

Envirothon Advisors Training Aquatics Vocabulary

A

absorption

the uptake of water, other fluids, or dissolved chemicals by a cell or an organism (as tree roots absorb dissolved nutrients in soil).

accretion

a gradual increase in land area adjacent to a river.

acid rain

the acidic rainfall which results when rain combines with sulfur oxides emissions from combustion of fossil fuels.

acidic

the condition of water or soil that contains a sufficient amount of acid substances to lower the pH below 7.0.

acre-foot

the amount of water required to cover one acre to a depth of one foot. An acre-foot equals 325,851 gallons, or 43,560 cubic feet. A flow of 1 **cubic feet per second** produces 1.98 acre-feet per day.

adsorption

the adhesion of a substance to the surface of a solid or liquid. Adsorption is often used to extract pollutants by causing them to be attached to such adsorbents as activated carbon or silica gel. Hydrophobic, or water-repulsing adsorbents, are used to extract oil from waterways in oil spills.

aeration

the mixing or turbulent exposure of water to air and oxygen to dissipate volatile contaminants and other pollutants into the air.

aerobic treatment

process by which microbes decompose complex organic compounds in the presence of oxygen and use the liberated energy for reproduction and growth. Such processes include extended aeration, trickling filtration, and rotating biological contactors.

aerobic

life or processes that require, or are not destroyed by, the presence of oxygen.

aggradation

a progressive build up of a channel bed with sediment over several years due to a normal sequence of scour and deposition, as distinguished from the rise and fall of the channel bed during a single flood.

algae

simple rootless plants that grow in sunlit waters in proportion to the amount of available nutrients. They can affect water quality adversely by lowering the dissolved oxygen in the water. They are food for fish and small aquatic animals.

algal bloom

a phenomenon whereby excessive nutrients within a river, stream or lake cause an explosion of plant life which results in the depletion of the oxygen in the water needed by fish and other aquatic life. Algal bloom is usually the result of urban runoff (of lawn fertilizers, etc.). The potential tragedy is that of a "fish kill," where the stream life dies in one mass extinction.

alkaline

the condition of water or soil that contains a sufficient amount of alkali substance to raise the pH above 7.0.

<http://www.edwardsaquifer.net/glossary.html>

<http://www.nature.com/scitable/knowledge/library/rivers-and-streams-life-in-flowing-water-23587918>

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alkalinity

the measurement of constituents in a water supply which determine alkaline conditions. The alkalinity of water is a measure of its capacity to neutralize acids. See [pH](#).

alluvial

referring to loose inorganic substrates such as sand, gravel, and boulders eroded, transported, and deposited and often sorted by the action of water.

anaerobic

a life or process that occurs in, or is not destroyed by, the absence of oxygen.

anadromous:

Fish spending most of their life cycle in salt water and migrating to freshwater to reproduce.

anhydrous

without water.

anti-degradation clause

part of federal and water quality requirements prohibiting deterioration where pollution levels are above the legal limit.

appropriative rights

"first in time, first in right" principle of allocating water rights based. Usually involves a user being allowed to take water from a particular source without regard to the contiguity of the land to the source.

aquatic

growing in, living in, or frequenting water.

aquatic life use

a beneficial use designation in which the water body provides suitable habitat for survival and reproduction of desirable fish, shellfish, and other aquatic organisms.

aqueous

something made up of water.

aquifer

a geologic formation that will yield water to a well in sufficient quantities to make the production of water from this formation feasible for beneficial use; permeable layers of underground rock or sand that hold or transmit groundwater below the water table.

armorings

the formation of an erosion-resistant layer of relatively large particles on a streambed or bank resulting from removal of finer particles by erosion.

assay

a test for a specific chemical, microbe, or effect.

assemblage

an organism group of interacting species in a given ecosystem, for example, a fish assemblage or a benthic macroinvertebrate assemblage.

assimilation

the ability of a water body to purify itself of pollutants.

assimilative capacity

the capacity of a natural body of water to receive and dilute wastewaters or toxic materials without damage to aquatic life or humans who consume the water.

attenuation

the process whereby the magnitude of a flood event is reduced by slowing, modifying, or diverting the flow of water.

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B

background level

the concentration of a substance in an environmental media (water or soil) that occurs naturally or is not the result of human activities.

bank

the sloping land bordering a stream channel that forms the usual boundaries of a channel. The bank has a steeper slope than the bottom of the channel and is usually steeper than the land surrounding the channel. Right and left banks are named facing downstream.

bank-full capacity

the rate of water flow that completely fills a channel; the flow rate at which the water surface is level with the flood plain.

bank stability

occurs when the channel bank configuration does not change significantly over time.

base flows

the component of a flow regime that represents normal flow conditions between precipitation events. Base flows provide a range of suitable habitat conditions that support the natural biological community of a specific river sub-basin.

bathymetric

related to the measurement of water depth within a water body.

bed load

the particles in a stream channel that mainly move by bouncing, sliding, or rolling on or near the bottom of the stream.

beneficial use

the amount of water necessary when reasonable intelligence and diligence are used for a stated purpose; Texas law recognizes the following uses as beneficial: (1) domestic and municipal uses, (2) industrial uses, (3) irrigation, (4) mining, (5) hydroelectric power, (6) navigation, (7) recreation, (8) stock raising, (9) public parks, and (10) game preserves.

benthic

pertaining to the bottom of a body of water, on or within the bottom substrate material.

benthos:

the community of organisms inhabiting the solid floor, or *benthic zone* of any water body.

Best Management Practice (BMP)

methods or measures designed and selected to reduce or eliminate the discharge of pollutants from point and nonpoint source discharges. As used in the stormwater context, BMPs are a schedule of activities, prohibitions of practices, maintains procedures and other management practices to prevent or reduce the pollution of waters of the state. BMPs include treatment requirements, operating procedures and practices to control plant site runoff, spills or leaks, sludge or waste disposal, or drainage from raw material storage.

bioaccumulation

uptake and retention of substances by an organism from its surrounding medium (usually water) and from food.

bioassessment

monitoring the aquatic environment to determine the health of a stream.

biodiversity

the variety of plant, animal, and microorganism species present in the ecosystem and the community structures they form.

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biomes:

large biogeographical regions characterized by a particular community type. They are broadly defined by climatic variables including temperature and precipitation. Examples include desert, rain forest, and tundra.

bioremediation

a process that uses living organisms to remove pollutants.

biosphere

the earth and all its ecosystems.

biota

the plant (flora) and animal life (fauna) of a region or ecosystem.

bloom

a proliferation of algae and/or higher aquatic plants in a body of water; often related to pollution or excessive nutrients, especially when they accelerate growth.

bog

a type of wetland that accumulates appreciable peat deposits. They depend primarily on precipitation for their water source, and are usually acidic and rich in plant matter with a conspicuous mat or living green moss.

brackish

mixed fresh and salt water.

C

calcium carbonate

CaCO_3 - a white precipitate that forms in water lines, water heaters and boilers in hard water areas; also known as scale.

canopy

the overhanging cover formed by branches and foliage.

carbonates

the collective term for the natural inorganic chemical compounds related to carbon dioxide that exist in natural waterways.

catadromous

migrating from fresh to salt water to spawn.

catchment:

the area that drains to a single stream or river. Frequently referred to as a *river basin*.
Synonymous with *watershed* in North American usage.

CFU

colony forming units. Concentrations of water quality indicator organisms such as fecal coliform bacteria are measured in cfu/100 ml.

channel

a natural or artificial watercourse that continuously or intermittently contains water, with definite bed and banks that confine all but overbanking streamflows.

channelization

natural or intentional straightening and/or deepening of streams so water moves faster and causes less flooding. Channelization can sometimes exacerbate flooding in other downstream areas.

clean Water Act

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federal legislation enacted in 1972 to restore and maintain the chemical, physical and biological integrity of the surface waters of the United States. The stated goals of the Act are that all waters be fishable and swimmable.

coliform bacteria

non-pathogenic microorganisms used in testing water to indicate the presence of pathogenic bacteria.

collectors:

a macroinvertebrate functional feeding group using small organic particles as a primary food source. *Filtering collectors* accumulate this material from the water column. *Gathering collectors* accumulate this material from the benthic zone.

conductivity

the degree to which a specified material conducts electricity, calculated as the ratio of the current density in the material to the electric field that causes the flow of current. It is the reciprocal of the resistivity.

cone of depression

natural depression in the water table around a well during pumping.

connectivity

refers to the movement and exchange of water, nutrients, sediments, organic matter, and organisms within a riverine ecosystem. Connectivity occurs laterally (between the stream and its floodplain), longitudinally (along the stream), vertically (between the stream and groundwater), and temporally.

consumptive use

the quantity of water not available for reuse. Evapotranspiration, evaporation, incorporation into plant tissue, and infiltration into groundwater are some of the reasons water may not be available for reuse. Compare [nonconsumptive use](#).

contact recreation

activities involving a significant risk of ingestion of water, such as wading by children, swimming, water skiing, diving and surfing. Compare [noncontact recreation](#).

contamination

the introduction into water of sewage or other foreign matter that will render the water unfit for its intended use.

creek

a small stream of water which serves as the natural drainage course for a drainage basin. The term is relative according to size. Some creeks in a humid region would be called rivers if they occurred in an arid area.

cubic foot per second (CFS)

the rate of discharge representing a volume of one cubic foot passing a given point during 1 second. This rate is equivalent to approximately 7.48 gallons per second, or 1.98 [acre-feet](#) per day.

current

the portion of a stream or body of water which is moving with a velocity much greater than the average of the rest of the water. The progress of the water is principally concentrated in the current. See [thalweg](#).

current velocity

the velocity of water flow in a stream, measured in units of length per unit of time, such as feet per second (fps).

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cutoff

where the stream cuts through the neck of a meander bend.

D

dam

a structure of earth, rock, or concrete designed to form a basin and hold water back to make a pond, lake, or reservoir.

deionized water

water free of inorganic chemicals.

delta

an alluvial deposit made of rock particles (sediment, and debris) dropped by a stream as it enters a body of water.

demand

the number of units of something that will be purchased at various prices at a point in time. Compare [supply](#).

deposition

the laying down of material by erosion or transport by water or air.

detection limit

the lowest level that can be determined by a specific analytical procedure or test method.

detention time

the time required for a volume of water to pass through a tank at a given rate of flow; in storage reservoirs, the length of time water will be held before being used.

detritus

decaying organic matter (mostly leaves and other matter from vegetation).

diatomaceous

consisting of or abounding in diatoms, a class of unicellular or colonial algae having a silicified cell wall that persists as a skeleton after death.

discharge

the volume of water that passes a given point within a given period of time. It is an all-inclusive outflow term, describing a variety of flows such as from a pipe to a stream, or from a stream to a lake or ocean.

discharge permit

a permit issued by a state or the federal government to discharge effluent into waters of the state or the United States. In many states both State and federal permits are required.

dissolved oxygen (DO)

amount of oxygen gas dissolved in a given quantity of water at a given temperature and atmospheric pressure. It is usually expressed as a concentration in parts per million or as a percentage of saturation.

diversion

to remove water from a water body. Diversions may be used to protect bottomland from hillside runoff, divert water away from active gullies, or protect buildings from runoff.

downgradient

the direction that groundwater flows; similar to "downstream" for surface water.

drainage area

of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified location.

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drawdown

the drop in the water table or level of groundwater when water is being pumped from a well; the amount of water used from a tank or reservoir; the drop in the water level of a tank or reservoir.

dredging

removal of mud from the bottom of water bodies. This can disturb the ecosystem and cause silting that kills aquatic life. Dredging of contaminated mud can expose biota (the flora and fauna of a region) to heavy metals and other toxics. Dredging activities may be subject to regulation under state and federal laws.

E

ecoregion

a geographic area over which the macroclimate is sufficiently uniform to permit development of similar ecosystems on sites with similar geophysical properties.

ecosphere

total of all the ecosystems on the planet, along with their interactions; the sphere of air, water, and land in which all life is found.

ecosystem

the interacting system of a biological community and its non-living environmental surroundings; a complex system composed of a community of fauna and flora, taking into account the chemical and physical environment with which the system is interrelated.

ecotone

a transition zone between two distinctly different ecosystems or communities.

effluent

any substance, particularly a liquid, that enters the environment from a point source. Generally refers to wastewater from a sewage treatment or industrial plant.

effluent limitation

restrictions established by a regulating agency such as a State or the EPA in an NPDES permit on quantities, rates, and concentrations in wastewater discharges.

electrofishing

a biological collection method that uses electric current to facilitate capturing fishes.

endangered species

one having so few individual survivors that the species could soon become extinct in all or part of its region.

environment

aggregate of external conditions that influence the life of an individual organism or population.

environmental indicator

a measurement, statistic or value that provides evidence of the effects of environmental management programs or of the state or condition of the environment.

Environmental Impact Statement (EIS)

a document that analyzes the effects of major federal projects on the environment. Required by the National Environmental Policy Act. It must be filed with the President and the Council on Environmental Quality, and made available to the public.

EPA

Environmental Protection Agency. The federal regulatory agency responsible for protecting environmental quality throughout the nation. Also acts in an oversight role to state environmental agencies that carry out federal laws.

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epilimnion

warm, less dense top layer in a stratified lake. Compare [hypolimnion](#).

erosion

the wearing away of the land surface by wind, water, ice or other geologic agents. Erosion occurs naturally from weather or runoff but is often intensified by human land use practices.

estuarine waters

deepwater tidal habitats and tidal wetlands that are usually enclosed by land but have access to the ocean and are at least occasionally diluted by freshwater runoff from the land (such as bays, mouths of rivers, salt marshes, lagoons).

estuarine zone

area near the coastline that consists of estuaries and coastal saltwater wetlands.

estuary

thin zone along a coastline where freshwater system(s) and river(s) meet and mix with a salty ocean (such as a bay, mouth of a river, salt marsh, lagoon).

euphotic zone

surface layer of an ocean, lake, or other body of water through which light can penetrate. Also known as the zone of photosynthesis.

eutrophic

having a large or excessive supply of plant nutrients (nitrates and phosphates). Compare [oligotrophic](#).

eutrophication (natural)

an excess of plant nutrients from natural erosion and runoff from the land in an aquatic ecosystem supporting a large amount of aquatic life that can deplete the oxygen supply.

evapotranspiration

combination of evaporation and transpiration of water into the atmosphere from living plants and soil. Distinguish [transpiration](#).

F

fecal coliform

the portion of the coliform bacteria group which is present in the intestinal tracts and feces of warm-blooded animals. A common pollutant in water.

feeding guilds:

organisms categorized by their feeding mode. Examples include nectar feeders, and parasites. See *functional feeding groups*.

functional feeding groups:

feeding guilds of aquatic macroinvertebrates. These include grazers (commonly called *scrapers*), shredders, collectors, and predators.

fen

a type of wetland that accumulates peat deposits, but not as much as a [bog](#). Fens are less acidic than bogs, deriving most of their water from groundwater rich in calcium and magnesium.

filtration

the mechanical process which removes particulate matter by separating water from solid material, usually by passing it through sand.

"first in time, first in right"

phrase indicating that older water rights have priority over more recent rights if there is not enough water to satisfy all rights.

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flood

an overflow or inundation that comes from a river or other body of water and causes or threatens damage. It can be any relatively high streamflow overtopping the natural or artificial banks in any reach of a stream. It is also a relatively high flow as measured by either gage height or discharge quantity.

flood frequency

how often, on average, a discharge of a given magnitude occurs at a particular location on a stream. Usually expressed as the probability that the discharge will exceed some size in a single year (for example, the 100 year flood has a 1 percent probability of being equaled or exceeded in any one year).

floodplain

land next to a river that becomes covered by water when the river overflows its banks .

flora

plant population of a region.

flow

the rate of water discharged from a source expressed in volume with respect to time.

flow augmentation

the addition of water to meet flow needs.

flow duration curve

a measure of the range and variability of a stream's flow. The flow duration curve represents the percent of time during which specified flow rates are exceeded at a given location. This is usually presented as a graph of flow rate (discharge) versus percent of time that flows are greater than, or equal to, that flow.

flow meter

a gauge indicating the velocity and/or volume of a flowing liquid.

flume

a natural or artificially made channel that diverts water.

fluvial

of, relating to, or inhabiting a river or stream.

fluviology

study of watercourses.

foodweb

a model structure used to represent the links between organisms within an environment, based upon the order in which various organisms consume one another.

forebay

the water behind a dam.

G

gaging station

the site on a stream, lake or canal where hydrologic data is collected.

game fish

a species such as trout, salmon, or bass, caught for sport.

gas chromatograph

an instrument that identifies the molecular composition and concentrations of various chemicals in water and soil samples.

geohydrology

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a term which denotes the branch of hydrology relating to subsurface or subterranean waters; that is, to all waters below the surface.

grab sample

a sample taken at a given place and time. Compare [composite sample](#).

grassed waterway

natural or constructed watercourse or outlet that is shaped or graded and planted in suitable vegetation for the disposal of runoff water without erosion.

grazers:

also called scrapers, a macroinvertebrate functional feeding group that consumes attached periphyton as its primary food source

groundwater

water within the earth that supplies wells and springs; water in the zone of saturation where all openings in rocks and soil are filled, the upper surface of which forms the water table.

groundwater hydrology

the branch of hydrology that deals with groundwater; its occurrence and movements, its replenishment and depletion, the properties of rocks that control groundwater movement and storage, and the methods of investigation and utilization of ground water.

groundwater recharge

the inflow to a ground water reservoir.

groundwater reservoir

an aquifer or aquifer system in which ground water is stored. The water may be placed in the aquifer by artificial or natural means.

groundwater runoff

the portion of runoff which has passed into the ground, has become ground water, and has been discharged into a stream channel as spring or seepage water.

groundwater storage

the storage of water in groundwater reservoirs.

guild

a group of species or organisms that use the same environmental resources (habitat, food source, etc.) or life history strategy (such as reproduction) in the same way.

gully

a deeply eroded channel caused by the concentrated flow of water.

H

habitat

the native environment or specific surroundings where a plant or animal naturally grows or lives. Habitat includes physical factors such as temperature, moisture, and light together with biological factors such as the presence of food or predator organisms.

habitat indicator

a physical attribute of the environment measured to characterize conditions necessary to support an organism, population, or community in the absence of pollutants. For example, salinity of estuarine waters or substrate type in streams or lakes.

halolimnic

of, like or pertaining to sea creatures who spend time in fresh water.

halophilous

tolerant of salt or salt-water.

hardpan

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a shallow layer of earth material which has become relatively hard and impermeable, usually through the deposition of minerals.

hardness (water)

condition caused by dissolved salts of calcium, magnesium, and iron, such as bicarbonates, carbonates, sulfates, chlorides, and nitrates.

hardwood bottomland

hardwood forested lowlands adjacent to some rivers, especially valuable for wildlife breeding, nesting, and habitat.

head

the pressure of a fluid owing to its elevation, usually expressed in feet of head or in pounds per square inch, since a measure of fluid pressure is the height of a fluid column above a given or known point.

herbicide

a chemical used to kill nuisance plants. Herbicides can contain pollutants found in runoff.

high flow pulses

the component of an instream flow regime that represents short-duration, in-channel, high flow events following storm events. They maintain important physical habitat features and longitudinal connectivity along the river channel.

hydric soil

a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

hydroelectric plant

electric power plant in which the energy of falling water is used to spin a turbine generator to produce electricity.

hydrogenic

caused or formed by water.

hydrogeology

the geology of groundwater, with particular emphasis on the chemistry and

hydrograph

a chart that measures the amount of water flowing past a point as a function of time.

hydrology

the science dealing with the properties, distribution, and circulation of water.

hypolimnion

bottom layer of cold water in a lake. Compare [epilimnion](#).

hyporheic zone

the zone under a river or stream comprising substrate whose interstices are filled with water.

I

impaired water body

a water body that has been determined under state and federal law as not meeting water quality standards, or having the potential to do so in the future.

imperiled species

declining, rare, or uncommon species; species federally listed as threatened or endangered, or candidates for such; and species with limited distributions.

impervious

the quality or state of being impermeable; resisting penetration by water or plant roots. Impervious ground cover like concrete and asphalt affects quantity and quality of [runoff](#).

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impoundment

a body of water such as a pond, confined by a dam, dike, floodgate or other barrier. It is used to collect and store water for future use.

Index of Biotic Integrity

a multi-metric measure of biological condition developed from collection of data for fish or other organisms. It consists of metrics in three broad categories: [species composition](#), [trophic composition](#), and [organism abundance and condition](#).

indicator organisms

microorganisms, such as coliforms, whose presence is indicative of pollution or of more harmful microorganism.

indicator parameters

measurable physical or chemical characteristics or attributes of water or soil-pore moisture used to indicate the possible presence of waste constituents, or the effects of waste constituents on waters.

indicator tests

tests for a specific contaminant, group of contaminants, or constituent which signals the presence of something else (ex., coliforms indicate the presence of pathogenic bacteria).

infiltration

the penetration of water through the ground surface into sub-surface soil or the penetration of water from the soil into sewer or other pipes through defective joints, connections, or manhole walls.

infiltration rate

the quantity of water that can enter the soil in a specified time interval.

inflow

entry of rainwater into a sewer system from sources other than infiltration, such as basement drains, manholes, storm drains, and street washing.

inland freshwater wetlands

swamps, marshes, and bogs found inland beyond the coastal saltwater wetlands.

instream cover

overhanging or instream structure, such as tree roots, undercut streambanks, boulders, or aquatic vegetation that offer protection for aquatic organisms.

instream use

use of water that does not require withdrawal or diversion from its natural watercourse; for example, the use of water for navigation, recreation, and support of fish and wildlife.

interbasin transfer

the physical transfer of water from one watershed to another; regulated by the Texas Water Code.

intermittent stream

one that flows periodically. Compare [perennial stream](#).

interstate water

according to law, interstate waters are defined as (1) rivers, lakes and other waters that flow across or form a part of state or international boundaries; (2) waters of the Great Lakes; (3) coastal waters whose scope has been defined to include ocean waters seaward to the territorial limits and waters along the coastline (including inland streams) influenced by the tide.

J

jetty

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a structure (as a pier or mole of wood or stone) extending into a sea, lake, or river to influence the current or tide or to protect a harbor.

K

key habitats

flow-sensitive habitats as well as habitats that support key species.

key species

species that are targeted for instream flow assessment or more generally taxa of interest; may include lotic-adapted species, imperiled species, sport fishes, or other species related to study objectives.

kinetic energy

energy possessed by a moving object or water body.

kilogram

one thousand grams.

L

lake

an inland body of water, usually fresh water, formed by glaciers, river drainage etc. Usually larger than a pool or pond.

leachate

water containing contaminants which leaks from a disposal site such as a landfill or dump.

leaching

extraction or flushing out of dissolved or suspended materials from the soil, solid waste, or another medium by water or other liquids as they percolate down through the medium to groundwater.

lentic system

a nonflowing or standing body of fresh water, such as a lake or pond. Compare [lotic system](#).

levee

a natural or man-made earthen obstruction along the edge of a stream, lake, or river. Usually used to restrain the flow of water out of a river bank.

limestone

rock that consists mainly of calcium carbonate and is chiefly formed by accumulation of organic remains.

limiting factor

factor such as temperature, light, water, or a chemical that limits the existence, growth, abundance, or distribution of an organism.

limnetic

living in fresh water; pertaining to fresh water.

limnobiology

study of freshwater ecosystems.

limnology

scientific study of physical, chemical, and biological conditions in lakes, ponds, and streams.

littoral zone

area on or near the shore of a body of water.

lotic system

a flowing body of fresh water, such as a river or stream. Compare [lentic system](#).

M

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macroinvertebrate

an animal without a backbone, large enough to be seen without magnification and unable to pass through a 0.595 mm mesh.

macrophyte

macroscopic plants in the aquatic environment. The most common macrophytes are the rooted vascular plants that are usually arranged in zones in aquatic ecosystems and restricted in their area by the extent of illumination through the water and sediment deposition along the shoreline.

meander bend

a windings or sinuous section of a stream channel. May become an **oxbow lake** if cut off from the mainstem.

mesohabitat

basic structural elements of a river or stream such as pools, backwaters, runs, glides, and riffles.

mesotrophic

reservoirs and lakes that contain moderate quantities of nutrients and are moderately productive in terms of aquatic animal and plant life.

micrograms per liter - Ug/L

micrograms per liter of water. One thousands micrograms per liter is equivalent to 1 milligram per liter. This measure is equivalent to **parts per billion** (ppb)

microhabitat

zones of similar physical characteristics within a mesohabitat unit, differentiated by aspects such as substrate type, water velocity, and water depth.

milligrams per liter - mg/L

milligrams per liter of water. This measure is equivalent to **parts per million** (ppm).

minimum streamflow

the specific amount of water reserved to support aquatic life, to minimize pollution, or for recreation. It is subject to the priority system and does not affect water rights established prior to its institution.

molecule

the smallest division of a compound that still retains or exhibits all the properties of the substance.

monitoring well

a well used to obtain water quality samples or measure groundwater levels.

N

National Pollutant Discharge Elimination System (NPDES)

a provision of the Clean Water Act that prohibits discharge of pollutants into waters of the United States unless a permit is issued that complies with the Clean Water Act. In Texas, the Texas Commission on Environmental Quality (TCEQ) administers the NPDES program and issues TPDES permits.

natural flow

the rate of water movement past a specified point on a natural stream. The flow comes from a drainage area in which there has been no stream diversion caused by storage, import, export, return flow, or change in consumptive use caused by man-controlled modifications to land use. Natural flow rarely occurs in a developed country.

natural resource

any form of matter or energy obtained from the environment that meets human needs.

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naturalized conditions

an estimate of natural conditions obtained by attempting to remove effects of human activities from a set of measured conditions.

nephelometric

method of measuring turbidity in a water sample by passing light through the sample and measuring the amount of light deflected.

nitrate

a compound containing nitrogen that can exist in water as a dissolved gas. It can have harmful effects on humans and animals. Nitrates in water can cause severe illness in infants and domestic animals. A plant nutrient and inorganic fertilizer, nitrate is found in septic systems, animal feed lots, agricultural fertilizers, manure, industrial wastewaters, sanitary landfills, and garbage dumps.

nitrogen

a plant [nutrient](#) that can cause an overabundance of bacteria and algae when high amounts are present, leading to a depletion of oxygen and fish kills. Several forms occur in water, including ammonia, nitrate, nitrite or elemental nitrogen. High levels of nitrogen in water are usually caused by agricultural runoff or improperly operating wastewater treatment plants. Also see [phosphorous](#).

nonconsumptive use

using water in a way that does not reduce the supply. Examples include hunting, fishing, boating, water-skiing, swimming, and some power production. Compare [consumptive use](#).

noncontact recreation

recreational pursuits not involving a significant risk of water ingestion, including fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity. Compare [contact recreation](#).

nondegradation

an environmental policy that does not allow any lowering of naturally occurring water quality regardless of pre-established health standards.

nonporous

something which does not allow water to pass through it. Compare [porous](#).

nonpoint source

source of pollution in which wastes are not released at one specific, identifiable point but from a number of points that are spread out and difficult to identify and control. Compare [point source](#).

nonpotable

not suitable for drinking. Compare [potable](#).

NTU

nephelometric turbidity units.

nutrient

as a pollutant, any element or compound, such as [phosphorous](#) or [nitrogen](#), that fuels abnormally high organic growth in aquatic ecosystems. Also see [eutrophic](#).

nutrient cycle

the cyclic conversions of nutrients from one form to another within biological communities. For example, the production and release of molecular oxygen from water during photosynthesis by plants and the subsequent reduction of atmospheric oxygen to water by the respiratory metabolism of other biota.

O

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oligotrophic

having a low supply of plant nutrients. Compare [eutrophic](#).

organism

any form of animal or plant life.

overbank flows

the component of an instream flow regime that represents infrequent, high flow events that exceed the normal channel. These flows maintain riparian areas and provide lateral connectivity between the river channel and active flood plain. They may also provide life-cycle cues for various species.

oxbow

a U-shaped bend in a river or stream that may or may not be cut off from the mainstem.

oxbow lake

a U-shaped water body formed when a [meander bend](#) is cut off from the mainstem of a river or stream to create a lake.

P**pathogen**

microorganisms which can cause disease.

perennial stream

one that flows all year round. Compare [intermittent stream](#).

periphyton:

the community of primary producers and heterotrophic microorganisms attached to submerged surfaces. In streams this would include algae, cyanobacteria, bacteria, and fungi and their associated extra-cellular secretions. Periphyton serves as the food base utilized by *grazers*.

permeability

the ability of a water bearing material to transmit water. It is measured by the quantity of water passing through a unit cross section, in a unit time, under 100 percent hydraulic gradient.

pH

numeric value that describes the intensity of the acid or basic (alkaline) conditions of a solution. The pH scale is from 0 to 14, with the neutral point at 7.0. Values lower than 7 indicate the presence of acids and greater than 7.0 the presence of alkalis (bases). Technically speaking, pH is the logarithm of the reciprocal (negative log) of the hydrogen ion concentration (hydrogen ion activity) in moles per liter.

phosphorous

a plant [nutrient](#) that can cause an overabundance of bacteria and algae when high amounts are present, leading to a depletion of oxygen and fish kills. High levels of phosphorous in water are usually caused by agricultural runoff or improperly operating wastewater treatment plants. Also see [nitrogen](#).

phytoplankton

free-floating, mostly microscopic aquatic plants.

piezometer

a nonpumping well, generally of small diameter, for measuring the elevation of a water table.

piezometric surface

the imaginary surface to which groundwater rises under hydrostatic pressure in wells or springs.

plankton

microscopic floating plant and animal organisms of lakes, rivers, and oceans.

point source

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source of pollution that involves discharge of wastes from an identifiable point, such as a smokestack or sewage treatment plant. Compare [nonpoint source](#).

pollution

undesireable change in the physical, chemical, or biological characteristics of the air, water, or land that can harmfully affect the health, survival, or activities of human or other living organisms.

pond

a body of water usually smaller than a lake and larger than a pool either naturally or artificially confined.

pool:

an area of low gradient water in a stream. See also *riffle*.

potable

suitable, safe, or prepared for drinking. Compare [non-potable](#).

ppb - parts per billion

number of parts of a chemical found in one billion parts of a solid, liquid, or gaseous mixture. Equivalent to [micrograms per liter](#) (Ug/L).

ppm - parts per million

number of parts of a chemical found in one million parts of a solid, liquid, or gaseous mixture. Equivalent to [milligrams per liter](#) (mg/L).

precipitate

a solid which has come out of an aqueous solution. (ex., iron from groundwater precipitates to a rust colored solid when exposed to air).

predators:

organisms whose primary food source is other animals.

preservative

a chemical added to a water sample to keep it stable and prevent compounds in it from changing to other forms or to prevent microorganism densities from changing prior to analysis.

profundal zone

a lake's deep-water region that is not penetrated by sunlight.

Q

R

rating curve

a graph showing the relationship between water surface elevation and discharge of a stream or river at a given location. Also called a stage-discharge curve.

reach

in general, a length of stream with relatively homogenous characteristics.

recharge

refers to water entering an underground aquifer through faults, fractures, or direct absorption.

recharge rate

the quantity of water per unit of time that replenishes or refills an aquifer.

recharge zone

the area where a formation allows available water to enter the aquifer. Generally, that area where the Edwards Aquifer and associated limestones crop out in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson counties and the outcrops of other formations in proximity to the Edwards limestone, where faulting and fracturing may allow recharge of the surface waters to the Edwards Aquifer.

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recruitment

survival of young plants and animals from birth to a life stage less vulnerable to environmental change.

remediation

methods used to remove or contain a toxic spill or hazardous materials from a Superfund site; a generic term used to describe cleanup activities.

reservoir

a pond, lake, tank, or basin (natural or human made) where water is collected and used for storage. Large bodies of groundwater are called groundwater reservoirs; water behind a dam is also called a reservoir of water.

residual

amount of a pollutant remaining in the environment after a natural or technological process has occurred.

resilience

the ability of an ecosystem to maintain or restore biodiversity, biotic integrity, and ecological structure and processes following disturbance.

riffle:

a high-gradient bar of deposited substrate, usually spanning the width of a stream. Typically found as part of a riffle-pool repeating sequence in streams of medium gradient. Not to be confused with ripple.

riparian zone

the area of terrestrial habitat adjacent to and most directly influenced by a river or stream.

ripple:

small-scale undulations on the surface unconsolidated fine substrates such as silt and sand. These features are shaped by the action of flowing water in low-gradient rivers.

river

a natural stream of water of considerable volume.

river Continuum Concept:

a model of longitudinal change in physical habitat, and the biological communities in rivers.

river basin

the area drained by a river and its tributaries.

runoff

surface water entering rivers, freshwater lakes, or reservoirs.

S

saline water

water containing more than 1,000 parts per million (ppm) of dissolved solids of any type. Compare [fresh water](#).

salinity

amount of dissolved salts in a given volume of water.

scour

the erosive action of running water in streams, which excavates and carries away material from the bed and banks. Or, pertaining to a place on a streambed scoured by running water.

sediment

soil particles, sand, and minerals washed from the land into aquatic systems as a result of natural and human activities.

shredders:

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Envirothon Advisors Training Aquatics Vocabulary

a benthic macroinvertebrate functional feeding group that utilizes leafy detritus as their primary food source. Although the leaves are consumed, nutritional value is derived from the attached community as well as the leaves themselves.

siltation

the deposition of finely divided soil and rock particles upon the bottom of stream and river beds and reservoirs.

solubility

the amount of mass of a compound that will dissolve in a unit volume of solution.

solute

any substance derived from the atmosphere, vegetation, soil, or rock that is dissolved in water.

soil erosion

the processes by which soil is removed from one place by forces such as wind, water, waves, glaciers, and construction activity and eventually deposited at some new place.

species composition

that portion of an [Index of Biotic Integrity](#) that is a metric measuring the number and identity of species.

specific conductance

a measure of the ability of a water to conduct an electrical current. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved solids concentration in water. In general, for the San Antonio River basin, conductivity * .6 approximates TDS. People monitoring water quality can measure electrical conductivity quickly in the field and estimate TDS without doing any lab tests at all. See [TDS](#).

spring

an issue of water from the earth; a natural fountain; a source of a body or reservoir of water.

stream segment

refers to the surface waters of an approved planning area exhibiting common biological, chemical, hydrological, natural, and physical characteristics and processes. Segments will normally exhibit common reactions to external stress such as discharge or pollutants.

streamflow

the discharge that occurs in a natural channel.

sub-basin

in general, a portion of a river basin.

surface irrigation

application of water by means other than spraying such that contact between the edible portion of any food crop and the irrigation water is prevented.

surface water

water that flows in streams and rivers and in natural lakes, in wetlands, and in reservoirs constructed by humans.

T

tail water

the runoff of irrigation water from the lower end of an irrigated field.

tailrace

The channel that is downstream of the draft tube that carries the water discharged from a turbine. The draft tube is the discharge section of the turbine.

thalweg

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the line of maximum depth in a stream. The thalweg is the part that has the maximum velocity and causes cutbanks and channel migration.

thermal gradient

temperature difference between two areas.

thermal pollution

an increase in air or water temperature that disturbs the climate or ecology of an area.

thermocline

fairly thin zone in a lake that separates an upper warmer zone (epilimnion) from a lower colder zone (hypolimnion).

threatened species

Under the Federal Endangered Species Act, animal populations may be determined to be either threatened or endangered. Populations listed as threatened are less severely depleted than populations classed as endangered.

tidal marsh

low, flat marshlands traversed by channels and tidal hollows, subject to tidal inundation; normally, the only vegetation present is salt-tolerant bushes and grasses.

Total Maximum Daily Load (TMDL)

a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources.

toxic pollutant

those pollutants or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism can, on the basis of information available, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions or physical deformation in such organism or their offspring. The quantities and exposures necessary to cause these effects can vary widely.

tragedy of the Commons

the idea that no one takes responsibility for things that everybody owns.

transport capacity

the capacity of a river to carry sediment in suspension or to move sediment along the riverbed.

tributary

a stream that contributes its water to another stream or body of water.

trophic composition

that portion of an [Index of Biotic Integrity](#) that is a metric measuring the proportion of species and proportions of omnivores, insectivores, and omnivores.

trophic structure

the feeding relationships among species within a food web.

turbid

thick or opaque with matter in suspension. Rivers and lakes may become turbid after a rainfall.

turbidimeter

a device that measures the cloudiness of suspended solids in a liquid; a measure of the quantity of suspended solids.

turbidity

a cloudy condition in water due to suspended silt or organic matter.

U

urban runoff

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Envirothon Advisors Training Aquatics Vocabulary

storm water from city streets and adjacent domestic or commercial properties that carries pollutants of various kinds into the sewer systems and receiving waters.

V

vadose zone

the zone between land surface and the water table where the moisture content is less than saturation (except in the capillary fringe) and pressure is less than atmospheric. Soil pore space also typically contains air or other gases. The capillary fringe is included in the vadose zone. Compare [phreatic zone](#).

W

wasteload allocation

term used in conjunction with the TMDL Program, a WLA is the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. Discharge limits are usually required for the specific water quality criterion addressed by the TMDL.

wastewater

water containing waste including greywater, blackwater or water contaminated by waste contact, including process-generated and contaminated rainfall runoff.

water

the liquid that descends from the clouds as rain; forms streams, lakes, and seas, and is a major constituent of all living matter. It is an odorless, tasteless, colorless, very slightly compressible liquid.

water column

an imaginary column extending through a water body from its floor to its surface. Ambient water quality monitoring programs may seek to quantify the water quality of a representative water column. Samples may be taken from a point or points throughout the depth of the water column.

water cycle

natural pathway water follows as it changes between liquid, solid, and gaseous states; biogeochemical cycle that moves and recycles water in various forms through the ecosystem. Also called the hydrologic cycle.

water pollution

degradation of a body of water by a substance or condition to such a degree that the water fails to meet specified standards or cannot be used for a specific purpose.

water quality

the chemical, physical, biological, radiological, and thermal condition of water.

water quality-based toxics control

an integrated strategy used in NPDES permitting to assess and control the discharge of toxic pollutants to surface waters. There are two approaches: the whole-effluent approach involves the use of toxicity tests to measure discharge toxicity; the chemical specific approach involves the use of water quality criteria or State standards to limit specific toxic pollutants directly.

water quality criteria

scientifically derived ambient limits developed and updated by EPA, under section 304(a)(1) of the Clean Water Act, for specific pollutants of concern. Criteria are recommended concentrations, levels, or narrative statements that should not be exceeded in a waterbody in order to protect aquatic life or human health.

water quality standards

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laws or regulations, promulgated under Section 303 of the Clean Water Act, that consist of the designated use or uses of a waterbody or a segment of a waterbody and the water quality criteria that are necessary to protect the use or uses of that particular waterbody. Water quality standards also contain an antidegradation statement. Every State is required to develop water quality criteria standards applicable to the various waterbodies within the State and revise them every 3 years.

water table

level below the earth's surface at which the ground becomes saturated with water. The surface of an unconfined aquifer which fluctuates due to seasonal precipitation.

water table aquifer

an aquifer confined only by atmospheric pressure (water levels will not rise in the well above the confining bed).

watershed

land area from which water drains toward a common watercourse in a natural basin.

watershed approach

a coordinated framework for environmental management that focuses public and private efforts on the highest priority problems within hydrologically defined geographic areas.

watershed management

water resource protection, enhancement, and restoration. Ideally, watershed management means developing a solution for each watershed that considers all its problems, includes all stakeholders in defining the problems, proposing solutions, and participating in implementing a common solution.

wetland

area that is regularly wet or flooded and has a water table that stands at or above the land surface for at least part of the year, such as a [bog](#), [pond](#), [fen](#), [estuary](#), or [marsh](#).

X

xeriscape

creative landscaping for water and energy efficiency and lower maintenance. The seven xeriscape principles are: good planning and design; practical lawn areas; efficient irrigation; soil improvement; use of mulches; low water demand plants; good maintenance.

xerophyte

plant adapted for life and growth with a limited water supply.

xerophytic

able to withstand drought.

Y

Z

zooplankton

tiny aquatic animals eaten by fish.