



# **Learning from the Drought**

## **Annual Status Report on Regional Water Supply Planning**

**Florida Department of Environmental Protection  
August 2008**

We gratefully acknowledge all of the water management district staff who contributed information to the development of this report. The photo on the front cover was provided by the South Florida Water Management District.

This report, prepared by the Florida Department of Environmental Protection (DEP) according to the statutory requirements of sections 373.0361(5) and 373.536(6)(a)4, Florida Statutes (F.S.), summarizes the water management districts' progress on their:

- Regional water supply plans,
- Five-year water resource development work programs, and
- Development of alternative water sources through funding provided by the Water Protection and Sustainability Program.

In addressing those topics, this report also provides information on:

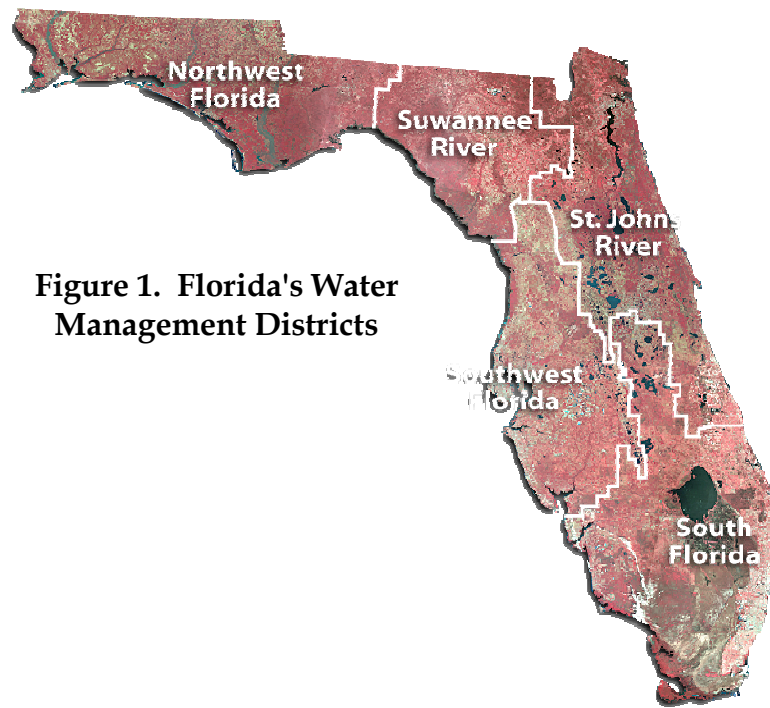
- Historic trends in fresh water use,
- Impacts of the drought, and
- Drought management strategies.

The 2006 - 2008 drought presented many challenges. Fortunately, Florida had response mechanisms in place that reduced the most adverse effects of the drought. The water management districts (Figure 1) continued to implement the long-term strategies detailed in their regional water supply plans. Those plans identify sources to meet foreseeable demands through the year 2025, and were instrumental in mitigating the worst effects of the current drought.

Even though the regional water supply plans identified sufficient water to meet the reasonable needs of a growing population, these projects are not yet built. There are still many technical, institutional, and financial hurdles that need to be overcome before we can achieve success.

Meeting our future needs while protecting the water resources essential to Florida's economy and our quality of life will only be accomplished through the development of both alternative water supplies and increased water use efficiency.

This report provides information on statewide trends and offers suggestions on priorities for the next cycle of regional water supply plans.



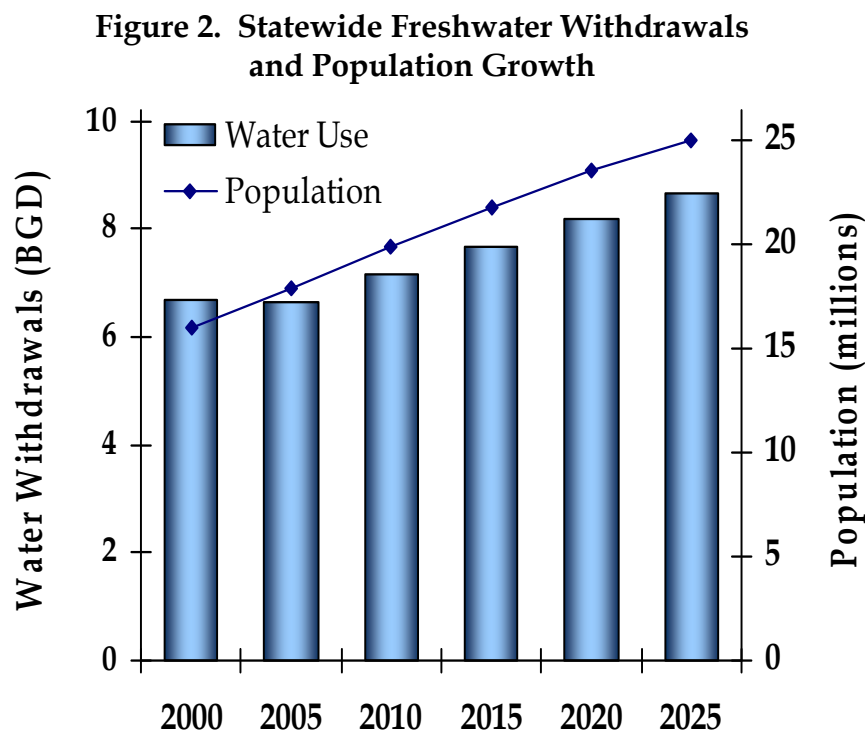
**Figure 1. Florida's Water Management Districts**

## Background

### Water Use Trends

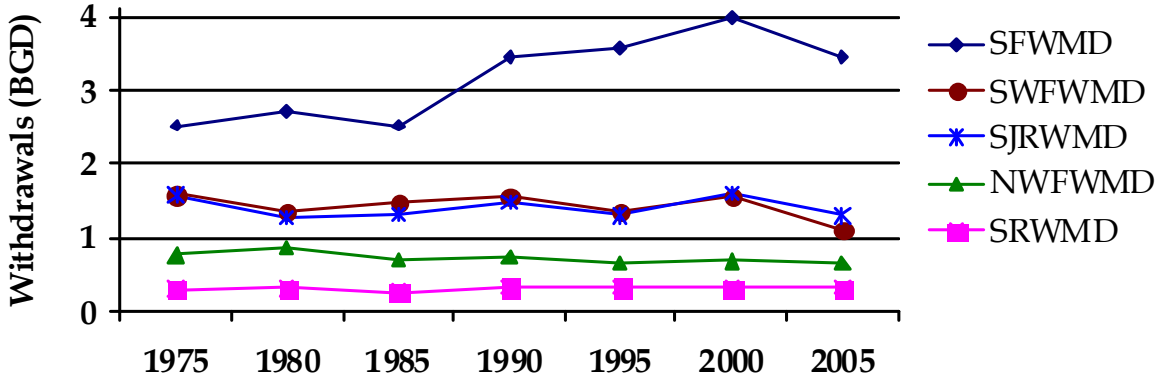
Floridians used an estimated 6.7 billion gallons per day (bgd) of fresh water in 2000. This is estimated to increase by about 30 percent to 8.7 bgd a day in 2025 (Figure 2). During this same period, Florida's population is expected to increase by 57 percent, from 15.9 million to approximately 25 million.

Water use data and trends must be interpreted carefully. For example, total water use in 2005 was slightly less than use in 2000, which might lead one to conclude that Floridians were using water more efficiently in 2005 than in 2000. While improved water use efficiency might be a factor, the more accurate explanation for the reduction in demand over that five-year period is that Floridians used more water during the drought in 2000 than they did during the more normal rainfall year of 2005.



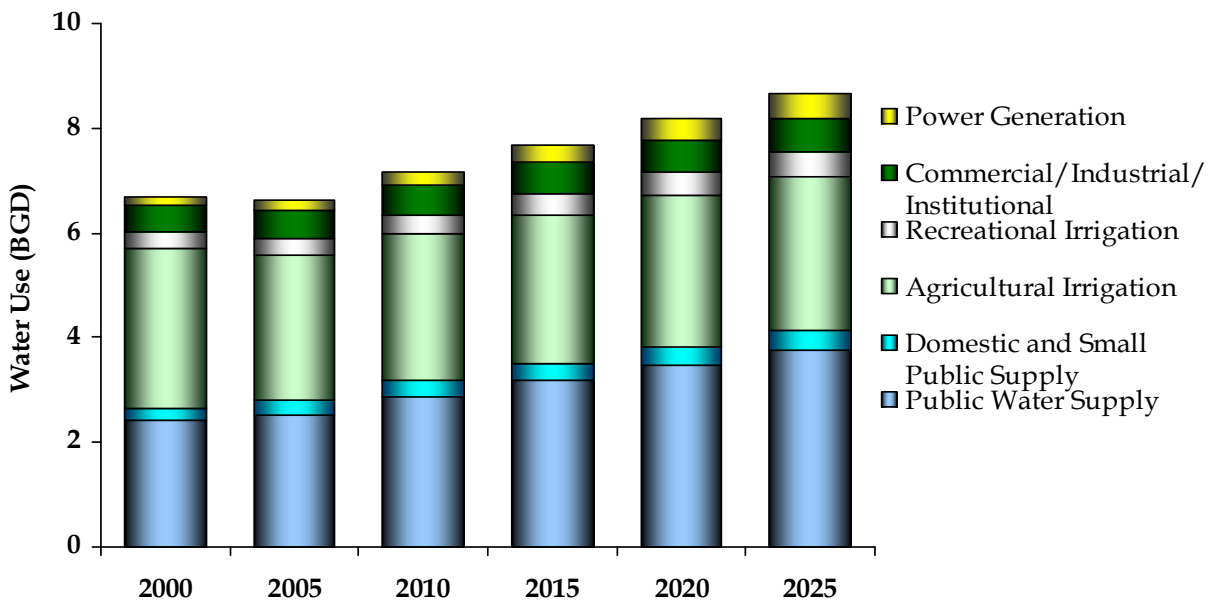
Figures on total water withdrawals do not necessarily show important trends within different sectors of water use, or within regions. By examining water use trends in regions and user categories, we can gain greater insight about where and how we can best meet the future needs. Figure 3 shows the distribution of fresh water withdrawn in each water management district since 1975. In the northern part of the state, total fresh water withdrawn since 1975 has remained relatively stable. Water withdrawals in the South Florida Water Management District alone are about 50 percent of all withdrawals in the entire state. In this district, water withdrawals increased substantially after 1985 until 2000. After 2000, a record dry year, withdrawals declined to about 1995 levels.

**Figure 3. Total Fresh Water Use by Water Management District**  
 (Source: U.S. Geological Survey)

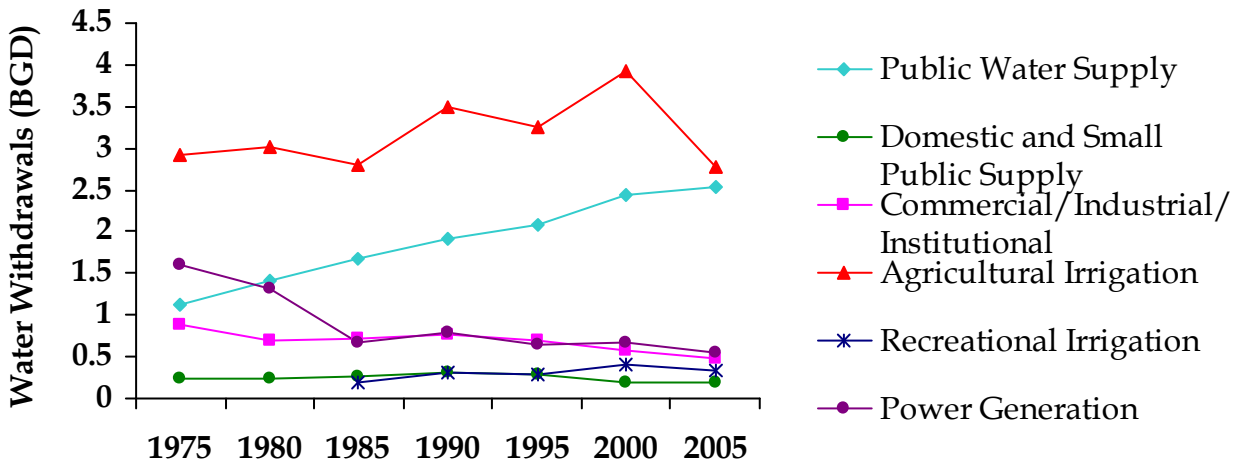


Use also varies between water use categories. Agriculture currently is the largest user of fresh water in the state; however, public water supply is projected to become the largest user by 2010 (Figure 4). Based upon water management district projections, public water supply will account for the majority of overall growth in statewide demand between 2000 and 2025. The regional water supply plans estimate that, by 2025, demands in public water supply will increase by about 49 percent and account for about 43 percent of the total estimated use of 8.7 bgd. Agriculture will be the second largest use, but will only increase by about 6 percent.

**Figure 4. Statewide Freshwater Demand Projections and Water Use Categories**



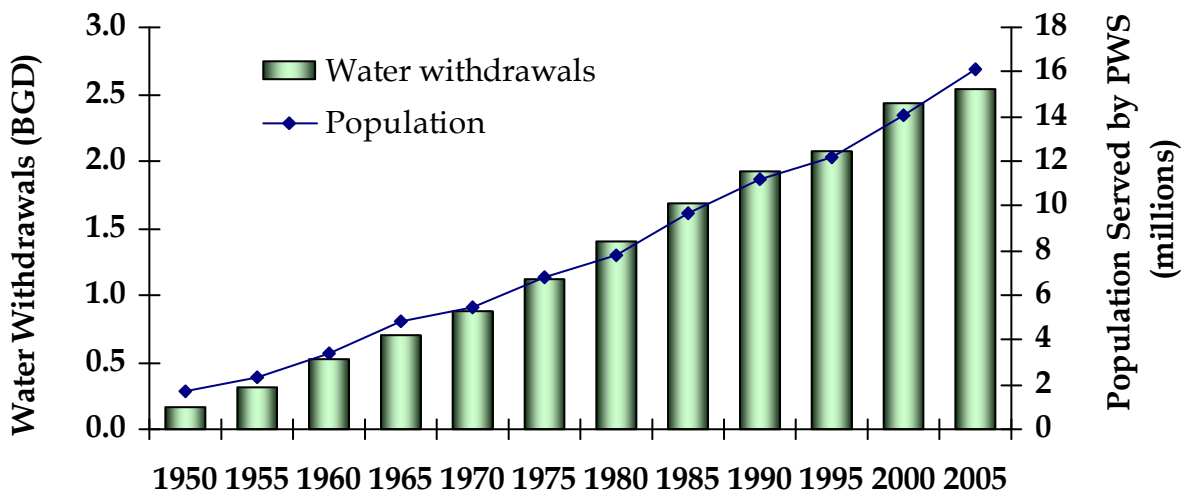
**Figure 5. Historic Uses of Freshwater**  
 (Source: US Geological Survey)



Except for public water supply, the historical use of fresh water for most of the sectors has remained relatively uniform or declined since 1975 (Figure 5). Agricultural use has peaked during exceptional drought years, but has declined to same levels as in 1975. On the other hand, public water supply has shown a steady increase.

Looking more closely at historical public water supply use, Figure 6 shows the amount of water used and the population served by public water supply. It shows a large overall increase in water withdrawn since 1950, and also that water use has been increasing in direct proportion to population growth. This trend could be altered by more emphasis on promoting water use efficiency and by greater use of reclaimed water.

**Figure 6. Historic Public Water Supply Withdrawals and Population Served**  
 (Source: US Geological Survey)



In planning to meet future demands, water managers must consider not only the quantity of water needed (an additional 2 bgd by 2025), but also the location of the demand, and whether the water sources in the location of need can meet projected demand without harm to the natural system. In some parts of the state, these

source/demand considerations are leading toward water supply planning at regional or county levels, rather than community levels. A regional water supply system can be more responsive to localized shortages than individual utilities with more limited source availability.

### **Regional Water Supply Plans**

To meet the anticipated needs of 2025, the Florida Water Resources Act (Chapter 373, F.S.) requires water management districts to develop regional water supply plans where existing and anticipated water sources are deemed inadequate. Regional water supply plans must be updated every five years and must include a list of water supply sources and water resource development projects that will meet anticipated demands while sustaining water resources and related natural systems.

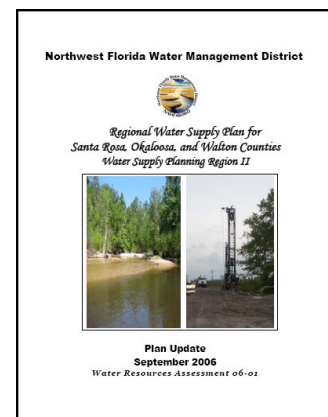
In 2001, the Northwest Florida, St. Johns River, Southwest Florida, and South Florida Water Management Districts completed the first set of regional water supply plans. The original plans identified sufficient sources of water to meet 2020 demands. They included many projects that would help the districts better manage regional water resources.

By February 2007, these four districts completed the five-year plan updates. These updated plans have identified long-term strategies that, if implemented in a timely manner, will be more than sufficient to meet the reasonable-beneficial uses of 2025, while protecting the water resources. (Additional information on each district's plan may be found in the appendices at:

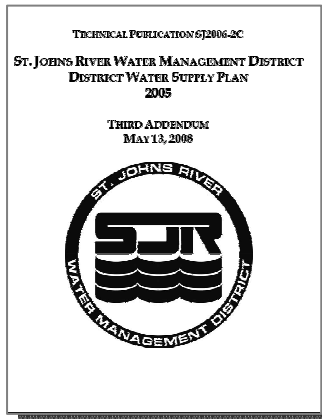
<http://www.dep.state.fl.us/water/waterpolicy/rwsp.htm>).

The Suwannee River Water Management District determined that water supplies in the district were sufficient to meet the 2025 demand and no regional water supply plan was needed. Still, this district is closely monitoring three areas with high population growth to ensure that water supplies will be adequate to meet future demands.

The Northwest Florida Water Management District has approved regional water supply plans for two of seven planning regions within the district. In Region II (Okaloosa, Walton, and Santa Rosa Counties), the District has been assisting with the development and expansion of an inland Floridan Aquifer well field to reduce demand on coastal wells that are vulnerable to saltwater intrusion. Additional projects in this region include reclaimed water facilities, the expansion of an inland Sand-and-Gravel Aquifer well field, and the completion of a groundwater sustainability model. In Region V (Gulf and Franklin Counties), the major project under development is the Port St. Joe surface water supply project that is expected to be completed in 2008. The District also has completed a draft regional water supply plan for Region III (Bay County). The focus of this plan is the development of an inland well field to diversify regional source options and provide back-up supply for Deer Point

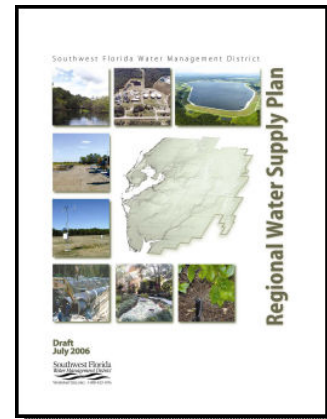


Lake Reservoir, the primary source of supply in the region. The reservoir is potentially vulnerable to seawater contamination from storm surge associated with hurricanes.



During the past year, the St. Johns River Water Management District completed nine of the water supply development projects identified in its updated water supply plan. Those projects are estimated to be capable of producing 15.2 million gallons per day (mgd) of water. Twenty-four additional projects, mostly reclaimed water facilities, are under construction. The district estimates that the projects completed by the end of 2008 will create an additional 19.5 mgd of water. The district also is updating its water supply assessment, which will include 2030 demand projections and will identify areas where supplies are not sufficient to meet demands.

The Southwest Florida Water Management District has completed 25 of the reclaimed water projects identified in their regional water supply plan and 58 are underway. Additionally, five water conservation projects have been completed and 19 are underway. The Tampa Bay Water Seawater Desalination plant, which has the capacity to produce 25 mgd, is now operational. Other large projects include the expansion of the Peace River Manasota Regional Water Supply Authority facilities (reservoir and Aquifer Storage and Recovery wells), the Tampa Bay Water System Configuration II (surface water withdrawals, storage, and infrastructure improvements), the Lake Hancock Level Modification (which will help with the restoration of flows to the Peace River), and the Facilitation of Agricultural Resource Management Systems project (agricultural conservation projects which have helped offset 10.2 mgd of groundwater use). These projects helped create approximately 40 mgd of water. By the end of next year, the district expects completed projects to produce an additional 7 mgd of water.



The South Florida Water Management District adopted plans for each of its four planning regions. The District worked with the utilities in each region to identify specific alternative water supply projects that would provide enough water to meet future needs. Many of these projects are funded through the Water Protection and Sustainability Program. Additionally, the District identified several projects that support the development of alternative water supplies such as feasibility studies, groundwater monitoring and assessment, and a comprehensive water conservation program. In 2008, the district has allocated approximately \$4.5 million for those support projects. The District's comprehensive water

conservation program is estimated to have made 2.85 mgd of additional water available.



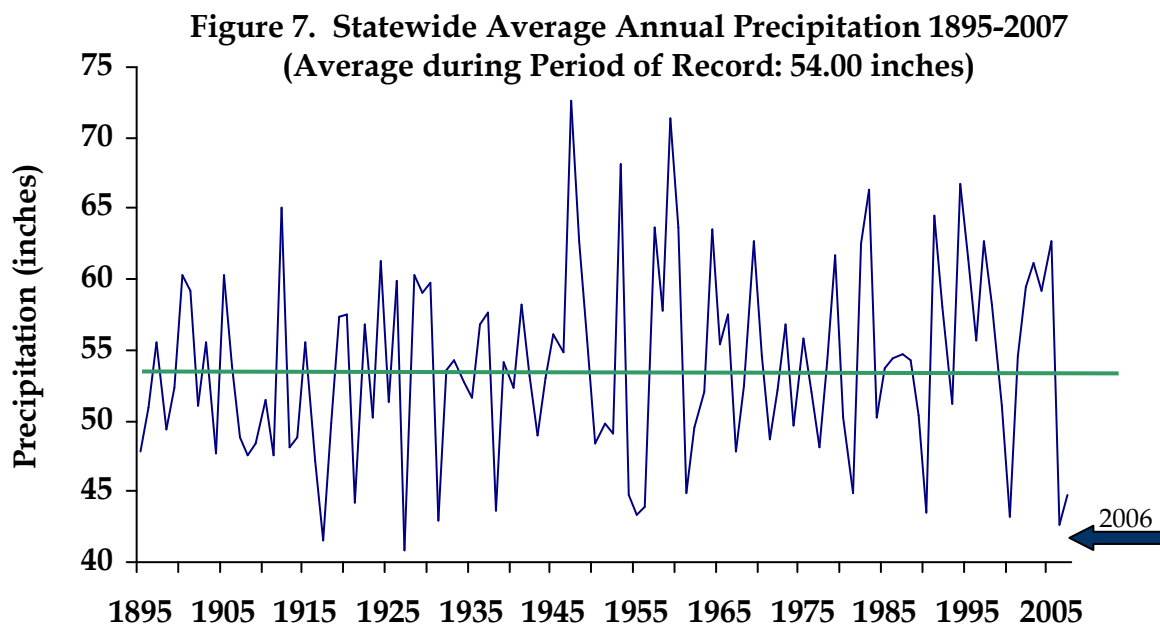
During fiscal year 2006-07, the water management districts spent approximately \$111 million implementing projects identified in their water supply plans. During the current fiscal year (FY 2007-2008), the districts expect to spend about \$193 million more on projects that will create additional water or will help protect and manage water resources more efficiently.

### Water Resource Development Work Programs

Each year, the water management districts prepare Five-Year Water Resource Development Work Programs, which describe the districts' implementation of the water resource development portion of their regional water supply plans. DEP reviewed this year's work programs and determined that they were consistent with the regional water supply plans and the expenditures appeared to be adequate.

## A Year of Drought Challenges

Florida's average annual rainfall is 54 inches (greater than any other state except Louisiana), but it is not evenly distributed and has some unusual characteristics that tend to produce periods of severe water shortages. Major statewide or regional droughts occurred in recent decades, including the early 1970s, the early 1980s, 1989-1990, and 1999-2001 (Figure 7). The recurrence of these extreme drought events presents some unique challenges when developing and implementing regional water supply plans.



# U.S. Drought Monitor

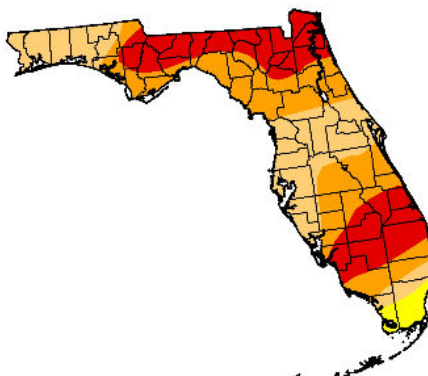
## Florida

May 29, 2007  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.2	99.8	96.3	66.1	30.6	0.0
Last Week (05/22/2007 map)	0.2	99.8	96.3	66.1	30.6	0.0
3 Months Ago (03/06/2007 map)	23.0	77.0	39.1	0.0	0.0	0.0
Start of Calendar Year (01/02/2007 map)	1.2	98.8	47.8	7.4	0.0	0.0
Start of Water Year (10/03/2006 map)	51.0	49.0	18.4	0.0	0.0	0.0
One Year Ago (05/30/2006 map)	31.5	68.5	34.8	0.0	0.0	0.0

**Intensity:**

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

<http://drought.unl.edu/dm>



Released Thursday, May 31, 2007  
Author: Ned Guttman, NOAA/NESDIS/NCDC

Most recently, 2006 was Florida's third driest year on record. By 2007, Florida's water managers faced serious challenges as the drought continued to diminish the water available in large portions of the state. The drought was particularly severe in the South Florida Water Management District where major surface water storage areas throughout the district - the Kissimmee Chain of Lakes, the Water Conservation Areas, and Lake Okeechobee - were

all experiencing critically low water levels at the same time. The Kissimmee River did not flow for eight months, and, in July 2007, Lake Okeechobee reached a new record low of 8.82 feet National Geodetic Vertical Datum (NGVD).

Other parts of the state were affected by abnormally dry conditions as well. In the Northwest Florida Water Management District, many of the rivers were flowing near record low levels. In the Southwest Florida Water Management District, the Peace and Hillsborough Rivers were flowing at levels lower than 19 years out of 20. In May, portions of the Suwannee River Water Management District experienced 12-month rainfall deficits of up to 30 inches. The St. Johns River Water Management District, although drier than usual, did not experience significant water shortages.

The summer rainy season of 2007 offered little relief from drought conditions, especially in South Florida. Most of the rain in South Florida fell in the coastal regions and was not able to be captured and stored as is usually possible. In the first half of 2008, conditions have improved statewide. An unusually wet February and March resulted in a return to

# U.S. Drought Monitor

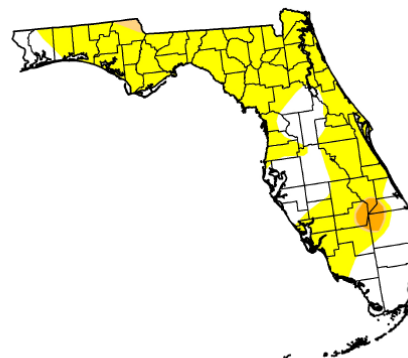
## Florida

July 8, 2008  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	29.6	70.4	3.1	1.9	0.0	0.0
Last Week (07/01/2008 map)	25.1	74.9	4.5	1.5	0.0	0.0
3 Months Ago (04/15/2008 map)	73.3	26.7	17.9	0.0	0.0	0.0
Start of Calendar Year (01/01/2008 map)	31.8	68.2	33.1	19.7	2.6	0.0
Start of Water Year (10/02/2007 map)	20.8	79.2	44.2	22.0	9.1	0.0
One Year Ago (07/19/2007 map)	12.9	87.1	69.2	31.9	1.6	0.0

**Intensity:**

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, July 10, 2008  
Author: Rich Tinker, CPC/NOAA

normal conditions for most of the Florida Panhandle and North Florida. Ground and surface water levels in South Florida still remain below average, but are higher this year than they were at this time last year. Lake Okeechobee is higher in June 2008 than it was last year, but still several feet lower than average and only a little above its all-time low in 2007. Much will depend on whether the 2008 summer rainy season delivers a normal amount of rainfall.

In the face of these drought challenges, Florida's water management system proved to be reasonably resilient. Lessons learned in past droughts were put into play. Regulatory tools such as water shortage orders, irrigation restrictions, and mandatory use limitations were implemented to stretch limited supplies and protect water resources. Alternative water supplies developed over the last several years supplemented traditional groundwater sources and reduced stress on aquifers. Increased use of reclaimed water and recycled stormwater resulted in less need to use potable water for purposes that can be accomplished with water of lower quality. Conservation programs and public education helped ensure that water was used efficiently and not wasted. In sum, Florida's water management programs worked largely as they were intended to, providing at least minimally adequate water for most uses even under an extreme and prolonged drought. Florida did not experience a more damaging water supply crisis even while in a severe meteorological drought, which is testament to the strength of the Florida Water Resources Act of 1972 (Chapter 373, F.S.). It also speaks well of water managers and water suppliers at the state, regional and local levels who have developed comprehensive and effective approaches to managing Florida's water resources.

Still, there are opportunities for improvement. Alternative water supplies which could help reduce reliance on stressed groundwater supplies are not being developed as quickly as could be hoped for. That trend might continue in light of state budget cutbacks, including funding for the development of alternative water supplies. Reclaimed water, though used at impressive levels in some areas, is underused in large parts of the state, and inefficiently used in many cases. Ocean outfalls in South Florida send some 300 million gallons a day of treated domestic wastewater into the sea – water that could be put to beneficial use on land. (Fortunately, the 2008 Florida Legislature has put the state on a long-term path to converting the ocean outfalls to beneficial uses of reclaimed water.)

Despite the state's many water conservation initiatives, there are still significant water use inefficiencies to be addressed. We continue to use about 50 percent of our potable water supplies to irrigate landscapes that often are not well suited to Florida's climate and soils. Although efficiency improvements have been made in the agricultural water use sector – in 2005 the largest use of water in Florida – agricultural water use is still measured less accurately than other water use sectors and has significant opportunities for improved efficiency.

## Adapting to Recurring Drought

Florida's approach to water management involves a wide range of planning, regulatory, and management tools. This approach is designed to promote orderly development of water supplies to meet reasonable projected demands without harming water resources, ecological systems, or existing legal uses of water. In recent years, greater emphasis has been placed on adapting the water management system to better manage extreme drought events.

### Planning

The regional water supply plans, which are the primary subject of this report, are the key planning tools used to ensure that Florida identifies sufficient developable water sources to meet projected demands while protecting the state's water resources. However, the plans are only designed to meet the demands anticipated to occur during a 1-in-10 year drought event. It is not feasible to build sufficient water supply infrastructure to meet all the demands in extreme droughts. Yet, extreme droughts are recurring events in Florida. For this reason, Florida has to plan for drought as a recurring event to be anticipated and managed, rather than an unanticipated crisis.

In 2007, the DEP, in cooperation with the Florida Department of Agriculture and Consumer Services, the South Florida Water Management District, and the Florida Division of Emergency Management, produced the Florida Drought Action Plan, which served to improve coordination and communication among key agencies, facilitate outreach to concerned parties, and express the basic short- and mid-term actions to address the drought. In response to one of the action steps in the plan, the participants of the Conserve Florida program, a statewide water conservation program for the public water supply sector, identified several water conservation measures that could lessen the adverse effects of drought. The recommendations from this group may be found in the *Being Drought Smart* report available on-line at:

<http://www.dep.state.fl.us/water/waterpolicy/index.htm>. (Click on the report in the "Highlights" section of the page.)

### Regulation and Management

The water management districts have all adopted water shortage rules that govern their response to drought. Pursuant to those rules, the districts implemented appropriate measures, based on the seriousness of the drought in their regions, the particular mix of water sources and water users, and the experience acquired in previous droughts. For example, the South Florida Water Management District, for the first time in its history, issued Phase III water shortage orders, which included a 45 percent reduction goal for many water uses and limited outdoor irrigation to one day per week. Less hard hit areas were subject to fewer restrictions, and in some areas only voluntary restrictions were imposed.

In addition to water use restrictions, other mechanisms were used to ensure that water supplies were available while protecting public health and minimizing environmental impacts. At various times and locations when conditions warranted, the DEP, water

management districts, or the U.S. Army Corps of Engineers implemented several types of emergency measures, including:

- Allowing the use of temporary pumps to overcome low water levels in Lake Okeechobee;
- Allowing water treatment plants to operate under alternative (but safe) standards for total dissolved solids, chloride, sulfate, pH, and sodium;
- Allowing the recharge of aquifers and well fields using reclaimed water;
- Authorizing the South Florida Water Management District to deviate from adopted regulation schedules for Lake Istokpoga and the Water Conservation Areas to increase supplies (authorization was granted, but never needed to be used); and
- Providing alternate surface water withdrawal schedules to increase water supplies while still meeting adopted minimum flows and levels.

In counties subject to regulation by more than one water management district, the districts worked with local governments to develop a consistent set of county-wide restrictions to avoid the confusion of having multiple sets of restrictions in one county.

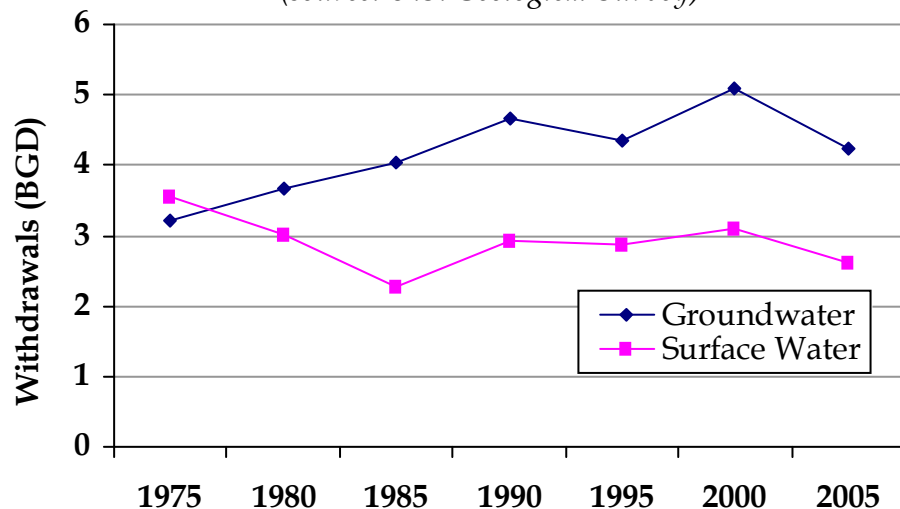
Other activities with regulatory implications are also underway. The South Florida Water Management District convened a stakeholder group to help develop a new comprehensive water conservation program. The St. Johns River, Southwest Florida, and South Florida Water Management Districts are working together to develop consistent rule language to update their existing year-round water conservation rules.

### Developing Alternative Supplies

Water use and demographic trends in Florida suggest that source diversification is another important consideration in effectively managing drought. As shown in Figure 8, since 1975, Florida has relied more heavily on fresh groundwater than surface water to meet water

supply needs. In 2005, groundwater withdrawals accounted for about 62 percent of all fresh water withdrawals in the state. Too much reliance on this one water source results in a system that is not drought resistant and can lead to water shortages and

**Figure 8. Statewide - Total Fresh Water Use**  
(source: U.S. Geological Survey)



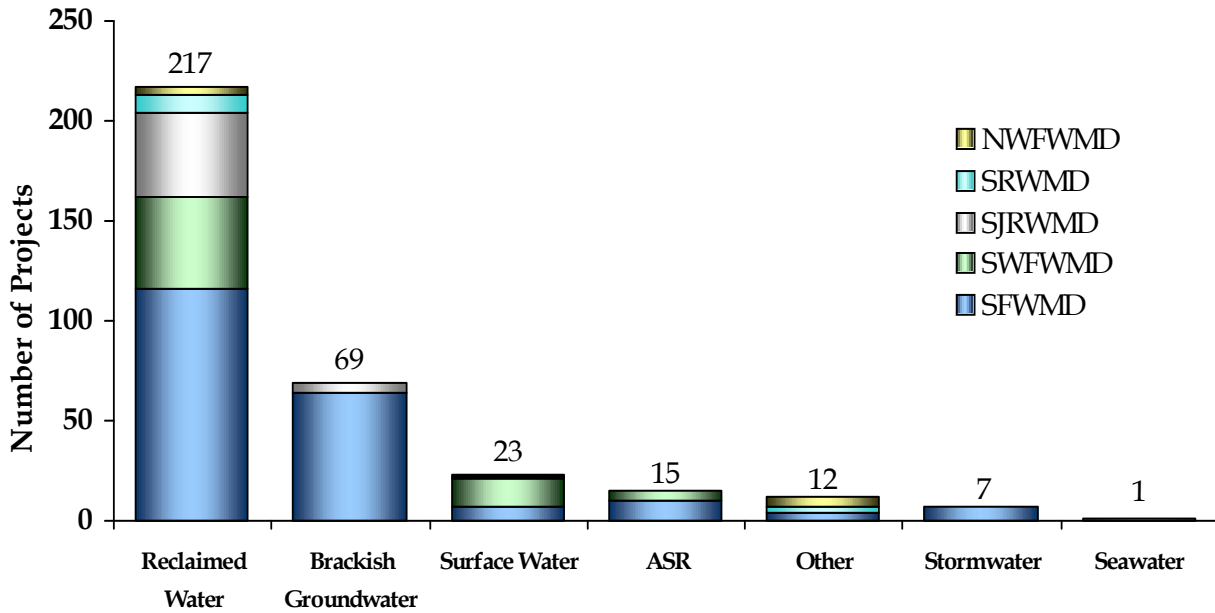
environmental damage. Supplies of fresh, inexpensively treated groundwater are increasingly limited in many parts of the state. For example, the Central Florida region is almost completely dependent upon groundwater. Water management district studies indicate that there is only enough ground water to meet regional demands through 2013. Already, in some instances, groundwater withdrawals have damaged wetlands and reduced spring flows. As a result, the South Florida, Southwest Florida, and St. Johns River Water Management Districts are working together to identify alternative sources of water to meet Central Florida’s water demands.

One way to improve drought resistance is to rely on water from several sources, at least some of which tend to still be available when rainfall is deficient. In 2005, the Florida Legislature created the Water Protection and Sustainability Program to encourage the development of alternative water supplies as a way to meet future needs. The development of alternative supplies will help diversify the state’s supply sources, which will decrease the adverse effects of drought. This program provides state funds to the water management districts for alternative water supply project construction as shown in Table 1. These funds, along with matching district funds, are awarded as grants to local water suppliers. Florida Statutes do not require the Suwannee River and Northwest Florida Water Management Districts to provide matching funds.

<b>Table 1. Funding Distributions for Alternative Water Supply through the Water Protection and Sustainability Program</b>			
<b>Water Management District</b>	<b>FY 2005 - 2006 Funds (\$ million)</b>	<b>FY 2006 - 2007 Funds (\$ million)</b>	<b>FY 2007- 2008 Funds (\$ million)</b>
<b>South Florida</b>	<b>30</b>	<b>18</b>	<b>15.6</b>
<b>Southwest Florida</b>	<b>25</b>	<b>15</b>	<b>13</b>
<b>St. Johns River</b>	<b>25</b>	<b>15</b>	<b>13</b>
<b>Suwannee River</b>	<b>10</b>	<b>6</b>	<b>5.2</b>
<b>Northwest Florida</b>	<b>10</b>	<b>6</b>	<b>5.2</b>
<b>Total</b>	<b>100</b>	<b>60</b>	<b>52</b>

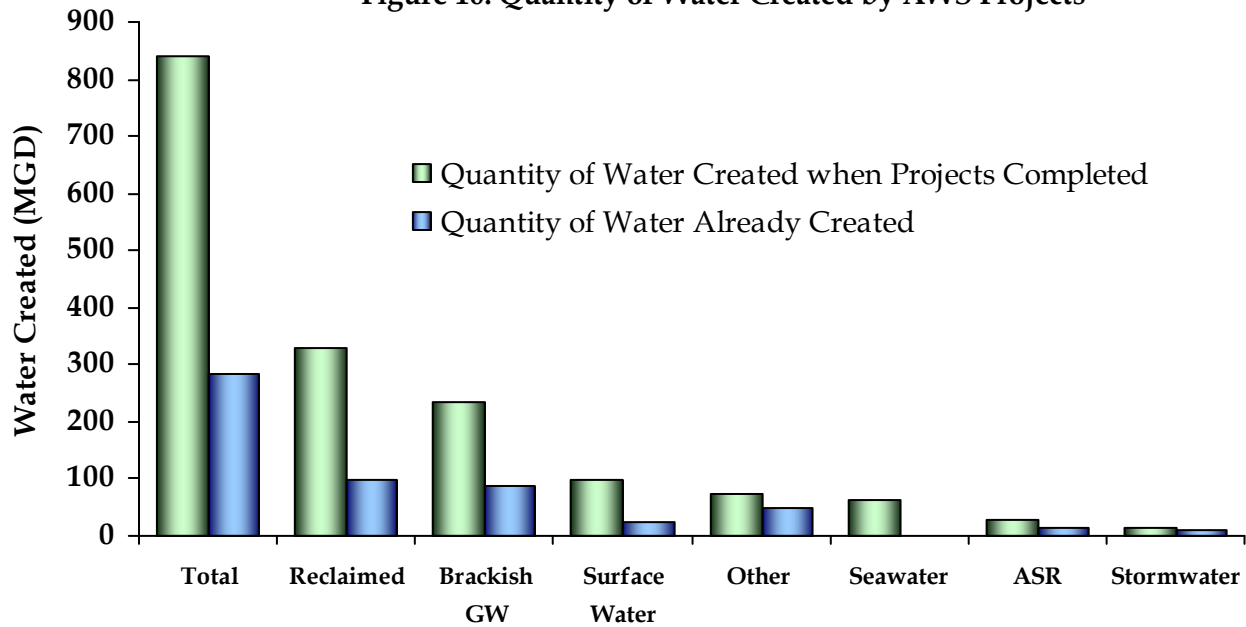
During the three years of the Water Protection and Sustainability Program, the water management districts provided funding assistance to local water suppliers for the construction of 344 projects. Figure 9 shows that approximately 63 percent of the projects funded were reclaimed water projects. The next most common group of projects funded were brackish groundwater projects, which comprised approximately 20 percent of the total.

Figure 9. Statewide Summary of Types of Alternative Water Supply Projects Funded



The districts estimate that when construction of these projects is complete they will help create approximately 842 mgd of “new water,” which is about 42 percent of the additional 2 bgd of water needed by 2025. Figure 10 shows that reclaimed water projects are expected to produce the largest amount of water, approximately 330 mgd. That is about 16.5 percent of the additional water needed by 2025 (though not all of the reclaimed water will completely offset groundwater use). Brackish groundwater

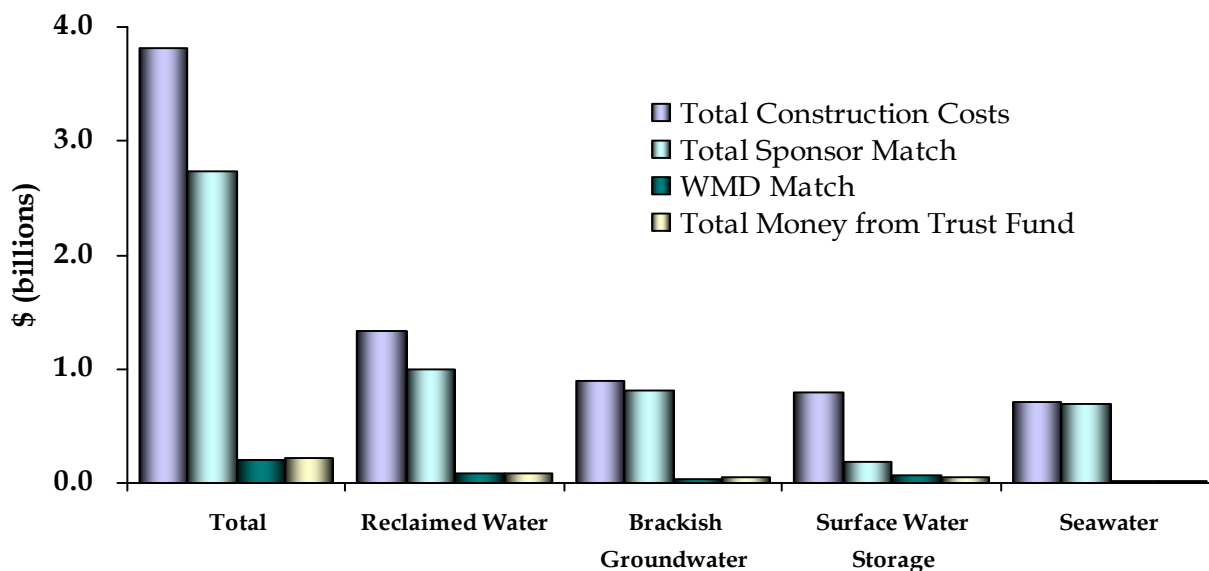
Figure 10. Quantity of Water Created by AWS Projects



projects are expected to produce the next largest amount of water, approximately 234 mgd. That is about 12 percent of the additional water needed by 2025.

The total construction costs of the projects selected for funding assistance are approximately \$3.8 billion (Figure 11). In the first three years, the Water Protection and Sustainability Program, including the match provided by the water management districts, will provide about \$422.6 million. This represents about 11 percent of the total construction costs. The water suppliers have committed to providing about \$2.7 billion toward construction of these projects, which represents about 72 percent of the total. Larger, multi-year projects may receive additional state and district funds in future years. However, in most cases, the statute requires that the local sponsor ultimately be responsible for at least 60 percent of the total project construction costs.<sup>1</sup>

**Figure 11. Statewide Costs of Alternative Water Supply Projects**



In addition to total costs, Figure 11 shows the cost breakdown for the four types of projects with the highest construction costs. The estimated costs for reclaimed water projects are \$1.3 billion and account for approximately 35 percent of the construction costs for all the alternative water supply projects. There is only one seawater desalination project proposed for funding assistance (by SJRWMD), yet the cost of that project is expected to be \$717 million and accounts for approximately 19 percent of the construction costs for all the alternative water supply projects.

Water suppliers are making good progress toward meeting projected 2025 demands, but as noted earlier in this report it is not feasible to build enough infrastructure to meet all demands in periods of extreme drought. Developing alternative water sources is simply one element of a diverse, drought resistant water supply system.

<sup>1</sup> The total construction costs are reported for the life of the project which may extend beyond three years, while the costs reported for the state program, water suppliers, and water management district match represent the costs reported for the first three years of the program. Larger projects may receive additional funds in subsequent years which is why the total of sponsor match, WMD match, and program match may not equal total construction costs.



## Looking to the Future

A principal purpose of the Annual Status Report on Regional Water Supply Planning is to report on progress in implementing the plans as written by the water management districts. Overall, DEP believes that good progress is being made. Looking forward, DEP suggests that the following issues will become important in the next cycle of updates of the regional water supply plans.

### *Climate Change*

In the face of changing climatic patterns, it is important to ensure reliable supplies of water for future needs. Climate change will have significant effects on our water supply systems, but the dimensions of that impact are only now being explored. It is a state priority to ensure that the effects of climate change are reduced as much as possible. The 2008 legislative session saw the passage of House Bill 7135 which created the Florida Energy and Climate Commission within the Executive Office of the Governor to centralize energy and climate change policy development and program implementation.

The bill contains numerous provisions to improve energy efficiency and reduce greenhouse gas emissions. Though not the main focus of the bill, water conservation will have to be addressed in various ways. There is a growing awareness of the energy use and greenhouse gas emissions associated with the withdrawal, treatment, transmission, and use of water, which makes water conservation an essential element of a comprehensive energy plan. Climate change also has significant implications for water supply planning, including potential changes in the frequency of droughts and tropical storms, as well as saltwater intrusion from rising sea level, and other impacts to surface water and groundwater.

### *Improving Water Use Efficiency*

The purpose of regional water supply planning is to identify water supply sources to meet 20-year projected demands in areas where sufficient sources have not been previously identified. Water use efficiency is a “source” of water that historically has not received the same level of consideration in water supply planning as ground and surface water sources. As supplies become increasingly limited and expensive to develop, improving efficiency should become a priority for water managers.

As noted earlier in this report, about 50 percent of publicly supplied water is used for landscape irrigation. The use of efficient irrigation products, the proper installation and management of irrigation systems, the increased use of Florida appropriate landscaping, and the enforcement of reasonable year-round irrigation restrictions could make a real difference in the amount of water used for landscape irrigation.

## ***Building Drought Resistance***

Currently, Florida's response to drought relies too much on the short term implementation of a series of water use cutbacks until the crisis has passed. Florida's water managers realize that creating a drought resistant water management system should lessen the economic and environmental impacts currently experienced during droughts. Toward that end, the state is considering ways to improve the effectiveness of various strategies, with emphasis on:

- Creating water supply systems that rely on a diverse array of sources, including reclaimed water, which will be less vulnerable to drought;
- Creating more interconnected or regional systems that would reduce the individual drought vulnerability of member utilities; and
- Using water more efficiently in all sectors.

It appears that Florida has the knowledge of how to meet the projected 2025 demands for water. However, as was apparent during the latest drought, Florida must do more to ensure that we are able cope with recurring droughts and the uncertainties associated with climate change. A more resilient water management system will rely on source diversification, improved water use efficiency, and the development of alternative water supplies.

**For more information about *Regional Water Supply Plans* please call or write:**

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