and Atmospheric Administration (NOAA)

- \$5.8 billion: total NOAA budget; 5.9% up from FY 2015<sup>14</sup>
- GOES satellites provide state-of-the-art weather forecasting over **South Dakota**<sup>15</sup>
- DISCOVER satellite monitors radiation and air quality over **South Dakota**<sup>15</sup>
- 172 National Weather Service Cooperative Observer Program (COOP) sites in **South Dakota**<sup>16</sup>

## National Science Foundation (NSF)

- \$7.46 billion: total NSF budget; 1.6% up from FY 2015<sup>17</sup>
- \$1.28 billion: total NSF Geosciences Directorate (GEO) awards; 1.6% up from FY 2015<sup>17</sup>
- 46 NSF grants in **South Dakota** totaling \$11.6 million in 2016<sup>17</sup>
- 3 NSF GEO grants in **South Dakota** totaling \$520,000 million in 2016<sup>17</sup>
- \$4.6 million: NSF GEO grants to **University of South Dakota** in 2016<sup>17</sup>

## U.S. Environmental Protection Agency (EPA)

- \$8.14 billion: total EPA budget; 0% up from FY 2015<sup>18</sup>
- 2 active/proposed superfund sites<sup>19</sup>
- \$194 million: federal grants for Drinking Water State Revolving Fund (DWSRF) in **South Dakota** (1997-2016)<sup>20</sup>
- \$8 million: annual value of federal DWSRF grants in **South Dakota** in 2016<sup>20</sup>

## Major Federal Facilities in South Dakota

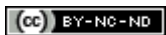
- USGS Earth Resources Observation and Science Center, Sioux Falls
- USGS South Dakota Water Science Center, Rapid City
- USGS South Dakota Field Research Station, Yankton

## References

- <sup>1</sup>Data Derived from Bureau of Labor Statistics [Occupational Employment Statistics 2015](#)
- <sup>2</sup>DOI [U.S. Extractive Industries Transparency Initiative](#)
- <sup>3</sup>American Geosciences Institute [Directory of Geoscience Departments 2016](#)
- <sup>4</sup>USGS [Estimated Use of Water in the United States in 2010](#)
- <sup>5</sup>USGS WaterWatch [Total Streamgage Stations, March 10, 2017](#)
- <sup>6</sup>USGS [Mineral Commodity Summaries 2017](#)
- <sup>7</sup>FEMA [Summary of Disaster Declarations and Grants, 2016](#)
- <sup>8</sup>NOAA [Billion-Dollar Weather and Climate Disasters: Mapping](#)
- <sup>9</sup>DOI [www.doi.gov/budget](http://www.doi.gov/budget)
- <sup>10</sup>USGS [National Cooperative Geologic Mapping Program](#)
- <sup>11</sup>NASA [Budget Documents, Strategic Plans and Performance Reports](#)
- <sup>12</sup>American Institute of Physics [FY2016 Appropriations](#)
- <sup>13</sup>Gravity Recovery and Climate Experiment ([GRACE](#)); Soil Moisture Active Passive ([SMAP](#)); Plankton, Aerosol, Cloud, ocean Ecosystem ([PACE](#)), Global Precipitation Measurement ([GPM](#))
- <sup>14</sup>NOAA [Total Budget](#)
- <sup>15</sup>Geostationary Operational Environmental Satellite ([GOES](#)) & Deep Space Climate Observatory ([DISCOVER](#))
- <sup>16</sup>[NOAA in Your State](#)
- <sup>17</sup>NSF [Budget Internet Information System](#)
- <sup>18</sup>EPA [Budget and Spending](#)
- <sup>19</sup>EPA [Search for Superfund Sites Where You Live](#)
- <sup>20</sup>EPA [Drinking Water State Revolving Fund National Information Management System Reports](#)

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