

Home Water Conservation

Tom Harrington
Master Farmer Training
Coordinator

Michael Daniels
Professor, Environmental
Management

Phil Tacker
Associate Professor and
Extension Engineer

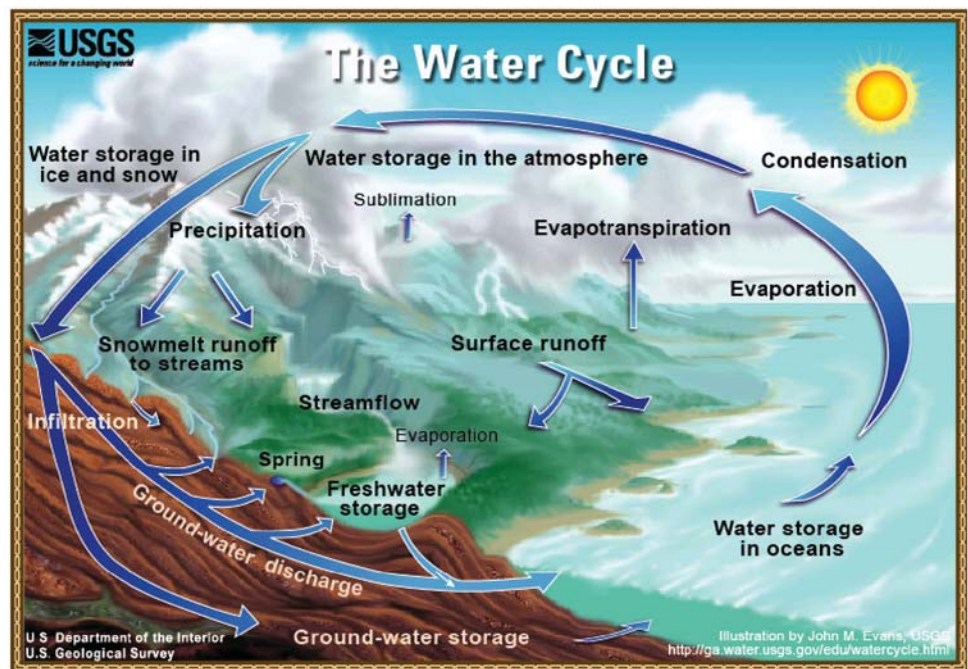
Water is one of our most abundant, yet precious, natural resources as it is a basic necessity for sustaining human life. Water makes up more than two-thirds of the weight of the human body, and without it, humans would die in a few days. The amount of water in our environment is static and cycles to various locations and to various forms (Figure 1).

The United States Geological Survey (USGS) estimates the total water volume of the world is 326 million cubic miles (a cubic mile of water equals more than one trillion gallons). However, the USGS estimates that

only 0.3 percent of water on earth is in a form usable by humans (Figure 2, page 2).

Arkansas has tremendous surface and groundwater supplies. However, it is also susceptible to drought. The USGS estimates that 2.3 million Arkansans collectively use 421 million gallons of public-supplied water per day for domestic use. This equates to over 180 gallons per person per day. In 2005, precipitation deficits from normal amounts averaged almost 14 inches across the state, which made it the second driest year overall (Figure 3, page 2). The 2005 drought placed tremendous stress on several public water supplies.

Figure 1. The Water Cycle

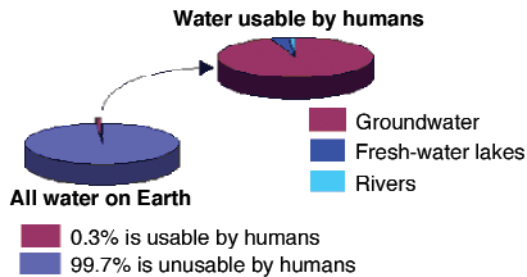


(Image courtesy of the United States Geological Survey)

*Arkansas Is
Our Campus*

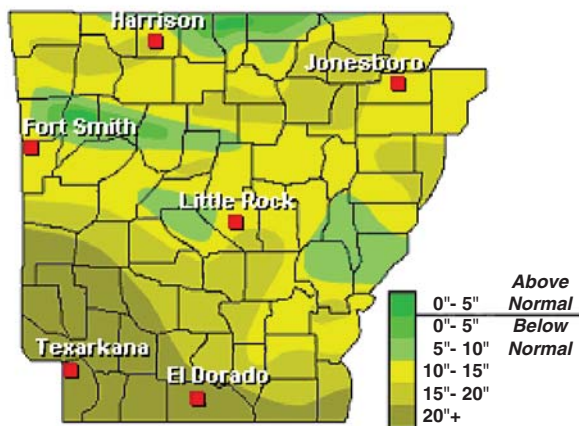
Visit our web site at:
<https://www.uaex.uada.edu>

Figure 2. How Much of Earth's Water Is Usable by Humans?



(Image courtesy of the United States Geological Survey)

Figure 3. Annual Precipitation Departure From Normal in Inches During 2005




(Source: National Weather Service, Little Rock, Arkansas)

Relieving stress on our water supplies is just one benefit of home water conservation. Other benefits include decreased water bills, decreased wastewater treatment costs for communities and preservation of our aquatic environment. The purpose of this publication is to help home water users realize these benefits by providing tips on water conservation. The information for this article has been adapted from similar publications in other states, and their contributions are noted.

(The following is courtesy of the USGS.)

General Household Tips

Don't Let It Run. We have all developed the bad habit of letting the faucet run while we brush our teeth or wait for a cold glass of water. Keeping a pitcher of water in the refrigerator or turning the faucet off while we brush our teeth can save several gallons of water each day. It's simple really. Before you turn on the tap, think of ways you can use less water to accomplish the same purpose.

Fix the Drip. There is no such thing as a little drip. A leaky faucet with a drip of just 1/16 of an inch in diameter (about this big ) can waste 10 gallons

of water every day. You can turn off that drip by replacing worn washers or valve seats.



Fix the Silent Leak. Even worse than the careless hand on the faucet is the silent toilet bowl leak, probably the single greatest water waster in homes. A leak of 1 gallon every 24 minutes – an average amount – totals 2.5 gallons per hour or 60 gallons per day. To check your toilet for a leak, place a few drops of food coloring in the tank and wait. If the color appears in the bowl, then there's a leak. Often these leaks can be fixed with a few minor adjustments – cleaning calcium deposits from the toilet ball in the tank or replacing worn valves.

Close the Hose. Letting the garden hose run faster or longer than necessary while we water the lawn or wash the car often becomes a careless and wasteful habit. A 1/2-inch garden hose under normal water pressure pours out more than 600 gallons of water per hour, and a 3/4-inch hose delivers almost 1,900 gallons in the same length of time. If left on overnight, one garden hose can easily waste twice as much water as the average family uses in a month.



Check the Plumbing. Proper maintenance is one of the most effective water savers. Faucet washers are inexpensive and take only a few minutes to replace. At home, check all water taps, hoses and hose connections (even those that connect to dishwashers and washing machines) for leaks. Check the garden hose too – it should be turned off at the faucet, not just at the nozzle.



Teach Your Community. Just as it is important to conserve water in your own home, it is important to help our towns and cities save water by teaching others to use water wisely. In agricultural areas, water may be saved by using more effective irrigation methods. In industrial areas, manufacturers can save water by reusing it and by treating industrial wastes. Cities and towns can save water by eliminating leaks and installing meters. Wastewater can be treated and reused. As you conserve water at home and in your community, you will help ensure that the water available now continues to meet the growing water needs of the future.

Tips for Water Usage in the Bathroom

Toilets

- **Check for leaks.** Put a little food coloring in your toilet tank. If, without flushing, the color begins to appear in the bowl within 30 minutes, you have a leak that should be repaired immediately. Most replacement parts are inexpensive and easy to install.
- **Don't use the toilet as an ashtray or a wastebasket.** Every time you flush a cigarette butt, facial tissue or other small bit of trash, 5 to 7 gallons of water is wasted.
- **Put plastic bottles in your toilet tank.** To cut down on water waste, put an inch or two of sand or pebbles inside each of two plastic bottles to weigh them down. Fill the bottles with water, screw the lids on and put them in your toilet tank, safely away from the operating mechanisms. This may save 10 or more gallons of water per day. Be sure at least 3 gallons of water remain in the tank so it will flush properly. For new installations, consider buying "low flush" toilets, which use 1 to 2 gallons per flush instead of the usual 3 to 5 gallons.



Showers

- **Install water-saving shower heads and low-flow faucet aerators.** Your local hardware or plumbing supply store has inexpensive, water-saving shower heads or restrictors that are easy for the homeowner to install. Also, long, hot showers can use 5 to 10 gallons every unneeded minute. Limit your showers to the time it takes to soap up, wash down and rinse off. All household faucets should be fitted with aerators. This single best home water conservation method is also the cheapest!
- **Take shorter showers.** One way to cut down on water use is to turn off the shower after soaping up and then turn it back on to rinse. A four-minute shower uses approximately 20 to 40 gallons of water.

Other Ideas

- Rinse your razor in the sink. Fill the sink with a few inches of warm water. This will rinse your razor just as well as running water, with far less waste of water.
- Turn off the water after you wet your toothbrush. There is no need to keep the water running while brushing your teeth. Just wet your brush and fill a glass for mouth rinsing.

Tips for Water Usage Outdoors

Outdoor Cleaning Projects

- **Don't run the hose while washing your car.** Clean the car using a pail of soapy water. Use the hose only for rinsing.
- **Use a broom, not a hose, to clean driveways and sidewalks.** A leaf blower is also helpful if you have a lot of leaves or debris.

Lawn and Garden

- **Water your lawn only when it needs it.** A good way to see if your lawn needs watering is to step on the grass. If it springs back up when you move, it doesn't need water. If it stays flat, the lawn is ready for watering. Letting the grass grow (to 3") will promote water retention in the soil.
- **Deep-soak your lawn.** When watering the lawn, do it long enough for the moisture to soak down to the roots where it will do the most good. A light sprinkling can evaporate quickly and tends to encourage shallow root systems. Put an empty tuna can on your lawn. When it's full, you've watered about the right amount.



- **Put a layer of mulch around trees and plants.** Mulch will slow evaporation of moisture while discouraging weed growth.
- **Water during the cool, non-windy parts of the day.** Early morning is generally better than dusk because it helps prevent the growth of fungus. Watering early in the day is also the best defense against slugs and other garden pests. Try not to water when it's windy; wind can blow sprinklers off target and speed evaporation.

- **Don't water the gutter.** Position your sprinklers so water lands on the lawn or garden, not on paved areas.
- **Watch out for run-off.** Soil conditions and slopes can lead to run-off if the watering is not managed properly. The length of time water is applied to an area should be short enough so that excess run-off and the wasting of water does not occur.
- **Install an automatic water shut-off device.** Consider installing simple control devices that can be set to automatically shut off water flow from faucets and/or hoses. This can prevent water loss when someone forgets to turn the water off. Shut-off devices are very affordable and generally available at hardware stores and garden centers.
- **Use efficient watering systems for shrubs, flower beds and lawns.** You can greatly reduce the amount of water used for shrubs, beds and lawns by strategically placing soaker hoses, rain barrel catchment systems and simple drip-irrigation systems.
- **Plant drought-resistant shrubs and plants.** Many beautiful shrubs and plants thrive with far less watering than other species. Replace herbaceous perennial borders with native plants. Consider applying the principles of xeriscape for a low-maintenance, drought-resistant yard.

Details about how you can develop your own rain barrel catchment system and plant a water-friendly garden appear below.

Collecting Rainwater for Watering Plants

Gardeners can play a key role in conserving freshwater by harvesting rainwater. In addition to reducing demand on our water supplies – especially important during drought and summer (when 40 percent of all water is used outdoors) – rainwater harvesting reduces water pollution. In a rainstorm, oil, pesticides, animal waste and fertilizers from our lawns, sidewalks, driveways and streets are washed into sewers that often overflow into rivers and estuaries, contaminating fish and other wildlife. Rainwater harvesting prevents rain from becoming polluted stormwater and puts it to use where it falls.

The quality of rainwater is unsurpassed when it comes to watering plants and landscapes. Captured rainwater is free of the salts and pollutants associated with ground and surface water. In urban areas, the natural acidity of rainwater is good for soils that have become alkaline from cement-leached lime. The natural temperature of rainwater doesn't shock plants with cold the way tap water can. Best of all,

rainwater contains no chlorine, a chemical added to drinking water that inhibits plant growth. And rainwater is free!

Collection of Rainwater

Regardless of how much rain your area gets or the size of your landscape, you can design a rainwater harvesting system that works for you. The most common method of capturing rainwater for irrigation involves taking rain from building gutters and storing it in an outdoor tank or rain barrel.

Ideally, rainwater harvesting systems for irrigation include five basic components:

- 1 Catchment or collection area – usually a roof
- 2 Transport for the water, such as gutters, downspouts and piping
- 3 Roof washer to intercept the first flush of rain (plus any debris or bird feces) from the roof – usually a sealed downspout next to the main downspout
- 4 Storage tank or barrels
- 5 Gravity- or pump-driven system for distributing water to the garden

Bear in mind that only nonpotable usage of rainwater is described here. Harvesting rainwater for drinking involves several levels of filtration as well as chemicals for disinfection.

The first step in designing a rooftop system is to analyze (and, if needed, change) the roof-surface materials. Roof material affects both the amount of water collected and its quality. For example, porous asphalt shingles and rolled roofing are less desirable than smooth steel (although all are used successfully) because rough materials absorb more water and bird feces. Roofs made of wooden shingles treated with chromated copper arsenate are not appropriate for rainwater harvesting. Zinc antimoss strips mounted on roofs also produce toxic chemicals that you want to keep out of your garden.

Most people already have gutters and downspouts attached to their roofs to transport rainwater away from the building. Ideally, the gutters should be covered with a leaf screen to keep debris from entering the system. If you want to divert water from your downspout during the growing season but send it back down the drain during off-season, you can install a downspout diverter. These simple devices usually cost less than \$20 at local hardware suppliers.

(Adapted from the Brooklyn Botanical Garden)

Drought-Resistant Landscape Plants

There are many landscape plants that can add beauty to your lawn without the use of large amounts of water. Here are just a few plants you might want to use – and a few you should avoid.

Perennials for Sun

- Lantana ‘Miss Huff’
- Swamp Sunflower (*Helianthus angustifolia*)
- Anise Sage (*Salvia guaranitica*)
- Mexican Bush Sage (*Salvia leucantha*)
- Mexican Bluebell (*Ruellia brittoniana*)
- Brown-eyed Susan (*Rudbeckia triloba*)
- Lamb’s Ears (*Stachys byzantina*)
- Silver King (*Artemisia ludoviciana*)
- Red-hot Poker (*Kniphofia uvaria*)



Silver King (*Artemisia ludoviciana*)
<arboretum.sfasu.edu>

Perennials for Shade

- Helebor hybrids
- Japanese autumn ferns
- Cast Iron Plant (*Aspidistra eliator*)
- Scarlet Bee Balm (*Monarda didyma*)
(It wilts but comes back.)
- Iris reticulata



Iris Reticulata
<www.longwoodgardens.org>

- Autumn Joy (*Sedum*)
- Iris siberica
- Hosta hybrids

Annuals

- Lantana camara hybrids
- Madagascar Periwinkle (*Catharanthus roseus*)
- Love-lies-bleeding (*Amaranthus caudatus*)
- Cockscomb (*Celosia cristata*)
- Portulaca hybrids
- Medallion Daisy (*Melampodium paludosum*)



Medallion Daisy (*Melampodium paludosum*)
<www.centralpark2000.com>

- Petunias (especially old-timey and “Wave” petunias)
- Byron’s Beauty (*Passiflora*)
- Mexican Aster (*Cosmos bipinnatus*)
- Cosmos sulfureus
- Mexican Sunflower (*Tithonia rotundifolia*)
- Moss Verbena (*Verbena tenuisecta*)
- Salvia farinaceae hybrids
- Zinnia elegans

Perennial Natives

- Lilium hybrids
- Blue Star (*Amsonia tabernaemontana*)
- Queen Anne’s Lace (*Daucus carota*)



Queen Anne’s Lace (*Daucus carota*)
<www.main.nc.us>

- False Dragonhead (*Physostegia virginiana*)
- Trumpet Honeysuckle (*Lonicera sempervirens*)
- Common Yarrow (*Achillea millefolium*)

- Sweet Autumn Clematis (*Clematis paniculata*)
- Evening Primrose (*Oenothera speciosa*)
- Blackberry Lily (*Belamcanda chinensis*)
- Boltonia asteroids
- Asters (native species)
- Purple Coneflower (*Echinacea purpurea*)
- Virginia Spiderwort (*Tradescantia virginiana*)
- Mistflower (*Eupatorium coelestinum*)
- Joe-Pye Weed (*Eupatorium fistulosum*)
- Butterfly Weed (*Asclepias tuberosa*)
- Crossvine (*Bignonia capreolata*)

Annuals to Avoid

- Impatiens
- Marigolds
- Begonias
- Scaevola



Scaevola

<www.plantoftheweek.org>

- New Guinea Impatiens
- Cape Daisy (*Osteospermums*)
- Ageratum (*Ageratum houstonianum*)
- Caladiums
- Coleus (shade type)
- Nicotiana

Perennials to Avoid

- Fall Phlox (*Phlox paniculata*)
- Veronica hybrids
- Jupiter's Beard (*Centranthus roseus*)



Fall Phlox

<www.ukstudentlife.com>

- Coreopsis grandiflora
- Petunias
- Non-native asters

(Adapted from the University of Georgia College of Agricultural and Environmental Sciences)

Summary

Home water conservation provides many benefits. For individuals, it may lower water bills. For communities, it reduces public water-supply quantity problems during drought and wastewater treatment costs. If we all conserve, it may also reduce mandatory use restrictions often imposed by municipalities to curb use during periods of high demand. The tips listed in this publication can help all Arkansans conserve water.

References

Paul Thomas, Horticulturist. University of Georgia College of Agricultural and Environmental Sciences. Information can be obtained via the internet at <<http://georgiafaces.caes.uga.edu/getstory.cfm?storyid=1165>>.

Robin Simmens, Brooklyn Botanical Garden. *Plant and Garden News*, Volume 20, Spring 2005.

TOM HARRINGTON, master farmer training coordinator, **DR. MICHAEL DANIELS**, professor, environmental management, and **PHIL TACKER**, associate professor and Extension engineer, are employees of the University of Arkansas Division of Agriculture, Cooperative Extension Service, Little Rock.

FSA9520-PD-9-06N

Pursuant to 7 CFR § 15.3, the University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services (including employment) without regard to race, color, sex, national origin, religion, age, disability, marital or veteran status, genetic information, sexual preference, pregnancy or any other legally protected status, and is an equal opportunity institution.