Glossary[1]

[1] Except where otherwise noted, terms are from or modified from Government of Canada 1996. Terms in italic are defined elsewhere in the Glossary.

A

acute toxicity: severe biological harm or death produced in an organism by a substance withina short time after exposure

algal bloom: See *bloom*.

ammonia nitrogen: Nitrogen in the form of ammonia (NH_3). See also *nitrogen fixation*.

anoxia: The absence of oxygen, which is necessary to sustain most life. In *aquatic ecosystems*, this refers to the absence of dissolved oxygen in water.

aquatic: Pertains to both freshwater and marine ecosystems.

B

benthic: Of or living on or in the bottom of a water body. See also *benthos*.

benthos: Organisms living on the bottom of bodies of water.

biochemical oxygen demand (BOD): A measure of the quantity of oxygen used in the biochemical oxidation of compounds containing carbon and nitrogen in a specified time, at a specified temperature, and under specific conditions. The standard measurement is made for five days at 20°C.

biologically available: The physical or chemical form of a substance that can be directly used by an organism.

bloom (also known as **algal bloom**): Rapid growth of certain algal constituents of *plankton* in and on a body of water that is so heavy as to colour the water. The rapid growth can be fuelled by enrichment of nutrients, such as phosphorus and nitrogen.

BOD: See *biochemical oxygen demand*.

C

chronic toxicity: a measurable, but not totally disabling, effect produced in an organism by a substance over a relatively long period. The end result of chronic toxicity can be death, although the usual effects are sublethal (e.g., inhibition of reproduction or growth).

coliform bacteria: A group of bacteria predominantly inhabiting the intestinal tracts of humans and other warm-blooded animals, but also occasionally found elsewhere. The total coliform group is commonly used as an *indicator* of the sanitary quality of water, because ingestion of these bacteria in drinking water can result in diseases such as cholera.

contamination: Introduction of any undesirable foreign substance — physical, chemical, or biological — into an ecosystem. Does not imply an effect (see *pollution*). Usually refers to the introduction of human-made substances.

cumulative effect: The effect on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions.

D

drainage basin: See *watershed*.

E

effective concentration [median ~] (EC_{50}) The concentration of a stressor estimated to be effective in producing a defined biological response, other than mortality, in 50% of the test organisms over a specific time interval (e.g., a 48-h *Daphnia* EC_{50} for immobilization).

effluent: A liquid waste material that is a by-product of human activity (e.g., municipal wastewater or liquid industrial waste), which may be discharged into bodies of water.

environmental indicator: A selected key statistic that represents or summarizes a significant aspect of the state of the environment, natural resource sustainability or related human activity. Environmental indicators focus on trends in environmental changes, the stresses that are causing them, how ecosystems and their components are responding to these changes, and societal responses to prevent, reduce or ameliorate these stresses. See also *indicator*.

eutrophic: Pertaining to a body of fresh water that is rich in nutrients. See also *trophic*, *trophic level*, and *trophic status*.

eutrophication (also known as **nutrient enrichment**): The process of over fertilization of a body of water by nutrients that produce more organic matter than the self-purification reactions can overcome. Eutrophication can be a natural process or it can be accelerated by an increase of nutrient loading to a water body by human activity. See also *trophic*, *trophic level*, and *trophic status*.

F

food chain: A food relationship in an ecosystem in which energy and nutrients are transferred through a series of organisms by each stage feeding on the preceding one and providing food for the succeeding stage. Each stage of a food chain is known as a trophic level. The first trophic level consists of the green plants that can undertake photosynthesis, thereby obtaining their energy from the sun. See also *food web*.

food web: A complex intermeshing of individual *food chains* in an ecosystem.

G

ground water: Water occurring below the ground surface, which may supply water to wells and springs. Ground water occupies pores, cavities, cracks, and other spaces in bedrock and unconsolidated surface materials.

H

habitat: The place or type of site where plant, animal, or microorganism populations normally occur. The concept of habitat includes the particular characteristics of that place, such as climate and the availability of water and other life requisites (e.g., soil nutrients for plants and suitable food and shelter for animals), which make it especially well suited to meet the life cycle needs of the particular wildlife.

hydrological cycle (also known as the **water cycle**): The complement of processes by which water reaches the Earth from atmospheric precipitation, passes through transport and storage stages on the Earth's surface, and is returned to the atmosphere through evaporation and evapotranspiration

I

indicator: A statistic or parameter measure that, tracked over time, provides information on trends in the condition of a phenomenon and has significance extending beyond that associated with the properties of the statistic itself. See also *environmental indicator*.

indicator species: An organism whose presence or absence suggests that certain ecological conditions prevail. An indicator species can be used to monitor how much of a factor is present and how an ecosystem is responding to stresses and changes.

intensive agriculture: large-scale agricultural production carried out on a relatively small land base.

L

leaching: Washing out of soluble substances by water passing down through soil. Leaching occurs when more water falls on the soil than is lost by evaporation from the surface. Rainwater running through the soil dissolves mineral nutrients and other substances and carries them via ground water into water bodies.

lethal concentration [median ~] (LC_{50}) The concentration of a stressor estimated to be lethal to 50% of the test organisms over a specific time interval (e.g., 96-h LC_{50})

loading: Total mass of contaminants to a water body or to the land surface over a specified time (e.g., tonnes per year of phosphorus).

M

macronutrient: An element, such as potassium or nitrogen, essential in large quantities for plant growth.

monitoring: The process of checking, observing, or keeping track of something for a specified period of time or at specified intervals

N

nitrogen fixation: Conversion of gaseous (atmospheric) nitrogen (N_2) to compounds such as ammonia (NH_3). Carried out in ecosystems mainly by certain bacteria and blue-green algae. See also ammonia nitrogen.

nitrogen oxides (NOx): A group of gases released by fossil fuel combustion, forest fires, lightning, and decaying vegetation. Nitrogen dioxide (NO_2), a reddish-brown gas with an irritating odour, is one of the key ingredients in smog. Nitrous oxide (N_2O) is a greenhouse gas whose principal source is agricultural soil in a degraded state.

no-observed-effect concentration (NOEC): The highest dose or concentration used in a toxicity test resulting in no statistically significant observed effect in the exposed organisms compared with control organisms.

non-point source: Source of pollution in which pollutants are discharged over a widespread area or from a number of small inputs rather than from distinct, identifiable sources. Examples include eroding croplands, urban and suburban lands, and logged forestlands. See also *point source*.

nutrient: Any element or compound that an organism must take in from its environment because it cannot produce it or cannot produce it as fast as it needs it. As pollutants, any substance or group of substances (e.g., phosphorus or nitrogen) that, if added to water in sufficient quantities, provides nourishment that promotes the growth of aquatic vegetation in those waters to such densities as to degrade or alter or form part of a process of degradation or alteration of the quality of those waters to an extent that is detrimental to their use by any plant or animal, including humans. An example would be eutrophication of a lake.

nutrient enrichment: See *eutrophication*.

O

organic compounds: Compounds based on carbon and usually also containing hydrogen, with or without oxygen, nitrogen, or other elements. Organic originally meant "of plant or animal origin," and it is still sometimes used in this way. For example, manure and sewage contain organic compounds of animal and plant origin. However, now that organic compounds are routinely created by people, the word "organic" is also used to refer to synthetic organic compounds, such as synthetic fertilizers.

organic matter: Plant, animal, or micro-organism matter, either living or dead.

oxygen depletion: Consumption of oxygen at a rate that exceeds the supply, usually from air. In a river or pond this may occur at night when oxygen production by plants ceases but oxygen consumption by plants and animals continues. In lakes that are sufficiently deep, oxygen depletion occurs naturally in the cold lower layer (hypolimnion) during the summer while it has no access to oxygen from the air.

P

pH: A numerical expression of the concentration of hydrogen ions in solution: pH 0–6.9 is acidic, pH 7 is neutral, and pH 7.1–14 is basic or alkaline.

phytoplankton: Microscopic aquatic vegetative life; plant portion of the plankton; the plant community in marine and freshwater situations that floats free in the water and contains many species of algae.

plankton: Collective noun for organisms that drift around in water because they are not capable of swimming against currents in the water. See also *phytoplankton* and *zooplankton*.

point source: A source of *pollution* that is distinct and identifiable. Includes outfall pipes from municipal sewage treatment plants and industrial plants. See also *non-point source*.

pollution: The release by humans, directly or indirectly, of substances or energy into ecosystems that results or is likely to result in such deleterious effects so as to harm living resources and life, be hazardous to human health, hinder human activities, impair the quality of the ecological resources, and reduce amenities.

primary wastewater treatment: First step in sewage treatment to remove large solid objects by screens (filters) and sediment and organic matter in settling chambers. See also *secondary wastewater treatment* and *tertiary wastewater treatment*.

S

secondary wastewater treatment: After *primary wastewater treatment*, removal of biodegradable organic matter from sewage using bacteria and other micro-organisms, inactivated sludge, or trickle filters. Also removes some of the phosphorus (30%) and nitrate (50%). See also *tertiary wastewater treatment*.

sublethal: involving a stimulus below the level that causes death.

T

tertiary wastewater treatment: Removal of nitrates, phosphates, organochlorine compounds, salts, acids, metals, and toxic organic compounds *after secondary wastewater treatment*. See also *primary wastewater treatment*.

toxic: Pertains to any substance if it is entering or may enter the environment in a quantity or concentration or under conditions having or that may have an immediate or long-term effect on the environment (including living organisms within it) or constituting or that may constitute a danger to human life or health.

toxicity: The inherent potential or capacity of a material to cause adverse effects in a living organism. See acute toxicity, chronic toxicity and sublethal.

trophic: Relating to processes of energy and nutrient transfer from one or more organisms to others in an ecosystem. See also *eutrophic*, *trophic level*, and *trophic status*.

trophic level: Functional classification of organisms in a community according to feeding relationships; the first trophic level includes green plants, the second level includes herbivores,and the third trophic level includes carnivores. See also *eutrophic*, *trophic*, and *trophic status*.

trophic status: A measure of the biological productivity in a body of water. Aquatic ecosystems are characterized as oligotrophic (low productivity), mesotrophic (medium productivity), or *eutrophic* (high productivity). See also *trophic* and *trophic level*.

turbid: Refers to water that is cloudy or murky as a result of suspended sediment. Water may become turbid as a result of soil erosion, from addition of effluents containing particulate matter, or through the churning up of bottom sediments (e.g., via boat traffic in a body of water).

turbidity: The state of being *turbid*.

W

watershed: An area of land that drains naturally into a stream or other waterway.

Z

zooplankton: Microscopic animals, usually invertebrates, that are found in the water of aquatic ecosystems. See also *phytoplankton* and *plankton*.