Written Testimony for

December 8, 2011 Hearing: Opportunities and Challenges to Address Domestic and Global Water Supply Issues

Submitted to:

Honorable Jeanne Shaheen

Chairman

Subcommittee on Water & Power

Committee on Energy and Natural Resources

United States Senate

Presented by:

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Public Agency

Introduction

Thank you for the opportunity to provide testimony to the Subcommittee on Water and Power of the Senate Committee on Energy and Natural Resources. We appreciate Chairman Jeanne Shaheen's heightened focus on the critical issue of water supply challenges and opportunities. My name is Melissa L. Meeker, and I appear before the subcommittee in my capacity as Executive Director of the South Florida Water Management District.

Headquartered in West Palm Beach, the South Florida Water Management District is one of Florida's five regional water management districts created to oversee and manage the state's water resources. Operating for the past forty years, these public agencies are charged with four broad mission responsibilities: flood control, water supply, natural systems and water quality. With general oversight and guidance provided by the Florida Department of Environmental Protection, the water management districts utilize a variety of tools and technologies to help ensure a reliable and sustainable supply of water for Florida's citizens, environment and economy, both for today and for our future.

The South Florida Water Management District has two additional responsibilities unique to South Florida. The first is managing and operating the Central and Southern Florida Project, one of the world's largest public works projects. This extensive infrastructure of canals, levees and structures was built by the U.S. Army Corps of Engineers fifty years ago to provide flood control and water supply benefits to an estimated population of 2 million. Today that system is supporting a population of 7.7 million—nearly four times the number of people it was designed for. At the same time, operation of this complex system of water management structures is capable of delivering nearly 1.4 billion gallons per day—or 500 billion gallons annually—to support the water supply needs of urban areas and the agricultural industry.

The agency's second unique responsibility is implementing the federal-state partnership to restore America's Everglades, the largest ecosystem restoration initiative in North America. The Comprehensive Everglades Restoration Plan is focused specifically on "getting the water right"—in quantity, quality, timing and distribution. Successful restoration will capture, store, treat and deliver water to revitalize the natural system, improve wildlife habitat and recharge the underground aquifer to ensure a reliable and sustainable supply of water for the Everglades and South Florida. This effort is a critical component of our overall water management strategy.

Overview: Where Does Florida's Water Come From?

Florida is a rainfall-dependent state. Average annual rainfall is 53 inches, making it one of the wettest states in the nation. Unlike other parts of the country, nearly two-thirds of Florida's freshwater use is pumped from underground aquifers. These include the deep

Floridan Aquifer and the shallower Biscayne Aquifer, which is highly dependent on rainfall for replenishment. The state's remaining fresh water is supplied from surface waters, including lakes and rivers, which are also dependent on rainfall. In South Florida, approximately 90 percent of the water used in homes and businesses comes from groundwater sources, with only 10 percent from surface waters.

At the center of South Florida sits the 730-square-mile Lake Okeechobee—the liquid heart of the greater Everglades ecosystem. It serves as both a direct source of public water supply and provides a supplemental source of irrigation water to more than 700,000 acres in agricultural production. In addition, the 'big lake' serves as the backup water supply for more than five million residents.

America's Everglades are a vital part of South Florida's water story. Dubbed the *River of Grass* for the sawgrass that flourished throughout the marsh, the Everglades is a mosaic of freshwater ponds, prairies and forested uplands that is home to dozens of federally threatened and endangered species, including the Florida panther, American crocodile, snail kite and wood stork. These vast, shallow wetlands, which once covered almost 11,000 square miles, help to recharge the region's underground water supplies. But because of efforts to drain the marshland for urban development, agriculture and flood control, the Everglades is today half the size it was a century ago.

Florida's Water Supply Challenges

Florida's water supply challenges are three-fold: the need for storage, unpredictable weather extremes and a growing demand coupled with competing uses.

Storage—Florida's flat landscape creates one of our most significant water supply challenges: lack of storage. Although rainfall recharges underground supplies, the ability to capture and store the rainwater for future use is extremely limited. When floods threaten—which occurs even during water shortage situations—the South Florida Water Management District's top priority is channeling excess water away from homes and businesses as quickly as possible. To lower the levels in coastal canals and accommodate direct rainfall and stormwater runoff for flood protection, fresh water must oftentimes be released to the Atlantic Ocean or the Gulf of Mexico.

Effective management of the Central and Southern Florida Project provides for the delivery of nearly 1.4 billion gallons per day to meet South Florida's water supply needs. But because of limited surface water storage and an infrastructure designed for flood control, it is estimated that a staggering 1.7 billion gallons of water per day, on average, is diverted through the extensive canal system and discharged to tide.

Weather Extremes – Despite the abundance of rainfall, the state's climate types yield significant rainfall variability from region to region and from year to year. In South Florida, most of the rain falls during just four summer months. In addition, a significant

amount of rainfall is lost through evapotranspiration or—because of the flat landscape and lack of regional storage—channeled out to tide for flood protection.

Florida is also prone to prolonged droughts and water shortages. Just this year, the region emerged from a multi-year period of rainfall deficit. Lake Okeechobee reached an all-time low of 8.82 feet above sea level in the summer of 2007, and from October 2010 to June 2011, the region experienced its driest dry season since recordkeeping began 80 years ago. In some areas, the rainfall deficit grew to more than 20 inches, with Lake Okeechobee, a water body with an average depth of only 9 feet, dropping more than 3.5 feet below normal. In essence, the Sunshine State is a state of meteorological extremes, where extended dry spells and big rain days are considered the norm.

And because Florida is largely surrounded by salt water, drought conditions require a constant vigil to monitor and combat the intrusion of heavier seawater into the state's underground freshwater supplies.

Demands and Competing Uses—During the past half-century, Florida's water demands have risen exponentially—and they are projected to continue increasing. Statewide, Floridians used an average of 6.7 billion gallons a day in 2010; the projection for 2030 is 8.1 billion gallons a day. That means that in the next 20 years, another 1.4 billion gallons a day must be identified and planned for. Planning and developing water for a growing population must also be balanced with ensuring water is available for our natural systems.

What makes Florida unique is its diversity of environmental features: beaches, rivers, lakes, bays, estuaries and wetlands, including the vast Everglades ecosystem. The vast interconnected Everglades system, which historically stretched from Orlando in the central part of the state down to Florida Bay, today encompasses 2.4 million acres and is the focus of a thirty-year, multi-billion dollar state-federal restoration effort.

The health of this ecosystem depends on delivering the right quality of water to the right places in the right amounts and at the right time. Successful restoration requires capturing, storing, treating and delivering water to revitalize the natural system. When complete, Everglades restoration has the very real potential to achieve both our environmental and economic water supply needs.

Florida's Water Supply Solutions

To meet Florida's future demands, the state's water management districts are diversifying the water supply portfolio to maximize traditional sources, while at the same time tapping into alternative sources. Strategies include sound planning and permitting; demand reduction through water conservation; development of alternative water sources such as surface waters, reuse and desalinization; and in South Florida,

restoring the Everglades, which will result in more water overall for environmental, urban and agricultural users.

Planning and Permitting—Water in the State of Florida is a public resource. Its use, as determined by state statutes, is guided by the diverse programs implemented by the water management districts (Chapter 373, Florida Statutes). The cornerstone of effective water supply management is sound planning and regulatory certainty.

To address future water needs, Florida's water management districts work with utilities, agriculture and other stakeholders to develop region-specific water supply plans. These plans use a 20-year planning horizon to evaluate water needs and identify strategies for meeting future demands. Developed through a collaborative effort with local governments and other stakeholders, each plan includes water demand estimates and projections; an evaluation of existing regional water resources; identification of water supply-related issues and options; water resource and water supply development components, including funding strategies; and recommendations for meeting projected demands.

In South Florida, the regional plans completed to-date have concluded that the use of traditional fresh water sources have been maximized. In 2010, urban and agricultural users in South Florida used an estimated 3.5 billion gallons per day of water. Over the next 20 years, water needs in the region are projected to increase by almost 1 billion gallons a day.

Regulatory programs also play an important a role in water supply management. When applied fairly and consistently, they aid in advancing water use efficiency, promoting water conservation, sustaining limited supplies and protecting the natural environment. Permit applications for water use are evaluated by Florida's water management districts under a "three-pronged test": the proposed use must be reasonable-beneficial, it must not interfere with any presently existing legal use of water, and it must be consistent with the public interest.

Additional rules are in place for protecting Florida's water bodies, especially wetlands, from harm that could result from water supply over-pumping. In addition, the state's Water Reservations authority allow for water to be set aside in an ecosystem for the protection of fish and wildlife. This has become an important tool in Everglades restoration.

Furthermore, in South Florida it is no longer an option for utilities or businesses to address future demands by requesting increased withdrawals from certain regions. Restricted Allocation Area rules prevent water users from tapping the famed *River of Grass* for new or additional supplies. "New" water from the Everglades is now

restricted for environmental restoration purposes only. A similar rule is in effect that limits withdrawals from Lake Okeechobee to current levels.

Alternative Water Supplies—Diversifying water supply sources is important to Florida's future and ensures communities are less susceptible to the effects of drought. In 2005, the Florida Legislature recognized this and enacted the Water Protection and Sustainability Program. Through funding, this precedent-setting program encourages cooperation between municipalities, counties, the state and the five water management districts to protect and develop water supplies in a sustainable manner. Examples of alternative water supplies that meet this objective include: treatment of saltwater and brackish water; water reuse; stormwater/surface water captured during heavy rainfalls; and sources made available through the addition of new storage capacity.

Since 2005, more than $551 million in state funding assistance has been provided toward 327 projects, about 15 percent of the $3.8 billion estimated total construction costs. When constructed, these alternative water supply projects will create a combined 761 million gallons a day of "new water"—more than 50 percent of the additional 1.4 billion gallons a day needed to meet the projected growth in demand.

In South Florida alone, funding has been provided in support of local alternative water supply projects since 1997. To-date, a total of $204 million in grants has been directed toward 474 alternative water supply projects that produced 429 million gallons of water per day. Funded projects have included reuse, use of brackish and seawater sources and aquifer storage and recovery.

The reuse of reclaimed water is a key component of the new "water pie." To date, more than 60 percent of the alternative water supply projects funded are for reclaimed water. This underscores the value of wastewater as a critical water resource rather than a disposal challenge. It is no longer acceptable to use water just once and then dispose of it. Water reuse is an excellent opportunity to integrate wastewater management and water supply. Reclaimed water can safely be used for irrigation, groundwater recharge, saltwater intrusion barriers, environmental enhancement and other beneficial uses.

Florida is today a leader in water reuse. The state's total reuse capacity has increased 331 percent between 1986 and 2010. Statewide today, there are more than 480 facilities in operation – collectively reusing 659 million gallons a day of reclaimed water that is estimated to have avoided the use of more than 121 billion gallons of potable quality water. This also adds more than 80 billion gallons back to available groundwater supplies.

To further increase the use of treated wastewater, the Florida Legislature in 2008 authorized the elimination of six ocean outfalls remaining in the state. This legislation requires utilities currently using ocean outfalls as a wastewater disposal method to go

to advanced wastewater treatment by 2018; to eliminate discharges (except for wet weather) by 2025; and to achieve, at a minimum, 60 percent reuse of the facility's actual annual flow by December 31, 2025.

The elimination of the state's ocean outfalls—all of which are located within the South Florida Water Management District's boundaries—will generate an estimated 178 million gallons per day of reclaimed water for use within some of the most heavily–populated areas of South Florida. Water supply development projects that support the reuse of treated wastewater are included in regional water supply plans and its beneficial use is encouraged in consumptive use permits. The challenge we face is in retrofitting our communities to accommodate reclaimed water infrastructure and the public perceptions associated with this valuable resource.

I recently had the opportunity to talk to a national audience about Florida's leadership and commitment to increasing water reuse in the state at the "2011 Potable Reuse Conference" sponsored by the WateReuse Association. A copy of that presentation is included here as part of my written testimony. *See attachment.*

Realizing Everglades Restoration — Together with traditional water supply augmentation and demand management strategies, efforts are also under way to capture, conserve and more effectively utilize water for the natural system through environmental restoration.

Today, the South Florida Water Management District and the State of Florida, along with the U.S. Army Corps of Engineers and other partner agencies, are working to undo the environmental damage inadvertently caused by the construction of the Central and Southern Florida Project and a century of drainage. The overarching goal is to capture the 1.7 billion gallons per day of fresh water that now flows unused to the ocean and the gulf and redirect it to storage for natural areas that need it most for restoration purposes. Returning a more historic flow of water to the remnant *River of Grass* will not only revive the native habitat for 68 threatened and endangered species, it will also naturally replenish the underground aquifers that supply drinking water to the population.

Authorized in the Water Resources Development Act of 2000, the joint state-federal Comprehensive Everglades Restoration Plan (CERP) partnership provides a framework to restore, protect and preserve the water resources of central and southern Florida, including the Everglades. CERP includes more than 60 elements. Any new water resulting from the construction of restoration projects will, first and foremost, be directed to environmental restoration and then will be made available for other purposes. Major components include surface water storage reservoirs; water preserve areas; management of Lake Okeechobee as an ecological resource; improved water deliveries to coastal estuaries; underground water storage; treatment wetlands;

improved water deliveries to the Everglades; removal of barriers to the natural sheetflow of water; storage of water in existing quarries; reuse of wastewater and improved water conservation.

Approximately 60 percent of the nearly 400,000 acres of lands needed to move forward with Everglades restoration are in public ownership. Design and/or construction of projects to increase storage, improve water quality and reestablish more historic flow patterns and hydrologic characteristics are under way. Federal agency coordination and authorizations of projects ready-to-go, along with continued federal and state funding, is crucial to maintaining restoration progress.

Conclusion

Just as rainfall is linked to water supplies, the availability of an affordable water supply is also tied to the economy. The economic downturn has been painful across the country, and the combination of a weak economy with recent record drought conditions has made it a challenge for many communities and businesses. That connection underscores the importance of planning for and developing adequate water supply for economic sustainability. Adequate, affordable water is needed to achieve economic growth; attract new industries and provide cooling water for new and existing utilities; sustain agriculture; and to maintain a healthy environment. These—and numerous other water-dependent businesses—all have the potential to create jobs. No one wants water scarcity or availability to be a limiting factor in any aspect of our state or nation's economic future.

Finding and implementing workable, cost-effective solutions to environmental, water resource protection and water supply availability issues requires a concerted and collaborative approach – a combination of public works projects and private participation that can yield mutually beneficial dividends. We must employ a variety of resource management tools to address our challenges, and we must commit to financial and political investments in water conservation, water resource development and alternative water supplies to ensure that future water needs will be met—not at the expense of our natural systems but as a result of innovative and cooperative solutions.

Federal support and investment in the Comprehensive Everglades Restoration Plan, community infrastructure improvements and new technologies are vital to helping local communities—and our nation—meet its water supply needs. The long-term benefits, particularly that of a healthy and sustainable economy, truly outweigh the costs.

Chairman Shaheen, the South Florida Water Management District would like to thank you for convening this hearing and for stimulating thoughtful dialogue that can lead to collaborative and productive solutions to the nation's water supply challenges. We appreciate the invitation extended to the State of Florida to provide input and our perspective on this important issue.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

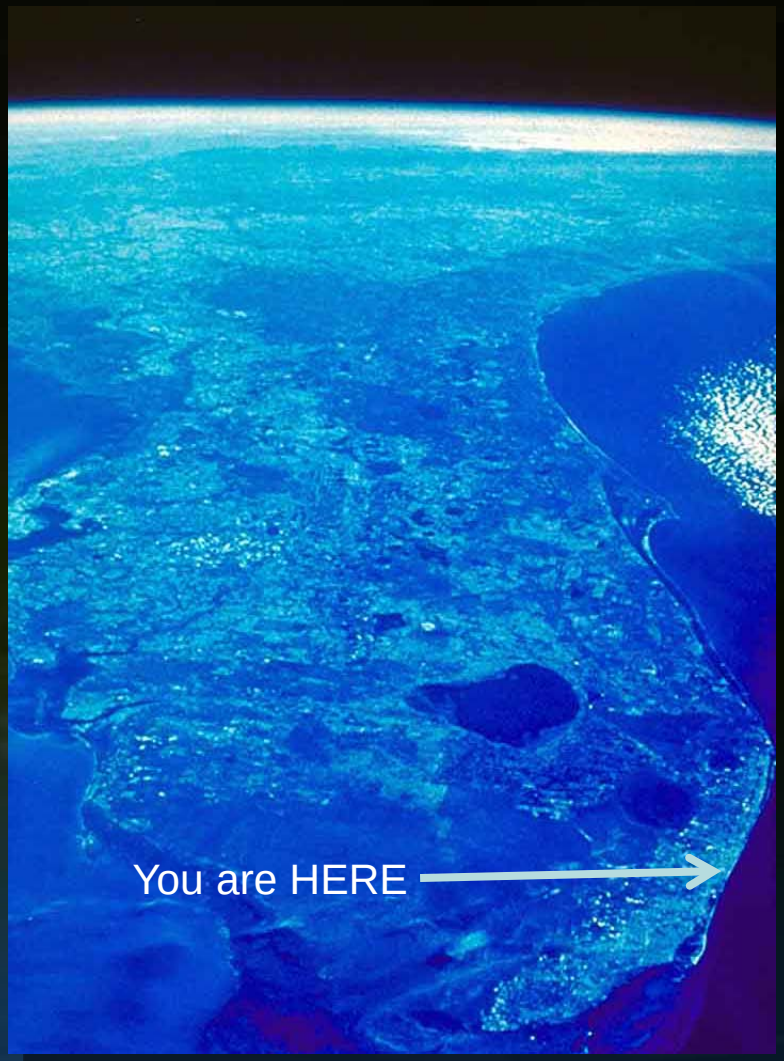
Water Reuse In South Florida
A Local Perspective

Melissa Meeker, SFWMD Executive Director

November 14, 2011

sfwmd.gov

Welcome to Florida!



The Basics:

- Dependent on rainfall – wide variation from region to region and year to year
- Surrounded by salt water
- Year-round urban and agricultural demands; seasonal residents; tourists
- Unique environmental needs – America's Everglades

Florida's Water Management Districts

Core Mission:

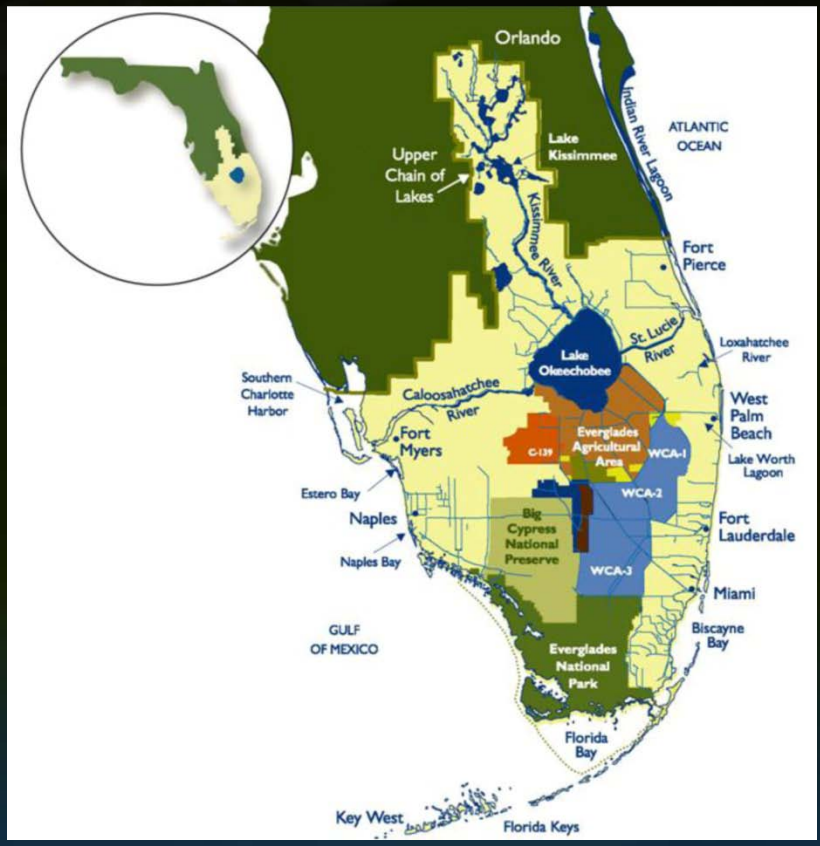
- Flood Protection
- Water Supply
- Natural Systems
- Water Quality

Statewide
Where Does Our Water Come From?

- **Two-thirds pumped from groundwater**
  - **Floridan Aquifer**
  - **Shallow Biscayne Aquifer *(South Florida only)***
  - **Other surficial and intermediate aquifers**
- **One-third from surface water**

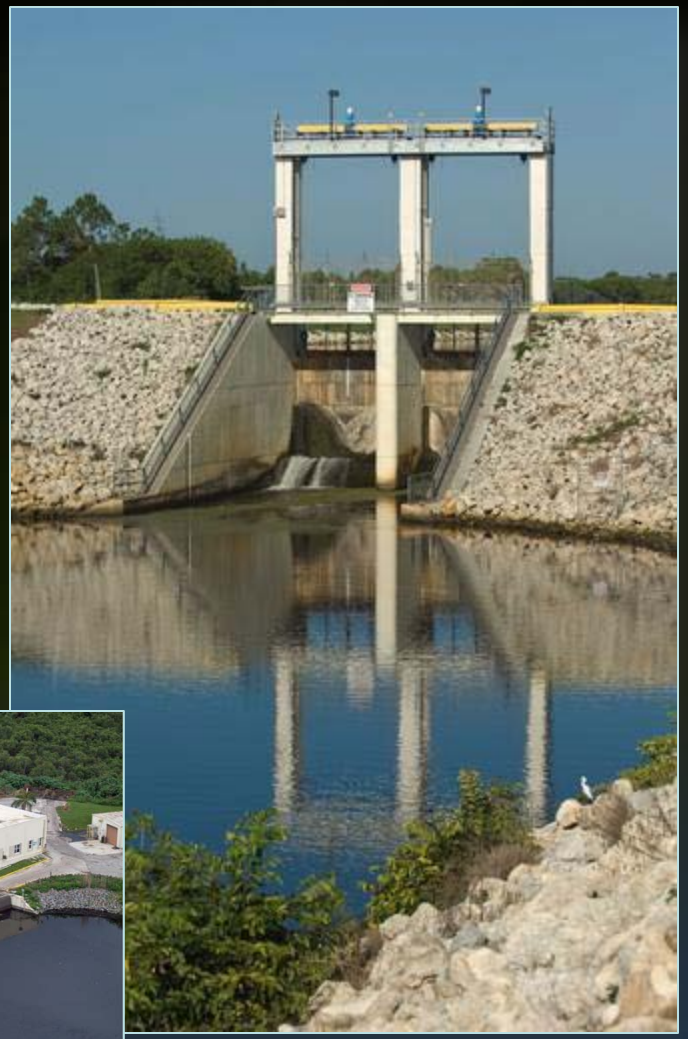
South Florida
Where Does Our Water Come From?

- 90 percent from groundwater
- Only 10 percent provided by surface water
- Liquid heart of South Florida system is Lake Okeechobee
  - Limited direct public water supply
  - Supplemental irrigation water
  - Back up supply for populated lower east coast
  - Critical environmental and economic role



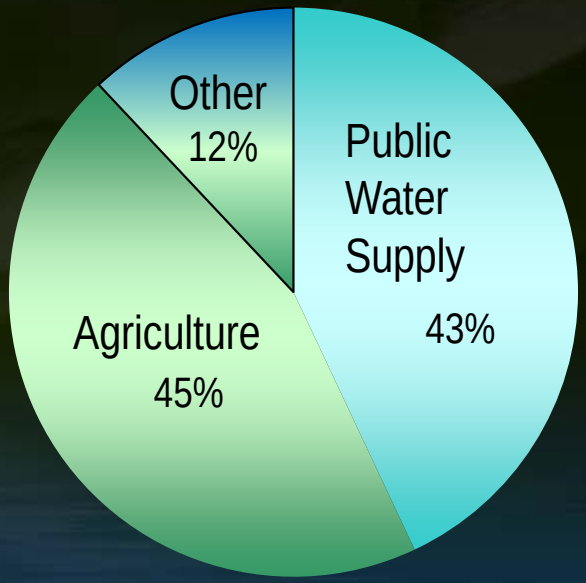
Water Management System Helps Balance Water Needs

- Benefits of regional canal, levee and water control system
  - Flood protection
  - Wellfield recharge
  - Saltwater intrusion barrier
- Moves more than 20 million acre-feet (5.5 trillion gallons) of water annually

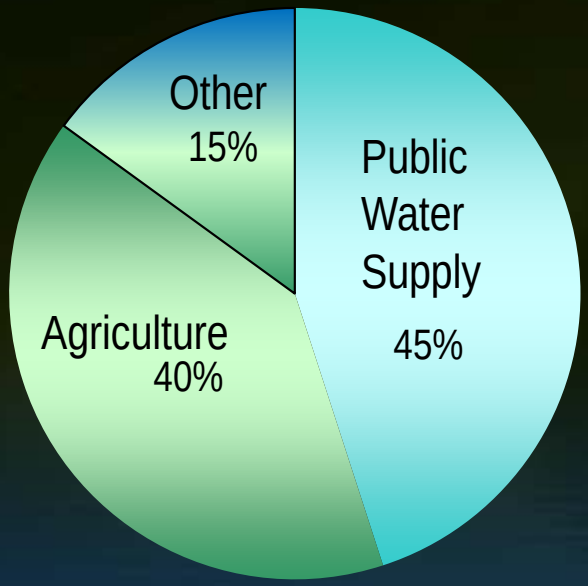


South Florida
Current and Projected Water Demands

2010
3.5 Billion GPD



2030 Projected
4.3 Billion GPD



South Florida
Water Supply Challenges

- Weather extremes
  - Droughts
  - Big Rain Days!
- Modified natural system
  - Lack of storage
  - Environmental needs
- Saltwater intrusion
- Increased demands

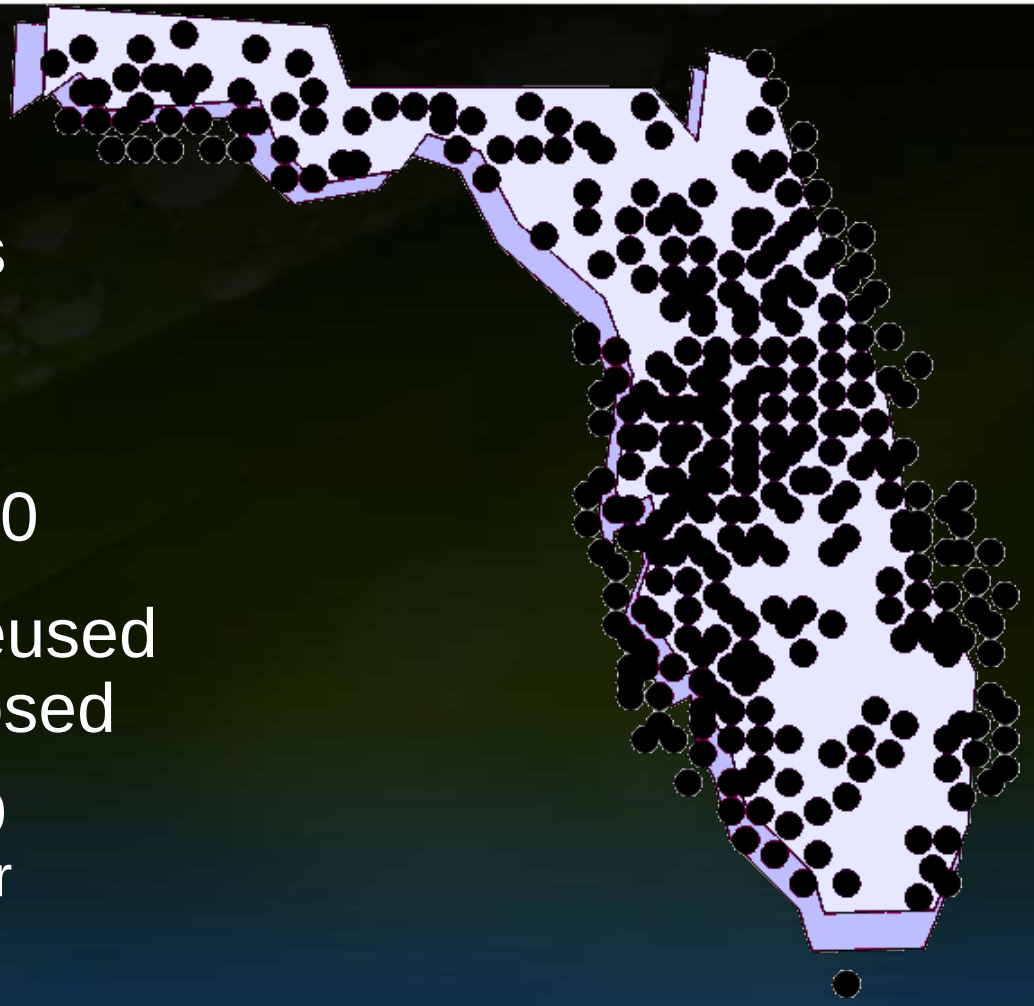
South Florida
Regional Water Supply Solutions

- Water Supply Planning
  - Resource development projects
  - Alternative Water Supplies
  - Conservation
- Everglades Restoration
  - Increased storage
- Regulation
  - Restricted Allocation Areas
  - Minimum Flows & Levels
  - Water reservations

South Florida
Water Supply Priorities Moving Forward

- Realize Everglades Restoration
- Implement regional water resource development projects
- Proactively manage droughts
- Increase water conservation
- Expand alternative water supplies, including reuse

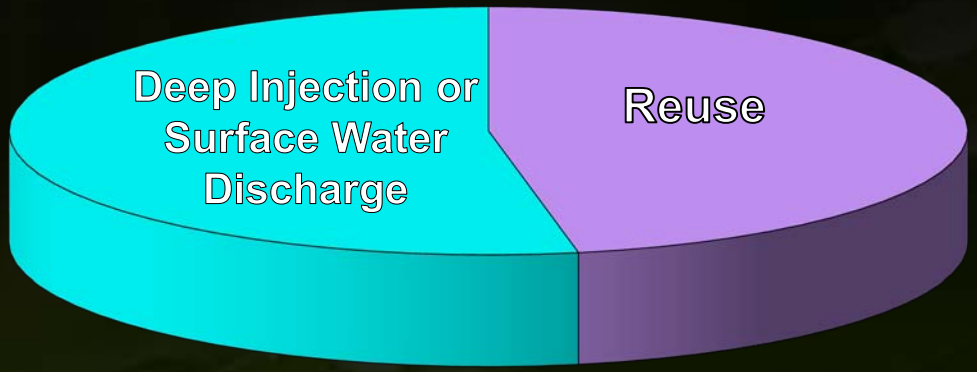
Focus on Reuse
Florida is National Leader in Reuse



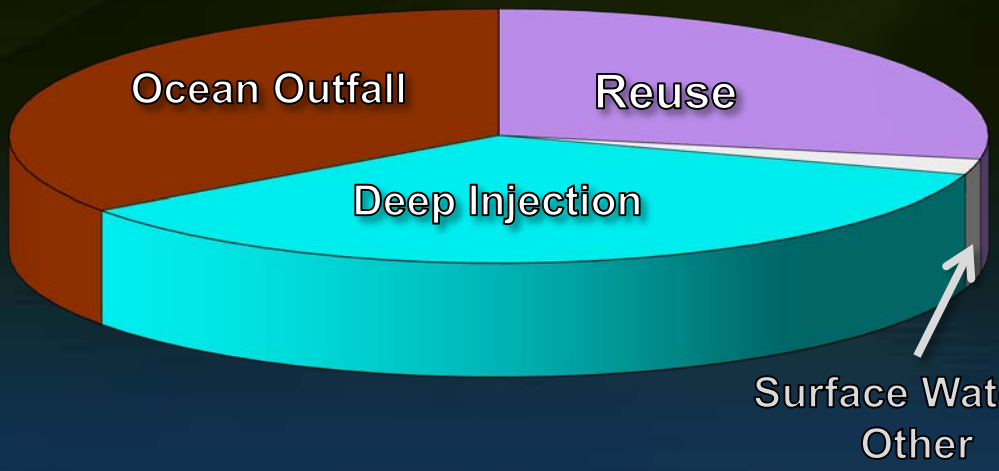
- More than 480 facilities
- Total reuse capacity increased 331 percent between 1986 and 2010
- 659 MGD now being reused rather than being disposed
  - Equates to more than 40 percent of all wastewater treatment plant flow

Wastewater Disposal vs Reuse

Statewide



South Florida



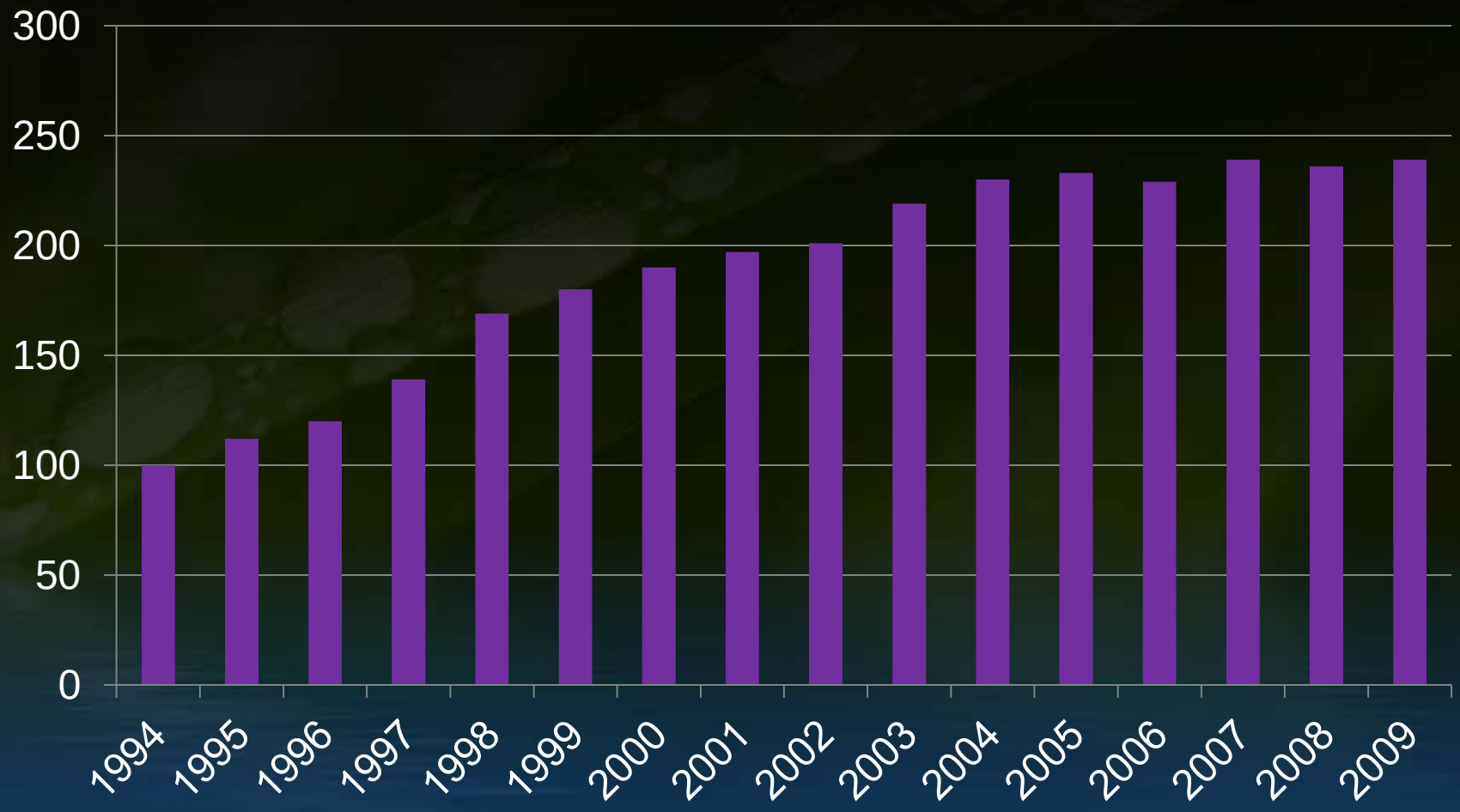
South Florida
Primary Disposal of Treated Wastewater

- 820+ MGD of Wastewater Treatment Plant flow
  - 586 MGD Currently Disposed
  - 235 MGD Currently Reused

Deep Well Injection

Ocean Outfall

South Florida's Reuse History in MGD



Current Water Reuse in South Florida

- More than 100 facilities:
  - Collectively reusing 235+ MGD or 29% of total wastewater treated, including irrigation of:
    - 100,000 residences
    - 189 golf courses
    - 210 parks
    - 70 schools
  - Remaining 586 MGD of wastewater treated sent to ocean or injected underground

Local Reuse Success Story
Pompano Beach

- Pulls water from Broward County ocean outfall pipe
- 7.5 MGD capacity
- Irrigation of residential lots, 2 golf courses and 5 parks

Local Reuse Success Story
Martin County Utilities

- Reused 2.5 MGD in 2010
- Irrigation for 1,250 residential lots, 8 golf courses and 2 parks

Local Reuse Success Story
City of Orlando/Orange County

- Conserv II – a joint venture
- More than 22 MGD of reuse in 2010
- Irrigation of 3,900 residential lots, 58 parks, 5 schools and 4 golf courses
- Irrigation of more than 5,000 acres of agriculture

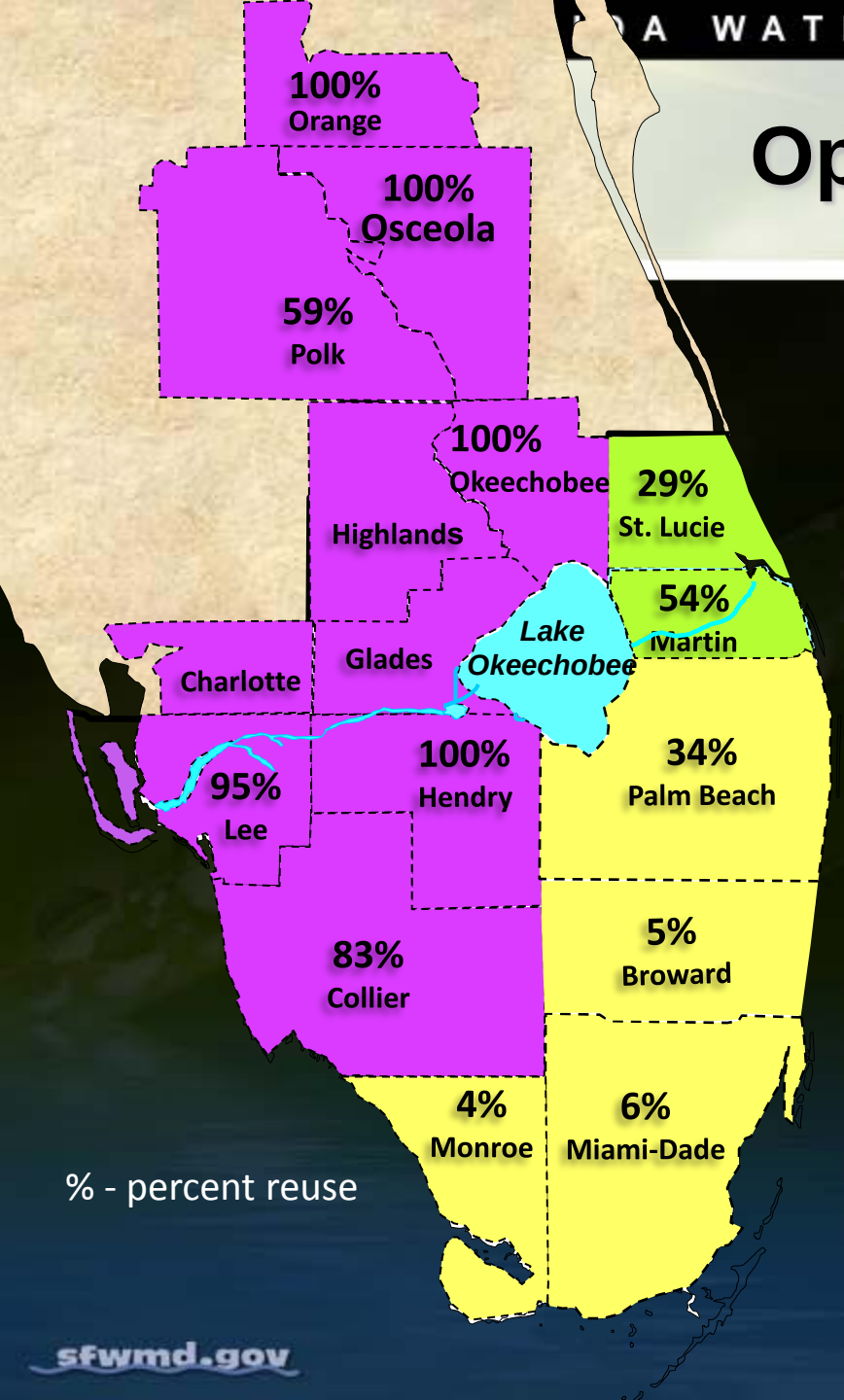
Local Reuse Success Story

Palm Beach County Water Utilities

- Mandatory Reuse Zone
- Irrigate 6,000 residential lots, 9 golf courses and 2 parks
- 150 acres of created wetlands
  - Green Cay & Wakodahatchee

Technical Tour
Green Cay & Wakodahatchee Wetlands

Opportunities to Expand



% - percent reuse

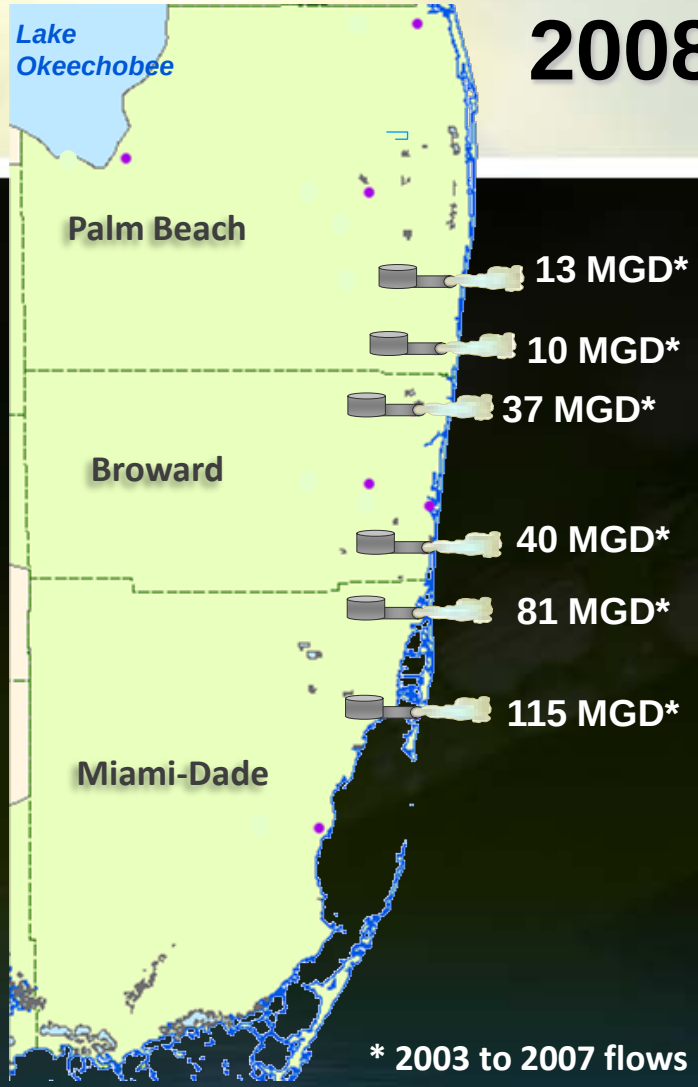
- Waiting lists
- Increased efficiency

- Regionalization occurring
- Distribution extensions underway

- Ocean outfall legislation
- Palm Beach County- 20% increase in 10 years

Number of Reuse Systems: 100
Total Reuse ~ 235 MGD
Percent Reuse: 29%

2008 Ocean Outfall Act



- By 2018: Discharges to meet advanced wastewater treatment levels
- By 2025: Must reuse at least 60% of annual average daily flow *(based on 2003-2007)*
- After 2025: Outfalls as backup discharge only; must meet advanced wastewater treatment levels

Required 60% Reuse = 178 MGD

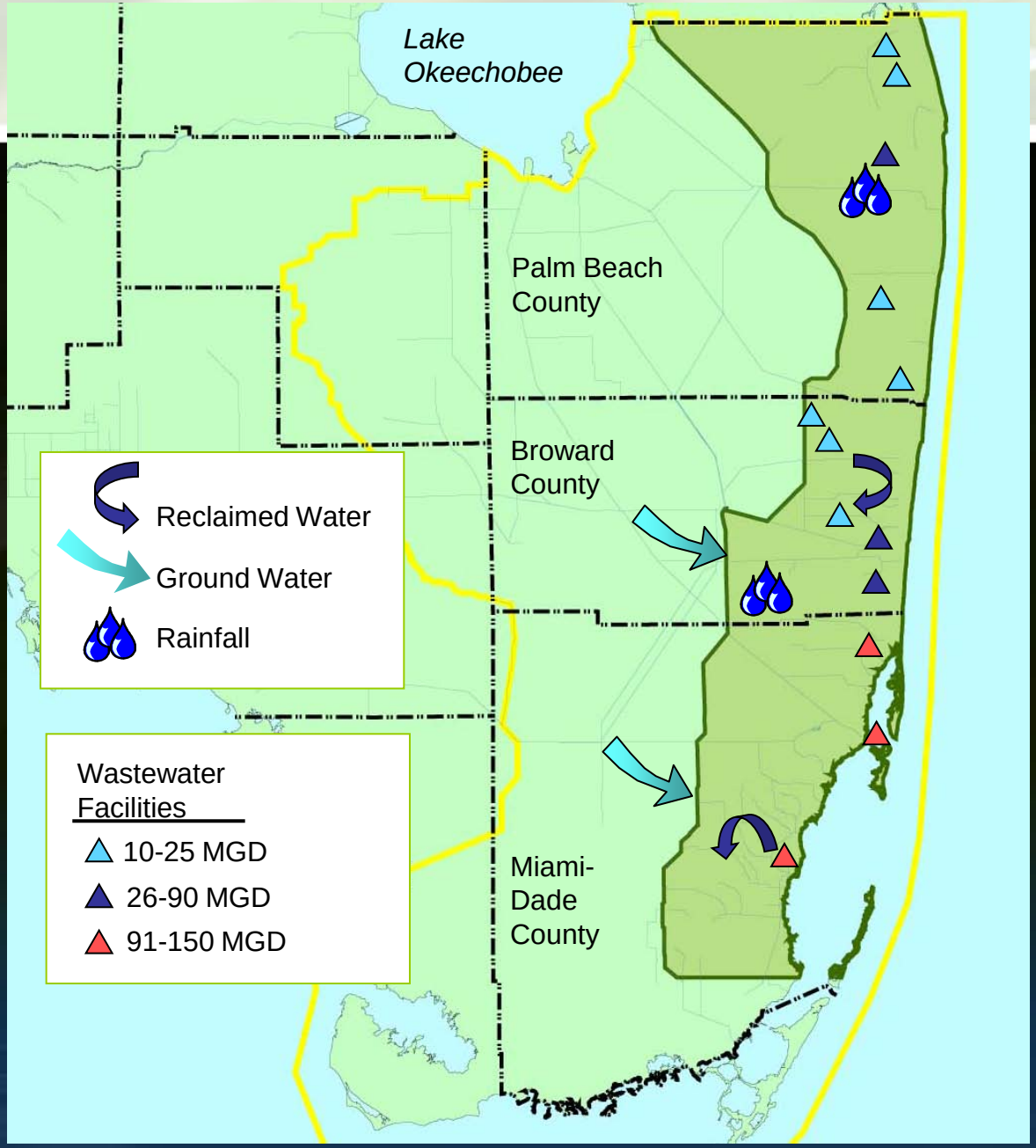
Taking it a step further
Concepts Under Consideration

- Aquifer recharge
  (Indirect potable reuse)
- Saltwater intrusion barriers
- Increased irrigation usage

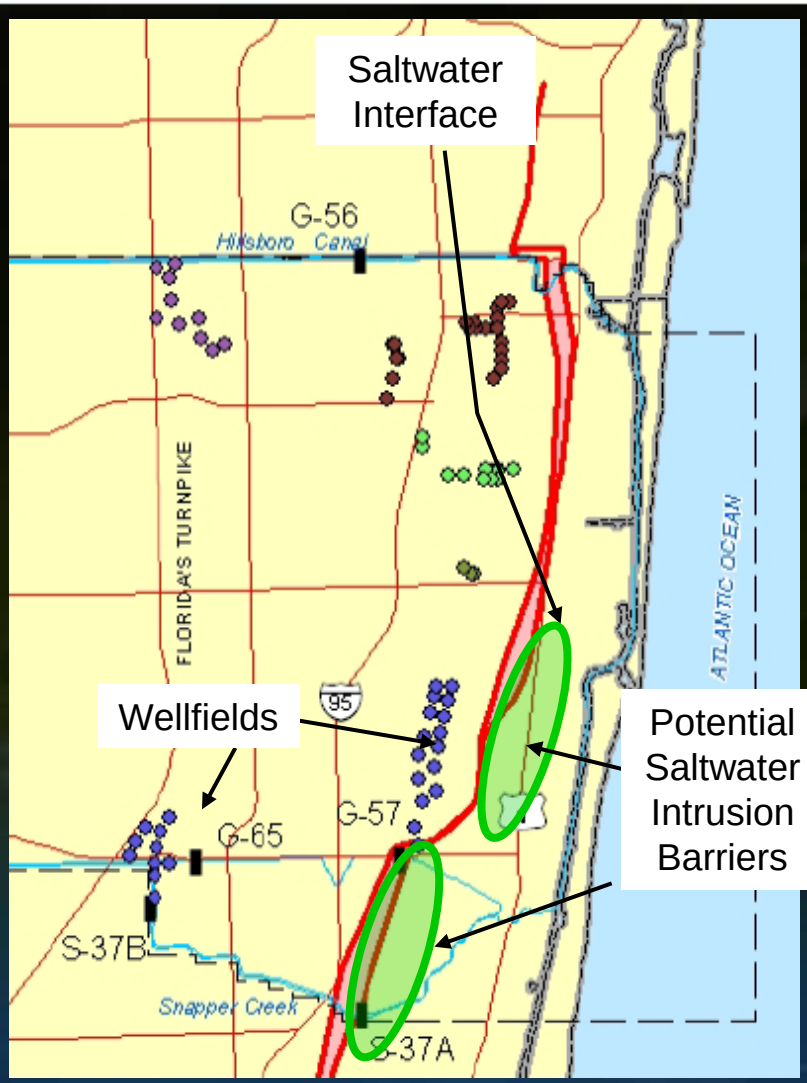
Aquifer Recharge

Replace existing fresh surface water regional water supply deliveries with highly treated reclaimed water

- Reduces dependency on regional resources
- “Drought-proofed” source of water
- Supports Everglades Restoration
- Benefits community as a whole



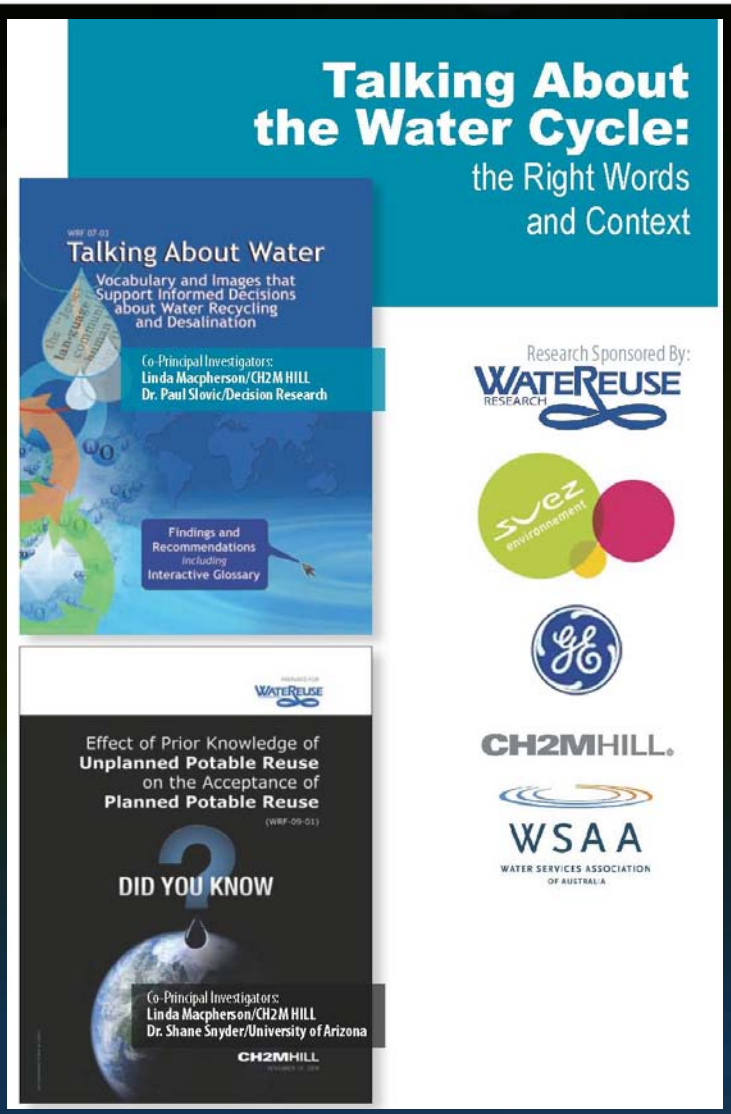
Saltwater Intrusion Barrier Concept



- Purpose is to create fresh water mound to impede movement of salt water inland
- Could use recharge basins or injection wells
- Successfully used in California for decades

Taking it a step further
Challenges to Overcome

- Public perception / acceptance
  - Pre-conference discussion
- Water quality requirements
  - Higher treatment standards
  - Numeric nutrient criteria
  - Total Maximum Daily Loads
- Cost & Funding



Expansion of Reuse Requires Coordination & Collaboration

- Stronger integration of wastewater management and resource management objectives can achieve better benefits
  - Common understanding
  - Public engagement
  - Science and technology available today
  - More expensive NOT to advance reuse

Enjoy Your Visit!