

Hydrologic Glossary

100-year floodplain: Area inundated during a 100-year flood.

100-year flood: A flood with a 1% annual probability.

Abandoned oxbows: Former river meanders that have been cut-off. River no longer flows through them.

Abandoned terraces: Areas of paleo-floodplain no longer part of active floodplain.

Absolute humidity: Mass of water vapor per unit volume of air.

Active floodplain: Valley areas inundated by plausible stormflows.

Actual evapotranspiration: Transfer of moisture from the earth to the atmosphere by evaporation of water and transpiration from plants.

Adiabatic lapse rate: Theoretical change in atmospheric temperature as a function of elevation occurring with no net loss or gain of energy.

Aggradation: Deposition of sediment or detritus on the soil surface or on a streambed.

Annual: Occurring on a yearly basis.

Aquiclude: Geologic formation that does not store or transmit appreciable quantities of water.

Aquifer: Geologic formation that contains sufficient saturated permeable materials to yield significant quantities of water to wells and springs.

Artesian aquifer: A confined aquifer in which the potentiometric surface is above the land surface.

Aquitard: A geologic unit that retards but does not prevent the flow of water to or from an adjacent aquifer. It does not readily yield water to wells, but may serve as a storage unit for ground water.

Atmosphere: The gaseous envelope surrounding the earth or a heavenly body. On the earth, the air mass above the water table.

Back channel swamp: Low area in floodplain near or below water table

Backwater: Water that accumulates in low-energy areas of a flood plain or flood way.

Bank erosion or scour: The loss of stream banks by the force of water. Usually greatest on outside bends, and near obstructions.

Baseflow: That part of the stream discharge that is not attributable to direct runoff from precipitation or melting snow. It is usually sustained by ground-water discharge.

Basin: A large or small depression on the surface of the land or ocean floor. It can also be used to mean a watershed.

Bedload sediment: The mineral matter transported by water along the bed of a stream.

- Blackwater:** Water containing large amounts of organic acids that cause the water to appear black.
- Boulder:** Particles larger than 264 mm (bigger than a basketball)
- Capillary rise:** The height above a water surface to which water will rise due to capillary forces.
- Channel order:** A ranking of channels from smallest (zero) largest. A *zero-order channel* is a hollow with no clear channel, a *first-order channel* is a headwater channel with no tributaries, a *second-order channel* is form when two first-order channels join, etc.
- Channel substrate:** Material on the bed of a channel.
- Closed system:** A system within which no external inputs or outputs are present.
- Cloud:** A visible collection of particles of water or ice suspended in air, usually at an elevation above he earth's surface.
- Coagulant:** To become or cause to become thickened into a compact mass.
- Cobble:** Particles greater than 64 mm and less than 264 mm (bigger than a softball, smaller than a basketball).
- Condensation:** To change from a vapor into a liquid or a solid with a concomitant release of energy.
- Cone of depression:** A lowering of the potentiometric surface near a well due to the extraction of water.
- Cone of impression:** An increase in the potentiometric surface near a well due to the injection of water.
- Confined aquifer:** An aquifer overlain by a formation of lower permeability and where the potentiometric surface is above the top of the aquifer.
- Conservation equation:** An identity that establishes a conservation relationship (e.g., conservation of mass, energy)
- Constitutive relationship:** A formula that relates inputs or outputs to state variables using parameters.
- Contaminant:** An undesirable substance not normally present, or an unusually high concentration of a naturally occurring substance.
- Continental air mass:** Referring to dry tropospheric air masses.
- Darcian flux:** The rate of ground-water discharge per unit area of porous medium measured perpendicular to the direction of movement.
- Degradation:** The removal of sediment or detritus from the soil surface or a streambed.
- Detention:** The temporary capture of water which is subsequently released after a delay.
- Dew:** Moisture condensed from the atmosphere and deposited in the form of small drops of liquid water upon any cool surface.

Dewpoint: The temperature to which air must be cooled, at a given pressure and water-vapor content, for it to reach saturation.

Energy: The capacity to do work.

Environmentalist: A person who advocates or works for protection of the air, water, animals, plants, and other natural resources from pollution or its effects.

Environmental lapse rate: The observed change in atmospheric temperature as a function of elevation.

Equipotential line or surface: Line (or surface) along which the total head or potential is constant.

Erosion: The process by which the land surface is worn away by the action of water, glaciers, wind, waves, etc.

Eutrophic: Having elevated nutrients that promotes biological productivity, resulting in an accumulation of oxygen in the photic zone, and a depletion of oxygen below the photic zone.

Eutrophication: The addition of nutrients resulting in the creation of a eutrophic water body.

Evaporation: To change from a liquid or a solid state into a vapor with a concomitant absorption of energy.

Evapotranspiration: Losing water from the soil both by evaporation from the soil and external plant surfaces, and by transpiration through plant stoma.

Extirpate: To eradicate or destroy wholly.

Fiber netting: Strong material of some fiber used to prevent soil erosion.

Flow duration: The amount of time any given flow is equaled or exceeded.

Flow volume: Sum of all flows during a given time period. This is the area under the hydrograph.

Fluid flux: The flow of water per unit area. In groundwater, equal to the darcian flux. In surface water, equal to the fluid velocity.

Fluid velocity: The rate at which a fluid particle moves along a streamline. In ground water, equal to the darcian velocity divided by the water content or porosity (if saturated) of the porous medium. In surface water, equal to the fluid flux.

Flux: The volume of fluid flow per unit time per unit area.

Fog: A cloud-like mass or layer of minute water droplets or ice crystals near the surface of the earth.

Forward modeling: The estimation of a forecast using observed data and a calibrated model.

Frost: Frozen moisture condensed from the atmosphere and deposited in the form of small ice crystals upon any cool surface below the freezing point of water.

- Gaia hypothesis:** A model of the earth as a self-regulating organism, advanced as an alternative to a mechanistic model.
- Global circulation belt:** Zones of global proportions where the air typically moves in a specific direction, eastward or westward.
- Gravel:** Particles greater than 2 mm and less than 64 mm in diameter (bigger than sand, smaller than a softball)
- Gravel or sand bars:** Deposits of sediment left in low-velocity areas of the channel
- Ground water:** Liquid water found below the surface of the earth.
- Gully:** A small valley or ravine originally worn away by running water and serving as a drainage way after heavy rains.
- Half life:** The time required for half of the atoms of a radioactive substance to disintegrate.
- Hydraulic conductivity:** A coefficient that relates the darcian velocity to the hydraulic gradient.
- Hydraulic head:** The total of the elevation head, pressure head, velocity head, and other factors, such as osmotic head.
- Hydraulic gradient:** The slope of the water table or potentiometric surface, or, the rate of change of total head with distance.
- Hydrogeology:** The science dealing with the occurrence and distribution of underground water.
- Hydrograph:** A a graph relating stage, streamflow, water level, velocity or other characteristics of water with respect to time.
- Hydrologic cycle:** The natural sequence through which water passes into the atmosphere as water vapor, precipitates to the earth and returns to the atmosphere through evaporation.
- Hydrology:** The science dealing with the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere.
- Hypereutrophic:** Having extremely elevated nutrients that promotes uncontrolled biological productivity, resulting in a severe depletion of oxygen below the photic zone and nuisance algae blooms.
- Ideal gas law:** Relates temperature of air mass to its pressure. As air rises to elevations with lower pressures, it cools as a function of this law.
- Infiltration:** The movement of water into the earth.
- Instantaneous peak discharge:** Flow rate at the peak of a storm hydrograph.
- Interception:** The accumulation of precipitation in the vegetative canopy that eventually evaporates and does not reach the earth's surface.
- Interflow:** Streamflow observed following rainfall that can not be attributed to stormflow or baseflow.

- Inverse modeling:** The estimation of input data or parameters using observed data and system outputs.
- Joule:** The SI unit of work or energy, equal to the work done by a force of one newton when its point of application moves through a distance of one meter in the direction of the force.
- Kilogram:** The base SI unit of mass; its international prototype, a platinum iridium cylinder, is kept in Sèvres, France.
- Kinetic energy:** The energy associated with motion, or inertia, equal to the one-half the mass times the squared velocity.
- Lapse rate:** The change in temperature with altitude. Normally, temperatures decrease with elevation.
- Latent heat:** The heat absorbed or radiated during a change of phase at constant temperature and pressure.
- Latent heat of fusion:** The amount of heat required to melt one gram of ice to liquid water at 0C.
- Latent heat of vaporization:** The quantity of heat that is absorbed or released when a gram of water evaporates or condenses, respectively. It is a function of temperature and is equal to 540 cal/g at 100°C.
- Leachate:** The fluid that drains from the bottom or sides of a landfill or waste dump.
- Linear function:** Having a response or output which is directly proportional to the input, that is $y(2x) = 2 y(x)$.
- Lower cloud limit:** The lowest elevation within a cloud at which the ambient temperature equals the dew point temperature.
- Maritime air mass:** Referring to wet tropospheric air masses.
- Matric suction:** The volumetric energy content of the water expressed as a negative pressure.
- Mean annual flow:** The average of all flows during the water year.
- Mesotrophic:** Having sufficient nutrients to promote moderate levels of biological productivity, resulting depletion of oxygen below the photic zone.
- Meter:** The base of the SI unit of length, equivalent to 1/299,792,458 of the distance that light travels in a vacuum in one second.
- Millibar (mb):** A unit of pressure equal to 0.07493 cm of mercury or 1.015 cm of water. Mean sea-level air pressure is 1013.2 mb, or the equivalent of 10.28 meters of water.
- Moisture characteristic curve:** The relationship between matric suction and water content for a porous material.
- Newton:** The SI unit of force, equal to the force that produces an acceleration of one meter per second per second on a mass of one kilogram.

- Oligotrophic:** Having low amounts of nutrients and biological activity with normal concentrations of oxygen at all depths.
- Open system:** A system in which inputs are received from external to the system, or outputs are discharged from the system.
- Ordinary high water mark:** Indicated by a change in vegetation along a channel. Typically marks the level of the annual flow (the 1.01-year flow).
- Overflow channels:** The channels used by river during *out of bank* flows
- Overland flow:** Water that flows across the surface of the earth that is not in a defined channel.
- Paleo-floodplain:** Valley areas covered by alluvial deposits.
- Parameter:** A coefficient that relates inputs, outputs or state variables.
- Pascal:** The SI unit of pressure or stress, equal to one newton per square meter.
- Peak flow:** The maximum rate of streamflow in response to a heavy rainfall.
- Peak annual flow:** The largest peak flow in a water year.
- Percolation:** The downward movement of water through the unsaturated zone.
- Perennial:** Plants that have a life cycle lasting more than two years.
- Permeability:** A measure of the ability of a porous material to transmit fluid in response to a fluid potential gradient.
- Petiole:** A slender stalk at the base of a leaf that attaches to the stem.
- Phreatic zone:** Same as saturated zone.
- Plume:** The volume within an outline of a substance that has moved or is moving through space.
- Polar air mass:** Referring to cold tropospheric air masses.
- Point bar:** A sediment deposit on the inside turn of a river where flow velocities are slower
- Porosity:** The total volume of voids per unit volume of porous material.
- Potential energy:** The energy of matter due to its position or arrangement of its parts.
- Potential evapotranspiration:** The possible maximum transfer of moisture from the earth to the atmosphere by evaporation of water and transpiration from plants. Water loss from a short green crop completely shading the ground and never short of water.
- Potentiometric surface:** The surface to which water would rise in a well.
- Power:** The work done or energy performed per unit of time.
- Precipitation:** The falling products of condensation in the atmosphere, such as rain, snow, and hail.

Radionuclide: An element that decays by spontaneously emitting particles or energy.

Rate: The change of a variable with respect to time.

Rating curve: The relationship between stream stage (i.e., water level) and stream discharge (i.e., streamflow).

Recharge: The addition of water to the saturated zone.

Relative humidity: The amount of water vapor in the air, expressed as a percentage of the maximum amount that the air could hold at the given temperature. Computed as the ratio of the actual vapor pressure to the saturation vapor pressure.

Relative hydraulic conductivity: The ratio of the unsaturated hydraulic conductivity to the (saturated) hydraulic conductivity.

Residence time: The period of time during which a substance remains present, adsorbed, suspended, or dissolved.

Retention: The complete capture of water without subsequent release.

Riffle: A shallow section of a river or stream associated with higher water velocity.

Rill or rille: A long, small gully, usually found together in large numbers on steep slopes and oriented parallel to the slope and to each other.

Riparian zone: Area where vegetation is influenced by the river, and the river microclimate is directly influenced by the vegetation.

Saltation: The skipping of particles across a surface, usually over a solid surface driven by water or wind.

Saturated zone: The region within the earth below the water table where all the pores are completely saturated with water and the fluid pressure exceeds the atmospheric pressure.

Saturation vapor pressure: Maximum vapor pressure that is thermodynamically stable, meaning that water usually condenses into droplets when the saturation vapor pressure is reached or exceeded. Actually, however, condensation requires small particles to initiate drop formation, so clean air can exceed the saturation vapor pressure.

Second: The base of the SI unit of time, equaling 9,192,631,770 cycles of radiation in a change in energy level of the cesium atom.

Sediment delivery ratio: The ratio between point and regional estimates of sediment production per unit area; normally a number less than one.

Sensible heat: Heat absorbed or radiated due to a temperature change at constant pressure and without a phase change.

SI: The international system of units. The basis of the metric system.

Sink: An output from a system, which is usually the input of another system.

Source: An input into a system, which is usually the output of another system.

Stage: The height of water in a stream or lake.

State variable: An observable feature of a system that can be used to predict inputs or outputs.

Stoma: A small opening on a leaf or stem surface that allows gasses (primarily carbon dioxide, oxygen, and water vapor) to exchange from the atmosphere to internal plant tissue.

Stormflow: The flow of water in a stream attributable to recent precipitation.

Stratosphere: The region of the upper atmosphere extending upward from the tropopause to about 50 km above the earth, characterized by little vertical change in temperature.

Streambanks: Definite channel walls formed by fluvial erosion. Most high flows are contained within the banks. The banks usually hold flows up to the 1.5-year flow.

Streamflow: Flow of water in a stream, the sum of baseflow and stormflow.

Streamline: The path of a particle entrained in a fluid that is flowing steadily and without turbulence.

Surface water: Liquid fresh water found above the surface of the earth.

Suspended sediment: Mineral or organic matter contained in flowing water not in contact with the streambed.

Thalweg: The deepest part of the channel

Tracer: A substance used as a marker to study biological, chemical, or physical systems.

Travel time: The period of time required for a substance to move from one point to another.

Tropical air mass: Referring to hot tropospheric air masses.

Tropopause: The boundary layer between the troposphere and the stratosphere.

Troposphere: The lowest layer of the atmosphere extending from the water table to the tropopause.

Unconfined aquifer: An aquifer in which the potentiometric surface is below the top of the aquifer.

Unsaturated zone: The region within the earth extending from the earth's surface down to the water table where the fluid pressure is less than atmospheric and not all pores are completely saturated with water.

Upper cloud limit: The highest altitude to which a cloud extends, the absolute limit being the tropopause.

Unsaturated hydraulic conductivity: The value of hydraulic conductivity for unsaturated flow conditions. Equal to the product of the relative hydraulic conductivity with the hydraulic conductivity.

Vadose zone: Same as unsaturated zone.

Vapor pressure: The partial pressure of water vapor, usually expressed in millibars.

Water content: The volume of water per unit volume of porous media.

Watershed: The region that drains to a particular point, such as into a lake, river, or ocean.

Water table: A surface within the earth which separates the saturated and unsaturated zones.

Water year: An annual cycle that extends from October 1 of one year to September 30 of the following year.

Water yield: The annual volume or depth of streamflow per unit watershed area.

Watt: The SI unit of power, equivalent to one joule per second and equal to the power in a circuit in which a current of one ampere flowing across a potential difference of one volt.

Wetland: A low-lying area of water-logged ground and standing water. Usually containing water for prolonged periods of time, with hydric soils, and vegetation adapted to saturated soils.

Work: The transfer of energy.

Xylem: Vascular plant tissue that provides support and conducts water and nutrients upward from the roots.