

DEFINITIONS

ALGAE - (Latin for "seaweeds"), are a large and diverse group of simple, typically autotrophic organisms, ranging from unicellular to multicellular forms. They are photosynthetic, like plants, and "simple" because they lack the many distinct organs found in land plants. Algae are prominent in bodies of water. Algae are variously sensitive to different factors, which has made them useful as biological indicators

ALUM SLUDGE - Alum is a chemical flocculent used to clarify water by catching the very fine suspended particles in a gel-like precipitate of aluminum hydroxide. This sinks to the bottom of the containing vessel and can be removed in a variety of ways. Sludge is the residual, semi-solid material left from industrial, or water treatment processes.

AQUIFER - A layer of relatively porous substrate that contains and transmits groundwater. When water can flow directly between the surface and the saturated zone of an aquifer, the aquifer is unconfined. The deeper parts of unconfined aquifers are usually more saturated since gravity causes water to flow downward.

BACTERIA - A large group of unicellular microorganisms. Typically a few micrometres in length, bacteria have a wide range of shapes, ranging from spheres to rods and spirals. Bacteria are ubiquitous in every habitat on Earth, growing in soil, acidic hot springs, radioactive waste, water, and deep in the Earth's crust, as well as in organic matter and the live bodies of plants and animals. There are typically 40 million bacterial cells in a gram of soil and a million bacterial cells in a millilitre of fresh water; in all, there are approximately five nonillion (5×10^{30}) bacteria on Earth, forming much of the world's biomass. Under optimal conditions, bacteria can grow and divide extremely rapidly, and bacterial populations can double as quickly as every 9.8 minutes

CAT/DEL – Abbreviation for Catskill/Delaware System is that portion of the NYC water supply system consisting of six reservoirs West of the Hudson River and

three reservoirs East of the Hudson River. Approximately, it supplies 40% of the water via the Catskill Aqueduct and 50% via the Delaware Aqueduct.

CONSERVATION EASEMENT - An encumbrance — sometimes including a transfer of usage rights (easement) — which creates a legally enforceable land preservation agreement between a landowner and a government agency for the purposes of conservation. The property remains the private property of the landowner. The primary purpose of a conservation easement is to protect land from certain forms of development or use. Landowners who donate a "qualifying" conservation easement may be eligible for a federal income tax deduction equal to the value of their donation.

CONTIGUOUS - A series of things in continuous connection, a grouping of parts in contiguous physical contact

CROTON – That portion of the NYC water supply system consisting of ten reservoirs located East of the Hudson River and supplies 10% of the water and at least 30% during droughts.

CRYPTOSPORIDIUM - A protozoan parasite. It affects the intestines of mammals and is typically an acute short-term infection. It is spread through the fecal-oral route, often through contaminated water. The parasite is transmitted by environmentally hardy cysts (oocysts) that, once ingested, exist in the small intestine and result in an infection.

DEVELOPMENT - Developers purchase a tract of land, determine the marketing of the property, develop the building program and design, obtain the necessary public approvals and financing, build the structure, and lease, manage, and ultimately sell it.

DIVERSION - The rerouting of water as part of a water supply network for drinking water .

EFFLUENT - An outflowing of water from a natural body of water, or from a man-made structure. Effluent in the man-made sense is generally considered to be water pollution, such as the outflow from a sewage treatment facility or the wastewater discharge from industrial facilities. In the context of waste water

treatment plants, effluent that has been treated is sometimes called *secondary effluent*, or *treated effluent*.

ENDOCRINE DISRUPTERS - The theory of endocrine disruption posits that low-dose exposure to chemicals that interact with hormone receptors can interfere with reproduction, development, and other hormonally mediated processes. Sometimes also referred to as **hormonally active agents** these are exogenous substances that act like hormones in the endocrine system and disrupt the physiologic function of endogenous hormones. Health effects attributed to endocrine disrupting compounds include a range of reproductive problems (reduced fertility, male and female reproductive tract abnormalities, and skewed male/female sex ratios, loss of fetus, menstrual problems, changes in hormone levels; early puberty; brain and behavior problems; impaired immune functions; and various cancers).

EUTROPHIC - An increase in chemical nutrients — compounds containing nitrogen or phosphorus — in an ecosystem, and may occur on land or in water. Eutrophication is frequently a result of nutrient pollution, such as the release of sewage effluent, urban stormwater run-off, and run-off carrying excess fertilizers into natural waters. Eutrophication generally promotes excessive plant growth and decay, favors certain weedy species over others, and is likely to cause severe reductions in water quality.

EXPORT COEFFICIENT – The transfer of nutrients from a substrate into water. A coefficient is a factor multiplicative (*For methods of computing products, including those of very large numbers*) factor of a certain object. A coefficient is a number placed in front of a term in a chemical equation to indicate how many particles take part in the reaction

FECAL COLIFORM - Are bacteria capable of growth in the presence of bile salts or similar surface agents,, and produce acid and gas from lactose within 48 hours at $44 \pm 0.5^{\circ}\text{C}$

Fecal coliforms include the genera that originate in feces. The assay is intended to be an indicator of fecal contamination, or more specifically *E. coli* which is an indicator microorganism for other pathogens that may be present in feces. As

recently as April 2006, many official websites including that of the Environmental Protection Agency failed to address the fact that presence of fecal coliforms does not necessarily indicate the presence of feces, as well as not being directly harmful.

FOREST - A forest is an area with a high density of trees. These plant communities presently cover approximately 9.4% of the Earth's surface (or 30% of total land area) in many different regions and function as habitats for organisms, hydrologic_flow modulators, and soil conservers, constituting one of the most important aspects of the Earth's biosphere.

FUNGICIDE - Chemical compounds or biological organisms used to kill or inhibit fungi or fungal spores. Fungicide residues have been found on food for human consumption. There are also recorded incidences of pathogens evolving multiple drug resistance.

GENOTYPING - Refers to the process of determining the genotype of an individual by the use of biological assays. Genotyping provides a measurement of the genetic variation between members of a species. Viruses for instance, or bacteria, can be genotyped. Genotyping in this context may help in controlling the spreading of pathogens, by tracing the origin of outbreaks.

GIARDIA - Is a parasite that colonize and reproduce in the small intestines, causing giardiasis. Their life cycle alternates between an actively swimming trophozoite and an infective, resistant cyst.

GLACIAL TILL - That part of glacial drift which was deposited directly by the glacier. It may vary from clays to mixtures of clay, sand, gravel and boulders. As a glacier melts, especially a continental glacier, large amounts of till are washed away and deposited in any proglacial lakes which may form

GROUNDWATER - Water located beneath the ground surface in soil pore spaces and in the fractures of lithologic formations. Groundwater can be found at nearly every point in the Earth's shallow subsurface, to some degree. Groundwater is recharged from, and eventually flows to, the surface naturally and can form oases or wetlands.

Groundwater is hypothesized to provide lubrication that can possibly influence the movement of faults.

Cause for concern is that groundwater drawdown from aquifers has the potential to cause severe damage to both terrestrial and aquatic ecosystems – in some cases very conspicuously but in others quite imperceptibly because of the extended period over which the damage occurs

HEADWATER - The source of a river or stream is the place from which the water in the river or stream originates. Headwaters are the most extreme upstream areas of a watershed. The river source is generally on or quite near the edge of the watershed

HERBICIDE - A substance used to kill unwanted plants. Herbicides used to clear waste ground, industrial sites, railways and railway embankments are non-selective and kill all plant material with which they come into contact

HYDROLOGY - Is the study of the movement, distribution, and quality of water throughout the Earth. The study of the distribution and movement of groundwater is hydrogeology, also called groundwater hydrology. By analyzing the statistical properties of hydrologic records, such as rainfall or river flow, hydrologists can estimate future hydrologic phenomena, assuming the characteristics of the processes remain unchanged.

INFRINGEMENT - In a legal context, an **infringement** refers to the violation of a law or a right.

INSECTICIDE - A pesticide used against insects. They include ovicides and larvicides used against the eggs and larvae of insects respectively. Nearly all insecticides have the potential to significantly alter ecosystems; many are toxic to humans; and others are concentrated in the food chain

MACRONUTRIENTS -.Nutrients needed in relatively large quantities are called macronutrients and those needed in relatively small quantities are called micronutrients. Usually they are sourced from inorganic (e.g. carbon dioxide, water, nitrate, phosphate, sulfate) or organic (e.g. carbohydrates, lipids, proteins)

compounds, although elemental diatomic molecules of nitrogen and (especially) oxygen are often used.

MARCELLUS SHALE - Marine sedimentary rock found in eastern North America. Named for a distinctive outcrop near the village of Marcellus, New York. It extends throughout much of the Appalachian Basin. The impervious limestone layers of the Onondaga directly below the Marcellus, and the Tully Limestone at the top of the Hamilton Group, have trapped valuable natural gas reserves in this formation. The gas is produced by thermogenic decomposition of organic materials in the sediments under the high temperature and pressure generated after the formation was buried deep below the surface of the earth.

MARSH - A type of wetland which is subject to frequent or continuous flood. Typically the water is shallow and features grasses, rushes, reeds, typhas, sedges, and other herbaceous plants. Woody plants will be low-growing shrubs Marshes are critically important wildlife habitat. Constructed wetlands featuring surface-flow design are usually in the form of a marsh.

MICROFILTRATION - A filtration process which removes contaminants from a fluid (liquid & gas) by passage through a microporous membrane. A typical microfiltration membrane pore size range is 0.1 to 10 micrometres (μm). Microfiltration is reverse osmosis, ultrafiltration or nanofiltration, differing in terms of the size of the molecules it retains. Membrane filters found immediate application in the field of microbiology and in particular in assessment of safe drinking water

MITIGATION - To "mitigate" means to make less harsh or hostile. Environmental mitigation is typically a part of an environmental crediting system established by governing bodies which involves allocating debits and credits. Debits occur in situations where a natural resource has been destroyed or severely impaired and credits are given in situations where a natural resource has been deemed to be improved or preserved. Because ecological success of mitigation work is not guaranteed, there is a greater risk of net environmental loss through failed, ineffective mitigation work intended to compensate for existing functioning natural resources

!!!MULTI-BARRIER – Controls to prevent contamination of drinking water reservoirs using many differing methods.

NITRATES - A salt of nitric acid with an ion composed of one nitrogen and three oxygen atoms (NO_3^-). Almost all inorganic nitrate salts are soluble in water at standard temperature and pressure.

NONPOINT – Pollution sources that are not located in a controlled area.

NUTRIENTS - A chemical that an organism needs to live and grow or a substance used in an organism's metabolism which must be taken in from its environment. The chemical elements consumed in the greatest quantities by plants are carbon, hydrogen, and oxygen. These are present in the environment in the form of water and carbon dioxide; energy is provided by sunlight. Nitrogen, phosphorus, potassium, and sulfur are also needed in relatively large quantities. Together, these are the elemental **macronutrients** for plants, often represented by the acronym CHNOPS. Bacteria are vital in recycling nutrients, with many steps in nutrient cycles depending on these organisms, such as the fixation of nitrogen from the atmosphere and putrefaction.

OOCYSTS/CYSTS - An oocyst is the thick-walled spore phase of certain protists (sporozoans), such as *Cryptosporidium* and *Toxoplasma*. This state can survive for lengthy periods outside a host and is very resistant.

ORDINANCE - A law made by a colony, or a municipality or other local authority, see also Local ordinance these laws are enforced locally in addition to state law and federal law

PARTICLE COUNT - Liquid Particle Counters are used to determine the quality of the liquid passing through them. The size and number of particles can determine if the liquid is clean enough to be used for the designed application. Liquid particle counters can be used to test the quality of drinking water.

PARTICULATES - Are tiny particles of solid or liquid suspended in a gas or liquid. In water pollution, particulates can either be in a solid or dissolved state. Solid particulates can be removed by filters or settle from the water, and is referred to as insoluble particulate matter. Whereas, dissolved particulate matter in water is

collected by allowing the water to evaporate, leaving behind the dissolved particulate matter. Salt is an example of dissolved particulate matter.

PHARMACEUTICALS - Can be loosely defined as any substances intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease. Since the 1990s water contamination by pharmaceuticals has been an environmental issue of concern. Most pharmaceuticals are deposited in the environment through human consumption and excretion. Once in the water they can have diverse, subtle effects on organisms

PHOSPHORUS - Is an essential element for all living cells. The most important commercial use of phosphorus-based chemicals is the production of fertilizers.

Phosphates cause pollution problems in lakes and streams. Over enrichment of phosphate can lead to algal bloom, because of the excess of nutrients. This causes more algae to grow, bacteria consumes the algae and causes more bacteria to increase in numbers. They use all the oxygen in the water during cellular respiration, causing many fish to die.

POTASSIUM - Potassium makes up about 1.5% of the weight of the Earth's crust and is the seventh most abundant element. Potassium compounds generally have excellent water solubility, due to the high hydration energy of the K^+ ion. The potassium ion is colorless in water

REMEDICATION - Means providing a remedy, so **environmental remediation** deals with the removal of pollution or contaminants from environmental media such as soil, groundwater, sediment, or surface water for the general protection of human health and the environment or from a brownfield site intended for redevelopment. Remediation is generally subject to an array of regulatory requirements, and also can be based on assessments of human health and ecological risks where no legislated standards exist or where standards are advisory.

RIPARIAN - A **riparian zone** or **riparian area** is the interface between land and a stream. Plant communities along the river margins are called riparian vegetation.

Riparian zones are significant in ecology, environmental management, and civil engineering because of their role in soil conservation, their biodiversity, and the influence they have on aquatic ecosystems. Riparian zones occur in many forms including grassland, woodland, wetland or even non-vegetative

SEPTICS - Are small scale sewage treatment systems common in areas with no connection to main sewage pipes The term "septic" refers to the anaerobic bacterial environment that develops and which decomposes or mineralizes the waste discharged into the tank. Septic tanks can be coupled with other on-site wastewater treatment units such as biofilters or aerobic systems involving artificial forced aeration. Septic drain fields are used to remove contaminants and impurities from the liquid that emerges from the septic tank. This is typically done by burying perforated pipes in trenches, thus allowing the liquid to leach out and the surrounding soil to absorb the waste.

SILT - soil or rock derived granular material of a grain size between sand and clay. Silt may occur as a soil or as suspended sediment in a surface water body. It may also exist as soil deposited at the bottom of a water body.

STREAM - A watercourse less than 60 feet (18 meters) wide. Streams are important as conduits in the water cycle, instruments in groundwater recharge, and they serve as corridors for fish and wildlife migration. The biological habitat in the immediate vicinity of a stream is called a **riparian zone**. Given the status of the ongoing Holocene extinction event, streams play an important corridor role in connecting fragmented habitats and thus in conserving biodiversity

SUSTAINABLE DEVELOPMENT- Balancing the fulfillment of human needs with the protection of the natural environment so that these needs can be met not only in the present, but in the indefinite future.

SWAMP - A wetland featuring temporary or permanent inundation of large areas of land by shallow bodies of water. A swamp generally has a substantial number of hammocks, or dry-land protrusions, covered by aquatic vegetation, or vegetation that tolerates periodical inundation.

TURBIDITY - Is the cloudiness or haziness of a fluid caused by individual particles (suspended solids) that are generally invisible to the naked eye. The measurement of turbidity is a key test of water quality.

WATERSHED - A **drainage basin**, an extent of land where water from rain or snow melt drains downhill into a body of water. The drainage basin includes both the streams and rivers that convey the water as well as the land surfaces from which water drains into those channels. Each drainage basin is separated topographically from adjacent basins by a geographical barrier such as a ridge, hill or mountain, which is known as a water divide. Watersheds drain into other watersheds in a hierarchical form, larger ones breaking into smaller ones or **sub-watersheds** with the topography determining where the water flows. Understanding geomorphology is essential in understanding how watersheds interconnect.

WATER TABLE - The depth at which soil pore spaces or fractures and voids in rock become completely saturated with water. The surface of saturated material in an aquifer is known as the water table..

WETLAND - An area of land whose soil is saturated with moisture either permanently or seasonally. Such areas may also be covered partially or completely by shallow pools of water. Wetlands are considered the most biologically diverse of all ecosystems.

(Condensed from the Wikipedia Encyclopedia)