

Glossary

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Project WET K-12 Curriculum and Activity Guide. 2010. The Watercourse and Council for Environmental Education.

Water Ways: A Minnesota Water Primer and Project WET Companion. 2010. MN DNR.

Minnesota DNR website: <http://www.dnr.state.mn.us/index.html>

Adhesion: The attraction of water molecules to other materials as a result of hydrogen bonding.

Aquifer: An underground formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Aquitard: Underground formations like clay that do not permit water to flow through them and prevent upward and downward movement of ground water.

Benthic Zone: The bottom of the lake where invertebrates live.

Bioaccumulation: The accumulation of a substance (e.g. toxic chemicals such as methylmercury or PCBs) in an organism or part of an organism.

Buoyancy: the upward force a liquid exerts on an object that is immersed in it, counteracting the downward force of gravity.

Capillary Action: The means by which water is drawn through tiny spaces in a material, such as soil, through the processes of adhesion and cohesion.

Channelize: To straighten, deepen and widen streams.

Climate: The meteorological elements, including temperature, precipitation, and wind, that characterize the general conditions of the atmosphere over a period of time at any one place or region of Earth's surface. Earth has three climate zones: Polar, Temperate, and Tropical. Climate zones are further classified into ecosystems and biomes.

Cohesion: The attraction of water molecules to each other as a result of hydrogen bonding.

Condensation Nuclei: Small particles of dust or matter floating in the air that water molecules condense around to form clouds.

Condensation: The process by which a vapor becomes a liquid; the opposite of evaporation.

Confined Aquifer: A water-saturated layer of soil or rock that is bounded above and below by impermeable layers.

Confluence: The place where two rivers come together.

Dams: Any artificial barrier which does or can impound water.

Decomposers: Organisms that break down nonliving organic material (e.g. dead plants or feces) back into its constituent molecules.

Deposition: The transition of a substance from a vapor phase directly to the solid phase without passing through intermediate liquid phase.

Diatoms: Single cell algae—one of the most common types of phytoplankton.

Dimictic Lakes: Lakes that turn over twice per year.

Eutrophic Lakes: Lakes with large amounts of nutrients, murky, shallow water, with silty bottoms and a mix of game fish and carp. They are typically found in southern Minnesota.

Floodplain: lowland areas adjoining lakes, wetlands, and rivers that are susceptible to inundation of water during a flood. For regulatory purposes, the floodplain is the area covered by the 100-year flood or the area that has a 1 percent chance of flooding every year. It is usually divided into districts called the floodway and flood fringe. Areas where the floodway and flood fringe have not been determined are called approximate study areas or general floodplain. Local units of government administer ordinances that guide development in floodplains.

Gas: The state of water in which individual molecules are highly energized and move about freely; also known as vapor.

Geomorphology: The study of landforms; from their origin and evolution to the processes that continue to shape them. Geomorphologists seek to understand landform history and dynamics, and predict future changes through a combination of field observation, physical experiments, and modeling.

Groundwater: The water beneath the land surface that fills the spaces in rock and sediment. It is replenished by precipitation. Under natural conditions much of that recharge returns to the atmosphere by evapotranspiration from plants and trees or discharges to surface waters. Ground water discharge to surface waters allows streams to flow beyond rain and snowmelt periods and sustains lake levels during dry spells.

Heat of Fusion: The amount of heat energy needed to turn a substance from solid to liquid.

Heat of Vaporization: The amount of heat energy needed to turn a substance from liquid to gas.

Hydrogen Bond: A type of chemical bond caused by electromagnetic forces, occurring when the positive pole of one molecule (e.g., water) is attracted to and forms a bond with the negative pole of another molecule (e.g., another water molecule).

Hydrology: the study of water. Hydrology generally focuses on the distribution of water and interaction with the land surface and underlying soils and rocks.

Instream Use: Uses in which the water is not removed from the lake, stream, groundwater, or other source. Examples include fishing, providing habitat for a wide range of living things, hydro-power production, and transporting goods.

Levees: Embankments or raised areas that prevent water from moving from one place to another.

Limnetic Zone: The open-water part of a lake where water becomes deep enough that light does not reach the bottom and vegetation is floating rather than attached to the bottom.

Limnology: The science of lakes, rivers, wetlands and other freshwater bodies.

Liquid: The state of water in which molecules move freely among themselves but do not separate like those in a gaseous state.

Littoral Zone: The part of a lake where light reaches the bottom and vegetation grows from the bottom.

Meromictic Lakes: Lakes that never mix or turn over completely.

Mesotrophic Lakes: Lakes with a moderate amount of nutrients, clear water with some algae blooms in summer and support many game fish. They are typically found in central Minnesota.

Monomictic Lakes: Lakes that turn over once per year.

Nonpoint Source Pollution: Pollutants that enter waters from dispersed and difficult to identify sources, such as runoff from a parking lot or farm field or pollutants carried by rain.

Offstream Use: water use that involves removing water from its source. Examples include diverting water for drinking, irrigating farm fields or cooling power plants.

Oligotrophic Lakes: Lakes with few nutrients, clear water, rocky or sandy bottoms, and support species that need clear, cold, oxygenated waters to survive. They are typically found in north east Minnesota.

Point Source Pollution: Pollutants introduced to waters through a specific outlet, such as a pipe from an industrial plant.

Polymictic Lakes: Lakes that turn over many times per year.

Primary Consumers: Organisms that eat primary producers.

Primary Producers: Living things that capture energy from the nonliving environment—most often in the form of sunlight, such as plants, protists and autotrophic bacteria.

Profundal Zone: The open water part of a lake below which not enough light penetrates to support photosynthesis.

Reasonable Use: Anyone who owns property on the shore of a body of water has the right to access it, as long as they do so in a way that doesn't unreasonably inhibit the ability of others to exercise their same right.

Riparian Rights: The right—as to fishing or the use of water—of one who owns land situated along the bank of a stream or other body of water.

Runoff: Precipitation that flows overland to surface streams, rivers, and lakes.

Secondary Consumers: Organisms that eat primary consumers.

Solid: The state of water in which molecules have limited movement.

Solvent: A material such as water that dissolves another substance (the solute) to form a solution.

Specific Heat Capacity: a measurable physical quantity that characterizes the amount of heat that is required to change a body's temperature by a given amount.

Stream: A natural watercourse of any size containing flowing water, at least part of the year, supporting a community of plants and animals within the stream channel and the riparian vegetative zone. A brook or a creek is a small stream. A river is a large stream. Other names for streams around the USA include kills, rills, cricks and sloughs.

Sublimation: The transition of a substance from a solid phase directly to the vapor phase without passing through intermediate liquid phase.

Surface Tension: The attraction among water molecules at the surface of a liquid; creates a skin like barrier between air and underlying water molecules.

Tertiary Consumer: Organisms that eat secondary consumers.

Transpiration: The process by which water absorbed by plants (usually through the roots) is evaporated into the atmosphere from the plant surface (principally from the leaves).

Tributary: A stream feeding, joining, or flowing into a larger stream (at any point along its course or into a lake). Synonyms: feeder stream, side stream.

Turbidity: A measure of the extent to which light passing through water is reduced due to suspended materials.

Unconfined Aquifer: An aquifer in which the upper boundary is the water table.

Water Cycle: The paths water takes through its various states—vapor, liquid and solid—as it moves throughout Earth's systems (oceans, atmosphere, groundwater, streams, etc.). Also known as the hydrologic cycle.

Water Table: The top of an unconfined aquifer; indicates the level below which soil and rock are saturated with water.

Watershed: The total land area that drains water to a river, stream or lake. Also called catchment area, drainage area, or basin.

Weather: The composite condition of the near-Earth atmosphere, including temperature, barometric pressure, wind, humidity, clouds, and precipitation. Weather variations in a given area over a long period of time create climate.

Wetland: An area of land that has mostly wet soil at least part of the year, is saturated with water either above or just below the surface and is covered with plants that have adapted to wet conditions.

Glossary additions for the Watershed Game

Phosphorus: Key nutrient influencing plant growth in lakes. Soluble reactive phosphorus (PO₄-3) is the amount of phosphorus in solution that is available to plants. Total phosphorus includes the amount of phosphorus in solution (reactive) and in particulate form.

Sediment: Detached soil particles deposited by flowing water or wind. Accumulated organic and inorganic matter on the lake bottom. Sediment includes decaying algae and weeds, precipitated calcium carbonate (marl), and soil and organic matter eroded from a watershed.

Clean Water Goal: A numeric target to achieve for clean water in order to support fish, biotic habitat, and for desired human uses such as recreation, fishing, or drinking.

Pollution Units (PUs): In the Watershed Game, this represents a generic amount of pollution. The game was designed with sediment and phosphorus in mind, however it may apply to other pollutants.