



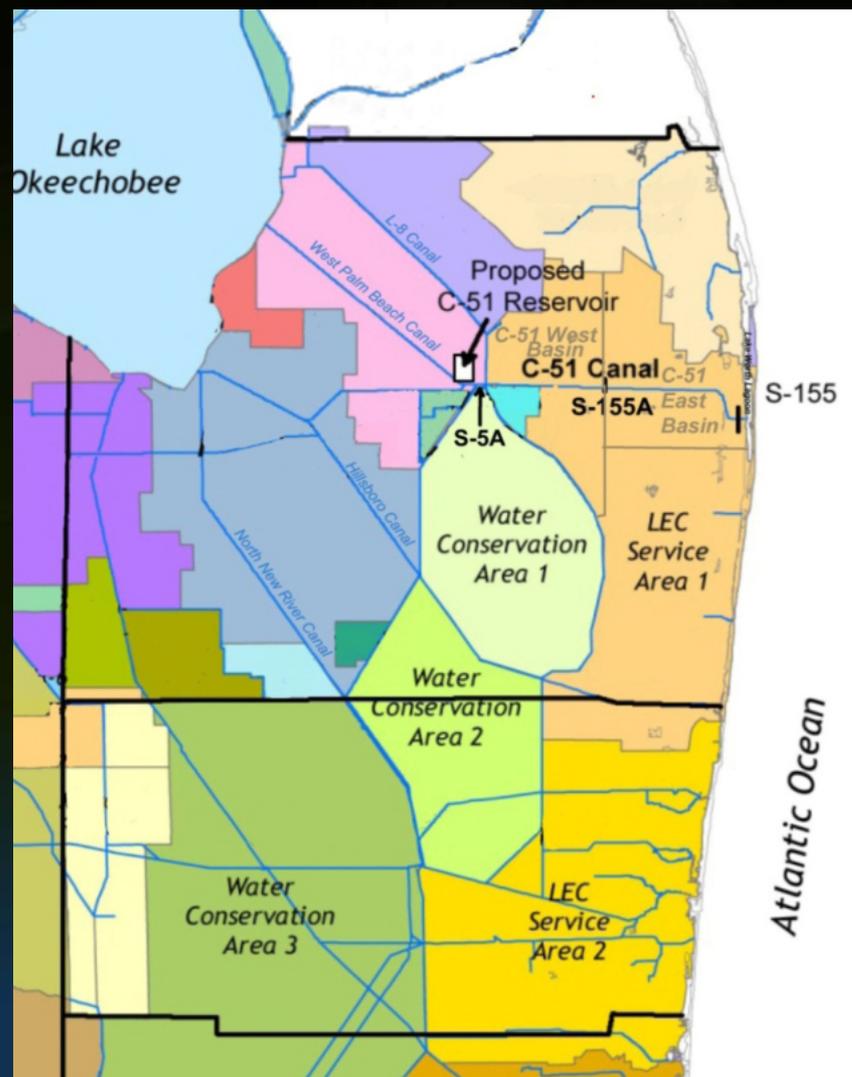
# **C-51 Reservoir Project**

## *Potential Opportunities*

*Robert M. Brown, Assistant Executive Director*

# Today's Discussion

- Background
- Description and Purpose
- Where is the project today?
- Potential Benefits



# C-51 Reservoir Timeline

- **1999:** Central and Southern Florida Project Comprehensive Review Study (“Yellow Book”) recommends 170 mgd of Aquifer Storage & Recovery (ASR) wells along the C-51 canal to capture and store excess runoff for later beneficial use
- **2006:** Seven South Florida utilities (Sunrise, Ft. Lauderdale, Plantation, Hollywood, Pompano, Broward County, Palm Beach County) begin investigating the feasibility of a collaborative regional approach to develop alternative water supply
- **2009:** Conceptual Report concludes that there are environmental and water supply benefits associated with storing wet season water from C-51 (*Hazen and Sawyer and MacVicar, Federico and Lamb, 2009*)

*Rescuing an Endangered Ecosystem:  
The Plan to Restore America’s Everglades*



*The Central and Southern Florida Project  
Comprehensive Review Study (The Restudy)*

*July 1999*

# C-51 Reservoir Timeline

- **2010:** Conceptual Design Report Phase IIA provides additional support for C-51 reservoir project benefits (*Hazen and Sawyer and MacVicar, Federico and Lamb*)
- **2010:** Conceptual design features developed (*Powell Kugler, Inc.*)
- **October 2010:** SFWMD Governing Board discusses benefits of C-51 reservoir to Everglades restoration and water supply
- **October 2010:** C-51 MOU drafting group (Palm Beach County utilities, Fort Lauderdale utilities, Lake Worth Drainage District, SFWMD) begins meeting to discuss drafting and executing MOU



# C-51 Reservoir Timeline

- **March 2011:** C-51 Steering Group formed and begins meeting monthly at Lake Worth Drainage District (LWDD)
- **Fall 2011:** District holds series of meetings with utilities, LWDD, financial consultants, and others to gather information on governance, financing, operations and maintenance options
- **November 2011:** C-51 MOU executed
- **July 2012:** Final Draft of the Preliminary Design and Cost Report released; costs included were developed by private entity for full project (*Lake Worth Drainage District, Palm Beach County, Broward County, SFWMD*)
- **Summer 2012:** District participated in numerous stakeholder meetings to determine feasibility of phasing, governance options and partnering opportunities

## C-51 RESERVOIR – PRELIMINARY DESIGN AND COST ESTIMATE – DRAFT FINAL REPORT



Prepared By:  
 Lake Worth Drainage District  
 Palm Beach County  
 Broward County  
 South Florida Water Management District  
 June 2012

# L-8 Reservoir



- Existing
- Northwestern Palm Beach County
- Former 950-acre rock mine
- 46,000 ac/ft of storage
- Benefit South Florida's ecosystem
- Essential Feature in the District's Restoration Strategies for WQ in the Everglades
- Assist in sustaining regional water supplies

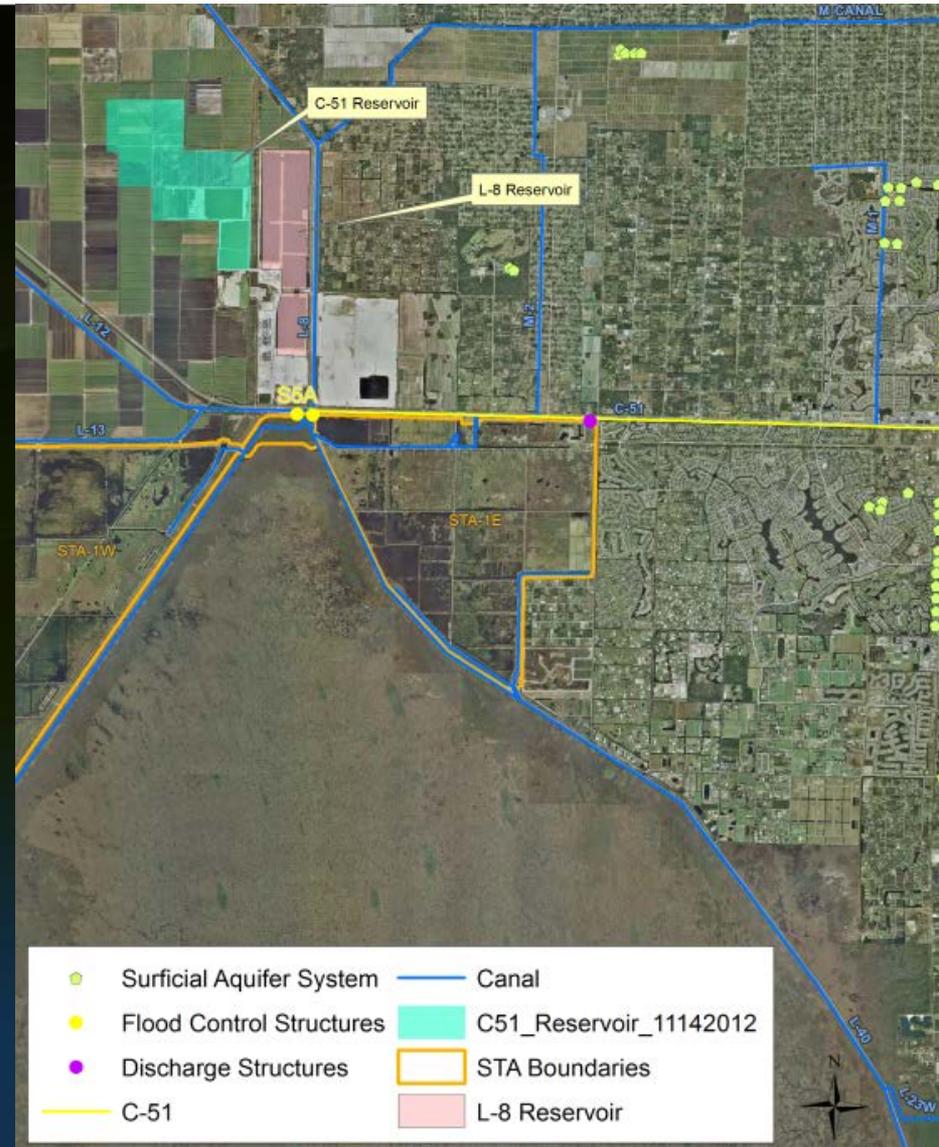
# C-51 Reservoir



- Proposed
- Located in western Palm Beach County
- 75,000 ac/ft of storage
- Capture and store excess surface water from C-51 basin
- Increased water storage and delivery to help benefit South Florida's regional water supplies
- Reduce harmful discharges to the Lake Worth Lagoon

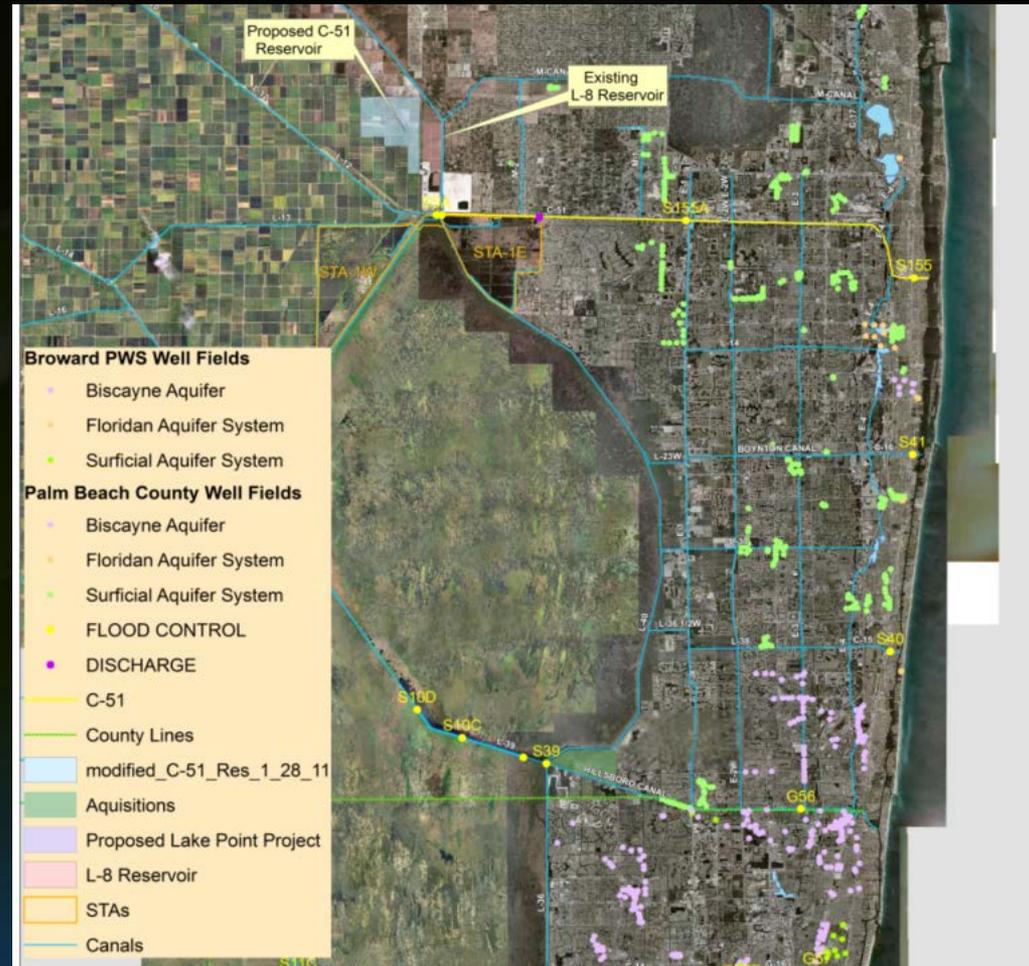
# C-51 Reservoir Project Summary

- Existing rock mine just north of West Pam Beach canal and adjacent to L-8 Reservoir
  - Same favorable geology
- Capture excess flows in L-8 and C-51 basins during wet times
- Release stored water to maintain flows in the canal systems during dry times
  - Increase regional availability of water along Lower East Coast
  - Recharge wellfields
  - Create freshwater head to maintain fresh/saltwater interface
- Utilizes existing infrastructure for conveyance with some improvements



# C-51 Reservoir Future Water Supplies

- Lower East Coast Water Supply Plan under way
  - Targeted for completion Spring 2013
- Sources capped
  - Regional Water Availability Rule approved 2007
- Feasibility Study Focus
  - Modeling of storage capability
  - Quantity of water lost to tide
  - Ability to move water through canal system to create head



## C-51 Reservoir Utility Needs

- Handful of utilities that have immediate needs
- Some utilities have stranded infrastructure capacity
- Current limitations on increased withdrawals that affect the Everglades & regional system could be offset by new source of water
- Utilities seeking sustainable and reasonably priced alternatives for future water supply

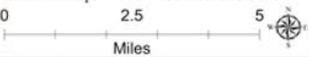


# C-51 Reservoir C-51 Discharges to Lake Worth Lagoon



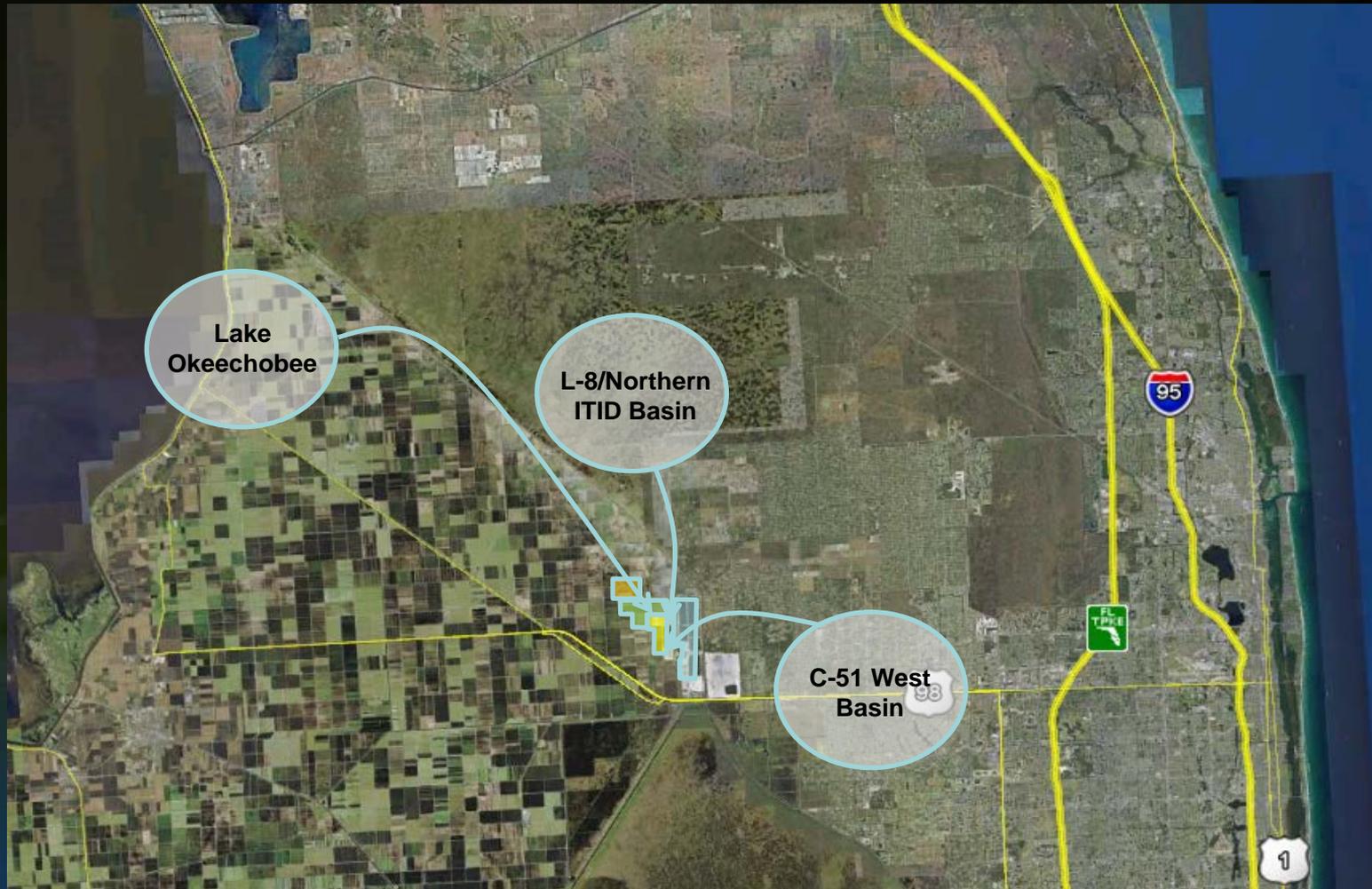
# C-51 Reservoir C-51 Canal Conveyance Capacity

- Challenges for western PBC communities



*Tropical Storm Isaac*  
Western Palm Beach County (C-51 Basin)  
SFWMDC Temporary Pumps and Diversion

# C-51 Reservoir Source of Water



# C-51 Reservoir Sub-Regional Geology

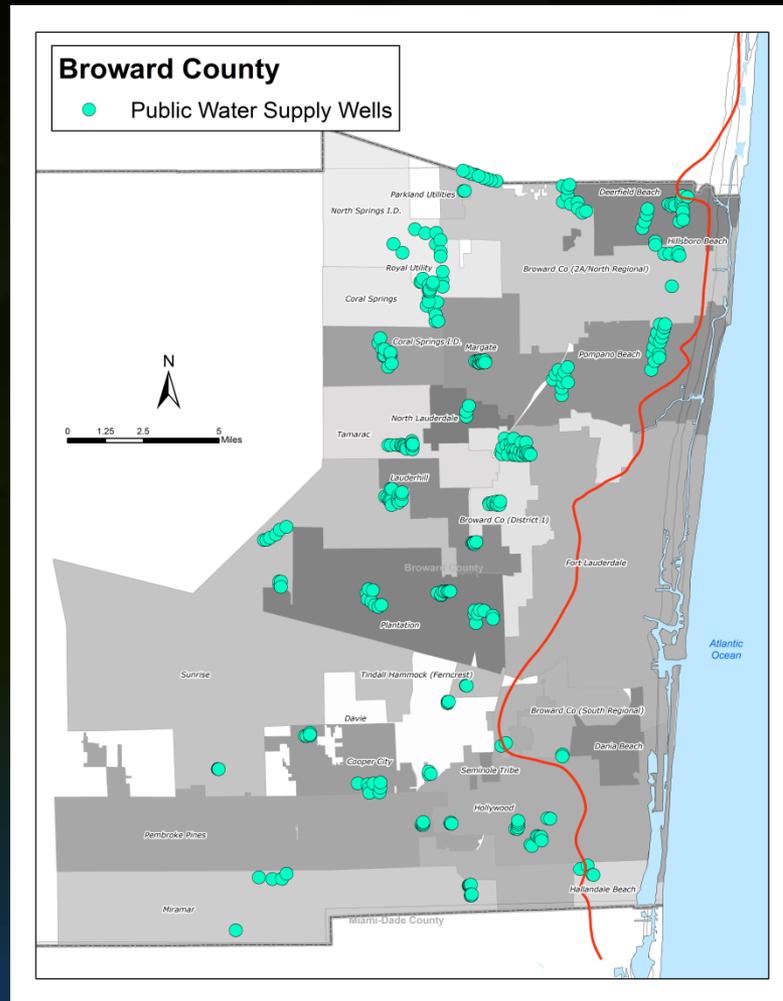
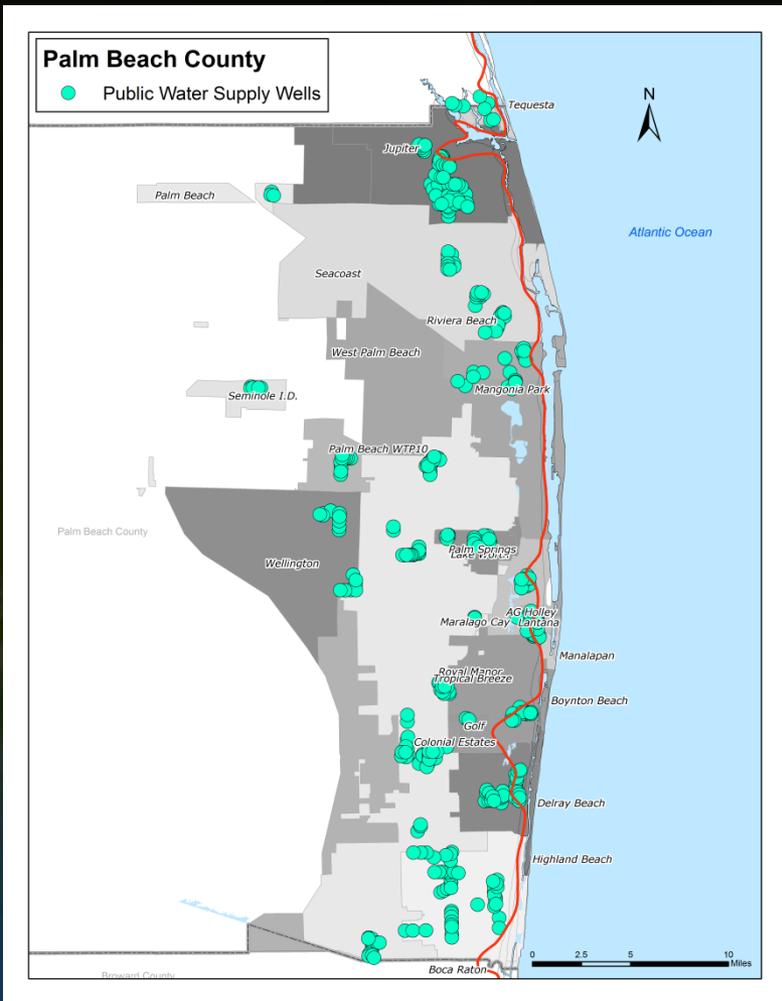


# C-51 Reservoir Conveyance



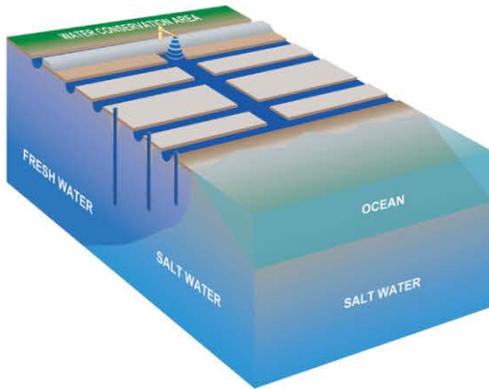
Reports have shown that it is feasible to use a combination of District and Lake Worth Drainage District facilities

# C-51 Reservoir Saltwater Intrusion

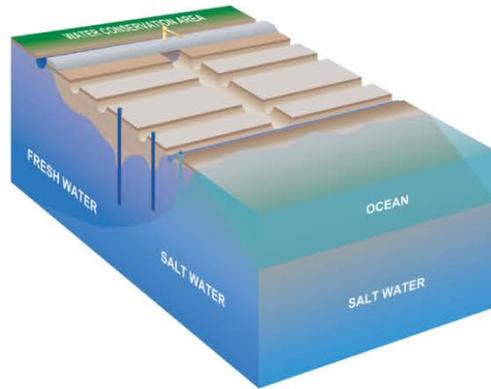


# SALTWATER INTRUSION

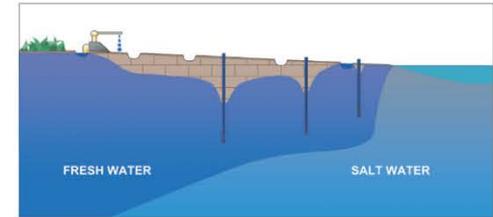
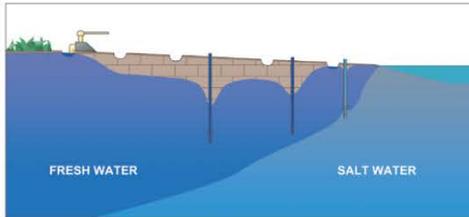
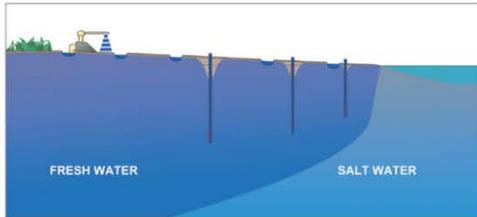
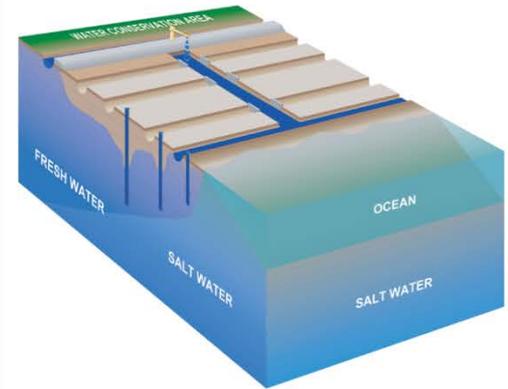
**NORMAL  
WATER DELIVERY**



**NO  
WATER DELIVERY**



**STRATEGIC  
WATER DELIVERY**

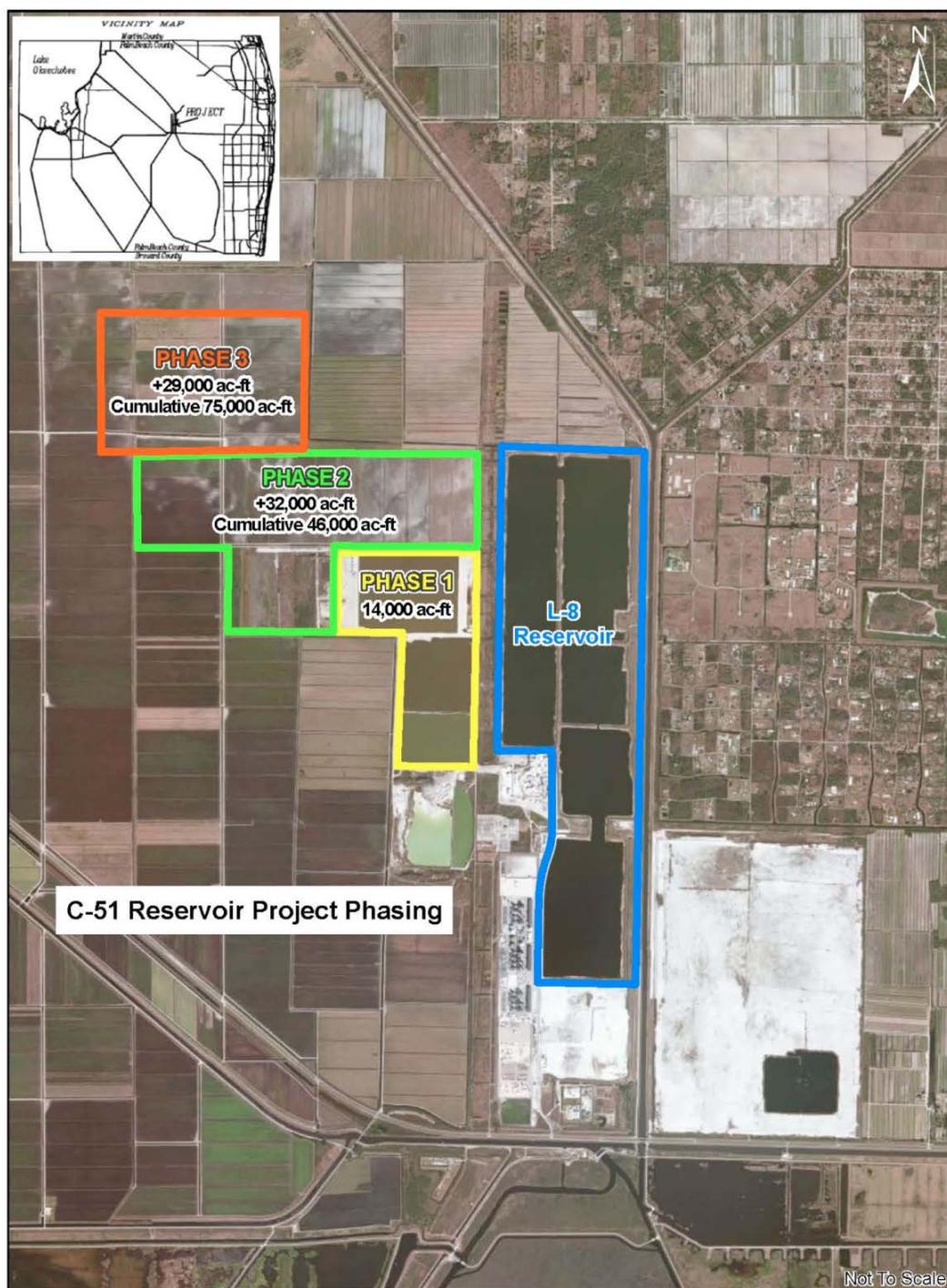


# C-51 Reservoir Opportunities & Challenges

- Multiple benefits and reasons for pushing forward
- Challenges
  - Timing
  - Financial
  - Governance/Control
- Revised Project

# C-51 Reservoir Project Phases

- **Phase I**
  - 14,000 Acre Feet Storage
  - Control elevation 16.5 NAVD
  - 2.5 years to construct
  - 35 mgd for water supply
  - Majority of excavation complete
- **Phase II**
  - +32,000 Acre Feet Storage
  - Control elevation 25 NAVD
  - 120 mgd for water supply
  - 2.5 years to construct
- **Phase III**
  - +29,000 Acre Feet Storage
  - Control elevation 25 NAVD
  - 185 mgd for water supply
  - 2 years to construct
- Phases can be constructed as needed



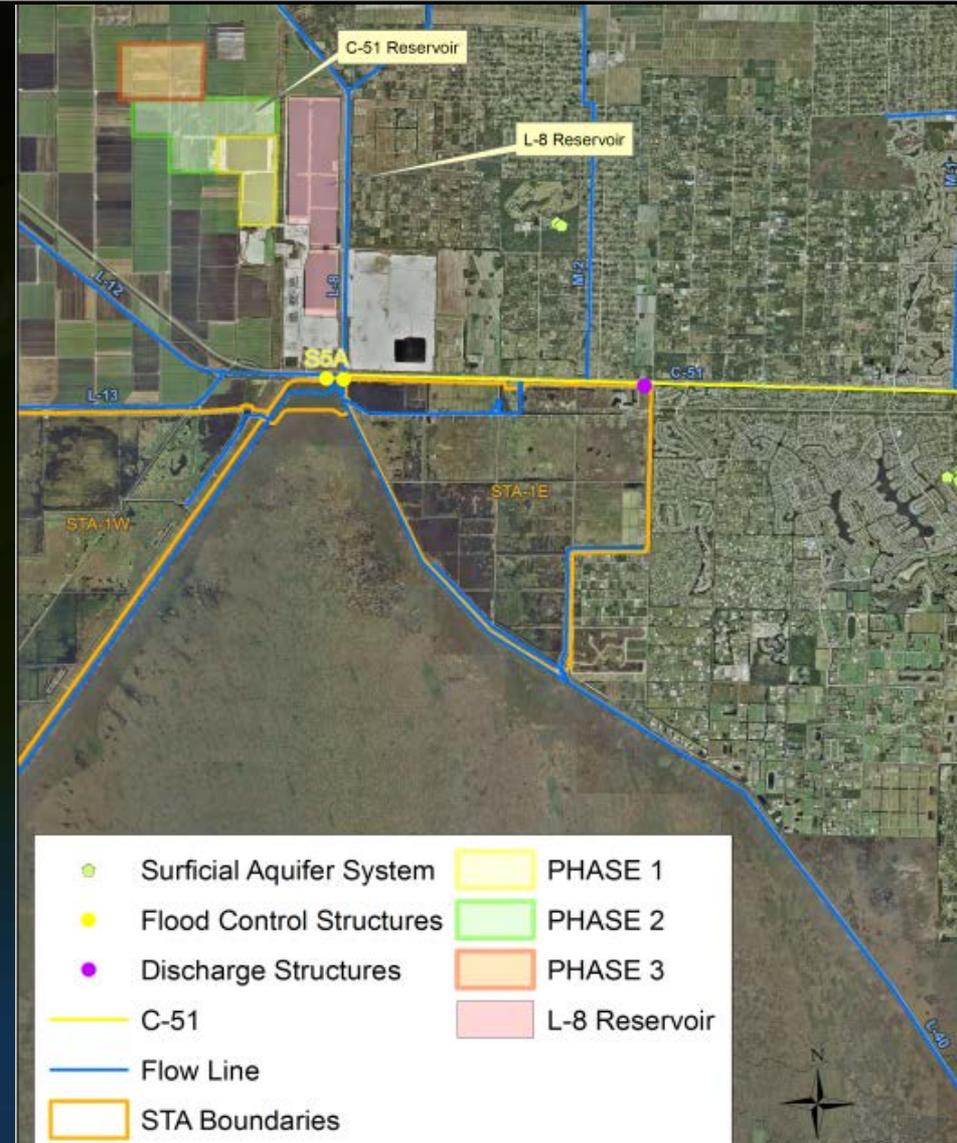
# C-51 Reservoir Considerations

- Construction: cost, schedule, performance, technology, completion and delivery
- Operations and Maintenance: cost and performance
- Renewal, replacement and life cycle costs
- Supply of water
- Contracts for water storage/market alternatives
- Financing/Credit Rating
- Regulatory



# C-51 Reservoir SFWMD Considerations

- Construction: cost, schedule, performance, technology, completion and delivery
- Operations and Maintenance: cost and performance (fee)
- Renewal, replacement and life cycle costs
- Supply of water
- Contracts for water storage/market alternatives
- Financing/Credit Rating
- Regulatory



# C-51 Reservoir Summary of Benefits

- Regionally significant project with multiple public purposes
  - Beneficial use of water lost to tide
    - Decrease in harmful fresh water releases to Lake Worth Lagoon
    - Long-term & cost-effective Alternative Water Supply
  - Potential flood relief for western Palm Beach County
  - Sea level rise & saltwater intrusion benefits
- Location and geology
  - Cross roads
  - Extensive canal infrastructure & conveyance capabilities
- Stakeholder interest and support





# Discussion

