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Introduction

The *2011 Upper East Coast Water Supply Plan Update* (2011 UEC Plan Update) presents current population, water demands, water resource and water supply projects, and other key information since publication of the *2004 Upper East Coast Water Supply Plan Update* (2004 UEC Update) and *2006 Upper East Coast Water Supply Plan Amendment* (UEC Amendment). Both the 2004 UEC Plan Update and 2006 UEC Plan Amendment used 2000 baseline data in making estimates and projections through 2025. For the 2011 UEC Plan Update, new 2005 baseline data was established to determine estimates and projections through 2030.

In the 2004 UEC Plan Update, population in the Upper East Coast (UEC) Planning Area was projected to reach 486,500 by 2025, and the 2006 UEC Plan Amendment's revised projections increased population growth to 585,000 by 2025. Based on 2005 baseline data used for the 2011 UEC Plan Update, population in the UEC Planning Area is now expected to reach 792,000 by 2030. Agriculture Self-Supply gross demands within the UEC Planning Area are projected to decline from the 2005 baseline of 164 MGD to 120 MGD by 2030. Despite this 27 percent reduction, agriculture is expected to remain the largest use category in the UEC Planning Area.

In the past five years, the region has seen significant fluctuations in the economy, residential and commercial development, and agricultural commodity markets. The 2011 UEC Plan Update reflects the impact of these factors on water users and the projected water needs of the UEC Planning Area (**Figure 1**) by estimating and projecting the gross and net water demands by water use category (**Chapter 2**); discussing the water resources available and issues facing the region (**Chapter 3**); evaluating the various water source options (**Chapter 4**); identifying the Water Resource Development projects (**Chapter 5**); and the Water Supply Development Projects (**Chapter 6**).

The legal authority and requirements for water supply planning are included in Chapters 373, 403, and 187 of the Florida Statutes. In accordance with Florida's Water Protection and Sustainability Program, regional water supply plans and local government comprehensive plans must ensure that adequate potable water facilities are constructed and concurrently available with new development. The alternative

NAVIGATE

The 2011 UEC Plan Update consists of this Planning Document and Appendices. In addition, the accompanying CD contains electronic versions of this update package, as well as the *Water Supply Plan Support Document.* This material is also available from the District's Water Supply website: http://www.sfwmd.gov/watersupply.

water supply portion of this program is meant to reduce competition between users and natural systems for available water by encouraging the development of alternative water supplies.

In October 2008, the South Florida Water Management District (SFWMD or District) adopted the Restricted Allocation Area Rule for the Lake Okeechobee Service Area (SFWMD 2010). Called the Lake Okeechobee Service Area Water Availability Rule, this rule protects the rights of existing legal users as well as the water resources by limiting the availability of water for consumptive use allocations. This rule's scope addresses requests for surface water withdrawals from Lake Okeechobee or hydraulically connected systems, including the C-44 (St. Lucie River) Canal and C-23, C-24, and C-25 canals in the UEC Planning Area, and the C-43 (Caloosahatchee River) Canal and integrated conveyance systems in the Lower West Coast Planning Area.

LAW / CODE

Section 373.0361(1), Florida Statutes (F.S.) provides:

The governing board of each water management district shall conduct water supply planning for any water supply planning region within the district identified in the appropriate district water supply plan under Section 373.036, F.S. where it determines that existing sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the planning period.

The Water Reservation for the North Fork of the St. Lucie Estuary became effective March 18, 2010. This reservation sets aside water for the natural system from consumptive use and can be found at 40E-10.051, F.A.C. The reservation protects water for the natural system provided by the Comprehensive Everglades Restoration Plan (CERP) Indian River Lagoon – South Project by restricting allocation of surface water from the C-23/C-24 North and South Reservoirs and STA Projects.

The result of these changes reinforced the need for local governments to develop alternative sources for part or all of their future water supply. As discussed in the previous plan update and amendment, traditional fresh groundwater and surface water supplies are expected to be inadequate to meet much of the projected new water demands for the region. Meeting the updated water supply demand projections over the next 20 years will require a continued focus on conservation and nontraditional water supply solutions.

In preparing the 2006 UEC Plan Amendment, local governments, and water suppliers in the UEC Planning Area worked closely with the SFWMD to identify and develop potable water supply projects to meet the expected need. These proposed projects were subsequently included in each local government's comprehensive plan. The 2011 UEC Plan Update continues to build on these projects with its list of projects in **Chapter 6**.

PURPOSE

The 2011 UEC Plan Update addresses the anticipated water supply needs of the UEC Planning Area for the next 20 years and describes how these needs will be met. The plan describes and meets current statutory requirements, including listings of proposed water supply projects and regional project implementation strategies for planners, policy makers, and utility directors. The majority of new water needs are planned to be met through the development of alternative water supplies. The 2011 UEC Plan Update contains a list of water supply projects for Fiscal Years (FY) 2010–2030. Providing that funding is available, the alternative water supply projects listed in this plan update are eligible for cost-sharing consideration through a separate annual funding process established by the District's Governing Board, consistent with statutory requirements.

PLAN GOAL

The SFWMD's strategic goal for all of its water supply planning efforts is to ensure an adequate supply of water to protect natural systems and to meet all existing and projected reasonable-beneficial uses, while sustaining water resources for future generations. Additionally, the goal of the 2011 LWC Plan Update is to identify sufficient sources of water to meet the needs of all reasonable-beneficial uses within the LWC Planning Area for 2030 during a 1-in-10 year drought event, while sustaining the region's water resources and related natural systems.

Some traditional supply development may be possible where appropriate local hydrologic conditions are present and regulatory requirements are met.

Regional Water Supply Plans

The SFWMD prepares water supply plans for each of its four planning areas to effectively support planning initiatives and address local issues. The regional water supply plans encompass a 20-year future planning horizon and are updated every five years. All local governments within each planning area are required to update their 10-Year Water Supply Facilities Work Plans, which identify water supply projects, and adopt revisions to their comprehensive plans within 18 months following the approval of this water supply plan update.

DISTRICT

Role of the South Florida Water Management District

The South Florida Water Management District (SFWMD or District) performs water supply planning for each region within its jurisdiction. The District's mission is to manage and protect water resources of the region by balancing and improving water quality, flood control, natural systems, and water supply. The agency serves local governments by supporting efforts to safeguard existing natural resources and meet future water demands.

Each regional water supply plan update provides:

- Revised water demand estimates and projections.
- An evaluation of existing regional water resources.

- Identification of water supply-related issues.
- A discussion of present water source options.
- Water resource and water supply development components including funding strategies.
- Recommendations for meeting projected demands for the region.

The 2011 UEC Plan Update also includes a discussion of minimum flows and levels (MFLs) established within the planning area, MFL recovery and prevention strategies where appropriate, water reservations adopted by rule, technical data, and support information.

Public Participation

The SFWMD established the Water Resources Advisory Commission (WRAC) to serve as an advisory body to the Governing Board. The WRAC is used as the primary forum for conducting workshops, presenting information, and receiving public input on water resource issues affecting south Florida. Commission members represent environmental, urban, and agricultural interests from all four of the District's water supply planning areas.

The SFWMD held WRAC Issue Workshops throughout the water supply planning process. Stakeholders representing a cross-section of interests in the region—agricultural, industrial, environmental protection, utilities, local government planning departments, and state and federal agencies—were invited to attend the workshops. During the workshops, participants reviewed and provided comments regarding projected demands compiled by SFWMD staff. Individual meetings were held with local government planning departments and utilities, as well as agricultural industry representatives to discuss water demand projections and coordinate planning processes.

2011 Upper East Coast Plan Objectives

The following six objectives for this plan update were developed. The objectives, which provide an overall framework for the planning process, were modified from those developed for the 2004 UEC Plan Update.

WATER SUPPLY Identify sufficient sources of water to meet reasonable-beneficial consumptive uses projected through 2030 under a 1-in-10 year drought event, without causing harm to the natural resources.

NATURAL SYSTEMS Protect and enhance wetland systems and the water resources from harm due to water use, including drawdowns and harmful movement of saline water.

ESTUARINE AND RIVERINE SYSTEMS Protect and enhance the estuarine and riverine systems through effective water deliveries and management of the water resources.

CONSERVATION AND ALTERNATIVE SOURCE DEVELOPMENT Encourage conservation measures to improve the efficiency of water use, and support and promote the development of alternative sources.

LINKAGE WITH LOCAL GOVERNMENTS Provide linkage between the UEC Plan Update and local government water supply related elements.

COMPATIBILITY AND LINKAGE WITH OTHER PLANNING EFFORTS Achieve compatibility with other related planning activities within the region and with adjacent water management districts.

FLORIDAN AQUIFER Continue to encourage development of the Floridan aquifer system (FAS) as an option for water sources that depend on local rainfall for recharge. Continue the monitoring program to enhance the understanding of the relationship between water use, water levels, and water quality.

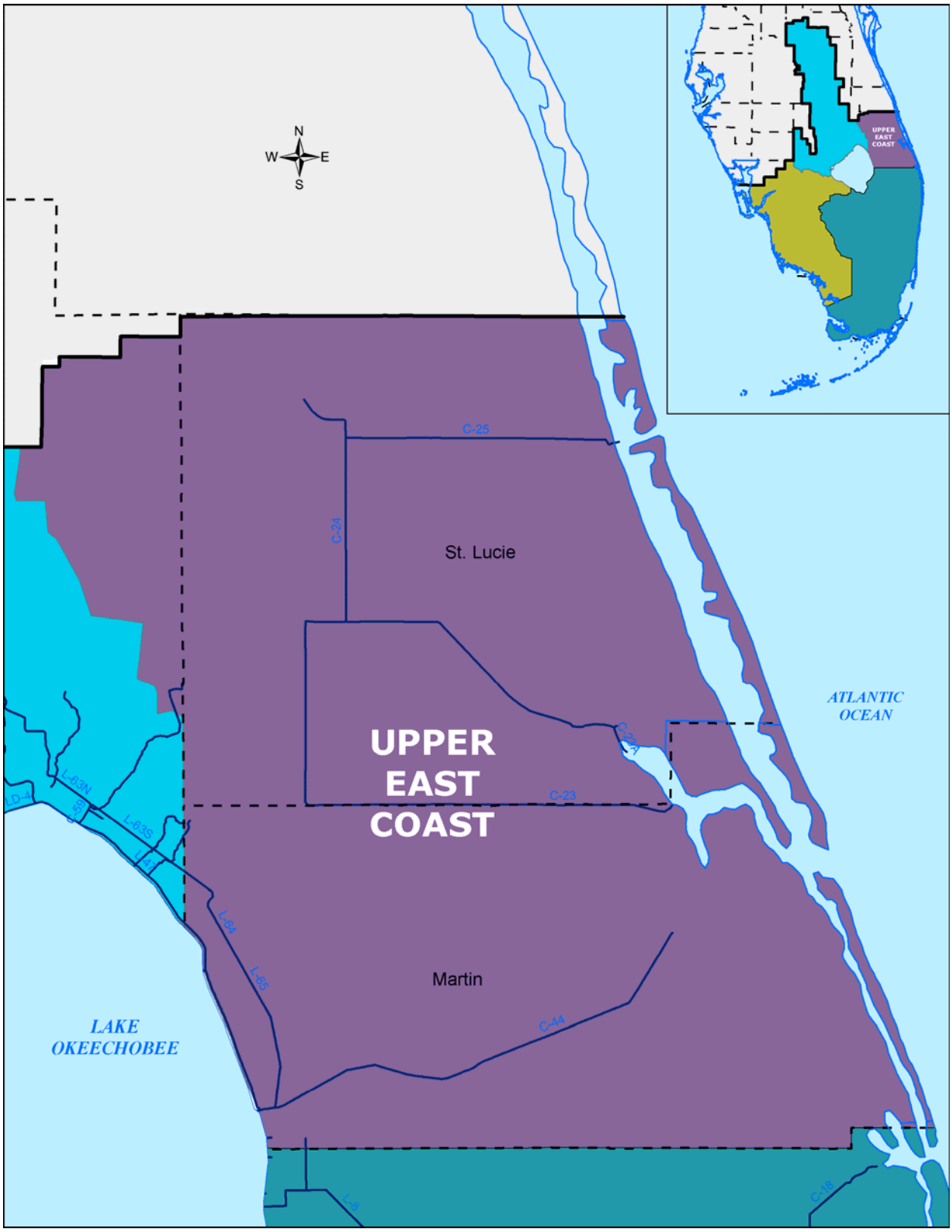

Figure 1. Upper East Coast Water Supply Planning Area.

Characteristics of the Upper East Coast Planning Area

- UEC Planning Area covers approximately 1,230 square miles and includes all of Martin and St. Lucie counties, and the eastern portion of Okeechobee County.
- The UEC generally reflects the watersheds of the C-23, C-24, C-25, and C-44 canals. Water needs of the Loxahatchee River and its watershed, which lies partially within Martin County, are considered, although these needs are covered in the Lower East Coast Water Supply Plan.
- Population is expected to increase by 107 percent from 382,400 in 2005 to about 792,000 by 2030.
- Increased population will result in an increase of 45 MGD net demand for Public Water Supply over the next 20 years, all or most to come from conservation and alternative sources.
- Agricultural lands in active production are expected to total more than 97,284 acres by 2030, making agriculture the largest use category in the UEC Planning Area. Although citrus production has declined, citrus remains the dominant crop. Overall, agricultural gross water use is projected to stabilize at approximately 120 MGD through 2030.
- Traditional water sources include fresh groundwater from the surficial aquifer system (SAS) and surface water, primarily from the C-23, C-24, C-25, and C-44 canals.
- Alternative water sources include brackish groundwater from the Floridan aquifer, reclaimed water, and excess storm water captured during the rainy season for beneficial use. Over 41 percent of the wastewater flow in the area is currently reused. More than 75 percent of the public water supply treatment capacity is reverse osmosis (RO) using the Floridan aquifer.
- The St. Lucie River in Martin and St. Lucie counties features North and South Forks that flow into the St. Lucie Estuary. Other creeks in both counties feed the St. Lucie River and Estuary.
- The St. Lucie Estuary is also part of the southern portion of the Indian River Lagoon, a water body composed of three distinct but interconnected estuarine systems. The Indian River Lagoon features the greatest species diversity of any estuary in North America.
- The Loxahatchee River and the North Fork of the St. Lucie River are designated as aquatic preserves by the State of Florida. The Northwest Fork of the Loxahatchee River was Florida's first Wild and Scenic River designated by the federal government. Natural tributaries to the Loxahatchee River system include the Loxahatchee Slough, North Fork, and several creeks.
- The region includes wetlands such as Allapattah Flats, Cane Slough, DuPuis Reserve, Pal-Mar, and the Savannas, one of the most endangered natural systems in south Florida.

PROGRESS SINCE THE 2004 UEC PLAN UPDATE

The 1998 UEC Plan and 2004 UEC Plan Update identified key regional issues concerning conservation, groundwater resources, reclaimed water, seawater, storage, surface water, and related implementation strategies. The 2004 UEC Plan Update contained 26 recommendations that will be addressed in **Appendix G** of this 2011 UEC Plan Update. The Five-Year Water Resource Development Work Program, contained in the SFWMD's *South Florida Environmental Report — Volume II*, (SFWMD 2010) annually summarizes the progress of these recommendations.

Since the 2004 UEC Plan Update, activities in the UEC Planning Area have enhanced the region's water resources, water supply needs, and natural systems, as noted by the following progress:

- In September 2008, the SFWMD adopted a Comprehensive Water Conservation Program to establish a proactive Districtwide water conservation program.
- The Districtwide year-round landscape irrigation rule became effective in March 2010 [Rule 40E-24, Florida Administrative Code (F.A.C.)], consistent with the Comprehensive Water Conservation Program.
- The Water Savings Incentive Program (WaterSIP) provides up to 50-50 cost-sharing funds for noncapital cost projects by utilities, municipalities, property owner associations, and large water users for purchasing and installing high-efficiency indoor plumbing fixtures, such as showerhead and toilet replacements, and outdoor irrigation retrofits, such as rain sensors and computerized central controllers. Between FY 2005 and FY 2009, the District allocated approximately $2.8 million in funding for 101 projects representing an estimated potential savings of 1,792 million gallons of water per year (MGY), including $248,512 for UEC Planning Area projects, which represents an estimate potential savings of 221 million MGY.
- Through the Alternative Water Supply (AWS) Funding Program, the District assisted water users in the development of AWS projects including reclaimed water and the use of the Floridan aquifer and RO treatment. Over the past five years, the District, in cooperation with the state, has provided more than $135 million in AWS funding for 254 projects. Of these projects, 33 projects in the UEC Planning Area are producing 67.0 MGD of new RO treatment capacity and new reclaimed water capacity.
- The SFWMD drilled three Floridan aquifer system exploratory/monitoring wells at C-23 Canal site in north-central Martin County. In addition, these wells are integrated into the long-term monitoring program in the UEC Planning Area. The results of this investigation are contained in the *Hydrogeologic Investigation of the Floridan Aquifer System C-23 Canal Site Martin County, Florid*a (SFWMD 2008), published in September 2008.
- The UEC Floridan Aquifer System Model and draft report have been developed and a peer review of the model is slated for FY 2011 or as funds become available. The model is designed to evaluate future effects of proposed use of the aquifer system.

- The District completed the *Subregional Feasibility Study of Water Supply Integration for St. Lucie County Area.* This effort comprised two studies. Phase I, summarized the existing and planned water resources projects within St. Lucie County. Phase II, consisted of a conceptual master plan for water systems integration and development of an institutional framework for merging utility systems in northern St. Lucie County. St. Lucie County is in the process of developing its own utility system for water and wastewater; therefore, no continued facilitation is requested or needed for a Phase III study.
- The *Water Resources Development Act of 2007* authorized the CERP Indian River Lagoon – South Restoration Project to reduce harmful freshwater inflows and generate habitat and water quality improvements in the St. Lucie Estuary and the Indian River Lagoon.
- The SFWMD has acquired approximately half of the land needed to restore the Allapattah Natural Storage Area, another component of the CERP Indian River Lagoon – South Project, to its historically natural condition. It has also completed contracts for ditch filling and structure upgrades. The property is open to the public for passive recreation usage. Contract work will continue with berming, ditch filling, and structure upgrade throughout this project feature.
- The SFWMD has acquired land and completed the design of C-44 (St. Lucie Canal) Reservoir and Stormwater Treatment Area Project, located in southern Martin County adjacent to the C-44 Canal. The project will consist of a 3,400-acre aboveground reservoir approximately 15 feet deep (50,600 acre-feet of storage) to capture local C-44 Basin runoff and a 6,300 acre Stormwater Treatment Area. All of the project's approximately 11,000 acres have been acquired, final design is complete, and reservoir test cells are complete. Construction is scheduled to occur from 2010 through 2017.
- In October of 2008, the South Florida Water Management District (SFWMD or District) adopted a Restricted Allocation Area rule for the Lake Okeechobee Service Area. Called the Lake Okeechobee Service Area Water Availability Rule, this rule protects the rights of existing legal users, as well as the water resources by limiting the availability of water for consumptive use allocations. This rule's scope addresses requests for surface water withdrawals from Lake Okeechobee or hydraulically connected systems, including the C-44 (St. Lucie River) Canal and C-23, C-24, and C-25 canals in the UEC Planning Area, and the C-43 (Caloosahatchee River) Canal and integrated conveyance systems in the Lower West Coast Planning Area.
- The Water Reservation for the North Fork of the St. Lucie Estuary became effective March 18, 2010. This reservation sets aside water for the natural system from consumptive use. The reservation protects water for the natural system provided by the CERP Indian River Lagoon – South Project by restricting allocation of surface water from the C-23/C-24 North and South Reservoirs and STA Projects.

- The *St. Lucie and Indian River Counties Water Resources Study*, co-sponsored by the SFWMD and St. Johns River Water Management District, was initiated in February 2009 and completed in November 2009 (HDR and HSW 2009). The objective of this study was to 1) address excess surface water in the St. Lucie and Indian River counties currently being discharged to the Indian River Lagoon by capturing, conveying, and storing the water to make it available for beneficial use, and 2) to provide for increased flexibility of water management in these counties. Five selected alternative plans were modified, analyzed, and ranked, resulting in the selection of a preferred alternative.

PLANNING PROCESS

1

Planning and Assessment

The process for development of the 2011 UEC Plan Update incorporated extensive public participation, including nine public workshops, as well as coordination with local governments, adjoining water management districts, and other state and federal agencies. A review of previous planning efforts in the region and documentation of activities since the approval of the 2006 UEC Amendment and the 2004 UEC Plan Update was a key starting point of this process. Planning efforts integrated development of Year 2030 demand projections, assessment of existing and projected resource conditions, and formulation of strategies to meet urban, agricultural, and environmental water needs.

2

Data Collection, Analysis and Issue Identification

Using the 2006 UEC Amendment and 2004 UEC Plan Update as a foundation, this water supply plan update involved collecting the latest information about water resources, rainfall, natural resources, water demands, water conservation and land use. Analyses, such as groundwater and surface water evaluations, regulatory information, mapping, wetland studies, and other related data, confirmed the validity to previously identified issues and helped identify new issues that may have emerged.

3

Evaluation of Water Source Options

The next phase of the planning process consisted of modifying existing solutions or developing new solutions to address the identified issues. In areas where projected demands exceeded available supplies, solutions included use of alternative water supplies and water conservation. Each water source option was evaluated, and local and regional responsibilities were identified.

4

Water Supply Development

Water supply projects that are intended to meet water needs for the next 20 years have been identified, compiled, and evaluated by the District with input from stakeholders. This information was used to create **Chapter 6**: Water Supply Development Projects, which evaluates existing and proposed supplies relative to projected future water demand.

OUTLOOK ON CLIMATE CHANGE

Climate change is occurring throughout the planet, yet the impact to regions will vary and the degree of the change is unsure. Long-term data shows changes in parameters, such as temperature change and sea level rise. Despite the uncertainties, climate change and the related effect on hydrogeologic conditions must be included as a consideration in water supply planning.

The anticipated rise of the sea level may increase the intrusion of salt water into groundwater. Analysis will be needed to identify the impact of the sea level rise on utility wellfields in the region at risk of saltwater intrusion. Additionally, comprehensive monitoring is required to understand and measure aquifer conditions and saltwater movement.

Other changes, such as increased evapotranspiration (ET) and changes in rainfall and tropical storms, are less predictable at this time. If the temperatures and ET increase as many expect, both Public Water Supply and Agricultural Self-Supply water demands could be expected to increase. More frequent intense rainfall events with longer dry periods in between could increase the annual rainfall, but could decrease effective rainfall, and water could be lost to runoff or tide.

WATER SUPPLY PLANNING FOR THE NEXT 20 YEARS

Because of the stronger legislative link between local governments' comprehensive plans and the District's regional water supply plans, data sharing and collaborative planning have improved the planning process. Moreover, the District's Consumptive Use Permitting is a key component of the planning process. Future updates to local governments' 10-year Facilities Work Plans and the District's five-year update of the 2011 UEC Plan Update will continue to influence the 20-year demand projections. **Chapter 2** presents the demand estimates and projections by water use category.

REFERENCES CITED

HDR Engineering and HSW. 2009. *St. Lucie and Indian River Counties Water Resources Study: Final Summary Report*. Prepared for the South Florida Water Management District and St. Johns River Water Management District. HDR Engineering, Jacksonville, FL, and HSW Engineering, Inc., Tampa, FL

South Florida Water Management District. 2010. *Basis of Review for Water Use Permit Applications.* Environmental Resource Regulation Department, SFWMD, West Palm Beach, FL.

South Florida Water Management District. 2010. *South Florida Environmental Report — Volume II*. SFWMD, West Palm Beach, FL.

South Florida Water Management District. 2009. *Basis of Review for Water Use Permit Applications.* Environmental Resource Regulation Department, SFWMD, West Palm Beach, FL.

South Florida Water Management District. 2009. *Technical Document to Support a Water Reservation Rule for the North Fork of the St. Lucie River*. SFWMD, West Palm Beach, FL.

South Florida Water Management District. 2008. *Hydrogeologic Investigation of the Floridan Aquifer System C-23 Canal Site Martin County, Florid*a. Technical Publication WS-24. SFWMD, West Palm Beach, FL.