
Glossary

Alpine Orogeny: A period of mountain building resulting from the collision of the European and African plates which took place during the late Tertiary Period.

Ammonite: An extinct marine cephalopod mollusc; most forms had a tightly coiled, planispiral shell. Modern relatives include Nautilus and squids.

Andesite: A volcanic rock, intermediate in composition between basalt and rhyolite.

Anticline: An arch-shaped fold, with younger strata on the outermost part of the arch.

Aplite: A fine-grained, often light-coloured, intrusive igneous rock with high silica content, found in veins and dykes associated with granite intrusions. Aplites have a characteristic 'sugary' texture.

Arthropod: A group of invertebrates which have a segmented body and jointed limbs and an external skeleton (e.g. insects, spiders and crustaceans).

Axis (plural 'axes'): In botany, main stem or root.

Back reef: The area lying landward of a reef.

Bar: A more or less linear ridge of sand and/or gravel.

Basalt: A fine-grained, usually dark-coloured, crystalline igneous rock, with a silica content less than 53% by weight.

Batholith: A large, irregular mass of igneous rock emplaced deep in the Earth's crust.

Bed: A layer within a sequence of sedimentary rocks defined by planar to irregular boundaries representing an original depositional surface.

Belemnite: An extinct marine cephalopod mollusc, which possessed a bullet-shaped internal calcium carbonate shell. Modern relatives include Nautilus and squids.

Bioherm: A mound-shaped build-up of mainly in situ colonial organisms.

Biostratigraphy: The stratigraphical sub-division and correlation of sedimentary rocks based on their fossil content.

Biostrome: A sheet-like accumulation of fossil shells that are preserved in their life positions.

Bivalve: A class of mollusc that has two shells (valves) held together at a hinge area. Typically, the valves are symmetrical at the plane of the junction between them. Examples are oysters and mussels.

(GCR) Block: The classification unit used to select and describe sites characteristic of the geology of Great Britain.

Boulder clay: Poorly sorted, unstratified sediment, with grains ranging in size from rock 'flour' to boulders, deposited beneath glaciers and ice sheets, or from melting ice. Also referred to as 'till'.

Brachiopod: A marine organism which has two shells (valves) held together at the hinge area. Typically the valves are dissimilar, the plane of symmetry being at right angles to the plane of junction between the valves (c.f. bivalves).

Breccia: A coarse-grained sedimentary rock consisting of angular fragments.

Bryozoan: Type of aquatic colonial organism (normally marine) comprising individuals living in linked box-like skeletons composed of calcium carbonate.

Caledonian Orogeny: A major period of mountain building which took place during the Lower Palaeozoic sub-Era, associated with the closure of the ancient Iapetus Ocean situated between 'Scotland' and the rest of present-day Britain.

Cambrian: The first geological period of the Palaeozoic Era (ranging from 570 to 510 million years ago). It contains the oldest fossils of organisms with mineralised skeletons.

Carbonate rocks: Rock formed mostly from carbonate minerals such as calcite (CaCO_3) and dolomite ($\text{CaMg}(\text{CO}_3)_2$).

Carboniferous: The geological period ranging from 345 to 280 million years ago of the Upper Palaeozoic sub-Era.

Cauldron subsidence: A collapsed area of a volcanic crater surrounded by circular igneous dykes.

Cenozoic: The youngest era of geological time spanning from approximately 65 million years ago to the present, consisting of the Tertiary and Quaternary periods.

Cephalopod: A class of marine mollusc which includes the extinct ammonites and belemnites, and the living squid, cuttlefish, octopus and Nautilus.

Chert: A fine-grained silica-rich rock occurring within sedimentary and volcanic rocks.

China clay: Deposit of the mineral kaolin, produced by the alteration of granite by hot fluids deep in the Earth's crust, or by surface weathering.

Chronostratigraphic unit (Time-rock unit): A sequence of rocks deposited during a particular interval of geological time. Historically, time-rock units were defined before the units in the geological time scale. Geological time scale units were actually based on time-rock units, rather than the other way round as suggested by the definition. For example, sediments laid down during the Ordovician Period (a geological time unit) belong to the Ordovician System (a chronostratigraphic unit). The hierarchy of chronostratigraphic units consists of erathem (equivalent to era), system (period), series, stage and chronozone.

Cirque: A deep, steep-walled hollow in a mountain caused by glacial erosion; equivalent to corrie in Scotland and cwm in Wales.

Clast: A fragment of rock or a mineral grain resulting from the erosion and transport of weathered rock material.

Clay: A sediment composed of extremely small grains less than four thousandths of a millimetre across.

Conglomerate: A very coarse-grained sediment consisting of rounded clasts.

Conservation: Protection, preservation and careful management of natural resources and the environment.

Contact: The junction between two different rock types. The term is often used to describe the juxtaposition of igneous and sedimentary rocks and the associated metamorphism of the latter ('contact metamorphism').

Continental crust: The part of the Earth's crust that lies beneath the continents and continental shelves and that has a density 2.7 to 3.0 times that of water. It varies in thickness from 25 to 70 kilometres.

Continental drift: The relative movement of the continents during Earth history.

Core: The central part of the Earth below a depth of 2900 kilometres, thought to be composed of a mixture of nickel and iron.

Correlation: In stratigraphy, the establishment of a correspondence between stratigraphic units using either similarities in rock type or fossil content. Isolated sequences of rock may be correlated as being once physically continuous units, or deposited during the same span of time.

Country rock: The rock intruded by a plutonic igneous rock.

Cretaceous: The last period of the Mesozoic Era, ranging from 140 to 65 million years ago.

Crust: The thin outermost solid layer of the Earth. It varies in thickness from about 5 kilometres (beneath the oceans) to 30–70 kilometres (beneath the continents).

Cryoturbation: Movements of the ground caused by seasonal freezing and thawing above a permanently frozen zone.

Cupola: A small dome-like protuberance projecting from the main body of an igneous intrusion.

Cuticle: Outer protective 'skin' covering the aerial parts of most land plants. It helps to reduce water loss.

Cyano-bacteria: Blue-green algae; micro-organisms capable of photosynthesising. Fossil forms have been found in rocks more than 3000 million years old.

Debris dyke: A crevasse-like feature in the ice surface filled with glacial debris.

Denudation: The combined processes of weathering and erosion that wear down landscapes. From the Latin denudare, to 'strip bare'.

Deposition: The accumulation of sediment in aqueous or subaerial environments.

Devonian: The first period of the Upper Palaeozoic sub-Era, ranging from 395 to 345 million years ago.

Dolerite: A medium-grained intrusive igneous rock which has the same chemical and mineralogical composition as extrusive basalt and plutonic gabbro.

Dolomite: A mineral composed of calcium- magnesium carbonate, or a rock composed of this mineral. Many dolomitic rocks are limestones that were 'dolomitised' by the action of groundwater solutions rich in magnesium.

Drift deposits: Sediments deposited from rivers, glaciers and ice sheets overlying older geological formations. Geological maps are referred to as 'drift maps' when they show such deposits, or as 'solid maps' when these deposits are omitted.

Drumlin: A streamlined, oval-shaped hill composed of boulder clay (and occasionally solid rock). Its long axis is parallel to the direction of flow of the ice sheet beneath which it formed.

Dyke: A sheet-like body of igneous rock that cuts across the bedding of the rocks it intrudes; it is often steeply inclined.

Earth heritage: The inheritance of rocks, soils and landforms (active and relict) and the evidence they contain that enables the history of the Earth to be unravelled.

Earth science: The applications of the principles and methods of mathematics, biology, chemistry, physics and those special to Earth science, to the study of the Earth and the elucidation of its history.

Echinoderm: Marine animals usually characterised by a five-fold symmetry, and possessing an internal skeleton of calcite plates and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lilies) and asteroids (starfish).

Ecosystem: A system that encompasses the interactions between a community of organisms and its surrounding environment.

Eon: The largest unit of geological time, divided into eras.

Era: A large unit of geological time composed of several periods. The Phanerozoic Eon is divided into the Palaeozoic, Mesozoic and Cenozoic eras, and their constituent periods are defined on the basis of their characteristic content of invertebrate, vertebrate and plant fossils.

Erosion: The process of wearing away the Earth's surface through the removal of rock debris by water, wind and ice.

Erratic: A large clast left behind by melting ice and composed of rock not found locally.

Esker: A sinuous ridge of sand and gravel deposited by a meltwater stream flowing within a tunnel under a glacier or ice sheet.

Evaporite: A general term used to describe sediments that formed by the precipitation of salts due to the evaporation of sea or lake water.

Exposure sites: Sites whose scientific or educational value lies in providing surface exposures of geological features that are extensive or plentiful underground, but are otherwise not visible (e.g. coastal cliffs, quarries).

Extrusive rock: Igneous rock that originally erupted as a liquid (magma) at the Earth's surface.

Fault: A fracture in the Earth's crust along which rock units were displaced relative to one another.

Fauna: Animal life of a region or environment today, or in the past.

Feldspar: A group of aluminium-silicate rock-forming minerals. They are the most abundant minerals in the Earth's crust.

Fluvial: Relating to a river or river system.

Fold: A bend in rock strata produced by earth movements.

Fossil: The preserved remains or traces of once-living animals and plants.

Gabbro: A coarse-grained, often dark-coloured plutonic igneous rock.

Gastropod: A class of marine, freshwater and terrestrial molluscs which live in a single shell that is usually coiled.

GCR: Geological Conservation Review, in which nationally important geological and geomorphological sites were assessed and selected with a view to their long-term conservation.

Geology: The study of the Earth, its origins, structure, composition and history (including the development of life), and the nature of the processes that have given rise to its present state.

Geomorphology: The study of landforms and the processes that formed them.

Glacier: A large body of ice occupying corries and a valley in a mountainous area, and which moves slowly under the influence of gravity.

Glaciofluvial sediments: Sands and gravels deposited from meltwater streams associated with ice sheets and glaciers.

Glaciolacustrine: Sediments deposited in lakes marginal to a glacier.

Glaciotectonic: Deformation of rocks or sediments caused by glacial movement.

Gneiss: A coarse-grained metamorphic rock, composed of alternating light and dark bands, formed at very high temperatures and pressures.

Granite: A coarse-grained plutonic igneous rock rich in silica, consisting largely of feldspar and quartz.

Granodiorite: A coarse-grained igneous rock similar to granite in texture but containing slightly less silica.

Graptolite: Extinct colonial planktonic animals, distantly related to chordates; widely used for Palaeozoic stratigraphical correlations.

Greywacke: A sandstone containing more than 15% clay between the constituent clasts.

Gypsum: Hydrated calcium sulphate, often occurring as an evaporite mineral.

Hornfels: A hard, fine-grained, splintery rock, resulting from the baking of sediments in contact with magma.

Hydrocarbons: Naturally occurring organic compounds containing hydrogen and carbon, such as natural gas, oil and bitumen.

Hydrothermal activity: Processes associated with igneous activity that involve heated or superheated water.

Ice Age: Popular name often given to the Quaternary Period during which large areas were repeatedly covered by ice sheets and glaciers.

Ice cap: An area of ice, smaller than an ice sheet, occurring in the polar regions and high mountains.

Ice foliation: Thinly bedded layering in the ice.

Ice sheet: Very large areas of ice, such as those covering much of Greenland and Antarctica today. During the Quaternary, ice sheets covered much of the Northern Hemisphere.

Igneous rocks: Rocks formed from molten rock (magma). They usually consist of interlocking crystals, the size of which is dependent on the rate of cooling (slow cooling gives larger crystals; rapid cooling produces small crystals).

In situ: Latin 'in place', used to describe features and fossils found where they were formed.

Integrity sites: Sites whose scientific or educational value lies in the fact that they contain finite and limited deposits or landforms that are irreplaceable if destroyed.

Interglacial: A period of relatively warm climate between two episodes of glaciation.

Intrusive rock: Rock which, in the molten state, was forced into ('intruded') pre-existing rocks and solidified without reaching the surface.

IUGS: International Union of Geological Sciences.

JNCC: Joint Nature Conservation Committee.

Joints: A fracture in a rock that exhibits no displacement across it (unlike a fault). Joints may be caused by the shrinkage of igneous rocks as they cool in the solid state, or, in sediments, by the regional extension or compression of sediment caused by earth movements.

Jurassic: The middle of the three periods of the Mesozoic Era, ranging from 195 to 140 million years ago.

Kame: A mound of sand and gravel originally deposited on top of a glacier or ice sheet by meltwaters, and remaining as a topographic feature after the ice melted.

Karst: Landscape produced by the dissolution of limestones by percolating groundwaters and underground streams. Named after the Karst region of the former Yugoslavia.

Kettle hole: A depression in glacial or glaciofluvial sediments, resulting from the melting of a mass of glacier ice that was buried in sediment.

Landform: A natural feature of the surface of the land.

Lava: Molten rock extruded onto the Earth's surface, or the resultant solid rock.

Limestone: A sedimentary rock composed of calcium carbonate (calcite), often derived from the shells of organisms.

Limestone pavement: A bare limestone surface formed by solution processes that enlarge joints to produce ridges ('clints') and clefts ('grykes').

Lithification: A general term used to describe the conversion of sediment into rock.

Lithology: The term encompassing the colour, size and shape of constituent crystals or clasts, and the mineral composition of a rock.

Lithostratigraphy: The stratigraphical sub-division and correlation of sedimentary rocks based on their lithological features.

Lodgement till: A glacial deposit laid down underneath an ice sheet or valley glacier. It is usually clay-rich and contains boulders.

Machair: Dune pasture with lime-rich soil.

Magma: Molten rock; referred to as lava when extruded onto the Earth's surface.

Maniraptor: A group of small, bipedal carnivorous dinosaurs.

Mantle: The layer of the Earth's interior situated between the core and the crust. It is about 2300 kilometres thick.

Marl: A calcareous clay or mudstone.

Mass extinction: The dying-out of several plant and/or animal groups over a brief period of geological time.

Mass movement: The down-slope movement of rock debris or sediment under the influence of gravity.

Mesozoic: The middle of the three eras that constitute the Phanerozoic Eon. Literal meaning is 'middle life', it spans the Triassic to the Tertiary, from 230 to 65 million years ago.

Metallogenetic: Containing metallic mineral deposits or ores.

Metamorphic rocks: Rocks which have been changed in the solid state by heat and/or pressure, without melting. They may originally have been either igneous or sedimentary rocks. Examples include slate (changed from clay) and marble (originally limestone).

Mineral: A naturally occurring chemical compound or element.

Mineralogy: The study of minerals.

Molluscs: Invertebrates with a fleshy soft body and, usually, a hard shell. May be marine, freshwater or terrestrial; includes gastropods (snails, limpets), bivalves (oysters, mussels), cephalopods etc.

Moraine: Ridges of unsorted, unstratified glacial till deposited on top of or at the margins of a glacier or ice sheet.

Nautilus: A living cephalopod mollusc with a coiled external shell, related to the squid and octopus.

NCC: Nature Conservancy Council.

(GCR) Network: A conceptual framework of geological characteristics which encompasses the Earth science features of a block; a block may contain one or more networks.

New Red Sandstone: A sequence of red, largely desert and fluvial sediments, which were formed in Britain after the Carboniferous Period, but before the Jurassic.

Oceanic crust: The part of the Earth's crust that lies beneath the ocean basins, varying in thickness between 6 and 11 kilometres, and composed largely of basalt and gabbro.

Oil shale: A dark-grey or black shale which contains organic substances that yield hydrocarbons, but does not contain free petroleum.

Old Red Sandstone: A sequence of red continental (largely fluvial) sediments in Britain of Devonian age.

Ooid: A spherical/ subspherical carbonate-coated sedimentary particle, less than 2 millimetres in diameter.

Ordovician: The second period in the Palaeozoic Era, ranging from 510 to 439 million years ago.

Ore: A mineral or rock that can be exploited commercially.

Orogeny: A mountain-building period, during which continental crust is thickened by processes associated with the closing of oceans and subsequent collision between continents.

Outcrop: An area of rock which is naturally exposed at the Earth's surface.

Outwash sediments: Sands and gravels deposited by streams beyond the ice margin. These streams originate within and beneath the ice, and transport the sediments to locations 'outside' the margin.

Palaeobotany: the study of the fragmentary fossilised remains of plants.

Palaeochannel: A 'fossil' river or tidal channel (i.e. one that is no longer active).

Palaeontology: The study of fossil fauna and flora, including their evolution and reconstruction of past animal communities and ancient environments.

Palaeozoic: The first of the three eras of the Phanerozoic Eon. Literal meaning 'old life', it spans the Cambrian to the Permian periods, from 570 to 230 million years ago. The era is sometimes divided into sub-eras, the Lower Palaeozoic (Cambrian to Silurian Periods) and the Upper Palaeozoic (Devonian to Permian periods).

Pangaea: A supercontinent that existed more than >200 million years ago, before being fragmented by continental drift.

Patch reef: An isolated body reef or body of reef rock.

Pegmatite: A very coarsely crystalline igneous rock, with crystals greater than 3 centimetres in length that formed during the final stages of cooling of a large volume of magma.

Peridotite: A coarsely crystalline, silica-poor, igneous rock consisting predominantly of the mineral olivine. The Earth's mantle is probably composed largely of peridotite.

Periglacial: A term applied to the region adjacent to a glacier. The ground is largely permanently frozen, but may thaw during the summer.

Period: A geological time scale unit (c.f. system, a chronostratigraphic (time-rock) unit).

Permian: The last period of the Palaeozoic Era, ranging from 280 to 230 million years ago.

Petrology: The study of the composition, occurrence and origin of rocks.

Phanerozoic: An eon comprising the Cenozoic, Mesozoic and Palaeozoic eras.

Photosynthesis: The process by which the energy of sunlight is used by organisms, especially green plants, to synthesise carbohydrates from carbon dioxide and water.

Pillow lava: Rounded masses of basaltic lava formed by extrusion under water.

Plate: A rigid 'slab' of the Earth's crust and uppermost mantle that moves relative to other plates.

Pluton: A general term for a deep-seated igneous intrusion, irrespective of its size.

Precambrian: An informal term to encompass all of the time that precedes the Phanerozoic Eon (i.e. 4600 to 570 million years ago).

Prograding shoreline: The seaward migration of a shoreline.

Proterozoic: The second eon of geological time, forming the later part of the 'Precambrian'.

Quartz: A mineral composed entirely of silica.

Quartzite: A metamorphic rock formed from pure quartz sandstones.

Quaternary: The latest period of geological time, from 1.6 million years ago to the present. (see 'Ice Age'.)

Radiometric dating: Methods of dating certain rocks or minerals using the relative abundances of radioactive and stable isotopes of certain elements, together with known rates of decay of radioactive elements. Radiocarbon dates extend back to only 50,000 years, but other elements (potassium, lead, uranium) are used to obtain dates in the order of tens to thousands of millions of years.

Raised beach: A former beach now situated above the level of the present shoreline as a result of earth movement or changes in global sea level or land level.

Reef crest: The top of the seaward slope of a reef.

Reef flat: The relatively flat area behind the reef crest.

(Marine) Regression: The withdrawal of water from parts of the land surface as a result of a fall in sea level relative to the land.

Relict: Descriptive of a geological feature surviving in its primitive form.

Rhyolite: A fine-grained lava, having the same chemical and mineralogical compositions as granite.

RIGS: Regionally Important Geological/ geomorphological Sites.

Rock: A mass of mineral matter that may or may not be lithified.

Roof pendant: A mass of country rock immediately above an igneous rock body.

Sabkha: The Arabic word for a wide area of coastal flats bordering a lagoon. Evaporite minerals are formed in such areas.

Sandstone: A sedimentary rock made of lithified sand.

Sauropod: Quadrupedal, herbivorous dinosaurs of the Jurassic and Cretaceous periods. Examples include Diplodocus and Brachiosaurus.

Schist: Metamorphic rock characterised by the parallel alignment of constituent minerals, commonly the platy mineral mica.

Scree: See 'Talus'.

Sediment: Loose material derived from the weathering and erosion of pre-existing rocks, from biological activity (e.g. shells and organic matter) or from chemical precipitation (e.g. evaporites).

Sedimentary rocks: Formed from the lithification (cementation) of sediment. Sedimentary rocks may be composed of mineral or rock particles (clasts) to form sandstones and claystones or sediments, of biological origin to form limestone and peat, or of chemical precipitation to form evaporites.

Shale: A fine-grained sedimentary rock composed of clay particles that splits easily into thin layers.

Silica (silicate): Silicon dioxide. (Mineral consisting of or incorporating silica.)

Sill: A sheet-like body of igneous rock which, in general, does not cross-cut the layering of the rocks that it intrudes.

Silurian: The third period of the Palaeozoic Era, ranging from 445 to 395 million years ago.

Slate: A fine-grained metamorphic rock formed from clays and shales. The alignment of platy minerals during metamorphism enables the rock to be split easily along planar surfaces not necessarily parallel to the bedding within the original sediment.

Soil creep: Gradual movement of wet soil on a slope, moving under the influence of gravity.

Spit: An elongate deposit of sand or gravel projecting obliquely seawards from a shoreline.

SSSI: Site of Special Scientific Interest.

Stage: A chronostratigraphic (time-rock) unit.

Stegosaur: A Jurassic/Cretaceous quadrupedal dinosaur characterised by a double row of protective bony plates along its back.

Stomata: Minute pores in the surface of a leaf through which gas and vapour may pass.

Strata (Singular: stratum): Layers within sedimentary rocks. The term is often used instead of beds.

Stratigraphical unit: A body of rock defined by its lithological features (lithostratigraphical unit) or fossil content (biostratigraphical unit).

Stratigraphy: The study of rock strata and their distribution in space and time.

Stratotype (type section): A sequence of sedimentary rocks at a particular locality chosen as the standard against which other sequences can be compared. Stratotypes are established for lithostratigraphical and biostratigraphical units, both regionally and internationally. See stratigraphical unit.

Stromatolite: A laminated mounded structure composed of limestone built by cyano- bacteria. Stromatolites form today in warm shallow tropical seas. They appear in the early Precambrian.

Subduction: Process whereby one plate made up of oceanic crust is carried down into the mantle beneath another plate.

Superglacial (Sometimes, 'supraglacial'): Literally 'over' or 'upon' the ice. Thus superglacial deposits are those that accumulated on the ice surface. When the ice disappears they are left on the land surface, frequently forming hummocks of sand, gravel and clay.

Sustainability: The concept of meeting the needs of the present without compromising the ability of future generations to meet their needs. In nature conservation terms, it refers to the use of a natural resource in a way where it can be renewed, such that the environment's natural qualities are maintained.

Talus: The accumulation of rock fragments at the foot of a cliff. Also called scree.

Taxon (Plural: taxa): Any unit of classification of organisms (e.g. phylum, class, order, family, genus, species).

Tectonism (Adjective: tectonic): Deformation of the Earth's crust and the consequent structural effects (e.g. faulting, folding etc.).

Tertiary: The penultimate geological period, ranging from 65 to 1.6 million years ago.

Till: Synonymous with boulder clay.

Tombolo: A bar or spit of sand or shingle, linking an island to the mainland or another island.

(Marine) Transgression: An advance of the sea over land, due to movements of the Earth's crust or to a global rise in sea level.

Triassic: The first period of the Mesozoic Era, ranging from 230 to 195 million years ago.

Trilobite: An extinct class of marine arthropods.

Tuff: A lithified volcanic ash.

Type area/locality: The location where the type section (or stratotype) for a stratigraphical unit is located, or where the original type section or fossil was first described. For example, Kimmeridge Bay in Dorset is the type locality for the Kimmeridge Clay Formation (a lithostratigraphic unit).

Unconformity: The surface that separates two sedimentary sequences of different ages; it represents a gap in the geological record when there was erosion and/or no deposition. There is often an angular discordance between the two sequences.

Variscan Orogeny: A mountain-building episode that occurred during the late Carboniferous Period in south-west England, South Wales and southern Ireland.

Vascular tissue: Living matter made up of, or containing, vessels that convey blood or sap, which transport nutrients etc.

Vent: The opening within a volcano through which igneous material is ejected.

Volcanic rocks: Lavas, ashes and near-surface igneous intrusions associated with volcanoes.

Weathering: The process by which rocks are broken down in place by physical, chemical and biological processes.

Xenolith: A piece of pre-existing rock found within an igneous rock, often composed of pieces of country rock into which magma was intruded.