

# Glossary

**Albedo** The fraction of light or solar radiation that is reflected back from a surface. Light surfaces with a low albedo, such as vegetation, look dark; surfaces with a high albedo, such as snow or ice, look bright.

**Antarctic Circumpolar Current (ACC)** The major ocean current that flows around Antarctica from West to East, connecting all three oceans linked to the Antarctic Ocean, Pacific, Indian and Atlantic. Driven by strong westerly winds, it is sometimes called the West Wind Drift.

**Benthic** Referring to the ecological zone close to the sea bottom. Organisms living in this zone are called benthos.

**Calve** (verb) The breaking off of an iceberg from an ice shelf or glacier.

**Camera lucida** An instrument that uses the deflection of light rays through a glass prism so that images are reflected on paper ready for drawing.

**Chert** A hard grey rock resembling flint, a chemical sedimentary rock composed of microcrystalline quartz. Breaks with a conchoidal fracture and very sharp edges and has been used for tool-making.

**Clast** In geology clast refers to a fragment of geological debris—chunks or fragments broken off other rocks by weathering or erosion, including, but not confined to, plucking by glacial action.

**Cobble** A clast of rock of a particular size, larger than a pebble and smaller than a boulder.

**Come on site** To arrive at the site or locality to be drilled.

**Continental rise** The slope transitional between the deep ocean floor, or abyssal plain, and the continent's edge.

**Core** A continuous, usually cylindrical section of rock or sediment.

**Coring** The act of drilling to retrieve a core.

**Coriolis effect** The observed motion of oceanic or atmospheric currents resulting from the Earth's rotation. Currents are deflected to the right in the northern hemisphere and the left in the southern hemisphere.

**Deep Sea Drilling Project (DSDP)** A scientific ocean drilling project that operated from 1968 to 1983 using the *Glomar Challenger* as the drilling ship.

**Diatoms** Microscopic unicellular or colonial organisms enclosed in a cell wall, or frustule, made of silica. They may inhabit the sea surface, or freshwater, or live in soils, even in ice. They dominate the phytoplankton and are large contributors to the primary production of the oceans.

**Dredging** Collecting sediment, rock or biological samples from the sea floor using a variety of sampling tools.

**Drilling ship** A vessel designed for exploratory offshore drilling, for scientific purposes or for oil and gas exploration.

**Earth's crust** The crust is the outer, solid shell of the Earth, underlain by Earth's mantle. The crust may be of oceanic or continental type. Oceanic rocks are made of dense, dark coloured rocks rich in iron and magnesium, such as basalt. Continental rocks are generally less dense, enriched in silicon, oxygen, aluminium and potassium; granite is typical.

**Fantail** The rear or aft end of a ship—the deck area over the stern.

**Fixist** With reference to continental drift, refers to the view or to persons believing that the position of the continents has remained fixed through time.

**Foraminifera** (Commonly called 'forams') A phylum or class of single-celled organisms with an external shell or test most commonly made of calcium carbonate. Some 40 per cent are planktonic, living at the sea surface, others live in brackish estuaries or salt marshes. They form an important part of the marine food chain.

**Grampus** Possibly refers to the killer whale, *Orcinus orca*. Usage here comes from HMS *Challenger* notes on maps showing dredging sites in the Southern Ocean.

**Granule** A large pebble or grain; a mineral fragment larger than a sand grain and smaller than a pebble.

**Great Ice Barrier** Usually refers to the Ross Ice Shelf. This usage dates from the HMS *Challenger* expedition and is mentioned in the 'Aims' of the *Challenger* voyage in 1874.

**Greenhouse Earth** A period in Earth history when there were no continental glaciers, the levels of carbon dioxide and water vapour were high, as were sea surface temperatures. Contrast **Icehouse Earth**.

**Growlers** Small icebergs showing 1 metre above the waterline.

**Ice Age** A period of low temperatures over the Earth, resulting in the expansion of the polar ice sheets and alpine glaciers. Within an ice age, such as that of the present Earth, individual periods of excessive cold are termed 'glacials', intervening warmer periods 'interglacials'. The Great Ice Age historically refers to the present Pleistocene Epoch, when large ice sheets covered Europe and North America.

**Ice belt** On an icebreaker this refers to a reinforced zone in the hull, typically extending 1 metre above and below the waterline.

**Iceberg** A large piece of freshwater ice floating freely in the ocean. About 90 per cent of the iceberg is below water.

**Icecap** A thick continuous layer of ice covering a continent such as Antarctica—in that instance also referred to as the 'Antarctic Ice Sheet'.

**Icehouse Earth** A period in Earth history when ice sheets are present—as currently at both poles. These may wax and wane between glacial and interglacial periods. Levels of carbon dioxide and water vapour are lower than in a greenhouse phase, and sea surface temperatures are significantly lower.

**Ice islands** An early term for icebergs; note references in James Cook's account of his second voyage.

**Ice-rafted debris (IRD)** Rock material eroded from the continent, carried into the ocean and eventually dropped when icebergs melt. It may take the form of pebbles, cobbles or boulders, even sand.

**Ice sheet** An extensive area of ice, usually covering land for a long time. Refers usually to those in Antarctica—e.g. East Antarctic or West Antarctic Ice Sheet—or to the Greenland Ice Sheet.

**Ice shelf** An extensive area of very thick ice, more or less flat and slowly moving, floating on the sea but attached on one side.

**IODP** Integrated Ocean Drilling Program; later International Ocean Discovery Program.

**IODP(1)** Integrated Ocean Drilling Program (2003–2013).

**IODP(2)** International Ocean Discovery Program (2013–2023).

**Krill** Any shrimp-like planktonic marine organisms in the order Euphausiacea.

**Mobilist** One who believes in change; with reference to the hypothesis of continental drift, refers to the view, or to those holding the view, who believe the position of the continents has changed through time. Compare **fixist**.

**Moon pool** The opening in the base of a ship's hull that allows the drilling bit and drill string to pass through.

**Moraine** A ridge of rock debris deposited at the edge of a glacier; terminal moraines are deposited at the glacier front or snout; lateral moraines at its edge.

**Nannofossils** The term refers to the remains of coccoliths and coccospheres of marine algae. Coccolith refers to the disc-like plate secreted by the organism; these are often found separated and they accumulate in marine sediments as calcareous oozes.

**ODP** Ocean Drilling Program.

**Ooze** (noun) In a geological sense, deposits of soft mud on the sea floor, with their composition usually reflecting the microscopic remains of organisms that live at the sea surface. Includes diatom ooze, nannofossil ooze and foraminiferal ooze.

**Palaeontologist** A scientist who studies fossils.

**Palaeothermometer** Anything in the natural record that allows us to deduce the temperature conditions of past ages; ratios of different chemical isotopes are included, as are annual growth rings in trees or corals.

**Palynologist** A scientist who studies living and fossil pollen grains and plant spores. Derived from the Greek *paluno*—to strew or sprinkle.

**Palynomorphs** Organic-walled microfossils; includes pollen grains and spores, but also dinoflagellates.

**Phytoplankton** Microscopic marine algae—included here are diatoms, coccoliths, algae and bacteria. Dinoflagellates are loosely included, though these are not strictly algae. These form the base of the food chain for aquatic animals, and fix large amounts of carbon.

**Pipe rack** The structure on a drilling ship that supports and stores lengths of drill pipe.

**Plate tectonics** Refers to the scientific theory and study of the way in which **tectonic plates** (see) move and their interaction with each other.

**Polar Front** Commonly called the Antarctic Convergence—the zone separating the Antarctic and Subantarctic water masses or, more generally, the zone where cold surface waters from Antarctica sink beneath warmer waters to the north. In the Southern Ocean it is associated with the Antarctic Circumpolar Current.

**Radiolaria** Single-celled, microscopic protists with an amoeba-like body enclosed within a spiny, elaborate skeleton of silica.

**Recycling, recycled** With respect to sediment particles it reflects the mixing of older particles into younger sequences. Around Antarctica the action of glaciers is the key process in recycling in sediments. The term often applies to older fossils mixed in with younger forms.

**Ross Ice Shelf** The world's largest body of floating ice, occupying the southern part of the Ross Sea. Named after James Clark Ross, who discovered the feature in 1841, and originally called The Barrier. The name was changed to Ross Ice Shelf by the US Board of Geographic Names in 1953, and published in 1956.

**Sea-floor spreading** Process by which molten magma from deep within the Earth rises at submarine ridges and spreads away from the ridge to form new sea floor.

**Sedimentologist** A scientist who studies modern or ancient sediments, such as sand, silt and clay, and their formation into sedimentary rock.

**Silt** A granular sedimentary material with particle sizes intermediate between sand and clay. May be deposited by water, ice and wind.

**Sounding** More formally ‘depth sounding’. Refers to measuring the depth of a body of water; this is usually applied to measurement with a line and sinker, but can refer now to ‘echo sounding’ using sound transmission.

**Spudded in** A term deriving from the oil exploration industry—refers to starting to drill a well or borehole; removing the initial rock debris from the site with the drill.

**Subduction** The process in plate tectonics wherein the edge of one plate slides beneath another. In the process the edge of one plate sinks into the Earth’s mantle.

**Tectonic plate** A massive slab of the Earth’s lithosphere—the Earth’s crust and uppermost layer of the Earth’s mantle. They are usually made up of both oceanic and continental crust that floats on the Earth’s upper mantle.

**Tillite** Cemented or consolidated sediments of glacial origin, usually an unsorted mixture of clay, sand and boulders; unconsolidated deposits of the same material are called till.

**Turbidites** Sedimentary rocks formed by gravity flow. The term usually refers to deposits made within the deep ocean; the beds grade upwards from coarser to finer particles.

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