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OSU HYDROLOGY SYMPOSIUM TERMINOLOGY

Aquatic nutrients (define and provide examples)

Nitrogen and Phosphorus are two nutrients that aquatic plants need to grow. Nutrients like this can cause too much growth of aquatic plants when nutrients are loaded into rivers due to run-off from farming practices. Excess nutrients also kill aquatic life such as fish.

Cyanobacteria (define, provide image)

Photosynthetic bacteria thought to have been the driving force for our current oxygen rich atmosphere. They convert CO2 and sunlight into energy like plants.

anoxic water conditions (describe)

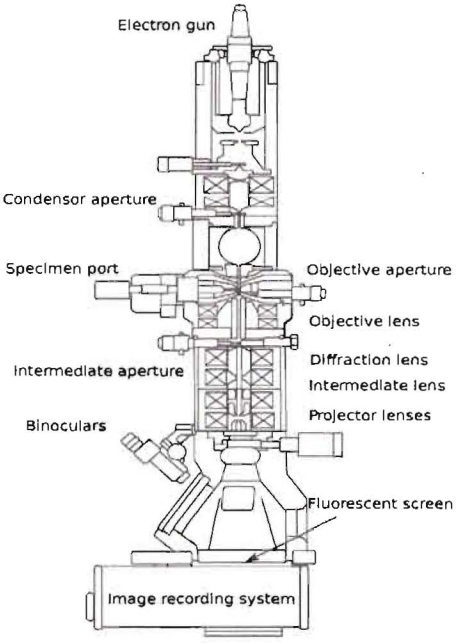
Water conditions where no "dissolved" oxygen is present.

nanoparticles (define and provide examples)

A particle between 1-100 nanometers in size. Titanium Dioxide is a widely used nanoparticle in white paint and sunscreen Many types of nanoparticles are used in the medical field to help disperse medicine or particles to provide image contrast throughout the body to help to show more info in a CAT scan. Nanoparticles are also utilized in the automotive industry to reinforce frames and to increase cohesion in tires on a rainy day.

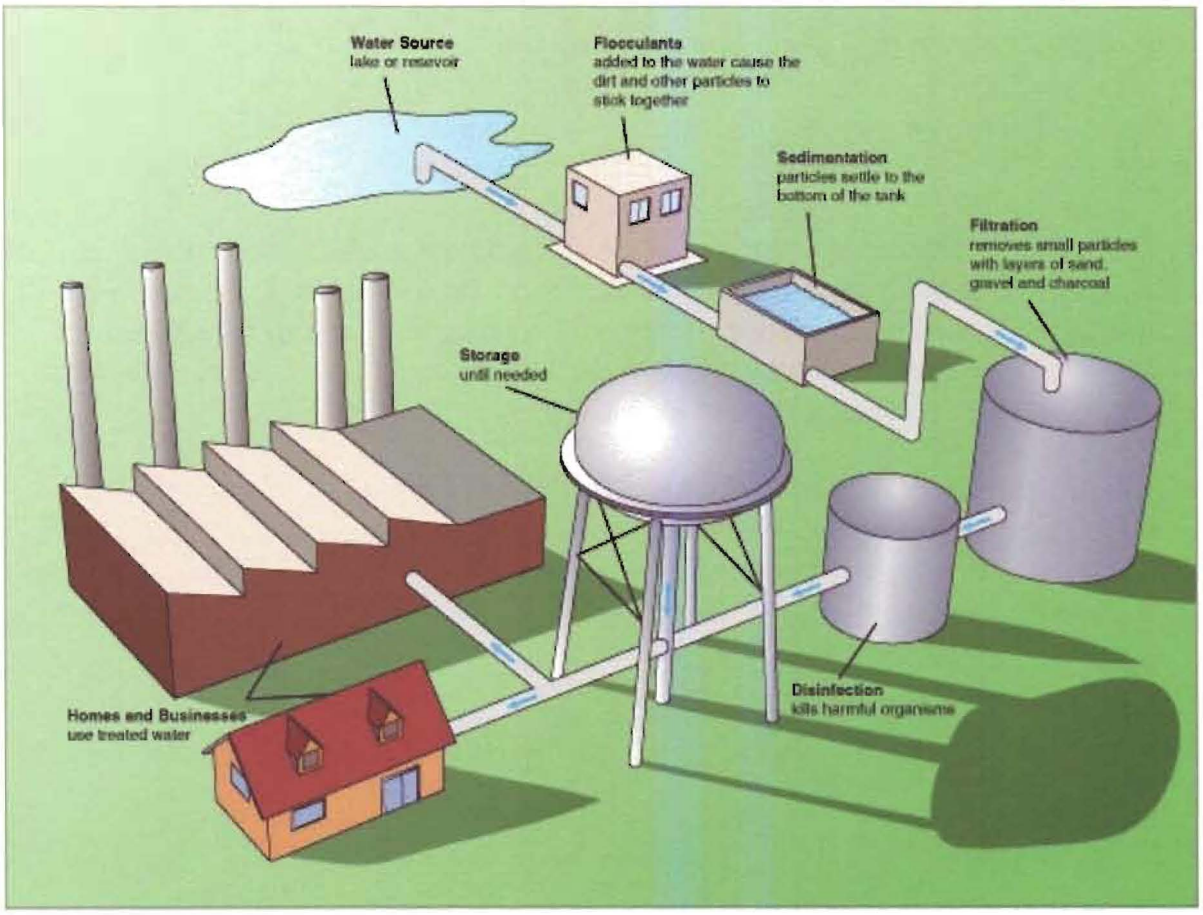
transmission electron microscope (describe and provide image)

A type of microscopy in which a beam of electrons passes through a super thin sample. This increases the ability to resolve images tenfold and provides detail down to a microscopist being able to observe a single row of atoms.



drinking water treatment (provide example techniques with diagrams)

Water goes through a complicated process from rain to tap. It begins when the water is coagulated where chemicals are added to the water termed "floc" which bind to dirt particles in the water increasing their mass. Next, the water is allowed to slow or stop in it's flow so that the "floc" will fall out of suspension bringing with it the dirt particles. Next the water passes through different sized sediments and charcoal to help filter out even smaller particles. Following this, a minute amount of chlorine is added to the water to kill any additional bacteria that may be present. Finally, the water is stored in a water tank or tower and then dispersed to the community as needed.

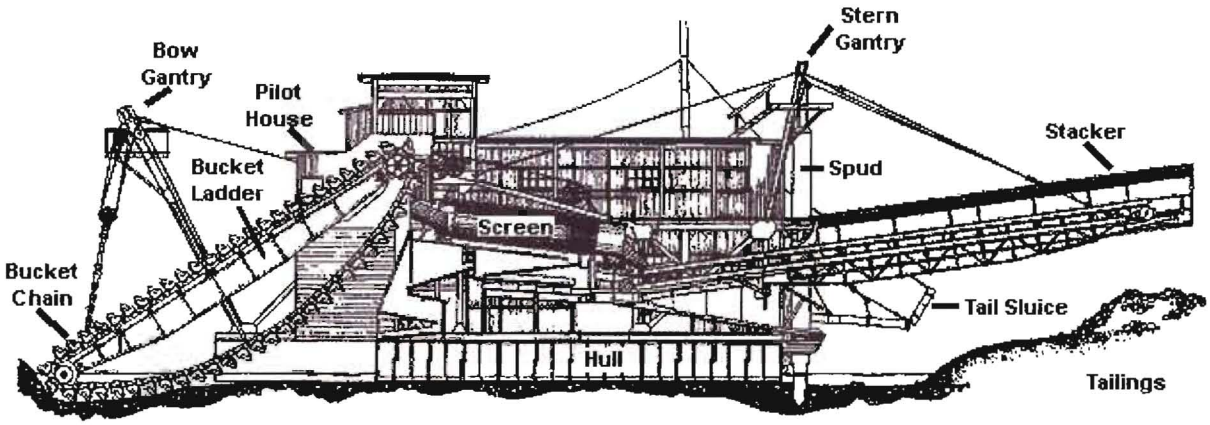


spawning habitat (define)

The area where a particular specie of fish return to in order to spawn(eat drink make more).

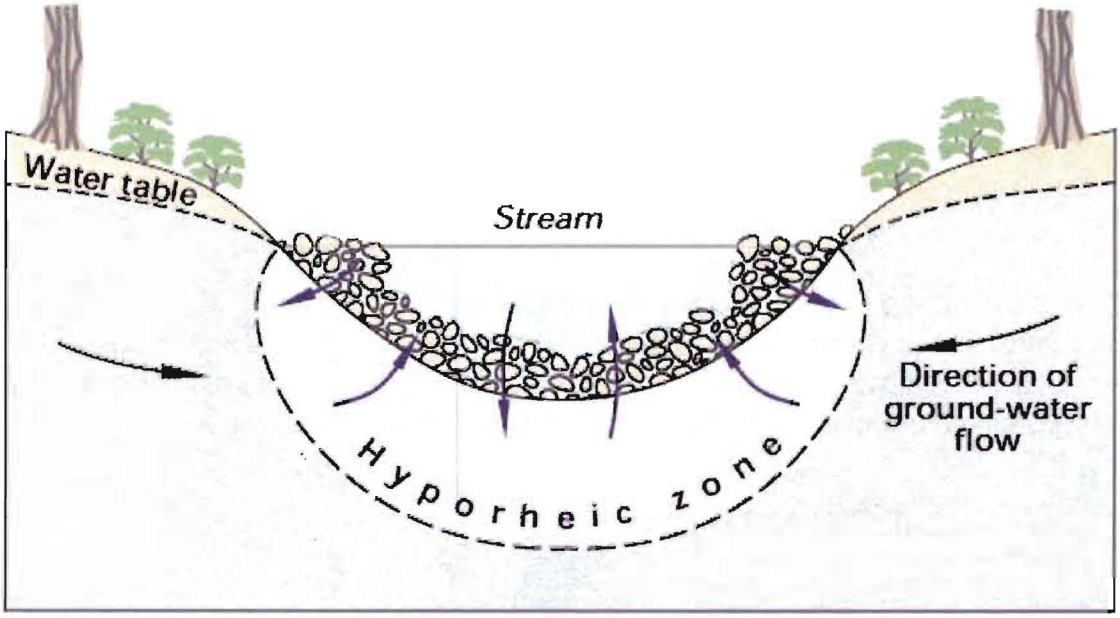
dredge mining (describe, provide image)

In dredge mining, a mining machine sucks up sediments from the ground and separates the ore from the sediments and then either redeposits sediments or stores the sediments and later deposits the sediments elsewhere.



hyporheic zone (define, provide diagram)

This is the zone is directly underneath and around the bed of a stream or river where groundwater interacts with surface water. It is extremely important in relation to the ecology of the aquatic life as well as to anyone that may use the groundwater.



distributed temperature sensing (DTS) (Describe)

A form of measuring temperature in a linear fashion utilizing optical fibers for sensors. This method of temperature sensing is extremely useful in monitoring changes in stream temperatures going the length of the stream.

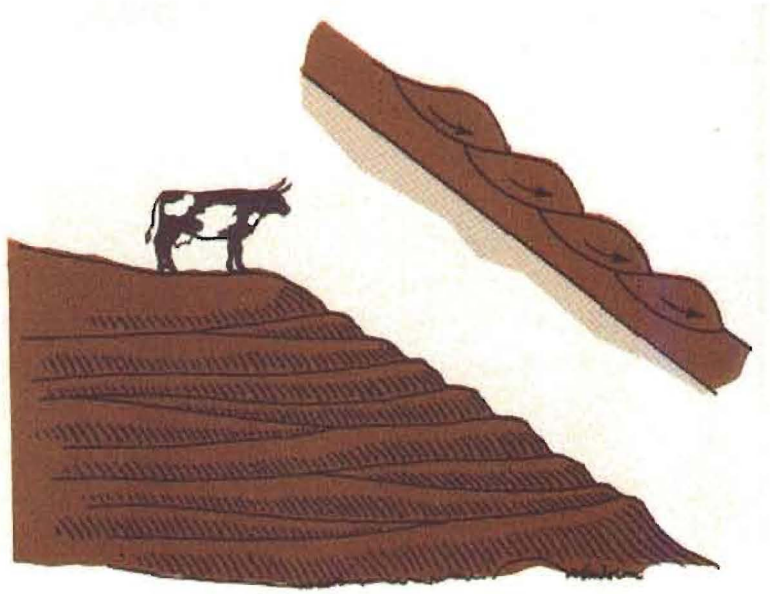
precision agriculture (describe, provide examples)

Is a complex combination of horticultural, botanical, technological, and spatial techniques combined in several processes which allow farmers to achieve greater yields. Using GPS and

topographic profiles a farmer would be able to determine sectors of the field to use differing concentrations of fertilizers.

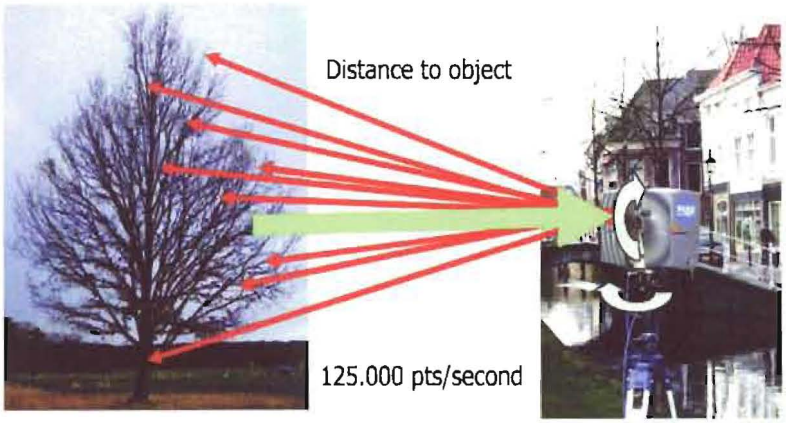
Terracettes (define, provide image)

Ridges that run perpendicular to the the slope of a hill. They are usually found in a repeating fashion down the sides of hills and are caused by freeze thaw erosional processes as well as a saturated to unsaturated process by which particles expand and flow with water and then contract when dry causing the ridges down the hillside. Ridges can then be further compacted by animal traffic.



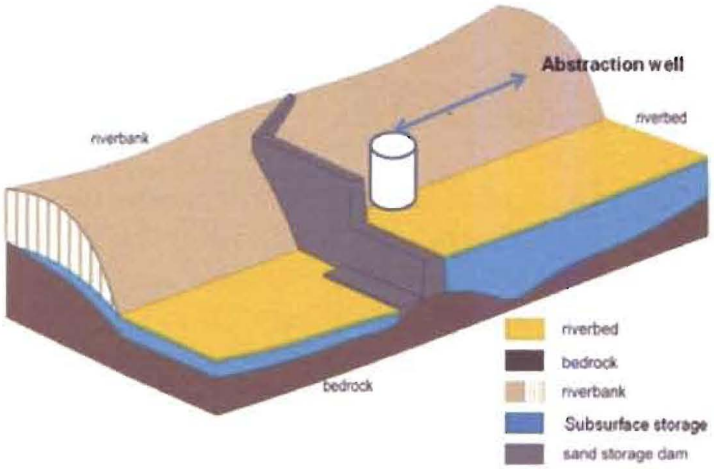
terrestrial laser scanning (Describe, provide image)

Lasers are pointed at well known angles, gathering distance measurements and then scanned over an area. This is combined with a digital photo to render 3D images of terrestrial landforms through assigning data points and superimposing the laser distance map over it.



Sand dams (define, provide images)

very shallow dams implemented on small streams that allow for water to be stored in a sand reservoir behind the dam and extracted from an abstraction well to the side of the stream. They are actually currently being studied with early results showing they're very good for the ecology, preventing mosquitoes from laying larvae in the stream and storing water beneath the sand seems to decrease evaporation and increase streamflow year around.



disease-carrying vectors (describe, provide examples)
These are basically everything humans as a whole hate. Fleas, ticks, lice, flies, and mosquitoes are all arthropods as well as disease carrying vectors meaning that they are agents for the transfer of infectious diseases. They all bite or leave excrement behind that can cause disease to transfer.

HEC-RAS (define, describe and provide example applications)
This is a hydrological computer rendering software for mapping the flow and surface of a stream, river, or channel. It would be used in a multitude of scenarios such as flood mitigation, to enhance farming practices, model effects of dams, and many other engineering projects such as channelizing a river through a city. It stands for Hydraulic Engineering Center River Analysis System.

Law of the River (describe)
The colorado River is restricted and governed by a menagerie of laws, contracts, decrees and court decisions. It's main use was to facilitate the distribution of water from the Colorado to the Seven states whose borders intersect it's basin.

riparian buffer (define and provide image)
an area of vegetation adjacent to streams, rivers, lakes, and other bodies of water which provides shade for aquatic life and increases the water quality of the river. It also provides a buffer space against property adjacent to the river possibly preventing excess chemicals from farming or other practices from reaching the body of water.

nonpoint source pollution (define, provide examples)

When rainfall or snowmelt moves over and through the ground and groundwater, it picks up numerous contaminants and chemicals along the way and transfers it into the river. This is termed nonpoint source pollution and can encompass anything from petroleum washing into our rivers from parking lots or nitrates dissolving into groundwater from farming.

Oncorhynchus kisutch (define, describe, provide images)

Otherwise known as the coho or silver salmon is a salmon specie found in the Pacific Northwest. It is under careful conservation law as it has decreasing populations across the Northwest due to river pollution, deforestation of riparian buffers, and global climate change. Almost all of the ecology of the Pacific Northwest is dependent on the Salmon at one stage or another of it's lifecycle so it is important that the fish not go extinct even though the trend has continued in that direction.

River fragmentation (define and describe, provide examples)

The fragmentation of rivers through dams, weirs, or withdrawal of water that interrupts the natural flow of the river. This is a measure of how much humans have altered river systems. When dams or withdrawal of water interupts flow and decreases the volume of water flowing through a river system, it can have negative impacts on the ecology as well as the aquatic environment within the stream.

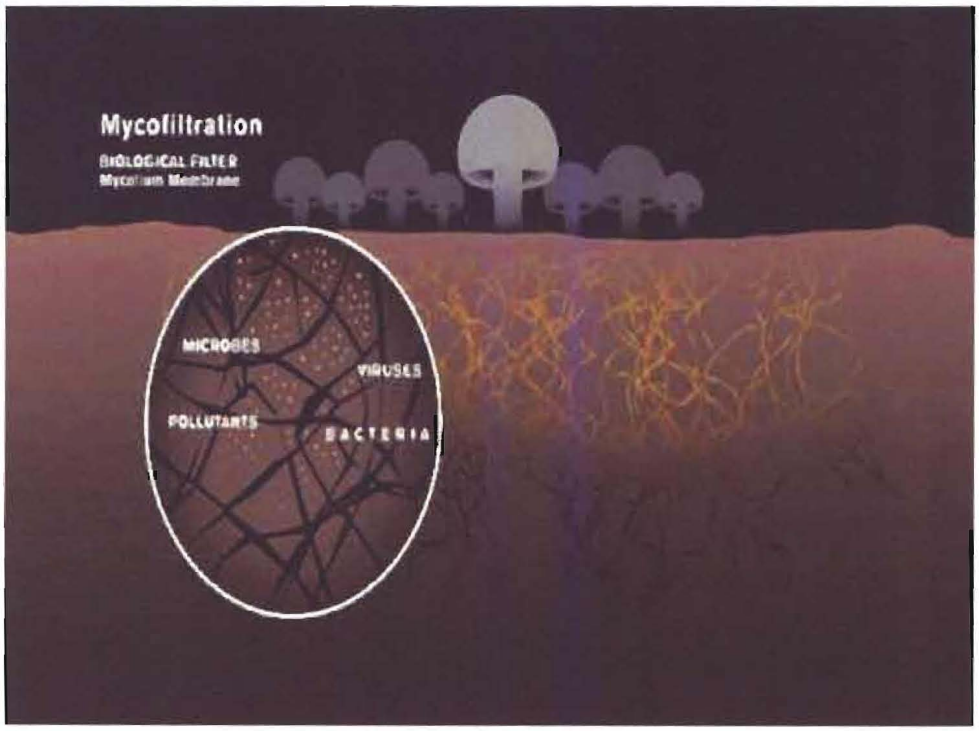
Pressure transducers (define)

A tool that measures the pressure of liquids or gases. It can be lowered into a system to generate data based on the pressure relative to the transducer.

MODFLOW (define, describe and provide example applications)
Models the flow of fluids through aquifers, (both confined and unconfined) river beds, wells and groundwater. It's useful in just about any scenario where one would have to drill a well or where one would withdraw water from an aquifer. It is also useful in modeling aquifers and groundwater systems so it could potentially be used to examine areas for landslide potential.

LiDAR (define, describe and provide example applications)
Light Detection and Altimetry Radar is used to provide high resolution images of landscapes with or without vegetation. It is extremely across almost all fields because of it's application. LiDAR utilizes laser altimetry and reflection to gather data by shooting out millions of laser pulses and collecting the data from their reflected return intervals which is later processed into extremely precise 3D images.

Mycofiltration (Describe, provide image)
The process of using fungi as a biological filter for water systems. Some mycofilters actually kill and prevent bacteria, viruses, and microbes as water washes over their root systems.

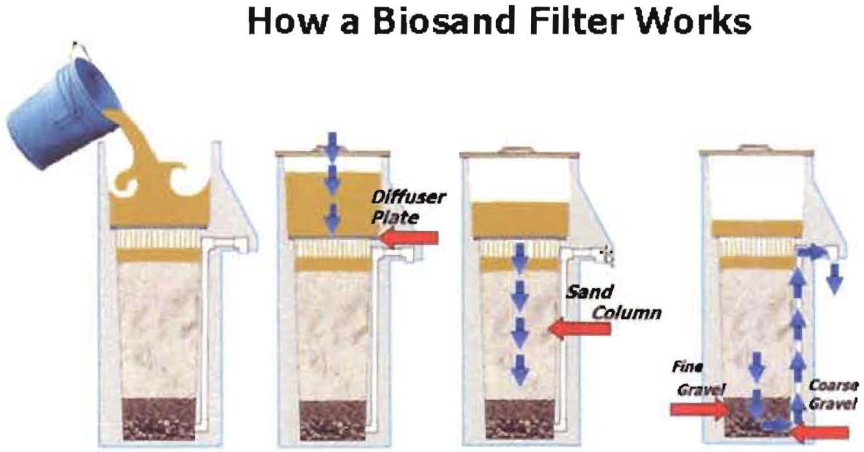


scenario analyses (define, describe and provide example applications)
Scenario analysis is thinking up alternatives to a current projected reality wherein one could discern possible conflicts or hazards in the future thereby raising awareness to said conflict or hazard and following with the proposal of a mitigation method. One might use scenario analysis to think about an upcoming tsunami and imagine a worst case scenario in order to think of how to prepare infrastructure.

DEM (define and describe, provide examples)

Digital Elevation Models, also referred to as digital surface models and digital terrain models are computer models of terrain that would allow one to, study or survey land for development, study volcanic bulges for potential volcanic hazards, map how flood waters might flow through terrain, assess slopes for danger of mass wasting, or model interstellar topography. The data is normally acquired from remote sensing through satellites.

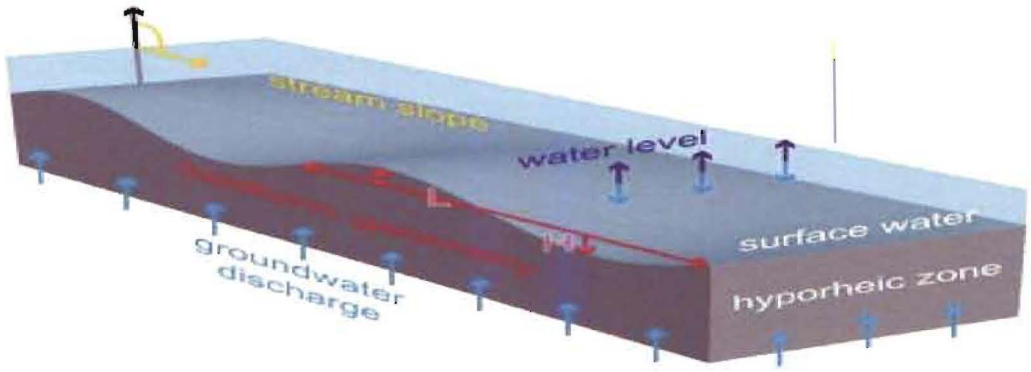
Biosand filter (Describe, provide image)
A filter that utilizes the combination of a slow sand filter in conjunction with biofilm, which is essentially a slimey goo of microorganisms, to filter out heavy metals, viruses, and contaminants from water. Water is poured through a cylinder with the sand and biofilm mixture followed by large-coarse gravel which prevents the sand from escaping.



Arsenic (define)
A Brittle Steel Grey metalloid whose atomic # is 33. It is poisonous to humans in even small doses.

Colloids (define)
A solution with particles ranging 1-1000 nanometers across that have an even distribution of particles. The particles remain dispersed through the colloid and don't fall out of suspension.

hyporheic exchange flow (define, describe, provide images)
The flow between groundwater and a river within the hyporheic zone



DOC / DIC (define and describe)
Dissolved Organic Carbon and Dissolved Inorganic Carbon are the sums of inorganic or organic species in a given solution. Both of these are significant in determining ocean acidity as well as food sources for microorganisms.

PCBs (define and describe)
Polychlorinated Biphenyls are a group of dangerous toxic chemicals synthesized from chlorine attached to two benzene rings. It is in a lot of coolants and insulators as well as sealants, wood finishes, adhesives, and pesticides. There are a lot of court cases related to their toxicity

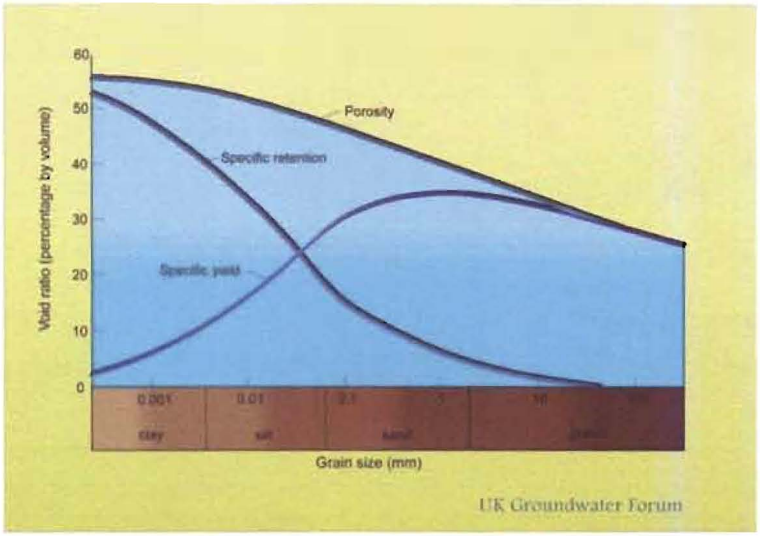
Denitrification (define)
The conversions of nitrates to nitrogen gas usually carried out by microorganisms in anoxic conditions.

Juniperus occidentalis (what is it)
The Juniper tree found in Eastern Oregon. They smell terrible and suck up water like a parched elephant pulling thousands of gallons of water out of the ground.

paired watershed study (describe)
This is a study one can conduct to determine many factors about water quality and conservation within watershed systems and is carried out through calibrating two watersheds in unison with one another so that one watershed is used as a control to account for weather changes and the other is used to show how effective a given treatment is at improving water quality. These studies must be conducted over several years to notice significant changes.

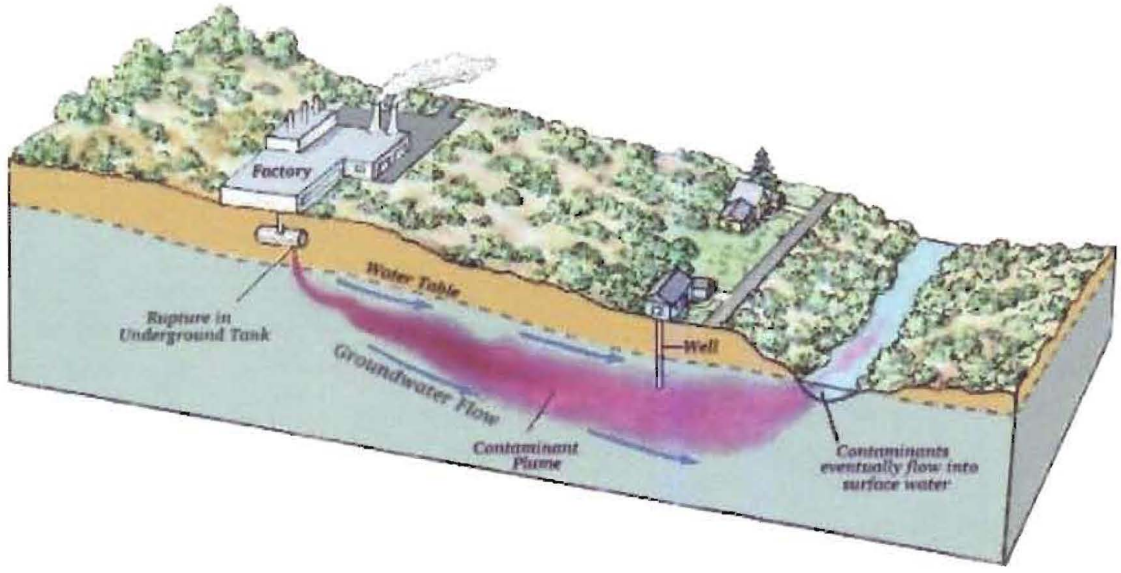
Snow water equivalent (define)
The amount of water contained in a snow pack. can be also defined as the depth of water should the snowpack be instantaneously melted.
SNOTEL (what is it)
It stands for snow telemetry and shows how much snow pack there is on a given slope, the air temperature, and the weather conditions. The stations record info every 15 minutes on average.
Groundwater specific yield (define provide diagram

Also known as drainable porosity, specific yield is a ratio of the water drained into a system against the volume of rock material in said system. The ratio is always less than or equal to one.



groundwater plume (define provide diagram)

Is a contaminant flow into a groundwater system resulting from a specific place. Examples would be a rupture in a chemical tank, broken sewage drainage field, and runoff from landfills penetrating into groundwater systems.



Willamette Water 2100 (what is it)

Is a OSU funded project that will try to determine how climate change, economics, and Oregonians will affect our willamette valley river basin.