



Cover photographs from Gino Piscelli, Mississauga, Ontario; Joy Stewart, Bristol, Tennessee; Linda Andrews, Olympia, Washington; and John Galbraith, Grants Pass, Oregon

Overview 1

What Is Water-Smart Landscaping? 2

Why Use Water-Smart Landscaping? 4

How Is Water-Smart Landscaping Applied? 5

Water-Smart Landscape Irrigation Methods..... 7

Water-Smart Landscape Examples 9

For More Information and Resources..... 12

Overview

Having a beautiful yard doesn't have to mean using a lot of water or spending a lot of money.

The U.S. Environmental Protection Agency's (EPA's) WaterSense program can help you take some of the guesswork out of keeping a healthy yard while using less water.

Outdoor water use stresses existing water supplies by contributing to peak demand during summer months. During these hot, dry times, utilities must increase capacity to meet water needs, sometimes as much as three to four times the amount used during the winter.

This brochure provides a holistic approach to developing a water-smart landscape for your home or property. From thoughts on landscape design to daily maintenance, it includes a step-by-step process for any homeowner and examples of beautiful, water-saving landscapes from across the country.

WaterSense and this brochure make it easy to find products and information to ensure you have a water-smart landscape that you can be proud of—for both its natural beauty and its low impact on the environment.

WATERSENSE'S KEY STEPS FOR SAVING WATER OUTSIDE

- **Timing is everything.** Know how much water your landscape actually needs before you set your sprinkler. Your local water utility can offer recommendations and best times to water.
- **Look for the label.** WaterSense labeled irrigation controllers use local weather data to water only when needed. If your system uses a clock timer, consider upgrading to this smart technology.
- **Go with a pro.** Contractors certified through a WaterSense labeled program can audit, install, or maintain your system to ensure water isn't wasted. Ask for credentials!

look for



What Is Water-Smart Landscaping?

Water-smart landscaping produces attractive landscapes because it uses designs and plants that are well suited to local conditions.

Water is our most precious natural resource; without it, there is no life. Yet judging by our water use and consumption practices, many Americans take it for granted.

The average American uses 100 gallons of water per day—that's 320 gallons used every day by the average family. More and more Americans are demonstrating their water smarts indoors by retrofitting their homes with WaterSense labeled products. But outdoors, especially in the summer, the amount of water used by a household can exceed the amount used for all other purposes in the entire year. This is especially true in hot, dry climates.

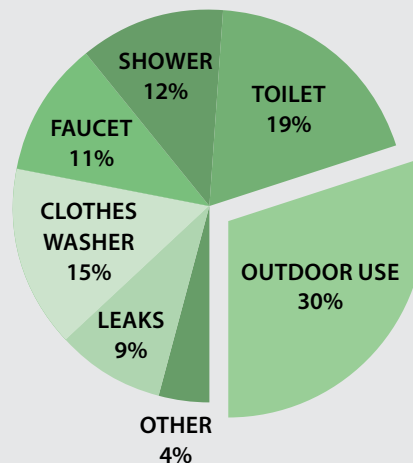
Gardening and lawn care account for the majority of this seasonal increase. Of the estimated 29 billion gallons of water used daily by households in the United States, more than 8.5 billion, or 30 percent, is devoted to outdoor water use. In dry climates, a household's outdoor water use can be as high as 60 percent. The majority of this is used for landscaping. In fact, it is estimated that the average American home consumes 58,000 gallons of water outdoors each year, mostly for irrigation.

Many mistakenly believe that stunning gardens and beautiful lawns are only possible through extensive watering, fertilization, and pesticide application. As this brochure

demonstrates, eye-catching gardens and landscapes that save water and protect the environment are, in fact, easily achieved by employing water-smart landscaping.

For specific information about how to best apply water-smart landscaping principles in your geographical area, consult with your county extension service and local garden and nursery centers. Local governments and water utilities also possess a wealth of information, suggestions, and sometimes incentives for using water more efficiently in all aspects of your life, including landscaping.

HOW MUCH WATER DO WE USE OUTDOORS?



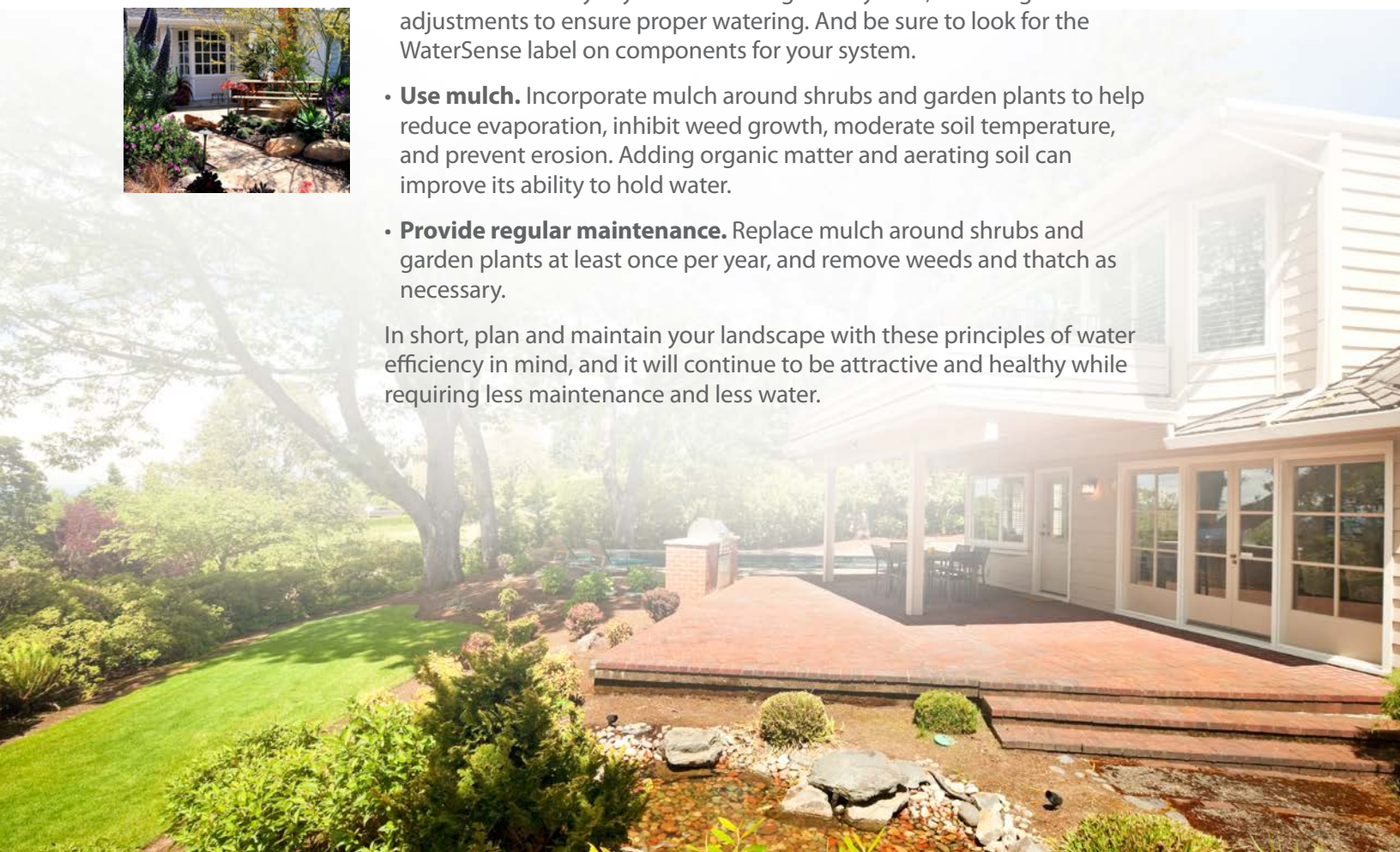
Source: American Water Works Association Research Foundation



KEY TIPS TO REMEMBER WHEN IT COMES TO WATER-SMART LANDSCAPING:

- **Go native or choose plants that need less water.** Once established, native and low water-using plants require little water beyond normal rainfall. If you're designing a new landscape or just sprucing up your current landscape, be sure to consider the water needs of the plants you choose.
- **Group plants according to their water needs.** Grouping vegetation with similar watering needs into specific "hydrozones" reduces water use by allowing you to water to each zone's specific needs. Turf areas and shrub areas should always be separated into different hydrozones because of their differing water needs.
- **Maintain healthy soils.** Healthy soils are the basis for a water-smart landscape; they effectively cycle nutrients, minimize runoff, retain water, and absorb excess nutrients, sediments, and pollutants.
- **Be selective when adding turf areas.** Turfgrass receives the highest percentage of irrigation water in traditional landscaping. To improve the aesthetics of your landscape and better manage outdoor water use, plant turfgrass only where it has a practical function.
- **Water wisely.** Know your plant's water needs and avoid watering during the heat of the day. If you have an irrigation system, make regular adjustments to ensure proper watering. And be sure to look for the WaterSense label on components for your system.
- **Use mulch.** Incorporate mulch around shrubs and garden plants to help reduce evaporation, inhibit weed growth, moderate soil temperature, and prevent erosion. Adding organic matter and aerating soil can improve its ability to hold water.
- **Provide regular maintenance.** Replace mulch around shrubs and garden plants at least once per year, and remove weeds and thatch as necessary.

In short, plan and maintain your landscape with these principles of water efficiency in mind, and it will continue to be attractive and healthy while requiring less maintenance and less water.



Why Use Water-Smart Landscaping?

Proper landscaping techniques not only create beautiful landscapes, but also benefit the environment and save water.

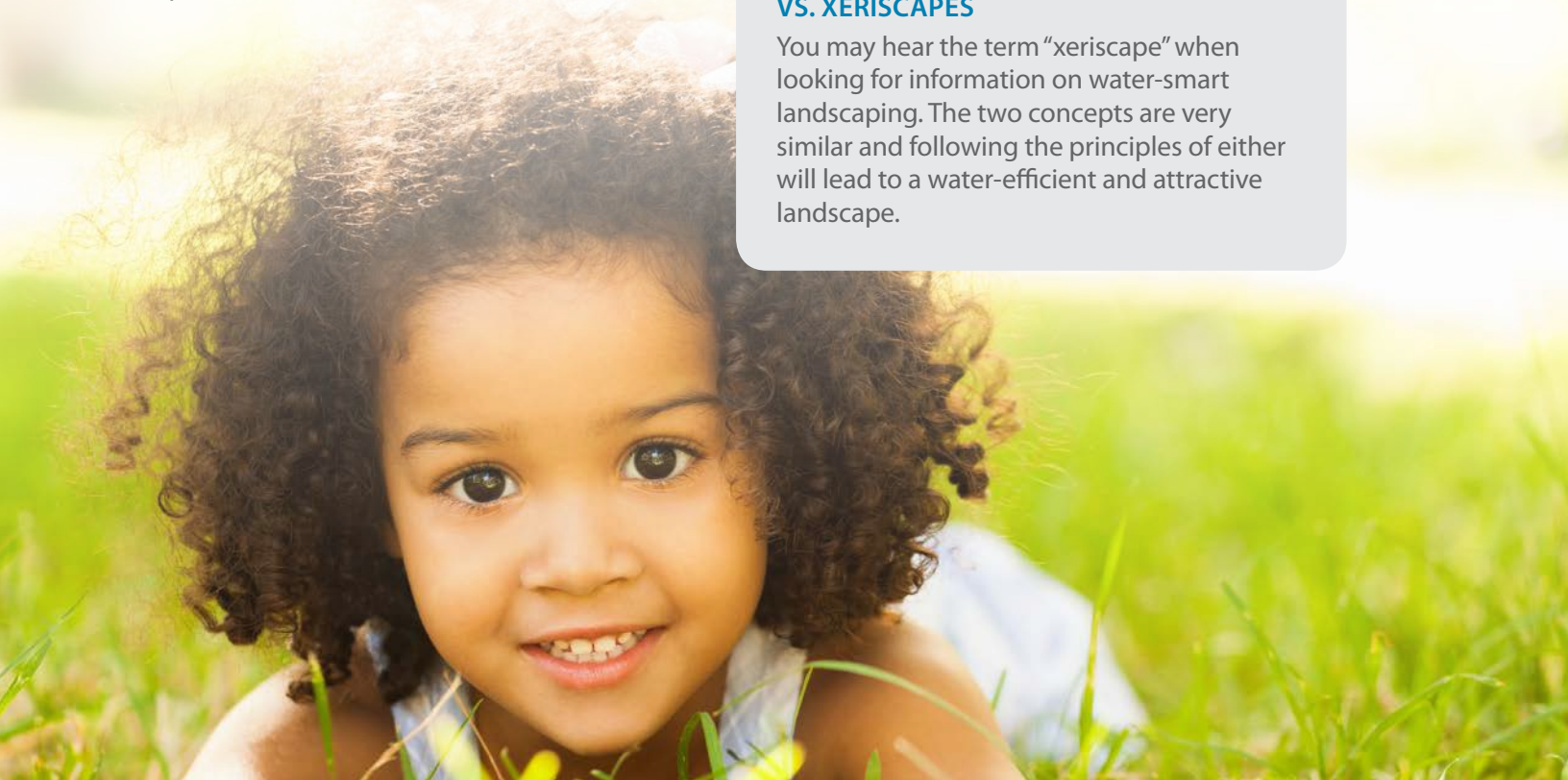
Water-smart yards often have increased curb appeal, which can lead to higher home values. In addition to requiring less water, fertilizer, pesticides, and usually less maintenance, water-smart landscapes offer many other benefits:

- Lower water bills from reduced water use.
- Conservation of natural resources and preservation of habitat for plants and wildlife, such as fish, birds, and waterfowl.
- Decreased energy use (and air pollution associated with its generation) because less pumping and treatment of water is required.
- Reduced home or office heating and cooling costs through the careful placement of shade trees and shrubs.
- Reduced runoff of stormwater and irrigation water that carries top soils, fertilizers, and pesticides into lakes, rivers, and streams.
- Fewer yard trimmings to be managed or landfilled.
- Reduced landscaping labor and maintenance costs.
- Extended life for water resource infrastructure (e.g., reservoirs, treatment plants, groundwater aquifers), thus reduced taxpayer costs.

If you've designed a water-smart landscape, you might be able to get all the water you need from rainfall alone. But sometimes, that might not be enough. Whether you water with a hose or use an irrigation system, smart watering habits can keep your lawn and landscape healthy and beautiful without wasting water or money.

WATER-SMART LANDSCAPES VS. XERISCAPES

You may hear the term "xeriscape" when looking for information on water-smart landscaping. The two concepts are very similar and following the principles of either will lead to a water-efficient and attractive landscape.



How Is Water-Smart Landscaping Applied?

Through careful planning, landscapes can be designed to be both pleasing to the senses and kind to the environment.

GO NATIVE OR CHOOSE PLANTS THAT NEED LESS WATER

Your landscape design should take into account your local climate as well as soil conditions. Focus on preserving as many existing trees and shrubs as possible, because established plants usually require less water and maintenance. Choose plants native to your region. Native plants, once established, require very little to no additional water beyond normal rainfall. Also, because they are adapted to local soils and climatic conditions, native plants commonly do not require the addition of fertilizers and are more resistant to pests and disease.

When selecting plants, avoid those labeled “hard to establish,” “susceptible to disease,” or “needs frequent attention,” as these types of plants frequently require large amounts of supplemental water, fertilizers, and pesticides. Be careful when selecting non-indigenous or exotic species, as some of them can become invasive. An invasive plant might be a water guzzler and will surely choke out native species. Your state or county extension service or local nursery can help you select appropriate plants for your area.

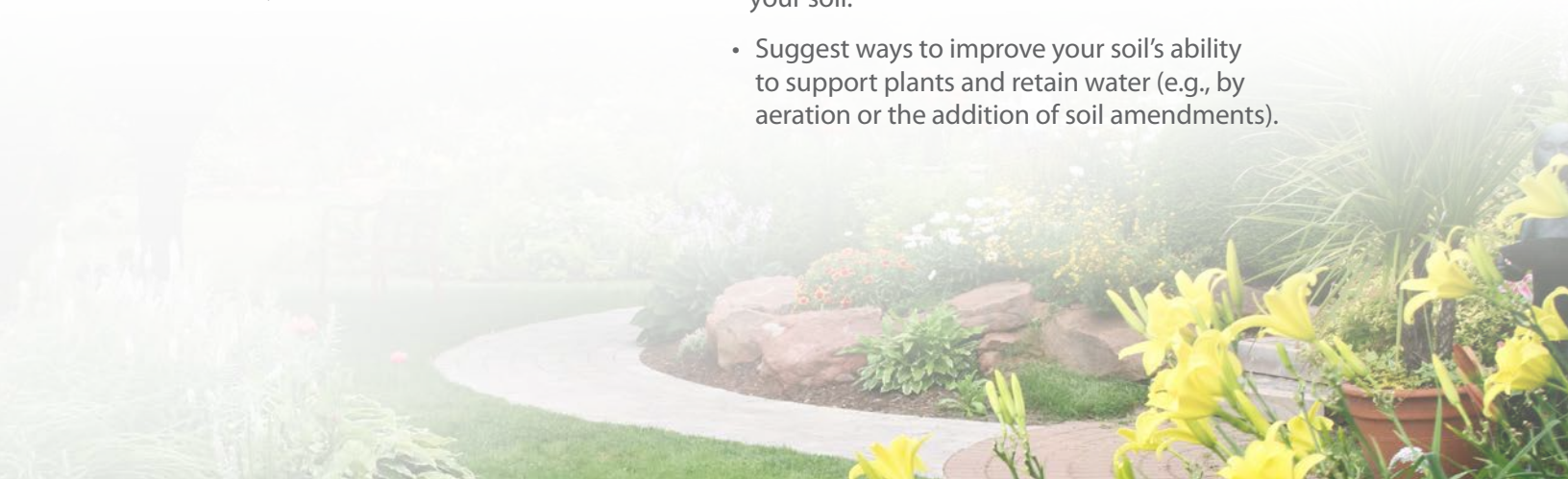
PLAN BEFORE YOU PLANT

Developing a landscape plan is the first and most important step in creating a water-smart landscape. Your plan should take into account the regional and microclimatic conditions of the site, existing vegetation, topography, intended uses of the property, and most importantly, the grouping of plants by their water needs. Also consider the plants’ sun or shade requirements and preferred soil conditions. A well-thought-out landscape plan can serve as your roadmap in creating beautiful, water-smart landscapes and allow you to continually improve your landscape over time.

MAINTAIN HEALTHY SOILS

Because soils vary from site to site, test your soil before beginning your landscape improvements. Check with your local garden center for soil test kits and proper amendments. Alternatively, your county extension service can likely:

- Analyze the pH levels; nutrient levels (e.g., nitrogen, phosphorus, potassium); and the sand, silt, clay, and organic matter content of your soil.
- Suggest ways to improve your soil’s ability to support plants and retain water (e.g., by aeration or the addition of soil amendments).



BE SELECTIVE WHEN ADDING TURF AREAS

How and where turf is placed in the landscape can significantly reduce the amount of irrigation water needed to support the landscape. Lawns require a large amount of supplemental water and generally greater maintenance than other vegetation. Use turf where it has a practical function, such as in play or recreation areas. Grouping turf areas can increase watering efficiency and significantly reduce evaporative and runoff losses. Select a type of grass that can withstand drought periods and become dormant during hot, dry seasons. Reducing or eliminating turf areas altogether further reduces water use.

WATER WISELY

Proper irrigation is an important part of using water efficiently outdoors, and applies in any landscape. For this reason, an entire section of this brochure addresses efficient irrigation; it can be found on page 7.

USE OF MULCHES

Mulches aid in greater retention of water by minimizing evaporation, reducing weed growth, moderating soil temperatures, and preventing erosion. Organic mulches also improve the condition of your soil as they decompose. Mulches are typically composed of wood bark chips, wood grindings, pine straws, nut shells, small gravel, and/or shredded

landscape clippings. Avoid using rock mulches in sunny areas or around non-arid climate plants, as they radiate large amounts of heat and promote water loss that can lead to scorching. Avoid using too much mulch, as excessive amounts can restrict water flow to plant roots.

APPROPRIATE MAINTENANCE

Water and fertilize plants only as needed. Too much water promotes weak growth and increases pruning and mowing requirements. Like any landscape, a water-smart yard can require regular pruning, weeding, pest control, and possibly irrigation.

As your landscape matures, it will require less maintenance and less water. Cutting turfgrass only when it reaches 2 to 3 inches promotes deeper root growth and a more drought-resistant lawn. As a rule of thumb, mow your turfgrass before it requires more than 1 inch to be removed. The proper cutting height varies, however, with the type of grass, so you should contact your county extension service or local nursery to find out the ideal cutting height for your lawn. Avoid shearing plants or giving them high-nitrogen fertilizers during dry periods because these practices encourage water-demanding new growth.



Water-Smart Landscape Irrigation Methods

Don't let your yard control your water bill.

The information included in this section applies to every yard, whether it is designed specifically with water efficiency in mind or not.

With today's common watering practices, up to 50 percent of the water applied to lawns and gardens is not absorbed by the plants. It is lost through evaporation, runoff, or being pushed beyond the root zone because it is applied too quickly or in excess of the plants' needs. The goal of efficient irrigation is to reduce these losses by applying only as much water as is needed to keep your plants healthy, whether you have a water-smart or a conventional landscape.

To promote the strong root growth that supports a plant during drought, water deeply and water only when the plant needs it. For clay soils, it is recommended to water less deeply, and in multiple cycles. Irrigating with consideration to soil type, the condition of your plants, the season, and weather conditions—rather than on a fixed schedule—significantly improves your watering efficiency and results in healthier plants. Grouping plants according to similar water needs also makes watering easier and more efficient.

Lawns, gardens, and landscapes can be irrigated manually or with an automatic irrigation system. Manual watering with a handheld hose tends to be the most water-efficient method. According to the American Water Works Association (AWWA) Research Foundation's *Residential End Uses of Water* study, households that manually water with a hose typically use 33 percent less water outdoors than the average household. The study also showed that households with

in-ground sprinkler systems used 35 percent more water; those with automatic timers used 47 percent more water; and those with drip irrigation systems used 16 percent more water than households without these types of systems. These results show that in-ground sprinkler and drip irrigation systems must be operated properly to be water-efficient.

YARDS WITHOUT AUTOMATIC IRRIGATION SYSTEMS

You can use a handheld hose or a sprinkler for manual irrigation. To reduce water losses from evaporation and wind, avoid sprinklers that produce a fine mist or spray high into the air. Soaker hoses can also be very efficient and effective when used properly. Also, consider using a handheld soil moisture probe to determine when irrigation is needed.

GET THE MOST OUT OF YOUR IRRIGATION SYSTEM

- **Set sprinklers to water the lawn or garden only**—not the street or sidewalk, because they don't grow!
- **Play "zone" defense.** Schedule each individual zone in your irrigation system to account for the type of sprinkler, sun or shade exposure, and the soil type for the specific area. The same watering schedule rarely applies to all zones in the system.
- **Consult a professional.** A certified irrigation professional can design, install, maintain, and/or audit your system to ensure optimal efficiency and that you are using the proper amount of water to maintain a healthy landscape.

YARDS WITH AUTOMATIC IRRIGATION SYSTEMS

To make automatic irrigation systems more efficient, consider upgrading your standard clock timer to a WaterSense labeled irrigation controller. And rain sensors or soil moisture sensors will also help prevent waste by ensuring that the sprinkler does not turn on during and immediately after rainfall or when soil moisture levels are above preprogrammed levels. Drip-type irrigation systems are considered the most efficient of the automated irrigation methods because they deliver water directly to the plants' roots.

With automatic systems, overwatering is most common during the fall when summer irrigation schedules have not been adjusted to the cooler temperatures. Irrigation system schedules should always be adjusted down in the fall to prevent overwatering in the colder months.

EPA's WaterSense program also recognizes professional certification programs that advance water-efficient irrigation techniques and practices. Whether you're upgrading your system, having it audited, or checking it at the beginning or end of the season, be sure to consult a professional who is certified by a WaterSense labeled program. Always ask for credentials to ensure that your contractor is knowledgeable about your plants' water needs and your irrigation system.

RAINWATER HARVESTING

Saving water from storms with rain barrels or cisterns is a great way to further reduce your water consumption. Homes with access to alternative sources of irrigation can reduce their water bills and the runoff that would otherwise go into the street. Commercial rooftop collection systems are available, but simply diverting your downspout into a covered barrel is an easy, low-cost approach. When collecting rainwater, cover all collection vessels to prevent animals and children from entering and to prevent mosquito breeding. Some states might have laws which do not allow collection of rainwater, so be sure to check with your state's water resource agency before implementing a rainwater collection system. Check with your local water utility or county government to see if there are rebate programs available in your area.

WATERSENSE LABELED IRRIGATION CONTROLLERS—TAKING THE GUESSWORK OUT OF WATERING

WaterSense labels irrigation controllers, a type of "smart" irrigation control technology that uses local weather data to determine whether your sprinkler system needs to turn on.

With proper installation, programming, and adjustments, WaterSense labeled irrigation controllers can help consumers save water, time, and money when compared to use of a conventional controller.



Water-Smart Landscape Examples

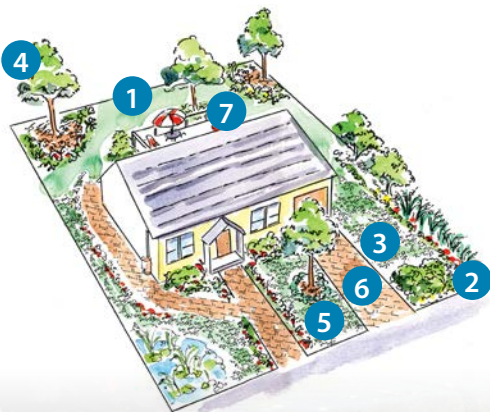
Designing a water-smart landscape can help you save money and water and doesn't have to mean piles of rocks and prickly cacti—in fact, it's just the opposite. Today's yards that incorporate hardy native plants, proper soil amendments, mulch, and smart irrigation systems (where needed), are beautiful, colorful, creative spaces that can add curb appeal and convenience.

Communities and local water utilities around the country support demonstration gardens that can provide information and inspiration to get you started. County cooperative extension offices, master gardeners, and local nurseries can also be great sources of information on native and adaptive plants that can thrive in your local climate.



For a climate that gets a moderate amount of rain with a typically wet summer and a long winter (e.g., some mid-Atlantic areas, such as Pittsburgh, Pennsylvania), this landscape design could be appropriate.

- 1 Low to medium water-using trees
- 2 Low to medium water-using groundcover
- 3 Mulched beds
- 4 Medium water-using turf
- 5 Low water-using shrubs



For a dry climate that gets minimal rain like Austin, Texas, a beautiful, water-smart yard includes a low water-using turf only where it is functional. A good alternative to turf is one of the many drought-tolerant groundcovers, such as *Phyla nodiflora*.

- 1 Low water-using turf
- 2 Low water-using shrubs
- 3 Low water-using groundcover
- 4 Low water-using trees
- 5 Mulched beds
- 6 Permeable pavers
- 7 Deck

MISSISSAUGA, ONTARIO



Photo credit: Gino Piscelli

This landscape was transformed from turfgrass plagued by stormwater runoff problems into a water-smart paradise. Nearly 75 percent of the lawn was replaced with native wildflowers, trees, shrubs, and grasses that are appropriate for local water conditions. To help reduce runoff, the property also features a 1,400-gallon pond, four rain gardens, a vegetated green roof, and a dry stream bed that collects and routes stormwater into the rain gardens.

This landscape design creates the aesthetics of a traditional garden with modern, low water-using plants, flowers, colors, and textures. In this sunny yard, placing the right plant in the right place was the key to creating a water-smart landscape. The owners installed a number of drought-tolerant plants that thrive in direct sunlight. Mulch was used to help reduce evaporation, inhibit weed growth, moderate soil temperature, and prevent erosion. The landscape requires little to no supplemental water, even during the peak summer months.

BRISTOL, TENNESSEE



Photo credit: Joy Stewart

OLYMPIA, WASHINGTON



Photo credit: Linda Andrews

This compact, no-turf landscape features both edible and drought-tolerant plants. A unique patio of permeable crushed rock and cobalt recycled glass aggregate adds eye-catching interest to the landscape. The plants are efficiently watered by a drip irrigation system, which irrigates slowly to minimize evaporation and runoff. The landscape also features a rain garden that captures rainwater from roofs, driveways, and sidewalks which reduces runoff by allowing stormwater to slowly soak into the ground.

GRANTS PASS, OREGON



Photo credit: John Galbraith

This drought-tolerant, regionally appropriate garden turns heads with its year-round color and texture. The owners transformed a high water-using landscape into a water-smart oasis by choosing drought-tolerant plants that require little water beyond normal rainfall. To get the most out of their irrigation system, the owners make use of water-efficient technologies such as rotary spray heads and a weather-based irrigation controller. When needed, the rotary spray heads deliver water in a thick stream, ensuring more water reaches plants and less is lost to evaporation and wind.

The owners of this home wanted to replace their turfgrass with a fun, low-maintenance landscape cover that was both beautiful and efficient. In keeping with the home's simple, modern features, the new landscape consists of low water-using shrubs, perennials, and ornamental grasses that sweep across the front of the house. The planting areas are dressed with aged bark mulch throughout to reduce evaporation and minimize erosion. An irrigation system utilizing rotary spray heads provides water, when needed, to the plantings.

DEL MAR, CALIFORNIA



Photo credit: Chris Roesink

JUNCTION, TEXAS



Photo credit: Scott Richardson; designed by Billy Kniffen

Junction Middle School's water-savvy landscape features rain gardens and a large palette of native perennials. Five rain gardens capture rainwater from the school's roof, reducing stormwater runoff and increasing infiltration. Nearly 300 native grasses, shrubs, and trees cover the landscape, which needs minimal supplemental water. Mulch covers the soil around the plants, reducing water loss from evaporation. An efficient, drip irrigation system irrigates plants only during the driest months. Volunteer students and adults donated their time to create this conservation landscape, dedicated to the memory of Opal B. Roberts, an exceptional teacher.

FOR MORE INFORMATION

The following list of organizations can provide more information on water-efficient landscaping. This is not an exhaustive list; it is intended to help you locate local information sources and possible technical assistance.

Your local water management district can often provide information on water conservation, including water-efficient landscaping practices. Your state or county extension service is also an excellent source of information. Many extension services provide free publications and advice on home landscaping issues, including tips on plant selection and soil improvement. Some also offer a soil analysis service for a nominal fee. A directory of Cooperative Extension System Offices can be found on the USDA's website (www.csrees.usda.gov/Extension).

A directory of Master Gardener programs can be found on the American Horticultural Society's website, (www.ahs.org/master_gardeners).

The WaterSense website (www.epa.gov/watersense) can link you to a number of additional resources, including information on how to choose the right plants for your landscape (www.epa.gov/watersense/outdoor/what_to_plant.html).

To contact WaterSense by phone, call toll-free (866) WTR-SENS (987-7367).

RESOURCES AND ACKNOWLEDGEMENTS

The brochure updates a 2002 brochure on water-efficient landscaping which included technical advice from Alice Darilek, Elizabeth Gardner, and David Winger.

The following is a partial list of publications on resource-efficient landscaping. For more information, particularly on plants suited to your locale, consult your local library, county extension service, nursery, garden clubs, or water utility.

Ball, Ken and American Water Works Association (AWWA) Water Conservation Committee. *Xeriscape Programs for Water Utilities*. Denver: AWWA, 1990.

Bennett, Jennifer. *Dry-Land Gardening: A Xeriscaping Guide for Dry-Summer, Cold-Winter Climates*. Buffalo: Firefly, 1998.

Bennett, Richard E. and Michael S. Hazinski. *Water-Efficient Landscape Guidelines*. Denver: AWWA, 1993.

Brenzel, Kathleen N., ed. *Western Garden Book*, 2001 Edition. Menlo Park: Sunset Publishing Corporation, 2001.

City of Aurora, Colorado, Utilities Department. *Landscaping for Water Conservation: Xeriscape!* Aurora: Colorado Utilities Department, 1989.

Johnson, Eric and Scott Millard. *The Low-Water Flower Gardener: 270 Unthirsty Plants for Color, Including Perennials, Ground Covers, Grasses & Shrubs*. Tucson: Ironwood Press, 1993.

Knopf, James M. *The Xeriscape Flower Gardener*. Boulder: Johnson Books, 1991.

Knopf, James M., ed. *Waterwise Landscaping with Trees, Shrubs, and Vines: A Xeriscape Guide for the Rocky Mountain Region, California, and the Desert Southwest*. Boulder: Chamisa Books, 1999.

Knox, Kim, ed. *Landscaping for Water Conservation: Xeriscape*. Denver: City of Aurora and Denver Water, 1989.

Mayer, Peter W. and William B. De Oreo. *Residential End Uses of Water*. Aqua craft, Inc. Water Engineering and Management. AWWA, 1998.

Nellis, David W. *Seashore Plants of South Florida and the Caribbean: A Guide to Identification and Propagation of Xeriscape Plants*. Sarasota: Pineapple Press, Inc., 1994.

Perry, Bob. *Landscape Plants for Western Regions: An Illustrated Guide to Plants for Water Conservation*. Claremont: Land Design Publishing, 1992.

Phillips, Judith. *Natural by Design: Beauty and Balance in Southwest Gardens*. Santa Fe: Museum of New Mexico Press, 1995.

Phillips, Judith. *Plants for Natural Gardens: Southwestern Native & Adaptive Trees, Shrubs, Wildflowers & Grasses*. Santa Fe: Museum of New Mexico Press, 1995.

Robinette, Gary O. *Water Conservation in Landscape Design and Maintenance*. New York: Nostrand Reinhold, 1984.

Rumary, Mark. *The Dry Garden*. New York: Sterling Publishing Co., Inc., 1995.

Springer, Lauren. *The Undaunted Garden: Planting for Weather-Resilient Beauty*. Golden: Fulcrum Publishing, 1994.

Springer, Lauren. *Waterwise Gardening*. New York: Prentice Hall Gardening, 1994.

Stephens, Tom, Doug Welsh, and Connie Ellefson. *Xeriscape Gardening, Water Conservation for the American Landscape*. New York: Macmillan Publishing, 1992.

Sunset Books, eds. *Waterwise Gardening: Beautiful Gardens with Less Water*. Menlo Park: Lane Publishing Company, 1989.

Vickers, Amy. *Handbook of Water Use and Conservation*. Amherst, MA: WaterPlow Press, 2001.

Weinstein, Gayle. *Xeriscape Handbook: A How-To Guide to Natural, Resource-Wise Gardening*. Golden: Fulcrum Publishing, 1998.

Williams, Sara. *Creating the Prairie Xeriscape*. Saskatchewan: University Extension Press, 1997.

Winger, David, ed. *Xeriscape Plant Guide: 100 Water-Wise Plants for Gardens and Landscapes*. Golden: Fulcrum Publishing, 1998.

Winger, David, ed. *Xeriscape Color Guide*. Golden: Fulcrum Publishing, 1998.

Winger, David, ed. *Evidence of Care: The Xeriscape Maintenance Journal*, 2002, Vol. 1, Colorado WaterWise Council, 2001.

Cover photographs from Gino Piscelli, Joy Stewart, Linda Andrews, and John Galbraith.

Illustrations by Mindy Mitchell.



U. S. Environmental Protection Agency
(4204M)

(866) WTR-SENS (987-7367)

EPA WaterSense Program

EPA 832-K-12-2002
July 2013