

# **Regional and Urban Water Resources**

## **Planning for the Future in Broward County**

Joint Meeting of the Broward Workshop and the  
Regional Business Alliance

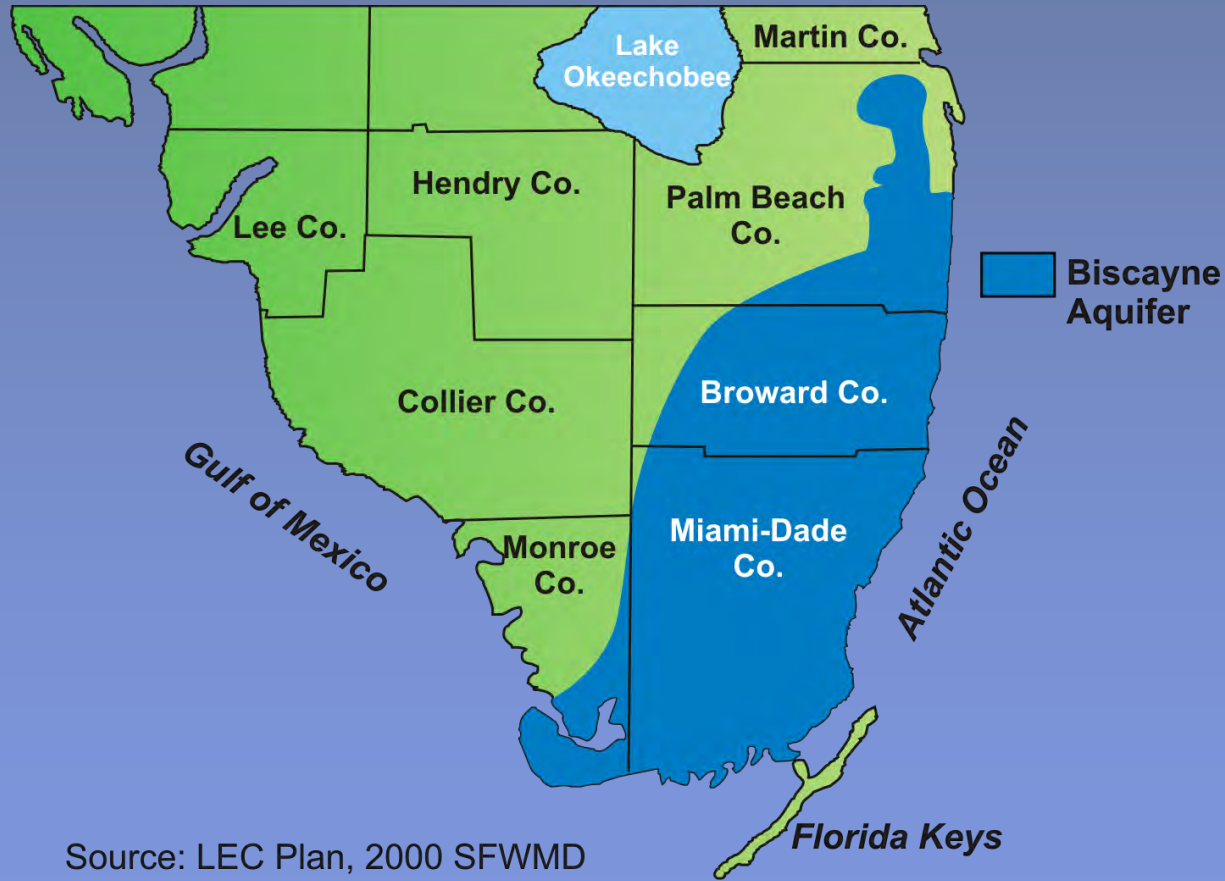
July 21, 2011



## Overview

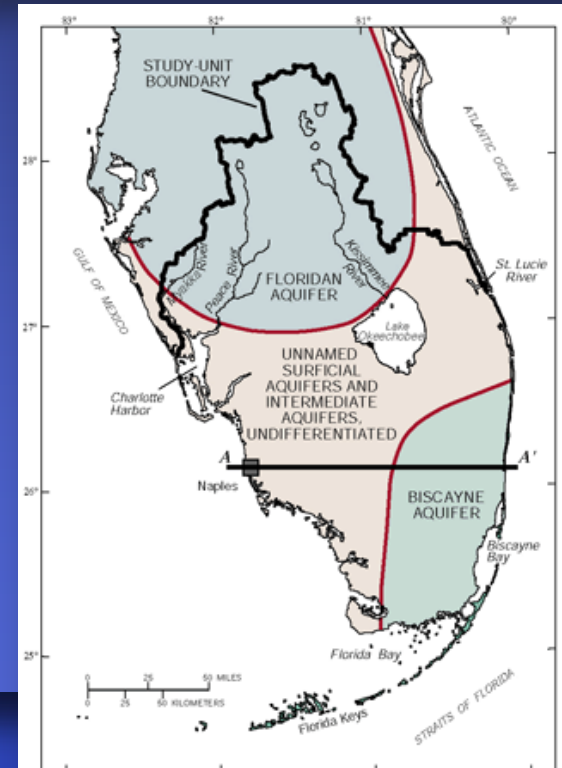
- **Water resource management and context**
- **Influences of water policy**
- **Water demands in a changing landscape**
- **Planning for the future**

# The Biscayne Aquifer



# Characteristics

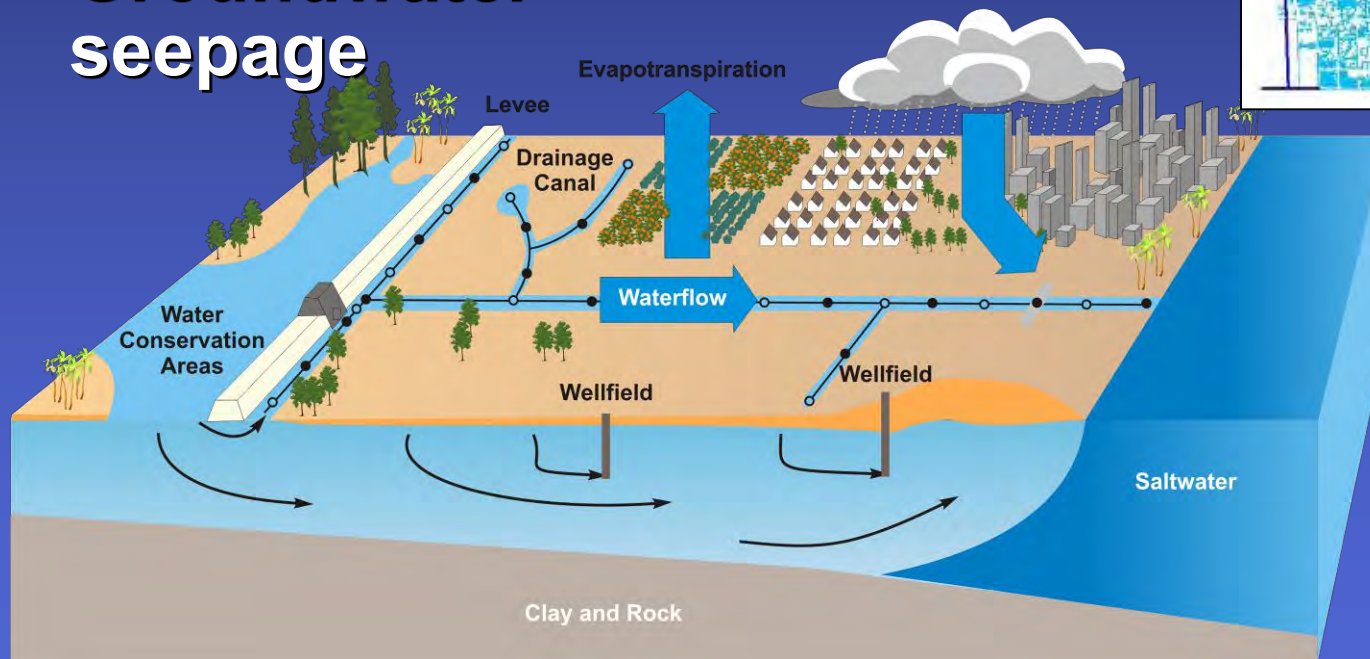
- **Coastal Aquifer**
- **Human-induced Stresses:**
  - Everglades drainage
  - Well field pumping
  - Canal water level management
  - Agricultural/Urban development
- **Natural Stresses:**
  - Sea level rise
  - Rainfall variations



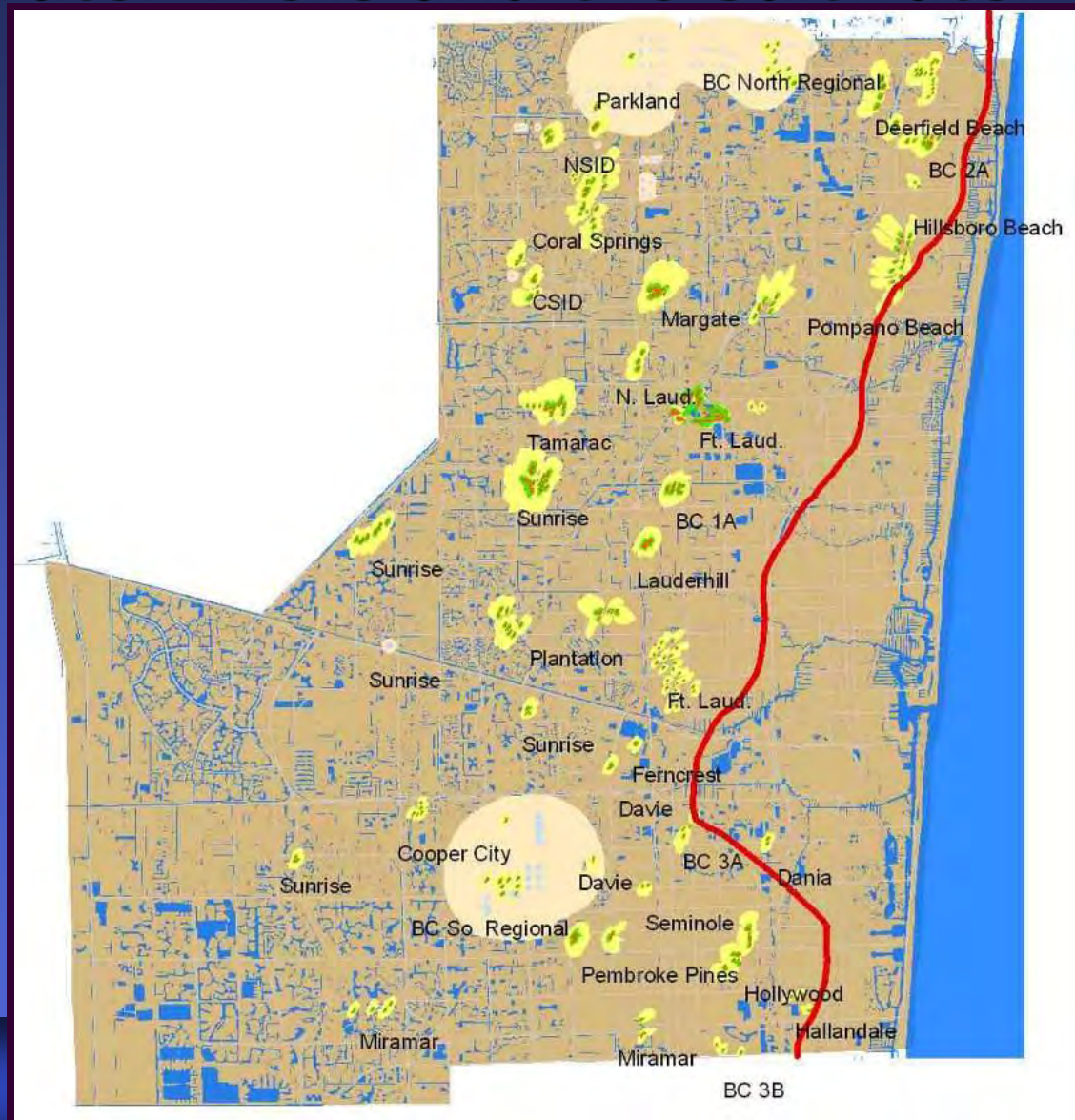
Base from U.S. Geological Survey digital data, 1:2,000,000, 1972  
Albers Equal-Area Conic projection  
Standard Parallels 29° 30' and 45° 30', central meridian -83° 00'

# Aquifer Recharge

- Rainfall
- Surface deliveries
- Groundwater seepage

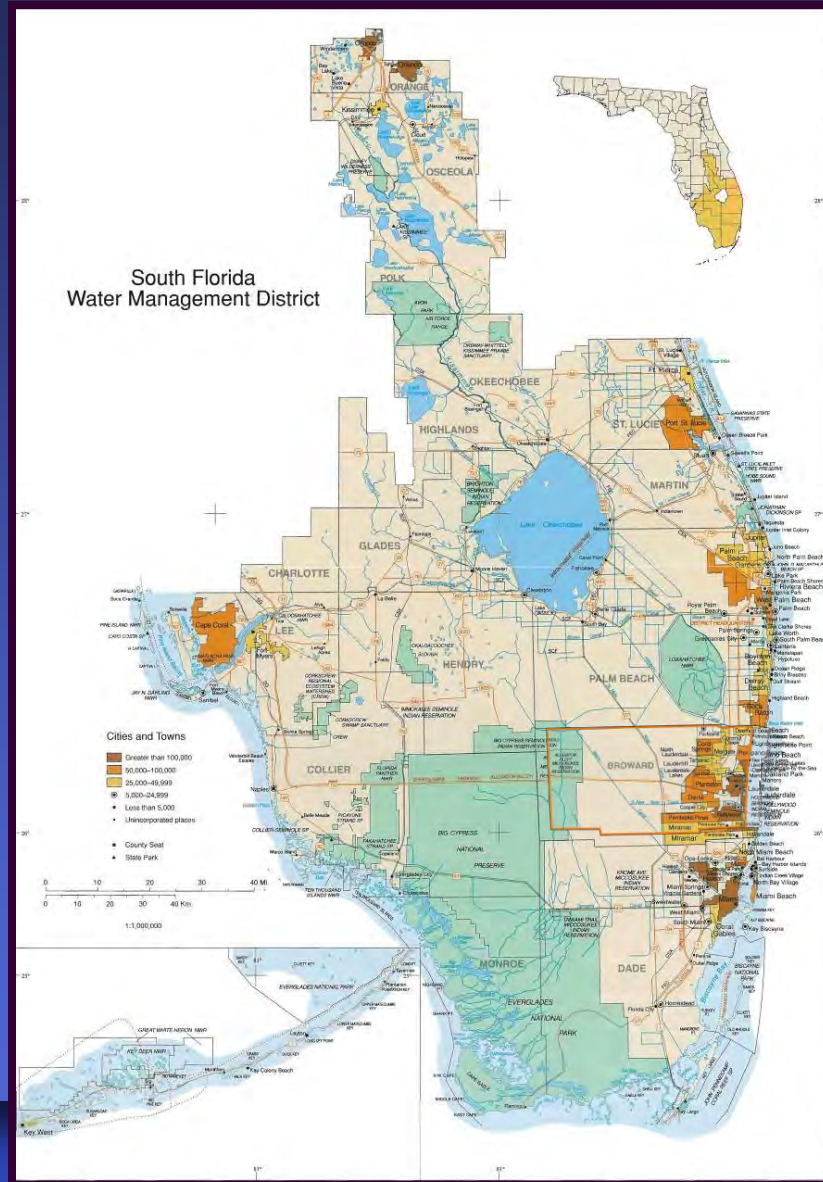


# Water Wells and the Saltwater Front



# Natural Resources Planning and Management Division

# Lake Okeechobee as a Water Source



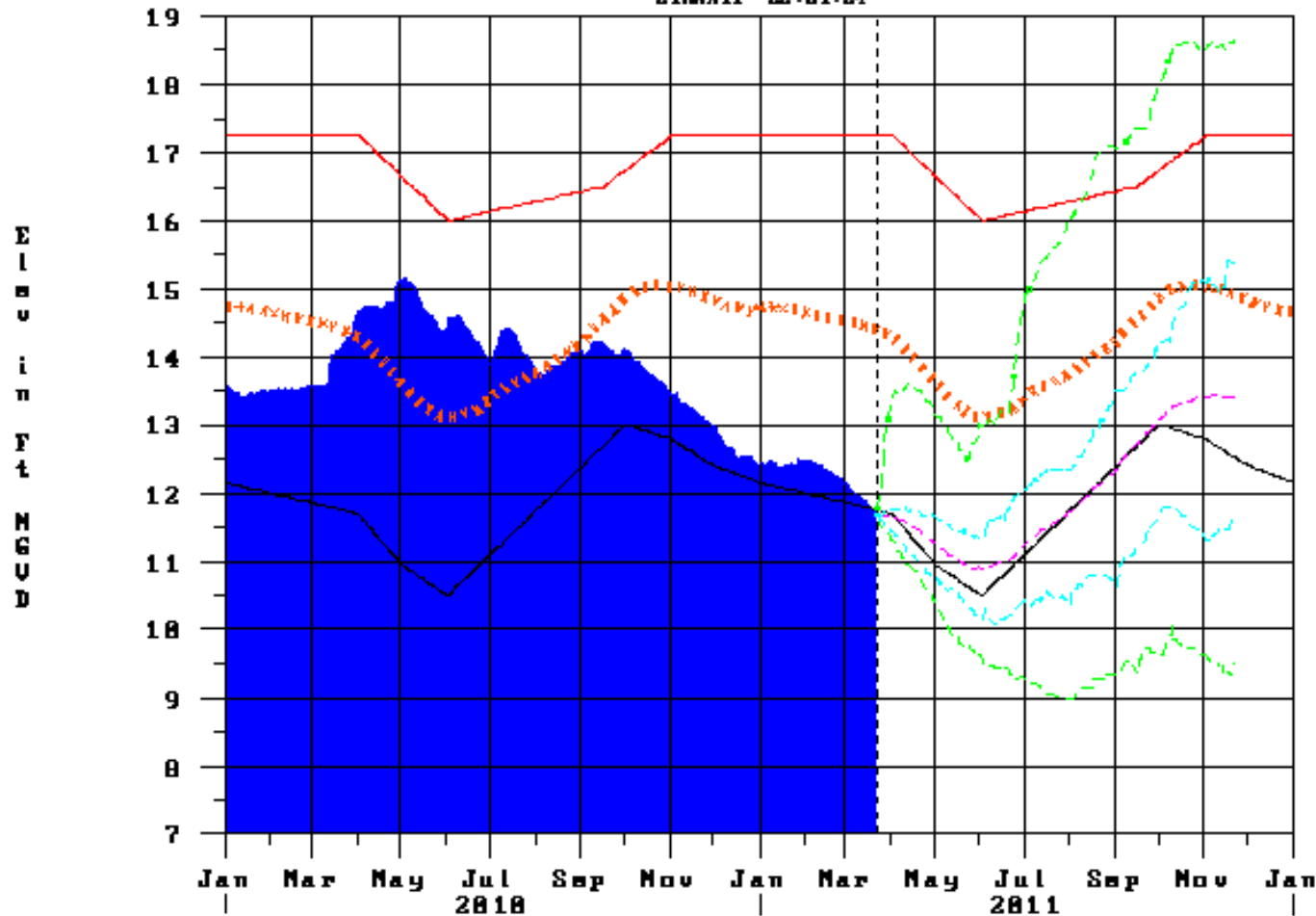
# Lake Okeechobee

- **Water levels managed in accordance with a regulatory schedule based on:**
  - Environmental needs
  - Water supply considerations
  - Rainfall predictions
- **Concerns about dike integrity have reduced total water storage capacity**
- **Low levels occur during regional water shortages**



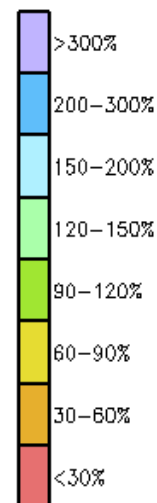
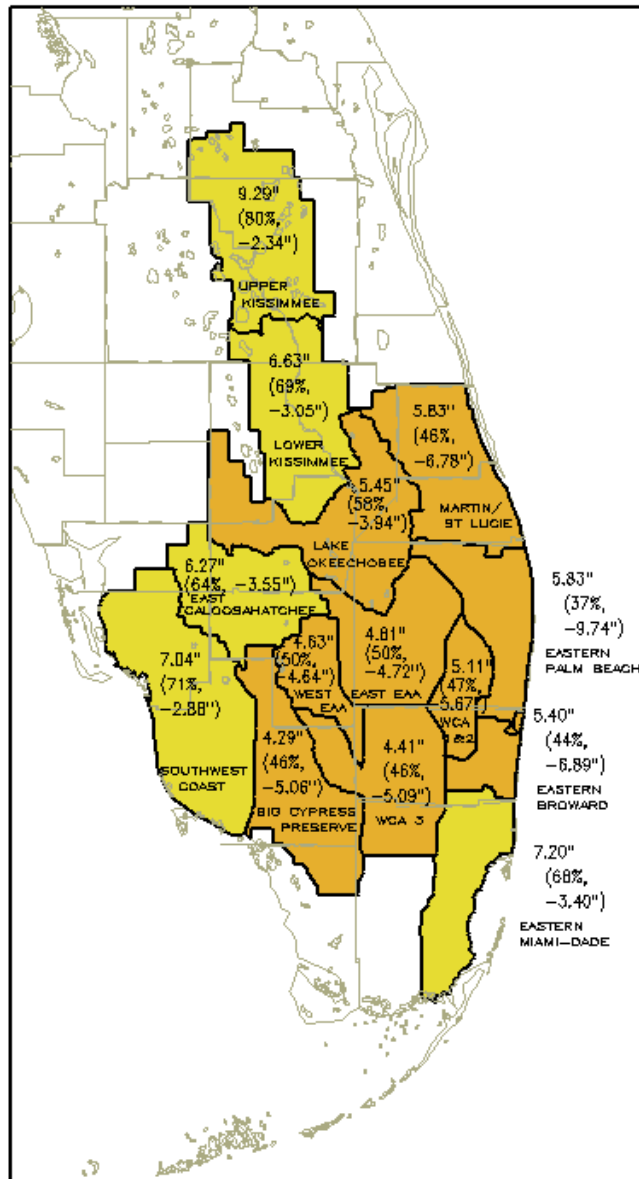
# Lake Okeechobee

21MAR11 22:01:24



- |                |                             |                 |                             |
|----------------|-----------------------------|-----------------|-----------------------------|
| — (Red)        | High Lake Management        | - - - (Green)   | Min Prob(No Release[65-07]) |
| — (Blue)       | Okeechobee Avg Elev         | - - - (Magenta) | Avg Prob(No Release[65-07]) |
| · · · (Orange) | Average Elev [1965-2007]    | - - - (Cyan)    | 25% Prob(No Release[65-07]) |
| — (Black)      | Water Shortage Management   | - - - (Cyan)    | 75% Prob(No Release[65-07]) |
| - - - (Green)  | Max Prob(No Release[65-07]) |                 |                             |

### SFWMD Rainfall 02-NOV-2010 to 21-MAR-2011

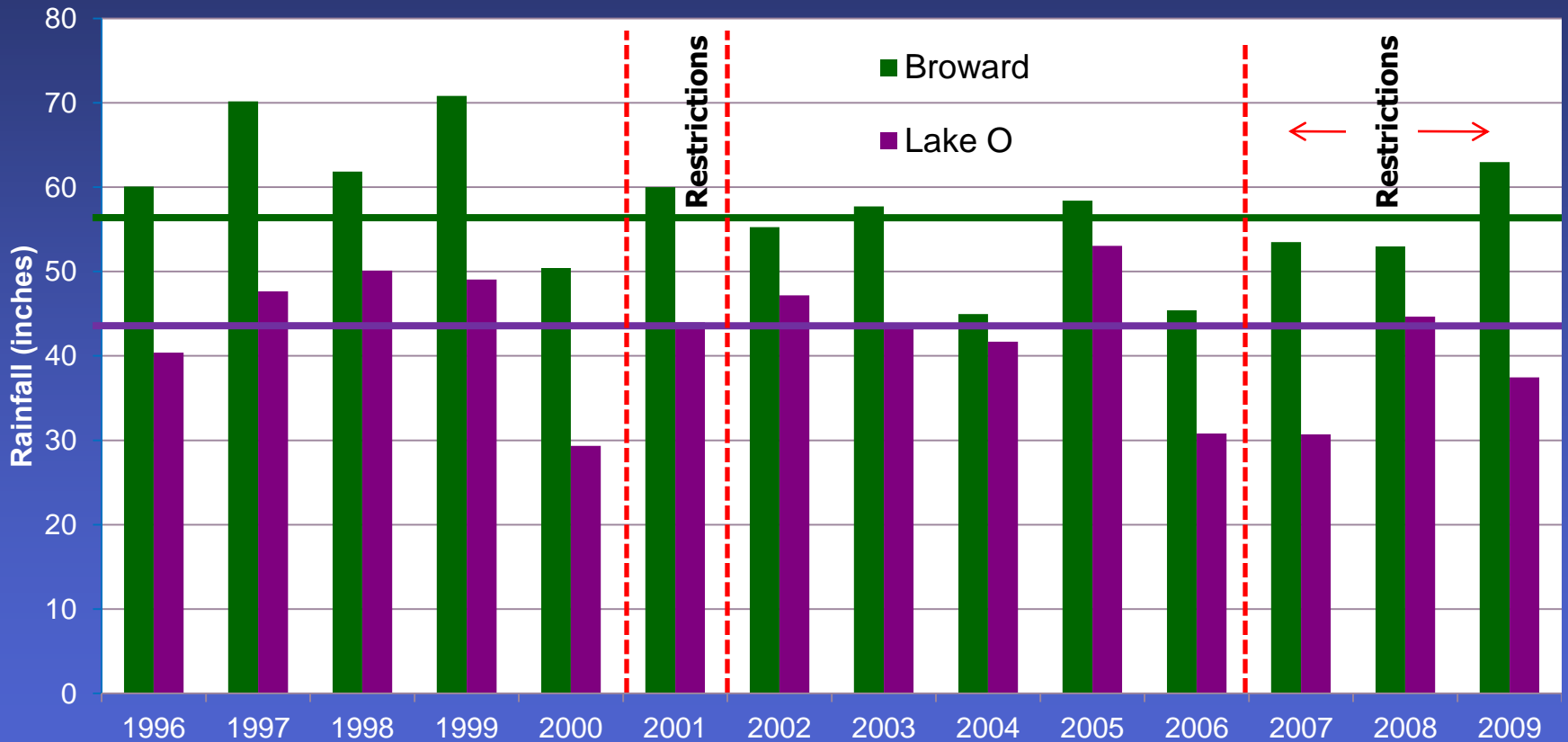


Measured  
(% of Avg.  
Diff From Avg)

DISTRICT-WIDE: 6.09" (58%, -4.39")



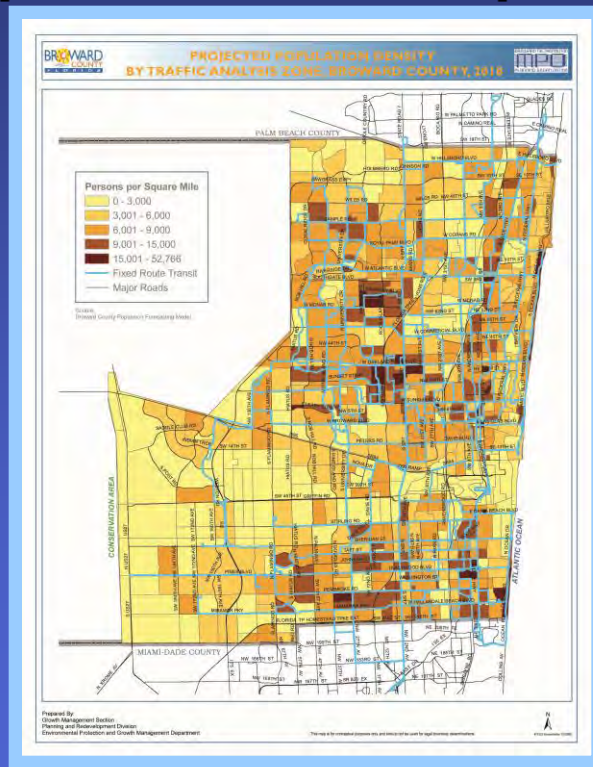
## Regional Annual Average Rainfall



# **WATER POLICY AND REGULATION**

## A Closer Look at Water

- 2002 – Strengthening of Growth Management Act to require greater consideration of future water supply as part of land-use planning



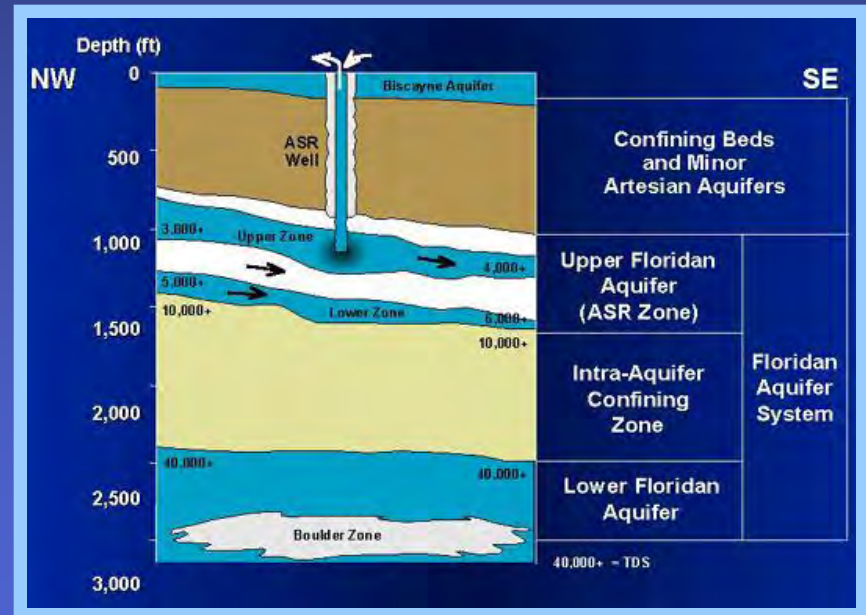
## Water Conservation

- **2004 – Legislation requires development of a state-wide water conservation program with focus on goal-based water conservation measures**



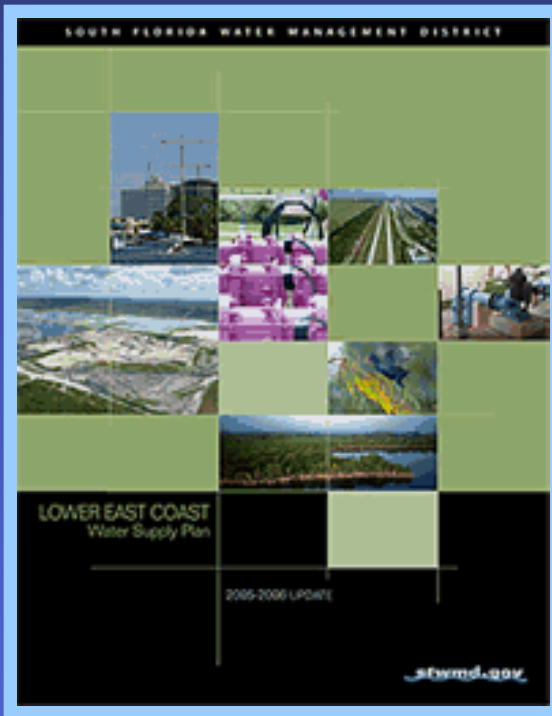
## Alternative Water Supply and Regional Projects

- 2005 – Passage of SB 360/444 provides state cost-share funding in the development of alternative water supplies and encourages multijurisdictional projects.



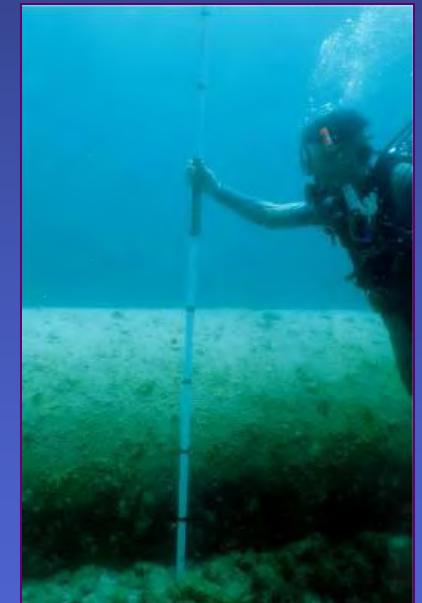
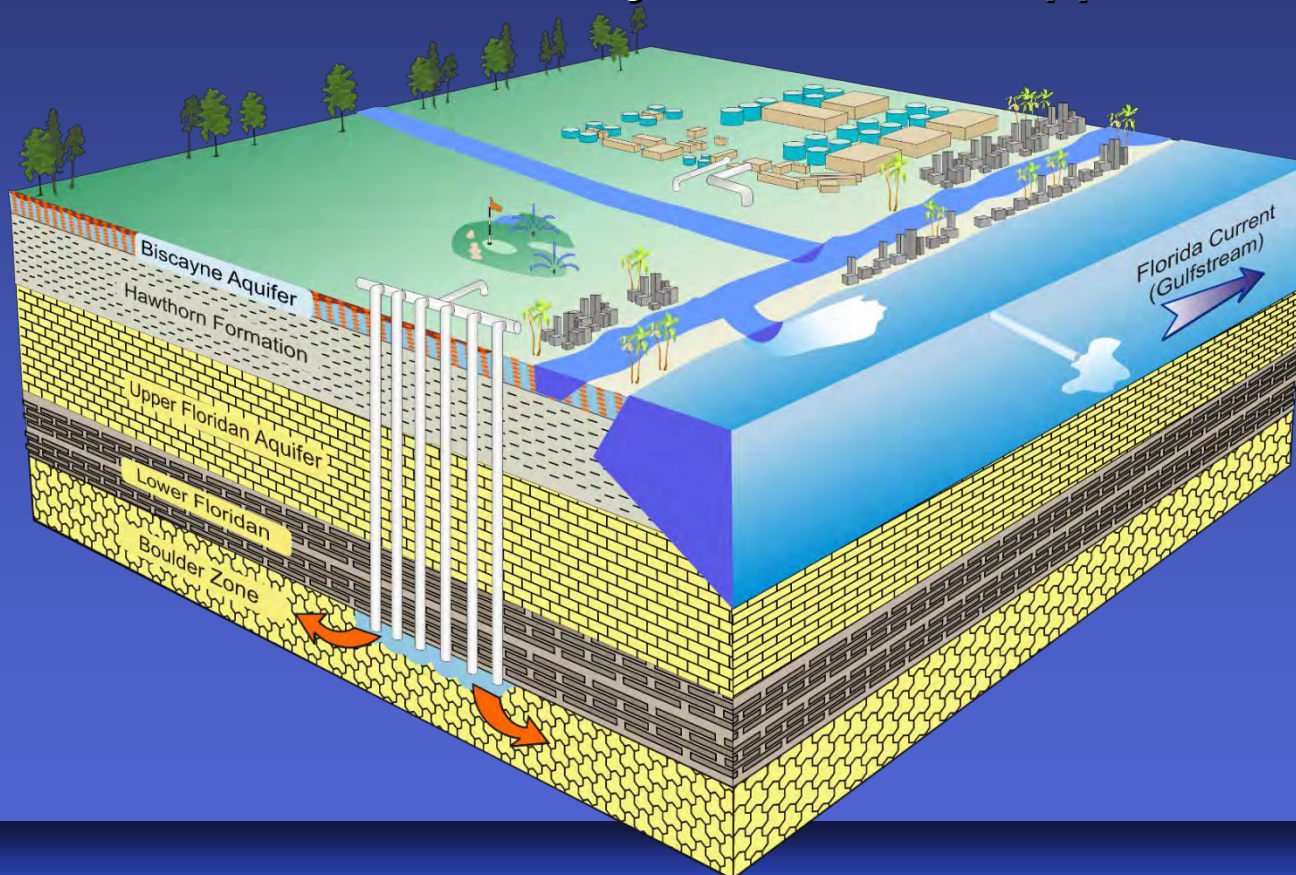
## Limits on Regional Water

- 2007 — Regional Water Availability Rule adopted by SFWMD caps future withdrawals from the Biscayne Aquifer.



# Ocean Outfall Legislation

- 2008 - Senate Bill 1302 was adopted requiring the elimination of ocean outfalls by 2025 and the transfer of 60% actual facility flow to reuse applications.



## Florida-Friendly Landscape Legislation

- 2009 - Chapter 373, F.S. amended to promote the adoption of Florida-friendly landscape ordinances by local governments as part of regional water conservation strategies.



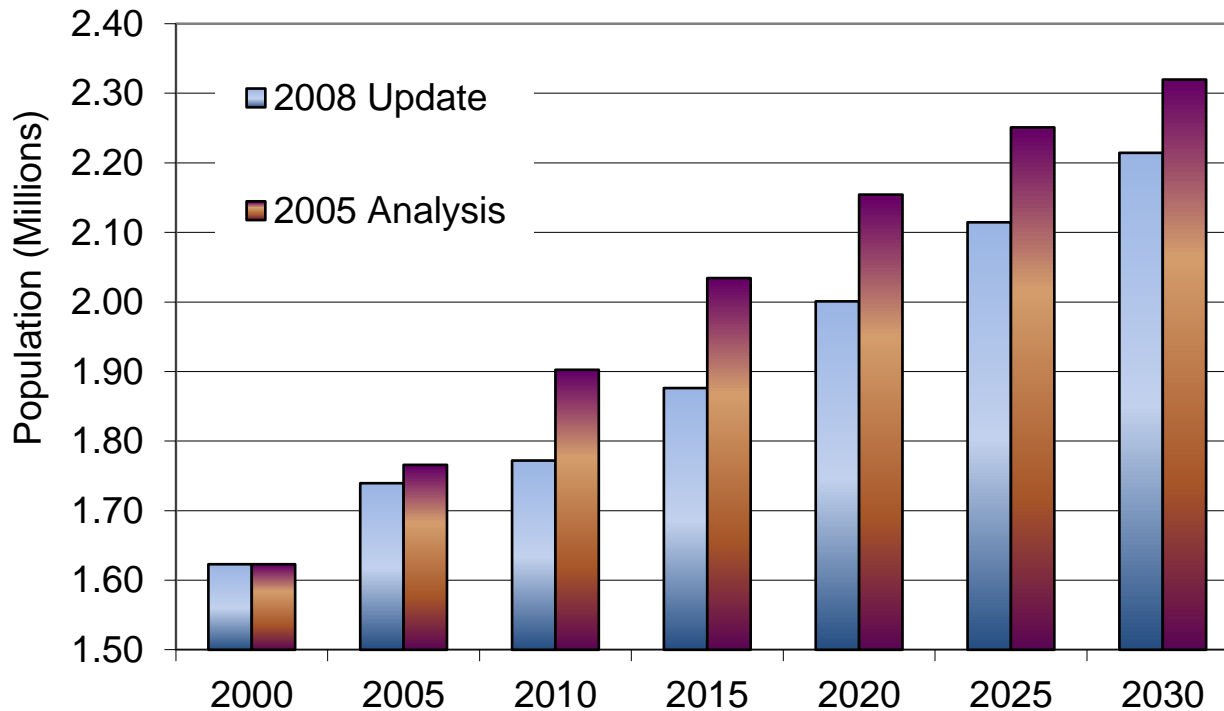
# **REGIONAL WATER RESOURCE PLANNING**

## **Broward Water Resources Task Force**

- Created in June 2008 through joint action by Broward County, SFWMD, and League of Cities
  - Convened for purpose of identifying and evaluating:
    - Regional and sub-regional water supply strategies
    - Solutions of appropriate water quality
    - Water conservation opportunities
- ... to meet regional water resources needs and conservation goals.

## Long-term Growth Trends

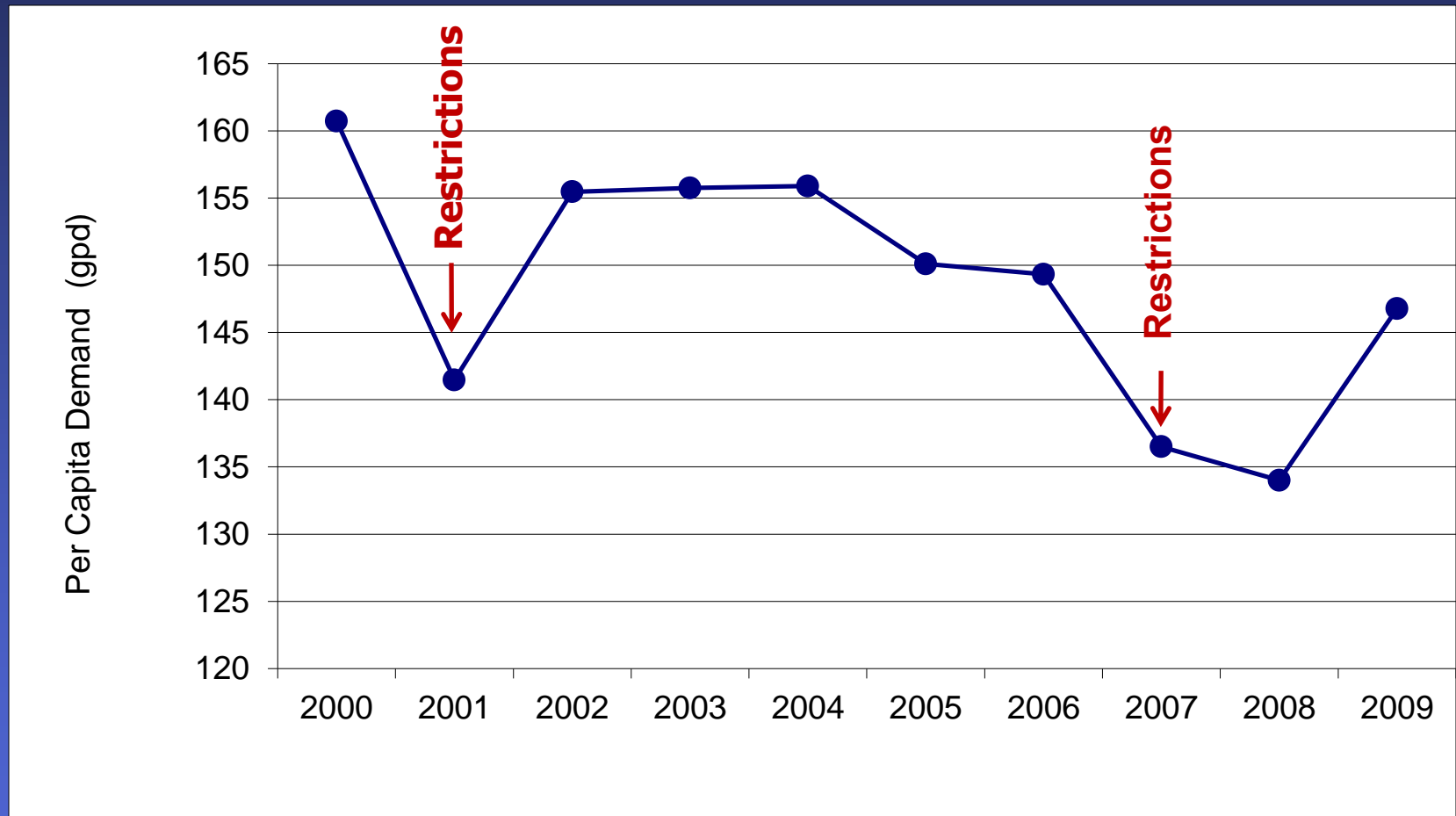
**Broward Population Projections**



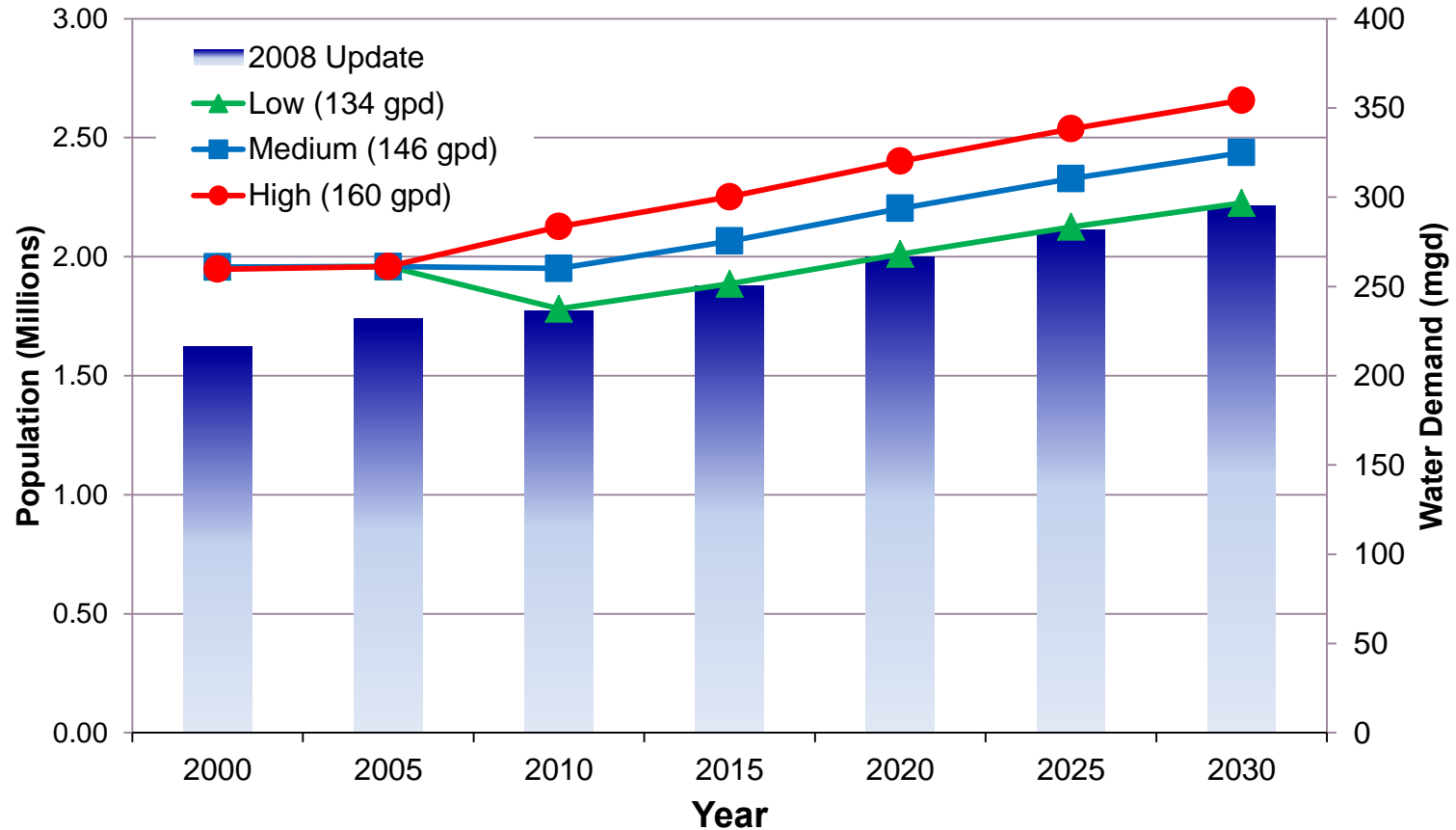
### Facts:

- **1.7 million**
- **15<sup>th</sup> most populous county in U.S.**
- **Exceeds that of 12 states**
- **Projected 25% increase by 2030**

## Historical Per Capita Water Consumption



# Water Demand as a Function of Per Capita Consumption



## Future Water Demands

- Population projections suggest a 25% in growth between 2010 and 2030
- Per capita water demands will substantially influence the “demand-not-met” number
- The 20-year projected increase in demand ranges from 28 to 86 MGD

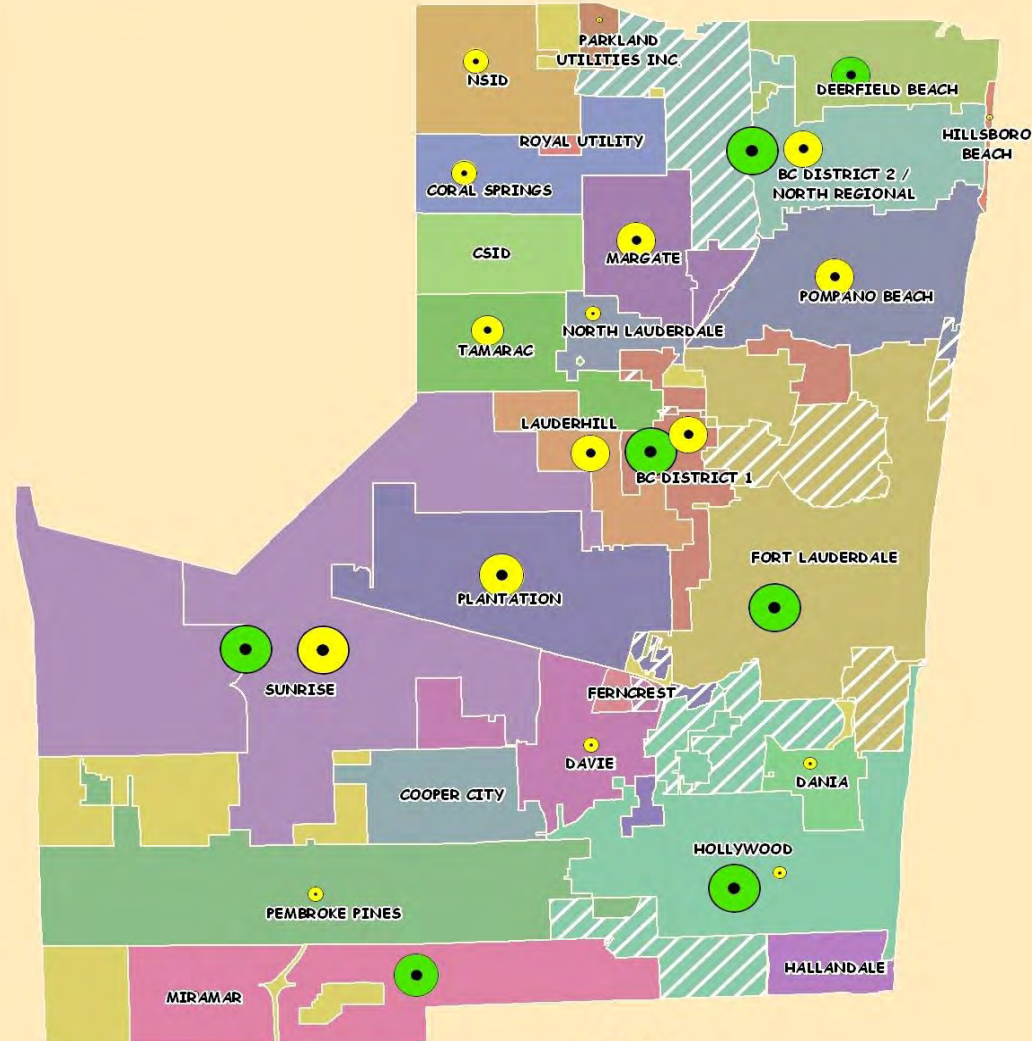
# Strategies for Meeting Unmet Demands

- A water conservation goal of 10% supports a 30 MGD water savings by 2030.
- Floridan commitments will produce 24 MGD in new water supplies by 2013
- Reuse obligations of 46.5 MGD expected to provide some reduction in potable water demand or offset
- Regional water supply projects offer further possibilities

# Natural Resources Planning and Management Division

## UNMET NEEDS ABOVE BISCIAYNE ALLOCATIONS FUTURE FLORIDAN PROJECTS

March 6, 2009

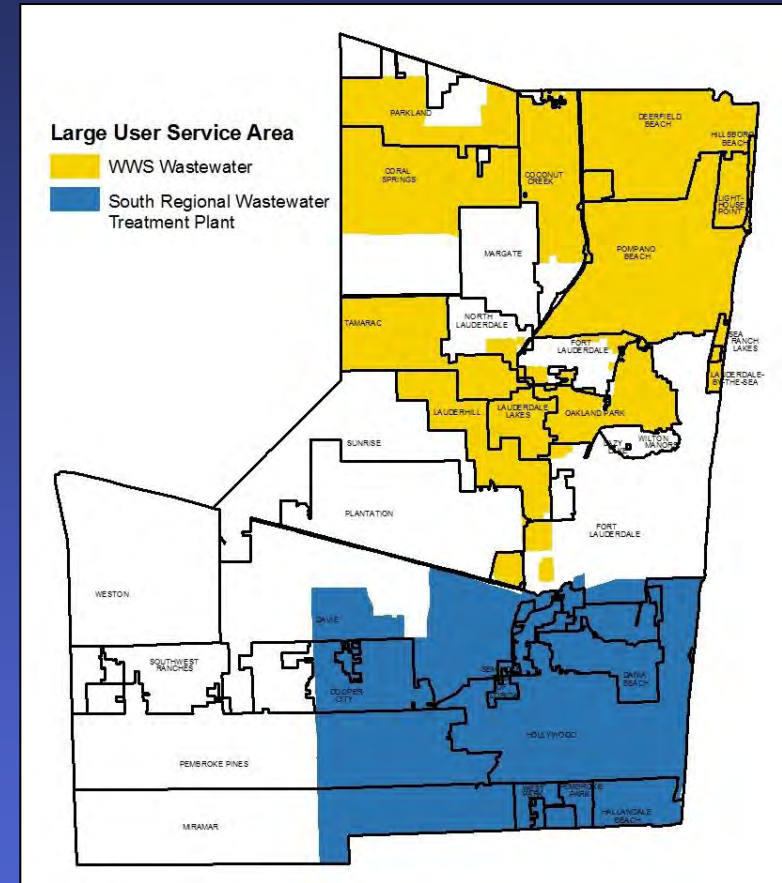


### Legend

- Unmet Need, MGD (2025 Demand - Biscayne Finished Water Allocation)
- Future Floridan Projects
- Retail Service Area

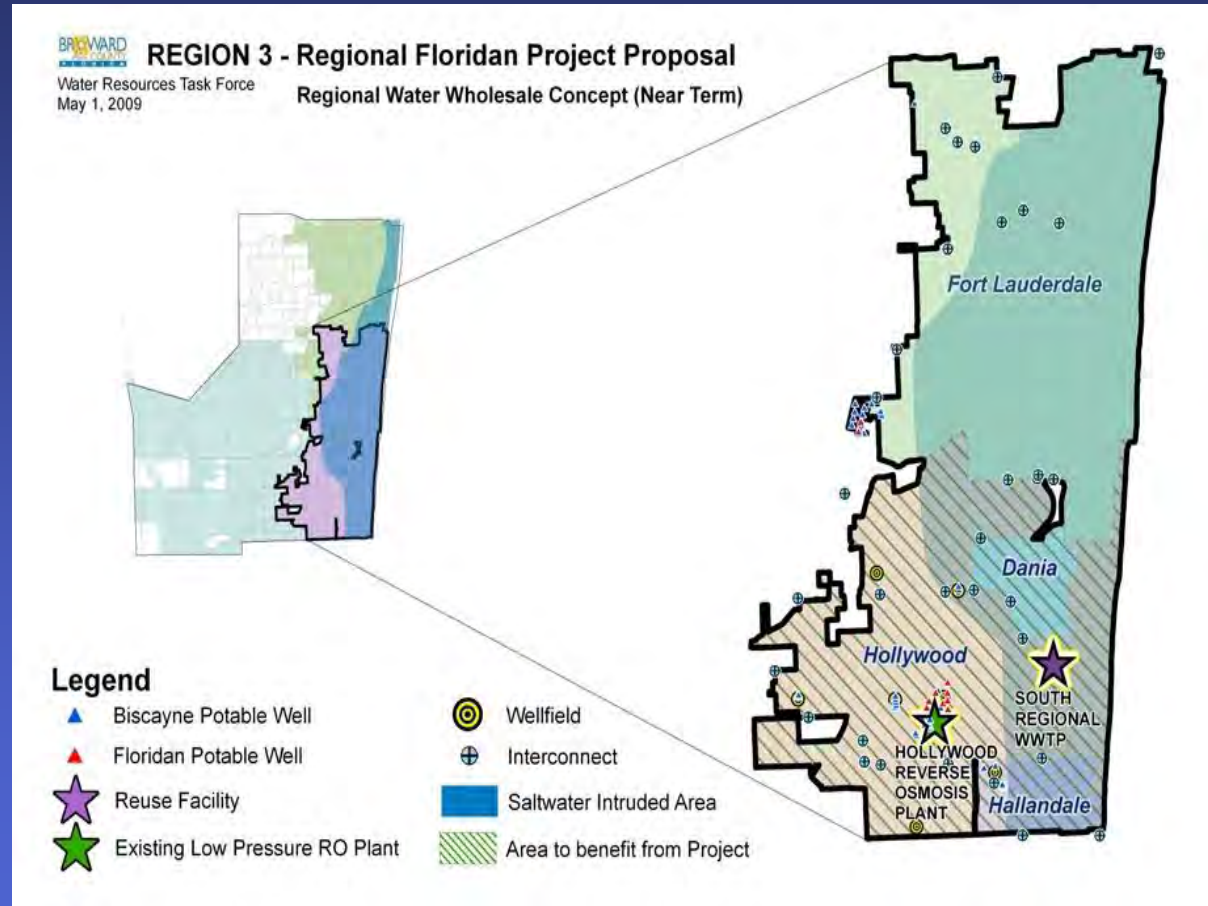
# Ocean Outfall Legislation and Implications

- **Two regional wastewater treatment facilities with outfalls**
- **Legislation requires 46.5 MGD in beneficial reuse projects**
- **50% of urban Broward County contributes flows to outfalls (24 of 31 cities)**
- **Compliance with legislation will require a regional strategy**



# Sub-Regional Water Supply Concepts

- Identified 3 sub-regions
- Developed 14 project concepts
  - 6 Floridan
  - 7 Reuse
  - 1 Stormwater
- Projects were evaluated and ranked
- Presented for further development by likely partners



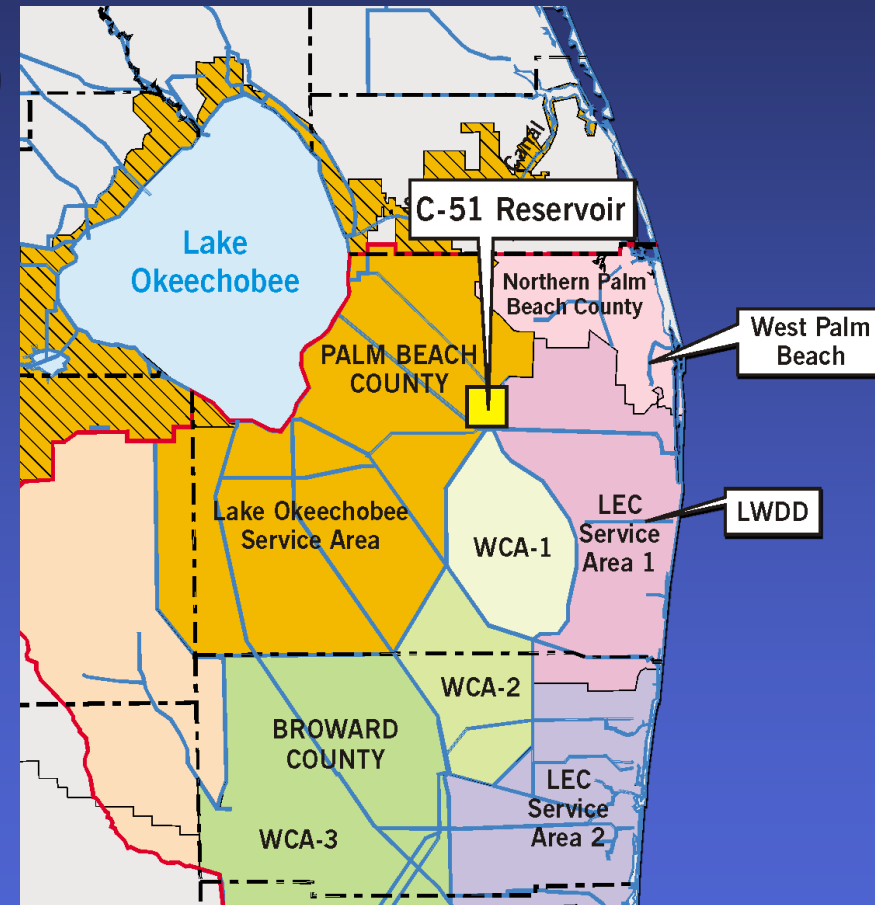
## Regional Surface Water Reservoir

- 7 Utilities
  - Broward and Palm Beach Counties
    - Broward County
    - Palm Beach County
    - Sunrise
    - Plantation
    - Hollywood
    - Pompano Beach
    - Fort Lauderdale

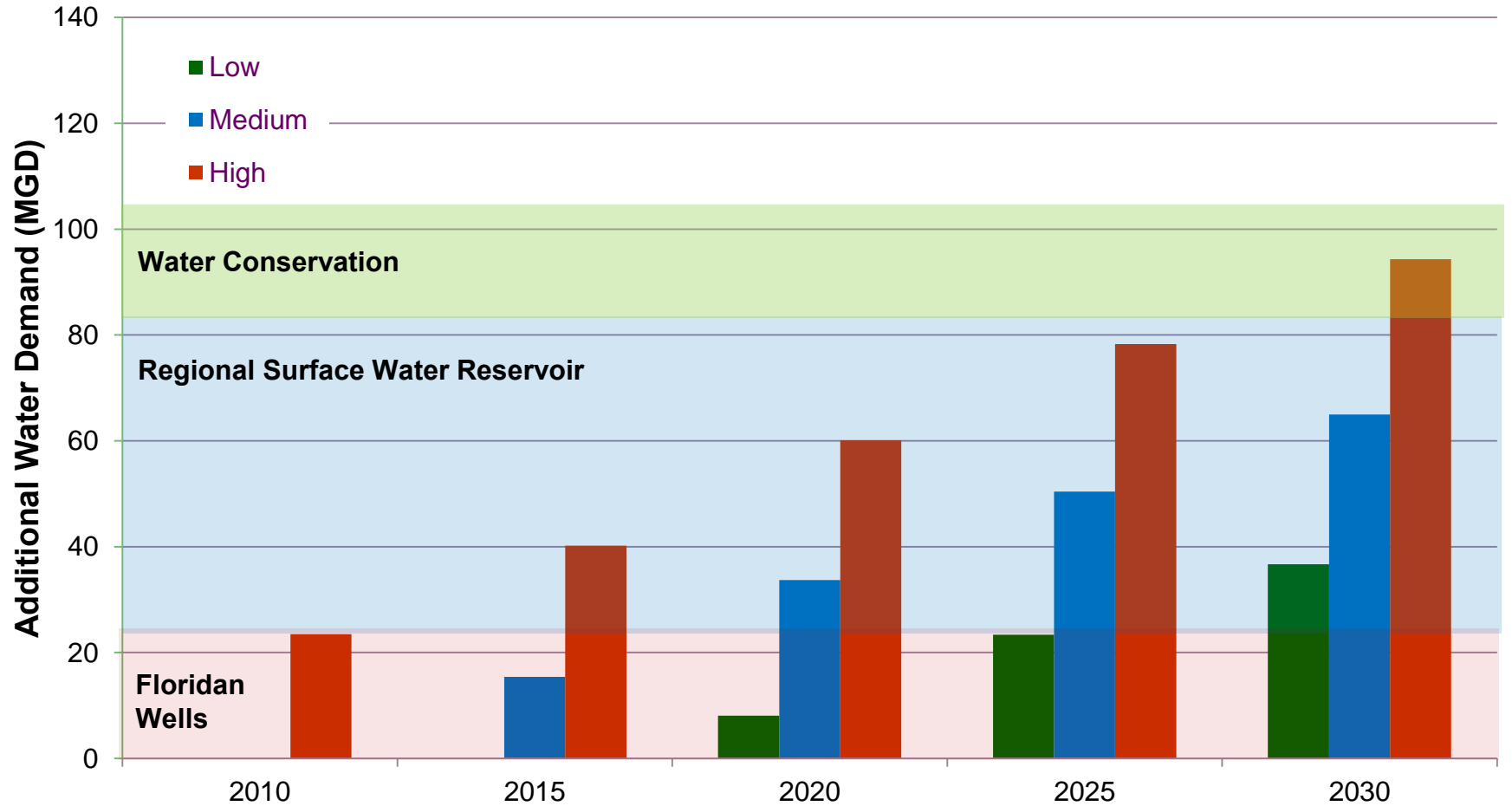


## C-51 Project Description

- C-51 proposed design at 1,200 acres with a depth of 50-55 feet
- Estimated 120 mgd available for capture during a 1:10 year drought
- Would capture water from the L-8 Canal
- Reduce basin discharges to the C-51 Canal and the Lake Worth Lagoon



## Potential Water Supplies and Projected Deficits



# **Integrated Water Resources Master Plan**

- **Completed March 2011**
- **Provides analysis of existing, planned, and proposed Biscayne and Floridan projects**
- **Neither C-51 or reuse projects alone fully offset impacts of future withdrawals from Biscayne, but combination of projects offset 75 mgd**
- **Floridan withdrawals are likely to induce changes in chlorides, can be partially mitigated**
- **Aquifer recharge, whether of the Biscayne or Floridan Aquifer, offers an important strategy for improving resource sustainability**

# WRTF RECOMMENDATIONS

## Water Conservation Highlights

- **Develop a County-wide Water Conservation Incentives Program**
- **Require the sale and use of high-efficiency plumbing fixtures**
- **Pursue code amendments to require low-bleed cooling towers and condensate recovery**
- **Adopt water conservation landscape codes**
- **Adopt permanent water conservation measures**



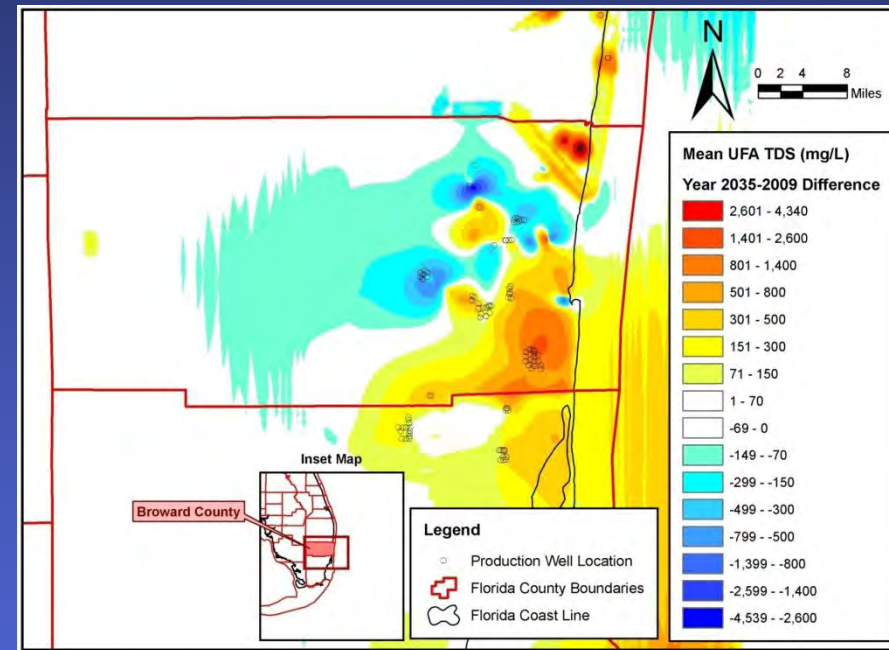
## Reuse Planning and Development

- Develop a regional reuse master plan
- Coordinate with FDOT and MPO to integrate reuse policy and projects into workplans
- Utilize corridors in reuse planning efforts
- Amend land use and comprehensive plans to better integrate reuse planning
- Establish mandatory reuse zones



# Research and Investigations

- Further studies and research relating to Floridan Aquifer and saltwater intrusion
- Investigate effects of climate change and how best to mitigate impacts
- Consider alternative water supply projects within the context of climate change
- Further secondary canal integration to support aquifer recharge



## **Next Steps**

- **Launch the Countywide Water Conservation Incentives Program in Summer 2011**
- **Solicit for development of reuse Master Plan in Summer 2011**
- **Complete saltwater models to assess relative influence of SLR and operations on location of saltwater front**
- **Develop a stormwater/climate vulnerability model to evaluate influences of climate changes and adaptation strategies**

# Opportunities to Make a Difference

- Support Water Matters Day
- Partner in the regional water conservation and incentives program
- Upgrade to low-bleed cooling towers and condensate recovery



# Opportunities to Make a Difference

- Install other water conserving devices in facilities and appropriate signage
- Notify your water utility or county staff if interested in reuse
- Adhere to water restrictions and maintain Florida-friendly landscapes at home and business.



# Questions or Comments?

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