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Zebra Mussel — The zebra mussel, a freshwater Eurasian lamellibranch mollusk (*Dreissena polymorpha*), is a marine shellfish which was first discovered in the Great Lakes of the United States in 1988 and is believed to have arrived in North America by being carried in the ballast water of a cargo vessel. Since the first discovery of this exotic species, they have spread rapidly through North American surface waters, particularly throughout the Great Lakes and Mississippi River basins and their navigable tributaries. As of March 1996, zebra mussels were resident in nineteen states and two Canadian provinces. Zebra mussels can cause severe fouling of municipal drinking water, electric power generation, and industrial water systems; they are also harmful to aquatic ecosystems, boating and navigation, agricultural irrigation equipment, aquacultural equipment, and recreation beach use.

Zeta Potential — (Water Quality) In a *Colloidal* system, the difference in potential between the immovable layer attached to the surface of the dispersed phase and the dispersion medium. It is related to particle stability and therefore is a useful parameter in coagulation operations.

Zeolite — (1) (Geology) Any of various hydrous silicates that are analogous in composition to the feldspars, occur as secondary minerals in cavities of lavas, and can act as an ion-exchanger. (2) (Chemistry) Also, any of various natural or synthesized silicates of similar structure used especially in water softening and as an adsorbent and catalyst. (3) (Water Quality) A type of ion exchange material used to soften water. Natural zeolites are siliceous compounds which remove calcium and magnesium from hard water and replace them with sodium. Synthetic or organic zeolites are ion exchange materials which remove calcium or magnesium and replace them with either sodium or hydrogen.

Zero Discharge — The goal, in the preamble to the *Clean Water Act (CWA)*, of zero pollutants in water discharges.

Zingg Bench Terrace — A special type of bench terrace designed for dryland moisture conservation. Typically employs an earthen embankment similar to the ridge terrace; a part of the terrace interval immediately above the ridge is bench-leveled. Runoff water from the sloping area is retained on the leveled area and absorbed by the soil. Also see *Terrace*.

Zone — (1) (Ecology) An area characterized by similar flora or fauna; a belt or area to which certain species are limited. (2) (Engineering) In earth dams, a segment of the earthfill containing similar materials; earth structures may be divided into two or more segments or zones to make the best use of available materials.

Zone of Accumulation — The combination of the *A-Horizon* and the *B-Horizon*.

Zone of Aeration — The comparatively dry soil or rock located between the ground surface and the top of the *Water Table*. A zone immediately below the surface of the ground, in which the openings are partially filled with air, and partially with water trapped by molecular attraction. Generally subdivided into: (a) belt of soil moisture; (b) intermediate belt; and (c) capillary fringe. Also referred to as the *Unsaturated Zone* or the *Vadose Zone*.

Zone of Contribution (ZOC) — The area surrounding a pumping well that encompasses all areas or features that supply ground-water recharge to the well.

Zone of Eluviation — The two uppermost zones in the soil profile, consisting of the *A-Horizon*, from which soluble *Salts* and *Colloids* are leached, and in which organic matter has accumulated and generally constitutes the most fertile soil layer, and the *B-Horizon*, or the lower soil zone which is enriched by the deposition or precipitation of material from the overlying zone, or *A-horizon*. Also referred to as the *Solum*.

Zone of Engineering Control — The area occupied by a hazardous waste treatment, storage, or disposal facility which the owner or operator can readily decontaminate if a leak is detected, thus preventing hazardous waste or its constituents from entering groundwater or surface water.

Zone of Influence (ZOI) — (1) (Hydrologic) The area surrounding a pumping well within which the water table or *Potentiometric Surfaces* has been changed due to ground-water withdrawal. (2) (Environmental) The geographic area whose social, economic, and/or environmental conditions is significantly affected by changes in the study area.

Zone of Initial Dilution (ZID) — That area within a lake or stream where the discharge from an outfall first mixes with the receiving water.

Zone of Net Metabolic Production — (Biology) The region (or depth) of a body of water in which constructive metabolism (*Anabolism* or *Assimilation*) is equal to or greater than destructive metabolism (*Catabolism* or *Dissimilation*). *Metabolism* is the sum of the processes concerned in the building up of protoplasm and its

destruction incidental to life; the chemical changes in living cells, by which the energy is provided for the vital processes and activities, and new material is assimilated to repair the waste. Metabolism may be considered as including two aspects or processes: constructive metabolism (Anabolism) or destructive metabolism (Catabolism). Anabolism and Catabolism go on together, but one may predominate and obscure the other. Below this level (the *Compensation Level*), the destructive process tend to exceed the constructive processes. Also referred to as the *Photic Zone*.

Zone of Saturation — Underground region within which all openings are filled with water. The top of the zone of saturation is called the *Water Table*. The water that is contained within the zone of saturation is called ground water.

Zone of Transport (ZOT) — The area surrounding a pumping well, bounded by an Isochrone and/or isoconcentration contour, through which a contaminant may travel and reach the well.

Zoning — The partition of a city, county, township, or other governmental unit or area by ordinance into sections reserved for different land-use purposes, such as residential, business, manufacturing, greenbelt, or agriculture.

Zooglea — (Water Quality) A jelly-like matrix developed by bacteria which is abundant in activated sludge flocs and trickling filter slimes.

Zoology — The branch of *Biology* that studies animals, including their structure, function, growth, origin, evolution, and distribution.

Zooplankton — (1) Small, usually microscopic animals found in lakes and reservoirs that possess little or no means of propulsion. Consequently, animals belonging to this class drift along with the currents. (2) The animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.