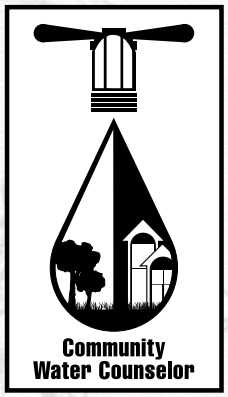
Community Water Counselor



Southwest Florida
Water Management District

Reference Guide

This Community Water Counselor Workshop was hosted by

Southwest Florida
Water Management District

The Community Water Counselor Reference Guide is produced by the Southwest Florida Water Management District. If you have questions or comments, please call the District at 1-800-423-1476 (Florida only) or (352) 796-7211, extension 4776. http://www.swfwmd.state.fl.us

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Introduction to Florida's Water World

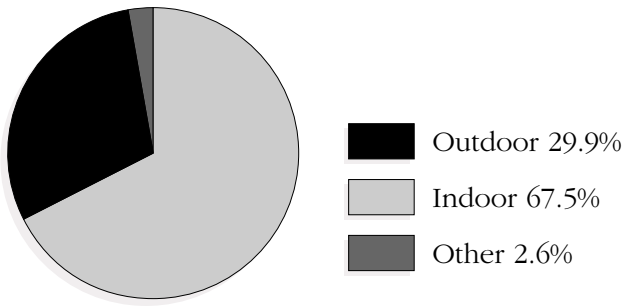
Community
Water Counselor

Introduction to Florida's Water World

Meeting today's water needs can be a challenge — a challenge for government agencies who provide water; for people and businesses who use water; and a challenge for the environment which provides our water. Most of us realize this and we try to do our best to conserve or reduce the amount of water we use. Conservation is one thing that we *all* can do to help.

The goal of the Community Water Counselor program is to give you the knowledge and hands-on experience to implement various conservation techniques in your home and to help your neighbors implement techniques in their homes. If we all conserve water, we can further help the environment meet the challenge of supplying our water.

A study conducted by the American Water Works Association of home water use in Tampa revealed how water is used:



One household *can* make a difference. If each household in a neighborhood saves 30 to 40 gallons per day — the conservation adds up and can make a significant, positive impact on our water use and on the environment.

The Community Water Counselor program is designed to help you:

- ▲ Understand where your water comes from and the impact of humans on the water resource;
- ▲ Evaluate your current water use, both inside and outside of your home;
- ▲ Determine which water conservation techniques are best for your situation;
- ▲ Implement those conservation practices;
- ▲ Monitor and track your before and after water use; and,
- ▲ Share this knowledge with your neighbors.

Florida's Water Resources

We all know how important water is for our daily lives. But imagine for a moment, a day in which you use no water. That means no shower, no flushing the toilet and no drinking. This simple substance — just three molecules — makes life on Earth possible. Without water, we could not live more than 3 days!

The goal of this section is to increase your knowledge of:

- ▲ Where your water comes from;
- ▲ Influences on the water resource;
- ▲ Why we all need to conserve water.

The Hydrologic Cycle: How Nature Provides Water

The earth's water travels through a continuous process known as the hydrologic cycle. Multiple actions through the cycle allow the replenishment of water to the sky, sea and earth.

These are the major parts of the cycle:

1. **Evaporation:** The sun's energy warms the earth's surface waters, such as oceans, rivers, lakes and streams. As the water molecules heat up, they move apart and the water becomes a vapor, rising into the atmosphere.

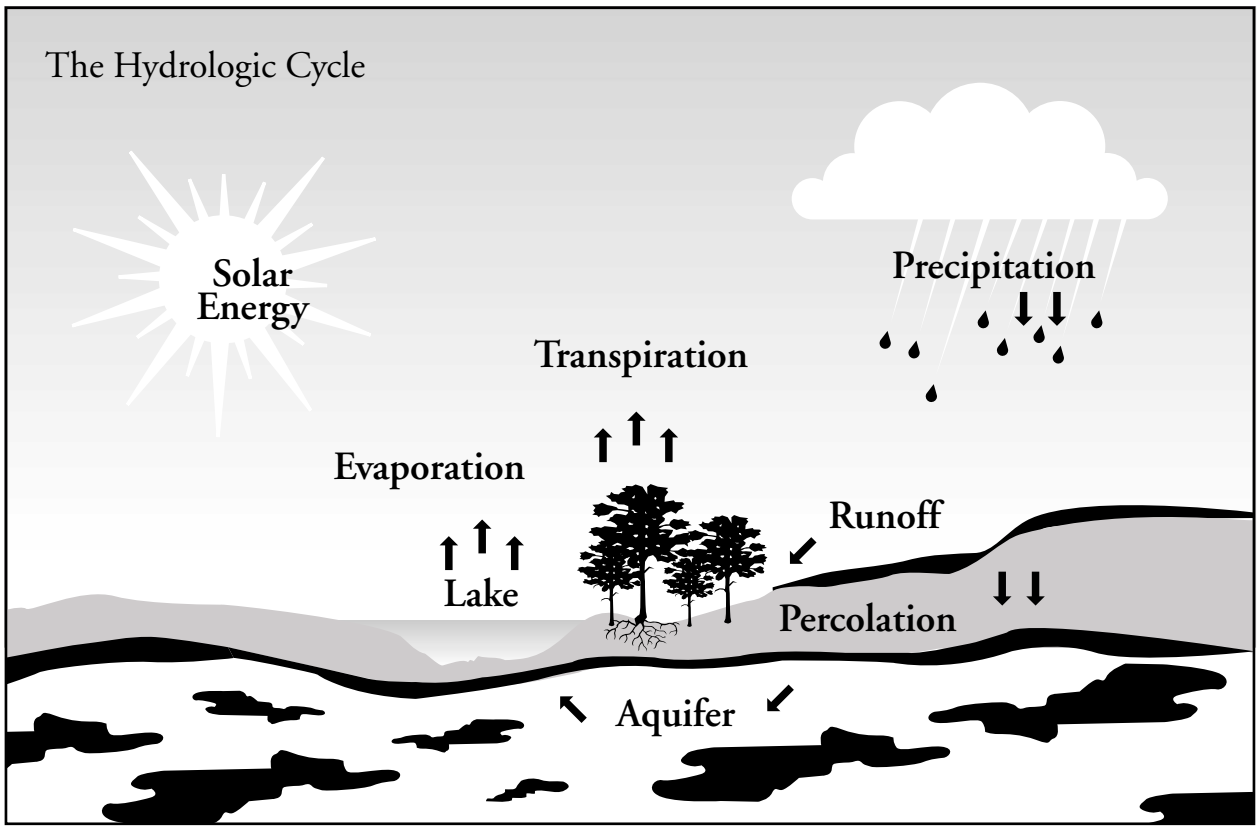
2. **Transpiration:** The sun's heat also causes plants to release water vapor into the air.

3. **Condensation:** As this vapor cools, the molecules move closer together, forming visible moisture, such as clouds or fog.

4. **Precipitation:** When condensation cools even more, it forms the liquid we know as water. This water returns to earth in both liquid (rain) and solid forms (snow and hail).

5. **Percolation:** Precipitation collects in lakes or rivers, waters the soil and plants, and soaks through the soil to become underground water.

Because each part of the process is connected to one another, it really has no beginning or end. No water is gained or lost, but what is available at any given time for human use fluctuates widely, depending on geographic and climatic conditions.



Natural Water Sources

Nature provides water in two ways: surface water (rivers, lakes and the sea), and ground water (from the aquifer). At first glance, these two may appear to be separate. However, in many areas the strong relationship connects the two. Reductions in underground water can affect surface water levels and quality several miles away. For example, in some areas, lake levels are a direct reflection of underground water levels. If the water level in an aquifer supporting a lake drops due to low rainfall or pumping, lake levels can fall as well. Remember though, lakes naturally fluctuate and may drop for many other reasons. Underground water also provides the base flow of streams from springs. Reduced flow in rivers can cause an increase in salinity levels in estuaries, which affect plants, fish, and ultimately, humans.

Two other concepts that influence our water resources are watersheds and ecosystems.

Watersheds, or drainage basins, are natural drainage networks that carry rainwater from backyards, parking lots and streets into rivers, lakes and streams in a particular area. Humans can have a profound effect on watersheds when we build and pave large areas. These surfaces do not allow water to soak into the ground. Stormwater that runs off these impermeable surfaces can carry trash, chemicals and other pollutants into waterways, affecting water quality and impacting the hydrologic cycle.

An **ecosystem** is the relationship between living things (plants, animals and other organisms) and the environment (sunlight, air, water and soil). All parts must work together to maintain a healthy balance. Aquatic ecosystems include oceans, lakes, rivers, streams, estuaries and wetlands. These are sensitive systems which can be significantly altered by changes such as pumping water, discharging pollutants, and introducing exotic species of plants, animals and insects.

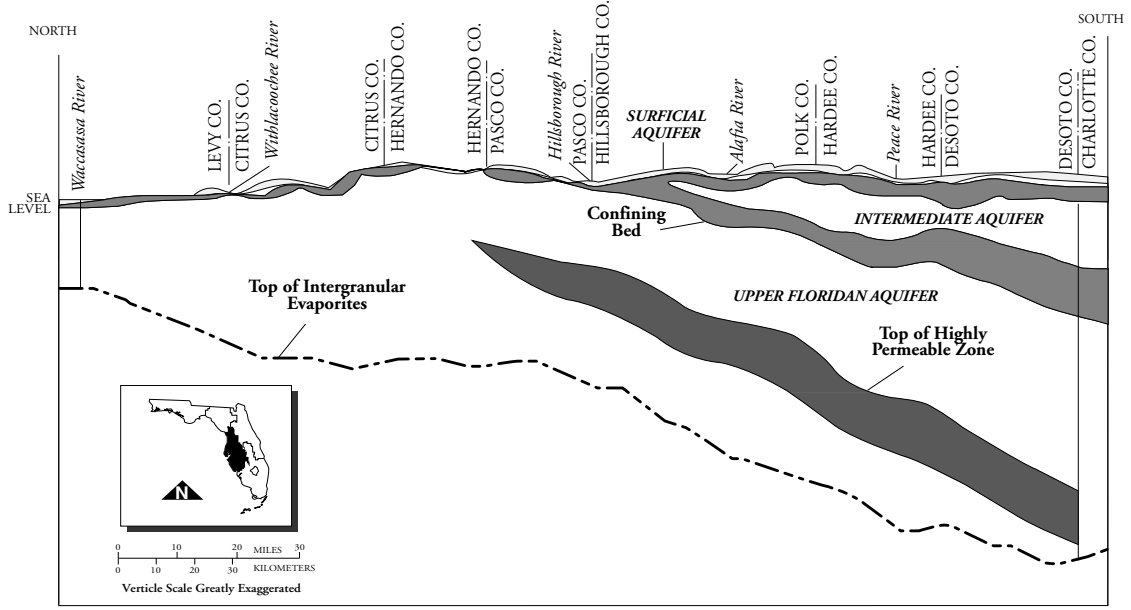
Aquifers: The Underground Source

Most of Florida's drinking water comes from aquifers — saturated sedimentary layers below the earth's surface that can hold large quantities of water. These layers may be rock, sand, gravel or a mixture of these. Our aquifers are primarily limestone or limestone-dolomite mixtures, containing many cracks and enlarged pores allowing water to move easily through the rock. Water from aquifers is referred to as ground water and provides more than 80 percent of all water used in the Southwest Florida Water Management District's area.

Aquifers can be thought of as underground rivers. Water flows into them and water flows out of them. They are not stagnant reservoirs. But, compared to rivers, the water moves very slowly, usually, slower than a snail's pace. Aquifers are said to "recharge" when water percolates, or filters down from the land surface, into the aquifer. The first aquifer to be recharged is usually the unconfined water table aquifer lying near land surface. Some aquifers are called "confined" because they are capped above by a layer of clay or very dense rock. These aquifers are more difficult to recharge as water flows into them only where the aquifer comes near the surface or the confining layer is thin or absent.

Water discharges, or flows out of the aquifer, where the aquifer intercepts a coastline, or sometimes, at a spring, lake or stream. As ground water flows toward a coastline it encounters seawater. The fresh ground water is forced up by the dense seawater and the ground water is discharged through the sea floor. Beneath the Southwest Florida Water Management District are as many as three aquifers. From top to bottom, they are the Surficial aquifer system, the Intermediate aquifer system and the Floridan aquifer system.

Hydrologic Cross Section of the
Southwest Florida Water Management District



The Surficial aquifer system is the unconfined aquifer system lying just below the land's surface. It generally consists of sands, marl, gravel and clay. This aquifer is highly productive along the sand ridges of Polk and Highlands counties. Elsewhere, it is so thin that it is usually only adequate for limited landscape irrigation or livestock watering.

The Intermediate aquifer is absent in the northern part of the District and very thin to absent in Polk and Hillsborough counties. It gets thicker to the south of Hillsborough and Polk counties. This confined aquifer may be 500 feet thick in south Sarasota and Charlotte counties, and is a significant source of water for DeSoto, Charlotte, Manatee and Sarasota counties. Water from this aquifer is frequently brackish (a mixture of saltwater and freshwater) in the coastal areas or has a high mineral content and must be treated with a desalination process such as reverse osmosis, before drinking.

The Floridan aquifer is one of the most productive aquifers in the world. The uppermost portion of this aquifer, the Upper Floridan aquifer, is up to 1,400 feet thick and provides 10 times the water of the other two aquifers combined. Water quality in the lower portion of the Floridan aquifer is poor and unusable, due to high mineral content. The aquifer is confined in the south and central portions of the Southwest Florida Water Management District. In the north, the aquifer is so close to land surface that it is easily recharged by rainfall. This also makes it very susceptible to contamination from surface sources and stormwater runoff.

Surface Water Sources

Although there are more than 1,800 lakes measuring 10 acres or larger within the District, they account for a very small amount of the public water supply. Lakes are easily affected by rainfall and other factors, but are still important sources for domestic, small agricultural and industrial uses.

Creeks and Rivers within the District used for Public Water Supplies:

Source: ..... **Hillsborough River**
Area Served: ..... **City of Tampa**
Permitted Withdrawal:
..... **62.0 million gallons per day (mgd)**

Source: ..... **Manatee River**
Area Served: ..... **Manatee County**
Permitted Withdrawal: ..... **34.9 mgd**

Source: ..... **Peace River**
Area Served: ... **Charlotte, DeSoto, Sarasota Counties, City of North Port**
Permitted Withdrawal: ..... **32.7 mgd**

Source: ..... **Braden River**
Area Served: ..... **City of Bradenton**
Permitted Withdrawal: ..... **5.6 mgd**

Source: ..... **Shell Creek**
Area Served: ..... **Punta Gorda**
Permitted Withdrawal: ..... **4.2 mgd**

Source: ..... **Myakkahatchee/Big Slough**
Area Served: ..... **City of North Port**
Permitted Withdrawal: ..... **2.1 mgd**

Area Water Sources: Where Your Water Comes From

Before discussing where your water comes from, it will be helpful to understand the roles of the various agencies involved in managing the water as it comes to your home:

1. Department of Environmental Protection (DEP)
The state agency responsible for protecting all of Florida's natural resources. It works in cooperation with the water management districts to ensure that the state's water resources are managed effectively.

2. Southwest Florida Water Management District (SWFWMD) One of five water management districts in the state, SWFWMD is responsible for managing and protecting water resources in west central Florida. The District coordinates with local governments to solve water problems. Because SWFWMD serves a regulatory function, it does not supply water to people — this is accomplished by water supply authorities and water utilities.

3. Water Supply Authorities
A voluntary cooperation exists between local and/or county governments to manage water resources. Different cooperative counties and cities work together to ensure that a particular region has enough quality water for all its users. They generally own wellfields where they can pump large quantities of water out for their member governments and may also hold permits from SWFWMD to withdraw certain quantities of water from surface water sources, such as lakes or rivers.

- **Withlacoochee Regional Water Supply Authority**
  Provides water to the water utilities of Citrus, Hernando and Sumter counties.

- **Tampa Bay Water**
  Provides water to the water utilities of Hillsborough, Pasco and Pinellas counties, and the cities of New Port Richey, Tampa and St. Petersburg.

- **Peace River/Manasota Regional Water Supply Authority**
  Provides water to the water utilities of Charlotte, DeSoto, Manatee and Sarasota counties.

4. Your Local Water Utility

Water utilities generally receive water supplies through a system of pipes from regional wellfields. They also may directly receive supplies from surface water sources. After cleaning the water, utilities then provide it to customers through a system of pipes to homes or businesses. They are generally owned by the local government to provide the public with a basic need.

The Water We Use

In 1995, an average of approximately 1.51 *billion* gallons of freshwater was used each day within the 16 counties that make up the Southwest Florida Water Management District. Approximately 80 percent of this came from groundwater sources.

Water Use	1995 *(mgd)*	2020 *(mgd)*
Public Supply *(i.e.: City or County)*	428.1	638.0
Shallow Private Wells	88.8	149.6
Agricultural	684.7	850.0
Power Generation	10.2	61.8
Mining, Industrial, Commercial	226.8	196.0
Recreational *(i.e.: Golf Courses)*	66.5	109.2
Total	1,505.1	2,004.6

In some regions of the District, groundwater pumping, combined with drainage modifications, has resulted in several adverse effects such as saltwater intrusion into the aquifer along the coast, and reduced flow or levels in springs, lakes and wetlands.

If we are to meet tomorrow's water needs, including the needs of the environment, other sources of water need to be developed.

Alternative Water Sources

Reuse

The use of reclaimed wastewater or reuse is strongly encouraged. Reuse projects conserve water by replacing potable (drinkable) water used for non-potable purposes with reclaimed water. Reclaimed water can be used for many agricultural and urban irrigation needs, fire fighting, and many industrial purposes.

During the past 10 years, Florida rapidly became a national leader in reuse of reclaimed water. In DEP's 1996 Reuse Inventory, about 400 reuse systems state-wide were identified, using about 400 million gallons of reclaimed water for beneficial purposes. By the year 2020, reuse flows are expected to increase to about 720 million gallons per day.

For 1997

County	Waste Water Treatment Plants	Reuse Flow (mgd)
Charlotte	12	5.04
Citrus	8	2.61
DeSoto	3	0.26
Hardee	4	0.48
Hernando	11	3.99
Highlands	7	1.93
Hillsborough	20	20.81
Lake	(No WWTPs within SWFWMD boundaries)	
Levy	1	0.25
Manatee	5	10.46
Marion	6	0.59
Pasco	24	10.48
Pinellas	19	41.81
Polk	31	18.25
Sarasota	22	10.39
Sumter	3	1.02
Total	176	128.37

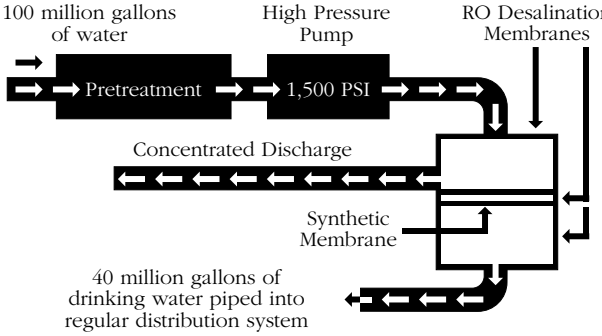
Working in partnership with local governments to develop reclaimed water systems, the SWFWMD provides financial assistance through its Cooperative Funding and New Water Sources Initiative programs.

As a testimony to the success of Florida's reuse program, the U.S. Environmental Protection Agency honored Florida's program with the 1993 and 1996 Municipal Water Use Efficiency Awards in the Most Effective and Innovative Legislative Review and Proposal Category. Reflecting their excellence, Florida's reuse rules figure prominently in the development of national reuse guidelines.

Desalination

Desalination is a general term for a number of water treatment processes that remove minerals and other dissolved solids, including salt, from seawater or groundwater. Some of these processes include reverse-osmosis, electrodialysis and membrane softening. Desalination currently plays only a minor role in public water supply within the Southwest Florida Water Management District. Though 18 desalination plants exist in the District, their combined production capacity is only approximately 20 mgd.

Desalination
Reverse Osmosis Process



Desalination Plants, Locations and Capacities

Utility	Service Area	Capacity in MGD
Sarasota County	Sarasota	12.0
City of Dunedin	Dunedin	7.5
City of Sarasota	Sarasota	4.5
City of Venice	Venice	4.0
Englewood Water District RO Plant	Englewood	2.5
Venice Gardens Utility Corp.	Venice	1.0
City of Wauchula	Wauchula	0.95
Englewood Water District	Sarasota	0.5
Rotunda West Utilities	Rotunda	0.5
The Plantation	Venice	0.5
Charlotte Harbor Water Association	Harbor Heights	0.45
Southern States / Burnt Store Utilities	Port Charlotte	0.36
Sorrento Utilities	Nokomis	0.25
Southbay Utilities	Sarasota	0.25
Gasparilla Pines	Englewood	0.2
Sun 'n Fun Resort Inc.	Sarasota	0.131
Camelot Lakes	Sarasota	0.1
Spanish Lakes MHP	Nokomis	0.1

Conservation

While not a water "source" in the traditional sense, conservation practices do result in water savings which reduces stress on environmental systems and helps to extend current, traditional water supplies.

The District works with local governments and organizations to encourage a variety of conservation methods, from toilet rebate programs and retrofit kit distribution, to enforcement of outdoor water use restrictions. Significant programs are under way to educate the public, business and industrial communities about ways to conserve.

It Takes All of Us

The water we use ultimately comes from one source — rainfall — recharging the aquifer and adding to surface flows. Groundwater continues to be the main source we turn to, and current demands and withdrawals have already stretched the supply in some areas.

Increasing the number of water sources we use — ground and surface water, reuse, desalination, conservation and other alternative sources — will help meet current and future needs, while protecting the environment that provides us with water.

Conservation — reducing the amount of water we each use — is something we all can do to help.

Section 2:

Indoor
Water Efficiency Techniques

Community
Water Counselor

Indoor Water Efficiency Techniques

The goal of this section is to:

- ▲ Increase your knowledge of how you use water indoors;
- ▲ Identify if your fixtures are using water most efficiently; and,
- ▲ Help you develop an action plan to make your house as water efficient as possible.

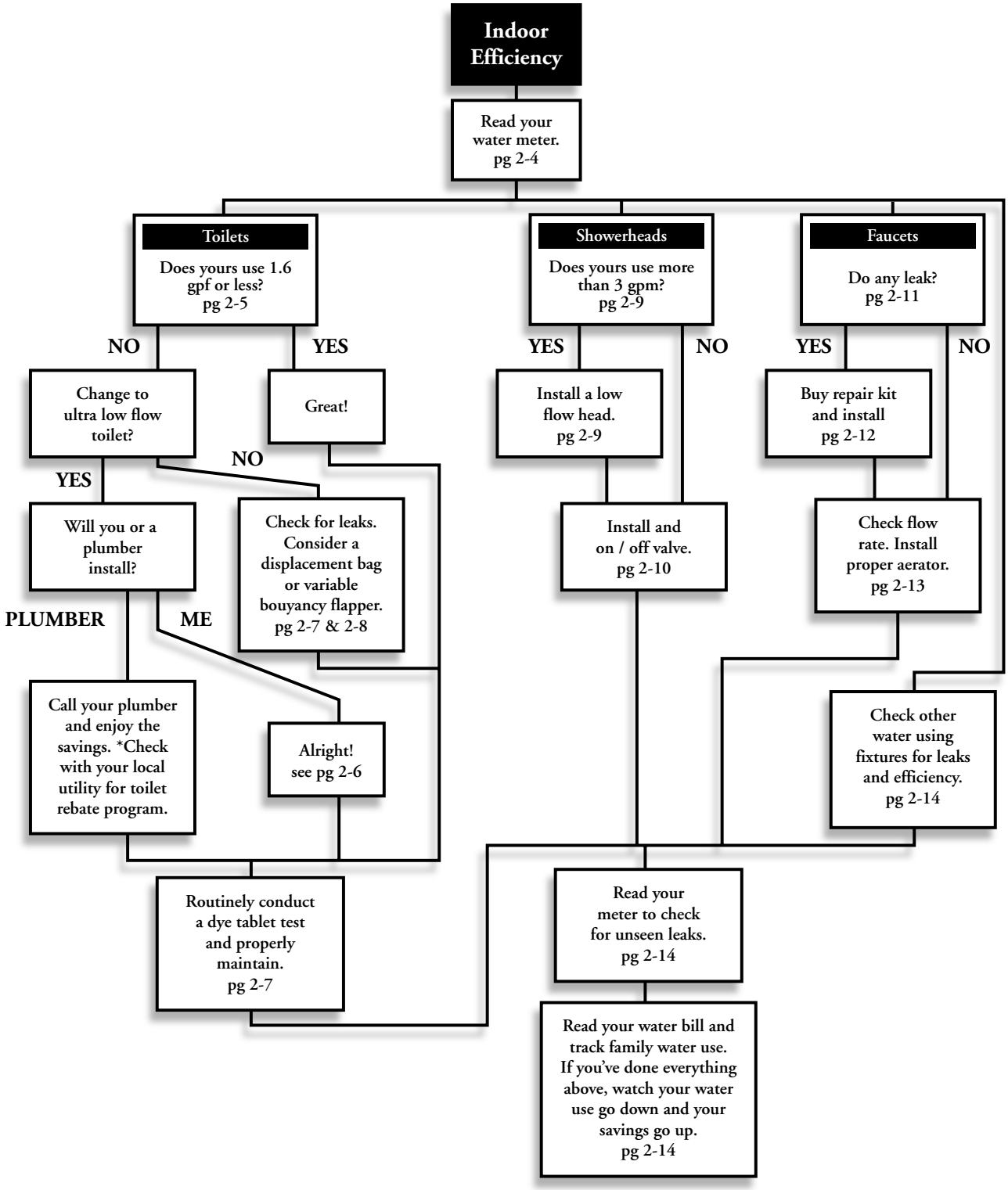
In the Southwest Florida Water Management District, daily water use averages 128 gallons per person. With a population of more than 3.5 million people, that's over 448 million gallons of water every day, and that does not include industrial, agricultural or other water uses!

Of the 128 gallons of water the average person uses, a little more than half is used inside the house for everything from washing dishes and clothes, to taking showers and baths, to flushing the toilet.

If you can become just a little more water efficient and reduce your water use by even 10 percent — that's about 13 gallons per day — you can make a difference in helping to protect the water resource and the environment. If everyone had a low-flow toilet, or took shorter showers, or fixed all the leaky toilets and faucets, we could save more than 44 million gallons of water everyday — that's about 35-40 percent of the water that either Hillsborough or Pinellas counties use daily.

The purpose of this section is to help you, your family and your neighbors become more water efficient by understanding indoor water use and actions that can be taken to increase efficiency.

The flow chart on the next page will guide you through the steps to identifying if your fixtures are using water most efficiently. Knowing this, you can develop an action plan to make your house more water efficient. Along the way, you will become more aware of how you use water, and through this awareness you will start doing other things to conserve water. Page numbers in the flow chart refer to sections in this chapter that discuss that activity.


Indoor Efficiency
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NO
YES
Change to ultra low flow toilet?
Great!
YES
NO
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PLUMBER
ME
Call your plumber and enjoy the savings. *Check with your local utility for toilet rebate program.
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Did You Know?

▼
A standard washing machine uses an average of 50 gallons per load.

▼
A front-loading (or "H-axis") washing machine uses about 25 percent less water.

▼
Toilets produced prior to 1994 use 3.5 to 7 gallons or more per flush, but new ultra-low volume toilets use 1.6 gallons or less per flush.

▼
A dishwasher uses 10 to 15 gallons per load, but a dishwasher with a water-saver function saves 10 to 20 percent.

▼
Washing and rinsing dishes with tap running uses up to 3 to 5 gallons per minute, but washing and rinsing dishes in a filled sink uses 5 to 10 gallons total.

▼
Running the garbage disposal uses 3 to 5 gallons a minute, versus using dirty dishwater to run the disposal or throwing debris in trash or compost pile.

▼
A bathroom faucet uses up to 5 gallons per minute.

▼
A standard shower head delivers 5 to 8 gallons a minute, but a low-flow shower head only delivers 1.5 to 2.5 gallons a minute

▼
Washing a car with running water from an open-ended hose for 20 minutes uses 100 to 200 gallons, but washing a car with a pistol-grip shutoff uses 15 to 30 gallons.

▼
An uncovered pool loses between 900 to 3,000 gallons of water a month to evaporation, whereas a covered pool, cuts water loss by up to 90 percent.

Conducting a Home Water Audit

How much water do you use? If the fixtures in your house are not low-flow or water-saving devices, use these figures to estimate the amount of water used daily in your household:

Toilet flush ..... 3.5 gallons
Old toilets maybe as high as ..... 5-7 gallons
Full bathtub ..... 60 gallons
Automatic dishwasher cycle ..... 10-15 gallons
Washing machine cycle ... 50 gallons (average)
Washing dishes by hand ... 15 gallons per day

Fixing leaks and installing a few inexpensive water-saving devices in your home could save you more than 30,000 gallons of water each year. And, if you use city or county water, your efforts could reduce your monthly water and wastewater bill significantly.

Unless your house was built in the last few years or recent fixture replacements have occurred, you probably have pre-conservation era plumbing that guzzles water. Retrofitting your home — fixing leaks and replacing old plumbing fixtures with new water-saving ones — is a simple and easy way to protect our drinking water supply and, at the same time, save money.

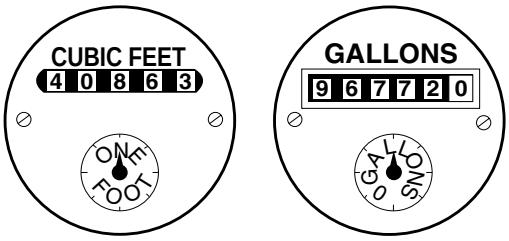
Most retrofit devices will reduce your water and wastewater bill enough to pay for themselves within 2 to 3 years.

Reading your water meter

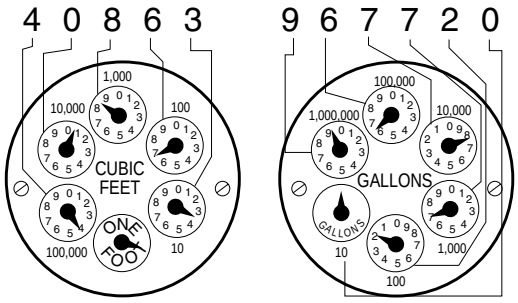
The best method to determine household water use is to look at your water meter. By reading the meter, you can calculate daily usage, individual appliance usage, as well as check for leaks within your home. Reading your meter before and after making changes inside and outside your home will help you see the fruits of your water-efficiency labor. Here's how:

A. Most residential water meters are located in a covered box in the ground near the street. The meter shows the total amount of water used since it was installed. The measurement is either in cubic feet or in gallons (1 cubic foot = 7.48 gallons).

B. There are two types of meters:



1. **Straight reading meters** are the simplest to read since it shows only one number like a car odometer.



2. **Round reading meters** read like a clock with some of the dials turning counterclockwise. Check the numbers to determine the direction of the turning dial. Start with the highest numbered dial (100,000) then the next (10,000) then the next (1,000) until you have read all dials. Add these numbers together to determine the current reading.

C. To calculate daily usage: Read the meter at the same time on two consecutive days. Next, subtract the first day's number from the second. The difference will give you the amount of water your household used in one day. To convert cubic feet to gallons per day, take this number and multiple by 7.48, which will give you the number of gallons per day. Now divide the total number of gallons used in one day by the number of family members; this will give you the number of gallons used per capita (person) per day (gpcd). How does this figure compare to the Districtwide average of 128 gpcd?

D. To read how much one appliance or one water activity uses, first turn off all water inside the house. Note the meter reading. Start an appliance, take a shower, run the dishwasher or water the lawn. When finished with the one activity, read the meter and subtract your first reading from the second. For cubic feet readings, multiply by 7.48, to determine the number of gallons.

E. To check for leaks, go around the house and turn off all water (don't forget the ice maker!). Then look at your water meter and check where the point of the dial needle is located. Make a mark on the rim of the dial. Don't run any water for 30 minutes. Then check the meter. If the indicator has moved from your mark, you have a leak. Some meters have a little triangle which spins to show flow. This movement would be further evidence of a leak.

F. Your next task would be to track down your leaks. The first culprit to check is the toilet, using the dye method explained on page 2-7. Next, inspect all faucets, including in the shower and outside.

Although you may have to call a professional to help with the invisible leaks in plumbing and pools, try to track down the leak yourself by looking for wet spots, sinkholes, and cracks in walls. Pools are more likely places for leaks than plumbing lines. Today, plumbers use electronic leak detection devices, which can locate running water through several feet of concrete.

Toilets

Toilet use accounts for about 35 percent of your total indoor water usage and about half of the water used within the bathroom. So having a water-efficient toilet can help to save a significant amount of water.

A leaky toilet can waste 40 gallons of water or more a day! In the course of a month, that means more than a 1,000 gallons of water goes unused down the drain. Properly maintaining a toilet is the first and most important thing you can do to make your bathroom more water efficient.

How much water does the toilet use? Is it a low-flow toilet?

If your house was built after 1994, your toilet should be a 1.6 gallon per flush (gpf) toilet. At that time, the federal government required toilets be produced to meet the 1.6 gpf standard. You may be able tell by looking for a stamp or sticker (UPC or IAPMO) which indicates approval. Gallons per flush should be printed in the tank.

If you are unable to tell the gallons per flush by looking at the toilet, use a measuring tape to estimate the tank volume. Using the figures below, determine what type of toilet you have:

53 inches in circumference = approximately 3.5 gpf
63 inches in circumference = approximately 5 gpf
79 inches in circumference = approximately 7+ gpf

Yes, it is a low-flow toilet

Great! The best thing you can do is simply maintain the toilet. The 1.5 or 1.6 gpf toilet is the lowest-volume toilet widely available on the market at this time. Any further modifications (a displacement bag or variable-buoyancy flapper) will reduce the water flow too much and you would probably have to flush twice to remove any waste.

Conduct a dye-tablet test to check for internal leaks. See Page 2-7 to conduct the test.

No, it is not a low-flow toilet

If your toilet is older and uses more than 1.6 gpf, you have two options:

1. Replace the old toilet with a new ultra-low flow (ULF) toilet, or
2. Modify the old toilet so that it uses less water.

You'll cut your water use the most by installing a newer version of the low-flush toilet. Older toilets can use 3.5 gallons or more per flush. Installing a new ultra-low volume toilet which uses 1.6 gallons can save up to 15 percent of total indoor water consumption.

New low-volume toilets are completely re-engineered. They have steeper bowl sides, shallower traps, smaller siphon outlets and 3.5-gallon tanks that release only 1.6 gallons per flush with 3.5 gallons of force and pressure. With these changes, they perform better than many units using twice the water. These new toilets must conform with the stricter 1990 American National Standards Institute hydraulic performance standard. This standard covers bowl cleaning, removal of solids and drain-line carry over a distance of 40 feet.

Having a plumber install a new ultra-low flow toilet

Contact your plumber and have them replace your toilet with a 1.6 gpf ULF toilet.

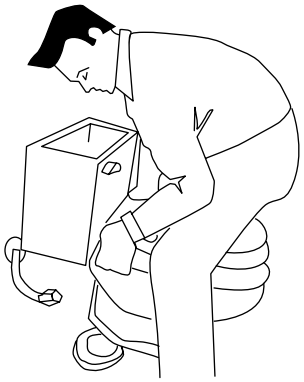
Some local governments offer rebates for purchasing and installing a new ultra low-volume toilet. Check with your utility to see if they offer such a rebate.

Be sure to ask your plumber about regular maintenance procedures for your new toilet.

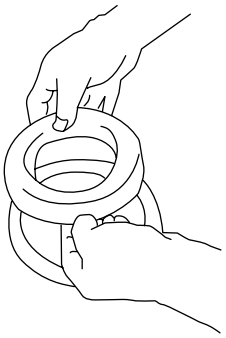
Installing a new ULF toilet yourself

Before installing new toilets in older houses, check the "rough-in dimension" — the distance between the back wall studs and the center of the drain hub. Toilets are designed with different rough-ins. This dimension will determine how far from the wall the toilet will sit.

Replacing a toilet requires an adjustable wrench, a screwdriver, new toilet and new wax ring, and grout. You may need or want to replace the water supply lines. Follow these three steps:



A. Close the supply valve. Flush the toilet, unscrew supply line and hold-down nuts. Remove lid to lessen weight and remove toilet.



B. Remove old wax ring and old putty. Set new ring over toilet horn or drain flange as shown here. The wax ring provides a watertight seal and prevents gasses from the drain from escaping.

C. Apply grout where the toilet meets floor to give it a finished look. Smooth the grout bead with a wet finger. Re-connect the supply line, fill the tank and flush to test.

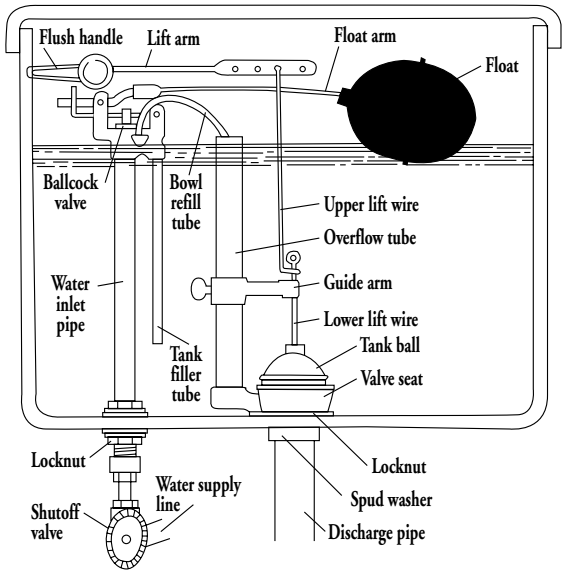
Smaller toilets often do not fill an older toilet's "foot print." There are devices — sometimes called a "toilet shoe" — to fix this aesthetically. Check with your hardware or home store.

Checking for a leaky toilet (dye tablet test)

To check your toilet for leaks, remove the lid from the toilet tank, remove any colored cleaning agent, flush to clear water in the bowl, then drop one leak-detecting dye tablet (or five drops of food coloring) into the tank and wait 15 minutes. If colored water appears in the toilet bowl without additional flushing, there is a leak.

Repairing a leaky toilet

Fixing a leaky toilet is one of the easiest and most important things you can do to conserve water in your home. If your toilet has the smallest of leaks, it could let 40 or more gallons a day go down the drain.



To fix the leak yourself, you will need a large adjustable wrench and a screwdriver. Now, follow these steps which begin with the most common and easy solutions to the more involved:

A. Jiggle the handle. If that makes the toilet stop running, the chain or guide wire attached to the handle may be out of alignment or kinked.

   Make sure the handle fits snugly against the tank. If it doesn't, use the adjustable wrench to tighten the nut attached to the handle on the inside of the tank. The nut on the handle tightens and loosens in the opposite direction of normal nuts.

B. Check the rubber flapper or flush valve at the bottom of the tank. It may not be reseating tightly after flushing. If it is worn or corroded, it needs to be replaced. If you touch the

flapper and black rubber residue comes off, the flapper is corroded. Look at the surface and edges of the flapper; if it is warped or disfigured, it needs to be replaced. Replacement kits with easy-to-follow instructions are available at most hardware and home stores.

Note: It is critical that you purchase the correct replacement flapper for your toilet. If you don't, the flapper will not seat properly, and your 1.6 gpf toilet will become a 3.5 gpf toilet by continuing to leak. You may want to take the old flapper with you to the store to ensure you buy the correct replacement.

Also, check to see if the valve seat is rough, scaled, or corroded. If it is, dry it with a cloth and smooth it with sand paper. With the new stopper installed, turn the water shutoff valve back on, fill the tank and repeat the dye check.

C. Make sure the float arm is screwed tightly into the ball cock assembly which joins to the inlet pipe. Tighten if necessary.

D. Next, check to see if the float ball is riding too high for a good tank water level. The correct water level is about 1/2 to 1 inch below the top of the overflow tube in the tank. The overflow tube drains directly into your waste water system. To lower the water level, use the screw driver to adjust the screw on the end of ballcock float arm or bend the float arm down until the correct water level is achieved. The float ball should shut off the inlet valve sooner and with more force. If the water doesn't shut off, replace both the flapper and the ballcock.

E. If these simple procedures don't stop the leak, you should call your plumber.

Water-saving modifications

If you choose to keep an older toilet using 3.5 gallons per flush or more, you can still reduce the water it uses by making some modifications. If you already have a ULF toilet, making further efficiency modifications is *not* recommended, because the toilet will not flush efficiently.

A. A displacement bag can save about 1 gallon per flush, helping lower your water use.

Fill either a displacement bag or a plastic milk/soda bottle with water and place it inside the tank between the tank wall and the intake valve. Be sure to install it so that it does not touch or interfere with any of the toilet's mechanisms. Be sure to check it regularly, since loose objects inside a toilet tank tend to move around. Easy-to-install displacement bags are available at most hardware, plumbing and home stores. Check with your local utility — they may have some available free of charge. However, if you have to flush more than once, a different retrofit mechanism may be your next step.

B. Variable-buoyancy flappers and flap actuators that ride on the overflow tube will greatly increase the efficiency of your existing toilet. These devices are designed to make the flapper close before all the water rushes from the tank into the bowl, but the water that does rush though still moves with its original full force. If such a device is put into a 5-gallon toilet and adjusted to save 2 gallons, all 5 gallons are still moving downward once flushing is started, but the flap will close while 2 gallons still remain in the tank. These can be found at hardware and home stores.

C. Dual-handle mechanisms work in a similar way, but they give you a choice. They still let you use the full flush with one handle, but have a second handle that releases up to 75 percent less water — but this is still enough force to carry away liquid waste.

Proper maintenance

Properly maintaining a toilet is the most important way to keep your bathroom water efficient. Listen for running water when the toilet hasn't been flushed recently. Conduct a dye tablet test (page 2-7) if you suspect the toilet may be leaking and follow the steps to maintain the toilet.

Showerheads

Showers and baths account for about 30 percent of the water use within your bathroom. Today's low-flow showerheads have a rate of flow of about 1.5 gallons per minute (gpm); older showerheads flow at a rate of 3 gpm or more. By replacing your showerhead, you can make a huge difference in the amount of water you and your family use.

The first thing you need to do with your showerhead is find out its flow rate.

Check the showerhead's flow rate

The easiest way to save water in the shower is to install a low-flow shower head which reduces maximum flow to less than 2.5 gallons per minute, depending on head design and your water pressure.

To check the flow rate of the existing showerhead:

A. Take a one-gallon jug and cut a piece out of the top so that the showerhead fits inside;

B. Turn the shower on all the way and time how long it takes to fill the jug. (After the test, use the water in the jug to water a plant.)

Seconds to fill jug	Flow *(gallons per minute / gpm)*
10	6.0
15	4.0
20	3.0
24	2.5
30	2

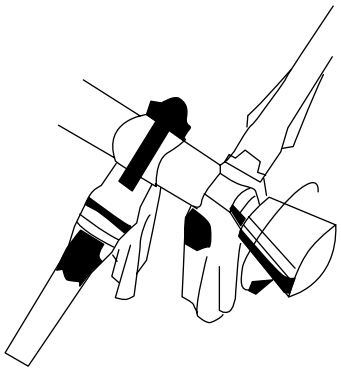
If the jug fills in less than 24 seconds, your showerhead uses more than 2.5 gpm. Replacing it with a more efficient showerhead will not only save you money on your water bill, but will also save you the cost of heating water that is wasted.

Installing a low-flow showerhead

If your showerhead's flow rate is greater than 2.5 gpm, you should consider changing it to a low-flow model.

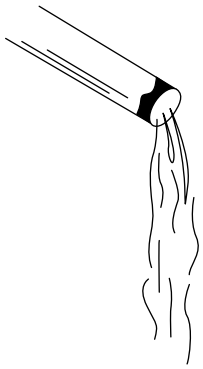
Gather the following supplies: an adjustable wrench or pliers, joint sealer or teflon tape, and a low-flow showerhead of your choice.

Note: some showerheads may require an adapter in order for the new low flow head to fit onto the existing plumbing.

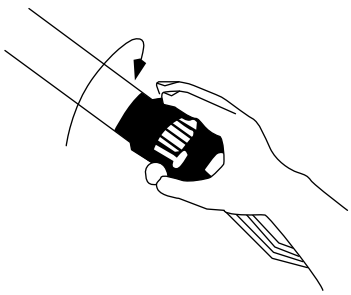


A. Shut off the water supply to the showerhead; this is usually the faucet knob you use to turn

the shower on and off. Use the adjustable wrench to remove the old showerhead

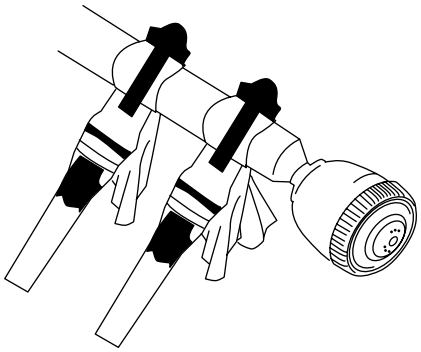


B. Clean the threads to remove old joint sealer or tape.



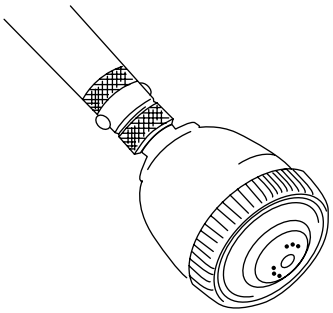
C. Apply new joint sealer or tape, using package instructions. Use adjustable wrench to install new showerhead.

Tip: Use a cloth between the new showerhead and the jaws of the wrench to avoid scratching your new fixture.



D. Turn water supply back on and check for leaks around the showerhead.

Installing an on-off valve



Water-saving hardware also includes shutoff valves. These valves can and should be used even with low-flow showerheads.

An easily accessible on-off valve near the shower head allows a person in the shower to shut off water while soaping, shampooing, or shaving. If about half of your shower time is spent soaping, shampooing, or shaving, shutting off the water while you do those things would significantly save water and the energy needed to heat it.

Valves are designed to dribble when closed, so water in the pipe stays at the selected temperature and doesn't blast the person in the shower with a cold stream when turning the valve back on. These valves are built into many low-flow heads. Models include push-button valves and different kinds of twist levers.

Shutoff valves are also available for sinks.

The steps for installing an on-off valve are basically the same as for installing a low-flow showerhead:

A. Gather the following supplies: an adjustable wrench or pliers, joint sealer or teflon tape, andthe on-off valve of your choice.

   Note: some on-off valves may require an adapter in order to fit onto the existing piping.

B. Shut off the water supply to the showerhead; this is usually the faucet knob you use to turn the shower on and off.

C. Use the adjustable wrench to remove the showerhead.

D. Clean the threads to remove old joint sealer or tape from the faucet.

E. Apply new joint sealer or tape, using package instructions.

F. Use adjustable wrench to install the on-off valve.

   Tip: Use a cloth between the new on-off valve and the jaws of the wrench to avoid scratching your new fixture.

G. Clean the threads to remove old joint sealer or tape from the showerhead.

H. Apply new joint sealer or tape, using package instructions.

I. Use adjustable wrench to re-install the showerhead.

   Tip: Use a cloth between the new on-off valve and the jaws of the wrench to avoid scratching the showerhead.

J. Turn water supply back on and check for leaks.

Faucets

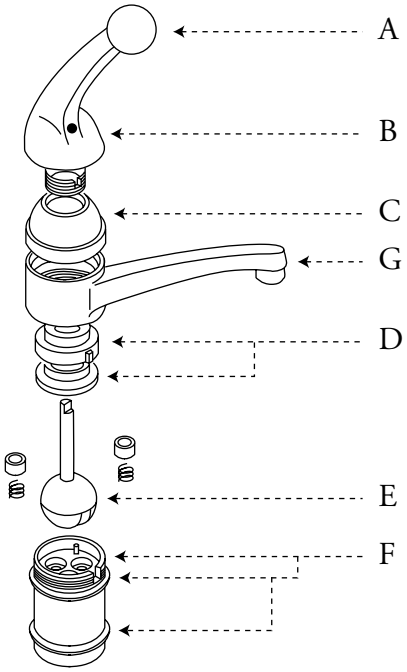
A leaky faucet that drips one drop of water every second for a year wastes 2,700 gallons of water. And if it is hot water faucet, you're losing water and the energy required to heat it. Leaky faucets are usually caused by a worn washer or 'O' ring.

To fix leaky faucets, you'll need: an adjustable wrench or pliers, a screwdriver, maybe a pair of needlenose pliers, and a repair kit for the specific faucet you are going to fix.

There are four types of faucet on-off mechanisms — ball and cartridge mechanisms are common; tipping valves are the most common; and ceramic disc are new. You will need the proper repair kit for the specific type of faucet you are fixing. Faucet repair kits are available at your hardware store. It will help to know the brand name and model of the faucet you are repairing.

The faucet repair kit you purchase will most likely include instructions for your particular faucet-type. If not, here are the *general procedures* for three types of mechanisms:

A. Repairing a Ball Faucet

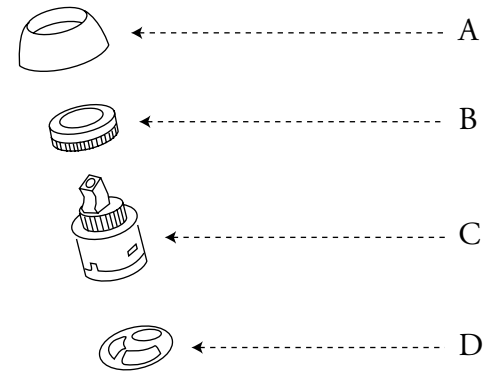


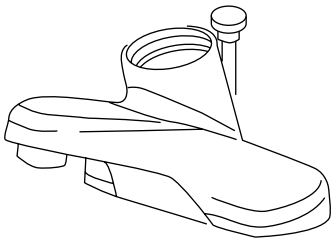
Tools required: Allen wrench, pliers

1. Turn off water supply.
2. Using Allen wrench, partly unthread set screw (B), then pull off handle (A).
3. Unthread and remove cap assembly (C).
4. Remove ball and cam assembly (D) by pulling up on stem ball (E).
5. Remove spout (G) by pulling upward.
6. Remove worn spout "O" rings (F) and apply replacement "O" rings.
7. Reassemble spout (G) onto faucet body.
8. Check rubber seats and springs (H) for wear. If worn, replace with manufacture seats and springs.
9. Replace worn ball.
10. Reassemble faucet in reverse order.

B. Repairing a Ceramic Disc Faucet

In most cases, these are guaranteed for life.





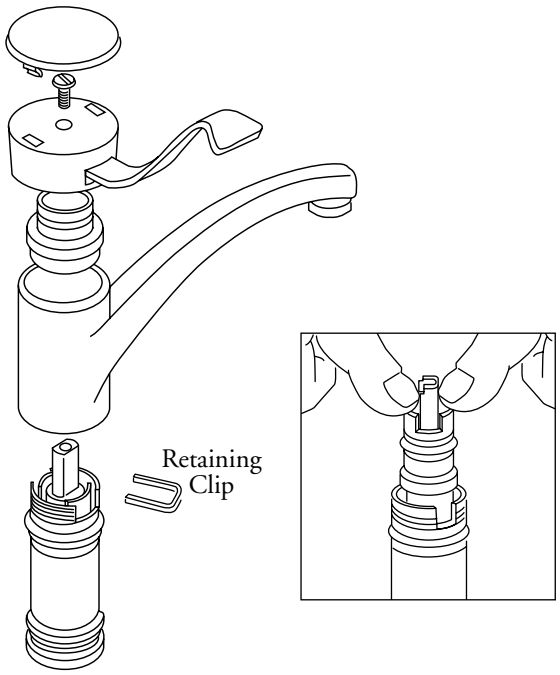
Tools required: pliers

1. Turn off water supply.
2. Remove handle.
3. Remove top dome-shaped cap (A) by unscrewing counter-clockwise.
4. Using pliers, unscrew the retaining ring (B).
5. Carefully remove cartridge assembly (C) by pulling straight up on stem with pliers.

6. Install appropriate gasket (D) based on handle type and replacement kit instructions.

7. Install new cartridge assembly. Reassemble by reversing steps.

C. Repairing a Cartridge Faucet



Tools required: Pliers, Standard (flat-tipped) and Phillips (cross-tipped) screwdrivers.

1. Turn off water supply.

2. Pry handle cover off.

3. Unscrew handle screw and remove handle knob and handle parts.

4. Pull out retainer clip with pliers.

5. Remove cartridge.

6. Pull stem of new cartridge to open position. Insert new cartridge into faucet body by pushing on cartridge "ears" (if water appears around stem when cartridge is inserted, this is not a leak, this is normal).

7. Align the cartridge ears with the slots in the faucet body. Insert clip through the faucet body slots, straddling the cartridge ears and into opposite faucet body slots.

8. Align notched flat on cartridge stem according to handle type and manufacture's instructions.

9. Replace handle according to handle type and manufacture's instructions.

Faucet aerators

Another way to reduce water use with your faucets is by using aerators. Start by checking the amount of water flowing from each faucet. You can do this by opening the faucet and allowing water to flow into a container for 10 seconds. Multiply the amount of water in the container by six to determine the per minute flow. If your existing aerator flows above 3 gallons per minute, you should replace it with a low-flow aerator. This one simple step can save 3 to 5 percent of your total indoor water bill.

In the kitchen, you will want a 2.5 gallon-per-minute aerator to make sure the flow of water is enough to wash and rinse dishes, and fill cooking containers. You may want to use a low-flow aerator with an on/off flip handle that allows you to increase or reduce the flow as needed.

Your bathroom faucet is used primarily for rinsing tasks. Here, a 1.5 to 2 gallon-per-minute aerator will provide enough water for shaving, hand washing and other personal hygiene tasks.

The steps to installing an aerator are:

A. Buy an aerator with the proper flow rate for your use, and one that will fit the faucet. You may want to take the old one with you to the hardware store to ensure buying the correct size.

B. Remove the old aerator; you may need a wrench.

C. Screw in the new aerator.

Other household water uses

Washing Machines

Replacing your traditional washing machine which spins upright or vertically, with a front-loading or horizontal-axis ("H-axis") machine can reduce water use by 30 to 60 percent.

Even if you don't replace your machine, whenever you do wash clothes be sure to wash full loads and adjust the water level to fit the size of the load.

Dish Washers

Here again, if you are getting a new machine, look for one that is water efficient. Otherwise, be sure to wait until you have a full load before running the washer and run it at the shortest cycle possible.

Sinks and Tubs

If your kitchen sink's stainer-basket stopper leaks as you're doing the dishes, replace the rubber stopper on the bottom. Take the entire stopper to your hardware store inorder to get the correct replacement.

If your bathtub drainplug leaks as you're bathing, tighten it up! A chain connecting the lever to the plug may have some slack in it, not allowing you to get a tight fit. Removing the lever cover will give you access to tighten up the chain.

Finding other leaks in the home

Now that you have all the visible leaks fixed, check for those that you don't know about by reading your water meter, as explained on page 2-4 and make note of the meter reading. Then turn off all water-using fixtures in your home and don't use any water for an hour. Now, go back and check the reading on the meter. If it has changed, you may have leaking pipes and will need a plumber to help you find and repair them.

Reading your water bill

In the State of Florida, water belongs to everyone, and can not be sold. On your water bill, what you pay for is the service to provide you with drinking water, sometimes called the "3 P's" of water — purification, piping and pressure. You pay to have water piped into your home and that cost is based on the amount you use. The cost for purification and pressure is built into this amount. You also pay to have the wastewater piped out — unless, of course, you have a septic system. The more water you use, the more there is to dispose of — and the higher your water and wastewater charges climb. (With a septic system, keep in mind there are inherent maintenance costs.)

Understanding your water bill — the meter readings, number of service days, rate per thousand gallons, sewer charges — will help you become more aware of your water use. You will also be able to monitor the effectiveness and money-savings of your conservation efforts.

Section 3:

Outdoor Water Efficiency Techniques

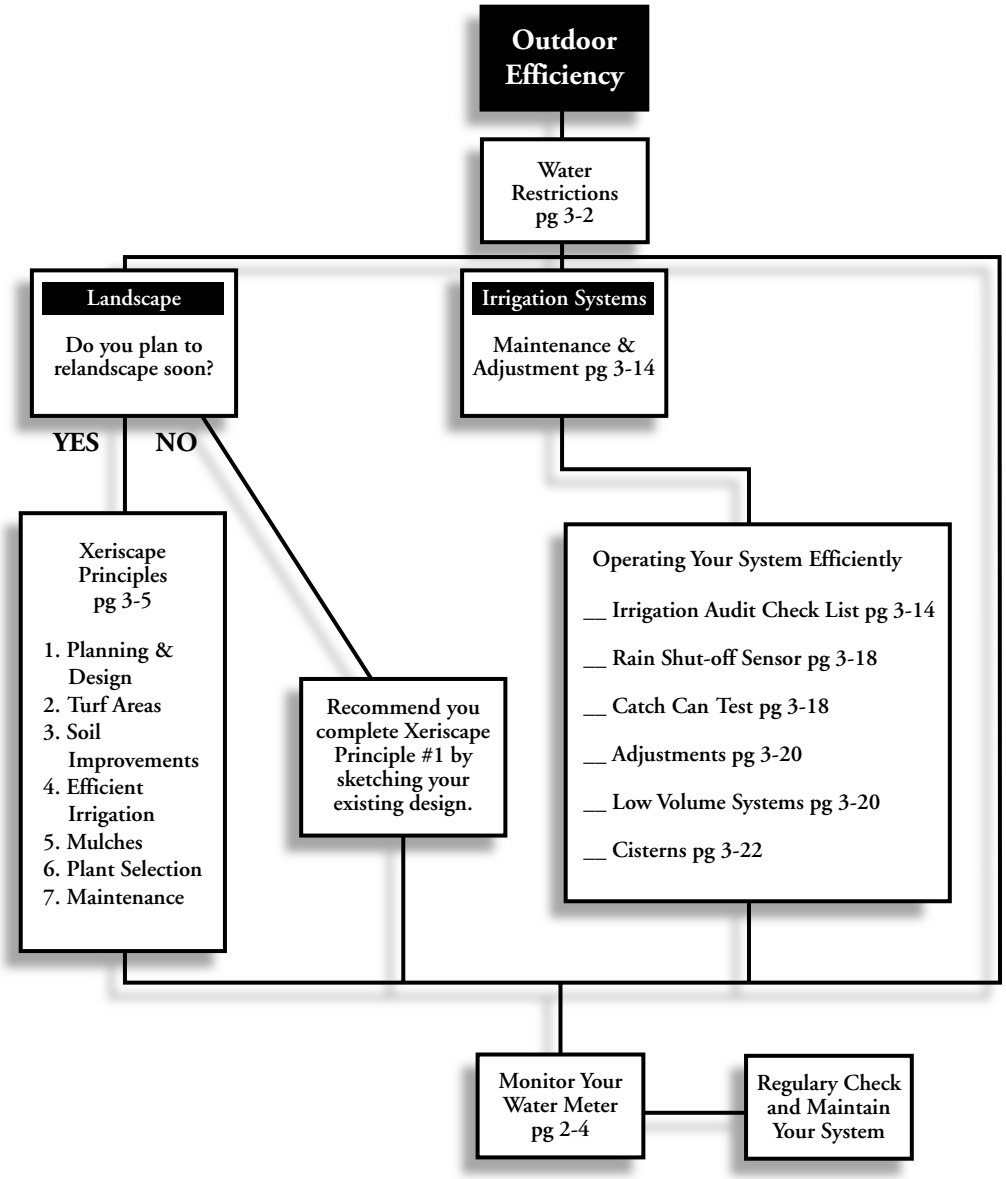
Community Water Counselor

Outdoor Water Efficiency Techniques

The goal of this section is to :

- ▲ Increase your awareness of how you use water outdoors;
- ▲ Help you examine your landscape and irrigation methods to see if you can increase your water-use efficiency;
- ▲ Help you make future landscape decisions that will be water efficient decisions.

Statistics show that a little less than half of the water that goes to a home is used outdoors, primarily for landscape irrigation. For this reason, heavy emphasis is placed on efficient water use and conservation outdoors.



Water restrictions

Even though Florida receives an average of 53 inches of rain annually, water supplies in the Southwest Florida Water Management District area have been under stress for several years. The District uses several management techniques to preserve our natural resources, including: developing new, alternative sources of water in cooperation with public and private interests; and, promoting the use of common-sense habits and state-of-the-art conservation technologies. The implementation of water use restrictions is another management tool used throughout the District.

Florida has two hydrological seasons — the rainy season (usually June through September) and the dry season (October through May). Nearly 65 percent of the 53-inch annual rainfall (about 34.5 inches) occurs during the four-month rainy season. The remaining 35 percent (or 18.5 inches) falls during the eight-month dry season. The drastic difference in rainfall between seasons can cause significant stress on the environment. With everyone conserving water, we can reduce the human impact on the environment.

Season	Rainfall inches (avg.)	Percent
"Rainy" June – September	34.5 inches	65%
"Dry" October – May	18.5 inches	35%

The restrictions, along with the other conservation measures, help as the District strives to strike a balance between meeting current and future water needs and protecting the natural resource.

The water restrictions affect all water users. The most well-known part of the restrictions concern landscape irrigation, prescribing the days and times people may water their landscape. Other restrictions also apply to farms, golf courses and other businesses. These restrictions have been in force since March 1992 for Pasco County south to Charlotte County, and since December 1993 for Hernando County north to Marion County. Some form of the restrictions have been in effect since June 1977. The current District-wide water restrictions are on page 3-3.

Local governments can implement tighter restrictions, and many of them do. It is recommended that you check with your local water utility to find out if there are any other watering restrictions you should be aware of. A list of local government restrictions also starts on page 3-3.

Local governments enforce landscape watering restrictions, while the District focuses its enforcement efforts on farms, golf courses and other large water users. Violations can include citations and fines. The days and times specified in the District's restrictions are designed to be flexible enough to allow you to give your landscape the water it needs. Although these restrictions provide 18 hours in which to do watering on "allowable" days, most residential lots can be watered in only four to six hours. The extra hours are intended to help larger properties (and people without automatic irrigation systems, especially people who work second and third shift jobs).

Overwatering will damage your plants, reduce our water resources, and cost you money. Signs of overwatering include: dollar weed, root and leaf diseases, and thatch build up on lawns. Overuse of chemicals to combat the signs of overwatering can contribute to local lake and well water pollution as well. Additionally, less frequent watering encourages deeper root development, leading to healthier turf.

Districtwide Restrictions (Modified Phase III*)

* Phase III of Chapter 40D-21 F.A.C. as modified by Board Orders 92-12, 92-21 and 92-60, or Board Order SWF 93-105.

These District restrictions allow watering two days a week according to address:

- odd addresses may irrigate Wednesday and/or Sunday;
- even addresses, Tuesday and/or Saturday).

Watering is allowed from 12:01 a.m. to 10 a.m. and/or 4 p.m. to 11:59 p.m.

Handwatering of vegetable gardens, flower beds, trees and shrubs is allowed without regard to day of week or time of day. Irrigation using reclaimed water (highly treated wastewater effluent) or geothermal unit discharge is allowed without regard to day of week or time of day. Car washing is allowed on any day, but any hose used for this purpose must have an automatic shutoff nozzle. Additional restrictions and certain exemptions apply.

HILLSBOROUGH COUNTY

Unincorporated Hillsborough County
813-272-5977

Days: Same as District.

Hours:
Irrigation prohibited 9 a.m. to 5 p.m.
(Does not apply to the municipalities of Tampa, Plant City, and Temple Terrace)

City of Tampa
813-223-8663

Days: Same as District.

Hours:
Irrigation prohibited 9 a.m. to 5 p.m.

PASCO COUNTY

Unincorporated Pasco County
813-847-8145

Days: Same as District.

Hours:
Irrigation allowed 5 to 9 a.m. and/or
7 to 11 p.m.

Other:
Watering in of insecticides, fungicides and herbicides shall only be done during allowable days and hours.

Fountains prohibited unless using recycled water.

No variances allowed.

City of New Port Richey
727-841-4536

Days: Same as District.

Hours:
Irrigation allowed 5 to 9 a.m. and/or
7 to 11 p.m.

Other:
Watering in of insecticides, fungicides, and herbicides shall- only be done during allowable days and hours.

PINELLAS COUNTY

Pinellas County
727-464-4520

Days: Same as District

Hours:
Irrigation allowed 5 to 9 a.m.
and 7 to 11 p.m.

Other:
Applies to Pinellas County Water System customers except as indicated below; applies to potable water only (wells and other water sources may follow District hours).

Town of Belleair
727-584-7134

Days:
Odd addresses may water Friday only; even addresses may water Tuesday only.

Hours:
Irrigation prohibited 9 a.m. to 5 p.m.

City of Belleair Bluffs
727-581-6808

Days: Same as District

Hours:
Irrigation prohibited 9 a.m. to 5 p.m.

City of Clearwater
727-462-6848

Ordinance generally follows Pinellas County or District restrictions (whichever is stricter).

Days: Same as District.

Hours:
Irrigation allowed 5 to 9 a.m. and/or
7 to 11 p.m.

Other:
Unlike Pinellas County restrictions, these hours also apply to wells and other water sources.

City of Dunedin
727-734-4151

Days:
Odd addresses may water Friday only; even addresses may water Tuesday only.

Hours:
Irrigation prohibited from 10 a.m. to 4 p.m.; in-ground irrigation systems may only water between 12:01 a.m. to 10:00 a.m.

Other:
Vehicle washing is restricted to Saturday and Sunday only; rinsing of boats and flushing of boat motors is permitted for 10 minutes a day for each boat.

City of St. Petersburg
727-893-7251

Days: Same as District.

Hours: Irrigation allowed 5 to 9 a.m.
and/or 7 to 11 p.m.

Hand watering and car washing are same as District. (These restrictions also apply to private wells) Rinsing of boats and flushing of boat motors is permitted for 10 minutes a day for each boat.

Water-Efficient Landscaping

There are three parts to a water-efficient landscape — the landscape design itself, the irrigation system for the plants in the landscape, and the management of the landscape and irrigation system.

So whether you have an automated irrigation system or you water your plants manually, you can save water by understanding your plants' needs and your equipment.

Landscape Design

If you are planning to landscape or re-landscape your yard, or you've been thinking about it, putting careful thought into the design before you begin will pay you big dividends — a water-efficient yard that you can be proud of.

Even if you are not planning any major re-landscaping projects, understanding what a water-efficient landscape is will help as you add to or adjust your existing design.

In Florida, when talking about landscaping the term "Xeriscape™" is often used and it is a very important concept to understand. Xeriscape is a form of quality landscaping that saves water and helps to protect the environment.

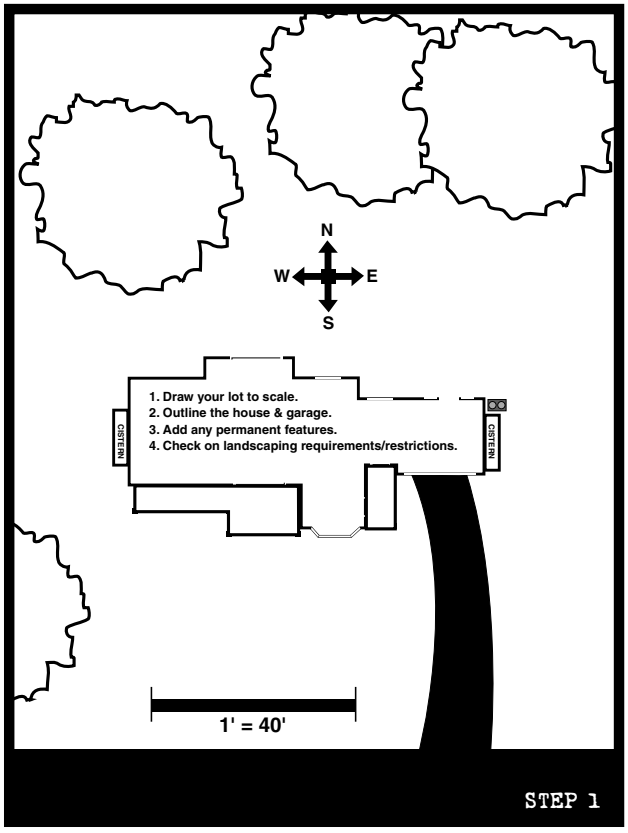
A Xeriscape landscape conserves water through creative, appropriate landscape design and water management. The key words are "appropriate design" and "management," since you can have the garden-look you want, while saving water. You can achieve this by implementing the seven principles of Xeriscape.

The Seven Principles of Xeriscape

1. Planning and Design

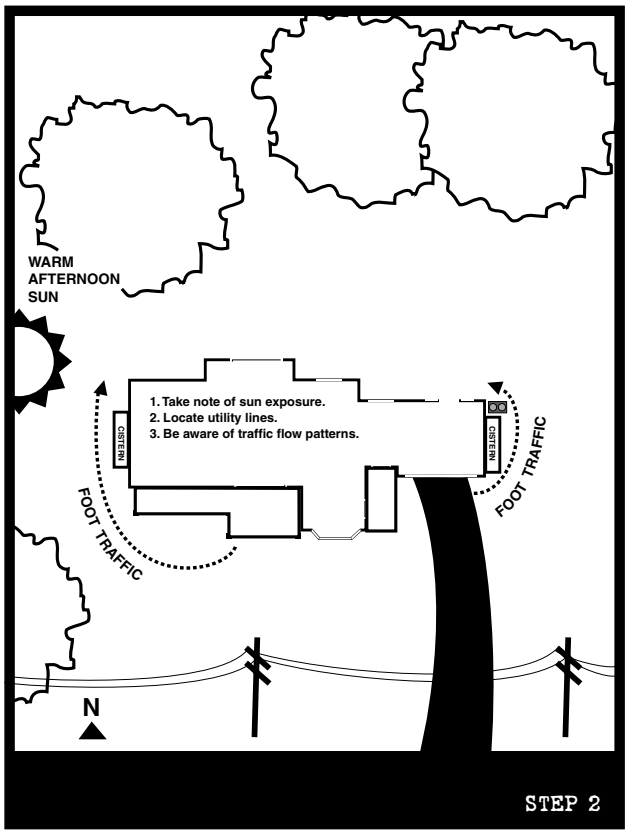
Of the seven principles, Planning and Design is a critical step to a successful landscape. Time spent developing a good, detailed plan will payoff in the long run. It will allow you to:

- Progress in phases, as your time and budget allow;
- Avoid costly mistakes of buying too many plants or plants that will not survive your site conditions or level of maintenance;
- Develop the beautiful landscape you want. A seven-step planning and design process starts on the next page.



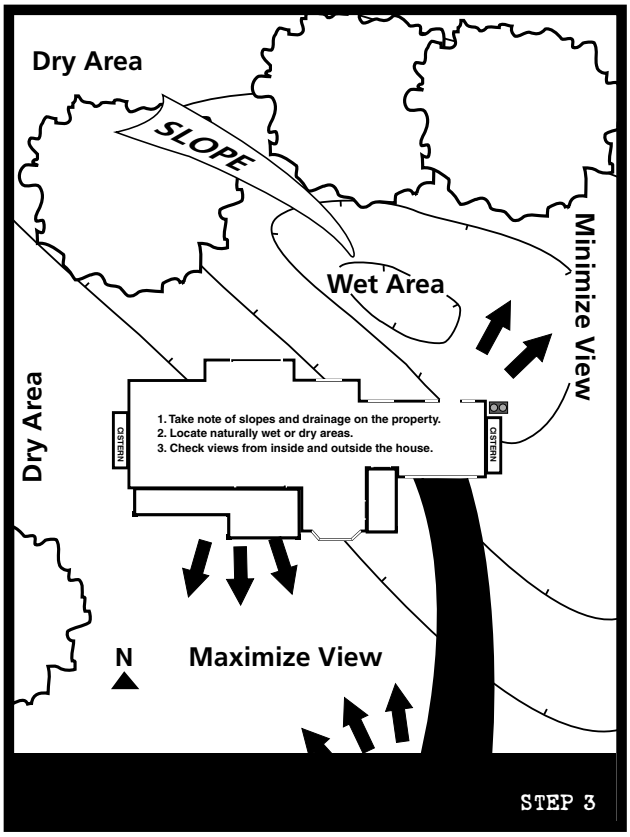
Step 1

- Planning your Xeriscape is an important first step. It will help you avoid costly mistakes and give you a "road map" that will make completing your Xeriscape landscape much easier.
- Be sure to draw your plan to scale. It will save you time in the long run, because it will help you better estimate the amount of materials needed.
- Add all the permanent features you plan to work around: trees, driveways, buildings, etc. You will want to build them into your plan.
- Be sure you know local landscape requirements and, if you live in a deed-restricted community, the neighborhood requirements. You want to plan something that meets the requirements.



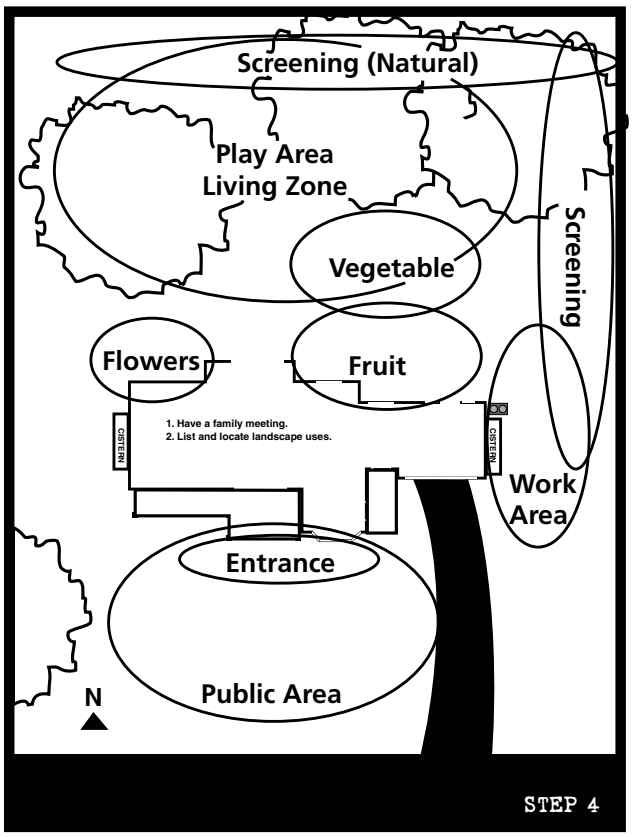
Step 2

- Look to see which parts of your yard are sunny, partly sunny and shady. How does that change over the course of a day? Is it different at different times of the year?
- In general, the southwest corner of your yard has the potential to be a hot spot. Also, our chilly winter winds usually blow from the northwest.
- When looking at utility lines, be sure to look up and down. Digging up underground lines can be inconvenient, hazardous, illegal and costly. Don't plant trees or other plants that will interfere with overhead lines or underground utilities.
- Don't fight old habits. It's easier to plan a path or walkway where traffic flow patterns already exist, than it is to redirect traffic.



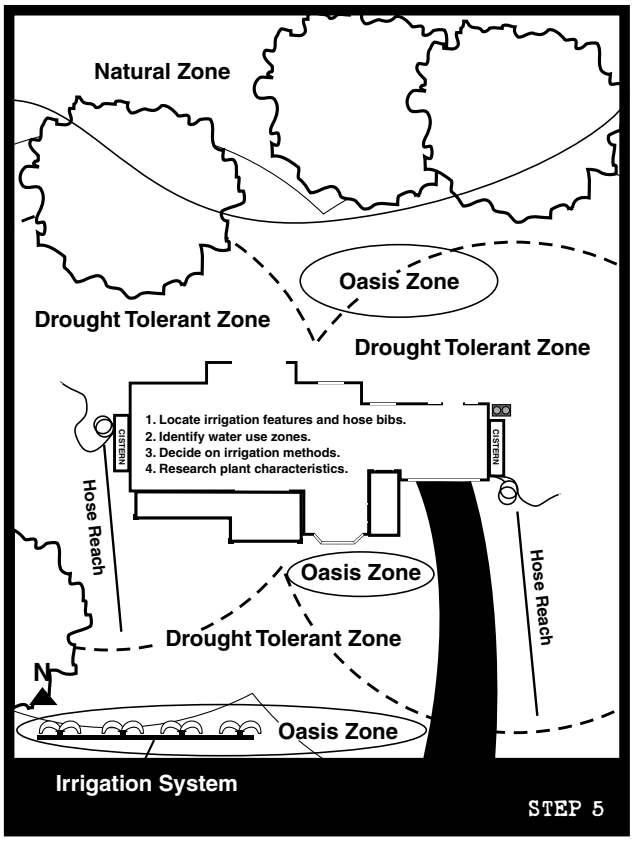
Step 3

- Watch how water drains—or doesn't drain—in your yard. You may want to plan a grassy buffer zone or plant bed to slow and filter water draining to a lower area.
- An area doesn't have to look wet to be wet. Dig down about 6 inches in an area you think may be holding water to see if the soil is moist below the surface.
- Take a good look around your yard. Are there things you want to make sure remain in sight from a certain area? Are there sights or noises you want to block out?
- Make sure you go inside to look out, too. You will want to maximize good views and block those that are not so good. And, don't forget the curb appeal. You will want to plan something that looks good from the street, too.



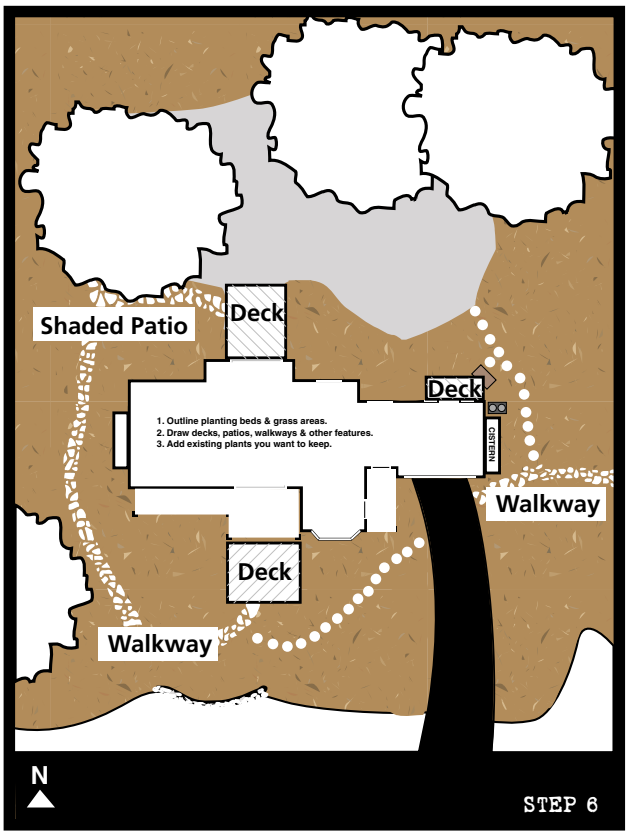
Step 4

- This is the time for an all-important family meeting to talk about how each family member wants to use the yard.
- Don't forget the family pet. Your pet will need a place to play and exercise.
- Take your time on this part of the planning. This will help you create a realistic list and make sure that your landscape will be one every member of the family can enjoy.



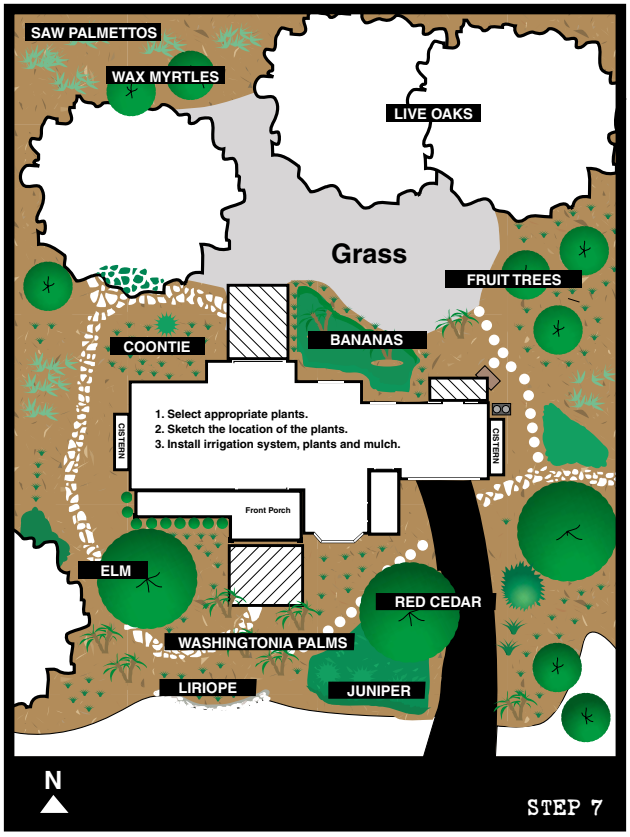
Step 5

- Think of different areas of your yard as "zones." Grouping plants with similar water needs into those zones will help you water efficiently.
- Plant materials in the "natural" zones will survive on rainfall without irrigation. Those in the "drought-tolerant" zones may need a little supplemental irrigation during dry weather. "Oasis" zones contain plants that need frequent watering. Two of the oasis zones are within reach of the hose. The oasis zone along the street is a turf grass area and is the only area in the yard where an irrigation system exists.
- You can use the District *Plant Guide* or other materials available in bookstores, libraries and at your local extension service, to help identify plant material to meet your needs. If you live on or near salt water, be sure to check salt tolerances before making your decision.



Step 6

- Now that all the preliminary work is done, you are ready to add the final touches. In the sketch, the light colored areas contain turf grass. The remaining area contains decking, plant beds, mulched areas and walkways...all placed to meet the needs earlier identified by the family.



Step 7

- Here's the final plan. You don't have to implement the entire plan at once. Now that you have it on paper, you can install your Xeriscape in sections if you like.

- *Your local additional County Extension Service is a good source for information on Xeriscape and other landscaping techniques.*

2. Practical Turf Areas

Turf is probably the thirstiest plant in the typical landscape, and it requires frequent maintenance. Lawns are great places to play, relax and enjoy nature, but you can reduce your water use and maintenance by considering how much turf you really need. More options are available than high-maintenance sod. Where they may perform the same function as turf, consider less thirsty materials such as islands of drought-tolerant shrubs, trees, ground covers, mulches or hardscapes, such as decks and patios.

3. Soil Amendments or Improvements

Adding organic material improves the soil, allowing better water penetration, increasing water-holding capacity and providing nutrients for plants. To determine if improvements are needed, you should first have your soil's pH-level tested. Your county's Cooperative Extension Service can provide information on having your soil tested. Make any soil improvements prior to installing plants or an irrigation system.

If you are considering soil amendments or improvements, keep two things in mind:

▲ It is much easier to select plants that are suited to your existing soil conditions, rather than attempting to make the soil suitable for the plants.

▲ Soil amendments are temporary and once plants are in place, it is difficult to reapply the amendments.

4. Efficient Irrigation

If your landscape design includes an irrigation system, remember, the combination of a sound irrigation design and installation, along with routine management are both needed to conserve water. Irrigation technology has boomed in the last several years and offers improved product quality, variety and increased efficiency. (Specific information on irrigation systems is covered in the next section, page 3-13, Irrigation Systems).

Different types of irrigation should be used for specific needs. Turf irrigation should be on separate irrigation zones from other plants.

1. Turf areas are best watered with rotary or spray heads. Sprinkler heads should produce a uniform, low trajectory stream to reduce susceptibility to wind and evaporation.

2. Trees, shrubs, flower beds and ground covers can be watered with low volume sprinklers, drip or bubbler emitters (and these are exempt from water restrictions).

All automatic irrigation systems should have an automatic rain shutoff device installed. In fact, Florida law requires that all systems installed after May 1, 1991 include an automatic rain shutoff device. Check with your local utility, local ordinances may be more stringent.

Even if you have a rain shutoff device and an automatic system, keeping the system on "manual" lets your lawn tell you when it needs water. Thirsty grass blades will fold slightly and turn a bluish-grey, and your footprints will remain visible.

Knowing how much water and when your plants need it, as well as monitoring and maintaining your irrigation system, are the biggest keys to conserving water outdoors.

5. Mulches

Mulches can be a goldmine in your landscape—they cover and cool the soil, reduce weed growth, slow erosion and minimize evaporation. The variety of textures and materials available also provide landscape interest. There are two basic types of mulch: organic or inorganic.

Organic mulches decay and provide small amounts of nutrients and structure to the soil. Because of this, they need to be replaced more frequently than inorganic mulches, but they are less expensive. Organic mulches include shredded bark or chips, wood grindings, compost, fallen leaves, pine needles, etc. Some local municipalities and counties provide a recycled mulch service to their community.

Inorganic mulches are usually rock or gravel products, but can include materials such as shredded tires or plastic. Inorganic mulches do not moderate the soil temperature or hold moisture as well as organic mulches.

6. Appropriate Plant Selection

Many popular landscape plants are more water efficient than you might imagine. One of the key concepts of Xeriscape is to select the most appropriate plants for the site conditions of your yard. In other words, "put the right plant in the right place." For example, if there is an area of your yard that is always wet, choose plants that require wet conditions. Consider the use of drought-tolerant plants whenever possible, because these plants are more water-efficient.

Nearly every landscape function can be served with low water-use plants — year-round greenery, bright flowers, borders, or accents. It is more common now for nurseries to tag their low water use plants for easy selection.

7. Sound Maintenance

Although less frequent maintenance is required of Xeriscaped landscapes, some regular maintenance is necessary to preserve the intended beauty and save water too. Pruning, weeding, proper fertilization and water schedule adjustments contribute to decreasing your water use and ultimately your time savings.

Frequently asked questions about Xeriscape:

Q: Isn't Xeriscape just cactus and gravel?

A: Absolutely not! A landscape designed using Xeriscape principles can be soft, green and flowered. Xeriscape demonstration areas, such as at the Florida House in Sarasota, have a naturalistic character with walking paths, rocks, inviting shade, as well as beautiful plants. Of course, some cactus and succulents can also make attractive additions.

Q: I like grass. What about my lawn?

A: One of the key concepts of Xeriscape is to select the most appropriate plant for the site conditions of your yard. This includes turf areas only where they are the most practical, such as the children's play area. By limiting your turf areas, you can reduce the maintenance and water that turf requires.

Q: Does Xeriscape include all native plants?

A: Not at all. Although a native garden can be beautiful for both humans and wildlife, we have a whole world of plants from which to choose. Some plants native to Florida require a lot of water. On the other hand, some non-native plants require very little water, pesticides or fertilizers.

Q: Where can I find plants that are suitable for Xeriscape?

A: Any plant can be used in a landscape design using Xeriscape principles. Additionally, your county's Cooperative Extension Service office has information on a wide-variety of plants. The District *Plant Guide* has information on over 240 plants, and is available at no charge from the District or your county's Cooperative Extension Service office.

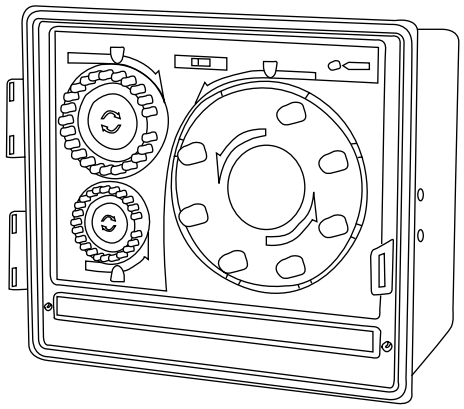
Irrigation Systems

You can reduce your outdoor water use by up to 30 percent simply by having a well maintained, properly adjusted irrigation system that operates only within the allotted watering times, and is equipped with a rain shutoff device.

Irrigation System Components

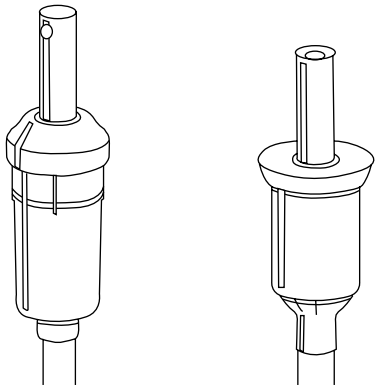
Before you can begin to maintain and adjust your system, you need to know the components of your system.

Most residential irrigation systems consist of the following components:

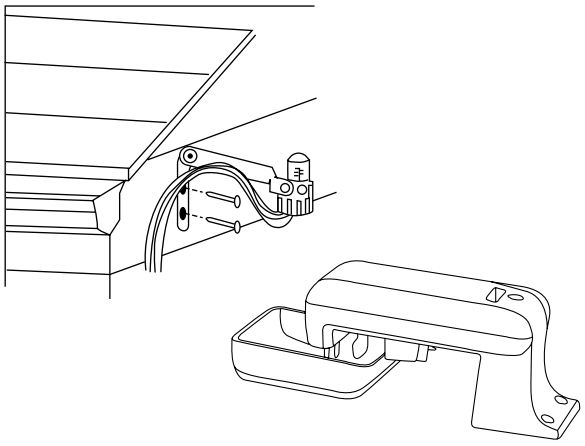


▲ The **controller** is an electronic or mechanical timer connected to a series of valves to turn the system on and off at specified intervals. Each area watered by a control valve is called a zone. Electronic controllers are often preferred because they allow different operating schedules for each zone. Not knowing how to operate or adjust the controller leads to the greatest waste of water.

■ A **backflow prevention assembly** ensures one-way flow between the meter and the control valves. The assembly prevents water from backing up into the main line flowing into the home.



▲ **Sprinklers** are categorized as spray heads or rotors. Spray heads apply water at relatively high rates (1.5 in./hr.) to the immediate area, while rotors use 2 to 3 times less water, and irrigate larger areas. Therefore, spray zones are operated for shorter durations than rotor zones.



▲ The **rain shutoff device** keeps the irrigation system from operating when rainfall accumulation reaches a pre-set level. They are designed to interrupt the flow of electricity to the pumps, so that the timer in the controller does not need to be reset. Florida law requires that all automatic inground irrigation systems (installed after May 1, 1991) be equipped with an automatic rain shutoff device.

Maintaining Irrigation Systems

Maintaining an irrigation system is one of the most important things you can do to conserve water outdoors. The visual inspection is a simple check list that requires a minimum investment of time and can reveal common problems. It only takes about a half hour to complete. Ask the following questions as you check out the irrigation system:

Visual Inspection [1]

Are plant beds on separate zones from turf?

One of the most common over-watering problems occurs when shrub or flower beds and turf are in the same irrigation zone. Most shrubs require less frequent watering than turf and some common landscape shrubs require no supplemental watering once they are established. When shrub beds are watered at the same time as turf, the beds are almost always over watered.

Are rotors and spray heads on separate zones?

Spray heads apply water two to three times faster than rotors. Spray heads and rotors should be on separate zones for uniform application.

Are spray heads turned off in areas with mature, natural shrubs?

The District *Plant Guide* defines "natural" as surviving only on rainfall. Zones landscaped with natural shrubs and ground covers do not need to be operated once plants are established, although during periods of extended below-normal rainfall, some supplemental irrigation may be necessary. Consult the District *Plant Guide* for a complete list of natural trees, palms, shrubs, ground covers and vines.

Does the current irrigation schedule water excessively?

Without conducting either a pressure and flow test, or a catch can test, it is impossible to determine the application rate and therefore the correct operating time for an irrigation system. In general however, 45 minutes and 15 minutes is adequate for most rotor zones and spray zones respectively. (Catch-Can test procedures are listed on page 3-18.)

Is a rain shutoff device installed and is it functioning properly?

Make sure the irrigation system has an automatic rain shutoff device properly installed. It should be installed so that

1. Visual Inspection and Checklist, and Catch Can Test from Mobile Irrigation Laboratory, Urban Irrigation Evaluation Teaching Manual; January 1996; U.S. Department of Agriculture, Natural Resources Conservation Service.

rainfall can reach the device easily and where it will not be watered by the sprinkler system. This allows the system to function automatically if the home owner is away from home.

Is the system operated during designated times?

Inspect the controller to make sure the operating schedule complies with local watering restrictions.

Is irrigation sprinkler spacing correct?

Proper spacing is necessary for uniform coverage. Inspect the system to see if the spray pattern from one sprinkler overlaps at least 80% of the radius (40% diameter) of existing systems or 100% of the radius (50% diameter) in new systems to the adjacent sprinklers.

Are flow rates from sprinklers matched?

The flow rate from rotors covering 1/4 circles should be one fourth of the flow rate from rotors covering a full circle. Without conducting flow rate measurements this is determined by visual inspection. Rotors frequently have a number associated with their flow rate either stamped on top of the sprinkler or on he nozzle. Compare this number with manufacturers' catalogs to make sure that rotors irrigating 1/4 circles and 1/2 circles are delivering water at 1/4 and 1/2 the rate of rotors watering full circle.

Is the irrigation stream from rotors free of obstacles?

Keeping turf trimmed low around rotors is the easiest way to improve system uniformity. Some rotors only rise 4 inches. If turf is allowed to grow up around rotors a substantial portion of the applied water is blocked and not available to the rest of the zone.

Is the spray pattern from spray heads free from obstacles?

If spray heads are used for shrub and ground cover irrigation, leaves and branches should be removed from around spray nozzles. Shrub interference around the spray stream can block most of the applied water, preventing water from reaching root zones.

Are risers used to place spray heads above or below shrub interference?

When spray heads are installed for shrub irrigation, they are designed for the shrub height at the time of installation. As shrubs grow, spray heads will need to be raised or lowered.

Is all water applied within the landscape area?

Water being applied to driveways or sidewalks can run off into the street and into stormwater drains. To reduce this waste, adjust sprinklers so that watering onto concrete areas is minimized

Are sprinklers unclogged?

Inspect spray heads and rotors for clogging. If the flow from one spray head or rotor appears low and system pressure appears to be adequate throughout the zone and no leaks are found, the nozzle is probably clogged. Spray nozzles easily unscrew and can be washed out. If a gear driven rotor becomes, clogged, the nozzle must be removed and thoroughly cleaned.

Are sprinklers undamaged and the heads protected from hazards?

One of the most common irrigation system maintenance problems is broken sprinklers that have either been hit by a lawn mower or run over by a car. Sprinklers subjected to these possible hazards, especially along the driveway, should be protected with flex joints or concrete donuts.

Are rotors and spray heads in upright position?

Sprinklers must be perpendicular to the ground to more uniformly apply water across the zone.

Are all rotors in the zone the same?

There is no single best rotor. Most have a variety of features to distinguish themselves from their competition, and each has benefits and drawbacks. Each brand does have performance characteristics that define how it applies water over distance. For uniform applications, rotors with similar characteristics should be used throughout the zone.

Do turf and plants appear healthy?

Inspect leaves for fungus or signs of over- or under-watering. Look for areas in the turf where water coverage may not be adequate.

Are beds planted with native and/or drought-tolerant vegetation?

A good way to reduce the amount of required supplemental irrigation is through appropriate plant selection. Zones landscaped with native and/or drought-tolerant shrubs and groundcovers do not need to be operated once plants are established, except during periods of extended below-normal rainfall. Turning shrub zones off completely can save thousands of gallons of water per year.

Is the property landscaped with drought tolerant turf?

St. Augustine turf has low drought tolerance. If you are re-landscaping in the future or planning to sod the yard, you should consider a drought-tolerant turf such as Bahia. If the appearance of St. Augustine is desired, consider FX-10, which is a variety of St. Augustine that develops a more extensive root system and is very drought tolerant.

Is mulch being used appropriately in beds?

At least 2–3 inches of mulch should be applied to shrub beds to keep moisture in the ground and minimize water lost to evaporation. When mulch is applied correctly, the frequency of supplemental watering should be reduced. Too much water applied to the roots can result in fungus problems. Also, do not mound mulch directly around the base of a tree or woody ornamental plant, as this will encourage crown rot.

Are low volume emitters being used for bed irrigation?

Spray heads are most commonly used to irrigate shrub and ground cover beds. Spray heads apply water to the surface of leaves and the surface of mulch where it is not useful to the vegetation. By using low flow emitters on the ground surface, below the mulch, water can be applied directly to the root zone. This reduces the required supplemental irrigation by as much as 70 percent.

Irrigation System Visual Inspection

Name _____

Address _____

Phone _____

Date _____

Questions	Yes	No
Layout		
Are turf and shrub beds on separate irrigation zones?	Yes	No
Are rotors and spray heads on separate irrigation zones?	Yes	No
Are turf or plant areas that require irrigation receiving it?	Yes	No
Are turf or plant areas that do not require irrigation receiving it?	Yes	No
Appropriate Timer Settings		
45–60 minutes for rotor zones?	Yes	No
15–20 minutes for spray zones?	Yes	No
Rain Shutoff Device		
Is a properly installed rain shutoff device present?	Yes	No
Designated Operating Times		
Is the irrigation system operating during designated water restriction times?	Yes	No
Are sprinklers covering at least 80% of the distance to the next sprinkler?	Yes	No
Matched Sprinklers		
Are all flow rates matched to the area covered?	Yes	No

Questions	Yes	No
Interference		
Are spray patterns free from interference caused by vegetation or other objects?	Yes	No
Application Outside Landscape		
Is all the water applied within the landscape area (does not extend to driveways or sidewalks)?	Yes	No
Maintenance		
Are sprinklers undamaged?	Yes	No
Are sprinklers unclogged?	Yes	No
Are sprinklers protected from hazards?	Yes	No
Are there leaks in pipes?	Yes	No
Are rotors and spray heads in an upright position?	Yes	No
Do all rotors and spray heads have the same flow rate in the same zone?	Yes	No
Turf and Plants (Optional)		
Do turf and plants appear healthy?	Yes	No
Are beds planted with vegetation?	Yes	No
Is the lawn landscaped with drought tolerant turf?	Yes	No
Is mulch being used appropriately in beds?	Yes	No
Are low volume emitters being used for bed irrigation?	Yes	No

Operating an Efficient System

Rain Shutoff Device

Since there are different makes and models of rain shutoff devices, for specific wiring directions, consult the instructions for your particular device. Most models only have two or three wires, so it is just a matter of determining how to connect them to the right place in your system.

Here are some general guidelines when installing a rain shutoff device:

— Mount the device where it will be exposed to unobstructed rainfall, but not in the path of irrigation spray. A suitable location maybe on the side of the house or on a post. The closer it is to the controller, the shorter the wire run will be and the less chance for wire breaks.

— Mounting the device where it receives a lot of direct sun, may cause the device to dry out sooner than desired. Likewise, mounting it in the shade may keep it from drying out soon enough.

— Most devices allow you to adjust the amount of rainfall needed to activate it. You may need to experiment with the adjustments to achieve the desired effect. These adjustments can help you compensate for an overly sunny installation location.

Catch Can Test [1]

This evaluation requires a little time, but it is simple, inexpensive and the information it provides is very valuable. The catch can test will show you if your irrigation system distributes water evenly across the yard, and help you locate wet or dry spots. You will also be able to determine application rates for your turf and decide how long to operate your irrigation system to improve water use efficiency. Reducing irrigation by only 5 minutes per cycle can save thousands of gallons of water each year.

For this test to be accurate and help you become the most water efficient, the irrigation system needs to be well-maintained. If the system itself leaks, fixing the leaks is the first and best thing you could do.

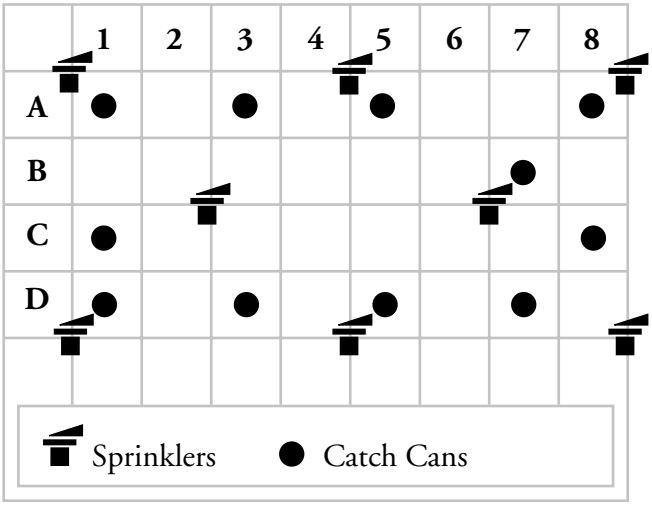
To conduct the catch can test:

1. Select catch cans to place throughout the sprinkling area. These cans can be purchased, but others could be used if they are at least 2 inches in diameter, tall enough to prevent splash, and heavy enough not to tip over easily. The cans need to be uniformed in size; soup cans work well, even a set of coffee mugs would work.

2. Select one irrigation zone, such as the front yard. If other turf zones are designed with the same brands of sprinklers and have a similar layout, you could assume these zones will operate with similar efficiency and uniformity.

1. Visual Inspection and Checklist, and Catch Can Test from Mobile Irrigation Laboratory, Urban Irrigation Evaluation Teaching Manual; January 1996; U.S. Department of Agriculture, Natural Resources Conservation Service.

3. Place catch cans in a uniform grid using at least 16 cans. The more cans you use, the more accurate the test. Cans should be placed at, and between, each sprinkler head.



4. Turn on the system or zone for 7 to 10 minutes for a spray head zone or 20 to 40 minutes for a rotor zone. Visually check the cans during the test to see if a measurable amount of water has collected; if not, run the system longer, recording the time.

Note: If an area is irrigated by more than one zone, then all zones irrigating that area need to be operated.

5. Measure the water in each of the cans using a ruler or measuring tape.

Record this measurement on a grid-pattern data sheet similar to how the cans were laid out. This will show you if the irrigation system distributes water evenly across the zone, and if there are any wet or dry areas.

Example: After running zone for 30 minutes, these measurements are recorded:

	1	2	3	4	5	6	7	8
A	3/8"		7/16"		1/2"			1/4"
B					7/16"		3/8"	
C	5/16"							1/4"
D	1/2"		3/8"		7/16"		1/4"	

6. To determine the average irrigation cycle time, first find the average volume in the cans by adding all the values together then dividing by the number of cans measured.

Example:

3/8 + 5/16 +1/2 + 7/16 + 3/8 + 1/2 +
7/16 + 7/16 + 3/8 + 1/4 + 1/4 + 1/4 = 72/16
= 4 1/2"

4.5 ÷ 12 = .375
= 3/8" avg.

Having done this, we now know that, by running that irrigation zone for 30 minutes, an average of 3/8 of an inch of water will fall.

This is very valuable information to know. Why? Because, during Florida's dry season (October through May), turf needs about 1/2 to 1 inch of water per week. During the summer rainy season (June through September), it needs about 1 to 2 inches per week.

Using a rain gauge, track the amount of rain received during a week. If the volume of rain that fell was enough to satisfy the lawn, then you don't need to irrigate. On the other hand, if not enough rain fell, then you can calculate how long you will need to operate the irrigation system to provide the lawn with the additional water it needs.

Knowing the water needs of your landscape and giving only what is needed is one of the most important things you can do to conserve water outdoors.

C. Adjusting Your System

There are many brands and models of irrigation controllers, each with its own adjustment procedure. If you do not know how to adjust your controller and do not have the instructions, the best thing you can do is go to an irrigation supply business and get the instructions for your make and model of controller.

If, after following the instructions, you are unable to correctly adjust the controller, you may want to call an irrigation specialist to show you how to troubleshoot the problem.

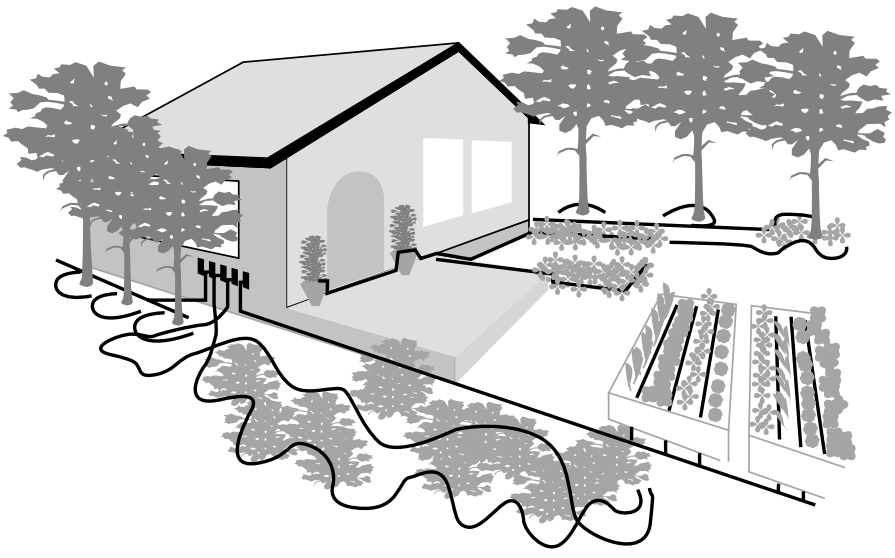
The time and effort you spend to correctly adjust your system will be worthwhile — you'll save not only water, but also the cost of the water on your utility bill *and* possibly the cost of a fine for not following the local watering restrictions.

Just as there are many brands and models of irrigation controllers, there are many brands and models of spray heads. At the back of the reference guide are the adjustment instructions for just a few of the many residential spray heads. If you do not see instructions for the type heads you have, again, go to an irrigation supply business and get the instructions for the makes and models in you have.

Low-Volume Irrigation Systems

The most practical and water-conscious way to water plants is through micro irrigation. This option provides several important benefits:

- ▲ Gets water slowly and directly to the roots;
- ▲ Eliminates runoff;
- ▲ Reduces evaporation and overspray losses;
- ▲ Saves you up to 70 percent more water than other kinds of irrigation systems;
- ▲ Can handle any design by mixing components. For example, you can combine low volume emitters, minisprays and misters;
- ▲ Can be used in combination with a digital automatic controller;
- ▲ It is exempt from water restrictions when it is used for other than turf grass irrigation.



Low-volume irrigation is well suited to most types of garden watering since you can design it to accommodate trees, shrubs, ground covers, vegetables and potted plants. It is also suited for special planting situations. A multi-cycle mist can be created for shallow root plants such as bonsai. To water hanging pots, you can run tubing along eaves.

▲ The **clock or controller** regulates the frequency, starting time and duration of an irrigation cycle. Options range from simple clock timers to computer-controlled programmers.

▲ **Water valves** are electric shutoffs operated by the controller that turn water on and off.

▲ **Water regulators** restrict the pressure of water delivered to drip systems. Drip systems require lower pressure than most homes use.

▲ **Filters** screen sediments so that tiny emitter openings operate without clogging. Filters are essential if you are on a reclaimed water or self supply wells.

▲ **Delivery pipes** transport water from source to emitters and are usually made from PVC or more flexible "poly" materials.

▲ **Micro tubes** are flexible mini-distribution tubes to connect main delivery pipes to individual emitters.

▲ **Emitters** deliver water from main distribution lines to the plants. They must operate under reduced pressure in order to deliver water at a specified rate. Water flows from an emitter in gallons per hour while sprinkler irrigation delivers water in gallons per minute. Emitters may be color-coded for flow rate and come in three types: diaphragms that open or close to control flow as pressure changes, turbulent flow and vortex which spin water in interior chambers to lower pressure where the water exits. You can choose from a variety of emitters:

• Drip: operates at different pressures, most precise and efficient for confined or potted plants;

• Misters, mini-spray sprinklers: spread water over a wider area but at low-flow rates. They are thrifty and best used for closely-spaced ground covers, flowers and vegetables;

• Porous and perforated pipe: sometimes called soaker hoses or "ooze tubes" are used either above or below ground, and seep water slowly or quickly;

• Bubblers: dispense a fair volume of water but at reduced force to prevent erosion. Some can be screwed onto existing spray heads, while others attach to hoses;

The other options you have for getting water to your plants can be relatively inexpensive.

Among the cheapest are soil basins, constructed of circular ridges of soil around the base of plants. They concentrate water at the roots of trees and shrubs and are most useful for plants growing in open soil with little surrounding lawn or ground cover.

Rain Barrels — An Alternative Source for Irrigation.

Have you ever thought of your roof as a water-saving device? If you are looking for a source of water for irrigation to supplement natural rainfall, your own roof may be an answer. After all, why let rain go down the gutter? Factoring in evaporation, an 1800-square-foot roof can shed up to 750 gallons from an inch of rain! Capturing this rainwater can be as simple as using an ordinary trash can as a rain barrel. This barrel can store water from your roof to irrigate your plants.

Rain barrels and cisterns are two different words for similar rain collection techniques. The term cistern

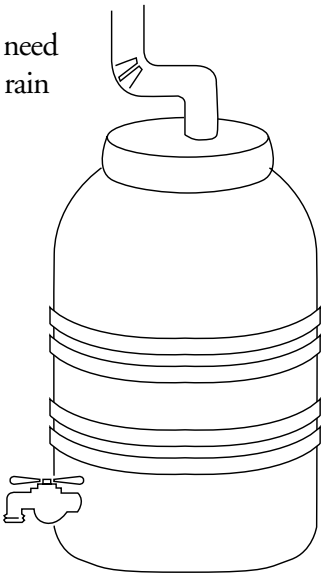
generally refers to a large-scale system of collecting and storing rainwater and using the water for more than just outdoor irrigation. A rain barrel is just that, a barrel to store 50 or so gallons of rain.

Although cisterns are not prohibited by local statutes or codes, if considering installing a cistern, check with your local building and health department for any applicable codes to be followed.

When considering a rain barrel, one factor that cannot be ignored is the variation of annual rainfall in west central Florida. Most of our rainfall occurs during the summer months, when supplemental irrigation is not required. Therefore, the size of the barrel must be adequate to store enough water for an extended period of time. This may make using a rain barrel to irrigate large areas impractical.

To set up a rain barrel, you need a plastic trash can or barrel (be sure the barrel has not been used for chemicals or petroleum products) with a hole cut in the top, a downspout which fits into the hole, and a way to drain out the water you want. Some garden supply stores sell barrels specifically designed for rainbarrels, with a hole in the top and a handy drain tap positioned part way up the side. (Evidence has shown that light-colored plastic barrels break down from sunlight much faster than dark-colored plastics.)

If you use a rain barrel or cistern, some precautions need to be observed. Although rain water is essentially clean and appropriate for outdoor purposes, it can present some hazards, especially when stored in outdoor containers for a long time. Remember, roofs may be contaminated by bird and wildlife deposits, leaves, airborne pollutants and some chemicals from roof materials. All of these will end up in your rain barrel or cistern. Additionally, your storage container needs to have a tight-fitting cover to prevent mosquitoes from using it as a breeding site.



Pools and Spas

A swimming pool holding some 20,000 gallons may seem excessive; however, once filled, a pool will use less water than a turf area of the same size. And a well-maintained, water-smart pool will consume only half that!

A. Use a pool or spa cover when not in use. Covers are a wise investment for several reasons:

   1. Reduces evaporation losses by up to 70 percent;

   2. Acts as an insulating barrier to keep in heat;

   3. Protects water from direct sunlight, reducing chlorine use up to 50 percent;

   4. Helps keep falling and blowing debris out of the pool;

   5. Extends pool and spa life by cutting down on need for acid washes, liner repair, and filter, pump and heater replacement;

   6. Makes pool or spa safer. More than half of all the children who drown, do so in the family pool.

B. Plug the overflow drain before using the pool, but not before using an indoor spa.

C. Turn off the spray device on automatic cleaning equipment.

D. Clean filters by dismantling and cleaning, rather than backwashing.

E. Reduce the thermostat setting for heated pools and spas to reduce evaporative losses and energy use.

Calculating Pool or Spa Water Loss Through Evaporation

How much water your pool loses to evaporation will suprize you and the procedure to determine this is easy:

1. Mark the existing water level on the side of the pool with a grease pencil.

2. One week later, mark the water level again and measure the difference with a ruler. Convert your measurement to a decimal number.

   Example: 1 1/2 inches = 1.5 inches

   Now multiply that number by 0.083. This converts your measurement in inches to a measurement in feet. Example: 1.5 inches x 0.083 = 0.125 feet

3. Determine the pool's surface area in feet by multiplying the pool length by the width. For irregular shaped pools, approximate or look at pool blueprints.

Width (ft.)	Length (ft.)	Surface area (sq. ft.)
8	16	128
12	24	288
15	30	450

4. Now multiply the surface area of your pool (step 3) by the amount of pool water loss in feet (step 2). This will be the number of cubic feet of water lost to evaporation.

5. Finally, convert cubic feet to gallons by multiplying by the number 7.48.

For example:

1. Say our loss measurement for a week is 2 2/3 inches.

   2 2/3 inches = 8/3 inches
   = 8 ÷ 3 = 2.66 inches

   To convert to feet: 2.66 x 0.083 = 0.22 feet

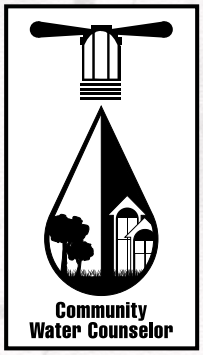
2. Our pool is 10 ft. x 15 ft., or 150 square feet.

3. 150 square feet x 0.22
   = 33 cubic feet of water loss

4. 33 cubic feet x 7.48 = 246.8 gallons of water lost every week to evaporation. If this rate of evaporation continued for one year, we would lose nearly 12,800 gallons a year!

Section 4:

Helping Your Community



Helping Your Community

Congratulations on completing the Community Water Counselor program.

We hope you will now take what you have learned and experienced during the two workshops, and share it with your neighbors. By showing them what you've learned, you will:

- Help the environment through water conservation;
- Help your neighbors become water-efficient and save money on their water bill; and,
- Feel good because you've helped make a difference in your community.

This section will give you some ideas on how you can reach out to your neighbors.

Presenting the Information

1. First, answer these questions:

- ❑ What are the top three things that I got out of the workshops?
- ❑ Why are those my top three?
- ❑ What got me most excited about them?
- ❑ Will they save me the most on my water bill?
- ❑ Are they things I know can now do myself?

Once you have three things that you're excited about, now it's just a matter of finding the best way to present those three things to your friends and neighbors.

2. Next, we need to let your community know about you — their new Community Water Counselor. If your association prints a newsletter, fill in the "Press Release" template at the end of this section and give it to the person who publishes the newsletter.

Also, go to the next association meeting to give a short report on the CWC program you attended, explain what you learned in the workshops, and tell your neighbors that you are willing to share your new knowledge.

3. Plan some activities that would allow you to "show" rather than "tell" people how to save money and water.

- If you know neighbors are interested in Xeriscape™ landscaping, plan to create a community demonstration area of water-saving landscape alternatives. A project like this would involve members actively, and it would also gain the interest of others.
- Start a monthly or biannual landscaping award program for water efficient landscapes.
- Circulate a questionnaire or survey on water use, then present the results at your association meeting or in the newsletter to create interest.
- Start a contest to see who can cut their water bill the most within a specified time frame.
- Present a new water-saving tip at each association meeting. Or, include tips you have learned to improve efficiency in your community's newsletter.
- Circulate brochures and information about classes or activities from the Cooperative Extension or Water Department.

NOTE: The CWC workshops were NOT intended to qualify you to be the neighborhood plumber. They were intended to familiarize you with the relative simplicity of the processes involved, give you a chance to see the process "inaction," and supplement other home-repair guidance that you normally turn to.

4. How will you evaluate the community's move toward water efficiency?

Some utilities have the ability to provide collective water-use statistics for a given neighborhood. This would allow the neighborhood association to track communitywide water savings as various efficiencies are implemented on a community-scale. Call the water resource contact for your utility (end of the reference book) to see if they are able to provide water-use data in this form.

Also, you can survey homeowners, much like you were surveyed at the start of the two workshops. Again, present the results at an association meeting.

5. What are your resources?

All projects take time, energy, leadership and material resources. Becoming a water efficient community can take a few or many resources, depending on the desired outcome.

What resources do you already have available —

- Interested neighbors?
- "Experts" such as plumbers, people who sell or repair appliances, gardeners or nursery owners who already live in your community?
- A meeting place?
- A community association as a forum for your ideas?
- Funding, connections with government resources?

You maybe able to find other resources through:

- The contacts you've made during these workshops;
- The course reference guide. Materials from the guide can be requested from the District, or the appropriate agency. Teaching aids are available for sign-out from the District;
- Speakers from the different agencies are available to discuss a wide variety of water and environmental issues.

Helping others become good stewards of the water resource can be fun and educational for everyone. The benefits to your community, the shared experiences of making a positive difference in your community, and the rewards of living in harmony with nature will all make it worthwhile to be an active Community Water Counselor.

We congratulate you on completing the program and are here to help you in the future.

Press Release For Community Newsletters

"Our Community Now Has a Water Counselor"

_____ recently completed the Community Water Counselor (CWC) program, sponsored by _____ and the Southwest Florida Water Management District (SWFWMD).

The CWC program was specifically designed for homeowners' associations to help residents save water and, in most cases, money as well. Most of us are already conserving water in some way. As our CWC, _____ can share other tips and techniques to help us conserve even more.

Most of these techniques are easy, once you know how.

Topics covered during the CWC Program included:

- **Florida's water resources, and where our drinking water comes from;**
- **Indoor water efficiency techniques, such as:**
  - — Reading your water meter and understanding your water bill;
  - — Conducting a home water audit;
  - — Installing a low-flow showerhead and toilet, and their proper maintenance;
  - — Fixing leaky faucets.
- **Outdoor efficiency techniques include:**
  - — Xeriscape principles, and applying them to your landscape;
  - — Cistern use for the residential landscaper;
  - — Maintaining and adjusting a residential irrigation system;
  - — Drip irrigation systems.

Residents interested in learning more water conservation tips can contact _____ at (phone number or address or contact method).

Community Water Counselor (CWC) Program Internet Sites

The following Internet sites provide good information on the particular subject indicated. These sites were active as of August 20, 1999. A listing in this index does not constitute an endorsement by the SWFWMD, and the SWFWMD is not responsible for the information contained on these Internet sites. These are examples of the many Internet sites that contain information related to water conservation and protection.

Section 1 — Florida's Water World

The Hydrologic Cycle	http://www.getwise.org/cycle/cycle.html
Earth's Ground Water	http://wwwga.usgs.gov/edu/earthgw.html
Florida's Ground Water	http://www.clas.ufl.edu/users/guerry/Flwater.htm http://www.epa.gov/surf2/locate
Florida Water Factoids	http://www2.dep.state.fl.us.enviropage/html/water.htm
Water Quality	http://www.savannah-online.com/watercon/stream.htm http://wwwga.usgs.gov/edu/characteristics.html

Water Use

Water Use in the U.S.	http://h2o.usgs.gov

Alternative Sources

The ABC's of Desalting	http://www.ida.bm/html/abc.htm
Desalination in the Tampa Bay area	http://www.tampabaywater.org/New_TBW/MWP_Projects/Desal/Desal.htm
Reuse	http://www.srcsd.com/about/about_waste/waste.html
Aquifer Storage & Recovery	http://141.232.1.11/org/pld/proj/asr/asr_in_fla.htm
Repurified Water	http://tampareuse.org/fact_sheets/purified_water.html

Compare your knowledge of the environment with adults across the country. http://www.swfwmd.state.fl.us/quiz/input.html

Section 2 — Indoor Conservation

http://www.ci.santa.barbara.ca.us/wresourc/bfindoor.htm

Reading Your Water Meter	http://www.savannah-online.com/watercon/education.htm
Home Water Audit	http://www.savannah-online.com/watercon/survey.htm
Saving Money by Saving Water	http://solstice.crest.org/environment/gotwh/general/indoor-water/index.html
55 Facts and Figures on Water Conservation	http://www.water.denver.co.gov/cnserv55.htm
Consumer Report on Low-Flow Toilets	http://terrylove.com/crtoilet.htm

Facts on Low-Flow Toilets and Showerheads	http://www.dnr.state.co.us/cwcb/owc/freefa.htm
Toilet maintenance, repair, replacement	http://www.toiletology.com/toc.sht
FAQs About 1.6 gpf Toilets	http://www.ci.austin.tx.us/watercon/toiletq.htm
Toilet Tummies	http://www.thames-water.com/waterwise/hippo/hippo.html
Showerheads	http://www.hometips.com
Faucets	http://www.msue.msu.edu/msue/imp/mod02/01500175.html http://www.hometips.com

Section 3 — Outdoor Conservation http://hort.usu.edu/classes/Plsci4100/index.htm

Water Restrictions	http://www.swfwmd.state.fl.us/rules/swfrestr

Water Efficient Landscaping

Xeriscape Principles	http://www.swfwmd.state.fl.us/conservation/xeris/swfxeris.html
Drought-Tolerant Plants	http://www.floridaplants.com http://www.floridata.com/main_fr.cfm

Efficient Irrigation

Catch Can Test	http://hort.usu.edu/classes/Plsci4100/sec6/sld029.htm
Sprinkler Irrigation Design Tutorial	http://www.JessStryker.com/spklr.htm
Irrigation Filtration Tutorial	http://www.JessStryker.com/filters.htm
Irrigation Installation Tutorial	http://www.JessStryker.com/install.htm
Irrigation Scheduling Tutorial	http://www.JessStryker.com/irrsch.htm
Lawn Sprinkler Selection & Lay Out for Uniform Water Application	http://edis.ifas.ufl.eduscriptshtmlgen.exe? DOCUMENT_AE084
Maintenance Calendar St. Augustine Grass	http://edis.ifas.ufl.edu/scripts/htmlgen.exe? DOCUMENT_LH021
Maintenance Calendar Bahia Grass	http://edis.ifas.ufl.edu/scripts/htmlgen.exe? DOCUMENT_WI003
Coping with Drought in the Landscape	http://edis.ifas.ufl.edu/scripts/htmlgen.exe? DOCUMENT_MG026
Florida Yards and Neighborhoods Program	http://hort.ufl.edu/fyn

Other Outdoor Conservation Techniques

Rain Barrel and Cisterns	http://hammock.ifas.ufl.edu/txt/fairs/1897
Pools and Spas	http://ladwp.com/resserv/coninfo/swimpool/swpool.htm http://homeownernet.com/articles/swpools.html