

# Lake Okeechobee Watershed Protection Plan

Steffany Olson, Science Supervisor  
South Florida Water Management District  
July 21, 2020

# Objectives

- Engage stakeholders and the public in a collaborative approach to meet NEEPP goals
- Identify projects, activities, and programs that can be implemented for additional water quality improvements, with an emphasis on meeting reduction goals in priority basins.
- Review Lake Okeechobee Watershed characteristics, recent data, and projects and programs
- Prioritize areas for SFWMD focused assessments to identify sources and integrated solutions

<https://www.sfwmd.gov/wpps>

# Workshop Schedule



Freddy playing kickball

- June 26 - Kickoff and Overview
  - <https://www.sfwmd.gov/wpps>
- **July 21 – Lake Okeechobee Watershed**
- August 28 - St. Lucie River Watershed
- September 2 – Caloosahatchee River Watershed

# NEEPP: Coordinating Agency Roles

Northern Everglades and Estuaries Protection Program (F.S. 373.4595)

Lake Okeechobee (LO) Watershed Protection Program

Caloosahatchee River Estuary and St. Lucie River Watershed Protection Programs

LO Internal Phosphorus Management Program (SFWMD)

Watershed Protection Plans (SFWMD)

Agricultural BMPs (FDACS)

BMAPS (FDEP)

Exotic Species Control Program (Coordinating Agencies)

Research & Monitoring Program (Primarily SFWMD)

Watershed Construction Projects & Programs (SFWMD)

- Water storage projects
- Water treatment projects
- Wetland restoration
- Hydrologic restoration
- Cost Share programs
- Chapter 40E-61, FAC

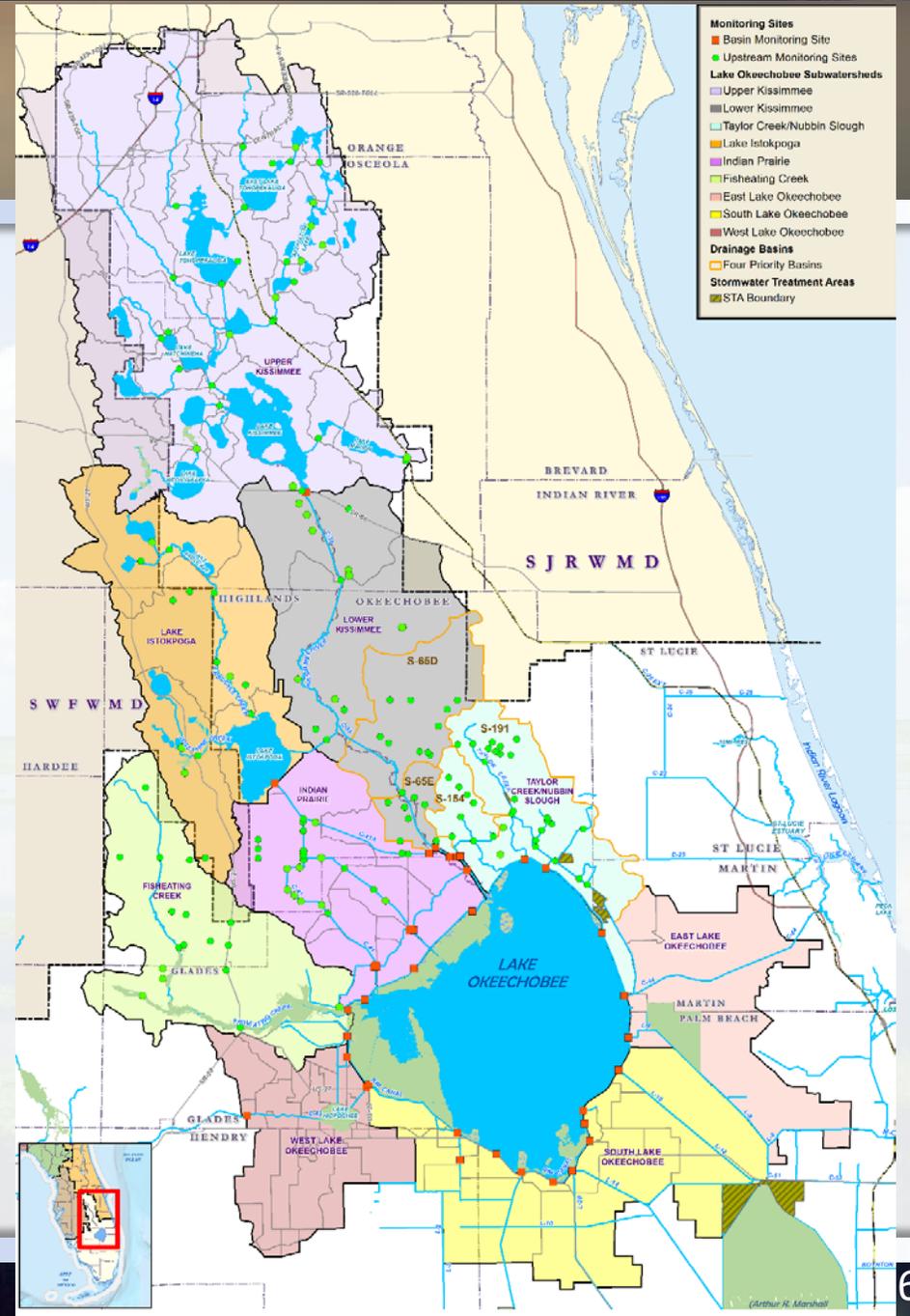
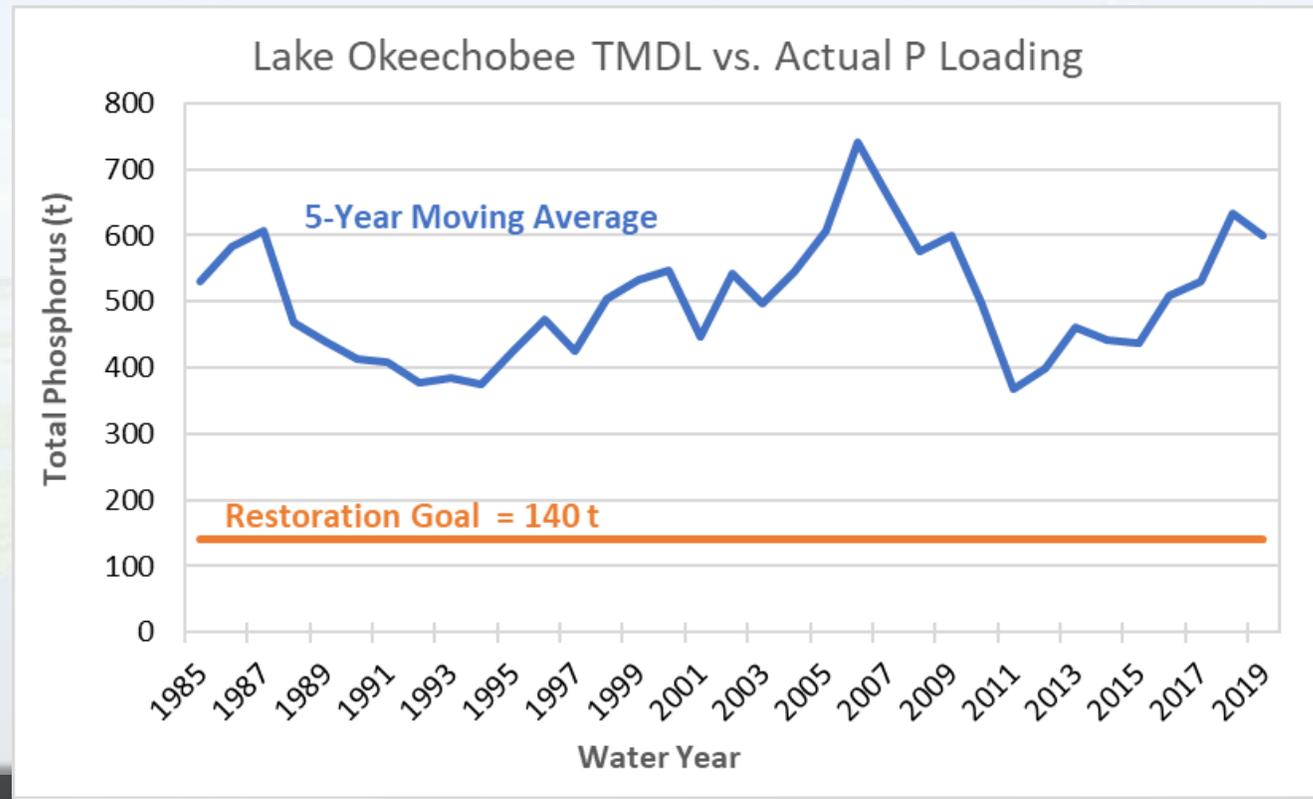
# Workshop Approach for Identifying Solutions

1. Summarize Water Quality Data
2. Identify areas of focus
3. Account for existing projects and programs
4. Define the gaps & remaining “problems”
5. Facilitate discussions to solve the problems
6. Identify potential solutions via projects and programs



# Lake Okeechobee Watershed (LOW)

- Nine Subwatersheds
- 3,450,475 acres



# Considerations

## Parameters

- Nutrient Load: The cumulative weight of a constituent transported (usually by stormwater) passed the point of measurement. Commonly expressed in pounds (lbs) or metric tons (t).
- Discharge Volume (acre-feet): Amount of water required to cover 1 acre of land to a depth of 1 foot.
- UAL: Unit Area Load is the nutrient load per acre of area.
- FWMC: Flow Weighted Mean Concentration: Represents the average concentration of a constituent that passes through a structure relative to the total flow volume passing through.

## Other

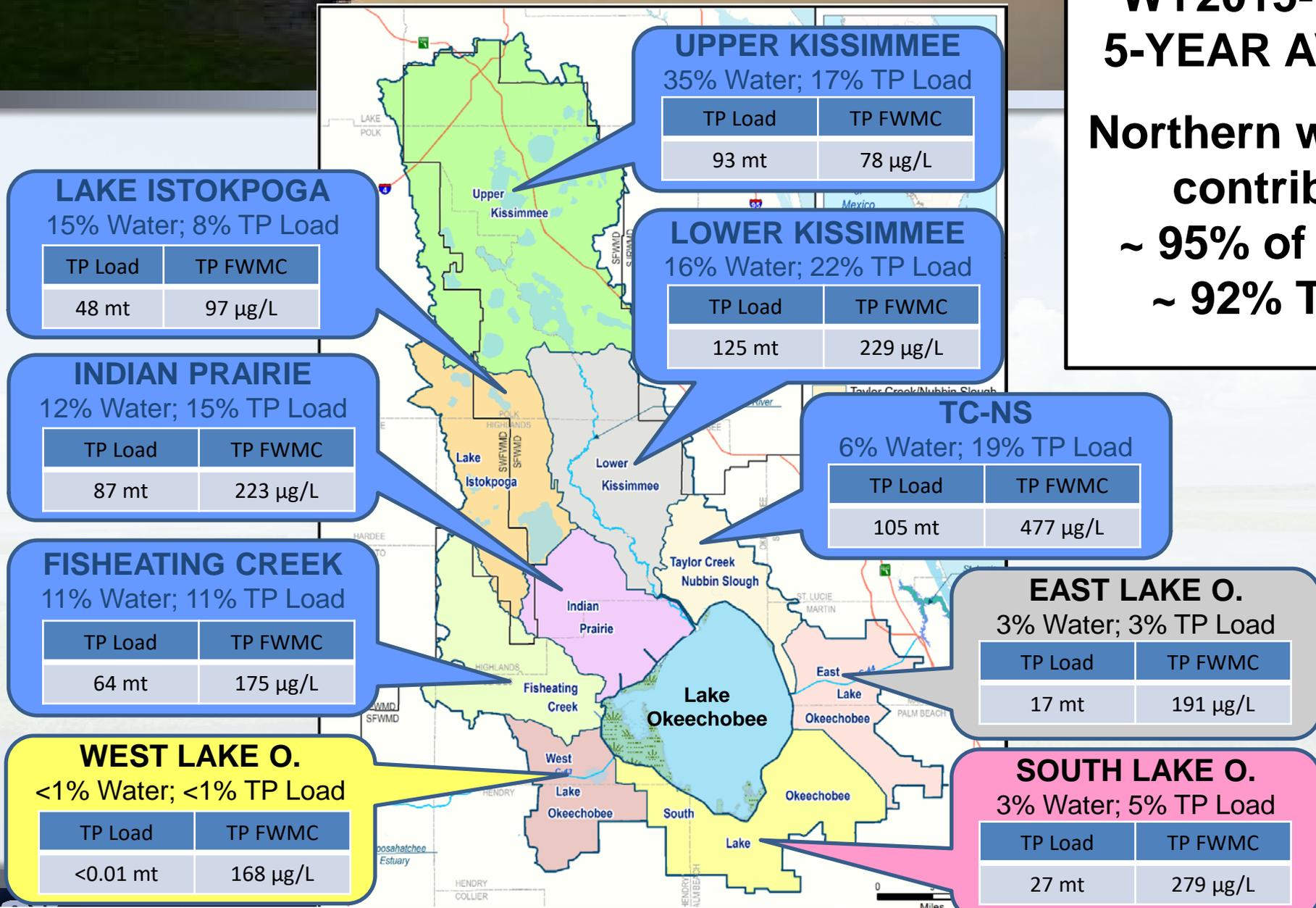
- Proximity to receiving waterbody
- Trends in the data
- Quick fix vs. Long-term goal



# Lake Okeechobee Inflow Phosphorus

**WY2015-WY2019  
5-YEAR AVERAGE**

**Northern watershed  
contributes:  
~ 95% of flow and  
~ 92% TP load**



Source: Draft 2020 South Florida Environmental Report, Volume 1 Chapter 8B, Table 8B-10

# LOW 5-year Average for WY2015-WY2019

Subwatershed	TP UAL (lb/ac)	TP FWMC ( $\mu\text{g/L}$ )	TP Load (t)	Discharge (ac-ft)	Area (ac)
Taylor Creek/Nubbin Slough	1.17	477	104.7	178,000	197,795
Indian Prairie	0.7	223	87.3	317,000	276,577
Lower Kissimmee	0.64	229	124.7	441,000	429,188
Fisheating Creek	0.44	175	63.6	295,000	318,042
Lake Istokpoga	0.27	97	47.7	400,000	394,203
Upper Kissimmee	0.2	78	93.4	976,000	1,028,421
South Lake Okeechobee	0.16	279	26.8	77,700	363,141
East Lake Okeechobee	0.15	191	16.7	71,100	239,013
West Lake Okeechobee	0	168	0	36	204,094

Source 2020 SFER

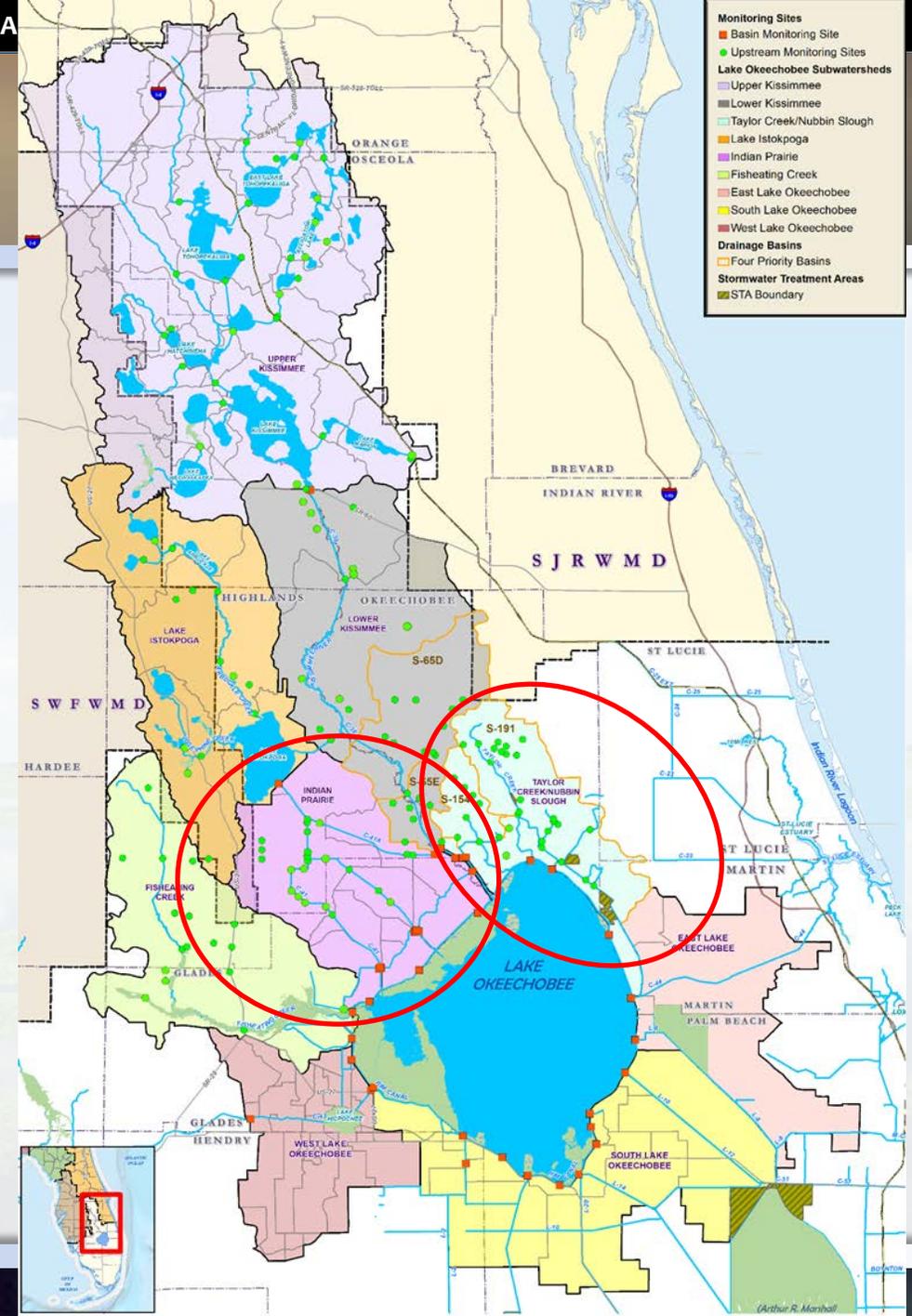
# Subwatersheds

## ➤ Taylor Creek/Nubbin Slough

- Highest UAL (1.17 lb/ac)
- Long term 19% TP load
- Directly discharges into lake
- 104.7 t recent avg 5 yr load

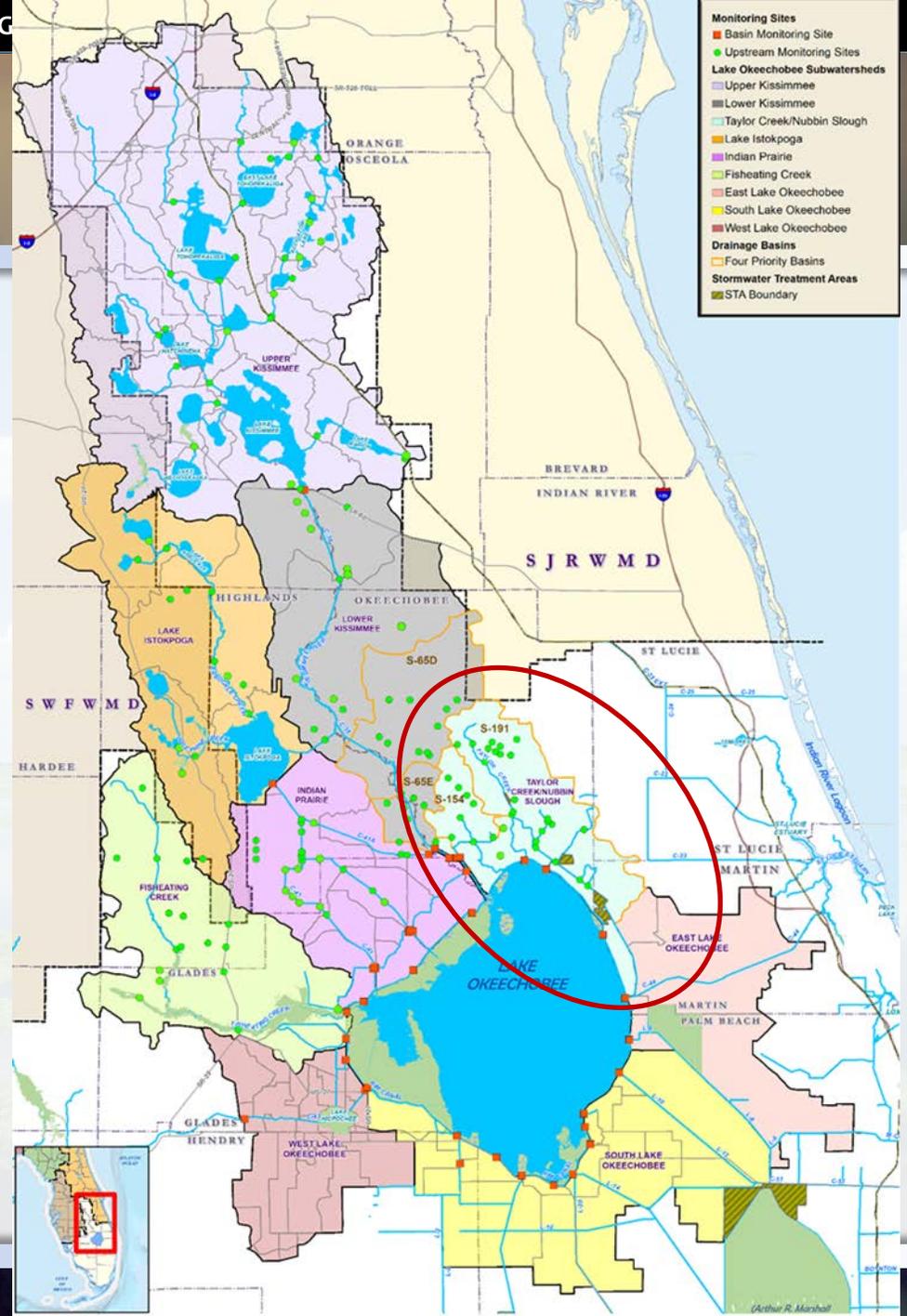
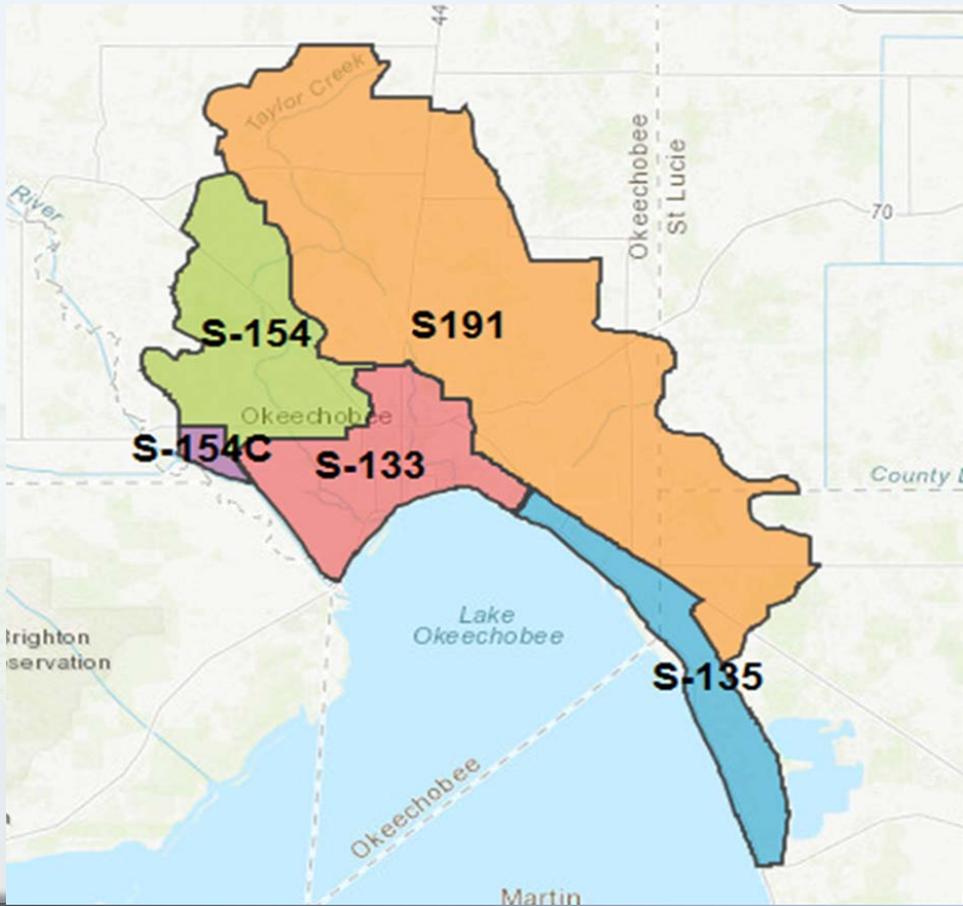
## ➤ Indian Prairie

- Second highest UAL (0.7 lb/ac)
- Long term 15% TP load
- Directly discharges into lake
- 87.3 t recent avg 5 yr load



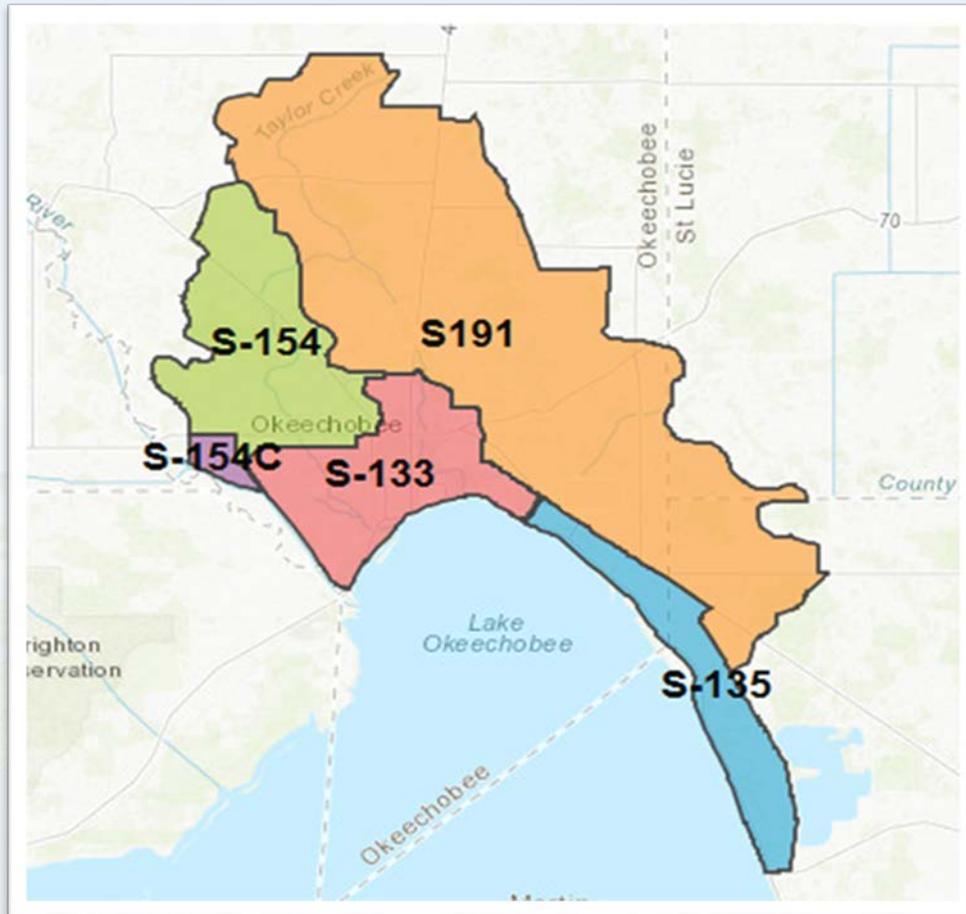
# Taylor Creek/Nubbin Slough Subwatershed

Five Basins totaling 197,795 acres

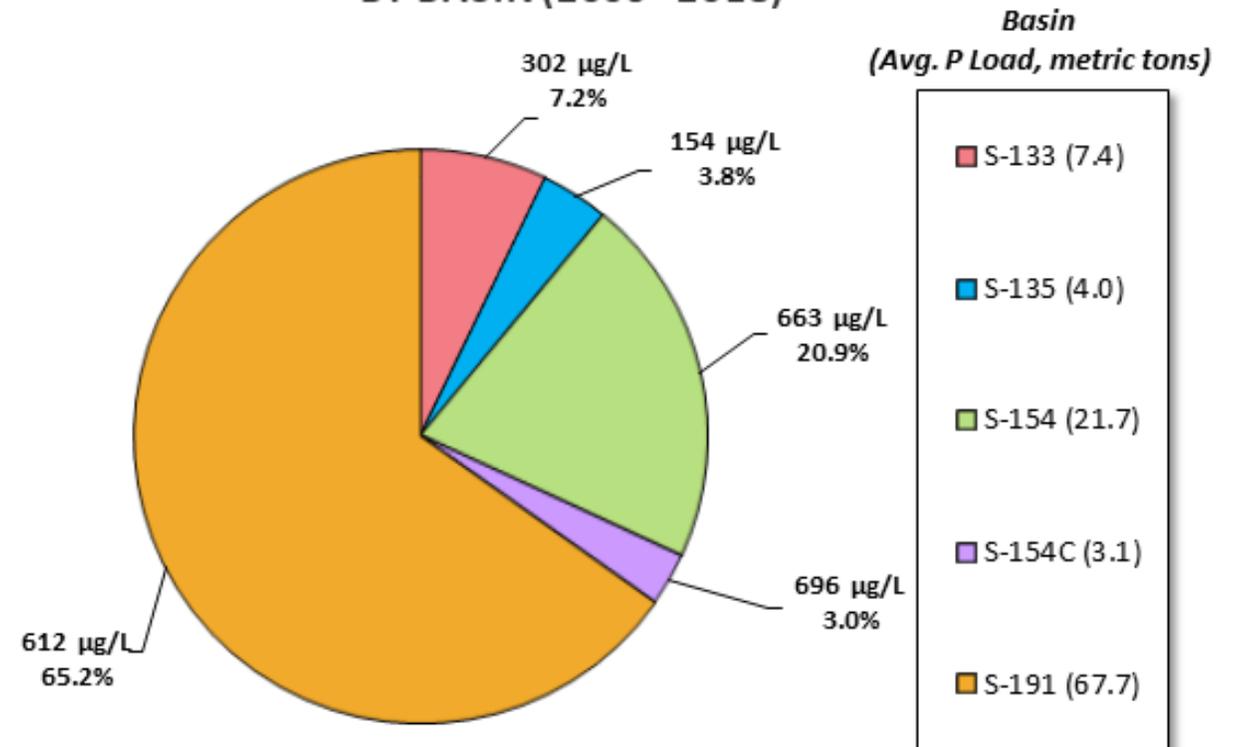


# Taylor Creek Nubbin Slough

## Long Term Basin Data



MEAN FWM TP AND PERCENT P LOAD CONTRIBUTION BY BASIN (2005 - 2018)



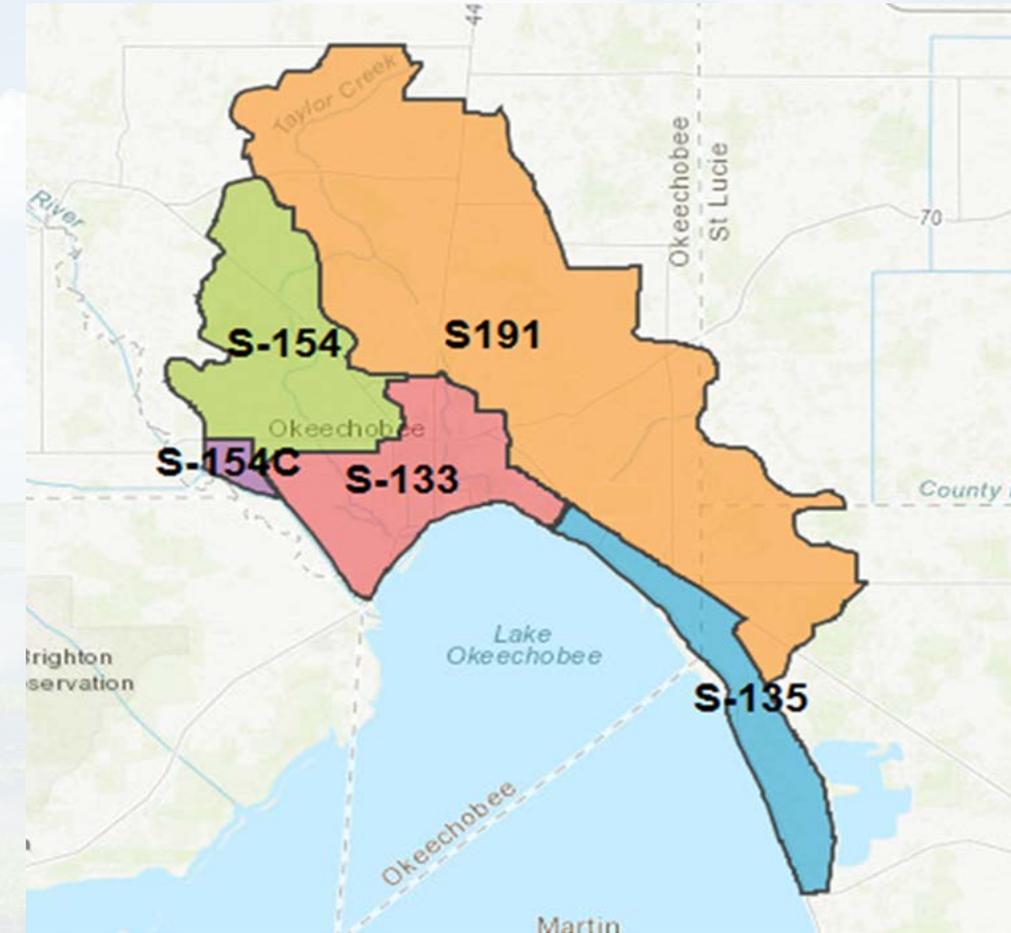
# Taylor Creek Nubbin Slough BMAP Trends

- Seasonal Kendall Trend analysis
- Period – WY2009-WY2018

## Results

- **S-191** and S-135 had statistically significant increasing trends in TP FWMC
- **S-154**, S-133, and S-135 had statistically significant increasing trends in TP load

Source – 2020 Lake Okeechobee BMAP



# Taylor Creek/Nubbin Slough Subwatershed Data

5-year average for WY2015-WY2019

Taylor Creek/Nubbin Slough	TP UAL (lb/ac)	TP FWMC ( $\mu\text{g/L}$ )	TP Load (t)	Discharge (ac-ft)	Area (ac)
S-154C Basin	2.71	711	2.6	2,990	2,134
S-191 Basin	1.28	627	69.7	90,100	120,464
S-154 Basin	1.22	580	17.6	24,700	31,815
S-133 Basin	0.75	243	8.7	29,000	25,626
S-135 Basin	0.75	157	6.1	31,300	17,756
<b>Subwatershed Total</b>	<b>1.17</b>	<b>477</b>	<b>104.7</b>	<b>178,000</b>	<b>197,795</b>

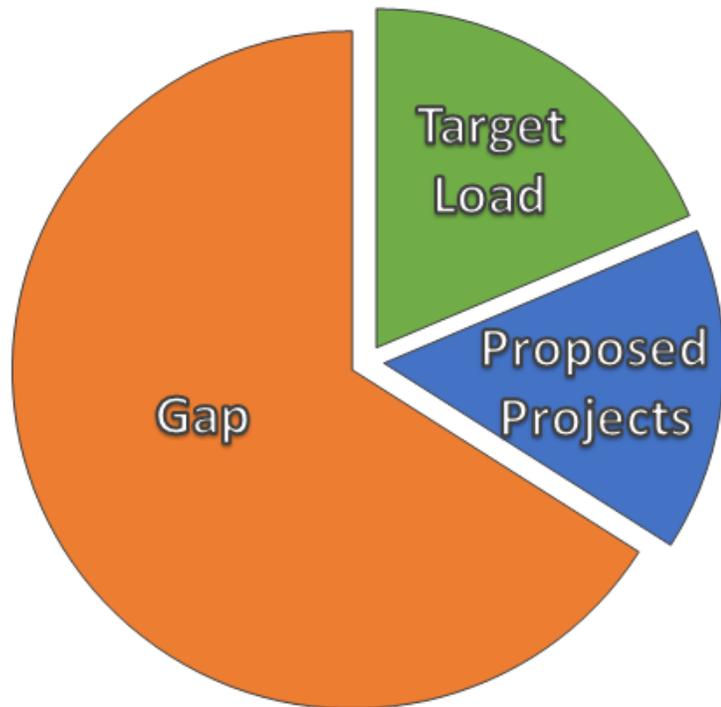
Source 2020 SFER

# Projects

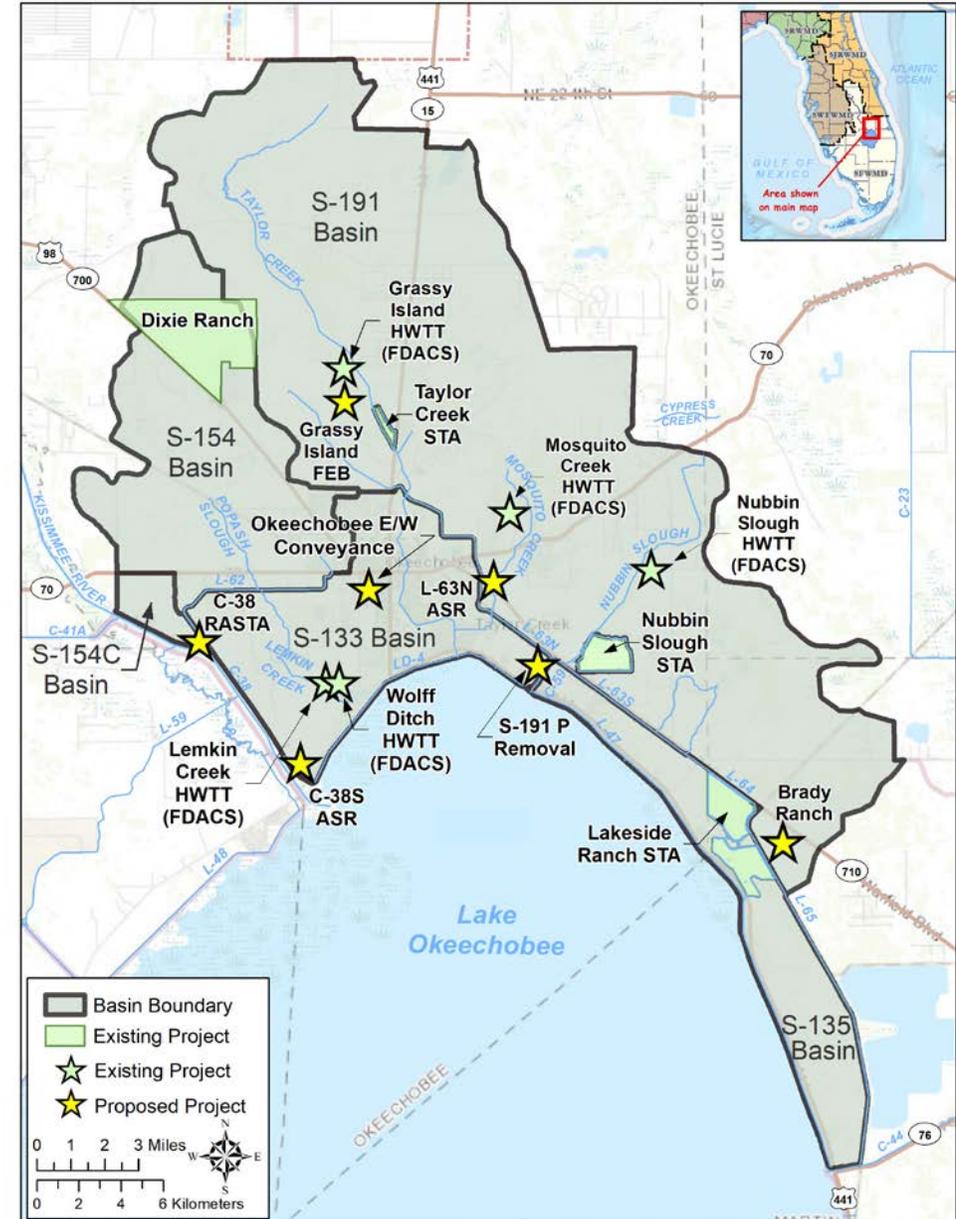
## Taylor Creek/Nubbin Slough

Total Phosphorus  
WY2015-2019

Whole pie 104.7 t



Reductions from Proposed Projects are rough estimates

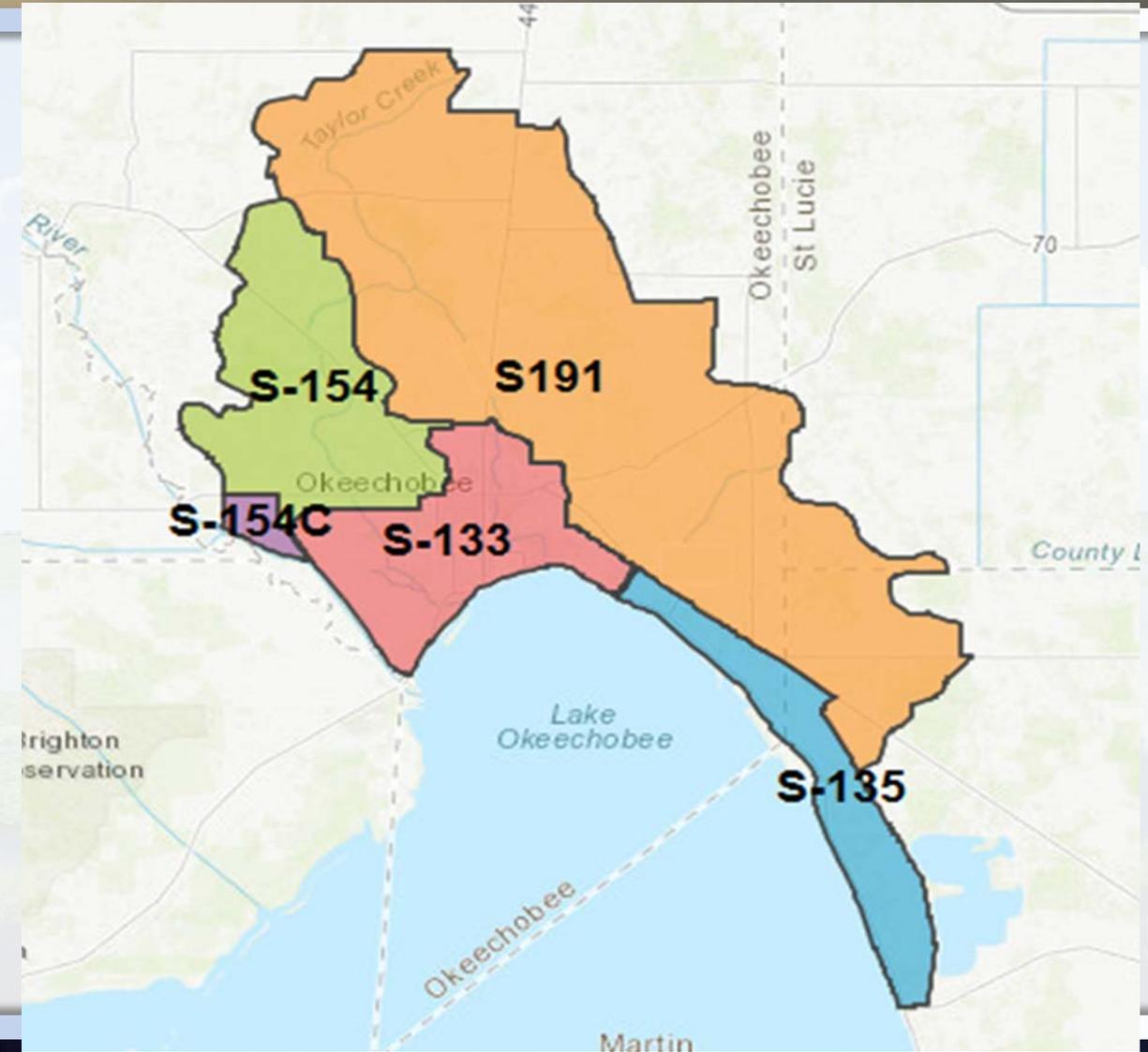


User Name: emroylan Map Produced on Date: 7/17/2020 11:05:57 AM [http://wad.sfwmd.gov/tfs/root/data/enr\\_gis/projects/EVGE/NE\\_protectionPlan/mxd/20200717\\_LOW\\_TCNS\\_SFWMDFrj.mxd](http://wad.sfwmd.gov/tfs/root/data/enr_gis/projects/EVGE/NE_protectionPlan/mxd/20200717_LOW_TCNS_SFWMDFrj.mxd)

# Discussion for Taylor Creek/Nubbin Slough

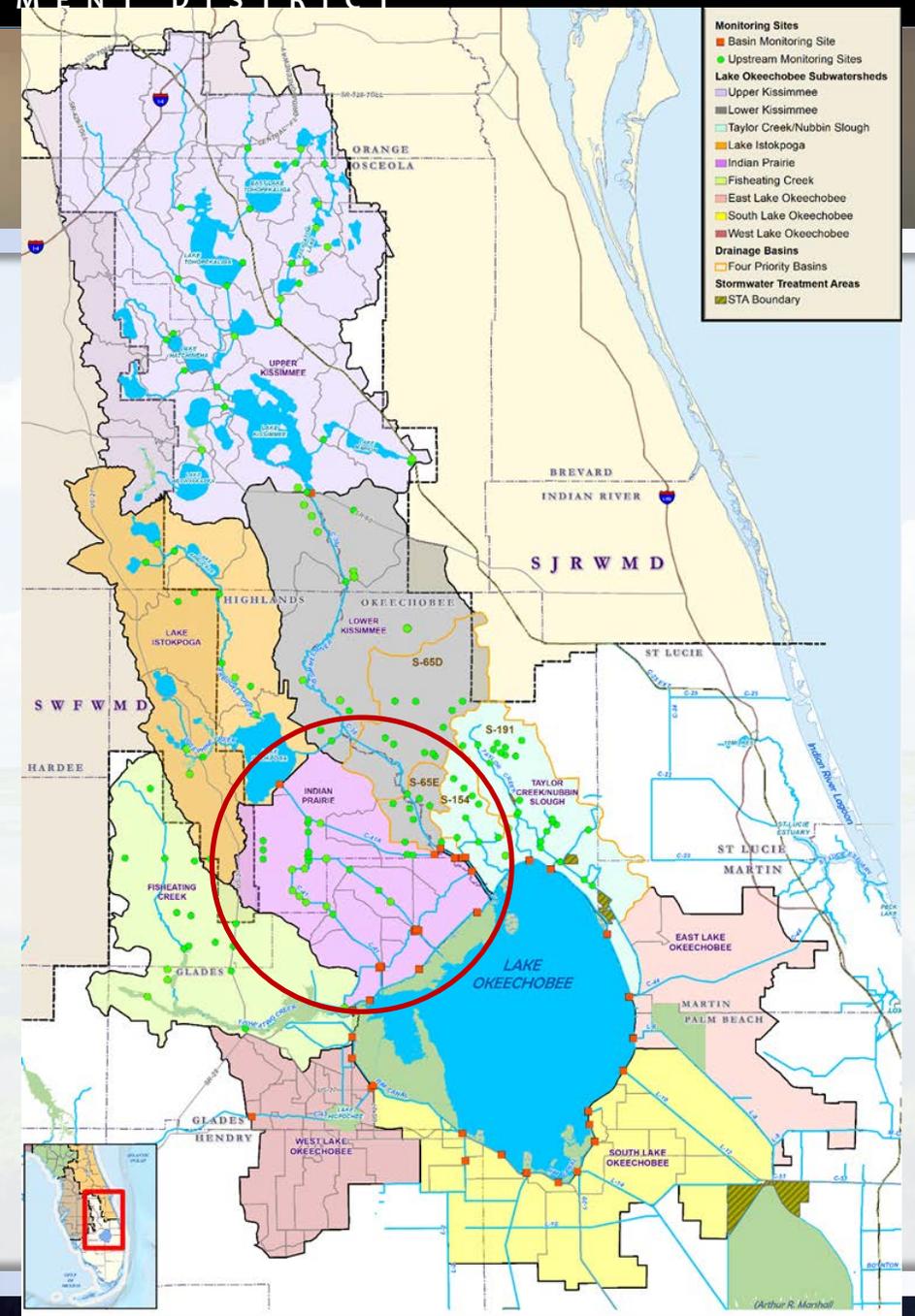
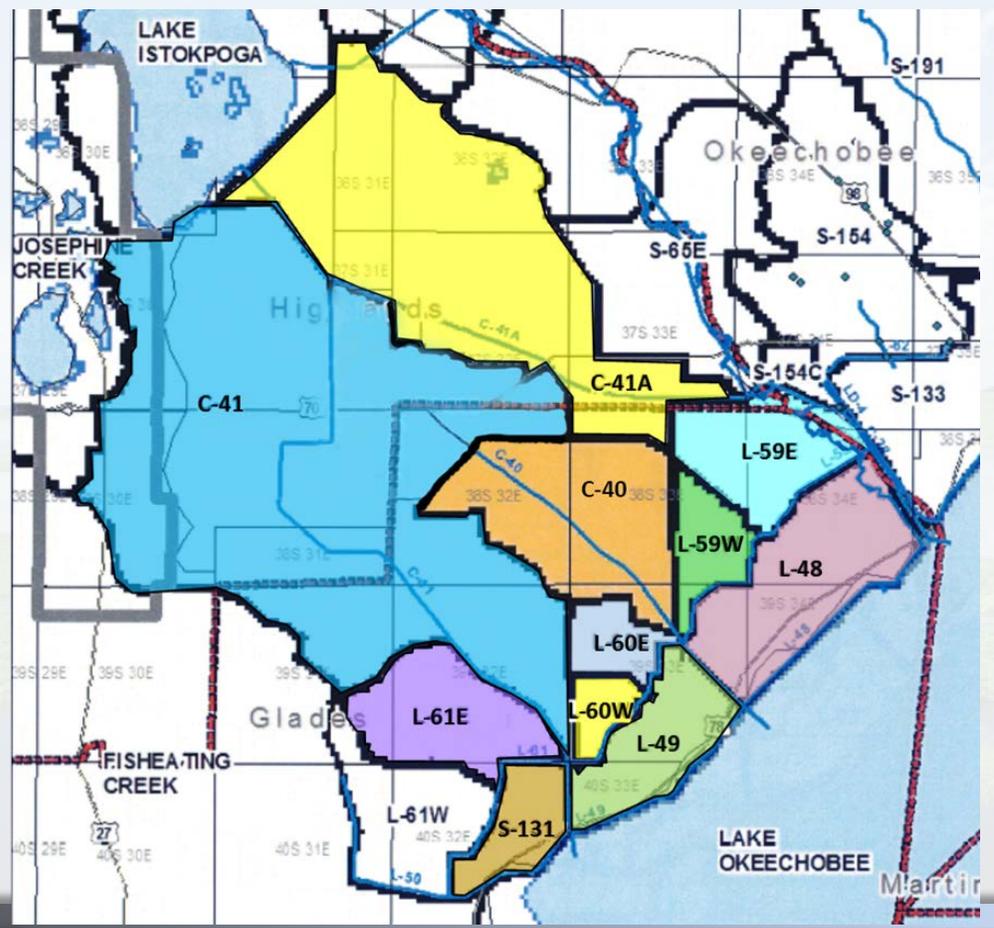
- 5-year average load for WY2015-WY2019 is 104.7 mt
- The S-154C, S-191, and S-154 Basins have the highest UALs and FWMC. TP load from these 3 basins was 89.9 mt

Taylor Creek/Nubbin Slough	TP UAL (lb/ac)	TP FWMC ( $\mu\text{g/L}$ )
S-154C Basin	2.71	711
S-191 Basin	1.28	627
S-154 Basin	1.22	580



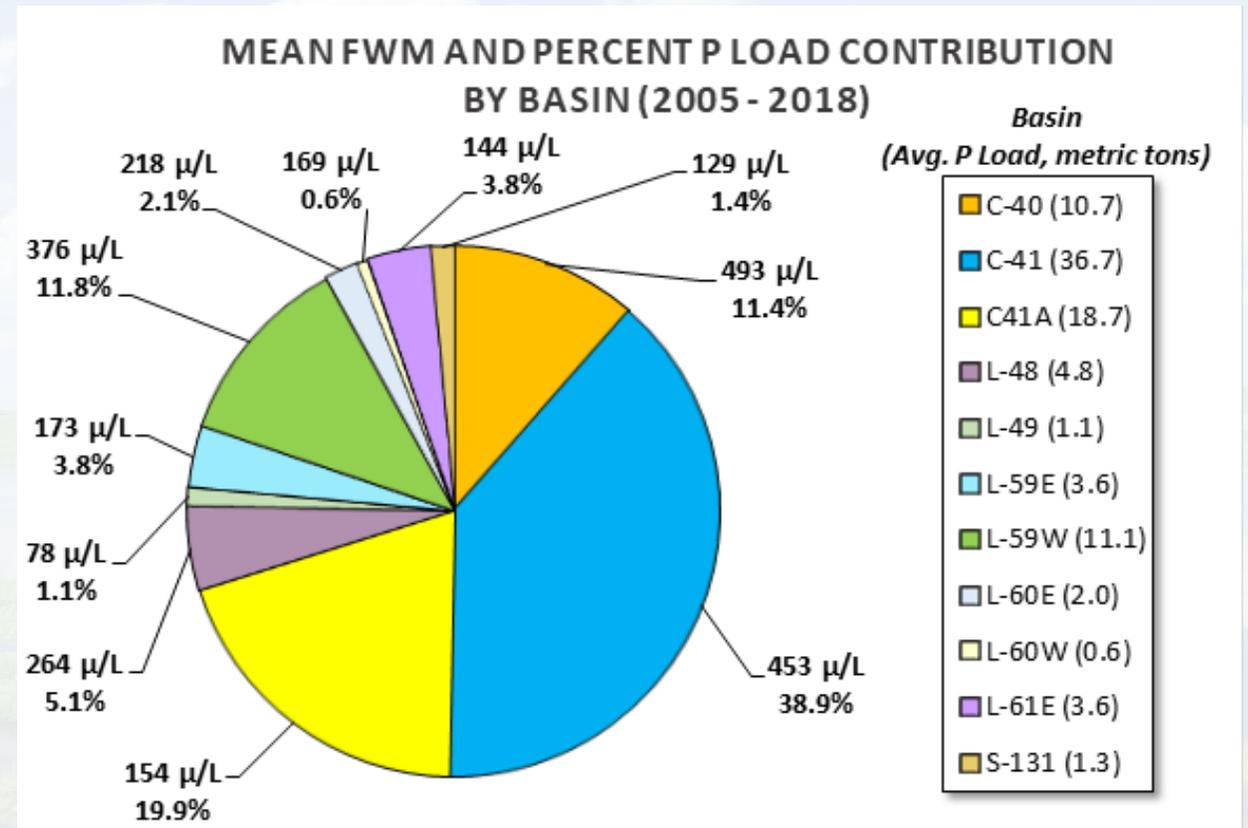
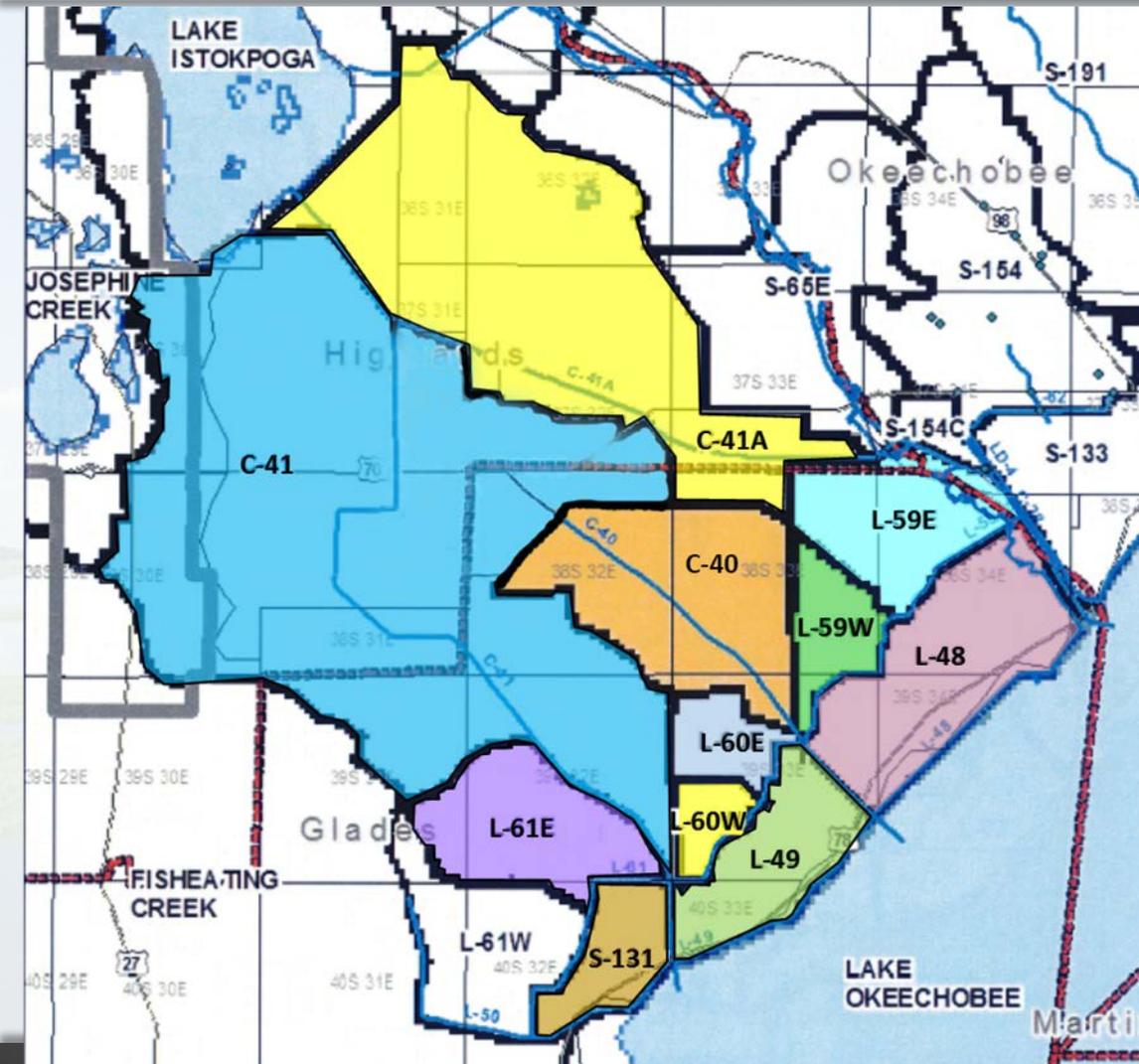
# Indian Prairie Subwatershed

Eleven Basins totaling 276,577 acres



# Indian Prairie

## Long Term Basin Data

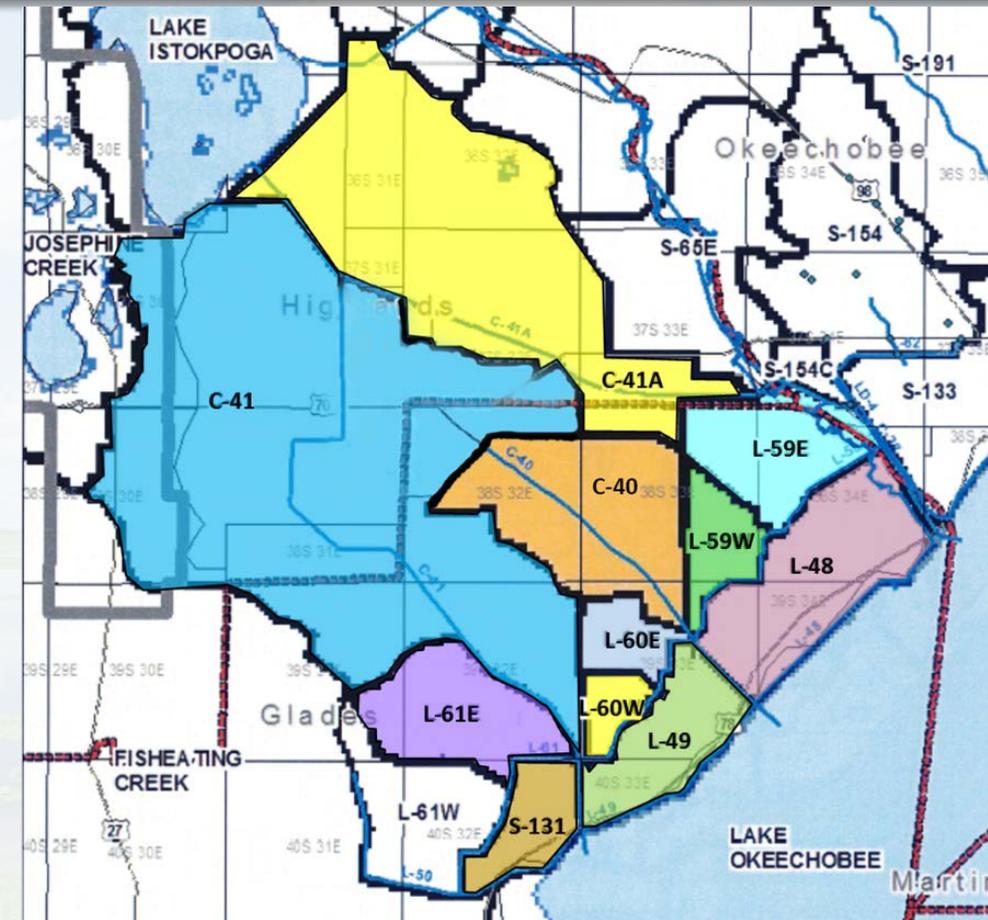


# Indian Prairie BMAP Trends

- Seasonal Kendall Trend analysis
- Period – WY2009-WY2018

## Results

- **C-40** and **C-41A** had statistically significant increasing trends in TP FWMC
- **L-59W** and L-49 had statistically significant decreasing trends in TP FWMC
- **C-40**, **C-41A**, L60E, L-60W, and S-131 had statistically significant increasing trends in TP loads



Source – 2020 Lake Okeechobee BMAP

# Indian Prairie Subwatershed Data

5-year average for  
WY2015-WY2019

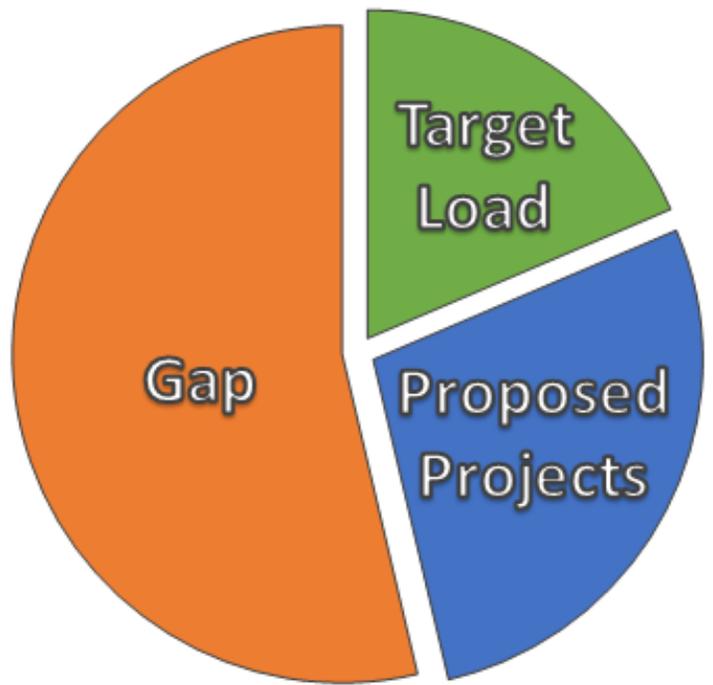
Indian Prairie	TP UAL (lb/ac)	TP FWMC ( $\mu\text{g/L}$ )	TP Load (t)	Discharge (ac-ft)	Area (ac)
L-59W Basin	3.07	237	9.2	31,400	6,596
C-41A Basin	1.13	160	29.5	150,000	57,748
L-60E Basin	1	192	2.2	9,460	4,944
L-61E Basin	0.7	142	4.6	26,100	14,407
C-40 Basin	0.69	475	7.5	12,800	24,076
C-41 Basin	0.53	488	27.2	45,300	112,880
L-48 Basin	0.41	189	3.9	16,700	20,798
L-60W Basin	0.3	134	0.5	2,860	3,453
S-131 Basin	0.26	99	0.8	6,770	7,122
L-59E Basin	0.2	193	1.2	4,920	12,589
L-49 Basin	0.13	52	0.7	10,700	11,966
<b>Subwatershed Total</b>	<b>0.7</b>	<b>223</b>	<b>87.3</b>	<b>317,000</b>	<b>276,577</b>

Source 2020 SFER

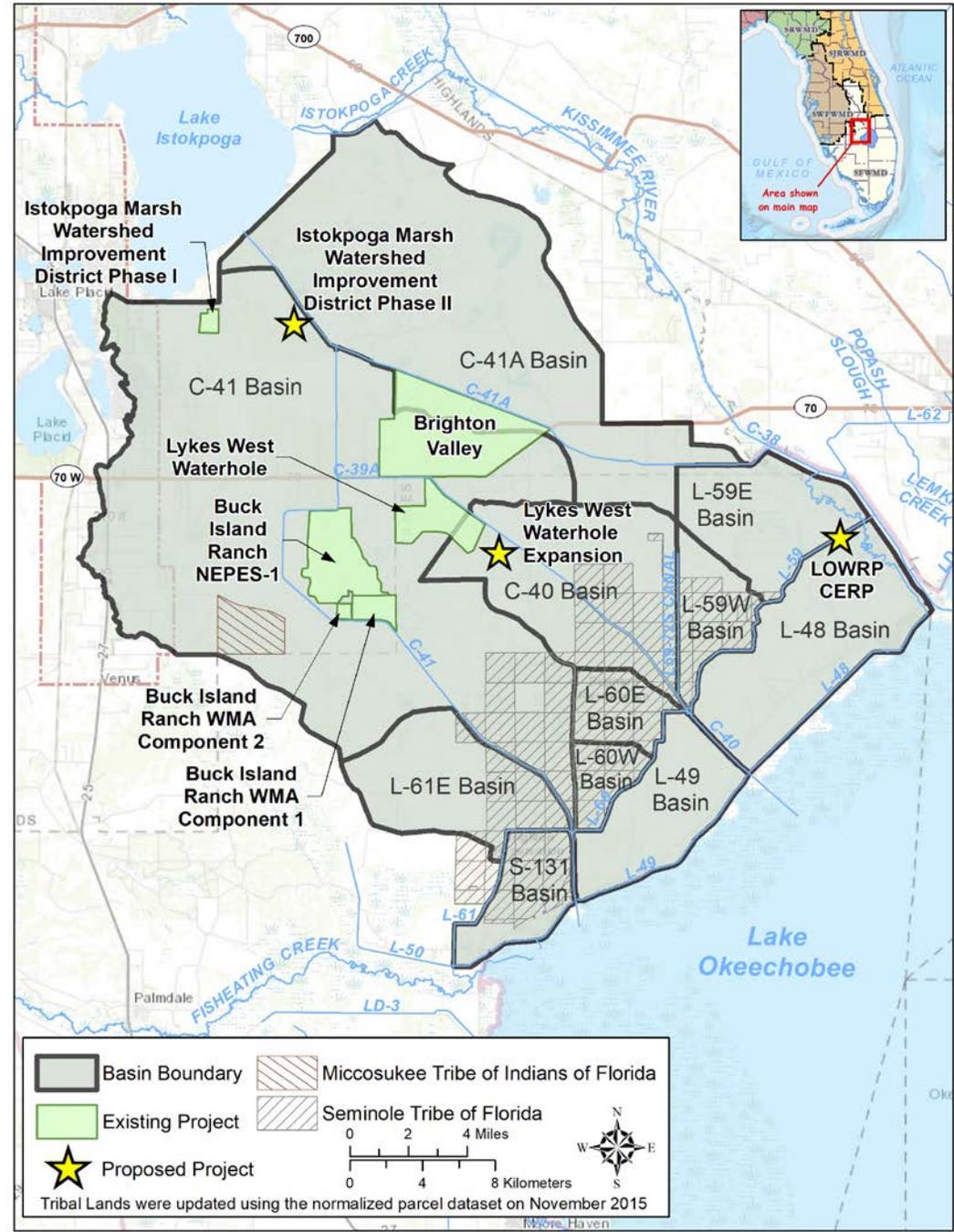
# Projects

**Indian Prairie**  
 Total Phosphorus  
 WY2015-2019

Whole pie 87.3 t



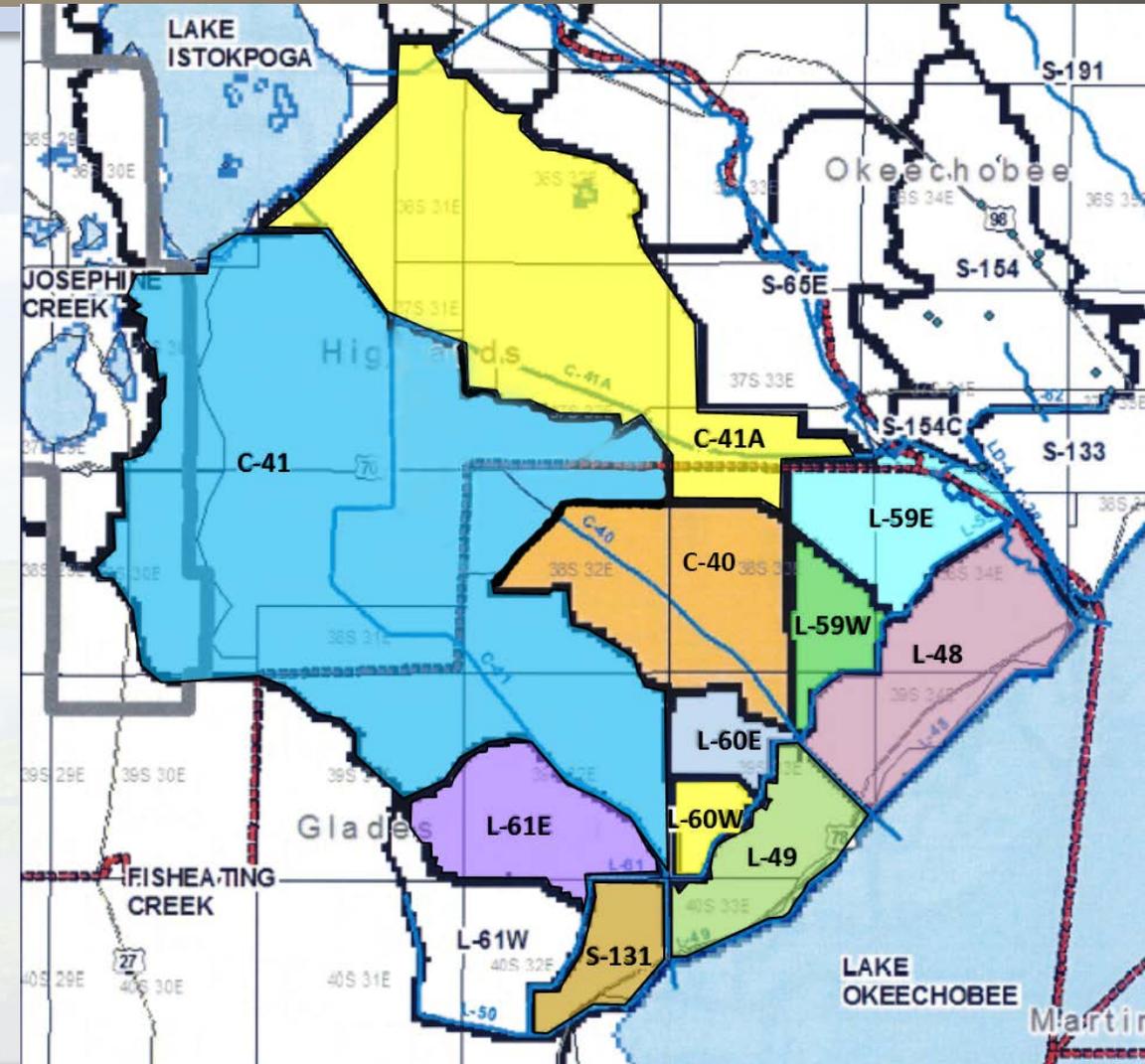
Reductions from Proposed Projects are rough estimates



# Discussion for Indian Prairie

- 5-year average load for WY2015-WY2019 is 87.3 mt
- C-40 and C-41A had stat. sign. Increasing trends for TP FWMCs and TP loads
- C-41 has highest TP FWMC and 2<sup>nd</sup> highest TP load
- L-59W had highest 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

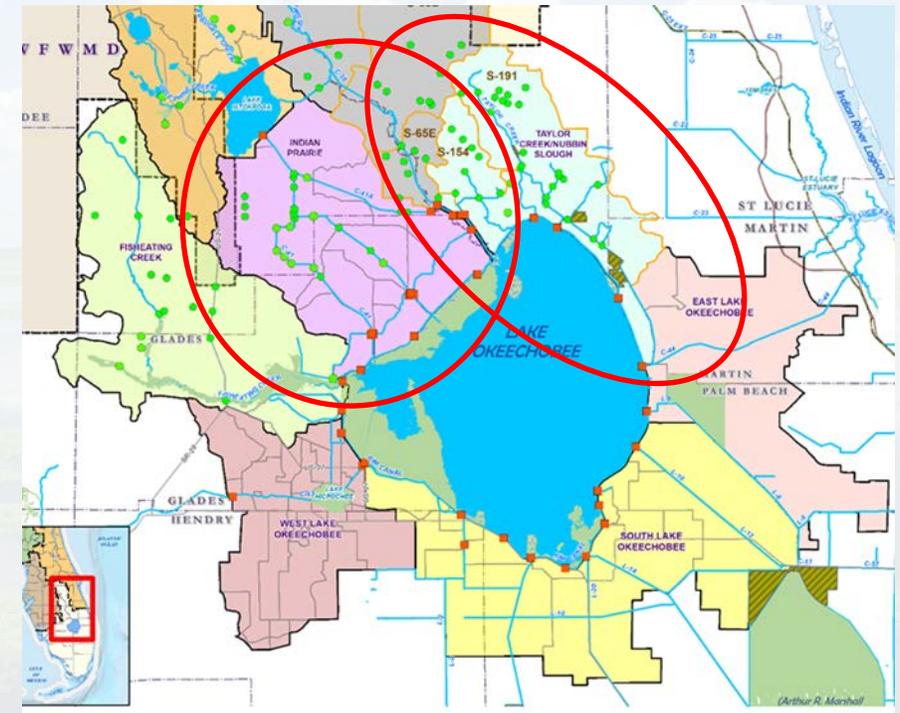


# Summary

WY2015-WY2019 Lake Load ~600 t

- Taylor Creek/Nubbin Slough contributed 104.7 t
  - S-191, S-154, S-154C
- Indian Prairie contributed 87.3 t
  - C-41A, C-40, C-41, L-59W

Subwatershed	TP UAL (lb/ac)	TP FWMC (µg/L)	TP Load (t)
Taylor Creek/Nubbin Slough	1.17	477	104.7
Indian Prairie	0.7	223	87.3

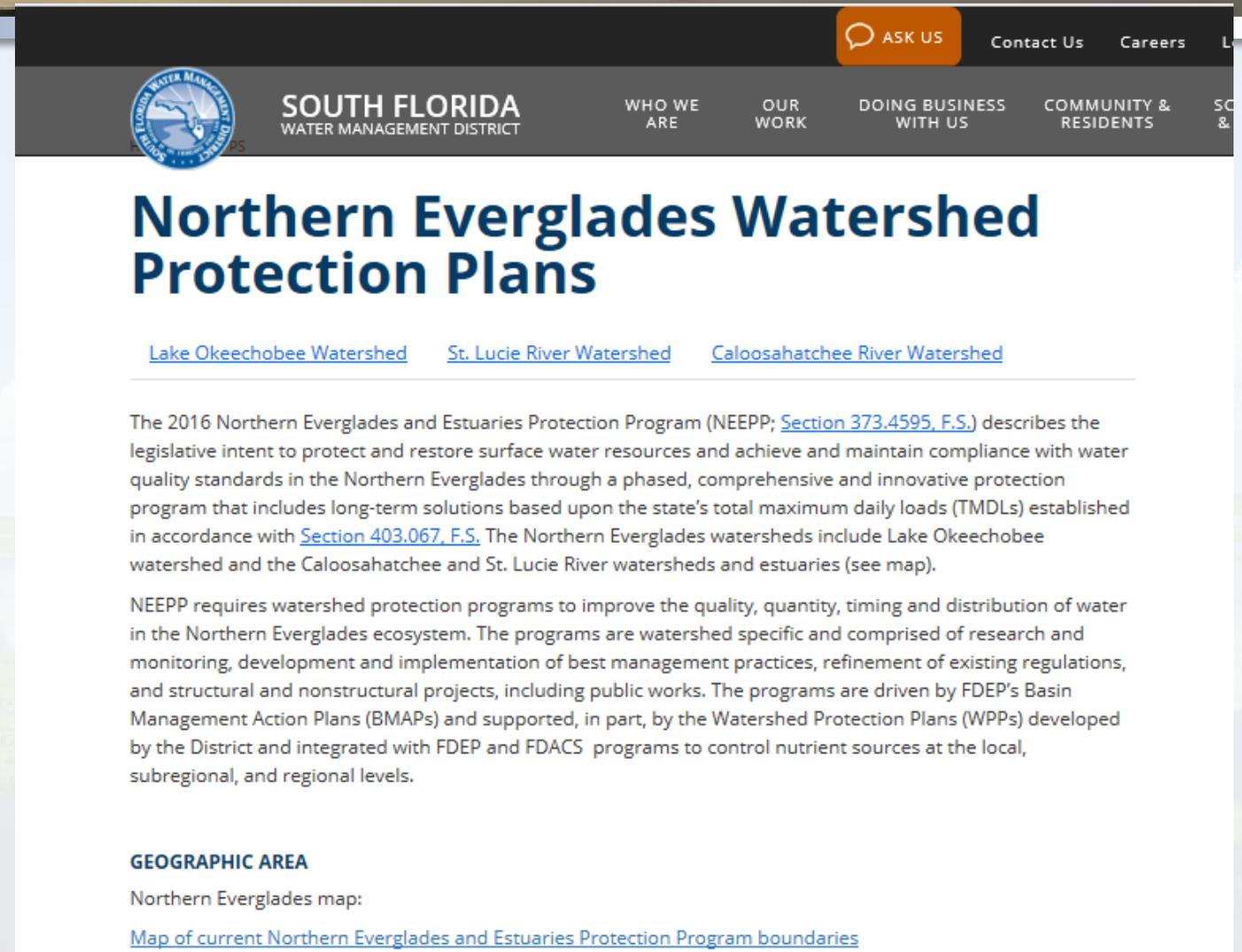


# Next Steps

- Gather detailed information on focus areas
- Perform detailed assessments to identify all potential contributing sources and potentially responsible entities (e.g. local ordinances to control urban runoff, stricter ERPs, more NOIs, septic tank hook ups, etc.)
- Future workshops to discuss findings and recommendations
- Comment by August 4

# Watershed Protection Planning Website

<https://www.sfwmd.gov/wpps>



The screenshot shows the website header with the South Florida Water Management District logo and navigation links: ASK US, Contact Us, Careers, WHO WE ARE, OUR WORK, DOING BUSINESS WITH US, and COMMUNITY & RESIDENTS. The main heading is "Northern Everglades Watershed Protection Plans". Below the heading are three links: [Lake Okeechobee Watershed](#), [St. Lucie River Watershed](#), and [Caloosahatchee River Watershed](#). The text describes the 2016 Northern Everglades and Estuaries Protection Program (NEEPP) and its goals. It also mentions that NEEPP requires watershed protection programs to improve water quality and quantity. The "GEOGRAPHIC AREA" section includes a link to a map of current NEEPP boundaries.

**SOUTH FLORIDA WATER MANAGEMENT DISTRICT**

**ASK US** Contact Us Careers

WHO WE ARE OUR WORK DOING BUSINESS WITH US COMMUNITY & RESIDENTS

## Northern Everglades Watershed Protection Plans

[Lake Okeechobee Watershed](#) [St. Lucie River Watershed](#) [Caloosahatchee River Watershed](#)

The 2016 Northern Everglades and Estuaries Protection Program (NEEPP; [Section 373.4595, F.S.](#)) describes the legislative intent to protect and restore surface water resources and achieve and maintain compliance with water quality standards in the Northern Everglades through a phased, comprehensive and innovative protection program that includes long-term solutions based upon the state's total maximum daily loads (TMDLs) established in accordance with [Section 403.067, F.S.](#) The Northern Everglades watersheds include Lake Okeechobee watershed and the Caloosahatchee and St. Lucie River watersheds and estuaries (see map).

NEEPP requires watershed protection programs to improve the quality, quantity, timing and distribution of water in the Northern Everglades ecosystem. The programs are watershed specific and comprised of research and monitoring, development and implementation of best management practices, refinement of existing regulations, and structural and nonstructural projects, including public works. The programs are driven by FDEP's Basin Management Action Plans (BMAPs) and supported, in part, by the Watershed Protection Plans (WPPs) developed by the District and integrated with FDEP and FDACS programs to control nutrient sources at the local, subregional, and regional levels.

**GEOGRAPHIC AREA**

Northern Everglades map:

[Map of current Northern Everglades and Estuaries Protection Program boundaries](#)

# Question & Answer Period

Have a question?

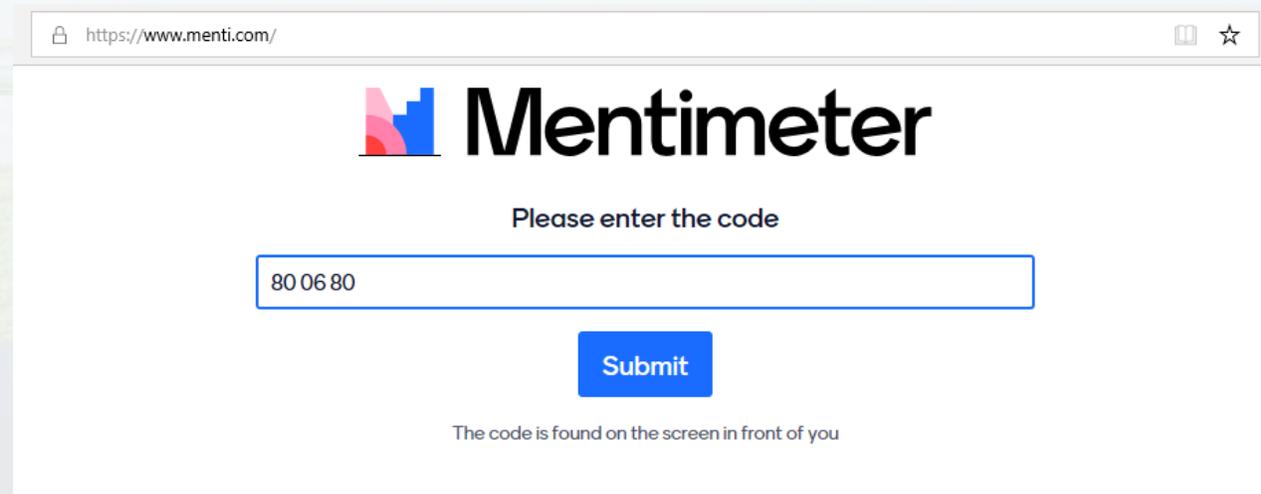
- Please use the Q & A feature using zoom to type in your question so that we respond.



# Menti.com Instructions

- **Step 1:** Open a new internet browser on your computer or smart phone (such as Internet Explorer, Safari, Google, or Edge). To view all public input leave the Zoom meeting window open. We will be coming back to the Zoom Meeting for Q&A.
- **Step 2:** Type the web address, Menti.com and hit enter.
- **Step 3:** Enter the Menti Code in the box on your screen and click “Submit”

- **Today's Code:**  
80 06 80



The screenshot shows a web browser window with the URL <https://www.menti.com/>. The page features the Menti logo, which consists of a stylized bar chart with red, blue, and green bars. Below the logo, the text "Mentimeter" is displayed in a large, bold, black font. Underneath, the instruction "Please enter the code" is shown. A text input field contains the code "80 06 80". Below the input field is a blue button labeled "Submit". At the bottom of the page, a small note reads "The code is found on the screen in front of you".

# Public Comment

Want to comment?

- Each speaker will have 3 minutes complete their comment
- Please remember to first state your name and who you are representing for the record.
- Zoom audio/microphone
  - If you're participating via zoom – use the Raise Hand feature
- Phone
  - If you're participating via you phone –
  - \*9 Raises Hand
  - \*6 Mutes/Unmutes your phone

