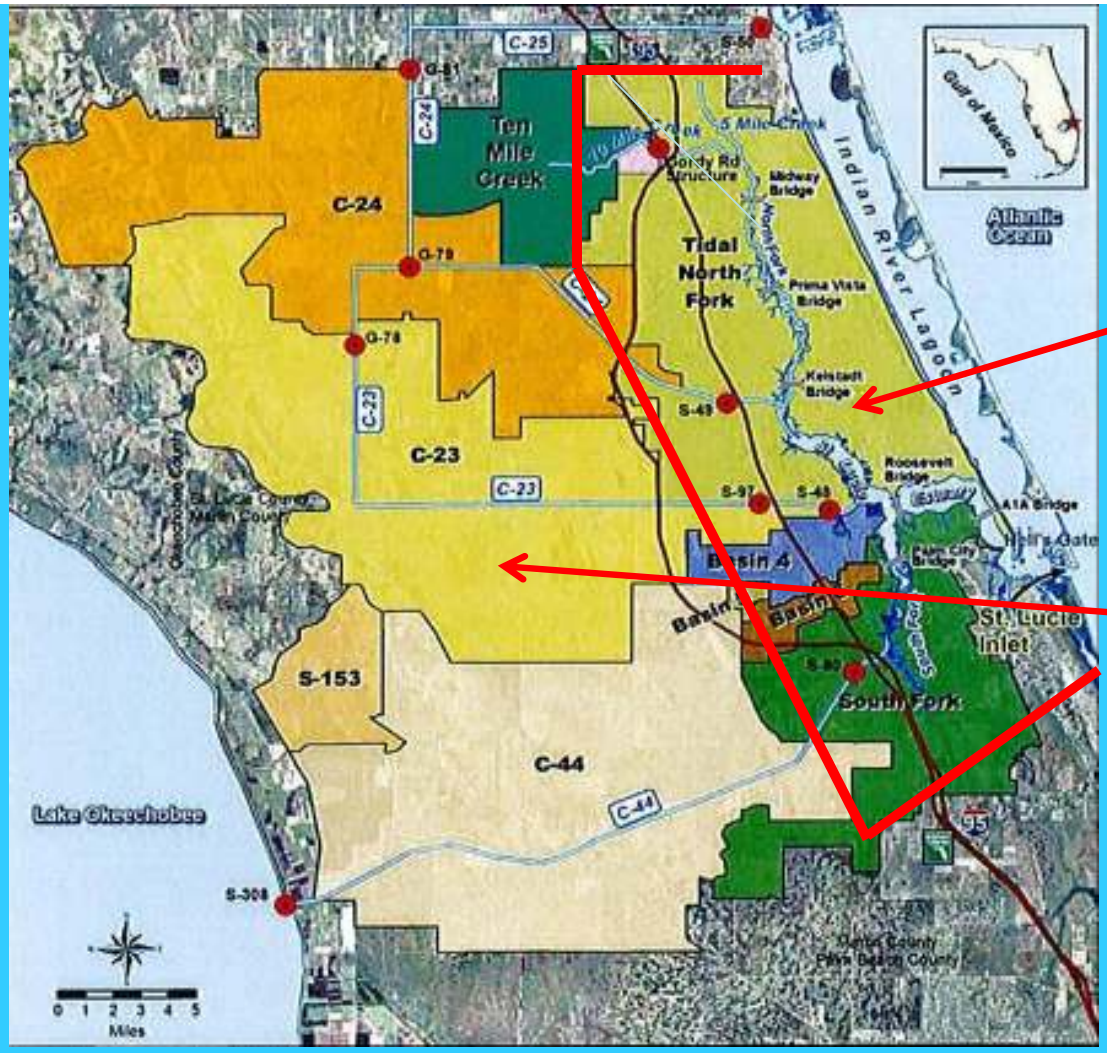
St. Lucie River Watershed: Works of the District, Impacts to the River

Rivers Coalition

July 25, 2019

Mark Perry, Executive Director
Florida Oceanographic Society

Florida Oceanographic Society



Historic Watershed:
210,060 acres

Total Present Day:
525,816 acres

Florida Oceanographic Society

St. Lucie Estuary Watershed

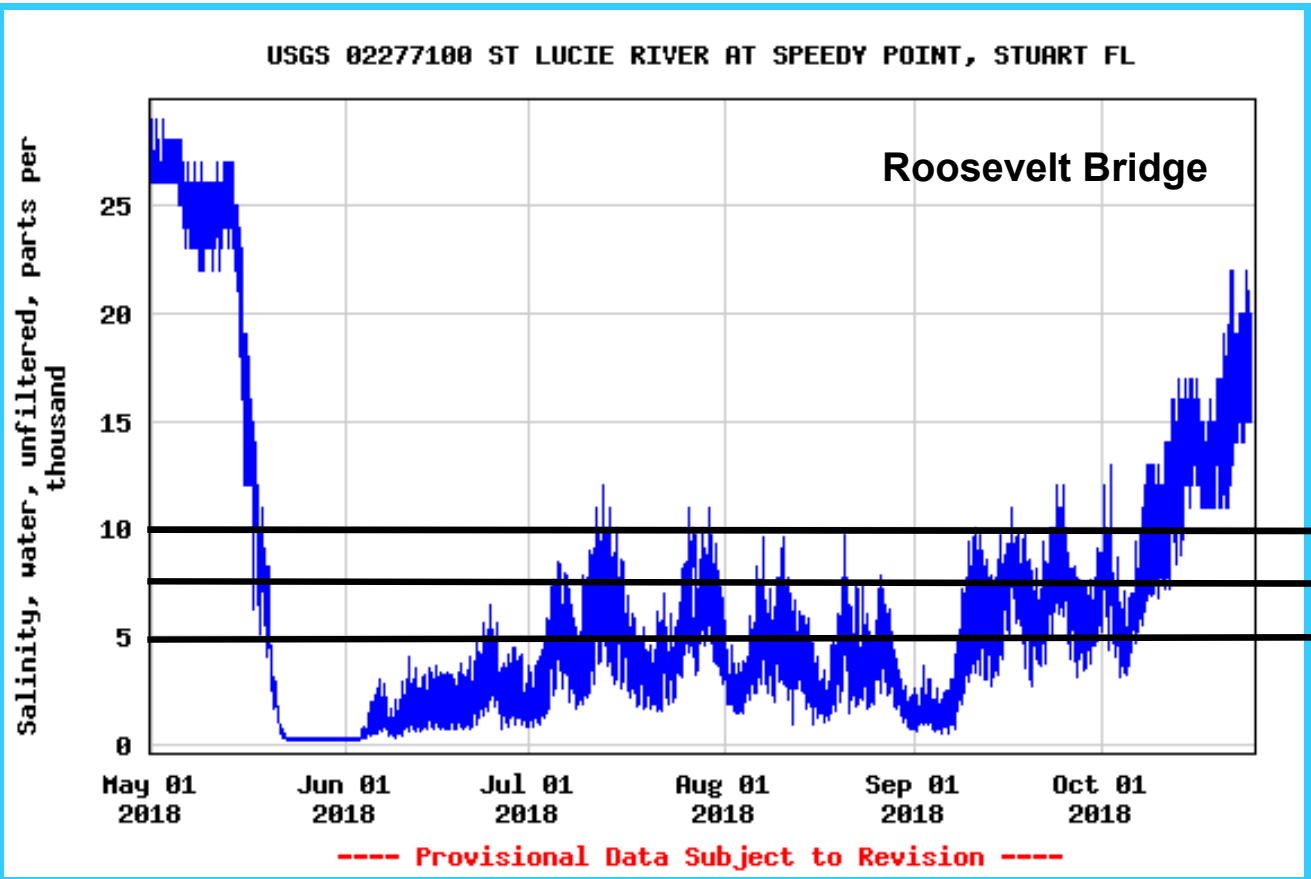
Environmental Impacts **Oyster Reefs**, **Seagrass Beds**, **Nearshore Coral Reefs**

Human Health Impacts

Economic Impacts

Lake Okeechobee Discharges- Impacts to the Watershed and Nearshore Environments

Florida Oceanographic Society



Stress

Harm

Death

Salinity Tolerance for **Oysters**

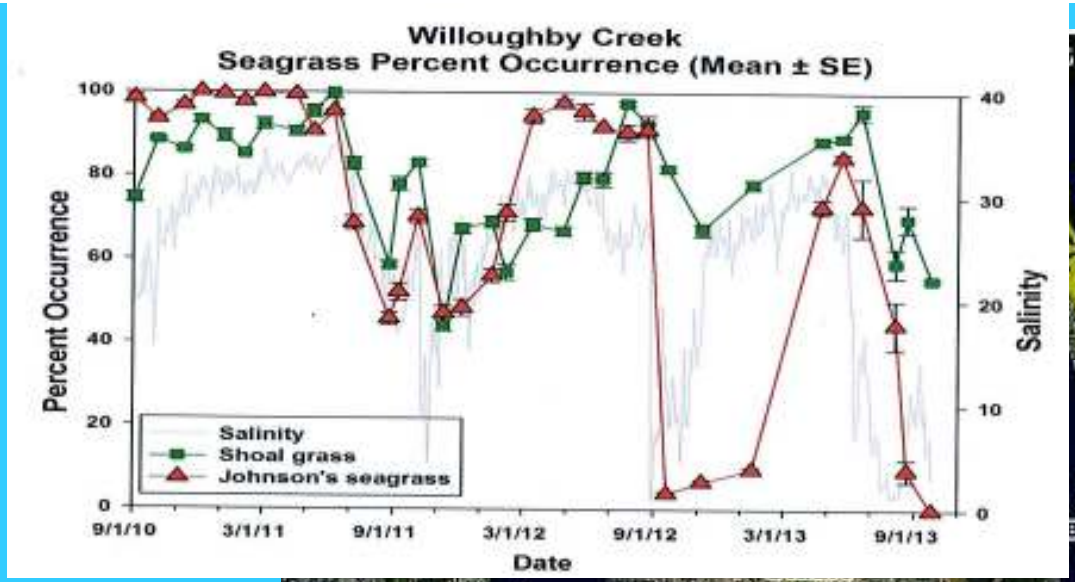
Florida Oceanographic Society

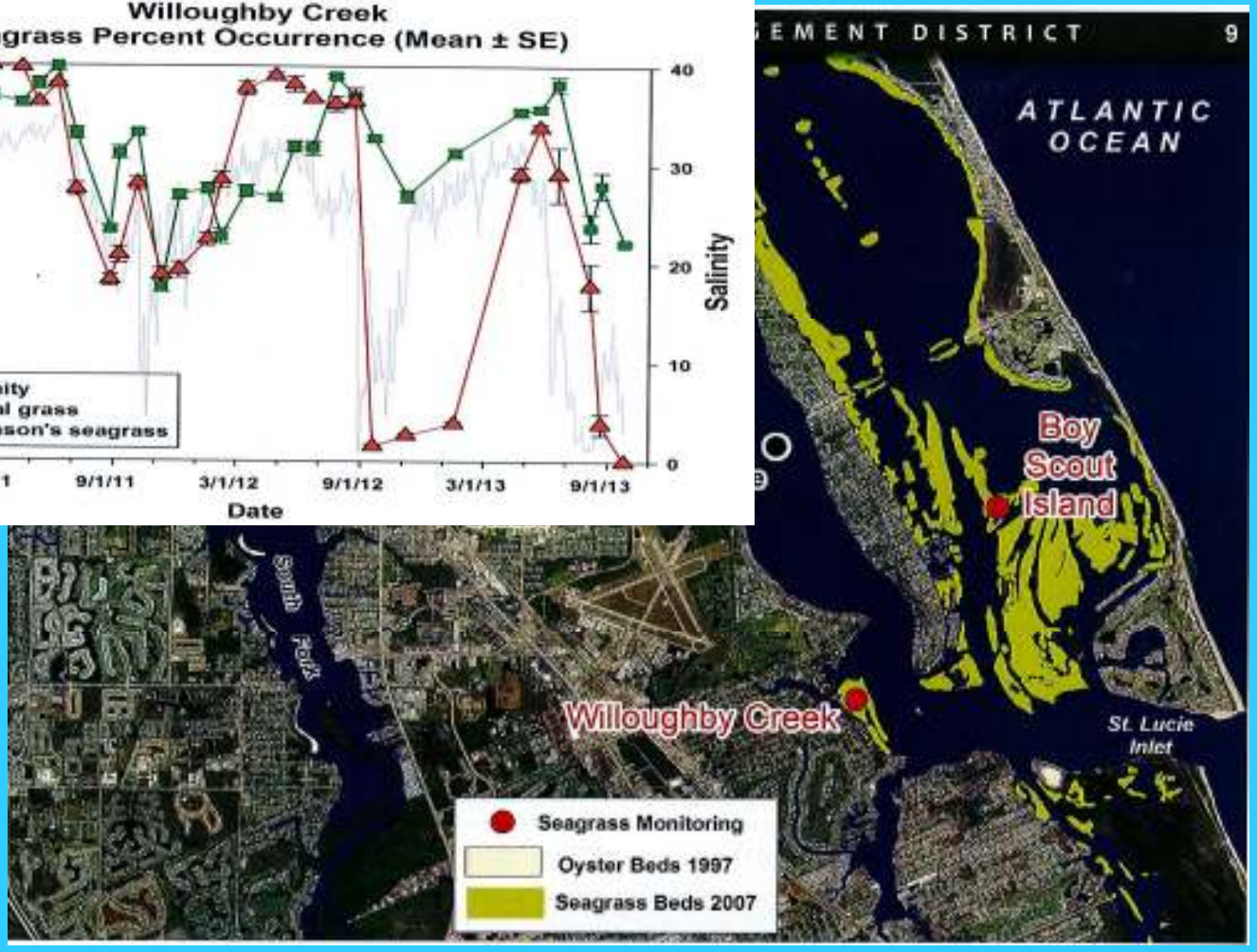
127 Days – October 25, 2018

Death

7 Days For Spat & Juveniles

14 – 28 Days For Adults





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Effects of Freshwater Discharges on Seagrasses –
Johnson's Seagrass is a Threatened Species under the ESA

Seagrass cover - **2010**

Seagrass cover - **2017**

Todd Thurlow-historical imagery data-provisional

Seagrass Lost

St. Lucie Inlet
Indian River Lagoon

1970 - 405.8 acres
2004 - 335.3 acres
2016 - 218.2 acres
2017 - ?
2018 - ??

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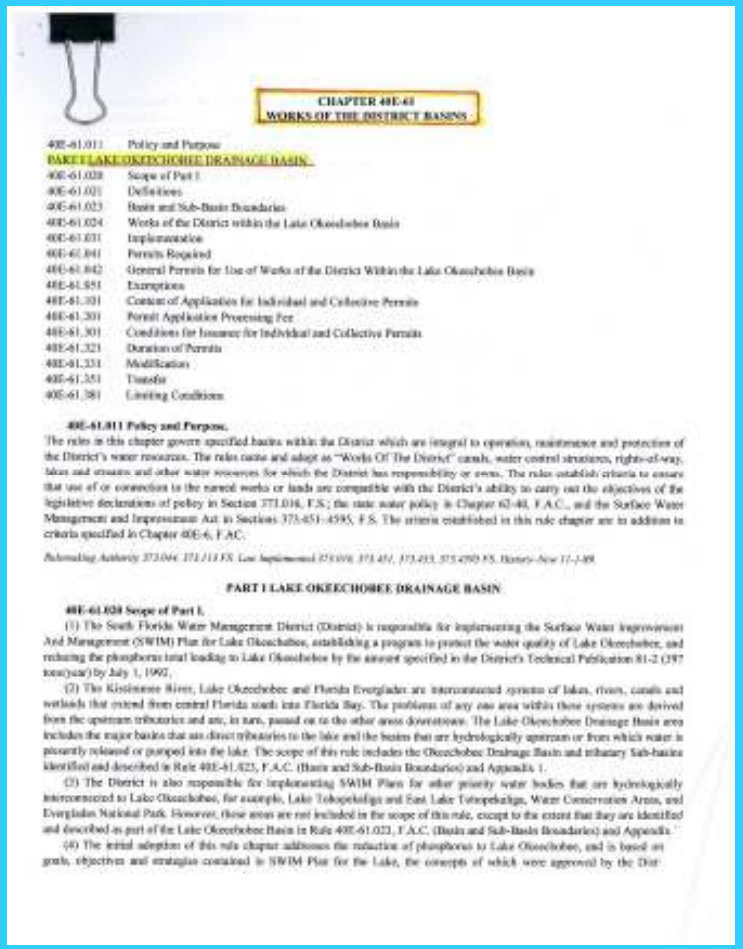


CHAPTER 40E-61
WORKS OF THE DISTRICT BASINS

40E-61.011 Policy and Purpose
PART I LAKE OKEECHOBEE DRAINAGE BASIN
40E-61.020 Scope of Part I
40E-61.021 Definitions
40E-61.023 Basin and Sub-Basin Boundaries
40E-61.024 Works of the District within the Lake Okeechobee Basin
40E-61.031 Implementation
40E-61.041 Permits Required
40E-61.042 General Permits for Use of Works of the District Within the Lake Okeechobee Basin
40E-61.051 Exemptions
40E-61.101 Content of Application for Individual and Collective Permits
40E-61.201 Permit Application Processing Fee
40E-61.301 Conditions for Issuance for Individual and Collective Permits
40E-61.321 Duration of Permits
40E-61.331 Modification
40E-61.351 Transfer
40E-61.381 Limiting Conditions

40E-61.011 Policy and Purpose.
The rules in this chapter govern specified basins within the District which are integral to operation, maintenance and protection of the District's water resources. The rules name and adopt as "Works Of The District" canals, water control structures, rights-of-way, lakes and streams and other water resources for which the District has responsibility or owns. The rules establish criteria to ensure that use of or connection to the named works or lands are compatible with the District's ability to carry out the objectives of the legislative declarations of policy in Section 373.016, F.S.; the state water policy in Chapter 62-40, F.A.C., and the Surface Water Management and Improvement Act in Sections 373.451-4595, F.S. The criteria established in this rule chapter are in addition to criteria specified in Chapter 40E-6, F.A.C.

Rulemaking Authority 373.044, 373.113 FS. Law Implemented 373.016, 373.451, 373.453, 373.4595 FS. History–New 11-1-89.

PART I LAKE OKEECHOBEE DRAINAGE BASIN

40E-61.020 Scope of Part I.
(1) The South Florida Water Management District (District) is responsible for implementing the Surface Water Improvement And Management (SWIM) Plan for Lake Okeechobee, establishing a program to protect the water quality of Lake Okeechobee, and reducing the phosphorus total loading to Lake Okeechobee by the amount specified in the District's Technical Publication 81-2 (397 tons/year) by July 1, 1992.
(2) The Kissimmee River, Lake Okeechobee and Florida Everglades are interconnected systems of lakes, rivers, canals and wetlands that extend from central Florida south into Florida Bay. The problems of any one area within these systems are derived from the upstream tributaries and are, in turn, passed on to the other areas downstream. The Lake Okeechobee Drainage Basin area includes the major basins that are direct tributaries to the lake and the basins that are hydrologically upstream or from which water is presently released or pumped into the lake. The scope of this rule includes the Okeechobee Drainage Basin and tributary Sub-basins identified and described in Rule 40E-61.023, F.A.C. (Basin and Sub-Basin Boundaries) and Appendix 1.
(3) The District is also responsible for implementing SWIM Plans for other priority water bodies that are hydrologically interconnected to Lake Okeechobee, for example, Lake Tohopekaliga and East Lake Tohopekaliga, Water Conservation Areas, and Everglades National Park. However, those areas are not included in the scope of this rule, except to the extent that they are identified and described as part of the Lake Okeechobee Basin in Rule 40E-61.023, F.A.C. (Basin and Sub-Basin Boundaries) and Appendix 1.
(4) The initial adoption of this rule chapter addresses the reduction of phosphorus to Lake Okeechobee, and is based on goals, objectives and strategies contained in SWIM Plan for the Lake, the concepts of which were approved by the Dist

Works of the District-Lake O-1989

Rules of the
South Florida Water Management District

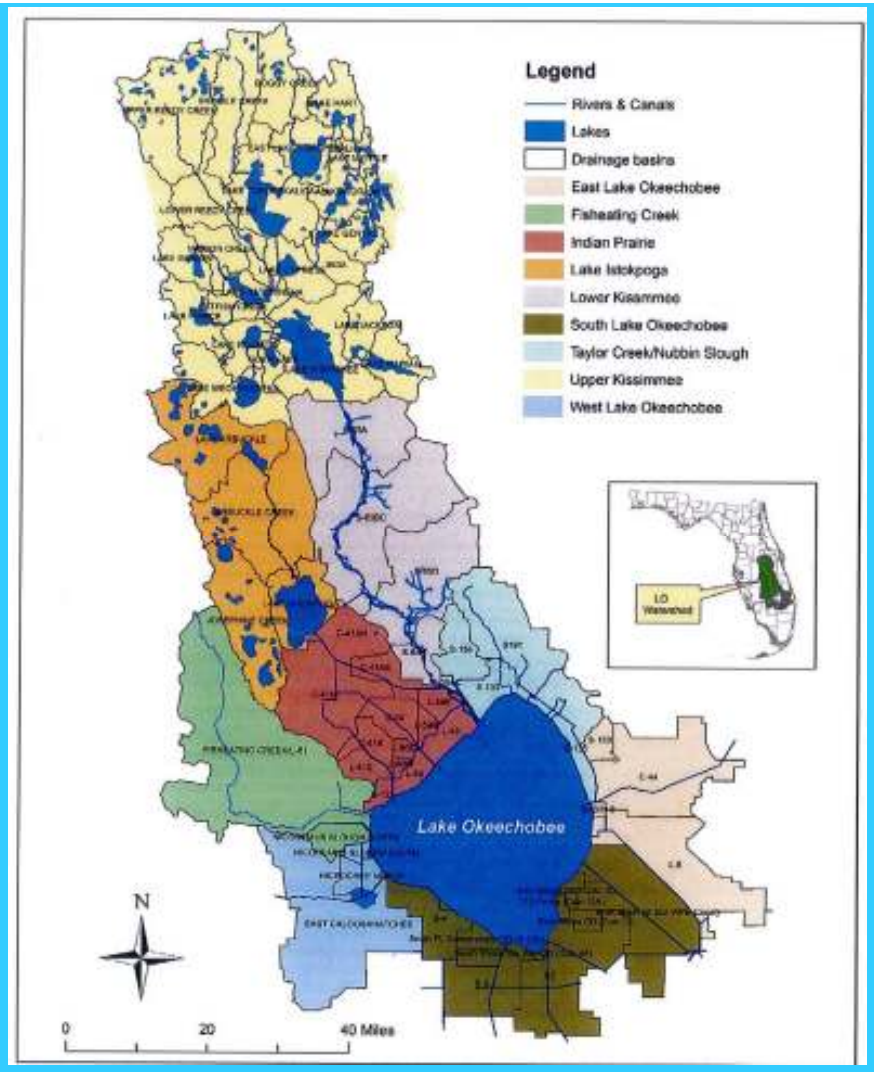
WORKS OF THE DISTRICT BASINS
Chapter 40E-61, F.A.C.

Amended October 1, 2006

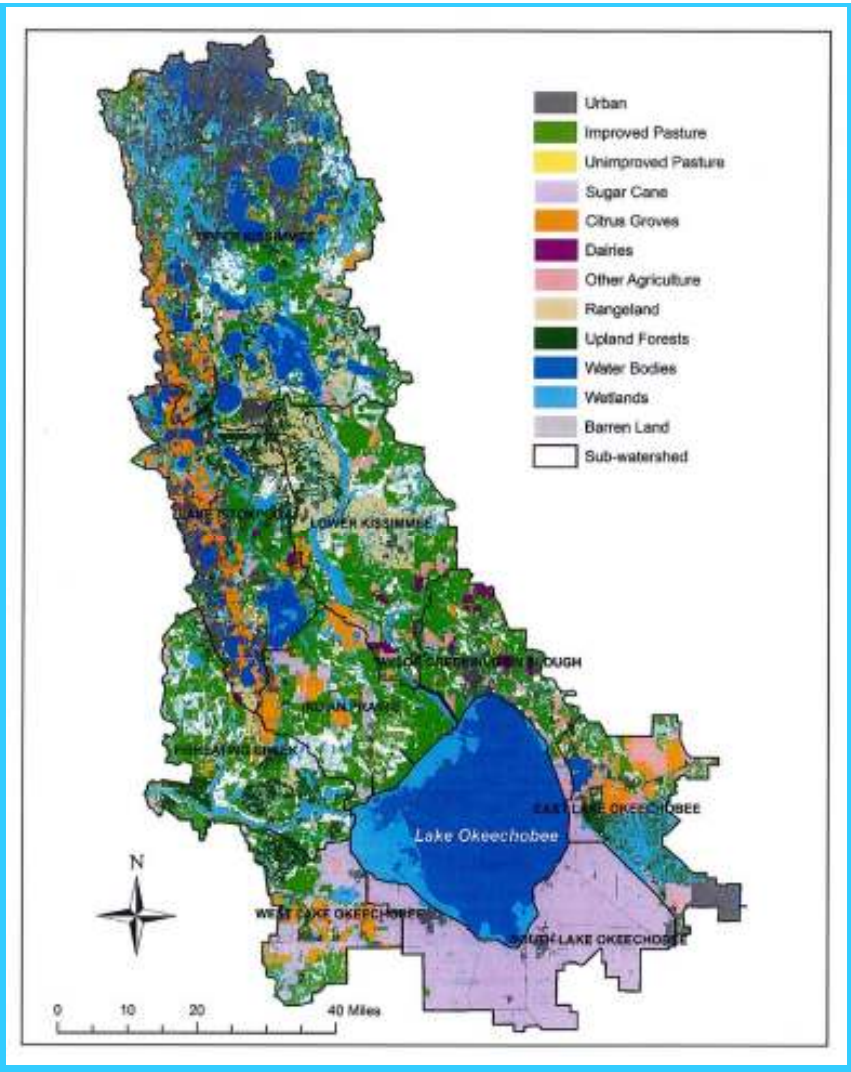
CHAPTER 40E-63
EVERGLADES PROGRAM

PART I EVERGLADES REGULATORY PROGRAM: EVERGLADES AGRICULTURAL AREA (EAA) BASIN
40E-63.011 Policy and Purpose
40E-63.091 Publications Incorporated by Reference
40E-63.101 Scope
40E-63.102 Definitions
40E-63.104 EAA Basin Boundaries
40E-63.106 Works of the District within the Everglades
40E-63.108 Implementation
40E-63.110 EAA Basin – Permits Required
Subpart A EAA Basin – General Permits
40E-63.120 General Permits for Use of Works of the District Within the Everglades
Subpart B EAA Basin – Individual Permits
40E-63.130 Individual Permit Application Requirements in the EAA Basin
40E-63.132 Content of Application for Individual Permits in the EAA Basin
40E-63.134 Permit Application Processing Fee for Individual Permits in the EAA Basin
40E-63.136 Conditions for Issuance of Individual Permits in the EAA Basin
40E-63.138 Duration of Individual Permits in the EAA Basin
40E-63.140 Modification of Individual Permits in the EAA Basin
Delegation of Authority Pertaining to Letter Modifications and Administrative Information Updates of Existing Individual Permits
40E-63.142 Transfer of Individual Permits in the EAA Basin
40E-63.143 Limiting Conditions for Individual Permits in the EAA Basin
40E-63.145 Compliance and Enforcement of Individual Permits in the EAA Basin
Subpart C EAA Basin – Master Permits
40E-63.150 Master Permit Application Requirements in the EAA Basin
40E-63.152 Content of Application for Master Permits in the EAA Basin
40E-63.154 Permit Application Processing Fee for Master Permits in the EAA Basin
40E-63.156 Conditions for Issuance for Master Permits in the EAA Basin
40E-63.158 Duration of Master Permits in the EAA Basin
40E-63.160 Modification of Master Permits in the EAA Basin
Delegation of Authority Pertaining to Letter Modifications and Administrative Information Updates of Existing Master Permits
40E-63.162 Transfer of Master Permits in the EAA Basin
40E-63.163 Limiting Conditions for Master Permits in the EAA Basin
40E-63.165 Compliance and Enforcement of Master Permits in the EAA Basin
PART II EVERGLADES WATER SUPPLY AND HYDROPERIOD IMPROVEMENT AND RESTORATION
40E-63.201 Scope (Repealed)
Subpart A BMP Replacement Water
40E-63.211 Purpose (Repealed)
40E-63.212 Definitions (Repealed)
40E-63.223 Model to Quantify Annual Allocation of Replacement Water (Repealed)
40E-63.225 Delivery of Average Annual Allocation of Replacement Water (Repealed)
PART III BMP RESEARCH, TESTING AND IMPLEMENTATION TO ADDRESS WATER QUALITY STANDARDS
40E-63.301 Scope
40E-63.302 Permits Required
40E-63.305 Master Permit
40E-63.310 Conditions for Issuance of a Master Permit
40E-63.312 Transfer of Master Permit
40E-63.313 Master Permit Duration

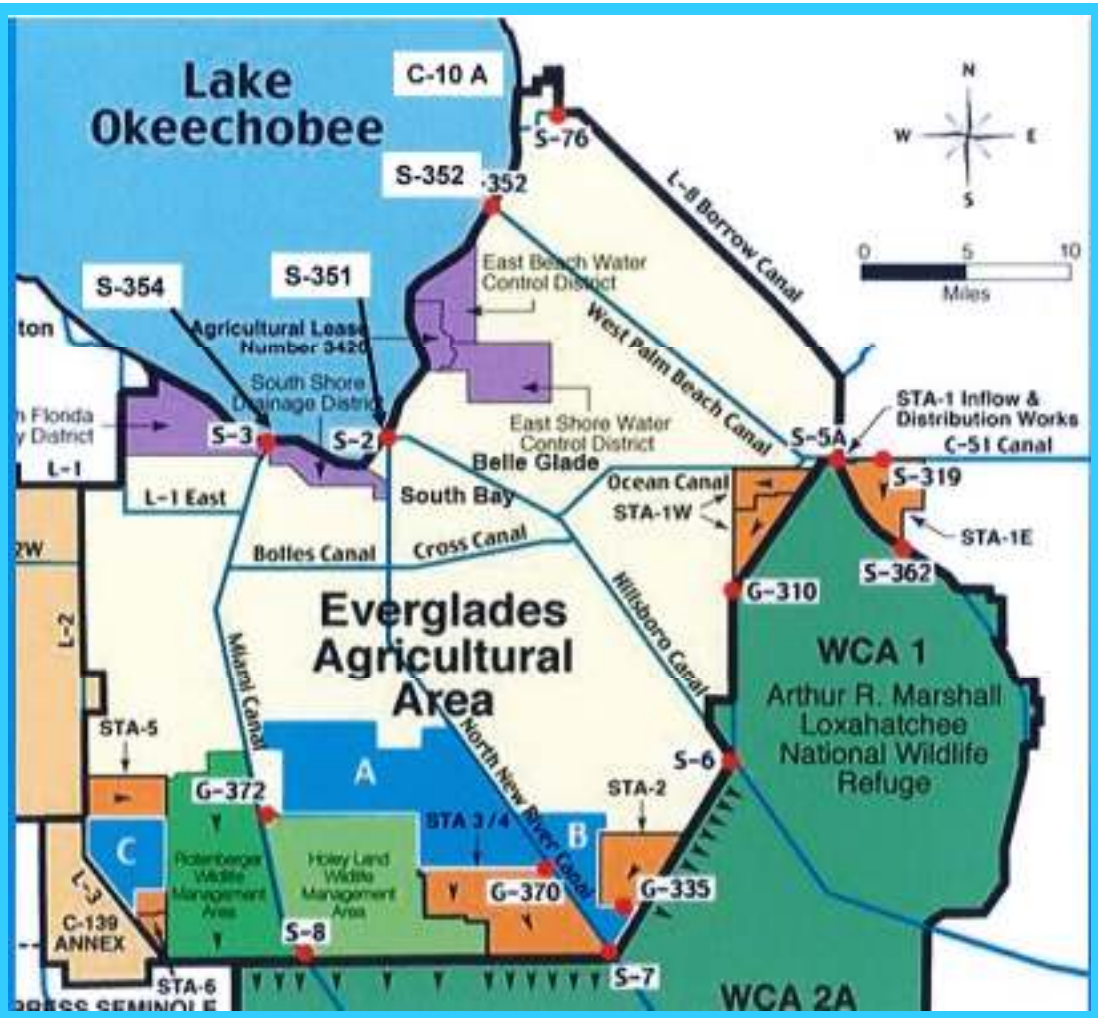
Works of the District-EAA-1992



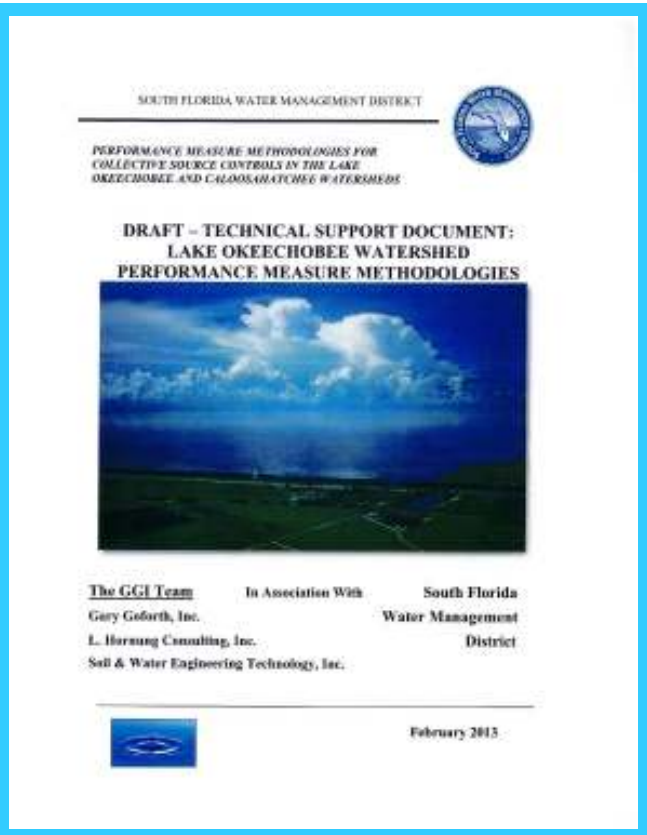
Lake Okeechobee Watershed- 3.4 Million Acres-9 Basins



Land Use in the Watershed



EAA – Works of the District – 213 Drainage Sub-basins-
289 Permitted Structures



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PERFORMANCE MEASURE METHODOLOGIES FOR COLLECTIVE SOURCE CONTROLS IN THE LAKE OKEECHOBEE AND CALOOSAHATCHEE WATERSHEDS

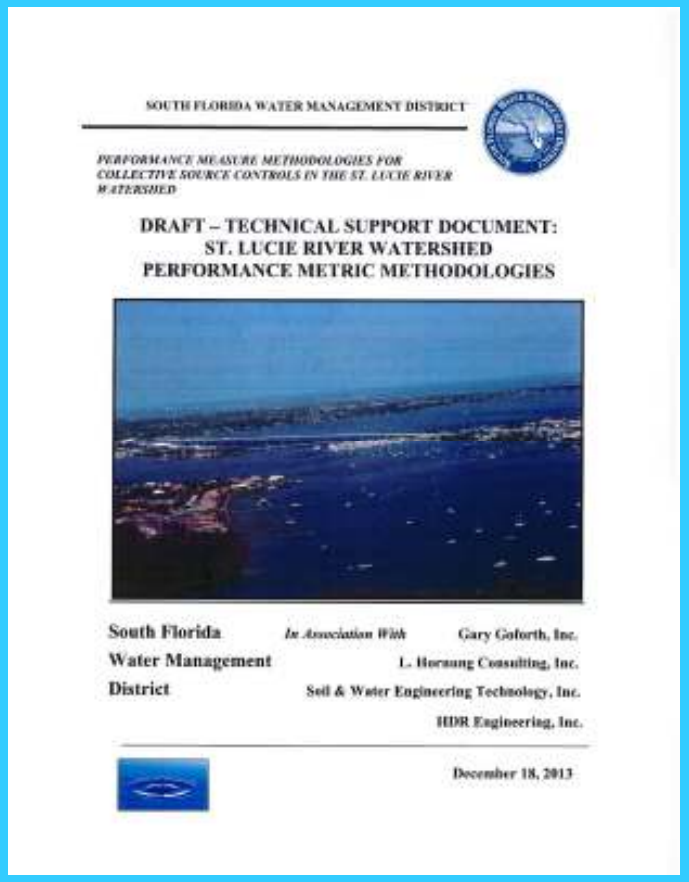
DRAFT – TECHNICAL SUPPORT DOCUMENT: LAKE OKEECHOBEE WATERSHED PERFORMANCE MEASURE METHODOLOGIES

The GGI Team
Gary Goforth, Inc.
L. Horsang Consulting, Inc.
Soil & Water Engineering Technology, Inc.

In Association With

South Florida Water Management District

February 2013



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PERFORMANCE MEASURE METHODOLOGIES FOR COLLECTIVE SOURCE CONTROLS IN THE ST. LUCIE RIVER WATERSHED

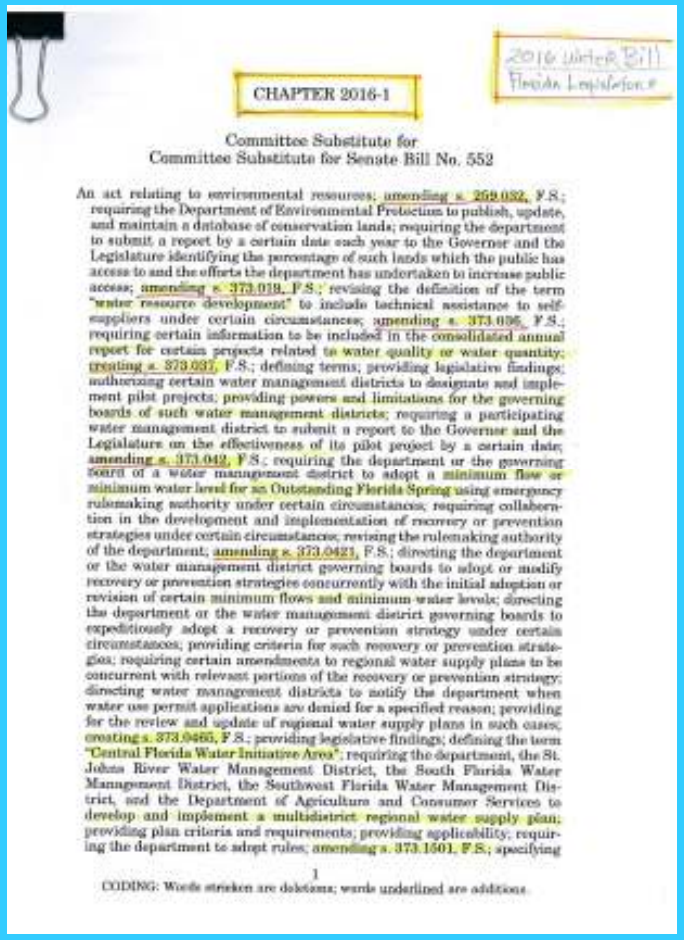
DRAFT – TECHNICAL SUPPORT DOCUMENT: ST. LUCIE RIVER WATERSHED PERFORMANCE METRIC METHODOLOGIES

South Florida Water Management District

In Association With

Gary Goforth, Inc.
L. Horsang Consulting, Inc.
Soil & Water Engineering Technology, Inc.
HDR Engineering, Inc.

December 18, 2013



2016 Water Bill
Florida Legislature

CHAPTER 2016-1

Committee Substitute for
Committee Substitute for Senate Bill No. 552

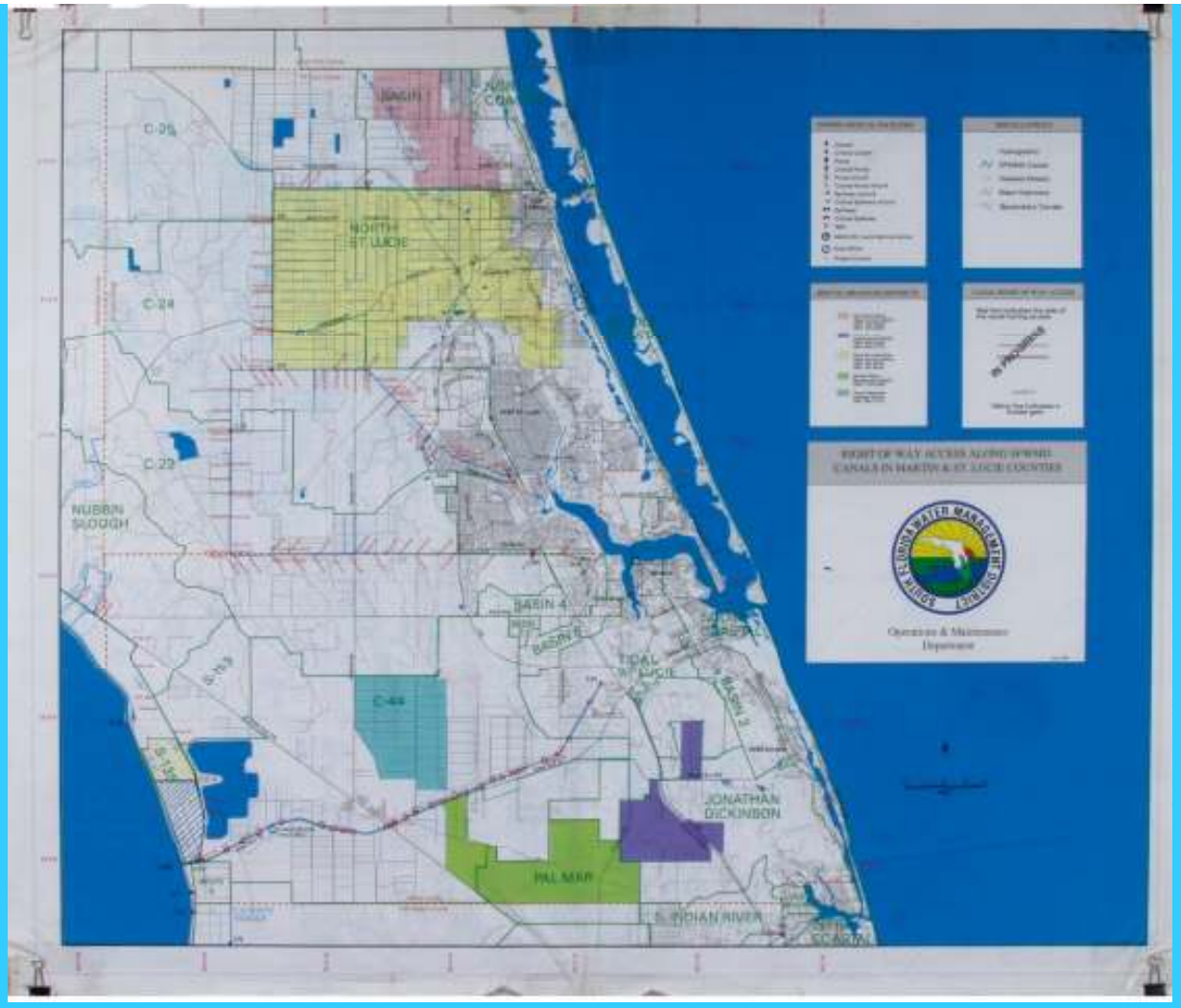
An act relating to environmental resources; amending s. 259.032, F.S.; requiring the Department of Environmental Protection to publish, update, and maintain a database of conservation lands; requiring the department to submit a report by a certain date each year to the Governor and the Legislature identifying the percentage of such lands which the public has access to and the efforts the department has undertaken to increase public access; amending s. 373.019, F.S.; revising the definition of the term "water resource development" to include technical assistance to self-suppliers under certain circumstances; amending s. 373.036, F.S.; requiring certain information to be included in the consolidated annual report for certain projects related to water quality or water quantity; creating s. 373.037, F.S.; defining terms; providing legislative findings; authorizing certain water management districts to designate and implement pilot projects; providing powers and limitations for the governing boards of such water management districts; requiring a participating water management district to submit a report to the Governor and the Legislature on the effectiveness of its pilot project by a certain date; amending s. 373.042, F.S.; requiring the department or the governing board of a water management district to adopt a minimum flow or minimum water level for an Outstanding Florida Spring using emergency rulemaking authority under certain circumstances; requiring collaboration in the development and implementation of recovery or prevention strategies under certain circumstances; revising the rulemaking authority of the department; amending s. 373.0421, F.S.; directing the department or the water management district governing boards to adopt or modify recovery or prevention strategies concurrently with the initial adoption or revision of certain minimum flows and minimum water levels; directing the department or the water management district governing boards to expeditiously adopt a recovery or prevention strategy under certain circumstances; providing criteria for such recovery or prevention strategies; requiring certain amendments to regional water supply plans to be concurrent with relevant portions of the recovery or prevention strategy; directing water management districts to notify the department when water use permit applications are denied for a specified reason; providing for the review and update of regional water supply plans in such cases; creating s. 373.0465, F.S.; providing legislative findings; defining the term "Central Florida Water Initiative Area"; requiring the department, the St. Johns River Water Management District, the South Florida Water Management District, the Southwest Florida Water Management District, and the Department of Agriculture and Consumer Services to develop and implement a multidistrict regional water supply plan; providing plan criteria and requirements; providing applicability; requiring the department to adopt rules; amending s. 373.1501, F.S.; specifying

1

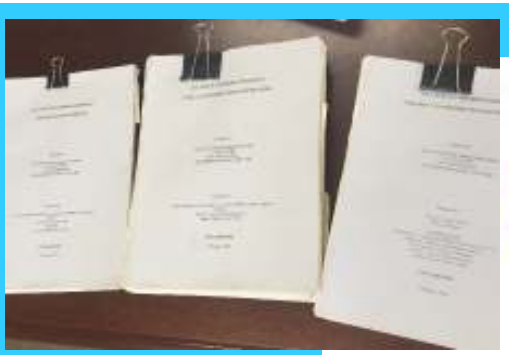
CODING: Words stricken are deletions; words underlined are additions.

Technical Support Documents-Source Controls in Watersheds – 2013 Gary Goforth-SFWMD

2016 Water Bill – Reliance on BMPs and TMDL/BMAP-Not Regulatory



SFWMD-Major Drainage Canals (C23,C24,C25,C44) 96 Project Culverts conveying all drainage to St. Lucie River Estuary



ST. LUCIE WATERSHED ASSESSMENT

VOLUME B: BASIN PRIORITIES

Prepared for:

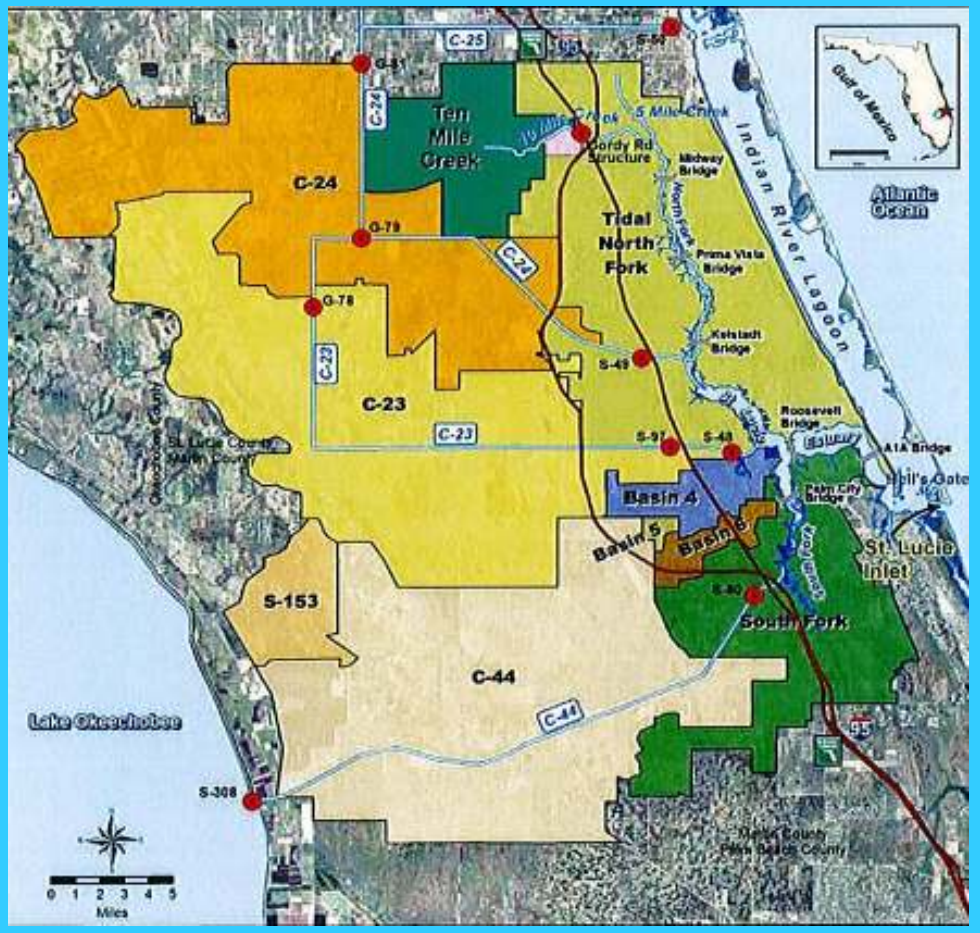
South Florida Water Management District
P.O. Box 24680
3301 Gun Club Road
West Palm Beach, Florida 33416-4680

Prepared by:

Anthony Janicki, David Wade, J. Raymond Pribble, Pam Latham
PBS&J
5300 West Cypress Street
Suite 300
Tampa, Florida 33607-1712

FINAL REPORT

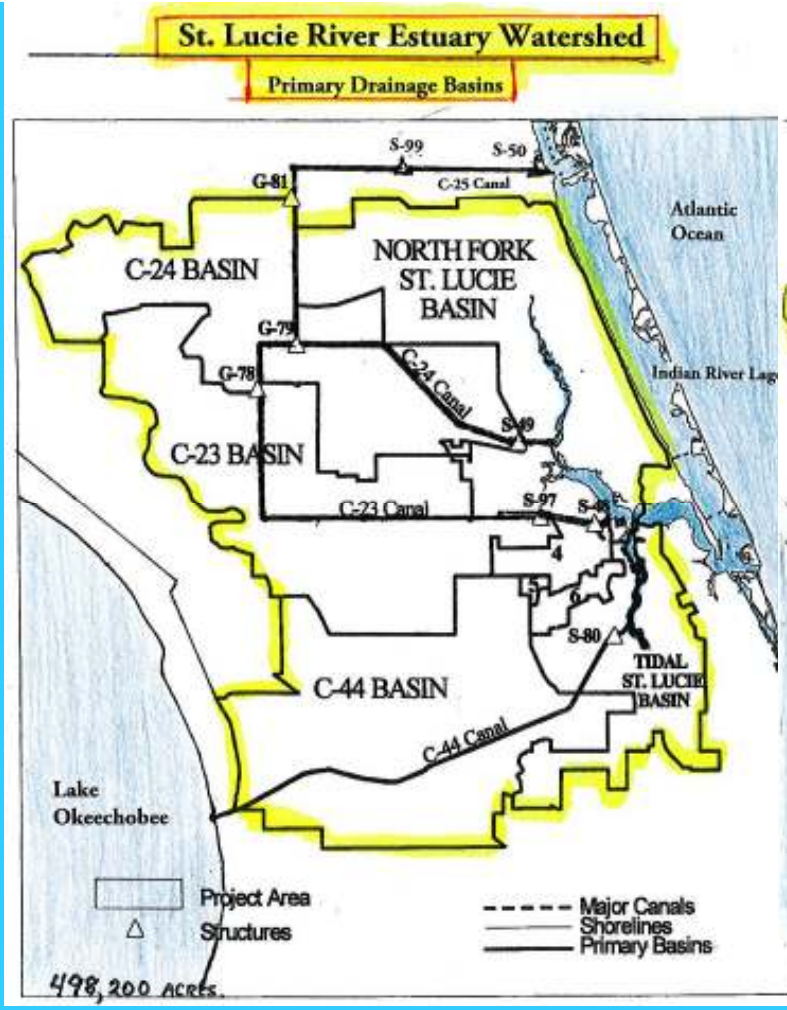
February, 1999



Florida Oceanographic Society

Watershed Assessment - February 1999

St. Lucie River Watershed 514,646 Acres



8 Basins – 186 Secondary Basins

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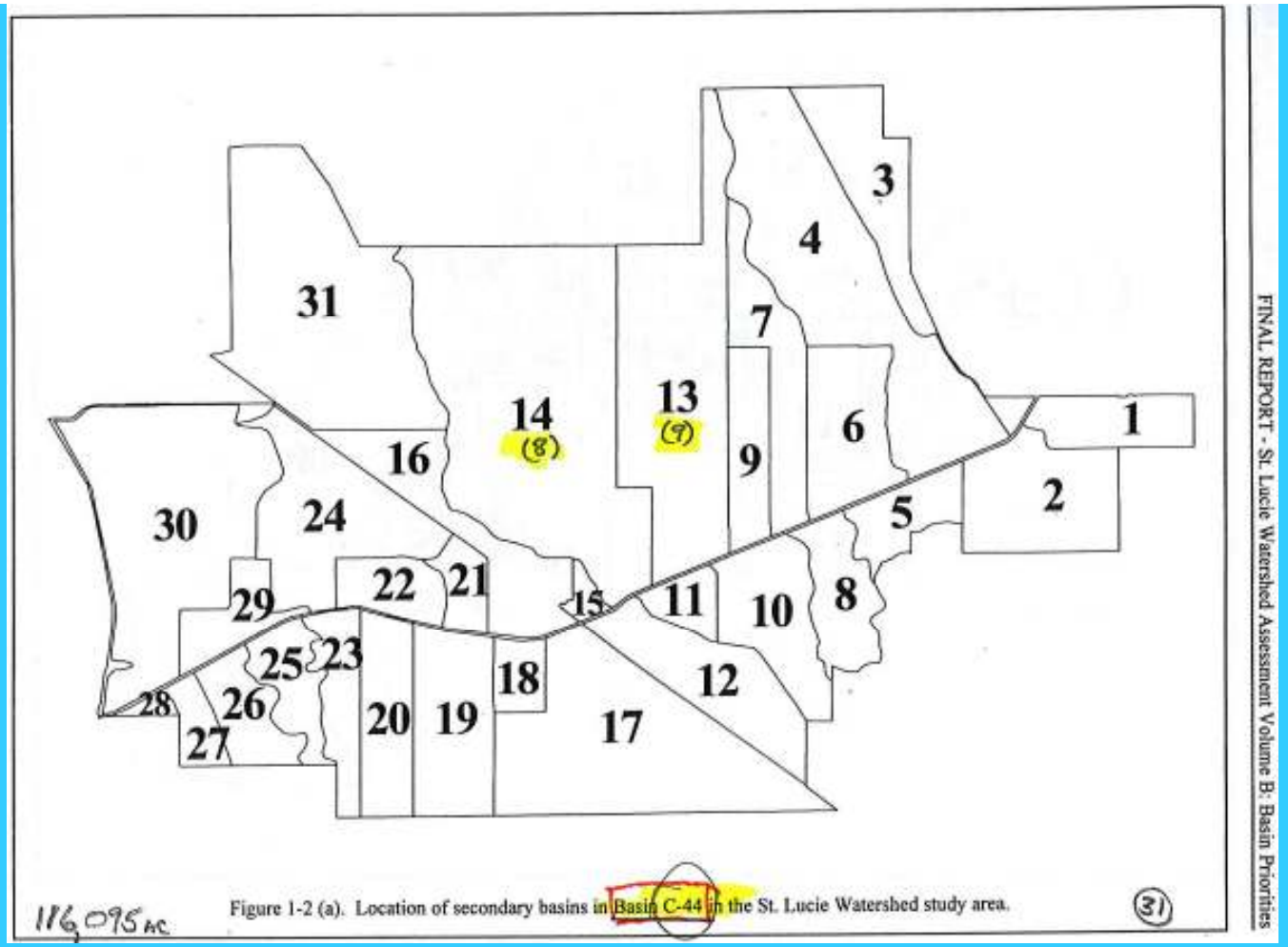
St. Lucie River Estuary Watershed



Florida Oceanographic Society

C-44 Basin - 31 Secondary Drainage Basins

25 Pump Stations for Agriculture Irrigation

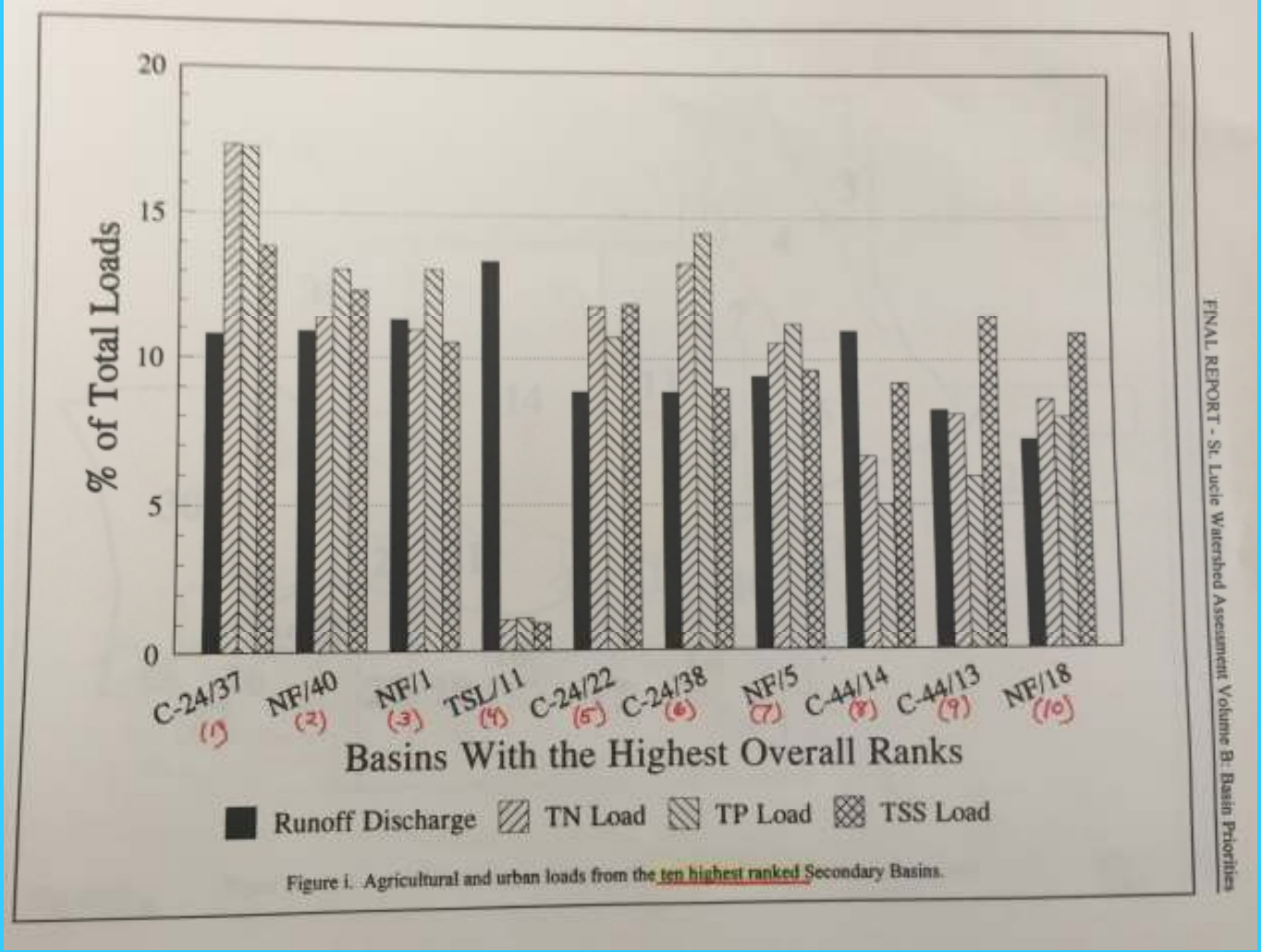
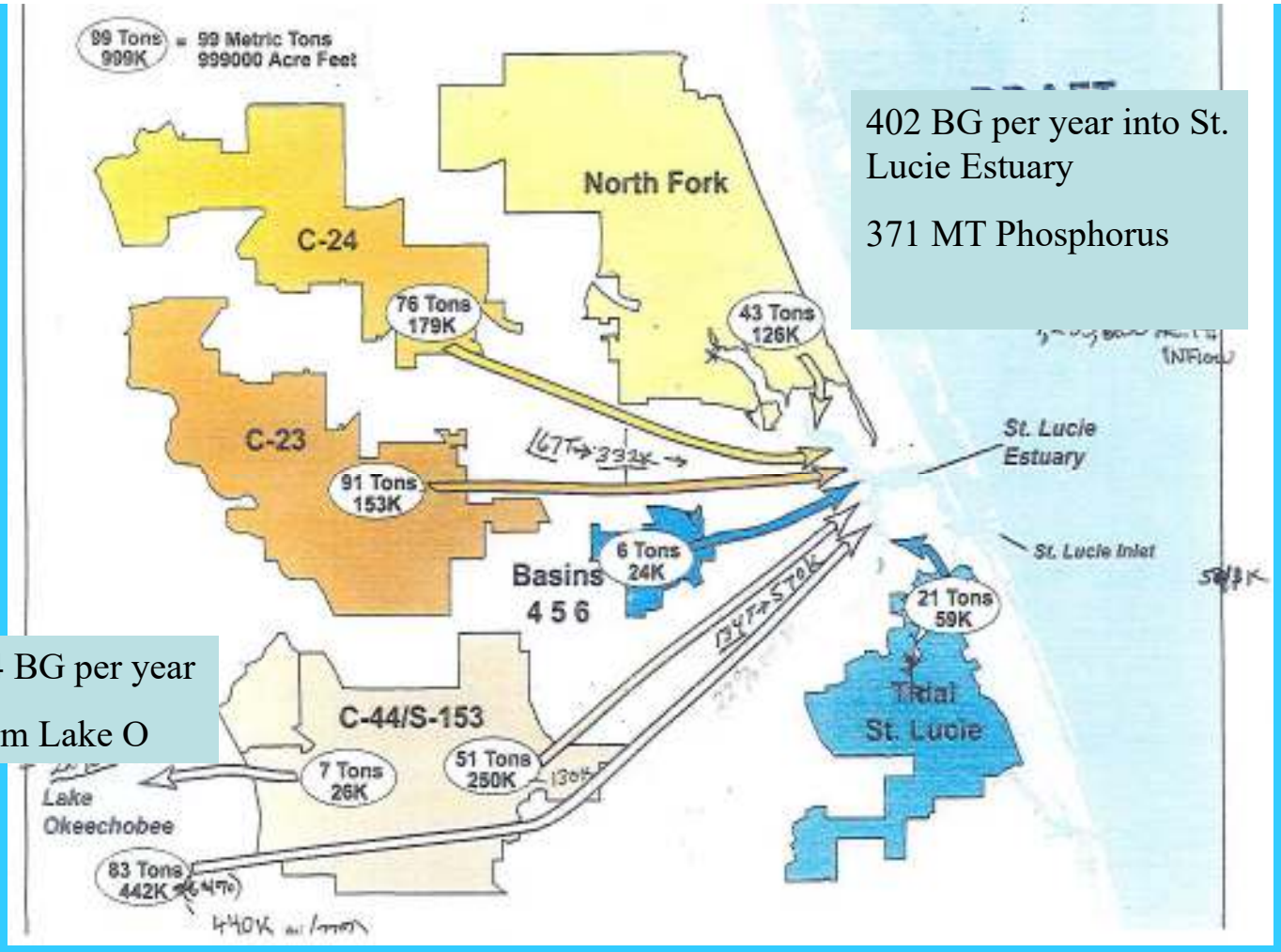


Figure i. Agricultural and urban loads from the ten highest ranked Secondary Basins.

Florida Oceanographic Society

Top 10 Secondary Basins for TN, TP and TSS Loads – SLE- 1999



402 BG per year into St. Lucie Estuary

371 MT Phosphorus

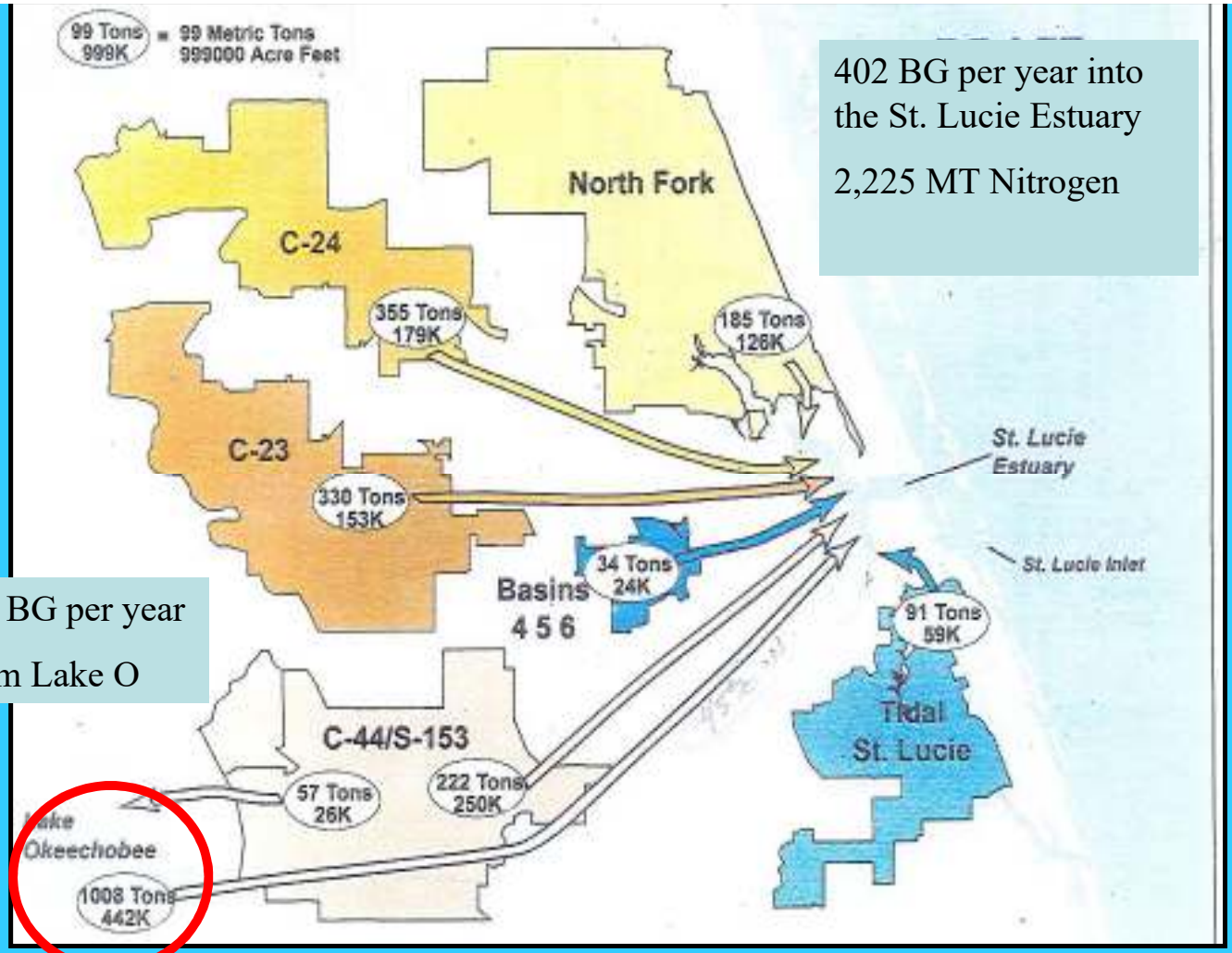
144 BG per year

From Lake O

Annual **Phosphorus** Loads by Basin to the St. Lucie Estuary

Period of Record 1995-2005 SFWMD

Florida Oceanographic Society



402 BG per year into the St. Lucie Estuary

2,225 MT Nitrogen

144 BG per year

From Lake O

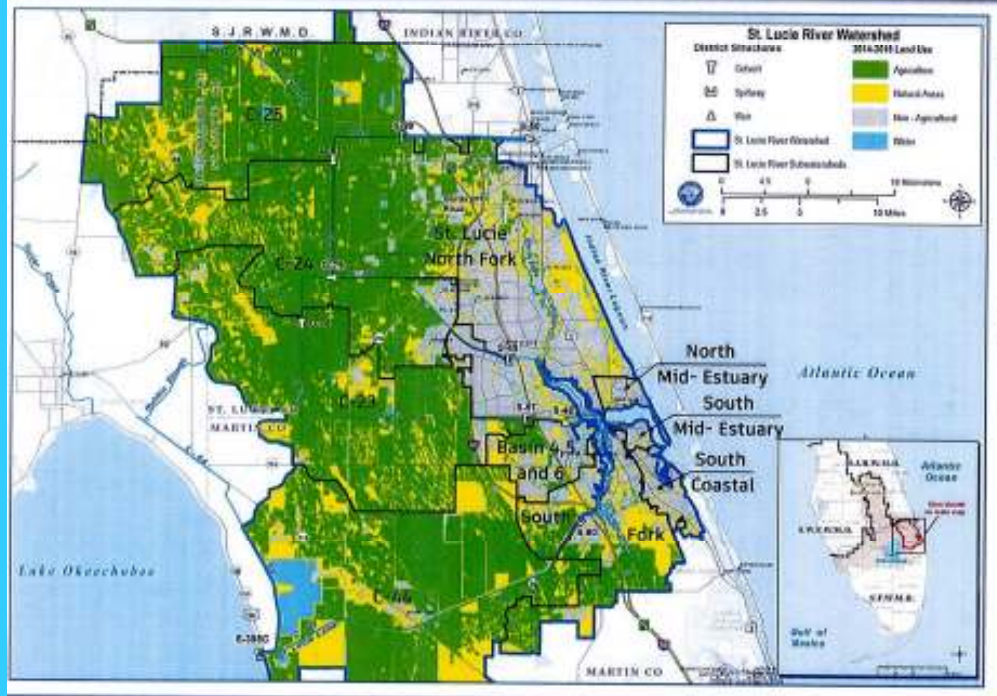
Florida Oceanographic Society

Annual **Nitrogen** Loads by Basin to the St. Lucie Estuary

Period of Record 1995-2005 SFWMD

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

St. Lucie Watershed Land Use and Drainage Features



Land Use 2014-2016

Basin	Agriculture	Non-Agriculture	Natural Areas
C-44	68%	6%	26%
C-23	76%	5%	19%
C-24	75%	9%	16%
Tidal Basin[a]	30%	48%	22%

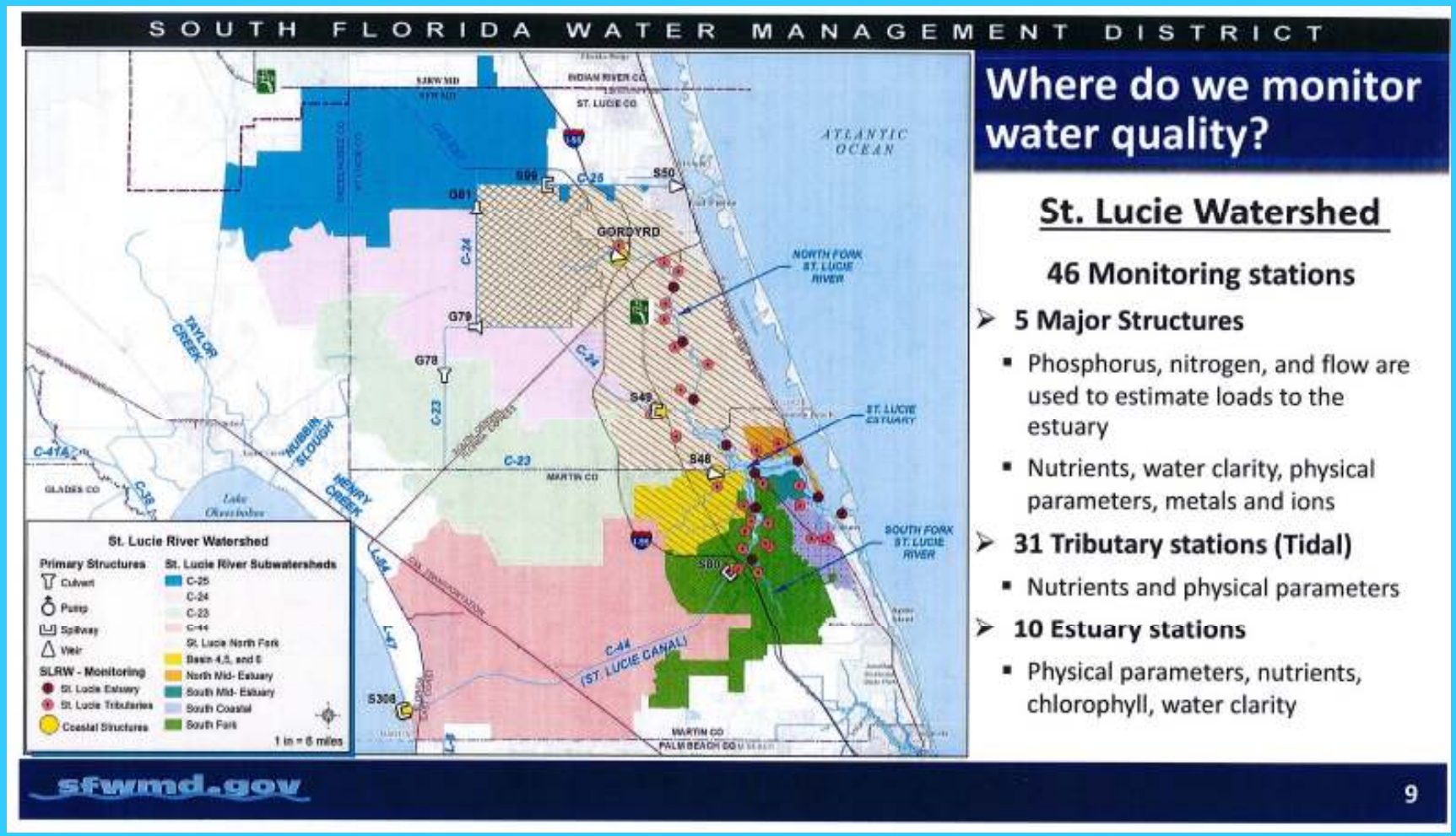
[a] *Includes Ten Mile Creek*

- Lake Okeechobee and five St. Lucie Basins (C-44, C-23, C-24, Ten Mile Creek, and Tidal)
- TP and TN TMDL adopted in 2008 by FDEP for St. Lucie Estuary (Roosevelt Bridge)
- Water quality monitoring at major structures, tidal tributaries and estuary stations

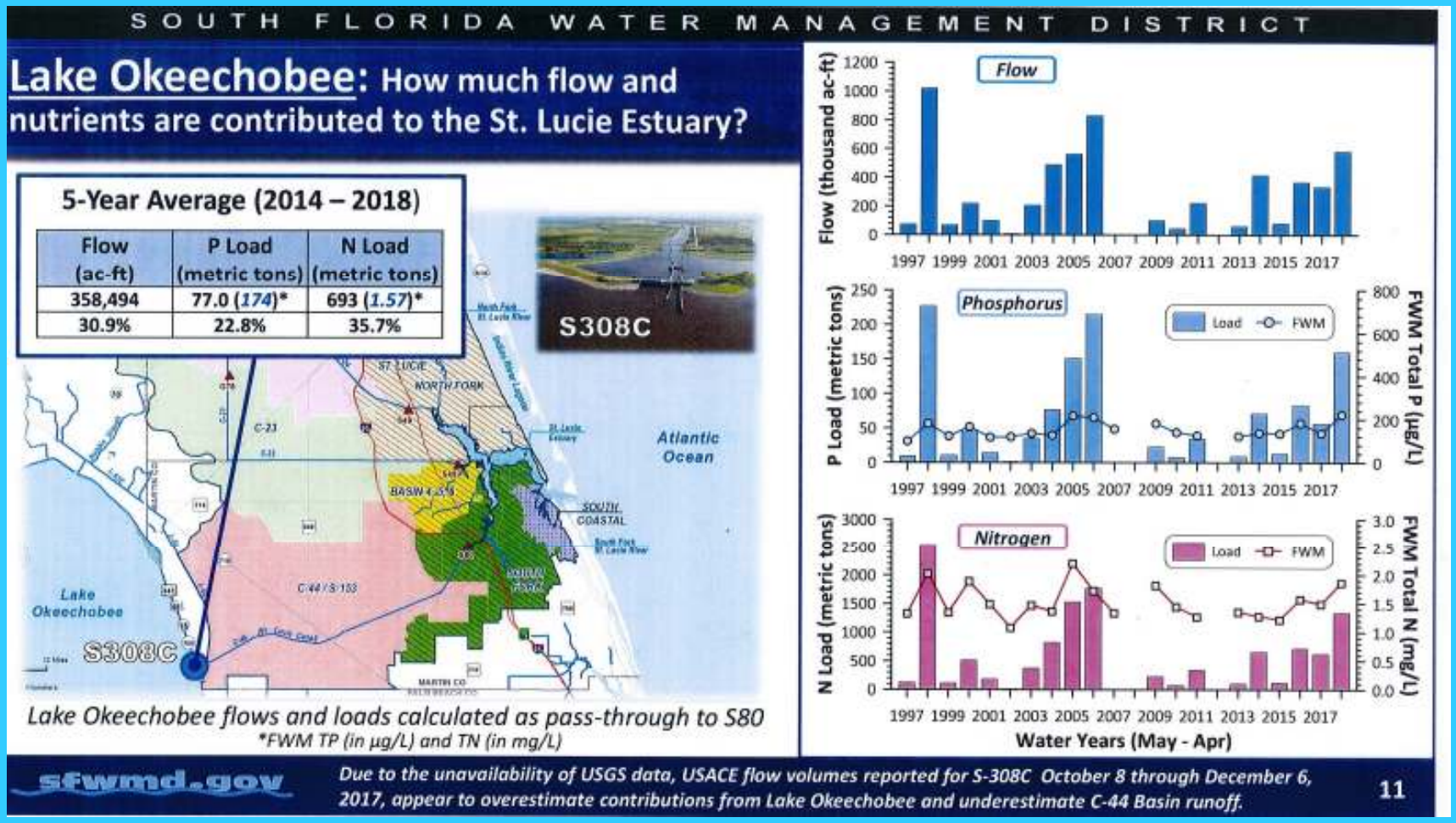
sfwmd.gov

8

St. Lucie Watershed-Water Quality- Stuart Van Horn-SFWMD-Workshop July 10, 2019



St. Lucie Watershed-Water Quality- Stuart Van Horn-SFWMD-Workshop July 10, 2019



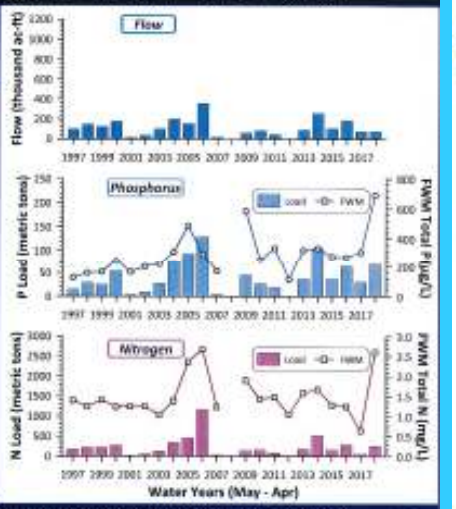
St. Lucie Watershed-Water Quality- Stuart Van Horn-SFWMD-Workshop July 10, 2019

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

C-44 Basin: How much flow and nutrients are contributed to the St. Lucie Estuary?

5-Year Average (2014 – 2018)

Flow (ac-ft)	P Load (metric tons)	N Load (metric tons)
142,475	61.1 (347)*	262 (1.49)*
12.3%	18.0%	13.5%



*FWM TP (in µg/L) and TN (in mg/L)

Due to the unavailability of USGS data, USACE flow volumes reported for S-308 October 8 through December 6, 2017, appear to overestimate contributions from Lake Okeechobee and underestimate C-44 Basin runoff.

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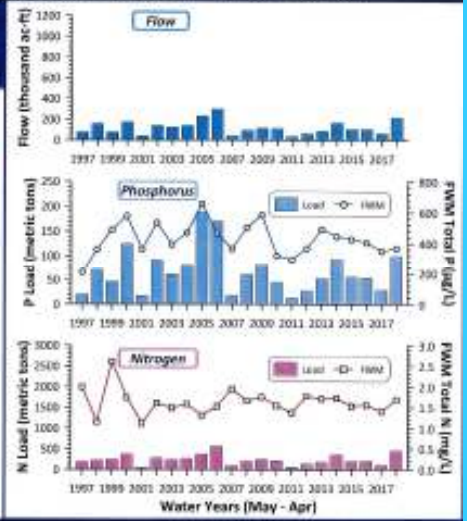
12

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

C-23 Basin: How much flow and nutrients are contributed to the St. Lucie Estuary?

5-Year Average (2014 – 2018)

Flow (ac-ft)	P Load (metric tons)	N Load (metric tons)
133,335	66.1 (402)*	267 (1.62)*
11.5%	19.5%	13.8%



*FWM TP (in µg/L) and TN (in mg/L)

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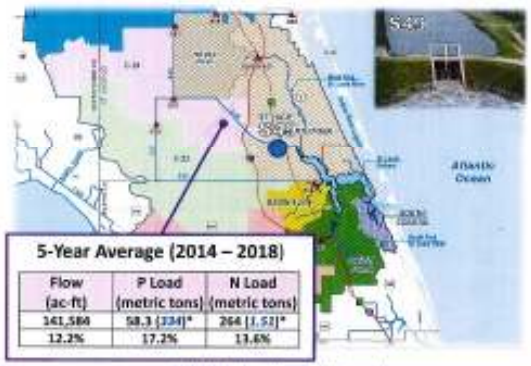
13

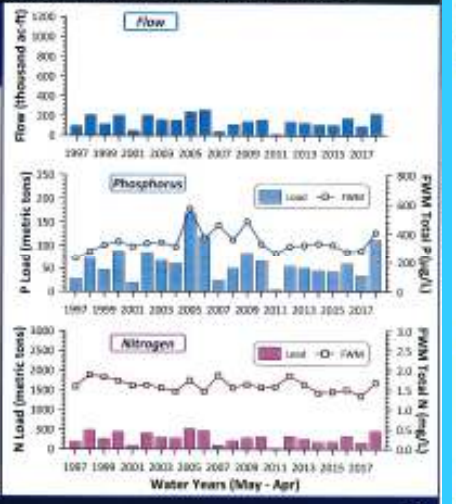
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

C-24 Basin: How much flow and nutrients are contributed to the St. Lucie Estuary?

5-Year Average (2014 – 2018)

Flow (ac-ft)	P Load (metric tons)	N Load (metric tons)
141,584	58.3 (334)*	264 (1.51)*
12.2%	17.2%	13.6%





*FWM TP (in µg/L) and TN (in mg/L)

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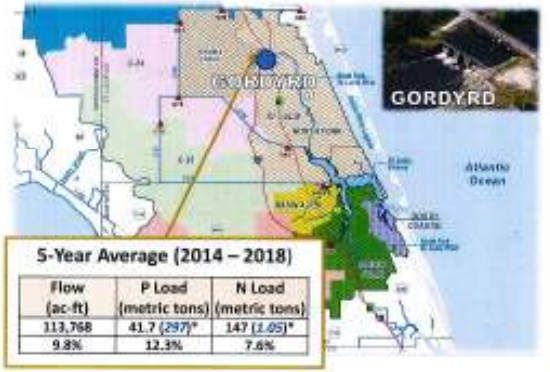
14

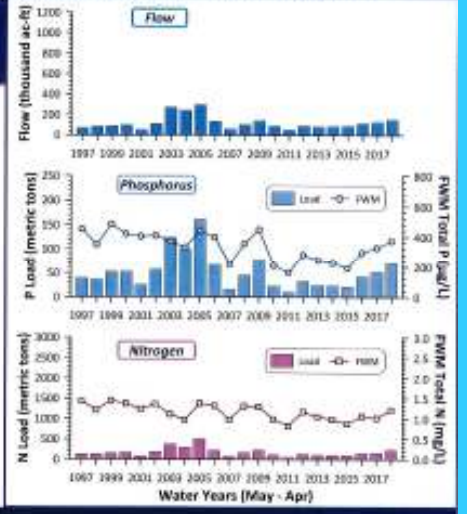
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Ten Mile Creek: How much flow and nutrients are contributed to the St. Lucie Estuary?

5-Year Average (2014 – 2018)

Flow (ac-ft)	P Load (metric tons)	N Load (metric tons)
113,768	41.7 (297)*	147 (1.05)*
9.8%	12.3%	7.6%





*FWM TP (in µg/L) and TN (in mg/L)

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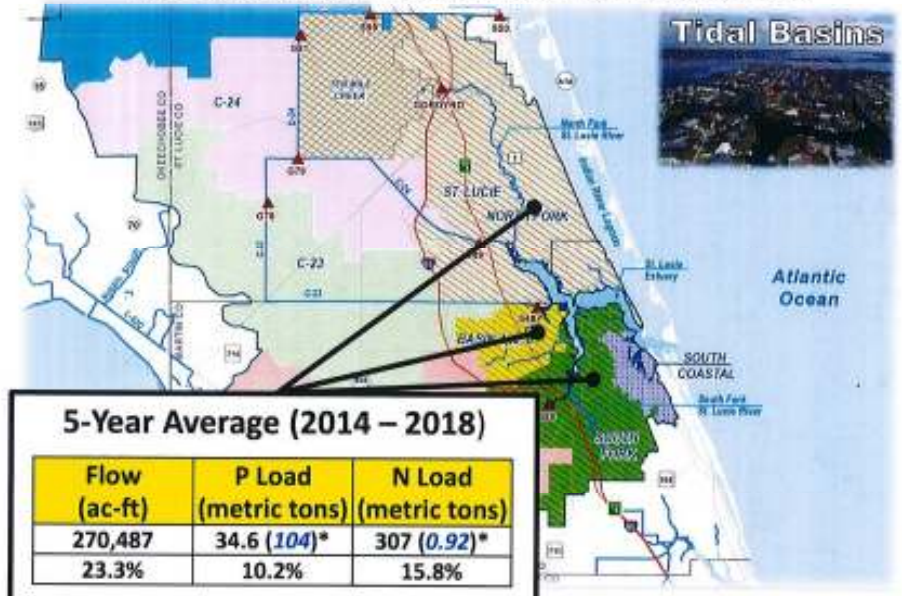
15

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Tidal Basins: How much flow and nutrients are contributed to the St. Lucie Estuary?

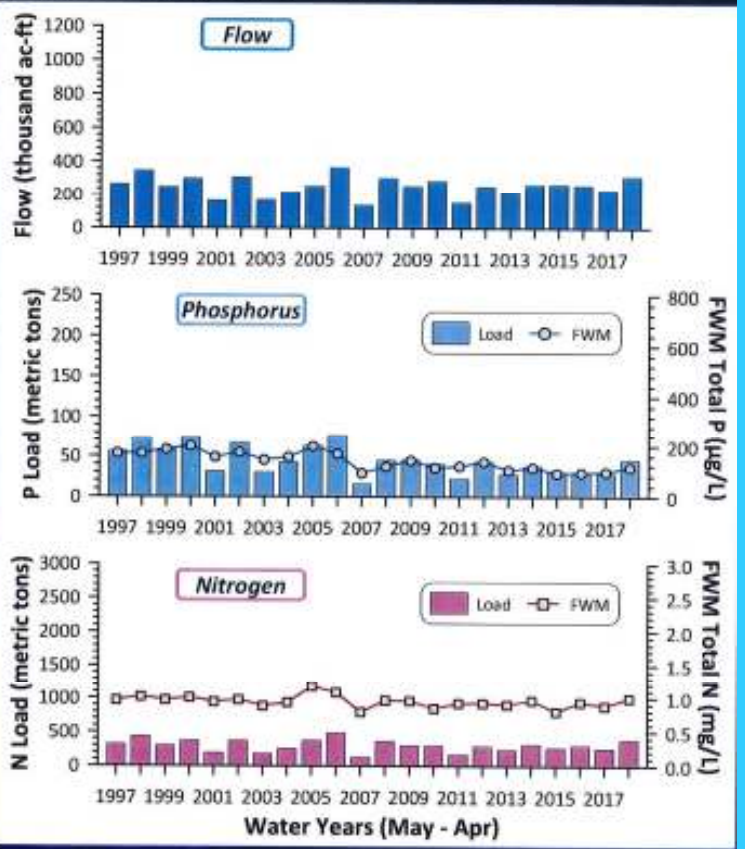
Tidal basin loads are calculated using modeled flows



5-Year Average (2014 – 2018)

Flow (ac-ft)	P Load (metric tons)	N Load (metric tons)
270,487	34.6 (*104*)*	307 (*0.92*)*
23.3%	10.2%	15.8%

*FWM TP (in µg/L) and TN (in mg/L)



sfwmd.gov

16

St. Lucie Watershed-Water Quality- Stuart Van Horn-SFWMD-Workshop July 10, 2019

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

St. Lucie Water Quality Summary

5-year average (WY2014 – WY2018) of flow, nutrient loads and concentrations

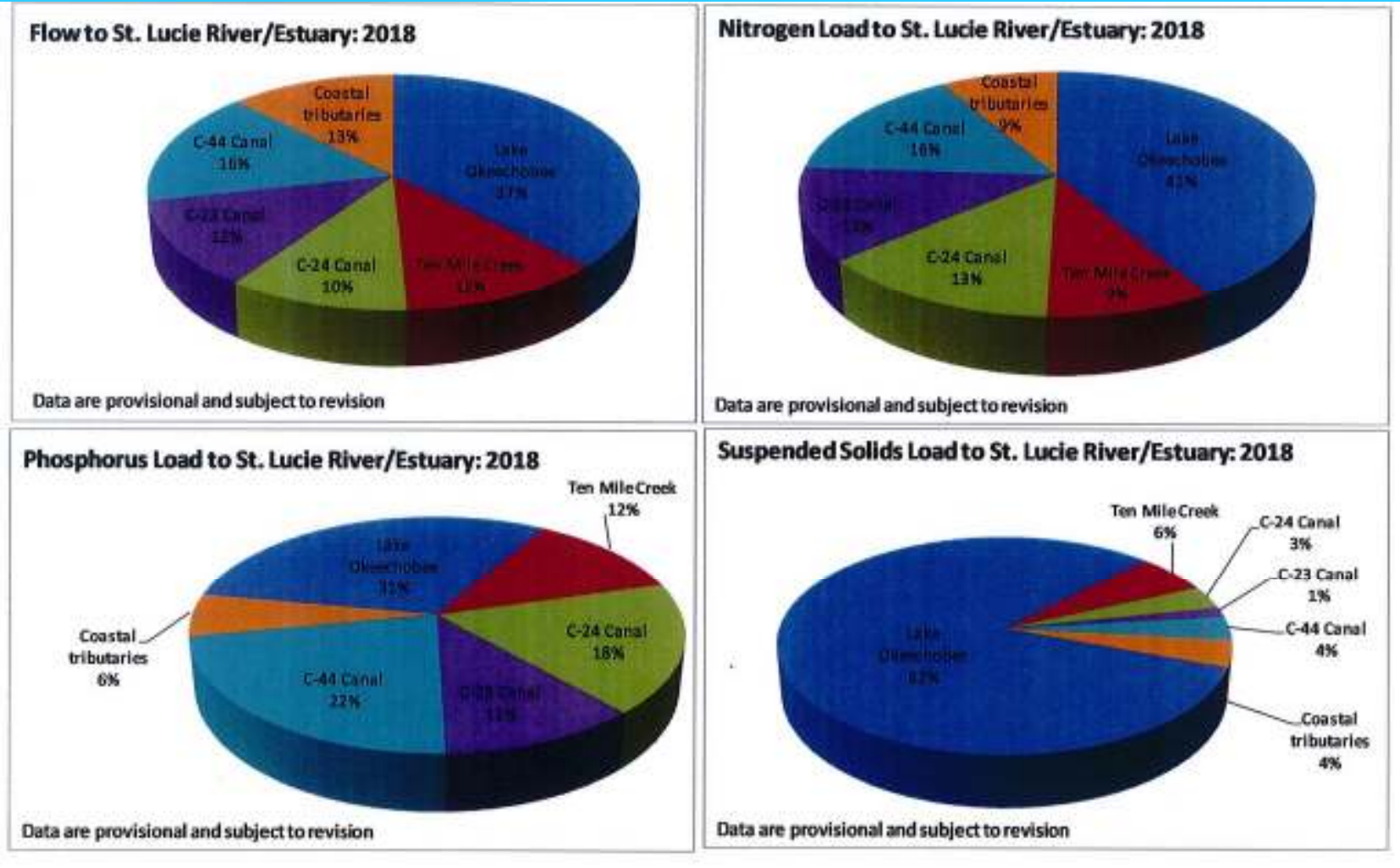
	Flow (ac-ft)		P Load (metric tons)		P FWM (µg/L)	N Load (metric tons)		N FWM (mg/L)
Lake Okeechobee [a]	358,494	(30.9%)	77	(22.7%)	174	693	(35.7%)	1.57
Tidal Basins	270,487	(23.3%)	35	(10.2%)	104	307	(15.8%)	0.92
St. Lucie Basins	531,162	(45.8%)	227	(67.1%)	347	940	(48.5%)	1.44
St. Lucie Basins Sub-total								
C-44 Basin	*142,475*	*(26.8%)*	*61*	*(26.9%)*	*347*	*262*	*(27.8%)*	*1.49*
C-23 Basin	*133,335*	*(25.1%)*	*66*	*(29.1%)*	*402*	*267*	*(28.4%)*	*1.62*
C-24 Basin	*141,584*	*(26.7%)*	*58*	*(25.7%)*	*334*	*264*	*(28.1%)*	*1.51*
Ten Mile Creek	*113,768*	*(21.4%)*	*42*	*(18.4%)*	*297*	*147*	*(15.7%)*	*1.05*
St. Lucie Watershed [b]	**1,160,142**		**339**		**237**	**1,940**		**1.36**

[a] Lake Okeechobee Pass Through to the Estuary

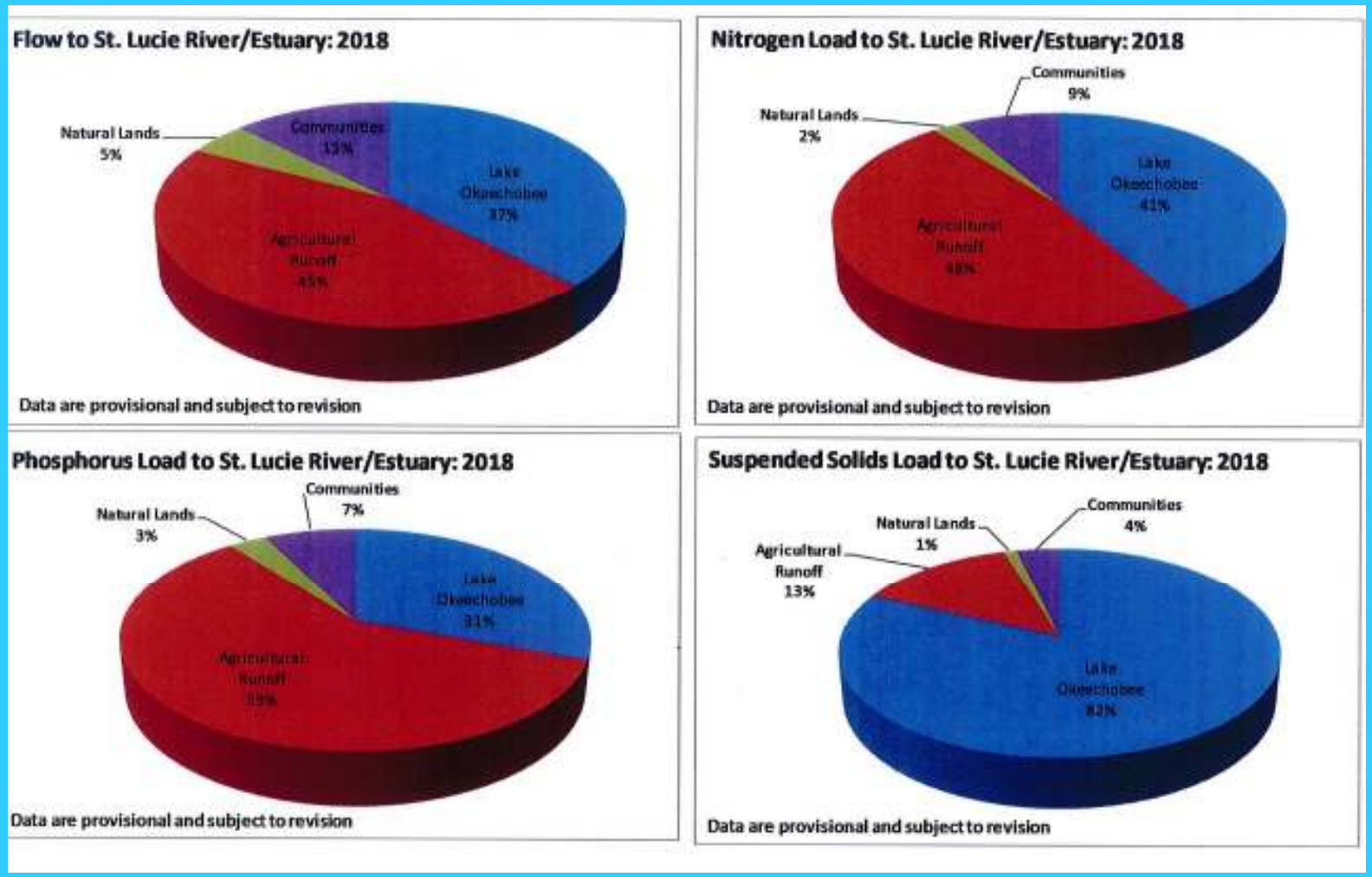
[b] Aggregate of Lake Okeechobee, St. Lucie Basins and Tidal Basin

- Highest flows and loads to St. Lucie Estuary are from St. Lucie Basins (C-23, C24, C-44 and Ten Mile Creek)
- C-44, C-23, and C-24 have comparable flows, nutrient loads and concentrations
- Highest nutrient concentrations are observed from C-23

St. Lucie Watershed-Water Quality- Stuart Van Horn-SFWMD-Workshop July 10, 2019



St. Lucie River Estuary Flows and Loads 2018 Summary Draft- Gary Goforth-7-10-19



St. Lucie River Estuary Flows and Loads 2018 Summary Draft- Gary Goforth-7-10-19

Preliminary estimates of flows and loads to the St. Lucie Estuary

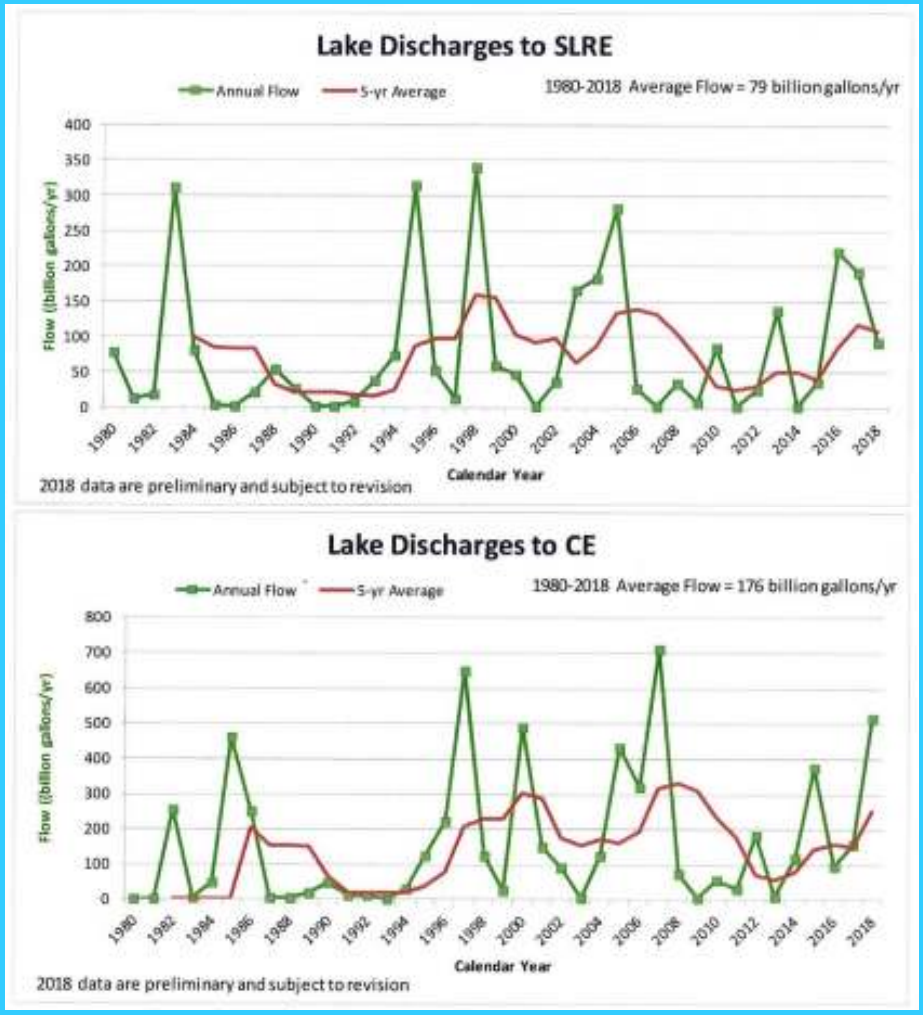
2018 Source	Flow, Billion Gallons	TN loads, pounds	TP loads, pounds	TSS loads, pounds	TN conc ppb	TP conc ppb	TSS conc ppb
Lake Okeechobee	92.0	1,076,650	153,974	23,150,788	1,403	201	30,162
Ten Mile Creek	29.2	235,058	61,462	1,668,379	965	252	6,851
C-24 Canal	25.9	345,719	90,261	982,033	1,600	418	4,545
C-23 Canal	29.2	316,481	56,571	409,869	1,297	232	1,680
C-44 Canal	39.1	403,474	113,309	1,009,922	1,238	348	3,098
Coastal tributaries	31.1	221,006	29,589	1,103,935	853	114	4,258
Total	***246.4***	***2,598,388***	***505,166***	***28,324,925***	***1,264***	***246***	***13,774***
Lake Okeechobee	92.0	1,076,650	153,974	23,150,788	1,403	201	30,162
Agricultural Runoff	111.5	1,240,896	298,078	3,820,341	1,333	320	4,105
Natural Lands	11.8	60,071	15,838	308,960	612	161	3,147
Communities	31.1	220,771	37,276	1,044,836	849	143	4,020
Total	***246.4***	***2,598,388***	***505,166***	***28,324,925***	***1,264***	***246***	***13,774***

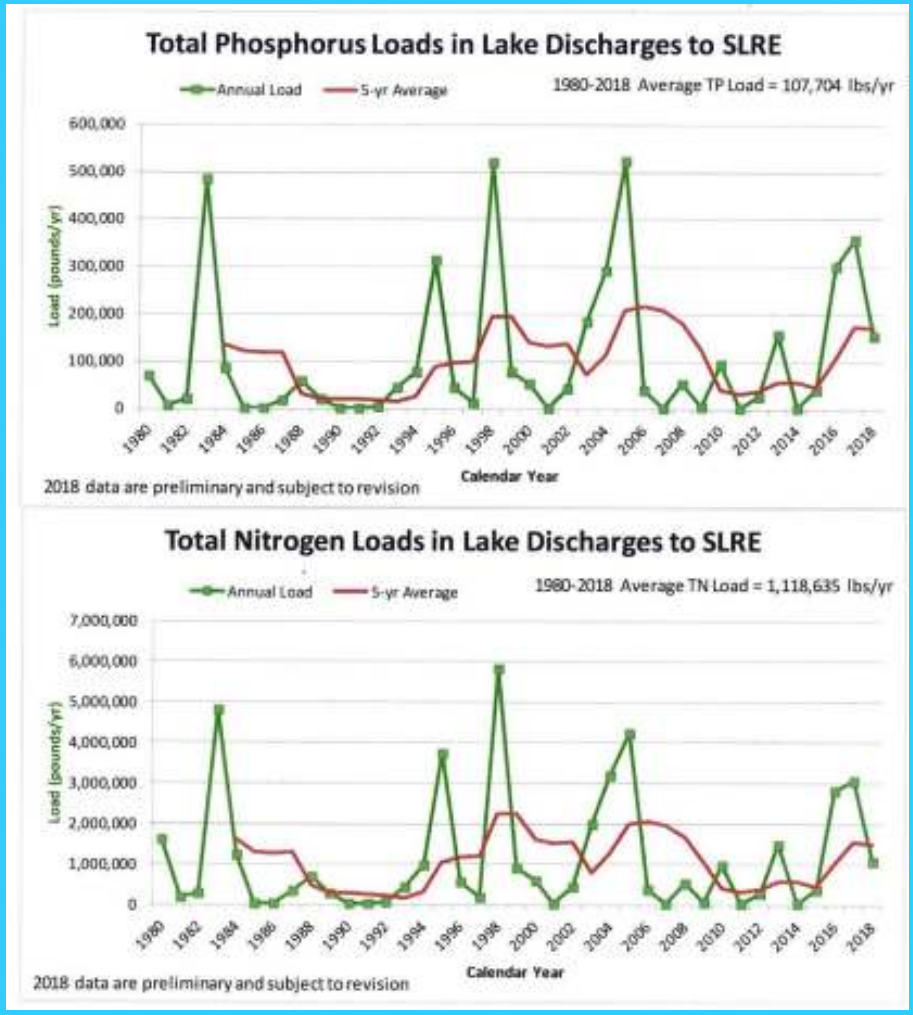
Preliminary estimates of flows and loads to the Caloosahatchee Estuary

2018 Source	Flow Billion Gallons	Total Nitrogen Load pounds	Total Phosphorus Load pounds	Total Suspended Solids Load pounds	Total Nitrogen Conc ppb	Total Phosphorus Conc ppb	Total Suspended Solids Conc ppb
Lake Okeechobee	234.9	2,394,035	293,800	21,787,895	1,221	150	11,117
C-43 Basin	281.1	4,097,025	430,563	0	1,746	184	0
Total through S-79	***516.0***	***6,491,060***	***724,363***	***21,787,895***	***1,507***	***168***	***2,721***

Note: Zero load values indicate sedimentation within canals

St. Lucie River Estuary Flows and Loads 2018 Summary Draft- Gary Goforth-7-10-19





St. Lucie River Estuary Flows and Loads 2018 Summary Draft- Gary Goforth-7-10-19

DRAFT

BASIN MANAGEMENT ACTION PLAN

for the Implementation of Total Maximum Daily Loads for Nutrients and Dissolved Oxygen Adopted by the Florida Department of Environmental Protection

in the

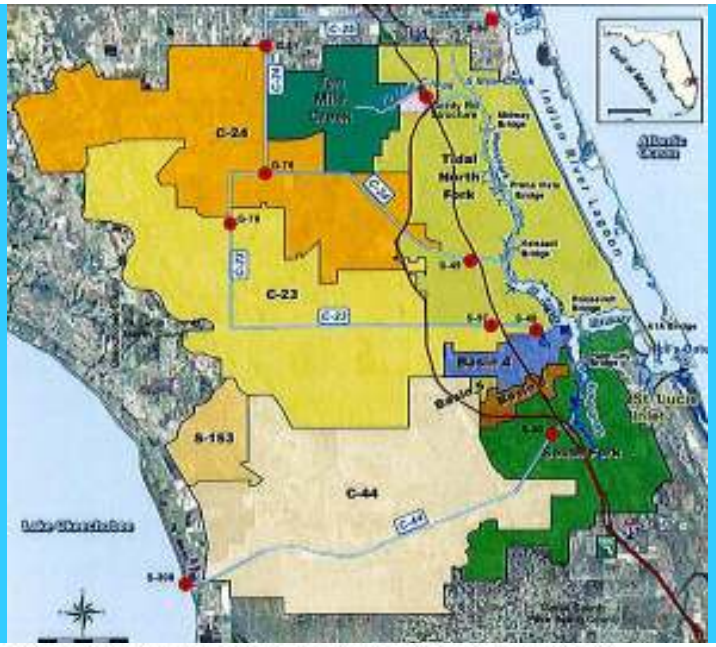
St. Lucie River and Estuary Basin

developed by the
St. Lucie River and Estuary Basin Technical Stakeholders

in cooperation with the
Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration
Bureau of Watershed Restoration
Tallahassee, Florida 32399

April 2013

Florida Oceanographic Society



Draft St. Lucie River and Estuary Basin Management Action Plan – April 2013

TABLE 8: ACRES BY ENTITY

ENTITY	BASINS 4, 5, AND 6 (ACRES)	C-23 (ACRES)	C-24 (ACRES)	C-44 S-153 (ACRES)	NORTH FORK (ACRES)	SOUTH FORK (ACRES)	TOTAL (ACRES)
Agriculture	2,445	84,744	63,488	65,937	3,957	18,176	238,757
Copper Creek CDD	-	-	2	-	-	-	2
FDOT District 4	171	306	137	270	894	606	2,384
Fort Pierce MS4	-	-	-	-	3,706	-	3,706
FPL Pond	-	-	-	6,501	-	-	6,501
Hobe St. Lucie Conservancy District	-	-	-	2,949	-	1,945	4,894
Martin County MS4	4,989	1,738	-	2,231	4,378	7,763	21,099
Natural Lands	7,830	23,706	15,701	37,153	33,129	18,987	136,516
North St. Lucie River WCD	-	-	4,028	-	32,491	-	36,519
Okeechobee County MS4	-	574	30	-	-	-	604
Pal Mar WCD	-	-	-	1,161	-	4	1,165
Port St. Lucie MS4	-	326	1,258	-	34,118	-	35,702
Sewall's Point MS4	-	-	-	-	457	-	457
St. Lucie County MS4	-	-	-	-	3,996	-	3,996
St. Lucie County Non-MS4	-	783	2,172	-	1,146	-	4,081
Stuart MS4	-	-	-	-	353	2,386	2,739
Tradition CDD	-	-	923	-	6	-	929
Troup-Indiantown WCD	-	-	-	13,649	-	-	13,649
Turnpike	147	10	-	-	528	226	911
Verano CDD	-	-	36	-	-	-	36
Total	**15,582**	**112,167**	**87,775**	**129,861**	**119,138**	**50,123**	**514,646**

Final St. Lucie River and Estuary Basin Management Action Plan – May 2013

TABLE 6: TN STARTING LOADS BY ENTITY

Nitrogen

y cell/no data

ENTITY	BASINS 4, 5, AND 6 (LBS/YR)	C-23 (LBS/YR)	C-24 (LBS/YR)	C-44 S-153 (LBS/YR)	NORTH FORK (LBS/YR)	SOUTH FORK (LBS/YR)	TOTAL (LBS/YR)	TOTAL (MT/YR)
Agriculture	17,051	470,081	574,852	350,703	24,355	126,080	1,563,122	709.02
Copper Creek CDD	-	-	14	-	-	-	14	0.01
FDOT District 4	952	1,510	950	1,176	4,277	3,649	12,514	5.68
Fort Pierce MS4	-	-	-	-	17,041	-	17,041	7.73
FPL Pond	-	-	-	41,022	-	-	41,022	18.61
Hobe St. Lucie Conservancy District	-	-	-	13,374	-	10,819	24,193	10.97
Martin County MS4	26,394	5,947	-	8,243	19,806	40,423	100,813	45.73
Natural Lands	15,128	14,991	24,792	49,942	43,326	26,980	175,159	79.45
North St. Lucie River WCD	-	-	37,251	-	160,152	-	197,403	89.54
Okeechobee County MS4	-	3,184	121	-	-	-	3,305	1.50
Pal Mar WCD	-	-	-	6,758	-	22	6,780	3.08
Port St. Lucie MS4	-	1,515	8,275	-	146,691	-	156,481	70.98
Sewall's Point MS4	-	-	-	-	1,771	-	1,771	0.80
St. Lucie County MS4	-	-	-	-	18,114	-	18,114	8.22
St. Lucie County Non-MS4	-	1,594	16,757	-	5,409	-	23,760	10.78
Stuart MS4	-	-	-	-	1,614	12,384	13,998	6.35
Tradition CDD	-	1	7,057	-	31		7,089	3.22
Troup-Indiantown WCD	-	-	-	62,219	-	-	62,219	28.22
Turnpike	789	51	-	-	2,651	1,286	4,777	2.17
Verano CDD	-	-	257	-	-	-	257	0.12
TOTAL	**60,314**	**498,874**	**670,326**	**533,437**	**445,238**	**221,643**	**2,429,832**	**1,102.18**

Total Required Reduction 1,053,414 (Lbs/yr) 477 (MT/yr)

Target Load 1,136,633 (Lbs/yr) 515 (MT/yr)

TMDL – BMAP Implementation June 2013 - Adopted & Enforceable (?)

2013 – 2018 "First Phase" -30% Reduction

2018 – 2028 "Second & Third Phase" Remaining 70% Reduction

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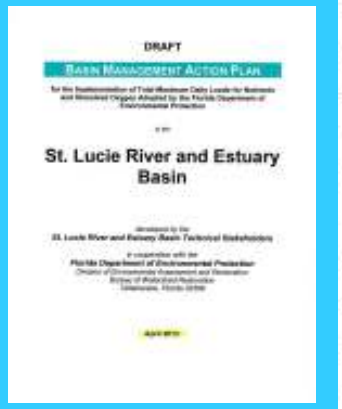

Final St. Lucie River and Estuary Basin Management Action Plan – May 2013

TABLE 7: TP STARTING LOADS BY ENTITY — Phosphorus

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ENTITY	BASINS 4, 5, AND 6 (LBS/YR)	C-23 (LBS/YR)	C-24 (LBS/YR)	C-44 S-153 (LBS/YR)	NORTH FORK (LBS/YR)	SOUTH FORK (LBS/YR)	TOTAL (LBS/YR)	TOTAL (MT/YR)
Agriculture	3,920	150,255	136,471	66,809	5,988	26,869	390,312	177.04
Copper Creek CDD	-	-	3	-	-	-	3	0.00
FDOT District 4	200	464	226	175	818	659	2,542	1.15
Fort Pierce MS4	-	-	-	-	3,879	-	3,879	1.76
FPL Pond	-	-	-	8,361	-	-	8,361	3.79
Hobe St. Lucie Conservancy District	-	-	-	2,689	-	2,563	5,252	2.38
Martin County MS4	5,930	2,250	-	1,431	4,339	8,419	22,369	10.15
Natural Lands	3,383	19,795	11,341	3,525	9,639	5,054	52,737	23.92
North St. Lucie River WCD	-	-	9,063	-	36,821	-	45,884	20.81
Okeechobee County MS4	-	937	38	-	-	-	975	0.44
Pal Mar WCD	-	-	-	1,008	-	4	1,012	0.46
Port St. Lucie MS4	-	518	2,206	-	32,292	-	35,016	15.88
Sewall's Point MS4	-	-	-	-	384	-	384	0.17
St. Lucie County MS4	-	-	-	-	4,127	-	4,127	1.87
St. Lucie County Non-MS4	-	838	3,961	-	1,273	-	6,072	2.75
Stuart MS4	-	-	-	-	379	2,727	3,106	1.41
Tradition CDD	-	-	1,903	-	7	-	1,910	0.87
Troup-Indiantown WCD	-	-	-	12,623	-	-	12,623	5.73
Turnpike	170	16	-	-	506	233	925	0.42
Verano CDD	-	-	63	-	-	-	63	0.03
TOTAL	**13,603**	**175,073**	**165,275**	**96,621**	**100,452**	**46,528**	**597,552**	**271.03**

Total Required Reduction 404,166 (Lbs/yr) 183 (MT/yr)

Target Load 127,016 (Lbs/yr) 57 (MT/yr)

TMDL – BMAP Implementation June 2013 - Adopted & Enforceable (?)

2013 – 2018 "First Phase" -30% Reduction

2018 – 2028 "Second & Third Phase" Remaining 70% Reduction

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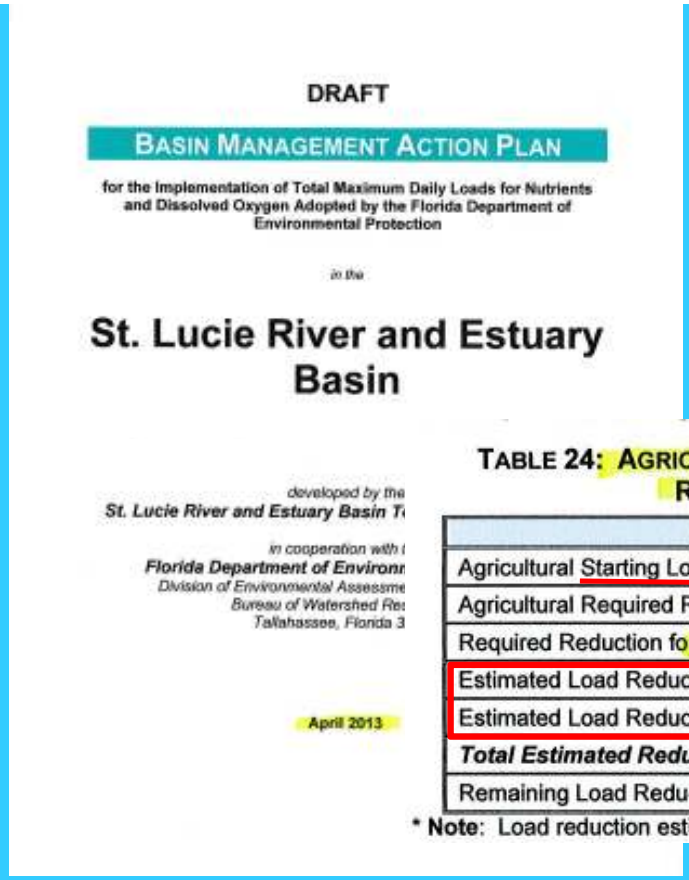

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in cooperation with
Florida Department of Environ
Division of Environmental Assessme
Bureau of Watershed Re
Tallahassee, Florida 3

April 2013

TABLE 24: AGRICULTURAL TN AND TP LOAD REDUCTION ALLOCATIONS AND ESTIMATED REDUCTIONS IN TN AND TP LOAD IN THE FIRST 5 YEARS

ESTIMATED LOADS	TN (LBS/YR)	TP (LBS/YR)
Agricultural Starting Load	1,563,122.0	390,312.0
Agricultural Required Reduction	812,924.0	307,059.0
Required Reduction for First Phase of BMAP	243,877.2	92,117.7
Estimated Load Reductions via BMPs, 90% Target Enrollment*	197,216.6	40,442.0
Estimated Load Reduction Credit for Land Use Changes*	171,776.4	54,191.1
Total Estimated Reductions	***368,993.0***	***94,663.1***
Remaining Load Reductions Needed for First Phase of BMAP	-125,115.8 (credit)	-2,515.4 (credit)

* **Note**: Load reduction estimates/credits do not include agricultural lands within WCDs.

TMDL – BMAP Implementation

June 2013 - Adopted & Enforceable (?)

2013 – 2018 "First Phase" -30% Reduction

2018 – 2028 "Second & Third Phase" Remaining 70% Reduction

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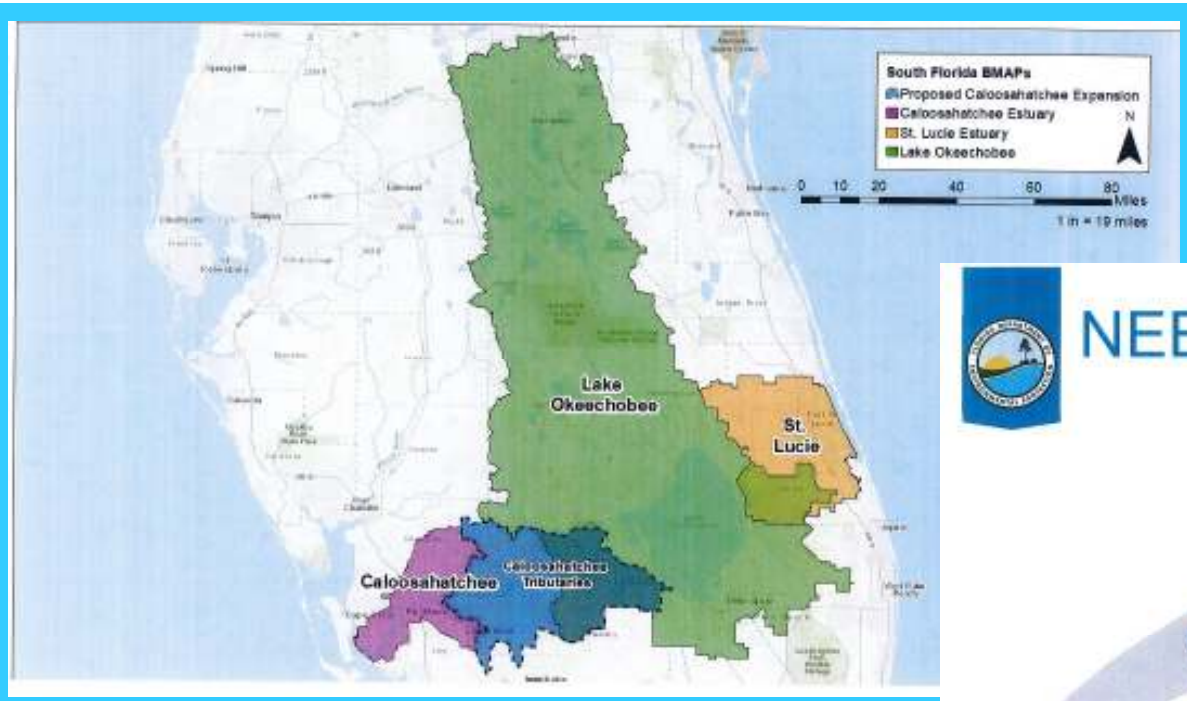


NEEPP BMAPs Timeline

January 2020
All 3 BMAPs updated

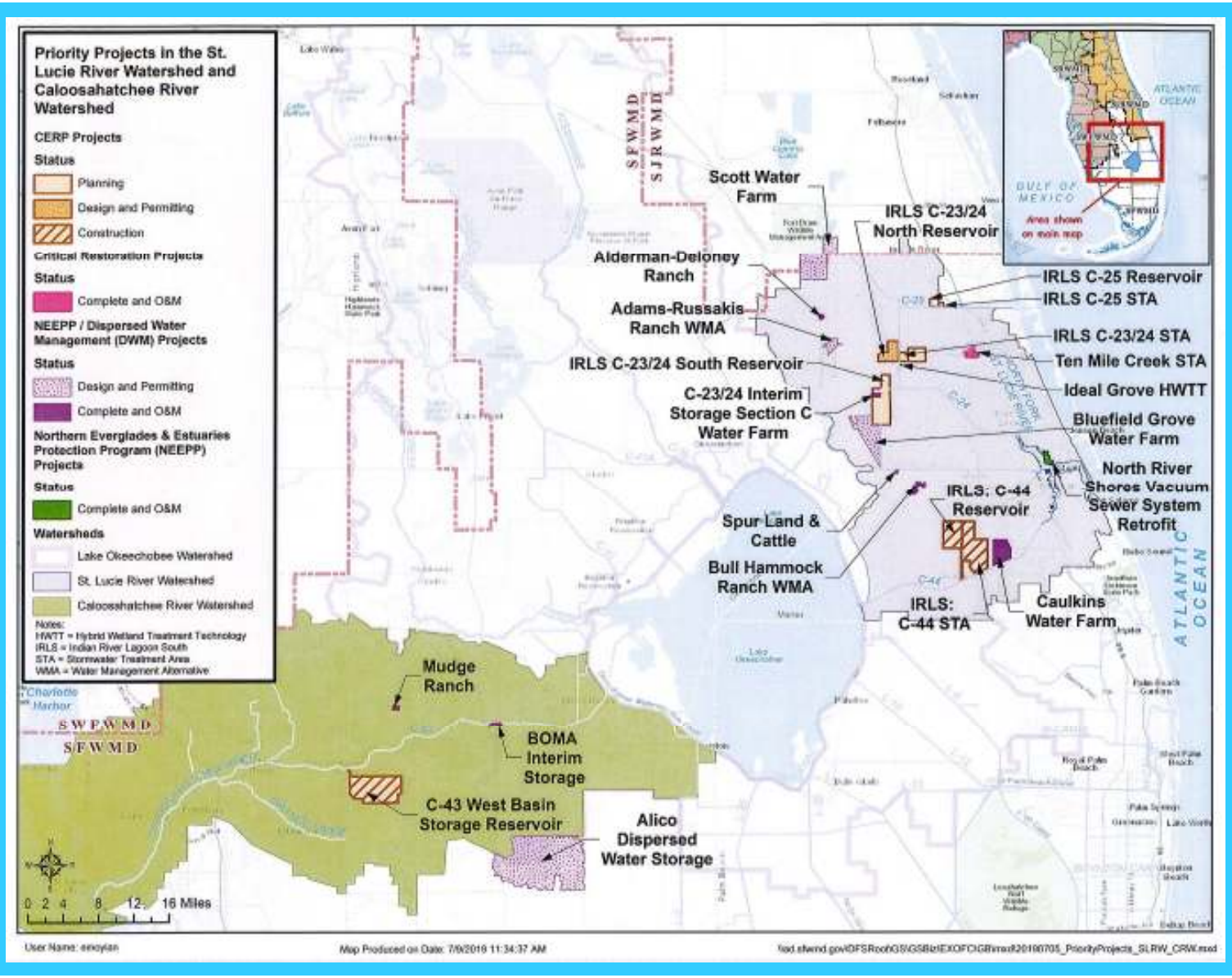
Caloosahatchee
5-Year Review
Nov. 2017

St. Lucie
5-Year Review
June 2018

Lake Okeechobee
5-Year Review
Dec. 2019

Tentative 2019 South FL BMAP Meeting Schedule			
2019	St Lucie	Caloosahatchee	Lake Okeechobee
July			BMAP Public Meeting/webinar
August	BMAP Public Meeting/webinar	BMAP Public Meeting/webinar	
September			
October	BMAP Public Meeting/webinar	BMAP Public Meeting/webinar	BMAP Public Meeting/webinar
November			
December	Draft BMAP document	Draft BMAP document	Draft BMAP document

Northern Everglades and Estuaries Protection Program (NEEPP)
Basin Management Action Plans (BMAP) timeline – Tom Frick-FDEP at SFWMD Workshop-7-10-19


Priority Projects in the St. Lucie River Watershed and Caloosahatchee River Watershed
CERP Projects
Status
Planning
Design and Permitting
Construction
Critical Restoration Projects
Status
Complete and O&M
NEEPP / Dispersed Water Management (DWM) Projects
Status
Design and Permitting
Complete and O&M
Northern Everglades & Estuaries Protection Program (NEEPP) Projects
Status
Complete and O&M
Watersheds
Lake Okeechobee Watershed
St. Lucie River Watershed
Caloosahatchee River Watershed
Notes:
HWTT = Hybrid Wetland Treatment Technology
IRLS = Indian River Lagoon South
STA = Stormwater Treatment Area
WMA = Water Management Alternative
SFWMD
SJRWMD
Scott Water Farm
IRLS C-23/24 North Reservoir
Alderman-Deloney Ranch
Adams-Russakis Ranch WMA
IRLS C-23/24 South Reservoir
C-23/24 Interim Storage Section C Water Farm
IRLS C-25 Reservoir
IRLS C-25 STA
IRLS C-23/24 STA
Ten Mile Creek STA
Ideal Grove HWTT
Bluefield Grove Water Farm
North River Shores Vacuum Sewer System Retrofit
IRLS: C-44 Reservoir
Spur Land & Cattle
Bull Hammock Ranch WMA
IRLS: C-44 STA
Caulkins Water Farm
ATLANTIC OCEAN
GULF OF MEXICO
Area shown on main map
Mudge Ranch
BOMA Interim Storage
C-43 West Basin Storage Reservoir
Alico Dispersed Water Storage
SWFWMD
SFWMD
0 2 4 8 12 16 Miles
User Name: emoylan
Map Produced on Date: 7/9/2019 11:34:37 AM

Florida Oceanographic Society

Part of Comprehensive Everglades Restoration Plan

Indian River Lagoon-South Plan

12,000 acres above ground Storage Reservoirs

9,000 acres STA manmade wetlands

90,000 acres Natural Area Storage

2,650 acres benthic habitat created- 922 acres submerge aquatic habitat restored

7.9 million cubic yards of muck removed

889 acres of restored oyster habitat

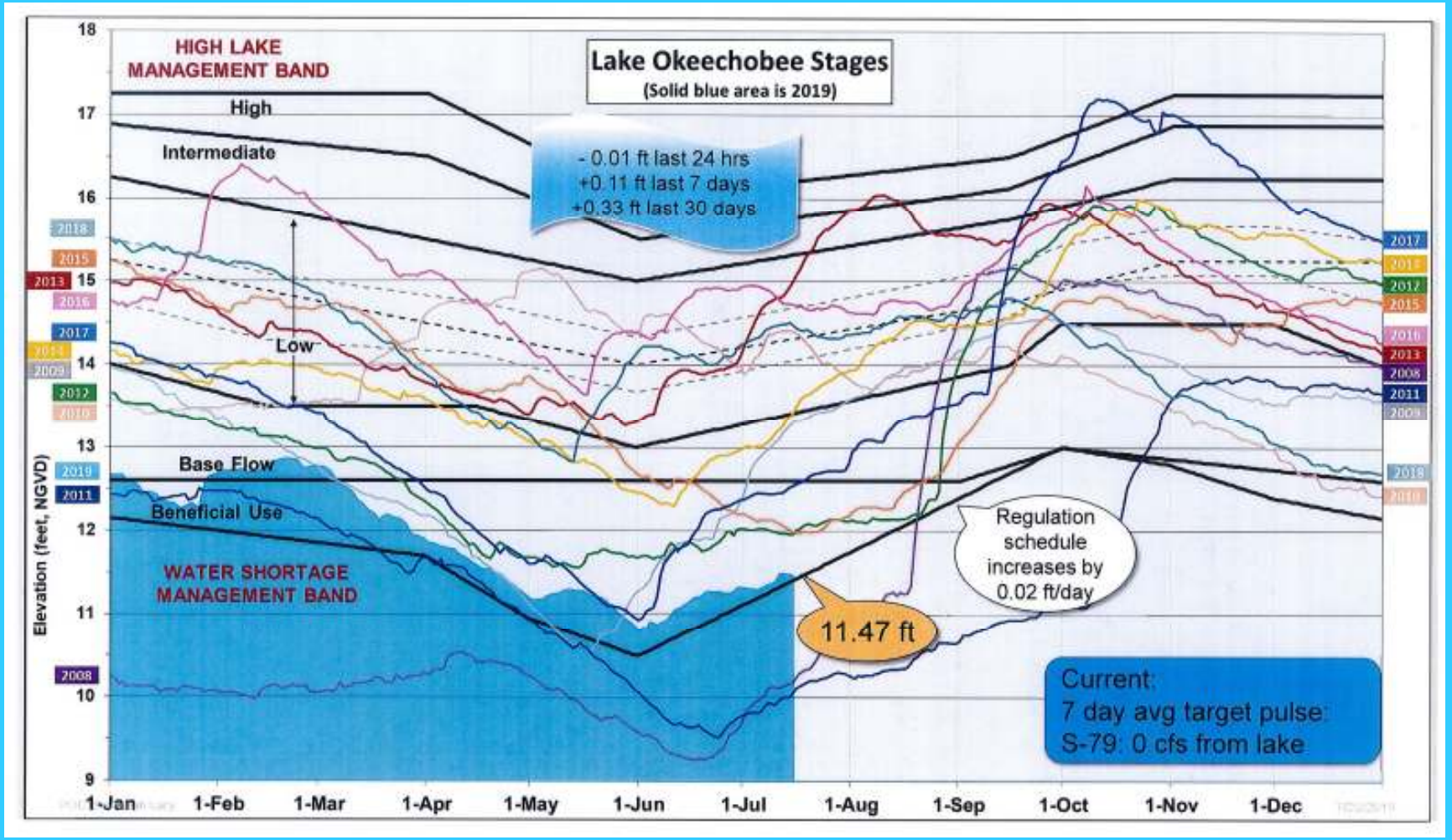
41% reduction in Phosphorus

26% reduction in Nitrogen

C-44 BASIN COMPONENTS
- C-44 – Reservoir
- C-44 – Stormwater Treatment Area
- Palmar Complex – Natural Storage and Water Quality Area

C-23/24 BASIN COMPONENTS
- C-23/24 – North and South Reservoirs
- C-23/24 – Stormwater Treatment Area
- Allapattah, Cypress Creek and Trail Ridge Complex – Natural Storage and Water Quality Area

C-25, NORTH FORK AND SOUTH FORK BASIN COMPONENTS
- C-25 – Reservoir
- C-25 – Stormwater Treatment Area
- North Fork Natural Floodplain Restoration Muck Remediation and Artificial Habitat



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Lake Okeechobee Regulation Schedule and Lake Levels - USACE- July 16, 2019


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