

Glossary of helpful terms

Abiotic

Non-living thing. Usually refers to the physical and chemical components of an organism's environment. Also called inorganic.

Ablation

Surface removal of ice or snow from a glacier or snowfield by melting, sublimation, and/or calving.

Ablation Zone

Region in a glacier where there is a surface net removal of snow and/or ice by melting, sublimation, and/or calving.

Abrasion

Physical wearing and grinding of a surface through friction and impact by material carried in air, water, or ice.

Absolute Humidity

Measurement of atmospheric humidity. Absolute humidity is the mass of water vapor in a given volume of air (this measurement is not influenced by the mass of the air). Normally expressed in grams of water vapor per cubic meter of atmosphere at a specific temperature.

Absolute Zero

Temperature of -273.15° Celsius. At this temperature atomic motion stops.

Absorption

- (1) Process of taking in and being made part of an existing amount of matter.
- (2) Interception of electromagnetic radiation or sound.

Absorption (Atmospheric)

Atmospheric absorption is defined as a process in which solar radiation is retained by a substance and converted into heat energy. The creation of heat energy also causes the substance to emit its own radiation. In general, the absorption of solar radiation by substances in the Earth's atmosphere results in temperatures that get no higher than 1800° Celsius. According to Wien's Law, bodies with temperatures at this level or lower would emit their radiation in the longwave band.

Abstract Space

Geographic model or representation of the real world. For example, maps and globes are abstractions of the real world or concrete space.

Abyssal Fan

Fan shaped accumulation of sediment from rivers that is deposited at the base of a submarine canyon within a ocean basin.

Abyssal Plain

Another name for ocean floor.

Acclimation

Slow adjustment of an organism to new conditions in its environment.

Accretion

The growth of the continental masses over geologic time via the addition of marine sediments. These sediments are added on to the edges of the continents through tectonic collision with other oceanic or continental plates.

Accumulation

Surface addition of snow to a glacier or snowfield.

Accumulation Zone

(1) Region in a glacier where there is a surface net addition of snow.

(2) Part of a hillslope that has a net gain of material leading to a progressive raising of the slope's surface.

Acid

(1) Substance having a pH less than 7.

(2) Substance that releases hydrogen ions (H⁺).

Acid Deposition

Atmospheric deposition of acids in solid or liquid form on the Earth's surface. Also see acid precipitation

Acidic

Any substance with a pH below 7.

Acidic Solution

Any water solution that is acidic (pH less than 7) or has more hydrogen ions (H⁺) than hydroxide ions (OH⁻). Also see basic solution and neutral solution.

Acid Precipitation

Atmospheric precipitation with a pH less than 5.6. Normal pH of precipitation is 5.6.

Acid Rain

Rain with a pH less than 5.6. Normal pH of precipitation is 5.6.

Acid Shock

A sudden acidification of runoff waters from the spring melting of accumulated snow in the middle latitudes because of the winter deposition of acidic precipitation.

Actinomycetes

Group of filamentous microorganisms that are intermediate between bacteria and fungi.

Active Layer

Upper zone of soil in higher latitude locations that experiences daily and seasonal freeze-thaw cycles.

Active Remote Sensing

Form of remote sensing where the sensor provides its own source of electromagnetic radiation to illuminate the object under study. Radar is an example of an active remote sensing device.

Actual Evapotranspiration

Is the amount of water that is actually removed from a surface due to the processes of evaporation and transpiration.

Actual Mixing Ratio

Another term used to describe mixing ratio.

Adaptation

(1) Evolutionary adaptation - a genetically based characteristic expressed by a living organism. Particular adaptations found in populations become frequent and dominant if they enhance an individual's ability to survive in the environment.

(2) Physiological adaptation - change in an organism's physiology as a result of exposure to some environmental condition.

Adaptive Radiation

The evolution of a number of new species from one or a few ancestor species over many thousands or millions of years. Normally occurs after a mass extinction creates a number of vacant ecological niches or when a radical change in the environment produces new ecological niches.

Adiabatic

A process in which heat does not enter or leave a system. In the atmospheric sciences, adiabatic processes are often used to model internal energy changes in rising and descending parcels of air in the atmosphere. When a parcel of air rises it expands because of a reduction in pressure. If no other non-adiabatic processes occur (like condensation, evaporation and radiation), expansion causes the parcel of air to cool at a set rate of 0.98° Celsius per 100 meters. The opposite occurs when a parcel of air descends in the atmosphere. The air in a descending parcel becomes compressed. Compression causes the temperature within the parcel to increase at a rate of 0.98° Celsius per 100 meters.

Adiabatic Cooling

The cooling of a rising parcel of air due to adiabatic processes.

Advection

Advection involves the transfer of heat energy by means of horizontal mass motions through a medium.

Advection Fog

Fog generated when winds flow over a surface with a different temperature. Two types of advection fog exist. When warm air flows over a cold surface it can produce fog through contact cooling. Cold air blowing over a warm moist surface produces a form of advection fog known as evaporation fog.

Aeolian

Geomorphic process involving wind. Alternative spelling eolian.

Aeolian Landform

Is a landform formed from the erosion or deposition of weathered surface materials by wind. This includes landforms with some of the following geomorphic features: sand dunes, deflation hollows, and desert pavement. Alternative spelling eolian landform.

Aerial Photography

Form of remote sensing that captures images of objects using photographic cameras and film from platforms in the atmosphere.

Aerobic

- (1) Presence of molecular oxygen.
- (2) Occurring only in the presence of molecular oxygen.
- (3) Growing in the presence of molecular oxygen.

Aftershock

Smaller earth tremors that occur seconds to weeks after a major earthquake event.

Aggradation

Readjustment of the stream profile where the stream channel is raised by the deposition of bed load.

Agronomy

Field of science that studies phenomena related to agriculture.

A Horizon

Soil horizon normally found below the O horizon and above the B horizon. This layer is characterized by the following two features:

- (1) A layer in which humus and other organic materials are mixed with mineral particles.
- (2) A zone of translocation from which eluviation has removed finer particles and soluble substances.

Air Mass

A body of air whose temperature and humidity characteristics remain relatively constant over a horizontal distance of hundreds to thousands of kilometers. Air masses develop their climatic characteristics by remaining stationary over a source region for a number of days. Air masses are classified according to their temperature and humidity characteristics.

Air Pollution

Toxification of the atmosphere through the addition of one or more harmful substances in the air. Substance must be in concentrations high enough to be hazardous to humans, other animals, vegetation, or materials. Also see primary pollutant and secondary pollutant.

Air Pressure

See atmospheric pressure.

Albedo

Is the reflectivity of a surface.

Aleutian Low

Subpolar low pressure system found near the Aleutian Islands. Most developed during the winter season. This large-scale pressure system spawns mid-latitude cyclones.

Alfisols

Soil order (type) of the United States Natural Resources Conservation Service Soil Classification System. Soil associated with forest vegetation. Upper layers of this soil are relatively rich in organic matter. Whitish layer found in the A horizon because of eluviation. Illuvial layer forms in the B horizon.

Algae

A simple photosynthetic plant that usually lives in moist or aquatic environments. The bodies of algae can be unicellular or multicellular in design.

Alien Species

Species that is not naturally found in a region.

Alkaline

(1) Having a pH greater than 7.

(2) Substance that releases hydroxyl ions (OH⁻).

Allele

Alternative forms of a gene. Each form produces a unique inheritable characteristic.

Allelopathy

A particular form of amensalism found in plants. In this interaction, one species produces and releases of chemical substances that inhibit the growth of another species.

Allogenic Succession

A succession caused by a change in environmental conditions that is unrelated to the activities of the developing plant community.

Allopatric Speciation

The evolution of a new species because of the isolation of a small group of individuals from the other members of a population.

Allophane

Hydrated aluminosilicate substance ordinarily found associated with clay minerals.

Alluvial Fan

Large fan shaped terrestrial deposit of alluvial sediment on which a braided stream flows over. Form as stream load is deposited because of a reduction in the velocity of stream flow.

Alluvial Terraces

Flat elevated benches composed of unconsolidated alluvium found either side of a stream channel. Formed when a stream down cuts into its floodplain.

Alluvium

Sediment that originates from a stream.

Alpha Particle

Particle of matter that is positively charged. This particle consists of two neutrons and two protons and is emitted as a form of radioactivity from the nuclei of some radioisotopes. Also see beta particle and gamma rays.

Alpine Glacier

Small glacier that occupies a U-shaped valley on a mountain. Also called a mountain glacier.

Alpine Permafrost

Form of permafrost that exists at high altitudes in mountainous environments.

Alpine Tundra

High altitude biome dominated by a few species of dwarf shrubs, a few grasses, sedges, lichens, and mosses. Productivity is low in this biome because of the extremes of climate. Quite similar to tundra.

Alternative Hypothesis (H1)

Is a hypothesis that has been suggested because it is believed to be false or because it is to be used as a starting point for scien 04/16/2008 12:20 ng to organize arguments.

Altitude

Vertical distance above sea-level.

Altostratus Clouds

Middle altitude cloud that is colored from white to gray. This cloud is composed of a mixture of water droplets and ice crystals. It appears in the atmosphere as layers or patches that are well rounded and commonly wavelike. Found in an altitude range from 2,000 to 8,000 meters.

Altostratus Clouds

Gray-looking middle altitude cloud that is composed of water droplets and ice crystals. Appears in the atmosphere as dense sheet like layer. Can be recognized from stratus clouds by the fact that you can see the Sun through it. Found in an altitude range from 2,000 to 8,000 meters.

Amensalism

Interspecific interaction where one species suffers in terms of fitness, while the fitness of the other species does not change. See allelopathy.

Amino Acid

Organic nitrogen containing acids which are used to construct proteins.

Ammonia

Chemical compound composed of nitrogen and hydrogen (NH_3). Component of the nitrogen cycle. Immediately released from organic matter upon decomposition.

Ammonium

Chemical compound composed of nitrogen and hydrogen (NH_4). Component of the nitrogen cycle. Product of organic matter decomposition. Can be fixed to clay minerals and later exchanged.

Amphibian

Group of vertebrate animals that can inhabit both terrestrial and aquatic habitats. This group of animals consists of frogs, newts, and salamanders. These organisms live at the land/water interface and spend most of their life in water. Descended from fish and ancestors to reptiles.

Amphibole

A group of double chained inosilicate minerals whose basic chemical unit is the tetrahedron (SiO_4). They are common rock forming minerals and are found in most igneous and metamorphic rocks. They form at low temperatures with the presence of water in the crystallization environment. There are about 60 recognized mineral types in this group.

Anaerobic

- (1) Absence of molecular oxygen.
- (2) Occurring only in the absence of molecular oxygen.
- (3) Growing in the absence of molecular oxygen.

Andesite

An extrusive igneous rock that develops from a magma that is chemically between felsic and mafic and whose mineral crystals are fine.

Andisols

Soil order (type) of the United States Department of Agriculture Comprehensive Soil Classification System. These soils develop from parent materials that are volcanic in origin.

Anemometer

Mechanical instrument used to measure wind speed. These instruments commonly employ three methods to measure this phenomenon: 1) A device with three or four open cups attached to a rotating spindle. The speed of rotation is then converted into a measurement of wind speed; 2) A pressure plate that measures the force exerted by the moving wind at right angles; 3) An instrument consisting of a heated-wire where electrical resistance (temperature of the wire) is adjusted to account for heat lost by air flow. The faster the wind the greater the heat loss and thus the more energy that is required to keep the wire at a constant temperature. As a result, wind speed is measured through the drain of electrical current.

Aneroid Barometer

Barometer that measures atmospheric pressure via the expansion and contraction of a sealed hollow cell which is partially depleted of air.

Angiosperms

Group of vascular plants who encase their seeds in a mature ovary or fruit.

Angle of Incidence

Angle at which the Sun's rays or insolation strike the Earth's surface. If the Sun is positioned directly over head or 90° from the horizon, the incoming insolation strikes the surface of the Earth at right angles and is most intense.

Angle of Repose

Measurement commonly used in civil engineering. It is the maximum angle at which a material can be inclined without failing. Geomorphologists use this measurement for determining the stability of slope to mass movements.

Animal

Organisms that belong to the kingdom Animalia. General characteristics of these organisms include: eukaryotic cell type, mitochondria, and a complex nervous system. This group of life includes organisms like sponges, jellyfishes, arthropods (insects, shrimp, and lobsters), mollusks (snails, clams, oysters, and octopuses), fish, amphibians (frogs, toads, and salamanders), reptiles (turtles, lizards, alligators, crocodiles, snakes), birds, and mammals (kangaroos, bats, cats, rabbits, elephants, whales, porpoises, monkeys, apes, and humans).

Animalia

Group, at the kingdom level, in the classification of life. Multicellular organisms that have a eukaryotic cell type, mitochondria, and a complex nervous system.

Anion

An ion carrying a negative atomic charge.

Annual Plant

Plant species that completes its life in one growing season.

Antarctic Circle

Latitude of 66.5° South. The northern limit of the area of the Earth that experiences 24 hours of darkness or 24 hours of day at least one day during the year.

Antarctic High

A region of high pressure that occupies central Antarctic throughout the year. This pressure system is responsible for very cold temperatures and extremely low humidity.

Anticline

A fold in rock layers that forms an arch.

Anticyclone

An atmospheric pressure system consisting of an area of high pressure and outward circular surface wind flow. In the Northern Hemisphere winds from an anticyclone blow clockwise, while Southern Hemisphere systems blow counterclockwise.

Aphelion

It is the point in the Earth's orbit when it is farthest from the Sun (152.5 million kilometers). Aphelion occurs on the 3rd or 4th of July.

Applied Physical Geography

The field of Applied Physical Geography uses theoretical information from the various fields of Physical Geography to manage and solve problems related to natural phenomena found in the real world.

Aquatic

With reference to water.

Aquiclude

Rock formations that are impermeable to groundwater water.

Aquifer

Rock formations that store groundwater water.

Aquifer Recharge Area

Surface area that provides water for an aquifer.

Archaea

Is a group of recently discovered organisms that resemble bacteria. However, these organisms are biochemically and genetically very different from bacteria. Some species of the domain Archaea live in the most extreme environments found on the Earth.

Archaeobacteria

Term used to describe organisms that belong to the biological domain Archaea.

Archean

Geologic eon that occurred from 2500 to 3800 million years ago. During this time period, the first single-celled prokaryote organisms evolved and developed.

Archipelago

A group of islands that have an arc shaped distribution. These islands are usually of volcanic origin and are associated with subduction zones.

Area Studies Tradition

Academic tradition in modern Geography that investigates an area on the Earth from a geographic perspective at either the local, regional, or global scale.

Arête

Sharp topographic ridge that separates cirques on a mountain that is or has been glaciated.

Arkose

A type of sedimentary sandstone that contains a large quantity of weathered feldspar grains. This type of sedimentary rock forms in arid conditions.

Aridisols

Soil order (type) of the United States Natural Resources Conservation Service Soil Classification System. Aridisols are commonly found in dry environments that are low in organic matter and rich in deposited salts.

Artesian Water

Groundwater that is confined by two impermeable layers beneath the Earth's surface.

Artesian Well

A well where the water rises and flows out to the surface because of hydrostatic pressure.

Arctic Circle

Latitude of 66.5° North. The southern limit of the area of the Earth that experiences 24 hours of darkness or 24 hours of day at least one day during the year.

Asexual Reproduction

Any process of reproduction that does not involve the fusion of gametes.

Assimilation

(1) Absorption and creation of food resources.

(2) Organic metabolic products of food digestion. Usually the various organic constituents of the organism.

Asthenosphere

Zone in the Earth's mantle that exhibits plastic properties. Located below the lithosphere at between 100 and 200 kilometers.

Astronomy

Field of knowledge that studies the nature, motion, origin, and constitution of celestial bodies.

Atmosphere

The atmosphere is the vast gaseous envelope of air that surrounds the Earth. Its boundaries are not easily defined. The atmosphere contains a complex system of gases and suspended particles that behave in many ways like fluids. Many of its constituents are derived from the Earth by way of chemical and biochemical reactions.

Atmospheric Pressure

Weight of the atmosphere on a surface. At sea-level, the average atmospheric pressure is 1013.25 millibars. Pressure is measured by a device called a barometer.

Atmospheric Stability

Relative stability of parcels of air relative to the atmosphere that surrounds them. Three conditions are generally described: stable, unstable, and neutral.

Atoll

A ring shaped reef composed largely of coral. These features are quite common in the tropical waters of the Pacific Ocean.

Atom

Smallest unit of an element that still maintains its chemical characteristics.

Atomic Energy

Energy released from an atomic nucleus because of a change in its subatomic mass.

Atomic Mass Number

Combined number of an atom's protons and neutrons.

Atomic Number

Number of protons in the nucleus of an atom.

Atomic Weight

Combined weight of an atom's electrons, protons, and neutrons.

Aurora

Multicolored lights that appear in the upper atmosphere (ionosphere) over the polar regions and visible from locations in the middle and high latitudes. Caused by the interaction of solar wind with oxygen and nitrogen gas in the atmosphere. Aurora in the Northern Hemisphere are called aurora borealis and aurora australis in the Southern Hemisphere.

Autogenic Succession

Succession where the plant community causes the environment to change and this modification drives the succession.

Autotroph

An organism that produces food molecules inorganically by using a light or chemical based sources of external energy. This organism does not require outside sources of organic food energy for survival. Also see chemical autotrophs and photosynthetic autotrophs.

Autumnal Equinox

One of two days during the year when the declination of the Sun is at the equator. The autumnal equinox denotes the first day of the fall season. For the Northern Hemisphere, the date of autumnal equinox is on either September 22 or 23 (changes yearly). March 20 or 21 is the date of the autumnal equinox in the Southern Hemisphere. During the autumnal equinox, all locations on the Earth (except the poles) experience equal (12 hour) day and night.

Available Water

Portion of the capillary water that is available for plant root uptake.

Average Global Temperature

Average annual temperature of the Earth's entire surface atmosphere.

Azimuth

A system that measures direction clockwise from North over 360°.

Azonal soil

A soil without developed horizons.

B

Background Extinction

Normal extinction of species that occurs as a result of changes in local environmental conditions. Also see mass extinction.

Backscattering

Portion of solar radiation directed back into space as a result of particle scattering in the atmosphere.

Backshore

Area behind the shore. This coastal feature is located between the beach berm and the backshore slope.

Backshore slope

Sloping bank landward of the shore. This coastal feature is composed of relatively non-mobile sediments.

Backswamp

Marshy low lying area in a stream's floodplain. Commonly found behind levees.

Backwash

The return water flow of swash. This sheet of water flows back to ocean because of gravity.

Bacteria

Simple single celled prokaryotic organisms. Many different species of bacteria exist. Some species of bacteria can be pathogenic causing disease in larger more complex organisms. Many species of bacteria play a major role in the cycling of nutrients in ecosystems through aerobic and anaerobic decomposition. Finally, some species form symbiotic relationships with more complex organisms and help these life forms survive in the environment by fixing atmospheric nitrogen.

Badlands

(1) Term used to describe a part of South Dakota.

(2) Term used to describe a semi-arid landscape that has been influenced by heavy fluvial erosion. Characterized by deep ravines and gullies, sharp ridges, and a generally barren surface.

Bajada

Consecutive series of alluvial fans forming along the edge of a linear mountain range. Surface of this feature undulates in a rolling fashion as one moves from the center of one alluvial fan to another. Normally occurs in arid climates.

Bank-Caving

Collapse of stream bank material into a stream channel.

Bar

(1) Coarse grained deposit of sediment from a stream or ocean currents.

(2) A unit of measurement for quantifying force. Equivalent to 1,000,000 dynes per square centimeter.

Barchan Dune

Crescent shaped sand dune that has its long axis transverse to the wind and its crescent tips pointed downwind.

Barometer

Instrument that measures atmospheric pressure.

Barrier Beach

A long and narrow beach of sand and/or gravel that runs parallel to the coastline and is not submerged by the tide.

Barrier Island

Long, narrow islands of sand and/or gravel that are usually aligned parallel to the shore of some coasts.

Basal Sliding

The sliding of a glacier over the surface it rests on. Caused by the gradient of the slope and the weight of the glacier's mass.

Basalt

A dark colored fine grained igneous rock formed from mafic magma.

Basalt Plateau

Extensive continental deposits of basaltic volcanic rock.

Basaltic Magma

Mafic magma that forms basaltic igneous rocks.

Base

(1) Substance having a pH greater than 7.

(2) Substance that releases hydroxide ions (OH⁻).

Base Flow

Rate of discharge in a stream where only the throughflow and groundwater flow from subsurface aquifers contribute to the overall flow.

Base Level

The subterranean elevation below which a stream cannot vertically erode sediment. For many streams this hypothetical elevation is sea-level.

Basement Rock

Very old granite and metamorphic rocks found in continental crust. These rocks make up the continental shield.

Basic

Substance having a pH greater than 7.

Basic Solution

Any water solution that is basic (pH greater than 7) or has less hydrogen ions (H^+) than hydroxide ions (OH^-). Also see acidic solution and neutral solution.

Basin

A topographic rock structure whose shape is concave downwards.

Batholith

A large mass of subsurface intrusive igneous rock that has its origins from mantle magma.

Bay

A body of sheltered water found in a crescent shaped coastal configuration of land.

Bayhead Beach

An extensive deposit of sand and/or gravel in the form of a beach at the back of a bay.

Bay-Mouth Bar

A narrow deposit of sand and/or gravel found across the mouth of a bay.

Beach

The terrestrial interface area in between land and a water body where there are accumulations of unconsolidated sediments like sand and gravel. These deposits are laid down by the action of breaking waves.

Beach Drift

The lateral movement of sediments on a beach when the angles of swash and backwash differ.

Bearing

A system that measures in reference to the cardinal points of a compass in 90 degree quadrants.

Beaufort Wind Scale

Descriptive system that determines wind speed by noting the effect of the wind on the environment. Originally developed for use at sea by Admiral Beaufort of the British Navy in 1806.

Bed

Sedimentary structure that usually represents a layer of deposited sediment.

Bedding Plane

A layer in a series of sedimentary beds that marks a change in the type of deposits.

Bed Load

Portion of the stream load that is carried along the stream bed without being permanently suspended in the flowing water.

Bedrock

Rock at or near (beneath soil and regolith) the Earth's surface that is solid and relatively unweathered.

Benthos

The plant and animal organisms that live on the sea floor. Often divided into two categories: deep-sea benthos, below 200 meters and the littoral benthos, from 200 meters to the high-water spring tide level.

Bergschrund

A deep crevasse commonly found at the head of an alpine glacier. Forms when the glacial ice pulls away from the mountain side.

Berm

Low hill of sand that forms along coastal beaches.

Bermuda High

High pressure system that develops over the western subtropical North Atlantic. Also called Azores High.

Beta Particle

Electron emitted from the nucleus of a radioactive isotope. Also see alpha particle and gamma rays.

B Horizon

Soil horizon normally found below the A horizon and above the C horizon. This layer is characterized by the following features:

- (1) Enrichment of clay because of illuviation from the A horizon.
- (2) Enrichment of iron and aluminum oxides because of illuviation of these materials from the A horizon. In some cases the precipitation of iron can cause the development of a hardpan.
- (3) Accumulation of calcium carbonate, calcium sulfate, and other salts.

(4) Higher bulk density because of the illuvial deposition of clay particles.

Biennial Plant

Plant species that completes its life in two growing seasons.

Bifurcation Ratio

Quantitative ratio determined between the parts of systems that display branching. For example, trees have a main stem that bifurcates into smaller and smaller branches. The ratio between the branches that are derived from a larger branch or main stem is the bifurcation ratio.

Big Bang

Theory that suggests that about 15 billion years ago all of the matter and energy in the Universe was concentrated into an area smaller than a atom. At this instant, matter, energy, space and time did not exist. Then suddenly, the Universe began to expand at an incredible rate and matter, energy, space and time came into being. As the Universe expanded, matter began to coalesce into gas clouds, and then stars and planets. Some scientists believe that this expansion is finite and will one day cease. After this point in time, the Universe will begin to collapse until a Big Crunch occurs.

Big Crunch

Collapse of the Universe into its original form before the Big Bang. At the end of this process matter, energy, space, and time will not exist.

Biodiversity

The diversity of different species (species diversity), genetic variability among individuals within each species (genetic diversity), and variety of ecosystems (ecosystem diversity). Abbreviation of biological diversity.

Biogeochemical Cycling

Cycling of a single element, compound or chemicals by various abiotic and biotic processes through the various stores found in the biosphere, lithosphere, hydrosphere, and atmosphere.

Biogeography

Field of physical geography that studies the spatial pattern of living organisms.

Biological Amplification

Increase in concentration of toxic fat-soluble chemicals in organisms at successively higher trophic levels of a grazing food chain or food web because of the consumption of organisms at lower trophic levels.

Biological Weathering

The disintegration of rock and mineral due to the chemical and/or physical agents of an organism.

Biomass

The weight of living tissues usually measured per unit area over a particular time interval. Can include the dead parts of organisms like bark, hair, and nails.

Biome

Largest recognizable assemblage of animals and plants on the Earth. The distribution of the biomes is controlled mainly by climate.

Bioregion

A unique region on the Earth that has distinct soils, landforms, watersheds, climates, native plants, and animals, and/or other particular natural characteristics.

Biosphere

Part of the Earth where life is found. The biosphere consists of all living things, plant and animal. This sphere is characterized by life in profusion, diversity, and clever complexity. Cycling of matter in this biosphere involves not only metabolic reactions in organisms, but also many abiotic chemical reactions. Also called ecosphere.

Biotic

(1) Referring to life.

(2) Influences caused by living organisms.

Biotic Potential

Maximum rate that a population of a given species can increase in size (number of individuals) when there are no limits on growth rate.

Biotite

Rock forming mineral of the mica group.

Bird

Group of warm blooded vertebrate animals whose body is covered with feathers.

Black Body

Is a body that emits electromagnetic radiation, at any temperature, at the maximum possible rate per unit surface area. This body also absorbs all electromagnetic radiation that is intercepted by it.

Blizzard

Winter severe weather condition characterized by strong wind, blowing snow, and cold temperatures.

Blowout Depression

Saucer shaped depressions created by wind erosion. At the leeward end of the feature there usually is a deposit of sand. Blowouts are found in coastal beach areas and in arid and semiarid regions of the world. These features are smaller than a deflation hollow.

Body Wave

Type of seismic wave that travels through the interior of Earth.

Bog

A habitat that consists of waterlogged spongy ground. Common vegetation are sedges and sphagnum moss. Bogs are common in Canada, Russia, and Scandinavia.

Bolson

Is a closed desert basin with no drainage outlet, surrounded by mountains.

Boulder

Large fragment of rock that has a diameter greater than 256 millimeters (200 millimeters in the United Kingdom).

Bora

Term used to describe a katabatic wind in Yugoslavia.

Boreal Forest

High to mid-latitude biome dominated by coniferous forest. Predominant vegetation of this biome is various species of spruce, fir, pine, and cedars. Also called Taiga.

Bottomset Bed

Horizontal deltaic deposit of alluvial sediment composed of fine silt and clay.

Bowen Reaction Series

Model that explains the origin of the various types of igneous rocks. It suggests that the presence or absence of particular minerals in igneous rocks depends on the temperature of crystallization and on the magma's original chemical composition.

Brackish

Environment that is influenced by seawater with a salinity less than 35 parts per thousand (usually caused by the presence of an inflow of fresh water).

Braided Stream

Shallow stream channel that is subdivided into a number of continually shifting smaller channels that are separated by bar deposits.

Breaker

The quick collapse of an overextended water wave as it approaches the shoreline. The collapse occurs when the ratio of wave height to wavelength exceeds 1:7. This phenomenon also produces swash.

Breccia

Coarse grained sedimentary rock composed of cemented angular rock fragments.

Brine

Seawater with a salinity greater than 35 parts per thousand. Usually occurs in isolated bodies of seawater that have high amounts of water loss due to evaporation.

British Thermal Unit (Btu)

Measurement unit for heat. It is the amount of energy required to raise the temperature of one pound of water one degree from 62 to 63° Fahrenheit. One Btu is equal to 252 calories and to 1055 joules.

Bromeliad

Plants of the bromeliad family (Bromeliaceae). These plants grow from the dry deserts of the subtropics to equatorial tropical rain forests. Many bromeliads grow high up on the branches and trunks of trees in the tropical rainforest. Based on growth habits and other characteristics, Bromeliaceae is divided into the subfamilies Pitcairnioideae, Tillandsioideae, and Bromelioideae.

Brunisol Soil

Soil order (type) of the Canadian System of Soil Classification. This soil type is associated with forest vegetation. It is usually poorly developed and immature. The most identifying trait of this soil is the presence of a brown B horizon.

C

Calcification

A dry environment soil-forming process that results in the accumulation of calcium carbonate in surface soil layers.

Calcite

Mineral formed from calcium carbonate. Common mineral found in limestone.

Calcium Carbonate

Compound consisting of calcium and carbonate. Calcium carbonate has the following chemical structure CaCO_3 .

Caldera

A large circular depression in a volcano.

Caldera Volcano

Explosive type of volcano that leaves a large circular depression. Some of these depressions can be as large as 40 kilometers in diameter. These volcanoes form when wet granitic magma quickly rises to the surface of the Earth.

Caliche

An accumulation of calcium carbonate at or near the soil surface.

Calorie

Quantity of energy. Equals the amount of heat required to raise 1 gram of pure water from 14.5 to 15.5° Celsius at standard atmospheric pressure.

Calving

The loss of glacier mass when ice breaks off into a large water body like an ocean or a lake.

Cambrian

Geologic period that occurred from 570 to 505 million years ago. During this period, invertebrates become common in the oceans and the Burgess Shale was formed.

Cambrian Explosion

Great diversification of multicellular life forms in the Earth's oceans that started during the Cambrian about 570 million years ago.

Canadian High

High pressure system that develops in winter over central North America.

Canadian Shield

Very old igneous and metamorphic shield rock that covers much of northern Canada. Created more than two to three billion years ago.

Canadian System of Soil Classification

A hierarchical system that is used in Canada to classify soils. This system has five levels: order, great group, subgroup, family, and series. At the order level, nine types of soils are recognized: brunisol, chernozem, cryosol, gleysol, luvisol, organic, podzol, regosol, and solonetzic.

Canopy Drip

Redirection of a proportion of the rain or snow falling on a plant to the edge of its canopy.

Canyon

Steep-sided valley where depth is considerably greater than width. These features are the result of stream erosion.

Capillary Action

Movement of water along microscopic channels. This movement is the result of two forces: the adhesion and absorption of water to the walls of the channels; and cohesion of water molecules to each other.

Capillary Water

Water that moves horizontally and vertically in soils by the process of capillary action. This water is available for plant use.

Carbohydrate

Is an organic compound composed of carbon, oxygen, and hydrogen atoms. Some examples are sugars, starch, and cellulose.

Carbonate

Compound consisting of a single atom of carbon and three atoms of oxygen. Carbonate has the following chemical structure CO_3 .

Carbonation

Is a form of chemical weathering where carbonate and bicarbonate ions react with minerals that contain calcium, magnesium, potassium, and sodium.

Carbon Cycle

Storage and cyclic movement of organic and inorganic forms of carbon between the biosphere, lithosphere, hydrosphere, and atmosphere.

Carbon Dioxide

Common gas found in the atmosphere. Has the ability to selectively absorb radiation in the longwave band. This absorption causes the greenhouse effect. The concentration of this gas has been steadily increasing in the atmosphere over the last three centuries due to the burning of fossil fuels, deforestation, and land-use change. Some scientists believe higher concentrations of carbon dioxide and other greenhouse gases will result in an enhancement of the greenhouse effect and global warming. The chemical formula for carbon dioxide is CO_2 .

Carbon Monoxide

A colorless, odorless, and tasteless gas that is produced by the incomplete burning of fossil fuels. The chemical formula for carbon dioxide is CO.

Cardinal Points

The four main navigational directions (North, East, South, and West) found on a compass or a map.

Carnivore

Heterotrophic organism that consumes living animals or the parts of living animals for food. Examples of carnivores include lions, cheetahs, leopards, frogs, snakes, hawks, and spiders. A carnivore can also be called a secondary consumer or tertiary consumer. Also see herbivore, detritivore, scavenger, and omnivore.

Carrying Capacity (K)

The maximum size of population of a single species that a certain habitat can support.

Cartography

Field of knowledge that studies map construction. The act of creating a map.

Cascading System

This is a system where we are primarily interested in the flow of energy and/or matter from one element to another and understand the processes that cause this movement. In a cascading system, we do not fully understand quantitative relationships that exist between elements related to the transfer of energy and/or matter.

Catastrophism

General theory that suggests that certain phenomena on the Earth are the result of catastrophic events. For example, the Biblical Flood is responsible for sedimentary rock formations and the extinction of the dinosaurs.

Cation

An ion carrying a positive atomic charge.

Cation Exchange

Chemical trading of cations between the soil minerals and organic matter with the soil solution and plant roots.

Cation Exchange Capacity

The capacity of a soil to exchange cations with the soil solution. Often used as a measure of potential soil fertility.

Cave

A natural cavity or recess that is roughly positioned horizontally to the surface of the Earth.

Cavitation

Process of intense erosion due to the surface collapse of air bubbles found in constricted rapid flows of water. Causes the detachment of material from a surface.

Cell

A cell is the smallest self-functioning unit found in living organisms. Each cell is enclosed by an outer membrane or wall and contains genetic material (DNA) and other parts to carry out its life functions. Some organisms such as bacteria consist of only one cell, but most of the organisms found on the Earth are made up of many cells.

Cellular

Composed of cells. Process occurring between or within cells.

Cellulose

A type of carbohydrate. Primary component used in the construction of plant cell walls.

Celsius Scale

Scale for measuring temperature. In this scale, water boils at 100° and freezes at 0°.

Cenozoic

Geologic era that occurred from 65 million years ago to today.

Central Vent

The main passage way by which volcanic magma travels to the Earth's surface.

Centripetal Force

Force required to keep an object moving in a circular pattern around a center of rotation. This force is directed towards the center of rotation. Common in meteorological phenomena like tornadoes and hurricanes.

C Horizon

Soil horizon normally found below the B horizon and above the R horizon. This layer is composed of weathered bedrock that has not been yet significantly affected by the pedogenic processes.

Chain Reaction (Nuclear)

A large number of nuclear fissions, taking place within a certain mass of a fissionable isotope, that release a great quantity of energy in a short time.

Chalk

Form of limestone. This sedimentary rock is composed of the shells and skeletons of marine microorganisms.

Chaparral

A type of plant community common to areas of the world that have a Mediterranean climate (for example, California and Italy). It is characterized by shrubs, shrubby thickets and small trees that are adapted to seasonal dry conditions. Also called Mediterranean Scrubland.

Chelate

Organic substances that cause the chemical process of chelation.

Chelation

Chemical weathering process that involves the extraction of metallic cations from rocks and minerals by chelates.

Chemical

One of the millions of different elements and compounds found naturally and synthesized by humans.

Chemical Autotroph

Organism that uses the external energy found in chemical compounds to produce food molecules. The process used to produce food by these organisms is known as chemosynthesis.

Chemical Energy

Energy consumed or produced in chemical reactions.

Chemical Reaction

Reaction between chemicals where there is a change in the chemical composition of the elements or compounds concerned.

Chemical Weathering

Breakdown of rock and minerals into small sized particles through chemical decomposition.

Chemosynthesis

Process in which specific autotrophic organisms extract inorganic compounds from their environment and convert them into organic nutrient compounds without the use of sunlight. Also see photosynthesis.

Chernozem Soil

(1) Soil order (type) of the Canadian System of Soil Classification. This soil is common on the Canadian Prairies.

(2) Type of soil commonly found in grassland environments. These soils are often black in color and have a well developed A horizon rich in humus.

Chinook Wind

The name of a North American wind that occurs on the leeward side of mountains. This wind is warm and has a low humidity.

Chlorofluorocarbons (CFCs)

Is an artificially created gas that has become concentrated in the Earth's atmosphere. This very strong greenhouse gas is released from aerosol sprays, refrigerants, and the production of foams. The basic chemical formula for chlorofluorocarbons is CF_xCl_x .

Chlorophyll

Green pigment found in plants and some bacteria used to capture the energy in light through photosynthesis.

Chloroplast

Organelle in a cell that contains chlorophyll and produces organic energy through photosynthesis.

Chromosome

Organic structure that carries an organism's genetic code (DNA).

Cinder Cone Volcano

A small volcano, between 100 and 400 meters tall, made up of exploded rock blasted out of a central vent

at a high velocity. These volcanoes develop from magma of basaltic to intermediate composition.

Circle of Illumination

A line that bisects areas on the Earth receiving sunlight and those areas in darkness. Cuts the spherical Earth into lighted and dark halves.

Circum-Pacific Belt

A zone circling the edge of the Pacific Ocean basin where tectonic subduction causes the formation of volcanoes and trenches. Also called the ring of fire.

Cirque

Glacially eroded rock basin found on mountains. Most alpine glaciers originate from a cirque.

Cirque Glacier

Small glacier that just occupies a cirque.

Cirrocumulus Clouds

Patchy white high altitude cloud composed of ice crystals. Found in an altitude range from 5,000 to 18,000 meters.

Cirrostratus Clouds

High altitude sheet like clouds composed of ice crystals. These thin clouds often cover the entire sky. Found in an altitude range from 5,000 to 18,000 meters.

Cirrus Clouds

High altitude cloud composed of ice crystals. The appearance of these clouds is white feather like patches, filaments or thin bands. Found in an altitude range from 5,000 to 18,000 meters.

Classification

Process of grouping things into categories.

Clastic Sedimentary Rock

Sedimentary rocks that are formed by the lithification of weathered rock debris that has been physically transported and deposited.

Clay

Mineral particle with a size less than 0.004 millimeters in diameter. Also see silt and sand.

Cleavage

The tendency of some minerals or rocks to break along planes of weakness. This weakness occurs because of the nature of the bonds between mineral grains.

Cliff

A tall steep rock face.

CLIMAP Project

Multiuniversity research project that reconstructed the Earth's climate for the last million years by examining proxy data from ocean sediment cores.

Climate

General pattern of weather conditions for a region over a long period time (at least 30 years).

Climatic Optimum

Warmest period during the Holocene epoch. This period is dated from about 5,000 to 3,000 BC. During this time average global temperatures were 1 to 2° Celsius warmer than they are today.

Climatology

Scientific study of the Earth's climate over long time spans (greater than several days). May also involve the investigation of climate's influence on the biotic and the abiotic environment.

Climax Community

Plant community that no longer undergoes changes in species composition due to succession.

Climograph

Two dimensional graph that plots a location's air temperature and precipitation on times scales that range from a 24 hour period to a year.

Clone

(1) A group of genetically similar plants that have originated by vegetative asexual reproduction from a single parent.

(2) Replication of an individual who is genetically identical to its parent.

Closed System

Is a system that transfers energy, but not matter, across its boundary to the surrounding environment. Our planet is often viewed as a closed system.

Closed Talik

Is a form of localized unfrozen ground (talik) in an area of permafrost. It is completely enclosed by permafrost in all directions.

Cloud

A collection of tiny particles of liquid or solid water occurring above the Earth's surface. Clouds are classified accord to their height of occurrence and shape. The major types of clouds include: Cirrus, Cirrocumulus, Cirrostratus, Altocumulus, Altostratus, Nimbostratus, Stratocumulus, Stratus, Cumulus, and Cumulonimbus.

Coal

Sedimentary rock composed of the compacted, lithified and altered remains of plants. Coal is a solid, combustible mixture of organic compounds, hydrocarbons, with 30% to 98% carbon by weight, mixed with various amounts of water and small amounts of sulfur and nitrogen compounds. It is formed in several stages as the remains of plants are subjected to heat and pressure over millions of years.

Coalescence

Process where two or more falling raindrops join together into a single larger drop because of a midair collision.

Coastal Dune

Sand dune that forms in coastal areas. The sand for its formation is supplied from a beach.

Coastal Wetland

Wetland habitat found along a coastline and is covered with ocean salt water for all or part of the year. Examples of this type of habitat include tidal marshes, bays, lagoons, tidal flats, and mangrove swamps.

Coastal Zone

Relatively nutrient-rich, shallow part of the ocean that extends from the high-tide mark on land to the edge of the continental shelf.

Coastline

The line that separates a land surface from an ocean or sea.

Coefficient of Determination

Statistic that measures the proportion of the variation in the dependent variable that is associated with the statistical regression of an independent variable. Can be calculated by taking the square of the correlation coefficient.

Coevolution

The coordinated evolution of two or more species that interact and exert selective pressures on each other that can cause each species to undergo associated adaptations. Also see evolution and natural selection.

Col

Saddle like depression found between two mountain peaks. Formed when two opposing cirque glaciers back erode an arête.

Cold Desert

Desert found in the high latitudes and at high altitudes where precipitation is low. Surface air temperatures are generally cold in these dry environments.

Cold Front

A transition zone in the atmosphere where an advancing cold air mass displaces a warm air mass.

Cold Glacier

Glacier in which the ice found from the its surface to base has a temperature as cold as -30° Celsius throughout the year. This is well below the pressure melting point. Pressure melting can cause the melting of ice at the base of these glaciers. One of the three types of glaciers: cold glacier; temperate glacier; and subpolar glacier.

Colonization

Movement of individuals or propagules of a species to a new territory.

Comet

A large mass of ice and dust that has an orbit around a star.

Commensalism

Biological interaction between two species where one species benefits in terms of fitness while the other experiences no effect on its fitness.

Community

Refers to all the populations of interacting species found in a specific area or region at a certain time.

Community Boundary

Spatial edge of a unique community.

Compass

Navigation instrument that uses the Earth's magnetic field to determine direction.

Competition

Interaction where two or more organisms in the same space require the same resource (e.g., food, water, nesting space, and ground space) which is in limiting supply to the individuals seeking it. Competition can occur at the interspecific or intraspecific biotic levels. Competition may also be the result of two different processes: exploitation or interference.

Competitive Exclusion

Situation where no two competitively interacting species can occupy exactly the same fundamental niche indefinitely because of resource limitations. The outcome of this process is the local extinction of the species that is a poorer competitor.

Composite Volcano

Volcano created from alternate layers of flows and exploded rock. Their height ranges from 100 to 3,500 meters tall. The chemistry of the magma of these volcanoes is quite variable ranging from basalt to granite.

Composites

Plants of the compositae family (Asteraceae). Common examples of these flowering plants are thistles, dandelion, and sunflowers.

Compound

A compound is the atoms of different elements joined together.

Concrete Space

Actual geographic space in the real world. Geographers approximate this space when they try to represent it in a model or map. This approximation is referred to as abstract space.

Condensation

The change in state of matter from vapor to liquid that occurs with cooling. Usually used in meteorology when discussing the formation of liquid water from vapor. This process releases latent heat energy to the environment.

Condensation Nuclei

Microscopic particle of dust, smoke or salt that allows for condensation of water vapor to water droplets in the atmosphere. Nucleus for the formation of a rain drop. Condensation normally occurs on these particles when relative humidity becomes 100%. Some condensation nuclei, like salt, are hygroscopic and water can condense on them at relative humidities lower than 100%.

Conduction

Conduction consists of energy transfer directly from atom to atom and represents the flow of energy along a temperature gradient.

Cone of Depression

Cone shaped depression occurring horizontally across a water table. Causes by excessive removal of groundwater by a surface well.

Confined Aquifer

Aquifer between two layers of relatively impermeable earth materials, such as clay or shale.

Confined Groundwater

Groundwater trapped between two impervious layers of rock.

Conglomerate

Coarse grained sedimentary rock composed of rounded rock fragments cemented in a mixture of clay and silt.

Coniferous Vegetation

Cone-bearing vegetation of middle and high latitudes that are mostly evergreen and that have needle-shaped or scale like leaves. Compare with deciduous vegetation.

Conservation Biology

Multidisciplinary science that deals with the conservation of genes, species, communities, and ecosystems that make up Earth's biodiversity. It generally investigates human effects on biodiversity and tries to develop practical approaches to preserving biodiversity and ecological integrity.

Consumer

An organism that receives the nutrients (food) required for maintenance, growth, and reproduction from the consumption of tissues of producers and/or other consumers. Also called a heterotroph. Several different kinds of consumers have been recognized including: carnivores, omnivores, scavengers, herbivores, detritivores, secondary consumers, and tertiary consumers.

Contact Metamorphism

Is the small scale metamorphic alteration of rock due to localized heating. It is usually caused by an igneous intrusion like a sill or a dyke.

Continental Arctic Air Mass (A)

Air mass that forms over extensive landmass areas of the high latitudes. In the Northern Hemisphere, these systems form only in winter over Greenland, northern Canada, northern Siberia, and the Arctic Basin. Continental Arctic air masses are very cold and extremely dry. These air masses are also very stable.

Continental Crust

Granitic portion of the Earth's crust that makes up the continents. Thickness of the continental crust varies between 20 to 75 kilometers. See sial layer.

Continental Divide

The elevated area that occurs on a continent that divides continental scale drainage basins.

Continental Drift

Theory that suggests that the Earth's crust is composed of several continental plates that have the ability to move. First proposed by A. Snider in 1858 and developed by F.B. Taylor (1908) and Alfred Wegener (1915).

Continental Effect

The effect that continental surfaces have on the climate of locations or regions. This effect results in a greater range in surface air temperature at both daily and annual scales. Also see maritime effect.

Continental Glacier

Largest type of glacier with a surface coverage in the order of 5 million square kilometers.

Continental Ice Sheet

See continental glacier.

Continental Margin

The area between a continent's shoreline and the beginning of the ocean floor. It includes the continental shelf, continental rise, and continental slope.

Continental Plate

A rigid, independent segment of the lithosphere composed of mainly granite that floats on the viscous plastic asthenosphere and moves over the surface of the Earth. The Earth's continental plates are an average 125 kilometers thick and were formed more than 3 billion years ago. Also see oceanic plate.

Continental Polar Air Mass (cP)

Air mass that forms over extensive landmass areas of middle to high latitudes. In North America, these systems form over northern Canada. Continental Polar air masses are cold and very dry in the winter and cool and dry in the summer. These air masses are also atmospherically stable in both seasons.

Continental Rise

Thick layers of sediment found between the continental slope and the ocean floor.

Continental Shelf

Shallow submerged margin of the continents that lies between the edge of the shoreline and the continental slope. This nearly level area of the continental crust has surface layers composed of sediment or sedimentary rock.

Continental Shelf Break

Boundary zone between the continental shelf and slope.

Continental Shield

See shield.

Continental Slope

Steeply sloping portion of continental crust found between the continental shelf and continental rise.

Continental Tropical Air Mass (cT)

Air mass that forms over extensive landmasses areas of the low latitudes. In North America, these systems form over southwestern United States and northern Mexico. Continental Tropical air masses are warm and dry in the winter and hot and dry in the summer. These air masses are also generally unstable in the winter and stable in the summer.

Contour (Line)

Line on a topographic map that connects all points with the same elevation.

Contour Interval

Difference in elevation between two successive contour lines. The interval at which contours are drawn on a map depends on the amount of the relief depicted and the scale of the map.

Control System

A system that is intelligently controlled by the activities of humans. For example, a dam on a river.

Continuous Permafrost

Form of permafrost that exists across a landscape as an unbroken layer.

Convection

Convection involves the transfer of heat energy by means of vertical mass motions through a medium.

Convection Current

The movement of a gas or a fluid in chaotic vertical mass motions because of heating.

Convective Lifting

The vertical lifting of parcels of air through convective heating of the atmosphere. This process can initiate adiabatic processes inside the air parcel.

Convective Precipitation

Is the formation of precipitation due to surface heating of the air at the ground surface. If enough heating occurs, the mass of air becomes warmer and lighter than the air in the surrounding environment, and just like a hot air balloon it begins to rise, expand and cool. When sufficient cooling has taken place saturation occurs forming precipitation. This process is active in the interior of continents and near the equator forming cumulus clouds and possible later thunderstorms. Rain is usually the precipitation type that is formed, and in most cases this moisture is delivered in large amounts over short periods of time in extremely localized areas.

Convergence

Horizontal inflow of wind into an area. Once at the area, the wind then travels vertically.

Convergence Precipitation

The formation of precipitation due to the convergence of two air masses. In most cases, the two air masses have different climatological characteristics. One is usually warm and moist, while the other

is cold and dry. The leading edge of the latter air mass acts as an inclined wall or front causing the moist warm air to be lifted. Of course the lifting causes the warm moist air mass to cool due to expansion resulting in saturation. This precipitation type is common at the mid-latitudes where cyclones form along the polar front. Also called frontal precipitation.

Convergent Lifting

The vertical lifting of parcels of air through the convergence of opposing air masses in the atmosphere. This process can initiate adiabatic processes inside the air parcel.

Coordinated Universal Time (UTC)

Current official world time reference for civil and scientific purposes. Coordinated Universal Time is measured from six standard atomic clocks at the International Bureau of Weights and Measures (BIPM) in Paris, France. Implemented in 1964.

Coral

Simple marine animals that live symbiotically with algae. In the symbiotic relationship, the algae provides the coral with nutrients, while the coral provide the algae with a structure to live in. Coral animals secrete calcium carbonate to produce a hard external skeleton.

Coral Bleaching

Situation where coral lose their colorful symbiotic algae. Thought to be caused by unusually warm water, changes in salinity of ocean seawater, or excessive exposure to ultraviolet radiation.

Coral Reef

Ridge of limestone found generally below the ocean surface. This marine feature is produced by numerous colonies of tiny coral animals, called polyps, that create calcium carbonate structures around themselves for protection. When the corals die, their vacant exterior skeletons form layers that cause the reef to grow. Coral reefs are found in the coastal zones of warm tropical and subtropical oceans.

Core

The core is a layer rich in iron and nickel found in the interior of the Earth. It is composed of two sub-layers: the inner core and outer core. The core is about 7,000 kilometers in diameter.

Coriolis Force

An apparent force due to the Earth's rotation. Causes moving objects to be deflected to the right in the Northern Hemisphere and to the left in the Southern hemisphere. Coriolis force does not exist on the equator. This force is responsible for the direction of flow in meteorological phenomena like mid-latitude cyclones, hurricanes, and anticyclones.

Correlation Coefficient

Statistic that measures the degree of linear association between two variables. Its values vary from between -1 and 1. Perfect positive (the dependent variable increases with an increase in the independent variable) linear association has a correlation coefficient of 1. Perfect negative (the dependent variable decreases with an increase in the independent variable) linear association has a correlation coefficient of -1. Absolutely no association between variables has a value of zero.

Coulee

- (1) Steep-sided flow of volcanic lava that has solidified.
- (2) Abandoned glacial meltwater channel.
- (3) Term used in the United States to describe a steep-sided stream valley.

Counter-Radiation

Redirection of the Earth's longwave radiation back to the surface because of the greenhouse effect.

Craton

Stable foundation core of the Earth's various plates of continental crust. Composed of the shield and platform.

Crater

Circular depression in the ground surface created by volcanic activity or asteroid impact.

Creep

(1) Slow mass movement of soil downslope. Occurs where the stresses on the slope material are too small to create a rapid failure. See soil creep.

(2) Another term used to describe traction.

Cretaceous

Geologic period that occurred roughly 65 to 144 million years ago. During this period, the first flowering plant species appear and dinosaurs are at their greatest diversity. Dinosaurs die out at the end of this period.

Crevasse

(1) Opening on a levee that allows for the drainage of water from the floodplain to the stream channel.

(2) Fracture on the brittle surface of a glacier.

Critical Entrainment Velocity

Velocity required to entrain a particular sized particle into the moving medium of air or water.

Crust

Earth's outer most layer of solid rock. Between 7 to 70 kilometers thick. Two types of crust exist: oceanic crust and continental crust.

Cryosol Soil

Soil order (type) of the Canadian System of Soil Classification. This soil is common to high latitude tundra environments. The main identifying feature of this soil is a layer of permafrost within one meter of the soil surface.

Cryostatic Pressure

Pressure exerted on a substance by ice at rest.

Cryotic

Something that is frozen.

Cumulus Cloud

Puffy clouds with relatively flat bases. Cumulus clouds form when moist warm air bubbles vertically escape from the Earth's surface. Found in an altitude range from 300 to 2,000 meters.

Cumulonimbus Cloud

A well developed vertical cloud that often has top shaped like an anvil. These clouds are very dense with condensed and deposited water. Weather associated with this cloud includes: strong winds; hail; lightning; tornadoes; thunder; and heavy rain. When this weather occurs these clouds are then thunderstorms. Can extend in altitude from a few hundred meters above the surface to more than 12,000 meters.

Cuspate Foreland

Is a triangular accumulation of sand and/or gravel located along the coastline. This feature is formed by the joining of two spits.

Cyanobacteria

Bacteria that have the ability to photosynthesize.

Cyclogenesis

Process of cyclone formation, maturation, and death.

Cyclone

Area of low pressure in the atmosphere that displays circular inward movement of air. In the Northern Hemisphere circulation is counterclockwise, while Southern Hemisphere cyclones have clockwise wind patterns.

Cytoplasm

All of the protoplasm in a cell except for what is contained in the nucleus.

D

Day Length

Period of time for a location on the Earth when insolation from the Sun is being received.

Daylight Savings Time

The setting of time so it is one hour ahead starting in the spring and one hour back beginning in the fall in the Northern Hemisphere. In Canada and the United States the dates for these events is the first Sunday in April (spring ahead) and the last Sunday in October (fall back).

Debris Flow

A type of mass movement where there is a downslope flow of a saturated mass of soil, sediment, and rock debris.

December Solstice

Date during the year when the declination of the Sun is at 23.5° South of the equator. During the December solstice, locations in the Northern Hemisphere experience their shortest day. The December solstice is also the first day of winter in the Northern Hemisphere. Locations in the Southern Hemisphere have their longest day on the June solstice. This date also marks the first day of summer in the Southern Hemisphere.

Declination

Location (latitude) on the Earth where the Sun on a particular day is directly overhead (90° from horizon) at solar noon. This location is somewhere between 23.5° North and 23.5° South depending on the time of the year.

Deciduous Vegetation

Type of vegetation that sheds its leaves during winter or dry seasons. Compare with coniferous vegetation.

Decomposition

(1) To chemically or physically breakdown a mass of matter into smaller parts or chemical elements.

(2) Breakdown of organic matter into smaller parts or inorganic constituents by decomposing organisms.

Decomposer

A type of detritivore. Decomposers play an important role in recycling organic matter back into inorganic nutrients in ecosystems. This recycling is done by decomposing complex organic matter and then converting the less complex organic products into inorganic compounds and atoms. Much of the recycled inorganic nutrients are then consumed by producers. Bacteria and fungi are the most common decomposers found in most ecosystems. Also see detritus feeders.

Deduction

Inference in which the conclusion about particulars follows necessarily from general theory. In a science like Physical Geography, deductive reasoning would involve stating a theory first and then trying to find facts that reject this idea.

Deflation

Process where wind erosion creates blowout depressions or deflation hollows by removing and transporting sediment and soil.

Deflation Hollow

A surface depression or hollow commonly found in arid and semiarid regions caused by wind erosion. Also see the related blowout depression.

Deforestation

Removal of trees from a habitat dominated by forest.

Degradation

Readjustment of the stream profile where the stream channel is lowered by the erosion of the stream bed. Usually associated with high discharges.

Delta

Large deposit of alluvial sediment located at the mouth of a stream where it enters a body of standing water.

Dendritic

Term used to describe the stream channel pattern that is completely random. Resembles the branching pattern of blood vessels or tree branches.

Denitrification

Conversion of nitrates into gaseous nitrogen and nitrous oxide.

Denudation

- (1) The erosion or wearing down of a landmass.
- (2) Removal of the vegetative cover from an area.

Density (of Matter)

Refers to the quantity of mass per unit volume. For gases, density involves the number of atoms and molecules per unit volume.

Deoxyribonucleic Acid (DNA)

Form of nucleic acid that is organized into a double-helix molecule. DNA is used by most organisms to chemically code their genetics and to direct the development and functioning of cells. This direction requires RNA which represents a copy of a portion of DNA. Found in the nucleus of cells.

Dependent Variable

Variable in a statistical test whose observation's values are thought to be controlled through cause and effect by another independent variable modeled in the test.

Deposition

- (1) The change in state of matter from gas to solid that occurs with cooling. Usually used in meteorology when discussing the formation of ice from water vapor. This process releases latent heat energy to the environment.

(2) Laying down of sediment transported by wind, water, or ice.

Depositional Landform

Is a landform formed from the deposition of weathered and eroded surface materials. On occasion, these deposits can be compressed, altered by pressure, heat and chemical processes to become sedimentary rocks. This includes landforms with some of the following geomorphic features: beaches, deltas, floodplains, and glacial moraines.

Deposition Nuclei

Six-sided microscopic particle that allows for deposition of water as ice crystals in the atmosphere. Nucleus for the formation of snowflakes. Deposition normally occurs on these particles when relative humidity becomes 100%.

Depression

(1) Concave hollow found on the Earth's surface.

(2) Term used to describe a cyclone or an atmospheric low pressure system.

Deranged Drainage

Drainage pattern that is highly irregular. Areas that have experienced continental glaciation may have this type of drainage pattern.

Desert

(1) Biome that has plants and animals adapted to survive severe drought conditions. In this habitat, evaporation exceeds precipitation and the average amount of precipitation is less than 25 centimeters a year.

(2) Area that receives low precipitation. Also see cold desert and warm desert.

Desertification

Conversion of marginal rangeland or cropland to a more desert like land type. Desertification can be caused by overgrazing, soil erosion, prolonged drought, or climate change.

Desert Pavement

A veneer of coarse particles left on the ground after the erosion of finer particles by wind.

Detachment

One of three distinct processes involved in erosion. This process involves the disengagement of a particle from its surroundings.

Detrital Rock

Sedimentary rock that is composed of particles transported to their place of deposition by erosional processes. Examples of such rock include sandstone and shale.

Detritus

Shed tissues, dead body parts, and waste products of organisms. In most ecosystems, detritus accumulates at the soil surface and other types of surface sediments.

Detritus Feeder

A type of detritivore. Detritus feeders acquire the nutrients they need from partially decomposed organic matter found in shed animal tissues, plant litter, dead bodies of plants and animals, and animal waste products. Some examples of detritus feeders include various species of beetles, various species of ants, earthworms, and termites. Also see decomposer.

Detritus Food Chain

Model describing the conversion of organic energy in a community or ecosystem into inorganic elements and compounds through decomposition. The organisms involved in this conversion are called detritivores.

Detritivore

Heterotrophic organism that feeds on detritus. Examples of such organisms include earthworms, termites, slugs, snails, bacteria, and fungi. Two types of detritivores are generally recognized: decomposers and detritus feeders.

Deuterium

Isotope of hydrogen, with a nucleus containing one proton and one neutron, and an atomic mass number of 2.

Devonian

Geologic period that occurred roughly 360 to 408 million years ago. During this period, the first amphibians and trees appear.

Dew

Condensation of water on the Earth's surface because of atmospheric cooling.

Dew Point

Dew point is the temperature at which water vapor saturates from an air mass into liquid or solid usually forming rain, snow, frost or dew. Dew point normally occurs when a mass of air has a relative humidity of 100%. If the dew point is below freezing, it is referred to as the frost point.

Diffused Solar Radiation

Solar radiation received by the Earth's atmosphere or surface that has been modified by atmospheric scattering.

Diffusion

(1) Molecular mixing of one substance into another substance.

(2) Redirection or refraction of solar insolation in many directions. Process cause the beam of traveling radiation to become less intense.

Diorite

A coarse grained igneous rock of intrusive origin that is darker and chemically more mafic than granite.

Dip

One of the directional properties of a geologic structure such as a fold or a fault. Dip is the inclination angle of the formation as measured at right angles to strike.

Diploid

Cell that contains two sets of chromosomes. Also see haploid.

Direct Solar Radiation

Solar radiation received by the Earth's atmosphere or surface which has not been modified by atmospheric scattering.

Discharge

See stream discharge.

Discontinuous Permafrost

Form of permafrost that contains numerous scattered pockets of unfrozen ground.

Dispersal

An organism leaving its place or birth or activity for another location.

Dissociation

Chemical process where a compound or molecule breaks up into simpler constituents.

Dissolution

The process of a substance dissolving and dispersing into a liquid.

Dissolved Load

Portion of the stream load that is in solution in the flowing water.

Distance Ratio

Method for measuring the gradient of a slope. Simply involves dividing the vertical change in distance (rise) by horizontal change in distance (run) or rise/run. The measurement is usually presented as a percentage or relative to some unit distance traveled in the horizontal.

Distributary

A smaller branching stream channel that flows away from a main stream channel. Common on deltas. Opposite of tributary.

Distributional Limit

Spatial boundary that defines the edge of a species geographical range.

Disturbance

(1) Partial or complete alteration of a community or an ecosystem by a biotic or abiotic factor.

(2) Cyclonic low pressure system.

Diurnal Tide

Tides that have one high and one low water per tidal period.

Divergence

Horizontal outflow of wind from an area. In a surface divergence, outflow originates from the upper atmosphere.

Divergent Evolution

Creation of two or more unique species from one ancestral species through the differential evolution of isolated populations.

Diversity

See Species Diversity.

Divide

The topographic ridge that separates drainage basins.

Doldrums

Area of low atmospheric pressure and calm westerly winds located at the equator. Similar to Intertropical Convergence Zone.

Dolomite

(1) Sedimentary rock formed from $\text{CaMg}(\text{CO}_3)_2$.

(2) Mineral with the chemical formula $\text{CaMg}(\text{CO}_3)_2$.

Downdraft

Downward movement of air in the atmosphere.

Downwelling Current

Ocean current that travels downward into the ocean because of the convergence of opposing horizontal currents or because of an accumulation of seawater.

Dune

(1) Stream bed deposit found streams whose channel is composed mainly of sand and silt. Dunes are about 10 or more centimeters in height and are spaced a meter or more apart and are common in streams with high velocities.

(2) Terrestrial deposit of sand that resembles a mound or ridge that was formed from aeolian processes. Also see sand dune.

Dune Field

An extensive region covered by numerous sand dunes.

Dust Dome

Dome of air that surrounds a city created from the urban heat island effect that traps pollutants like particulate matter.

Drainage Basin

Land surface region drained by a length of stream channel.

Drainage Density

Is the measure of the length of stream channel per unit area of drainage basin. Mathematically its is expressed as:

Drainage Density (Dd) = Stream Length / Basin Area

Drainage Divide

Topographic border between adjacent drainage basins or watersheds.

Drainage Network

System of interconnected stream channels found in a drainage basin.

Drainage Pattern

Geometric pattern that a stream's channels take in the landscape. These patterns are controlled by factors such as slope, climate, vegetation, and bedrock resistance to erosion.

Drainage Wind

A wind common to mountainous regions that involves heavy cold air flowing along the ground from high to low elevations because of gravity. Also see katabatic wind.

Drift

Any material deposited by a glacier.

Drought

Climatic condition where water loss due to evapotranspiration is greater than water inputs through precipitation.

Drumlin

A hill shaped deposit of till. The shape of these features resembles an elongated teaspoon laying bowl down. The tapered end of the drumlin points to the direction of glacier advance. Drumlins come in assorted sizes. Lengths can range from 100 to 5,000 meters and heights can be as great as 200 meters.

Dry Adiabatic Lapse Rate (DALR)

The rate of decline in the temperature of a rising parcel of air before it has reached saturation. This rate of temperature decline is 9.8° Celsius per 1000 meters because of adiabatic cooling.

Dry-Bulb Thermometer

Thermometer on a psychrometer used to determine current air temperature. This measurement and the reading from a wet-bulb thermometer are then used for the determination of relative humidity or dew point from a psychrometric table.

Dry Deposition

The transport of gases and minute liquid and solid particles from the atmosphere to the ground surface without the aid of precipitation or fog. Compare with wet deposition.

Dry Line

A boundary that separates dry and moist air in the warm sector of a mid-latitude cyclone wave. Found ahead of the cold front.

Dyke

Thin vertical veins of igneous rock that form when magma enters and cools in fractures found within the crust. Also see intrusive igneous rock.

Dynamic Equilibrium

A dynamic equilibrium occurs when a system displays unrepeated average states through time.

Dynamic Metamorphism

Form of metamorphism that causes only the structural alteration of rock through pressure. The minerals in the altered rocks do not change chemically. The extreme pressures associated with mountain building can cause this type of metamorphism.

Dyne

A unit of force that creates an acceleration on a mass of 1 gram equal to 1 centimeter per second. 105 dynes equals one newton.

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