

AQA Geography A-level

Water and Carbon Cycles

Glossary of Definitions



Acidification - The gradual reduction of pH of the oceans, due to dissolving carbon dioxide from the atmosphere.

Afforestation - Planting trees and vegetation in the aim of increasing forest cover.

Anticyclone - A system of high pressure, causing high temperatures and unseasonably high evaporation rates.

Aquifer - A permeable or porous rock which stores water.

Biofuel - Burning crops and vegetation for electricity and heat.

Carbon Capture & Storage (CCS) - The capture of carbon dioxide emissions directly from the factory, pumped into disused mines rather than being released into the atmosphere.

Carbon Fluxes - The movement of carbon between stores.

Carbon Neutral - A process that has no net addition of carbon dioxide to the environment.

Carbon Stores - Places where carbon accumulates for a period of time such as rocks and plant matter.

Channel Flow - Water flowing in a rivulet, stream or river.

Choke Points - Points in the logistics of energy and fuel that are prone to restriction.

Combustion - The process of burning a substance, in the presence of oxygen, to release energy.

Convective Precipitation - Solar radiation heats the air above the ground, causing it to rise, cool & condense forming precipitation (often as thunderstorms).

Cryosphere - The global water volume locked up within a frozen state (i.e. snow and ice).

Decomposition - The break down of matter, often by a decomposer which releases carbon dioxide through their own respiration.

Depression - A system of low pressure, with fronts of precipitation where low and high pressure air masses meet.



Desalination Plant - The conversion of seawater to freshwater, suitable for human consumption.

Desublimation - The change of state of water from gas to solid, without being a liquid (the opposite process to sublimation).

Drainage Basin - The area of land drained by a river and its tributaries.

Drainage Density - The total length of all rivers & streams divided by the area of the drainage basin.

Drought - An extended period of deficient rainfall relative to the statistical average for the region (UN).

Economic Water Scarcity - When water resources are available but insufficient economic wealth limits access to it.

Energy Mix - The composition of a country's energy sources.

Energy Security - The ownership and full control of a country's energy source, production and transportation.

Energy Pathway - The movement of energy from its extraction or source, through pipes, freight logistics or cabling.

Energy Players - Key companies and individuals who own, distribute and sell energy and energy sources.

Enhanced Greenhouse Effect - The build-up of greenhouse gases in the atmosphere, reducing the amount of solar radiation reflected into space.

ENSO Cycles - El Niño Southern Oscillations - naturally occurring phenomena that involves the movement of warm water in the Equatorial Pacific.

Evapotranspiration - The combined total moisture transferred from the Earth to the atmosphere, through evaporation and transpiration.

Frontal Precipitation - Where air masses of different temperatures meet at a front, one mass will be forced over another, causing precipitation beneath the front.



Global Hydrological Cycle - The continuous transfer of water between land, atmosphere and oceans. The Earth is a closed system.

Groundwater Flow - Water moving horizontally through permeable or porous rock due to gravity.

Hydrological Drought - Insufficient soil moisture to meet the needs of vegetation (crops, trees, plants) at a particular time

Infiltration - The movement of water vertically through the pores in soil.

Integrated Drainage Basin Management - Establishing a frame of coordinated efforts between administrations (e.g. local government) and stakeholders (e.g. businesses) to achieve balanced management of a basin (World Bank).

Inorganic Carbon - Carbon stored in carbonated rocks.

Interception - Raindrops are prevented from falling directly onto the ground, instead hitting the leaves of a tree.

Meteorological Drought - When long-term precipitation trends are below average.

Monsoon - The drastic variation between wet and dry seasons for sub-tropical areas, caused by a changed prevailing wind. Can lead to annual flooding.

Non-Renewable - A source of energy that can only be used once to generate electricity or takes thousands of years to replace e.g. Fossil Fuels.

Nuclear Fusion - The process of joining atomic nuclei together, to produce energy.

OPEC - Oil and Petroleum exporting countries. An organisation that supports and coordinates fossil fuel exporting countries.

Open System - A system affected by external flows and inputs (such as a drainage basin, or a sediment cell).

Organic Carbon - Carbon stored in plant material and living organisms.

Outgassing - The release of dissolved carbon dioxide (e.g. at plate boundaries, warming the oceans).

Percolation - Water moving vertically from soil into permeable rock.



Photosynthesis - The process of converting carbon dioxide and water into glucose and oxygen. All plants and some organisms rely on this process to survive.

Physical Water Scarcity - A physical lack of available freshwater which cannot meet demand.

Phytoplankton - Small organisms that rely on photosynthesis to survive, so intake carbon dioxide from the atmosphere.

Primary Energy - The initial source of energy, as it is naturally found. This could be natural ores, water, crops or radioactive material.

Relief Precipitation - Precipitation caused when air masses are forced to rise over high land, determined by the relief/ morphology of the land.

Renewable - Primary energy that can be re-used to produce electricity or has a short lifetime, therefore any used can be replaced quickly e.g. Hydroelectric, biomass, solar.

Respiration - The process of converting glucose and oxygen into carbon dioxide and energy. Some organisms rely on respiration to survive.

River Regime - The pattern of river discharge over a year.

Runoff - Water flowing over the surface of the ground eg. after precipitation or snowmelt.

Salinisation - Where salt water contaminates freshwater stores or soils, creating saline conditions and reducing human use/ consumption.

Saltwater Encroachment - The movement of saltwater into freshwater aquifers or soils. This may be caused by sea level rise, storm surges or over-extraction.

Secondary Energy - The product of primary energy, mostly electricity.

Sequestration - The transfer of carbon from the atmosphere to stores elsewhere - living biosphere, inorganic rocks, etc.

Smart Irrigation - Providing crops with a water supply less than optimal, to make crops resistant to water shortages.



Storm Hydrograph - Variation of river discharge over a short period of time (days).

Sublimation - The change of state of water from solid to a gas, without being a liquid.

Thermohaline Circulation - The movement of volumes of seawater from cold deep water to warm water surface water.

Throughflow - Water moving horizontally through the soil, due to gravity.

Tipping Point - A critical threshold where any changes to a system after the tipping point are irreversible.

Transpiration - The process through which water evaporates through the stomata in plants' leaves.

Urbanisation - The growth of populations in towns and cities.

Water Budget - The annual balance between inputs and outputs within a system.

Water Conservation - Strategies to reduce water usage and demand.

Water Recycling - The treatment and purification of waste water, to increase supply.

Water Scarcity - There are limited renewable water sources (between 500 and 1000 cubic metres per capita per year).

Water Security - The ability to protect and access a sustainable source to adequately meet demand.

Water Sharing Treaty - International agreements for transboundary sources.

Water Transfer - Hard engineering projects, such as pipelines or aqueducts, that divert water between basins to meet demand.

Watershed - The boundary between neighbouring drainage basins.

