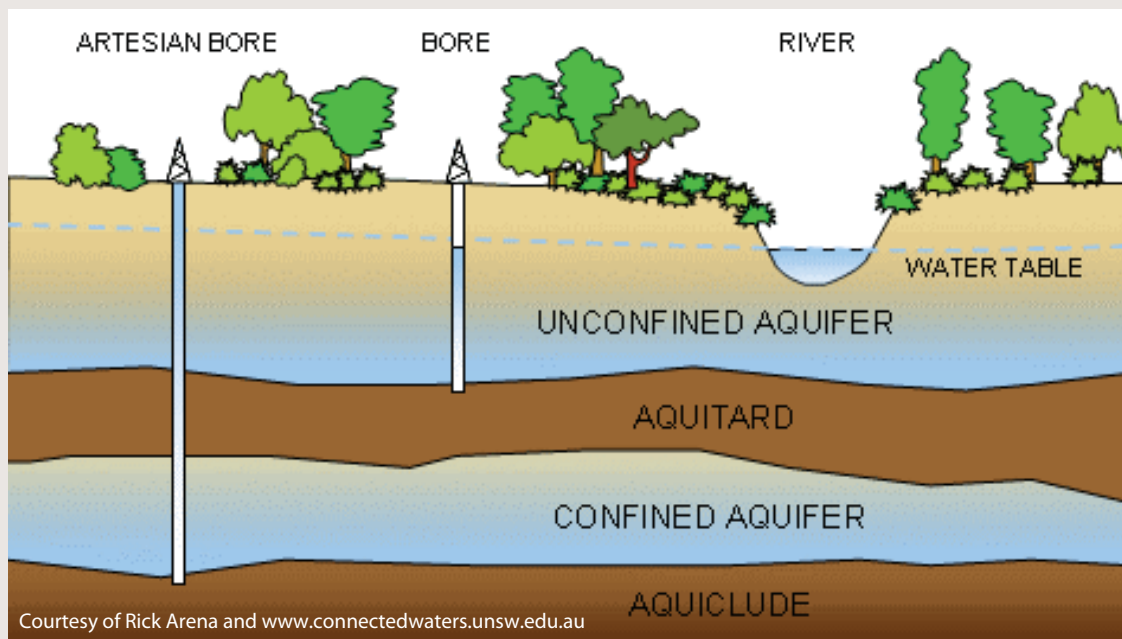


What is Groundwater?

Groundwater Series: Skills & Knowledge | Fact Sheet 1 | Produced by Cotton Catchment Communities CRC and UNSW Water Research Laboratory

Groundwater is the term referring to water that occurs under the ground. Groundwater is a vast and slow moving resource that greatly exceeds the volume of other available freshwater sources. The study of groundwater is known as hydrogeology.



Although the earth's surface might appear to be made of solid materials like rock, these are actually porous. Occupying the tiny spaces between particles, groundwater forms subterranean reservoirs.

The word substrate refers to all the soils, sediments and rocks beneath our feet. The porosity of a substrate determines the amount of water it can contain and transmit. Highly porous substrates can contain and transmit larger volumes of water than those with low porosity.

An aquifer is a layer of relatively porous substrate that contains and transmits groundwater. When water can flow directly between the ground surface and the saturated zone of an aquifer, the aquifer is unconfined. Because water tends to flow downward due to gravity, the deeper parts of unconfined aquifers are usually more saturated with groundwater. The upper limit of this saturated layer of an unconfined aquifer is called the water table.

Substrate with relatively low porosity that permits limited transmission of groundwater is known as an aquitard.

An aquiclude is a substrate with porosity that is so low it is virtually impermeable to groundwater.

A confined aquifer is an aquifer that is overlain by a relatively impermeable layer of rock or substrate such as an aquiclude or aquitard. Confined aquifers are usually under pressure because they occur at depth from the surface and are compressed by the overlying confining rock and substrate. Groundwater that is under sufficient pressure to allow it to flow to the surface is referred to as artesian water.

Groundwater usually originates at the surface. Rainwater infiltrates the surface layers and percolates through the substrate to supply an aquifer. The flow of water into an aquifer is known as recharge.

Groundwater can also return to the surface. The level of the water table in an unconfined aquifer influences the volume of water in surface drainage channels that flow across it. When erosion removes overlying layers or cuts deeply into the earth's surface,

the groundwater in aquifers can be brought closer to the surface. The deformation of aquifers and confining layers by geological processes can cause groundwater from aquifers water to flow from springs at the surface.

Where groundwater does not come to the surface naturally, it is usually obtained from the penetration of an aquifer by digging a well or bore. Water that flows from the surrounding saturated permeable substrate of the aquifer into space formed by the bore can then be pumped to the surface.



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