

Contain Your Rain

Soak It, Don't Send It, For Tomorrow You Drink It!

Passaic River Coalition's Homeowner Guide #1

Your Drinking Water Comes from Clouds. Where Is It Stored?

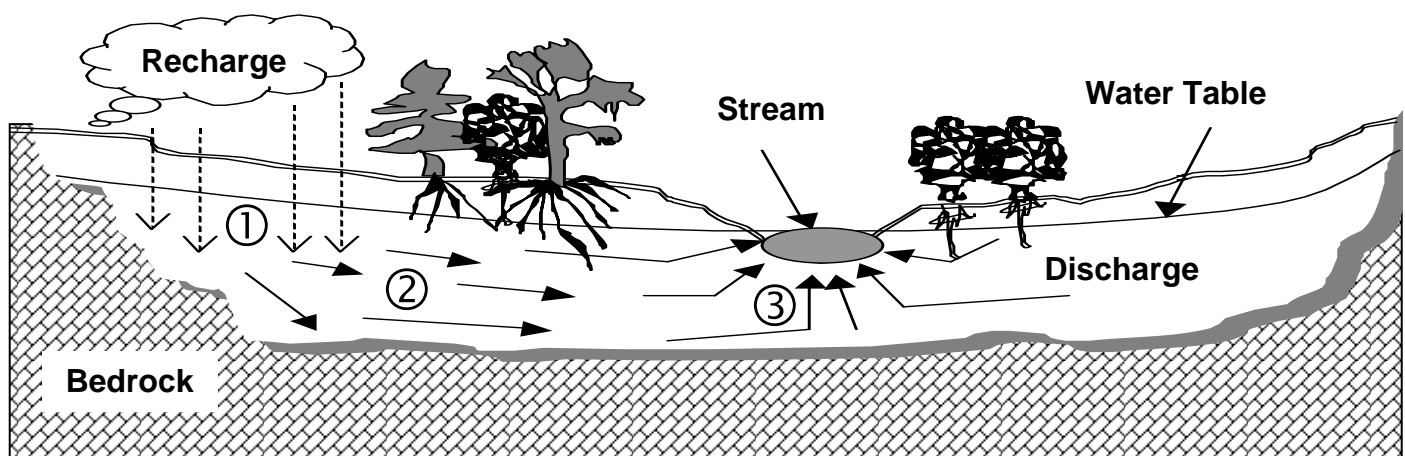
The water that comes out when you turn on a tap begins its journey as rain or snow. Each drop of water that drips from your faucet was a splash of rain or snow that landed on the ground somewhere, maybe even in your own backyard. The time it takes a drop of water to travel from when it hits the ground to when it drips from your faucet may be days, years or centuries. Most of the water that you use for drinking or bathing is stored in the ground as ground water. Even if the water you use is piped from a reservoir or river, much of this water spent some time collecting underground. To keep the drinking water flowing, rain has to be allowed to soak into the ground to replenish ground water supplies.

The Downs and Ups of Ground Water -- Recharge, Discharge and Base Flow

Ground water recharge begins with rain, snow and other forms of water that drop out of the clouds and onto the ground. Water that falls on the land may run off over the surface, get returned to the atmosphere through evaporation, or seep into the soil. Water in the soil is either taken up by plants in the upper layers, or infiltrates down into deeper layers. In the upper layers of soil the pores, or spaces between the soil particles, often are filled with air so that water can trickle through. The deeper layers form a saturated zone where water is held, like a sponge, in all the spaces between the rock particles. The water table marks the top of this saturated zone. Water in the soil recharges ground water when it reaches the water table.

Ground water discharge occurs where the land's surface dips below the water table, allowing the water to flow out to the surface. Ground water exits the earth at discharge areas, coming to the surface to feed springs, streams and wetlands.

Base flow is the ground water discharge that keeps streams and wetlands soggy between rainfalls, even during times of drought. When recharge areas are covered with impervious, or watertight, surfaces, rainwater can't replenish the ground water, base flow gets reduced, and streams run lower than usual during dry spells. Impervious surfaces also make flooding worse, because all the stormwater runoff that would normally soak into the ground then gets added to flood-swollen streams.

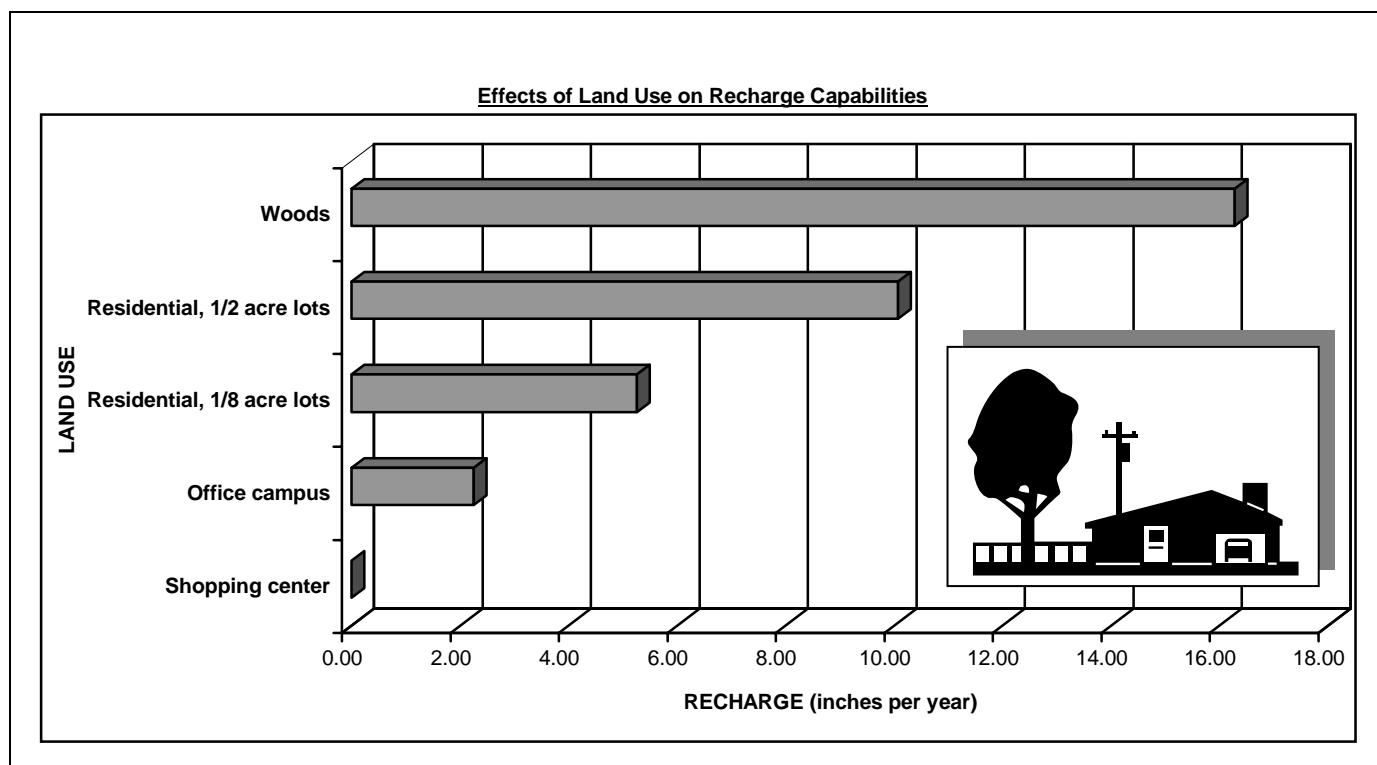


- Base Flow Basics: (1) Precipitation recharges ground water;
(2) Ground water travels through spaces between rocks and soil particles;
(3) Ground water discharges into stream as base flow.

The Downs and Ups of Ground Water Recharge

Ground water recharge areas are land surfaces where the soil naturally allows rainwater to seep down to the water table. Ground water recharge areas function best when the land surface and the ground beneath it are permeable so water can infiltrate into, and flow through, the ground. Permeability is the relative ease with which water can move through soil or rock. For instance, beach sands are highly permeable, and the ocean water soaks into them readily, while dense clays have a very low permeability and rain runs off of them instead of soaking into the ground. Trees, bushes and grasses put down roots, helping to keep soil permeable. It is the combination of water permeable soils and vegetation that keep ground and surface water sources of drinking water clean and plentiful. When land is built upon, impervious surfaces, such as buildings, roads, and parking lots, seal up recharge areas and prevent rainwater from seeping into the ground. Even converting forest or meadow landscapes into lawn makes the soil less permeable, and the recharge less abundant.

Land use changes recharge. People have developed the land in various ways. Many of these changes in land use have added impervious surfaces and decreased the permeability of soils. Nowadays less water soaks into the ground to recharge ground water than it did before the natural landscape was altered. This means that there is less water stored in the ground that can later be used for drinking water. The graph below compares the amounts of water that recharge ground water in an average year on the same type of soil (Haledon) with the same amount of rain and snow (Chatham Borough), but with different land uses.¹ A highly altered landscape such as a shopping center concentrates rain runoff, diverts it from recharge areas, and sends it into the nearest brook to be sped on its way out of town.



Increasing ground water recharge is possible, if you contain your rain, by directing storm water into the ground instead of piping it to a stream. For more information on how you can contain your rain, please see Passaic River Coalition's Homeowner Guides #2, #3, and #4, or contact the –

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Funding was provided by a Section 319(h) grant from the New Jersey Department of Environmental Protection

¹ Charles, E.G., C. Behroozi, J. Schooley, and J.L. Hoffman. 1993. A method for evaluating ground water recharge areas in New Jersey. New Jersey Geological Survey Report GSR-32. Division of Science and Research, New Jersey Department of Environmental Protection and Energy, Trenton, NJ.