

# JOB DESCRIPTION: Geoscientist

A career as a geoscientist

## **Introduction**

Geoscientists are curious about the Earth and the solar system. Is there life on other planets? How are they changing? What effects will shrinking glaciers have on the oceans and climate? What makes a continent move, a mountain form, a volcano erupt? Why did the dinosaurs become extinct?



Geoscientists are concerned about the Earth. How is the global climate changing? How do Earth systems work? How and where should we dispose of industrial wastes? How can society's growing demands for energy and water be satisfied while conserving natural resources for future generations? As global populations increase, can we grow enough food and fiber to sustain them?

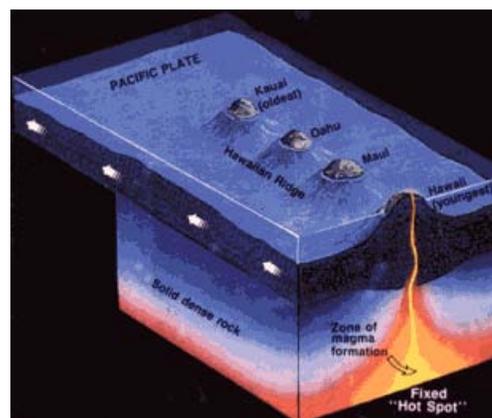
The Earth is an outdoor laboratory filled with opportunities to observe Earth processes in action. By applying their knowledge of forces and factors that shape the Earth, geoscientists seek to reconstruct the past and anticipate the future. Geoscientists gather and interpret data about the Earth and other planets. They use their knowledge to increase our understanding of Earth processes and to improve the quality of human life. Their work and career paths vary widely because the geosciences are so broad and diverse. The National Science Foundation considers geology, geophysics, hydrology, oceanography, marine science, atmospheric science, planetary science, meteorology, environmental science, and soil science as the major geo-science disciplines.

Geoscientists are stewards or caretakers of Earth's resources and environment. They work to understand natural processes on Earth and other planets. Investigating the Earth, its soils, oceans, and atmosphere; forecasting the weather; developing land-use plans; exploring other planets and the solar system; determining environmental impacts; and finding new sources of useful Earth materials are just a few of the ways geoscientists contribute to our understanding of Earth processes and history. Geoscientists provide essential information for solving problems and establishing governmental policies for resource management; environmental protection; and public health, safety, and welfare.

The following list gives a glimpse of what geoscientists do in these disciplines and a variety of sub-disciplines.

**Atmospheric scientists:** study weather processes; the global dynamics of climate; solar radiation and its effects; and the role of atmospheric chemistry in ozone depletion, climate change, and pollution.

**Economic geologists:** explore for and develop metallic and nonmetallic resources; they study mineral deposits and find environmentally safe ways to dispose of waste materials from mining activities.



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**Engineering geologists:** apply geological data, techniques, and principles to the study of rock and soil surface materials and ground water; they investigate geologic factors that affect structures such as bridges, buildings, airports, and dams.

**Environmental geologists:** investigate the interaction between the geosphere, hydrosphere, atmosphere, biosphere, and human activities. They work to solve problems associated with pollution, waste management, urbanization, and natural hazards, such as flooding and erosion.

**Geochemists** use physical and inorganic chemistry to investigate the nature and distribution of major and trace elements in ground water and Earth materials; they use organic chemistry to study the composition of fossil fuel (coal, oil, and gas) deposits.

**Geochronologists** use the rates of decay of certain radioactive elements in rocks to determine their age and the time sequence of events in the history of the Earth.

**Geologists** study the materials, processes, products, physical nature, and history of the Earth.

**Geomorphologists** study Earth's landforms and landscapes in relation to the geologic and climatic processes and human activities, which form them.

**Geophysicists** apply the principles of physics to studies of the Earth's interior and investigate Earth's magnetic, electric, and gravitational fields.

**Glacial geologists** study the physical properties and movement of glaciers and ice sheets.

**Hydrogeologists** study the occurrence, movement, abundance, distribution, and quality of subsurface waters and related geologic aspects of surface waters.

**Hydrologists** are concerned with water from the moment of precipitation until it evaporates into the atmosphere or is discharged into the ocean; for example, they study river systems to predict the impacts of flooding.



**Marine geologists** investigate the ocean-floor and ocean-continent boundaries; they study ocean basins, continental shelves, and the coastal environments on continental borders.

**Meteorologists** study the atmosphere and atmospheric phenomena, including the weather.

**Mineralogists** study mineral formation, composition, and properties.

**Oceanographers** investigate the physical, chemical, biological, and geologic dynamics of oceans.

**Paleoecologists** study the function and distribution of ancient organisms and their relationships to their environment.

**Paleontologists** study fossils to understand past life forms and their changes through time and to reconstruct past environments.

**Petroleum geologists** are involved in exploration for and production of oil and natural gas resources.

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**Petrologists** determine the origin and natural history of rocks by analyzing mineral composition and grain relationships.

**Planetary geologists** study planets and their moons in order to understand the evolution of the solar system.

**Sedimentologists** study the nature, origin, distribution, and alteration of sediments, such as sand, silt, and mud. Oil, gas, coal and many mineral deposits occur in such sediments.

**Seismologists** study earthquakes and analyze the behavior of earthquake waves to interpret the structure of the Earth.

**Soil scientists** study soils and their properties to determine how to sustain agricultural productivity and to detect and remediate contaminated soils.

**Stratigraphers** investigate the time and space relationships of rocks, on a local, regional, and global scale throughout geologic time -- especially the fossil and mineral content of layered rocks.

**Structural geologists** analyze Earth's forces by studying deformation, fracturing, and folding of the Earth's crust.

**Volcanologists** investigate volcanoes and volcanic phenomena to understand these natural hazards and predict eruptions.



So if you love the outdoors, and want to contribute to a better understanding of how the earth affects human activities and how human activities impact earth processes, then you should definitely consider a career as a geoscientist

**Links to more Information click below:**

- **American Geological Institute**, 4220 King Street, Alexandria, Virginia 22302-1502  
Phone: 703/379-2480, FAX: 703/379-7563 - [workforce@agiweb.org](mailto:workforce@agiweb.org) - <http://www.agiweb.org/>
- **American Association of Petroleum Geologists**, P.O. Box 979, Tulsa, Oklahoma 74101-0979  
Phone: 918/584-2555, FAX: 918/560-2636 - [postmaster@aapg.org](mailto:postmaster@aapg.org) - <http://www.aapg.org/>
- **Geological Society of America**, 3300 Penrose Place, P.O. Box 9140, Boulder, Colorado 80301  
Phone: 303/447-2020 - FAX: 303/447-1133, [educate@geosociety.org](mailto:educate@geosociety.org) - <http://www.geosociety.org>
- <http://www.humboldt.edu/geology/students>
- <http://geologyonlinecourses.com/geology-career/>

Courtesy: [AGI, GSA], *Geotimes* (photo)

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