

Glossary of Terms

< Less than.

> Greater than.

Aerobic – Oxygen-requiring. Aerobic bacteria need oxygen to grow. Aerobic exercise requires the heart and lungs to work harder to meet the body's increased oxygen demand.

Ambient – Surrounding or in the vicinity of.

Amphipods – Amphipoda is an order of animals that includes over 7,000 described species of shrimp-like crustaceans ranging from 0.039 to 5.5 inches in length. Amphipod means "feet [poda] on both sides [amphi]", in Greek. Most amphipods are marine, and may live in the water column or on the ocean bottom. Amphipods are eaten by seabirds, fish, and marine mammals. Terrestrial amphipods, such as sand fleas, can often be seen amongst sand and pebbles or on beaches.

Anaerobic – Occurring in the absence of oxygen or not requiring oxygen to live. Anaerobic bacteria produce energy from food molecules without the presence of oxygen.

Annelids – The annelids, collectively called Annelida, are a large phylum of segmented worms, with over 17,000 modern species. They include polychaetes worms (such as "pile worms"), earthworms, and leeches. They are found in marine environments from tidal zones to hydrothermal vents, in freshwater, and in moist terrestrial environments.

Arthropods – An arthropod is an invertebrate that has an exoskeleton (external skeleton), a segmented body, and jointed attachments called appendages. They include the insects, arachnids (spiders), crustaceans, and others. Arthropods are characterized by their jointed limbs and cuticles (shells), which are mainly made of chitin. The rigid cuticle inhibits growth, so arthropods replace it periodically by molting. The arthropod body plan consists of repeated segments, each with a pair of appendages. It is so versatile that they have become the most species-rich members of all ecological guilds in most environments. They have over a million described species, making up more than 80% of all described living species. They range in size from microscopic plankton up to forms a few meters long.

Anthropogenic – Caused by human activities.

Arcadia – A town on the north shore of the entrance to Totten Inlet, about 3 miles northeast of the proposed mussel farm site.

Array – A group of mussel-raft units as they are arranged over the surface of the water.

Benthic – Related to the bottom of a body of water.

Biodeposits – Excretions from animals, such as fecal pellets and pseudo-feces from mussels

Biomass – The weight or other measure of living organisms.

Calanoid copepods – Calanoida is an order of copepods, a kind of zooplankton. They include 43 families with about 2000 species of both marine and freshwater copepods. Calanoid copepods are important in many food webs, taking in energy from phytoplankton and algae and 'repackaging' it for consumption by

higher trophic level predators like birds, fishes and mammals. Many commercial fishes are dependent on calanoid copepods for diet in either their larval or adult forms. Baleen whales such as the bowhead whale eat copepods, as do plankton-eating seabirds like Crested Auklets and Least Auklets.

Chaetognaths – Chaetognatha is a phylum of predatory marine worms that are a major component of plankton worldwide. The common term for the phylum is Arrow Worms. They are found in all marine waters from surface tropical waters and shallow tide pools to the deep sea and polar regions. Most chaetognaths are transparent and are torpedo-shaped. They range in size from 0.08 to 4.7 inches in length. There are more than 120 modern species. Chaetognaths are transparent or translucent and are covered by a cuticle. They have fins and a pair of hooked, chitinous, grasping spines on each side of their heads that are used in hunting. The spines are covered with a hood when swimming. They have a distinct head, trunk and tail.

Cladocerans – Any of various small, mostly freshwater crustaceans of the order Cladocera, which includes the water fleas.

Copepods – Any of numerous minute marine and freshwater crustaceans of the subclass Copepoda, having an elongated body and a forked tail. A favorite food for many larval and juvenile fishes.

Ctenophores – Any of various marine animals of the phylum Ctenophora, having transparent, gelatinous bodies bearing eight rows of comb-like cilia used for swimming. An example is a “comb jelly”.

Decapod larvae – The decapods or Decapoda (literally means "ten footed") are an order of crustaceans within the class Malacostraca, including many familiar groups, such as crayfish, crabs, lobsters, prawns and shrimp. Most decapods are scavengers. The life stage between egg and juvenile is called larvae. At this stage they form part of the small plankton eaten by juvenile fish and other species.

Diatoms – Any of various microscopic one-celled or colonial algae of the class *Bacillariophyceae*, having cell walls of silica that consist of two interlocking symmetrical halves (or valves). These organisms live in the water. Many are food for zooplankton.

DIN – Dissolved inorganic nitrogen.

Dinoflagellates – Microscopic plants of the order *Dinoflagellida*. They live in the water and have 2 flagella (hair or whip-like structures) lying in grooves in an often elaborately sculptured shell (pellicle). The shell gives some dinoflagellates very bizarre shapes. They are very abundant in marine plankton. *Gymnodinium* and *Gonyaulax*, the causes of “red tide”, produce toxins that, if accumulated by filter feeding molluscs, can be fatal if they are eaten by humans.

Dissolved oxygen (DO) – Oxygen gas (O₂) that is dissolved in water. DO concentrations are increased if air is bubbled through water.

Drogue – A kite-like device that drift in water currents, also can be used as a sea-anchor.

Ebb tide – The out-going or receding tide.

Echinoderm – Echinoderms (Phylum Echinodermata) are a phylum of marine animals. Echinoderms are found at every ocean depth. Echinoderms include starfish, brittle stars, sea urchins, sand dollars, and sea cucumbers.

Embayment – A bay or baylike shape; an indentation of a shoreline larger than a cove but smaller than a gulf.

Entrainment – The process or condition of being caught within something.

Epibiota – Organisms living on the seafloor surface; organisms that attach to other organisms.

Euphausiids – The collection of small marine crustaceans of the order Euphausiacea that are the principal food of baleen whales. Krill is an example.

Eutrophic – Refers to nutrient over enrichment, generally caused by excessive nitrogen in marine waters and phosphorus in freshwater. Coastal eutrophication results principally human activities such as sewage disposal, fertilizer use, and atmospheric inputs. The addition of nitrogen to coastal waters stimulates algal blooms and growth of bacteria, and can cause broad shifts in ecological communities present and contribute to anoxic events and fish kills.

Extreme low water (ELW) – The lowest elevation reached by the sea as recorded by a water level gauge during a given period. The National Ocean Service routinely documents monthly and yearly extreme low water for its control stations. *Note:* For the North Totten Inlet site, ELW is estimated to be -4.5 feet MLLW (U.S. Engineers Office 1980).

Flood tide – The in-coming or rising tide.

Flux – The movement of a substance through a medium.

Fouling community – An aggregation of organisms, like barnacles, sea anemones, algae, and mussels, that grow on a hard substrate in the water.

Gammarid amphipods – Amphipods of the suborder Gammaridea. Any of the small, shrimp-like crustaceans in the order Amphipoda. It contains about 5,700 of the 7,000 described species of amphipods.

Gastropods – The class Gastropoda (or gastropods) form a major part of the phylum Mollusca. The marine shelled species of gastropod include edible species such as abalone, conches, periwinkles, whelks, and limpets.

Gelatinous zooplankton – Very small jellyfish larvae that float freely in the water.

Harpacticoid copepods – Harpacticoid copepods are small crustaceans that commonly live on the bottom, or swim just above the bottom. Generally harpacticoids have a smoothly tapering body, whereas the calanoid copepods have a pronounced constriction just before the last thoracic segment. They are some of the most important food items in natural marine systems. They are the food of many small fishes, small sea anemones, small-mouthed corals, and some other benthic animals.

Holoplankton – Plankton that remains free-swimming through all stages of its life cycle (unlike crab larvae that grow into large adult crabs).

Ichthyoplankton – Refers to planktonic fish larvae.

Infauna/infaunal community – Animals living within the bottom substrates under a body of water.

In-situ – In the original position, not having been moved.

Interannual variance – The change in the state of something (like the size or density of an eelgrass bed) from year to year.

Larvaceans – Small transparent animals found in marine plankton; belong to subphylum Urochordata.

Macroalgae – Large, aquatic, photosynthetic plants that can be seen without the aid of a microscope. Macroalgae come in many colors including green, red, brown and blue, as well as in a variety of forms – some growing tall, while others growing as mats. The most familiar types of macroalgae can be generally divided into three groups: green, red, and brown-kelps.

Macrofauna, macroinvertebrates – These refer to larger animals, like fish, and marine mammals, as well as adult forms of crabs and clams.

Mean Low Water (MLW) – A tidal datum. The average of all the low water heights observed over the National Tidal Datum Epoch. For stations with shorter series, comparison of simultaneous observations with a control tide station is made in order to derive the equivalent datum of the National Tidal Datum Epoch. *Note:* for the North Totten Inlet site, MLW is estimated to be +3.0 feet MLLW (U.S. Engineers Office 1980).

Mean Lower Low Water (MLLW) – A tidal datum. (0.0 feet MLLW). The average of the lower low water height of each tidal day observed over the National Tidal Datum Epoch. For stations with shorter series, comparison of simultaneous observations with a control tide station is made in order to derive the equivalent datum of the National Tidal Datum Epoch.

Medusae – The tentacled, usually bell-shaped, free-swimming sexual stage in the life cycle of a coelenterate, such as a jellyfish.

Megafauna – Larger animals that can be easily seen by the human eye.

Meroplankton – Animals that are planktonic only in their larval form.

Microflagellates – Microscopic aquatic animals (zooplankton) that feed on phytoplankton. They move by waving flagella (hair or whip-like organs) back and forth.

Microzooplankton – Microscopic planktonic animals

μM – Refers to a micro-molar solution. A molar solution is one that has the same number of grams of the element (or compound) per liter of water as the atomic weight of the element or compound. For example, the atomic weight of nitrogen (N) is approximately 14, so a molar solution of N is one that has approximately 14 gm of N/L. A μM is one millionth of a mole.

Mollusks – Refers to animals belonging to the phylum Mollusca. There are around 93,000 recognized species, making it the largest marine phylum with about 23% of all named marine organisms. Representatives of the phylum live in a huge range of habitats including marine, freshwater, and terrestrial environments. Cephalopod molluscs such as squid, cuttlefish and octopus are among the most neurologically advanced of all invertebrates. The phylum includes marine snails and sea slugs.

Mysids – Refers to a group of small, shrimp-like creatures comprising the order Mysida. Despite their superficial resemblance to shrimp, they are only quite distantly related to the true shrimps, which are classified in the order Decapoda. Wherever mysids occur, whether in salt or fresh water, they are often very abundant and form an important part of the normal diet of many fishes.

Naturally-enriched conditions – Refers to nutrient enrichment (high levels of nitrogen) from natural causes in marine waters.

Nauplii – The free-swimming first stage of the larva of certain crustaceans, having an unsegmented body with three pairs of appendages and a single median eye.

Neap tide – A tide that occurs when the difference between high and low tide is least; the lowest level of high tide. Neap tide comes twice a month, in the first and third quarters of the moon.

Neritic – Relating to the region of shallow water adjoining the shore.

Nitrogen:phosphorus ratio – The proportion, by weight, of phosphorus to nitrogen in seawater or in plankton.

NTI – North Totten Inlet.

Organic detritus – Fragments or debris of plant and animal produced by disintegration, abrasion, etc.

Pelagic – Of, relating to, living in the water column as opposed to on or near the bottom; in the open ocean rather than waters adjacent to land or inland waters.

Pelagic coelenterates – Refers to the combination of jellyfishes and comb jellies that are free swimming in the water column.

Photosynthetic phytoplankton – Phytoplankton that derive their energy from photosynthesis.

Phyla – The plural of phylum. In biology, a phylum is a taxonomic rank below Kingdom and above Class.

Phytoplankton – Microscopic aquatic plants.

Planktonic – Refers to the passively floating or weakly swimming usually minute animal and plant life of a body of water.

Polychaetes – Multi-segmented, worm-like organisms; for example, pile worms.

Primary production – The total amount of new organic matter produced by photosynthesis in plants.

Pseudofeces – These are a way that filter-feeding bivalve mollusks (and filter-feeding gastropod mollusks) get rid of suspended particles, which have been rejected as unsuitable for food. The rejected particles are wrapped in mucus, and are expelled without having passed through the digestive tract.

Remineralization – The breakdown of complex structures (like plant material) into its smaller and simpler parts.

Shannon's Index – Actually, the Shannon index, also known as the Shannon-Wiener Index and sometimes incorrectly referred to as the Shannon-Weaver Index, is one of several diversity indices used to measure diversity of species in an area that is being biologically sampled.

Significant – “Significant” as used in the Washington State Environmental Policy Act (SEPA) means a reasonable likelihood of more than a moderate adverse impact on environmental quality. “Significance” involves context and intensity and does not lend itself to a formula or quantifiable test. The context may vary with the physical setting. Intensity depends on the magnitude and duration of an impact. The severity of an impact should be weighted along with the likelihood of its occurrence. An impact may be significant if its chance of occurrence is not great, but the resulting environmental impact would be severe if it occurred (WAC 197-11-794). It must be taken into account that the same proposal may have a significant adverse impact in one location but not in another location. Several marginal impacts, when considered together may result in a significant impact (WAC 197-11-330).

Silicate – The anion, SiO_4^{4-} , found, for example, in solutions of sodium and potassium silicate, formed by dissolving silica (sand) or silicate minerals in sodium hydroxide (NaOH) solution.

Sill depth – The maximum depth of the threshold, or sill, between the basin of Totten Inlet where it flows into the basin of the rest of Puget Sound.

Siphonophores – Any of various transparent, often subtly colored marine hydrozoans of the order Siphonophora, consisting of a floating or swimming colony of polyp-like and medusa-like individuals. An example is the Portuguese man-of-war jellyfish.

Species richness – The number of different species in a given area. It is represented in equation form as “S.” Typically, species richness is used in conservation studies to determine the sensitivity of ecosystems and their resident species. The actual number of species calculated alone is largely an arbitrary number. These studies, therefore, often develop a measure for valuing the species richness number(s) or adopt one from previous studies on similar ecosystems.

Spring ebb tide – Very low tide. When the moon is full or new, the gravitational pull of the moon and sun are combined. At these times, the high tides are very high and the low tides are very low. This is known as a spring tide. Spring tides are especially strong tides (they do not have anything to do with the season Spring). They occur when the Earth, the Sun, and the Moon are in a line. The gravitational forces of the Moon and the Sun both contribute to the tides. Spring tides occur during the full moon and the new moon.

Standing stock – A measure of population density.

Stratification – The formation layers of water with different temperature or salinity properties.

Strings – Lines of netting or ropes on which seed mussels grow.

Surficial – Near the surface of something.

Symbiotic – Refers to the living together of unlike organisms, such as a clown fish amid the tentacles of a sea anemone. The term symbiosis commonly describes close and often long-term interactions between different biological species.

Taxa – The plural of taxon: taxonomic category or group, such as a phylum, order, family, genus, or species.

Tintinnids – Any microscopic animal of the ciliate order Tintinnida that are characteristically conical or trumpet-shaped. Most are marine. The tintinnids secrete loosely fitting gelatinous envelopes, sometimes containing foreign particles.

Total volatile solids (TVS) – Volatile solids are primarily organic solids (materials) that burn in the presence of oxygen at a given temperature (usually 550 or 600° Centigrade [1,022 or 1,112° Farenheit]). The solids or ash remaining behind are comprised of the non-volatile or fixed solids. The volatile solid is used as an estimate of organic matter in a sample.

Vertical and horizontal particle velocity – The speed at which a molecule of water rises/falls, and goes from one point to another.

Zooplankton – Plankton that consists of microscopic animals, including the larval forms of fish, corals, rotifers, sea anemones, and jellyfish.

