

2021 Upper East Coast Water Supply Plan Update



Welcome!

2021 UEC Stakeholder Kickoff Meeting

April 30, 2021

Questions and public comment will occur after each presentation.



Agenda

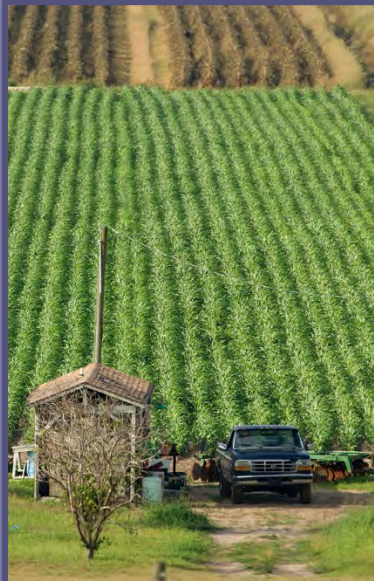
- **Welcome and Progress Since 2016** – *Mark Elsner, SFWMD*
 - **2021 Plan Update Process and Overview** – *Nancy Demonstranti, SFWMD*
 - **Status of the Citrus Industry** – *Lorenzo Rossi, University of Florida IFAS*
 - **Demand Estimates and Projections** – *Nathan Kennedy, NES Consulting*
-

10-minute Break

- **Water Resource Protection Tools** – *Toni Edwards, SFWMD*
- **Comprehensive Everglades Restoration Plan Projects** – *Leslye Waugh, SFWMD*
- **Next Steps** – *Nancy Demonstranti, SFWMD*
- **Adjourn**

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Welcome

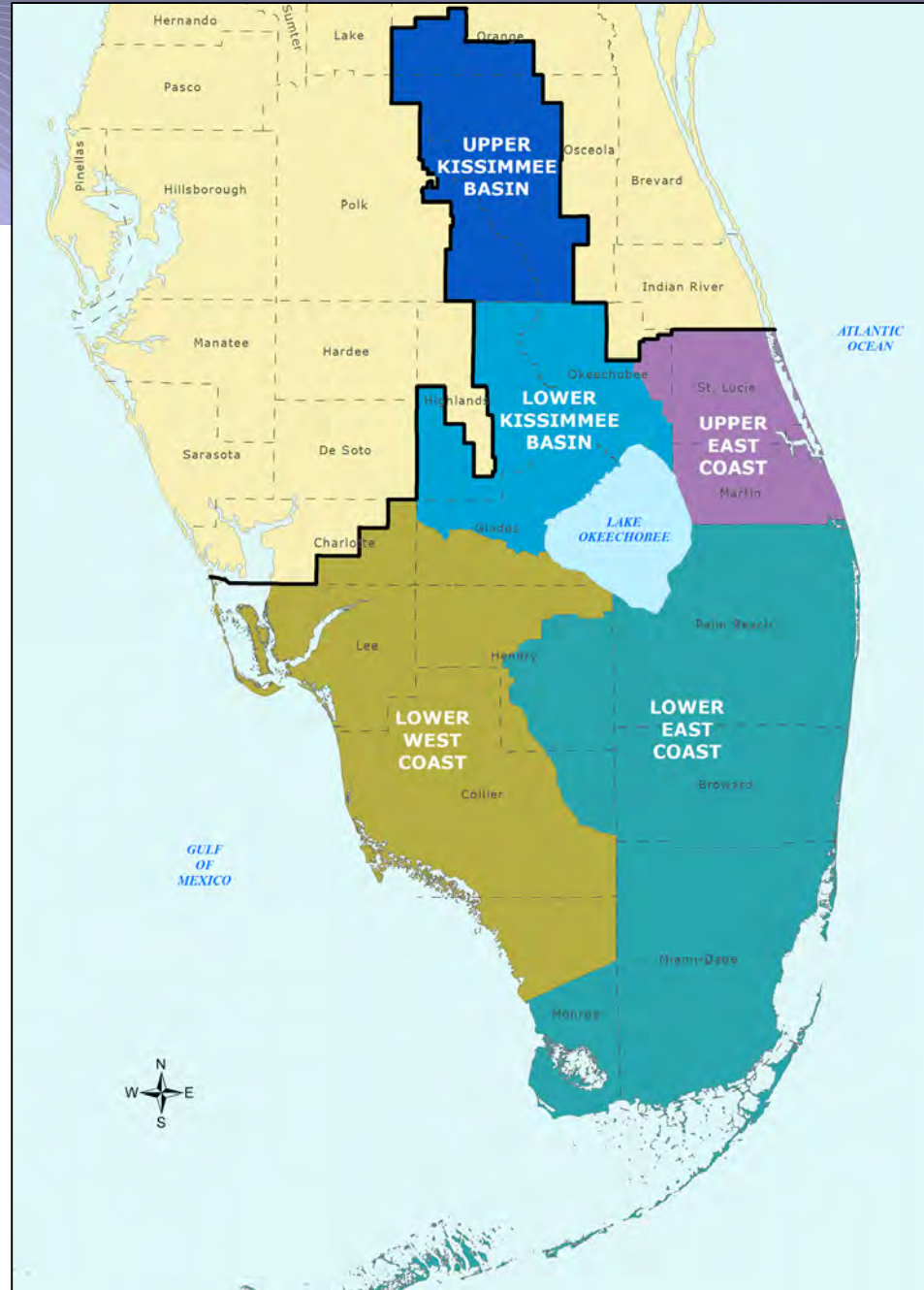


Mark Elsner, P.E.
Bureau Chief, Water Supply

2021 UEC Stakeholder Kickoff Meeting
April 30, 2021



SFWMD Water Supply Planning Areas



Regional Water Supply Plan

What it Does

- Provides a road map to meet future water needs while protecting water resources and natural systems
- Conducts a planning-level approach
- Projects future water demands
- Identifies and evaluates water source options

What it Does NOT Do

- Does not authorize consumptive use permits
- Does not establish MFLs
- Does not adopt rules
- Does not require water users to implement specific projects
- Does not address surface water quality issues (e.g., algal blooms)

Progress Since 2016



Mark Elsner, P.E.
Bureau Chief, Water Supply

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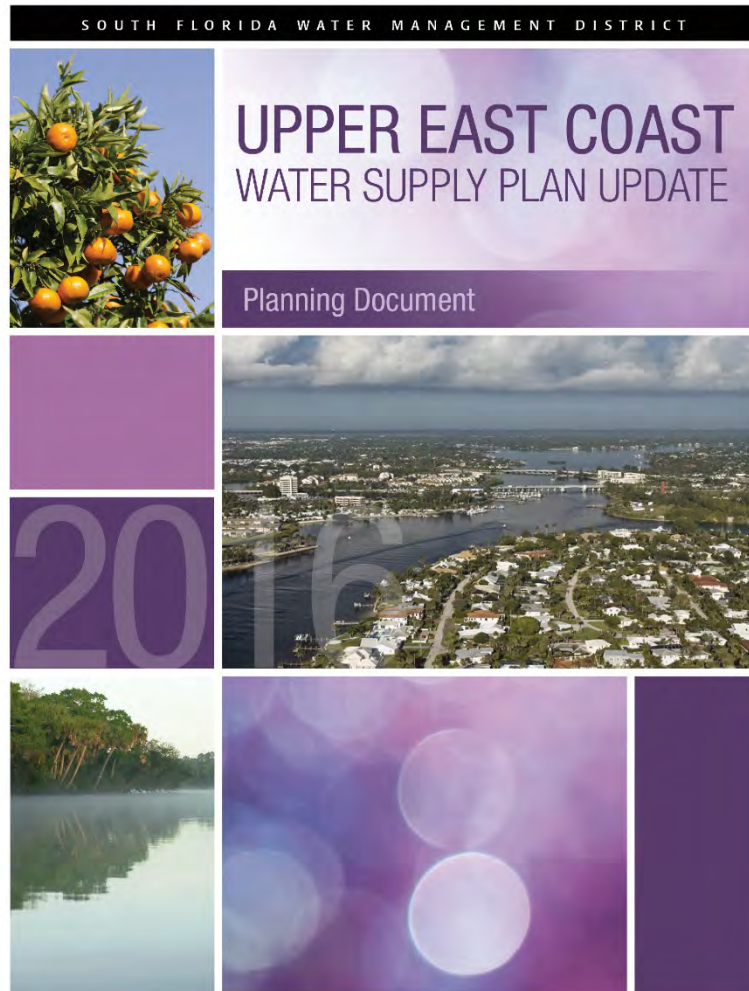


2016 Water Resource Considerations

- In many areas, especially coastal areas, large increases in withdrawals from the surficial aquifer system are limited due to low aquifer productivity
- Regulatory limitations on surface water availability
 - C-23, C-24, C-25, and C-44 canals and the Lake Okeechobee Service Area Restricted Allocation Area rules
 - Lake Okeechobee Service Area (LORS 2008)
- Freshwater discharges affecting coastal resources
 - Timing and volume
- Long-term availability of the Floridan aquifer system



2016 Upper East Coast Water Supply Plan Update Conclusions



- Future 2040 projected water needs of the region can be met with appropriate management, conservation, and implementation of projects.
- CERP implementation and other projects will be necessary to meet future water needs.
- Construction of one potable water supply development project.

2016 Future Direction

- Continue SAS and FAS aquifer monitoring programs
- Construct CERP and related projects
- Promote local storage projects
- Promote water reuse and conservation measures
- Coordinate with other agencies, local governments, and utilities on water supply elements
- Identify the potential impact of sea level rise on utilities and other users



Progress Since the 2016 UEC Plan Update



- Restoration & construction projects
 - C-44 reservoir and STA construction
 - C-23/C-24 STA design completion
 - Lakeside Ranch STA Phases 1 and 2 completion
 - Herbert Hoover Dike rehabilitation
- Regulatory protection efforts
 - Lake Okeechobee System Operating Manual (LOSOM)
- Hydrologic studies & modeling
 - East Coast Floridan Model update
 - CERP aquifer storage and recovery
 - Continued surficial and Floridan aquifer system groundwater monitoring

Water Supply and Conservation Project Support

➤ Alternative Water Supply Funding

- Port St. Lucie Tradition and Western Grove Communities Reclaimed Water Main Extension
- Stuart FAS Production Well #1
- Martin County Tropical Farms FAS Wells 6 and 7
- Port St. Lucie McCarty Ranch Reservoir Areas 3, 4 and 6

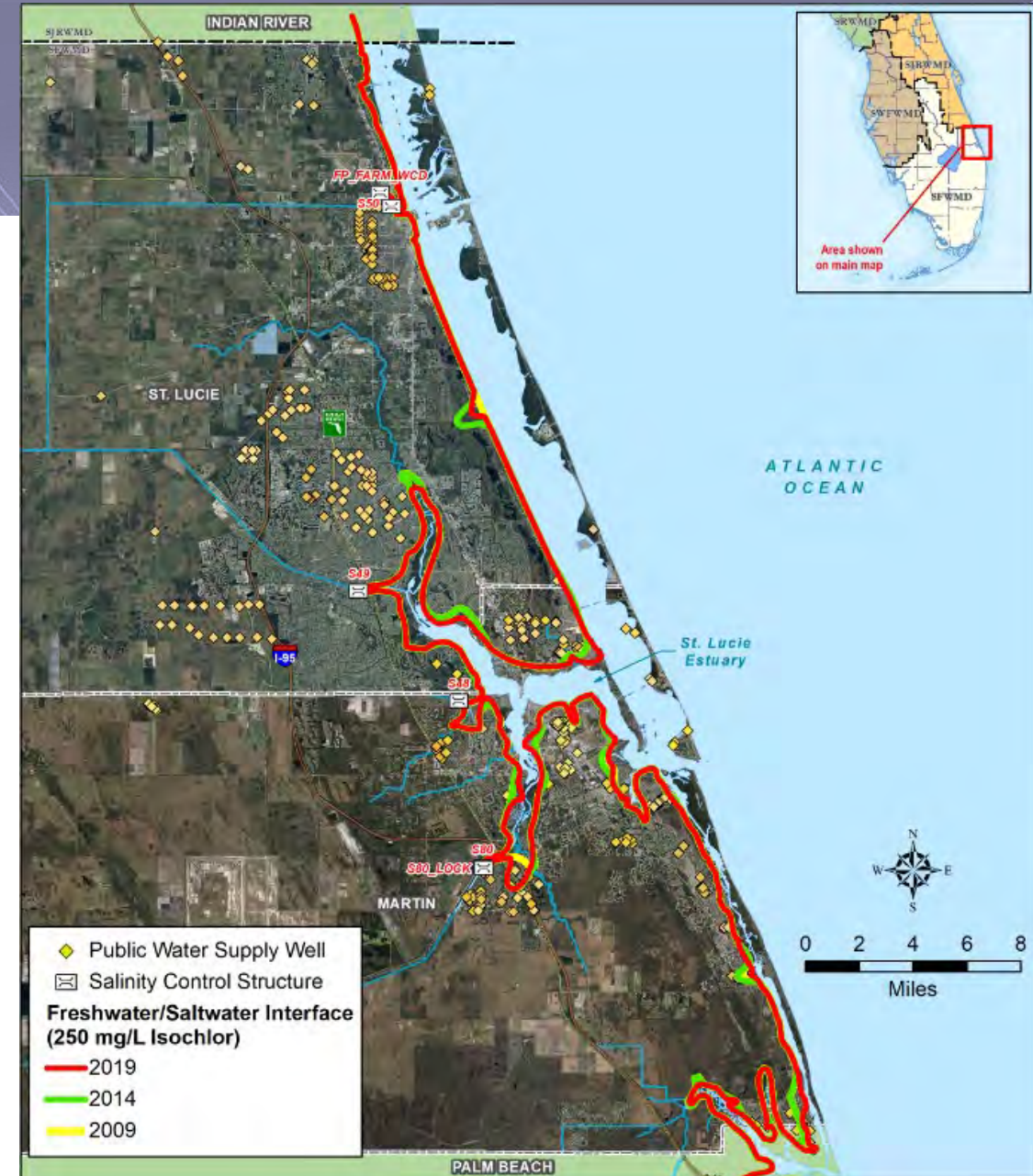
➤ Conservation Funding

- Bernard Egan & Company River Basket Citrus Grove Ag Irrigation Retrofit (225 acres)
- Bernard A Egan Groves, Inc. Cow Creek Citrus Grove Ag Irrigation Retrofit (1,200 acres)
- Graves Brothers Company Ashland Citrus Grove Ag Irrigation Retrofit - Site 10, 11, 12 (203.5 acres)
- Scott Groves, Inc. Scott Grove #2 Citrus Ag Irrigation Retrofit (511 acres)
- Scott Groves, Inc. Scott Groves #3 Citrus Ag Irrigation Retrofit (196 acres)
- Wescott Groves, LLC Wescott Grove 1 Citrus Ag Irrigation Retrofit (986 acres)
- Nettles Island, Inc. A Condominium Irrigation Water Conservation Retrofit
- Field Operations Division Martin County Engineering Irrigation H2O Conservation Retrofit Project



2019 Saltwater Interface Update

- Surficial aquifer system saltwater interface
 - 250 mg/L isochlor lines
- Update and comparison to 2009 and 2014 mapping effort
- No major changes, but interface is dynamic
- Maps published on SFWMD website



Questions and Public Comment



- If you are participating via Zoom:
 - Use the Raise Hand feature

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2021 Upper East Coast Water Supply Plan Update



Nancy Demonstranti, P.G.
Upper East Coast Plan Manager

2021 UEC Stakeholder Kickoff Meeting
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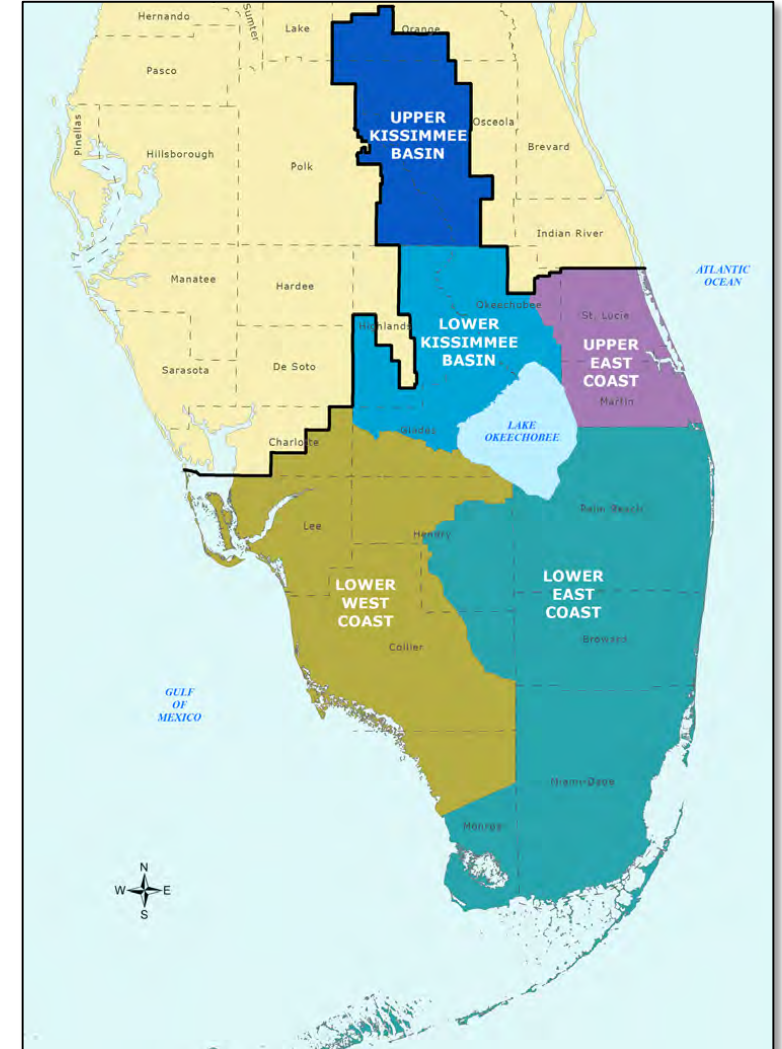
Statutory Goal of Water Supply Plans (Section 373.709, F.S.)

*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 **2045** while sustaining water resources and related natural systems.*



Water Supply Plan Requirements

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



Public Participation

➤ Active participation to ensure plan reflects the needs of the planning area

- Agricultural interests
- Public water suppliers
- Environmental community
- County commissions/city councils
- County/city planning staff
- Regional planning council
- Local Governing Board member involvement
- Water management districts

➤ Opportunities for public participation

- Stakeholder meetings
- Governing Board meetings
- One-on-one meetings
- Draft document review and comment



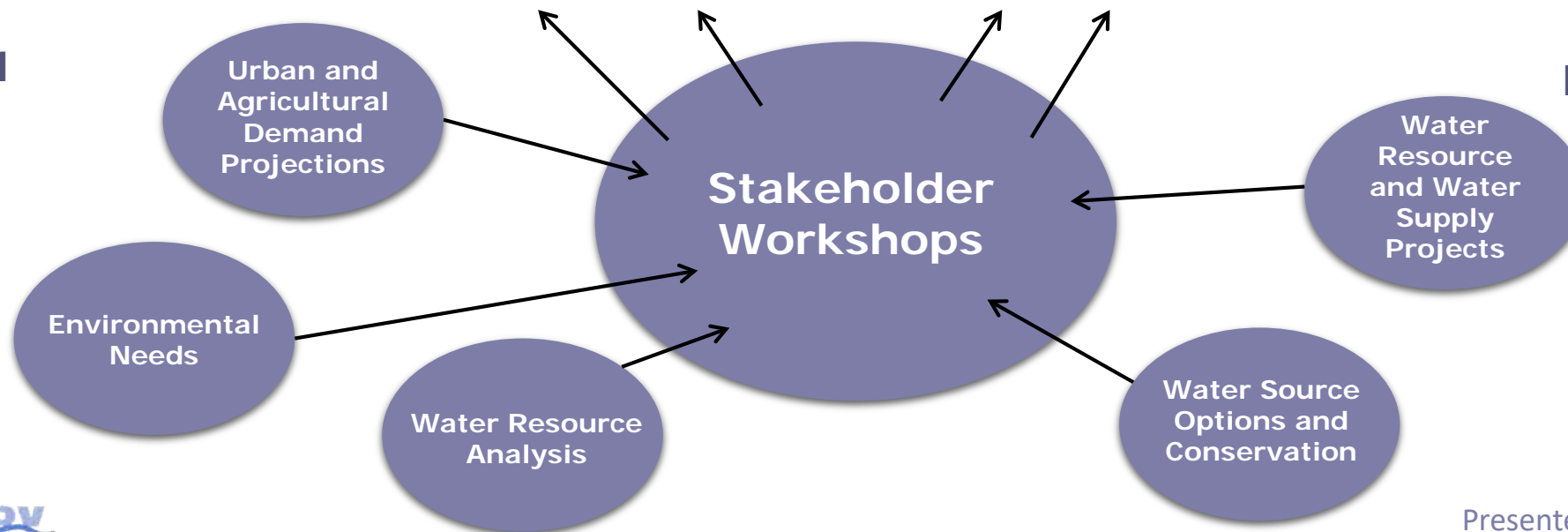
UEC Water Supply Plan Update Process



Upper East Coast Water Supply Plan

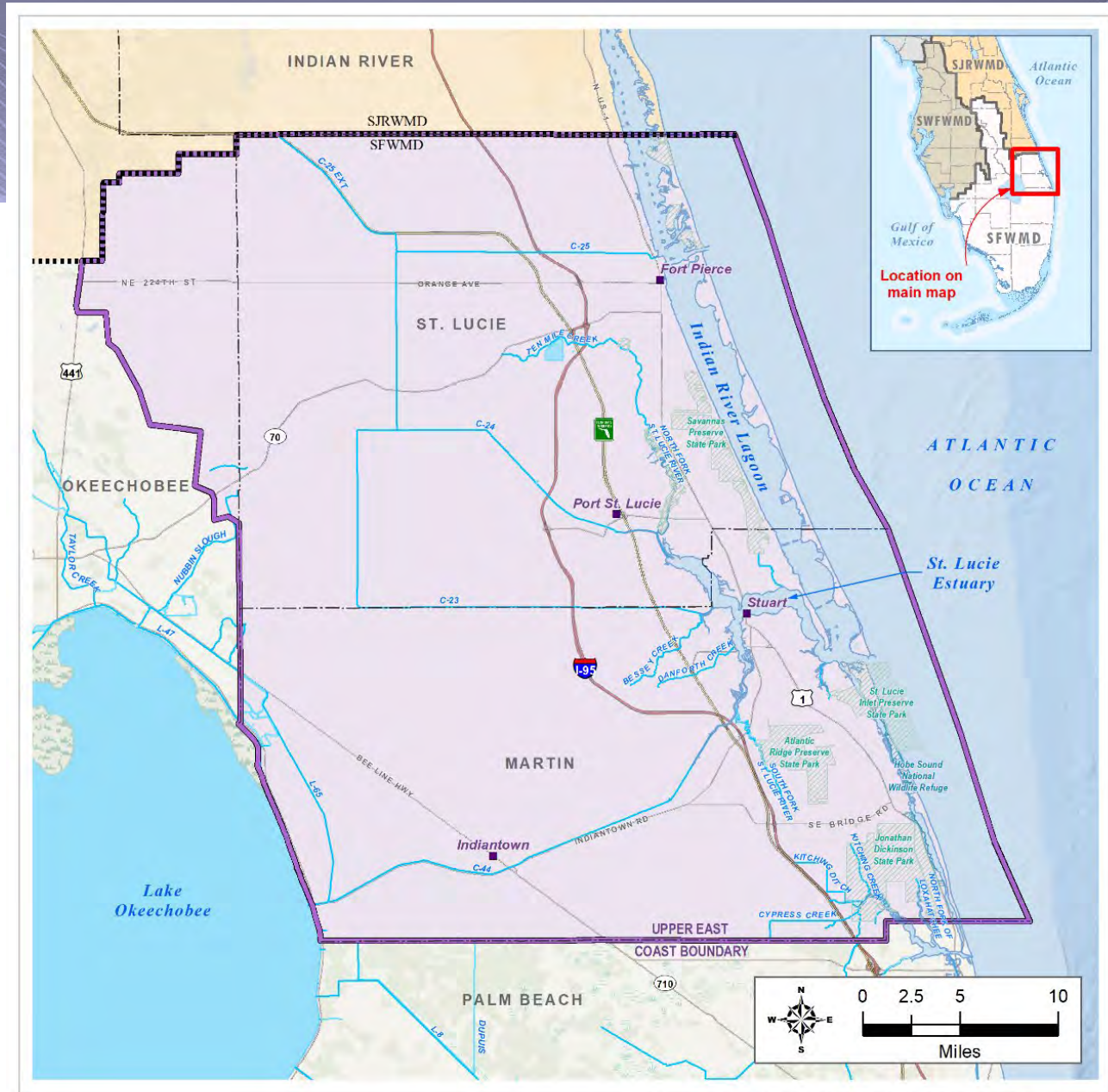
**Kickoff
April 2021**

**Board Approval
November 2021**



UEC Planning Area

- All of Martin and St. Lucie counties and the northeastern portion of Okeechobee County
- 1,230 square miles
- 17 public supply utilities
- Major agricultural industry
- Important natural and water resources
 - C-23, C-24, and C-25 canals
 - St. Lucie River and Estuary
 - Indian River Lagoon
 - North Fork of the Loxahatchee River



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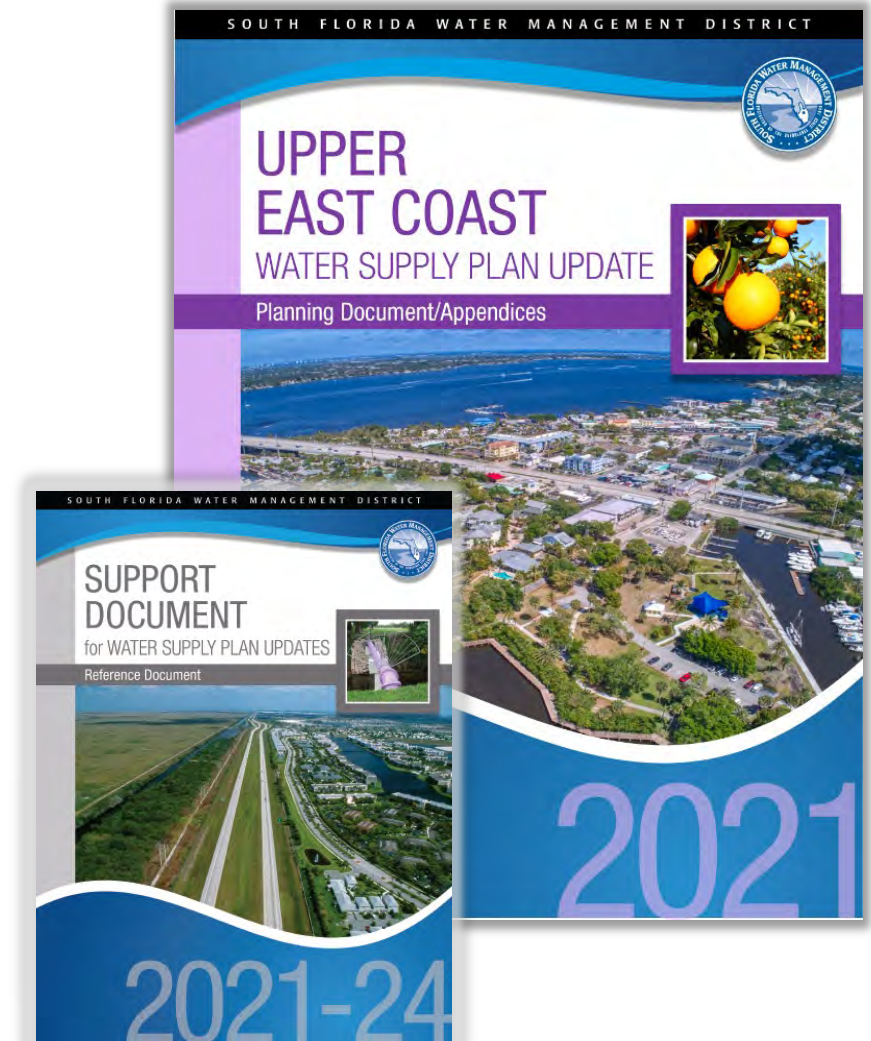
Objectives of 2021 UEC Plan Update

1. Water supply during 1-in-10 year drought conditions through 2045
2. Protect and enhance natural systems
3. Encourage water conservation measures
4. Promote compatibility with local government planning
5. Coordinate and integrate with other water resource initiatives

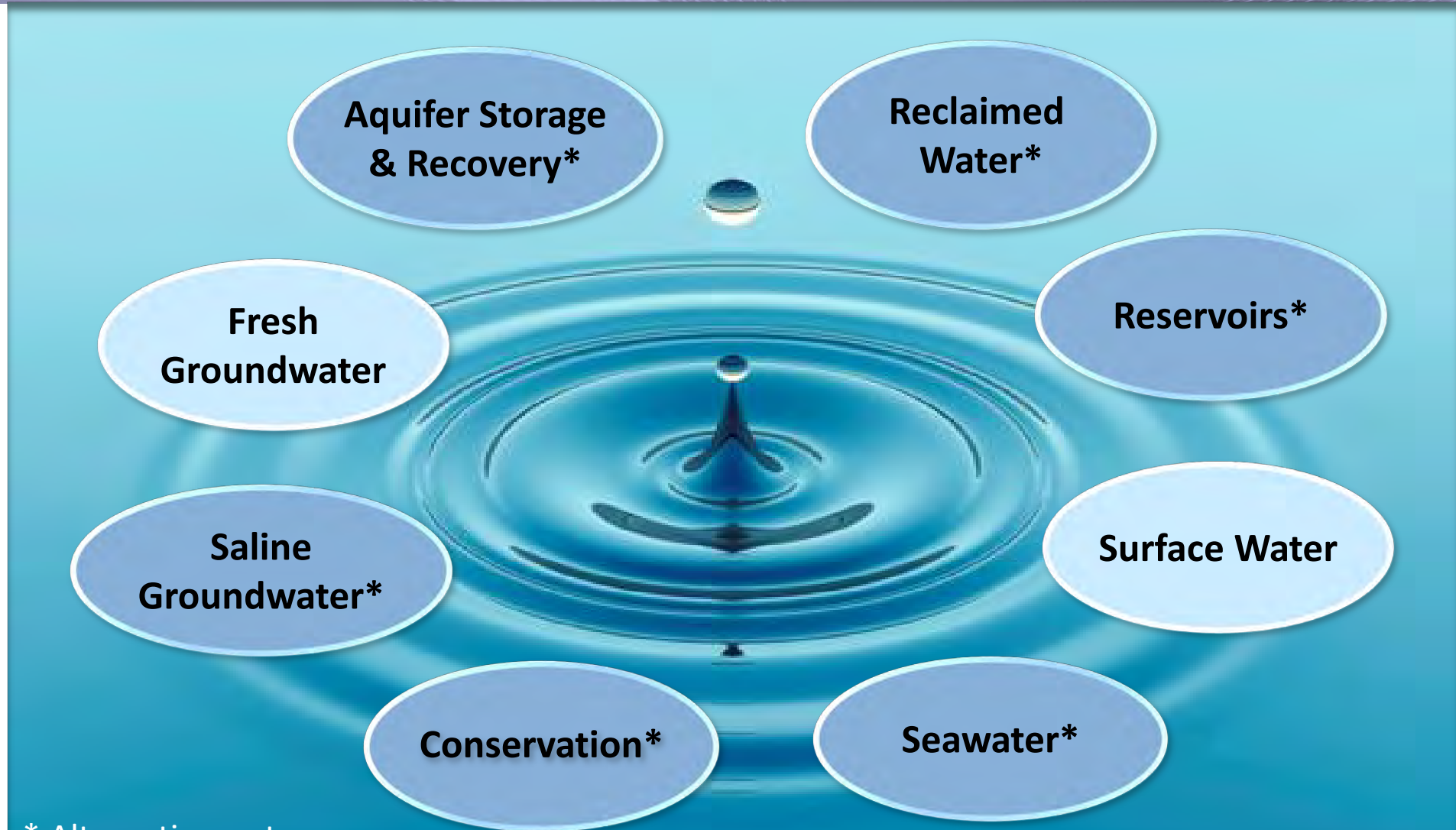


2021 UEC Water Supply Plan Organization

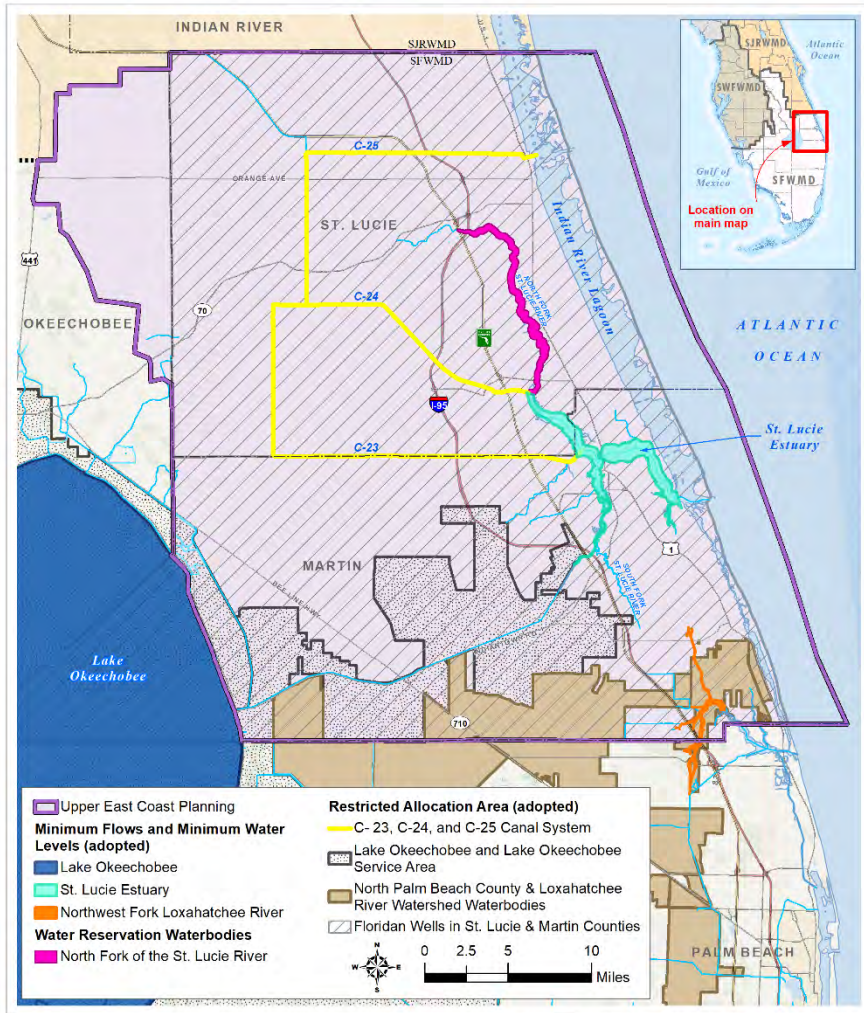
- Executive Summary
- Chapter 1: Introduction
- Chapter 2: Demand Estimates & Projections
- Chapter 3: Water Conservation
- Chapter 4: Resource Protection
- Chapter 5: Water Source Options
- Chapter 6: Water Resource Issues & Analyses
- Chapter 7: Water Resource Development Projects
- Chapter 8: Water Supply Development Projects
- Chapter 9: Future Direction



Water Source Options & Alternatives

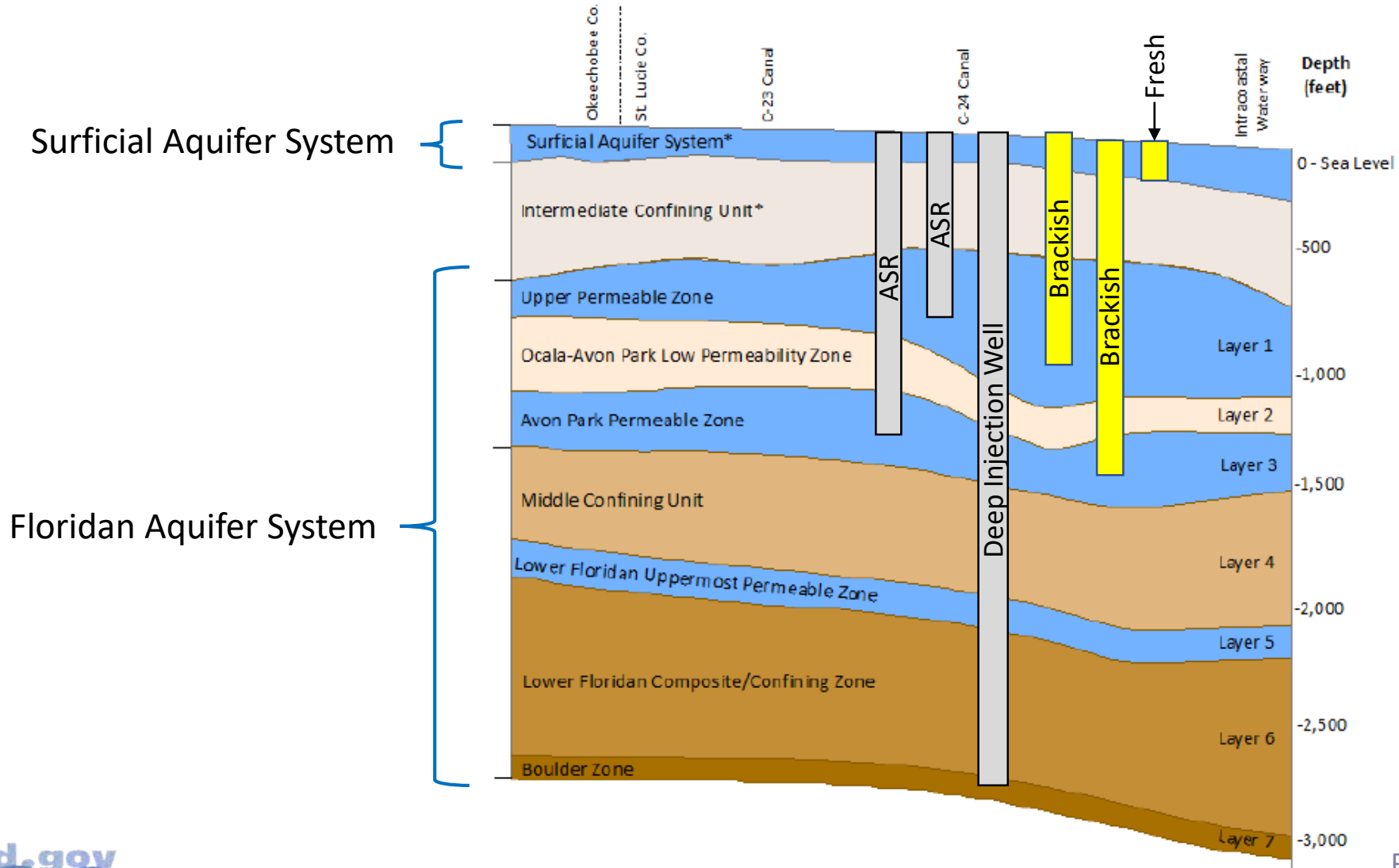


Water Resource Protection



- **Minimum Flows and Minimum Water Levels**
 - St. Lucie Estuary
 - North Fork of Loxahatchee River
 - Lake Okeechobee
- **Water Reservations**
 - North Fork of the St. Lucie River
- **Restricted Allocation Areas**
 - C-23, C-24 and C-25 canals
 - Lake Okeechobee Service Area
 - North Palm Beach County and Loxahatchee River Watershed waterbodies
 - Floridan wells in Martin and St. Lucie counties

Groundwater Sources



Aquifer Recharge Areas

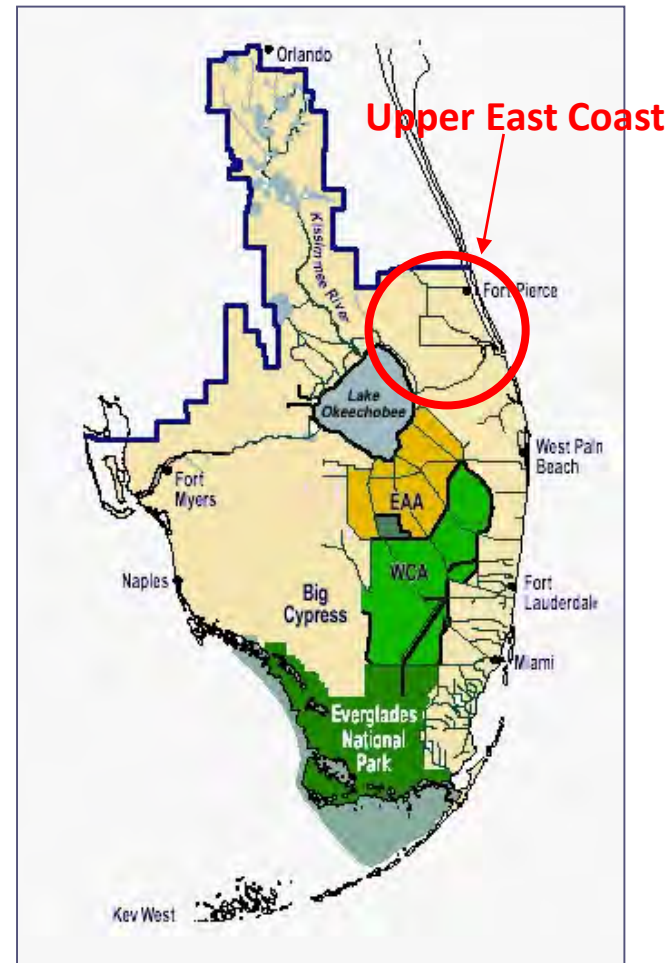
➤ Surficial aquifer system

- Recharged primarily by local rainfall
- Low transmissivity & productivity
- Some local recharge by C-44 and regional canals

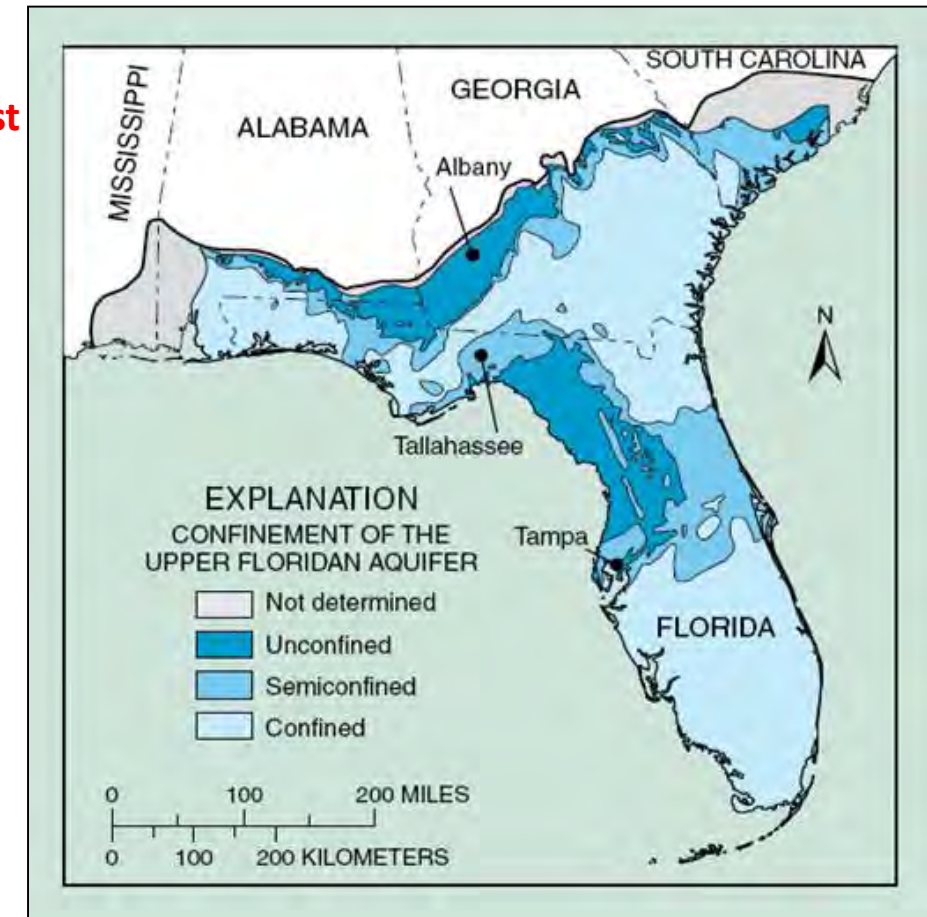
➤ Floridan aquifer system

- Extensive recharge area
- Primarily in Central Florida
- Higher transmissivity

Surficial Aquifer System



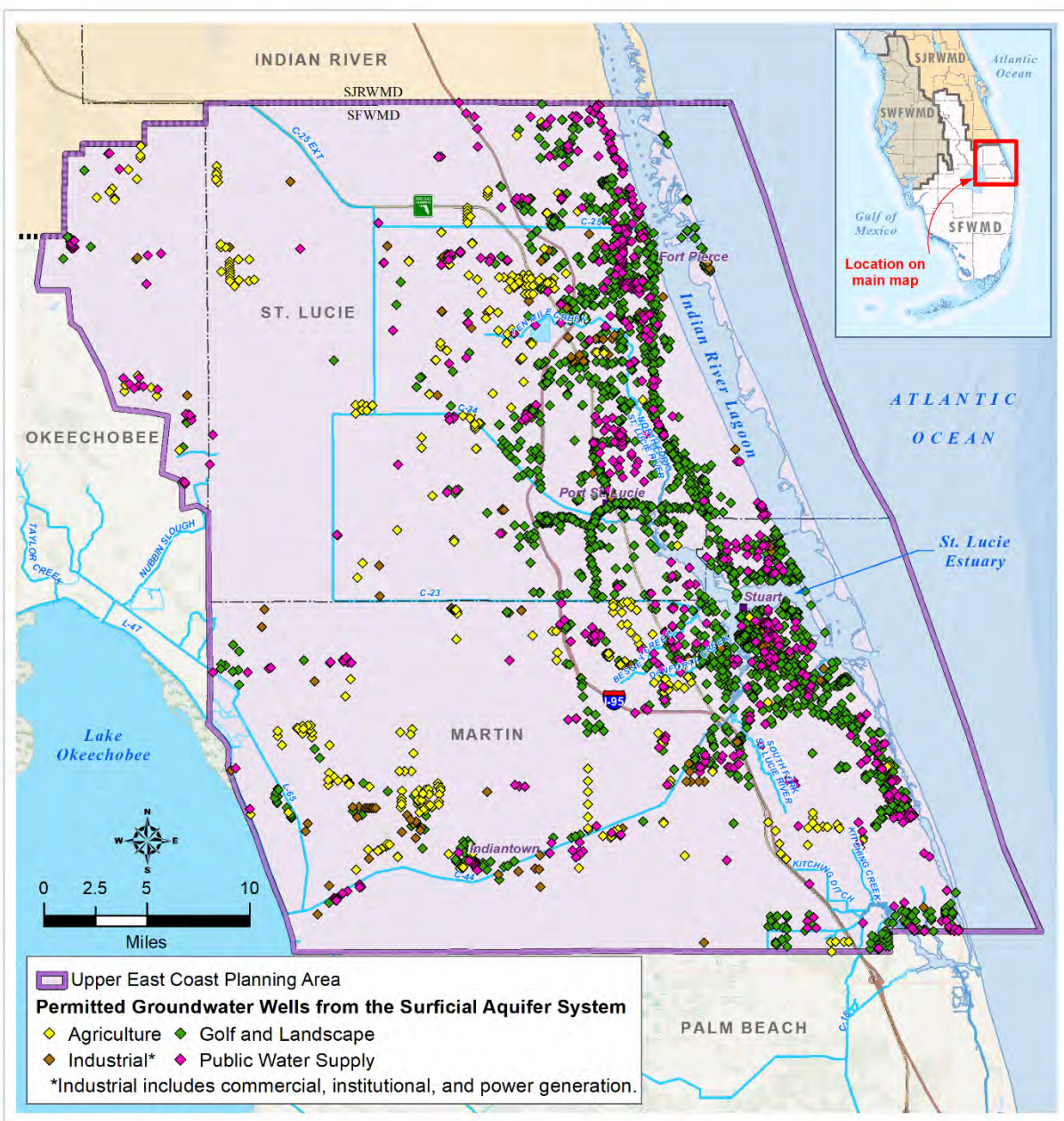
Floridan Aquifer System



Groundwater Resource Evaluation

- Minimal projected demand for new surficial aquifer system use through 2045
- Updated East Coast Floridan Model to evaluate:
 - 2019 current demands (78.4 mgd)
 - 2045 projected demands (98.9 mgd)
- Numerous data sources used for 2021 water resource evaluation efforts

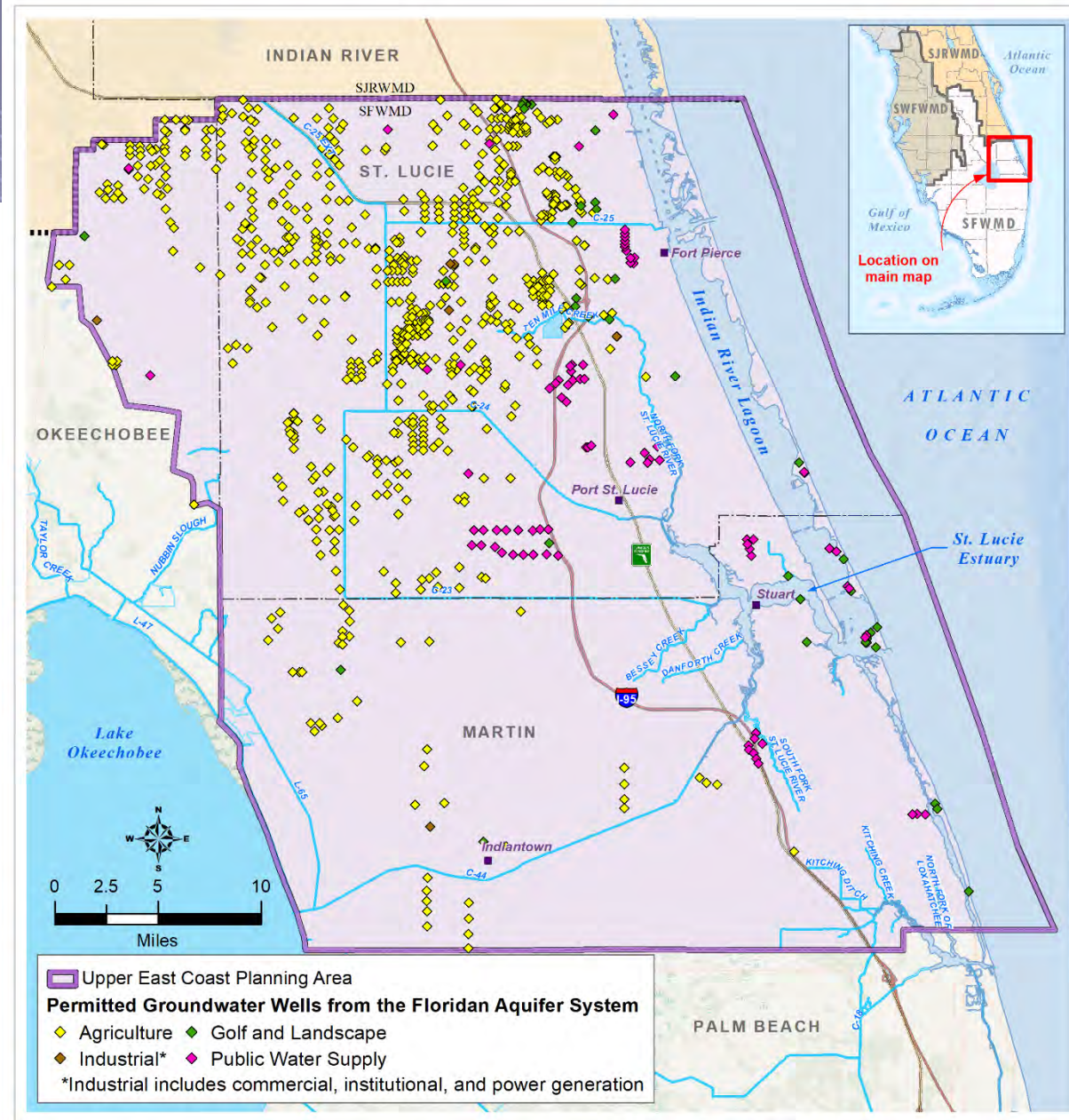




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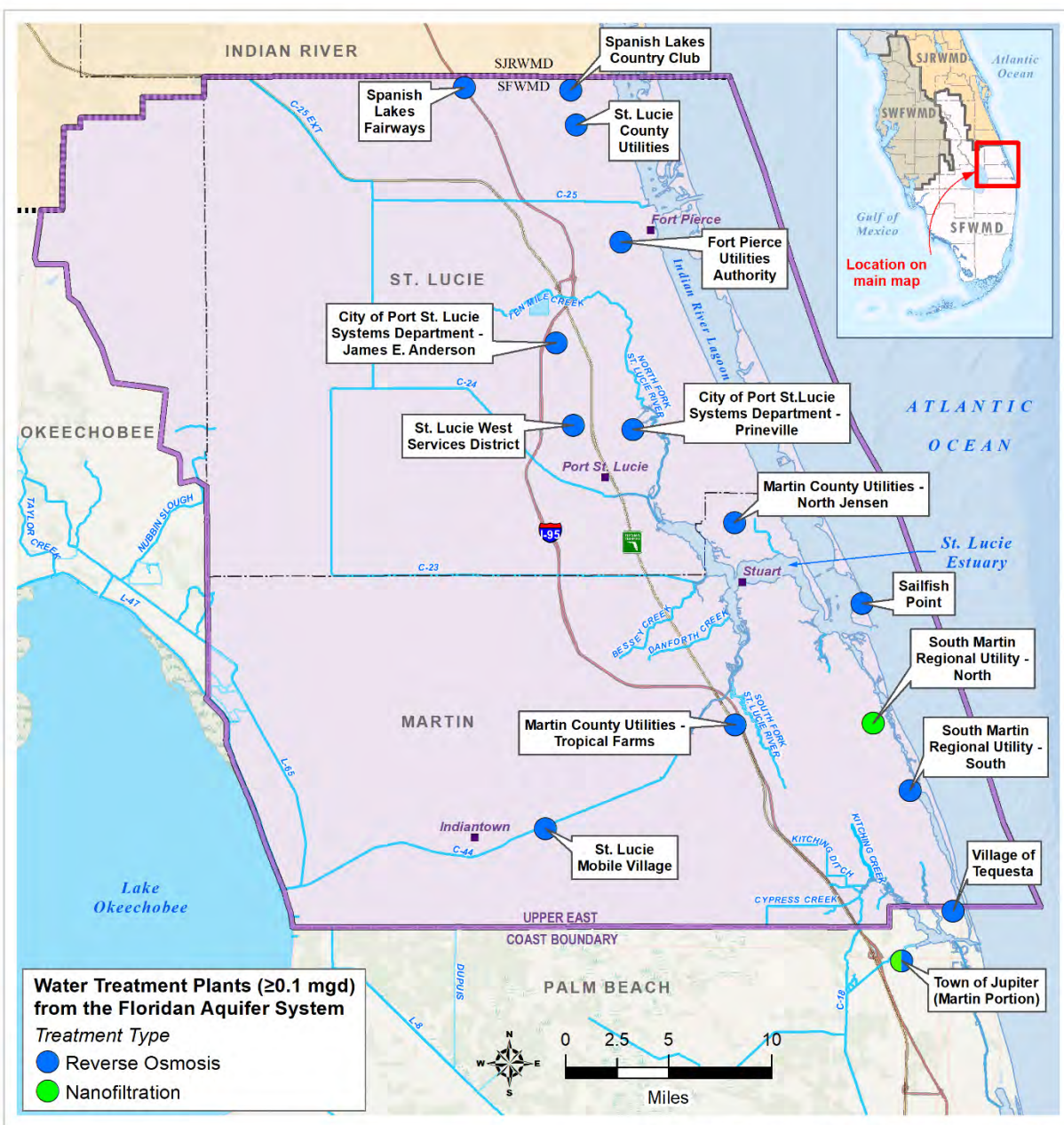
Permitted Surficial Aquifer System Wells in the UEC Planning Area

Permitted Floridan Aquifer System Wells in the UEC Planning Area



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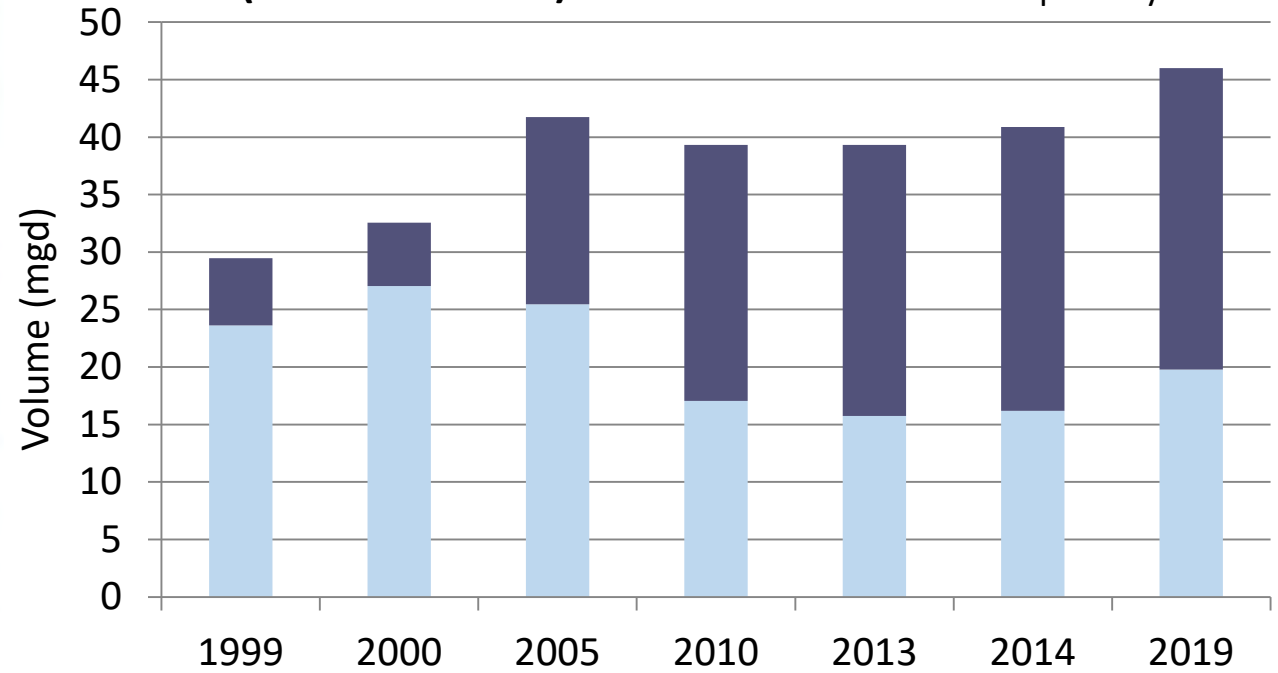
Public Supply Groundwater Demands



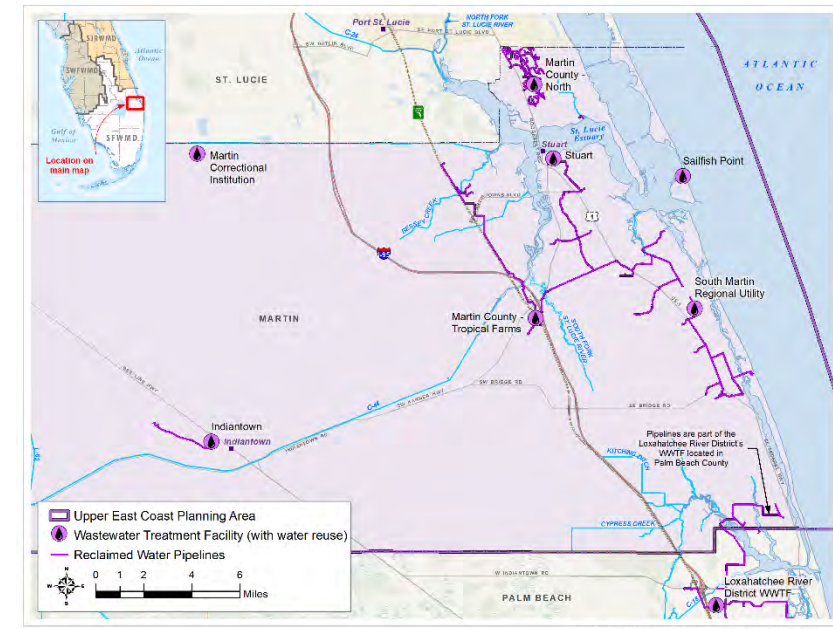
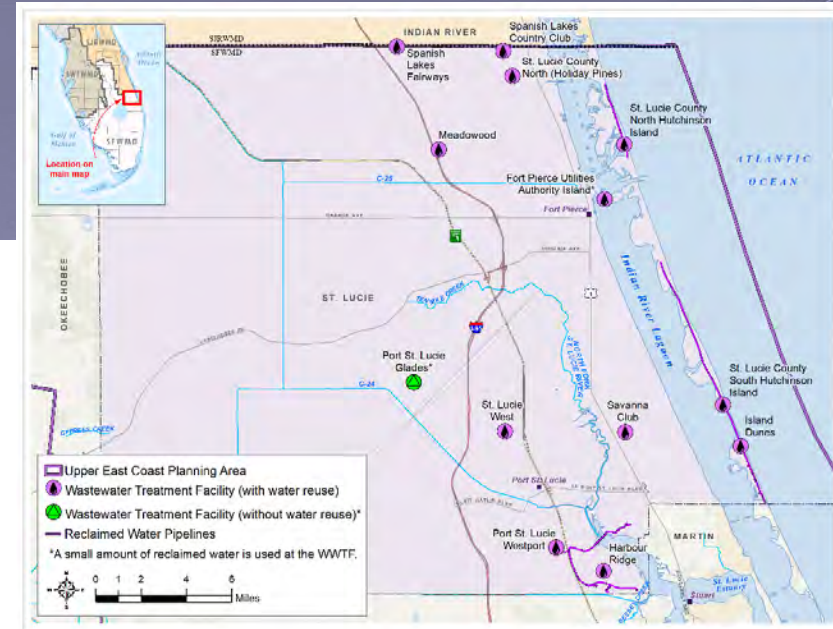
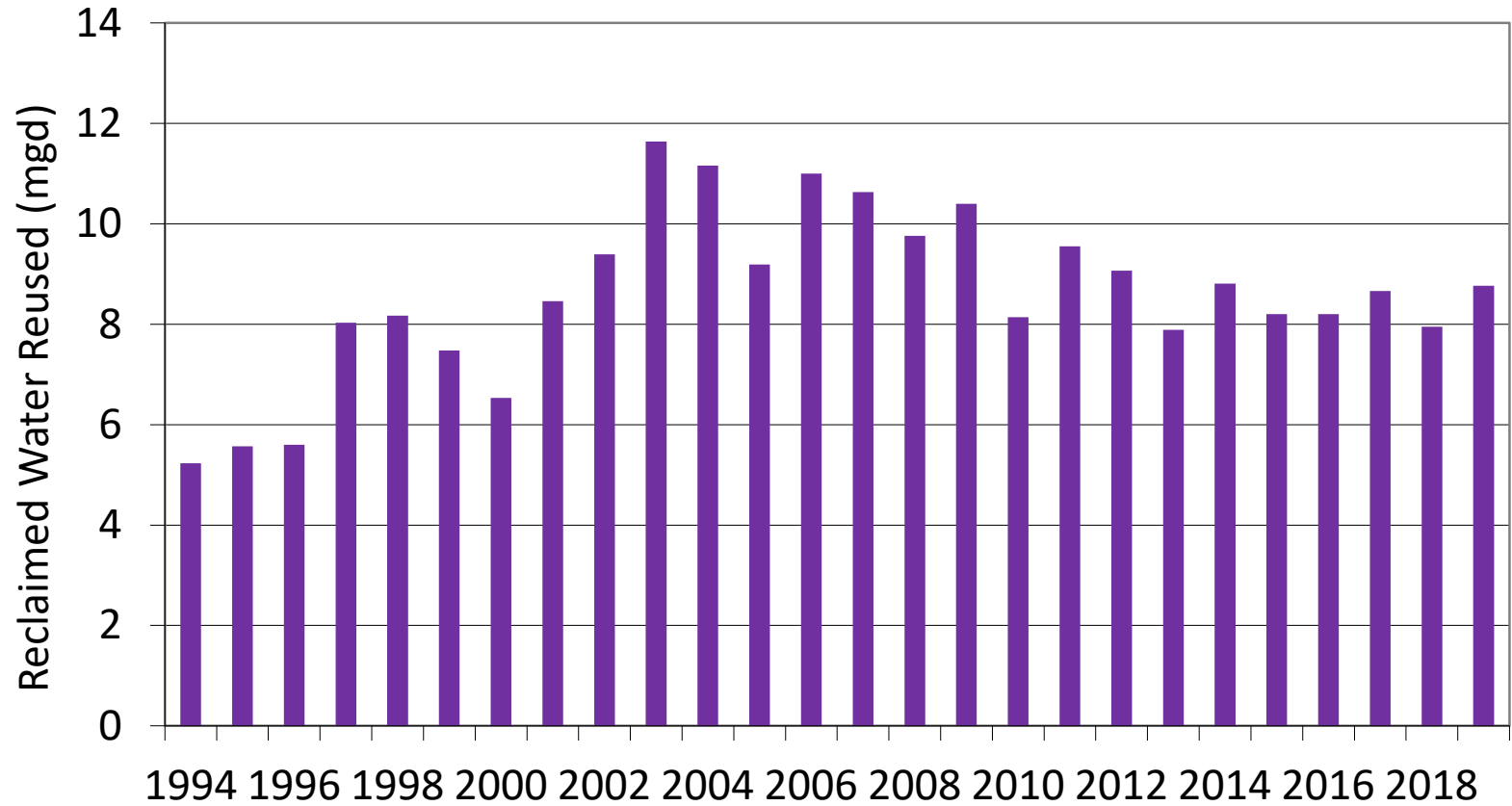
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Public Supply Utilities Water Sources (Finished Water)

- Floridan Aquifer System
- Surficial Aquifer System



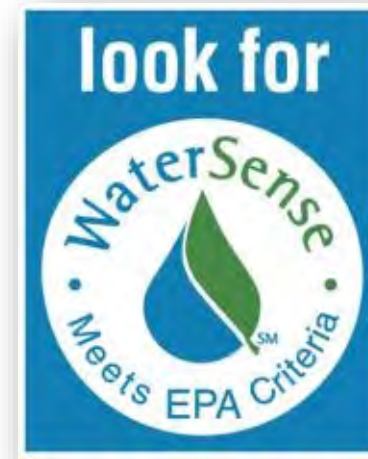
Upper East Coast Reuse History (1994-2019)



Water Conservation

- All water sources should be used efficiently by all users
- Agriculture
 - Conversion to microirrigation
 - FDACS best management practices
- Public supply per capita use rate (gallons per capita per day)

2000	167
2014-19	130
<i>22% decrease</i>	



The cheapest gallon of water is the gallon we don't use

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Status of the citrus industry in the Indian River district

Lorenzo Rossi, Ph.D.

UF | IFAS Research
UNIVERSITY of FLORIDA

Howdy!

Lorenzo Rossi

Assistant Professor *of* Plant Root Biology

Horticultural Sciences Department

UF/IFAS Indian River REC

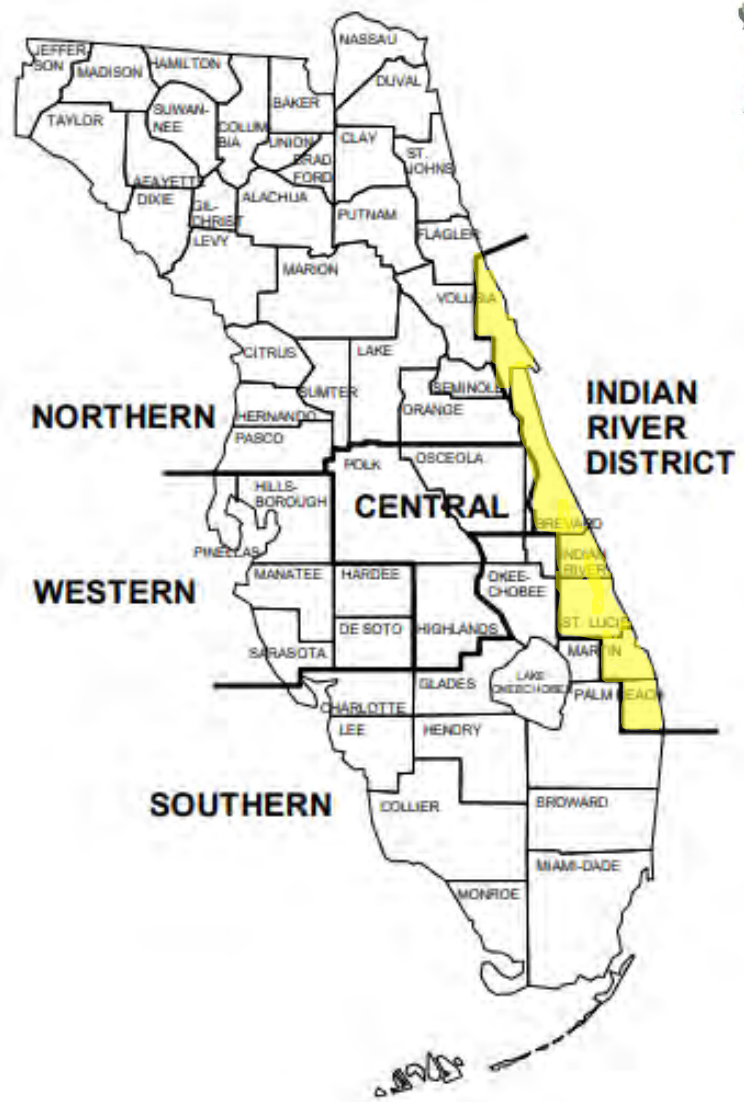
Fort Pierce, FL

772-577-7341

l.rossi@ufl.edu



Welcome to the Indian River district!



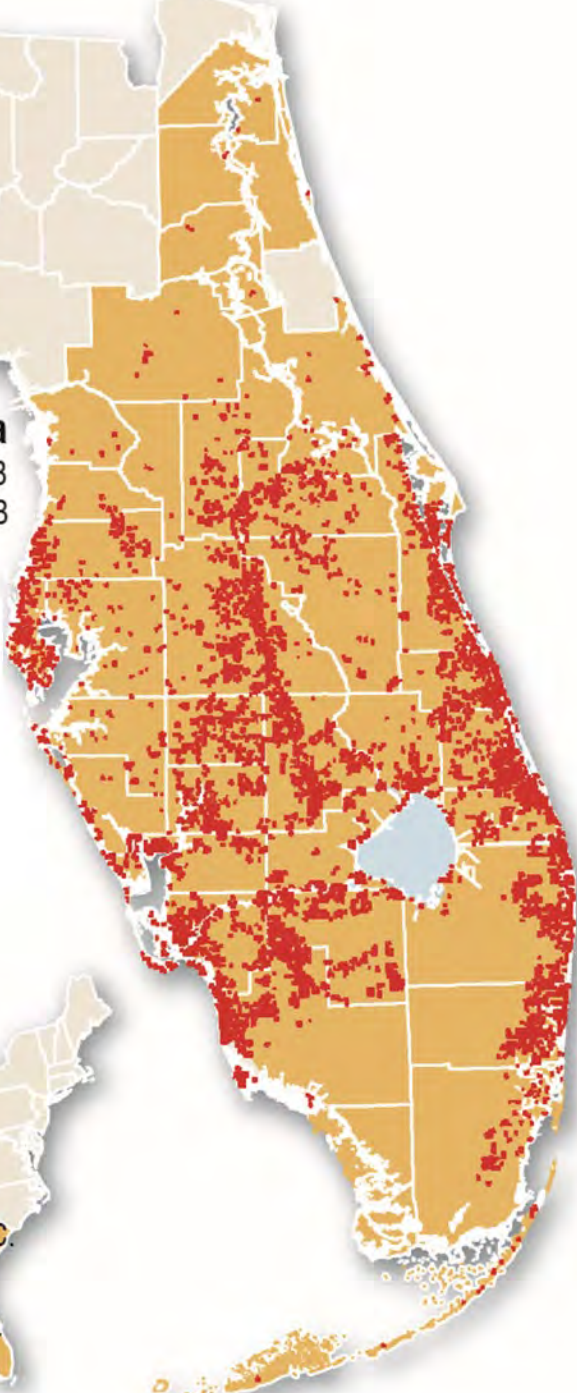
<https://indianriverselect.com/>



<https://www.orchidislandjuice.com/>

Citrus greening in Florida

- 37 counties with HLB
- Reported areas of HLB



States affected by citrus greening



HLB-affected grapefruit grove in Ft. Pierce



A close-up photograph of a person's hand holding a citrus leaf. The leaf exhibits characteristic symptoms of Huanglongbing (HLB), including yellowing and mottling of the leaf surface. The background shows other citrus leaves and a dark, textured ground surface.

HLB-affected citrus leaves

HLB-affected grapefruit tree

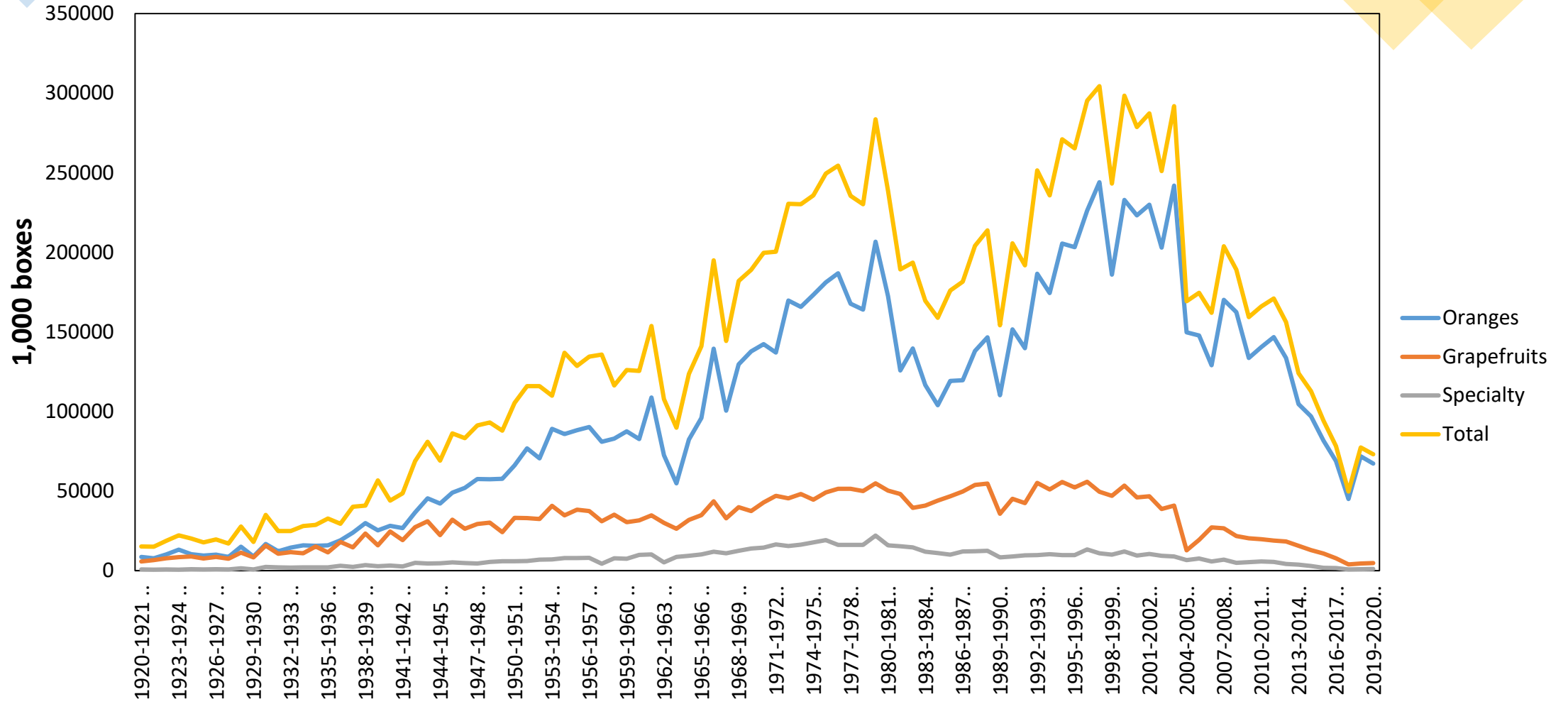


HLB-affected grapefruit fruit

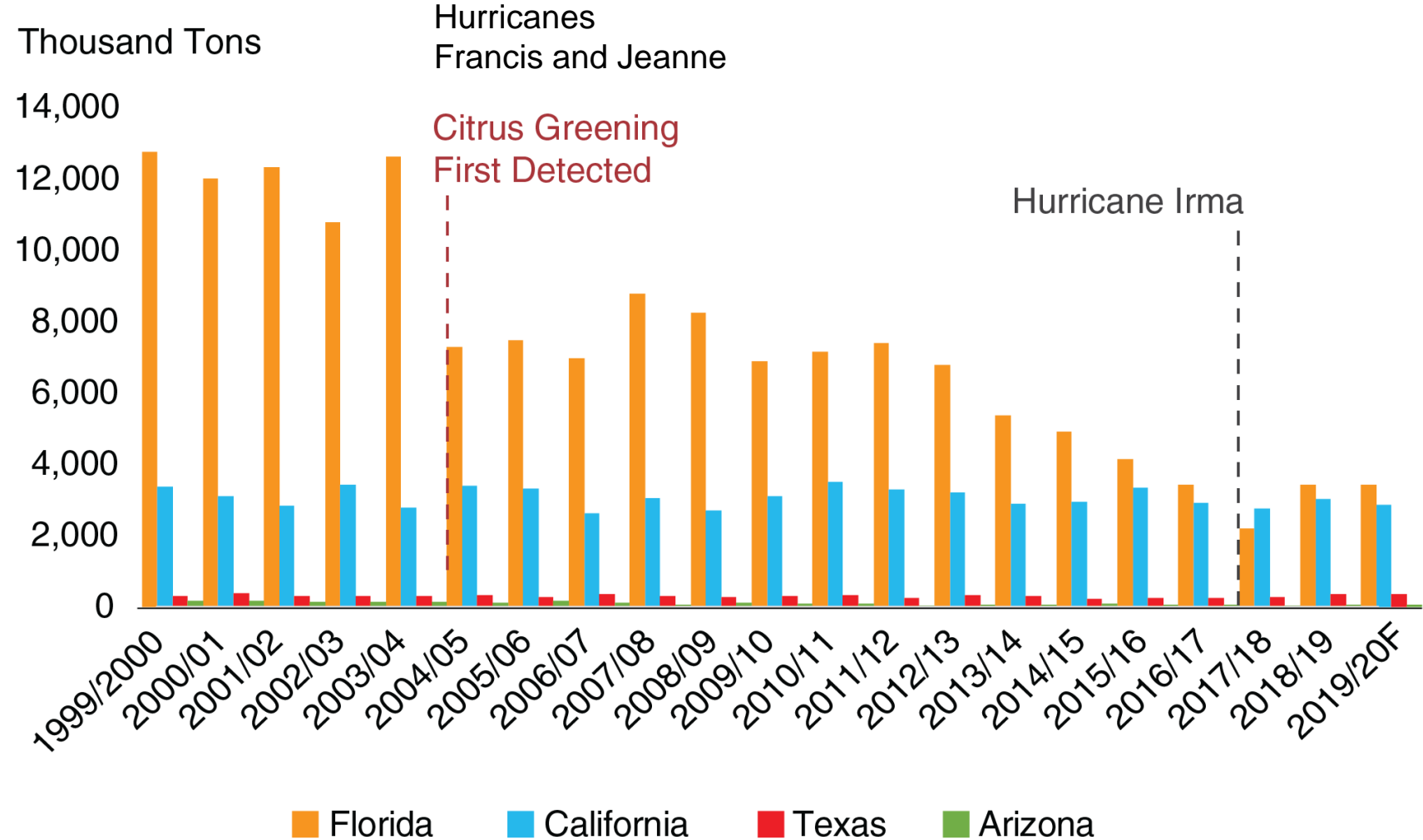
UF



Florida citrus production



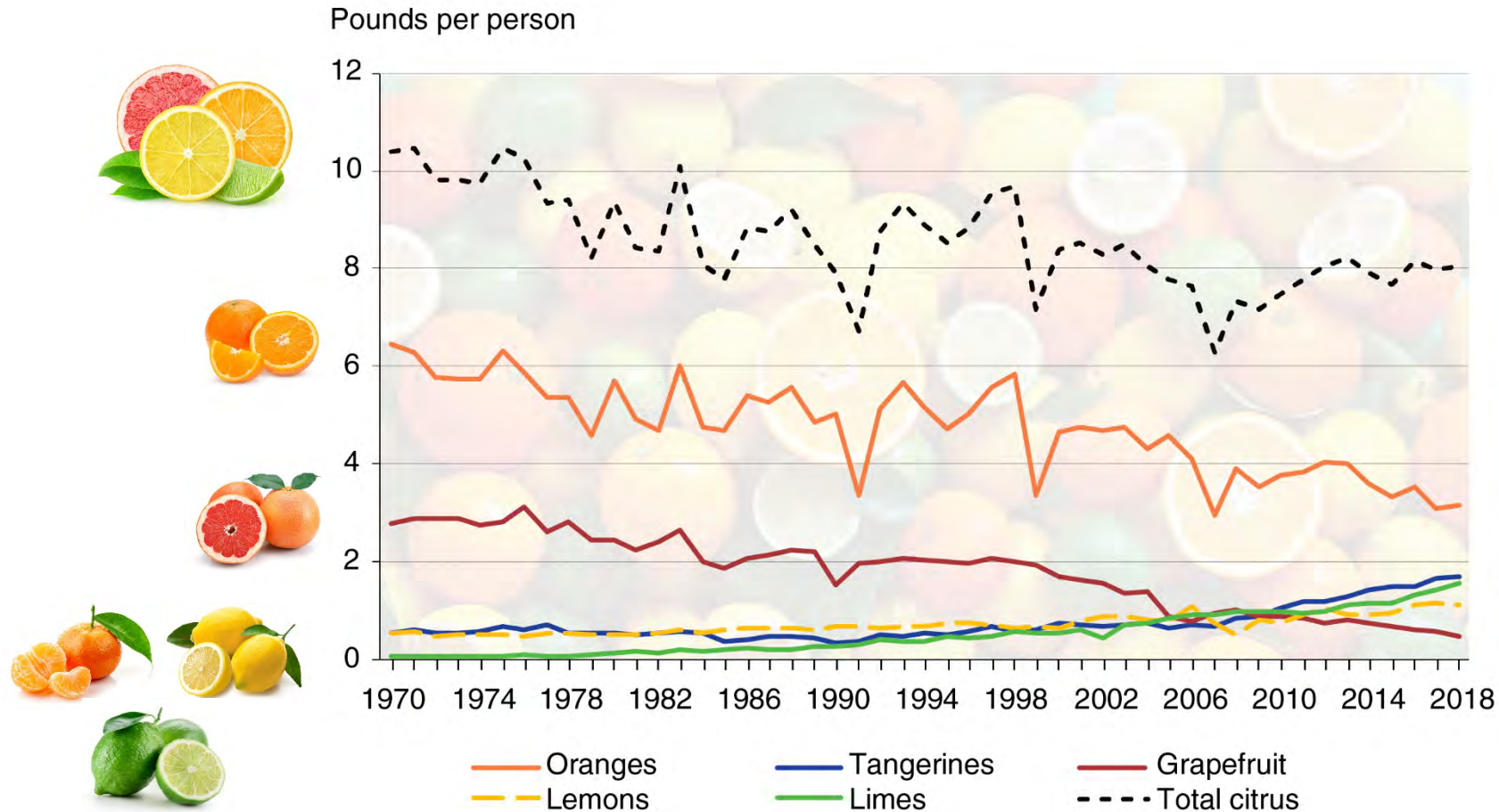
Citrus production by US states



Note: F = forecast. Citrus production includes production of grapefruit, oranges, and lemons; excludes production of tangerines, mandarins, and tangelos due to lack of data.

Source: USDA, Economic Research Service.

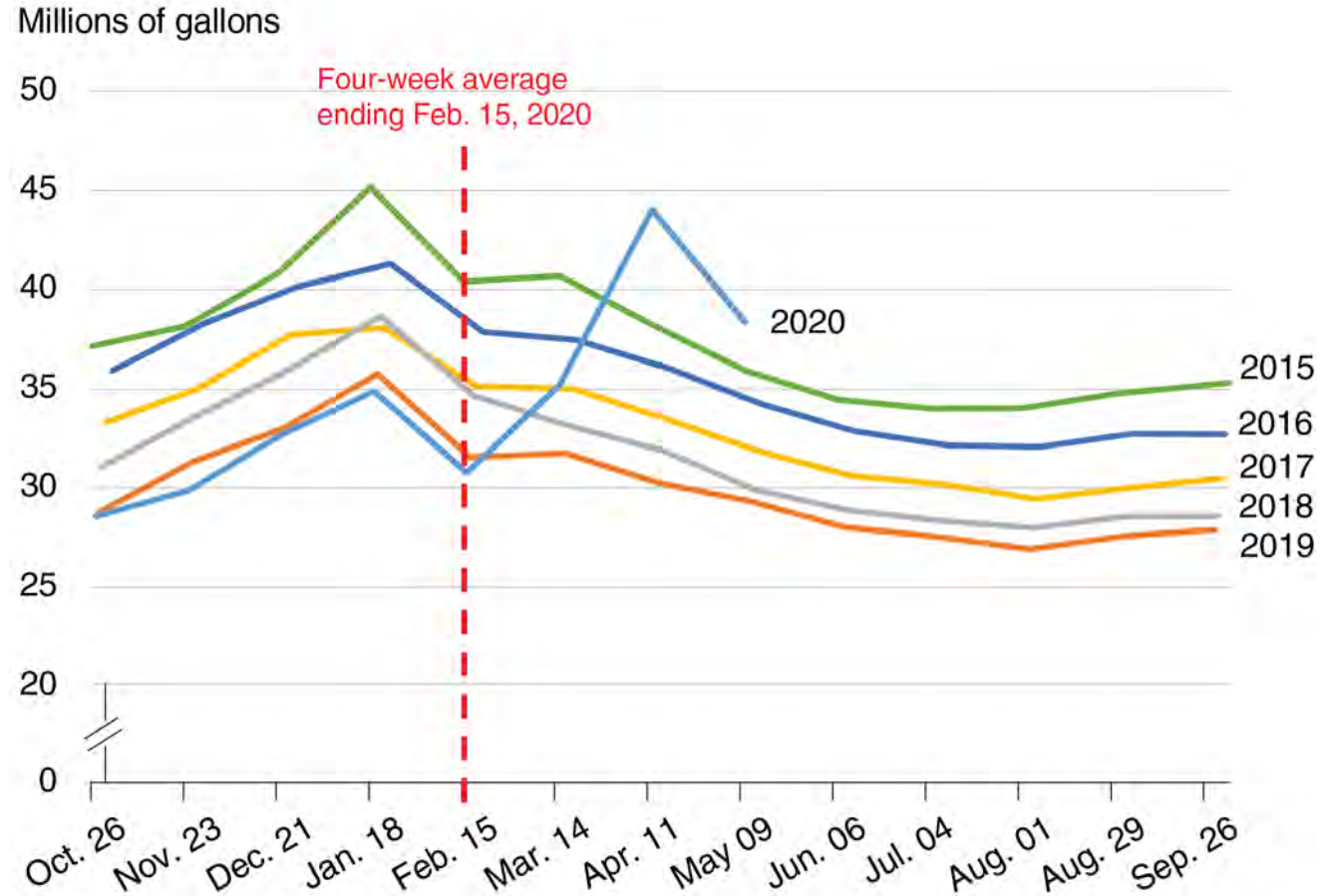
Loss-adjusted fresh citrus availability in the US 1970-2018



Note: The Economic Research Service's loss-adjusted food availability data are designed to approximate consumption by accounting for some of the spoilage, plate waste, and other losses in food stores, restaurants, and households.

Source: USDA, Economic Research Service, Loss-Adjusted Food Availability Data.

US orange juice sales – four weeks average 2015-2020



Notes: The reports are issued every four weeks during the marketing year. The dates in the chart are from marketing year 2020, when orange juice sales reporting began on September 29, 2019, with the first report being issued on October 26, 2019.

Source: USDA, Economic Research Service using Florida Department of Citrus Nielsen Sales Data.

Number of citrus operations in Florida

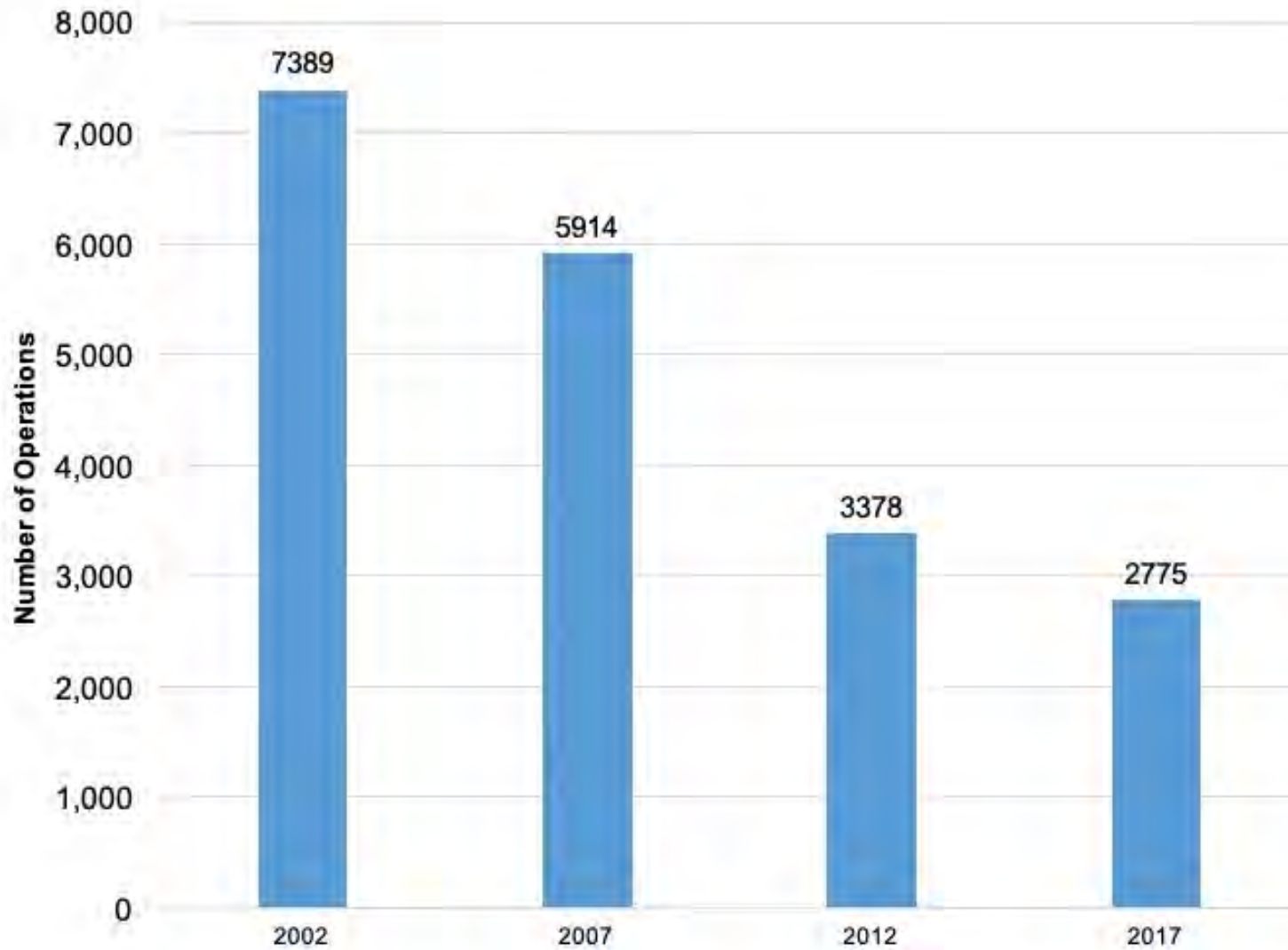


Figure 4. Number of citrus operations in Florida

Source: U.S. Department of Agriculture-National Agricultural Statistics Service



Number of juice processing facilities and packinghouses in Florida

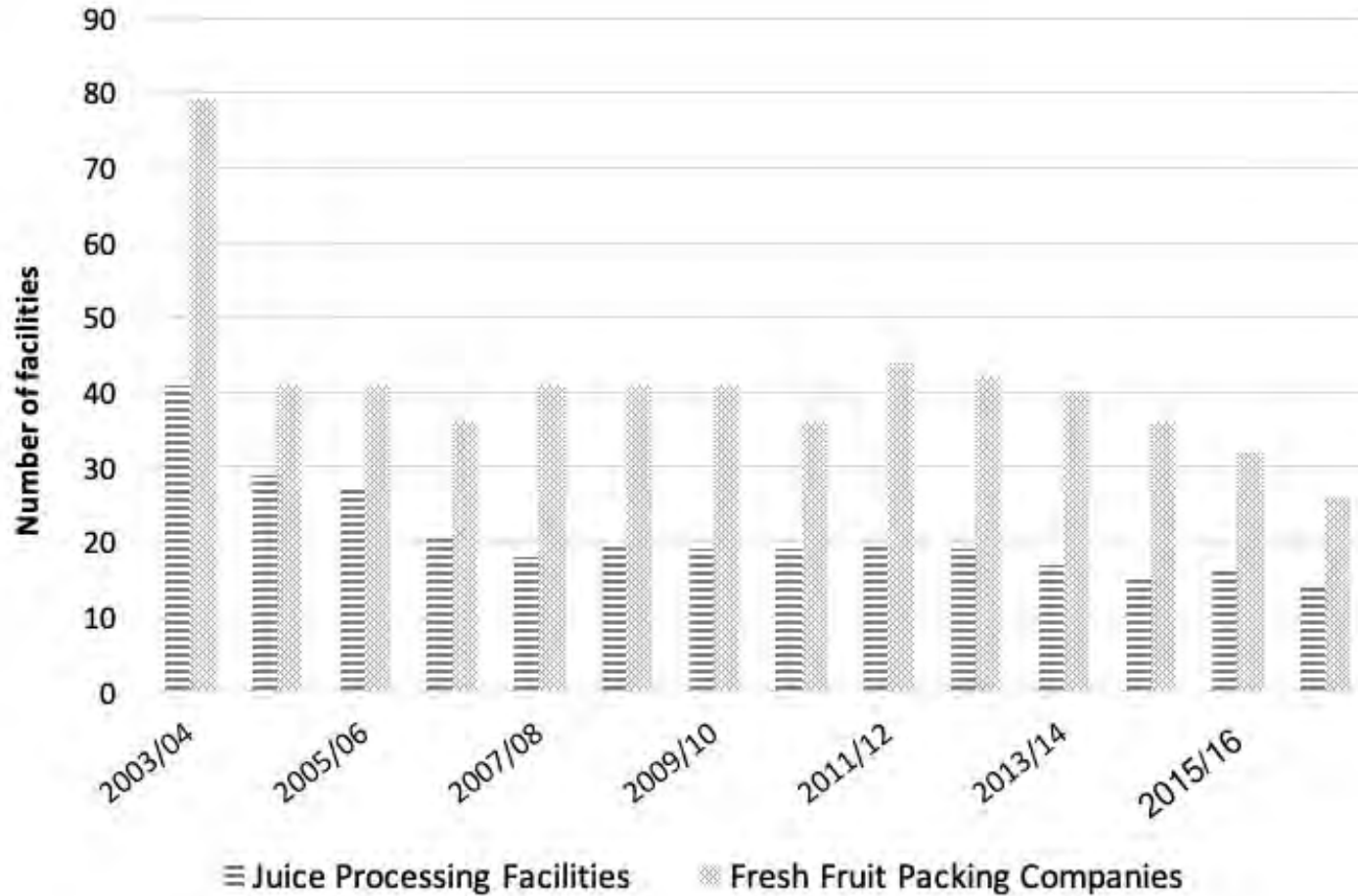
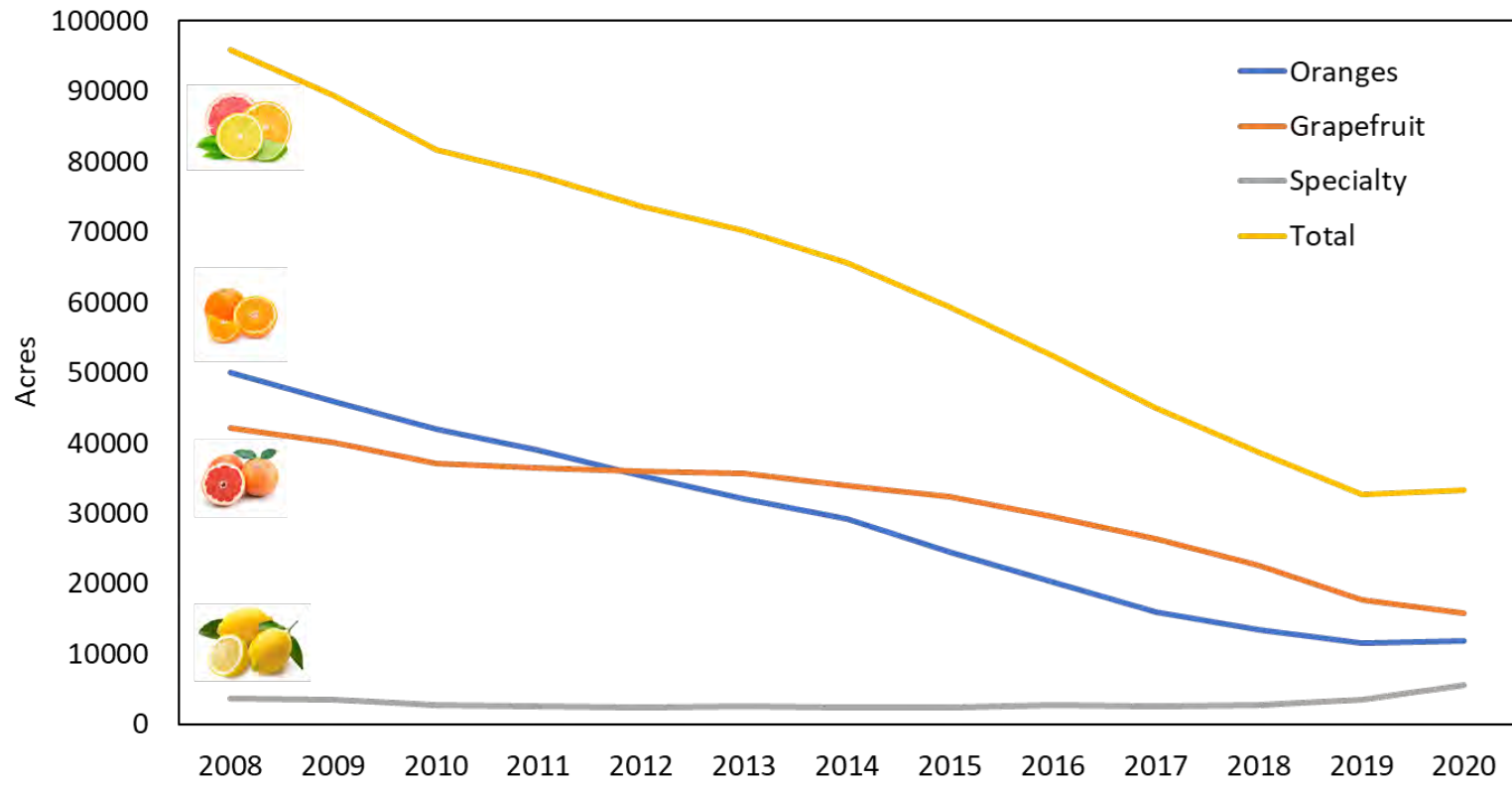


Figure 5. Number of juice processing facilities and packinghouses in Florida

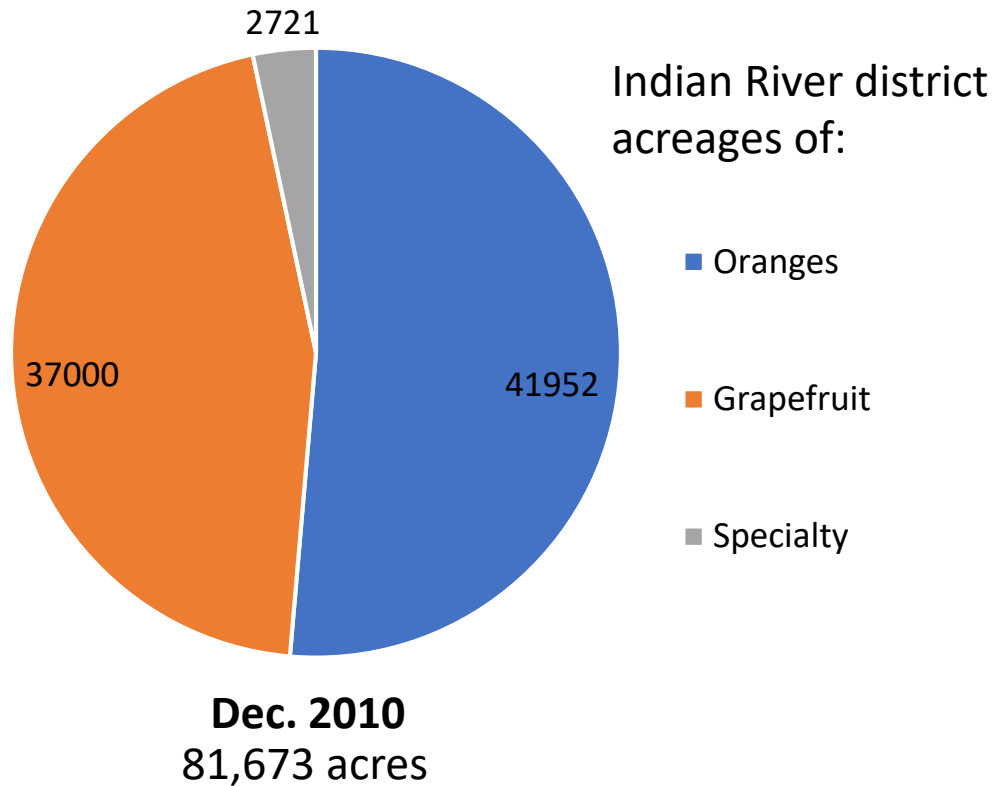
Source: Florida Department of Agriculture and Consumer Services



Commercial citrus acreage - Indian River district

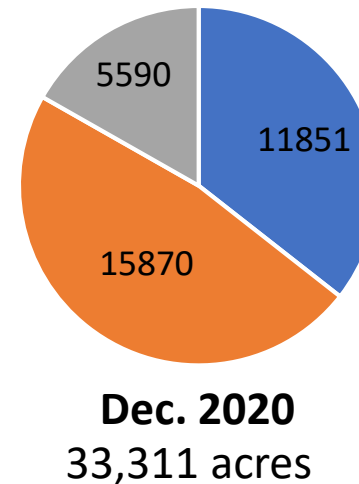


10-year comparison (2010 vs 2020)

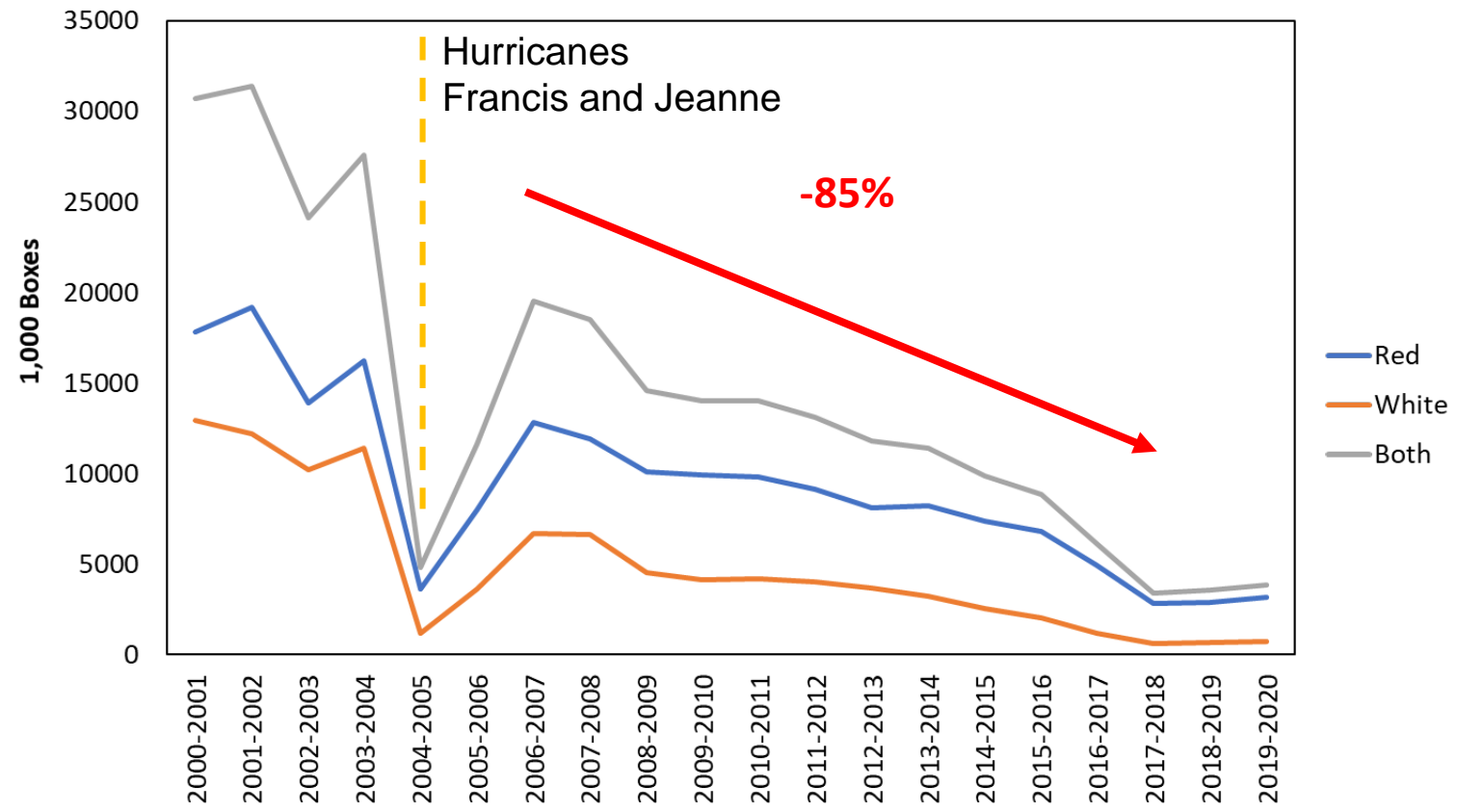


Indian River district acreages of:
 Specialty +100%
 Grapefruit -57%
 Oranges -71%

-60% in citrus acreages



Grapefruit production – Indian River district



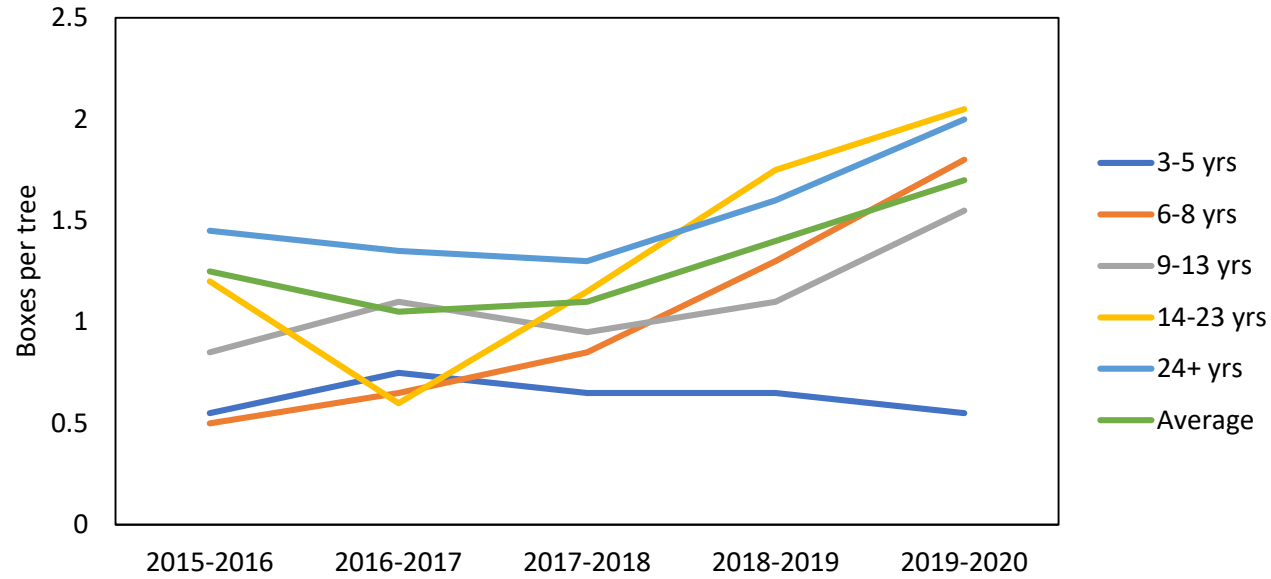
Specialty crops in the Indian River district

With the loss of citrus acreage, growers are switching to:

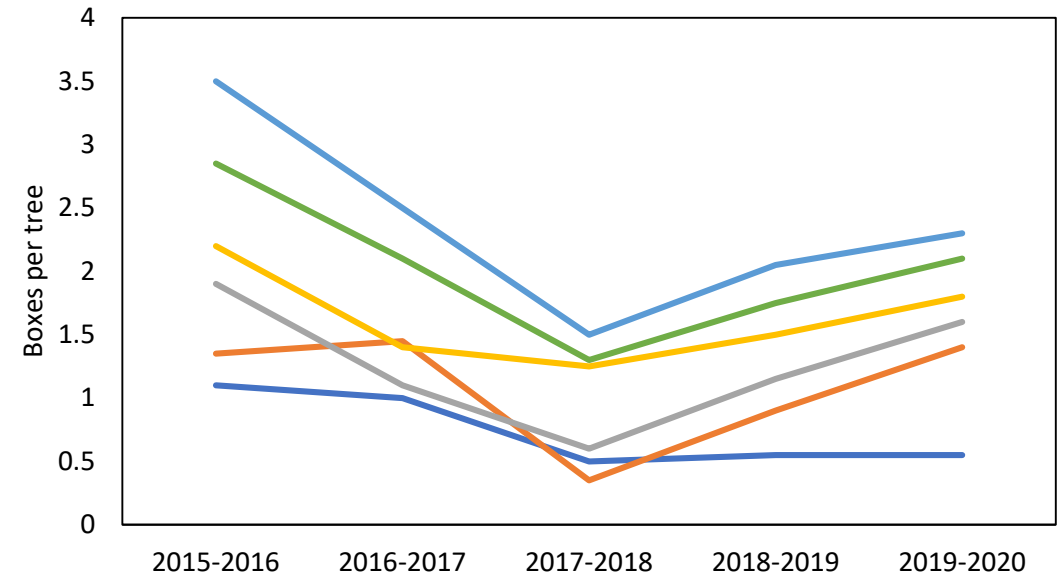
- Peaches
- Pongamia
- Lemon trees



Orange trees production by age Indian River



Grapefruit trees production by age Indian River



As of December 2020

Indian River district has:

- 15870 acres of grapefruits
- 11851 acres of oranges
- 5590 acres of specialty citrus (i.e., lemons, tangerines, etc.)

- One of the largest citrus processing plants (Tropicana)
- One of the best small juice plants known globally as Natalie's Juice Company
- The world's largest USDA Citrus Research lab
- UF/IFAS Indian River Research and Education Center
- 7 packing houses

How to control HLB?

- Control of the Psyllid (ACP)



- Pesticides
- Citrus under protective screens (CUPS and mini-CUPS)
- Reflective mulch
- Cover crops
- Use of colored clays
- ...

- Control of the bacterium (CLAs)



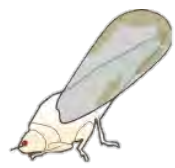
- Traditional breeding (new varieties)
- Micronutrients (Boron, Zinc, Manganese...)
- Antibiotics
- GMO
- Natural compounds with antibacterial properties (i.e., oak extracts)
- ...

Direct ways

- By enhancing the overall “soil health”

- Compost
- Cover crops
- Ground covers
- Mulching
- ...

Indirect ways

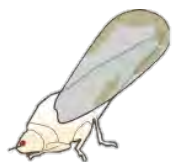


Control of the psyllid

1. Pesticides



Lorenzo Rossi



Control of the psyllid

2. CUPS and mini-CUPS





Control of the psyllid

3. Reflective mulch



- Robert Adair



Control of the psyllid

4. Cover crops



- Lukas Hallman



- Ed James



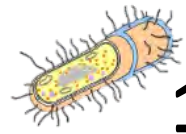
Control of the psyllid

4. Use of Kaolin clays



- Christopher Vincent

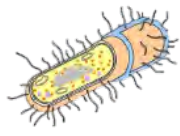
- Christopher Vincent



Control of the CLas

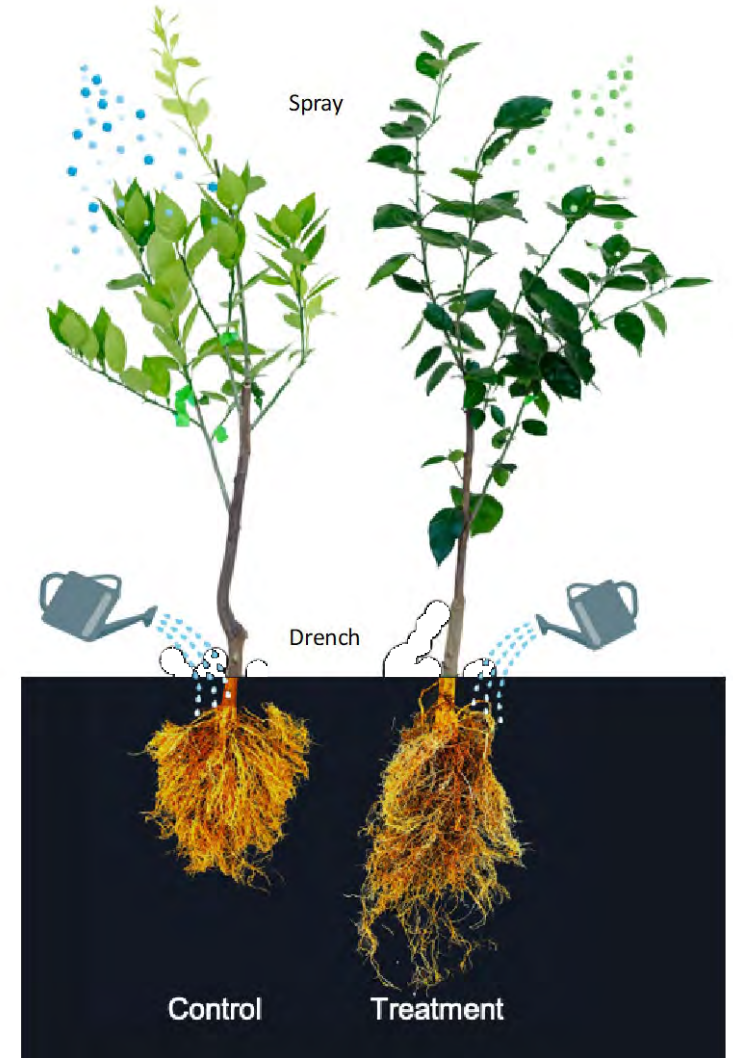
1. Micronutrient overdoses





Control of the CLAs

2. Use of natural compounds



Enhancing “soil health”

1. Use of oak mulch and compost



Enhancing “soil health”

2. Use of ground covers



Conclusions

- No cure for HLB.
- Growers must rely on management strategies to prolong the producing life of affected trees.
- A combination of strategies may be the most effective.
 - cover crops and mulching
 - enhanced nutritional programs
 - mini CUPS to reduce inoculation on young trees



Acknowledgements

- Dr. Robert Shatters (USDA)
- Dr. Davie Kadyampakeni (UF/IFAS)
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- Dr. Sandra Guzman (UF/IFAS)
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- Dr. Sarah Strauss (UF/IFAS)
- Dr. Alan Wright (UF/IFAS)
- Dr. Evan Johnson (UF/IFAS)
- Dr. Marco Pitino (Agrosource)
- Dr. Christina Dorado (USDA)
- Dr. Liliana Cano (UF/IFAS)
- Dr. Mark Ritenour (UF/IFAS)
- Dr. Ronald Cave (UF/IFAS)
- Dr. Brian Scully (USDA)
- Dr. Jose Chaparro (UF/IFAS)
- Dr. Monique Rivera (UC Riverside)
- Dr. Elezier Louzada (Texas A&M-Kingsville)
- Dr. Cate Simpson (Texas Tech)
- Mr. Lukas Hallman (UF/IFAS)
- Mr. John Santiago (UF/IFAS)
- Mr. John-Paul Fox (UF/IFAS)
- Mr. Robert Adair (FL Research Center)
- Mr. Daniel Scott (Scott Citrus Groves)
- Mr. Doug Bournique (Indian River Citrus League)
- Mr. Robert Croft (Croft Farm)
- Mr. Travis Murphy (Murphy Citrus Groves)



United States Department of Agriculture
National Institute of Food and Agriculture



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Thank you!

UF | IFAS
UNIVERSITY of FLORIDA



PLANT ROOT SCIENCE
CONSORTIUM

Plant Root Biology Laboratory



l.rossi@ufl.edu



<https://hos.ifas.ufl.edu/plantrootbiologylab/>



@UFRootBioLab



@UFRoots

Upper East Coast Demand Estimates & Projections



Nathan Kennedy, Ph.D.
NES Consulting

2021 UEC Stakeholder Kickoff Meeting
April 30, 2021



Water Use Categories

1. Public Supply
2. Domestic Self-Supply
3. Agriculture
4. Commercial/Industrial/Institutional
5. Landscape/Recreational
6. Power Generation



Population Projections

Define Current and 2045 Service Area Boundaries

- Coordination with utilities

Calculate 2010 – 2019 Baseline Population Estimates

- U.S. Census and BEBR* annual reports

Calculate 2020 – 2045 Projected Utility Service Area Populations

- Projections based on county growth rates published by BEBR

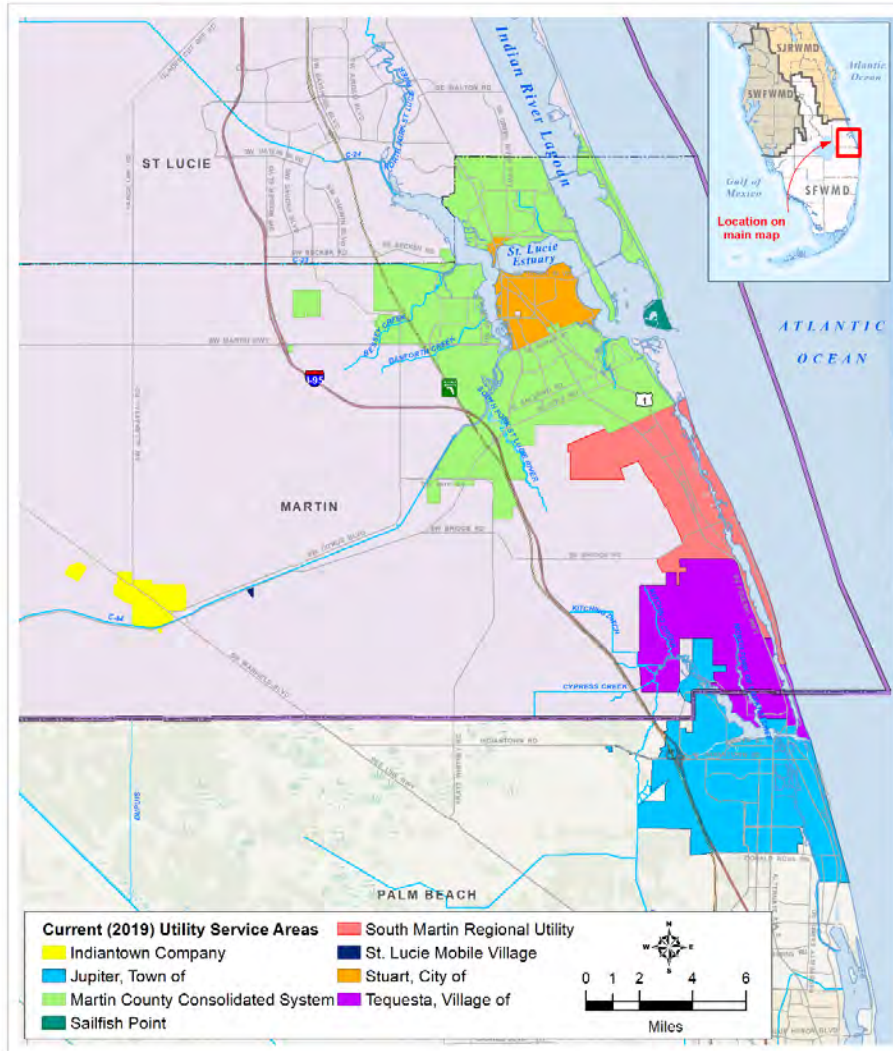
Review Population Projections with Stakeholders

- Adjustments with local input considered

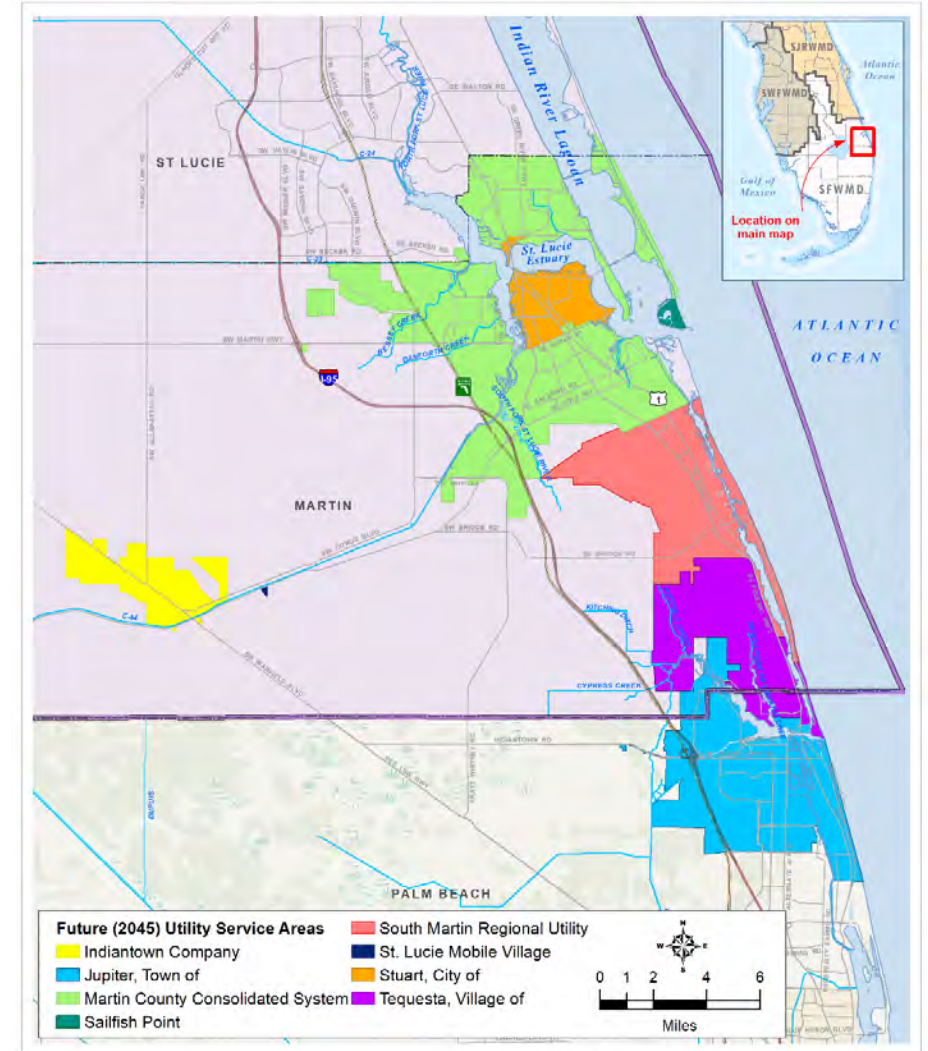
* The University of Florida's Bureau of Economic and Business Research (BEBR) produces Florida's official state and local population estimates and projections.

Service Areas in Martin County

2019



2045



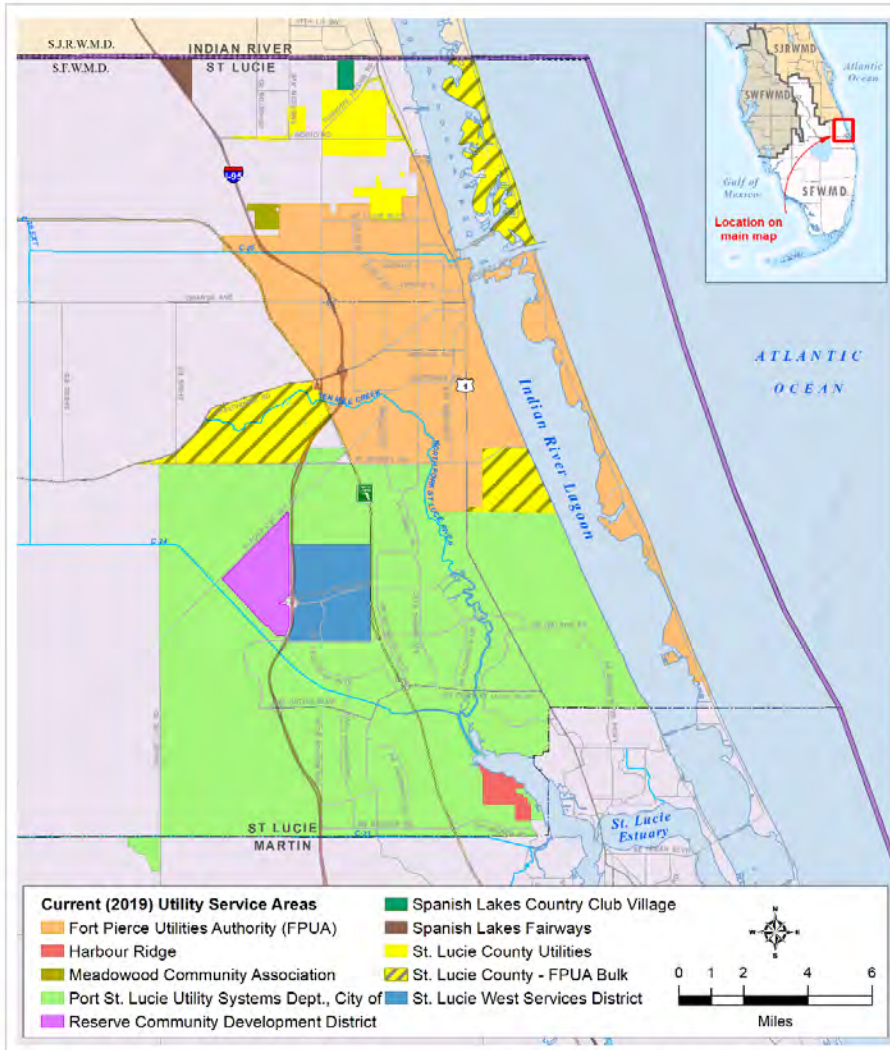
Population Projections in Martin County

Public Supply Utility	2019	2045
Indiantown, Village of	6,367	8,455
Martin County Utilities	94,163	117,215
Sailfish Point	1,054	1,122
South Martin Regional Utility	21,126	24,228
St. Lucie Mobile Home Village	801	913
Stuart, City of	20,596	23,518
Jupiter, Town of*	2,257	2,770
Tequesta, Village of*	3,533	3,804
Port St. Lucie Utility Systems Department*	1,609	1,705
Public Supply Total	151,506	183,729
Domestic Self-Supply Total	7,092	9,271
Martin County Total	158,598	193,000

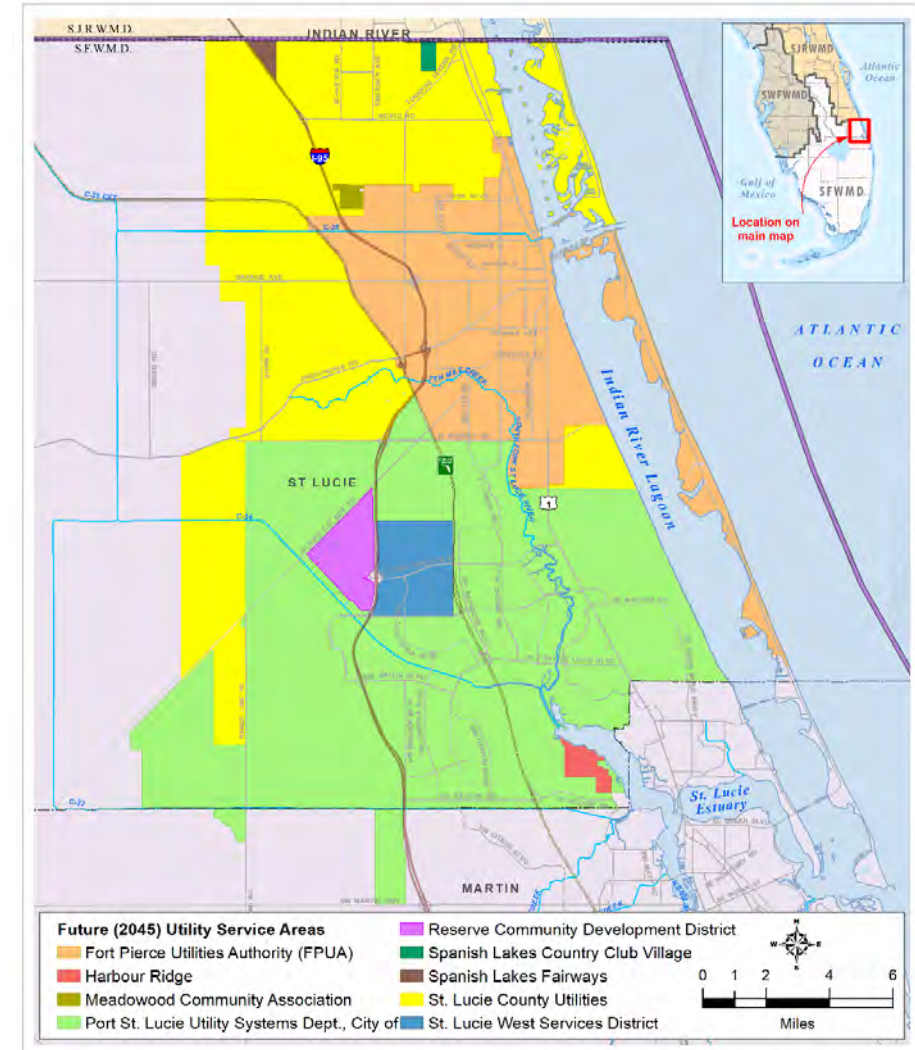
* Portion within Martin County

Service Areas in St. Lucie County

2019



2045

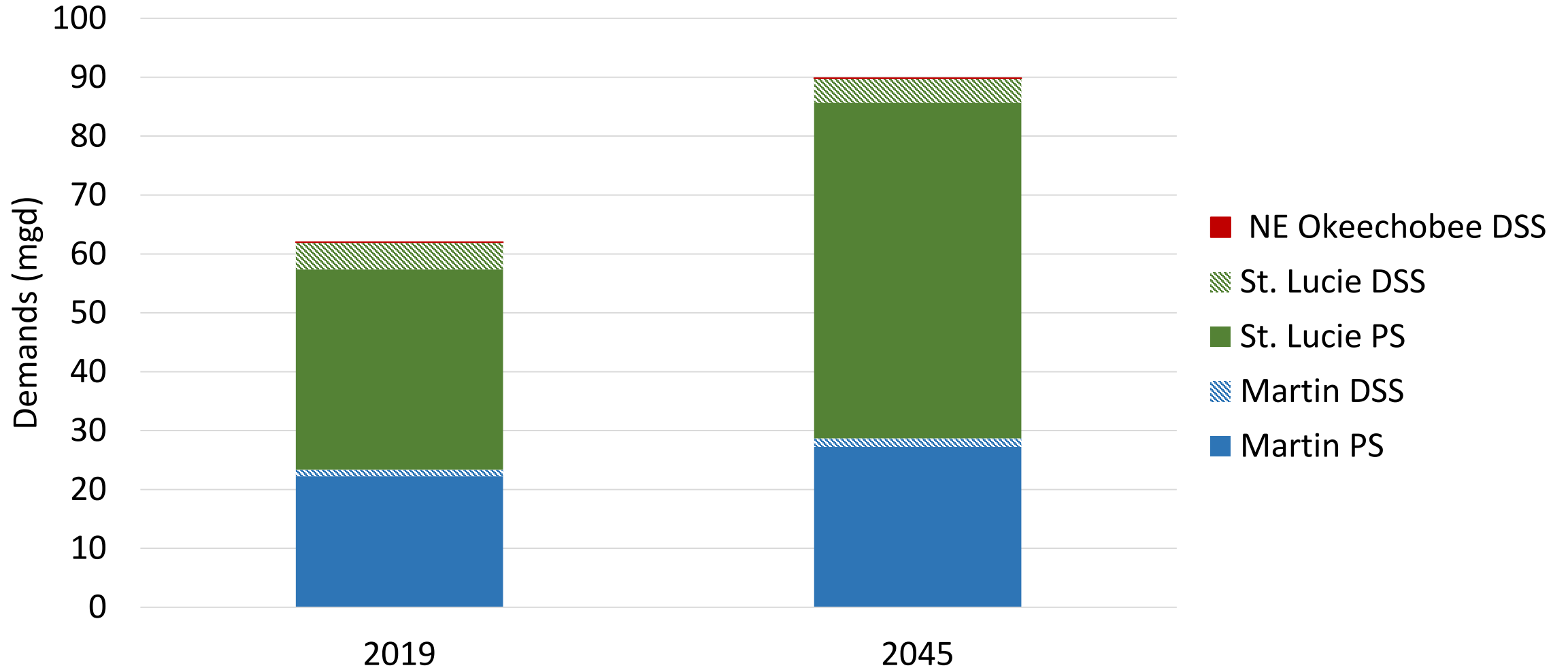


Population Projections in St. Lucie County

Public Supply Utility	2019	2045
Fort Pierce Utilities Authority	46,615	54,635
Harbour Ridge	1,042	1,397
Martin County Utilities*	1,934	2,192
Meadowood Community Association	589	654
Port St. Lucie Utility Systems Department	186,206	322,742
Reserve Community Development District	3,353	3,735
Spanish Lakes Country Club	1,649	1,781
Spanish Lakes Fairways	2,241	2,251
St. Lucie County Utilities Department	14,883	56,544
St. Lucie West Services District	13,785	13,785
Public Supply Total	272,296	459,715
Domestic Self-Supply Total	37,060	33,085
St. Lucie County Total	309,356	492,800

* Portion within St. Lucie County

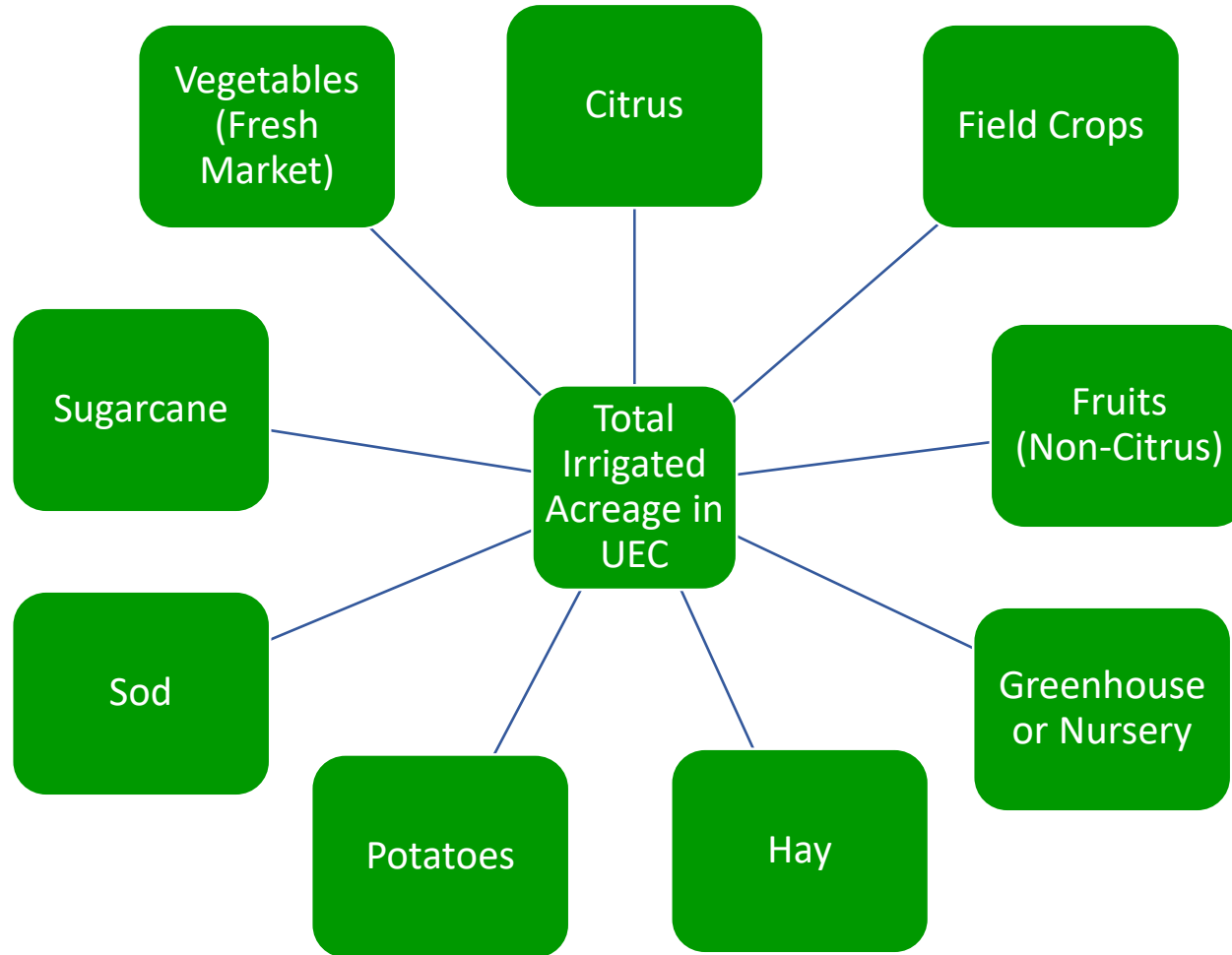
Public Supply and Domestic Self-Supply Demands



Water Use Categories

1. Public Supply
2. Domestic Self-Supply
3. Agriculture
4. Commercial/Industrial/Institutional
5. Landscape/Recreational
6. Power Generation

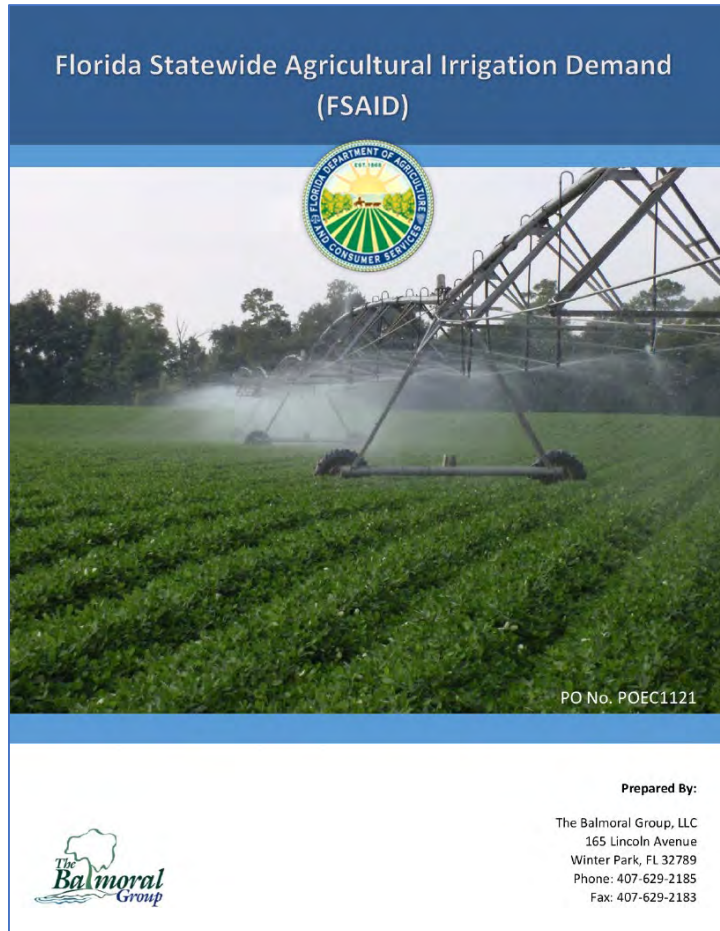
Crop Categories



Data Sources for Agricultural Projections



Statutory Basis for Projections



- 2013 legislation (Section 570.93, Florida Statutes) requires FDACS to develop statewide agricultural demand projections
 - Acreage – historical, current, and 20-year projection, by crop
 - Demands for average rainfall and 1-in-10 year drought, by crop
 - Metered data factored into estimates of historical and current demands
 - Consult with stakeholders
- FDACS publishes the annual FSAID report

Statutory Basis for Projections

- Section 373.709, Florida Statutes: Agricultural demand projections in water management districts' regional water supply plans should be based on best available data
 - Must consider data of future demands provided by FDACS
 - Any deviation from data must be described
 - FDACS data are presented with adjusted data



Basic Components of Agricultural Demand Projections

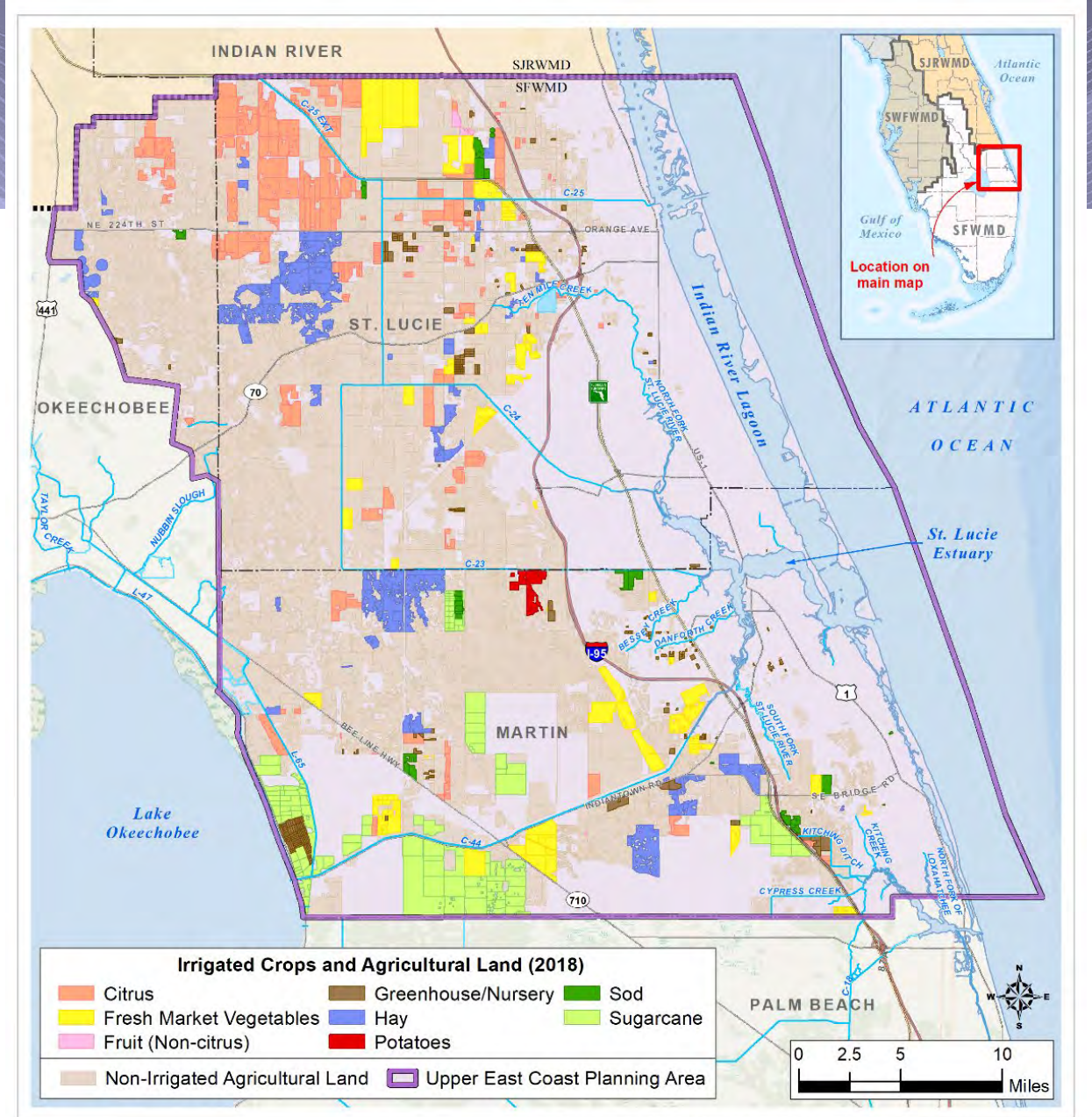
Irrigated Acreages

- FSAID Irrigated Lands Geodatabase
- SFWMD land use map and acreage projections

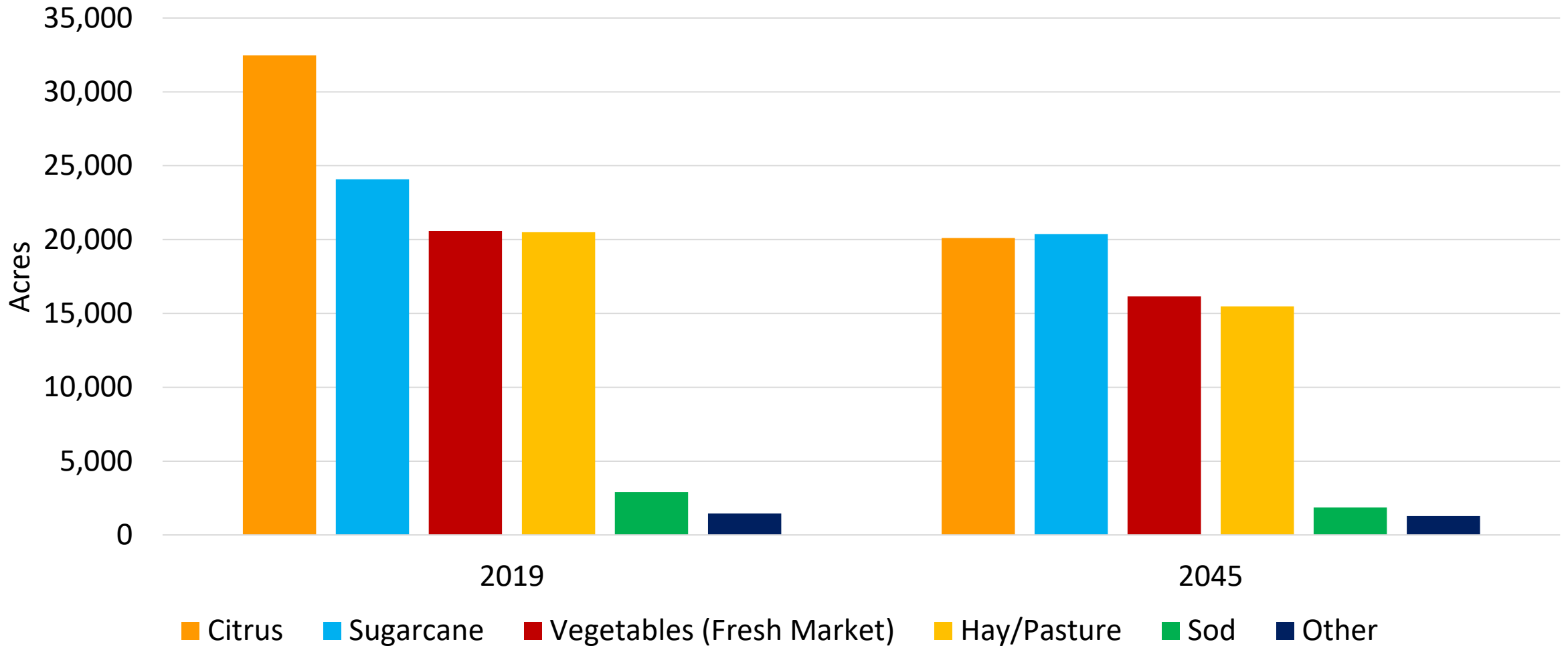
Water Demand Models

- FSAID water use model
- Agricultural Field-Scale Irrigation Requirements Simulation (AFSIRS) model

FSAID/FDACs Upper East Coast Irrigated Agricultural Areas



Upper East Coast Agricultural FSAID Acreage



AFSIRS and FSAID

Water Demand Model Comparison

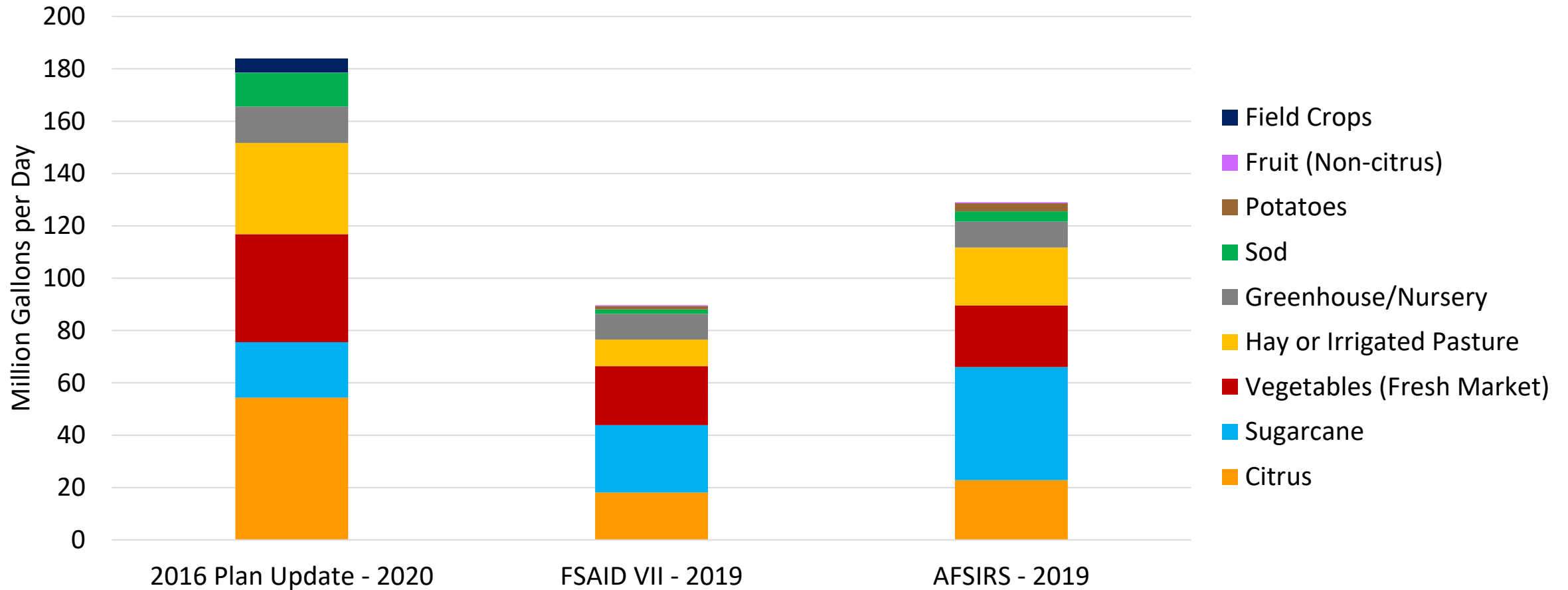
AFSIRS	FSAID
Built with data from University of Florida field experiments	Built with available reported water use from all water management districts
Uses a wide range of location-specific environmental variables	A limited set of environmental variables are used directly in the model
Does not consider changing irrigation intensities in response to crop profitability	Irrigation intensities vary in response to crop profitability

Use of AFSIRS in 2021 UEC Plan Update

- AFSIRS model is similar to the model used to establish water use permit allocations in the region
- AFSIRS estimates are consistent with previous planning efforts for the UEC and other planning areas
- Unique aspects of agricultural production in the UEC may be under-represented with statewide FSAID model

Upper East Coast Agricultural Demands

Comparison of UEC Demand Projections



Livestock Water Demands

- 92,200 head of cattle (6% of state herd)
- FDACS estimates water demands at 1.90 mgd
- No change projected in livestock population or water demand



Upper East Coast Agriculture Demands Summary

Agriculture Subcategory	2019	2045
Crops	172.75	129.01
Livestock	1.91	1.91
Aquaculture	0.07	0.07
UEC Planning Area Total	174.73	130.99

Demands in million gallons per day.

Water Use Categories

1. Public Supply
2. Domestic Self-Supply
3. Agriculture
4. **Commercial/Industrial/Institutional**
5. **Landscape/Recreational**
6. **Power Generation**

Commercial/Industrial/Institutional

County	2019	2045
Martin	3.46	4.21
St. Lucie	0.92	1.47
Okeechobee	0.05	0.06
UEC Planning Area Total	4.43	5.73

Demands in million gallons per day.

Water Use Categories

1. Public Supply
2. Domestic Self-Supply
3. Agriculture
4. Commercial/Industrial/Institutional
- 5. Landscape/Recreational**
- 6. Power Generation**

Landscape/Recreational

Landscape/Recreational includes irrigation of golf courses and other landscaped areas such as parks, sports fields, and common areas of residential developments.

County	2019	2045
Martin	15.54	17.36
St. Lucie	16.43	23.21
Okeechobee	0.06	0.07
UEC Planning Area Total	32.03	40.63

Demands in million gallons per day.

Water Use Categories

1. Public Supply
2. Domestic Self-Supply
3. Agriculture
4. Commercial/Industrial/Institutional
5. Landscape/Recreational
6. **Power Generation**

Power Generation

County	2019	2045
Martin	16.46	14.13
St. Lucie	1.45	3.34
Okeechobee	0.00	0.00
UEC Planning Area Total	17.91	17.47

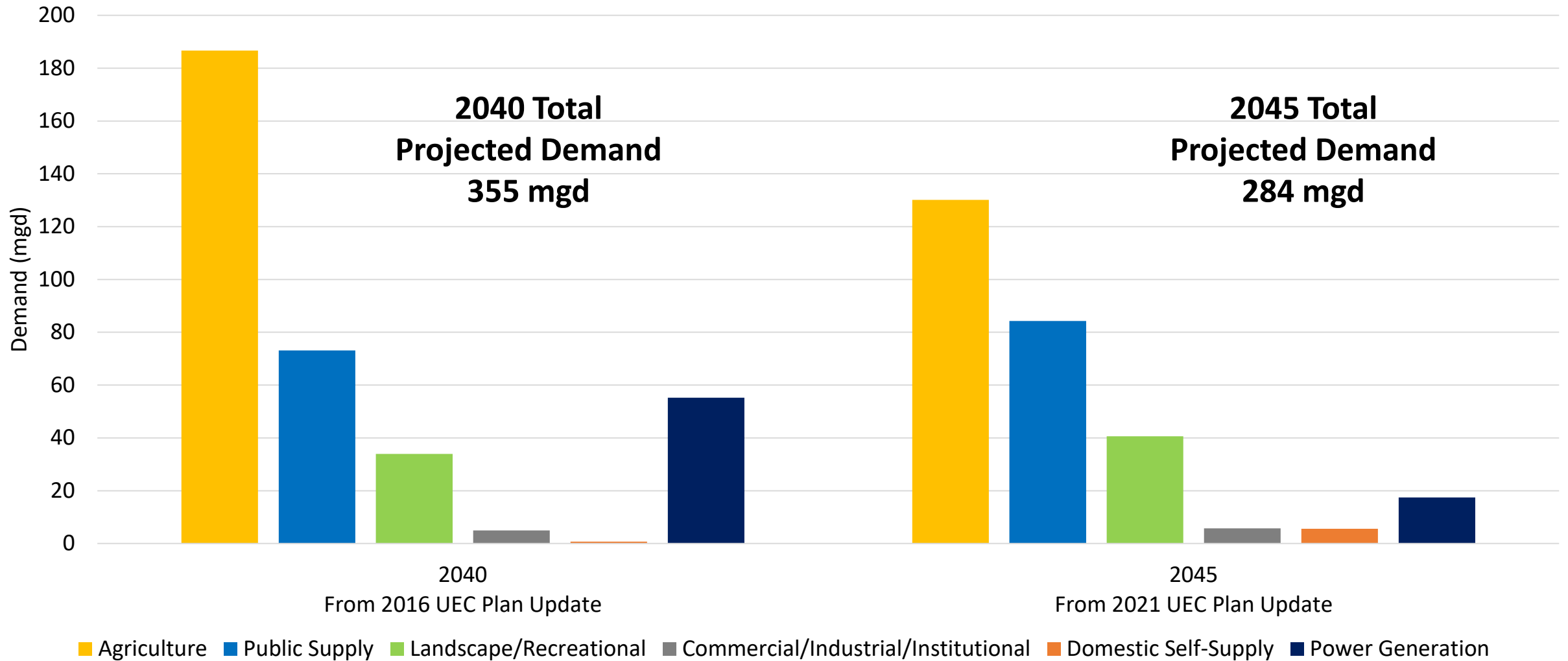
Demands in million gallons per day.

Upper East Coast Draft Water Demands Summary

Water Use Category	2019	2045
Public Supply	56.25	84.27
Domestic Self-Supply	5.76	5.61
Agriculture	174.73	130.10
Commercial/Industrial/Institutional	4.43	5.73
Landscape/Recreational	32.03	40.63
Power Generation	17.89	17.47
UEC Planning Area Total	291.09	283.81

Demands in million gallons per day.

2016 UEC Plan Update (2040) versus 2021 UEC Plan Update (2045) Demand Comparison



Questions and Public Comment



- If you are participating via Zoom:
 - Use the Raise Hand feature

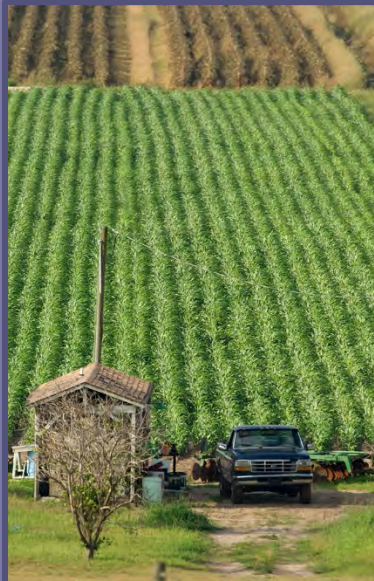
- If you are participating via phone:
 - *9 raises hand
 - *6 mutes/unmutes your line

- When you are called on, please state your full name and affiliation prior to providing comments and/or questions

10-minute Break



Water Resource Protection Tools

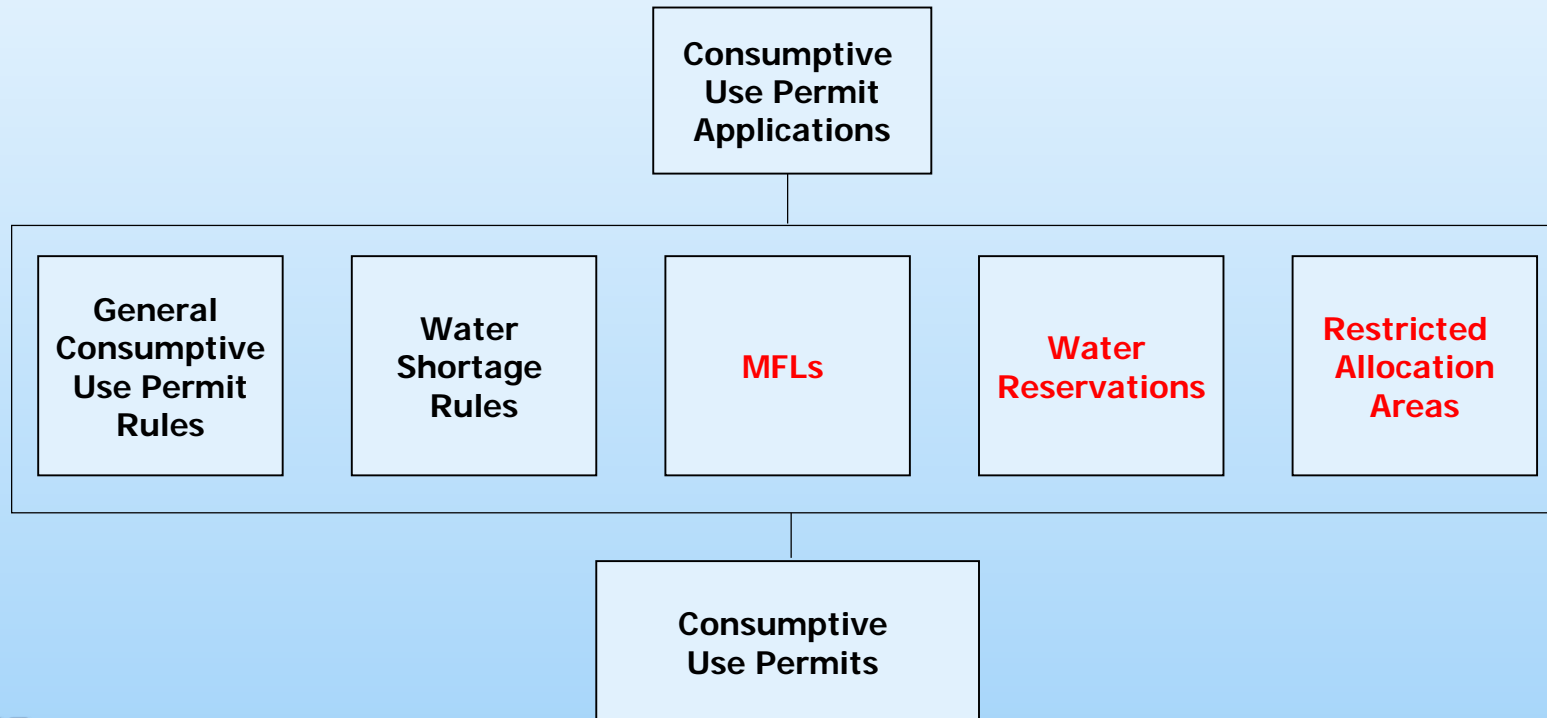


Toni Edwards
Senior Scientist

2021 UEC Stakeholder Kickoff Meeting
April 30, 2021



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



Minimum Flows and Minimum Water Levels (MFLs)

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

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

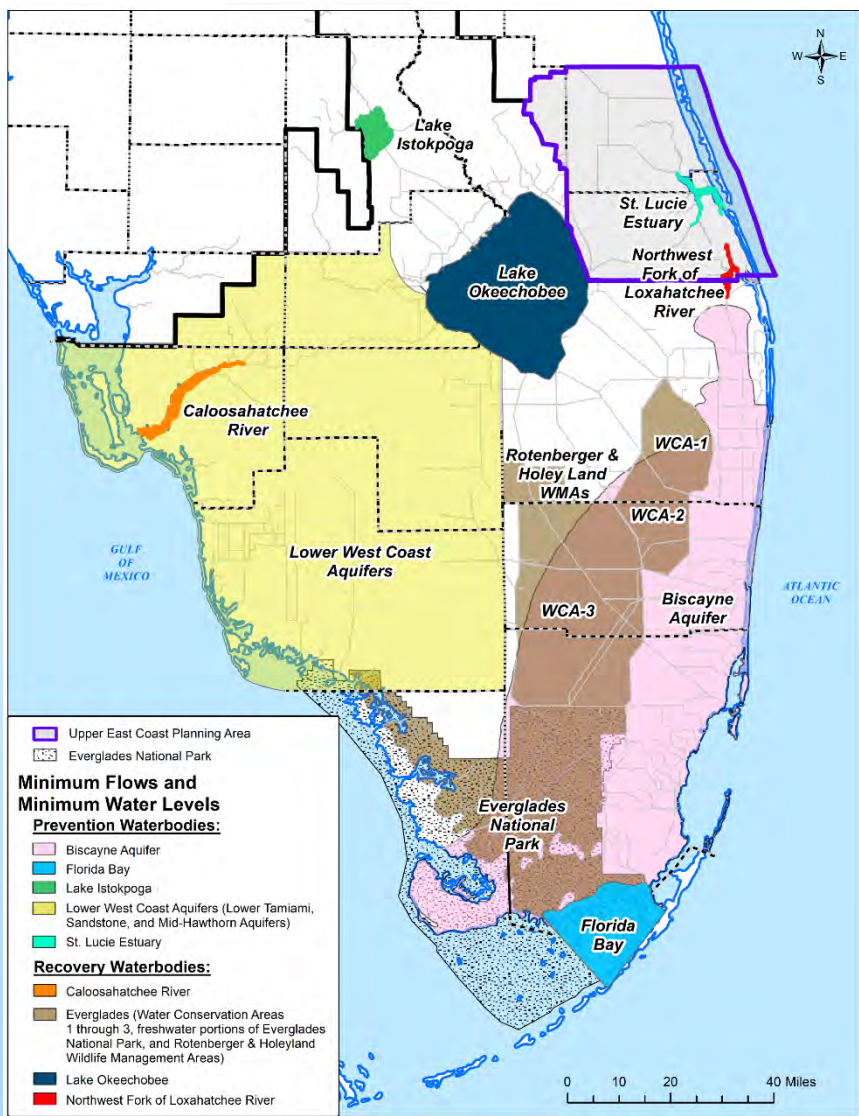
- For waterbodies that are meeting the MFL but are not expected to meet it in 20 years
- Prevent the existing flow or level from falling below the adopted MFL



Great Egret (*Ardea alba*) and American Alligator (*Alligator mississippiensis*)

Source: <https://naturetime.wordpress.com>

MFLs Adopted to Date in SFWMD



With Prevention Strategies

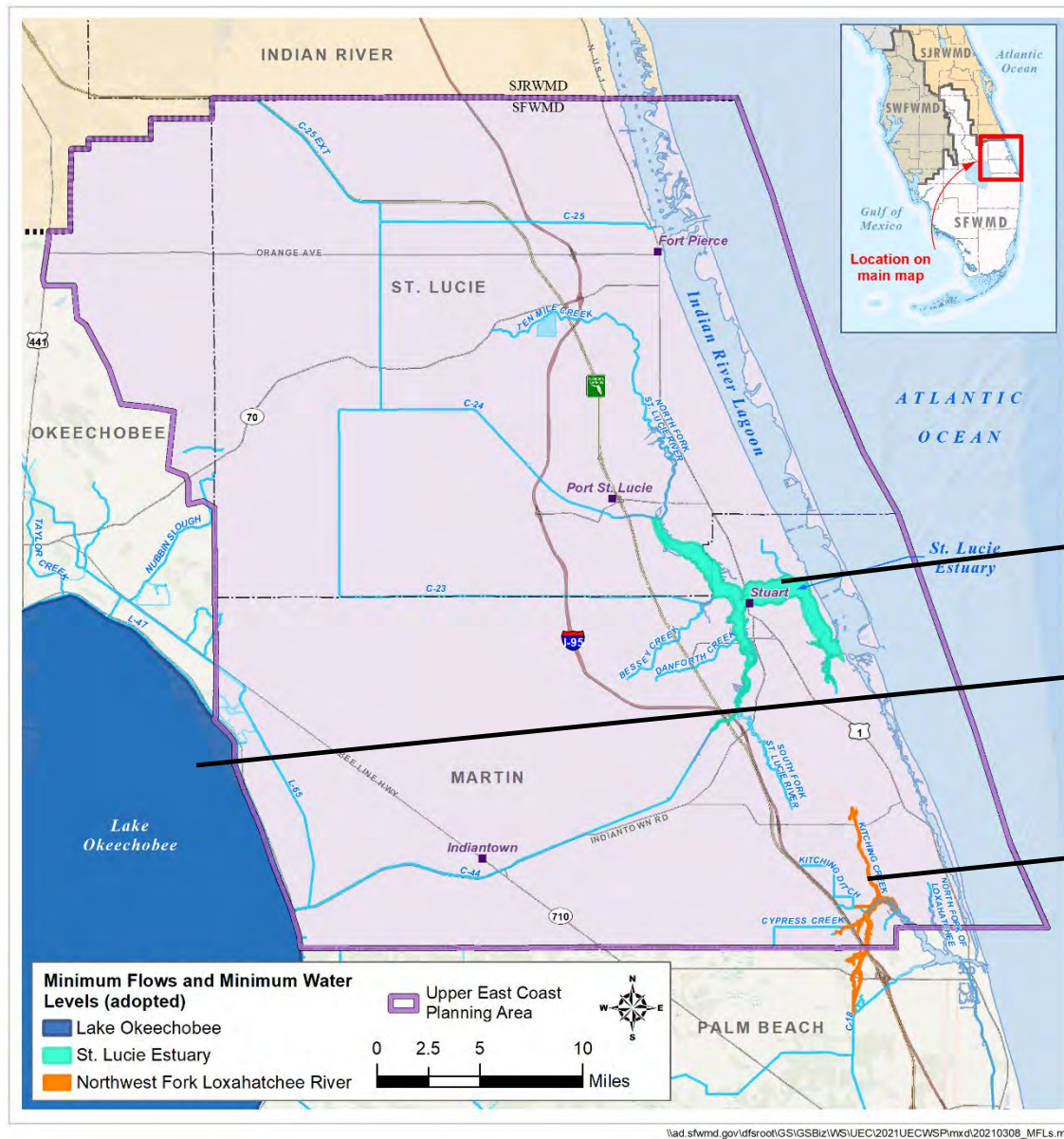
- Biscayne Aquifer
- Lower West Coast Aquifers
- **St. Lucie Estuary**
- Florida Bay
- Lake Istokpoga

With Recovery Strategies

- Caloosahatchee River
- Everglades
- **Lake Okeechobee**
- **Northwest Fork of Loxahatchee River**

Cover > 6.6 million acres Districtwide

MFLs Adopted in the UEC



St. Lucie Estuary

Lake Okeechobee

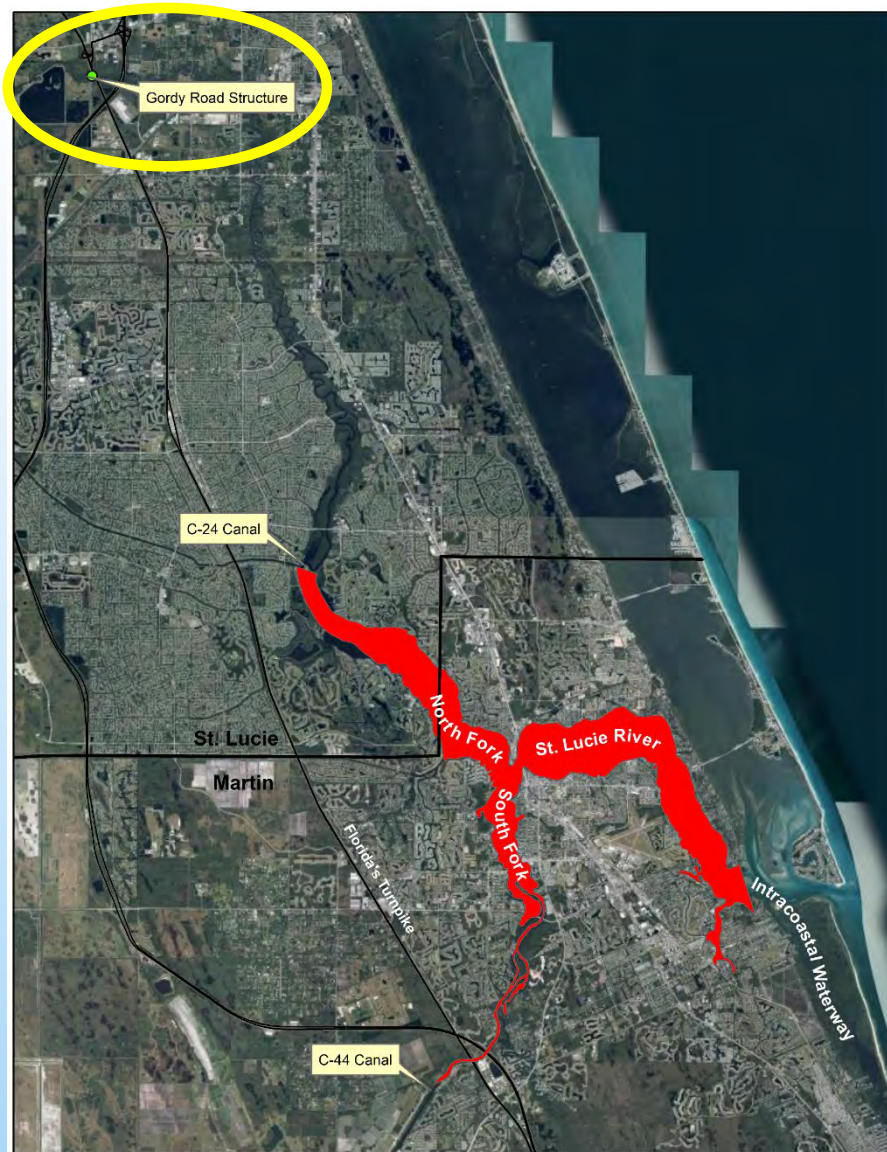
NW Fork of Loxahatchee River

MFLs Covered in Other Water Supply Plans

MFL Waterbody	Water Supply Plan	MFL Criteria	Recovery or Prevention Strategy
Northwest Fork of Loxahatchee River	Lower East Coast	Subsection 40E-8.221(4), F.A.C.	<p style="text-align: center;">Recovery</p> Subsection 40E-8.421(6), F.A.C.
Lake Okeechobee	Lower East Coast	Subsection 40E-8.221 (1), F.A.C.	<p style="text-align: center;">Recovery</p> Subsection 40E-8.421(2), F.A.C.



St. Lucie Estuary MFL



Rule 40E-8.341, F.A.C. (adopted 2002)

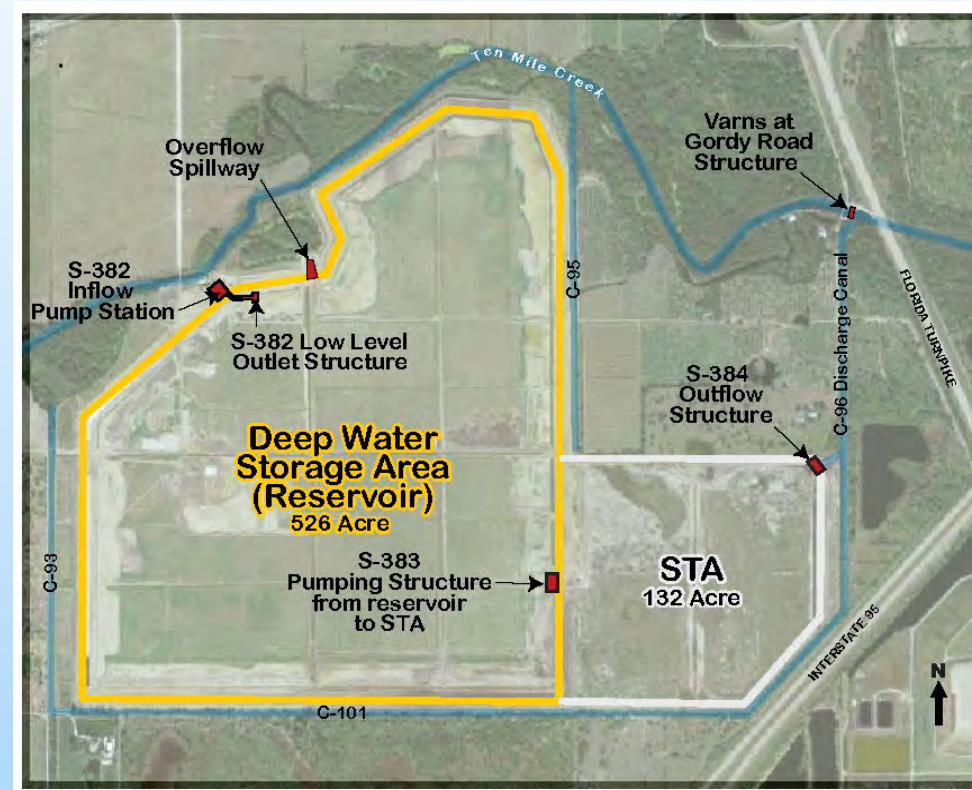
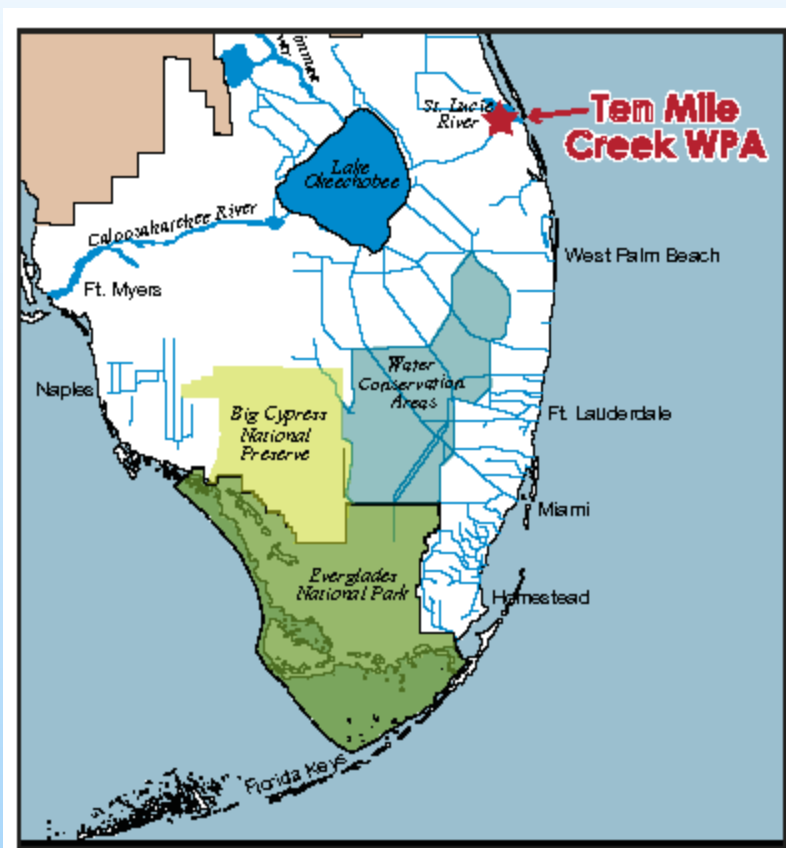
Defined in Subsection 40E-8.021(29), F.A.C, as... “the surface water body south of the confluence of the St. Lucie River North Fork and the C-24 Canal; north of the confluence of the St. Lucie River South Fork and the C-44 Canal; and west of the western boundary of the Intracoastal Waterway, exclusive of canals”

- Minimum mean monthly flow of 28 cubic feet per second (cfs) at the Gordy Road Structure
- An MFL violation occurs when:
 - Mean monthly flow at the Gordy Road Structure declines below 28 cfs, for two consecutive months, during a 365-day period, for two consecutive years

St. Lucie Estuary Prevention Strategy

Subsection 40E-8.421(5), F.A.C., and Upper East Coast Water Supply Plan

Discharges from the North Fork are managed within the operational protocols of the Ten Mile Creek Project



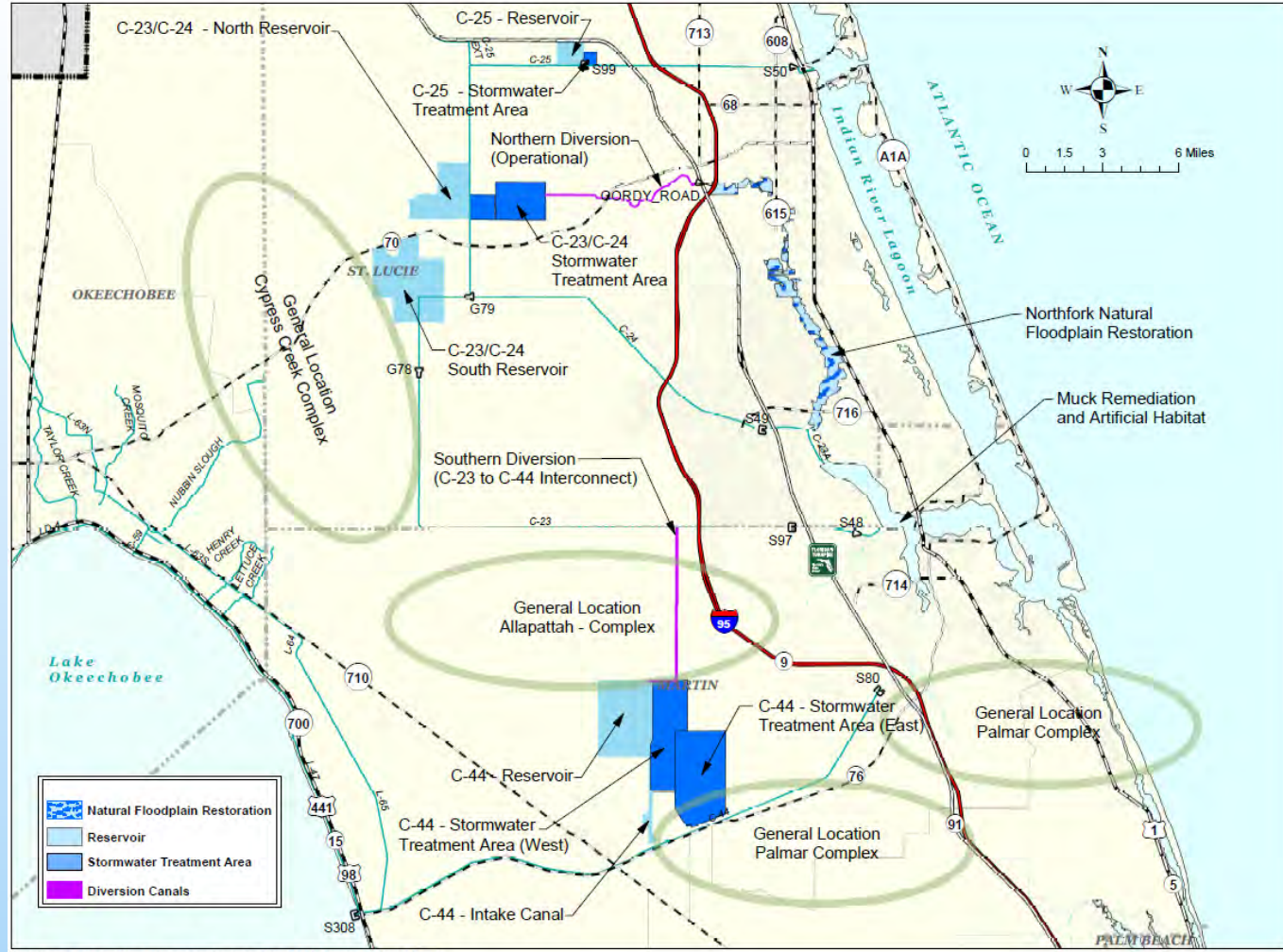
Ten Mile Creek Project components.

From: <https://www.saj.usace.army.mil/Media/Fact-Sheets/Article/479985/ten-mile-creek-water-preserve-area/>

St. Lucie Estuary Prevention Strategy

Subsection 40E-8.421(5), F.A.C., and Upper East Coast Water Supply Plan

Flow targets are consistent with the Comprehensive Everglades Restoration Plan (CERP) performance requirements for Indian River Lagoon as part of the CERP Indian River Lagoon – South (IRL-S) Project



For copies of this map (\\nrc_data\maps\proj\indian\am\Uec_8.5x11_Revised_APR2021_4.mxd

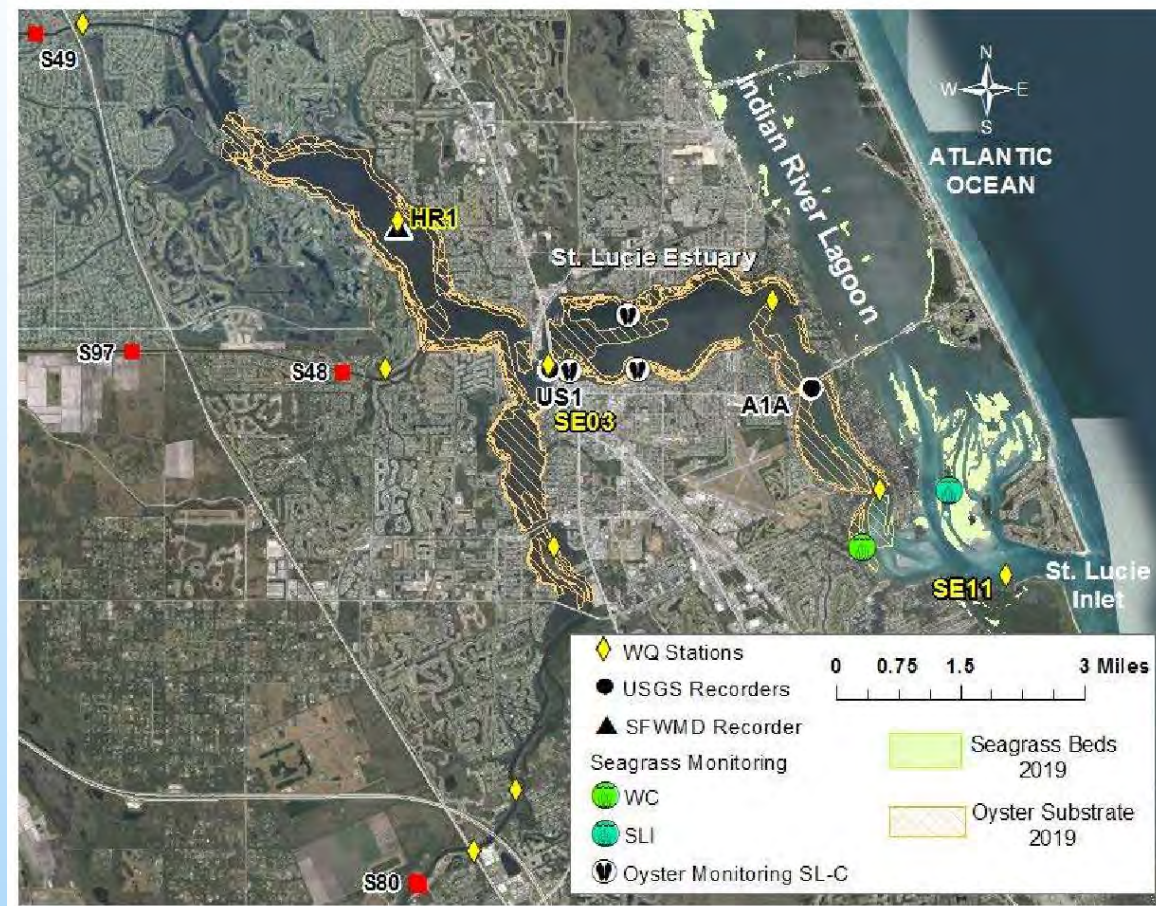
St. Lucie Estuary Prevention Strategy

Subsection 40E-8.421(5), F.A.C., and Upper East Coast Water Supply Plan

Ongoing research and monitoring are conducted in the North and South Forks of the St. Lucie River



Eastern Oyster (*Crassostrea virginica*).



St. Lucie Estuary monitoring locations for water quality (HR1, SE03, and SE11), salinity (US1 and A1A salinity recorders), seagrass (Willoughby Creek= WC and St. Lucie Inlet= SLI sites), and oysters (St. Lucie Central Site = SL-C, stations C1, C2, and C3). Also shown are the seagrass cover maps from aerial photography conducted in 2019 of the Southern IRL and lower SLE, and the 2019 sidescan-sonar mapping results for oyster substrate, which includes live oysters and oyster shell.

From: 2021 South Florida Environmental Report https://apps.sfwmd.gov/sfwmd/SFER/2021_sfer_final/v1/chapters/v1_ch8c.pdf

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

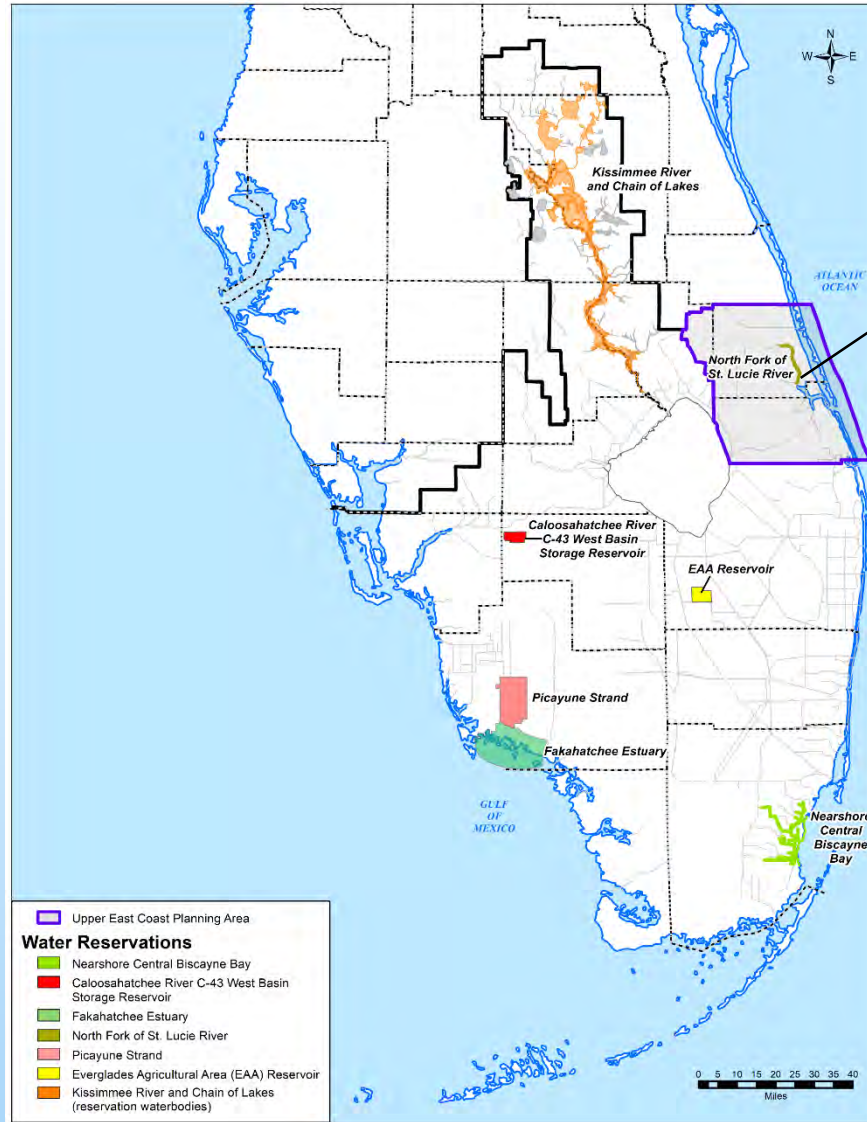


S-67 water control structure (replaced G-85 structure)
Source: SFWMD



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

Water Reservations Adopted to Date in SFWMD



- Fakahatchee Estuary
- Picayune Strand
- **North Fork of the St. Lucie River**
- Nearshore Central Biscayne Bay
- Caloosahatchee River C-43 West Basin Storage Reservoir
- Everglades Agricultural Area (EAA) Reservoir
- Kissimmee River and Chain of Lakes

Cover 356,281 acres Districtwide

Water Reservations Adopted in the UEC

North Fork of the St. Lucie River, Subsection 40E-10.051, F.A.C.

For the protection of fish and wildlife



Common snook (*Centropomus undecimalis*)
Source: <https://www.treasurecoast.com/>

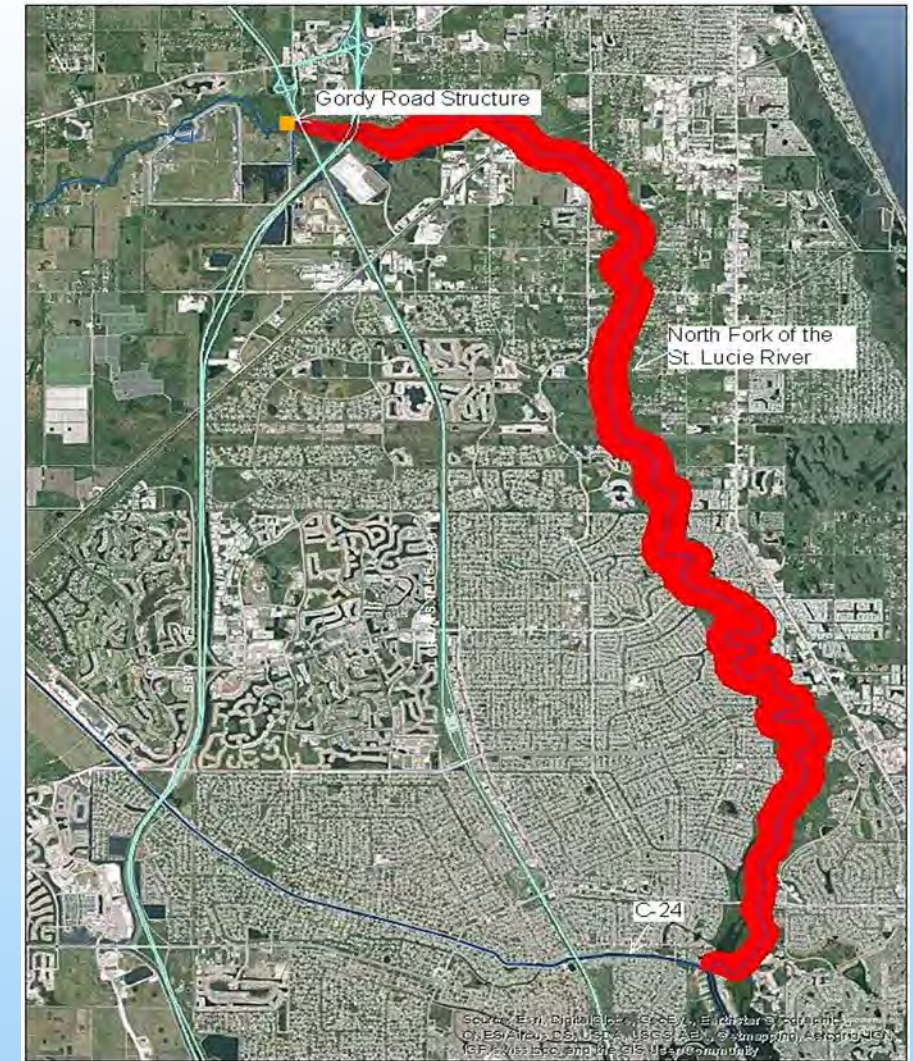


West Indian manatee (*Trichechus manatus latirostris*)
Source: James R. D. Scott
<https://www.gettyimages.com>

North Fork of St. Lucie River Water Reservation

Section 40E-10.051, F.A.C.

- Prospective reservation - water available to fish and wildlife when the CERP C-23/C-24 North and South Reservoirs and STA Project components are operational
- Mean monthly flow of 130 cfs over Gordy Road Structure from November 1 through May 31



Restricted Allocation Areas (RAAs)

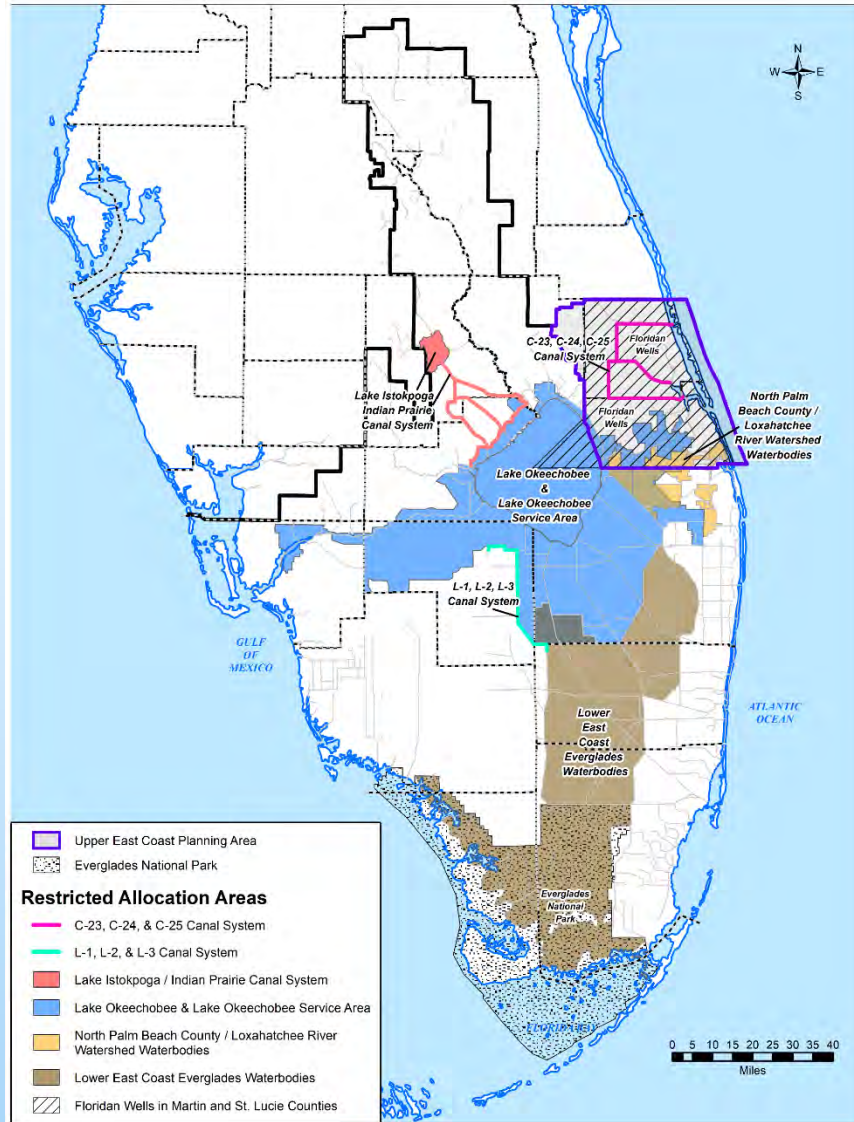
Listed in **Section 3.2.1 of the SFWMD Applicant's Handbook¹**, incorporated by reference in **Rule 40E-2.091, F.A.C.**

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

¹ SFWMD. 2021. *Applicant's Handbook for Water Use Permit Applications within the South Florida Water Management District*. South Florida Water Management District, West Palm Beach, FL. March of 2021.

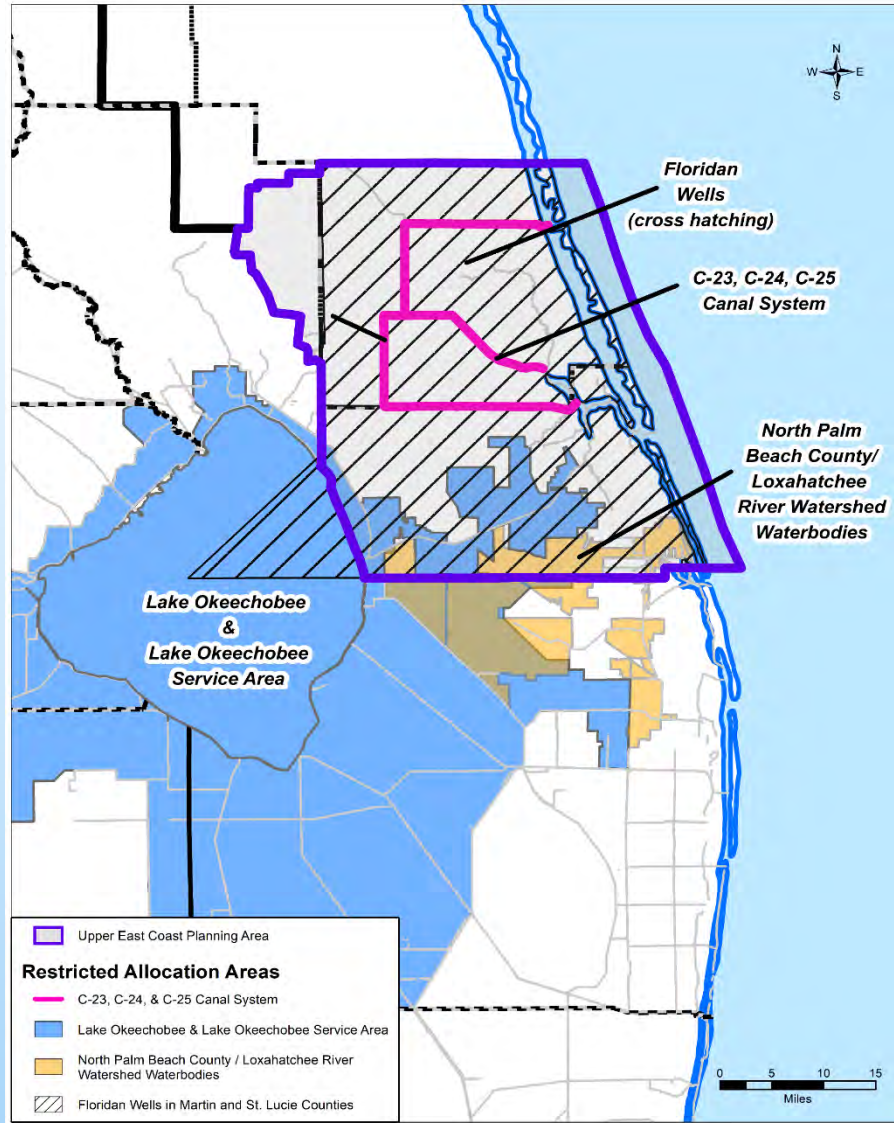
Restricted Allocation Areas in the SFWMD



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

Cover > 4.3 million acres Districtwide

Restricted Allocation Areas Adopted in the UEC



Osprey (*Pandion haliaetus*) nest just off the C-23 Canal.
Source: <https://www.SFWMD.gov>



Florida Agriculture Along Lake Okeechobee, Aerial View, 1974.
Source: Southeast Florida Memories by Philip Abromats
<https://www.pinterest.com/pin/592856738421422043/>

Restricted Allocation Area Criteria

C-23, C-24, and C-25 Canal System

- No additional surface water allocations from these canals, or directly connected canals, above existing allocations
- No increase in surface water pump capacity

Northern Palm Beach County/Loxahatchee River Watershed Waterbodies

- Water allocations are limited to base condition uses described in *Applicant's Handbook*

Floridan Wells in Martin and St. Lucie Counties

- No pumps on flowing Floridan aquifer wells in Martin and St. Lucie counties, except under *Applicant's Handbook* guidelines

Lake Okeechobee and Lake Okeechobee Service Area

- Water allocations are limited to historical condition water uses that occurred from April 1, 2001 to January 1, 2008



Questions and Public Comment

For more information contact:

Toni Edwards
at tedwards@sfwmd.gov
or (561)682-6387

Don Medellin
at dmedelli@sfwmd.gov
or (561)682-6340

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

- If you are participating via Zoom:
 - Use the Raise Hand feature
- If you are participating via phone:
 - *9 raises hand
 - *6 mutes/unmutes your line
- When you are called on, please state your full name and affiliation prior to providing comments and/or questions

Red Mangroves in the South
Fork of the St. Lucie River



Comprehensive Everglades Restoration Plan: Project Updates

2021 Upper East Coast Water Supply Plan Update – Public Stakeholder Meeting

April 30, 2021



Leslye Waugh

Section Administrator

Ecosystem Restoration Planning & Project Management

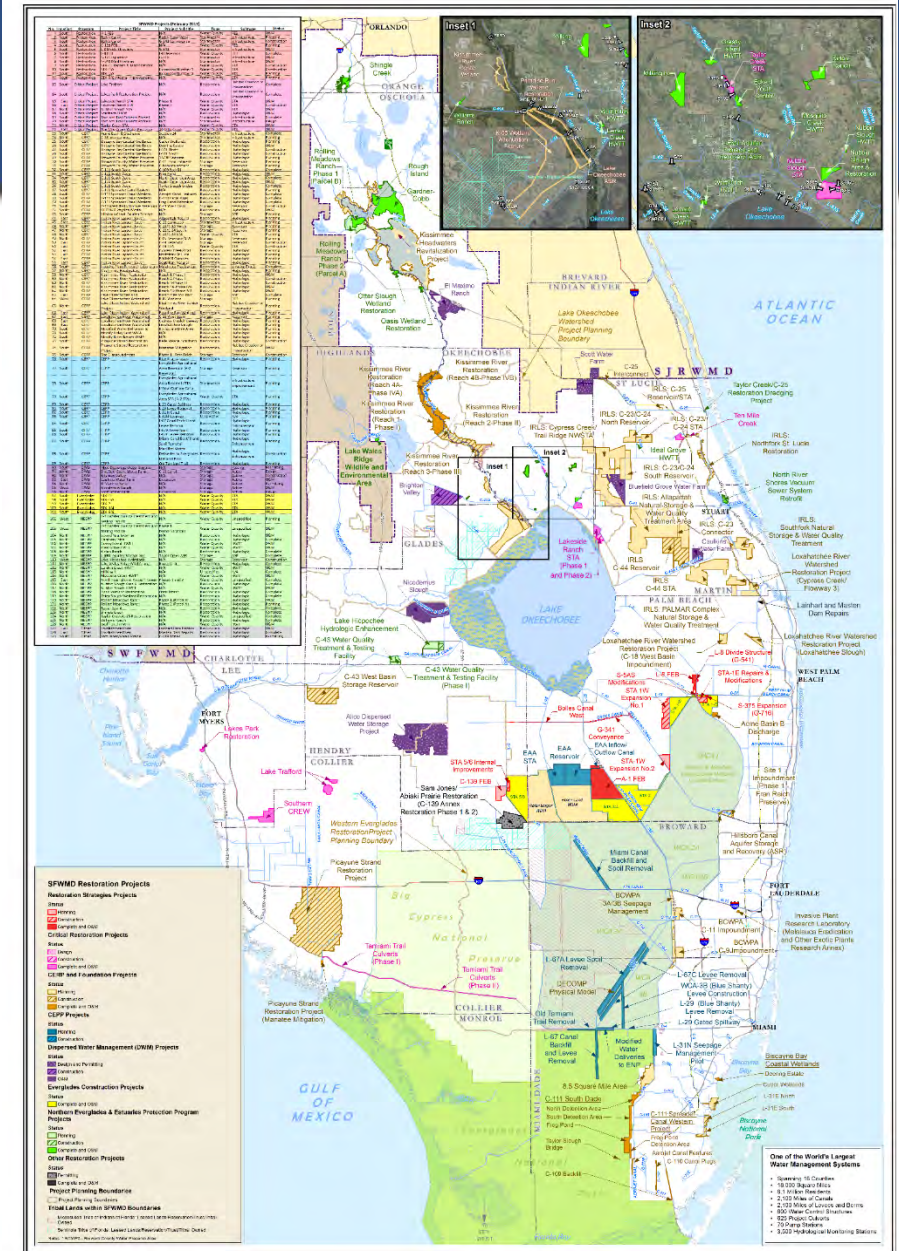
Presentation Outline

- **Restoration Projects**
- **CERP Project Updates**
 - Central Everglades Planning Project
 - Caloosahatchee River (C-43) West Basin Storage Reservoir
 - Lake Okeechobee Watershed Restoration Project: Aquifer Storage and Recovery Wells
 - Indian River Lagoon - South
- **CERP Planning Projects**
- **Integrated Delivery Schedule (IDS)**

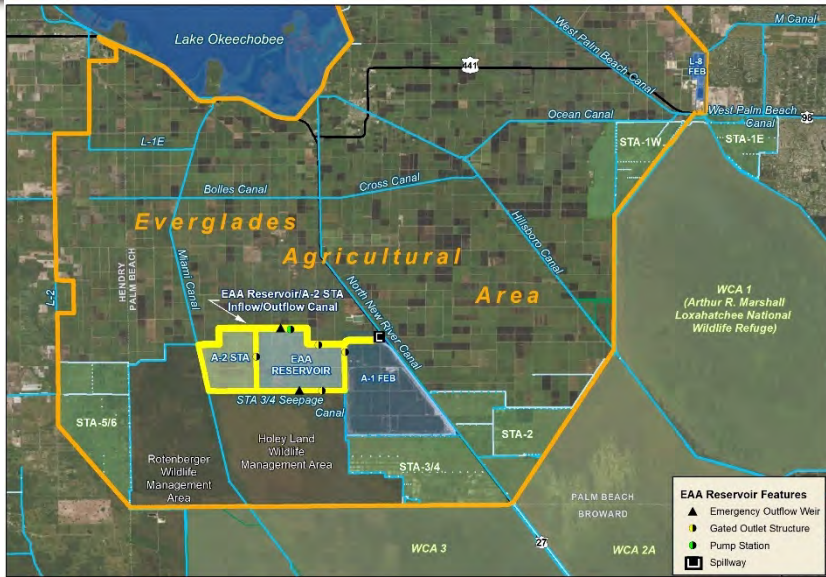
Restoration Projects

- **State Projects**
 - Restoration Strategies Program
 - Everglades Construction Project
 - Stormwater Treatment Areas (STA)
 - Northern Everglades and Estuaries Program
 - Dispersed Water Management
- **Federal Projects**
 - South Florida Ecosystem Restoration Program
 - Comprehensive Everglades Restoration Plan (CERP)
 - Non-CERP

<https://sfwmd.maps.arcgis.com/apps/MinimalGallery/index.html?appid=1fac32f199240b49a326432258c102f>



Central Everglades Planning Project



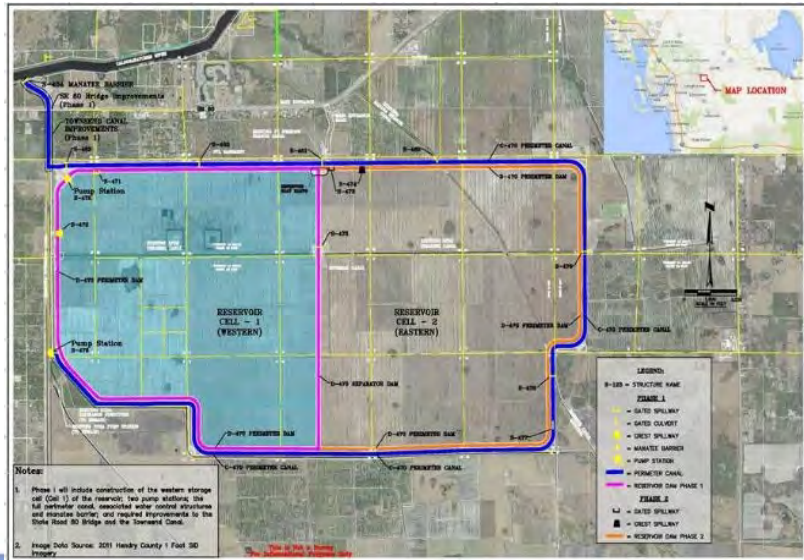
- **CEPP EAA Phase**
 - SFWMD Signed Project Partnership Agreement (PPA)
 - STA under construction by SFWMD
 - Reservoir in design by USACE
- **CEPP North Phase**
 - SFWMD lead on design and construction
- **CEPP South Phase**
 - S-333N spillway completed by SFWMD
 - Old Tamiami Trail Removal under construction by SFWMD
 - L-67A Culverts and L-67C Levee Gaps under construction by USACE
 - USACE lead on design and construction of remaining features
- **CEPP New Water Phase**
 - Seepage Barrier, L-31N Levee



Caloosahatchee River (C-43) West Basin Storage Reservoir

SFWMD began construction in 2015

- Purpose is to improve salinity balance in the Caloosahatchee Estuary by capturing and storing basin runoff and Lake Okeechobee regulatory releases during the wet season and providing essential flows during the dry season.
- 10,700-acre area with 170,000-acre-feet storage capacity
- Construction completion expected in 2024

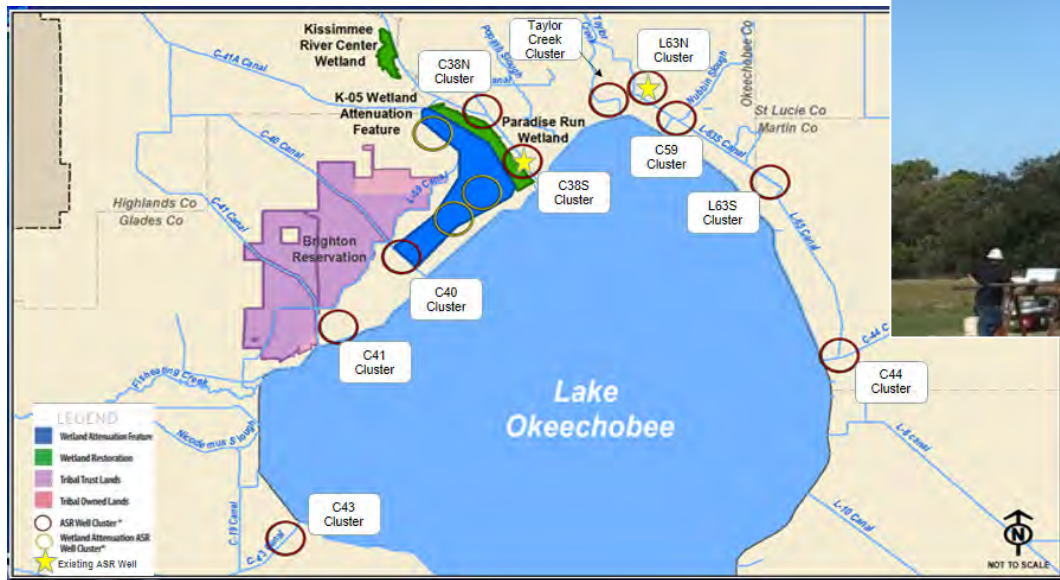


S-470 Pump Station



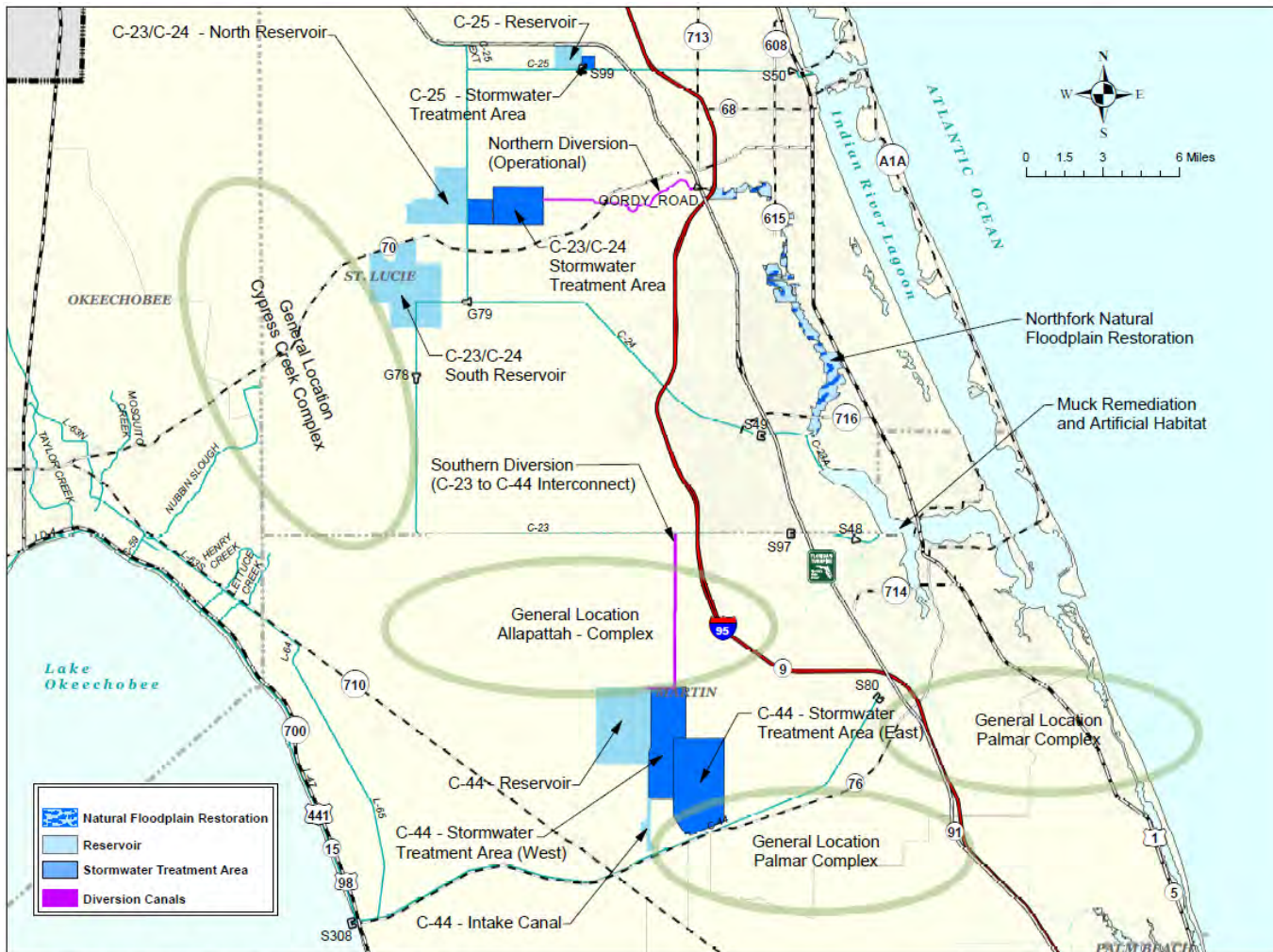
Perimeter Canal

Lake Okeechobee Watershed Restoration Project Aquifer Storage and Recovery Wells



- **Project Implementation Report pending Final Chief’s Report and Congressional Authorization**
- **SFWMD initiating work on Aquifer Storage and Recovery (ASR) well clusters**
 - siting evaluation and site selection activities
 - conducting continuous cores as part of exploratory well program
 - initiating exploratory testing and well drilling
- **Developing Science Plan for ASR implementation to address uncertainties**

Indian River Lagoon - South



For copies of this map (\\arc_data\maps\proj\indian\am\Uec_8.5x11_Revised_APR2021_4.mxd

Purpose

- To capture, store, and treat local basin runoff to restore the delicate balance of freshwater and salt water in the St. Lucie Estuary and the southern portion of the Indian River Lagoon, and revitalize degraded habitat within the watershed.

Structural Component

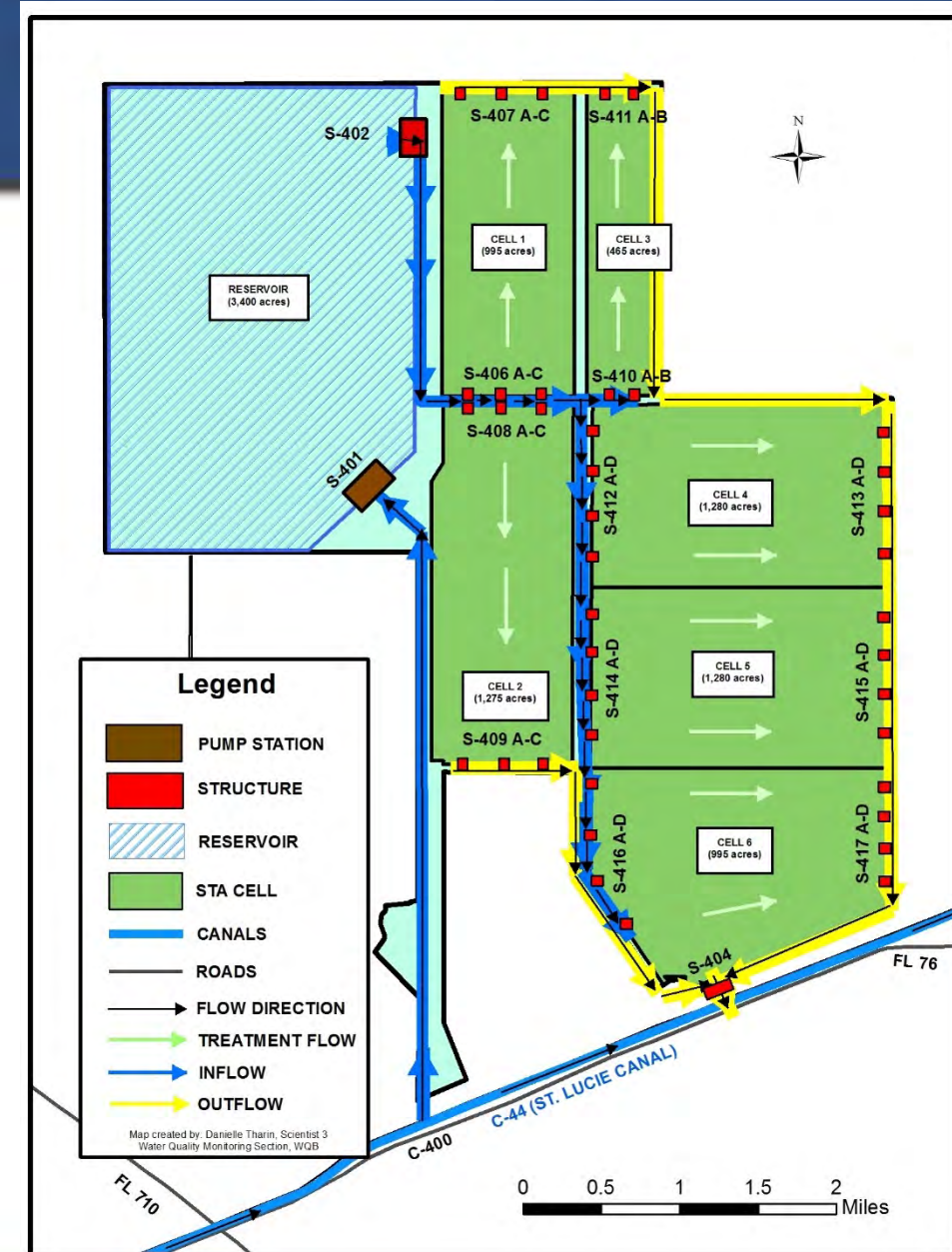
- C-44 Reservoir & STA
- Southern Diversion – C23/C24 Interconnect Canal
- C23/C24 South and North Reservoir & STA
- Northern Diversion – discharge from the STA to the North Fork of the St. Lucie Estuary
- C25 Reservoir & STA

Natural Lands Component

- Cypress Creek
- Allapattah Complex
- Palmar Complex

IRL-S: C-44 Reservoir & STA

- Purpose is to capture, store, and treat local C-44 basin runoff
- **SFWMD Projects:**
 - Pump Station 1,100 cfs – complete
 - STA 6,300 acres – complete
- **USACE Project:**
 - Reservoir 3,400-acre area
 - 50,600-acre-foot storage capacity
 - Construction completion in 2021
 - Filling to start in Fall 2021



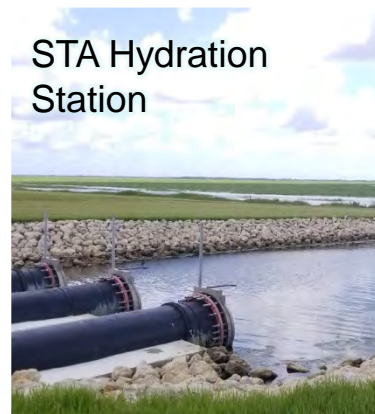
IRL-S: C-44 Reservoir



Reservoir



Pump Station



STA Hydration Station



S-404 Spillway

IRL-S: C44 STA



IRL-S: C-23/C-24 Reservoir & STA

Stormwater Treatment Area (STA)

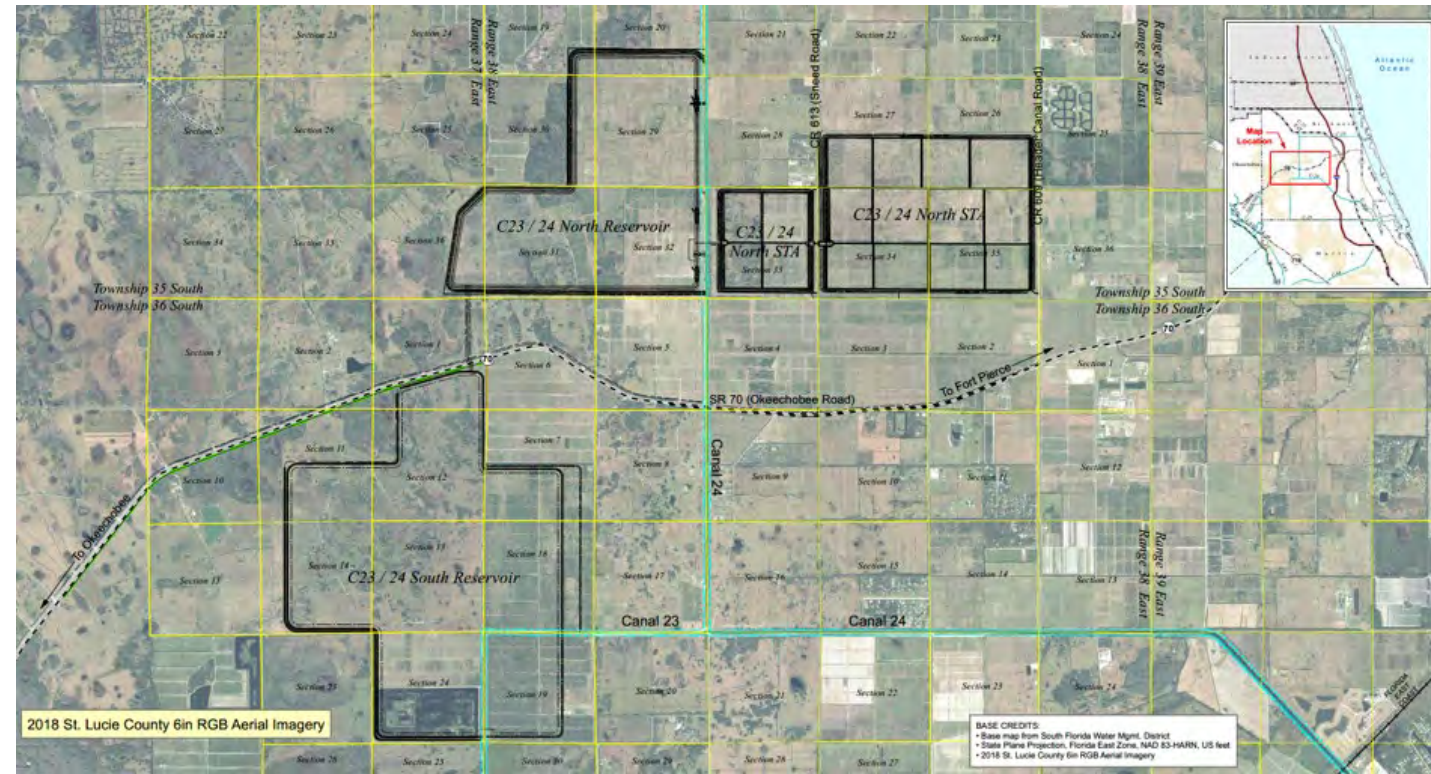
- 1,970-acre treatment area
- Design completion in May 2021
- Contract award scheduled for late 2021 and construction completion expected 2025

North Reservoir

- Approximately 2,000 acres
- 30,000 acre-feet storage capacity
- Final design expected in March 2022
- Construction scheduled for 2022 to 2028

South Reservoir

- Approximately 3,500 acres
- 60,000 acre-feet storage capacity
- Final design expected in 2024
- Construction scheduled for 2024 to 2030



Lakeside Ranch STA

- Constructed by the SFWMD under the **Northern Everglades & Estuaries Program**
- Purpose is to reduce phosphorus loads to Lake Okeechobee
- Located in Martin County
- 2,700-acre parcel
 - Phase I (North STA)
 - Phase II (South STA & S-191A Pump Station)
- Construction completion in 2021



Loxahatchee River Watershed Restoration Project

Alternative 5R

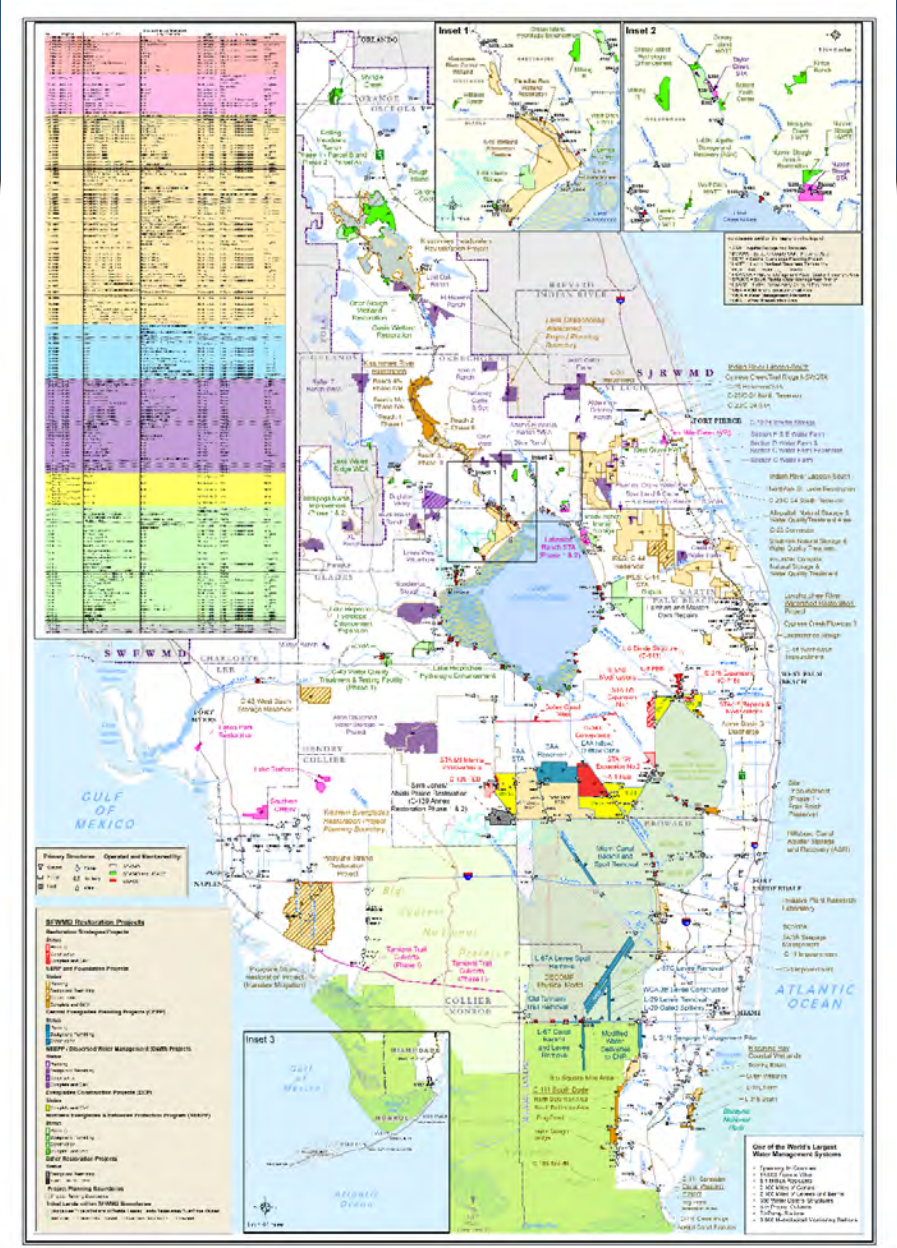
1. **Kitching Creek (Restoration/hydratation):** (Spreader canal; weir/plug (Jenkins Ditch)
2. **Moonshine Creek (MC) & Gulfstream East (GE) Restoration:** Connect HSLCD ditch to MC; clear MC vegetation; weir in Hobe Grove Ditch; grade area to historic topography
3. **Cypress Creek Canal (CCC)(Reduce over-drainage):** Replace CCC weir to raise control elevation, raise berm at Ranch Colony, automate twin 84" culverts; pump and spreader swale; regrade CC southern forks
4. **Gulfstream West (GW)(Restoration & reduce over- drainage):** Partial backfill & relocate southern end of HSLCD canal; small pump, construct flow through marsh to attenuate flows
5. **Pal-Mar East (Restoration & Connectivity):** Plug ditches; remove pipes; improve northern berm; construct western berm improve eastern berm; pumps at Thomas Farm to redirect drainage to GW flow- redirect drainage to GW flow-through marsh via north Nine-Gems Canal
6. **C-18W Reservoir (9,500 ac-ft. & 4 ASR wells):** Above ground reservoir; inflow pump, discharge structure; seepage control; M-O canal connector and pump
7. **G-160 Structure (Reduce over-drainage):** Improve hydroperiod in Loxahatchee Slough
8. **G-161 Structure (Connectivity):** GWP water to Loxahatchee Slough
9. **GWP Triangle (Connectivity):** Grade and reconnect
10. **M-1 Pump Station (conveyance):** Deliver lower M-1 basin water to M-Canal, GWP and G-161



- **Authorized in WRDA 2020**
- Purpose is to restore and sustain the overall quantity, quality, timing, and distribution of fresh waters to the federally designated “National Wild and Scenic” Northwest Fork of the Loxahatchee River for current and future generations.
- This project also seeks to restore, sustain, and reconnect the area’s wetlands and watersheds that form the historic headwaters for the river.
- Few project features located in Martin County but majority are in Palm Beach County
- Project is fully described in Lower East Coast Plan

Planning Projects

- Lake Okeechobee Watershed Restoration Project (LOWRP) (includes ASR Wells)
- Western Everglades Restoration Project (WERP)
- Biscayne Bay Southeastern Everglades Ecosystem Restoration Project (BBSEER)



Questions and Public Comment



- If you are participating via Zoom:
 - Use the Raise Hand feature

- If you are participating via phone:
 - *9 raises hand
 - *6 mutes/unmutes your line

- When you are called on, please state your full name and affiliation prior to providing comments and/or questions

Next Steps



Nancy Demonstranti, P.G.
Upper East Coast Plan Manager

2021 UEC Stakeholder Kickoff Meeting
April 30, 2021

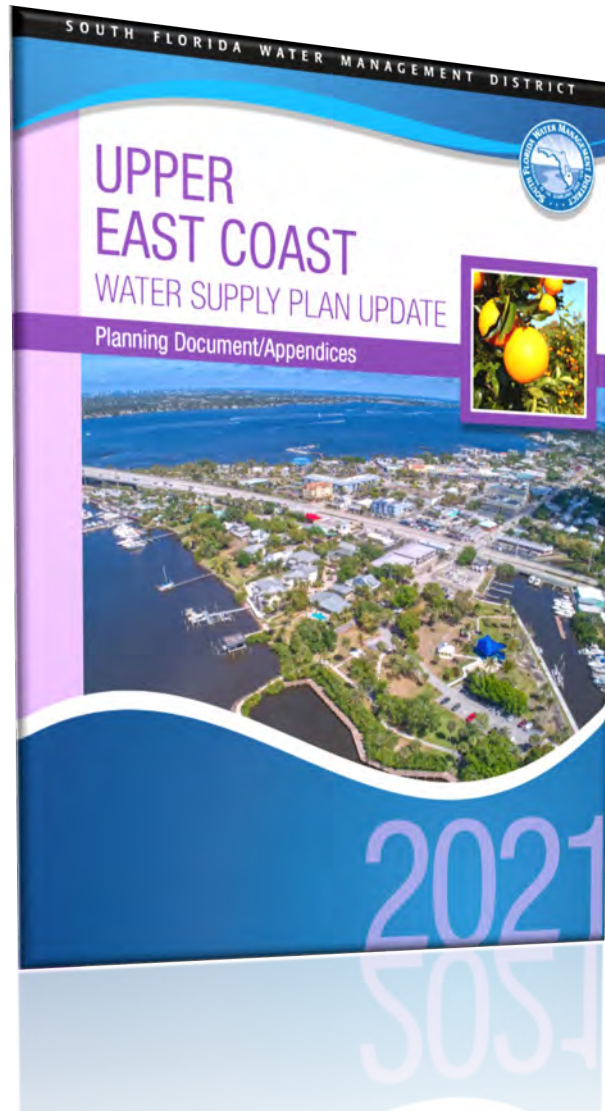


Next Steps

- Continue coordination with utilities, agricultural operations, state agencies, and other stakeholders
- Groundwater model simulations
- Stay up to date with progress of regional projects
- Next stakeholder meeting: Late summer/Early Fall of 2021



Need Water Supply Plan Information?



- Plan information can be found at www.sfwmd.gov/uecplan
- Workshop announcements sent via email

Questions and Public Comment

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