

# APPENDIX U

## COUNTY AGENCIES AND PROGRAMS

The counties in the Cayuga Lake Watershed each have a committee or council responsible for providing guidance and monitoring of issues related to county water quality and resources. Each of the groups consists of members from various agencies including planning, DOH, SWCD, and others. NPS is an oft-discussed topic among the committees, agencies, and councils. Studies and reports conducted in each county have monitored and assessed NPS to assist in developing guidance for controlling NPS.

### *County Water Quality and Resource Groups*

Cayuga County Water Quality Management Agency

Cortland County Water Quality Coordinating Committee

Schuyler County Water Quality Coordinating Committee

Seneca County Water Quality Committee

Tioga County Water Quality Coordinating Committee

Tompkins County Water Resources Council

Each county has a SWCD responsible for implementing the NYS Agricultural Nonpoint Source Abatement and Control Program. The New York Soil and Water Conservation Law administered by the SWCC requires owners of agriculture, livestock, or timber producing lands to apply to their respective county's SWCD for a soil and water conservation plan. The SWCD is obligated to produce such a plan upon request by the owner of the land, but there is no penalty for not implementing the plan upon its completion. The Agricultural Nonpoint Source Abatement and Control Program is often included as part of the Agricultural Environmental Management (AEM) (see Appendix H - Agricultural Programs) program that produces such plans.

Each county or region has a Health Department which oversees the drinking water supplies. This can include implementation of the Source Water Assessment Program (SWAP) (*for more information see <http://www.dec.state.ny.us/website/dow/uwa/index.htm>*), inspection of on-site wastewater systems, and enactment of Watershed Rules and Regulations (see Appendix R).

Each county in the watershed has a Planning Department that oversees the development of planning activities, planning boards, and supports municipal local land use regulation and control efforts. The following table outlines the counties land use regulation and control activities:

Other countywide ordinances, laws, plans, and programs that address NPS are also in place within the

County	Comprehensive Plan	Drainage Plan	Sediment & Erosion Control Laws	Vegetation Retention Laws	Other County Plans	Other County Ordinances	Planning Board/ Commission
Cayuga	No	No	No	No	Yes (Land Use)	Yes (Sanitary Code)	Yes
Cortland	Yes	No	No	No	No	No	Yes
Schuyler	Yes	No	No	No	Yes (Water Quality)	Yes (Watershed Protection)	Yes
Seneca	No*	No	No	No	Yes (Agriculture)	No	Yes
Tioga	Yes	No	No	No	Yes (Agriculture and Future Use)	No	Yes
Tompkins	Yes	No	No	No	Yes	Yes	No

\* Prepared but not adopted

Cayuga Lake Watershed. The *Cayuga County Sanitary Code* requires periodic inspection of all septic systems within the watershed. In Seneca County a countywide drainage plan assists in the management of NPS through standards set to protect and enhance water.

Through the 1994 *Watershed Protection Law of Schuyler County*, NPS management is attained through regulation and enforcement of sewage disposal and wastewater treatment systems throughout the county. Provisions are stipulated for the discharge and disposal of sewage and the design, construction, and certification of wastewater treatment facilities.

Five of the six counties in the watershed have planning boards or commissions responsible for conducting reviews and issuing approval for proposed development. The Tompkins County Planning Department, under provisions of their Charter, is responsible for reviewing development proposals. Although they do not have a planning board or commission at the county level, they do have a Planning Advisory Board that assumes the functions of a planning board. Cayuga, Cortland, Schuyler, and Tompkins Counties each have an environmental management council while Tioga County has a conservation board. These groups monitor and advise on issues related to development and sustaining/

improving the environmental character of their respective counties. None of the counties in the watershed currently have sediment and erosion control laws or vegetation retention laws.

In addition to its comprehensive plan, Tioga County has a future land use plan and an agriculture and farmland protection plan. The *Tioga County Agriculture and Farmland Protection Plan* focuses on retaining and building upon the economic benefits of agriculture in the county through more viable farming practices. Tompkins County has an approved Farmland Protection Plan.

## APPENDIX V

### GLOSSARY OF TERMS

**Adsorption.** The adhesion of one substance to the surface of another.

**Aeration.** A process that involves pumping or lifting water from a lake bottom (hypolimnion) for exposure to the atmosphere, with the oxygenated waters being returned back to the bottom.

**Agricultural Conservation and Stabilization Service.** Federal government agency that works with farmers to improve the efficiency of agricultural operations and protect the long-term condition of the farmers' soil and water resources.

**Agricultural Management Practices.** Practices whose goals are to maintain soil fertility, increase farm productivity, and reduce pollutant loading in receiving waters. Pollutants from agricultural sources that can be controlled through the use of management practices include sediment, nutrients, pesticides, and pathogens.

**Algae.** Microscopic plants, considered primary producers in the lake food web, capable of photosynthesis.

**Algal blooms.** Massive growths of phytoplankton, commonly occurring in lakes in the spring. When the phytoplankton are profuse, the water may be stained bright green or blue and the lake rendered unfit for swimming or drinking.

**Alluvium.** A general term for unconsolidated material deposited by a stream or other body of running water.

**Animal unit.** A unit of measurement for any animal feeding operation calculated by adding the following numbers: the number of slaughter and feeder cattle multiplied by 1.0, plus the number of mature dairy cattle multiplied by 1.4, plus the number of swine weighing over 25 kilograms (approximately 55 pounds) multiplied by 0.4, plus the number of sheep multiplied by 0.1, plus the number of horses multiplied by 2.0.

**Aquatic herbicides.** Chemicals, such as Diquat and 2,4-D, used to eradicate aquatic plants.

**Aquifer.** A water-bearing rock unit (unconsolidated or bedrock) that will yield water in a usable quantity to a well or spring.

**Artesian aquifer.** Groundwater that rises to an elevation above the water-bearing unit from which it is released, as a result of a confining layer. In common usage, artesian usually means discharging above the land surface.

**Backflow prevention device:** A safety device used to prevent water pollution or contamination by preventing flow of water and/or chemicals in the opposite direction of that intended (ASAE, 1989).

**Baseflow.** Sustained or fair-weather flow of a stream.

**Bedding plane.** In bedrock a fracture that is parallel to the bedrock unit, usually found where two bedrock units of different origins (i.e., shale and limestone) are in contact. Potentially a zone of water movement.

**Bedrock.** The massive formations that underlie the soil and other unconsolidated surficial materials.

**Best Management Practices.** A series of approved practices that can be used to address specific pollution problems. Examples include changes in land use activities, a ban on pesticides, or following design standards for installing a septic system.

**Best use.** A series of classifications designating the most desired use of the water and bordering lands. 14 classifications are used, ranging from AA (source of water supply for drinking, culinary, or food processing purposes) to II (waters which constitute the Interstate Sanitation District).

**Bioaccumulate.** The process by which toxic pollutants (such as heavy metals, inorganic chemicals, and organic chemicals) amass in the tissues of organisms after repeated intake or exposure.

**Biochemical Oxygen Demand (BOD).** The consumption of oxygen caused by decomposition or metabolism of biodegradable organic compounds by microbes.

**Biodegradation.** The metabolic breakdown of materials into simpler components by living organisms.

**Bog/Marsh/Swamp.** Land that has less than 10.0 percent stocking with live trees and which characteristically supports low, generally herbaceous or shrubby vegetation, and which is intermittently covered with water during all seasons; includes tidal areas that are covered with brackish water during high tides.

**Buffer strips.** Strips of land along water courses that contain natural and (or) planted grasses, plants and trees that filter out sediment and increase uptake of nutrients in runoff.

**Clean Water Act.** National environmental law enforced by the United States Environmental Protection Agency (USEPA) that regulates water pollution.

**Cluster septic systems.** Method of waste disposal where wastewater is transported via small-diameter sewers to a drainfield, mound or sand filter which is used by several residences. Used where site conditions prohibit the use of on-lot systems.

**Coliform.** Bacteria group often involved in contamination of water. Can be associated with the intestinal tract of humans (fecal coliform) or from feces and decaying lake matter (total coliform). Coliform can also be an indicator organism and not necessarily a pathogen.

**Combined Sewage Overflow (CSO).** A water drainage pipeline that receives surface runoff as well as sanitary or industrial wastewater.

**Composting.** A controlled process of degrading organic matter by microorganisms

**Cone of depression.** The drawdown of the water table caused by the withdrawal of water by a well. Usually a circular depression (cone) but may vary in shape dependent on the properties of the material from which the water is being taken.

**Confined aquifer.** An aquifer bounded by materials having a distinctly lower hydraulic conductivity than the aquifer itself.

**Conservation easements.** A legal document that restricts the type and amount of development that may take place on a parcel of land. They are often developed for open space preservation, historic preservation, protection of natural habitats, and preservation of areas for public recreation or education.

**Contaminant plume.** An elongated and mobile column or band of a pollutant moving through the subsurface.

**Cover crops.** Grasses and other close-growing crops grown on fields during the winter to provide soil protection between harvest and spring plowing. Cover crops are also used to enrich soils.

**Crop rotation.** Growing different crops in a sequential pattern on the same field. Crops that conserve soil and nutrients, alternated with those that deplete them provide opportunities for maintaining soil productivity, reducing soil erosion, and reducing fertilizer usage. Rotations may prevent the build-up of large pest populations that can occur when single crops are grown continuously on a field.

**Cropland.** Land that currently supports agricultural crops including silage and feed grains, bare farm fields resulting from cultivation or harvest, and maintained orchards.

**Cubic-foot stand-volume class.** A classification of forest land based on net cubic-foot volume of all live trees per acre.

**Denitrification.** The chemical or biochemical reduction of nitrate or nitrite to gaseous nitrogen, either as molecular nitrogen or as an oxide of nitrogen

**Dense Non-Aqueous Phase Liquids (DNAPLs).** Organic compounds more dense than water that tend to sink to the bottom of a water column.

**Deposition.** The accumulation of material dropped because of a slackening movement of the transporting material water or wind.

**Detention basin.** A constructed holding area for storm-water runoff. Basins can protect streams and lakes from sediment and other pollutants derived from up-gradient land use activities. The removal rate for particulate pollutants depends on the volume of runoff, length of time provided for sedimentation, and the settleability characteristics of the particulate matter. Artificial marshes can be incorporated within the basins to provide additional biological removal of pollutants.

**Dilution.** A lowering of the concentration of a chemical constituent in a water column through mixing with a less concentrated water column.

**Discharge area.** An area in which water is lost from the zone of saturation.

**Dissolved oxygen.** The quantity of oxygen dissolved in the water. In lakes, the amount of oxygen dispersed in the water helps determine the degree of stratification, and the potential for depletion of oxygen, fish and other aquatic organisms. Dissolved oxygen is affected by temperature (as water temperature decreases, increasing amounts of oxygen can be dissolved in water), time of day (photosynthetic plants create oxygen during the day, and use oxygen at night), and pollution (*aerobic* bacteria and other organisms require oxygen for the consumption of wastes).

**Diversion.** A channel, embankment, or other man-made structure constructed to divert water from one area to.

**Drainage basin.** Used interchangeably with *catchment* or *watershed*. The term can also imply a larger area containing several watersheds or *sub-basins*.

**Drainage class (natural).** Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

***Excessively drained.***---Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

***Somewhat excessively drained.***---Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

***Well drained.***---Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

***Moderately well drained.***---Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

***Somewhat poorly drained.***---Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

***Poorly drained.***---Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

*Very poorly drained.*--- Water is removed from the soil so slowly that free water remains at or on the surface during the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example is “hillpeats” or “climatic moors.”

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Drawdown.** A technique that involves manipulating the water level of a lake to expose rooted aquatic vegetation and sediments to freezing and drying conditions, which serves to affect the growth of plants. Can also be used in the context of surface water in defining rule curves and safe yields.

**Dredging.** Form of sediment removal that involves clearing bottom sediment from a lake to increase the depth, control nuisance aquatic vegetation, control nutrient release from sediments, and to remove toxic substances.

**Drumlin.** A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

**Ecosystem.** A group of living organisms that behave as a unit.

**Effluent.** Wastewater that flows into receiving water by way of a domestic or industrial point source.

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Environmental Impact Statement (EIS).** A report containing a description of some proposed action, the environmental setting, potential environmental impacts, ways to minimize the impacts, and reasonable alternatives. The EIS also serves as a public disclosure of the record used by an agency in its environmental decision-making process.

**Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

**Epilimnion.** Surface layer of lake

**Erosion.** The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion (geologic).* Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion (accelerated).* Erosion much more rapid than geologic erosion, mainly as a result of the actions of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

**Esker (geology).** A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream beneath a glacier.

**Eutrophic.** A stage of nutrient availability and biological productivity, the natural result of the aging of a lake. The highest stage of nutrient availability is hyper-eutrophic.

**Eutrophication.** The process of natural lake aging, nutrient enrichment, and basin fill-ing. Human activities that increase nutrient and sediment loadings to a lake are called *cultural eutrophication*.

**Evaporation.** Conversion of water from the liquid phase to the gaseous phase.

**Evapotranspiration.** The combined loss of water from water bodies (evaporation) and plants (transpiration – plant uptake, consumption and release of soil water through leaves).

**Fallow.** Allowing cropland to lie idle, either tilled or untilled, during the whole or greater portion of the growing season.

**Fecal coliform.** A type of bacteria whose natural habitat is the colon of warm-blooded mammals, such as man. The presence of this type of bacteria in water, beverages, or food is usually taken to mean that the material is contaminated with solid human waste.

**Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**Fertilizer.** Any organic or inorganic material of natural or synthetic origin that is added to a soil to supply elements essential to plant growth.

**Field capacity.** The soil-water content after the force of gravity has drained or removed all the water it can, usually 1 to 3 days after rainfall

**Filter (see buffer) strips.**

**First flush.** Stormwater runoff, usually early in the storm, that contains the majority of accumulated sediments and chemical constituents (pollutants) derived from the upstream watershed.

**Fish habitat.** The zone where environmental conditions are spatially uniform and ideal for supporting fish life.

**Flocculate.** Phosphorus located in the water column, assisting in algal growth.

**Flooding.** The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

**Floodplain.** The area that borders a water body and is subject to flooding on a periodic basis.

**Forest land.** Land that is at least 10 percent stocked with trees of any size, or that formerly had such tree cover and is not currently developed for a nonforest use. The minimum area for classification of forest land is one acre. The components that make up forest land are

timberland and all noncommercial forest land.

**Forest-type group.** A classification of forest land based on the species forming a plurality of live-tree stocking. A combination of forest types that share closely associated species or site requirements are combined into the following major forest-type groups (the descriptions apply to forests in this state):

**White/red pine.** Forests in which eastern white pine, red pine, or eastern hemlock, singly or in combination, make up the plurality of the stocking; common associates include red maple, oak, sugar maple, and aspen.

**Spruce/fir.** Forests in which red, white, black, or Norway spruces, balsam fir, northern white-cedar, tamarack, or planted larch, singly or in combination, make up a plurality of the stocking; common associates include white pine, red maple, yellow birch, and aspens.

**Hard pine** (also called loblolly/shortleaf pine). Forests in which eastern redcedar or pitch pine, singly or in combination, make up a plurality of the stocking; common associates include white pine, paper birch, sugar maple, and basswood.

**Oak/pine.** Forests in which hardwoods (usually hickory or upland oaks) make up a plurality of the stocking and in which pines or eastern redcedar contribute 25 to 50 percent of the stocking.

**Oak/hickory.** Forests in which upland oaks, hickory, yellow-poplar, black locust, sweetgum, or red maple (when associated with central hardwoods), singly or in combination, make up a plurality of the stocking and in which pines or eastern redcedar make up less than 25 percent of the stocking; common associates include white ash, sugar maple, and hemlock.

**Oak/gum/cypress.** Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, make up a plurality of the stocking and in which pines makes up less than 25 percent of the stocking; common associates include cottonwood, willow, ash, elm, hackberry, and maple.

**Elm/ash/red maple** (also called elm/ash/cottonwood). Forests in which elm, willow, cottonwood, or red maple (when growing on wet sites),

singly or in combination, make up a plurality of the stocking; common associated include white ash, sugar maple, aspens, and oaks.

**Northern hardwoods** (also called maple/beech/birch). Forests in which sugar maple, beech, yellow birch, black cherry, or red maple (when associated with northern hardwoods), singly or in combination, make up a plurality of the stocking; common associated include white ash, eastern hemlock, basswood, aspens, and red oak.

**Aspen/birch.** Forests in which aspen, paper birch, or gray birch, singly or in combination, make up a plurality of the stocking; common associates include red maple, white pine, red oaks, and white ash.

**Fragipan.** A loamy, brittle substance horizon low in porosity in content of organic matter and low in moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

**Freshwater.** Water containing only small quantities (generally less than 1,000 mg/L) of dissolved minerals.

**Freshwater Wetlands Act.** Law passed in 1975 that regulates the use and development of the State's freshwater wetland resources for the purpose of preserving, protecting, and conserving the wetlands and the benefits derived from them. Provides for the regulation of all wetlands over 5 hectares (12.4 acres) in size, and for smaller ones if they have been determined by the DEC to be of unusual ecological importance.

**Geographic Information (GISs).** Software that is used for digitizing and accessing hydrologic information.

**Glacial drift (geology).** Rock and associated materials (sorted and unsorted) which is transported and deposited by glacial processes.

**Glacial outwash (geology).** Gravel, sand, and silt, commonly stratified, deposited from melt water as it flows from glacial ice.

**Glacial till (geology).** Unsorted, nonstratified, compact glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

**Glaciofluvial deposits (geology).** Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

**Glaciolacustrine deposits (geology).** Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes by water originating mainly from the melting of glacial ice. Many are interbedded or laminated.

**Grab sample.** Type of water sample usually taken from either the surface alone, or the bottom waters alone. They can be collected by hand, or with specialized collection devices that minimize surface layer contamination and maximizes reproducibility. They involve a discrete sample time, which can be latter aggregated as a composite sample.

**Grade.** (1) The slope of a road, channel, or natural ground. (2) To finish the surface of a canal bed, roadbed, top of embankment, or bottom of excavation.

**Gravel.** Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

**Gravelly soil material.** Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

**Grazing unit.** An area of public or private pasture, range, grazed woodland, or other land that is grazed as an entity.

**Ground cover.** Maintenance of a vegetative cover for silviculture (forestry) activities in order to reduce sediment and nutrient runoff from an activity site as well as control weeds.

**Ground water (geology).** Water filling all the unblocked pores of underlying material below the water table, which is the upper limit of saturation.

**Ground water divide.** A ridge in the water table or potentiometric surface from which ground water moves away at right angles in both directions. The line of highest hydraulic head in the water table or potentiometric surface.

**Growing-stock trees.** Live trees of commercial species

classified as sawtimber, poletimber, saplings, or seedlings; that is, all live trees of commercial species except rough and rotten trees.

**Growing-stock volume.** Net volume, in cubic feet, of growing-stock trees 5.0 inches d.b.h. and larger from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs. Net volume equals gross volume less deduction for cull.

**Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

**Habitat.** A zone where environmental conditions are rather uniform spatially.

**Hardpan.** A hardened cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey, and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Hardwater.** Water that is high in calcium, magnesium, and (or) other minerals. In lakes, hard water can cause "whiting events", when changes in water pH causes the calcium to precipitate from the water column.

**Herbaceous.** A vascular plant that does not develop woody tissue

**Herbicides.** Chemical compounds, applied in either liquid or granular form, used to kill undesired rooted vegetation and restrict further vegetation growth.

**Herding.** The guiding of a livestock herd to desired areas or density of distribution.

**Hazardous Waste.** The Resource Conservation and Recovery Act (RCRA) defines hazardous waste as a solid waste that may cause an increase in mortality or serious illness or pose a substantial threat to human health and the environment when improperly treated, stored, transported, disposed of, or otherwise managed. A waste is hazardous if it exhibits characteristics of ignitability, corrosivity, reactivity, and/or toxicity.

**Holding pond.** A reservoir, pit, or pond, usually made of earth, used to retain polluted runoff water for disposal

on land.

**Hydraulic conductivity.** The capacity of a rock to transmit water; expressed as the volume of water that will move in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow.

**Hydraulic gradient.** The slope of the water table or potentiometric surface; that is, the change in water level per unit of distance along the direction of maximum head decrease. Determined by measuring the water level in several wells.

**Hydraulic head.** In ground water, the height above a datum plane (such as sea level) of a column of water. In a ground water system, it is composed of elevation head and pressure head.

**Hydrogeology.** The science of the interactions between water and geologic materials.

**Hydrologic budget.** A mass balance expression of hydrologic inputs and outputs (precipitation, condensation, evapotranspiration, surface and ground water storage, gains and losses, etc.)

**Hydrologic cycle.** An abstraction of water's movement, in solid, liquid and gaseous states, through the atmosphere, lithosphere, and biosphere.

**Hydrology.** The science of water. It describes the movement, distribution, chemistry, and occurrence of water.

**Hypolimnion.** Bottom layer of lake.

**Idle farmland.** Former cropland or pasture that has not been tended for within the last 2 years and has less than 10 percent stocking with live trees (established seedlings or larger trees), regardless of species.

**Igneous rock.** A rock that solidified from molten or partly molten material.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Incineration.** The controlled process by which solids, liquid, or gaseous combustible wastes are burned and changed into gases; the residue produced contains little or no combustible material.

**Industrial and commercial land.** Supply yards, parking lots, factories, etc.

**Inert.** A substance that does not react with other substances under ordinary conditions.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**In-lake control techniques.** Treatment actions that are conducted in the lake itself. There are four major types of in-lake control techniques. *Physical techniques* alter the physical structure of the land or water, examples being sediment dredging, aquatic plant harvesting, and the construction of stormwater sediment traps. *Chemical techniques* involve the use of chemicals that either change the behavior of the lake or poison some of the lakes' plants and animals. *Biological techniques* consist of introducing or removing specific types of plants and/or animals. *Institutional techniques* involve methods that focus on society, including regulating the actions of individuals by law.

**Insecticide.** A pesticide compound specifically used to kill or control the growth of insects.

**Integrated pest management.** A technique that uses two or more control methods to minimize pesticide pollution of surface or ground waters and provide an economic control of pests.

**Irrigation.** Application of water to soils to assist in production of crops. Methods of irrigation are---

*Basin.*---Water is applied rapidly to nearly level plains surrounded by levees or dikes.

*Controlled flooding.*---Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

*Corrugation.*---Water is applied to small, closely

spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

*Furrow.*---Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

*Sprinkler.*---Water is sprayed over the soil surfaces through pipes or nozzles from a pressure system.

*Subirrigation.*---Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

**Kame (geology).** An irregular, short ridge or hill of stratified glacial drift.

**Karst.** A landscape or region characterized by rock dissolution (generally in limestone).

**Kettle (geology).** A depression in the ground surface formed by the melting of an ice block buried in glacial drift.

**Lacustrine deposit (geology).** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Lagoon.** A reservoir or pond built to contain water and animal wastes until they can be decomposed either by aerobic or anaerobic action.

**Lake plain.** An area dominated by low-lying relief that formed at the bottom of a glacial lake during part of the glacial period.

**Lake stratification, also thermal stratification.** During ice-free season, lake are warmer at the top and colder at the bottom. Deeper lakes tend to exhibit a warm layer of water of uniform temperature at the surface, a region of water exhibiting rapid temperature decrease beneath, and a uniformly cold layer of water at the bottom.

**Land trust.** A private, not-for-profit group, controlled by local citizens, that acquires land or interests in land for the protection of open space, recreation, or resource lands. There are currently over 25 land trusts in New York State.

**Land use planning.** A method of watershed regulation where a program is developed in order to effectively

manage growth and development within the watershed.

**Leachate.** Liquids that have percolated through a soil and that contain substances in solution or suspension.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Legume.** A member of a large family that includes many valuable food and forage species, such as peas, beans, peanuts, clovers, alfalfas, sweet clovers, lespe-dezas, vetches, and kudzu.

**Light Non-Aqueous Phase Liquids (LNAPLs).** Organic compounds less dense than water that tend to float or pool at the surface of a waterbody or water table, and migrate in the direction of water flow.

**Light textured soil.** Sand and loamy sand.

**Limestone.** A rock that is formed chiefly by accumulation of organic remains (as shells and coral), consists mainly of calcium carbonate.

**Liming.** The process by which calcium-based products are added to acidified lakes or their surrounding watershed to bring the pH closer to neutral and to restore the alkalinity levels to buffer future acidic inputs.

**Limiting nutrients.** Those nutrients that restrict or limit algal growth when not sufficiently present or utilized. In most lakes, either phosphorus or nitrogen serve as the limiting nutrient.

**Limnologist.** A scientist involved in the study of freshwaters.

**Limnology.** The study of freshwaters--- lakes, ponds, reservoirs, streams and wetlands.

**Littoral zone.** The area between land and open water, can also be described as that portion of the lake where rooted aquatic plants exist. One of the three important habitats of a lake, consisting of the shoreline. This zone is very similar ecologically to terrestrial habitats, and is very productive and rich in diversity.

**Livestock.** Domestic animals.

**Load.** The quantity (i.e., mass) of a material that enters a waterbody over a given time interval.

**Loam.** Soil material that is 7 to 27 percent clay parti-

cles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Losing stream.** A stream or reach of a stream that contributes water to the zone of saturation.

**Macronutrient.** Nutritional necessities of algae, required and available in larger amounts (the classic examples are carbon, nitrogen, phosphorus, hydrogen, sulfur, oxygen)

**Macrophyte.** Rooted aquatic plants in the lake ecosystem that grow and propagate by photo-synthesis.

**Management practices.** Techniques implemented in order to improve the quality of a certain area. In a lake environment, techniques implemented to improve water quality.

**Manure.** The fecal and urinary defecations of livestock and poultry; may include spilled feed, bedding litter, or soil.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Mesotrophic.** An intermediate stage of nutrient availability and biological productivity. Less nutrient-rich than eutrophic but more than oligotrophic.

**Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

**Mineralized water.** Water containing dissolved materials in concentrations large enough to affect the use of the water for some purposes. A concentration of 1,000 mg/L of dissolved solids is used commonly as the lower limit for mineralized water.

**Mining and waste land.** Surface mining, gravel pits, dumps.

**Mixing zone.** The transition boundary between the fresh groundwater and saltwater zones. Also used to describe the transition zone where a pollutant load mixes with the receiving water.

**Moderately coarse textured (moderately light textured) soil.** Sandy loam and fine sandy loam.

**Moderately fine textured (moderately heavy textured) soil.** Clay loam, sandy clay loam, and silty clay loam.

**Monitoring program.** Strategy which uses and analyzes water quality data to build a representation of conditions present in the lake.

**Monomictic.** Monomictic lakes have one period of complete mixing each year, separated by one period of thermal stratification. Cayuga Lake typically mixes completely from late November through early June. Thermal stratification develops in June and persists through November.

**Mooring regulations.** Restrictions on the number, size, and location of docks, or the materials to construct them. These restrictions help to reduce overcrowding and strain on the lake ecosystem.

**Moraine (geology).** An accumulation of earth, stones, and other debris deposited by a glacier. Types are terminal, lateral, medial, and ground.

#### Morphology

**Soil -** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Lake –** Lake morphological characteristics such as depth and shape (e.g. bathymetry).

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance--- *few, common, and many*; size--- *fine, medium, and coarse*; and contrast--- *faint, distinct, and prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

**Muck.** Dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20 percent.

**National Forest lands.** Federal lands legally designated

as National Forests or purchase units and other lands administered as part of the National Forest System by the USDA Forest Service.

**Nonpoint source pollution.** Type of pollution involving complex transport and delivery mechanisms within the lake watershed. Unlike point source pollution, where the pollutants are discharged directly to the lake or tributaries. Thus, this pollution is much more difficult to control.

**Nutrient, plant.** Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

**Outwash, glacial.** Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by water that originated mainly from the melting of glacial ice. Glacial outwash is commonly in valleys on landforms known as valley trains, outwash terraces, eskers, kame terraces, kames, outwash fans, or deltas.

**Outwash plain.** A land form of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

**Overland flow.** The flow of rainwater or snowmelt over land surface toward receiving waters.

**Pan.** A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer; for example, *hardpan, fragipan, claypan, plowpan, and traffic pan*.

**Parent material.** The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

**Pasture.** Grazing lands planted primarily to introduced or domesticated native forage species that receives periodic renovation and/or cultural treatments such as tillage, fertilization, mowing, weed control, and irrigation. Not in rotation with crops.

**Peat.** Unconsolidated material, largely undecomposed

organic matter, that has accumulated under excess moisture.

**Pelagic zone.** The open water portion of a lake.

**Percolation.** The downward movement of water through the soil.

**Permeability.** The quality that enables the soil to transmit water or air, measures as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *mod-erately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

**Pesticide.** A chemical compound used to eliminate or control insects which may include herbicides.

**pH.** A number used by chemists to express the acidity of solutions, including water. A pH value lower than 7 indicates an acidic solution, a value of 7 is neutral, and a value of higher than 7 indicates an alkaline solution. Most ground waters in the United States have pH values ranging from about 6.0 to 8.5.

**Phosphorus.** An element which is an essential macro-nutrient for plant growth. Phosphorus is often the limiting nutrient for freshwater lakes in New York State.

**Phosphorus budget.** A biogeochemical cycle that accounts for the major sources of phosphorus to a lake (soil erosion, transport by streams, human waste) and from the lake (withdrawals, surface and groundwater outflows).

**Phosphorus inactivation.** A method of removing phosphorus from the water column in order to limit algal growth. A chemical is added to the water in order to bind with phosphorus present in the bottom sediments, minimizing the release of biologically available phosphorus from sediments when oxygen is depleted from the hypolimnion.

**Phosphorus precipitation.** A method of removing phosphorus from the water column in order to limit algal growth. Certain chemicals (usually alum salts) are added to the lake that will bind the phosphorus in the water column and sink it to the lake bottom.

**Photic zone.** The zone of a lake between the lake surface and the depth where light is about 1 percent of

surface levels.

**Photosynthesis.** The process by which plants convert the sun's energy into biomass or chemical energy. The primary way that energy enters the lake ecosystem.

**Phytoplankton.** The scientific designation for the class of organisms known as algae and some bacteria (e.g. cyanobacteria) which are the base of the food chain.

**Piezometric surface.** The level to which water would rise if a well were installed at a particular depth.

**Piezometer.** A nonpumping well used to observe the elevation of the water table or the potentiometric surface.

**Plankton.** Microscopic plants and animals that drift with the movement of the water and are a major source of food for aquatic life.

**Planning basins.** Watershed boundaries for major rivers.

**Plume.** A relatively concentrated mass of emitted chemical contaminants spreading in the environment.

**Point source pollution.** Form of pollution where the pollutants are discharged directly ("pipe" discharge) to a lake or its tributaries.

**Poletimber stand.** A stand-size class of forest land that is stocked with at least 10 percent of minimum full stocking with live trees with half or more of such stocking in poletimber or sawtimber trees or both, and in which the stocking of poletimber exceeds that of sawtimber.

**Poletimber tree.** A live tree of commercial species meeting regional specifications of soundness and form and at least 5.0 inches in d.b.h., but smaller than a sawtimber tree.

**Pollutant.** Any particle or substance that disturbs the operation of an ecosystem.

**Pollution.** Any activity that causes an impairment in the environment.

**Polychlorinated biphenyls (PCBs).** Synthetic organic compounds that can accumulate in the bodies of fish and other organisms and cause death with enough exposure. Probable human carcinogen.

**Poorly graded.** Refers to soil material consisting mainly of particles or nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Porosity.** The volume of openings in a rock. When expressed as a fraction, porosity is the ratio of the volume of openings in the rock to the total volume of the rock.

**Potable water.** Water that is suitable for drinking.

**Potentiometric surface.** An imaginary surface representing the level to which water will rise in a well.

**Primary wastewater treatment.** The first step in the treatment process, involving screens to remove the larger floating solids (such as sticks, seeds, rags, or paper). Skimming tanks remove excess oil or grease, and settling or sedimentation basins remove settleable suspended matter such as sand, gravel, and some organic solids.

**Producers.** Organisms, such as phytoplankton, that provide energy for other members of the food web. Photosynthetic organisms are classified as producers.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Public access.** The principle that non-resident visitors have full admittance to use a lake. Restricting public access is one of the techniques frequently discussed as a method to protect water quality.

**Recharge.** The water that infiltrates the water table. Recharge is the leftover precipitation after losses to surface runoff and evapotranspiration.

**Recharge area.** The area where water reaches the saturated zone by surface infiltration.

**Recreation site.** Parks, campgrounds, playing fields, tracks, etc.

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock. Soil scientists regard as soil only the part of the regolith that is modified by organisms and other soil-building forces. Most engineers describe the whole regolith, even to a great depth, as "soil".

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Removals.** The net growing-stock volume harvested or killed in logging, cultural Operations (such as timber stand improvement) or land clearing, and the net growing-stock volume neither harvested nor killed but growing on land that was reclassified from timberland to noncommercial forest land or nonforest land during the period between surveys. The volume is decided by the number of growing seasons to produce average annual removals.

**Request for Proposals (RFPs).** A problem statement and a detailed scope of proposed services to be provided by a consultant.

**Residence time.** Also called Detention time. The inverse of flushing rate, which is the time it takes a lake to complete one full exchange of water.

**Respiration.** The process that photosynthetic plants undertake, when oxygen is used to burn up the chemical fuels that were produced during photosynthesis. As a result, carbon dioxide and water are produced.

**Retention basin.** Much like a detention basin, where water is stored and pollutants are removed through sedimentation.

**Rill.** A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

**Riparian area.** Vegetated ecosystems along a waterbody through which energy, materials, and water pass. Riparian areas characteristically have a high water table and are subject to periodic flooding and influence from the adjacent waterbody.

**Riprap.** Rock and stone rubble used as a blanket or liner to prevent erosion in highly susceptible areas. This practice is used on sites that are subjected to large volumes of water that cannot be stabilized with less expensive vegetative measures.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Root zone.** The part of the soil that is, or can be, penetrated by plant roots

**Runoff.** The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

**Salinity.** The concentration of dissolved solids or salt in water.

**Salmonid.** A class of fish, including lake trout and brown trout, best suited for a deep, cold water portion of oligotrophic lake with a small littoral zone.

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sandstone.** Sedimentary rock containing dominantly sand-size particles.

**Sapling.** All live trees 1.0 through 4.9 inches d.b.h.

**Sapling/seedling stand.** A stand-size class of forest land that is stocked with at least 10 percent of minimum full stocking with live trees with half or more of such stocking in saplings or seedlings or both.

**Saturated.** When referring to soil, the maximum amount of water that can be held either when the soil is frozen or the spaces between the soil particles are filled with water. Any additional seepage over saturated soil will result in runoff.

**Saturated zone.** The zone (below the unsaturated zone) where interconnected openings contain only water.

**Sawtimber stand.** A stand-size class of forest land that is stocked with at least 10 percent of minimum full stocking with all live trees with half or more of such stocking in pole timber or sawtimber trees or both, and in which the stocking of sawtimber is at least equal to that of pole timber.

**Sawtimber tree.** A live tree of commercial species at least 9.0 inches d.b.h. for softwoods or 11.0 inches for hardwoods, containing at least one 12-foot sawlog or two noncontiguous 8-foot sawlogs, and meeting regional specifications for freedom from defect.

**Secchi disk.** A 20cm steel or heavy plastic disk, composed of alternating black and white quadrants, used to measure the transparency of lakes. The transparency is considered the average of the depths at which the disk first disappears from view, and first reappears, respectively.

**Secondary wastewater treatment.** This intermediate step is used to reduce high oxygen demand before the wastewater is discharged into a lake or stream. Filtration and biological and chemical processes are used to remove a high percentage of organic matter from the wastewater.

**Sediment.** The deep water bottom or suspended material that may be rocky, sandy, or muddy.

**Sediment basins.** Depressions that can be constructed to protect lakes and streams from upstream land use activities. Stormwater is detained and released at a controlled rate, which can be modified to optimize sedimentation.

**Sediment removal.** Management technique that involves dredging bottom sediment from a lake to increase the depth, control nuisance aquatic vegetation, control nutrient release from sediments, and to remove toxic substances.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Sedimentation.** The process or act of depositing sediment.

**Seedling.** A live tree less than 1.0 inch d.b.h. and at least 1 foot tall.

**Seepage.** Water escaping through or emerging from the ground along an extensive line or surface as contrasted with a spring, where the water emerges from a localized spot.

**Septic leachate detector.** A hand held fluorometer that can locate effluent plumes and domestic waste water in lakes. When the probe is submerged in lake water in front of a shoreline home, a response can be noted if

human sewage, detergents, or whiteners are detected. Also known as a septic snooper.

**Septic tank mound.** An alternative method to the septic tank-leach field system, used in areas where soil conditions are not well suited for subsurface soil absorption. An above-ground mound is created with fill material, usually a porous sandy soil. Wastewater from the tank is allowed to seep through the soil in the mound, which then filters back through the ground. Clay barriers around the mound serve to reduce the seepage of wastewater to the surrounding ground.

**Septic tank sand filter.** Used in area where soils are unsuitable for conventional drain fields. The wastewater filters from the septic tank to a second tank, which periodically releases the water through a sand filter. The filter is lined with clay or plastic to prevent wastewater leakage, and the filtrate is collected and piped to a disinfection unit.

**Septic tank.** The most common on-site system for the treatment and disposal of domestic wastewater from individual residences, involving the transport of wastewater from a residence to a buried tank. Perforated pipes then transport the wastewater to a subsurface drainage system where it percolates into the soil.

**Settleable solids.** Solids in a liquid that can be removed by stilling a liquid. Settling times of 1 hour (APHA/AWWA/WPFC, 1975) or more are generally used

**Sewer system.** A replacement for small scale treatment systems such as on-lot septic tanks and cluster systems. Used at many larger lake communities, most involve pumping or carrying the outflow of septic tanks to a treatment facility or large interceptor sewer.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Sheet flow.** Water, usually storm runoff, flowing in a thin layer over the ground surface.

**Silage.** A fodder crop that has been preserved in a moist, succulent condition by partial fermentation; such crops include corn, sorghums, legumes, and grasses

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Silviculture.** A branch of forestry dealing with the cultivation and management of trees in order to produce a crop resource on a continuing basis.

**Sinkhole.** A depression in a landscape where limestone has been locally dissolved.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

**Sludge.** The material resulting from chemical treatment of water or coagulation.

**Soil.** A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil profile.** A vertical section of the soil from the surface through all its horizons, including C horizons.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.02 millimeter).

**Soil survey.** A general term for the systematic examination of soils in the field and in laboratories; their description and classification; the mapping of kinds of soil; the interpretation of soils according to their adaptability for various crops, grasses, and trees; their behavior under use or treatment for plant production or for other purposes; and their productivity under different management systems.

**Solubility.** The relative capacity of a substance to dissolve in liquid. Sugar has a high solubility in water, whereas gold has a low solubility in water.

**Stand.** A group of forest trees growing on forest land.

**Stand-size class.** A classification of forest land based on the size class (that is, seedlings, saplings, poletimber, or sawtimber) of all live trees in the area.

**Stocking.** The degree of occupancy of land by trees, measured by basal area and/or number of trees in a stand compared with the basal area and/or number of trees required to fully use the growth potential of the land (or the stocking standard). In the Eastern United States this standard is 75 square feet of basal area per acre for trees 5.0 inches d.b.h. and larger, or its equivalent in numbers of trees per acre for seedlings and saplings. Two categories of stocking are used in this report: all live trees and growing- stock trees. The relationships between the classes and the percentage of the stocking standard are: nonstocked (0 to 9); poorly stocked (10 to 59); moderately stocked (60 to 99); fully stocked (100 to 129); and overstocked (130 to 160).

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

**Storage.** Available capacity for temporarily removing water from circulation.

**Stratified.** Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

**Strip cropping.** A means of reducing soil erosion on tilled cropland. The intent is to Break the length of slope into segments by laying out strips across the natural slope of the land. Strips of close-growing crops or meadow grasses are planted between tilled row crop strips to serve as sediment filters or buffer strips in controlling erosion. The strips increase water infiltration, retain soil particles, and reduce velocity of runoff.

**Strip mine.** Area devoid of vegetation due to current or recent general excavation.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are--- *platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or sub- angular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Sublimation.** The process by which a solid vaporizes directly to a gas.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Subsurface layer.** Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

**Surface soil.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon".

**Surface water.** All water whose surface is exposed to the atmosphere.

**Suspended sediment.** The very fine soil particles that remain in suspension in water for a considerable period of time

**Taxonomy.** The identification of living organisms.

**Temperature profile.** The temperature of a water column at specific points. Used in lake profiling to determine the degree of stratification, and the potential for depletion of oxygen, fish and other aquatic organisms.

**Terminal moraine.** A belt of thick glacial drift that generally marks the termination of important glacial advances.

**Terrace (geologic).** An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

**Terraces.** Earth embankments, channels or a combination ridge and channel construct-ed across the slope of a field to control runoff. They are generally applied where contouring, strip cropping and reduced tillage operations do not offer adequate protection from soil erosion and are most practical on deep soils. By breaking the length of slope into smaller segments and intercepting the flow of runoff, terraces effectively reduce soil erosion and the transport of sediment off-site. In reducing the volume and velocity of runoff, water is retained on the land for moisture conservation.

**Tertiary wastewater treatment.** The third step in treatment is used to significantly reduce nutrient concentrations in the wastewater. These advanced treatment processes usually involve a combination of chemical (alum or iron salt addition), biological (biological treatment columns), and physical (filtration and/or settling) techniques. This may provide more than 90% removal of phosphorus.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

**Thermocline.** The region of rapid temperature decline in a lake, related to the transparency of the lake water and how exposed the lake is to the wind. A clear lake will have a deeper thermocline than a turbid lake. A wind-exposed lake will have a deeper thermocline than a protected lake.

**Thin layer.** Otherwise suitable soil material too thin for the specified use.

**Till.** A compact, unsorted and unstratified mixture of clay, silt, sand, gravel, and boulders deposited directly by glaciers.

**Till plain.** An extensive flat to undulating area underlain by glacial till.

**Tillage.** The operation of implements through the soil to prepare seedbeds and rootbeds, control weeds and brush, aerate the soil, and cause faster breakdown of organic matter and minerals to release plant foods.

**Tilth.** The physical condition of the soil as related to its ease of tillage, its fitness as a seedbed, and its impedance to seedling emergence and root penetration.

**Timberland.** Forest land producing or capable of producing crops of industrial wood (more than 20 cubic feet per acre per year) and not withdrawn from timber utilization (formerly known as commercial forest land).

**Time of travel.** The amount of time it takes for water to reach a well or stream from a certain distance.

**Topographic map.** A map that shows contours of elevation above sea level.

**Topography.** The relative positions and elevations of the natural or man-made features of an area that describe the configuration of its surface.

**Topsoil (engineering).** Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

**Toxicity.** A gauge of how detrimental a substance is to a living organism. Toxic effects can either be *acute* (causing immediate death or impairment) or *chronic* (causing subtle damage that may not show up until years after exposure).

**Transmissivity.** The rate of groundwater flow through a unit area of an aquifer under a hydraulic gradient of 1.

**Transpiration.** The process by which trees, shrubs, and grasses in a watershed draw water out of the soil and emit water vapor to the air.

**Transportation right-of-way.** Land associated with highways and railroads.

**Tree class.** A classification for the quality or condition of trees for sawlog production. Tree class for sawtimber trees is based on their current condition. Tree class for poletimber trees is a prospective determination—a forecast of their potential quality when they reach sawtimber size (11.0 inches d.b.h. for hardwoods, 9.0 inches d.b.h. for softwoods)

**Trenches.** An infiltration practice that provides an opportunity for surface water to filter runoff through the surface soil. A trench involves infiltration through uncovered soil.

**Trickling filter.** A fixed bed of rock over which wastewater is applied for aerobic biological treatment. Slimes form on the rocks and treat the wastewater. A distributor system continues dosing the filter beds, and the treated wastewater is collected by an underdrain system.

**Trophic state classifications.** Using the Trophic State Index, a value is determined that classifies a water sample as being either oligotrophic (low-nutrient), mesotrophic (average nutrients), or eutrophic (high-nutrient). Oligotrophic lakes often provide an excellent

drinking water supply, while eutrophic lakes often support excellent warmwater fisheries.

**Turbidity.** A water chemistry parameter, caused by suspended materials such as clay, silt, algae, and other materials that cause light to be scattered and absorbed, not transmitted in straight lines through water. It has a major influence on Secchi disk transparency and therefore the clarity of the lake.

**Turn over.** The upper layer cools down in the fall, until the lake reaches uniform temperature. The thermal barrier to mixing is gone and the lake will mix, or turn over, from top to bottom. This process is called fall overturn. In the spring, the ice melts and the lake again becomes one uniform temperature and mixes, called spring overturn.

**Unconfined aquifer.** An aquifer that contains both an unsaturated and a saturated zone (i.e., an aquifer that is not full of water) and does not have a confining layer at its top.

**Underground Storage Tanks (USTs).** A tank with at least 10 percent of its volume beneath the ground, including attached pipes.

**Unsaturated.** When referring to soil, any sample that has still has the capability to hold more water without experiencing runoff.

**Unsaturated zone.** The subsurface zone, usually starting at the land surface, that contains both water and air.

**Upland (geology).** Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

**Use impairment.** When referring to a lake, a “problem” in the complete functioning of the lake ecosystem.

**Valley fill.** In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams emerging from hills or mountains and spreading sediments onto the lowland as a series of adjacent alluvial fans.

**Vegetative cover.** A management technique that involves growing grasses, trees or shrubs in areas where slope and soils are particularly vulnerable to erosion

and runoff damage. Because permanent protection is provided, it is an effective control for most pollutants, especially sediments.

**Volatile Organic Compounds (VOCs).** A category of volatile organic compounds with relatively high vapor pressures.

**Waste.** Material that has no original value or no value for the ordinary or main purpose of manufacture or use; damaged or defective articles of manufacture; or superfluous or rejected matter or refuse.

**Water table.** The upper limit of the soil or underlying rock material that is wholly saturated with water.

*Water table, apparent.* A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

*Water table, artesian.* A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

*Water table, perched.* A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

**Watershed.** The area that consists of all the land, streams, rivers, lakes, and other water bodies that contributes water to the lower end of that watershed at its point of discharge.

**Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth’s surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

**Weir.** A device for measuring or regulating the flow of water.

**Well graded.** Refers to a soil or soil material consisting of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

**Wetland.** An area with some open water and much shoreline and emergent vegetation. The water in a wetland may be only a few inches deep.

**Zone of aeration.** Also called the unsaturated zone. The portion of the subsurface between the water table and the ground surface.

**Zone of saturation.** The portion of the subsurface that is saturated with groundwater.

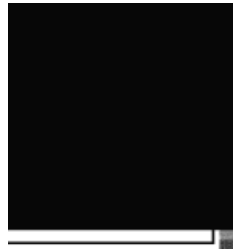
**Zoning.** A method by which local governments can protect natural resources by using regulations to

control land use activities. Through zoning, an area is divided into districts. The local government then established laws that govern the use of land with these districts.

**Zoning variances.** A method that can be developed in some areas to facilitate unusual landscape features, such as steep hillsides, scenic vista, erosive sites, and natural drainage that may restrict development.

**Zooplankton.** The primary consumers of the lake food web. Small, microscopic animals that drift with the movement of the water.

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