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Voluntary Estuary Monitoring Manual Back Material: Including the Glossary and Index

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Glossary

Glossary and Acronyms



Glossary and Acronyms

Note: The terms contained within this glossary are general definitions and are accurate as they relate to water analysis. They are for reference only.

Abiotic – Pertaining to factors or things that are separate and independent from living things: nonliving.

Accuracy – A measure of confidence in a measurement. As the difference between the measurement of a parameter and its "true" or expected value becomes smaller, the measurement becomes more accurate.

Acid – Any substance capable of giving up a proton; a substance that ionizes in solution to give the positive ion of the solvent; a solution with a pH measurement less than 7. See also alkaline.

Acid rain – Precipitation composed of water particles, sulfuric acid, and/or nitric acid. These acids are formed from sulfur dioxides from the smokestacks of coal and oil burning power plants and from nitrogen oxides emitted by motor vehicles. This precipitation form can change the chemistry of healthy soils and waters, potentially making them unfit to support life.

Acidity – A measure of the number of free hydrogen ions (H^+) in a solution that can chemically react with other substances. Also see pH.

Acute toxicity – When exposure levels result in death within 96 hours. Lethal doses differ for each toxin and species, and are influenced by the potency and concentration of the toxin.

Aerobic – Living or occurring only in the presence of oxygen.

Algae – Organisms containing chlorophyll and other pigments that permit photosynthesis. Algae lack true roots, stems, or leaves.

Algaecide – Chemical agent added to water to destroy algae.

Algal bloom (algae bloom) – Excessive growth of aquatic algae resulting from nutrients such as nitrogen and phosphorus being added to the environment. Other physical and chemical conditions can also enable algae to reproduce rapidly.

Alkaline or basic – A solution with a pH measurement above 7.0. Alkaline solutions contain an alkali, which is any base or hydroxide (OH^-) that is soluble in water and can neutralize acids. Also see base, acid.

Alkalinity – The capacity of water to neutralize acids, a property imparted by the water's content of carbonate, bicarbonate, hydroxide, and on occasion borate, silicate, and phosphate. It is expressed in milligrams per liter of equivalent calcium carbonate ($mg/l CaCO_3$).

Anaerobic – Living or occurring only in the absence of free oxygen.

Analyte – Parameter being tested.

Anion – Ion having a negative charge; an atom with extra electrons. Atoms of non-metals, in solution, become anions. See conductivity.

Anoxia – A condition when the water becomes totally depleted of oxygen (below 0.5 mg/l) and results in the death of any organism that requires oxygen for survival. The adjective is anoxic.

Anthropogenic – Coming from human activities, e.g., human sources of pollutants and other impacts on natural environments.

Atmospheric deposition – The process whereby air pollutants are deposited on land and water, sometimes at great distances from their original sources. Pollution deposited in snow, fog, or rain is called wet deposition, while the deposition of pollutants as dry particles or gases is called dry deposition. Air pollution can be deposited into waterbodies either directly from the air or through indirect deposition, where the pollutants settle on the land and are then carried into a waterbody by runoff.

Atomic absorption – Quantitative chemical method used for the analysis of elemental constituents.

Autoclave – An oven-like vessel used for sterilization of equipment, carrying out chemical reactions, etc., at high temperature and pressure.

BMP – See best management practices.

BOD – See biochemical oxygen demand.

Bacteria – Any of numerous unicellular microorganisms of the class Schizomycetes, occurring in a wide variety of forms, existing either as free-living organisms or parasites, and having a wide range of biochemical, often pathogenic properties. Some bacteria are capable of causing human, animal or plant diseases; others are essential in pollution control because they breakdown organic matter in air and water.

Bacterial examination – The examination of water and wastewater to determine the presence, number, and identification of bacteria. Also called bacterial analysis.

Ballast water – Water taken on vessels to keep them stable at sea. Ballast water can contain aquatic plants, animals, and pathogens that can be introduced to an estuary when it is discharged near ports.

Base – Any substance that contains hydroxyl (OH⁻) groups and furnishes hydroxide ions in solution. A molecular or ionic substance capable of combining with a proton to form a new substance; a substance that provides a pair of electrons for a covalent bond with an acid; a solution with a pH of greater than 7.0. Also see pH.

Baseline data – Initial data generated by consistent monitoring of the same sites over time.

Benthic – Pertaining to the bottom (bed) of a waterbody.

Best Management Practices (BMPs) – Pollution control techniques that aim to reduce pollution from agriculture, timber harvesting, construction, marinas, stormwater and other sources.

Bioassay (biological assay) – A controlled experiment using a change in biological activity as a qualitative or quantitative means of analyzing a biological response to a pollutant by using viable organisms. Depending on the test, microorganisms, planktonic animals, or live fish can be used as test organisms to determine the effects a toxic substance has on living organisms.

Biochemical oxygen demand (BOD) – The amount of oxygen taken up by microorganisms that decompose organic waste matter in water.

Biocides – Chemical agents with the capacity to kill biological life forms. Bactericides, insecticides, herbicides, pesticides, etc. are examples.

Biodegradability – The susceptibility of a substance to decomposition by the actions of microorganisms.

Biological accumulation (bioaccumulation) – The uptake and storage of chemicals (e.g., DDT, PCBs) from the environment by animals and plants. Uptake can occur through feeding or direct absorption from water or sediments. The concentration of a substance in the tissue of an individual organism.

Biological magnification (also called bioamplification or bioconcentration) – The progressive increase in the concentration of chemical contaminants (e.g., DDT, PCBs, methyl mercury) from the bottom of the food chain (e.g., bacteria, phytoplankton, zooplankton) to the top of the food chain (e.g., fishing-eating birds such as a cormorant).

Biomass – The amount of living matter in a given habitat or the total mass of a particular species or groups of species in a specified area.

Biomonitoring – The use of living organisms to evaluate the anthropogenic, or human-induced, impacts on biota.

Bioturbation – Disturbance of sediment by animals.

Bloom – A dramatic increase in the number and volume of planktonic species as a result of favorable environmental conditions (e.g., temperature, nutrient availability, etc.). See algal bloom.

Brackish – Having a salinity between that of fresh and marine water.

Buffer – A substance dissolved in water that resists changes in pH (minimizes changes in hydrogen ion concentration).

Buret – A graduated glass tube used for measuring and releasing small and precise amounts of liquid.

Calibration – The checking, adjusting, or systematic standardizing of the graduations of a quantitative measuring instrument.

Carcinogen – A substance that causes cancer.

Cation – A positively charged atom or group of atoms, or a radical which moves to the negative pole (cathode) during electrolysis. See conductivity.

Chlorinated hydrocarbons – Compounds such as DDT and PCBs made of carbon, hydrogen, and chlorine atoms. Once released into the environment, these chemicals become biologically amplified as they move up the food chain; that is, as minnows eat zooplankton, larger fish eat minnows, and seabirds eat the larger fish, the concentration of these chemicals in tissues is greatly increased.

Chlorophyll – A group of green pigments found in most plants, including phytoplankton, which are used for photosynthesis. The chlorophyll a pigment is generally measured.

Chronic toxicity – Also referred to as sub-lethal. Does not result in death (at exposures of at least 96 hours) but can cause impairment to aquatic animals, organ damage and failure, gastro-intestinal damage, and can affect growth and reproduction.

Coliform bacteria – Any of several bacilli, especially of the genera *Escherichia*, found in the intestines of animals. Their presence in water suggests contamination with sewage or feces, which in turn could mean that disease-causing bacteria or viruses are present. Fecal coliform bacteria are used to indicate possible sewage contamination. Fecal coliform bacteria are not harmful themselves, but indicate the possible presence of disease-causing bacteria, viruses, and protozoans that live in human and animal digestive systems. In addition to the possible health risks associated with them, the bacteria

can also cause cloudy water, unpleasant odors, and increased biochemical oxygen demand.

Combined sewer – Sewer system that carries both sanitary wastes and storm runoff to a wastewater treatment plant to be treated and released to a body of water.

Combined sewer overflow (CSO) – If a wastewater treatment plant does not have the capacity to treat the increased volume caused by stormwater runoff, the combined sewer may discharge untreated sewage and stormwater directly into a body of water.

Comparability – The extent to which data from one study can be compared directly to either past data from the current project or data from another study. Using standardized sampling and analytical methods, units of reporting, and site selection procedures help ensure comparability.

Completeness – A measure of the number of samples you must take to be able to use the information, as compared to the number of samples you originally planned to take.

Compound – Two or more elements combined; a substance having properties different from those of its separate elements.

Concentrated – Being of full strength or undiluted.

Conductivity – A measure of the ability of water to pass an electrical current. Conductivity in water is affected by the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, and phosphate anions (ions that carry a negative charge) or sodium, magnesium, calcium, iron, and aluminum cations (ions that carry a positive charge). As the concentration of salts in the water increases, electrical conductivity rises; the greater the salinity, the higher the conductivity. Conductivity is also affected by temperature: the warmer the water, the higher the conductivity. For this reason, conductivity is extrapolated to a standard temperature (25°C).

Contamination – A general term signifying the impairment of water, sediments, plants or animals by chemicals or bacteria to such a degree that it creates a hazard to public and/or environmental health through poisoning, biomagnification, or the spread of disease.

DDT – Dichlorodiphenyltrichloroethane. A chlorinated hydrocarbon widely used as a pesticide in the United States until its use was banned in the United States in 1972. Toxic to humans and wildlife when swallowed or absorbed through the skin.

DO – See dissolved oxygen.

DQOs – See data quality objectives.

Data Quality Objectives (DQOs) – Statements that define quantitative and qualitative information required by the data users to meet program needs.

Deionized water – Water with all ions removed.

Denitrification – The process whereby bacteria convert nitrate to nitrite and then to nitrogen gas.

Detection limit – The lowest concentration of a given pollutant that an analytical method or equipment can detect and still report as greater than zero. Generally, as readings approach the detection limit (i.e., as they go from higher, easier-to-detect concentrations to lower, harder-to-detect concentrations), they become less and less reliable.

Detritus – Small particles of dead and decomposing organic matter, including twigs, leaves and other plant and animal wastes.

Digital titrator – A titrator unit having a counter that displays numbers. As the reagent is dispensed, the counter changes in proportion to the amount of reagent used.

Dilute – To thin out, or having been thinned out; less than full strength.

Dinoflagellate – A dominant planktonic form occurring as a microscopic single cell. Often has two flagella to assist with movement.

Dioxin – A family of some 210 synthetic, organic chemicals of the chlorinated hydrocarbon class. Some dioxins are known to be highly toxic and are thought to increase the incidence of cancer and birth defects in humans.

Dissolved oxygen (DO) – Oxygen molecules that are dissolved in water and available for living organisms to use for respiration. Usually expressed in milligrams per liter or percent of saturation. The concentration of DO is an important environmental parameter contributing to water quality.

Dissolved solids – The total amount of dissolved material, organic and inorganic, contained in water or wastewater. Measurements are expressed as ppm or mg/l.

Distilled water – Water that has been purified by distillation (boiling the water off as steam and condensing it back to a liquid, leaving the impurities behind). Having been boiled, the water is also sterile.

Dry deposition – See atmospheric deposition.

Ecosystem – A community of species interacting with each other and with the physical (nonliving) environment.

Effluent – A discharge to a body of water from a defined or point source, generally consisting of a mixture of waste and water from industrial or municipal facilities.

Emergent Plants – Plants rooted under water, but with their tops extending above the water.

Endpoint – That stage in titration at which an effect, such as a color change, occurs, indicating that a desired point in the titration has been reached.

Endocrine disrupters – chemicals that can mimic, block, or otherwise disrupt human hormones.

Enrichment – The addition of nitrogen, phosphorous, carbonaceous compounds, or other nutrients into a waterway that greatly increase the growth potential for algae and other aquatic plants.

Entanglement – To become tangled in or ensnared. A common cause of death for marine animals is entanglement by marine debris. Animals can become caught in discarded fishing nets, monofilament line, and other gear, rope, six-pack rings, balloon ribbons, plastic grocery bags, and other floating debris.

Enterococci – A group of bacteria found primarily in the intestinal tract of warm-blooded animals. Enterococci are unrelated to the coliforms; rather, they are a subgroup of the fecal streptococci group.

Environment – All the factors that act upon an organism or community of organisms, including climate, soil, water, chemicals, radiation, and other living things.

Environmental Protection Agency (EPA) – A federal agency, established in 1970, concerned with air and water quality, radiation, pesticides, and solid-waste disposal. It is responsible for enforcing most federal environmental laws and for administering the National Estuary Program (NEP).

Epiphyte – A plant that grows upon another plant, but is not parasitic. On aquatic plants, excessive epiphytes can decrease the amount of sunlight reaching the host plant.

Erosion – The process where wind, water, ice, and other mechanical and chemical forces wear away rocks and soil, breaking up particles and moving them from one place to another.

Escherichia coli – A single species within the fecal coliforms group. Commonly used as indicator bacteria. Occurs only in the feces of warm-blooded mammals

Estuary – A semi-enclosed coastal body of water which has free connection with the open sea and within which seawater is measurably diluted with fresh water derived from land drainage. Estuaries are transition zones between fresh water and the salt water of an ocean.

Eutrophic – Highly productive condition, generally the result of nutrient enrichment in the water column that may cause algae (e.g., phytoplankton) to bloom.

Eutrophication – A condition in an aquatic ecosystem where high nutrient concentrations stimulate blooms of algae (e.g., phytoplankton). Algal decomposition may lower dissolved oxygen concentrations. Although eutrophication is a natural process in the aging of lakes and some estuaries, it can be accelerated by both point and nonpoint sources of nutrients.

Fecal coliforms – See coliform bacteria.

Filter feeders – Animals (e.g., clams and oysters) that feed by filtering out of the water column small food items such as detritus, phytoplankton, and zooplankton.

Filtration – The process of separating solids from a liquid by means of a porous substance (filter) through which only the liquid can pass.

Fish Consumption Advisory – An advisory issued by government agencies and used to reduce human health risks associated with

exposure to chemical contaminants (e.g., PCBs, DDT, mercury) found in fish and shellfish. Advisories may recommend bans and restricted consumption of specific species in specific geographical areas of an estuary.

Fixed sample – A sample that has been rendered chemically stable or unalterable, meaning that atmospheric oxygen will no longer affect the test result.

Flushing rate – The time it takes for all the water in an estuary to be moved out to sea. Flushing rates vary from days to weeks.

Food chain – A sequence of organisms in an ecological community, each of which is food for the next higher organism, from the primary producer to the top consumer.

Food web – A complex system of energy and food transfer between organisms in an ecosystem. Refers to the way that organic matter is transferred from the primary producers (plants) to primary consumers (herbivores), and on up to higher feeding (trophic) levels.

Formalin – A 40% solution of Formaldehyde (CH₂O), which is a preservative, an irritant, and a probable carcinogen. Formalin is used to preserve organisms for later observation.

Fresh water – Water that is not salty. Fresh water enters estuaries from rivers, streams and through precipitation (rain, snow).

Habitat – The place where a population or community (e.g., microorganisms, plants, animals) lives and its surroundings, both living and nonliving.

Habitat disruption – Destruction or alteration of a habitat by cutting across or establishing barriers to migration routes or destroying breeding areas or food sources. Loss of habitat is the primary cause of loss of biodiversity.

Heavy metals – A general term given to the ions of metallic elements such as mercury, copper, zinc, chromium, and aluminum.

Herbicide – A pesticide designed to kill specific plants.

Hydrocarbon – A chemical compound containing only hydrogen and carbon.

Hypoxia – A condition where very low concentrations of dissolved oxygen are in the water column. When the level of dissolved oxygen falls below 3 mg/l, water is considered hypoxic. At this level, many species will move elsewhere and immobile species may die.

Indicator – 1) A compound that changes color under a particular condition or over a particular range of conditions. 2) An organism whose presence suggests the presence of other organisms. See coliform bacteria. 3) A measurement of environmental conditions or trends in environmental quality which can be used to evaluate resource protection programs and assess the general state of the environment.

Ingestion – To eat. Some animals die from marine debris when they mistakenly ingest humanmade materials. By consuming these materials, damage can be caused to the animals' digestive systems, or animals may stop eating because their stomachs are full. Because the debris in their stomachs offers no nutritional value, creatures eventually starve to death.

Inorganic – Being or composed of matter that is not organic.

Invertebrates – Animals that lack a spinal column or backbone. Includes molluscs (e.g., clams and oysters), crustaceans (e.g., crabs and shrimp), insects, starfish, jellyfish, sponges, and many types of worms that live in the benthos.

Land use – The way land is developed and used in terms of the kinds of anthropogenic (human) activities that occur (e.g., agriculture, residential areas, industrial areas).

Larva, larvae – An immature form of an organism that will undergo metamorphosis to become a juvenile and then an adult.

mg/l – See milligrams per liter.

MPN – See most probable number.

Macro – A prefix meaning large. Usually refers to organisms large enough to be seen with the un-aided eye.

Macroinvertebrates – Organisms that are large (macro) enough to be seen with the naked eye and lack a backbone (invertebrate).

Marsh or salt marsh – A protected intertidal wetland where fresh water and salt water meet. Characterized by plants such as salt hay, black rush, and smooth cordgrass.

Mean (Average) – Using a set of n numbers, the sum of the numbers divided by n .

Measurement range – The range of reliable measurements of an instrument or measuring device.

Membrane filtration – An analytical method commonly used to identify coliforms in water. A measured amount of water is passed through a membrane filter, trapping bacteria on its surface. The filter is then placed on a pad that has been saturated with a specific medium designed to permit the growth of the organism or organisms being sought. The filter is incubated, and the bacterial colonies which have grown on the filter surface are counted to determine the number of bacteria in the water sample.

Meniscus – The curved upper surface of a non-turbulent liquid in a container; it is concave (curves upward) if it wets the container walls, and convex (curves downward) if it does not. For accurate measurements, readings should be taken at the flat center of the meniscus. The curve of the meniscus is due to surface tension.

Metadata – “Data about data.” Information that helps characterize the data that volunteers collect. Metadata answer who, what, when, where, why, and how about every facet of the data being documented. This information helps others understand exactly how the data was obtained.

Metals, toxic – Some fifty of the eighty elemental metals used in industry, many of which (e.g., cadmium, lead, mercury and zinc) are toxic to humans and are primarily absorbed into the body by inhalation or ingestion.

Micro – A prefix meaning one-millionth of a unit.

Microorganisms – Organisms (microbes) observable only through a microscope; larger, visible types are called macroorganisms.

Milligrams per liter (mg/l) – A weight per volume designation used in water and wastewater analysis. Equivalent to parts per million (1 ppm = 1 mg/l).

Molecule – The simplest structural unit of a substance that retains the properties of the substance and is composed of one or more atoms.

Most probable number (MPN) – An analytical method used to detect the presence of coliforms in a water sample and estimate their numbers.

NEP – See National Estuary Program.

NERRS – See National Estuarine Research Reserve System.

National Estuarine Research Reserve System (NERRS) – A federal program administered by the National Oceanic and Atmospheric Administration (NOAA). NERR sites monitor the effects of natural and human activities on estuaries to help identify methods to manage and protect coastal areas.

National Estuary Program – A federal program administered by the EPA that targets a broad range of issues and engages local communities in the process. Each NEP is made up of representatives from federal, state, and local government agencies and members of the community working together to identify problems in the estuary, develop specific actions to address those problems, and create and implement a formal management plan to restore and protect the estuary.

Nephelometer – An instrument that measures scattered light in a liquid.

Nephelometric turbidity unit (NTU) – A standard unit of turbidity measurement.

Neutral – On the pH scale, neither acid nor alkaline. Pure water is neutral, and has a pH of 7.0.

Nitrates – One form of nitrogen that plants can use for growth.

Nitrification – The process whereby some bacteria transform ammonium into nitrite and then to nitrate.

Nitrogen – An essential nutrient for plant and animal development. Too much of this nutrient can cause accelerated plant growth, algae blooms, and increase the amount of material available for decomposition (which lowers dissolved oxygen).

Non-Indigenous Species (NIS) – Species that migrate or are carried by animals and humans into ecosystems outside their normal range of occurrence. These “alien invaders” are known by many names, including alien, non-native,

introduced, nuisance, invasive, and exotic species. Some of these organisms can wreak havoc on any ecosystem—including estuaries—once they become established.

Nonpoint source pollution – Pollution that enters water from sources that cannot be traced to a single point. Generally initiated by stormwater runoff from agricultural, urban, forestry, marina, construction, and other land uses.

Nonsettleable matter – Suspended matter that neither settles nor floats to the surface of water in a period of one hour.

Nutrient – Any of a necessary complement of organic or inorganic elements or compounds that are considered essential to the biological growth of an organism.

Nutrient loading – Delivery of nutrients to a waterbody. An excess of nutrient loads beyond normal levels may lead to a phytoplankton population increase. See algal blooms.

Organic matter – Composed of chemical compounds based on carbon chains or rings, and also containing hydrogen with or without oxygen, nitrogen, or other compounds.

Orthophosphate – An acid or salt containing phosphorus as PO_4 , such as K_3PO_4 (potassium phosphate).

Outliers – Findings that differ radically from past data or other data from similar sites.

Overturn – A process characterized by a breakdown in the stratification of a waterbody (e.g., by changing seasons or storms) and the subsequent mixing of deep water with surface water.

PAHs – See polycyclic aromatic hydrocarbons.

ppm – See parts per million.

ppt – See parts per thousand.

PCBs – See polychlorinated biphenyls.

Parts per million (ppm) – The unit commonly used to represent the degree of pollutant concentration where the concentrations are small. Larger concentrations are given in percentages. Equivalent to milligrams per liter (mg/l) where $1 \text{ ppm} = 1 \text{ mg/l}$; in water, ppm represents a weight/volume ratio.

Patchiness – Refers to the uneven spatial distribution of organisms. Plankton tend to exhibit patchiness in the water column, grouping together in “patches.”

Pathogen – An organism (such as a bacterium or virus) that can cause a disease.

Percent saturation – Amount of oxygen in the water compared to the maximum it could hold at that temperature.

pH – A measure of the alkalinity or acidity of a substance. Also defined as “the negative logarithm of the hydrogen ion concentration ($-\log_{10}[\text{H}^+]$)” where H^+ is the hydrogen ion concentration in moles per liter. The pH of a substance is neutral at 7.0, acidic below 7.0, and alkaline above 7.0.

Phosphorus – An essential nutrient for plant and animal development. However, too much of this nutrient can cause accelerated plant growth, algae blooms, and increase the amount of material available for decomposition (which lowers dissolved oxygen).

Photosynthesis – Process by which chlorophyll-containing cells in green plants convert incident light to chemical energy and synthesize organic compounds from inorganic compounds (including carbon dioxide and water).

Phytoplankton – Microscopic plants that are common components of our natural waters. These plants are microalgae, and contain an

assortment of pigments in their cells. They are represented by single cell or colonial forms that are the primary food and oxygen producers within freshwater, estuarine, and marine habitats. Through the process of photosynthesis they utilize the sun's energy to reproduce and provide the food resources necessary to support other organisms.

Plankton – A broad group of aquatic microorganisms that form the basis of the food chain. They are incapable of moving against water currents. Included in this group are bacterioplankton (bacteria), phytoplankton (plants), and zooplankton (animals).

Point source pollution – Pollution discharged into a waterbody from any discrete pipe or other conveyance. Easier to identify, and often less expensive to cleanup than nonpoint sources of water pollution.

Polychlorinated biphenyls (PCBs) – Group of more than two hundred chlorinated toxic hydrocarbon compounds that can be amplified, that is, spread and increased, in food chains and webs.

Polycyclic aromatic hydrocarbons (PAHs) – A class of chemical compounds composed of fused six-carbon rings. PAHs are commonly found in petroleum oils (e.g., gasoline and fuel oils) and are emitted from various combustion processes (e.g., automobile exhausts, coal-burning operations).

Precipitant – A chemical or chemicals that cause a precipitate to form when added to a solution.

Precipitate – The discrete particles of material separate from a liquid solution.

Precision – The degree of agreement among repeated measurements of the same parameter on the same sample or on separate samples collected as close as possible in time and place. It tells you how consistent and

reproducible your methods are by showing you how close your measurements are to each other. Typically, precision is monitored through the use of replicate samples or measurements.

Presence-absence test (P-A test) – A method commonly used to determine whether the target organism or organisms (for example, total coliforms or *E. coli*) are present in a water sample or not.

Protozoans – Any of a number of one-celled, usually microscopic animals, belonging to the lowest division of the animal kingdom.

QA/QC – See quality assurance/quality control.

Quality assurance project plan (QAPP) – A written plan which details monitoring objectives, scope of the program, methods, procedures (field and lab), and the activities necessary to meet stated data quality objectives.

Quality assurance/quality control (QA/QC) – The total integrated program for assuring reliability of monitoring and measurement data.

Reagent – A chemical substance used to cause a reaction for the purpose of chemical analysis.

Replicate samples – Two or more samples taken from the same place at the same time.

Representativeness – The extent to which measurements actually depict the true environmental condition or population you are evaluating.

Risk management – To control issues that can cause physical or financial injury or damage. Risk management programs include plans to reduce risk and liability by stressing safety with volunteers, purchasing insurance, and using waivers.

Runoff – Water from rain, melted snow or agricultural or landscape irrigation that flows over the land surface.

SAV – See submerged aquatic vegetation.

Salinity – A measure of the amount of salts dissolved in water. Generally reported as “parts per thousand” (i.e., grams of salt per 1,000 grams of water) and abbreviated as “ppt” or ‰. Estuaries vary in salinity from 0 ppt to 34 ppt depending on the relative input of fresh and marine water.

Salt – Any compound formed by combination of any negative ion (except hydroxide) with any positive ion (except hydrogen or hydronium); the precipitate produced as the result of neutralization of an acid with a base.

Seagrass – In marine environments, rooted vascular plants that generally grow up to the water surface but not above it. See submerged aquatic vegetation.

Secchi depth – The depth beneath the water’s surface at which a Secchi disk can no longer be seen.

Secchi disk – A round, eight-inch (20 cm), weighted, usually black and white disk that is lowered by rope into the water. Secchi disks are used to measure transparency, which is an integrated measure of light scattering and absorption.

Sediment – Mud, sand, silt, clay, shell debris, and other particles that settle on the bottom of waterways.

Sedimentation – The deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material. Also called settling.

Sensitivity – The capability of a method or instrument to discriminate between measurement responses. The more sensitive a method is, the better able it is to detect lower concentrations of a variable. Sensitivity is related to detection limit, which is the lowest concentration of a given pollutant your methods or equipment can detect and report as greater than zero.

Settleable solids – Particles of debris and fine matter heavy enough to settle out of water.

Sewage – The total of organic waste and wastewater generated by residential and commercial establishments.

Sewage, combined – Wastewater containing both sanitary sewage and surface or stormwater with or without industrial wastes.

Sewage, industrial – Sewage in which industrial wastes predominate.

Sewage, raw – Sewage prior to receiving any treatment.

Shellfish – Any aquatic animal with a shell, as the clam, oyster, mussel, and scallop. The organism feeds by filtering water through its gills and removing food materials.

Solution – A liquid (solvent) that contains a dissolved substance (solute).

Species, alien, invasive or introduced – See non-indigenous species.

Species – 1) A single, distinct kind of organism, having certain distinguishing characteristics. Organisms forming a natural population that transmit specific characteristics from parent to offspring. 2) Chemical forms. For example, nitrogen comes in many different chemical forms, including nitrite (NO_2^-) and nitrate (NO_3^-).

Specific gravity – Also called relative density. The ratio of the density of a substance to the density of some reference substance. Hydrometers use this principle to determine salinity of a water sample, compared to fresh water.

Standard (or standardized solution) – A solution containing a known, precise concentration of an element or chemical compound, often used to calibrate water quality monitoring equipment.

Standard deviation – A statistical measure of the dispersion of data.

STORET – (Store-Retrieve) A data storage system operated by EPA that stores raw data on water quality, bacteriological, biological, and other parameters. Using the data, one can create reports for a given site and compare one watershed with another.

Stratification – The formation, accumulation, or deposition of material in layers, such as layers of fresh water overlying salt water in estuaries.

Submerged Aquatic Vegetation (SAV) – Aquatic plants that generally include rooted vascular plants that grow up to the water surface but not above it (although a few species have flowers or tufts that may stick a few centimeters above the surface). The definition of SAV usually excludes algae, floating plants, and plants that grow above the water surface. Sometimes called seagrass in marine environments.

Suspended Sediments – Particles of soil, sediment, living material, or detritus suspended in the water column.

Temperature – A measure of the hotness or coldness of anything, as usually determined by a thermometer. Temperature is a determining factor for biological and chemical processes.

Tide – The alternating rise and fall of the ocean and estuary surface, caused by the gravitational pull of the sun and the moon upon the earth.

Titration – A method of analyzing the composition of a solution by adding known amounts of a standardized solution until a given reaction (color change, precipitation, or conductivity change) is produced.

Titration – Instrument that forcefully expels a reagent by using a manual or mechanical plunger. The amount of reagent used is calculated by subtracting the original volume in the titration from the volume left after the endpoint has been reached.

Total coliforms – A group of closely related bacterial genera that all share a useful diagnostic feature: the ability to metabolize (ferment) the sugar lactose, producing both acid and gas as byproducts.

Toxic waste – Discarded material that is capable of causing serious injury, illness, or death. Toxins can be poisonous, carcinogenic, or otherwise harmful to living things.

Transparency – An integrated measure of light scattering and absorption. Secchi disks are commonly used to measure transparency of water.

Turbidimeter – An instrument for measuring turbidity in which a standard suspension is used for reference.

Turbidity – A measure of how clear the water is; how much the suspended material in water results in the scattering and absorption of light rays. An analytical quantity is usually reported in turbidity units and determined by measurements of light diffraction. Material that can increase the turbidity (reduce clarity of water) are suspended clay, silt, sand, algae, plankton, microbes, and other substances.

Volume – The space occupied in three dimensions.

Voucher collection – A preserved archive of organisms that have been collected and identified. In addition to preserved specimens, the collection may involve photography or microscopy.

Water clarity – Measurement of how far an observer can see through water. The greater the water clarity, the further you can see through the water.

Water column – The water between the surface and the bottom of a river, lake, estuary, or ocean.

Water quality parameters – Any of the measurable qualities or contents of water. Includes temperature, salinity, turbidity, nutrients, dissolved oxygen, and others.

Watershed – The entire area of land whose runoff of water, sediments, and dissolved materials (e.g., nutrients, contaminants) drain into a river, lake, estuary, or ocean.

Wet deposition – See atmospheric deposition.

Wetlands – Lands that are often transitional areas between terrestrial and aquatic systems, with enough surface or groundwater to support a complex chain of life, including microorganisms, vegetation, reptiles, fish, and amphibians. Wetlands usually border larger bodies of water such as rivers, lakes, bays, estuaries and the open sea, and may serve as breeding grounds for many species. Examples include swamps, marshes, and bogs.

Whirl-pak bag – Sterilized, clear polyethylene bags used to collect water samples for analysis.

Wrack – Line of seaweed and organic material that can be seen when the high tide recedes.

Zooplankton – Aquatic microorganisms that are free floating or capable of minimal movement. Zooplankton feed primarily on phytoplankton and bacteria, and can be either adult microorganisms, or larval forms of fish or shellfish.

Index



Index

A

accuracy, 3-5, 4-10, 5-6, 5-7, 5-9—5-11, 5-18, 5-22, 6-3, 9-6, 9-9, 9-11, 11-4, 11-7—11-9, 13-3, 14-5, 17-2, 17-10

accurate, 2-9, 6-3, 6-5, 7-12, 8-2, 9-4, 9-13, 10-7, 10-8, 11-3, 11-4, 11-6, 11-10, 14-7, 15-4, 15-6, 16-11, 17-11, 19-5, 19-15

acid (acidic), 9-13, 11-2, 11-6—11-8

aerobic, 17-3

algae, 5-14, 7-6, 7-13, 10-2, 10-3, 11-3, 12-6, 15-2, 17-12, 18-1, 18-3, 18-8, 18-9, 19-7—19-9

algal blooms, 2-6, 2-8, 7-2, 8-8, 8-16, 10-2, 10-6, 11-2, 17-8, 18-3, 18-4, 19-9, 19-10

harmful algal blooms (HAB), 12-2, 12-6, 19-9, 19-12, 19-14

alkalinity, **Ch. 11**, 2-6, 5-12

ammonium, 10-6

anaerobic, 17-3

analyte, 5-10, 5-11

anions, 14-3

anoxia, 9-3, 9-4

anoxic, 10-3, 10-6

anthropogenic sources, 12-3

atmospheric deposition, 2-5, 10-1—10-3, 10-11, 10-12, 12-2, 12-4, 12-8

autoclave, 7-8, 7-15, 17-8, 17-11, 17-12

B

bacteria, **Ch. 17**, 2-6, 2-7, 2-10, 2-13, 5-10, 5-12, 6-2, 6-6, 7-5, 7-8, 7-13—7-15, 8-12, 9-2, 10-2, 10-3, 10-6, 15-3, 19-4, 19-7, 19-9

blooms, 10-6

culture disposal, 17-12

source tracking, 17-4

bar graph, 8-11, 8-12

base, 11-8

basic, 11-2

benthic, 2-7, 15-3, 17-3, 19-3

bias, 5-6

bioassay (biological assay), 12-7

biochemical oxygen demand (BOD), **Ch. 9**, 2-6, 6-3, 7-16

biological accumulation (bioaccumulation), 12-3, 12-4

biological amplification (bioamplification), 12-3, 12-4

brown tide, 10-3

buffer, 11-4, 11-6, 17-16

C

cadmium, 12-4, 19-4

calibrate (calibration), 5-2, 5-4, 5-21, 5-22, 6-3, 7-9, 7-17, 9-7, 9-10, 10-7, 10-8, 11-6, 11-9, 14-2, 14-4, 14-6, 15-7, 15-8

calibration blank, 5-11, 5-12

calibration standards, 5-11, 5-12, 11-4

cations, 14-3

chlorinity, 14-3, 14-4

chlorophyll, 6-2, 10-10, 19-16

chromium, 12-4

color comparator, 6-3, 11-3

colorimeter, 10-7, 10-8, 11-3—11-5, 14-3

colorimetric method, 11-3—11-5

comparability, 5-9, 5-18, 5-19, 5-22

completeness, 5-8, 5-18, 5-19, 5-22

conductivity, 2-6, 5-12, 6-3, 14-3—14-6

copper, 12-4

crab jubilee, 6-7

D

data

analysis, 3-8, 8-2

forms/cards/sheets, 3-4, 3-5, 4-4, 4-5, 4-10, 5-19, 5-22, 7-2, 7-9, 7-13, 7-16, 7-17, 8-2—8-6, 9-10, 10-10, 10-12, 11-6, 11-9, 11-10, 13-4, 14-6, 14-7, 15-7—15-9, 16-6—16-12, 17-10, 18-12, 18-13, 19-12, 19-19

- interpretation, 4-4, 7-2, 7-10, 8-2, 8-7, 10-8
 loggers, 13-3
 management, 3-2, 3-4, 3-8, 5-15, 5-21,
 8-2—8-5
 presentation, 8-2, 8-10
 quality objectives, 3-2, 5-14, 5-18, 5-19,
 5-22, 9-7, 10-8, 11-5, 11-7, 13-3, 14-5,
 15-4, 19-12, 19-19
 user(s), 3-2, 3-5, 4-4, 4-12, 5-2, 5-3, 5-9,
 5-13—5-16, 5-18—5-20, 5-22, 7-17, 8-
 2, 8-8, 8-10, 8-16, 17-13, 19-19
- DDT, 12-1—12-3, 12-5
 deionized water, 5-10, 5-11, 7-9, 7-15, 11-4,
 11-6, 11-8, 14-6
 demineralized water, 11-4
 denitrification, 10-6
 density, 14-3, 14-4
 detection limit, 5-9, 8-8, 8-9
 detritus, 10-4, 15-3, 17-3, 18-2, 19-4
 digital titrator, 11-7, 11-8
 dinoflagellate(s), 7-13, 10-3, 19-7—19-9,
 19-17
 dioxin, 12-6
 dissolved oxygen (DO), **Ch. 9**, 2-6,
 2-8—2-11, 5-12, 5-19, 6-2, 6-3, 6-5, 6-6,
 7-12—7-17, 8-12, 8-13, 10-3, 10-6, 13-2,
 13-3, 14-2, 15-2, 15-3, 18-1, 18-4
 saturation, 9-12
 distilled water, 5-10, 6-3, 7-9, 11-9, 14-6,
 15-9
 dry deposition, 10-11
- E**
 eelgrass, 18-4—18-6, 18-8, 18-12
 wasting disease, 18-5
 effluent, 7-14, 17-12, 17-7, 17-9
 endocrine disrupter, 12-5
 endpoint, 9-6, 9-10, 11-7, 11-9, 14-5
 entangle(ment), 16-3, 16-8, 16-10, 16-12
 enterococci, 17-1, 17-2, 17-5, 17-6,
 17-12—17-14
 EPA—*see U.S. Environmental Protection
 Agency*
- epiphytes, 18-3
Escherichia coli, 17-1, 17-2, 17-5, 17-6,
 17-11—17-14
 eutrophic, 9-14
 eutrophication, 2-6, 10-2
 external check, 5-11, 5-12
 external field duplicate, 5-11, 5-12
- F**
 fecal coliform, 6-2, 17-1—17-6, 17-8,
 17-10—17-13, 17-16, 19-4, 19-5
 fertilizers, 6-6, 10-2, 10-3, 10-5, 10-6, 10-11,
 12-4
 field blank, 5-10—5-12
 field replicate, 5-10, 5-12
 fish kill, 2-8, 6-7, 7-13, 10-3
 food chain, 2-10, 12-4—12-6
 food web, 2-7, 17-3, 19-2, 19-8, 19-17
 fundraising, 2-13, 3-7—3-10
- G**
 Geographic Information System(s) (GIS), 8-14
 global positioning system (GPS), 7-3, 7-4,
 7-9, 7-11, 7-12, 18-10—18-12
 graphics, 3-13, 3-14, 8-3, 8-10—14, 8-17
 groundtruth(ing), 18-7, 18-9, 18-10
- H**
 harmful algal blooms (HAB)—*see algal
 blooms*
 hydrometer, 5-19, 14-4—14-6
 hypoxia, 9-2—9-4
 hypoxic, 10-3, 19-9
- I**
 indicator, 17-2, 17-4—17-6, 17-10—17-14,
 19-1—19-4
 ingestion, 16-3
 insurance, 3-6, 3-7
 internal check, 5-10, 5-12
 invertebrate, 2-12, 12-7, 18-4, 19-2

K

Kemmerer (water sampler), 7-17, 9-4, 9-7, 10-5, 19-11, 19-15

L

lab replicate, 5-10, 5-12

land use, 2-5, 2-13, 3-3, 5-9, 7-12, 8-8, 8-14, 15-2, 16-4, 18-4

associated pollutants, 2-6

lead, 12-4

liability, 3-6, 4-13

line graph, 8-13

M

macroinvertebrate, 2-11, 2-12, 6-2, 19-1—19-3

manatee grass, 18-6

maps, 18-7, 18-9—18-12

topographic, 18-14

bathymetric, 18-14

marine debris, **Ch. 16**, 2-7, 2-10, 8-12

marker buoy method, 7-11

MARPOL, 16-3

maximum turbidity, 2-10

mean, 5-5, 5-6, 8-6, 8-8

measurement range, 5-9

median, 8-6

membrane filtration (MF), 17-10—17-17

meniscus, 9-9, 14-6

mercury, 12-3, 12-4, 12-8, 13-3, 17-2, 19-4

metadata, 5-15

metals, 2-6, 2-7, 6-2, 11-2, 12-2, 12-6, 12-7, 19-4

most probable number (MPN), 17-10—17-12, 17-14

N

National Estuarine Research Reserve System (NERRS), 2-12, 3-11

National Estuary Program (NEP), 2-12, 3-7, 3-11

National Oceanic and Atmospheric

Administration (NOAA), 2-11, 2-12, 3-3, 3-7, 3-11, 7-15

negative plate, 5-10, 5-12

neutral, 11-2

nitrate, 10-5, 10-6, 14-3, 14-4, 17-3

nitrification, 10-6

nitrite, 9-8, 10-5, 10-6, 17-3

nitrogen, 2-8, 7-15, 10-1, 10-2, 10-4—10-8, 10-11, 10-12, 18-3

fixation, 10-2, 10-6

non-indigenous species (NIS), 2-10, 3-5, 16-4, 18-4, 19-1, 19-2, 19-16—19-20

nonpoint source (NPS), 2-5, 2-9, 2-10, 3-14, 6-5, 10-2, 10-5, 17-14

nutrient(s), **Ch. 10**, 2-3, 2-6, 2-8—2-11, 5-12, 6-2, 6-5, 6-6, 7-14, 8-9, 8-10, 9-2, 11-2, 12-4, 13-2, 17-2, 17-3, 17-17, 18-1—18-5, 19-2, 19-9, 19-10

“pillows,” 9-15

O

outlier, 8-5, 8-6

overturn, 9-3

oxygen, **Ch. 9**, 6-5, 6-7, 7-6, 10-2, 10-6, 10-7, 10-10, 14-3, 15-3, 18-2, 18-4, 19-7—19-9

P

PAHs (polycyclic aromatic hydrocarbons), 12-1—12-3, 12-5, 12-6, 19-4

partnership, 3-11, 3-12

pathogens, 2-10, 14-2, 17-1, 17-2, 17-4, 19-2, 19-4, 19-16

PCBs (polychlorinated biphenyls), 12-1—12-3, 12-5, 12-6, 17-2, 19-4

percent saturation, 2-11, 9-7, 9-8, 9-12, 14-3

performance based measurement system (PBMS), 5-20

pesticides, 2-6, 6-2, 6-6, 12-5, 15-3, 17-2, 19-4

Pfiesteria, 10-3

pH, **Ch. 11**, 2-6, 2-9, 2-11, 5-9, 5-12, 5-19, 6-2, 6-3, 8-12, 13-3, 14-3, 17-15

phosphate, 7-15, 10-6, 14-3
 phosphorus, 7-15, 10-1, 10-2, 10-4—10-8,
 10-10, 18-3
 phytoplankton, **Ch. 19**, 6-2, 7-13, 7-14, 9-2,
 10-3, 10-8—10-10, 12-3, 13-2, 15-1, 15-5,
 18-3, 18-4
 blooms, 7-14, 10-6, 10-7, 18-2, 18-3, 19-2
 pie chart, 8-12, 8-13
 plankton, 2-10, 2-11, 7-13, 9-3, 15-2,
 19-7—19-9, 19-11, 19-13—19-15
 net, 19-11—19-15
 point source(s), 2-5, 2-9, 2-10, 6-5, 6-6, 10-2,
 10-5, 10-11
 positive plates, 5-10, 5-12
 precise, 4-2, 5-6, 6-3, 9-10, 10-7, 11-7, 15-6
 precision, 4-10, 5-4—5-6, 5-10, 5-11, 5-18,
 5-22, 17-18, 19-11
 presence-absence (P-A) test, 17-10, 17-12,
 17-14
 press conference, 3-13, 8-17
 press release, 2-13, 3-12—3-14, 4-2, 8-17

Q

quality assurance (QA), 2-13, 3-8, 4-4, 5-3,
 5-4, 5-15, 5-16, 5-22, 7-3, 8-10, 9-9, 10-8,
 15-6, 16-7, 17-7, 17-8, 19-5, 19-11
 quality assurance project plan (QAPP), **Ch. 5**,
 2-13, 3-2, 3-8, 6-2, 7-1, 8-4, 8-8, 9-10,
 11-5
 quality control (QC), 2-13, 4-4, 4-9—4-11,
 5-4, 5-10—5-12, 5-16, 5-19—5-22, 7-3,
 7-10, 8-4, 8-11, 9-6, 9-7, 10-8, 11-5, 11-7,
 13-3, 14-5, 15-6, 15-7, 17-7, 17-8, 17-13,
 17-18, 19-11, 19-12, 19-19
 external QC, 5-4
 internal QC, 5-4

R

rain gauge, 7-14, 10-12
 reagent(s), 3-1, 4-4, 4-5, 5-10, 5-11, 5-21, 6-3,
 7-5—7-7, 7-9, 9-5—9-7, 9-9—9-11, 9-13,
 10-7—10-9, 11-3, 11-4, 11-5, 11-7, 11-8,
 15-6, 15-9, 17-12, 17-17
 red tide, 10-3, 12-6, 19-9, 19-17

refractivity, 14-3, 14-4
 refractometer(s), 14-4—14-6
 relative percent difference (RPD), 5-5, 5-6
 relative standard deviation (RSD), 5-5, 5-6
 replicate, 5-10
 representativeness, 5-8, 5-18, 5-19, 5-22
 risk management, 3-6
 runoff, 2-8, 2-10, 6-5, 7-14, 8-9, 9-2, 10-2,
 10-3, 10-6, 10-11, 11-2, 12-2, 12-3, 12-6,
 15-2, 15-4, 15-6, 17-1, 17-2, 18-4,

S

safety, 3-5—3-7, 4-5, 4-6, 5-3, 5-19, 7-1—
 7-3, 7-5, 9-7, 10-8, 11-5, 11-7, 13-3, 14-5,
 15-7, 16-11, 19-5, 19-11, 19-19
 salinity, **Ch. 14**, 2-11, 5-12, 5-19, 6-2, 6-3,
 6-5, 9-1, 9-6—9-8, 9-10, 9-12, 17-15,
 18-3—18-5
 sample
 duplicate, 5-10, 5-12
 fixed, 9-6, 9-9, 9-11, 9-13
 spiked, 5-11, 5-12
 split, 5-11, 5-12, 17-7, 17-18
 seagrass, 2-8, 16-4, 18-1, 18-5, 18-6, 18-10,
 19-4
 Secchi, 3-5, 5-19, 6-6, 8-9, 8-12, 15-4—15-8,
 18-11, 18-12, 19-12
 sediment, 2-3, 2-7, 2-10, 7-15, 7-16, 9-2, 9-3,
 10-2, 10-7, 10-10, 10-12, 11-2, 15—15-5,
 15-9, 17-3, 17-5, 17-7—17-9, 17-12,
 18-1—18-4, 18-10—18-12, 19-2—19-4,
 19-17
 toxins in, 12-5—12-7
 sensitivity, 5-9, 5-18, 11-4
 shellfish, 2-7, 7-13, 9-2, 10-3, 12-3, 12-6,
 12-7, 17-1, 17-2, 17-7, 17-11, 17-14, 17-
 15, 18-4, 19-3—19-6, 19-9, 19-14, 19-16,
 19-17, 19-20
 shoal grass, 18-6
 shoreline landmark method, 7-11
 species, 10-1, 10-5, 12-4
 mercury, 12-4
 nitrogen and phosphorus, 10-6
 spectrophotometer, 10-7, 10-8, 12-7

spikes, 5-22
 standard deviation, 5-4, 8-8, 8-9
 standard operating procedures (SOPs), 4-5, 5-2, 5-3, 5-9, 5-13, 5-15, 5-16, 5-19, 5-20
 standard(s), 5-9, 5-11, 5-21, 7-7, 8-12, 9-6, 10-7, 11-3—11-5, 11-7—11-9, 14-5, 14-6, 15-7—15-9, 16-11, 17-12, 19-5
 STORET, 5-3, 8-4
 stormwater runoff, 2-5, 2-6, 9-14, 10-2, 15-2, 17-3
 stratification, 2-2, 2-11, 6-5, 7-15, 9-3, 9-4, 13-2, 14-2
 submerged aquatic vegetation (SAV), **Ch. 18**, 2-10, 6-2, 7-13, 8-8, 10-3
 SAV index, 18-6, 18-7

T

TBT (tributyltin), 12-6
 temperature, **Ch. 13**, 2-9, 5-12, 5-19, 6-2, 6-3, 6-6, 7-2, 7-5, 7-6, 8-13, 9-3, 9-6—9-8, 9-12, 9-14, 9-15, 11-4, 11-5, 11-7, 11-8, 14-2—14-4, 15-2, 15-3, 17-5, 17-10—17-13, 17-15, 17-18, 18-3, 19-8, 19-9
 air, 7-14, 13-2, 13-4
 thermometer, 7-8, 7-9, 7-14, 13-1, 13-3, 13-4, 14-6
 tide, 2-11, 6-5, 6-6, 7-4, 7-9, 7-15, 13-2, 14-2, 14-3, 18-3, 18-6, 18-8, 18-10
 titration, 7-6, 9-5, 9-6, 9-9—9-11, 9-13, 11-7, 11-8, 14-4, 14-5
 titrator(s), 11-7, 11-8
 total coliforms, 17-1, 17-2, 17-4—17-6, 17-12—17-14, 17-17
 total dissolved solids, 6-3
 total solids, **Ch. 15**, 2-6, 5-12
 toxicity
 acute, 12-2
 chronic, 12-2
 toxin, **Ch. 12**, 2-6, 2-7, 2-10, 19-17
 transect, 18-7, 18-8, 19-4
 transparency, 6-2, 19-12

transparency tube(s), 15-4, 15-6—15-9
 tributary, 2-2, 2-5, 8-14, 13-2, 18-5
 turbidity, **Ch. 15**, 2-6, 2-9, 2-10, 5-12, 6-2, 7-14, 8-9, 8-12, 14-2, 19-2
 meter, 15-6—15-8
 turtle grass, 18-5, 18-6

U

U.S. Environmental Protection Agency (EPA), 2-12, 3-3, 3-11, 5-3, 5-13, 5-16—5-18, 5-20, 8-4, 12-4, 16-5, 17-5, 17-6, 17-10, 17-11, 17-13, 19-3

V

Van Dorn (water sampler), 7-17, 9-4, 9-7, 10-5, 19-11, 19-15
 visual assessment, 7-12, 19-11
 voucher collection, 5-7, 5-8, 5-19

W

waste, 7-5, 7-8, 7-9, 9-5, 9-10, 10-10, 17-11
 watershed, 2-4, 2-5, 2-8, 3-5, 3-9, 4-6, 6-4, 7-12, 8-14, 10-4, 10-6, 10-11, 10-12, 15-2, 15-4, 17-2, 17-4, 17-15
 survey, 5-14
 wet deposition, 10-11, 10-12
 wetlands, 2-3, 2-5, 12-4, 19-17, 19-21
 Whirl-pak (bag(s)), 7-15—7-17, 10-9, 11-5, 15-8, 15-10, 17-8, 17-9
 widgeon grass, 18-5
 wild celery, 18-5
 Winkler (method) (titration), 5-19, 9-5, 9-6, 9-8—9-11
 wrack, 17-3, 17-5

Z

zooplankton, 6-5, 10-10, 19-7—19-10, 19-12, 19-13, 19-15

