

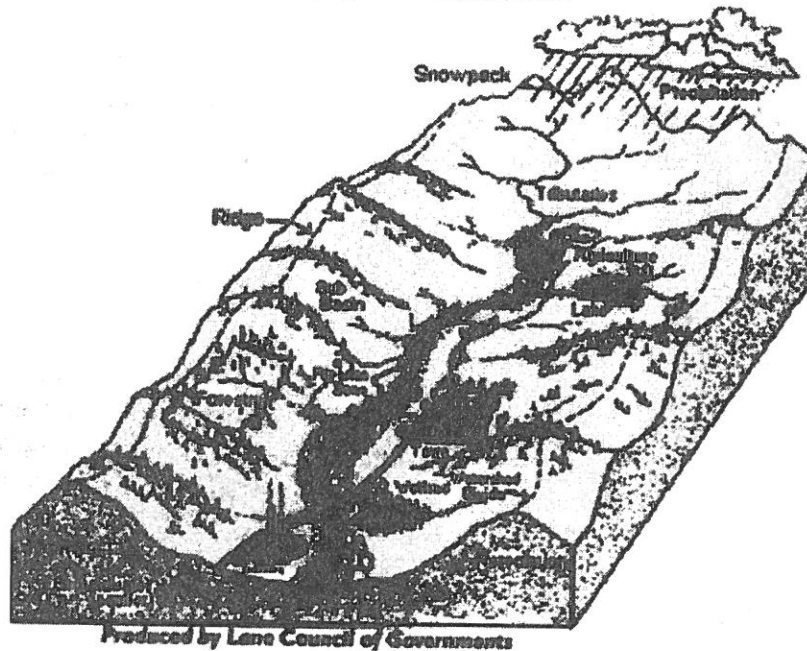
What is a Watershed???

From EPA Website:

A watershed is the area of land where all of the water that is under it or drains off of it goes into the same place. John Wesley Powell, scientist geographer, put it best when he said that a watershed is:

"that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community."

Watersheds come in all shapes and sizes. They cross county, state, and national boundaries. In the continental US, there are 2,110 watersheds; including Hawaii, Alaska, and Puerto Rico, there are 2,267 watersheds.



Watershed Demonstration

1. Describe what happened to the water in the watershed model.
2. Why are watersheds important to protect?
3. What would happen to pollutants located on the land such as fertilizers, pesticides, and road salts?

Background

Water stored in the spaces (pore spaces) between particles of granular materials (rock and soil) is called *groundwater*. When the pore space is completely saturated, the zone holding the water is called an *aquifer* and the surface of the saturated zone is called the *water table*. Water is added to the aquifer by 1) precipitation percolating downward, 2) water moving horizontally by capillary action, or 3) pressure from water moving from above (infiltration).

If the water table is higher than adjoining land (such as on a hillside) the water can escape from the aquifer as *springs*. In some areas, fresh-water marshes or lakes develop where the surrounding topography holds a water table that is higher than the valley floor. Water continually seeps into the lakes or the marsh. Lakes, rivers and reservoirs obtain some of their water directly from precipitation (rain or snow), but most of the water added to these surface-water sources comes from water infiltrating and percolating from surrounding aquifers.

Water can be obtained from aquifers by pumping it up through holes drilled from ground level down to the water table. These holes are called *wells*, and some eastern Massachusetts cities and towns obtain their fresh-water supplies from such wells. If the surrounding water table is higher than the point where a well is drilled, the water may come to the surface under its own pressure. Such a well is called an *artesian* well. Wells drilled during the early development of eastern Massachusetts were quite shallow because less water was being used in those days, thus the water table was close to the surface. Today, shallow wells are prone to contamination because pollutants can easily reach the water table; water from many shallow wells is now unsuitable for human consumption, and in some instances, people have actually died from drinking contaminated well water.

If the demand for water increases or if insufficient precipitation occurs to *recharge* the aquifer, the water table is lowered. When the water table drops, shallow wells run dry, and reservoirs, streams and rivers contain less water.

The depth of a well depends on the depth of the water table and the structure of the underground soil and rock. Deep wells generally produce purer water. Underground water from deep wells has percolated through greater volumes of rock and soil and thus has been better filtered to remove contaminants. But deeper wells have disadvantages. They require more energy to pump the water, and they produce water that has been in contact with rock for long periods of

time. Small amounts of rock dissolve in the water and the water contains more minerals than shallow wells. Hence the water from deep water tables is described as being *hard water*. Hard water requires more soap for washing clothes and dishes. Mineral deposits build up inside water pipes, thus shortening their usable lives.