

Status of the Northern Everglades and Estuaries Protection Program and Projects in Lake Okeechobee Watershed

Jennifer Reynolds, Division Director
Ecosystem Restoration & Capital Projects Division
South Florida Water Management District
Governing Board Meeting
May 13, 2021



Achieving More Now For Florida's Environment



➤ Gov. DeSantis signed Executive Order 19-12 in January 2019

- Established Blue-Green Algae Task Force
- Prioritized water quality and Everglades funding

➤ Gov. DeSantis signed the Clean Waterways Act in June 2020

- Implements recommendations of Blue-Green Algae Task Force

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sfwmd.gov/DBHYDROInsights

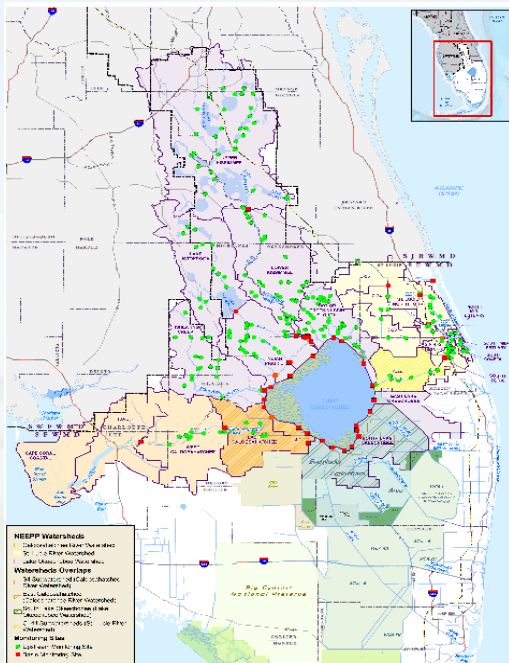
The screenshot shows the DBHYDRO Insights web application. At the top, there is a blue header with the SFWMD logo, the text "DBHYDRO insights", and navigation links for "Menu", "Favorites", "Info", and a "Search Insights" button. Below the header, five lake status cards are displayed, each showing a lake name, a numerical value, and "ft-NGVD".

Lake Name	Value (ft-NGVD)
Lake Okeechobee	13.88
Lake Istokpoga	38.83
Lake Tohopekalliga	52.70
East Tohopekalliga	55.66
Lake Kissimmee	50.99

Below the lake cards is a search bar labeled "Search Insights" and a "Search Filter: None" dropdown. Underneath is a section titled "Available Lens Options" with six icons representing different data views: Sites, Structures, Stormwater Treatment Areas, Watersheds, Data, and System (Coming Soon!). A link "Show Lens Descriptions" is located below these icons. At the bottom is a "Popular Resources" section with four items: "S6 structure", "Flow 0 cfs", "Upstream Stage 10.10 ft NGVD29", and "Downstream Stage 13.86 ft NGVD29".

Watershed Protection Plans

Monitoring



Projects



Programs



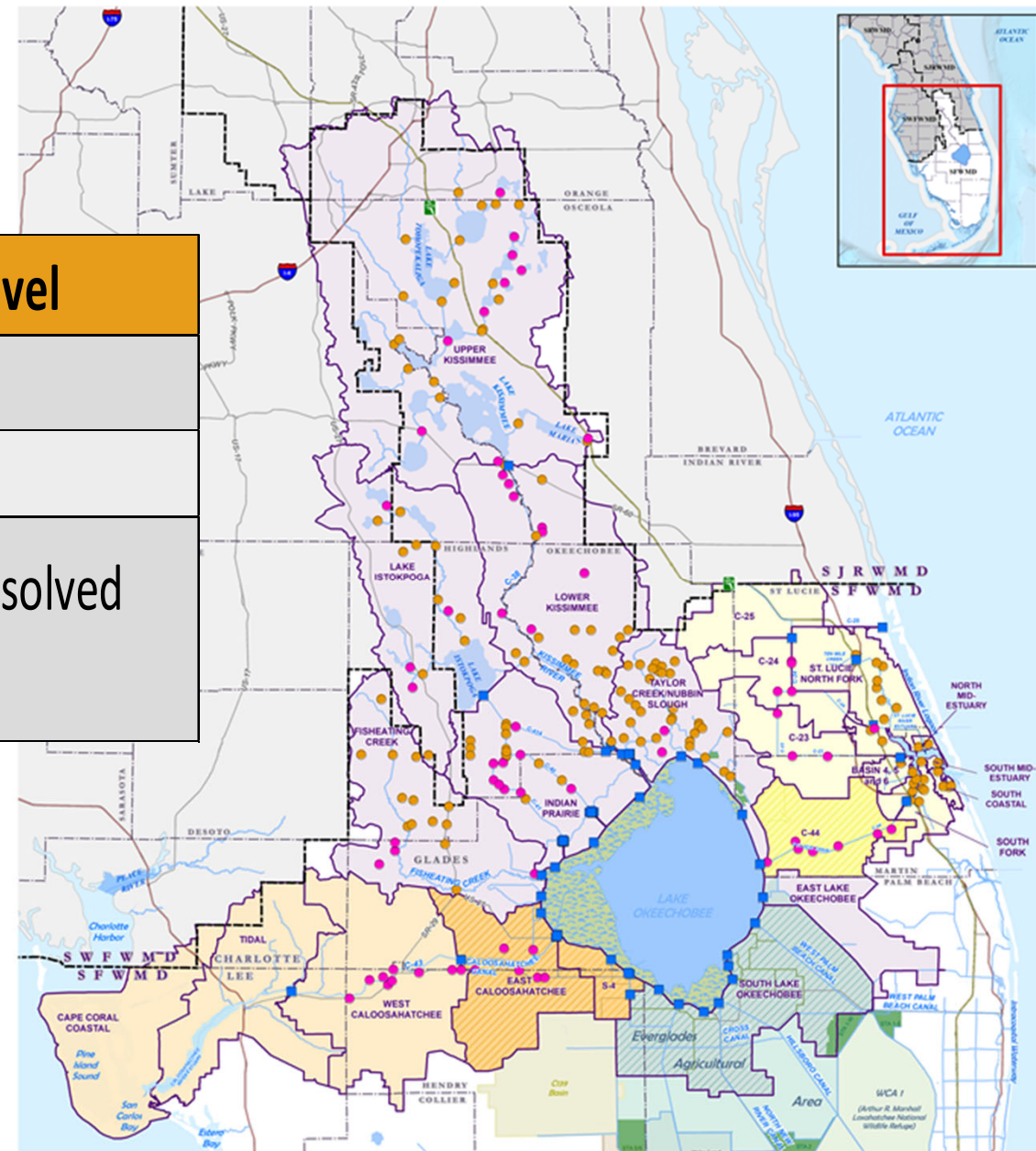
**Basin
Management
Action Plan
(BMAP)
Progress
&
Updates**

Review Watershed Protection Plans (WPPs)

Expanded Monitoring Network

Elements	Basin Level	Upstream Level
# of sites	47	211
Frequency	Biweekly or Weekly	Biweekly
Monitored Parameters	TP, OPO4, TN, NH4, NOx, pH, Temperature, Dissolved Oxygen, Conductivity	

- Basin sites
- New sites
- Existing sites



Interagency Agreement

- **Required by NEEPP**
- **Further details agency roles and processes**
- **Current agreement expires March 2022**
 - SFWMD Governing Board directed staff to update the agreement in March 2021
- **District initiated update to include:**
 - River watersheds
 - Recognition of District's expanded monitoring
 - Process for public engagement and accountability



Northern Everglades Planning Process

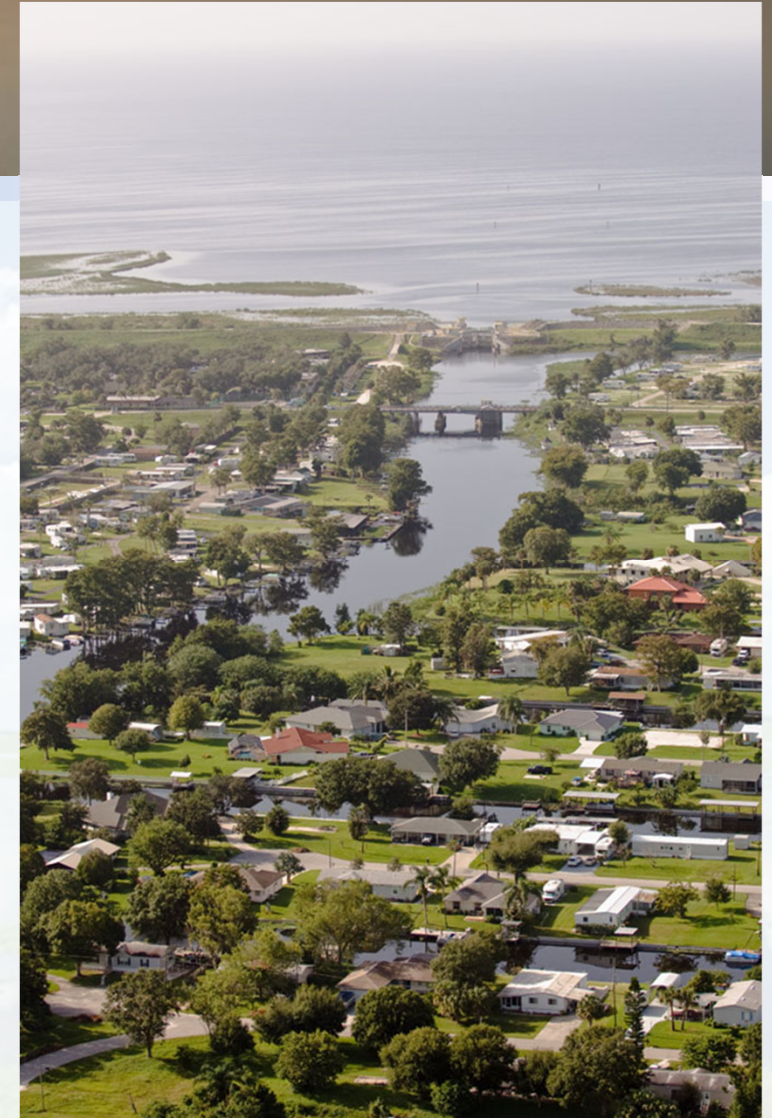
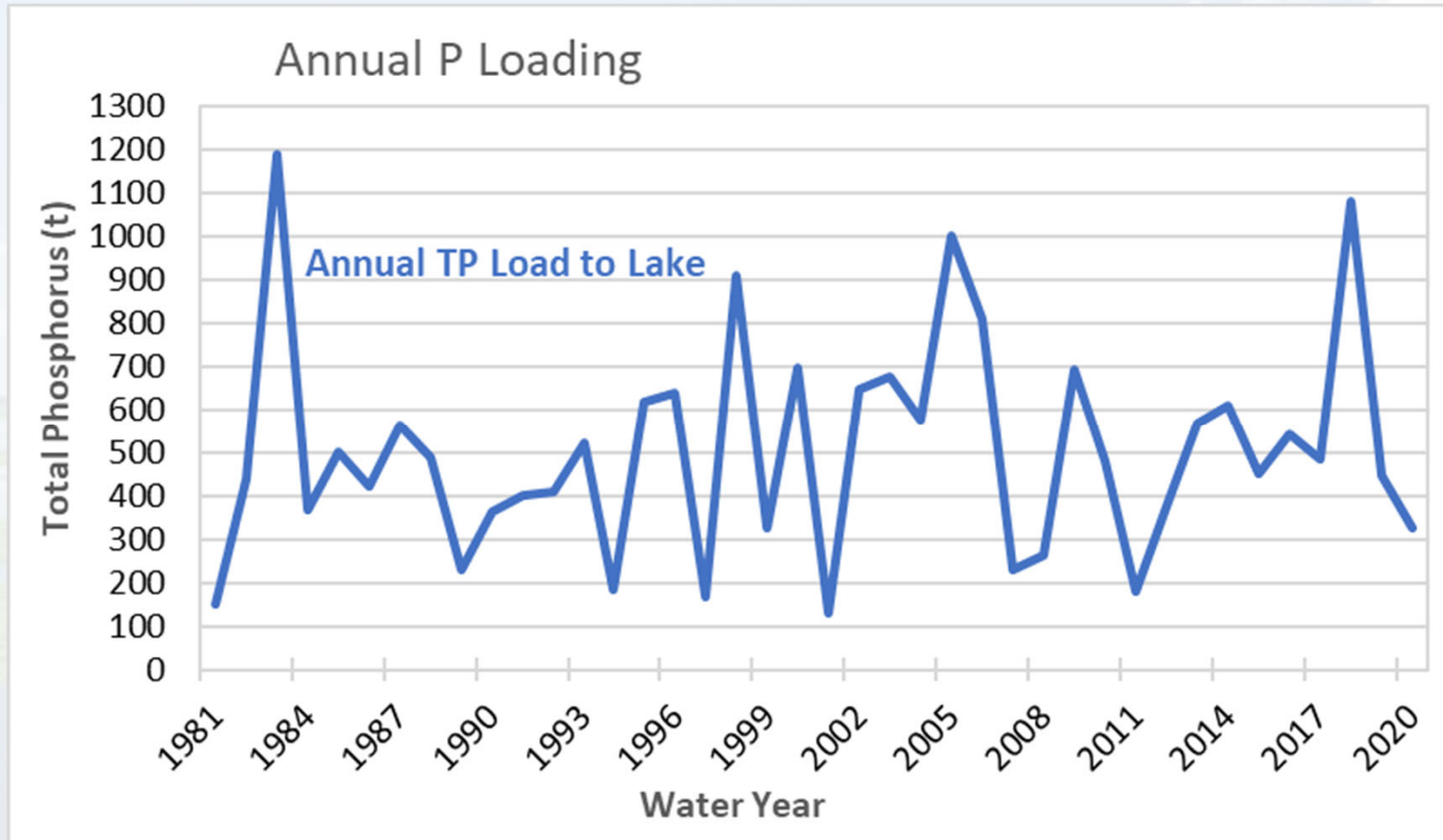
Northern Everglades and Estuaries Protection Program (NEEPP) Florida Statute 373.4595

- **FDEP** – Establishes Total Maximum Daily Loads (TMDLs), Basin Management Action Plans (BMAPs), non-agricultural Best Management Practices (BMP) programs
- **FDACS** – Agricultural BMP programs and research
- **SFWMD** – Watershed Protection Plans, hydrologic improvements, storage and treatment projects, water quality monitoring
- **Local entities** – Ordinances, programs, projects



Lake Okeechobee Watershed

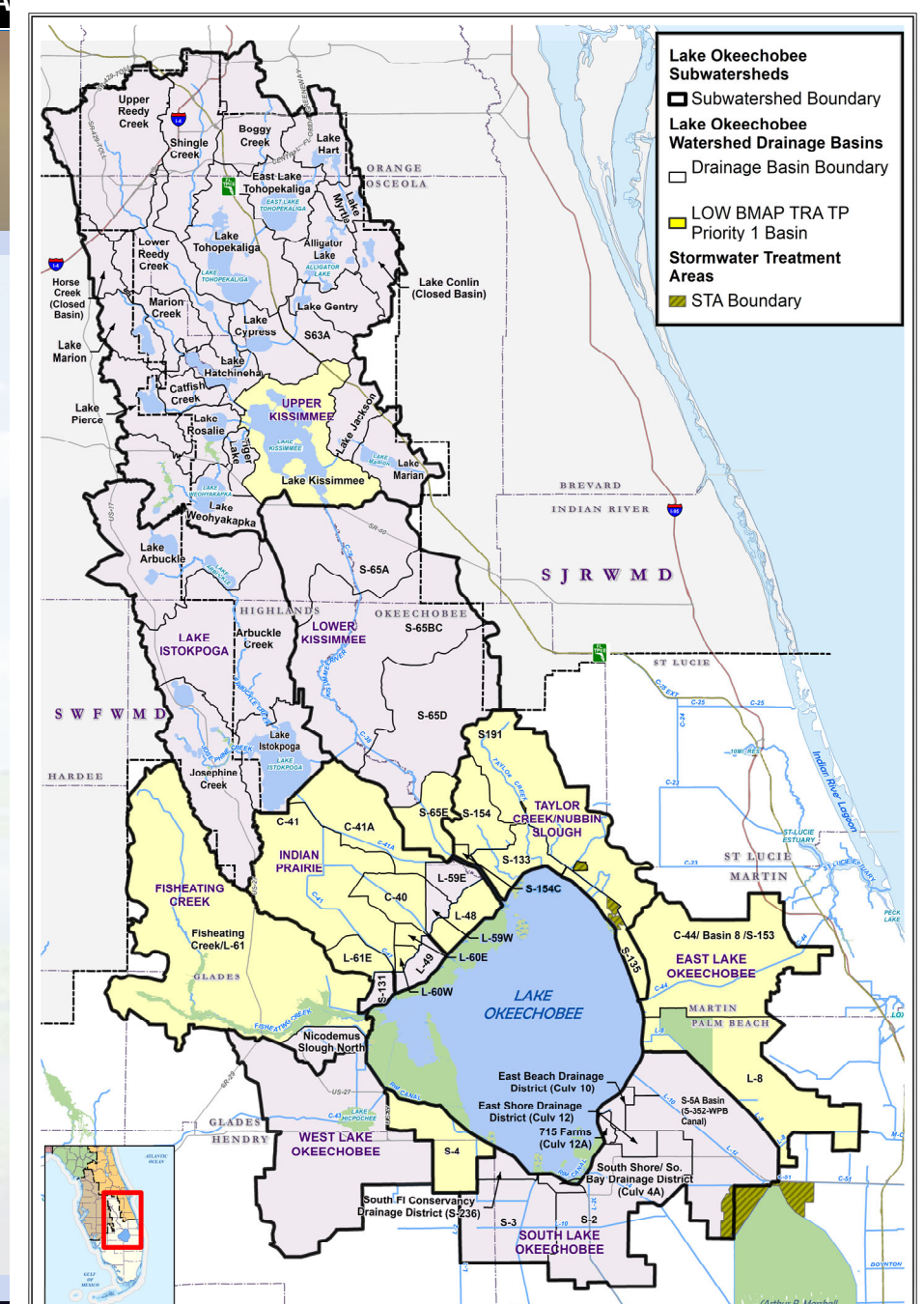
Nine Subwatersheds 3,450,475 acres



Taylor Creek and Lake Okeechobee

- Priority rankings: 18 out of 64 basins were ranked as Priority 1 for total phosphorus (TP)

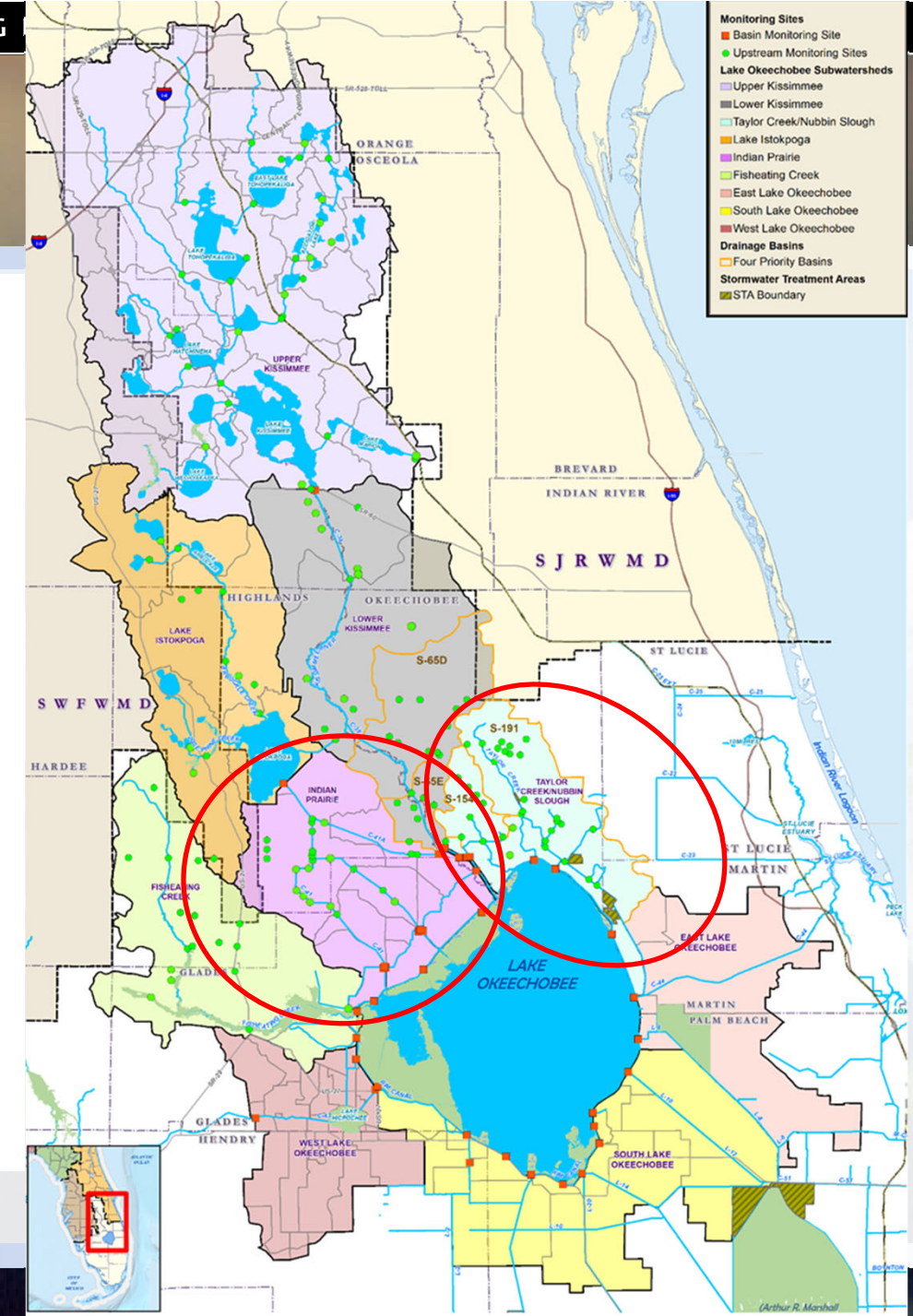
➤ **Report progress towards achieving TMDL**



Subwatersheds Selected

Subwatershed	TP UAL (lb/ac)
Taylor Creek/Nubbin Slough	1.17
Indian Prairie	0.7
Lower Kissimmee	0.64
Fisheating Creek	0.44
Lake Istokpoga	0.27
Upper Kissimmee	0.2
South Lake Okeechobee	0.16
East Lake Okeechobee	0.15
West Lake Okeechobee	0

Based on WY2015-WY2019 Data

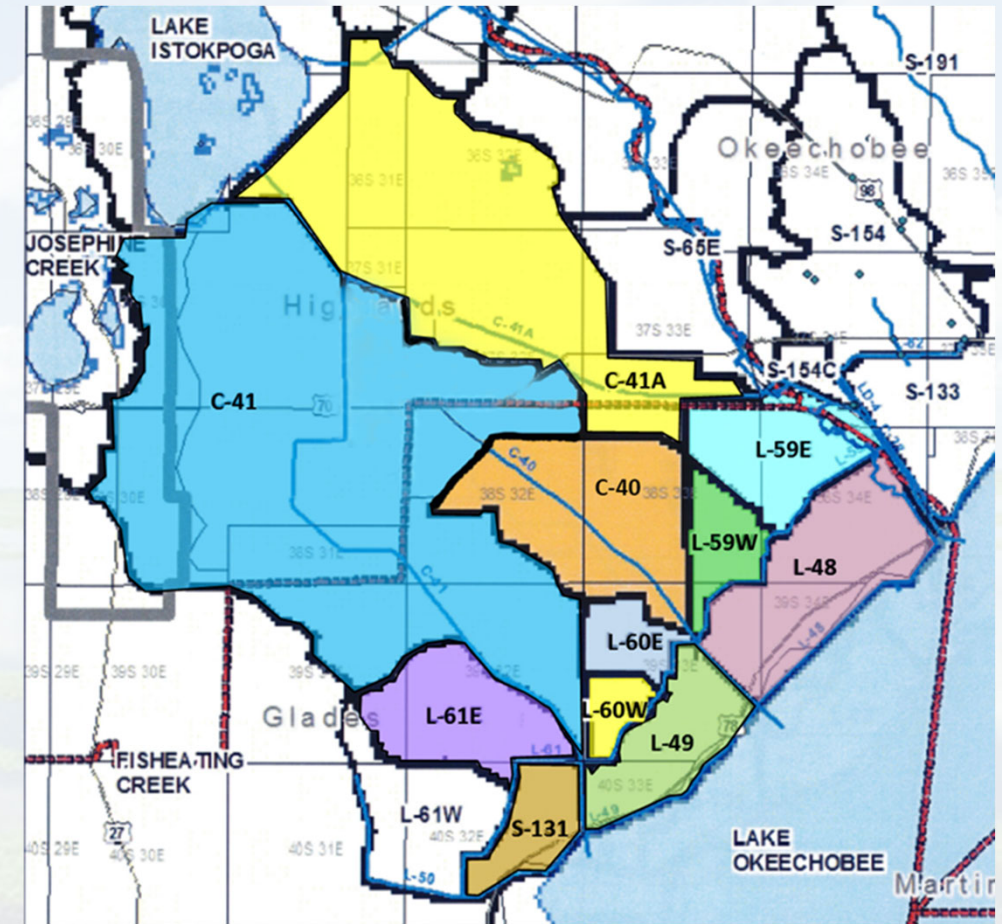


Indian Prairie Basins Selected

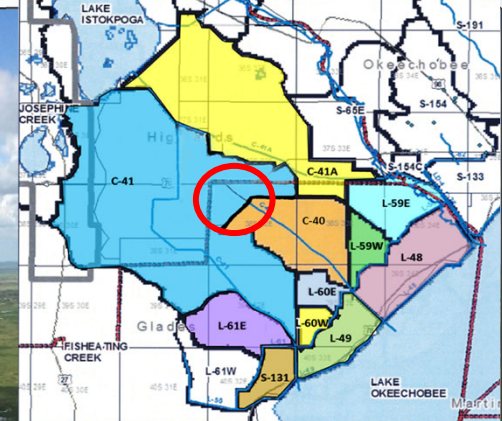
Based on WY2015-WY2019 Data

- 5-year average load for Indian Prairie was 87.3 MT
- C-41A and C-41 had the highest TP loads, C-40 had high TP concentrations (FWMC), and L-59W had the highest load/area (UAL). TP Load from these 4 basins was 73.4 mt

Indian Prairie	TP UAL (lb/ac)	TP FWMC (µg/L)	TP Load (t)	Discharge (ac-ft)	Area (ac)
L-59W Basin	3.07	237	9.2	31,400	6,596
C-41A Basin	1.13	160	29.5	150,000	57,748
C-40 Basin	0.69	475	7.5	12,800	24,076
C-41 Basin	0.53	488	27.2	45,300	112,880



- 2,370-acre public-private partnership.
- Observed long-term average reduction:
 - Total Phosphorus: 5.3 metric tons/year
 - Total Nitrogen: 24.0 metric tons/year
- Status: Routine operation and maintenance. Contract renewed in 2020 for additional 10 years.



Buck Island Ranch

C-41 Focus Basin

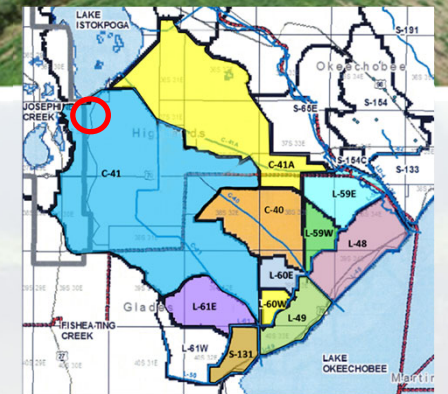
- 4,607-acre public-private partnership.
- 188-acre component to assess viability of nutrient removal using a wetland forage.
- Estimated long-term average benefit:
 - Total Storage: 2,193 acre-feet/year
 - Total Phosphorus (Component 2): 0.71 metric tons/year reduction
- Status: Routine operation and maintenance.



Istokpoga Marsh Watershed Improvement

C-41 Focus Basin

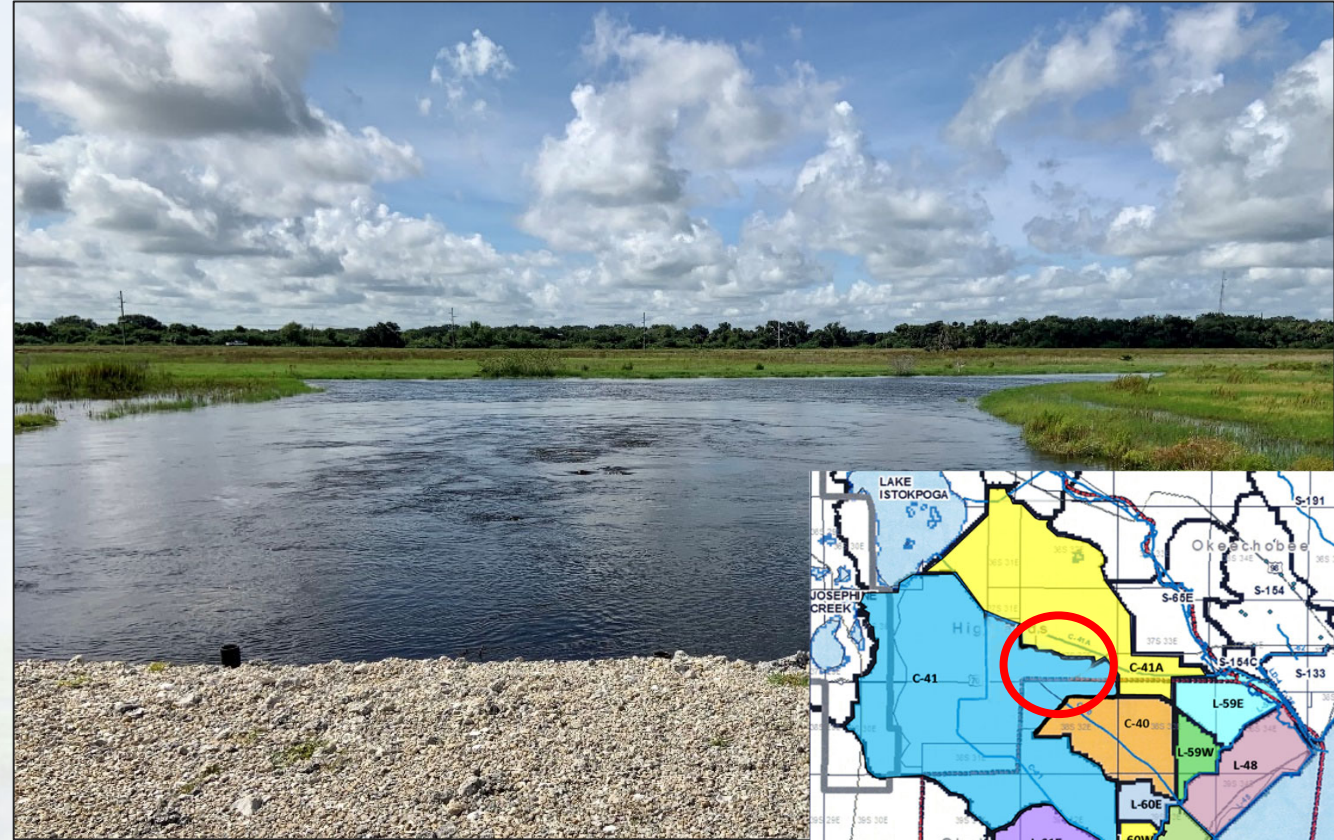
- 308-acre Stormwater Impoundment owned by Highlands County.
- Estimated long-term average reduction:
 - Total Phosphorus: 1.36 metric tons/year
- Status: Routine operation and maintenance.



Brighton Valley

C-41 A Focus Basin

- 8,142-acre public-private partnership.
- Estimated long-term average reduction:
 - Total Phosphorus: 3.2 metric tons/year
 - Total Nitrogen: 27.3 metric tons/year
- Status: Routine operation and maintenance. Recently completed first year of project operation.

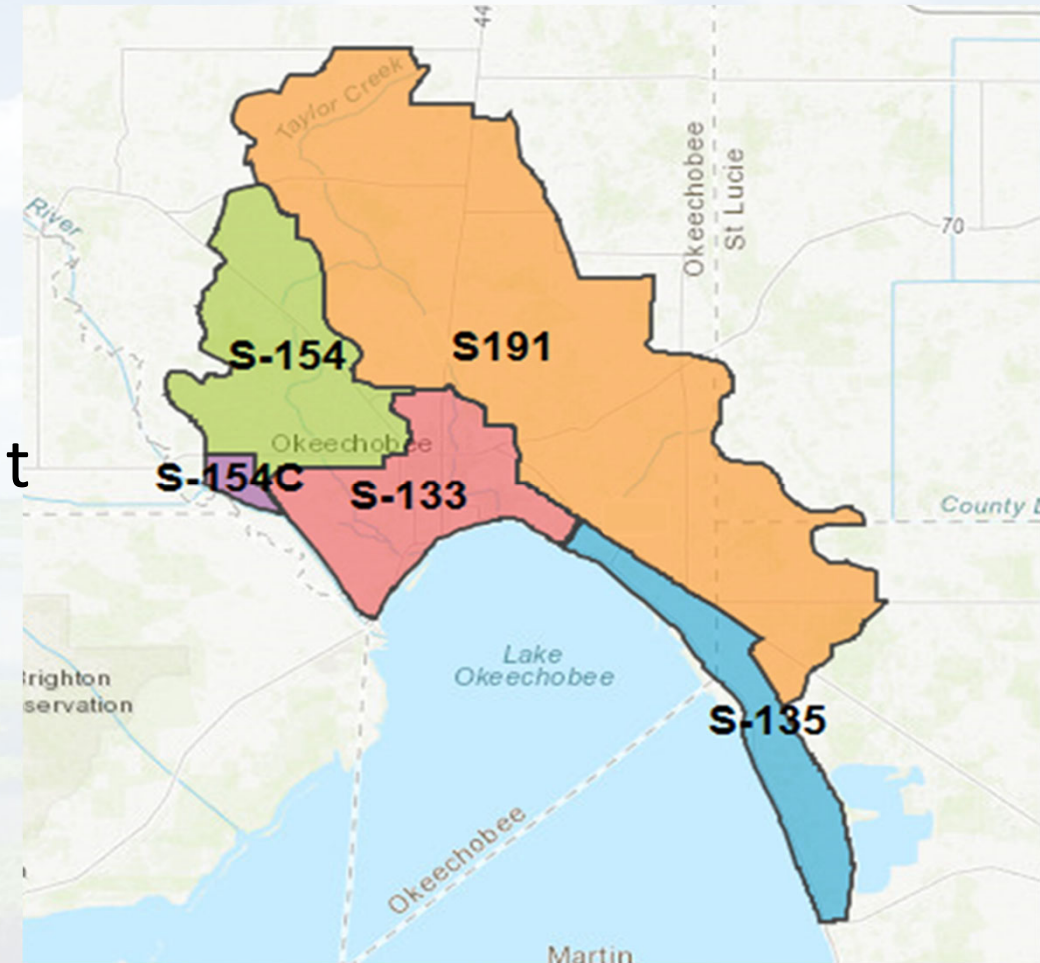


Taylor Creek Nubbin Slough Basins Selected

Based on WY2015-WY2019 Data

- 5-year average load for Taylor Creek Nubbin Slough was 104.7 t
- The S-154C, S-191, and S-154 Basins had the highest load/area (UAL) and concentrations (FWMC). TP load from these 3 basins was 89.9 t

Taylor Creek/Nubbin Slough	TP UAL (lb/ac)	TP FWMC (µg/L)
S-154C Basin	2.71	711
S-191 Basin	1.28	627
S-154 Basin	1.22	580

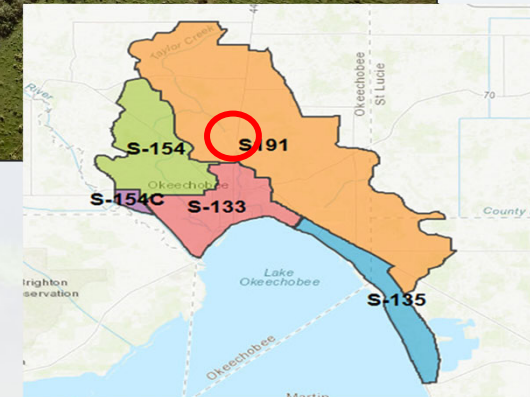


Taylor Creek STA

S-191 Focus Basin

- 118-acre stormwater treatment area.
- Estimated long-term average reduction:
 - Total Phosphorus: 1.9 metric tons/year
- Status: Routine operation and maintenance.

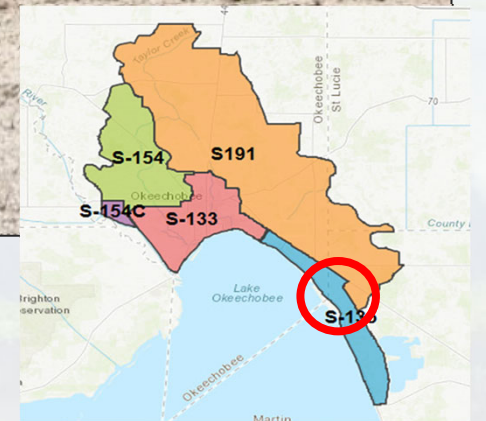
Parameter	WY2013	WY2014	WY2015	WY2016	WY2017	WY2018	WY2019	WY2020
Period of operation (days)	276	275	315	366	317	70	365	366
Total inflow volume (ac-ft)	5,963	4,895	6,416	7,219	5,266	939	3,115	2,240
Hydraulic loading rate (cm/day)	5.58	4.60	5.26	5.10	4.29	3.46	2.20	1.58
Inflow FWM TP concentration (µg/L)	362	272	264	373	358	408	247	297
Total inflow load (t)	2.66	1.64	2.09	3.32	2.33	0.47	0.95	0.82
TP mass loading rate (g/m ² /yr) ^a	5.57	3.44	4.37	6.95	4.87	0.99	1.99	1.72
Total outflow volume (ac-ft)	5,841	3,823	4,102	3,866	3,037	200	2,022	1,629
Outflow FWM TP concentration (µg/L)	288	218	184	304	302	793	233	191
Total outflow load (t)	2.08	1.03	0.93	1.45	1.13	0.20	0.58	0.38
Hydraulic retention time (days) ^b	9.1	14.7	13.9	15.3	17.7	28.6	27.5	43.9
TP mass removed (t)	0.6	0.6	1.2	1.9	1.2	0.3	0.4	0.4
TP concentration reduction (%)	20	20	30	18	16	-94	6	36
TP load reduction (%)	22	37	56	56	52	57	39	54



Lakeside Ranch STA

S-191 Focus Basin

- 1,707-acre stormwater treatment area.
- Estimated long-term average reduction:
 - Total Phosphorus: 11.5 metric tons/year
- Status: Routine operations and maintenance.

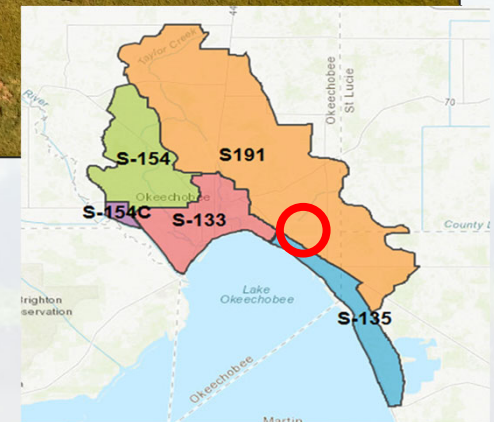


Time Scale	Parameter	FW 1	FW 2	FW 3	FW4	FW5	FW6	Entire
Last 28 days	Inflow Volume (ac-ft)	1,321	12	1	486	356	119	1,150
	Hydraulic Loading Rate (cm/d)	4.7	0.0	0.0	1.3	2.0	0.7	0.7
	Flow-weighted Mean Inflow TP Conc. (µg/L)	263	245	243	118	165	183	264
	Inflow TP Load (kg)	429	3	0	71	73	27	374
	TP Loading Rate (g/m ² /yr)	4.5	0.0	0.0	0.6	1.2	0.4	0.7
	Outflow Volume (ac-ft)	944	3	17	62	177	51	291
	Flow-weighted Mean Outflow TP Conc. (µg/L)	127	258	144	122	68	48	76
	Outflow TP Load (kg)	148	1	3	9	15	3	27
	TP Load Retained (kg)	281	3	-3	61	58	24	347
	TP Load Reduction (%)	65	72	N/A	87	80	89	93

Nubbin Slough STA

S-191 Focus Basin

- 773-acre stormwater treatment area.
- Estimated long-term average reduction:
 - Total Phosphorus: 4.2 metric tons/year
- Status: Offline for construction. Repairs to be completed in August 2021



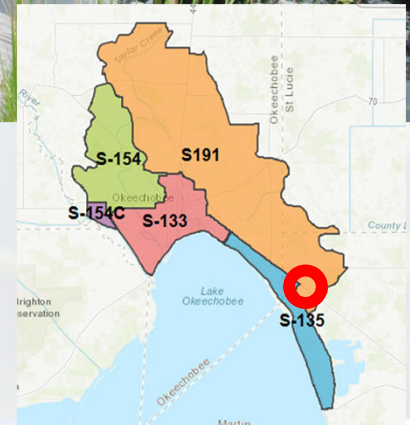
Brady Ranch FEB & ASR

S-191 Focus Basin

- 1,800-acre Brady Ranch owned by SFWMD
- Develop FEB¹ & ASR² project to:
 - Expand regional storage and reduce nutrient loads in the Lake Okeechobee watershed
 - Assist with Lakeside Ranch STA operations (wetland hydration and timing, distribution, and magnitude of inflows)
- Estimated long-term average benefit:
 - 7,200 ac-ft storage
 - TP: 3.95 metric tons/year reduction
- Status: Developing scope of work for project design

¹ FEB - Flow Equalization Basin

² ASR – Aquifer Storage and Recovery Wells



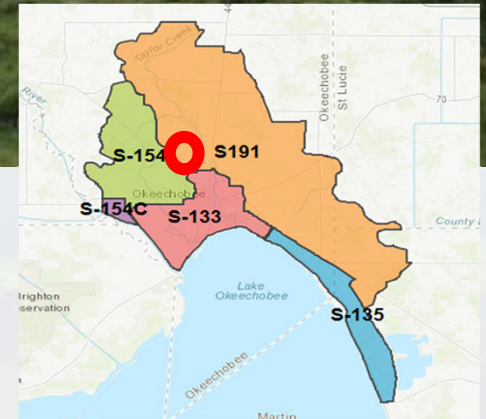
Grassy Island FEB & ASR

S-191 Focus Basin

- 4,000-acre Grassy Island property owned by SFWMD
- Develop FEB¹ & ASR² project:
 - Expand regional storage and reduce nutrient loads in the Lake Okeechobee watershed
 - Assist with Taylor Creek STA operations (wetland hydration and timing, distribution, and magnitude of inflows)
- Estimated long-term average benefit:
 - 3,200 ac-ft storage
 - TP: 0.79 metric tons/year reduction
- Status: Developing scope of work for project design

¹ FEB - Flow Equalization Basin

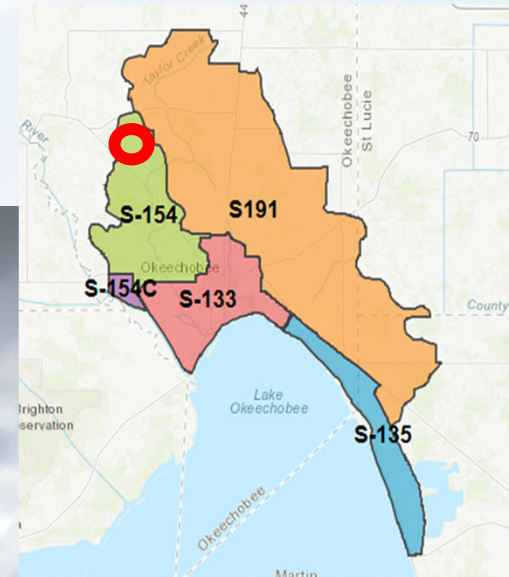
² ASR – Aquifer Storage and Recovery Wells



Dixie Ranch

S-154 Focus Basin

- 3,771-acre public-private partnership.
- Estimated long-term average benefit:
 - Total Storage: 856 ac-ft/yr
- Status: Routine operation and maintenance



A. Lower Kissimmee Basin Stormwater Treatment Project

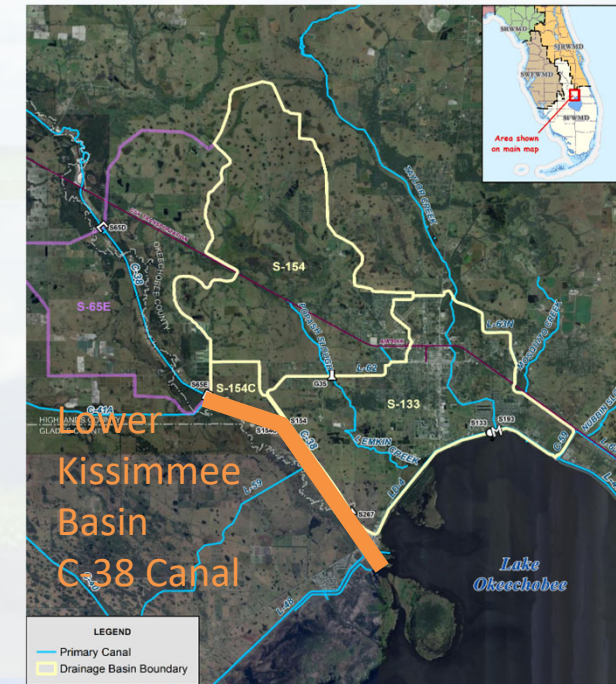
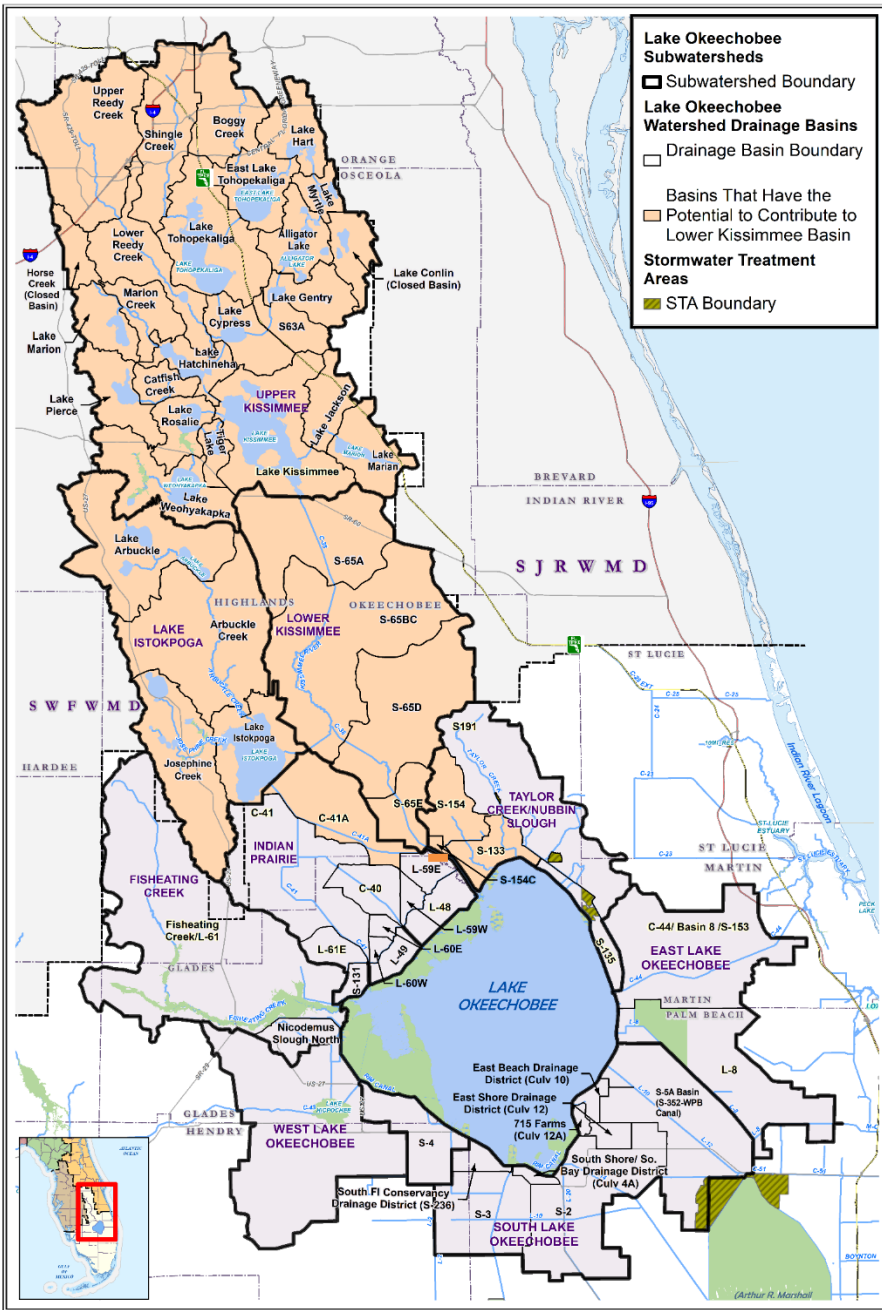
Jennifer Reynolds, Division Director
Ecosystem Restoration & Capital Projects Division
South Florida Water Management District
Governing Board Meeting
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Project Location

- A Northern Everglades and Estuaries Protection Program (NEEPP) Project
- Allows for the treatment of water to the lake
- Lower Kissimmee Basin receives runoff from a large portion of the watershed including:

- S-154, S-65D, and S-65E NEEPP priority basins
- S-154, S-154C and C-41A focus basins
- Upper Kissimmee Subwatershed
- Lower Kissimmee Subwatershed
- Lake Istokpoga Subwatershed



Project Purpose

- Design, construction, operation and maintenance of a new stormwater treatment facility to maximize capturing stormwater runoff and reducing nutrient loading from high TP source areas
 - Project will be designed to achieve a minimum long-term annual average of 13-15 metric tons/year
 - No project-specific nitrogen reduction or water storage targets but these are also desirable
- As a secondary objective, project will also include a water storage/treatment component to assist in retaining/treating surface water directly from Lake Okeechobee
- Overall, complement other NEEPP projects, by implementing a regional watershed project to reduce nutrients, particularly TP, in the Lower Kissimmee Basin
- After 5 years of operation, it is anticipated that the facility and land will be transferred to SFWMD

Proposal Summary

- RFP Advertised: March 12, 2021
- Pre-Solicitation Conference: March 22, 2021
- Proposal Opening: April 12, 2021
- Number of Proposals Received: 2
- Short-Listed Firms:
 - EIP Florida Water Quality, LLC – Ecosystem Investment Partners, LLC
 - HGS, LLC dba Angler Environmental, LLC, or “RES”
- Sunshine Committee Evaluation: Qualifications/Approach
- Oral Presentations: May 3, 2021

-

Activity	Timeframe
Contract to preliminary design (preliminary design approved and permits submitted)	8 months
Survey and Geotech	15 weeks
Preliminary engineering and design	25 weeks
Phase II: Implementation + Operations	
Activity	Timeframe
Permits and approvals	16 months
Final engineering and design	16 months
Design to initiate upland construction	5 months
Procurement of pump components	40-60 weeks
Begin construction and land preparation where possible	12 months prior to 404/408 permit
Construction (pump fabrication and final grading)	18 months
Possible PES operations	6 months after construction initiation
Water Year 0 – STA Start up	May 1, 202X to April 30, 202X
Water Year 1	May 1, 202X to April 30, 202X
Water Year 2	May 1, 202X to April 30, 202X
Water Year 3	May 1, 202X to April 30, 202X
Water Year 4	May 1, 20XX to April 30, 20XX
Water Year 5	May 1, 20XX to April 30, 20XX

Resolution

A Resolution of the Governing Board of the South Florida Water Management District to authorize the official ranking of short-listed firms and enter into a 9-year contract for the Design/Build of a Lower Kissimmee Basin Stormwater Treatment Project, subject to successful negotiations with EIP Florida Water Quality, LLC - Ecosystem Investment Partners, LLC in an amount not to exceed \$300,000,000, of which \$12,600,000 in state dedicated funds is budgeted and the remainder is subject to future state funding and Governing Board approval of future years budgets; providing an effective date. If negotiations are unsuccessful with EIP Florida Water Quality, LLC - Ecosystem Investment Partners, LLC, the District will proceed with negotiations in ranked order until a contract has been successfully negotiated.

B. Lake Okeechobee S-191 Basin Surface Runoff Phosphorus Removal Using Innovative Technologies Project

**Seán Sculley, PE
Chief, Applied Sciences Bureau
South Florida Water Management District
Governing Board Meeting
May 13, 2021**



Identifying Solutions to Harmful Algal Blooms

- FDEP \$10M Innovative Technology grant solicitation—SFWMD responds
- SFWMD awarded \$3M grant; \$3M of Northern Everglades and Estuaries Protection Plan funds also allocated

STATE OF FLORIDA

OFFICE OF THE GOVERNOR EXECUTIVE ORDER NUMBER 19-12 (Achieving More Now For Florida's Environment)

WHEREAS, water and natural resources are the foundation of Florida's communities, economy and way of life; and

WHEREAS, protection of water resources is one of the most critical issues facing our state and requires immediate action; and

WHEREAS, recent algae blooms have resulted in an increasing threat to our environment and fragile ecosystems, including our rivers, beaches and wildlife, as well as causing the issuance of health advisories, closures of recreational areas and economic losses in adjacent communities; and

WHEREAS, as the Governor of the State of Florida, a primary mission of my tenure is to follow in the words of President Theodore Roosevelt by having Florida treat its "natural resources as assets which it must turn over to the next generation increased, and not impaired, in value";

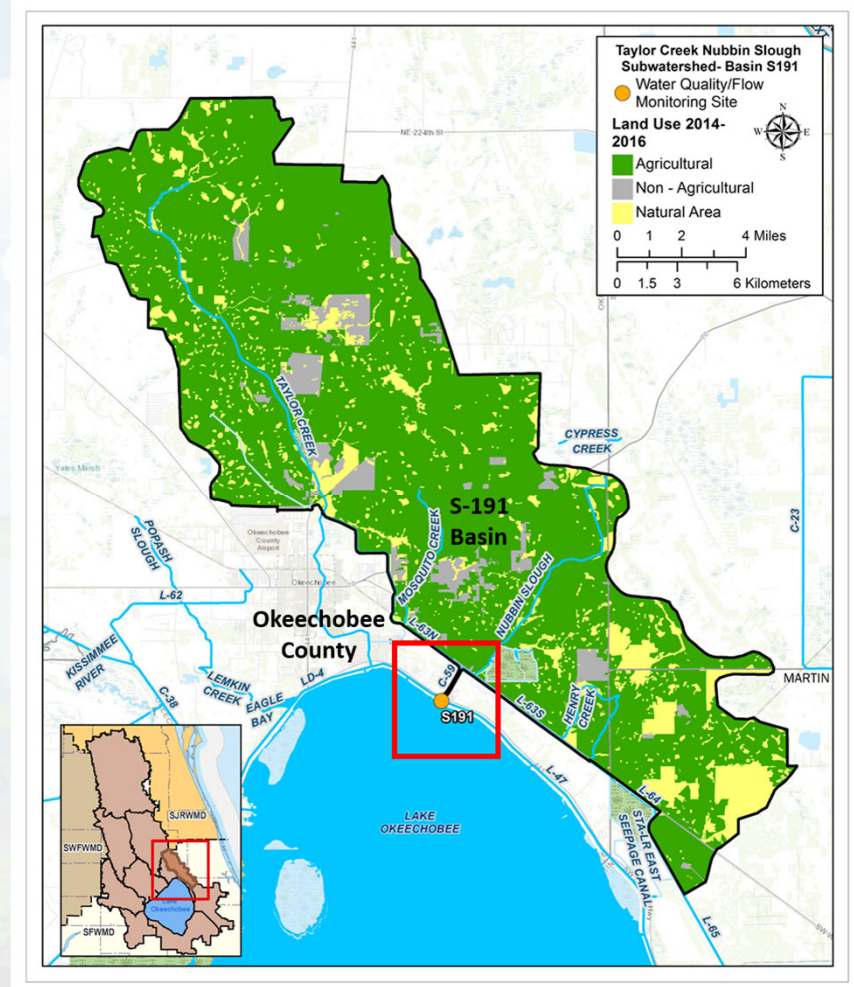
NOW, THEREFORE, I RON DESANTIS, as Governor of Florida, by virtue of the authority vested in me by Article IV, Section (1)(a) of the Florida Constitution, and all other applicable laws, do hereby issue the following Executive Order, to take immediate effect:

Section 1: Focus on Rapid Improvement for Water Quality, Quantity and Supply

I hereby direct the Department of Environmental Protection (DEP), the Department of Health (DOH) as provided in paragraph J below, and Visit Florida and the Department of

S-191 Basin

- 120,500-acre sub-basin
- In the past five water years:
 - 63 metric tons of TP discharged to Lake Okeechobee
- All these metrics are among the poorest performing in Lake Okeechobee Watershed



Additional Site Selection Considerations

- Project location on SFWMD right-of-way
- Immediately upstream of Lake Okeechobee inflow water control structure S-191
- Will complement other projects nearby
 - Lakeside Ranch STA
 - Taylor Creek STA
 - Nubbin Slough STA
 - Aquifer Storage and Recovery (ASR) wells



Contract Specifications

- To be awarded to Ferrate Solutions, Inc. (lowest responsive and responsible bidder); submitted bid of \$154 per pound of TP removed
- Innovative solicitation: payment is based solely on TP removal performance; contractor assumes risk
- Four-years (mobilization, operation and demobilization)
- Not-to-exceed amount is \$6 million

The Innovative Technology

- C-59 Canal surface water will be withdrawn and treated with ferrate, an iron complex containing oxygen
- The ferrate binds with phosphorus (P) by way of a quick oxidation and coagulation process and is then removed by sedimentation.
- None of the ferrate additive remains in the treated outflow that is returned to the C-59 canal
- Nitrogen (N) and suspended solids are also removed from surface water

Expected Performance

- The contractor is expected to remove up to 39,000 pounds or nearly 18 metric tons of TP under the terms of this contract (4 years).
- Operation of this project will be compatible with that of the Lakeside Ranch STA.

Resolution

A Resolution of the Governing Board of the South Florida Water Management District to authorize entering a four-year contract with Ferrate Solutions Corp., the lowest responsive and responsible bidder for the Lake Okeechobee S-191 Basin Surface Runoff Phosphorus Removal Using Innovative Technologies Project, in an amount not-to-exceed \$6,000,000, for which dedicated funds (State General Revenue) are budgeted in Fiscal Year 2020-2021 (Contract Number 4600004416).

<https://www.fdacs.gov/ezs3download/download/78962/2320452/Media/Files/Agricultural-Water-Policy-Files/Maps/Statewide-Enrollment-Map/Enrollment.pdf>

