Appendix C: Glossary

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.

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).

Base flow: Sustained or fair-weather flow of a stream.

Best Management Practice: A methods that have been determined to be the most effective, practical means of addressing a problem.

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.

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.

Detention basin: A constructed holding area for stormwater 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.

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).

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

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.

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.

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*.

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.

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

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.

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, protect- ing, 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 Systems (GISs): Software that is used for digitizing and accessing hydrologic information.

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.

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.

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

Hard water: 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.

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

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.

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.

Impervious surface: 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.

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 r ate 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.

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.

Lacustrine: Of or pertaining to a lake.

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

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.

Leach field.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.

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. Inmost lakes, either phosphorus or nitrogen serve as the limiting nutrient.

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.

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

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.

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.

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.

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.

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 of 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.

On-site wastewater treatment.

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

Peat: Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture.

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).

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 macronutrient 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 biolog- ically 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.

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.

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.

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.

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.

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

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.

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

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: Of or pertaining to a river or stream.

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.

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 oligotrphic lake with a small littoral zone.

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

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 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.

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 submersed 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 domes-tic 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

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 80percent or more silt and less than 12 percent clay.

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 form 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 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.

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 in- herited 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.

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 subangular), 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).

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

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

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.

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 processed 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.

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.

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.

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).

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.

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.

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.

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

Use impairment: When referring to a lake, a "problem" in the complete functioning of the lake ecosystem.

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

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 thislayer 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.

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.