

driven programming system. Drip-type irrigation systems are considered the most efficient of the automated irrigation methods because they deliver water directly to the plants' roots. It is also important to revise your watering schedule as the seasons change. Over-watering is most common during the fall when summer irrigation schedules have not been adjusted to the cooler temperatures.

To further reduce your water consumption, consider using alternative sources of irrigation water, such as gray water, reclaimed water, and collected rainwater. According to the AWWA Research Foundation, homes with access to alternative sources of irrigation reduce their water bills by as much as 25 percent.<sup>4</sup> Graywater is untreated household waste water from bathroom sinks, showers, bathtubs, and clothes washing machines. Graywater systems pipe this used water to a storage tank for later outdoor watering use. State and local graywater laws and policies vary, so you should investigate what qualifies as gray water and if any limitations or restrictions apply. Reclaimed water is waste water that has been treated to levels suitable for nonpotable uses. Check with local water officials to determine if it is available in your area. Collected rainwater is rainwater collected in cisterns, barrels, or storage tanks. Commercial rooftop collection systems are available, but simply diverting your downspout into a covered

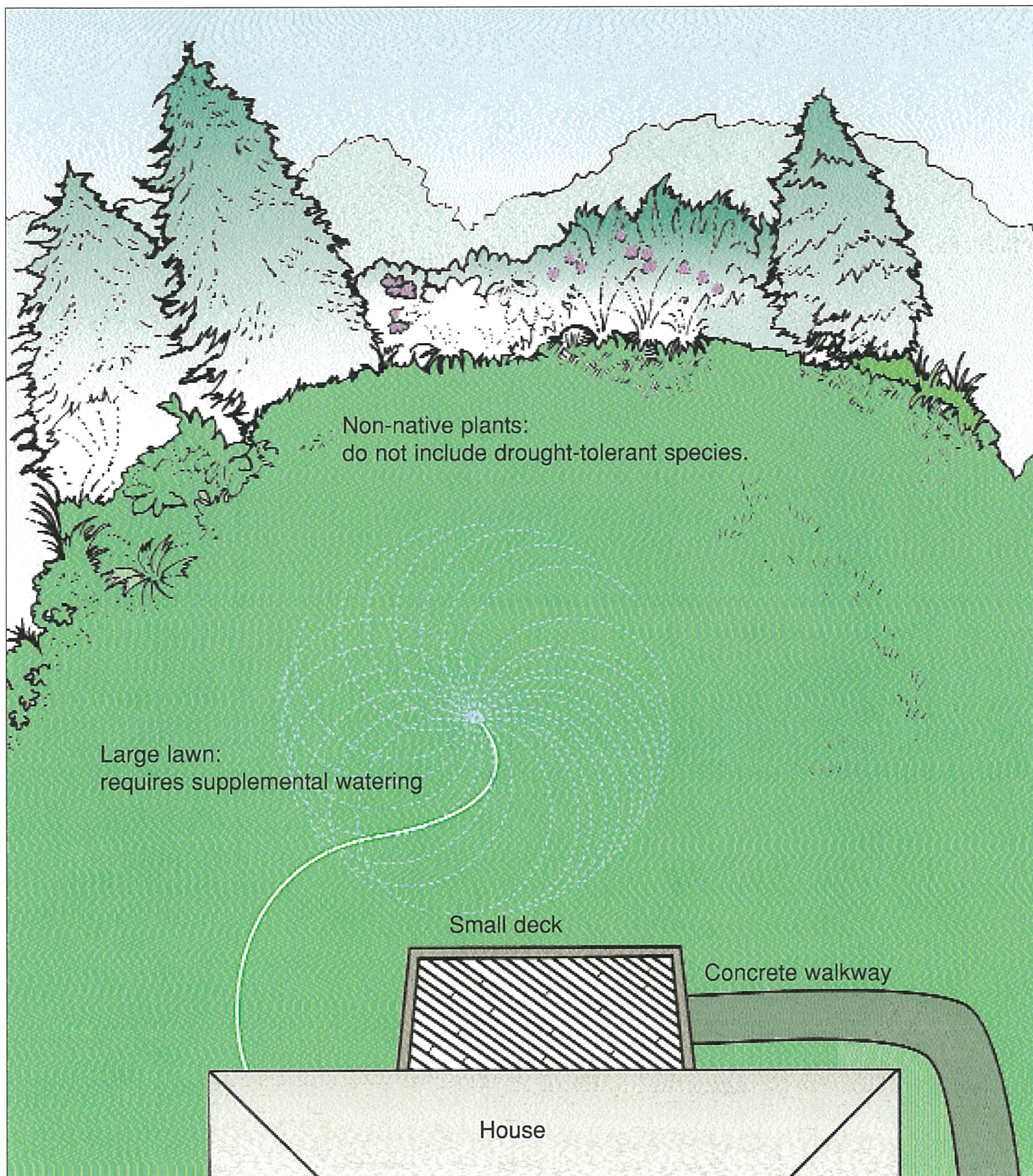


*Red Valerian (Centranthus ruber)*

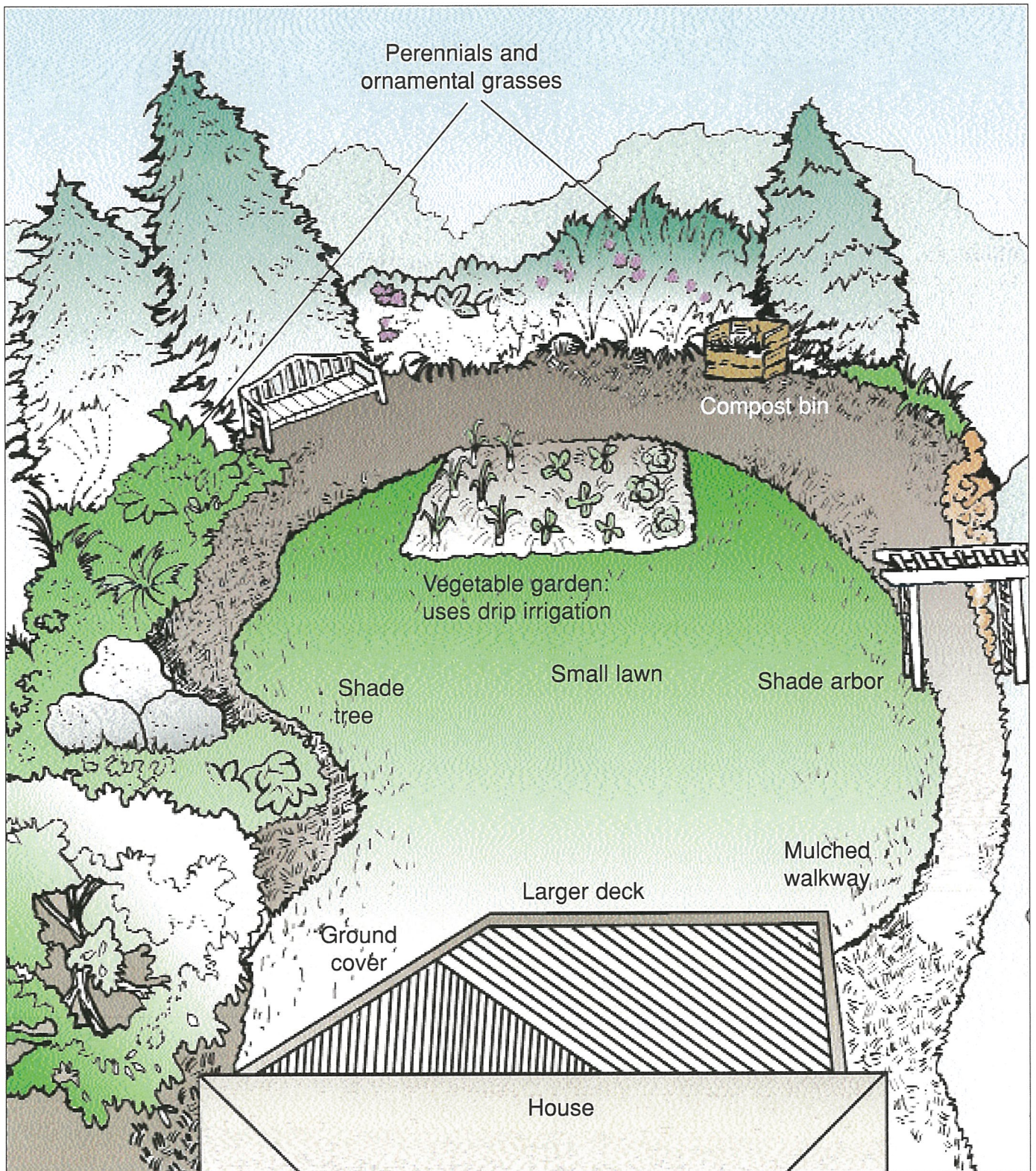
barrel is an easy, low-cost approach. When collecting rainwater, cover all collection vessels to prevent animals and children from entering and to prevent mosquito breeding. Some states might have laws which do not allow collection of rainwater, so be sure to check with your state's water resource agency before implementing a rainwater collection system.

<sup>4</sup> AWWA Research Foundation. 1999. *Residential End Uses of Water*. <[www.waterwiser.org](http://www.waterwiser.org)>

# Non-xeriscaping



# Xeriscaping



# Examples of Successful Water-efficient Landscaping Projects

**W**ater-efficient landscaping techniques can be used by individuals, companies, state, tribal, and local governments, and businesses to physically enhance their properties, reduce long-term maintenance costs, and create environmentally conscious landscapes. The following examples illustrate how water-efficient landscapes can be used in various situations.



*Oriental Poppies (Papaver orientale)*

## Homeowner–public/private partnership

- The South Florida Water Management District, the Florida Nurserymen and Growers Association, the Florida Irrigation Society, and local businesses worked together to produce a television video called “Plant It Smart with Xeriscape.” The video shows how a typical Florida residential yard can be retrofitted with Xeriscape landscaping to save energy, time,

and money. The showcase yard (selected from 70 applicants) had a history of heavy water use—more than 90,000 gallons per month. After the retrofit, the yard’s aesthetic value was enhanced; plus it now uses 75 percent less water and relies on yard trimmings for mulch and compost.

- The Southwest Florida Water Management District (SWFWMD), the City of St. Petersburg, and Pinellas County, Florida, produced a video called “Xeriscape It!” It shows a landscape being installed using the seven Xeriscape principles. The SWFWMD also funded several Xeriscape demonstration sites and maintains a Xeriscape demonstration garden at its Brooksville, Florida, headquarters. The garden features a variety of native and non-native plants and is available for public viewing, along with a landscape plant identification guide.
- Residents of Glendale, Arizona, can receive a \$100 cash rebate for installing or converting more than half of their landscapable area to non-grass vegetation. The Glendale Water Conservation Office conducts an inspection of the converted lawn to ensure compliance with rebate requirements and then issues a rebate check to the homeowner. The purpose of the Landscape Rebate Program is to permanently reduce the amount of water used to irrigate grass throughout Glendale.

## State government

- Although perceived as a water-rich state, Florida became the first to enact a statewide Xeriscape law. Florida’s legislature recognized that its growing population and vulnerable environment necessitated legal safeguards for its water resources. The Xeriscape law requires Florida’s Departments of Management Ser-

vices and Transportation to use Xeriscape landscaping on all new public properties and to develop a 5-year program to phase in Xeriscape on properties constructed before July 1992. All local governments must also consider requiring the use of Xeriscape and offering incentives to install Xeriscaping.

- Texas also developed legislation requiring Xeriscape landscaping on new construction projects on state property beginning on or after January 1994. Additional legislation, enacted in 1995, requires the Department of Transportation to use Xeriscape practices in the construction and maintenance of roadside parks. All municipalities may consider enacting ordinances requiring Xeriscape to conserve water.

## City government

In Las Vegas, Nevada, homeowners can receive up to \$1,000 for converting their lawn to Xeriscape, while commercial landowners can receive up to a \$50,000 credit on their water bill. The city and several other surrounding communities hope these eye-catching figures will help Las Vegas meet its goal of saving 25 percent of the water it would otherwise have used by the year 2010; to date, it has saved 17 percent. Local officials plan to reach the target with the assistance of incentive programs encouraging Xeriscape, a city ordinance limiting turf to no more than 50 percent of new landscapes, grassroots information programs, and a landscape awards program specifically for Xeriscaped properties. Preliminary results of a five-year study show that residents who converted a portion of their lawns to Xeriscape reduced total water consumption by an average of 33 percent. The xeric vegetation required less than a quarter of the water typically used and one-third the maintenance (both in labor and expenditures) compared to traditional turf.



*Yellow Ice Plant (Delosperma nubigenum) close-up*

## Developers

Howard Hughes Properties (HHP), a developer and manager of more than 25,000 acres of residential, commercial, and office development property, has enthusiastically used drought tolerant landscaping on all of its properties since 1990. Most of the company's properties are located in Las Vegas, one of the country's fastest growing metropolitan areas. To conserve resources, the city and county have implemented regulations requiring developers to employ certain Xeriscape principles in new projects. Specifically, a limited percentage of grass can be used on projects, and it must be kept away from streets. As the area's first large-scale developer to recognize the need and value in incorporating drought tolerant landscaping in parks, streetscapes, and open spaces, HHP uses native and desert-adaptive plants that survive and thrive in the Las Vegas climate with minimal to moderate amounts of water.

Drip system irrigation controllers are linked to weather stations that monitor the evapotranspiration rate. This allows HHP to determine the correct amount of water to be applied to plants at any given time. HHP tests the irrigation systems regularly and adds appropriate soil amendments to promote healthy plant growth. The maintenance program also includes pest management, the use of mulching mowers, and the use of rock mulch top dressing on all non-turf planting areas. These measures combine to ensure a beautiful, healthy, and responsible landscape.

## Public/private partnerships

Even the most water-conscious homeowners in Southern California are over-watering by 50 to

70 gallons per day. The excess water washes away fertilizers and pesticides, which pollute natural waterways. The quantity of water wasted (and the dollars that pay for it) are even more substantial for large-scale commercial properties and developments.

An innovative partnership in Orange County links landscape water management, green mate-

rial management, and non-point source pollution prevention goals into one program—the Landscape Performance Certification Program. This program emphasizes efficient landscape irrigation and features a “landscape irrigation budget” based on a property’s landscape area, type, and the daily weather. The Municipal Water District monitors actual water use through a system of 12,000 dedicated water meters installed by participating landscape managers.

Participants, including landscapers, property managers, and homeowner associations, can compare the actual cost of water used on their property with the calculated budget. Those staying within budget are awarded certification, a proven marketing tool. This new voluntary program is implemented by the Municipal Water District with input from the California Landscape Contractors’ Association, the Orange County Integrated Management Department, the Metropolitan Water District of Southern California, and local nurseries and has the support of 32 retailing water suppliers. The program is already credited with increasing the use of arid-climate shrubs and landscaping to accommodate drip irrigation, and has resulted in cost savings to water customers.



*Miscanthus sinensis*  
(Miscanthus grass, also called  
Maiden grass) variety with  
leaves turning yellow for fall.



# For More Information

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

## Water Management Districts or Utilities

Your local water management district often can provide information on water conservation, including water efficient landscaping practices. Your city, town, or county water management district can be found in the Blue Pages section of your local phone book or through your city, town, or county's Web site if it has one. If you do not know your city, town, or county's Web site, check for a link on your state's Web site. URLs for state Web sites typically follow this format: <www.state.(two letter state abbreviation).us>.

## State/County Extension Services

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. Your county extension service can be found in the Blue Pages section of your local phone book under the county government section or through your county's Web site if it has one. The U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service ([www.reeusda.gov/statepartners/usa.htm](http://www.reeusda.gov/statepartners/usa.htm)) provides an online directory of land-grant universities which can help you locate your state extension service. Government Guide ([www.governmentguide.com](http://www.governmentguide.com)) is yet another online resource that might prove helpful in locating state or local agencies.

## Organizations

The following is a partial list of organizations located across the United States that provide helpful information on water-efficient landscaping.

### American Water Works Association (AWWA)

6666 West Quincy Avenue

Denver, CO 80235

Telephone: 303 794-7711

and

1401 New York Avenue, NW, Suite 640

Washington, DC 20005

Telephone: 202 628-8303

Web: <[www.awwa.org](http://www.awwa.org)>

### Arizona Municipal Water Users Association

(AMWUA)

Web: <[www.amwua.org/program-xeriscape.htm](http://www.amwua.org/program-xeriscape.htm)>

### BASIN

City of Boulder Environmental Affairs

P.O. Box 791

Boulder, CO 80306

Phone: 303 441-1964

E-mail: [basin@bcn.boulder.co.us](mailto:basin@bcn.boulder.co.us)

Web: <[bcn.boulder.co.us/basin/local/seven.html](http://bcn.boulder.co.us/basin/local/seven.html)>

### Denver Water

1600 West 12th Avenue

Denver, CO 80204

Phone: 303 628-6000

Fax: 303 628-6199

TDDY: 303 534-4116

Office of Water Conservation hotline:

303 628-6343

E-mail: [jane.earle@denverwater.org](mailto:jane.earle@denverwater.org)

Web: <[www.water.denver.co.gov/conservation/conservframe.html](http://www.water.denver.co.gov/conservation/conservframe.html)>

### New Mexico Water Conservation Program/Water Conservation Clearinghouse

P. O. Box 25102

Santa Fe, NM 87504

Phone: 800 WATER-NM

E-mail: [waternm@ose.state.nm.us](mailto:waternm@ose.state.nm.us)

Fax: 505 827-3813

Web: <[www.ose.state.nm.us/water-info/conservation/index.html](http://www.ose.state.nm.us/water-info/conservation/index.html)>

### Project WET - Water Education for Teachers

201 Culbertson Hall

Montana State University

Bozeman, MT 59717

Phone: 406 994-5392

Web: <[www.montana.edu/wwwwet](http://www.montana.edu/wwwwet)>

### Rocky Mountain Institute

1739 Snowmass Creek Road

Snowmass, CO 81654-9199

Phone: 970 927-3851

Web: <[www.rmi.org](http://www.rmi.org)>



*Turkish Speedwell (Veronica liwanensis) in background and tulips in foreground.*

**Southern Nevada Water Authority**  
1001 S. Valley View Boulevard, Mailstop #440  
Las Vegas, NV 89153  
Phone: 702 258-3930  
Web: <www.snwa.com>

**Southwest Florida Water Management District**  
2379 Broad Street  
Brooksville, FL 34604-6899  
Phone: 352 796-7211 or 800 423-1476 (Florida only)  
Web: <www.swfwmd.state.fl.us/watercon/xeris/swfxeris.html>

**Sustainable Sources Green Building Program: Sustainable Building Source Book**  
E-mail: info@greenbuilder.com  
Web: <www.greenbuilder.com/sourcebook/xeriscape.html>

**Water Conservation Garden – San Diego County**  
12122 Cuyamaca College Drive West  
El Cajon, CA 92019  
Phone: 619 660-0614  
Fax: 619 660-1687

E-mail: info@thegarden.org  
Web: <www.thegarden.org/garden/xeriscape/index.html> and <www.sdcwa.org/manage/conservation-xeriscape.phtml>

**WaterWiser: The Water Efficiency Clearing House**  
(Operated by AWWA in cooperation with the U.S. Bureau of Reclamation)  
6666 West Quincy Avenue  
Denver, CO 80235  
Phone: 800 559-9855  
Fax: 303 794-6303  
E-mail: bewiser@waterwiser.org  
Web: <www.waterwiser.org>

**Xeriscape Colorado!, Inc.**  
P.O. Box 40202  
Denver, CO 80204-0202  
Web: <www.xeriscape.org>

## Resources

The following is a partial list of publications on resource efficient landscaping. For even 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 Water Conservation Committee. *Xeriscape Programs for Water Utilities*. Denver: American Water Works Association, 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: American Water Works Association, 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.

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.