

# Watershed Terms

**Algae:** Algae are simple single-celled, multi-celled or colonial, aquatic plants that contain the green pigment chlorophyll. They grow by absorbing nutrients (nitrogen and phosphorus) from the water or sediments, add oxygen to the water during the process of photosynthesis and represent the basic component of the aquatic food chain.

**Algae Blooms:** Refers to noxious and excessive growths of algae generally caused by excessive nutrients in the water. Algae blooms often result in scum forming on the water surface and associated foul odors. Blooms can be potentially harmful to fish and wildlife (and people) in extreme situations.

**Aquatic Respiration:** Refers to the use of oxygen in an aquatic system including the decomposition of organic matter and the use of oxygen by fish, aquatic invertebrates, algae and microorganisms for metabolism.

**Bioaccumulation:** The progressive increase in the amount of a substance or chemical in an organism resulting from repeated exposures to that substance or chemical. Certain chemicals, such as PCB's, mercury, and some pesticides, can be concentrated from very low levels in the water to toxic levels in animal tissues through this process.

**Chloride:** Chlorides are a form of salt that can be harmful to freshwater life at high levels. Large concentrations of chlorides in freshwater systems come from manmade sources such as roadway salting, irrigational practices and through discharge of domestic and industrial wastes.

**Chlorophyll:** Green pigment in plants and algae that transforms light energy into chemical energy during the process of photosynthesis.

**Combined Sewers:** Combined sewers capture both wastewater from your home or business along with all the rain that runs off of streets, yards and parking lots. Found mostly in the older sections of the City of Milwaukee and Village of Shorewood, combined sewers represent about 5% of the Milwaukee Metropolitan Sewerage District's total service area. One of the great benefits of the combined sewer system is that it delivers highly polluted stormwater runoff to the wastewater treatment plant for cleaning during rainstorms.

**Combined Sewer Overflows:** During heavy rains, there may be combined sewer overflows (CSO's). When this happens, stormwater pollutants along with some untreated sewage overflow into area waterways. It's estimated that combined sewer overflows consist of about 85% stormwater and 15% sewage. In this region, up to six CSO's are allowed per year.

**Decomposition:** Breakdown of organic matter by bacteria and fungi. Generally uses oxygen in the breakdown process.

**Dissolved Oxygen (DO):** The dissolved oxygen content is an indication of the status of the water with respect to the balance between oxygen-consuming and oxygen-producing processes. Fish and other desirable clean-water biota require relatively high dissolved oxygen levels at all times.

**Dry Deposition:** Fine particulate matter settling from the atmosphere onto land surfaces or water bodies during periods with no precipitation.

**Ecosystem:** All of the interacting systems and organisms in association with their interrelated physical and chemical environment.

**Eutrophication:** The process by which lakes and streams are enriched by nutrients (usually phosphorus and nitrogen) which leads to excessive plant growth or algae blooms.

**Fecal Coliform Bacteria:** Fecal coliform bacteria are found in the intestinal tracts of warm-blooded animals. Fecal coliform bacteria, like *E. coli* bacteria, are used as microbiological indicators that determine the safety of water for drinking or swimming. Fecal coliform bacteria in waterways originate from many sources that include bird droppings, pet waste, livestock waste, failing septic systems, stormwater runoff, and sanitary and combined sewer overflows.

**Food Chain:** The transfer of food energy from successive levels of organisms. An example of the food chain sequence is algae being eaten by aquatic invertebrates, which in turn are eaten by small fish, which are then eaten by larger fish, which are eventually eaten by people.

**Habitat:** Every stream has its own set of unique characteristics that evolve in concert with and in response to surrounding ecosystems. For example, deep pools provide space, cover, and a place for fish to seek protection during storms or droughts. Likewise the amount of vegetation and trees that line the banks defines the available cover and shading of the stream. These factors in combination with many others create the habitat of the stream.

**Impervious Surfaces:** Hard land surfaces such as roads, parking lots, buildings, etc. that prevent rainwater from soaking into the soil. Runoff from impervious surfaces carries deposited contaminants from those surfaces to the local waterways.

**Land use:** Land use describes the dominant character of a geographic area and describes the dominant types of human activities which are prevalent in the area or region. Examples of various land uses include cropland, forest, pastureland, suburban and urban developments.

**Landscape:** All the natural geographical features, such as fields, hills, forest, and water that distinguish one part of the earth's surface from another part. These characteristics are a result not only of natural forces but of human use of the land as well.

**Mercury:** Mercury is one of several heavy metals widely distributed in the environment which can bioconcentrate. Mercury is used in fungicides, bactericides, and slimicides because of its toxic properties. Fuel combustion, coal burning and smelting processes release mercury to the atmosphere, where it can subsequently be transported and/or deposited to the water.

**Nitrogen:** Nitrogen is one of several nutrients needed by all plants and animals. Nitrogen is a key component of proteins, and as plants and animals live and die, they release many nitrogen compounds to the surrounding environment.

**Nonpoint Source Pollution:** Nonpoint source pollution comes from diffuse, undefined sources; it is associated mainly with the surrounding land use such as urban development or agriculture. Nonpoint source pollution or polluted stormwater runoff is considered the greatest threat to water quality both nationally and in Wisconsin.

**pH:** pH is an important factor in the chemical and biological systems of natural water and is the measure of hydrogen ion activity. Whether the water is acidic (low pH) or basic (high pH) affects the toxicity of many compounds (i.e. heavy metals). A pH range of 6.0 to 9.0 appears to provide adequate protection for the life of freshwater fish and bottom-dwelling invertebrates.

**PAH's:** PAH's (Polycyclic Aromatic Hydrocarbons) are formed from the incomplete combustion of fossil fuels and organic matter. They are also a component of many petroleum products, creosote, asphalt, cigarette smoke and vehicle exhaust. Forest fires and residential wood combustion are thought to be a major source of PAH's in rural and urban environments. PAH's are considered carcinogens.

**PCB's:** PCB's (Polychlorinated Biphenyls) are a group of fat-soluble chlorinated chemicals. PCB's have been used as dielectric fluids in capacitors and transformers, and in hydraulic fluids. PCB's are persistent and bioconcentrate in the aquatic food chain because of their stability and ability to concentrate in fatty tissue. PCB's are only moderately acutely toxic; however, they cause chronic toxic effects such as developmental and reproductive toxicity.

**Phosphorus:** Phosphorus is one of the major nutrients required for plant nutrition. Excess concentrations of phosphorus can stimulate rapid algae and plant growth which can lead to a condition of accelerated aging of waters (eutrophication). Phosphorus can enter waterways from multiple sources including domestic and industrial wastewater discharges and from agricultural practices and fertilization of urbanized and suburban areas.

**Photosynthesis:** The process by which green plants convert carbon dioxide (CO<sub>2</sub>) dissolved in water to sugars and oxygen using sunlight for energy. Photosynthesis is essential in producing the aquatic food chain base, and is an important source of oxygen for many waterbodies.

**Sanitary Sewer Overflow:** Sanitary sewer overflows (SSO's) occur when leaky sanitary sewer lines fill beyond their capacity during heavy rains. These sewers are designed to carry wastewater, not rainwater. Leaks occur through illegal sewer connections, cracks in sewer lines or connection joints and through poorly sealed manhole covers in streets. Rather than allowing the rainwater and sewage to back up into people's basements, relief is provided to the system through an overflow point to an area waterway.

**Separate Sanitary Sewers:** Sanitary sewers take wastewater from your home or business to the wastewater treatment plants for processing. About 95% of Milwaukee Metropolitan Sewerage District's total service area has separate sewers, a system that consists of two separate sewer pipes (a sanitary sewer and a storm sewer).

**Solids:** Solids are an important water quality variable that can originate from soil particles or other sources. High solids concentrations can reduce spawning habitat when settling in a stream or to a lake bottom and can clog gills of fish and invertebrates or make drinking water supplies undesirable, reduce light penetration, and may cause adverse effects for irrigation and industrial processes.

**Storm Sewers:** The storm sewer collects stormwater runoff from streets and yards and delivers that water directly to a river or lake every time it rains or the snow melts.

**Stormwater Runoff:** Precipitation and snowmelt runoff from farm fields, roadways, parking lots, roof drains that is collected in gutters and drains. Polluted stormwater runoff is considered the greatest threat to water quality in Wisconsin.

**Temperature:** Water temperature is important to aquatic organisms because it affects the solubility of dissolved oxygen and the toxicity of various substances found in the water. Water temperature influences the rate of biochemical processes, metabolism, respiration and reproduction of aquatic organisms.

**Turbidity:** Turbidity is suspended particles found in water and is measured by a particle's ability to scatter sunlight. Excessive turbidity can clog the gills of fish and mussels, and can cover bottom habitats of invertebrates and fish spawning areas.

**Watershed:** Defined by nature's boundaries, a watershed is an area of land that captures water and drains to a river or lake. If a drop of water falls outside of the boundary, it becomes part of another watershed. Also called Drainage Basin or Water Basin.