

Water Facts

We universally agree that water is a limited, but naturally recycling resource. We generally accept that...

- 97% of the world's water lies in the oceans and seas
- 2% is locked up as glacial ice
- 1% is available for human use.

With only minor fluctuations, these percentages have remained unchanged for eons. Scientists have concluded that the amount of water present on Earth has remained stable at an estimated 290 million cubic miles of water. Conversely, the human demand for water has risen at remarkable rates as a result of increasing population and water use.

Water shortages and water-quality issues are global, not simply local, and there is a growing need to both conserve and clean the world's water supplies. Emergence of water issues is a matter of *when, not if*. Solutions must be based on site-specific determinants and have long-term considerations.

What is an inch of water?

One inch of water a week is generally recommended for maintaining a viable landscape in a temperate zone, including vegetables, turf, trees and flowers, in a temperate zone. But how much is 1 inch of water?

1 inch of water (applied or rainfall) on

- 1,000 square feet equals 624 gallons or 5,200 pounds
- 1 acre equals 27,154 gallons or 200,000 pounds
- 1 square mile equals 17.4 million gallons or 145 million pounds

1 gallon of water equals

- 128 fluid ounces, 8.337 pounds, 3.782 kilograms
- 15,100 drops, 16 cups, 8 pints, 4 quarts
- 231 cubic inches, 0.2337 cubic feet
- 0.83262 British or Imperial gallon
- 3,785.4 milliliters or cubic centimeters

1 cubic foot equals 7.48 gallons, 62.4 pounds

1 cubic yard equals 202 gallons, 1,685 pounds, 764.5 liters

1 cubic meter equals 264.2 gallons, 2,002 pounds

1 acre-foot (12-inch depth across 43,560 square feet) equals 325,851 gallons, 2.7 million pounds.

Source: TPI Water Right guide

Drought Basics

The reality is that we can never exhaust our water supply, nor can we ever increase it—we can only recycle it. Our water emergencies would evaporate if homeowners and communities use water more efficiently and take advantage of the recycling technology that exists today.

What Causes Water Shortages?

Water shortages occur for many reasons:

- weather
- industrialization
- urbanization
- economic expansion
- land use
- development
- preservation.

Not all causes are based on an *actual shortage of water*. In some cases development outpaces infrastructure. Homes and commercial structures are built, but local water service can't keep up because of supply, treatment capacity or quantity of pipe and pumping stations. In other cases environmental concerns, regulations or legal decisions restrict the amount of water that can be used to serve an area's population.

Mechanical and structural shortcomings also cause water shortages. A main pump or pipe breaks, and water temporarily stops flowing into homes and businesses. In older water distribution systems, more than 50% of treated water can be lost through major leaks.

What Are the Effects of Drought?

- Drought, according to the National Oceanic and Atmospheric Administration (NOAA), causes annual economic losses of \$6 billion – \$8 billion, more than the losses caused by floods (\$2.41 billion) or hurricanes (\$1.2 billion – \$4.8 billion).
- Using recycled water (treated to almost drinkable standards) on landscaping would save this country enough fresh water in a year for everyone in New York City to take a 10-minute shower every day for 4.5 years.
- Loss of revenue to green industry businesses due to delayed landscape projects and reduced retail sales.

Find Out More About Drought in Your Area

Additional Resources:

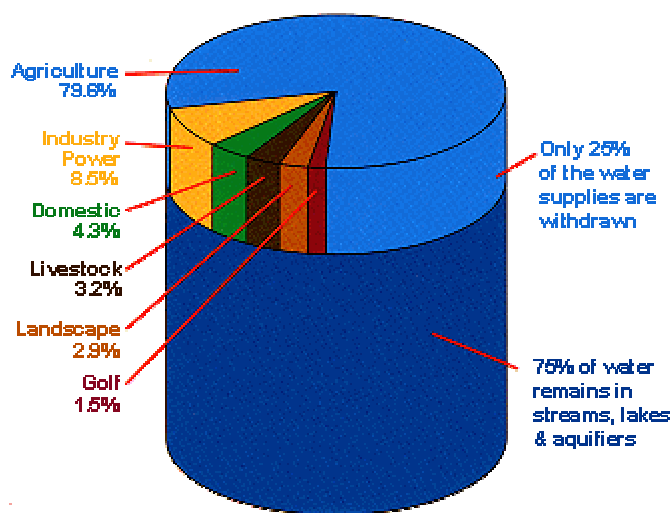
Web Sites

- National Drought Policy Commission. (www.fsa.usda.gov/drought/)
- National Drought Mitigation Center. (www.drought.unl.edu/index.htm)
- Environmental Protection Agency (EPA). (www.epa.gov/owm/water-efficiency/drouhome.htm)
- National Oceanic and Atmospheric Administration (NOAA). (www.drought.noaa.gov/)
- “Drought: A Handbook for Prevention.” The Irrigation Association (IA). (www.irrigation.org)
- “Water Right: Conserving Our Water, Preserving Our Environment.” Turfgrass Producers International (TPI). (www.TurfGrassSod.org)

Facts About Landscaping and Water Use

Water use—and waste—is determined *more by people than by type of landscaping*. Many people assume America’s lush lawns are inefficient consumers of water. Landscaping accounts for only 2.9% of total water usage nationwide. And with sensible stewardship of our limited water resources, this figure could be reduced even further.

Fresh Water Use in the United States



Pie chart represents 100% of fresh water

Source: Irrigation Association

Supporting this position is the research report of Dr. J. B. Beard and Dr. R. L. Green, which was published in the *Journal of Environmental Quality*. The study concluded that “the main cause for excessive landscape water use in most situations is the human factor. The waste of water results from improper irrigation practices and poor landscape designs, rather than any one major group of landscape plant materials.”

Depending on an area’s climate, residential outdoor water use can account for 22% to 67% of total annual water use. Clearly, this represents a vast opportunity for conservation. But to maintain an individual’s right to personal choice, a one-size-fits-all solution will not be effective.

The Environmental Value of Landscaping

Green areas provide countless benefits to the environment, including the following:

- soil erosion control
- dust prevention
- rainwater entrapment and ground water recharge
- solar heat dissipation
- glare reduction
- organic chemical/pollutant entrapment and degradation
- noise reduction

A lack of shade trees and turf cause cities to bear the burden of “heat islands,” which are 10 degrees to 30 degrees hotter than outlying rural areas. Further, when turfgrass is removed, the amount of smog and dust in the air increases, because there are not sufficient numbers of plants to hold down the dust and trap particulate pollutants.

Without the filter of plant material, there is an increased prevalence of dust that carries disease-causing bacteria and viruses. Lack of grass also increases erosion, and erosion raises levels of pollution and damages water quality in ponds, streams, rivers and lakes.

Streets, sidewalks and paved areas reflect heat and glare during the day and retain significant amounts of heat energy during the night. As a result, cooling seldom occurs in built-up areas. When rains do come, water drains into the sewer system. Sewer water requires treatment and is dumped into the ocean and not reused. Ideally, this water should be allowed to naturally soak into the soil, replenishing soil moisture, recharging the groundwater supplies or flowing into streams, filtered by the roots of trees and turf.

Fast Facts on the Benefits of Environmental Landscaping

- Grass, trees and plants reduce soil erosion—a major cause of water pollution and sedimentation.
- One tree removes 26 pounds of carbon dioxide from the air each year and can produce enough oxygen—about 13 pounds—for a family of four to live on.
- Plants, trees and grass fight pollution and provide storm water control and shelter for wildlife.
- Shrubs, turf and trees reduce noise pollution by up to 50%.
- Proper selection and placement of plant material can lower heating and cooling costs by as much as 20%.
- Trees absorb as much as 85% of the sun's direct heat.
- Eight average front lawns have the cooling effect of 70 tons of air conditioning.
- Trees can reduce power demand by as much as 59%.
- Temperatures around grassy areas are about 25 degrees cooler than around dead grass or concrete "heat islands."
- One large tree can absorb as much heat as several window air conditioners and can lower temperatures by 10 degrees.
- Healthy turf is a strong component in fire prevention.

Economic and Life-Enhancing Benefits of Landscaping

Results of the U.S. Homeowner Landscaping, Lawn Care and Tree Care Survey, conducted by the Gallup Organization, were based on interviews with a representative sample of 1,500 households nationwide. The study looked at spending in 1999 for landscaping, lawn care and tree care, as well as anticipated spending for 2000.

The survey also asked American homeowners to identify the most important benefits of a residential or commercial property that has a well-maintained lawn and landscape. They ranked the benefits as follows:

- Adds beauty and relaxation for the family, employees or visitors (54.0%)
- Reflects positively on its owner (53.2%)
- Offers a comfortable place to entertain, work or visit (47.4%)
- Increases real estate market value (44.1%)
- Helps beautify the neighborhood (43.3%)
- Provides a safe, high-quality play area for children (36.7%)
- Provides an exercise area for pets (21.3%)
- Helps purify the air (19.9%)
- Helps cool the air (17.8%)
- Provides a natural water filter to protect water quality and the environment (13.5%).

The Gallup Survey was sponsored by the Associated Landscape Contractors of America (ALCA), the American Nursery & Landscape Association (ANLA), the International Society of Arboriculture (ISA), the National Arborist Association (NAA) and the Professional Lawn Care Association of America (PLCAA). It was conducted in cooperation with the National Gardening Association (NGA).

Green Spaces Influence Behavior

A July 2001 study by Frances Kuo and William Sullivan, directors of the Human Environment Research Laboratory at the University of Illinois, Urbana-Champaign, suggests there is evidence that green spaces reduce crime. The study demonstrated that exposure to nature may reduce aggression and violence in inner-city neighborhoods. Compared to residents living near barren areas, those nearer to green spaces were typically friendlier and more social, creating stronger community ties and offering more opportunities for a healthier neighborhood. The study documented the following:

- Children with Attention Deficit Disorder (ADD) function better indoors after they have been outdoors in green areas and among trees and greens.
- Landscaped settings in inner cities can help reduce stress and restore focus that everyday issues related to poverty and urban congestion can foster.
- Exposure to green spaces can mitigate chronic mental fatigue, which can lead to irritability, inattentiveness and impulsive behavior.

Additional Resources:

Research

– “Green Streets, Not Mean Streets, Vegetation May Cut Crime in the Inner City,” condensed from “Environment and Crime in the Inner City: Does Vegetation Reduce Crime?” *Environment and Behavior*, Volume 33, Number 3 (May 2001), pp 343-367. F.E. Kuo and W.C. Sullivan. Copyright 2001 Sage Publications, Inc.

– “Girls & Greenery, Views of Green Help Girls Succeed,” condensed from “Views of Nature and Self-Discipline: Evidence from Inner City Children,” *Journal of Environmental Psychology*, Volume 22, (2002), pp 49-63. A. Faber Taylor, F.E. Kuo and W.C. Sullivan. Copyright 2002 Elsevier Science Ltd.

– “Go Out and Play! Nature Adds Up for Kids with ADD,” condensed from “Coping with ADD: The Surprising Connection to Green Play Settings,” *Environment and Behavior*, Volume 33, Number 1 (January 2001), pp 54-77. A. Faber, F.E. Kuo and W.C. Sullivan. Copyright 2001 Sage Publications, Inc.

– “Nice to See You, How Trees Build a Neighborhood,” condensed from “Fertile Ground for Community: Inner-City Neighborhood Common Spaces,” *American Journal of Community Psychology*, 26 (6), 823-851. F.E. Kuo, W.C. Sullivan, R.L. Coley and L. Brunson. (1998) Copyright 1998 Plenum Publishing Corporation.

– “Green Relief, Trees Ease Poverty’s Burden in Inner City Neighborhoods,” condensed from “Coping with Poverty: Impacts of Environment and Attention in the Inner City,” *Environment and Behavior*, Volume 33, Number 1 (January 2001), pp 5-34. F.E. Kuo. Copyright 2001 Sage Publications, Inc.

– “Cooler in the Shade, Aggression and Violence are Reduced with Nature Nearby,” condensed from “Aggression and Violence in the Inner City, Effects of Environment via Mental Fatigue,” *Environment & Behavior*, 33(4), 543-571. F.E. Kuo, W.C. Sullivan. (2001)

The Economic Impact of the Green Industry

- The Business of Being Green -

American consumers spent a total of \$39.6 billion on their lawns and gardens in 2002, an increase of \$1.9 billion, or 5%, over 2001. During the past five years, total lawn and garden sales have increased at a compounded annual growth rate of 8%. From 1997-2002 lawn and garden sales increased from \$26.6 billion to the aforementioned \$39.6 billion.

Grower cash receipts from nursery and greenhouse sales (on sales of plants to retail and distribution businesses) have grown steadily over the last two decades and are increasing at approximately \$500 million per year. On average, consumers spent \$466 per household on their lawns and gardens in 2002. Over the past five years, annual spending has grown by about 4% per year and has averaged \$452.

Eight out of 10 U.S. households (79%) or 85 million households participated in one or more types of do-it-yourself indoor and outdoor lawn and garden activities in 2002. This is the same as in 2001 and is equal to the highest level of participation seen in the past five years.

A Gallup survey, taken in 1999 and sponsored in part by ALCA and ANLA, found that lawn and landscape maintenance accounted for the largest dollar volume of green home improvements (\$6.7 billion) and the greatest household participation (13.1 million), while landscape installation and construction represented the largest average amount spent per household (\$1,479).

In 1999, Americans age 50 and older represented the largest customer group, accounting for one half (\$8.7 billion) of total spending on professional lawn and landscaping services.

A Leading Agricultural Producer

The United States is the world's largest producer and market for nursery and greenhouse crops. These crops represent an important and unique segment of agriculture, and their impact is felt on the national, state and community level. In terms of economic output, nursery and greenhouse crops are the...

- **second most important sector in U.S. agriculture**, ranking seventh among all agricultural commodities in cash receipts and among the highest in net farm income
- **top five agricultural commodities in 27 states, and the top 10 commodities in 42 states.**

Ten states account for more than two-thirds of all nursery-crop output in the United States:

California (20%)	Oregon (5%)
Florida (11%)	Michigan (2% – 4%)
North Carolina (8%)	Pennsylvania (2% – 4%)
Texas (8%)	Oklahoma (2% – 4%)
Ohio (5%)	New York (2% – 4%)

Turfgrass is the number one or number two agricultural crop in Maryland, Pennsylvania, Florida, New Jersey and North Carolina.

In October 1999, the U.S. Department of Agriculture's Economic Research Service reported: "Floriculture and environmental horticulture is the fastest-growing segment in U.S. agriculture in grower cash receipts [for 1998], averaging nine percent annual growth."

A year 2000 study released by the California Green Industry Council reports, "The green industry in California is an economic powerhouse. It's one of California's largest industries. University studies have consistently found that this dynamic, growing industry represents more than \$12 billion in sales and hires 130,000 employees. What's more, landscapes cover more than 1.6 million acres in California—making our backyards one of California's largest and most valuable resources."

A 1994 University of Florida study examined turfgrass in the state and reported, "There was about 4.4 million acres [of turfgrass], with 75% of this area in the residential household sector. Turfgrass-industry employment was 185,000 full-time and part-time workers, or 130,000 full-time equivalents. Value added to Florida's economy by all sectors of the turfgrass industry totaled \$7.3 billion."

Many businesses, including those not associated directly with the landscape industry, can lose income and profits, which can result in employee cutbacks and layoffs. In areas where well-maintained landscapes attract a wide variety of short- and long-term visitors, tourism revenues can drop. Commercial and residential development can also decline as fewer people want to move into an area that cannot provide its citizens with what they view as a reasonable amount of water.

When landscape watering restrictions or bans go into effect
Who Feels the Impact?

Depending on the degree of the restrictions, everyone from a high school student working part-time selling lawn mowers to the owner of a landscape service or irrigation company can be affected. The impact can be economic, aesthetic and even environmental.

Direct Impact

- Homeowners (single-family dwellings)
- Apartment renters and condo owners (multi-family dwellings)
- Public and private airports, churches, cemeteries
- Golf courses, parks and playgrounds, sports fields
- Tourism
- Commercial operations (owners and employees)
- Feed and seed stores
- Gas stations
- Hardware stores
- Greenhouses, nurseries and garden centers

- Home centers
- Irrigation systems (manufacturing/installation)
- Mail-order firms
- Mass merchandisers
- Production nurseries
- Supermarkets and drug stores
- Turfgrass sod farms
- Landscape professionals (owners, employees)
- Architects and designers
- Contractors
- Golf course superintendents
- Groundskeepers
- Lawn-care operators
- Sports field managers

Indirect Impact

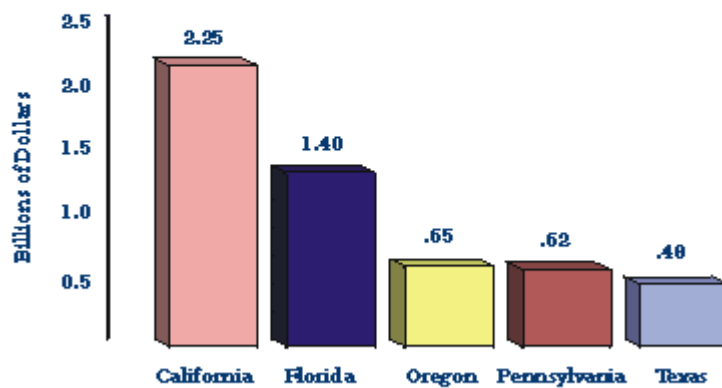
(as a result of related lost sales, unemployment, etc.)

- Material sales and delivery
- Service providers (cafes, dry cleaners, service stations, etc.)
- Sales and use taxes
- Trucking and other transportation

Five Leading States

Sales by State

Total Horticultural Sales = \$10,599,298,000



Source: 1998 Census of Horticultural Specialties

A Major Provider of Jobs

The American nursery and landscape industry employs more than 600,000 workers during peak seasons. Growers employ at least 45,000 workers year-round and 105,000 during peak seasons. Net farm income is the **highest** of any production specialty in domestic agriculture. At an annual average of \$53,589, nursery and greenhouse income is **four times higher** than the national average (\$13,458). Landscape and retail firms employ nearly 500,000 full-time, part-time and seasonal workers.

Additional Resources:

Research

- “1997-2002 Professional Landscape, Lawn and Tree Care Services.” American Landscape and Nursery Association (ALNA). See chart on following page.
(www.anla.org/pdffiles/LAWNlandscape1997_2002.prn.pdf)

Web Sites

Two USDA sites provide monthly update information on specific sectors and state-by-state information:

- “Horticulture Related Quick Facts, 1998 Census of Horticultural Facts.” USDA National Agricultural Statistics Service (NASS).
(www.nass.usda.gov/census/census97/horticulture/quickfacts)
- “Calendar” USDA Economics and Statistics System (ESS), Mann Library, Cornell University.
(www.usda.mannlib.cornell.edu – click on “Calendar”)

1997-2002 Professional Landscape, Lawn and Tree Care Services

Services Hired:	1997		1998		1999		2000		2001		2002	
	%	Mil.	%	Mil.	%	Mil.	%	Mil.	%	Mil.	%	Mil.
Lawn/Landscape Maintenance	14	14.3	13	13.7	14	14.9	15	16.3	16	17.8	18	19.4
Landscape Installation/Construction	2	2.0	2	2.4	2	2.6	2	2.8	3	2.9	3	3.2
Landscape Design	1	1.1	1	1.2	1	1.3	1	1.6	2	1.8	2	2.1
Tree Care	5	5.6	4	4.1	5	4.9	6	5.9	7	7.1	8	8.6
TOTAL (Mil. Households)	22	22.4	20	21.4	21	22.1	21	22.9	22	23.8	23	24.7

\$ Average Spent	1997	1998	1999	2000	2001	2002
	\$	\$	\$	\$	\$	\$

Lawn/Landscape Maintenance	\$533	\$581	\$540	\$543	\$547	\$550
Landscape Installation/Construction	\$1,772	\$2,630	\$2,825	\$3,035	\$3,260	\$3,502
Landscape Design	\$889	\$742	\$879	\$1,043	\$1,236	\$1,465
Tree Care	\$434	\$411	\$421	\$431	\$441	\$452
\$ TOTAL (Average Household)	\$647	\$855	\$925	\$1,000	\$1,082	\$1,170

\$ Total Spent	1997	1998	1999	2000	2001	2002
	\$ Bil.	\$ Bil.	\$ Bil.	\$ Bil.	\$ Bil.	\$ Bil.

Lawn/Landscape Maintenance	\$7.6	\$7.9	\$9.0	\$9.7	\$10.4	\$10.7
Landscape Installation/Construction	\$3.6	\$6.3	\$7.3	\$8.4	\$9.7	\$11.2
Landscape Design	\$1.0	\$9	\$1.3	\$1.7	\$2.3	\$3.1
Tree Care	\$2.4	\$1.7	\$2.9	\$3.2	\$3.5	\$3.9
\$ TOTAL (Average Household)	\$14.6	\$16.8	\$20.5	\$23.0	\$25.9	\$28.9

PLAN TO HIRE PROFESSIONAL LANDSCAPE, LAWN OR TREE CARE SERVICES IN 2003

Professional Services	Households	
	%	Mil.
Lawn/Landscape Maintenance	16	17.4
Tree Care	7	7.6
Landscape Installation/Construction	3	3.3
Landscape Design	2	2.1
Don't Know	11	11.9
None	66	71.6
Plan to Hire Services (Net.)	23	24.9

Source: ANLA