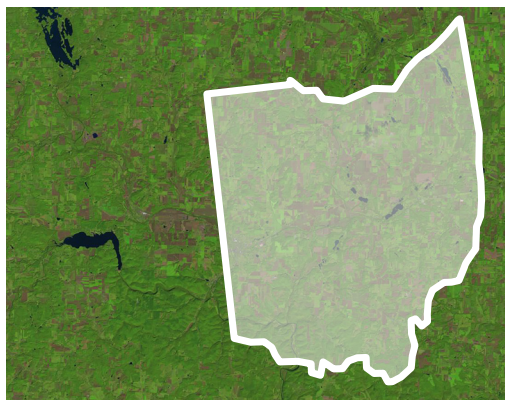


## WHAT IS GEOSCIENCE?

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: OHIO

- \$1.3 billion: value of nonfuel mineral production in 2016<sup>6</sup>
- 10,900: **geoscience employees** (non-federal/self-employed)<sup>1</sup>
- 13,800: **jobs** in extractive industries in 2015<sup>2</sup>
- 32 severe storm, hurricane/tropical storm, and tornado disaster declarations since 1953<sup>7</sup>
- 15 flooding disaster declarations since 1953<sup>7</sup>
- \$239 million: NSF grants awarded in Ohio in 2016<sup>17</sup>
- \$3.5 million: NSF GEO grants awarded in Ohio in 2016<sup>17</sup>

## WORKFORCE IN OHIO

- 10,900: **geoscience employees** (non-federal/self-employed) in 2015<sup>1</sup>
- \$72,760: average median geoscience employee salary<sup>1</sup>
- 13,800: **jobs** in extractive industries in 2015<sup>2</sup>
- 34: academic geoscience departments<sup>3</sup>

## WATER IN OHIO

- 930 million gallons/day: total groundwater withdrawal<sup>4</sup>
- 8.5 billion gallons/day: total surface water withdrawal<sup>4</sup>
- 1.4 billion gallons/day: public supply water withdrawal<sup>4</sup>
- 53 million gallons/day: water withdrawal for irrigation<sup>4</sup>
- 490 million gallons/day: self-supplied industrial fresh water withdrawal<sup>4</sup>
- 84% of the population is served by public water supplies<sup>4</sup>
- 94 USGS stream gages in **Ohio**<sup>5</sup>

## ENERGY AND MINERALS PRODUCTION IN OHIO

- \$1.3 billion: value of nonfuel mineral production in 2016<sup>6</sup>
- 26 million barrels: crude oil produced in 2015<sup>2</sup>
- 1 trillion cubic feet: natural gas produced in 2015<sup>2</sup>
- 22 million short tons: coal produced in 2014<sup>2</sup>
- 1.2 million megawatt hours: wind power produced in 2015<sup>2</sup>
- 77,000 megawatt hours: solar power produced in 2015<sup>2</sup>

## NATURAL HAZARDS IN OHIO

### FEMA statistics for Ohio

- 24 severe storm disaster declarations since 1953<sup>7</sup>
- 2 hurricane/tropical storm disaster declarations since 1953<sup>7</sup>
- 15 flooding disaster declarations since 1953<sup>7</sup>
- 6 tornado disaster declarations since 1953<sup>7</sup>
- \$47 million: individual assistance grants since 2005<sup>7</sup>
- \$78 million: mitigation grants since 2005<sup>7</sup>
- \$512 million: preparedness grants since 2005<sup>7</sup>
- \$236 million: public assistance grants since 2005<sup>7</sup>
- 49 weather and/or climate events, each with costs exceeding \$1 billion (inflation adjusted) 1980-2016<sup>8</sup>

<sup>1</sup> Data Derived from Bureau of Labor Statistics *Occupational Employment Statistics* (2015)

<sup>2</sup> U.S. DOI *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*

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## U.S. GEOLOGICAL SURVEY (USGS) GEOLOGIC MAPPING

- \$1.06 billion: total FY 2016 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)
- \$2.2 million: **Ohio** STATEMAP funding (1993-2016)<sup>10</sup>
- 6 **Ohio** universities participated in EDMAP<sup>10</sup>

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## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

- \$5.6 billion: total FY 2016 NASA Science budget; 6.6% up from FY 2015<sup>11</sup>
- \$1.9 billion: total FY 2016 NASA Earth Science budget; 7.7% up from FY 2015<sup>12</sup>
- GRACE satellites measure groundwater changes in all of **Ohio**<sup>13</sup>
- SMAP satellite measures soil moisture in all of **Ohio**<sup>13</sup>

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## NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

- \$5.8 billion: total FY 2016 NOAA budget; 5.9% up from FY 2015<sup>14</sup>
- GOES satellites provide state-of-the-art weather forecasting over **Ohio**<sup>15</sup>
- DISCOVR satellite monitors radiation and air quality over **Ohio**<sup>15</sup>
- 26 National Weather Service Automated Surface Observing Systems (ASOS) stations in **Ohio**<sup>16</sup>
- 173 National Weather Service Cooperative Observer Program (COOP) sites in **Ohio**<sup>16</sup>

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## NATIONAL SCIENCE FOUNDATION (NSF)

- \$7.46 billion: total FY 2016 NSF budget; 1.6% up from FY 2015<sup>17</sup>
- \$1.28 billion: total FY 2016 NSF Geosciences Directorate (GEO) awards; 1.6% up from FY 2015<sup>17</sup>
- 543 NSF grants in **Ohio** totaling \$239 million in 2016<sup>17</sup>
- 27 NSF GEO grants in **Ohio** totaling \$3.5 million in 2016<sup>17</sup>
- \$1.4 million: NSF GEO grants to **Ohio State University** in 2016<sup>17</sup>

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

- \$8.14 billion: total FY 2016 EPA budget; 0% up from FY 2015<sup>18</sup>
- 43 active/proposed superfund sites<sup>19</sup>
- \$597 million: federal grants for Drinking Water State Revolving Fund (DWSRF) in **Ohio** (1997-2016)<sup>20</sup>
- \$23 million: annual value of federal DWSRF grants in **Ohio** in 2016<sup>20</sup>

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## MAJOR FEDERAL FACILITIES IN OHIO

- USGS Michigan-Ohio Water Science Center - Ohio Office, Columbus
- NSF Center for Layered Polymeric Systems, Cleveland
- NSF U.S. Polar Rock Repository at the Byrd Polar Research Center, Columbus
- NASA Plum Brook Station, Sandusky NASA Safety Center
- DOE Ohio Field Office, Springdale

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## YOUR STATE SOURCE FOR GEOSCIENCE INFORMATION

### ODNR Division of Geological Survey

2045 Morse Rd., Bldg. C-1  
Columbus, OH 43229-6693  
<http://geosurvey.ohiodnr.gov>  
(614) 265-6576

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<sup>9</sup> DOI Budget and Performance

<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 (DISCOVR)

<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 (August 2017)

<sup>20</sup> EPA 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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