

## **Subject specific vocabulary**

These are the definitions of key terms used in our A-level Environmental Science (7447) specification.

Learners should be familiar with and gain an understanding of these terms.

### **Abiotic factors**

Physical factors such as light, temperature and water.

### **Acidification**

A process in which the pH drops as the conditions become more acidic.

### **Acoustic deterrent devices**

A device that deters mammals by using sound.

They are used to deter small cetaceans from fishing nets, or seals from fish farms, for example.

### **Acoustic fatigue**

Stress cracking of a material caused by repetitive vibrations induced by sound.

### **Acoustic monitoring**

Monitoring environmental sounds e.g. to detect the presence of dolphins and whales or bats.

### **Activated carbon filter**

A filter that reduces emissions of pollutants such as complex organic molecules that adsorb onto the surface of the activated carbon particles.

### **Activation products**

Atomic nuclei that become radioactive because they have absorbed neutrons that change them into less stable nuclei that emit ionising radiation.

### **Active traffic management (ATM)**

A method of controlling road lane usage and speed limits to smooth traffic flow and reduce congestion.

## Acute

Exposure to a substance or symptoms that appear rapidly.

## Adsorption

The process where a substance fixes onto a surface.

## Aerodynamics

The study of airflow over surfaces to allow the design of surfaces that reduce wind resistance, turbulence, friction and noise generation.

## Afforestation

Planting trees to increase the area of forest.

## Albedo

A measure of the reflectivity of a surface. More reflective surfaces have high albedos.

A surface that reflects all light has an albedo of 100%, while one that absorbs all light has an albedo of 0%.

The albedo of an area can affect the local climate.

## Antarctic Treaty (1959)

An international agreement signed by many countries to protect and manage Antarctica. Aspects of the treaty include control of military activities, waste disposal, mineral exploitation, wildlife conservation and tourism.

## Anthropogenic

Adjective describing outcomes caused by human activities.

## Aphotic zone

Deeper layers of water that receive no sunlight because they are absorbed by shallower layers.

## Aquaculture

The artificial production of aquatic organisms, including fish farming.

## Aquifer

A rock which contains water that is abstracted by humans.

## Artificial insemination

A form of selective breeding where semen is collected from a chosen male to be inserted artificially into the chosen female to cause her to become pregnant. It also allows semen to be stored for later use or the transport of semen without having to bring the animals together.

## As low as reasonably achievable (ALARA)

An approach to control pollution, especially ionising radiation, where levels are kept as low as is practically achievable, taking into account economic and technological factors.

## Atmosphere

The gases surrounding the Earth. Different layers are characterised by their temperature, density, turbulence and composition.

## Baffle mounds

Embankments that absorb and deflect noise, especially around mines, airports and major roads.

## Bag filter

A method reducing atmospheric pollution caused by smoke and particulate matter.

## Barrage

A dam built across an estuary to generate tidal power.

## Barrier crops

A crop that is grown around another crop to protect the neighbouring crop, usually by producing a scent that deters the pests.

## Beating tray

A method of sampling invertebrates on the branches of bushes and small trees.

## Becquerel (Bq)

The Becquerel is the unit of activity of a radioactive source.

1 Bq = 1 nuclear decay per second. It is usually related to a standard mass of material.

## Best available technology not entailing excessive cost (BATNEEC)

An approach to pollution control where control technology is used that achieves the lowest emission levels, without costing so much that further marginal gains would risk their financial viability.

## Bioaccumulation

The increase in concentration of a substance in living tissue as it is absorbed and stored faster than it is broken down and excreted.

## Biocapacity

A measure of the biological productivity of an area.

## Biodegradable

A material that can be broken down by living organisms, usually bacteria.

## Biodiversity

A measure of the variety and abundance of wildlife species.

A common quantitative method of measuring biodiversity is Simpson's Diversity Index.

## Biogeochemical cycle

A series of linked processes which use and re-use elements such as carbon, nitrogen, phosphorus, iron and sulfur, as they move between biotic and abiotic reservoirs.

## Bioleaching

A method of using bacteria to dissolve metals from low grade ores.

## Biological control

The control of pests using living organisms, usually predators or pathogens.

## Biological corridor

A habitat that links other habitats so that animals can move between them.

## Biomagnification

The progressive bioaccumulation of a material along a food chain e.g. organochlorine insecticides, heavy metals, etc.

## Biomass

The total mass of living, or recently living, material in an area.

## Biome

A large geographical region with particular climatic features, in which a characteristic, unique community of species lives e.g. Taiga, coral reefs, temperate grasslands, tundra, tropical rainforest, etc. Don't confuse the terms biome and ecosystem. Biome refers to the total area where the community of species is found, whereas ecosystem refers to a particular community and its interactions. So, there are many tropical rainforest ecosystems but only one biome.

## Biomimetics

The study of living organisms so the knowledge gained can be applied to engineering or other technological developments.

## Bioremediation

Cleaning up a contaminated site using living organisms such as bacteria that chemically degrade the pollutants or plants that absorb the pollutants.

## Biotic index

A measure of pollution based on the presence, abundance and state of health of selected living organisms e.g. lichens for acid rain, aquatic invertebrates for water pollution, etc.

## Blue baby syndrome/methaemoglobinaemia

A health problem with several possible causes, where the haemoglobin in a baby's blood does not carry enough oxygen.

Nitrates in drinking water can be converted to nitrites which reduce the ability of haemoglobin to carry oxygen.

## Bund wall

A wall that surrounds a tank which would contain the contents if the tank leaked or burst.

## Captive breeding and release programmes (CBR)

A method of boosting wild populations by keeping a breeding population in captivity. Some of the offspring produced may be released to join the wild population.

## Carbon capture and storage (CCS)

A method to reduce carbon dioxide emissions, by removing the gases and storing them in underground geological structures.

## Carbon footprint

An estimate of the total releases of greenhouse gases caused by the actions of an individual, group of people, an organisation or activity. The amounts of all greenhouse gases are expressed as the equivalent amount of carbon dioxide.

## Carbon sequestration

Any process which removes carbon dioxide from the atmosphere, such as afforestation or underground storage (carbon capture).

## Carcinogen

A substance or energy form that can cause cancer.

## Carrying capacity

The greatest population that can be supported sustainably in an area.

## Catalytic converter

A device that reduces emissions of pollutant gases from petrol and diesel engines. Catalysts such as platinum, palladium and rhodium catalyse reactions with oxides of nitrogen, carbon monoxide and unburnt hydrocarbons.

## Catch quota

A limit on the quantity of fish that can be caught.

## Cetaceans

Marine mammals including whales, dolphins and porpoises.

## Compact fluorescent lamp (CFL)

An early design of low-energy light.

## Chronic

Exposure to a substance or symptoms that appear over long periods of time.

## Cirrus cloud

Thin, wispy clouds, usually found at altitudes above 6000m.

Cirrus clouds can reflect infrared energy emitted by the Earth's surface and emit infrared produced from absorbed sunlight.

## Clean Air Act (1956)

UK legislation to control smoke pollution by the establishment of Smoke Zones by making Control Orders in large urban areas.

## Climax communities

The relatively stable community of species present at the end of ecological succession.

## Cloning

An artificial form of asexual reproduction.

## Cnidarians

A taxon of animals that includes corals and jellyfish.

## Colonisation media

A method of demonstrating the presence of species by providing places that they can colonise which can then be checked.

## Combined heat and power station (CHP)

A power station that has a high overall energy efficiency because the heat energy from the condenser cooling water is harnessed and used, often for heating buildings.

## Community of species

A community of species is made up of the populations of all the species living in a particular area.

## Companion crops

These are crops that are grown together to benefit one or both crops by actions such as providing nutrients, controlling pests or attracting beneficial insects.

## Concentrating solar power (CSP)

A method of increasing the intensity of solar energy by using a parabolic array of mirrors to reflect the light onto a smaller area.

## Constant descent angle

A method of approaching an airport where the aircraft descends at a constant angle, usually 3°.

## Contact action (pesticide)

A pesticide that kills pests by coming in contact with them after spraying. Unlike systemic pesticides, they are not absorbed and translocated around the crops.

## Contamination

Pollution caused by the pollutant staying in contact or mixing with materials such as soil, atmosphere, water or living organisms.

## Contour ploughing

A soil erosion control measure where land is cultivated by ploughing horizontal furrows along the contours of the land.

## Convention on international trade in endangered species (CITES)

The Convention on International Trade in Endangered Species (of wild fauna and flora).

CITES is an international agreement that controls the international trade in certain species of plants and animals and their products.

## Cooling towers

A method of reducing the temperature of effluent water to reduce thermal pollution and deoxygenation.

## Coppicing

The process of regularly cutting down tree branches close to ground level. The regrowth produces thin straight branches. It was traditionally done on a cycle of 6 to 10 years for making fence panels and wall panels. Short-rotation willow coppice is now used as a biofuel.

## Cradle to cradle design

The concept of designing items such that all the materials used can be reused or disposed of without leaving toxic or harmful wastes. The concept is based on the natural systems that recycle elements without depleting resources or causing harmful wastes to build up.

## Critical group monitoring

A method of monitoring pollutants, particularly radioactive discharges. If the members of the public that are most at risk are safe, then so is everyone else.

## Critical pathway analysis (CPA)

The prediction of the routes that an effluent will take in the environment, to assess pollution risk.

## Crop rotation

The practise of growing a different crop in a field on a cycle of three, four or five years.

## Crop wild relatives (CWRs)

These are wild plant varieties or species that are closely related to domesticated crops. CWRs may contain genetic characteristics that can be used in crop breeding programmes.

## Cryosphere

All the frozen water on Earth.

## Culling

Reducing the population of a species by selective killing.

## Cut-off ore grade

The lowest purity of a mineral that can be exploited economically.

## Cyclone separator

Equipment used to remove suspended particles from gaseous effluents.

## DAFOR scale

A qualitative scale that judges the abundance of organisms. Initials stand for: Dominant, Abundant, Frequent, Occasional, Rare.

## dB scale

A logarithmic scale used to measure sound levels.

## Debt for nature swaps

These are agreements whereby an organisation agrees to pay part of a country's debt in return for a commitment to a wildlife conservation programme.

## Decomposers

Organisms that break down dead organic matter, releasing nutrients in the process. Many bacteria and fungi are decomposers. They secrete enzymes onto the dead organic matter and absorb the products of digestion.

## Deflected succession

Natural ecological succession is stopped by human actions. Long-term continuation of the actions that deflect succession will create a plagioclimax.

## Deforestation

The action of removing trees, resulting in a reduction in forest area.

## Degradability

A measure of the ease with which a material breaks down.

## Demersal

Living on the seabed e.g. cod, plaice, etc.

## Dendrochronology

The method of determining the age of a piece of wood using the characteristic sequence of sizes of growth rings in the wood.

## Detritivores

These are heterotrophic animals that ingest and digest dead organic matter. Examples include earthworms, millipedes, woodlice, dung beetles and slugs. They often break up the dead organic matter into smaller pieces, providing access to decomposers.

## Directional drilling

The drilling of wells for oil or gas that are not vertical.

## Dolphin pingers

A type of acoustic deterrent device used to deter small cetaceans so they don't get caught in fishing nets.

## Drift net

A net which hangs vertical in the water. The top is held at the surface by floats, with the bottom being held down by weights.

## Dry flue-gas desulfurisation (dry FGD)

A method of removing sulfur oxides from effluent gases using a slurry of crushed lime (mainly calcium carbonate).

## Dynamic equilibrium

A balance created by active processes whose impacts cancel each other out.

## Ecological footprint

A method of assessing the sustainability of lifestyles by estimating the biologically productive area needed to provide the resources and services needed by an individual or group.

## Ecological niche

The role that an organism plays in its habitat, including its use of resources and its inter-relationships with other species.

## Ecological succession

The sequences of changes in community composition which changes as an area is colonised and develops until a climax community is eventually produced. The time period in which a species can survive depends upon the ease with which it colonises and the biotic and abiotic conditions that it is able to survive.

## Ecosystem

The community of organisms living in an area, their inter-relationships and interactions with their abiotic environment e.g. tropical rainforest, savannah grassland, coral reef, etc. Do not confuse the term 'ecosystem' with 'biome'.

## eDNA

eDNA is DNA detected in environmental samples such as water or soil that is used to confirm the presence of the species that produced it.

## Efficiency

A measure of the amount of product compared with the inputs usually expressed as a percentage.

## El Niño

The name given to events when the wind and ocean currents in the equatorial Pacific Ocean slow significantly or reverse. It alters heat distribution and weather patterns around the Pacific area and elsewhere in the world.

El Niño events are caused by natural processes but may be made more frequent by human activities.

It is also called ENSO: El Niño Southern Oscillation.

## Electrostatic precipitator

Equipment used to remove suspended particles from gaseous effluents by attracting them to electrically charged wires or plates.

## Embodied energy

The amount of energy that was used to make and install an item.

## Embryo transfer

The transfer of fertilised eggs or embryos from one female to another, such as from a rare species into a female of a closely related species that is more common. This enables more young to be produced than could be achieved through normal breeding. It is also used in livestock breeding.

## Encapsulation

The sealing of waste in a solid material such as glass, cement or plastic to prevent its escape.

## Endemic species

An endemic species is indigenous ('native') to a particular area and is not naturally found elsewhere. It is also used in disease epidemiology to mean a disease that is normally present.

## Energy density

The amount of energy in a particular mass of fuel or that can be harnessed by a particular mass of equipment.

## Eradication

The reduction of the population of a species by removal or culling.

## Escape panels

A spring-loaded part of a fishing net through which large by-catch organisms can escape e.g. turtles.

## European Union Common Fisheries Policy (EU CFP)

This is a set of regulations intended to ensure the sustainable management of fish stocks within the EU.

## EDGE species (evolutionary, distinct and globally endangered)

These are species that are threatened with extinction and have few relatives that are genetically similar. This genetic uniqueness means they should be a high priority for conservation.

## Exoskeleton

A skeleton on the outside of an organism, as found in insects and crustaceans.

## Exposure

In ionising radiation control, this refers to an object or person receiving radiation but not necessarily coming in contact with the source.

## Ex-situ conservation

The conservation of a species in an area which is not its natural habitat.

## Feedback mechanisms

A process where an action has consequences which affect the original process.

Positive feedback mechanisms increase the rate of the original action while negative feedback mechanisms reduce it.

## Flagship species

High-profile species that can be used to raise support for the conservation of their habitat and all the other species that live there.

## Food conversion ratios (FCRs)

A measure of the efficiency with which an organism converts its food into its own increasing biomass.  $FCR = \text{mass of food needed to produce one unit of new tissue}$ .

## Fuel cell

An electrochemical device that produces electricity from the chemical reaction between two substances (usually hydrogen or an alcohol) and oxygen.

## Genetic engineering/genetic modification (GM)

The method of altering an organism's genetic makeup by artificially introducing genes from another organism, often of another species.

## Ghost fishing

The capture and death of organisms that get caught in lost or discarded fishing gear.

## Gonadic

Relating to ovaries and testes.

## Gravimetry

A geological exploration technique that detects changes in the force of gravity.

## Grays

A unit of energy absorbed from ionising radiation.

## Greenhouse gas (GHG)

A gas that absorbs infra-red radiation emitted by the Earth's surface and causes atmospheric heating. Carbon dioxide and water vapour are the main naturally occurring greenhouse gases. Anthropogenic greenhouse gases include carbon dioxide, methane, NO<sub>x</sub> (Nitrogen Oxides), CFCs (Chlorofluorocarbons) and tropospheric ozone.

## Haber process

The industrial process that combines nitrogen from air with hydrogen from natural gas to produce ammonia.

## Habitat

The place where an organism, species or population lives.

## Haemoglobin

The protein in red blood cells that carries oxygen.

## Hard release

The release of animals from captivity where they are not provided with post-release support such as food.

## Horizontal axis wind turbines (HAWT)

Wind turbines where the blades rotate around a generator that has a horizontal axis of rotation.

## Hydraulic fracturing

A method using high pressure fluids to open cracks in fine-grained shales to allow trapped oil and gas to flow so it can be extracted.

## Hydrodynamics

The study of the flow of water, often in relation to ship design to reduce resistance to movement to reduce fuel use.

## Hydrogen economy

The proposal that hydrogen produced by electrolysis of water could be used as the main fuel to meet a country's energy demands.

## Hydrology

The study and understanding of the movement, distribution and properties of water in the environment.

## Hydrosphere

All the water on Earth, found in solid, liquid or gaseous form in a variety of reservoirs, including the oceans, ice caps, rivers and lakes, soil, groundwater, atmosphere and living organisms.

## Hydrothermal deposition

The deposition of mineral deposits from hot mineral-rich solutions.

## Incineration

The breakdown of a waste by burning it.

## In-situ conservation

The conservation of a species in its natural environment.

## Insolation

Sunlight that reaches a particular location.

## In-stream turbines

Tidal turbines that are rotated by marine currents, but without having a barrage to focus the water flow.

## Intensive agriculture/aquaculture

Agriculture/aquaculture where the yield is achieved with high levels of inputs. Productivity is usually high (yield per unit area) but efficiency is usually low (yield per unit input).

## International tropical timber organisation (ITTO)

An intergovernmental organisation which promotes the conservation and sustainable management, use and trade of tropical forest resources.

## International union for conservation of nature (IUCN)

This is an organisation of 1300 government and non-governmental organisations that provides information on the status of the natural world and the measures needed to safeguard it.

Meetings every four years drive their global agenda and have produced major agreements such as CITES and the Ramsar convention.

## International whaling commission (IWC)

The IWC is an international organisation which aims to ensure the sustainable exploitation of whales.

## Keystone species

A species that has much more important ecological functions within their ecosystem than their abundance might suggest. Such roles may include the control of the populations of other species, the provision of food or species that control structural habitat features, such as beavers creating dams.

## Kick sampling

A method of sampling aquatic invertebrates by disturbing the substrate.

## Kinetic energy recovery system (KERS)

A method of slowing a vehicle by using the kinetic energy of the vehicle to turn a flywheel or charge batteries. The stored energy is used for acceleration which reduces the amount of fuel that needs to be used.

## K-selected species

Species that have a relatively low breeding capacity: they often mature at a later age and have few young.

## Laser fusion

A developmental nuclear fusion technique that uses a laser beam to cause fusion in beads of frozen hydrogen.

## Lasky's principle

The theoretical model stating that, as the purity of available mineral deposits declines in a linear fashion, there is a logarithmic increase in the amount of the material present.

## Leachate

Drainage water that carries other substances, either in solution or as suspended solids.

## LED (Light emitting diode)

These are very energy-efficient lights.

## Legumes

Plants with symbiotic nitrogen fixing bacteria in root nodules e.g. peas and beans.

## Light traps

A method of sampling populations of night-flying organisms that are attracted to lights, especially moths.

## Limecrete

An alternative to concrete that has a much lower embodied energy because it uses calcium hydroxide rather than cement.

## Lincoln index

A catch, mark, release, recapture method of estimating animal populations.

## Liposolubility

A measure of how easily a substance dissolves in fats and oils.

## Lithosphere

The relatively hard outer layer of the Earth comprising the crust and upper layer of the mantle. It is the source of mineral resources such as metal ores and affects soil formation and properties.

## Local nature reserve (LNR)

LNRs are designated under the National Parks and Access to the Countryside Act (1949) for their local importance for wildlife, geology, education or public enjoyment. They are controlled or owned by local authorities.

## Long lining

A fishing method with many hooks attached to a main fishing line that is trailed behind the fishing boat. They can be used to catch pelagic or demersal fish.

## Magnetometry

A method of detecting mineral deposits based on their magnetism.

## Magnetosphere (of Earth)

The magnetic field around Earth which deflects charged particles travelling from the Sun.

## Marine conservation zone (MCZ)

MCZs are designated under UK law to protect a range of nationally important marine wildlife, habitats, geology and geomorphology, and can be designated anywhere in English and Welsh territorial and offshore waters.

## Marine nature reserve (MNR)

MNRs were designated under the Wildlife and Countryside Act (1981) by Natural England (or CCW).

Lundy Island and Skomer Island were MNRs, they have been re-designated as MCZs.

## Marine protected area (MPA)

A general name for marine areas that are legally protected for their wildlife, historical and cultural features. The legal protection is provided by the laws of the country involved.

## Maximum sustainable yield (MSY)

The greatest amount that can be harvested sustainably.

## Metamorphic processes

Geological processes that change the form of a rock with heat and/or pressure, but without melting it.

## Methane hydrate

A solid compound of methane trapped in ice crystals, often found in marine sediments.

## Monoculture

The growth of a single type of crop, usually over a large area.

## Montreal protocol

The international agreement that controlled the manufactured and use of CFCs and other ozone depleting substances.

## Mulch

Material placed on the soil surface to reduce evaporation losses and reduce weed growth.

## Multicropping

A form of polyculture where two or more different crops are grown in an area at the same time.

## Mutagen

A material that can cause changes in DNA structure.

## National nature reserve (NNR)

They are designated under UK law by the National Parks and Access to the Countryside Act (1949). They include important habitats with complete communities of species. They are designated by Natural England (or CCW).

## Natura 2000

A network of protected sites in the EU that combine the SPAs and SACs set up under the EU birds and habitats directives.

## Neonicotinoids

A widely used group of insecticides. They have been linked with the deaths of bees, especially when they act synergistically with some fungicides.

## Oil shales

Fine sedimentary rock that contains kerogen: a solid form of crude oil.

## Organochlorines

Hydrocarbon-based compounds that include chlorine. Their use is now banned or restricted.

## Overburden

The soil and rock above a mineral deposit that must be removed to provide access.

## Overfishing

Fishing above the MSY of a population.

## Pantograph

The electricity pick-up on the roof of a locomotive that allows the use of electricity from overhead cables.

## Pathogens

Organisms that cause disease.

## Peak shaving

The process of storing surplus energy to satisfy later peaks in demand.

## Peat bog

A wetland area with an accumulation of dead plant material, especially moss.

## Pelagic

Living near the water surface e.g. herring, tuna, etc.

## Permaculture

An agricultural system that incorporates the principles of natural ecosystems.

## Permafrost

A layer of soil in which the water is permanently frozen, often trapping bubbles of gases such as methane.

## Persistence

A measure of the rate at which a material breaks down and therefore the length of time it remains.

## Pheromone

A chemical released by an organism that changes the behaviour of other members of the same species, especially to attract a mate.

## Photoautotroph

An organism that produces high-energy food substances using sunlight in photosynthesis.

## Photochemical smogs

Atmospheric pollution events in which pollutants such as hydrocarbons, NO<sub>x</sub> and tropospheric ozone interact to produce more toxic pollutants such as PANs (peroxy acetyl nitrates).

## Photothermal

A system that converts light into heat.

## Photovoltaic (PV)

A system that converts light into electricity.

## Phytomining

A method used to extract metals that have been absorbed and concentrated by plants. It can be used as a method to exploit low purity metal deposits or decontaminate polluted areas.

## Phytoremediation

A method of decontaminating a polluted site by growing plants that absorb the toxic materials.

## Pioneer species

One of the first species to colonise an area at the start of ecological succession. They are usually well adapted to extreme abiotic factors.

## Pitfall trap

A method of sampling populations of mobile animals that live on the soil surface, by collecting individuals that fall into traps set into the ground.

## Plagioclimax

A community of species that does not develop to a natural climatic climax community, but is maintained by external influences which prevent this, including human activities such as burning, grazing or ploughing.

## Ploughing

The cultivation of the soil by turning over the surface layer.

## Plutonium reactors

Nuclear fission reactors that use plutonium as the fissile fuel.

## Polar vortex winds

Winds that blow around the north and south poles in a circular manner which reduce the mixing of polar air masses with the rest of the atmosphere.

## Pollarding

The process of regularly cutting down tree branches above ground level, usually to prevent the regrowth being eaten by animals such as livestock or deer. It is usually done on a cycle of 5 to 30 years.

## Pollen analysis

The use of the pollen present in environmental samples. This can be used to deduce the climate when historic sediments were deposited.

## Polyculture

An agriculture/aquaculture system involving the growth of more than one species in the same area at the same time.

## Population

All the individuals of a species living in a particular area.

## Power to gas systems (P2G)

A method of using surplus electricity which would be wasted to produce methane gas.

## Productivity

A measure of the yield of a system, often expressed as the yield per unit area, time or input.

## Proterozoic marine sediments

These include the iron oxide deposits produced by the reaction of dissolved iron minerals with the oxygen produced by photosynthesis. This occurred in the early Proterozoic era and delayed the build-up of oxygen in the atmosphere.

## Proxy data

The use of data that can be collected to predict the values of a related factor that cannot be measured, e.g. data on tree rings, pollen, coral growth and plankton in marine sediments can be used to determine historic climates.

## Pumped storage hydro-electric power (HEP)

An energy storage system where surplus electricity is used to pump water from a lower reservoir to a higher one. The energy stored as gravitational potential energy is allowed to flow downhill to generate electricity during periods of high electricity demand.

## Purse seining

A fishing method where a net is used to encircle a shoal of pelagic fish.

## Pyrethroids

Synthetic insecticide pesticides, based on the natural chemicals originally extracted from chrysanthemum flowers (pyrethrins). They are not persistent and have low mammalian toxicity.

## Quadrat

An area, usually square or circular, in which samples are taken. The size of the quadrats depends upon the organisms being studied.

## Rammed earth

A wall construction method where materials such as clay, soil, straw and sand are compacted. Because no cement is used, it has a low embodied energy.

## Ramsar site

A wetland site designated to protect its biodiversity under an international agreement: The Ramsar Convention on Wetlands (1971), especially as a habitat for water birds. They are designated in the UK by DEFRA.

## Relative biological effectiveness (RBE)

This is a measure based on the amount of energy absorbed from ionising radiation which takes into account the damaging effects of the type of radiation.

## Remote sensing

Any method of monitoring the features of a location from another location, normally used to describe surveys from satellites or high-flying aircraft.

## Resistivity

A method of predicting the mineral composition of mineral deposits underground using the ease with which they conduct electricity.

## Reverse thrusters

A method used on most aircrafts to slow down after landing.

## Risk: benefit analysis

A method to inform decision making by comparing the risks of carrying out an activity with the benefits of doing so.

## R-selected species

Species that have a relatively high breeding capacity: they often mature at a young age and have large numbers of young.

## Salinity

A measure of the salt concentration of a solution.

## Satellite imagery

The collection of images using satellites: visible light, infra-red, microwaves etc.

## Secondary succession

Ecological succession that takes place in an area where the existing climax community has been disturbed or destroyed.

## Seismic surveys

These use sound waves produced at the surface that reflect off underground geological structures to determine the depth and shape of the rock structures. The reflected sound waves are detected by geophones at the surface.

## Sere

A stage in ecological succession in the changes that occur, eventually producing the climax community.

## Shellfish

All the aquatic animals that are caught or grown to be eaten that have shells or an exoskeleton e.g. crustaceans and molluscs.

## Sievert

A unit of absorption of ionising radiation absorption that takes into account the amount of energy absorbed and the Relative Biological Effectiveness of the type of radiation.

## Simpson's index of biodiversity

A quantitative measure of the number of species and the abundance of each in an area.

## Sites of special scientific interest (SSSI)

SSSIs are designated by Natural England (or CCW) under UK law by The Wildlife and Countryside Act (1981) because of their importance for plants, animals, geological features or land forms.

## Smart motorways

A method of relieving traffic congestion which allows driving on the hard shoulder and reduces the speed limit during periods of heavy traffic flows.

## Smog

Atmospheric pollution event involving smoke and fog (see also [photochemical smog](#)).

## Soft release

The release of animals from captivity where they are provided with post-release support such as food.

## Somatic

An issue related to general body cells, but not the gonads (ovaries and testes).

## Sonograms

A graph showing the volumes of sounds at different frequencies.

## Special Area of Conservation (SAC)

SACs are designated by Natural England (or CCW) under the EU Habitats Directive to protect internationally important habitats for rare and vulnerable species.

## Special Protection Area (SPA)

SPAs are designated by Natural England (or CCW) under the EU Birds Directive to protect areas for rare and vulnerable bird species.

## Species

A group of organisms that resemble each other more than other organisms and naturally interbreed to produce fertile offspring.

## Sterile male techniques

A method of insect pest control that uses the release of males that have been sterilised. If they mate, no offspring will be produced.

## Strip cropping

The growth of more than one crop in alternating narrow strips, so that different sowing and harvesting times reduce soil erosion because the whole field is never all bare at the same time.

## Surber sampler

A method of sampling aquatic invertebrates by disturbing the substrate that produces more reliable quantitative data than kick sampling.

## Sweep nets

A method of sampling populations of flying insects and invertebrates among vegetation.

## Synergism

The process where the presence of two materials produces a greater effect than the sum of their individual effects.

## Systemic

A substance that is absorbed and transported throughout an organism e.g. by sap in plants.

## Tar sands

Very viscous crude oil found in sand.

## Taxon

A group of organisms based on their biological similarities e.g. domain, kingdom, phylum, class, order, family, genus, species, etc.

## Temperature inversion

A situation in the troposphere where the temperature is lower than normal so that relatively warm air lies above cold air.

## Teratogen

A substance that interferes with gene function in a growing embryo so that a non-inherited birth abnormality is produced.

## Terracing

The replacement of a sloping landscape by the creation of a series of narrow horizontal stepped strips, often used to reduce soil erosion.

## Thermal mass

A measure of the ability of a material or structure to absorb and store heat.

## Thermal stratification

The changing temperatures in different layers of the atmosphere.

## Thermohaline circulation

The movement of ocean currents caused by changes in temperature, salinity and density.

## Thorium reactor

A reactor that uses thorium 232 as a fertile fuel. Neutron bombardment converts the thorium 232 into uranium 233 which is fissile and releases energy.

## Tidal barrage

A tidal power scheme where a dam-like barrage is built across a bay or estuary so that all flowing water flows through the sluice tunnels in the barrage causing the turbines and generators to turn.

## Tidal lagoon

A tidal power scheme where a section of a bay or estuary is impounded by a seawall which has sluice tunnels and turbines like a tidal barrage. The environmental impacts are lower than those of a barrage as it only covers part of the bay or estuary.

## Tidal power

A method of generating electricity using the tidal water flow caused by the gravitational forces between the Moon and Earth.

## Tied ridging

A method of reducing soil erosion by creating a grid of raised ridges that cause rainfall to collect, increasing infiltration and reducing runoff.

## Tillage

The cultivation by turning the soil e.g. by ploughing.

## Tipping point

A tipping point is reached when the changes caused by human activities cause further changes such that the human activities are no longer needed to maintain the changes.

## Topography

The 3D shape of the land surface.

## Toroidal reactor

A nuclear fusion reactor in which hydrogen plasma is held in a torus: a ring-shaped tube.

## Toxicity

A measure of how poisonous a substance is, usually caused by its ability to cause enzyme inhibition.

## Transect

A line or belt of sampling sites across an area.

## Transgenics

The process of artificially transferring genetic material from one organism into an individual of another species.

## Tüllgren funnel

A piece of equipment used to extract invertebrates from soil or leaf litter.

## Turbidity

A measure of the level of suspended solids in water which affects the ability of light to penetrate the water.

## Universal Soil Loss Equation (USLE)

A formula that can be used to calculate rates of soil erosion.

## Urea spray

A method of reducing NO<sub>x</sub> emissions e.g. from coal-fired powered power stations.

## Vavilov centre

An area of the world, identified by the Russian zoologist Nikolai Vavilov, where crop plants were first domesticated and where wild varieties are still found.

## Vehicle to grid systems (V2G)

An energy storage method in which the batteries in vehicles are connected to the local electricity grid. If there is a shortage of electricity from other sources, a proportion of the energy from the batteries can be used to maintain supplies.

## Vertical Axis Wind Turbines (VAWT)

Wind turbines where the blades rotate around a generator that has a vertical axis of rotation.

## Wave power

A method of generating electricity using the movement of water caused by winds blowing over the water surface.

## Wet FGD

A method of removing sulfur oxides from effluent gases by dissolving them in a solution such as a spray of sodium sulphite solution.

## Wildlife and Countryside Act (1981)

A UK law that provides protection for many wildlife species and designated protected areas such as SSSIs. Most birds and many mammals are protected.

## Windbreaks

Hedgerows and rows of trees that reduce wind velocity to reduce soil erosion.