

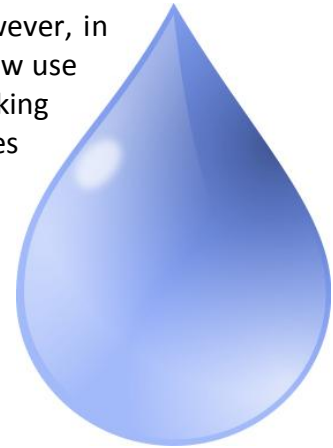
THE HOMEOWNERS' RESOURCE GUIDE TO WATER EFFICIENCY

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Why Water Efficiency?

Across the country, our growing population is putting stress on available water supplies. Between 1950 and 2000, the U.S. population nearly doubled. However, in that same period, public demand for water more than tripled! Americans now use an average of 100 gallons of water each day—enough to fill 1,600 drinking glasses! This increased demand has put additional stress on water supplies and distribution systems, threatening both human health and the environment.

There's a reason that water has become a national priority. A recent government survey showed at least 36 states are anticipating local, regional, or statewide water shortages by 2013. But by using water more efficiently, we can help preserve water supplies for future generations, save money, and protect the environment.



How Do We Use Water?

Water is the essential ingredient for many aspects of daily life, from personal use to agricultural, industrial, and commercial needs. The amount of water used is usually defined in terms of withdrawal—in other words, water that is collected from the Earth's surface or extracted from ground water.

There are four major categories of water users in the United States:

Domestic

Water used for residential, commercial, industrial, and public uses such as street cleaning, fire fighting, municipal parks, and public swimming pools. This includes both publicly supplied sources (water delivered by a public or private system) and self-supplied sources (water withdrawn directly from surface or ground water, such as from privately owned wells). Fifteen percent of American households are self-supplied, while more than 240 million people depend on public supply systems. Withdrawals for public supply systems total more than 43 billion gallons per day. Historically, nearly 60 percent of the public supply is delivered to households. Self-supplied water to households totals nearly 4 billion gallons per day.

Power Plants

Water used during the production of energy from fossil fuels, nuclear, or geothermal sources. Most water withdrawn for power plants is used for cooling purposes; power plants use 136 billion gallons of fresh water per day.

Agricultural

Water used to irrigate farm crops and for livestock, dairies, feedlots, fish farms, and other farm needs. Agricultural irrigation accounts for more than 142 billion gallons of fresh water per day.

Industrial & Mining

Water used for cooling in factories and washing and rinsing in manufacturing processes. Some of the major water-use industries include mining, steel, paper, and associated products, as well as chemicals and associated products. Industrial facilities withdraw more than 20 billion gallons of fresh water per day.

What Are the Benefits of Water Efficiency?**Save Water, Save Money**

The average household spends as much as \$500 per year on its water and sewer bill. By making just a few simple changes to use water more efficiently, you could save about \$170 per year. If all U.S. households installed water-efficient appliances, the country would save more than 3 trillion gallons of water and more than \$18 billion dollars per year! Also, when we use water more efficiently, we reduce the need for costly water supply infrastructure investments and new wastewater treatment facilities.

Savings Calculator

How much would you save by switching to WaterSense products?

<http://www.epa.gov/watersense/calculator/index.htm>

Save Water, Save Energy

It takes a considerable amount of energy to deliver and treat the water you use every day. American public water supply and treatment facilities consume about 56 billion kilowatt-hours (kWh) per year—enough electricity to power more than 5 million homes for an entire year. For example, letting your faucet run for five minutes uses about as much energy as letting a 60-watt light bulb run for 14 hours.

By reducing household water use you can not only help reduce the energy required to supply and treat public water supplies but also can help address climate change. In fact:

- If one out of every 100 American homes retrofitted with water-efficient fixtures, we could save about 100 million kWh of electricity per year—avoiding 80,000 tons of greenhouse gas emissions. That is equivalent to removing nearly 15,000 automobiles from the road for one year!
- If 1 percent of American homes replaced their older, inefficient toilets with WaterSense labeled models, the country would save more than 38 million kWh of electricity—enough to supply more than 43,000 households electricity for one month.

For more information, see www.epa.gov/watersense/pubs/waterenergy.htm.

Water Efficiency and the Environment

Depleting reservoirs and groundwater can put water supplies, human health, and the environment at serious risk. Lower water levels can contribute to higher concentrations of natural or human

pollutants. Using water more efficiently helps maintain supplies at safe levels, protecting human health and the environment.

Using Water Efficiently: What you can do at home...

Efficient water use can have major environmental, public health, and economic benefits by helping to improve water quality, maintain aquatic ecosystems, and protect drinking water resources. By using water more efficiently and by purchasing more water efficient products, we can also help mitigate the effects of drought. Efficiency measures can also save the homeowner money on their water and energy bills. This list of measures is not meant to be comprehensive, but rather a starting point.

Bathroom — where over half of all water use inside a house takes place:

- Do not let the water run while shaving or brushing teeth.
- Take short showers instead of tub baths. Turn off the water while soaping or shampooing.
- If you must use a tub, close the drain before turning on the water and fill the tub only half full. Bathe small children together.
- Never use your toilet as a waste basket.

Kitchen and Laundry — simple practices that save a lot of water:

- Keep drinking water in the refrigerator instead of letting the faucet run until the water is cool.
- Wash fruits and vegetables in a basin. Use a vegetable brush.
- Do not use water to defrost frozen foods; thaw in the refrigerator overnight.
- Scrape, rather than rinse, dishes before loading into the dishwasher; wash only full loads.
- Add food wastes to your compost pile instead of using the garbage disposal.
- Wash only full loads of laundry or use the appropriate water level or load size selection on the washing machine.

Equipment — homes with high-efficiency plumbing fixtures and appliances save about 30% of indoor water use and yield substantial savings on water, sewer, and energy bills:

- Consider purchasing high-efficiency toilets, or place a plastic container filled with water in the tank of your conventional toilet. Be sure it does not interfere with operation of the toilet's flush mechanisms.
- Install low-flow faucet aerators and showerheads.
- Consider purchasing a high efficiency washing machine which can save over 50% in laundry water and energy use.
- Repair all leaks. A leaky toilet can waste 200 gallons per day. To



By giving your bathroom a water efficiency makeover with [WaterSense](#) labeled toilets and faucets, you could save more than 11,000 gallons annually—and that's no drop in the bucket.

detect leaks in the toilet, add food coloring to the tank water. If the colored water appears in the bowl, the toilet is leaking. Toilet repair advice is available on www.toiletology.com/index.shtml.

Landscape Irrigation — depending on climate, up to 75 percent of a home's total water use during the growing season is for outdoor purposes (During drought conditions outdoor watering restrictions may be imposed, so some of the following tips will not apply.):

- Detect and repair all leaks in irrigation system.
- Use properly treated wastewater for irrigation where available.
- Water the lawn or garden during the coolest part of the day (early morning is best). Do not water on windy days.
- Water trees and shrubs, which have deep root systems, longer and less frequently than shallow-rooted plants that require smaller amounts of water more often. Check with the local extension service for advice on watering needs in your area.
- Set sprinklers to water the lawn or garden only – not the street or sidewalk.
- Use soaker hoses or trickle irrigation systems for trees and shrubs.
- Install moisture sensors on sprinkler systems.
- Use mulch around shrubs and garden plants to reduce evaporation from the soil surface and cut down on weed growth.
- Remove thatch and aerate turf to encourage movement of water to the root zone.
- Raise your lawn mower cutting height – longer grass blades help shade each other, reduce evaporation, and inhibit weed growth.
- Minimize or eliminate fertilizing, which promotes new growth needing additional watering.
- When outdoor use of city or well water is restricted during a drought, use the water from the air conditioning condenser, dehumidifier, bath, or sink on plants or the garden. Don't use water that contains bleach, automatic-dishwashing detergent or fabric softener.

The average single-family suburban home uses at least 30 percent of its water for outdoor purposes such as irrigation and as much as 70 percent in dry climates. Some experts estimate that more than 50 percent of landscape water is wasted due to evaporation, wind, or overwatering.

Other Outdoor Uses:

- Sweep driveways, sidewalks and steps rather than hosing off.
- Wash the car with water from a bucket, or consider using a commercial car wash that recycles water.
- When using a hose, control the flow with an automatic shut-off nozzle.
- Avoid purchasing recreational water toys which require a constant stream of water.
- Consider purchasing a new water-saving swimming pool filter.

- Use a pool cover to reduce evaporation when pool is not being used.
- Do not install or use ornamental water features unless they recycle the water. Use signs to show the public that water is recycled. Do not operate during a drought.

Water Conservation: Taking It to the Next Level

Everything you do to use less water, whether it's efficient equipment or changing behaviors is great for the environment and will save you money on your water bill. But how can you go beyond these basic water-saving techniques to truly minimize your consumption and conserve our most precious resource?

Rainwater Harvesting

Harvesting rainwater offers many advantages: it conserves municipal and well water; it is free; gravity fed systems conserve energy; it is low in salts and good for plants; and it can reduce flooding and erosion. Rainwater provides an excellent primary, supplementary, or alternative source of water. In terms of quality, it generally falls between groundwater and surface water. Rainwater can be used at multiple scales from residential to commercial and at the neighborhood or community level.

Harvesting rainwater can be as simple as purchasing a retrofit kit that connects to your rain gutter's downspout, and as advanced as designing a water collection, treatment and delivery system into a residential or commercial building.

- **Simple Solution:** Shop online, or at your local Home & Garden store for a rainbarrel kit. These kits usually consist of a hose that is connected to the downspout of your rain gutter. The hose diverts water from the gutter into plastic or ceramic barrel for use in the garden. The barrel should be covered to discourage contamination and mosquitos. With a hose attached to the bottom of the barrel, the stored water is perfect for watering plants, lawns and other outdoor, non-potable uses.
- **Advanced Solution:** Water system consultants work with homeowners to design and implement a system that collects water in a cistern that is either above or below ground. In new construction, this system can even utilize the roof as a delivery system to the cistern. Local laws vary regarding the end use of rainwater. Many municipalities allow it to be treated and used as drinking water provided its quality is maintained and tested regularly. Depending on local laws, a system can deliver all of the needs of a household, while eliminating many of the environmental problems and costs associated with stormwater run-off and treatment.



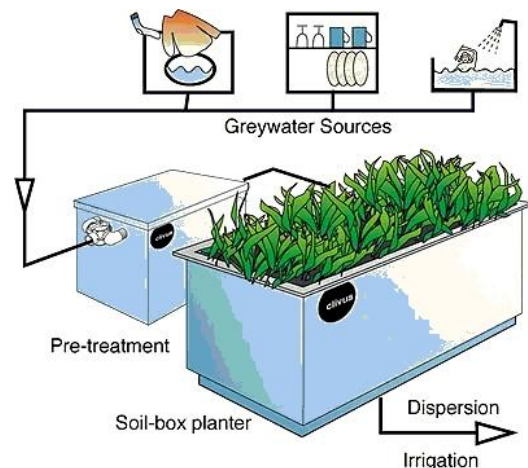
Greywater Recycling

Greywater is water that flows down sink, shower, and washing machine drains – but not the toilet. Greywater may contain traces of dirt, food, grease, hair, and household cleaning products. While greywater may look “dirty,” it is a safe and even beneficial source of irrigation water. If released into

rivers, lakes, or estuaries, the nutrients in greywater become pollutants, but to garden plants, they are valuable fertilizer. Aside from the obvious benefits of saving water (and money on your water bill), reusing your greywater keeps it out of the sewer or septic system, thereby reducing the chance that it will pollute local water bodies. Reusing greywater for irrigation reconnects urban residents and our backyard gardens to the natural water cycle.

Benefits of Greywater use

- **Lower fresh water use.** Greywater can replace fresh water in many instances, saving money and increasing the effective water supply in any regions. Residential water use is almost evenly split between indoor and outdoor. All except toilet water could be recycled indoors or outdoors, achieving the same or even better results than public systems with significantly less water diverted from nature.
- **Less strain on septic tank or treatment plant.** Greywater use greatly extends the useful life and capacity of septic systems. For municipal treatment systems, decreased wastewater flow means higher treatment effectiveness and lower costs.
- **Site unsuitable for a septic tank.** For sites with slow soil percolation or other problems, a greywater system can be a partial or complete substitute for a very costly, over-engineered system.
- **Less energy and chemical use.** Less energy and chemicals are used due to the reduced amount of both freshwater and wastewater that needs pumping and treatment. For those providing their own water or electricity, the advantage of a reduced burden on the infrastructure is felt directly.
- **Plant growth.** Greywater enables a landscape to flourish where water may not otherwise be available to support much plant growth.
- **Groundwater recharge.** Greywater application in excess of plant needs recharges groundwater.
- **Increased awareness of and sensitivity to natural cycles.** Greywater use yields the satisfaction of taking responsibility for the wise husbandry of an important resource.



Xeriscaping

The fundamental element of Xeriscape design is water conservation. Landscape designers constantly look for ways to reduce the amount of applied water and to maximize the use of natural precipitation. Xeriscapes do not have a single look - almost any landscaping style can be achieved. The principles can be applied to all or part of a yard, in any geographic region of North America.

Traditional landscaping techniques include the widespread use of lush-looking Kentucky Bluegrass lawns, punctuated with groupings of exotic ornamental shrubs, flowers, and trees. For many years it

was assumed that an unlimited water supply could provide the irrigation needed to maintain this vegetation, even in less hospitable hot or arid environments.

As increasing percentages of land area have been developed throughout the United States, water usage concerns have developed in nearly every region. In the East, problems with disposal of grass clippings and pollution from fertilizer/pesticide runoff have fueled the debate. Seasonal droughts may result in water restrictions in any part of the country. All these factors have encouraged the spread of xeriscaping techniques throughout the United States.

Benefits of Xeriscaping

- **Saves Water.** For most of North America, over 50% of residential water used is applied to landscape and lawns. Xeriscape can reduce landscape water use by 50 - 75%.
- **Less Maintenance.** Aside from occasional pruning and weeding, maintenance is minimal. Watering requirements are low, and can be met with simple irrigation systems.
- **No Fertilizers or Pesticides.** Using plants native to your area will eliminate the need for chemical supplements. Sufficient nutrients are provided by healthy organic soil.
- **Improves Property Value.** A good Xeriscape can raise property values which more than offset the cost of installation. Protect your landscaping investment by drought-proofing it.
- **Pollution Free.** Fossil fuel consumption from gas mowers is minimized or eliminated with minimal turf areas. Small turf areas can be maintained with a reel mower.
- **Provides Wildlife Habitat.** Use of native plants, shrubs and trees offer a familiar and varied habitat for local wildlife.



Xeriscaping cannot completely alleviate the need for landscaping maintenance and watering. Some plants may need more watering during the period that they are becoming established in the environment. Gardeners and landscape architects must plan and specify layouts more carefully to place appropriate vegetation in appropriate locations.