



Glossary of Water Quality Terms and Acronym List

Prepared by:

**Vernon N. Cox, Leon E. Danielson, Agricultural and Resource
Economics, Applied Resource Economics and Policy Group; and
Gregory D. Jennings, Biological and Agricultural Engineering**

This publication provides brief definitions of technical and regulatory terms often used when discussing surface water quality issues. It also contains descriptions of relevant federal and state legislation, agencies and programs, and provides a list of commonly used water quality acronyms.

Technical and Regulatory Terms

Aerobic: in the presence of, or requiring, oxygen.

Algal Bloom: a large, visible mass of algae found in bodies of water such as lakes or estuaries. Blooms occur most often during warm weather, but may also occur at other times of the year. Color ranges from green to red.

Anaerobic: in the absence of oxygen.

Aquifer: an underground geological formation or group of formations containing usable amounts of groundwater that can supply wells and springs.

Assimilative Capacity: the amount of pollutants that a water body may absorb while maintaining corresponding water quality standards, including protection of aquatic life and human health.

Background Level: amount of a substance expected to occur naturally in the environment.

Bacteria: microscopic one-celled organisms which live everywhere and perform a variety of functions. While decomposing organic matter in water, bacteria can greatly reduce the amount of oxygen in the water. (See Fecal Coliform)

Baseflow: the amount of water in a stream that results from groundwater discharge.

Best Management Practice (BMP): a structural or nonstructural method, activity, maintenance procedure, or other management practice used singularly or in combination to reduce nonpoint source inputs to receiving waters in order to achieve water quality protection goals. Examples include animal waste management systems, conservation tillage systems, vegetated filter strips, etc.

Best Usage: the most appropriate uses of a body of water as designated by the Environmental Management Commission given the characteristics of the water body and surrounding area. Best uses may include use for public water supplies; protection and propagation of fish, shellfish, and wildlife; recreation in and on the water; as well as uses for agriculture, industry, and navigation.

Biological Oxygen Demand (BOD): the amount of oxygen required by aerobic biological processes to break down the organic matter in water. BOD is a measure of the pollutional strength of biodegradable waste on dissolved oxygen in water.

Chemical Oxygen Demand (COD): the amount of oxygen utilized in the chemical reactions that occur in water as a result of the addition of wastes. COD is a measure of the pollutional strength of chemical waste on dissolved oxygen in water.

Classifications: all surface waters in North Carolina are assigned a classification by the EMC. These fall into two categories: freshwater classifications and saltwater classifications. Waters may also be assigned one or more supplemental classifications. Water classifications are based on best usage of those waters, and each classification is assigned water quality standards. (See also Freshwater Classifications, Saltwater Classifications, and Supplemental Water Classifications.)

Dissolved Oxygen (DO): oxygen dissolved in water and readily available to fish and other aquatic organisms.

Ecoregion: an area of relatively homogeneous environmental conditions, usually defined by elevation, geology, and soil type. Examples include mountains, piedmont, coastal plain, sandhills and slate belt.

Ecosystem: a community of animals and plants and the physical environment in which they live.

Effluent: wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

Environment: the sum of all the external conditions that may act upon a living organism or community to influence its development or existence.

Erosion: wearing away of rock or soil by the gradual detachment of soil or rock fragments by water, wind, ice, and other mechanical and chemical forces.

Estuary: coastal waters situated between rivers and near-shore ocean waters, where tidal action and river flow mix fresh and saltwater. Such areas include bays, sounds, mouths of rivers, salt marshes, and lagoons.

Eutrophication: degradation of water quality due to enrichment by nutrients primarily nitrogen (N) and phosphorus (P), which results in excessive plant (principally algae) growth and decay. Low dissolved oxygen in the water is a common consequence.

Fecal Coliform: bacteria found in the intestinal tracts of warm-blooded animals. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated sewage and/or the presence of animal feces. These organisms may also indicate the presence of pathogens that are harmful to humans.

Filter Strip: strip or area of vegetation often situated at the edge of a field or along a waterway that is used for removing sediment, organic matter, and other pollutants from stormwater runoff.

Frequency of Storm: anticipated number of years between storms of equal intensity and/or total rainfall volume. For example, a 25-year 24-hour storm is the volume of rainfall that could be expected to occur during a 24-hour period once every 25 years on average.

Freshwater: all waters that would have a chloride ion content of less than 500 parts per million under natural conditions.

● ***Freshwater Classifications:***
(See also *Classifications*)

Class C: freshwaters protected for secondary recreation, fishing, and propagation and survival of aquatic life; all freshwaters are classified to protect these uses at a minimum.

Class B: freshwaters protected for primary recreation, which includes swimming on a frequent or organized basis, and all Class C uses.

Class WS-I: waters protected as water supplies which are essentially in natural and undeveloped watersheds.

Class WS-II: waters protected as water supplies which are generally in predominantly undeveloped watersheds.

Class WS-III: waters protected as water supplies which are generally in low to moderately developed watersheds.

Class-IV: waters protected as water supplies which are generally in moderately to highly developed watersheds.

Class-V: waters protected as water supplies which are generally upstream of and draining to Class-IV waters.

Geographic Information System (GIS): a computerized database system containing information on natural resources and other factors that can be analyzed and displayed in spatial or map format.

Grey Water: wastewater other than sewage, such as sink or washing machine drainage.

Groundwater: underground water stored in aquifers. Groundwater is created by rain which soaks into the ground and flows down until it collects above an impervious zone.

Heavy Metals: those metals that have high specific gravity and high atomic mass, such as lead, cadmium, zinc, copper, silver, and mercury. In sufficient concentrations, these metals are toxic to humans and aquatic life.

Hydrologic Cycle: the movement of water in and on the earth and atmosphere through processes such as precipitation, infiltration, runoff, and evaporation.

Judicial Order by Consent (JOC): an administrative order issued by an administrative law judge which in some way modifies limitations of an NPDES permit by consent of both parties and provides interim limitations and conditions.

LC50: The concentration of a toxicant or percentage dilution of an effluent that is predicted to be lethal to 50% of a test population of organisms.

Loading: amount of a substance entering the environment (soil, water, or air).

Municipal Discharge: discharge of effluent from wastewater treatment plants operated by municipalities or public sewerage authorities; may include wastewater from households, commercial establishments, and industries.

Nitrogen: an element essential to the growth and development of plants; occurs in manure and chemical fertilizer and, in excess, can cause waters to become polluted by promoting excessive growth of algae and other aquatic plants.

Nonpoint Source Pollution: sources of water pollution not associated with a distinct discharge source; includes rainwater, erosion, runoff from roads, farms, and parking lots, and seepage from soil-based wastewater disposal systems.

Oxygen Demand: chemical and biological oxygen demand (COD and BOD) are measures of the oxygen consumed when a substance degrades. Materials such as food waste and dead plant or animal tissue use up dissolved oxygen in the water when decomposed through chemical or biological processes.

Pathogen: disease-causing biological agent such as a bacterium, virus, or fungus.

Performance Standard: a limitation on the emission or discharge of a pollutant that may be expressed as an emission or discharge standard or as a requirement for specific operating procedures.

pH: numerical measure of hydrogen ion activity with a scale of 0 to 14. Neutral is pH 7; values below 7 are acid, and values above 7 are alkaline.

Waters that are too acid or alkaline can be unfit for animal or plant life.

Phosphorous (P): an element essential to the growth and development of plants; occurs in manure and chemical fertilizer and, in excess, can cause waters to become polluted by promoting excessive growth of algae and other aquatic plants.

Point Source Pollution: a specific discharge that is traceable to a distinct source (pipe, ditch, container, well, etc.) such as those from wastewater treatment plants or industrial facilities.

Pollutant: a contaminant that adversely alters the physical, chemical, or biological properties of the environment. The term includes toxic metals, carcinogens, pathogens, oxygen-demanding materials, heat, and all other harmful substances, contaminants, or impurities.

Potable Water: water that is safe and palatable for human consumption.

Publicly Owned Treatment Works (POTW): wastewater treatment facilities owned by the state or a unit of local government; usually designed to treat domestic wastewaters, but may also treat a significant amount of industrial waste.

Receiving Water: body of water that receives runoff or wastewater discharges; may be a river, stream, lake, estuary, or groundwater.

Riparian: of, on, or pertaining to, the banks of a stream, river, or lake.

River Basin: the land area drained by a river and its tributaries. There are 17 major river basins in North Carolina.

Runoff: rainfall or other precipitation that is not absorbed by the soil, but drains off the land into streams, rivers, and other receiving waters.

Salinity: quality of water based on its salt content; sea-water contains approximately 18,000 parts per million of salt.

● ***Saltwater Classifications:***

(See also Classifications)

Class SA: suitable for commercial shellfishing and all other tidal saltwater uses.

Class SB: saltwaters protected for primary recreation, which includes swimming on a frequent or organized basis, and all Class SC uses.

Class SC: saltwaters protected for secondary recreation, fishing, and propagation and survival of aquatic life; all saltwaters are classified to protect these uses at a minimum.

Sediment: particles of mud, sand, clay, silt, and organic matter transported and deposited by water.

Septic Tank: an underground sewage disposal tank, generally installed to treat the wastewaters from an individual home, in which a continuous flow of waste material is decomposed by anaerobic (in the absence of oxygen) bacteria.

7Q10 Flow: the lowest average stream flow that would be expected to occur for 7 consecutive days once in 10 years.

Sewage: the waste and wastewater produced by residential and commercial sources and discharged into sewers.

Sludge: heavy, slimy residue remaining from the treatment of municipal and industrial water and wastewater.

Solubility: amount of a substance that will dissolve in a given amount of another substance, typically water.

Special Order by Consent (SOC): an administrative order entered by the Environmental Management Commission and an NPDES discharger which in some way modifies limitations of an NPDES permit by consent of both parties and provides interim limitations and conditions.

Stormwater: water that is generated by rainfall and is often routed into drain systems in urban areas to prevent flooding.

Supplemental Water Classifications: (See also Classifications)

HQW: High Quality Waters: waters with quality higher than state water quality standards.

NSW: Nutrient Sensitive Waters: waters subject to excessive growth of microscopic and macroscopic vegetation that need additional nutrient management. In general, management strategies for point and nonpoint source pollution control are designed to prevent any increase in nutrients over background levels.

ORW: Outstanding Resource Waters: unique waters of exceptional state or national recreational or ecological significance that require special protection to maintain existing uses.

Sw: Swamp Waters: waters with low velocities and other natural characteristics that differ from other surface waters.

Tr: Trout Waters: freshwaters protected for natural trout propagation and survival of stocked trout.

Tidal Saltwater: tidal waters that generally have a natural chloride ion content in excess of 500 parts per million; includes all waters assigned S classifications by the Environmental Management Commission (see Saltwater Classifications).

Total Dissolved Solids (TDS): the total amount, in milligrams, of solid material dissolved in one liter of water.

Total Maximum Daily Load (TMDL): the total waste (pollutant) loading from point and non-point sources that a water body can assimilate while still maintaining its water quality classification and standards.

Total Suspended Solids (TSS): concentration of all substances suspended in water (solids remaining after filtering of a water sample).

Tributary: a stream or river that flows into a larger stream or river.

Turbidity: a cloudy condition in water caused by suspended silt or organic matter.

Wastewater Treatment Plant (WWTP): facility that uses a combination of physical, chemical, and biological processes to treat wastewater (and sometimes runoff) from domestic and/or industrial sources.

Water Quality Criteria: levels of water quality expected to render a body of water suitable for its designated use. Criteria are based on specific levels of pollutants that would make the water harmful if used for drinking, swimming, fish production, or industrial uses.

Water Quality Standards: ambient standards for water bodies adopted by the EMC and approved by the EPA that prescribe the use of the water body and establish the water quality criteria that must be met to protect designated uses. Water quality standards may apply to dissolved oxygen, heavy metals, pH, and other water constituents.

Watershed: a geographic area in which water, sediment, and dissolved materials drain to a common outlet such as a point on a larger stream, a lake, an underlying aquifer, an estuary, or an ocean.

Wetlands: areas inundated or saturated by surface or groundwater at a frequency and duration to support and that, under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Coastal wetlands extend back from estuaries and include salt marshes, tidal basins, marshes, and mangrove swamps. Inland freshwater wetlands consist of swamps, marshes, and bogs.

Legislation, Agencies and Programs:

Agricultural Cost Share Program: a state program designed to accelerate the implementation of best management practices (BMP's) on agricultural operations to reduce the input of agricultural non-point source pollution into waters of the state.

This program, administered by the North Carolina Division of Soil and Water Conservation, reimburses farmers for up to 75 percent of the installation cost of approved BMP's and also provides incentive payments for management changes that improve water quality.

Agricultural Stabilization and Conservation Service (ASCS): a federal organization whose mission is to promote the wise use of agricultural land and water resources in partnership with farmers and ranchers. ASCS works in cooperation with other federal and state agencies and organizations to implement voluntary conservation programs.

Clean Water Act (CWA): federal legislation administered by the U.S. EPA that serves as the primary means of protecting and regulating the surface water quality of the United States.

The goal of this legislation is to eliminate the discharge of contaminants into United States waters and to achieve a level of water quality capable of supporting propagation of fish and wildlife and water-based recreation.

Coastal Area Management Act (CAMA): state legislation that requires local land use plans to be developed and adopted by individual counties and municipalities in North Carolina's twenty-county coastal area. Land use plans must be in accordance with standards adopted by the North Carolina Coastal Resources Commission.

Coastal Nonpoint Pollution Control Program (Section 6217): the portion of the Coastal Zone Act Reauthorization Amendments (CZARA) that requires states with approved coastal zone management programs to develop Non-point Pollution Control Programs.

These coastal nonpoint programs will build on existing coastal management and nonpoint source pollution programs designed to reduce and prevent coastal water quality problems.

Coastal Resources Commission (CRC): the body responsible for administering the North Carolina Coastal Area Management Act (CAMA).

Coastal Zone Act Reauthorization Amendments (CZARA): Legislation enacted by Congress in 1990 to reauthorize the Coastal Zone Management Act. The CZARA includes requirements for states with approved coastal zone management programs to develop coastal nonpoint pollution control programs.

Coastal Zone Management Act (CZMA): a federal program designed to encourage environmentally responsible development through long-range planning and the establishment of clear, enforceable standards for growth and land use in coastal areas.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as the "Superfund" legislation: authorizes EPA to clean up sites contaminated by disposal of hazardous substances.

Cooperative Extension Service (CES): an educational organization supported by federal, state, and county governments. CES programs fall into the general areas of agriculture and natural resources, home economics, 4-H and youth, and community and rural development.

The North Carolina CES is operated through the state's Land Grant universities: North Carolina State University and North Carolina A&T State University.

Department of Environment, Health and Natural Resources (DEHNR): the state government agency with primary responsibility for the stewardship of the state's natural resources and management of its health programs.

The department is divided into divisions that carry out these responsibilities through education, technical assistance, and regulation.

Division of Coastal Management (DCM): a division of DEHNR that provides staff support to the Coastal Resources Commission and the Coastal Resources Advisory Council which are responsible for carrying out the provisions of the North Carolina Coastal Area Management Act (CAMA).

Division of Environmental Health (DEH): the division of DEHNR responsible for administering eight programs in North Carolina in the following areas: food and lodging sanitation, institutional sanitation, milk sanitation, on-site sewage, shellfish sanitation, public water supply plans review, coastal mosquito management, and sleep products sanitation.

Division of Environmental Management (DEM): the division of DEHNR responsible for comprehensive planning, management, and regulation of the state's air, surface water, and groundwater resources.

The division issues permits to control sources of pollution, monitors compliance at permitted facilities, evaluates environmental quality, pursues enforcement actions for violations of environmental regulations, and serves as staff for the EMC.

Division of Forest Resources (DFR): the division of DEHNR that has the lead role in managing, developing, and protecting the forest resources of the state.

Division of Land Resources (DLR): the division of DEHNR whose purpose is to protect and conserve the state's land, minerals, and related resources through the effective implementation and management of programs related to sedimentation pollution control, mine land reclamation, dam safety, land records management, geodetic survey, resources inventory and analysis, and mineral resources conservation and development.

Division of Marine Fisheries (DMF): the division of DEHNR that is responsible for stewardship of the marine and estuarine resources of North Carolina.

Division of Parks and Recreation (DPR): the division of DEHNR that manages the state park system which includes state parks, state natural areas, state recreation areas, state trails, state lakes, and natural and scenic rivers.

Division of Soil and Water Conservation: the division of DEHNR that administers a comprehensive statewide program for conserving the state's soil and water resources, including the Agricultural Cost Share Program.

It serves as staff for the North Carolina Soil and Water Conservation Commission and assists local Soil and Water Conservation Districts.

Division of Water Resources (DWR): the division of DEHNR that manages programs for instream flow, interbasin transfers, water supply needs, water conservation, navigation, stream clearance, flood control, beach protection, aquatic weed control, hydroelectric power, and recreational uses of water.

Emergency Planning and Community Right-to-Know Act (EPCRA), also known as Title II of the 1986 "Superfund" Amendments and Reauthorization Act (SARA): Requires certain manufacturers to submit annual reports documenting the amount of toxic chemicals their facilities release into the environment. EPA supplies this information to government officials and the public. Requires every community in the United States to be part of a comprehensive emergency plan.

Environmental Management Commission (EMC): responsible for adopting rules to be followed in the protection, preservation, and enhancement of the water and air resources of the state.

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA): makes EPA responsible for regulating the manufacture, distribution, and use of pesticides in the United States. EPA provides North Carolina with support and oversight in enforcement of pesticide regulations and programs to train and certify pesticide applicators.

Marine Fisheries Commission (MFC): responsible for adopting rules to be followed in the management, protection, preservation, and enhancement of the marine and estuarine resources of the state, including commercial and sports fisheries resources.

National Environmental Policy Act (NEPA): federal legislation that requires federal agencies to prepare environmental statements for federal or federally assisted projects having an impact on the environment.

National Oceanic and Atmospheric Administration (NOAA): a federal agency whose fundamental objectives are to observe, describe and predict the natural variability of the global earth system and to identify any changes in the earth system caused by human activity.

NOAA administers the Coastal Zone Management Program in cooperation with EPA and other state and federal agencies in accordance with the Coastal Zone Management Act (CZMA) of 1972, as amended.

National Pollution Discharge Elimination System (NPDES): federal regulations that regulate discharge of wastewater to surface waters such as streams, rivers, lakes, and estuaries.

An NPDES permit is required for any project involving the construction, alteration, and/or operation of any sewer system, treatment works, or disposal system and for construction of certain stormwater runoff structures which would result in a discharge into surface waters.

North Carolina Environmental Policy Act (NCEPA): requires the preparation of an Environmental Assessment or Environmental Impact Statement for any activity that involves the expenditure of public monies or that requires state approval or that may significantly affect the quality of the environment.

Resource Conservation and Recovery Act (RCRA): federal legislation related to hazardous waste (Subtitle C); solid, non-hazardous waste (Subtitle D); and the recovery and use of recycled materials and energy (Subtitle F).

Safe Drinking Water Act (SDWA): legislation to insure safe drinking water. Passed by Congress in 1974 and amended in 1986, it directs the EPA to establish and enforce water quality standards to protect public health.

Section 404 Permit: Section 404 of the Clean Water Act requires that a permit be obtained from the U.S. Army Corps of Engineers prior to undertaking any activity that

will result in the discharge of dredged or fill materials into waters of the United States, including wetlands.

Sedimentation Pollution Control Act: applies to any land-disturbing activity that uncovers one or more contiguous acres of land. Its purpose is to protect the state's streams and lands from degradation caused by land disturbances that erode sediments.

All agricultural and mining activities are officially exempt from these regulations (although mining activities are covered under the Mining Act). Forestry activities must utilize accepted Best Management Practices to qualify for an exempt status.

Soil and Water Conservation Commission (SWCC): responsible for adopting rules to be followed in the development and implementation of the state's soil and water conservation program.

Soil and Water Conservation District: a sub-unit of state government responsible for the local soil and water conservation programs.

Soil Conservation Service (SCS): an agency of the U.S. Department of Agriculture whose mission is to provide national leadership in the conservation and wise use of soil, water and related resources through a balanced cooperative program that protects, restores, and improves those resources.

Superfund Amendments and Reauthorization Act (SARA): enacted in 1986, these amendments provided for a five-year extension to CERCLA.

United States Army Corps of Engineers (COE): the federal government's largest water resources development agency. The Corps is responsible for construction and maintenance of inland waterway, port, and dam projects throughout the country.

It also has primary responsibility for administering the permit program established in Section 404 of the Clean Water Act.

United States Environmental Protection Agency (EPA): created in 1970 to facilitate effective governmental coordination of actions that occur on behalf of the environment.

The agency's mission is to safeguard the health and welfare of the American people by protecting the environment and improving environmental quality. EPA is responsible for implementing most of the federal laws relating to protection of water and air quality.

United States Fish and Wildlife Service (USFWS): an agency of the U.S. Department of Interior whose mission is to conserve, protect, and enhance the nation's fish and wildlife and their habitats for the continuing benefit of the American people.

The agency is responsible for migratory birds, endangered species, certain marine mammals, inland sports fisheries, and specific fishery and wildlife research activities.

United States Geological Survey (USGS): an agency of the U.S. Department of Interior that operates hydrologic data networks and conducts a variety of water-resources studies to support the resource assessment, evaluation, planning, conservation, and protection programs of federal, state and local agencies.

Water Quality Certification: required by the Environmental Management Commission for any activity that may discharge fill into waters or wetlands and that requires a federal permit. The certification indicates that the discharge will not result in a violation of the state's water quality standards.

Water Supply Watershed Protection Act (WSWPA): state legislation enacted to limit growth and land disturbance in North Carolina's water supply watersheds in order to maintain the quality of surface drinking water supplies.

Counties and municipalities with water supply watersheds in their land-use jurisdictions are required to develop watershed protection plans and ordinances that meet or exceed state guidelines.

This publication is intended to serve as an educational guide only. For more detailed information, please contact the appropriate state or federal agency.

List of Acronyms

ASCS Agricultural Stabilization and Conservation Service

BMP Best Management Practice

BOD Biological Oxygen Demand

CAMA Coastal Area Management Act

COD Chemical Oxygen Demand

CRC Coastal Resources Commission

CWA Clean Water Act

CZMA Coastal Zone Management Act

CZARA Coastal Zone Act Reauthorization Amendments

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act

CES Cooperative Extension Service

COE Corps of Engineers

DCM Division of Coastal Management

DEH Division of Environmental Health

DEHNR Department of Environment, Health and Natural Resources

DEM Division of Environmental Management Resources

DMF Division of Marine Fisheries

DO Dissolved Oxygen

DPR Division of Parks and Recreation

DWR Division of Water Resources

EPA Environmental Protection Agency

EPCRA Emergency Planning and Community Right to Know Act

EMC Environmental Management Commission

FIFRA Federal Insecticide, Fungicide and Rodenticide Act

GIS Geographic Information System

HQW High Quality Waters

JOC Judicial Order by Consent

MFC Marine Fisheries Commission

NCEPA North Carolina Environmental Policy Act

NEPA National Environmental Policy Act

NOAA National Oceanic and Atmospheric Administration

NPDES National Pollution Discharge Elimination System

NSW Nutrient Sensitive Waters

ORW Outstanding Resource Waters

POTW Publicly Owned Treatment Works

RCRA Resource Conservation and Recovery Act

SARA Superfund Amendments and Reauthorization Act

SCS Soil Conservation Service

SDWA Safe Drinking Water Act

SOC Special Order by Consent

Sw Swamp Waters

SWCC Soil and Water Conservation Commission

TDS Total Dissolved Solids

TMDL Total Maximum Daily Load

TSS Total Suspended Solids

USFWS United States Fish and Wildlife Service

USGS United States Geological Survey

WWTP Wastewater Treatment Plant

WSWPA Water Supply Watershed Protection Act

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