

Structural Geology and Geophysics

Structural Geology and Tectonics

Aerial photograph is an image taken from an aircraft to analyze and interpret the geological features of an area, which is essential in Structural Geology and Tectonics to understand the large-scale structures and their relationships with the surrounding geology.

Accretionary prism is a wedge-shaped body of rock that forms when oceanic crust is being subducted beneath a continental or oceanic plate, resulting in the formation of a complex structure with a mixture of sedimentary and metamorphic rocks.

Active fault is a fault that has recently been active, or is expected to be active in the near future, and can be identified by the presence of fresh fractures, recent earthquakes, or other signs of recent tectonic activity.

Aeromagnetic survey is a geophysical survey that uses magnetic sensors to measure the magnetic field of the earth and identify subsurface structures and anomalies in the crust.

Amphibolite is a metamorphic rock that forms under high pressure and temperature conditions, typically in the lower crust, and is characterized by the presence of amphibole minerals such as hornblende and garnet.

Anatexis is the process of partial melting of rocks in the crust to form magma, which can occur due to increased temperature or decompression of the rocks.

Andesite is a volcanic rock that is intermediate in composition between basalt and rhyolite, and is typically rich in silica and alumina with a porphyritic texture.

Anisotropy is the property of a rock or mineral that exhibits different physical or mechanical properties in different directions, such as seismic velocity or electrical resistivity.

Anticline is a fold that is convex upward, with the oldest rocks in the center and the youngest rocks on the outside, and can be symmetric or asymmetric in shape.

Aplite is a type of granite that is rich in quartz and feldspar and has a fine-grained texture, often forming narrow veins or dykes in the crust.

Aquifer is a layer of rock or sediment that is permeable to water and can store and transmit large amounts of water, such as sandstone or limestone formations.

Archean is the oldest eon of the earth's history, spanning from 3.8 to 2.5 billion years ago, and is characterized by the formation of the first continents and the development of life on earth.

Aspect ratio is the ratio of the length to the width of a structure or feature, such as a fault or a fold, and can be used to describe the geometry and orientation of the structure.

Asthenosphere is the layer of the earth's mantle that lies beneath the lithosphere and is characterized by low viscosity and high temperature, allowing for convection and flow of the mantle material.

Basalt is a common volcanic rock that is rich in iron and magnesium and has a dark color and a fine-grained texture, often forming large plateaus or flows on the surface.

Batholith is a large body of intrusive rock that forms when magma rises into the crust and solidifies over a long period of time, often resulting in a complex structure with multiple phases and textures.

Bedding plane is a surface that separates two adjacent layers of sedimentary rock, often formed by a change in lithology or facies, and can be used to interpret the depositional environment and history of the rocks.

Biostratigraphy is the study of the distribution of fossils in rocks and the use of fossils to date and correlate rock units, which is essential in reconstructing the geological history of an area.

Brittle deformation is the process of deformation that occurs when a rock is stressed beyond its strength and fails by fracturing or faulting, resulting in the formation of fractures and faults in the rock.

Burial metamorphism is the process of metamorphism that occurs when rocks are buried to great depths and are subjected to high pressure and temperature conditions, resulting in the formation of metamorphic rocks such as slate or schist.

Caldera is a large depression that forms when a volcano collapses or erupts explosively, often resulting in the formation of a lake or a new volcanic cone in the center of the caldera.

Composite volcano is a type of volcano that is characterized by a steep cone-shaped profile and is composed of multiple layers of lava, ash, and other volcanic material.

Continental drift is the theory that the continents have moved over time and are still moving today, which is supported by evidence from fit of the continents, mid-ocean ridges, and paleomagnetism.

Convergent plate boundary is a boundary between two tectonic plates that are moving toward each other, resulting in subduction, collision, or mountain building processes.

Core is the central part of the earth that is divided into a solid inner core and a liquid outer core, with the inner core being smaller and denser than the outer core.

Craton is a region of the earth's crust that is stable and has been unaffected by recent tectonic activity, often consisting of ancient rocks that have been eroded to form a flat or gently sloping surface.

Creep is the process of slow and continuous deformation of a rock or material over a long period of time, often resulting in the formation of faults or fractures in the rock.

Cross-bedding is a type of sedimentary structure that forms when sand or gravel is deposited at an angle to the main bedding plane, often indicating the direction of current or wind during deposition.

Crust is the outermost layer of the earth that ranges in thickness from 5-70 kilometers and is composed of a variety of rocks and minerals, including granite, basalt, and sedimentary rocks.

Crystal is a solid material whose atoms are arranged in a regular and repeating pattern, often forming a geometric shape with flat faces and sharp edges.

Dacite is a type of volcanic rock that is intermediate in composition between andesite and rhyolite and is characterized by a porphyritic texture and a high silica content.

Decollement is a type of fault that occurs when a layer of rock is detached from the underlying rocks and is translated along a horizontal plane, often resulting in the formation of a thrust fault or a nappe.

Deep seismic sounding is a geophysical technique that uses seismic waves to image the structure of the earth's crust and upper mantle at depths of up to 100 kilometers.

Density is the mass of a rock or mineral per unit volume, often expressed in units of grams per cubic centimeter or kilograms per litre.

Deposition is the process of settling or accumulation of sediments or minerals in a new location, often

resulting in the formation of a new rock or mineral deposit.

Diapir is a type of structure that forms when a less dense rock or material rises through a denser rock or material, often resulting in the formation of a dome-shaped structure or a diapiric intrusion.

Dike is a type of intrusive rock that forms when magma rises into the crust and solidifies in a vertical or steeply dipping fracture or fault.

Dip is the angle at which a rock or structure is inclined from the horizontal, often measured in degrees and used to describe the orientation of a structure or feature.

Dip-slip fault is a type of fault that involves vertical movement of the earth's crust, often resulting in the formation of a scarp or a cliff along the fault plane.

Displacement is the distance or amount of movement of a rock or structure along a fault or fracture, often measured in meters or kilometers.

Drag fold is a type of fold that forms when a rock or structure is bent or deformed by the movement of a fault or a thrust sheet.

Earthquake is a sudden release of energy in the earth's crust that creates seismic waves and can cause damage to buildings and infrastructure.

Erosion is the process of wearing away or removal of rocks or sediments from the earth's surface by water, wind, or ice, often resulting in the formation of valleys, canyons, or coastal features.

Evaporite is a type of sedimentary rock that forms when water evaporates and leaves behind a deposit of minerals such as halite, gypsum, or anhydrite.

Exfoliation is the process of peeling or removal of rocks or layers from the surface of a rock or a structure, often resulting in the formation of a smooth or rounded surface.

Facies is a term used to describe the characteristics of a rock or a deposit in terms of its composition, texture, and structure, often used to interpret the depositional environment and history of the rocks.

Fault is a fracture in the earth's crust where rocks on either side of the fracture have moved past each other, often resulting in the formation of a scarp or a linear feature on the surface.

Fault block is a type of structure that forms when a fault cuts through the earth's crust and displaces rocks or blocks of rock on either side of the fault.

Fissure is a long and narrow fracture or opening in the earth's crust, often formed by tectonic activity or volcanic activity.

Folding is the process of bending or deformation of rocks or layers to form a fold, often resulting in the formation of an anticline or a syncline.

Foliation is a type of rock texture that forms when minerals or rocks are aligned or oriented in a specific direction, often due to tectonic forces or metamorphic processes.

Fracture is a break or crack in a rock or a material that can be caused by tectonic forces, weathering, or other processes, often resulting in the formation of a fault or a joint.

Gabbro is a type of intrusive rock that is rich in iron and magnesium and has a coarse-grained texture, often forming large bodies or intrusions in the earth's crust.

Geochemistry is the study of the chemical composition of rocks and minerals and the processes that control their formation and evolution, often used to interpret the geological history of an area.

Geodesy is the study of the shape and size of the earth and the measurement of the position of points on the earth's surface, often used to understand the tectonic processes that shape the earth's crust.

Geologic map is a map that shows the geological features of an area, including the types of rocks, the location of faults and folds, and the geological history of the area.

Geology is the study of the earth's physical structure, composition, and processes that shape the earth's crust, including the study of rocks, minerals, and fossils.

Geomorphology is the study of the shape and features of the earth's surface, including the study of landforms, valleys, and coastal features, and the processes that shape them.

Geophysics is the study of the earth's internal and external physical properties, including the study of seismic waves, gravity, and magnetic fields, and the use of geophysical methods to image the earth's internal structure.

Geothermal is the study of the heat from the earth, including the study of volcanic activity, hot springs, and geothermal energy resources.

Gneiss is a type of metamorphic rock that is formed under high pressure and temperature conditions and is characterized by a banded or foliated texture.

Grabben is a type of structure that forms when a block of rock is dropped or subsided along faults or fractures, often resulting in the formation of a valley or a basin.

Granite is a type of intrusive rock that is rich in silica and alkali minerals and has a coarse-grained texture, often forming large bodies or intrusions in the earth's crust.

Gravel is a type of sedimentary rock that is composed of small rocks or pebbles that are cemented together, often forming beaches, dunes, or alluvial fans.

Gravity is the force that attracts objects with mass towards each other, and is the main force that shapes the earth's surface and governs the motion of objects on the earth.

Groundwater is the water that is stored in the porous rocks and sediments beneath the earth's surface, and is an important resource for human consumption and ecosystems.

Half-graben is a type of structure that forms when a block of rock is tilted or rotated along a fault or a fracture, often resulting in the formation of a valley or a basin.

Heat flow is the transfer of heat from the earth's interior to the surface, often measured in units of watts per square meter.

Hydrothermal is the study of the hot waters that circulate through the earth's crust and interact with rocks and minerals, often resulting in the formation of economic deposits of metals and minerals.

Hypocenter is the point within the earth where an earthquake occurs, often located at a depth of several kilometers beneath the earth's surface.

Igneous is a type of rock that is formed from the cooling and solidification of magma or lava, often resulting in the formation of intrusive or extrusive rocks such as granite or basalt.

Intensity is a measure of the severity of an earthquake or a seismic event, often measured on a scale such as the Richter scale or the ShakeMap intensity scale.

Intrusion is a body of rock that is emplaced into the earth's crust while still in a molten or partially molten state, often resulting in the formation of a pluton or a dyke.

Isostasy is the state of balance between the weight of the earth's crust and the buoyancy of the mantle beneath it, often