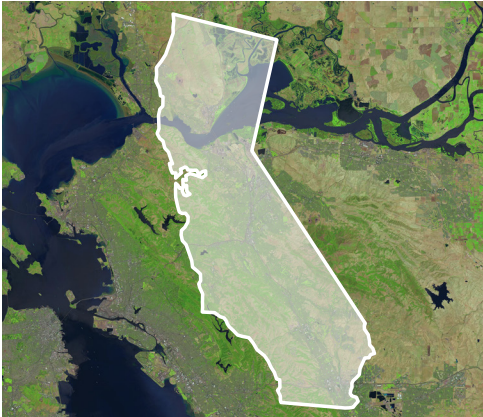


## WHAT IS GEOSCIENCE?

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.

## WORKFORCE IN CALIFORNIA

- 46,600: **geoscience employees** (non-federal/self-employed) in 2015<sup>1</sup>
- \$87,900: average median geoscience employee salary<sup>1</sup>
- 21,100: **jobs** in extractive industries in 2015<sup>2</sup>
- 115: academic geoscience departments<sup>3</sup>

## WATER IN CALIFORNIA

- 12.7 billion gallons/day: total groundwater withdrawal<sup>4</sup>
- 25.3 billion gallons/day: total surface water withdrawal<sup>4</sup>
- 6.3 billion gallons/day: public supply water withdrawal<sup>4</sup>
- 23.1 billion gallons/day: water withdrawal for irrigation<sup>4</sup>
- 400 million gallons/day: self-supplied industrial fresh water withdrawal<sup>4</sup>
- 93% of the population is served by public water supplies<sup>4</sup>
- 57 counties in 2015, and 51 counties in 2016, designated as primary natural disaster areas caused by drought<sup>5</sup>
- 250 USGS stream gages in **California**<sup>6</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> USDA Farm Service Agency [Disaster Designation Information \(2015 Crop Year & 2016 Crop Year\)](#)

<sup>6</sup> USGS WaterWatch [Total Streamgage Stations \(March 10, 2017\)](#)

## By the numbers: CALIFORNIA

- \$3.5 billion: value of nonfuel mineral production in 2016<sup>7</sup>
- 46,600: **geoscience employees** (non-federal/self-employed)<sup>1</sup>
- 21,100: **jobs** in extractive industries in 2015<sup>2</sup>
- 35 flooding disaster declarations since 1953<sup>8</sup>
- \$957.3 million: NSF grants awarded in **California** in 2016<sup>18</sup>
- \$178.5 million: NSF GEO grants awarded in **California** in 2016<sup>18</sup>

## ENERGY AND MINERALS PRODUCTION IN CALIFORNIA

- \$3.5 billion: value of nonfuel mineral production in 2016<sup>7</sup>
- 201 million barrels: crude oil produced in 2015, #3 in the nation<sup>2</sup>
- 14 million megawatt hours: hydroelectricity produced in 2015, #4 in the nation<sup>2</sup>
- 15 million megawatt hours: solar power produced in 2015, 56% of U.S. production<sup>2</sup>
- 171,000 megawatt hours: geothermal energy produced in 2015: 73% of U.S. production<sup>2</sup>

## NATURAL HAZARDS IN CALIFORNIA

### FEMA statistics for California

- 35 flooding disaster declarations since 1953<sup>8</sup>
- 184 fire disaster declarations since 1953<sup>8</sup>
- 12 earthquake disaster declarations since 1953<sup>8</sup>
- \$84 million: individual assistance grants since 2005<sup>8</sup>
- \$614 million: mitigation grants since 2005<sup>8</sup>
- \$3.7 billion: preparedness grants since 2005<sup>8</sup>
- \$1.3 billion: public assistance grants since 2005<sup>8</sup>
- 18 weather and/or climate events, each with costs exceeding \$1 billion (inflation adjusted) 1980-2016<sup>9</sup>

<sup>7</sup> USGS [Mineral Commodity Summaries \(2017\)](#)

<sup>8</sup> FEMA [Summary of Disaster Declarations and Grants \(2016\)](#)

<sup>9</sup> NOAA [Billion-Dollar Weather and Climate Disasters: Mapping](#)

AGI is a network of 51 member societies, representing more than 250,000 geoscientists.

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

- \$1.06 billion: total USGS budget; 1.6% up from FY 2015<sup>10</sup>
- The USGS National Cooperative Geologic Mapping Program (NCGMP) funds geologic mapping projects by states (STATEMAP) and universities (EDMAP)
- \$4.6 million: **California** STATEMAP funding (1993-2016)<sup>11</sup>
- Over 100 geologic maps in **California** created with STATEMAP support (1993-2014)<sup>11</sup>
- 32,000 square miles in **California** mapped through STATEMAP (1993-2014)<sup>11</sup>
- 16 **California** universities participated in EDMAP<sup>11</sup>

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## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

- \$5.6 billion: total NASA Science budget; 6.6% up from FY 2015<sup>12</sup>
- \$1.9 billion: total NASA Earth Science budget; 7.7% up from FY 2015<sup>13</sup>
- GRACE satellites measure groundwater changes in all of **California**<sup>14</sup>
- SMAP satellite measures soil moisture in all of **California**<sup>14</sup>

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## NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

- \$5.8 billion: total NOAA budget; 5.9% up from FY 2015<sup>15</sup>
- GOES satellites provide state-of-the-art weather forecasting over **California**<sup>16</sup>
- DISCOVER satellite monitors radiation and air quality over **California**<sup>16</sup>
- 86 National Weather Service observing stations in **California**<sup>17</sup>
- 493 National Weather Service cooperative observer sites in **California**<sup>17</sup>

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10 DOI Budget and Performance

11 USGS National Cooperative Geologic Mapping Program

12 NASA Budget Documents, Strategic Plans and Performance Reports

13 American Institute of Physics FY2016 Appropriations

14 Gravity Recovery and Climate Experiment (GRACE); Soil Moisture Active Passive (SMAP)

15 NOAA Total Budget

16 Geostationary Operational Environmental Satellite (GOES) & Deep Space Climate Observatory (DISCOVER)

17 NOAA in Your State

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## NATIONAL SCIENCE FOUNDATION (NSF)

- \$7.46 billion: total NSF budget; 1.6% up from FY 2015<sup>18</sup>
- \$1.28 billion: total NSF Geosciences Directorate (GEO) awards; 1.6% up from FY 2015<sup>18</sup>
- 2,532 NSF grants in **California** totaling \$957.3 million in 2016<sup>18</sup>
- 378 NSF GEO grants in **California** totaling \$178.5 million in 2016<sup>18</sup>
- The University of **California** at Santa Barbara, Los Angeles, and Berkeley each received over \$6 million in NSF GEO grants in 2016<sup>18</sup>

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

- \$8.14 billion: total EPA budget; 0% up from FY 2015<sup>19</sup>
- 99 active/proposed superfund sites<sup>20</sup>
- \$1.7 billion: cumulative federal grants for Drinking Water State Revolving Fund (DWSRF) in **California** (1997-2016)<sup>21</sup>
- \$83 million: annual value of federal DWSRF grants in **California** in 2016<sup>21</sup>

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## MAJOR FEDERAL FACILITIES IN CALIFORNIA

- USGS Earthquake Science Center, Menlo Park
- USGS **California** Water Science Center, Sacramento
- NSF International Ocean Discovery Program, La Jolla
- NOAA Cooperative Global Air Sampling Network, Los Angeles
- NASA Jet Propulsion Laboratory, Pasadena
- DOE Lawrence Livermore National Lab, Livermore

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## YOUR STATE SOURCE FOR GEOSCIENCE INFORMATION

### California Geological Survey

801 K Street, MS 12-30

Sacramento, CA 95814

<http://www.consrv.ca.gov/cgs>

(916) 445-1825

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18 NSF Budget Internet Information System

19 EPA Budget and Spending

20 EPA Search for Superfund Sites Where You Live (July 2017)

21 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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