

New York Sea Grant: Brown Tide Research Initiative

List of **Key Terms**

Term	Definition
alga(e)	Primitive, often aquatic, plants that carry on photosynthesis but lack the flowers, roots, stems, and leaves of higher plants.
algal bloom	High concentrations or densities of algae.
allopathy	The suppression of growth of an organism by another due to the release of a toxic substance.
amino acids	The building blocks for the synthesis of proteins. Can be a source of nitrogen and/or carbon.
ammonium	An ion, NH_4^+ , derived from ammonia by combination with a hydrogen ion that can be an inorganic source of nitrogen.
anthropogenic (source of nutrients)	Derived from humans (sewage) or human activities (e.g., crop farming, high intensity animal operations, automobile exhaust pipes, and urban runoff).
antibody test	An indication test that uses antibodies to determine the presence of an organism or substance.
assimilate	Conversion of nutritive materials into a living organism.
autolysis	Breakdown of all or part of a cell or tissue by self-produced enzymes.
autotrophic	Organisms such as plants and some bacteria which produce their own food from inorganic substances such as carbon dioxide and inorganic nitrogen (i.e., photosynthesis).
axenic culture	The growth of organisms of a single species in the absence of cells or living organisms of another species.
bacterial productivity	The amount of bacteria that grows during a given time period.
bacterivores	Organisms, such as protozoa, that eat bacteria.
benthic	Pertaining to the sea floor.
benthic-pelagic coupling	The interaction between the benthos or bottom, with the water column, or pelagic ecosystem. It refers to how the dynamics of one ecosystem influences the dynamics of the other.
benthos	The floor of a sea or ocean; also includes the bottom-dwelling organisms that live there.
bioassay	A method for quantitatively determining the concentration of a substance by its effect on the survival, development, growth, behavior, or measurable physiological response of a suitable animal, plant, or microorganism under controlled conditions.
biocides	Chemicals used to kill living organisms (e.g., pesticides, algaecides).
bioenergetic	The biology of energy transformations and energy exchanges within and between living things and their environments.
biogeochemistry	A branch of geochemistry that is concerned with biologic materials and their relation to earth chemicals in an area; the science studying changes in the earth's chemical constituents as mediated by living organisms (e.g., bacteria).
biomarker	A chemical compound produced by a specific organism that can be used as an indicator for the presence of that organism.
bivalve	Animals having a soft body enclosed in a calcareous two-part shell, e.g., Clams, scallops and oysters.
cell cycle	A growth process consisting of the four stages a brown tide cell goes through before dividing into two cells.
cell cycle proteins	Proteins involved in regulating cell growth and division (reproduction).
centric diatoms	Round shaped Cylindrical single-celled algae, mostly photosynthetic, that form silica cell walls and can be solitary or form chain-forming and range in size from 2 microns to several millimeters. They are found in marine and aquatic systems, up in the water column or on/in the bottom sediments. 
chelator	A metal that combines with an organic compound causing a reaction.
chemical flux	The concentration of a particular constituent multiplied by the flow of seepage rate of

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	the water entering the bay. if the flow rate is high, then the flux of that constituent is also high. The flux of a particular constituent is a function of its concentration and flow or seepage rate.
chlorophyll	The photosynthetic pigment responsible for converting light energy to chemical energy used for plant growth.
chlorophyte	A green alga.
chloroplast	The structure in a plant or algal cell that contains chlorophyll.
Chrysophyceae	Unicellular golden-brown algae that inhabit fresh and salt water environments.
ciliates 	Single-celled protozoa (0.001 in diameter and range up to about 0.25mm) often found in plankton that move by beating hair-like structures called cilia. Ciliates are especially important trophic links in microbial food webs because they are the major consumers of bacteria, pico- and nano- plankton, diatoms, dinoflagellates, and amoebae, and they are eaten in turn by animals such as copepods in the zooplankton. Because of their "keystone" role in microbial food webs, they are important indicators of the conditions and health of the environment at the microbial level.
clearance rate	As used in this Report Series, the rate at which clams filter-feeders, such as shellfish, remove particles (including plankton) from water by passing the water through their systems.
competition	The inter- or intraspecific interaction resulting when several individuals share an environmental necessity.
control	Observations made in an experiment which have not undergone treatment, to use in comparison with observations made on subjects which have undergone treatment.
copepod 	A small crustacean with both freshwater and marine forms. Important as a food source for higher trophic organisms such as fish. (typically 1-2 millimeters in length, oceanic species can reach over 1 centimeter).
crustacean	Any mainly aquatic arthropod usually having a segmented body and chitinous exoskeleton such as lobster, shrimps, crabs, wood lice, water fleas and barnacles.
culture	A growth of living cells or microorganisms in a controlled artificial environment.
culture medium	The nutrients and other organic and inorganic materials used for the growth of microorganisms and plant and animal tissue in culture.
cyanobacteria	Blue-green bacteria, sometimes called blue-green algae.
cytotoxicity	The characteristic of being toxic to living cells.
dark cycle (or Calvin Cycle)	The portion of photosynthesis that does not require light.
diatom	Single-celled algae, mostly photosynthetic, that form silica cell walls, can grow singly, in chains or in simple colonies.
diel	A 24-hour period.
DIN	Dissolved inorganic nitrogen (e.g., nitrate, nitrite and sometimes ammonium).
dinoflagellate 	a single-celled organism found in fresh and marine waters with characteristics of both plants (e.g., photosynthesis) and animals (e.g., uses outside organic sources of nutrition). Many harmful algae blooms are caused by dinoflagellates.
dissolved organic matter	Dissolved organic compounds ranging from macromolecules to low molecular weight compounds such as simple organic acids and short-chained hydrocarbons.
DON	Dissolved Organic Nitrogen, (e.g., urea).
ECOHAB	Ecology and Oceanography of Harmful Algal Blooms, an interagency research effort headed by NOAA's Coastal Ocean Program.

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ecosystem	Organisms of a natural community together with the environment.
electron microscopy	The technique used to produce an enlarged image of a tiny object that utilizes an electron microscope, an instrument that uses a beam of electrons focused by an electron lens. This type of microscopy is necessary when items or features are too small to be imaged by light. In this case, the image is created by the bending/reflection of an electron beam rather than a light beam.
enzyme	Protein produced by living cells that catalyze the biochemical processes necessary to sustain life.
eukaryotic	A cell with a distinct membrane-bound nucleus.
eutrophic	High in nutrients (nitrogen, phosphorus) and high in organic (biological) production.
eutrophication	The excessive addition of nutrients, which spurs accelerated algal growth, creating more plant biomass than the ecosystem is capable of using.
exponential growth phase	Or logarithmic growth phase is the period of growth during which the population grows at an exponential rate.
feeding rates	Rate at which a predator consumes its prey.
ferredoxin	An iron-containing protein important for growing cells.
flagellate	Flagellates are single-celled protista with one or more flagella, a whip-like organelle often used for propulsion. 
flavodoxin	A non-iron containing protein important for growing cells.
flow cytometry	Flow Cytometry is a process in which cell or particle measurements are made while the cells or particles pass, preferably in single file, through the measuring apparatus in a fluid stream. Flow Sorting extends flow cytometry by using electrical or mechanical means to divert and collect cells with one or more measured characteristics falling within a range or ranges of values set by the user.
fluorescence (of chlorophyll)	Red light emitted from chlorophyll.
gas chromatographymass spectrometry (GCMS)	A technique used to separate, identify and quantify chemicals.
gel electrophoresis	An electrochemical process in which charged molecules migrate in a gel under the influence of an electric current: typically used in studies of genetics.
gene sequence	The specific order in which the structural components of DNA are arranged for a particular gene.
genome	The genetic endowment of a species.
graze	To feed by browsing on, cropping, or eating.
groundwater	All subsurface water, especially that part in the zone of saturation.
growth	Increase in the quantity of metabolically active protoplasm, accompanied by an increase in cell number or cell size, or both. Growth of a phytoplankton bloom is the result of an increase in the number algal cells.
growth rate	Increase in the number of individuals in a population per unit time.
HAB	Harmful Algal Bloom.
herbivory	The consumption of plant material.
heterotrophic	Organisms that obtains nourishment from the ingestion and breakdown of organic matter such as plants and animals.
histopathology	A branch of pathology that deals with tissue changes associated with disease or toxic effects.
HPLC	High Performance Liquid Chromatography, commonly used for the separation, identification, purification and quantification of chemical compounds.
hydrolysis	Chemical reaction of a compound with water, usually resulting in the formation of one or more new compounds.

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hypothesis	An idea or statement that must be tested before it can be stated as fact.
immunofluorescence microscopy	A technique for identifying or counting organisms under a microscope using antibodies that glow under blue or other wavelengths of light.
<i>in situ</i>	In the original location (e.g., Water column or within the organism).
inorganic	Composed of chemical compounds that do not contain carbon as the principal element, that is, matter other than plant or animal.
interstitial water	Subsurface water contained in pore spaces between the grains of rock and sediments.
intertidal	The zone between high and low tide.
invertebrates	Animals lacking a backbone and internal skeleton.
iron stress	The condition of an organism lacking the necessary level of the trace-metal iron for growth.
isolates	Single species of algae picked from a natural population and established in culture.
light attenuation	The decrease in light intensity as a result of absorption of energy and of scattering due to particles in the water.
logarithmic growth phase	The period of growth during which the population grows at an exponential rate.
lytic or lysis	The process of disintegration or destruction of a cell.
macrobenthos	Larger (visible with the naked eye) bottom-living organisms.
macronutrient	Nutrient required in relatively large concentrations such as nitrates, nitrites and phosphates.
mesocosm	Experimental apparatus or enclosure designed to approximate natural conditions, and in which environmental factors can be manipulated.
mesozooplankton	Medium-sized zooplankton (size range: 20-200 microns).
metabolic marker	A change in proteins in the cell that reflect a nutrient deficiency.
microflagellate	Small protists that can be photosynthetic or heterotrophic.
micrometer (μm) or micron	One millionth of a meter (1 inch = 25,400 μm). 1 millimeter = 1000 microns.
micronutrient	Nutrient required in relatively small concentrations such as trace organics, metals and chelators.
microphytoplankton	Small, plant planktonic organisms in a size range 20 - 200 microns.
microplankton	Small, single-celled planktonic organisms in a size range 20 - 200 microns.
microzooplankton	Small animals (or animal plankton) in the size class 20-200 microns that are carried with the motion of the currents.
mixotrophic	Obtaining nutrition by combining autotrophic and heterotrophic mechanisms.
mollusk	A group of invertebrate animals including the snail, clam and octopus, that are characterized by the presence of an internal or external calcium shell.
morphology	The study of a form appearance and structure of an organism such as shape, size and color. The way the structure or form of an organism looks.
mucopolysaccharide	Complex polysaccharides containing an amino group; occur chiefly as components of connective tissue. Mucopolysaccharides are quite similar structurally to the better-known animal and plant polysaccharides such as glycogen and starch. Chitin is a particularly plentiful mucopolysaccharide and serves as a structural polysaccharide for many phyla of lower plants and animals such as lobsters, crayfish, crabs, insects, and many other invertebrate organisms.
nanoplankton	Small, single-celled planktonic organisms in a size range 2.0 - 20 microns. Can be animals – nanozooplankton or plants – nanophytoplankton.
negative growth	Reflects a decrease in the optical or light transmission signal of the turbidostat (only observed at night). The reduction in signal may reflect a change in the cellular optical properties (such as the carbohydrate reserves) during the night. At this time, this reduction is not believed to be due to a loss in cell density (numbers).
niche	A unique ecological role of an organism in a community.
nitrate reductase	An enzyme necessary for growth on nitrate.

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nitrogen	A biologically important nutrient essential to plant growth, which exists in solid, gaseous, and liquid states.
nutrient	Substances such as nitrogen and phosphorus, used by organisms to grow.
nutrient loading	Discharge of nutrients from the watershed into a receiving body such as a lake, stream, wetland or estuary.
organic	Containing carbon and also containing hydrogen with or without oxygen, nitrogen, or other elements.
paleochronology	A chronology of ancient events based on information obtained from geology and fossils.
pelagic	Open water that is above the bottom and below the surface.
Pelagophyceae	A class of alga that includes <i>Aureococcus</i> , <i>Aureoumbra</i> and related species.
peptide	A compound of two or more amino acids joined by peptide bonds. Proteins are formed by the linkage of many peptides.
peptide hydrolysis	The splitting of a peptide compound molecule (protein or polypeptide) by the addition of water.
peptone	An organic carbon source used to grow bacteria or other heterotrophic organisms.
phosphorus	A mineral nutrient also required for growth, which exists mainly as phosphate, a dissolved solid.
photosynthesis	The physicochemical process by which plants, algae and some bacteria can utilize the energy of sunlight to power the biosynthesis of organic molecules, using carbon dioxide as the carbon source.
phylogeny	The history of the development of a species of related organisms.
physiological	Characteristic of an organism's health or normal function.
phytoplankton	Microscopic, photosynthetic plants that are suspended in the water column.
phytosterol	Or plant sterols are found in all living plants and are natural constituents of the human diet.
picoalgae	Very small, single-celled planktonic algae in a size range of 0.2 – 2.0 microns.
picoalgae niche hypothesis	The hypothesis suggests succession from larger to smaller algal cells in Long Island bays between April and May. Typically, <i>Synechococcus</i> dominates the smaller picoalgae size class; however, if <i>Synechococcus</i> is selectively removed or its density is reduced, the picoalgae niche opens for some other similar sized algae, such as <i>Aureococcus anophagefferens</i> .
picoplankton	Very small, single-celled planktonic organisms (plants or animals) in a size range 0.2 - 2.0 microns.
pigments	Large, colored molecules that capture light energy and make it available for photosynthesis.
pinnate diatom 	Elongated single-celled algae, mostly photosynthetic, that form silica cell walls, can be solitary or chain-forming, range in size from 2 microns to several millimeters and are found in marine and aquatic systems, up in the water column or on/in the bottom sediments.
plankton	Organisms, both plant and animal, that are suspended in the water column and transported by tides and current.
polymerase chain reaction (PCR)	PCR is also used in classification to help show evolutionary relationships between organisms on the molecular level. It has the advantage of being able to be used even when only very small samples, such as tiny pieces of preserved tissue from extinct animals, are available.
polysaccharide	Polysaccharides are carbohydrates, such as starch and cellulose, formed from many connected sugar units.
primary producers	An organism that uses light to synthesize new organic material from carbon dioxide and water, also call autotrophic/autotroph.
primary productivity	The total amount of new organic matter produced by photosynthesis.
protist	A group of simple organisms not distinguished as animals or plants, though having

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	some characteristics common to both.
recharge (of groundwater)	The processes involved in the replenishment of water to the zone of saturation.
recharge area	An area in which water is absorbed that eventually reaches the zone of saturation in one or more aquifers.
recruitment	To increase or maintain by supplying anew (e.g., either by reproducing or migration).
reduce	The process by which electrons are added to a substance to reduce it (e.g., the conversion of a metallic oxide or sulfide to the free metal).
reticulated	Having or resembling a network of fiber or lines.
salinity	The total quantity of dissolved salts in seawater, measured by weight in parts per thousand.
Sarcinochrysidales	One of two taxonomic orders classified within the Pelagophyceae. This order includes <i>Aureoumbra lagunensis</i> .
seepage chambers	A devise used to collect groundwater seeping through intertidal sediments.
siderophore	High affinity iron chelators produced by freshwater and marine bacteria, to aid in iron uptake under iron-limited conditions.
	A group of cyanobacteria that contain chlorophyll-a are coccoid in shape.
stationary growth phase	The period following logarithmic growth phase when cell division remains relatively constant for a time.
sterol(s)	A type of lipid, such as cholesterol, present in the cell membranes of plants and animals.
strain	A group or organisms of the same species of presumed common ancestry with clear-cut physiological but usually not morphological distinctions (i.e., a stock or line).
subpopulation	A group of individuals that can be set apart from a larger group of individuals to which they also belong.
succession	Changes in the composition of an ecosystem as the available competing organisms and plants respond to and modify the environment.
symbiotic	An interrelationship between two different organisms in which the effects of that relationship are expressed as being harmful or beneficial; intimate associations in which organisms of more than one species live together. The association may be beneficial to both (mutualism), beneficial to one with no effect on the other (commensalism) or beneficial to one with harmful effects on the other (parasitism).
total chlorophyll-a	Represents the measure of chlorophyll form all phytoplankton in a given sample.
toxic	The kind and amount of a poison or toxin produced by a microorganism or a chemical substance not of biological origin.
toxicity	The state or effect of being toxic.
trace metal	A metal found in minute but measurable quantities.
treatment	Controlled technique or action applied in a specified process or experiment.
tropic level	Any of the feeding levels through which the passage of energy through an ecosystem proceeds.
turbidity	The clarity of a liquid as measured by the amount of suspended material (i.e., particulates such as sediments, phytoplankton, colloids, etc.) in a volume of water. Turbidity reduces the depth of light penetration in a water column.
urea	An organic waste product that can be used by phytoplankton a source of nitrogen.
VA vitamins	A mixture of vitamins added to nutrient media for the growth of algae.

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variable chlorophyll fluorescence	A measurement of the energy from sunlight that is absorbed by the cells, and then released again as light.
zooplankton	Microscopic animals that are suspended in the water column.

This glossary was compiled with input and definitions from an assortment of sources:

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various BTRI investigators & Steering committee members.