

## 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 WASHINGTON

- 12,118 geoscience employees (excludes self-employed) in 2017<sup>1</sup>
- \$80,786: average median geoscience employee salary<sup>1</sup>
- 11 academic geoscience departments<sup>2</sup>

## WATER USE IN WASHINGTON

- 1.53 billion gallons/day: total groundwater withdrawal<sup>3</sup>
- 2.73 billion gallons/day: total surface water withdrawal<sup>3</sup>
- 867 million gallons/day: public supply water withdrawal<sup>3</sup>
- 2.52 billion gallons/day: water withdrawal for irrigation<sup>3</sup>
- 412 million gallons/day: industrial fresh water withdrawal<sup>3</sup>
- 86% of the population is served by public water supplies<sup>3</sup>

## By the numbers: WASHINGTON

- 12,118 geoscience employees (excludes self-employed)<sup>1</sup>
- 1.53 billion gallons/day: total groundwater withdrawal<sup>3</sup>
- \$901 million: value of nonfuel mineral production in 2017<sup>4</sup>
- 132 total disaster declarations, including 78 fire, 28 flood, and 16 severe storm disasters (1953-2017)<sup>6</sup>
- \$34.4 million: NSF GEO grants awarded in 2017<sup>14</sup>

## ENERGY AND MINERALS IN WASHINGTON

- \$901 million: value of nonfuel mineral production in 2017<sup>4</sup>
- Sand and gravel (construction), stone (crushed), gold: top three nonfuel minerals in order of value produced in 2017<sup>4</sup>
- 82.8 million megawatt hours: hydroelectricity produced in 2017<sup>5</sup>
- 7.48 million megawatt hours: wind produced in 2017<sup>5</sup>
- 1.7 million megawatt hours: wood-derived fuels produced in 2017<sup>5</sup>

## NATURAL HAZARDS IN WASHINGTON

- 132 total disaster declarations, including 78 fire, 28 flood, and 16 severe storm disasters (1953-2017)<sup>6</sup>
- \$38 million: individual assistance grants (2005-2017)<sup>6</sup>
- \$145 million: mitigation grants (2005-2017)<sup>6</sup>
- \$571 million: preparedness grants (2005-2017)<sup>6</sup>
- \$327 million: public assistance grants (2005-2017)<sup>6</sup>
- 23 weather and/or climate events, each with costs exceeding \$1 billion (inflation adjusted) (1980-2017)<sup>7</sup>

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

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

# Geoscience, Washington, and Federal Agencies

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## U.S. GEOLOGICAL SURVEY (USGS)

- \$1.15 billion: total USGS budget in FY 2018 (5.8% increase from FY 2017)<sup>8</sup>
- The National Cooperative Geologic Mapping Program funds geologic mapping projects with federal (FEDMAP), state (STATEMAP), and university (EDMAP) partners
- \$4.14 million: Washington STATEMAP funding (1993-2016)<sup>9</sup>
- 4 Washington universities, including University of Washington and Washington State University, have participated in EDMAP<sup>9</sup>
- USGS streamgages collect real-time or recent streamflow, groundwater, and water-quality data for Washington

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## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

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

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## NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

- \$5.9 billion: total NOAA budget in FY 2018 (4.1% increase from FY 2017)<sup>11</sup>
- Next-generation geostationary (GOES) and polar orbiting (JPSS) satellites provide weather forecasting for Washington
- Deep Space Climate Observatory (DISCOVER) satellite monitors radiation and air quality over Washington
- 28 National Weather Service Automated Surface Observing Systems (ASOS) stations in Washington<sup>12</sup>
- 195 National Weather Service Cooperative Observer Program (COOP) sites in Washington<sup>12</sup>

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## NATIONAL SCIENCE FOUNDATION (NSF)

- \$7.8 billion: total NSF budget in FY 2018 (4% increase from FY 2017)<sup>13</sup>
- \$1.4 billion: total NSF Geosciences Directorate (GEO) awards in FY 2017 (7.2% increase from FY 2016)<sup>14</sup>
- 111 NSF GEO awards in Washington totaling \$34.4 million in 2017<sup>14</sup>
- \$29 million: NSF GEO grants awarded to University of Washington in 2017<sup>14</sup>

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## U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

- \$8.1 billion: total EPA budget in FY 2018 (0% change from FY 2017)<sup>15</sup>
- 49 active Superfund sites in Washington in 2018<sup>16</sup>
- \$18.4 million: Drinking Water State Revolving Fund (DWSRF) grants in Washington in 2017<sup>17</sup>

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## FEDERAL FACILITIES IN WASHINGTON

- USGS Cascades Volcano Observatory, Vancouver
- NOAA Olympic Coast National Marine Sanctuary, Port Angeles
- NOAA National Marine Fisheries Service, Seattle
- NOAA Pacific Marine Environmental Laboratory, Seattle
- DOE Pacific Northwest National Laboratory, Richland
- DOE Office of River Protection - Hanford Site, Richland

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## YOUR STATE SOURCE FOR GEOSCIENCE INFORMATION

Washington Geological Survey  
1111 Washington St, SE  
Olympia, WA 98504  
<https://www.dnr.wa.gov/geology>  
360-902-1450

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<sup>8</sup> U.S. Department of the Interior, FY 2019 Budget in Brief

<sup>9</sup> U.S. Geological Survey, National Cooperative Geologic Mapping Program

<sup>10</sup> National Aeronautics and Space Administration, FY 2019 Budget Estimates

<sup>11</sup> National Oceanic and Atmospheric Administration, FY 2019 Bluebook

<sup>12</sup> NOAA In Your State and Territory

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

<sup>14</sup> National Science Foundation, Budget Information System

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

<sup>16</sup> U.S. Environmental Protection Agency, Superfund Sites

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

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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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