INTRODUCTION

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- Welcome to the 1st PDT meeting of 2017 for the Lake Okeechobee Watershed Project
- Attendance – CERP Team and Public
- Housekeeping Items:
  - Please keep phones on mute unless you are talking
  - Please state your name and who you are representing before making a statement or asking a question
  - REMINDER: This is a CERP PDT meeting and follows FACA Requirements as outlined in CGM 011.02. A Public Comment period has been established at the end of our agenda.
- Agenda Overview

AGENDA

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1.	Introduction (Tim Gysan, USACE)	9:00 – 9:10
2.	90-day Look Ahead (Tim Gysan, USACE)	9:10 – 9:20
3.	Sub-team Updates	9:20 – 10:30
	a) Wetland Screening (Lisa Aley, USACE)	
	b) Reservoir Configuration/Preliminary Design (Matt Alexander, SFWMD)	
	c) Water Supply Update (Lisa Aley, USACE)	
	d) Deep Injection Well Application (Bob Verrastro, SFWMD)	
	e) Cultural Resource Update (Robin Moore, USACE)	
	f) Baseline Modeling (Clay Brown, SFWMD)	
4.	PDT Feedback – “What We’ve Heard”	10:30 – 10:40
5.	Public Comment Period	10:40 – 10:55
6.	Closing remarks and Adjourn	10:55 – 11:00

90 DAY LOOK AHEAD

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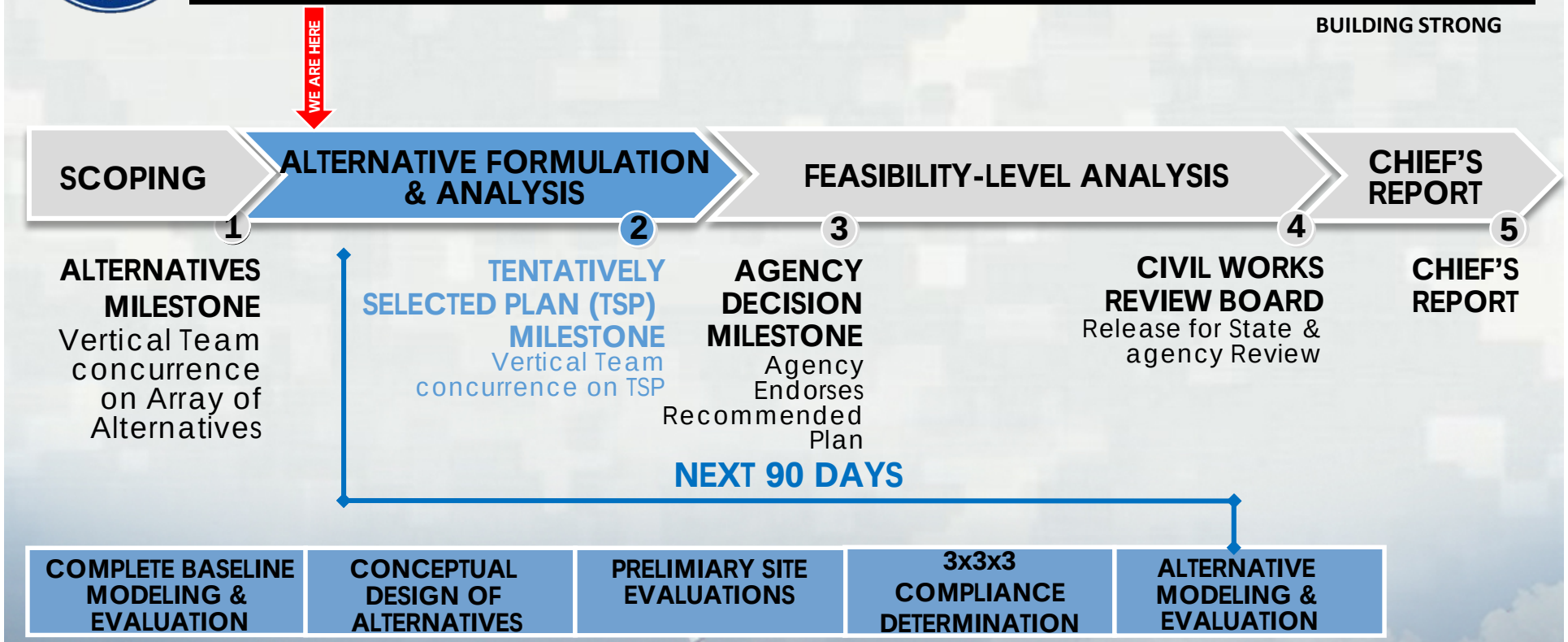

Wetland Screening

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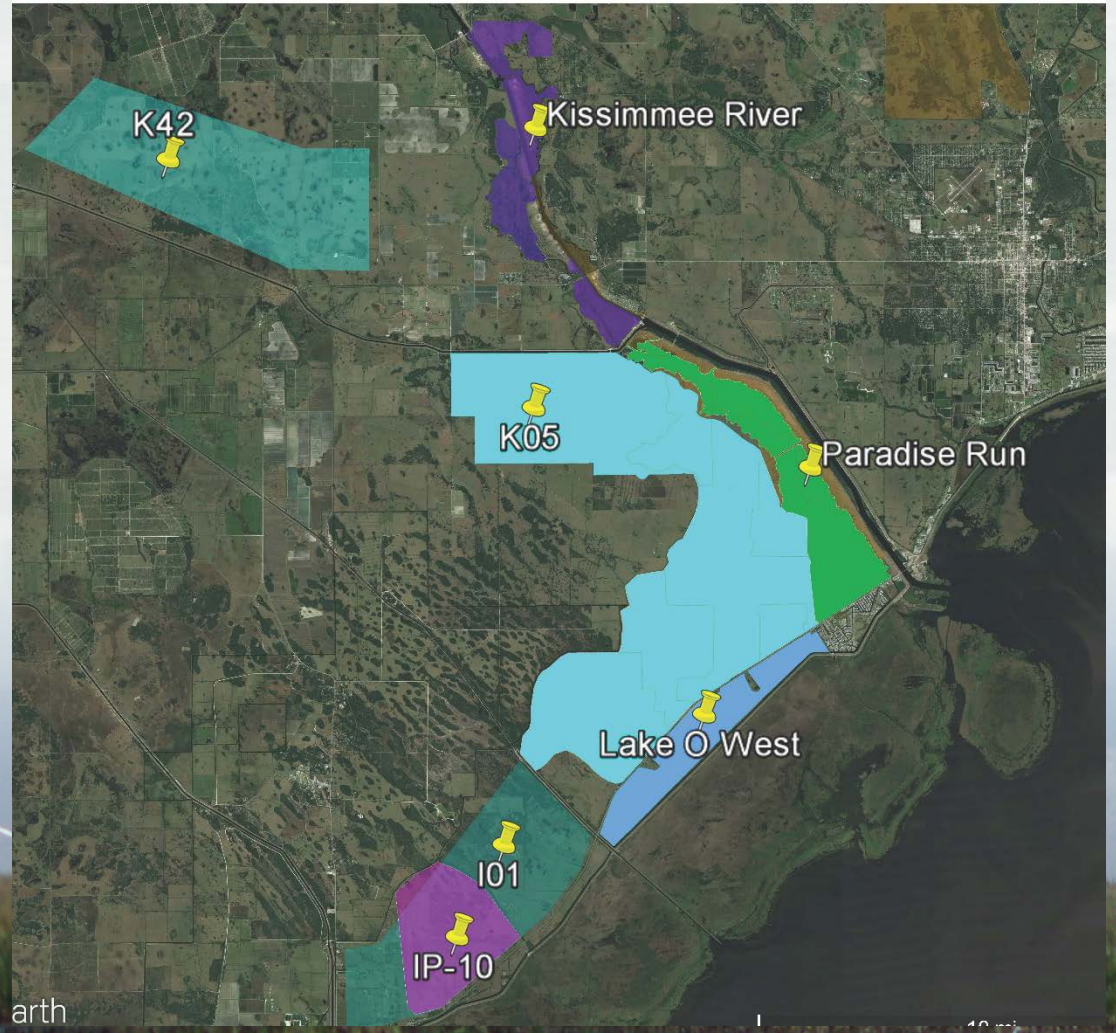
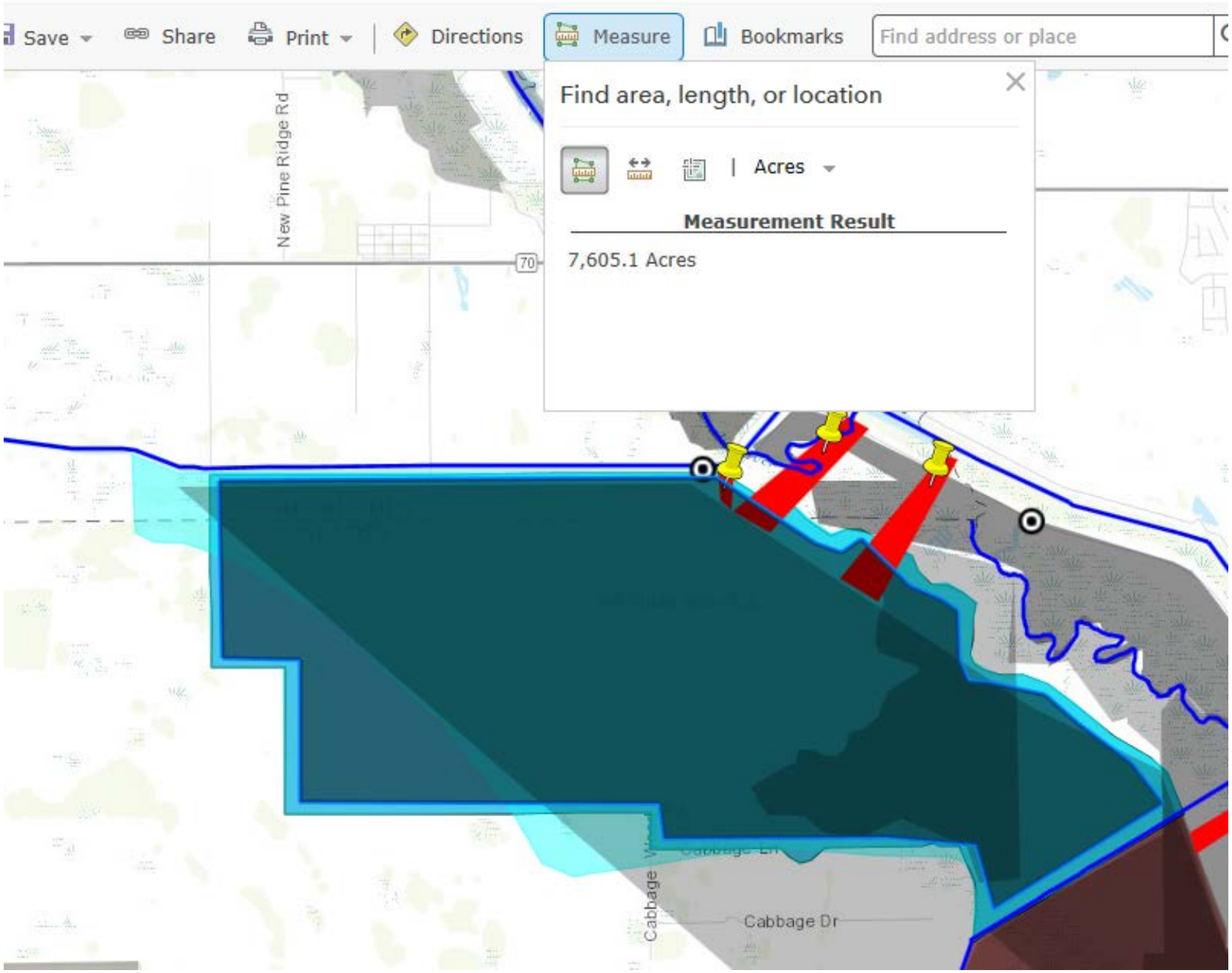
Top Wetland Sites

- Lake Okeechobee West: ~2,800 acres
- IP-10: ~3,500 acres
- Kissimmee River: ~3,300 acres
- Paradise Run: ~4,000 acres





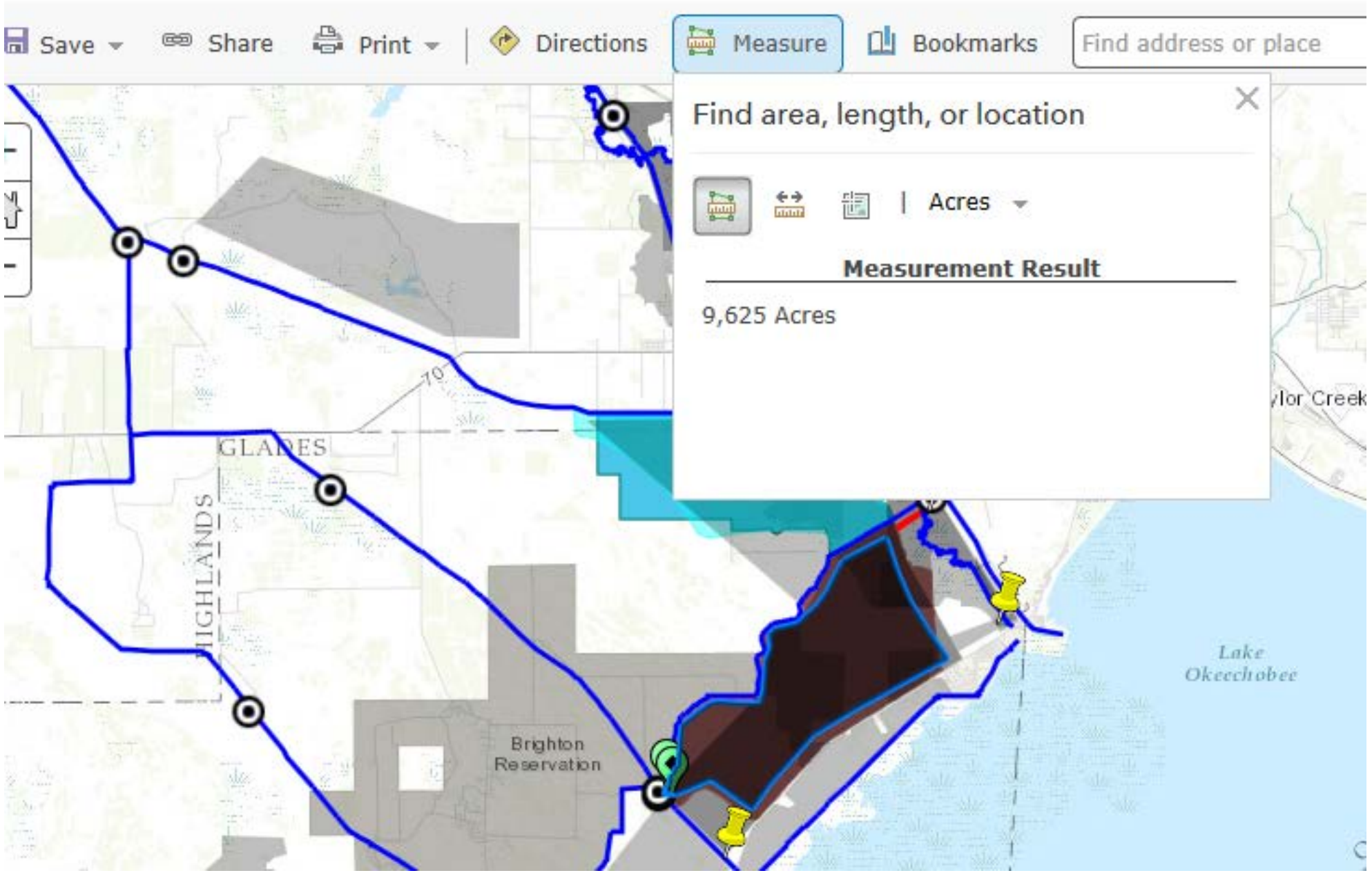
DRAFT

K-05 North

7,600 acres

15 ft deep

114,075 acre-ft



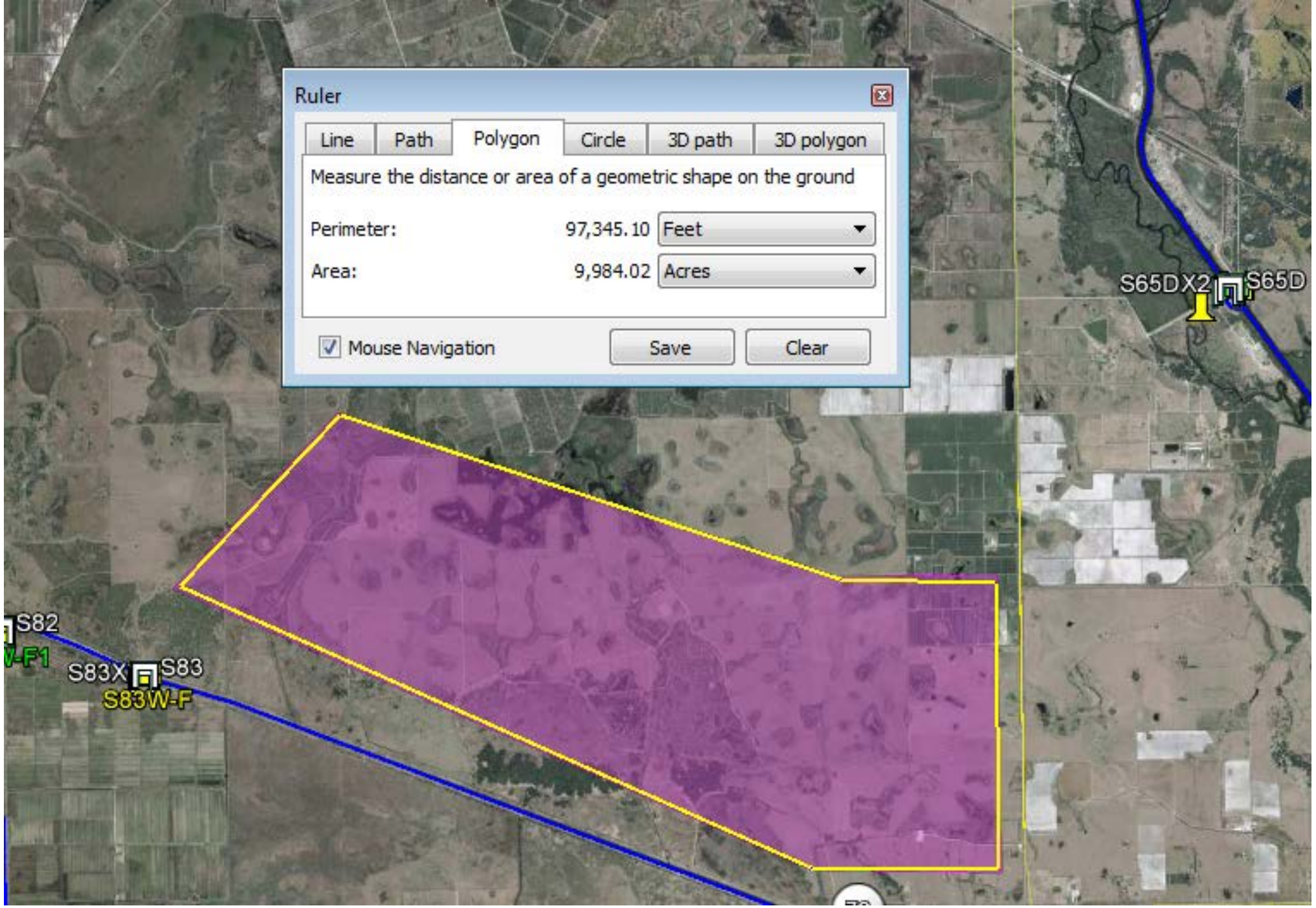
DRAFT

K-05 Horizontal

9,625 acres

15 ft deep

144,375 acre-ft



DRAFT

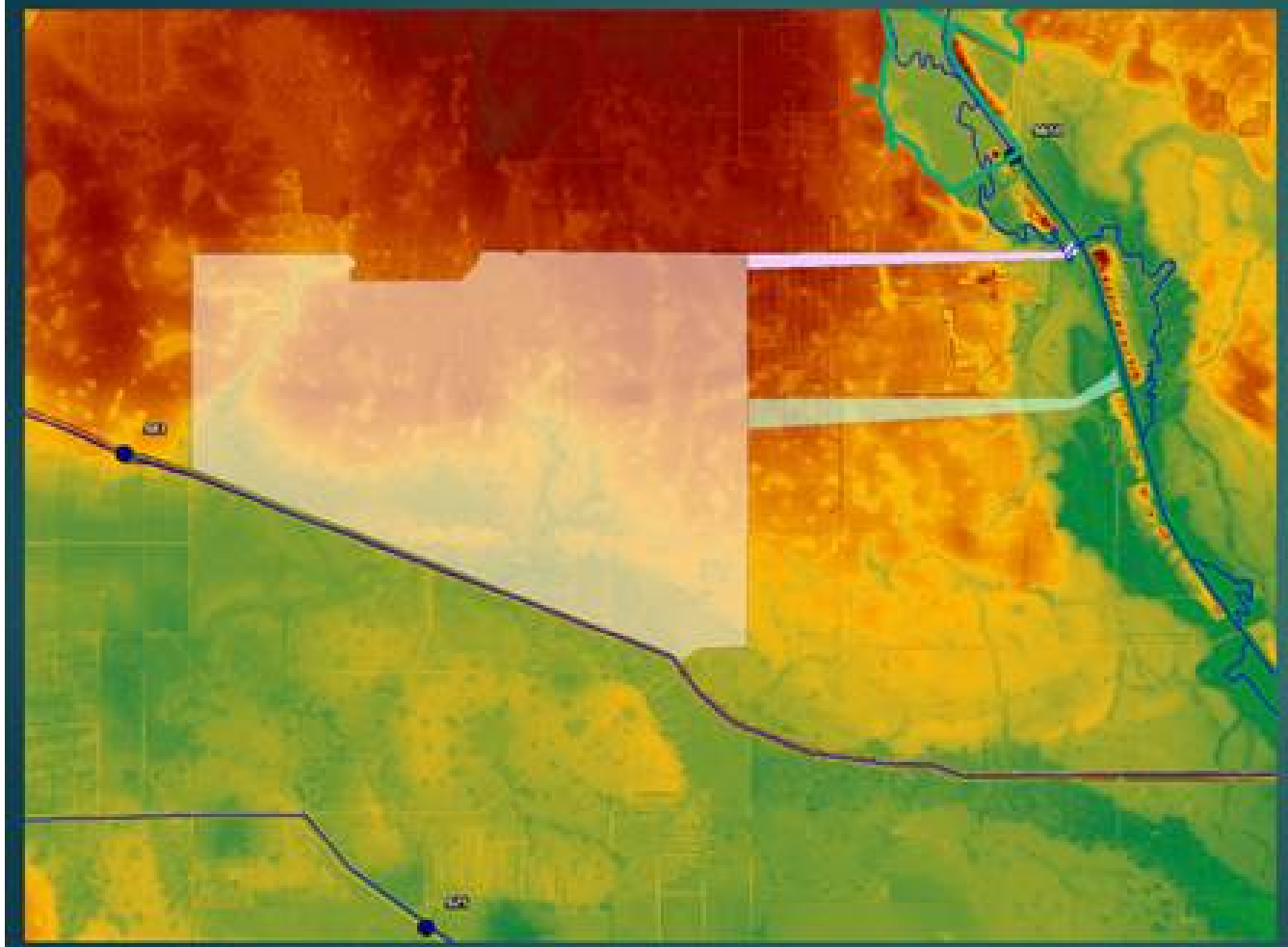
K-42

9,984 acres

15 ft deep

149,760 acre-ft

K-42



Intake channel Opt.2:
Approx. 3.5 miles, ~10 parcels

Intake channel Opt 1:
Approx. 4 miles, ~4 parcels

~2 parcels impacted by the reservoir footprint.

0% publicly owned land

Reservoir area: 13,379 acres

- DRAFT

Water Supply Considerations

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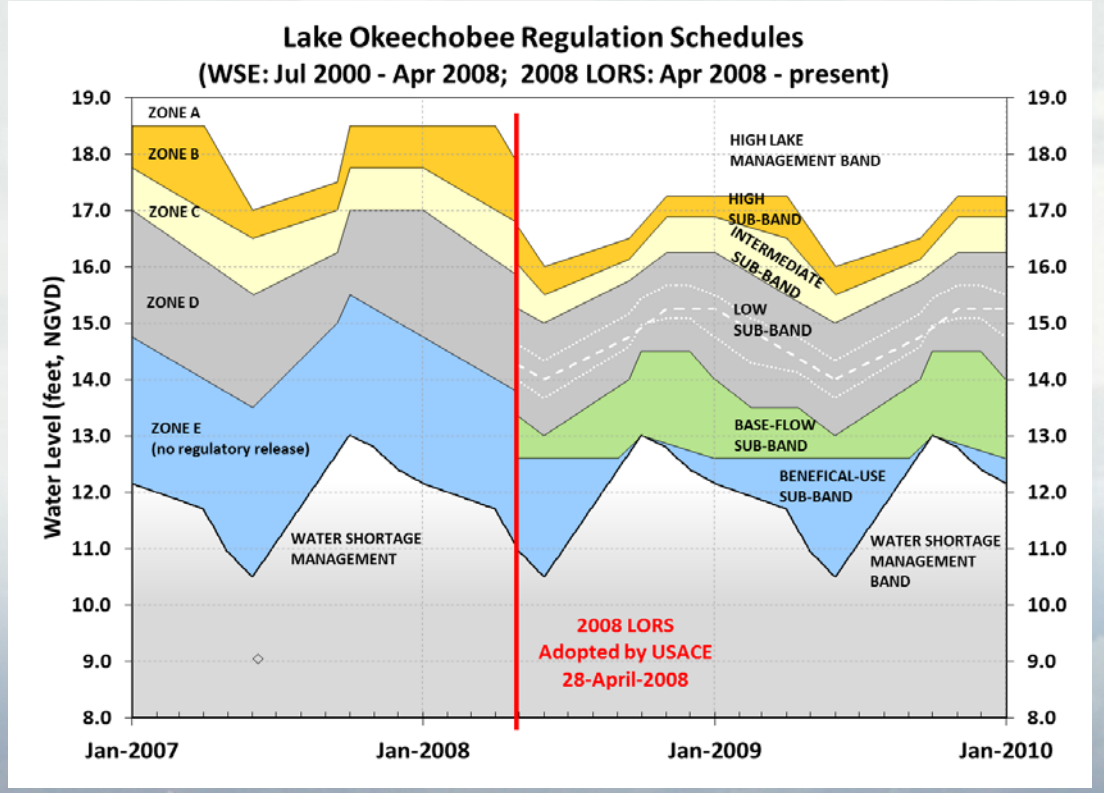
- LORS 2008 replaced the previous Lake Okeechobee regulation schedule known as WSE to manage lake elevations to reduce risk to the HHD and for environmental benefits
- 2007 LORS SEIS: LORS 2008 would adversely impact water supply by generally lowering Lake O stages and increasing the frequency and severity of simulated drought events.
- LOWP stakeholder are seeking a return to "WSE-like" performance and request using the LOWP to capture a portion of the water loss



Water Supply Considerations

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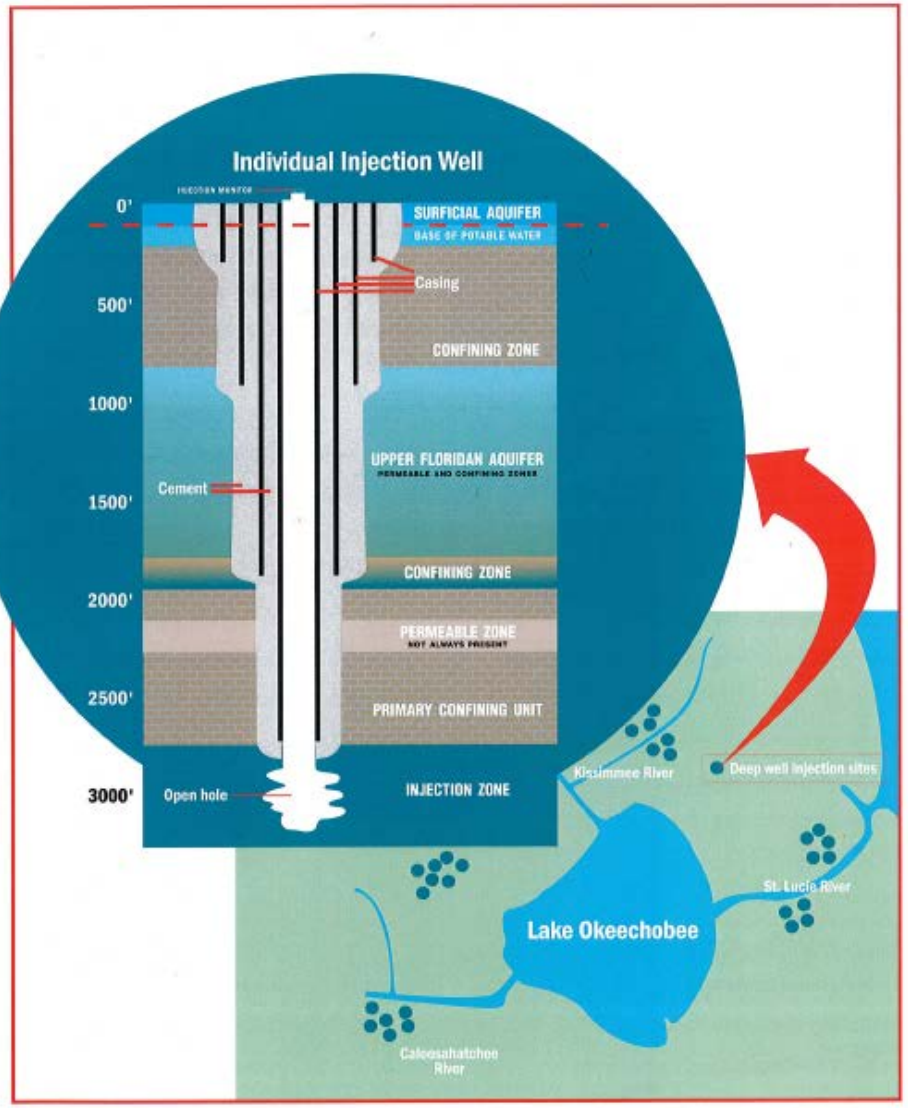
- USACE and SFWMD had a meeting on January 13th to discuss water supply formulation in the LOWP
- The objectives as currently considered in the LOWP are ecosystem restoration based without an agricultural or municipal and industrial (M&I) water supply objective. However, the current plan formulation process has identified improving water supply as an opportunity of the study.
- Next steps: scheduling an In-Progress Review in late January/early February with the USACE vertical team to come to a consensus on how to incorporate water supply in the planning process (remain an opportunity or become a planning objective)

Deep Injection Wells in the Lake Okeechobee Watershed

Bob Verrastro
Lead Hydrogeologist
Water Supply Bureau
SFWMD

June Mirecki
Hydrogeologist
Geotechnical Branch
USACE

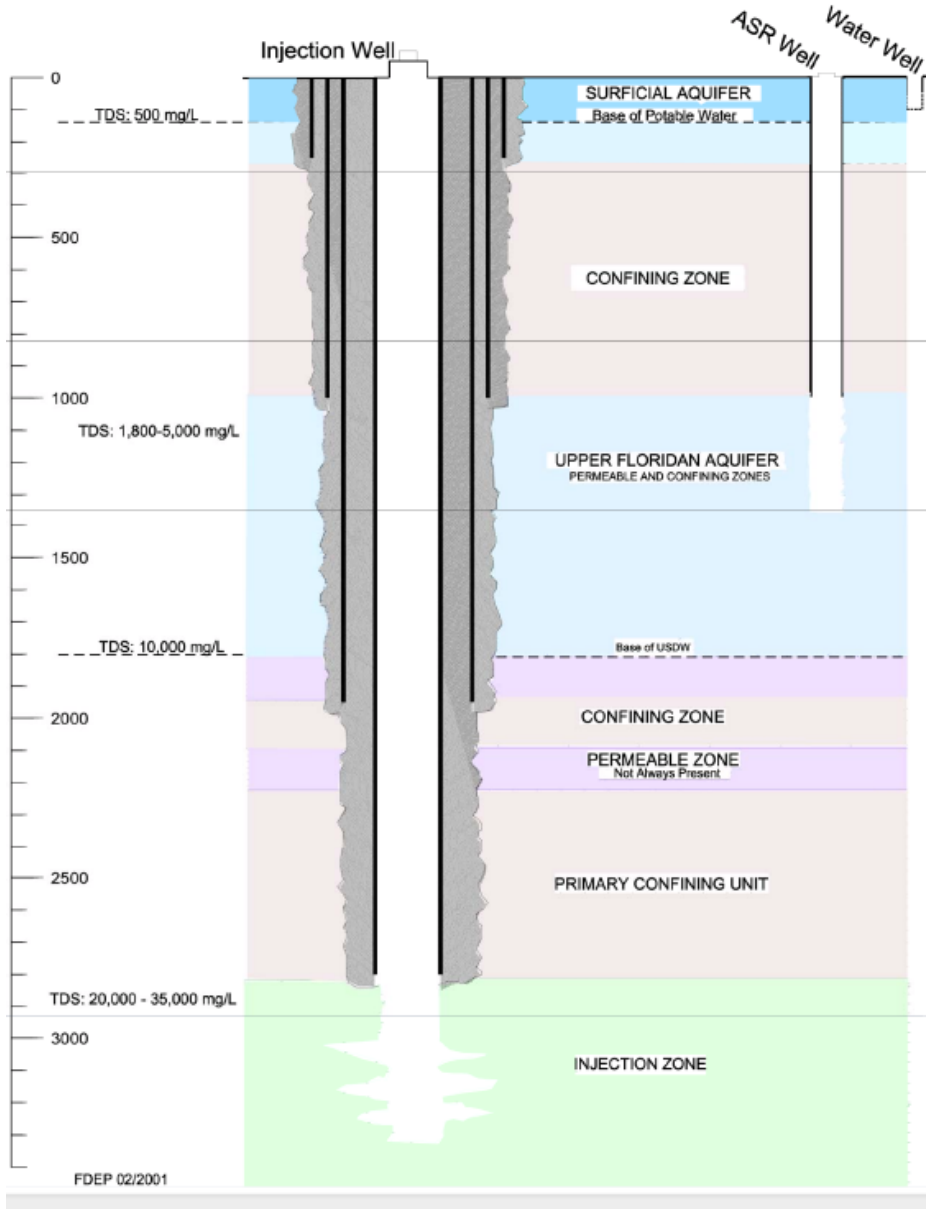


Presentation Outline

- Injection wells 101
- Hydrogeology
- Construction
- Implementation and siting strategies
  - Instantaneous capacity
  - Lake level control

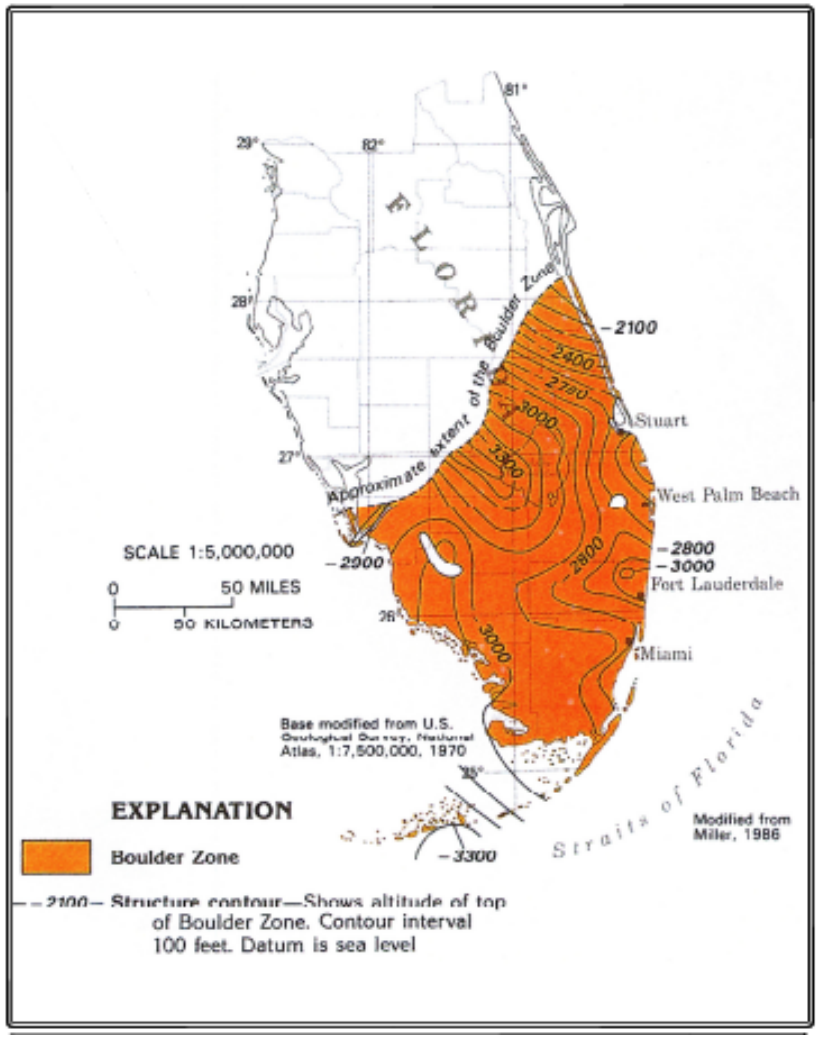
Injection well benefits

- Simple design
- No land acquisition/cultural resources
- Keeps land on county tax rolls
- Higher capacities (30 cfs) relative to ASR
- Permitting is straightforward
- Can be built in advance of large reservoirs
- Can assist in estuary and dike protection



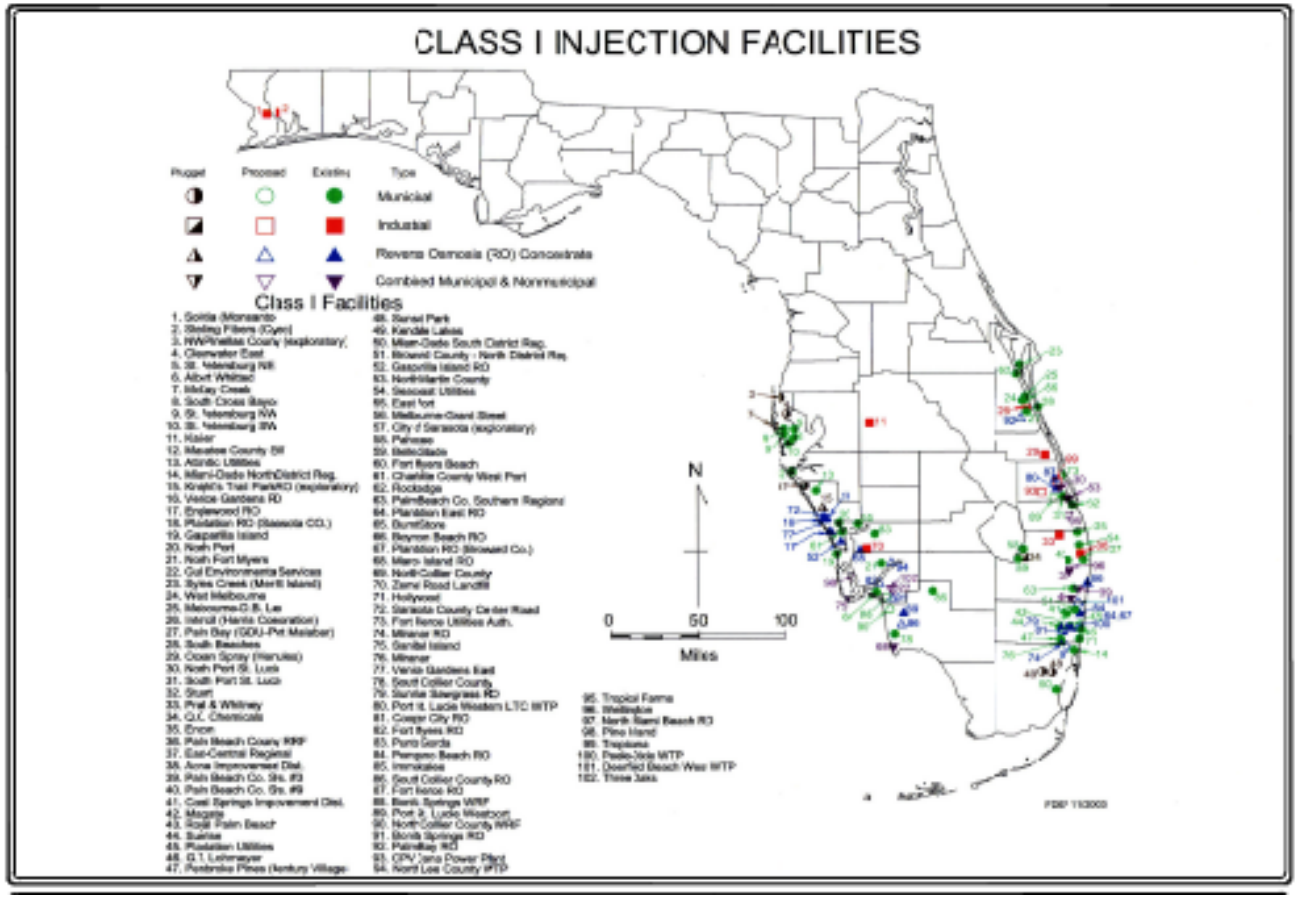
Injection well issues/risks/limitations

- Dependent upon local hydrogeology
- Relatively little geologic information in the LOWP area
- Relatively few drilling contractors
- Low flow rates (40-80 cfs) relative to surface features
- No water supply benefits – a “one-way” street
- Stigma associated with wastewater disposal wells



Where are Boulder Zone wells used?

- 180 Class I wells in currently in operation in Florida
- Mostly used for wastewater disposal by PWS utilities
- Largest cluster in south Florida is Miami-Dade South District WWTP (13 active wells)
- Identified in 2015 UF Study to reduce freshwater flows
- Evaluated during CERP ASR Regional Study Groundwater Modeling

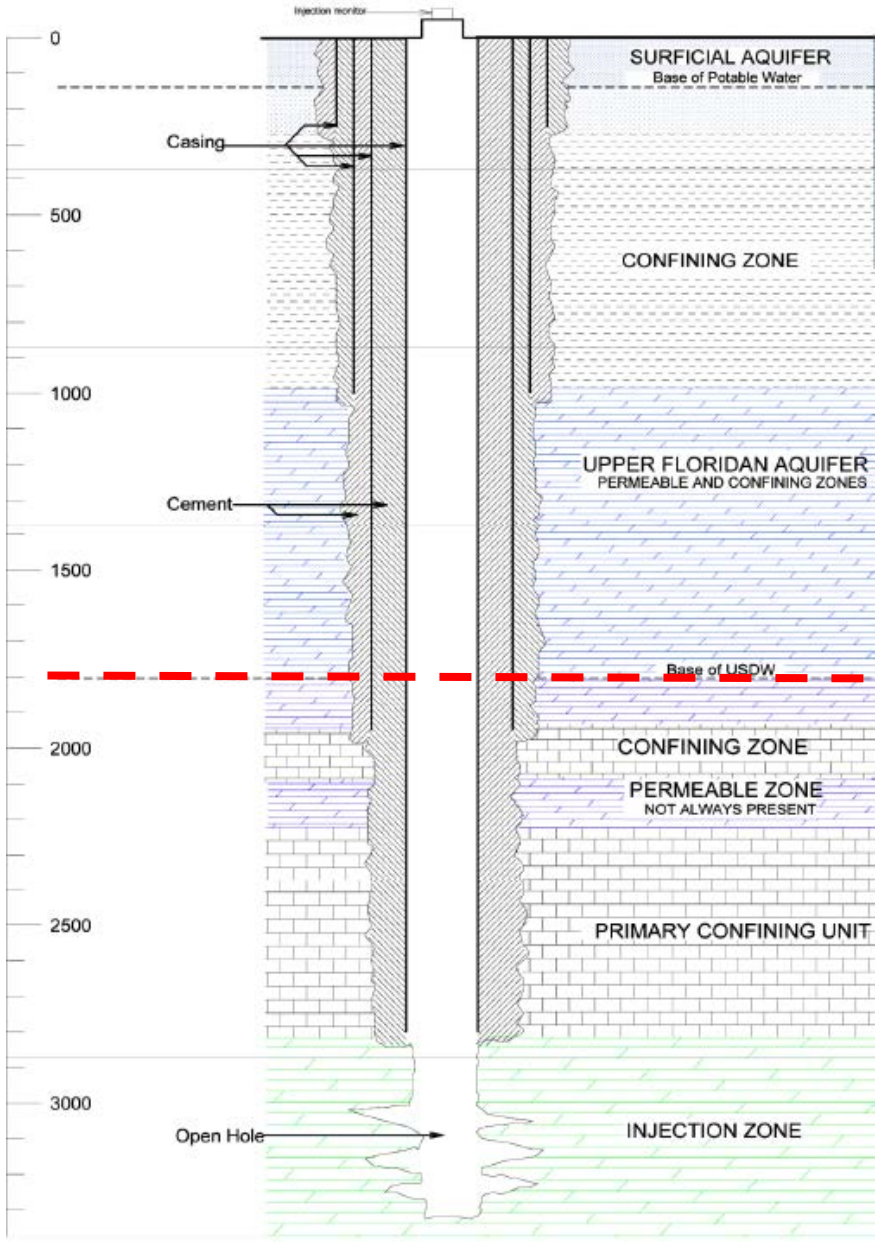


MDWSD South District WWTP

- Largest cluster in south Florida is Miami-Dade South District WWTP (13 active wells)
- Wells are 700-800 ft apart on a 260 acre footprint
- Surface facility is the injection wellhead and pad, linked via SCADA system to a central control facility that pressurizes the system.

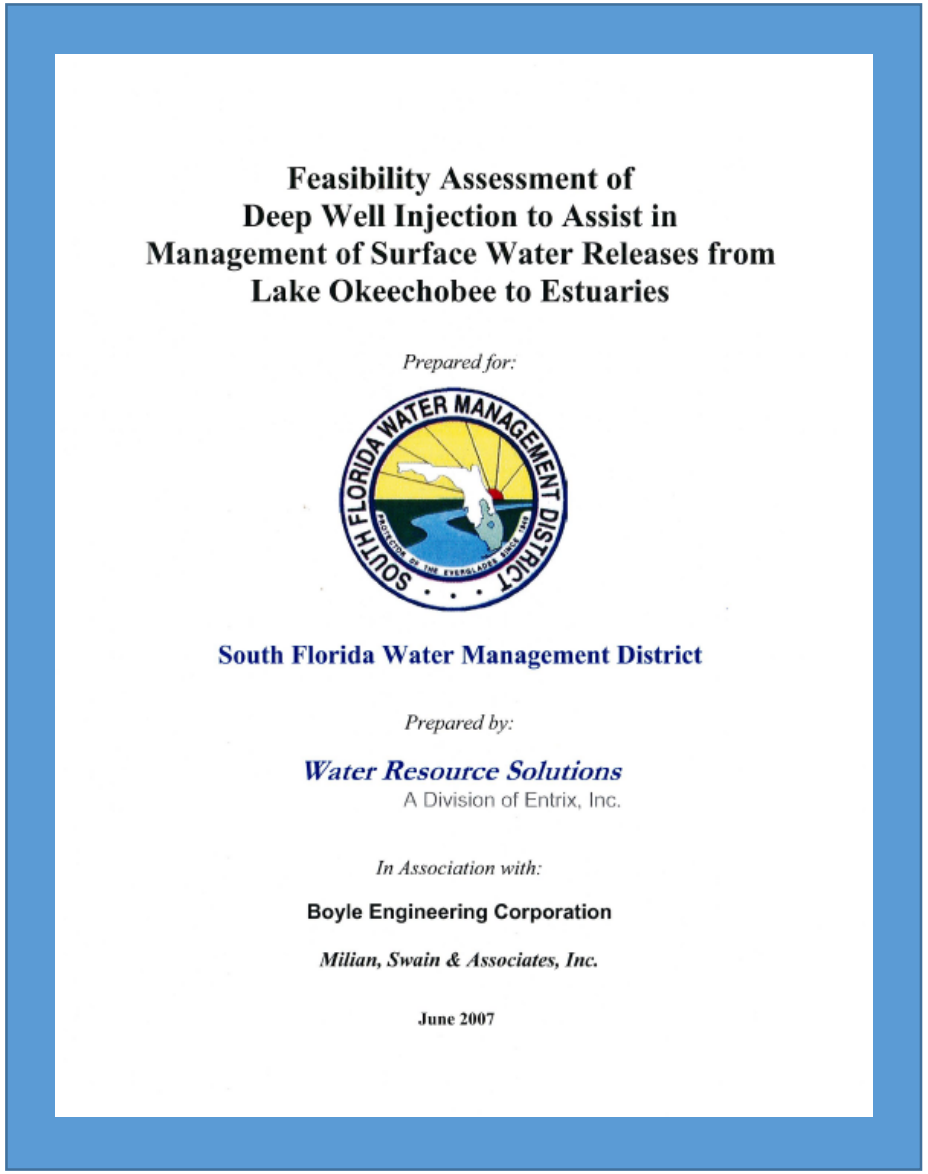
Construction

- Initiated with an exploratory well
- 24” to 30” casing, to about 3,000 feet bls
- Often constructed in pairs
- Inlet structure on canal, lake, or reservoir
- Basic filtration and injection pump
- Some monitor wells will be needed



2007 Feasibility Report

- Conducted as a component of SFWMD Lake Okeechobee and Estuary Recovery initiative
- Proposed injection well system target capacities based on 1) “lake level control” requiring operation prior to excess capacity ; or 2) “instantaneous discharge” requiring operation at the time when excess volume occurs



Feasibility Assessment of
Deep Well Injection to Assist in
Management of Surface Water Releases from
Lake Okeechobee to Estuaries

Prepared for:

South Florida Water Management District

Prepared by:

Water Resource Solutions
A Division of Entrix, Inc.

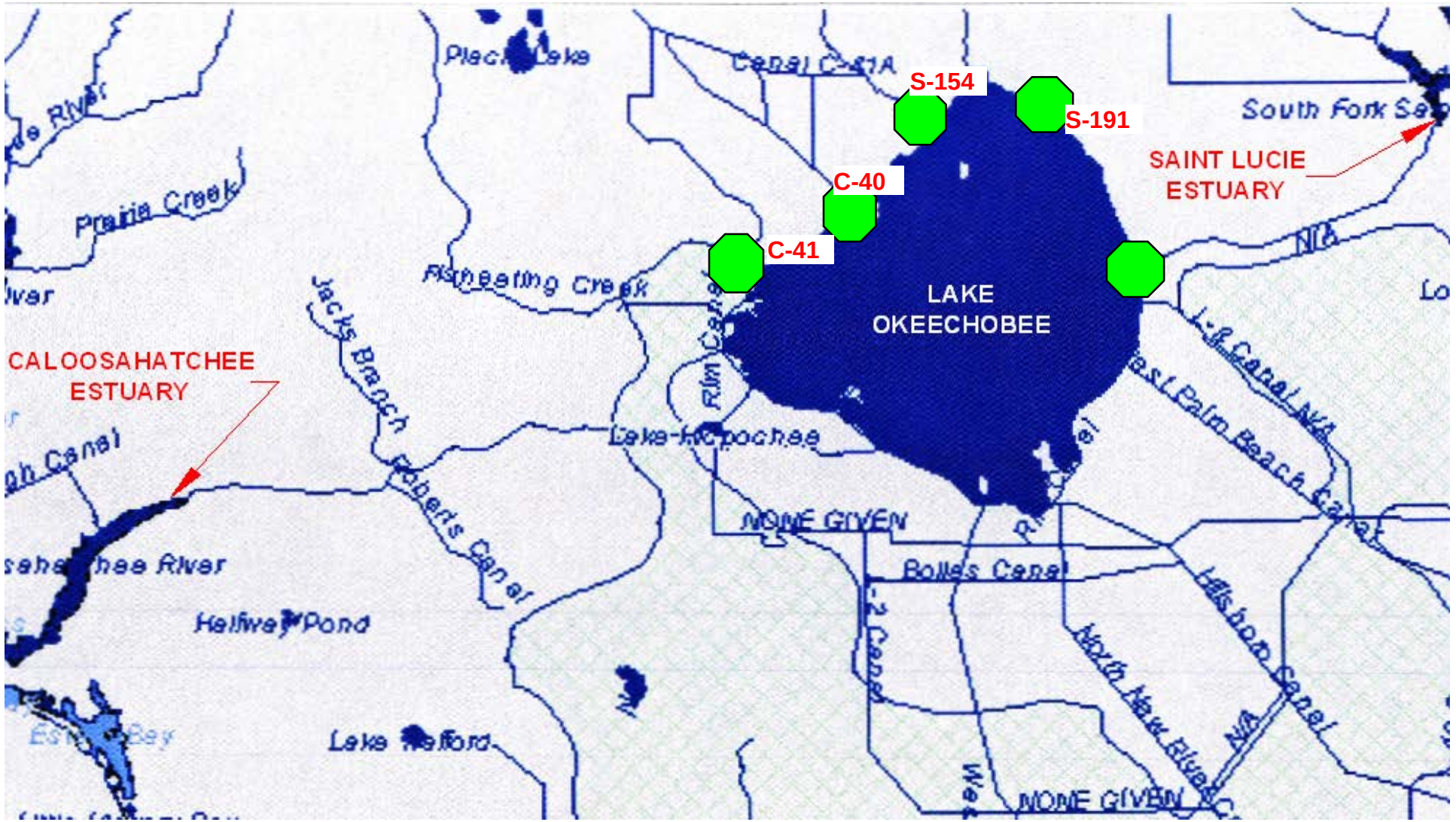
In Association with:

Boyle Engineering Corporation

Milian, Swain & Associates, Inc.

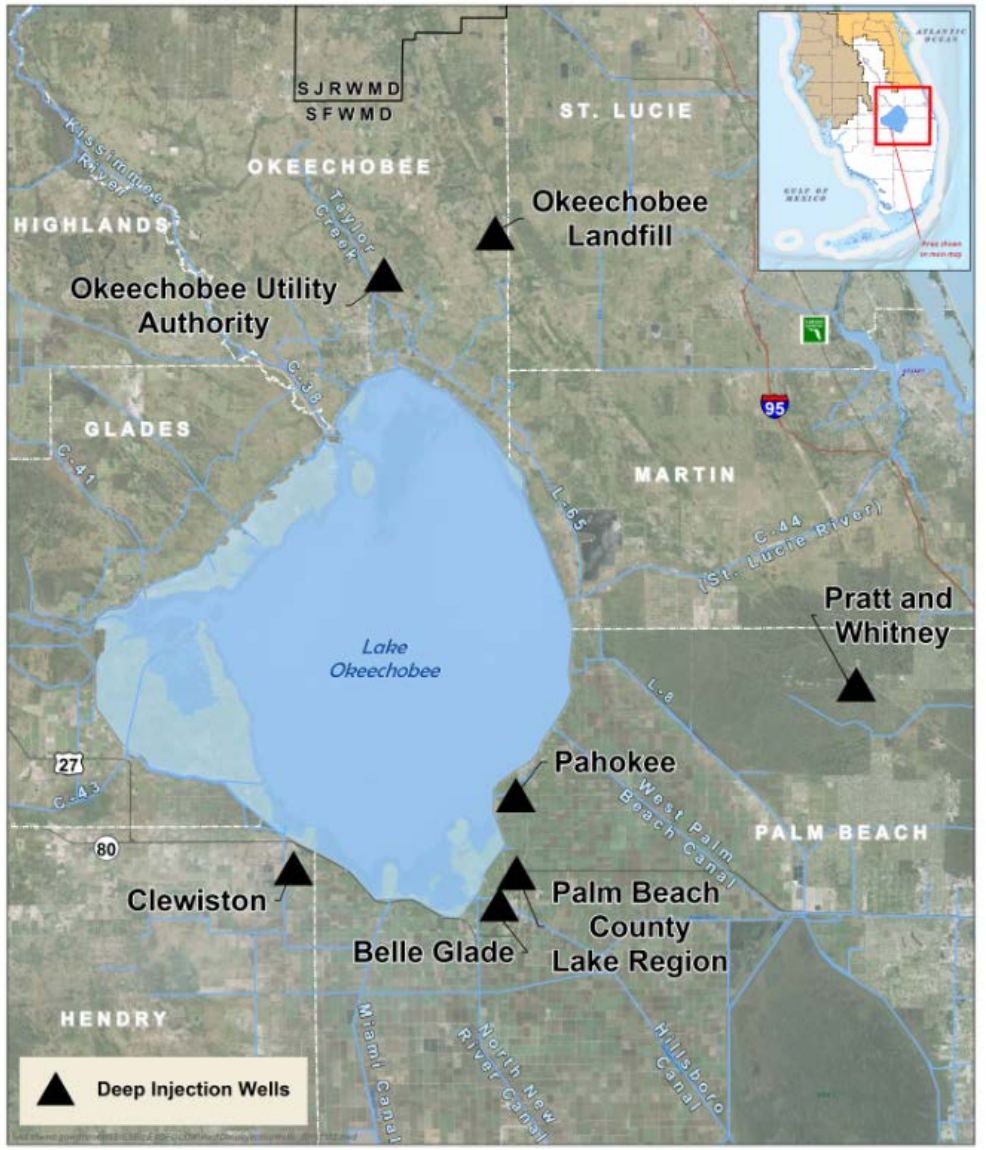
June 2007

Wells for Lake O Level Control



Existing Injection Wells in the LOWP

- Multiple utility-owned systems successfully operated
- Earliest wells since 1990's
- Monitoring data has shown confinement is substantial
- Wells demonstrate capacities of 1 to 10 MGD are possible around Lake O.



Themes for Subsurface Options

Estuary Discharge Minimization
MooreHaven
Port Mayaca

STA Storage Enhancement
Taylor Creek STA
Nubbin Slough STA
Lakeside Ranch STA

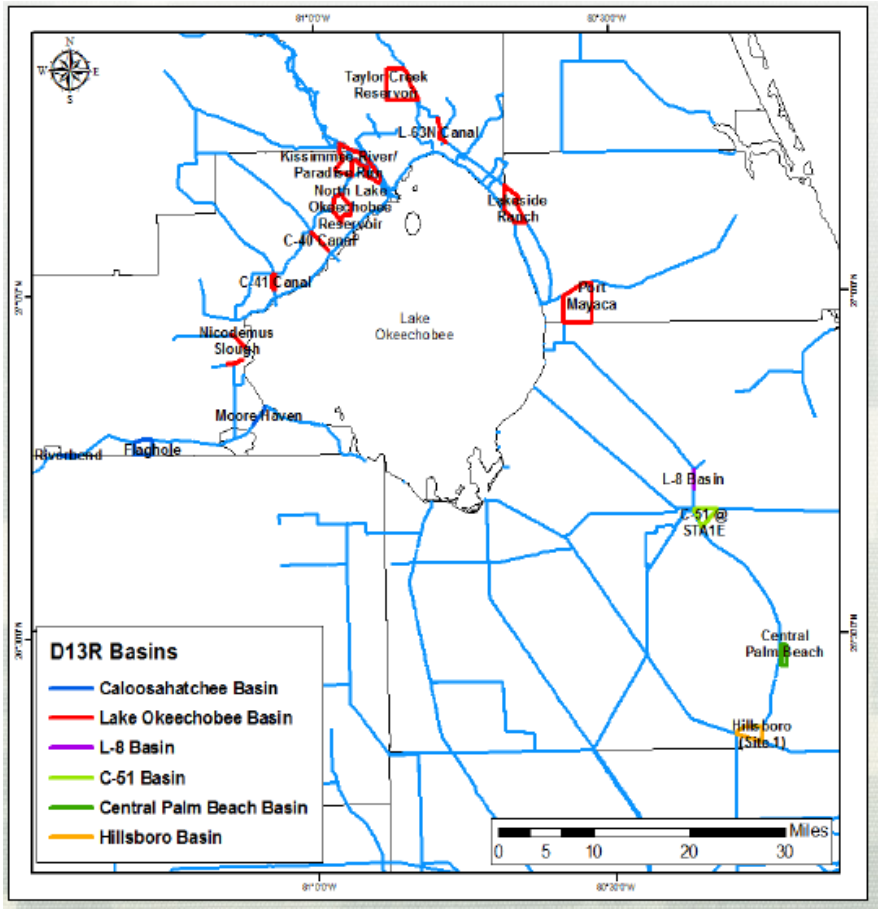
Lake Level Control
C-40 Canal Reach
C-41 Canal Reach
Kissimmee ASR System
S-191 Reach
Taylor Creek/L-63N Canal

Wetland/Floodplain Restoration
Paradise Run

Reservoir Storage Augmentation
Multiple locations to be determined

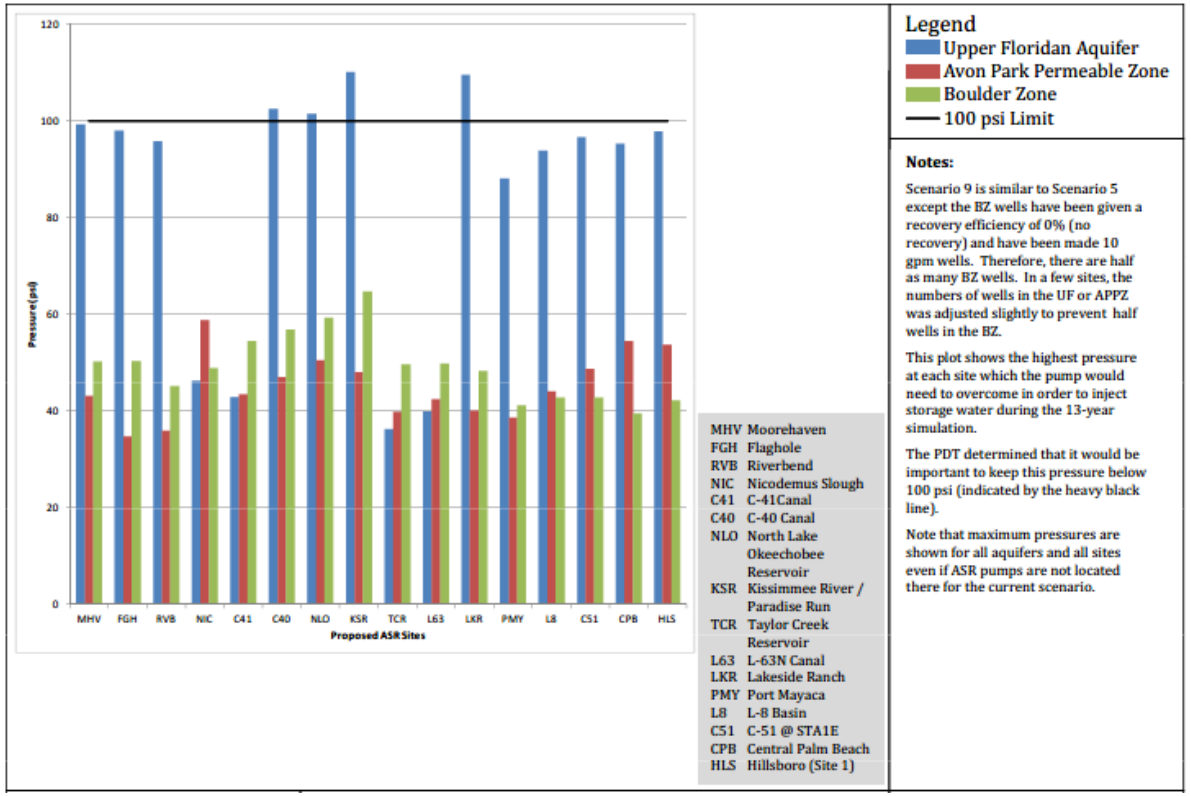
CERP ASR Regional Study Groundwater Model

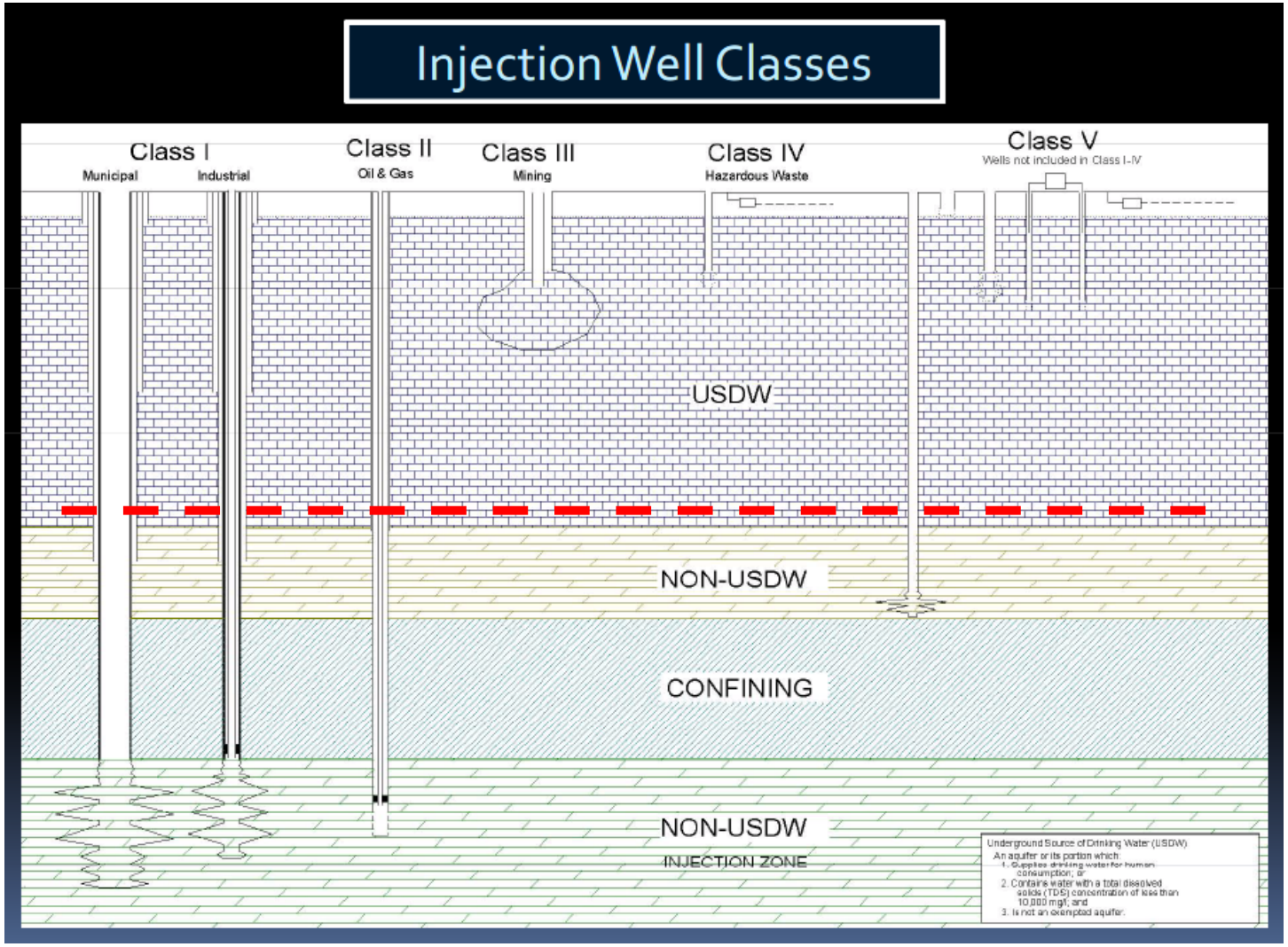
- Constraints included:
  - Limited to state-owned locations
  - Rock fracturing
  - Upconing
  - Lateral salt water intrusion
  - Effects to existing users
  - Maintaining artesian conditions
- About 130 ASR wells possible – 80 at Lake O
- Model did not consider alternative locations



Groundwater Model – Boulder Zone Analysis

- Simulated 139 10 MGD wells recharging the Boulder Zone in the Lake Okeechobee Basin
  - 1.4 billion gallons per day capacity
  - To provide benefits that were lost by having fewer ASR wells
- Recharge pressures remained low in overlying storage zones
- No recovery – just injection





Questions and Discussion

Archaeological Survey

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Objective

- Identify sites and assess their significance
- Refine a model for reliably identifying sites in the different environments within the LOWP

Methods

- Develop site expectations based upon historic research, previous archaeological work, analysis of prehistoric environmental conditions.
- Field strategies will sample the different environments within the LOWP area and the different probability zones within each environment.

Historical Research

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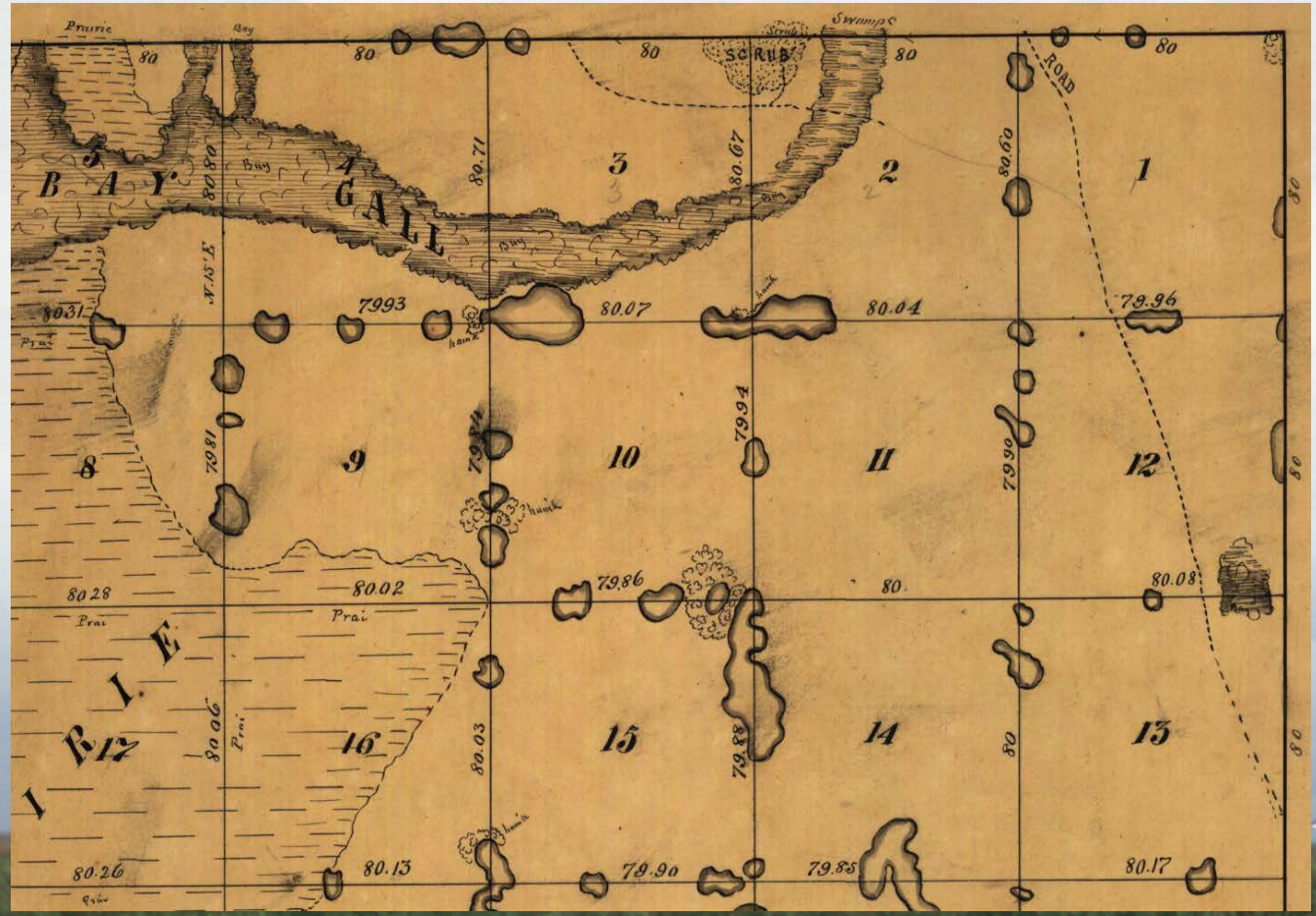
Cultural features identified on 19th and early 20th century General Land Office Survey plats.

Description	Location	Recorded on FMSF
"Road from Fort Kissimmee to Fort Capron"	T33S, R33E, Secs. 35, 36; T34S, R34E, Secs. 4, 5, 6, 9, 10, 11	No
"Road to Fort Van Swearingen"	T35S/R35E, Secs. 11, 14, 22, 23, 26, 27, 35	No
"Camp Starvation"	T35S/R35E/Sec. 27, NW1/4 of NW 1/4 of SW 1/4	No
"Road" segment	T35S/R35E, straddling Secs. 16 and 21	No
"Mound"	T36S, R28E, Sec. 35, SW 1/4of NE ¼ of NE 1/4	No
"Indian Mound and Village"	T36S/R32E/Sec. 1, NW 1/4, S of river	Daugherty/Williams Site, 8HG3
"Old Military Road," "Old Military Road from Ft. Denard to Ft. Bassinger," "Road to Ft. Bassinger"	T36S, R32E, Secs. 3, 4, 10, 11, 12; T36S, R33E, Secs. 7, 17, 18, 20, 29, 32; T37S, R33E, Secs. 5, 8, 16, 17, 21, 28, 33; T38S, R33E, Secs. 4, 9, 16, 20, 21, 29, 32: T39S, R32E, Secs. 1, 12, 13, 14, 22, 23, 27, 28, 32, 33; T40S, R31E, Secs. 1, 10, 11, 12, 15, 16, 17, 20, 29, 30, 31	No
"Indian Old Field"	T36S/R33E/Sec. 8, SE 1/4	Fort Bassinger Midden, 8HG17
"Fort Bassinger"	T36S/R33E/Sec. 17, SE 1/4	Fort Bassinger, 8HG669
"Indian Village"	T36S/R33E/Sec. 33, SE 1/4	possibly Shep's Camp, 8HG19
"Road from Forts Price and Capron to Ft. Bassinger"	T36S, R35E, Secs. 2, 3, 9, 10, 16, 18, 20, 21	No
"Footman's Trail"	T37S, R28E, Secs. 5, 8, 9, 15, 16, 22, 23, 25, 26, 36; T38S, R29E, Secs. 7, 8, 17, 20, 21, 28, 33, 34	No
"Indian Mound"	T37S, R34E, Sec. 19, straddling NE1/4 and SE ¼ of SW 1/4	probable Meekins Mound, 8OB8
"P. Raulerson" house and field	T37S/R35E straddling Secs. 21 and 22 S 1/2	No
"James Clements" house	T37S/R35E, Sec. 21, S ½ of SW ¼ of SE ¼	No
"H. Hancock" house	T37S,R35E, Sec. 21, NW ¼ of NW ¼ of SE 1/4	No
"Road from Bassinger to Jupiter" segments	T37S/R35E, Sec. 24, S ½; T37S/R36E, Secs. 29, 32	No
"Indian Mound"	T37S/R35E/Sec. 27, NE 1/4 of NW 1/4	Taylor Creek Mound, 8OB2



Color = K42 T/R
Color = K05 Big T/R
Color = I01 T/R
Color = Boot T/r
Color = Paradise Run

Archaeological Survey Sampling

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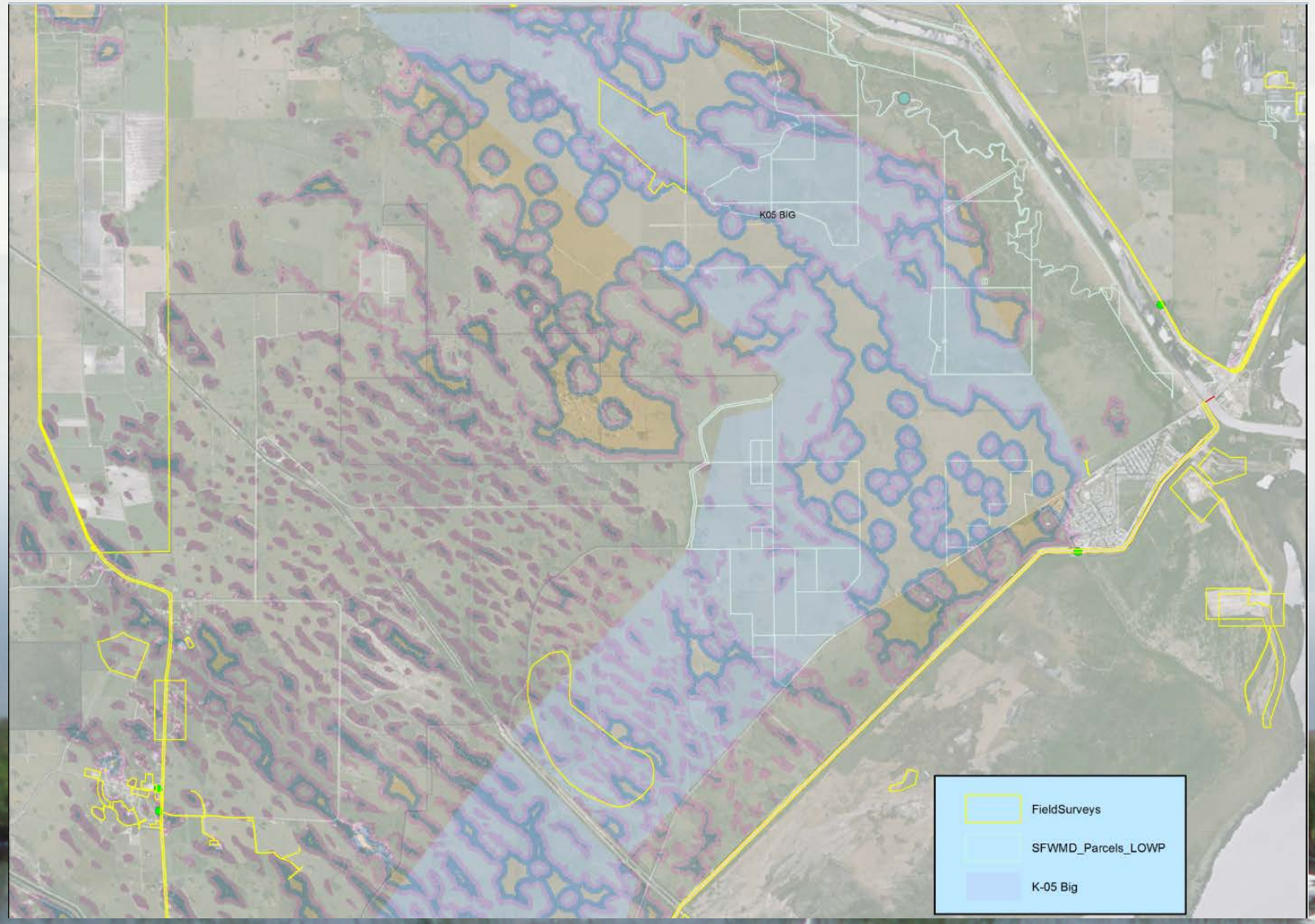

Strategy

Sample from each probability zone (high/medium/low) in each different environment

Constraints

Very little prior survey work to compare with in developing probability

Can only survey within State-owned lands

Baseline Modeling Update

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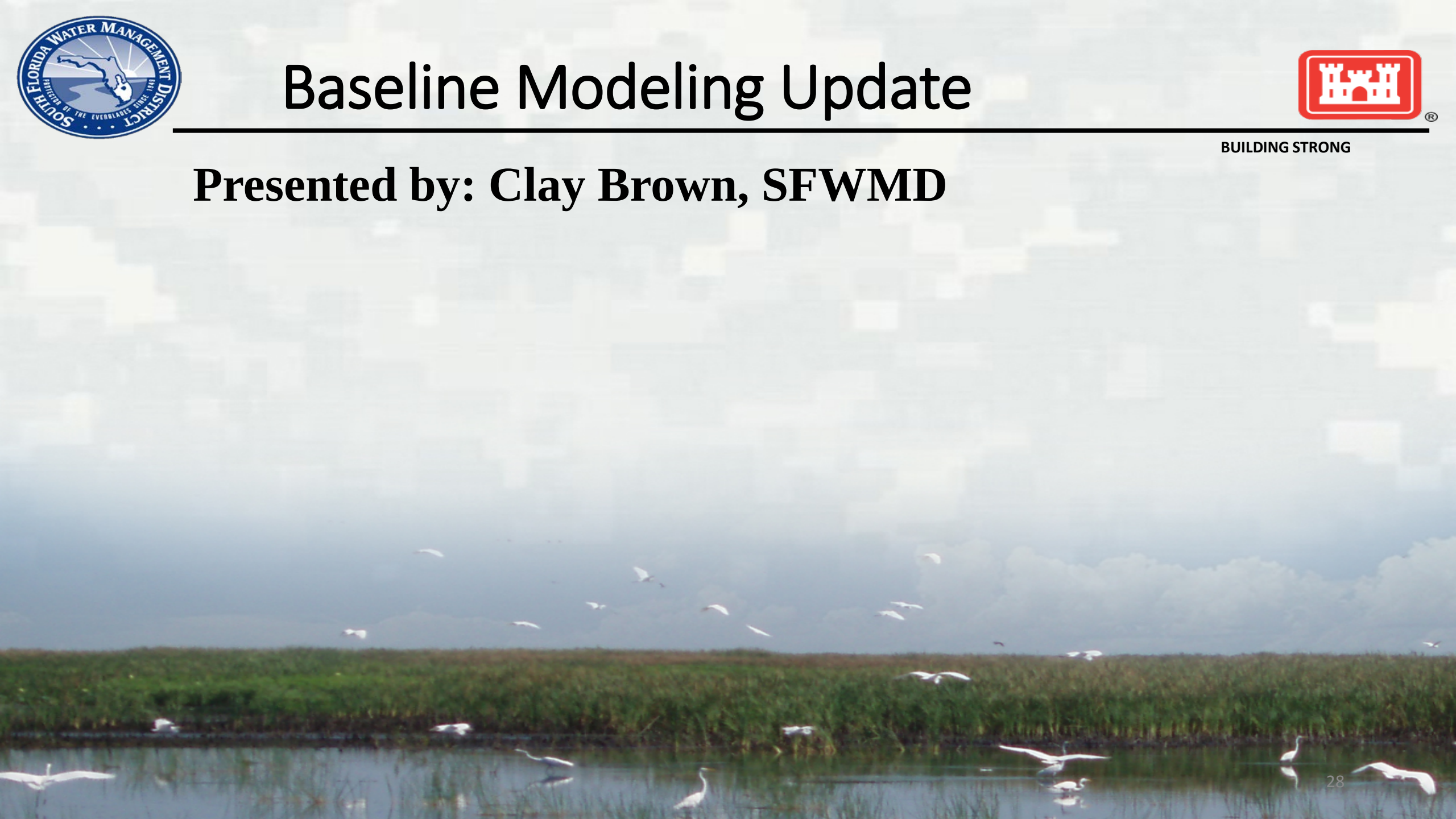
Presented by: Clay Brown, SFWMD



PDT Feedback
'What We've Heard'

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- Consider optimizing the Lake Okeechobee Regulation Schedule to maximize project performance and benefits
- Increase operational flexibility of the water management system
- Include water supply for agriculture, industrial, municipal and tribal use in project planning
- Dam Safety Concerns
- Suggest including water quality improvements
- Importance of Paradise Run wetland restoration site
- Minimize agricultural land taken out of production and maximize use of publically owned lands
- Additional storage considerations
- Potential for cultural resources in project area
- Support for expedited SMART planning schedule
- ASR/Deep injection well operational concerns
- Concerns with impacts to fisheries at reservoir and ASR well intake structures
- Consider ecological values of land when siting reservoir features
- Support for in-lake restoration (littoral shelf)