

# 2019 Lower Kissimmee Basin Water Supply Plan Update



**Mark Elsner, P.E.**  
Water Supply Bureau Chief  
Stakeholder Meeting #2  
October 4, 2019

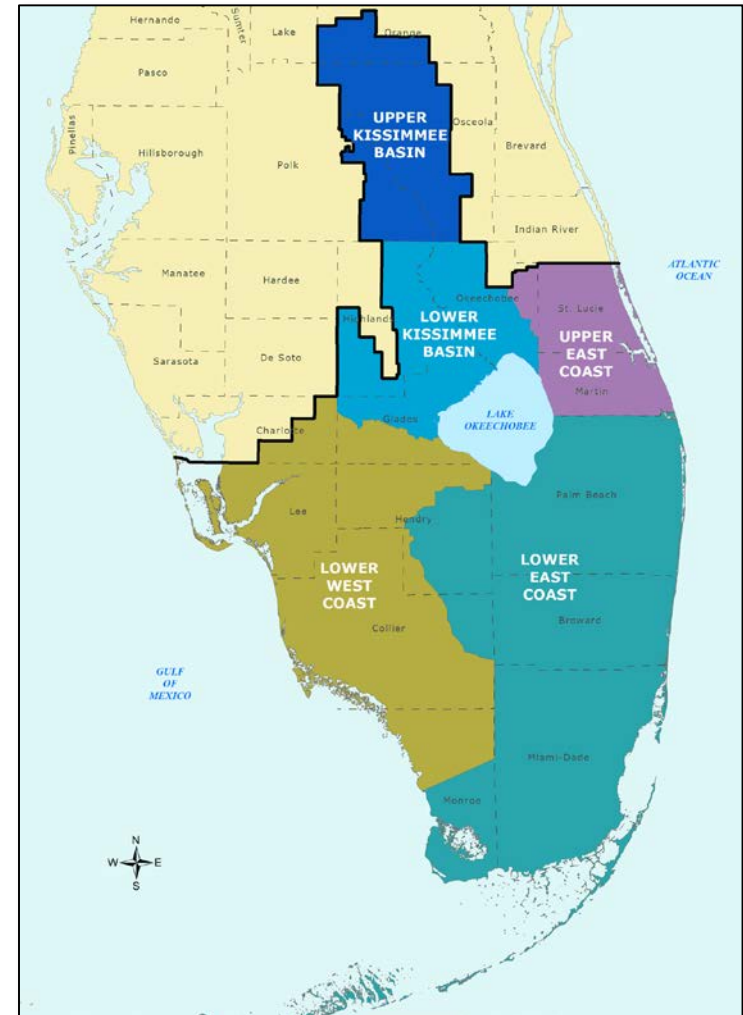


# Today's Agenda

- Opening remarks
- Water resource protection tools
- Public water supply by Okeechobee Utility Authority
- Overview of the Draft 2019 LKB Water Supply Plan Update (*posted online Sept. 27, 2019*)
  - Population and demand projections
  - Water source options
  - Water resource development projects
  - Conclusions and future direction
- Next steps

# Water Supply Plan Requirements

- 20-year planning period
- Demand estimates & projections
- Resource analyses
- Issues identification
- Evaluation of water source options
- Water resource development
  - Responsibility of water management district
- Water supply development
  - Responsibility of water users
- Minimum Flows & Minimum Water Levels
  - Recovery & prevention strategies





# Regional and Local Planning Linkage

- After the District Governing Board approves the water supply plan update:
  - All local governments must amend their Comprehensive Plan to incorporate a Water Supply Facilities Work Plan within 18 months of the plan update's approval
    - If plan update approved in December 2019, Work Plans will be due in June 2021
  - Utilities identify the projects to be developed
  - Utility annual progress reports
    - District automated WaSUP database – due annually in November





# Water Resource Protection Tools



**Toni Edwards**  
Senior Scientist

Stakeholder Meeting #2  
October 4, 2019



# Water Resource Protection Tools

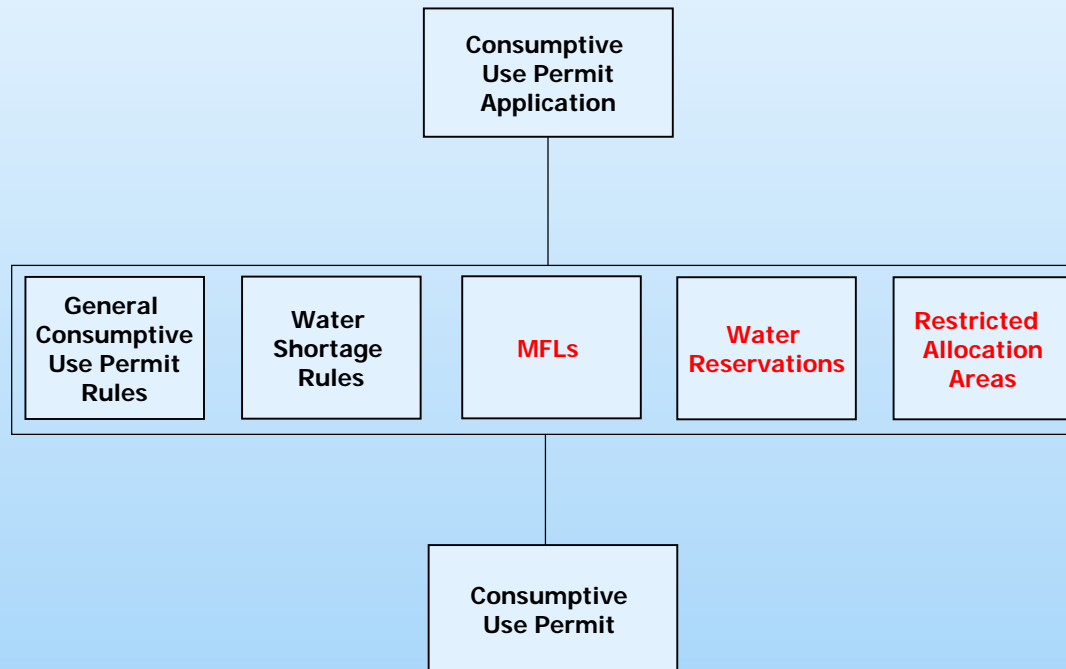
**Minimum Flows and Minimum Water Levels**

**Water Reservations**

**Restricted Allocation Areas**

Toni Edwards  
Senior Scientist – SFWMD  
October 04, 2019

- Minimum Flows and Minimum Water Levels (MFL)
- Water Reservations
- Restricted Allocation Areas (RAA)
  - Adopted by rule in the Florida Administrative Code (F.A.C.)
  - Considered in Consumptive Use Permitting (CUP) process





# Minimum Flows and Minimum Water Levels (MFL)

**Statutory Authority:** Chapter 373,  
Florida Statutes (F.S.)

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**Defined in Rule 40E-8.021, F.A.C.**

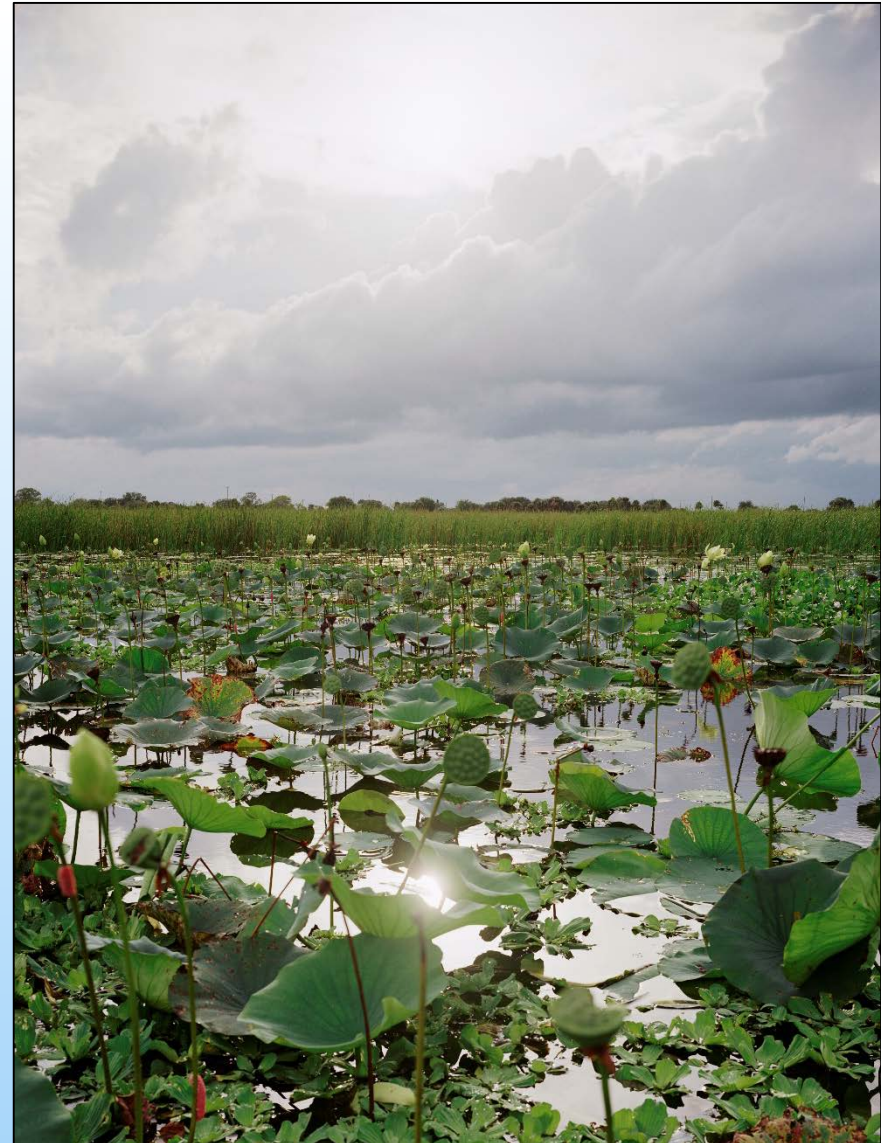
## MFL

- Point at which further withdrawals will cause "significant harm" to the water resources or ecology of an area

## Significant Harm

- Temporary loss of water resource functions that takes more than two years to recover, but is less severe than serious harm

*May be adopted for both surface waters and groundwaters*



Lotus pads on Lake Okeechobee

Source: Katherine Wolkoff at <https://www.audubon.org>

# MFL Recovery and Prevention Strategies

## Section 373.0421(2), F.S.

### Recovery Strategy

- For waterbodies not meeting the MFL at the time of adoption
- Achieve recovery to the established MFL as soon as “practicable”

### Prevention Strategy

- For waterbodies that are meeting the MFL but are not expected to meet it in 20 years
- Prevent the existing flow or level from falling below the adopted MFL

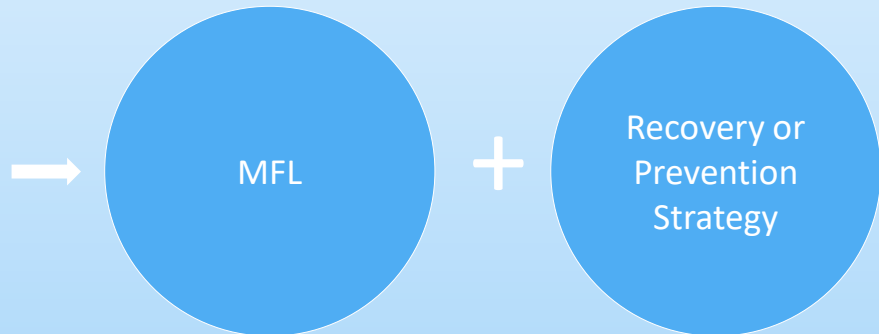
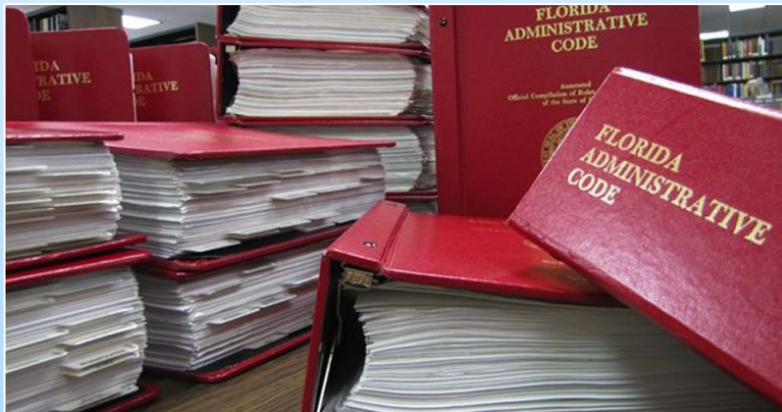


Great Egret (*Ardea alba*) and American Alligator (*Alligator mississippiensis*) in pond, Kissimmee, Florida  
Source: <https://naturetime.wordpress.com>

# MFL Recovery and Prevention Strategies

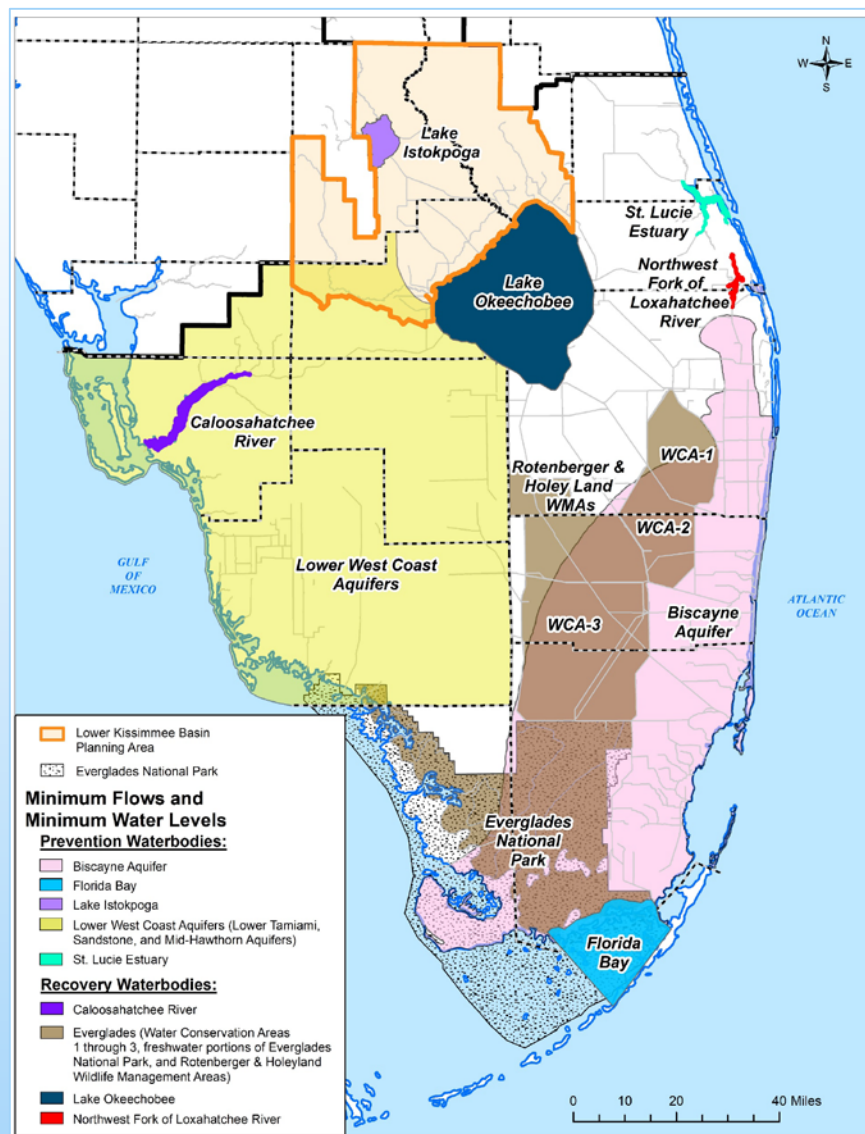
## Recovery and Prevention Strategies

- Strategies must be adopted simultaneously with MFL rule adoption
- When MFL is revised, strategy must be reviewed and revised (if needed) to meet the revised MFL
- Must include a phased-in approach or timetable for the components
- May not be based solely on water shortage restrictions





# MFLs Adopted to Date in SFWMD



## With Prevention Strategies

- Biscayne Aquifer (2001)
- Lower West Coast Aquifers (2001)
- St Lucie Estuary (2002)
- Florida Bay (2006)
- Lake Istokpoga (2006)

## With Recovery Strategies

- Caloosahatchee River (2001)
- Everglades (2001)
- Lake Okeechobee (2001)
- N.W. Fork of Loxahatchee River (2003)

*Cover > 6.6 million acres districtwide*

# MFLs Covered in Other Water Supply Plans

MFL Waterbody	Water Supply Plan	MFL Criteria	Recovery or Prevention Strategy
Lower West Coast Aquifers	Lower West Coast	Rule 40E-8.331, F.A.C.	<b>Prevention</b> Subsection 40E-8.421(4), F.A.C.
Lake Okeechobee	Lower East Coast	Subsection 40E-8.221 (1), F.A.C.	<b>Recovery</b> Subsection 40E-8.421(2), F.A.C.



# Lake Istokpoga MFL

## Rule 40E-8.351, F.A.C. (adopted 2006)

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Defined in Subsection 40E-8.021(11), F.A.C as..."the lands and waters contained within the lake below 40' NGVD, the top of the U.S. Army Corps of Engineers (USACE) regulation schedule"

- Lake level of 36.5' NGVD
- An MFL violation occurs when:
  - Surface water level falls below 36.5', for 20 or more weeks within a calendar year, more often than once every four years



Lake Istokpoga – Osprey (*Pandion haliaetus*), Cypress (*Taxodium distichum*), and shoreline  
Source: SFWMD

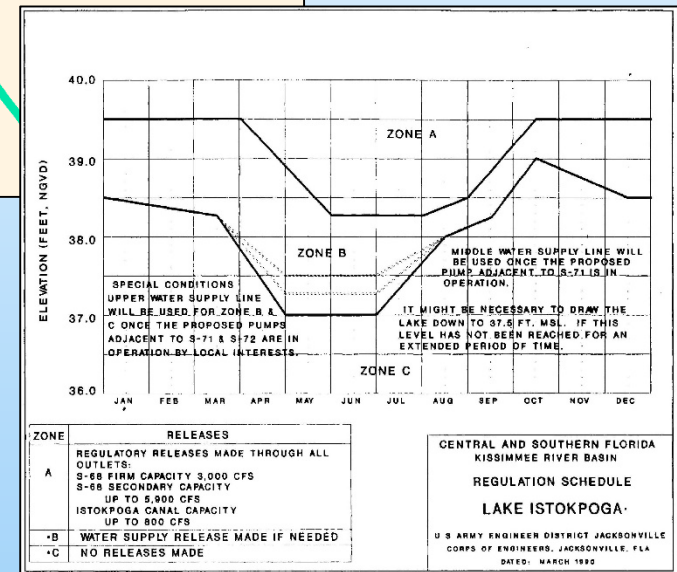
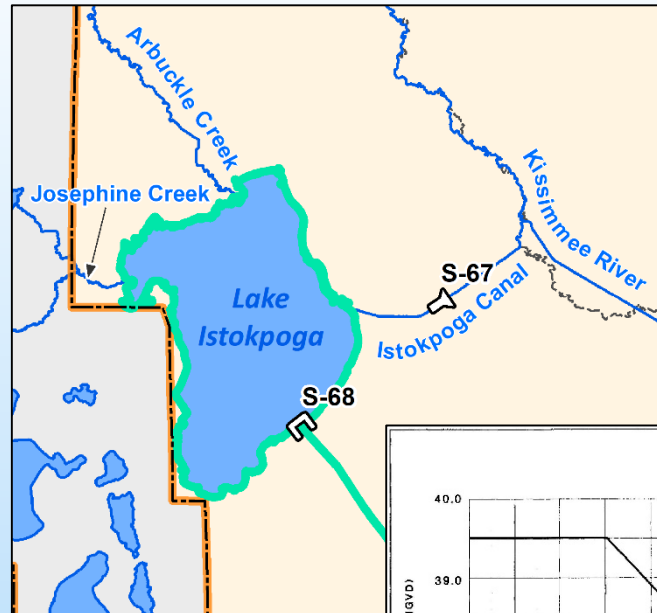


# Lake Istokpoga Prevention Strategy

## Subsection 40E-8.421(7), F.A.C. and Lower Kissimmee Basin Water Supply Plan

Lake water level controlled by operation of S-67 (replaced G-85) and S-68 structures in accordance with USACE regulation schedule

- Continue current operational plan and regulation schedule
- Re-evaluate MFL criteria when changes in lake management occur
- Implement extreme lake drawdowns, when necessary, in a manner that avoids MFL violations



# Water Reservations

**Statutory Authority:** Chapter 373, (F.S.)

## Functions and Considerations

- Reserve water for the protection of fish and wildlife or public health and safety
- Prevent use of reserved water for consumptive uses
- Required for CERP projects per federal Water Resources Development Act of 2000 (WRDA 2000)
- May be used as MFL recovery or prevention strategies

*Adopted for both surface waters and groundwaters*



Osprey (*Pandion haliaetus*) with bass (*Micropterus* sp.) on Merritt's Mill Pond  
Source: <http://nykography.weebly.com>

# Water Reservations Do Not...

- Prevent use of unreserved water or water allocated under CUPs
- Establish an operating regime
- Drought-proof the natural system
- Ensure wildlife proliferation



Lake Okeechobee under drought conditions  
Source: SFWMD



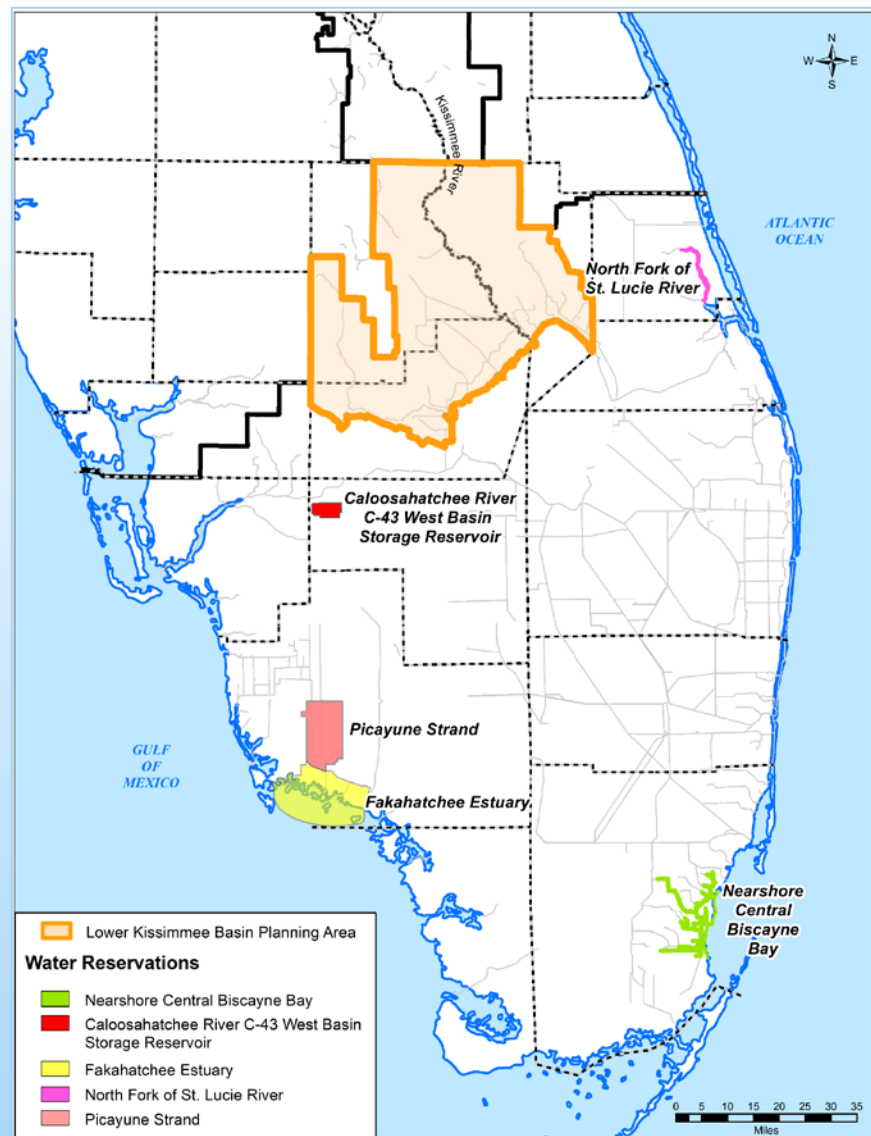
S-67 water control structure (replaced G-85 structure)  
Source: SFWMD



American Alligator (*Alligator mississippiensis*)  
Source: <http://www.photodrom.com>



# Water Reservations Adopted to Date in SFWMD



- Fakahatchee Estuary (2009)
- Picayune Strand (2009)
- North Fork of the St. Lucie River (2010)
- Nearshore Central Biscayne Bay (2013)
- Caloosahatchee River C-43 West Basin Storage Reservoir (2014)

*Cover 344,574 acres districtwide*

# Water Reservations under Development

## Kissimmee River and Chain of Lakes, Rule 40E-10, F.A.C.

### For the protection of fish and wildlife

Nationally recognized  
largemouth bass fishery



Largemouth Bass (*Micropterus salmoides*)  
Source: Engbretson Underwater Photography  
<https://www.underwaterfishphotos.com>

Endangered Wood  
Stork and Snail Kite  
nesting colonies

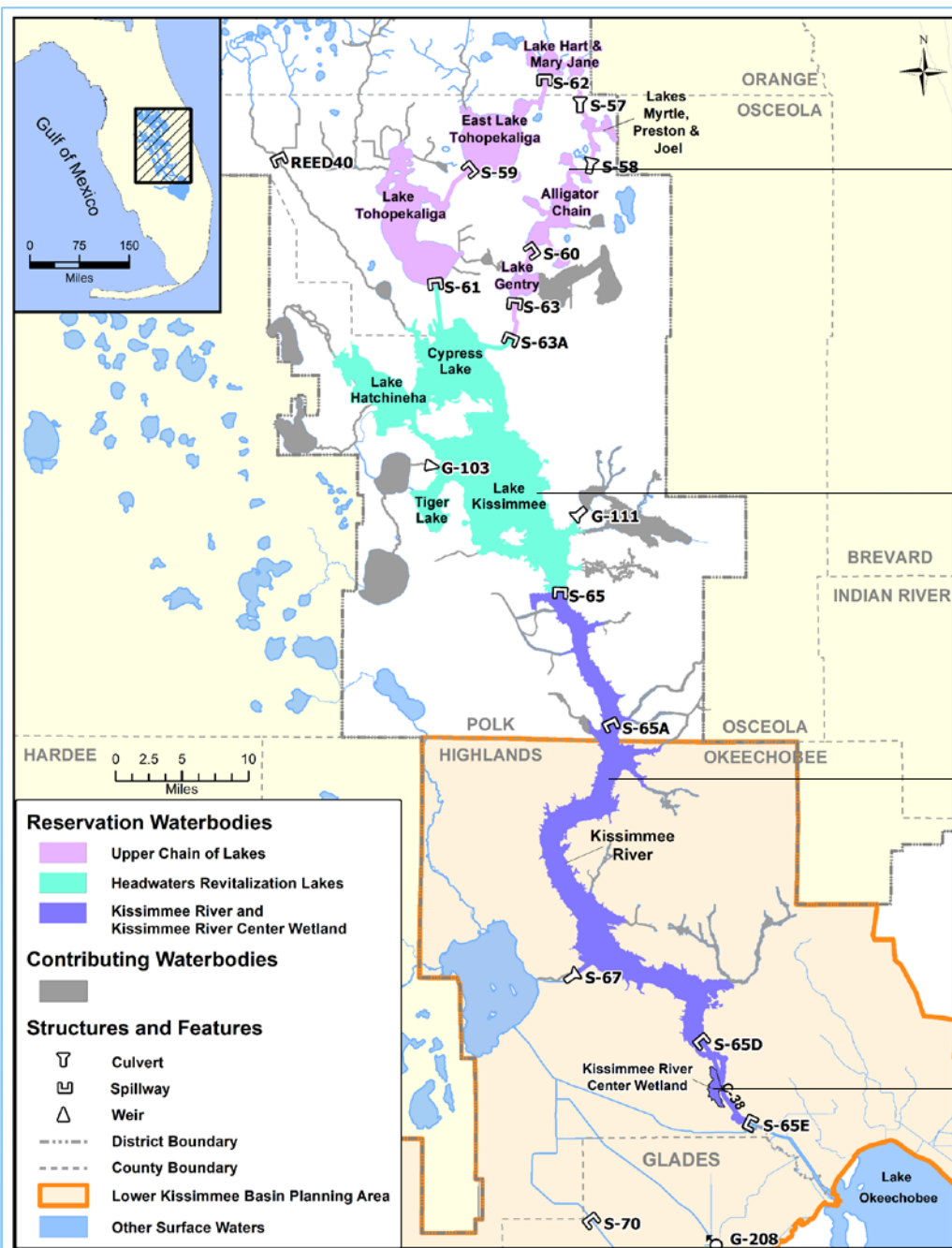


Snail Kite (*Rostrhamus sociabilis*)  
Source: <https://de.wikipedia.org>

One of the largest  
concentrations of nesting  
bald eagles in the U. S.



Bald Eagle (*Haliaeetus leucocephalus*)  
Source: Audubon.org



**Upper Chain of Lakes** (6 groups - Lakes Hart-Mary Jane, Lakes Myrtle-Preston-Joel, Alligator Chain of Lakes, Lake Gentry, Lake Tohopekaliga, East Lake Tohopekaliga - each containing several lakes and canals)

**Headwaters Revitalization Lakes** (Lakes Cypress, Tiger, Kissimmee and Hatchineha, and associated canals)

**Kissimmee River and Floodplain** (to S-65E structure north of Lake Okeechobee; includes Istokpoga Canal and floodplain, C-38 Canal and remnant river channels from S-65 to S-65E)

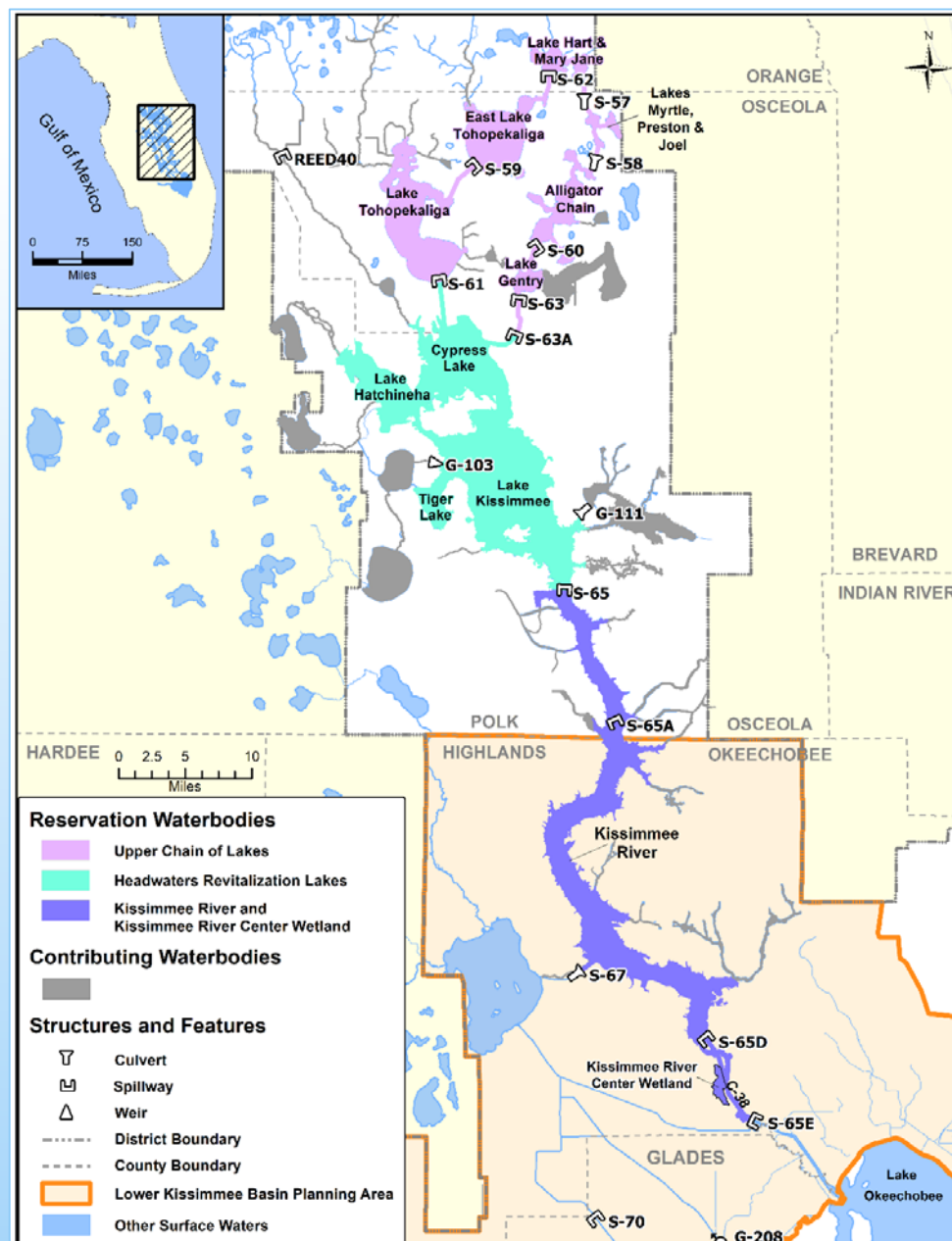
**Kissimmee River Center Wetland** (~ 1,200-acre wetland restoration area, part of CERP Lake Okeechobee Watershed Restoration Project)



- 172,500 acres and spans portions of LKB and UKB (CFWI) Planning Areas
- Kissimmee River downstream of S-65A is in LKB Planning Area
- Upper Chain and Headwaters Lakes - primary sources of water for the Kissimmee River
- Reservations will support KRRP (~\$1 billion public investment)



Kissimmee River Restoration Project (KRRP): Looking north from the south end of the Phase I restoration area.  
Source: SFWMD



# Kissimmee River and Chain of Lakes Water Reservations

## Water Proposed for Reservation from Allocation **(In Progress)**

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### Surface Water:

- **Upper Chain of Lakes Reservation Waterbodies**
  - All surface water up to specific water reservation stages
- **Headwaters Revitalization Lakes, Kissimmee River, and Kissimmee River Center Wetland Reservation Waterbodies**
  - All surface water

### Groundwater:

Surficial aquifer system groundwater contributing to the reservation waterbodies that is required for the protection of fish and wildlife

# Kissimmee River and Chain of Lakes Water Reservations

## Project Status

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- Currently in rule development (draft rule revised since Dec. 2014)
- Supporting Technical Document nearly complete (revised since March 2015)
- Public workshop by end of 2019 or early 2020 (contact Toni Edwards for workshop notifications at [tedwards@sfwmd.gov](mailto:tedwards@sfwmd.gov))
- Rule adoption by end of 2020
- Draft rules, Technical Document and other relevant documents will be available for review before rule adoption at <https://www.sfwmd.gov/our-work/water-reservations> and on the SFWMD web board at <https://sfwmd.websitetoolbox.com/> in the *SFWMD MFL and Water Reservation Categories/Water Reservations for the Kissimmee River and Chain of Lakes* forum



# Restricted Allocation Areas (RAA)

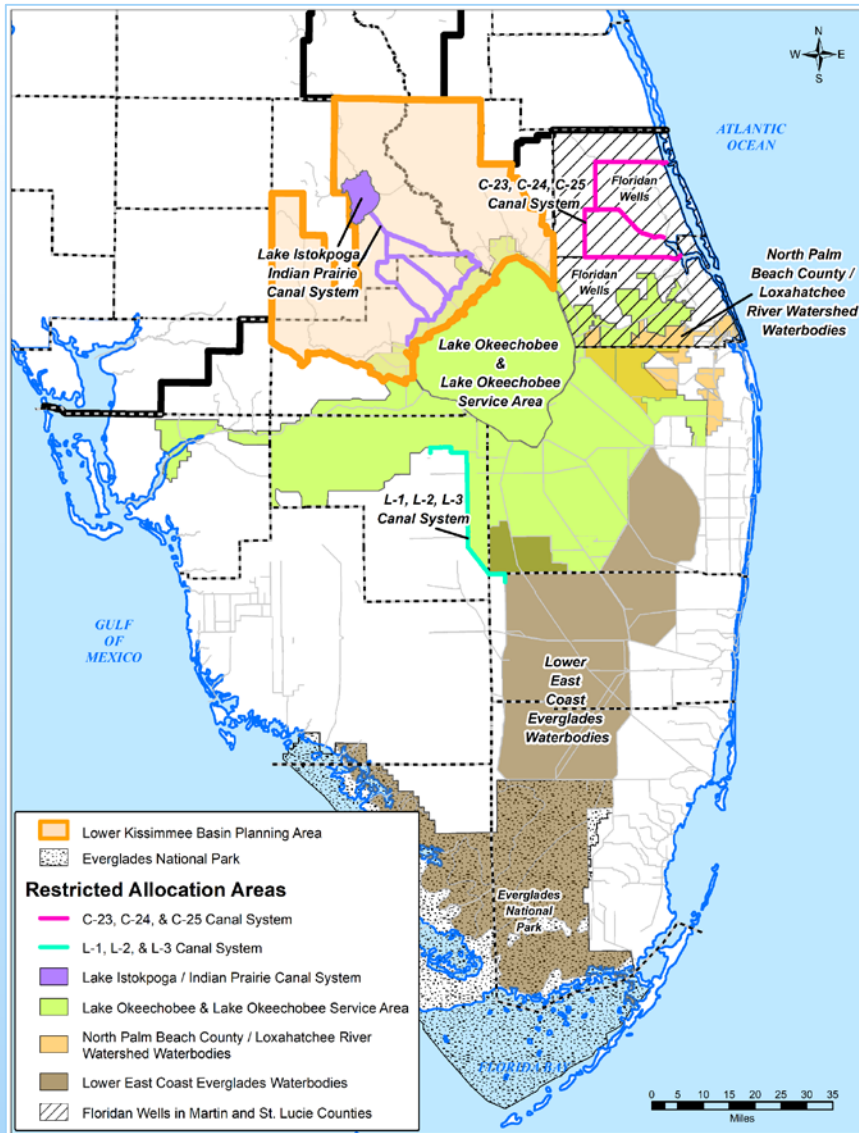
Listed in Section **3.2.1** of the ***Applicant's Handbook***, incorporated by reference in **Rule 40E-2.091, F.A.C.**

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## Definition and Uses

- Areas from which new or increased water allocations are restricted
- Regional in scope, for specific sources or areas of the SFWMD
- Implemented where water for projected needs is insufficient
- Protect water for natural systems and future restoration projects (CERP)
- May be designated as part of MFL recovery or prevention strategies

# Restricted Allocation Areas in the SFWMD



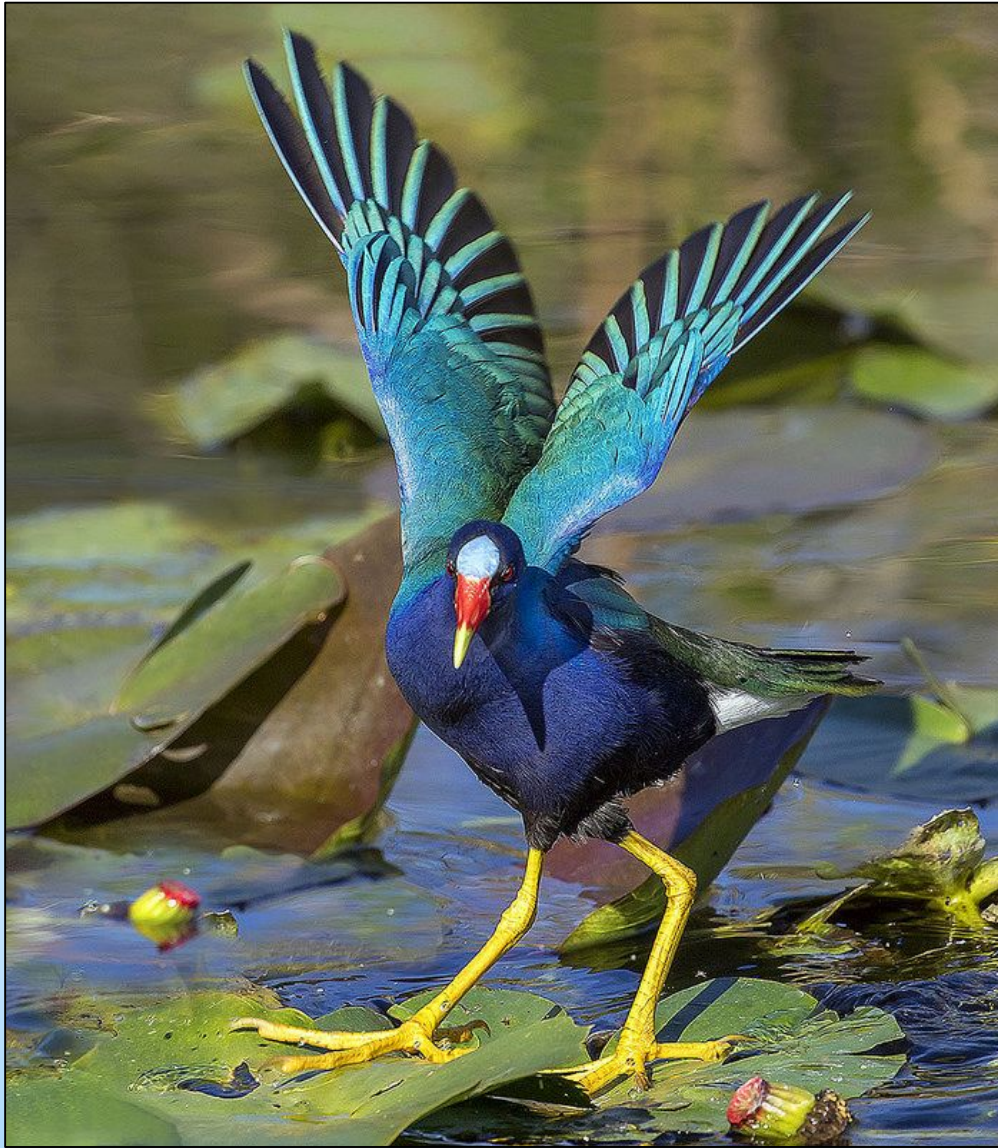
- C-23, C-24, & C-25 Canal System (1981)
- L-1, L-2, & L-3 Canal System (1981)
- Lake Istokpoga/Indian Prairie Canal System (1981)
- Lower East Coast Everglades Waterbodies (2007)
- North Palm Beach County / Loxahatchee River Watershed (2007)
- Pumps on Floridan Wells in Martin and St. Lucie Counties (2007)
- Lake Okeechobee & Lake Okeechobee Service Area (2008)

*Cover > 4.3 million acres districtwide*

## RAA Criteria in the Lower Kissimmee Basin Planning Area

RAA	Water Allocations Are Limited To:
<b>Lake Istokpoga / Indian Prairie Canal System</b>	Existing surface water allocations (no additional allocations) Existing surface water pump capacity (no increases in pump capacity)
<b>Lake Okeechobee and Lake Okeechobee Service Area</b>	Historic water use that occurred from <b>April 1, 2001 to January 1, 2008</b>





Purple Gallinule (*Porphyrio martinicus*)  
Source: flickr.com

## Questions?

**For more information contact:**

**Toni Edwards at**  
**[tedwards@sfwmd.gov](mailto:tedwards@sfwmd.gov) or**  
**(561)682-6387**

**Don Medellin at**  
**[dmedelli@sfwmd.gov](mailto:dmedelli@sfwmd.gov) or**  
**(561)682-6340**

**<https://www.sfwmd.gov/our-work>**

# Public Water Supply in the LKB Planning Area



**John Hayford**

Utility Director, Okeechobee Utility Authority

Stakeholder Meeting #2

October 4, 2019





# OKEECHOBEE UTILITY AUTHORITY

**2019 LKB Water Supply Plan Update Meeting  
Okeechobee, Florida  
October 4, 2019**



# **The Okeechobee Utility Authority**

- Created by Interlocal Agreement between the:
  - City Of Okeechobee;
  - Okeechobee County;
  - Okeechobee Beach Water Association.
- The Agreement signed in 1995

# **The Okeechobee Utility Authority**

The Interlocal Agreement creating the OUA established the OUA as a “Special District” defined by Chapter 189, F.S.

A Special District is defined as a local unit of special purpose, as opposed to a general purpose government.

## **Special Districts:**

- Have Governing Boards with policy making powers;

- Provide essential governmental services and facilities;

- Operate in a limited geographical area.

# The Okeechobee Utility Authority

Special Districts can be either:

Dependent Special Districts which means that they are:

- Under some control by a single County or Municipal government;
- May have identical governing board members;
- May appoint or remove any governing board member;
- May approve or veto annual budget.

Independent Special Districts

- Do not have any of the above mentioned characteristics;
- May include area from more than one County.

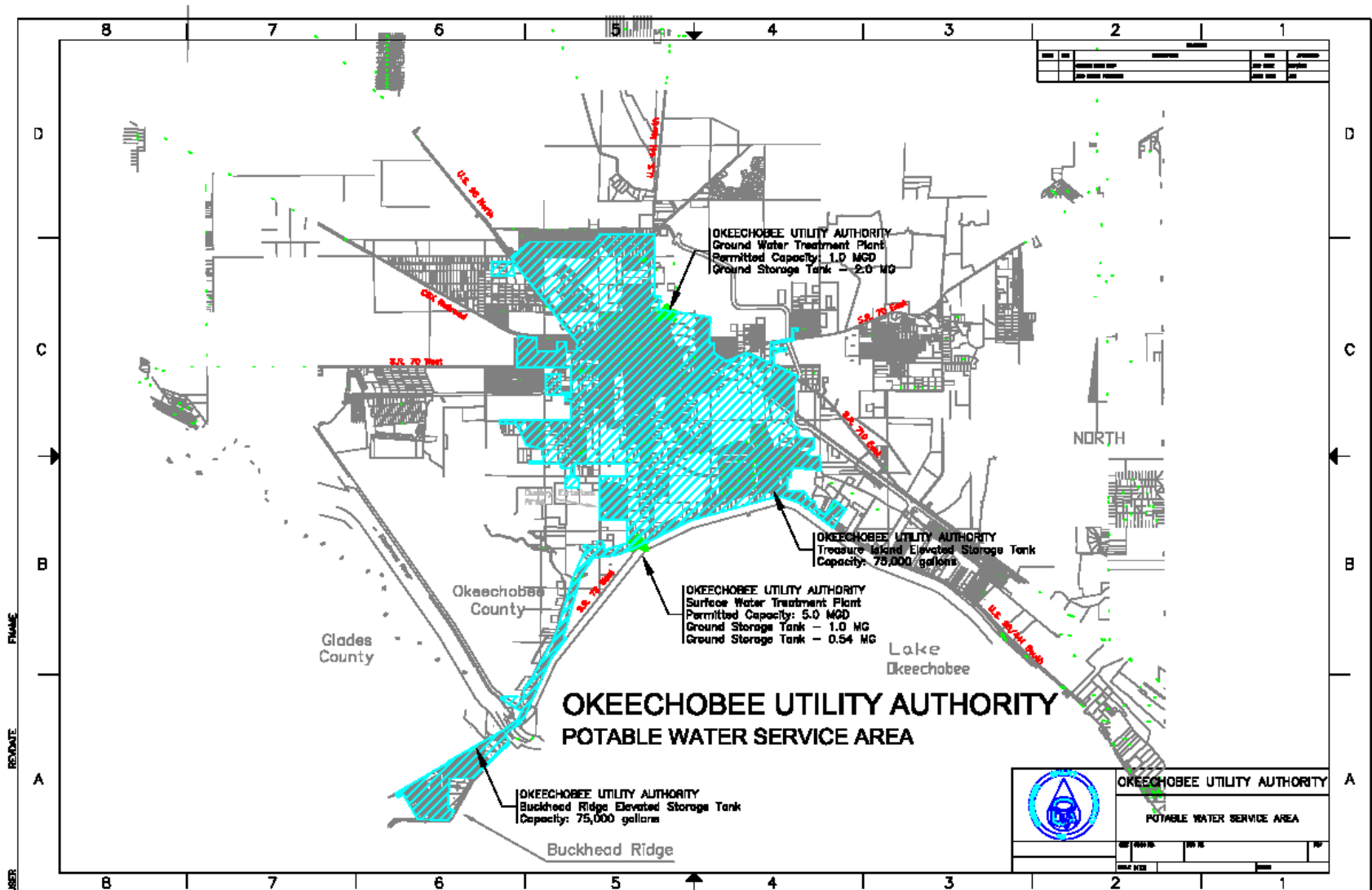
The OUA is an Independent Special District

# **The Okeechobee Utility Authority**

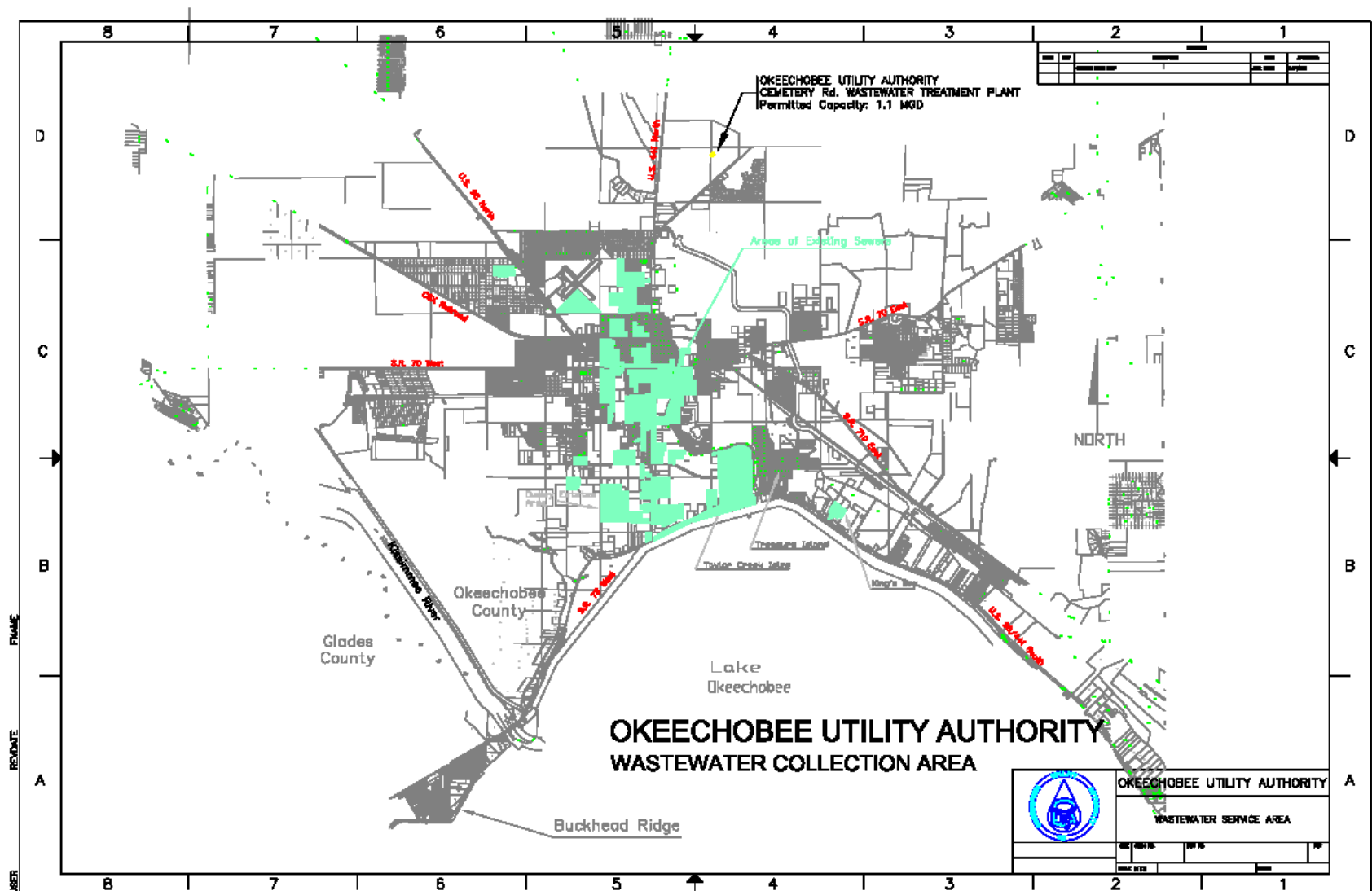
- The Okeechobee Utility Authority provides utility services, both water supply and wastewater treatment.
- The OUA Service Area consists of Okeechobee County and a portion of NE Glades County.
- Glades County area includes the Buckhead Ridge area.



# OUA Water Service Area



# OUA Wastewater Service Area



# Okeechobee Utility Authority Water Treatment Facilities







Photo by Florida Aerial Services, Inc

040408-3959

**OUA Surface Water Treatment Plant**





**OUA Ground Water Treatment Plant**

# Okeechobee Utility Authority

## Water Treatment Facilities

- OUA Surface Water Treatment Plant
  - FDEP Permitted Capacity 5.0 MGD
  - Constructed in 2005
  - Two lake intakes
  - One intake on the Rim Canal
- OUA Ground Water Treatment Plant
  - FDEP Permitted Capacity 1.0 MGD
  - Constructed in 1993
  - Seven Shallow Wells

# Okeechobee Utility Authority Wastewater Treatment Facility

- OUA Regional Wastewater Treatment Facility
  - FDEP Permitted Capacity 4.0 MGD
  - Final Construction completed in 2010
  - Effluent Disposal by land application or deep injection well
  - Residuals (AA) disposal to landfill or fertilizer supplement





Photo by Florida Aerial Services, Inc

040809-6582

**OUA Wastewater Treatment Plant**





**OUA WWTF Deep Injection Well**



**OUA WWTF Residuals Drying Facility**

# The Okeechobee Utility Authority

Where is the Okeechobee Utility Authority heading?

- Facility Infrastructure Expansion and Improvements

New wastewater septic to sewer projects to meet both public health concerns and water quality improvements

Construction of a new 3 MG ground storage tank at the surface water treatment plant (remove 1.5 MG )

Water & Wastewater Master Planning Projects

Continued facility restoration, replacement or upgrades

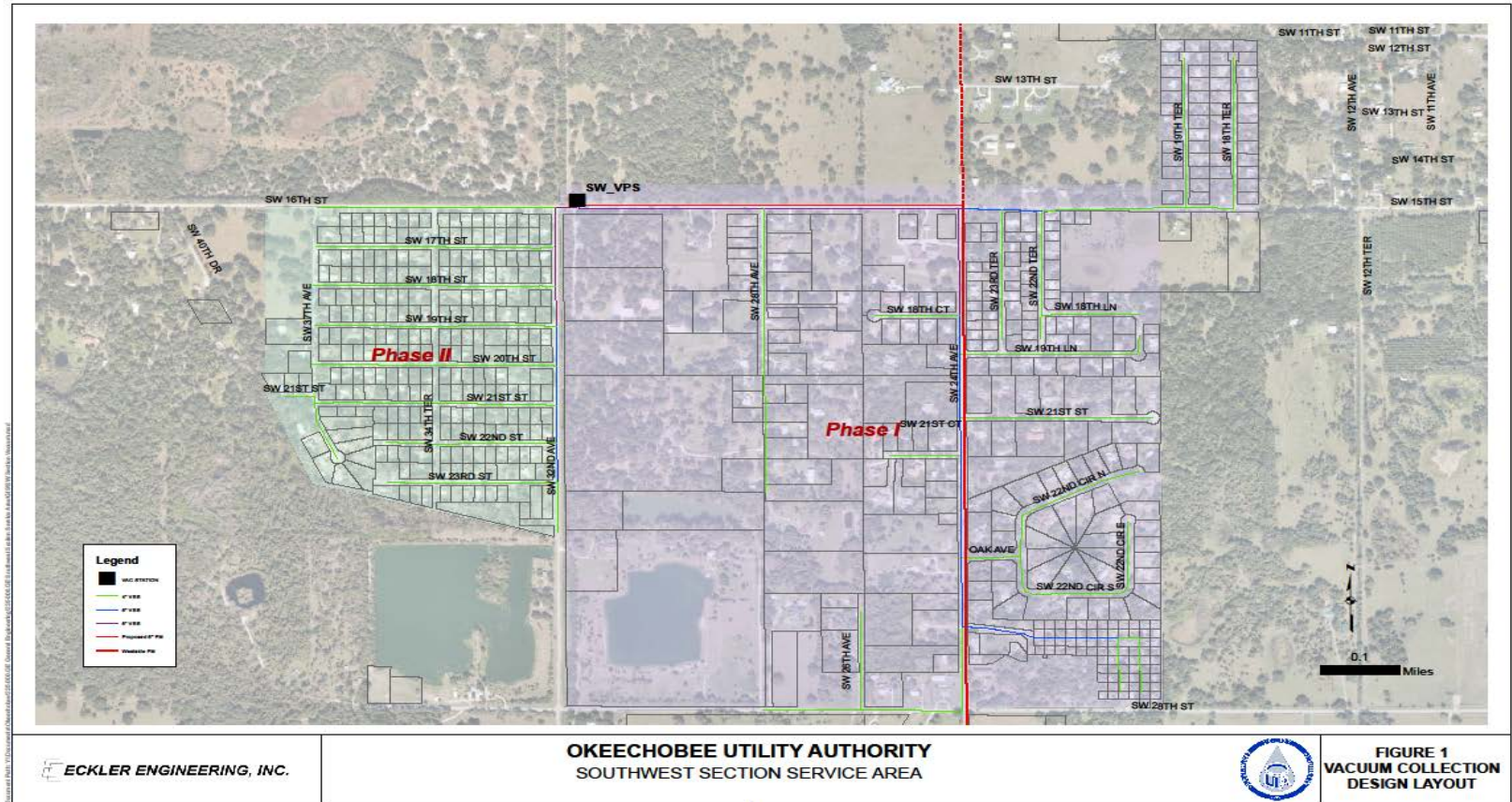
Consideration of Advanced Metering Infrastructure (AMI) as water meter replacement

# OUA Infrastructure Projects

- SW Wastewater Service Area Project
  - New Customers
    - Residential  $\pm 738$  (738 ERC's)  
(Where ERC = Equivalent Residential Connection)
  - Estimated to remove 6.7 tons per year of nitrogen
  - Estimated to remove 1.6 tons per year of phosphorus
  - Estimated Construction Cost - \$13,950,000



# Southwest Wastewater Service Area



# OUA Infrastructure Projects

- Pine Ridge Park Septic to Sewer Project
  - New Connections
    - Residential – 80 (80 ERC's)
  - Estimated to remove 0.75 tons per year of nitrogen
  - Estimated to remove 0.25 tons per year of phosphorus
  - Estimated Construction Cost - \$1,500,000

# OUA Infrastructure Projects

- Treasure Island Septic to Sewer Project
  - New Connections
    - Residential – 2,430 (2,430 ERC's)
  - Estimated to remove 21.9 tons per year of nitrogen
  - Estimated to remove 5.3 tons per year of phosphorus
  - Estimated Construction Cost - \$24,300,000

# OUA Infrastructure Projects

- Okee-Tantie Wastewater Improvements
  - New Connections
    - Residential – 39 (39 ERC's)
    - Non-Residential 14 (20 ERC's)
    - Master Meter - 33 (574 ERC's)
  - Estimated to remove 5.7 tons per year of nitrogen
  - Estimated to remove 1.4 tons per year of phosphorus
  - Estimated Construction Cost - \$10,500,000



# All Projects

## ➤ New Customers

- Residential  $\pm 3,287$  (3,287 ERC's)
- Non-Residential 14 (20 ERC's)
- Master Meter - 33 (574 ERC's)

➤ Estimated to remove 35 tons per year of nitrogen

➤ Estimated to remove 8.6 tons per year of phosphorus

➤ Estimated Construction Cost - \$50,250,000

# Water Supply Issues



**OUA Intake Looking East, circa 2007**

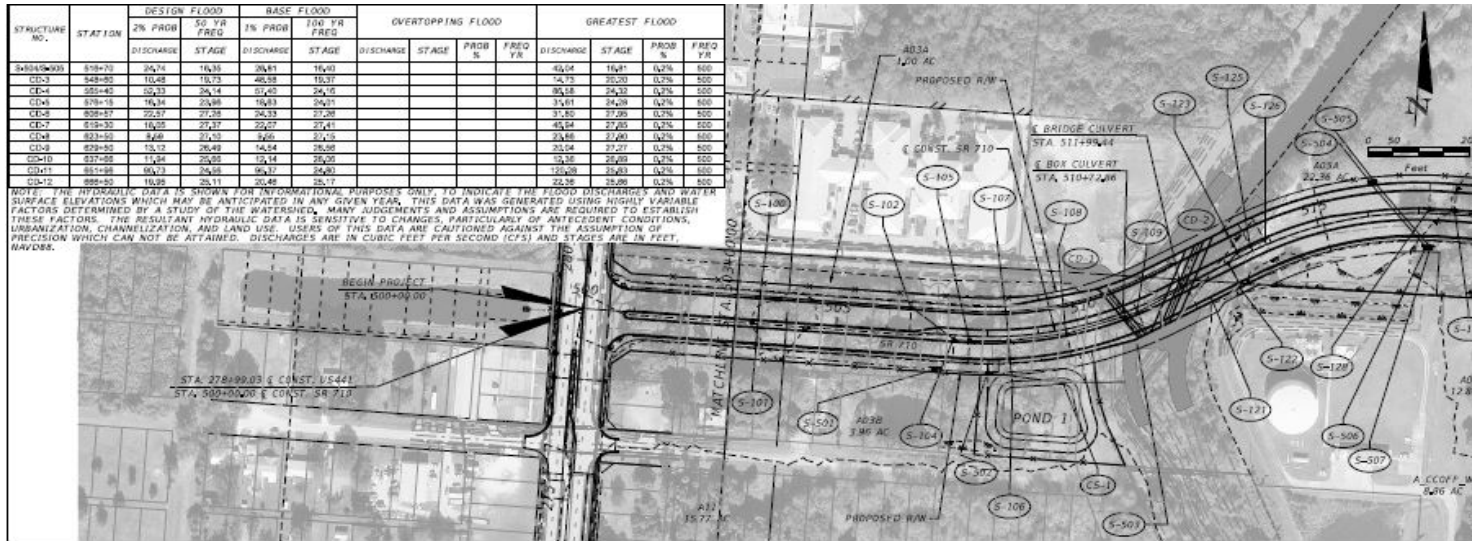
# Water Supply Issues



**OUA Intake Looking West, circa 2007**

# OUA Water Supply Issues

## Well Field Impacts





# Okeechobee Utility Authority

## Questions & Answers

# 2019 Lower Kissimmee Basin Water Supply Plan Update

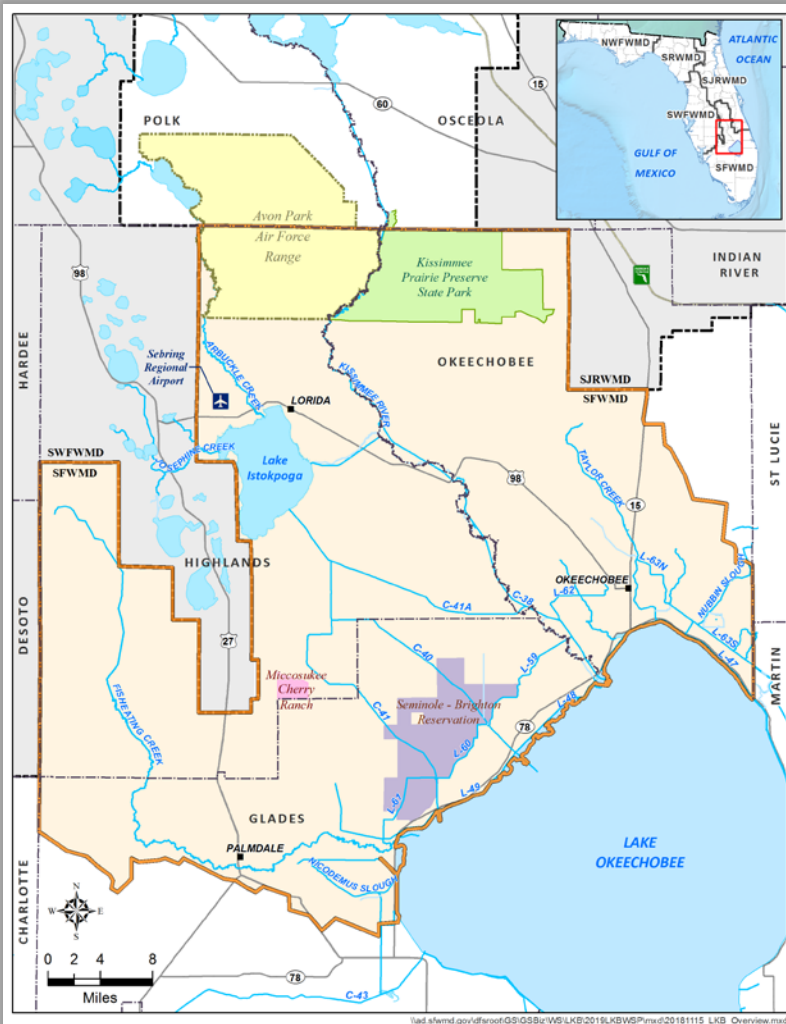


**Natalie Kraft**  
Plan Manager

Stakeholder Meeting #2  
October 4, 2019



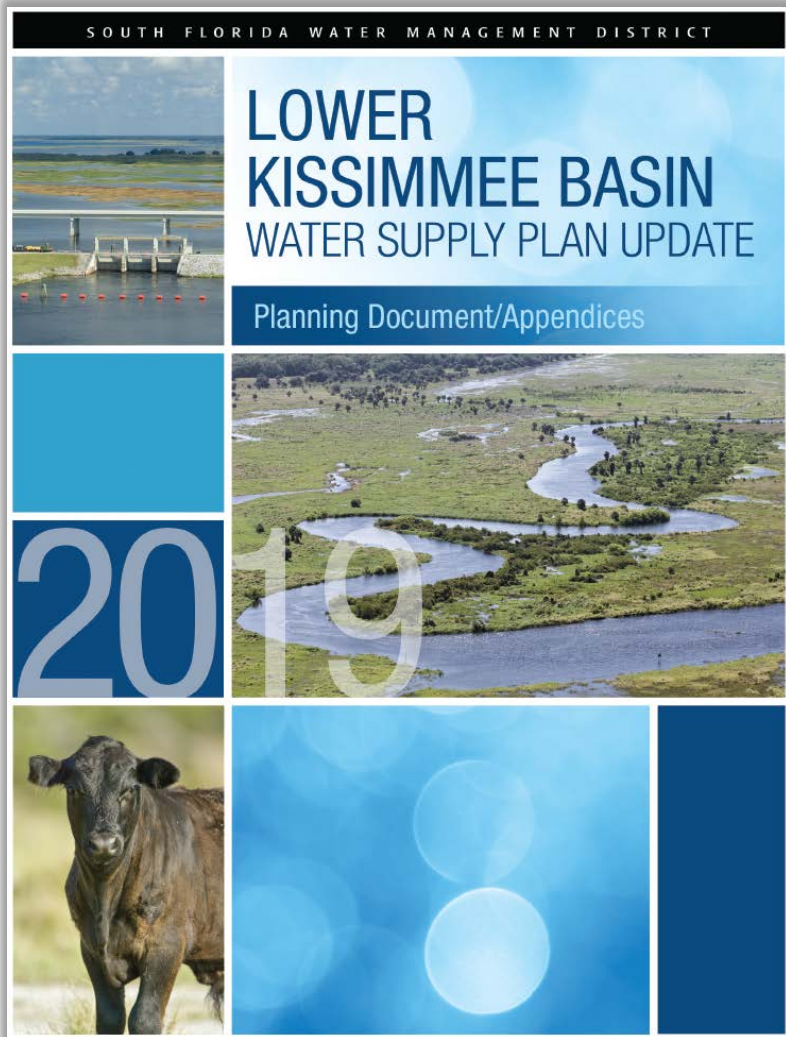
# Lower Kissimmee Basin Planning Area



- Portions of Okeechobee, Highlands, and Glades counties
- Seminole Tribe of Florida Brighton Reservation
- Population
  - 2017 52,496 residents
  - 2040 58,662 residents

*12% increase*
- Major agricultural industry
- Significant environmental systems

# Public Participation



- Governing Board updates
- Two stakeholder workshops
- Discussions with local government, tribal, agricultural, and utility representatives
- Draft LKB documents posted online September 27
- Written comments due back November 1



# Planning Document Outline

- Executive Summary
- Chapter 1: Introduction
- Chapter 2: Demand Estimates and Projections
- Chapter 3: Demand Management – Water Conservation
- Chapter 4: Water Resource Protection
- Chapter 5: Water Source Options
- Chapter 6: Water Resource Issues and Analyses
- Chapter 7: Water Resource and Supply Development Projects
- Chapter 8: Future Direction

## Appendices:

- Information for Local Governments
- Demand Projections
- MFLs
- Wastewater Treatment Facilities
- Utility Summaries

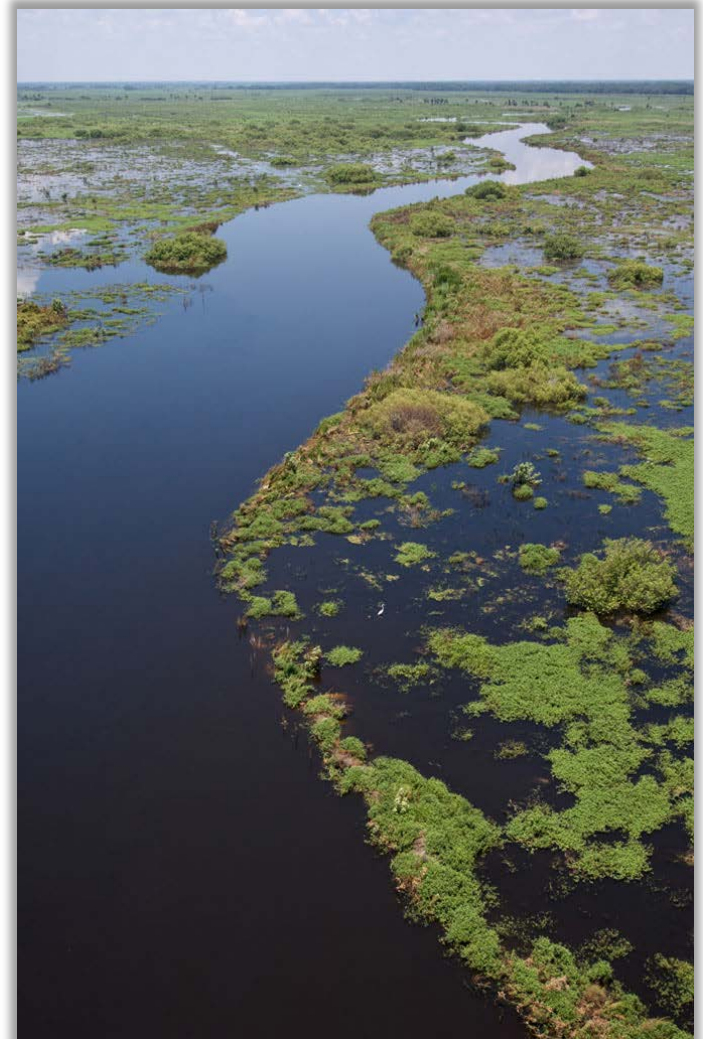
# Goal of Water Supply Plans

*To identify sufficient water supply sources and future projects to meet existing and future reasonable-beneficial uses during 1-in-10 year drought conditions through 2040 while sustaining water resources and related natural systems.*

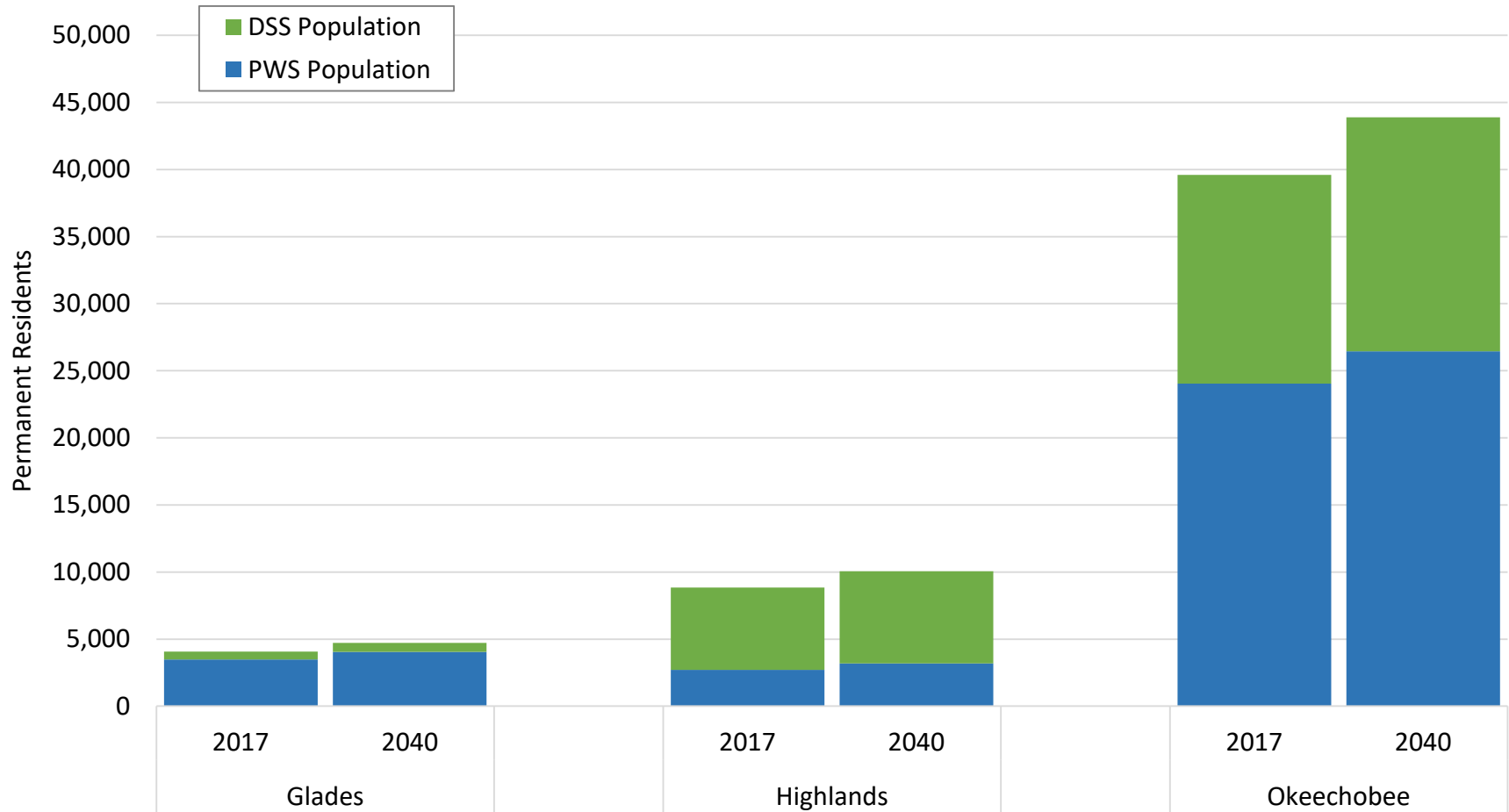


# 2019 LKB Plan Update Objectives

- Water Supply
- Natural Systems
- Conservation
- Linkage with Local Governments
- Compatibility and Linkage with Other Efforts



# Population Projections







# Agricultural Irrigation Demands – AFSIRS

Crop Type	2017		2040	
	Acres	Average Demand (mgd)	Acres	Average Demand (mgd)
Hay/Pasture	43,046	81.90	37,892	72.71
Citrus	38,316	64.03	36,957	62.37
Sugarcane	17,436	37.82	21,250	46.40
Other Crops*	20,236	45.57	27,019	59.13
<b>Crop Subtotal</b>	<b>119,034</b>	<b>229.49</b>	<b>123,118</b>	<b>240.61</b>
Livestock/Aquaculture	--	7.54	--	7.54
<b>Total</b>	<b>119,034</b>	<b>237.02</b>	<b>123,118</b>	<b>248.14</b>

\* Other crops includes sod, greenhouse/nursery, field crops, fruit (non-citrus), and potatoes.  
mgd = million gallons per day

# Total Demand Projections

Water Use Category	2017	2040	Change
Public Water Supply	3.04	3.39	+0.35
Domestic & Small Public Supply	2.02	2.28	+0.26
Agricultural Irrigation	237.02	248.14	+11.12
Industrial/Commercial/Institutional	1.70	1.95	+0.25
Recreational/Landscape Irrigation	1.64	1.73	+0.09
Power Generation	0.00	0.00	0.00
<b>Total</b>	<b>245.42</b>	<b>257.49</b>	<b>+12.07</b>

Demands under average rainfall conditions, in million gallons per day.

# Demand Management: Water Conservation

- Among the lowest-cost solutions
- Agriculture
  - FDACS Best Management Practices
  - More efficient irrigation systems
- Public water supply
  - Outdoor irrigation ordinances
  - More efficient plumbing fixtures
- Potential 2040 savings: 17 mgd





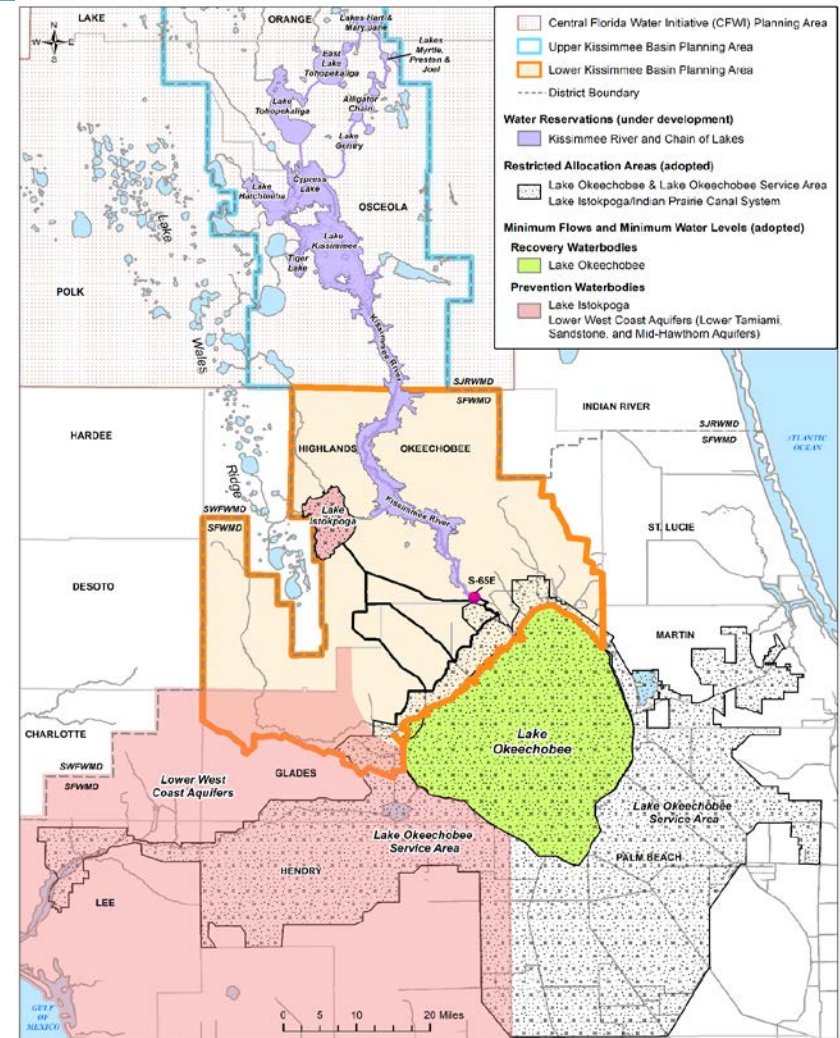
# Water Resource Considerations

- Environmental water needs for the Kissimmee River Restoration Project
- Seminole Tribe of Florida Brighton Reservation water entitlement
- Effects of groundwater withdrawals on Lake Wales Ridge MFL water bodies
- Impacts of climate change on agricultural water demands
- Regulatory limitations on surface water availability

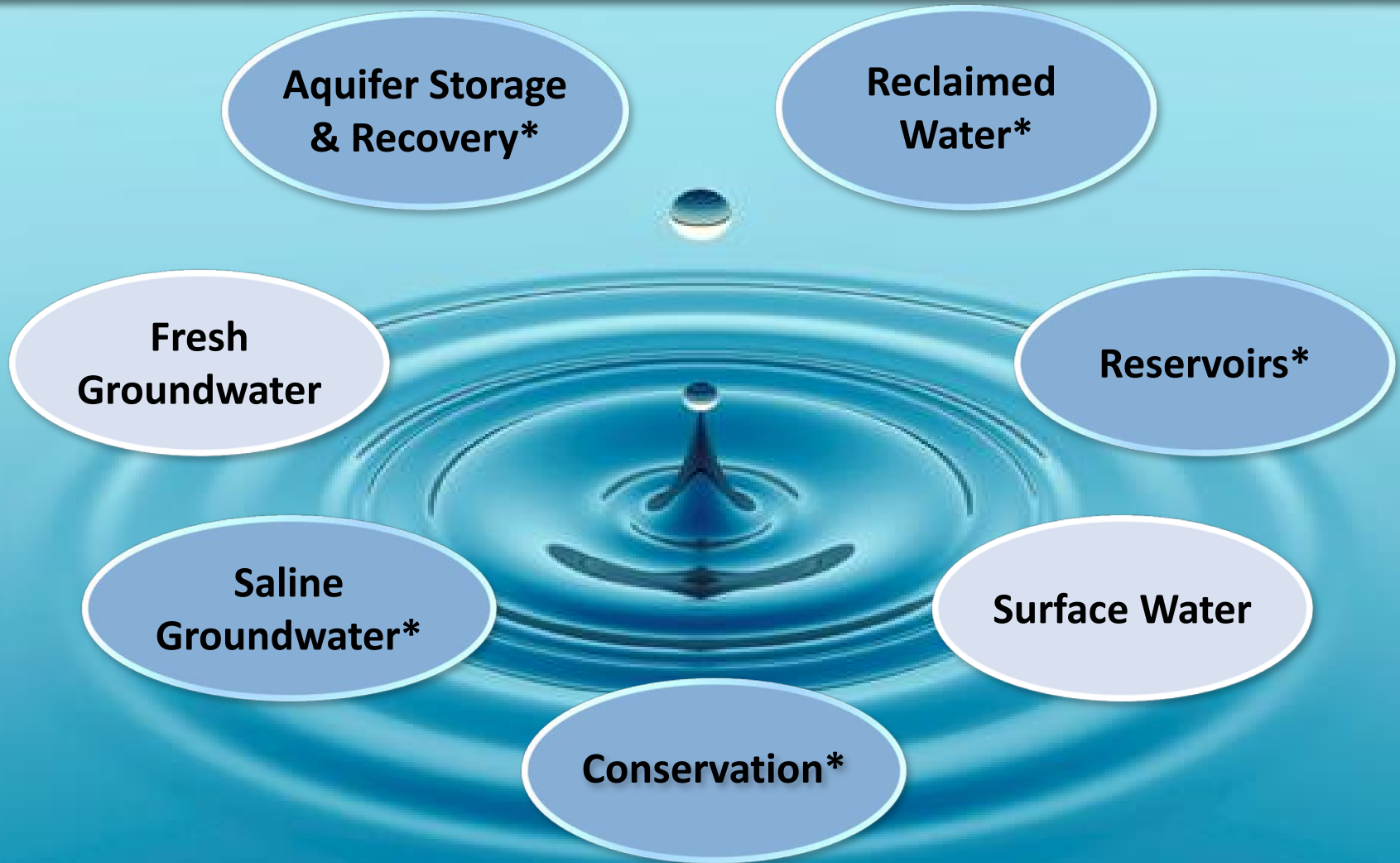


# Resource Protections

- Water Reservations
  - Kissimmee River and Chain of Lakes (under development)
- Minimum Flows & Minimum Water Levels (MFLs)
  - Lake Istokpoga
- Restricted Allocation Areas
  - Lake Istokpoga/Indian Prairie Canal System
  - Lake Okeechobee Service Area



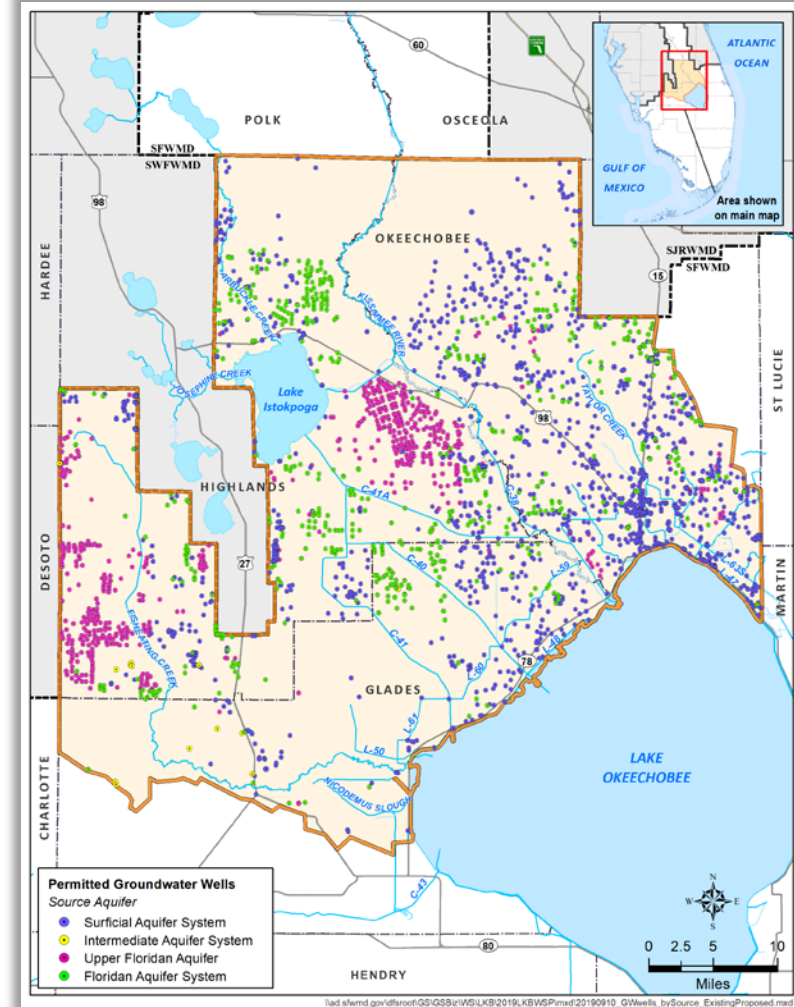
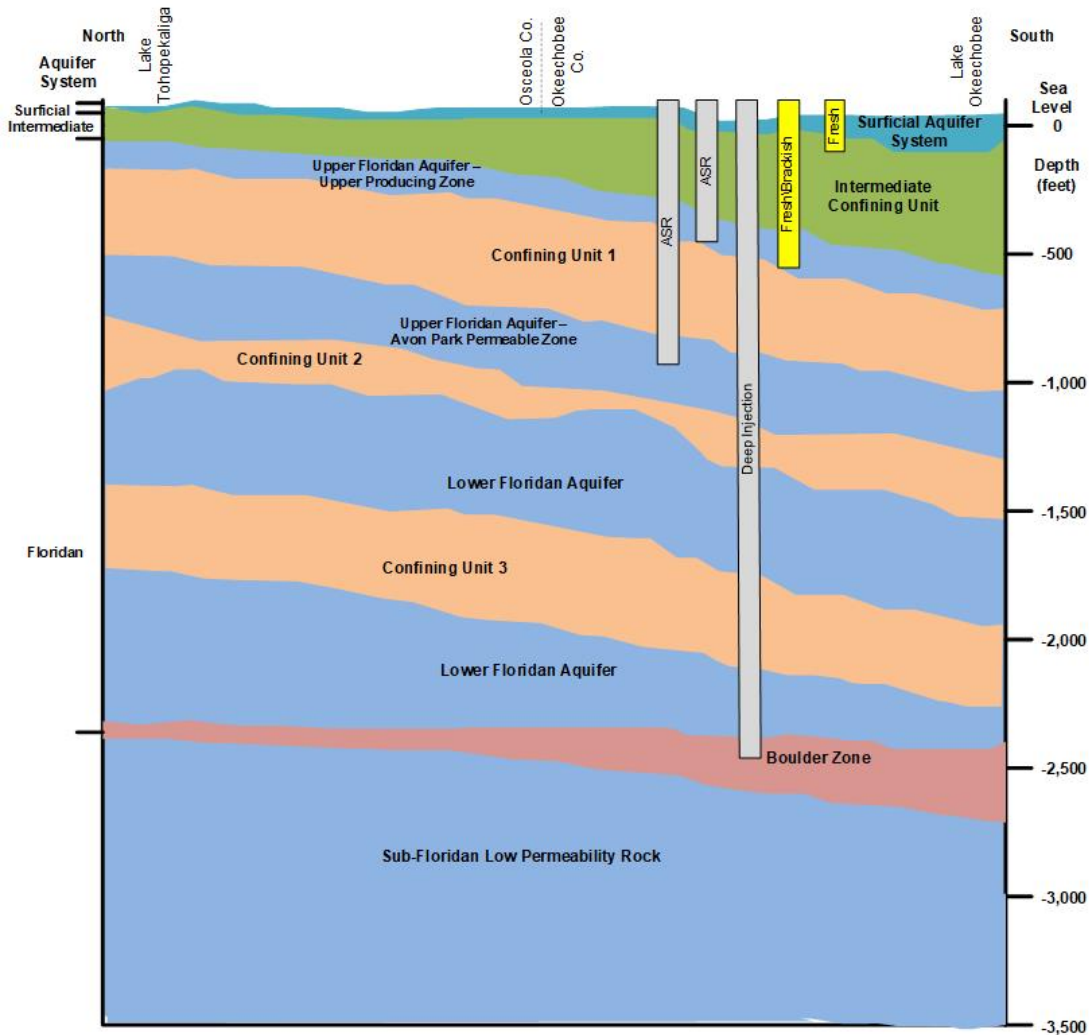
# Water Source Options



\* Alternative water source



# Groundwater Sources



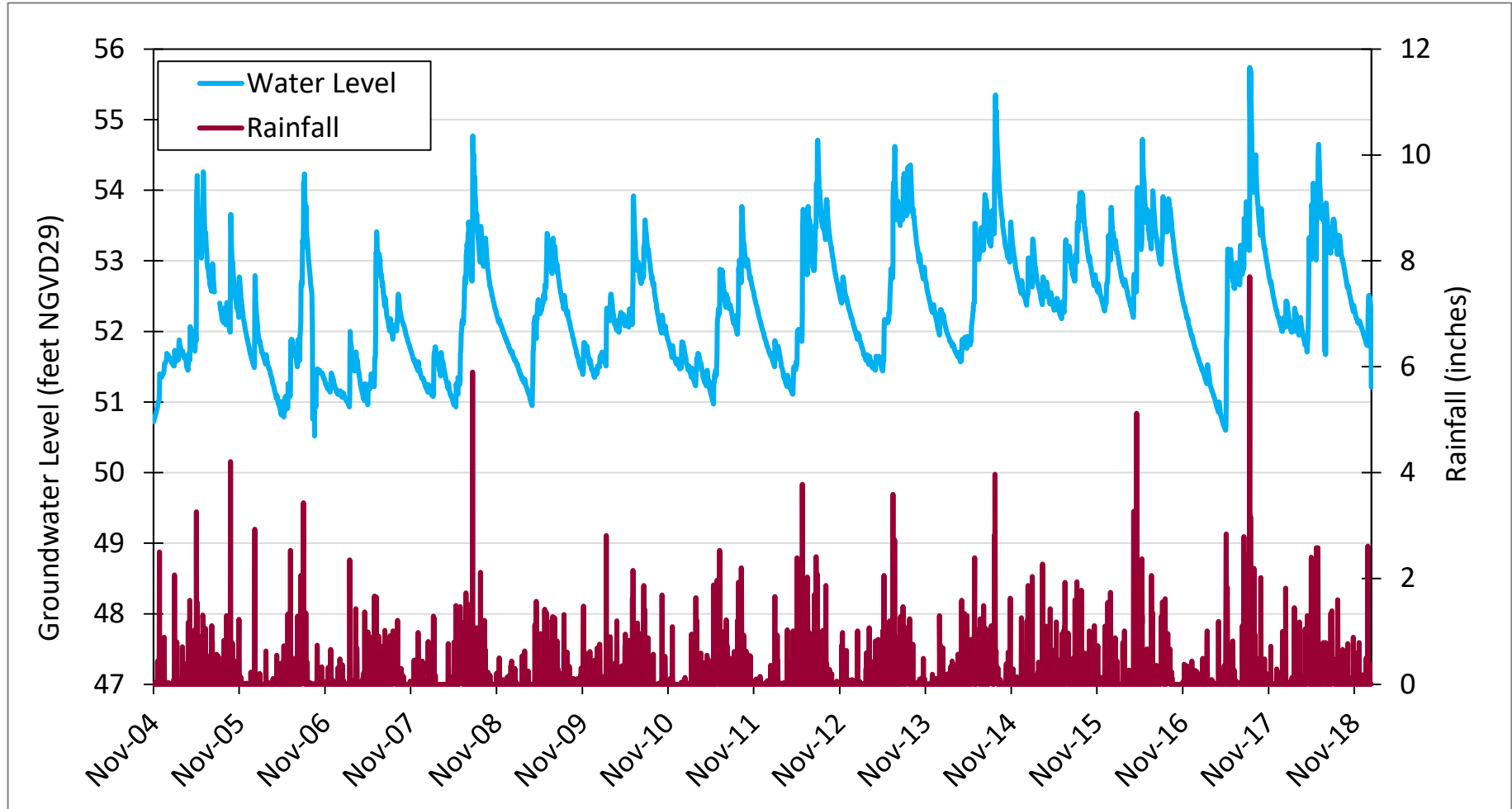


# Resource Evaluation & Analysis

- Review of 2014 groundwater modeling results
- Review of water use permit information
- Consideration of regulatory limits on surface water withdrawals
- Analysis of groundwater levels



# Groundwater Levels & Rainfall



# Water Resource Development Projects

- Kissimmee River Restoration Project
- CERP Lake Okeechobee Watershed Restoration Project
- Dispersed Water Management Program
- NEEPP Lake Okeechobee Watershed Protection Plan
- NEEPP Taylor Creek & Nubbin Slough STAs

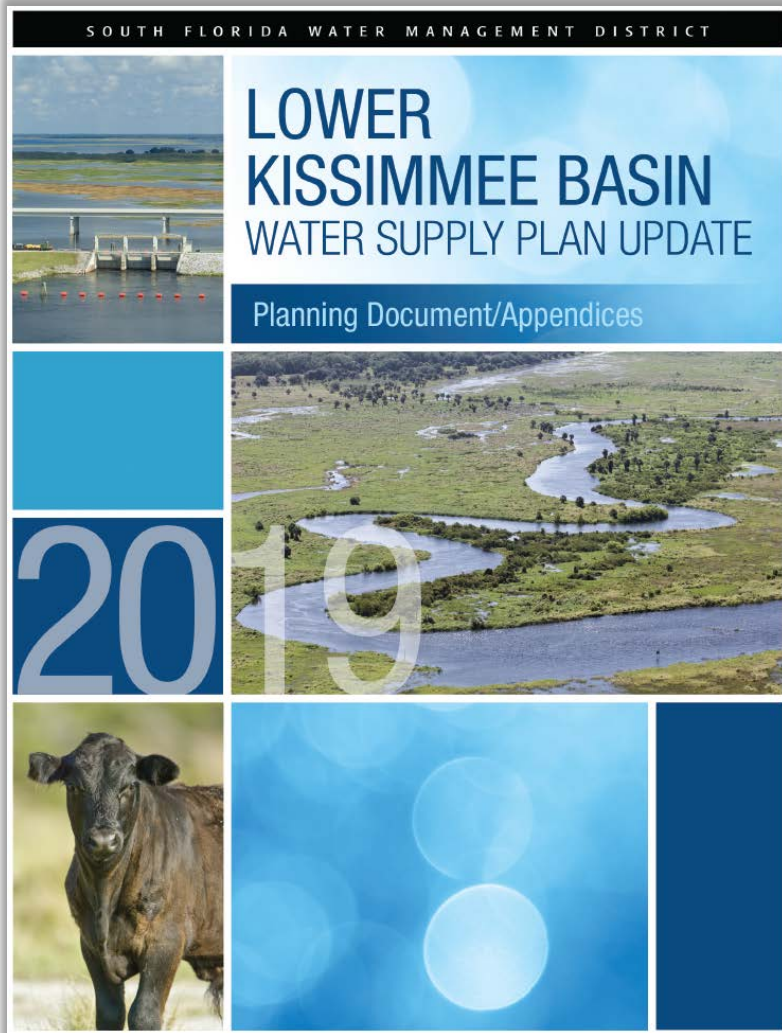


# Future Direction

- Complete the Kissimmee River Restoration Project
- Complete the Kissimmee River and Chain of Lakes Water Reservations
- Finalize & implement components identified in the Lake Okeechobee Watershed Restoration Project's tentatively selected plan
- As appropriate, reduce or augment water use for agricultural irrigation via stormwater and tailwater recovery and more efficient water conservation practices
- Continue coordination with local governments, other state agencies, tribal nations, utilities, and water users



# Draft Plan Conclusion



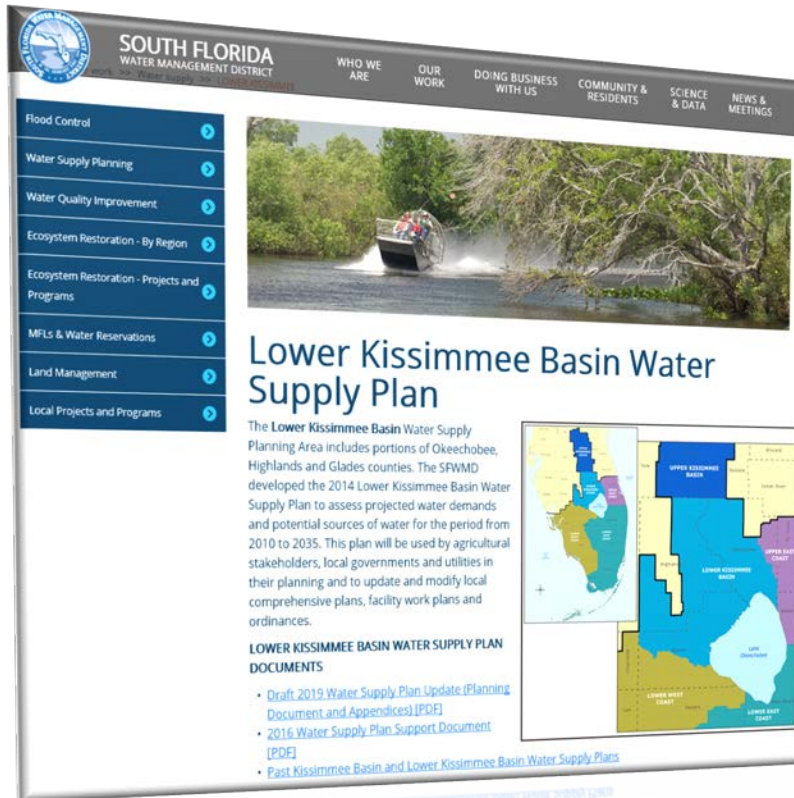
Future water needs of the region can be met through the 2040 planning horizon with appropriate management and conservation.

# Next Steps

- *September 27*      *Posted draft plan documents*
- *October 4*      Stakeholder meeting #2
- *October 10*      Presentation to Governing Board
- *November 1*      Deadline for external comments
- *December 12*      Final plan to Governing Board for consideration



# Questions?



- Plan information can be found at:  
[www.sfwmd.gov/lkbplan](http://www.sfwmd.gov/lkbplan)
- Written comments to:  
Natalie Kraft – Plan Manager  
[nkraft@sfwmd.gov](mailto:nkraft@sfwmd.gov)



# Thank You

Natalie Kraft

Plan Manager

[nkraft@sfwmd.gov](mailto:nkraft@sfwmd.gov)

(561) 682-2196

Mark Elsner, P.E.

Bureau Chief

[melsner@sfwmd.gov](mailto:melsner@sfwmd.gov)

(561) 682-6156

Tom Colios

Section Leader

[tcolios@sfwmd.gov](mailto:tcolios@sfwmd.gov)

(561) 682-6944