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Understanding Groundwater, Part 3: How to protect your well and the community's groundwater

BY SHARON MCCARTHY AND CHRIS MITCHELL | June 2, 2023

Editor's Note: This is the last in a series of articles on water use in Harvard.

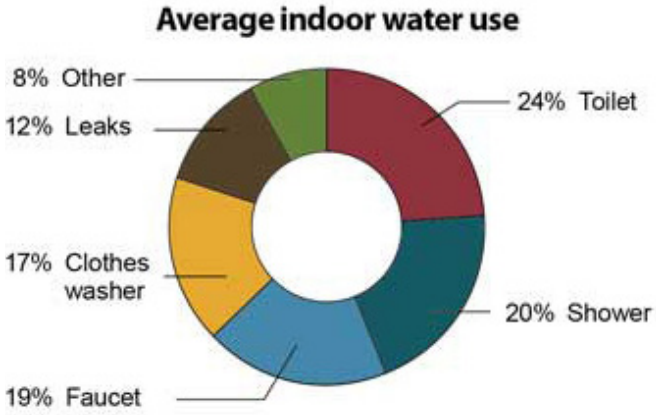
Groundwater is one of Harvard's precious and vulnerable resources. The first article of this series presented an overview of groundwater, making the point that although groundwater is plentiful, it is not limitless. Drought and overconsumption act to limit this community resource, and more frequent droughts are a consequence of the changing climate. The second article in this series described how drought affects not only our wells but also the rivers, ponds, ecosystems, and flora and fauna of those systems as well as the aquifers. Furthermore, droughts mean water to fight wildfires is limited when there is an increase in wildfire risk.

This article focuses on what residents can do to reduce their water consumption and help preserve our community's groundwater supply. Adjusting our habits to conserve water is how we can thrive in a drier climate and ensure enough water for all our needs.

Indoor water use

For a household, indoor water use accounts for the vast majority (about 70%) of the water consumed. See "Average indoor water use" for a breakdown of average indoor water use categories.

Reducing indoor water use is an effective, and often low-cost, water conservation measure. The three areas that are the most common sources of wasted water in a home are older fixtures and appliances; old habits of letting water run unnecessarily; and leaks. Reducing the amount of water used for a particular task and capturing water (for example, collecting tap water that is not yet hot in a small container) for alternative use are easy and effective actions to take. According to the state's Water Resources Commission, replacing old fixtures can save the average household 50 gallons of water a day. The U.S. Environmental Protection Agency's WaterSense program is an extensive resource of useful tips for saving water and a label for certified water-efficient products.



Source: Water Research Foundation, residential end uses of water, 2016.

People looking to replace fixtures or appliances can look for WaterSense-labeled products, independently certified for efficiency and performance. Such products use at least 20% less water and less energy than regular appliances. To find new fixtures or appliances with the label, go to the WaterSense website at www.epa.gov/watersense/about-watersense.

The second source of wasted water in the home is letting water run unnecessarily—for example, while brushing teeth, shaving, and washing dishes.

Think when you turn the water on, "Do I need to let it run?" and act accordingly, keeping in mind the following points.

- Turning the tap off while brushing your teeth or shaving can save 1 to 2 gallons per minute.
- Taking shorter showers can save 2 to 4 gallons per minute.
- Refraining from using the toilet as a wastebasket can save 1 to 7 gallons per flush.
- Run dishwashers and clothes washers only when they are filled to capacity.
- If doing dishes by hand, use a tub and don't run the water until dishes need rinsing.

Dripping faucets and showerheads can be the source of large volumes of wasted water, from 75 to several hundred gallons of water per week. Not all leaks are as obvious as a dripping faucet. There can also be hidden leaks in a toilet (that trickling sound), under the sink, or behind a washing machine (look for damage on the floor or the ceiling below). If you have metered water, check for changes in your usage. If you have a private well, note increases in the frequency of the pump coming on or in your electric bill—both could be caused by a leak. Be vigilant about addressing leaks or dripping faucets; they look small but have a huge impact on water consumption. And the cost of fixing a leaking faucet can be the few cents it costs to replace the existing washer in the faucet's stem.

Outdoor water use

According to the EPA, the average U.S. household uses more water outdoors than for showering and washing clothes combined. According to the Massachusetts Water Resources Authority (MWRA), residential outdoor water use increases from 10% to 50% in June through September, the most typical and most severe time for droughts.

Outdoor water use falls into two categories of use: landscaping and nonlandscaping. Landscaping uses include all forms of irrigation, from lawns to gardens. Mindful residents should consider three key items when watering their landscaped areas: when, how often, and how long. Timing is extremely important when considering watering a landscaped area. Avoid watering in the middle of the day as water will be lost to evaporation. How often depends on the weather and the plants and shrubs you have planted. The general metric for how long to water is half an inch, two times per week. One way to assess your sprinkler system is to put out an empty small can, turn on your sprinkler, and time how long it takes to fill the can with a half-inch of water. With these three factors in mind, residents should try using as little water for landscaping as needed based on recent precipitation, plant needs, and water supply output.

Lawns

Frequent watering weakens your lawn by encouraging shallow root systems that are less tolerant of dry conditions, and wet grass is more susceptible to disease. Grasses become dormant in hot, dry periods; they are not dead (so don't panic!). Cooler weather and rainfall will bring them back. When cutting lawns, leave the grass long to shade roots and reduce soil moisture loss.

Gardens

Shrubs and gardens have different water requirements. When planting new or replacing shrubs and plants, look for drought tolerance. It can be challenging to track when to water, so using the best sprinkler technology is important. Consider using weather-based or soil moisture-based irrigation controllers for inground systems and only water when needed. Another option is a micro-irrigation/drip system that applies water slowly and directly to plant root systems. The EPA's WaterSense webpage, www.epa.gov/watersense/microirrigation, has more information on such systems. Using mulch helps maintain the soil moisture for gardens, shrubs, and trees.

What else can be done?

- Saving water from rainstorms is a great way to supplement your water efficiency steps. Rain barrels or cisterns can collect rainwater that can then be used for irrigation or other outdoor uses. More information on harvesting rainwater can be found at www.pwdraincheck.org/en/stormwater-tools/rain-barrels.

- Cover pools to limit evaporation.

- Do not use a hose to "clean" your driveway; brooms work fine.

- When your car needs to be washed, either take it to a commercial car wash (most are required to recycle the water they use), or if doing it at home, park your car on a lawn area that needs water, use a bucket and don't use excessive water.

- Make sure sprinklers are not watering the pavement.

Conclusion

Climate change is bringing not only temperature changes but rainfall and snowfall changes that can adversely affect our precious groundwater supply. Less water going down the drain means more water available in the aquifer that underlies our community and our ponds, rivers, and streams that we use for recreation and flora and fauna require for survival. Using water more efficiently helps maintain supplies at safe levels, protecting human health and the environment.

For more information

- UMass Amherst's Center for Agriculture, Food, and the Environment provides a wealth of gardening tips, including information about testing soil, diagnosing problems with plants, and managing wildlife at https://ag.umass.edu/resources/home-lawn-garden. The center also offers a list of native plants that thrive in New England at https://ag.umass.edu/landscape/fact-sheets/north-american-plants-for-new-england-gardens.

- Grow Native Massachusetts offers a list of plants suitable for the state, including plants that support pollinators, at https://grownativemass.org/Great-Resources/Plant-Lists-Landscape-Guides.

- The Environmental Protection Agency offers advice about creating water-efficient landscapes at www.epa.gov/watersense/outdoors.

- The Massachusetts Water Resources Authority explains how to use rain barrels and offers tips for water-efficient gardening at www.mwra.com/comsupport/conservation/gardeningtips.htm.

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