

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 CALIFORNIA

- 48,528 geoscience employees (excludes self-employed) in 2017¹
- \$90,530: average median geoscience employee salary¹
- 53 academic geoscience departments²

WATER USE IN CALIFORNIA

- 17.4 billion gallons/day: total groundwater withdrawal³
- 11.3 billion gallons/day: total surface water withdrawal³
- 5.2 billion gallons/day: public supply water withdrawal³
- 19 billion gallons/day: water withdrawal for irrigation³
- 399 million gallons/day: self-supplied industrial fresh water withdrawal³
- 96% of the population is served by public water supplies³

By the numbers: CALIFORNIA

- 48,528 geoscience employees (excludes self-employed)¹
- 17.4 billion gallons/day: total groundwater withdrawal³
- \$3.52 billion: value of nonfuel mineral production in 2017⁴
- 252 total disaster declarations, including 184 fire, 35 flood, and 12 earthquake disasters (1953-2017)⁶
- \$190 million: NSF GEO grants awarded in 2017¹⁴

ENERGY AND MINERALS IN CALIFORNIA

- \$3.52 billion: value of nonfuel mineral production in 2017⁴
- Sand and gravel (construction), cement (portland), boron minerals: top three nonfuel minerals in order of value produced in 2017⁴
- 202 billion cubic feet: natural gas produced in 2017⁵
- 42.7 million megawatt hours: hydroelectricity produced in 2017⁵
- 23.1 million megawatt hours: solar produced in 2017⁵
- 13.97 million megawatt hours: wind produced in 2017⁵

NATURAL HAZARDS IN CALIFORNIA

- 252 total disaster declarations, including 184 fire, 35 flood, and 12 earthquake disasters (1953-2017)⁶
- \$84 million: individual assistance grants (2005-2017)⁶
- \$614 million: mitigation grants (2005-2017)⁶
- \$3.74 billion: preparedness grants (2005-2017)⁶
- \$1.34 billion: public assistance grants (2005-2017)⁶
- 33 weather and/or climate events, each with costs exceeding \$1 billion (inflation adjusted) (1980-2017)⁷

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

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

U.S. GEOLOGICAL SURVEY (USGS)

- \$1.15 billion: total USGS budget in FY 2018 (5.8% increase from FY 2017)⁸
- The National Cooperative Geologic Mapping Program funds geologic mapping projects with federal (FEDMAP), state (STATEMAP), and university (EDMAP) partners
- \$4.58 million: California STATEMAP funding (1993-2016)⁹
- 11 California universities, including Stanford University and University of Southern California, have participated in EDMAP⁹
- USGS streamgages collect real-time or recent streamflow, groundwater, and water-quality data throughout California

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

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

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

- \$5.9 billion: total NOAA budget in FY 2018 (4.1% increase from FY 2017)¹¹
- Next-generation geostationary (GOES) and polar orbiting (JPSS) satellites provide weather forecasting over California
- Deep Space Climate Observatory (DISCOVER) satellite monitors radiation and air quality over California
- 86 National Weather Service Automated Surface Observing Systems (ASOS) stations in California¹²
- 493 National Weather Service Cooperative Observer Program (COOP) sites in California¹²

NATIONAL SCIENCE FOUNDATION (NSF)

- \$7.8 billion: total NSF budget in FY 2018 (4% increase from FY 2017)¹³
- \$1.4 billion: total NSF Geosciences Directorate (GEO) awards in FY 2017 (7.2% increase from FY 2016)¹⁴
- 396 NSF GEO awards in California totaling \$190 million in 2017, including \$28 million awarded to UC San Diego Scripps Institute of Oceanography¹⁴

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

- \$8.1 billion: total EPA budget in FY 2018 (0% change from FY 2017)¹⁵
- 98 active Superfund sites in California in 2018¹⁶
- \$77.6: Drinking Water State Revolving Fund (DWSRF) grants in California in 2017¹⁷
- \$600,000: Brownfield cleanup grants awarded to California in 2018¹⁸

FEDERAL FACILITIES IN CALIFORNIA

- NOAA OAR Cooperative Institute for Ocean Exploration, Research, and Technology, Menlo Park
- DOE Lawrence Berkeley National Laboratory
- DOE Lawrence Livermore National Laboratory
- DOD Hydrologic Engineering Center, Davis
- DOI Pacific Outer Continental Shelf Region Office, Camarillo
- NSF International Ocean Discovery Program (IODP), La Jolla

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

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

18 U.S. Environmental Protection Agency, Brownfields Grant Fact Sheet Search

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

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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