

# WaterWeb

current water info for schools

A publication of the Southwest Florida Water Management District

January 2001



## The WaterWeb Query

### QUESTION:

What can I do to help meet Florida's increasing demand for water?

### ANSWER:

Conserve water. There are so many easy ways to save water.

You will use less water if you:

- turn off the water while washing your hands or brushing your teeth.
- take shorter showers.
- run only full loads of washing machines and dishwashers, or set the proper water level.
- avoid using the toilet as a trash can.
- install water-saving shower-heads and faucets.

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## Conservation and Our Water Supply What is the connection?

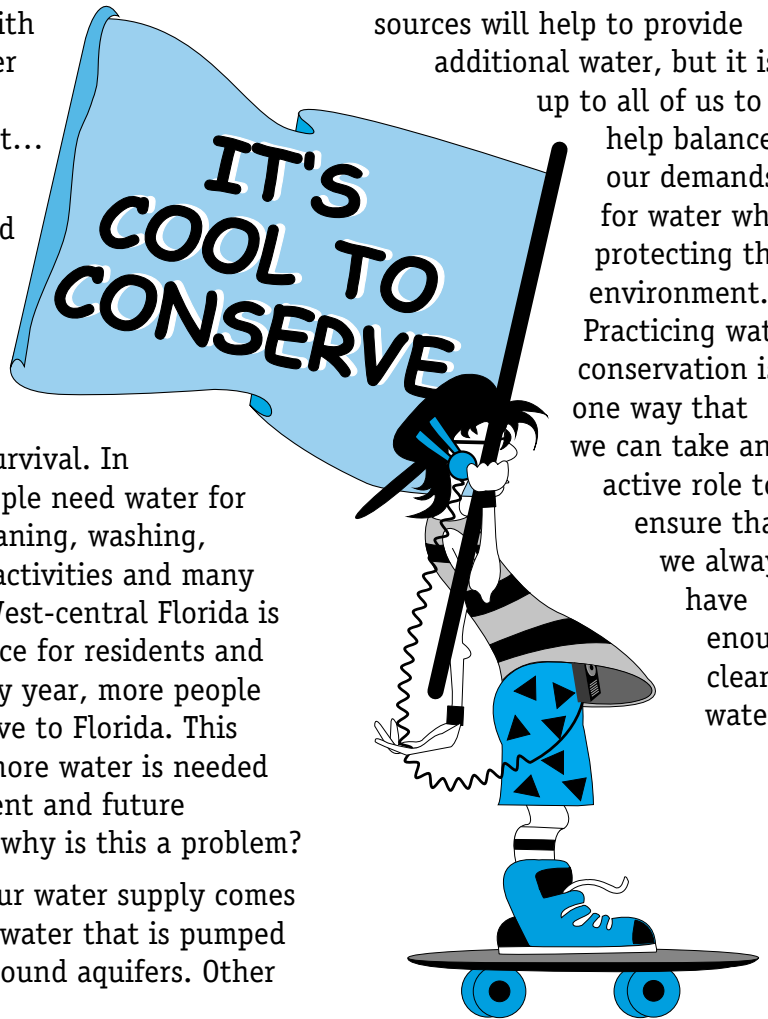
You probably already know that conservation means to use carefully or to use only what you need without wasting. But what does conservation have to do with Florida's water supply? Let's think about it...

All living things depend on clean, fresh water as part of their basic needs for health and survival. In addition, people need water for drinking, cleaning, washing, recreational activities and many other uses. West-central Florida is a popular place for residents and visitors. Every year, more people decide to move to Florida. This means that more water is needed to meet current and future demands. So why is this a problem?

Most of our water supply comes from ground water that is pumped from underground aquifers. Other

water comes from surface water bodies such as lakes, streams and rivers. The increased demand for water causes additional stress on our water sources. Alternative sources will help to provide additional water, but it is up to all of us to

help balance our demands for water while protecting the environment. Practicing water conservation is one way that we can take an active role to ensure that we always have enough clean water.



This issue of *WaterWeb* focuses on conservation and Florida's water supply. All of the articles and activities are designed to help you learn more about Florida's water supply sources and the importance of protecting this natural resource.

# Water Supply

Excerpted from *The Guide to the Southwest Florida Water Management District, August 1999*

A goal of the Southwest Florida Water Management District is to ensure that there is an adequate supply of the water resource for all reasonable and beneficial uses, now and in the future, while protecting and maintaining water and related resources.

The more people in an area, the more water they will need. That is the core of the water supply challenge in west-central Florida.

Anticipated population growth clearly shows that demand for water will outstrip traditional supplies in many areas. In some areas it already has. Estimates are that by 2020, the Southwest Florida Water Management District's population will grow to 5.6 million, a 43 percent increase since 1995. In addition, other

uses, such as agriculture and self-supplied recreation, also show increasing demands for water.

Approximately 76 percent of the fresh water used in the District is ground water, mostly drawn from the Floridan aquifer. The balance of what is used today

water desalination facilities.

All of those sources, as well as repurified water, are expected to play a role in the future water supply, but ground water will remain the primary source. Surface-water use will probably expand, but that is limited. The reuse of treated wastewater will grow. Desalination will

become a major new source of supply. The fastest, cheapest way to accommodate increasing demand is through conservation, but conservation alone won't be enough to meet increasing demands.

Again, unfortunately, in some areas demand has already exceeded what nature can provide without causing unacceptable impacts to the environment.



comes from surface water—mainly from rivers, reclaimed water (for irrigation) and small brackish-

## Check Your Facts About Water Supply



Where does most of our drinking water come from?



Define "surface water" and give three examples of this water source.



Why is water conservation important for meeting our future water demands?

# A Brief View of Florida's Water Supply Sources

### Ground water

Underground water is commonly referred to as “ground water” because it is water that has seeped into the ground and is held in soil and rock. Ground water that is pumped from underground aquifers makes up approximately 76 percent of our water supply.

### Surface water

The water on the land's surface in water bodies such as lakes, streams, rivers and oceans is called surface water. Surface water accounts for 24 percent of the Southwest Florida Water Management District's (District) water supply. Six rivers and creeks within the boundaries of the District provide fresh water to the public in Tampa, Bradenton, Punta Gorda, Port Charlotte and the counties of Manatee and Sarasota.

### Conservation and reuse

Reuse is taking water from a wastewater treatment facility and reclaiming it by treating it so it can be used for irrigation and other uses. Water conservation is all about practices that use less water.

### Alternative water sources

The District's alternative water sources include reclaimed water, reuse, rehydration and desalination. The following information will help you better understand these alternative sources.



Reclaimed water is water that has received at least secondary treatment and is reused for outdoor irrigation after flowing out of a wastewater treatment plant. Reclaimed water is high quality and has no smell.



Reuse is the deliberate application of reclaimed water according to rules established by the Florida Department of Environmental Protection and the District.



Rehydration is a process in which the amount of water going into the aquifer is increased by applying storm water or reclaimed water to the surface of well fields and wetlands.



Desalination is the process of treating salt water to remove minerals and other dissolved solids.

## EXTENDED ACTIVITIES

1. As you learned in this section, most of this region's water supply comes from ground water. But do you know where people living in other states get their drinking water? Using a search engine on the Internet, select three cities in other states and find out about their water supply sources.
2. Pretend that you live in a newly developed community that includes a golf course, park and recreation area, 200 homes and an apartment complex. Describe how reuse could help conserve water in the entire area. Also list several ways that residents could help to conserve water.

### The Seawater Desalination Project

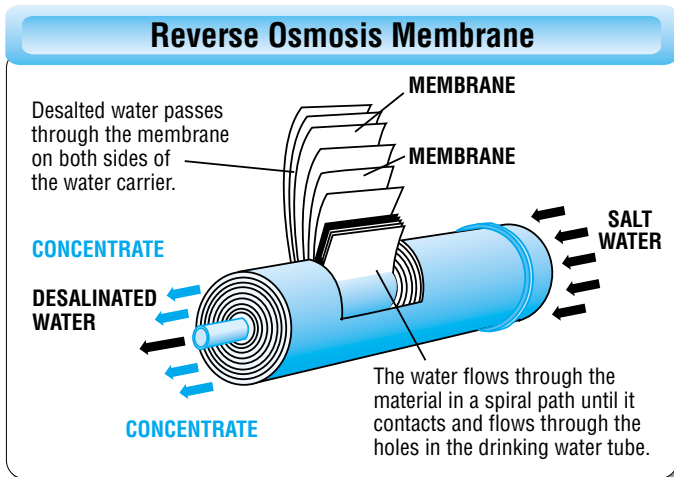
Finding new sources of water to meet our area's increasing water needs is a challenge. But if you follow current events in our area, you have probably already heard about a high-tech way to meet this challenge. It is Tampa Bay's desalination plant being developed near Apollo Beach in southern Hillsborough County. It's a BIG deal! In fact, it will be the largest desalinated seawater facility in North America. Although desalinated water costs more than ground water, the new plant will produce desalinated water that is the lowest price in the world. Funding from the Southwest Florida Water Management District will help to further reduce the cost to water users.

### What exactly is desalination?

Basically, desalination is a process that removes the salt from seawater. To desalinate means to remove the salt from water, or "de-salt." By removing salts and other minerals from the bay's seawater, our area can be provided with a new water supply source. Desalinated seawater will be the only droughtproof alternative water supply source in the Tampa Bay area. Studies have shown that it can be produced in an efficient manner and will not increase the salinity of the bay beyond natural variations.

### What technology is used for desalination?

The leading technology used in desalinating seawater is called reverse osmosis. The Tampa Bay plant's process will use high pressure to force seawater through long, tube-like membranes. Several layers of material located in the membranes remove salt as the water passes through, leaving behind only the salty, bay water concentrate. The cooling water from the Big Bend Power Station is mixed with the concentrate before it is returned to the bay.



### Tampa Bay's Seawater Desalination Plant

#### It will...

- be located next to the Big Bend Power Station.
- produce 25 million gallons per day (mgd).
- be operating by the end of 2002, according to plan.
- not increase the salinity of the bay beyond natural variations.
- reduce demand on the region's groundwater resources.

Fortunately, the Gulf of Mexico will not dry up even during droughts, so seawater desalination is one way of providing a new source of drinking water throughout the year. To learn more about the process of desalination and the seawater desalination project, be sure to visit this Web site: [www.tampabaywater.org](http://www.tampabaywater.org).

## Extended Activities

- Not all people are in favor of seawater desalination. List three reasons that could be used to persuade people that desalination is a good way to provide an alternative drinking source. Create a classroom poster that promotes desalination as an alternative resource.
- Visit the Web site listed above and use the facts presented at the site to create a multiple-choice quiz with 10 questions. Give the quiz to another classmate. Score 10 points for each correct answer.

## District Water Demands

As more people move to our area, the demand for water will continue to increase. Estimates for water usage have been developed for a variety of water users through the year 2020. The demand for water throughout the Southwest Florida Water Management District (District) is expected to increase from 1,505.1 million gallons per day (mgd) in 1995 to 1,964.3 mgd by the year 2020, which represents an increase of 30 percent. It is expected that the largest increase in the demand for water will be in the southern portions of the District. To learn more about our water demands, study the chart below and then quiz yourself.

### Water Demands

**Water Demands Throughout the District**

Type	1995	2020	% Change
• Public Supply	428.1*	609.1	42.0
• Domestic Self Supply/ Small Public Supply	88.8	141.0	59.0
• Agriculture	684.7	852.0	24.0
• Commercial Industrial Mining	226.8	196.0	(14) decrease
• Thermoelectric Power Generation	10.2	61.8	506.0
• Recreational List	66.5	104.0	56.0
Totals	1,505.1	1,964.3	30.0

*\*Figures are given as million gallons per day averages*

### Quiz Time

Circle Correct Answer Below

T F  
T F  
T F  
T F  
T F

Study the information about projected water demands to decide whether each statement below is True or False.

1. The largest expected increase in the demand for water will be in the northern portions of the District.
2. The only projected decrease in water demand will be in the area of commercial, industrial and mining.
3. The abbreviation for million gallons per day is mgd.
4. The smallest percent change is expected to be in the area of public supply.
5. Water used for recreational activities is expected to increase by more than 50 percent.

Answer key on page 8.

## WaterWeb Contest

### Taking an Active Role in Water Conservation

As more people move into communities within our District, it is essential that they realize the importance of water conservation. Pretend that you produce Web pages to welcome newcomers to our area. Using one sheet of paper, create a page that informs new residents about our water supply and ways to practice water conservation. Or create it on-line with any software that may be available to you. Just remember to be creative! If we decide to use your material on the District's Web site or in any other materials, we'll send you a free gift!

**Please return your entry and the form below to:**  
**WaterWeb Contest**  
 Communications and Community Affairs Department  
 Southwest Florida Water Management District  
 2379 Broad Street  
 Brooksville, FL 34604-6899  
 or e-mail to [beth.bartos@swfwmd.state.fl.us](mailto:beth.bartos@swfwmd.state.fl.us)

**Entry Form** (cut along dashed line and mail to above address)

Student's name: \_\_\_\_\_

Title of entry: \_\_\_\_\_

Home address: \_\_\_\_\_

Home phone number: \_\_\_\_\_

School name: \_\_\_\_\_

Grade level: \_\_\_\_\_ Teacher's name: \_\_\_\_\_

# Create Your Own Desalination Plant

After you have read about desalination on page 4, try this cool experiment.

## Learning Goals

- To learn about desalination through an experiment
- To stimulate thought about alternative sources of drinking water

## Subjects

- Science
- Social Studies

## Activity

1. Spray paint one of the bottles black.
2. Pour 1 quart of water in a pitcher and stir in 1/2 cup salt.
3. Pour the saltwater mixture into the black bottle.
4. Attach tubing to both of the bottles and secure with duct tape.
5. Set both bottles in a sunny window. Be sure to place the black bottle higher than the clear bottle.
6. For the next few weeks, examine the bottles each day and record your observations. (See sample observation chart below.)
7. Discuss the results.

## Sunshine State Standards

*Science (6-8):* Processes that Shape the Earth, SC.D.1.3, SC.D.2.3; The Nature of Science, SC.H.1.3.

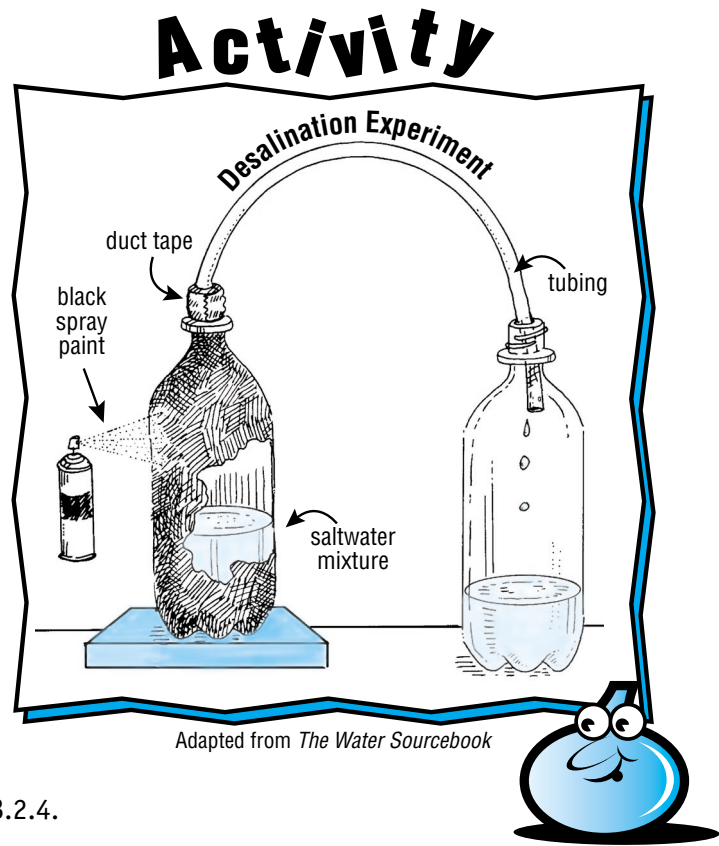
*Social Studies (6-8):* People, Places, and Environments, SS.B.1.3, SS.B.2.3.

*Science (9-12):* Processes that Shape the Earth, SC.D.2.4; The Nature of Science, SC.H.1.4, SC.H.2.4.

*Social Studies (9-12):* People, Places, and Environments, SS.B.2.4.

**Materials**

- two 2-liter bottles
- black spray paint
- duct tape
- one foot of 1/2" diameter clear plastic tubing
- water
- salt
- pitcher



## Desalination Experiment

Date	Weather Conditions	Observations

**SAMPLE**

## Discussion Questions

1. How long did it take for water to begin moving through the tube and into the clear bottle? What conditions would have caused the water to move sooner?
2. How many days did it take for all of the water to move into the clear bottle? What substance remained in the black bottle? What does this concentrate represent in a real desalination plant?
3. What suggestions can you give to improve this experiment?

# WaterWeb Crossword Puzzle

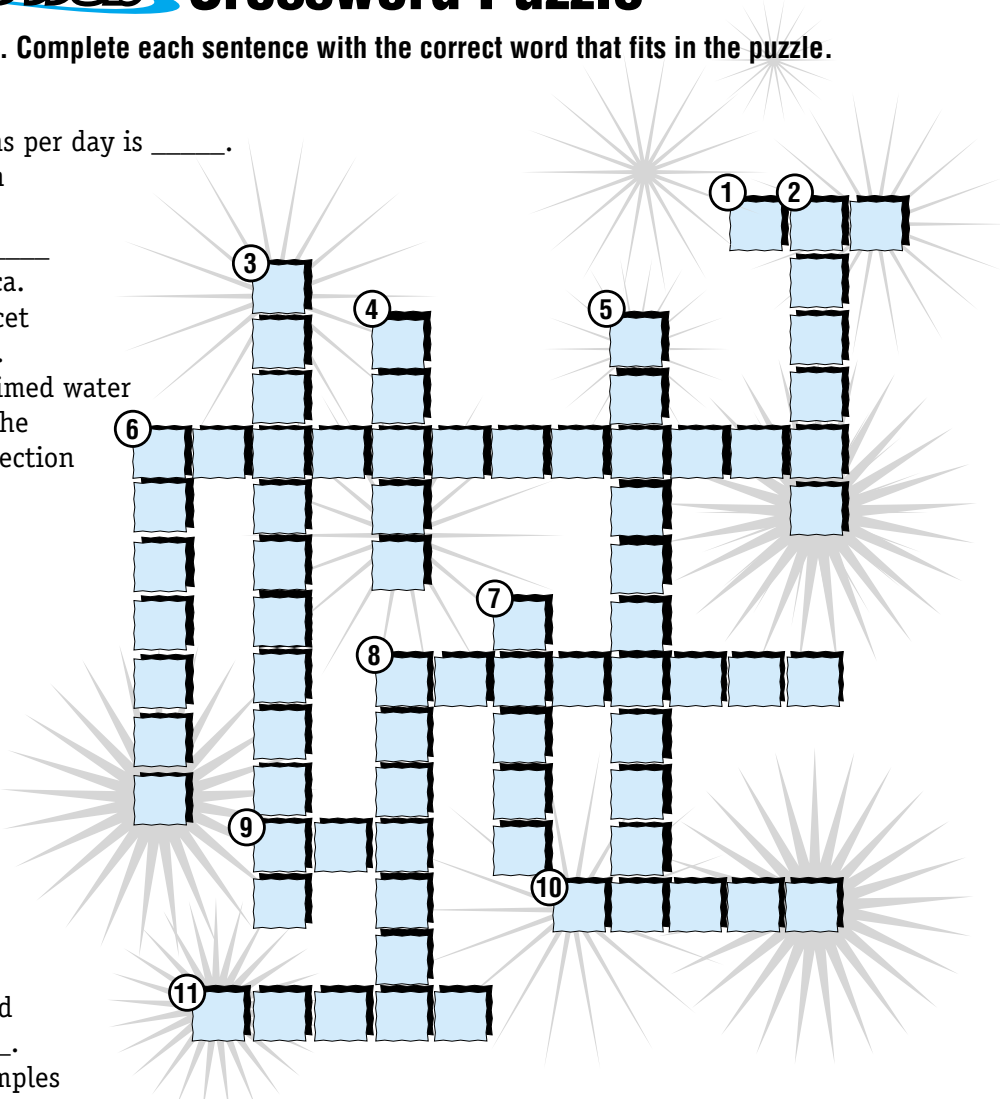
Sharpen your pencils. Complete each sentence with the correct word that fits in the puzzle.

**Across:**

1. The abbreviation for million gallons per day is \_\_\_\_\_.
6. The process that removes salt from seawater is called \_\_\_\_\_.
8. Tampa Bay will have the largest \_\_\_\_\_ desalination plant in North America.
9. To save water, turn \_\_\_\_\_ the faucet while you are brushing your teeth.
10. The deliberate application of reclaimed water according to rules established by the Department of Environmental Protection and the District is called \_\_\_\_\_.
11. As more people move to our area, the demand for \_\_\_\_\_ will increase.

**Down:**

2. Water pumped from underground aquifers is called \_\_\_\_\_ water.
3. Water \_\_\_\_\_ is all about practices that use less water.
4. The water in the Gulf of Mexico tastes \_\_\_\_\_.
5. Water sources other than ground water may be called \_\_\_\_\_ water sources.
7. A time when there is little rain and very dry weather is called a \_\_\_\_\_.
8. Streams, rivers and \_\_\_\_\_ are examples of surface water.
8. Water contained in water bodies on the land's surface is called \_\_\_\_\_.



## WaterWeb Scramble

Unscramble the letters to form words. Then use these words to complete the paragraph.

V A E S \_\_\_\_\_

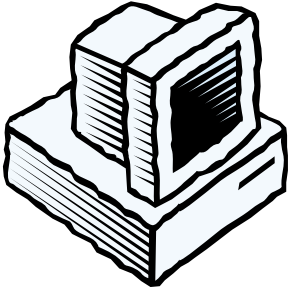
S O U R E E R C S \_\_\_\_\_

V E R S I O N N O C T A \_\_\_\_\_

T R E F U U \_\_\_\_\_

Practice simple water \_\_\_\_\_ habits and you can play an important role in meeting the \_\_\_\_\_ demands for our water supply. By encouraging others to \_\_\_\_\_ water, you will also help to ensure that we always have an adequate supply of the water \_\_\_\_\_.

## Sites for *WaterWeb* Readers to Explore



There is a lot of information about water conservation and water supply available on the Internet. So rev up your search engines and get ready to go on-line to find out more about these topics. Following are a few key words to get you started on your search for information. You may want to combine "Florida" with these words to narrow the scope of your search.

- Desalination
- Water conservation
- Alternative water sources
- Water saving devices
- Water saving tips

Also, don't forget to visit the Southwest Florida Water Management District's Web site: [www.swfwmd.state.fl.us](http://www.swfwmd.state.fl.us)

## Answers

### Quiz Time (page 5)

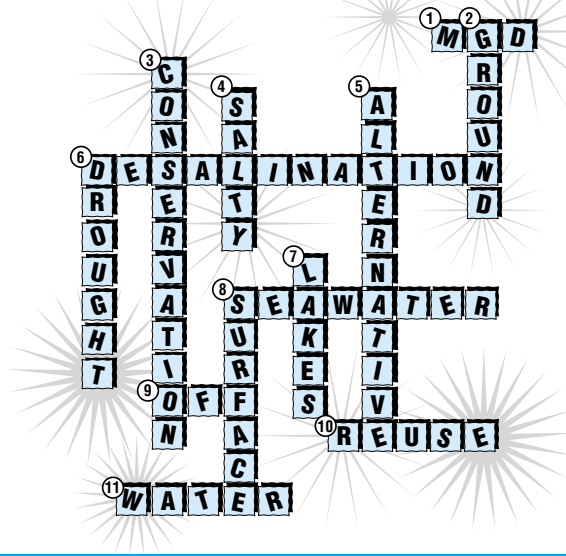
- False: 1,4
- True: 2,3,5

### Scramble (page 7)

save, resources, conservation, future

Practice simple conservation habits and you can play an important role in meeting the future demands for our water supply. By encouraging others to save water, you will help to ensure that we always have an adequate supply of the water resources.

### Crossword Puzzle (page 7)



## Credits

*WaterWeb* is written and developed by Susan Awbrey and published by the Southwest Florida Water Management District, 2379 Broad Street, Brooksville, Florida 34604-6899. Funding for this newsletter is provided by: the Alafia River, Coastal Rivers, Hillsborough River, Manasota, Northwest Hillsborough, Peace River, Pinellas-Anclote River and Withlacoochee River Basin Boards. For information or copies of this newsletter, please call 1-800-423-1476, extension 4757. For additional information, visit our Web site, [www.swfwmd.state.fl.us](http://www.swfwmd.state.fl.us).

Southwest Florida  
Water Management District

