

Geology

Earth science or geoscience includes all fields of natural science related to the planet Earth. This is a branch of science dealing with the physical and chemical constitution of the Earth and its atmosphere. Earth science can be considered to be a branch of planetary science, but with a much older history. Earth science encompasses four main branches of study, the lithosphere, the hydrosphere, the atmosphere, and the biosphere, each of which is further broken down into more specialized fields. Geology is an Earth science concerned with the solid Earth, the rocks of which it is composed, and the processes by which they change over time. Geology can also include the study of the solid features of any terrestrial planet or natural satellite such as Mars or the Moon. Modern geology significantly overlaps all other Earth sciences, including hydrology and the atmospheric sciences, and so is treated as one major aspect of integrated Earth system science and planetary science. Geology describes the structure of the Earth on and beneath its surface, and the processes that have shaped that structure. It also pro-

vides tools to determine the relative and absolute ages of rocks found in a given location, and also to describe the histories of those rocks. By combining these tools, geologists are able to chronicle the geological history of the Earth as a whole, and also to demonstrate the age of the Earth. Geology provides the primary evidence for plate tectonics, the evolutionary history of life, and the Earth's past climates. Geologists use a wide variety of methods to understand the Earth's structure and evolution, including field work, rock description, geophysical techniques, chemical analysis, physical experiments, and numerical modelling. In practical terms, geology is important for mineral and hydrocarbon exploration and exploitation, evaluating water resources, understanding of natural hazards, the remediation of environmental problems, and providing insights into past climate change. Geology is a major academic discipline, and it plays an important role in geotechnical engineering.