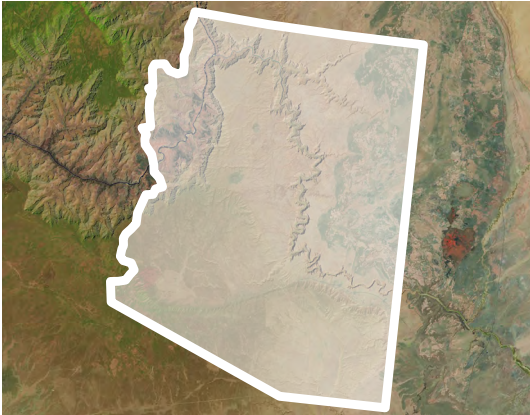


## WHAT IS GEOSCIENCE?

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: ARIZONA

- 6,703 geoscience employees (excludes self-employed)<sup>1</sup>
- 2.76 billion gallons/day: total groundwater withdrawal<sup>3</sup>
- \$6.61 billion: value of nonfuel mineral production in 2017<sup>4</sup>
- 65 total disaster declarations, including 39 fire, 13 flood, and 10 severe storm disasters (1953-2017)<sup>6</sup>
- \$12.8 million: NSF GEO grants awarded in 2017<sup>14</sup>

## WORKFORCE IN ARIZONA

- 6,703 geoscience employees (excludes self-employed) in 2017<sup>1</sup>
- \$67,578: average median geoscience employee salary<sup>1</sup>
- 10 academic geoscience departments<sup>2</sup>

## WATER USE IN ARIZONA

- 2.76 billion gallons/day: total groundwater withdrawal<sup>3</sup>
- 3.22 billion gallons/day: total surface water withdrawal<sup>3</sup>
- 1.2 billion gallons/day: public supply water withdrawal<sup>3</sup>
- 4.53 billion gallons/day: water withdrawal for irrigation<sup>3</sup>
- 6 million gallons/day: self-supplied industrial fresh water withdrawal<sup>3</sup>
- 97% of the population is served by public water supplies<sup>3</sup>

## ENERGY AND MINERALS IN ARIZONA

- \$6.61 billion: value of nonfuel mineral production in 2017<sup>4</sup>
- Copper, sand and gravel (construction), molybdenum concentrates: top three nonfuel minerals in order of value produced in 2017<sup>4</sup>
- 5.42 million short tons: coal produced in 2016<sup>5</sup>
- 6.97 million megawatt hours: hydroelectricity produced in 2017<sup>5</sup>
- 4.74 million megawatt hours: solar produced in 2017<sup>5</sup>
- 588,000 megawatt hours: wind produced in 2017<sup>5</sup>

## NATURAL HAZARDS IN ARIZONA

- 65 total disaster declarations, including 39 fire, 13 flood, and 10 severe storm disasters (1953-2017)<sup>6</sup>
- \$23 million: mitigation grants (2005-2017)<sup>6</sup>
- \$474 million: preparedness grants (2005-2017)<sup>6</sup>
- \$52 million: public assistance grants (2005-2017)<sup>6</sup>
- 22 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)

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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
- \$4.08: Arizona STATEMAP funding (1993-2016)<sup>9</sup>
- Arizona State University, Northern Arizona University, and University of Arizona have participated in EDMAP<sup>9</sup>
- USGS streamgages collect real-time or recent streamflow, groundwater, and water-quality data throughout Arizona

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

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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 over Arizona
- Deep Space Climate Observatory (DISCOVER) satellite monitors radiation and air quality over Arizona
- 18 National Weather Service Automated Surface Observing Systems (ASOS) stations in Arizona<sup>12</sup>
- 170 National Weather Service Cooperative Observer Program (COOP) sites in Arizona<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>
- 53 NSF GEO awards in Arizona totaling \$12.8 million in 2017<sup>14</sup>
- \$5.7 million: NSF GEO grants awarded to University of Arizona 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>
- 9 active Superfund sites in Arizona in 2018<sup>16</sup>
- \$14.9 million: Drinking Water State Revolving Fund (DWSRF) grants in Arizona in 2017<sup>17</sup>

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## FEDERAL FACILITIES IN ARIZONA

- USGS Flagstaff Library
- USGS Southwest Biological Science Center Research Stations, Flagstaff and Tucson
- USGS Southwest Climate Science Center, Tucson
- NOAA/NASA International Global Energy and Water Exchanges (GEWEX) Project Office, Elgin
- NSF National Optical Astronomy Observatory, Tucson

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## YOUR STATE SOURCE FOR GEOSCIENCE INFORMATION

Arizona Geological Survey  
1955 East Sixth St  
P.O. Box 210184  
Tucson, AZ 85721  
<http://www.azgs.arizona.edu/>  
520-621-2470

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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

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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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