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GLOSSARY

Some of the commonly used vernacular of ecorestoration and ocean science

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A

Abiotic Factor: The physical, chemical and other non-living components of the environment that an organism lives in. These factors include all aspects of climate, geology, and atmosphere that affect ecological systems. Compare biotic factor.

Abyssopelagic Zone: 'Abyssos' meaning 'no bottom', this zone of the ocean begins 4000 m below the surface of the ocean and extends down to the sea floor. This zone is home to a variety of unique critters that are specially adapted to the inhospitable conditions that these depths create. Visit the Abyssopelagic Zone on OceanLink to learn about life in the abyss.

Adaptation: Any change in the structure or function of an organism which makes it better suited to its environment. For example, the torpedo body shape of a tuna allows for fast swimming in the open ocean.

Aerosol: Small liquid or solid particles dispersed in the atmosphere. Large quantities are often regarded as pollutants in the form of haze and smoke

Air mass: A body of air that has relatively uniform temperature and humidity based on the surface characteristics of its source region.

Albedo: A measure of reflectivity: the planetary albedo of the Earth averages about 0.31, meaning that on average about 31 percent of the light from the Sun is reflected back to space. The value at any given time is dependent on cloud cover and ground cover (snow, ice).

Allele: One of the alternative forms of a particular gene. Each gene is comprised of two alleles, one inherited from the father and one from the mother. However, within a population, many alleles may exist for one gene. Hair colour in humans is a great example! See also genes.

Atmosphere: The mixture of gases that surrounds the Earth and some other planets. The concentrations of the gaseous constituents of Earth's atmosphere are determined by biogeochemical processes, including man made effect

Atmospheric pressure: The weight of the column of the atmosphere above a surface. On average, the atmospheric pressure at sea level is 1013.25 millibars (mb), but it can be relatively higher or lower than this value based on air temperature and humidity. Changes in atmospheric pressure at a given location often indicate changing weather.

Autotroph: An organism that synthesizes organic molecules from inorganic starting materials through photosynthesis or chemosynthesis. Autotrophs are ecologically important as primary producers as they ultimately provide energy for all heterotrophic organisms. See also chemosynthesis, photosynthesis; compare heterotroph.

AVHRR: The Advanced Very High Resolution Radiometer is the primary sensor on NOAA polar orbiting satellites. It detects cloud cover and surface temperatures of cloud layers, land and water.

B

Bathypelagic Zone: The zone of the ocean that extends from 1000m to 4000m below the surface of the ocean. Visit the Bathypelagic Zone on OceanLink for pictures and cool facts about life at this depth.

Benthic: Refers to organisms that live on or in the ocean bed. Benthic epifauna are organisms that live on the ocean floor or upon bottom objects such as sea anemones and barnacles, whereas benthic infauna are organisms that live within the surface sediments such as clams and worms. Compare pelagic.

Bioaccumulation: > The process whereby pollutants are taken up, retained and concentrated in the cells of plants and animals.

Biodiversity: The variation in life on Earth reflected at all levels, from various ecosystems and species, to the genetic variation within a species. See also ecosystem diversity, species diversity, genetic diversity.

Bioluminescence: Meaning living (bio) light (luminescence) is the light produced by living organisms and the emission of such biologically produced light. Also commonly referred to as 'phosphorescence'.

Biomass: The total mass of organic matter including living or dead plant material.

Biotic Factor: A living component of the environment which arises from and affects living organisms (distinct from physical factors). For example, the interaction between predators and prey is a biotic interaction. Compare abiotic factor.

C

Carbon dioxide CO₂: A colorless, odorless gas that is a major greenhouse gas. Commercially, carbon dioxide is used as a refrigerant (dry ice), in beverage carbonation, and in fire extinguishers. It is also produced from the burning of fossil fuels and organic matter. It is composed of a single carbon atom and two oxygen atoms.

Celsius: A scale for the measurement of temperature named after Anders Celsius, a Swedish astronomer, who invented it. Water freezes at 0 degrees C and boils at 100 degrees C.

CERES: The Clouds and the Earth's Radiant Energy System is one of the scientific satellite instruments developed for NASA's Earth Observing System (EOS).

Chemosynthesis: The process whereby chemical energy is used to make organic compounds from inorganic compounds. One example is the oxidation of ammonia to nitrite by nitrifying bacteria. Compare photosynthesis.

Chromosome: A linear sequence of genes wound up with proteins into a single unit that is found in the nucleus of cells. See also DNA, genes.

Community: A naturally occurring group of plants and animals that live within a certain environment and interact with each other. Communities are often defined by a dominant species (e.g. kelp forest community) or the major physical

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characteristics of the area (e.g. mud flats).

Concentration: The strength of a solution or mixture, or the amount of a substance in a liquid or gas. Units of measurement will vary depending upon the substance and medium (e.g. milligrams per meter cubed, parts per billion volume, etc.).

Conservation Biology: A field of science that deals with threats to biodiversity. The goals of conservation biology are to investigate human impacts of biodiversity and to develop approaches to prevent extinction through stewardship of entire biological communities.

Convection: The transfer of heat energy vertically through a medium. In the atmosphere, convection may be seen visibly by cloud formation and thunderstorm development.

Convergent Evolution: The development of similar structures in organisms that do not share recent common ancestor (e.g. eyes of squid and humans). Compare divergent evolution; see also evolution.

Coriolis force: An apparent force resulting from Earth's rotation that causes deflection of mass to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.

Cryptic Colouration: >To protect themselves against predators, many animals acquire colouring and markings to match and conceal them in their usual surroundings. For example the nudibranch (sea slug), *Rostanga pulchra*, is practically indiscernible from the red sponges on which it lays its eggs.

D

Diatoms: Microscopic algae with plate-like structures composed of silica.

Decomposer: An organism which gains energy by breaking down the final remains of living things. Predominantly bacteria and fungi, decomposers are important in freeing the last of minerals and nutrients from organics and recycling them back into the food web. See also decomposition; compare detritivore.

Decomposition: The biochemical process where biological materials are broken down into smaller particles and eventually into basic chemical compounds and elements. See also decomposer.

Desert dust: Aerosols comprising of minerals from arid and semi-arid regions that absorb sunlight as well as scatter sunlight. Through absorption of sunlight, the dust particles warm the layer of the atmosphere where they reside. This warmer air is believed to inhibit the formation of storm clouds. Desert dust is also a source of nutrients for many remote regions.

Detritus: Dead organic matter of plant or animal. See also detritivore.

Detritivore: An organism that feeds on large bits of dead and decaying organic matter. What detritivores leave behind is used by decomposers. Crabs and seabirds are examples of detritivores. Compare decomposer; see also detritus.

Divergent Evolution: The evolution of one species to a number of different forms. Compare convergent evolution; see also evolution.

DNA: Deoxyribonucleic acid. The primary genetic material of a cell that makes up genes and chromosomes. See also genes, chromosome.

E

Ecology: The study of the physical and biological interactions between an organism and its natural environment.

Ecological Niche: The role a plant or animal plays in its community. The niche of an organism is defined by what it eats, its predators, salt tolerances, light requirements etc. Two species cannot live stably in the same habitat if they occupy identical niches.

Ecosystem: A community of plants, animals and other organisms that are linked by energy and nutrient flows and that interact with each other and with the physical environment. Rain forests, deserts, coral reefs, and grasslands are examples of ecosystems.

Ecosystem Diversity: The diversity of biological communities and their physical environment. Diversity is determined by the species composition, physical structure and processes within an ecosystem. This is the highest level of biodiversity. See also biodiversity; compare species diversity, genetic diversity.

Effluent: Industrial or urban waste discharged into the environment.

El Nino: The term used to identify the irregular development of warmer ocean surface water off the coast of Ecuador and Peru when the Trade Winds weaken and the usual upwelling of cold, nutrient-rich water reduces.

Endangered: A species or ecosystem that is so reduced or delicate that it is threatened with or on the verge of extinction. Compare extinct, extirpated, threatened, vulnerable.

Endemic: An animal or plant species that naturally occurs in only one area.

ENSO: An acronym meaning El Nino - Southern Oscillation. The Southern Oscillation is the reversal of the atmospheric circulation in the Equatorial Pacific region which causes the onset of El Nino conditions. See definition for El Nino.

Environment: All of the physical, chemical, and biological factors in the area where a plant or animal lives.

EOS: Acronym for Earth Observing System. A major international science program to monitor climate and environmental change.

Epilithic: A term for organisms that live attached to rocks.

Latin translation: epi = upon, lith = rock. This term is general to terrestrial and marine habitats, ie. some lichens are epilithic.

Eipelagic Zone: see Photic Zone.

Equator: The line circling the Earth at 0 degrees latitude, dividing the North and South hemispheres.

Eutrophication: Enrichment of a water body with nutrients, resulting in excessive growth of phytoplankton, seaweeds, or vascular plants, and often depletion of oxygen.

Evolution: The process by which a species' structural and behavioural characteristics change over many generations, sometimes in response to changes in environmental conditions. "New" species develop in this way. For example, scientists think that whales gradually evolved from land animals. See also convergent evolution, divergent evolution.

Extinct: A species which no longer exists. The Stellar sea cow is an example of a species which once lived on the Pacific's East Coast and is now extinct. Compare extirpated.

Extirpated: A species no longer existing in Canada, but occurring elsewhere on Earth. Compare extinct.

F

Fahrenheit: A scale for the measurement of temperature named after Gabriel Daniel Fahrenheit, a German physicist who invented the mercury thermometer and this scale. Water freezes at 32 degrees F and boils at 212 degrees F.

Fertilization: The joining or fusion of the male gamete (sperm) and the female gamete (egg) to form a zygote during sexual reproduction. See also gamete, zygote.

Flux: The rate of transfer of a fluid, particles or energy across a unit area. In the atmosphere, this can be air, a particular pollutant or aerosol, or light or heat energy (which has units of Watts per square meter).

Food Chain: A linear sequence of organisms that exist on successive trophic levels within a natural community, through which energy is transferred by feeding. Primary producers capture energy from the environment (through photo- or chemo-synthesis) and form the base of the food chain. Energy is then passed to primary consumers (herbivores) and on to secondary and tertiary consumers (carnivores and top carnivores) (e.g. phytoplankton -> zooplankton -> herring -> salmon -> killer whales). Once they die, these organisms are in turn consumed and their energy transferred to detritivores and decomposers. Compare food web.

Food Web: A non-linear network of feeding between organisms that includes many food chains, and hence multiple organisms on each trophic level. For example, both sharks and tuna eat herring, and sharks also eat tuna. Visit and tour around the Pacific Northwest Food Web on the OceanLink website.

Fossil fuel: Any fuel that is created from decomposed carbon-based plant and animal organisms. Examples of fossil fuels: oil, coal, natural gas.

G

Gamete: A mature reproductive cell that is capable of fusing with another gamete of the opposite sex to form a zygote. Male gametes are typically known as sperm and female gametes a typically known as eggs. See also fertilization, zygote.

GIS: Geographical Information Systems; merges computerized data with its spatial location on a digital map.

Generalist: A species that can live in many different habitats and can feed on a number of different organisms. For example, shore crabs on the Pacific coast live in a wide variety of habitats, such as mud, sand and rock, and feed on everything from the algae growing on rocks to invertebrates to detritus. Compare specialist.

Genes: The hereditary material coded in cells that determine how an organism will look and behave. A gene is a single unit located on a chromosome and is thereby passed from one generation to the next. Genes are what make each species and individual unique. For example, genes are responsible for hair colour and texture in humans. See also chromosome, DNA.

Genetic Diversity: The genetic variation that occurs within a population or species. For example, there are several different colour dog wheel shells and ochre sea stars. See also biodiversity; compare ecosystem diversity, species diversity.

Genotype: The genetic makeup of an organism. The actual appearance of an individual (the phenotype) depends on the interaction between different forms (or alleles) of genes and between the genotype and the environment. Compare phenotype.

Gillnet: A net set upright in the water to catch fish by entangling their gills in its mesh.

Glacier: A body of moving ice on the land, formed by accumulation of snow.

Global warming: An increase of Earth's average temperature which could lead to climate change. Scientists are concerned that human activities are altering the concentration of greenhouse gases and might cause such global warming. See definition of greenhouse effect.

GPS: Global Positioning System; a satellite-receiver system used to determine a precise location on or above Earth's surface.

Greenhouse effect: The greenhouse effect is a naturally occurring process that aids in heating the Earth's surface and atmosphere. It results from the fact that certain atmospheric gases absorb longwave radiation from the Earth's surface. Without the greenhouse effect, life on this planet would probably not exist as we know it since the average temperature of the Earth would be a chilly -18 degrees Celsius, rather than the present 15 degrees Celsius. However, it is theorized that manmade perturbations to the greenhouse gases such as carbon dioxide may be causing global warming.

Gulf Stream: A warm ocean current that flows from the Gulf of Mexico northeastward along the coast of North America and across the North Atlantic Ocean to the British Isles.

Gyre: A large-scale circular current of water driven by winds at the ocean surface. Several gyres drive the ocean surface circulation patterns of Earth.

H

Habitat: The immediate space where an animal or plant lives and has food, water and protection. Habitat loss, which includes the destruction, degradation, or fragmentation of habitats, is the primary cause of decreasing biodiversity.

Hadley Cell: A major Earth atmospheric circulation pattern that consists of rising air at or near the Equator and sinking air at or near 30 degrees north or south of the Equator.

Herbivore: A plant-eating animal. Sea urchins re a good example of a marine herbivore as they feed on kelp. See also heterotroph, primary consumer.

Hermaphrodite: An animal that has both male and female reproductive organs. Nudibranchs (sea slugs) are a good example o a hermaphrodite.

Heterotroph: An organism that is unable to synthesize organic compounds (and thus its energy) from the environment and therefore fulfils its energy requirements by feeding on other organisms or organic matter. Compare autotroph.

Homogeneous: Similar or uniform structure or composition throughout.

Humidity: A measure of moisture (water vapor) in the atmosphere.

I

Infrared: Of or relating to invisible (to the human eye) radiation with wavelengths in the range from about 750

nanometers, just longer than red in the visible spectrum, to 1 millimeter, on the border of the microwave region

In situ: A measurement taken at a location of interest, usually in the troposphere by ground or airborne instruments, as opposed to a measurement made routinely by satellite.

Insolation: An abbreviated term for incoming solar radiation.

Ionosphere: The part of the atmosphere between the mesosphere and exosphere. Sufficient quantities of ions and free electrons exist to reflect or refract electromagnetic (especially radio) waves. This layer is what makes long-distance radio communication on Earth possible. The Earth's Atmosphere

Irradiance: The rate of energy transfer onto a unit surface area from a hemisphere of directions. Usually measured as watts (energy) per square meter

Inorganic: Part of or derived from non-biological material. A chemical compound that does not include a carbon chain. Compare organic.

Introduced Species: > An organism that has been brought into an area, usually by humans, where it does not normally occur. Introduced species often compete with and cause problems for native species. Introduced species are also called exotic, nonnative, and alien species. See also invasive species, native species.

ITCZ: The Intertropical Convergence Zone; a zonal band of low atmospheric pressure and thunderstorms caused by converging Trade Winds, rising air and intense thermal heating at or near the Equator; the location of the ITCZ shifts throughout the year resulting in wet and dry seasons in countries located in the tropics.

Invasive Species: An introduced species that out-competes native species for space and resources. Scotch Broom is an invasive species that out-competes local vegetation and results in a monoculture, and hence a decrease in local diversity. See also introduced species, native species.

J

Joule: A standard unit of energy (radiation) or work (mechanics). For energy, one joule is equal to one watt second.

JGOFS: JGOFS Joint Global Ocean Flux Study

K

Kelvin: An absolute temperature scale invented in the 1800's by William Thompson, Lord Kelvin. It places the zero point of the scale at absolute zero, the temperature which scientists believe is the lowest possible.

Keystone Predator: The dominant predator or the top predator that has a major influence on community structure. For example, sea otters are a keystone predator in kelp beds. Sea otters eat urchins that feed on kelp which house a huge diversity of other organisms. If sea otter populations are lowered in an area the kelp beds are generally reduced and urchin barrens appear.

Keystone Species: A species that has a major influence on community structure.

Kilometer: A metric unit of distance equivalent to 1,000 meters. One kilometer is a little more than one half of a mile

L

La Nina: The term used to identify opposite conditions from an El Nino when the Trade Winds strengthen and colder ocean surface water extends off the coast of Equador and Peru into the central Pacific Ocean

Latent heat: The energy required to change a substance to a higher state of matter (solid to liquid to gas). This same energy is released from the substance when the change of state is reversed (gas to liquid to solid).

Latitude: A measure which identifies the north - south location of a point on the Earth. It is the angle between the line connecting a point on the Earth and the Earth's center, and the equatorial plane of the Earth.

Longitude: A measure which identifies the east - west location of a point on the Earth. It is the angular distance along a line of latitude from the Greenwich Meridian - a reference longitude set to be zero degrees.

M

MCSST: Acronym for the Multi-Channel Sea Surface Temperature, a product derived from NOAA's AVHRR instrument. The data provide vital water surface temperature information in near real-time for a variety of applications such as offshore fishing operations, hurricane monitoring, El Nino and other climate studies

Mesopelagic Zone: Also called the "twilight zone" of the ocean, this area from 200m to 1000m in depth, is bordered by the photic zone above and darkness below. It's in this zone where you start to see bioluminescence on all sorts of animals. Visit the Mesopelagic Zone on OceanLink to learn about the animals unique to these depths.

Mesosphere: The layer of the Earth's atmosphere between the stratosphere and the ionosphere.

Micron: One-millionth of a meter (10.e-6 or 0.000001 m). Human hair is approximately 100 microns in diameter.

Millibar: A unit of measure used for atmospheric pressure. Standard atmospheric pressure is 1013.25 millibars, or mb, so this offers a very sensitive scale: 1 millibar represents a one tenth of one percent change in atmospheric pressure.

MISR: The Multi-angle Imaging SpectroRadiometer. MISR views Earth with cameras pointed in 9 different directions such that it can distinguish different types of clouds, particles and surfaces.

Mole: A standard unit of measure for the amount of a substance. One mole (mol) of a substance is numerically equal to the molecular weight of that substance. For gases, one mole is equal to Avogadro's number of molecules (6.022e23). In atmospheric chemistry, moles are sometimes used to quantify atmospheric constituents or pollutants.

Morphology: The form and structure of an organism, in particular its outside features.

N

Nanometer: One billionth of a meter (10.e-9 or 0.000000001 m). There are a billion (1,000,000,000) nanometers in one meter.

NASA: Acronym for National Aeronautics and Space Administration

Native Species: A species that occurs naturally in an area (i.e. is not introduced). Compare introduced species, invasive species.

Natural Selection: The main mechanism of evolutionary change. In a given population of organisms, there are heritable traits that enable some members to contribute a larger number of offspring than others. If these offspring also have a greater reproductive success, then the genetic composition of the population is altered, thus evolution. See also selection pressure.

Nekton: Pelagic organisms that are free-swimming and so whose movements are independent of the tides, currents and waves. Such animals include fish, whales, squid, crabs and shrimps. The distribution of nekton is limited by temperature and nutrient supply and decreases with decreasing depth. Compare benthic, plankton.

Net radiation: The amount of radiation that actually is added to a surface, taking into account all wavelengths and incoming as well as outgoing radiation.

Nonrenewable Resource: A resource that is in limited supply and can't be replenished by natural processes, at least not for thousands of years or more. Fossil fuels are nonrenewable resources. Compare renewable resource.

O

Optical depth: A measure of the reduction of light or energy transmitted through the atmosphere due to interactions with air, cloud or aerosol particles. Optical depth is much more significant to Earth's energy budget than the physical thickness of cloud or aerosol layers.

Organic: Part of or derived from living organisms. Or a chemical compound that contains carbon as an essential component. Compare inorganic.

Over-consumption: The use of resources at a rate that exceeds the ability of natural processes to replace them.

Ozone: A molecule consisting of 3 oxygen atoms found primarily in the stratosphere. When ozone is created in the troposphere, it can be a harmful pollutant. More information on ozone

Ozone layer: A region within the stratosphere that contains a high amount of ozone. This layer provides a protective shield against harmful UV radiation from the Sun.

P

PAR: Acronym for Photosynthetically Active Radiation, energy in the visible light region of the electromagnetic spectrum (400 - 700 nanometer wavelength) that plants use for photosynthesis, measured in watts per meter squared. PAR is an important parameter of interest for ecological and hydrological climate studies (carbon, oxygen and water cycles).

Parts per billion volume: One method of expressing chemical concentration, usually of a gas. For example, 20 ppbv of ozone means that, if a sample of gas contained one billion units, then 20 of the units would be ozone.

Pascal: The SI unit for pressure measurement, named after Blaise Pascal, a French mathematician and physicist. 1 Pa = 1000 millibars (mb). Atmospheric pressure at Earth's surface averages 101325 Pa.

Pelagic: Refers to the plants and animals that live in the water column or in the open waters of the ocean rather than the ocean floor (see benthic). Life is found throughout the pelagic zone, however is more concentrated at shallower depths. Pelagic organisms can be further divided into the plankton and nekton. Compare benthic.

Pesticides: Chemical products used to reduce or eliminate unwanted organisms, regarded as "pests". Pesticides are often used on gardens, agricultural land, roadsides, and golf courses to eliminate species considered undesirable or damaging.

Phenotype: The physical appearance of an individual that is the result of that individual's genotype and the interaction of the genotype with the environment during development. Hence, individuals with the same genotype may have different phenotypes in different environments. Compare genotype.

Phosphorescence: see Bioluminescence.

Photic Zone: The surface layer of the ocean that is penetrated by sunlight. The photic zone is the layer of the ocean that has been explored the most as it is relatively easy to access with conventional diving equipment. In the photic zone phytoplankton flourish and it is where the fish, marine mammals, and marine invertebrates that most people are familiar with are found. Light can penetrate down to approximately 200m which marks the end of the photic zone. Also referred to as the Sunlight Zone or the Epipelagic Zone.

Photometer: An instrument for measuring the amount of light. Depending on the purpose, a variety of filters can be used to measure light of specific wavelengths. A photometer can also be used to measure ambient light, or only a narrow beam that comes directly from a source like the Sun.

Photosynthesis: A chemical process whereby plants and algae use a sun's energy to make sugars (organic compounds) from carbon dioxide and water (inorganic compounds). See also autotroph, chemosynthesis.

Pixel: A picture element, the smallest element that can be displayed on an image or computer monitor, often used as a unit of measurement for image size and resolution.

Phylum: The broadest classification for animals. Compare species.

Phytoplankton: The plant and algae component of the plankton; the primary producers of almost all marine food webs. Compare zooplankton.

Plankton: Pelagic organisms that float through the water column, not attached to any substrate and unable to move against the currents and tides. Plankton can be further divided into phytoplankton and zooplankton, meroplankton and holoplankton. Compare nekton.

Population: The number of individuals of a particular species that live within a defined area.

Predator: An animal that hunts and kills other animals for food.

Prey: An animal that is used by other animals for food.

Primary Consumer: A heterotrophic, herbivorous organism that feeds directly on a primary producer. Urchins are a primary consumer as they feed on kelp. See also heterotroph, food chain; compare secondary consumer.

Primary Producer: An autotrophic organism that makes complex organic compounds from inorganic compounds through the process of photosynthesis or chemosynthesis. For example, phytoplankton synthesize sugars (organic compounds) from carbon dioxide and water (inorganic compounds) using energy from the sun. Phytoplankton is one example of a marine primary producer. See also autotroph, food chain.

Primary Production: Synthesis of organic matter by plants, which is the main source of energy and nutrition for other consumers in the ecosystem (e.g. herbivores). See also chemosynthesis, photosynthesis.

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Q

Quadrat: An ecological sampling unit that consists of a square frame of known area. The quadrat is used for quantifying the number or percent cover of a given species within a given area. See also transect.

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R

Rayleigh scattering: In the 19th century, Lord Rayleigh theorized that the sky is blue because our atmosphere causes the sun's light to bend or scatter into the colors of the visible light spectrum, thus we see blue because blue light scatters more than do other colors of light.

Reflectivity: The fraction of radiation (for example, light) reaching a surface that is reflected by that surface. A mirror has a very high reflectivity, near 1. In contrast, black objects generally have a very low reflectivity. A perfect blackbody (see definition) would have a reflectivity of 0. Surface Reflectivity

Refraction: The redirection of light after entering a medium; in the atmosphere, solar rays are redirected by interactions with air, cloud and aerosol particles.

Relative humidity: The ratio between the amount of water vapor in the air and the amount required for saturation; depends on atmospheric temperature and pressure.

Renewable energy: Energy that can be replenished in a short period of time such as energy from solar, wind, water or geothermal sources. Typically, there is little concern that these sources of energy will become scarce or used up, unlike fossil fuels.

Resolution: Refers to the separation of data points, whether in space or in time. See also pixel.

Renewable Resource: A resource that can be replenished through natural processes within a human life span, if it is soundly managed. Compare nonrenewable resource.

S

Secondary Consumer: A heterotrophic, carnivorous organism that feeds on a primary consumer. Herring feeding on zooplankton are an example of a secondary consumer. See also food chain, heterotroph, primary consumer.

Selection Pressure: A measure of the effectiveness of natural selection in altering the genetic composition of a population. See also natural selection.

Specialist: A species with a very narrow range in habitat or food requirements. For example, the Marbled Murrelet nests in old-growth forests on thick branches high up in the forest canopy. Compare generalist.

Speciation: The evolution of one or more species from an existing species.

Species: A group of organisms that differ from all other groups of organisms and that are capable of breeding and producing fertile offspring. This is the smallest unit of classification for plants and animals. Compare phylum.

Species Diversity: A measure of both species abundance and species richness. An area that has a large number of species and many representative individuals from each species is more diverse than an area that has only a single species. See also biodiversity; compare ecosystem diversity, genetic diversity.

Species Abundance: The total number of individual of a species within a given area or community. Compare species richness.

Species Richness: The number of different species that exist within a given area or community. Compare species abundance.

Substrate: The material upon or within which a plant or animal live or grows (e.g. rocky or sandy substrate). See also benthic.

Sunlight Zone: see Photic Zone.

Sustainable: A sustainable way of life is one in which human needs are met without diminishing the ability of other people, wild species, or future generations to survive.

Symbiosis: < An interaction between two different species where either both, one or neither of the organisms benefit from the relationship. Many symbiotic relationships are obligatory (e.g. tropical reef building corals and their algal symbiont).

Systematics: The area of biology that deals with the diversity of living organisms, their relationships to each other through evolution, and their classification. Can also be referred to as taxonomy.

T

Taxonomy: The theory and practice of describing, naming and classifying plants and animals. See also systematics.

Temperature inversion: An instance when a warm air layer overlays a cooler air layer in the atmosphere, often suppressing vertical mixing of air.

Temporal resolution: indicates the time increment of a data set, or the frequency at which data was measured.

Terra: The flagship of NASA's Earth Observing System (EOS), Terra is collecting a global data set to enable research into the ways that Earth's land, oceans, atmosphere, ice, radiant energy, and life function as a whole system.

Threatened: A species likely to become endangered if limiting factors are not reversed. Compare endangered, extinct, extirpated, vulnerable.

Transect: A straight line placed on the ground along which ecological measurements are taken. If an ecologist wanted to sample the diversity of intertidal organisms in the intertidal, he/she would place a number of transects perpendicular to the shore and take samples at predetermined interval lengths. See also quadrat.

Trophic levels: The energy levels or steps in a food chain or food web: primary producer, primary consumer, secondary consumer, tertiary consumer etc.

Twilight Zone: see Mesopelagic Zone.

U

Ultraviolet Radiation: Shortwave electromagnetic waves having wavelengths between 0.1 and 0.4 micrometers; ultraviolet (UV) radiation from the sun is significantly absorbed by the ozone layer in the stratosphere. It is harmful to plants and animals, including humans.

Upwelling: Ocean circulation which brings cold, nutrient-rich deep water to the surface, usually occurring along western coasts of continents.

V

Validation: The act of verifying the value of data, usually by comparing the data with other data sources. For satellite data, often ground or aircraft based measurements at a particular time and location will be compared to determine how well the data correlates.

Variance: The difference between what is expected and what actually occurs. In statistics, the variance is defined as the square of the standard deviation.

Vulnerable: A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events. Compare endangered, extinct, extirpated, threatened.

W

Water Cycle: The continuous circulation of water from the atmosphere to the earth, including the ocean, and back to the atmosphere through condensation, precipitation, evaporation, and transpiration.

Wind vector: An arrow on a map that represents both the direction and magnitude (speed) of the wind at a particular location for a particular time. The direction that the arrow points illustrates the direction of wind flow, and the length of the arrow tail indicates the wind speed proportional to a unit scale such as knots, meters per second or miles per hour.

X

X-axis: The vertical axis of a Cartesian (coordinate) plane.

Y

Y-axis: The vertical axis of a Cartesian (coordinate) plane.

Z

Zenith: The point directly above a location on Earth's surface, that is, the up direction.

Zooplankton: Animal component of the plankton that feed on phytoplankton and other zooplankton (primary consumers). Compare phytoplankton.

Zygote: A fertilized egg. Or the diploid cell that results from the joining of two haploid gametes (sperm and egg) during sexual reproduction, that will cleave to form an embryo. See also fertilization, gamete.