"What Can I do With a Major in…Geology?"

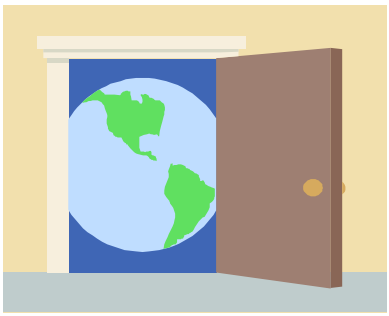
Facts About a Geology Degree

- A geology degree will prepare you for a wide range of careers
- Some career fields include research (for an academic institution, government agency, or private firm), teaching, environmental consulting, environmental law and public policy, government work
- Due to increasing demand for natural resources and the growing need for solutions to environmental problems such as pollution and climate change, geoscientists will continue to play a crucial role in effecting change and resolving the problems of our planet.

Skills Possessed by Geology Majors

- Observational and inductive problem solving skills
- Analytical and deductive problem solving skills
- Ability to work as part of a team
- Aptitude for organization and accurate details
- Can conduct and clearly explain scientific research
- Physical stamina, and manual dexterity
- Ability to read, write, and speak clearly and insightfully

Possible Job Titles for Geology Majors



Geologist

Studies composition, structure, and history of earth's crust: examines rocks, minerals, and fossil remains to identify and determine sequence of processes affecting development of earth. Applies knowledge of chemistry, physics, biology, and mathematics to explain these phenomena and to help locate mineral, geothermal, and petroleum deposits and underground water resources. Studies ocean bottom. Applies geological knowledge to engineering problems encountered in construction projects, such as dams, tunnels, and large buildings. Studies fossil plants and animals to determine their evolutionary sequence and age. Prepares geologic reports and maps, interprets research data, and recommends further study or action. May specialize in area of study and be designated Geomorphologist, Oceanographer, Photogeologist. May conduct or participate in environmental studies and prepare environmental reports. Workers applying principles of rock and soil mechanics for engineering projects may be designated Geological Engineer. Workers applying all branches of geologic knowledge to conditions that affect planning, design, construction, operation and safety to engineering projects may be designated Engineering Geologist.

*** Geologists often specialize within their field, for example:

- Mineralogy: The examination, classification, and analysis of minerals, gems, and precious stones.
- Petrology: The analysis and classification of rocks to learn their origin and history.
- Structural Geology: The study of the deformation of rocks and the forces that cause deformation.
- Sedimentology: The study of modern and historic depositional environments.
- Paleontology: The reconstruction of past ecosystems and environments by studying fossils and other characteristics of sedimentary rocks.
- Geochemistry: The study of the chemical composition of rocks and minerals for a variety of geological, environmental, and economic applications.
- Geophysics: The study of gravity, magnetism, and seismic characteristics of the Earth.
- Planetary Geology: The study of the formation of and geological process operating on other planets.

Atmospheric Scientists

Atmospheric science is the study of the atmosphere—the blanket of air covering the Earth. Atmospheric scientists, commonly called *meteorologists*, study the atmosphere's physical characteristics, motions, and processes, and the way in which these factors affect the rest of our environment. The best known application of this knowledge is forecasting the weather. In addition to predicting the weather, atmospheric scientists called *climatologists* attempt to

identify and interpret climate trends, reconstruct past weather and climate, and analyze today's climate in light of the past. Climatological and meteorological research are also applied in air-pollution control, agriculture, forestry, air and sea transportation, defense, and the study of possible trends in the Earth's climate, such as global warming, droughts, and ozone depletion.

Science Technicians

Science technicians use the principles and theories of science and mathematics to solve problems in research and development and to help invent and improve products and processes. However, their jobs are more practically oriented than those of scientists. Technicians set up, operate, and maintain laboratory instruments, monitor experiments, make observations, calculate and record results, and often develop conclusions. They must keep detailed logs of all of their work. Those who perform production work monitor manufacturing processes and may ensure quality by testing products for proper proportions of ingredients, for purity, or for strength and durability.

As laboratory instrumentation and procedures have become more complex, the role of science technicians in research and development has expanded. In addition to performing routine tasks, many technicians, under the direction of scientists, now develop and adapt laboratory procedures to achieve the best results, interpret data, and devise solutions to problems. Technicians must develop expert knowledge of laboratory equipment so that they can adjust settings when necessary and recognize when equipment is malfunctioning.

Petroleum Geology

Jobs in the petroleum industry are fun and exciting because they provide people with a chance to "do geology" in a well funded, high-technology, high-data environment. Even better, many petroleum companies provide generous salary and benefits packages that include annual bonuses, flexible work schedules and company-sponsored training. Petroleum geoscientists gather, process, and analyze seismic data and well data in order to locate drillsites for their companies. During a typical career, people learn to locate three different types of drillsites: exploration drillsites (big scale/high risk), field-development drillsites (medium scale/medium risk) and producing-field drillsites (small scale/lowest risk). Most petroleum industry jobs are based in major cities like Houston and Denver and require some domestic and foreign travel as part of the job assignment.

Economic Geology/Mining Consultants

Economic geology integrates the science of geology and the practical discipline of mining within the real-world constraints of economics. Economic geology careers are characterized by change. Economic geologists are experiencing fundamental changes in how they work, where they work, and for whom they work. Career success means responding to and leading that change. A range of duties can be performed in these professions including project evaluation, mining engineering, feasibility studies, project management, conceptual design, and environmental permitting services.

Mining and geological engineers, including mining safety engineers

Mining and geological engineers, including mining safety engineers find, extract, and prepare coal, metals, and minerals for use by manufacturing industries and utilities. They design open-pit and underground mines, supervise the construction of mine shafts and tunnels in underground operations, and devise methods for transporting minerals to processing plants.

Mining engineers are responsible for the safe, economical, and environmentally sound operation of mines. Some mining engineers work with geologists and metallurgical engineers to locate and appraise new ore deposits. Others develop new mining equipment or direct mineral-processing operations that separate minerals from the dirt, rock, and other materials with which they are mixed. Mining engineers frequently specialize in the mining of one mineral or metal, such as coal or gold. With increased emphasis on protecting the environment, many mining engineers work to solve problems related to land reclamation and water and air pollution. Mining safety engineers use their knowledge of mine design and practices to ensure the safety of workers and to comply with State and Federal safety regulations. They inspect walls and roof surfaces, monitor air quality, and examine mining equipment for compliance with safety practices.

Environmental Scientists and Hydrologists

Environmental scientists conduct research to identify, abate, and eliminate hazards that affect people, wildlife, and their environments. These workers analyze measurements or observations of air, food, water, and soil to determine the way to clean and preserve the environment. Understanding the issues involved in protecting the environment—degradation, conservation, recycling, and replenishment—is central to the work of environmental scientists. They often use this understanding to design and monitor waste disposal sites, preserve water supplies, and reclaim contaminated land and water to comply with Federal environmental regulations. They also write risk assessments, describing the likely affect of construction and other environmental changes; write technical proposals; and give presentations to managers and regulators.

Hydrologists study the quantity, distribution, circulation, and physical properties of bodies of water. Often, they specialize in either underground water or surface water. Groundwater hydrologists are employed in the search for new sources of subsurface freshwater, in the management of existing groundwater resources, and in the detection and remediation of groundwater contamination. Hydrologists use sophisticated techniques and instruments. For example, they may use remote sensing technology, data assimilation, and numerical modeling to monitor and predict the movement of water in an aquifer or around the globe. Surface-water hydrologists use sensitive stream-measuring devices to assess flow rates and water quality.

Federal Government Positions

The United States Geological Survey (USGS) serves the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

Created by an act of Congress in 1879, the USGS has evolved over the ensuing 125 years, matching its talent and knowledge to the progress of science and technology. Today, the USGS stands as the sole science agency for the Department of the Interior. It is sought out by thousands of partners and customers for its natural science expertise and its vast earth and biological data holdings. The USGS is the science provider of choice in accessing the information and understanding to help resolve complex natural resource problems across the Nation and around the world.

The U.S. Department of Commerce's National Oceanic and Atmospheric Administration employs over 10,000 people, of which about 6,000 are classified as scientists. Besides the civil servants employed by NOAA, thousands of affiliated staff are employed by contracting organizations, such as companies and universities, to work with NOAA in various capacities.

NOAA employs a broad range of geoscientists. These include meteorologists (~3,000 employees in NOAA), hydrologists (~280), oceanographers (~250), cartographers (~150), geodesists (~100), geophysicists (~25), geographers, remote sensing specialists, and geochemists. In addition, there is a general employment category of physical scientists (~550 employees in NOAA), which includes people from many of these specialties.

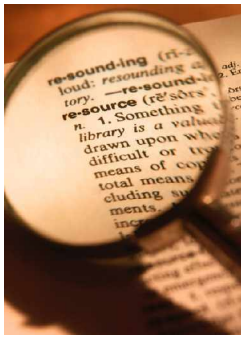
Many NOAA personnel with an educational background in geology and/or geophysics are currently classified as physical scientists or oceanographers. NOAA employers of non-meteorological geoscientists include the National Ocean Service (NOS), Oceanic and Atmospheric Research (OAR), and the National Environmental Satellite, Data, and Information Service (NESDIS). (Scientists dealing purely with weather and/or atmosphere are excluded from the following descriptions.)

Surveyors, Cartographers, Photogrammetrists, and Surveying and Mapping Technicians

Surveyors, cartographers, and photogrammetrists are responsible for measuring and mapping the Earth's surface. *Surveyors* establish official land, airspace, and water boundaries. They write descriptions of land for deeds, leases, and other legal documents; define airspace for airports; and take measurements of construction and mineral sites. Other surveyors provide data about the shape, contour, location, elevation, or dimension of land or land features. *Cartographers and photogrammetrists* collect, analyze, interpret, and map geographic information from surveys and from data and photographs collected using airplanes and satellites. *Surveying and mapping technicians* assist these professionals by collecting data in the field, making calculations, and helping with computer-aided drafting. Collectively, these occupations play key roles in the field of geospatial information.

*The content was adopted from the following websites:
http://geology.com/jobs.htm#jobs, http://www.bls.gov, http:///www.usgs.gov, http://www.saddleback.edu/faculty/jrepka/career.html, http://guide.agiweb.org/employer/index.html

Career Resources for Geology Majors



Specific Resources

American Geological Institute: http://www.agiweb.org/index.html

American Institute of Professional Geologists: http://www.aipg.org

Association of Women Geoscientists: http://www.awg.org

Geological Society of America: http://www.geosociety.org

Geology and Earth Science: http://geology.com

Geotimes: http://www.geotimes.org

Long Island Association of Professional Geologists: http://liapg.org

U.S. Geological Survey: http://www.usgs.gov/

General Resources

***CareerSearch:** http://www.careersearch.net/Hofstra
(username-hofstra, password-career)

Occupational Outlook Handbook: http://www.bls.gov/oco

Riley Guide: http://www.rileyguide.com

***Spotlight On Careers:** http://www.spotlightoncareers.org
(username-lacn, password-holland)

***Vault:** http://www.vault.com/cb/careerlib/careerlib_main.jsp?parrefer=6123
(You will be prompted for your Novell username and password)

*These websites require you sign in using a username and password.