

Water Flow and Nutrient Loads to Lake Okeechobee and the St. Lucie and Caloosahatchee Estuaries in Water Years 2013-2017



*St Lucie Estuary
Stuart and Sewall's Point*

**Water Resources Advisory Commission
South Florida Water Management District**

November 2, 2017

Stuart Van Horn, P.E. – Bureau Chief, Water Quality

Flow and Nutrient Loads to Lake Okeechobee, St Lucie and Caloosahatchee Estuaries

Presentation Content

- **Hydrologic drivers for Water Year 2017
(May 2016 – April 2017)**
- **Lake Okeechobee and Estuary Inflows**
 - Water Year 2017 flows and nutrient loads
 - Updated 5-year average flows and nutrient loads



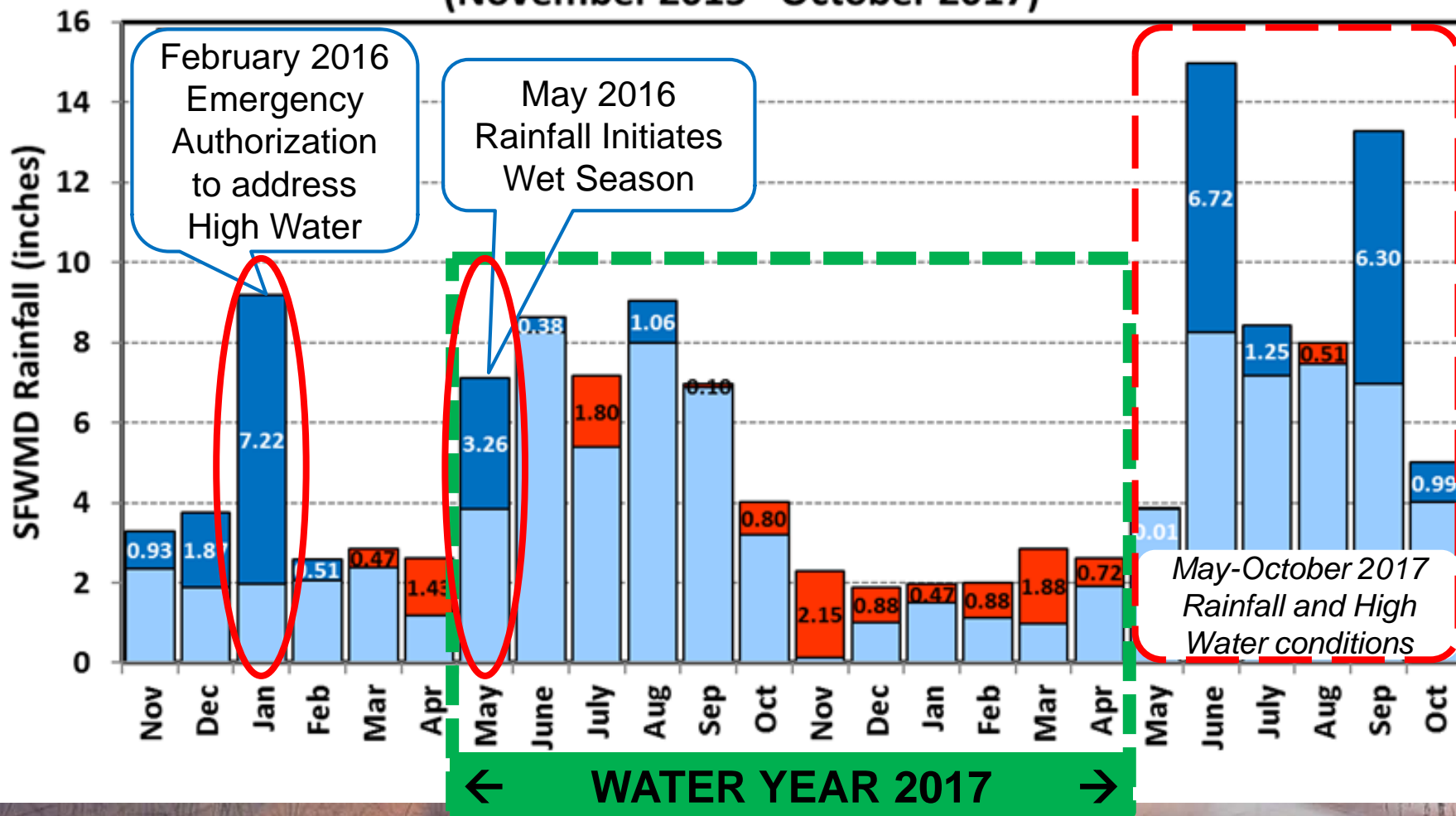
Kissimmee River

Flow and Nutrient Loads to Lake Okeechobee, St Lucie and Caloosahatchee Estuaries

Rainfall Driving Stages and Flows

SFWMD Rainfall Distribution Comparison

(November 2015 - October 2017)



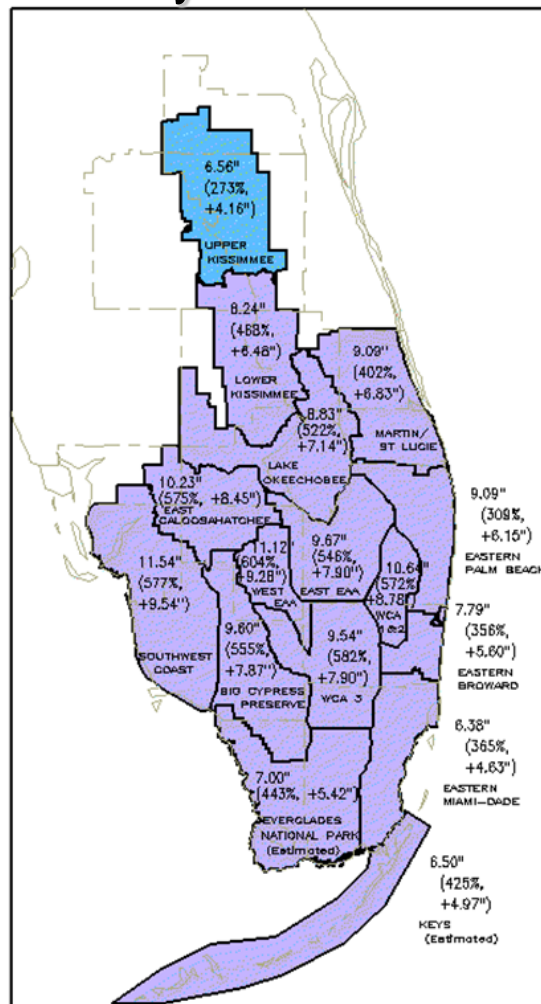
Flow and Nutrient Loads to Lake Okeechobee, St Lucie and Caloosahatchee Estuaries

High Water Emergency Order Operations

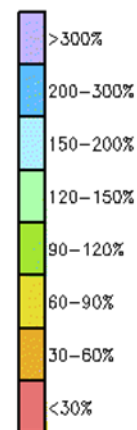
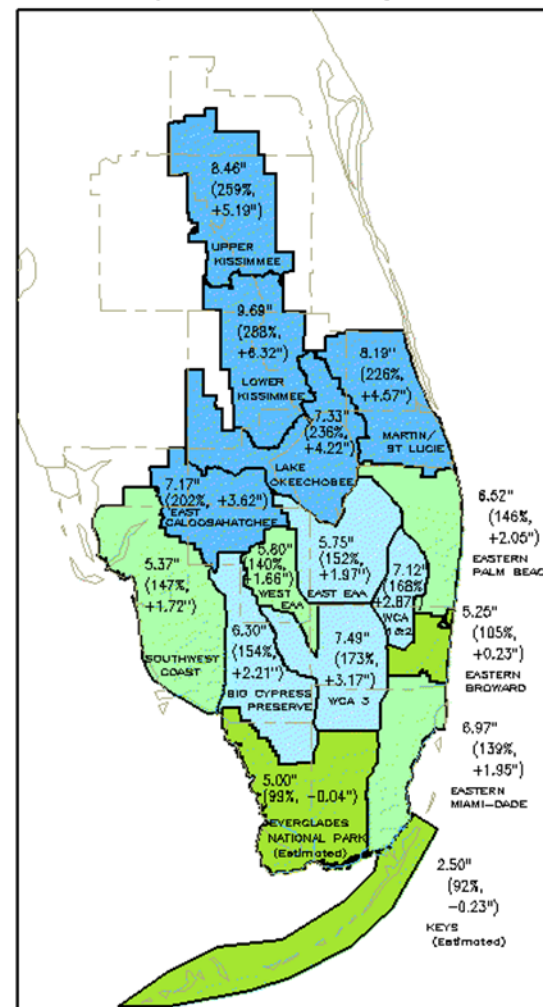
Events Leading Into WY2017

- Extraordinary dry season rainfall Jan '16
- High Water Emergency Order Feb '16
- Additional rain north of Lake May '16

January 2016 Rainfall



May 2016 Rainfall



Measured (% of Avg, Diff From Avg)

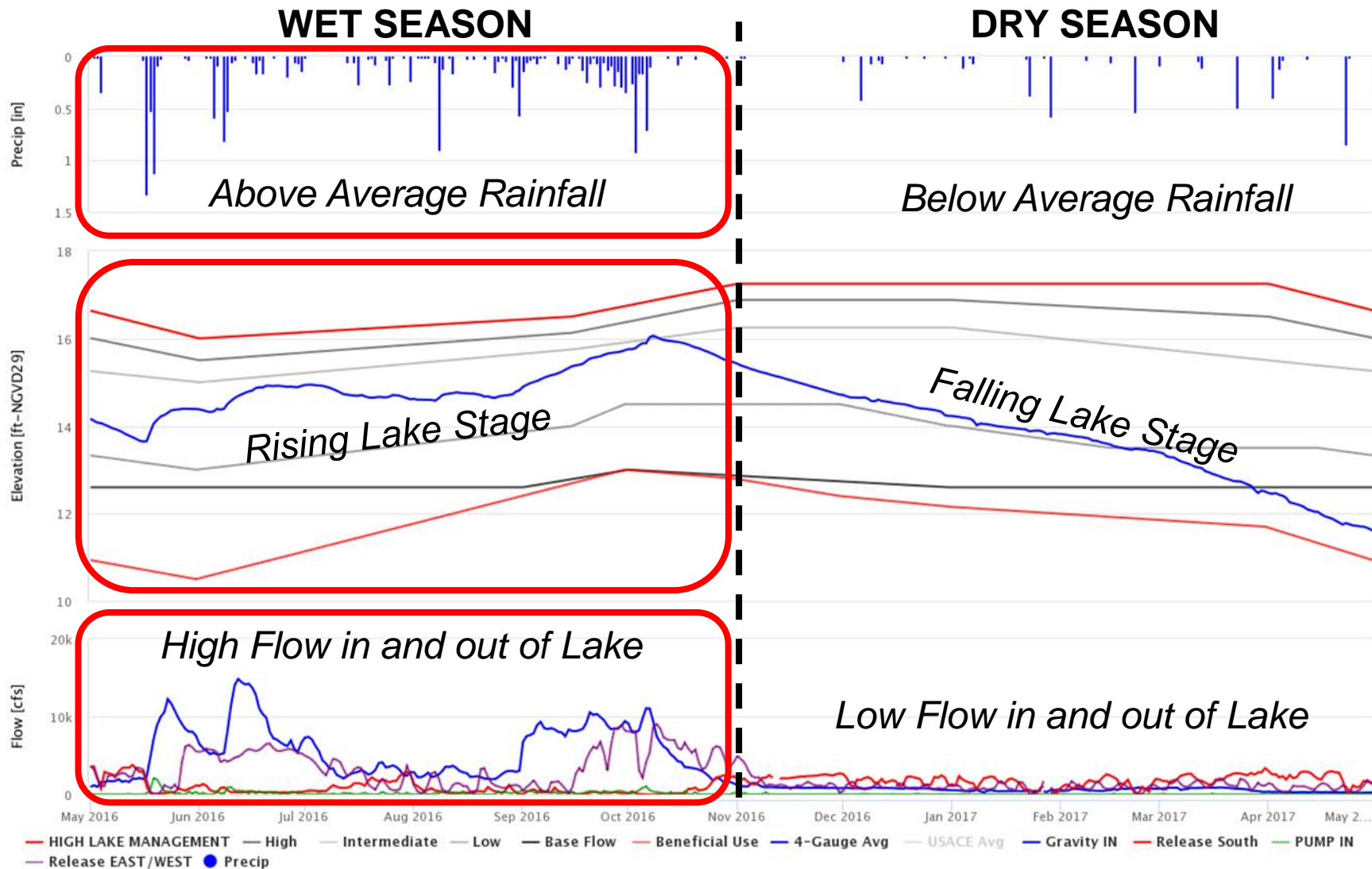
DISTRICT-WIDE: 9.18" (476%, +7.25") DISTRICT-WIDE: 7.11" (187%, +3.30")



Flow and Nutrient Loads to Lake Okeechobee

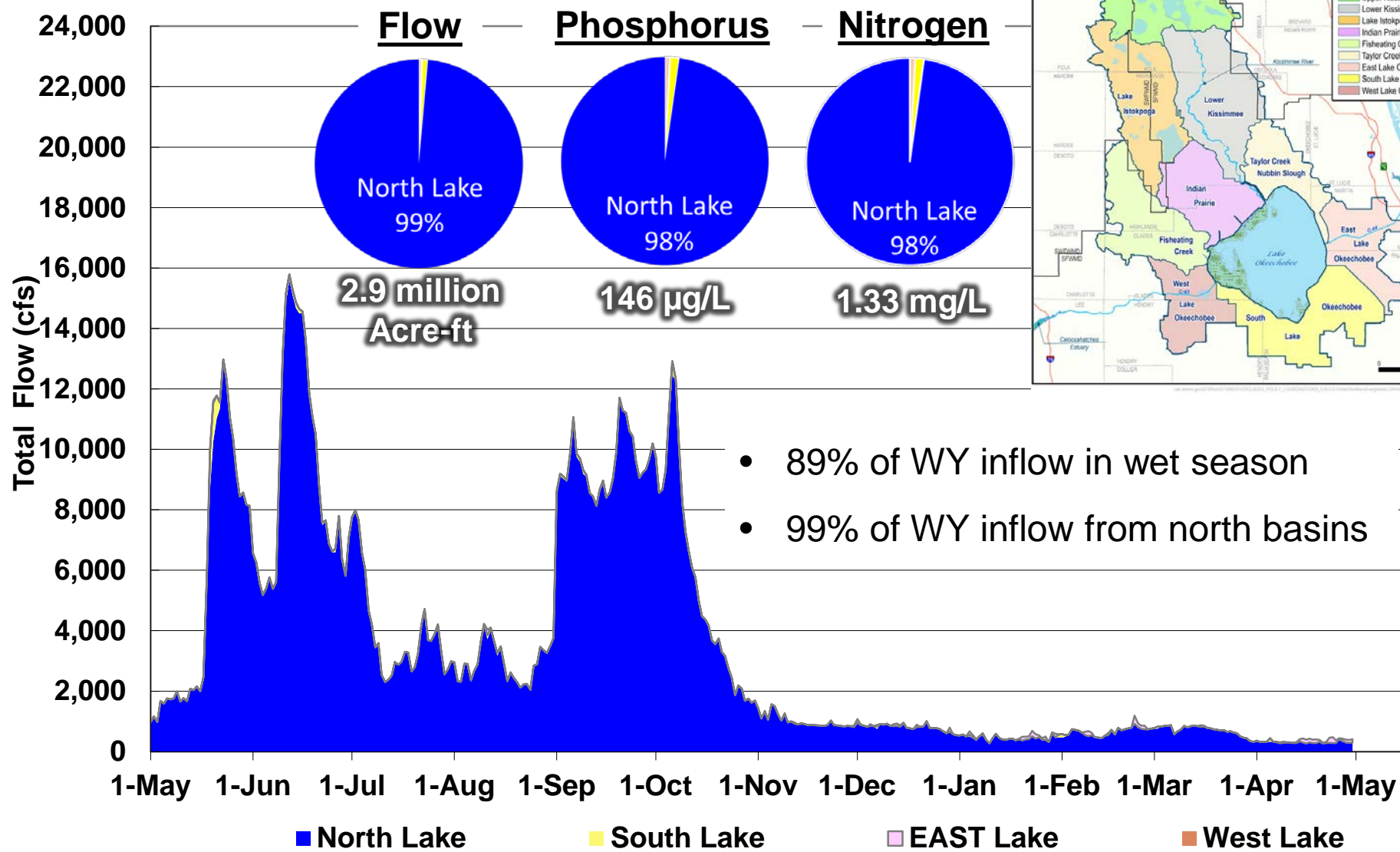
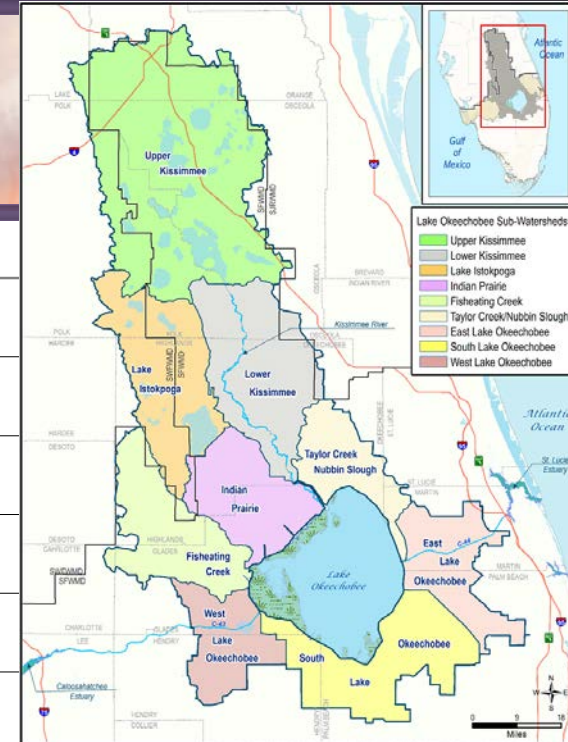
Wet and Dry Seasons Contrast

Water Year 2017



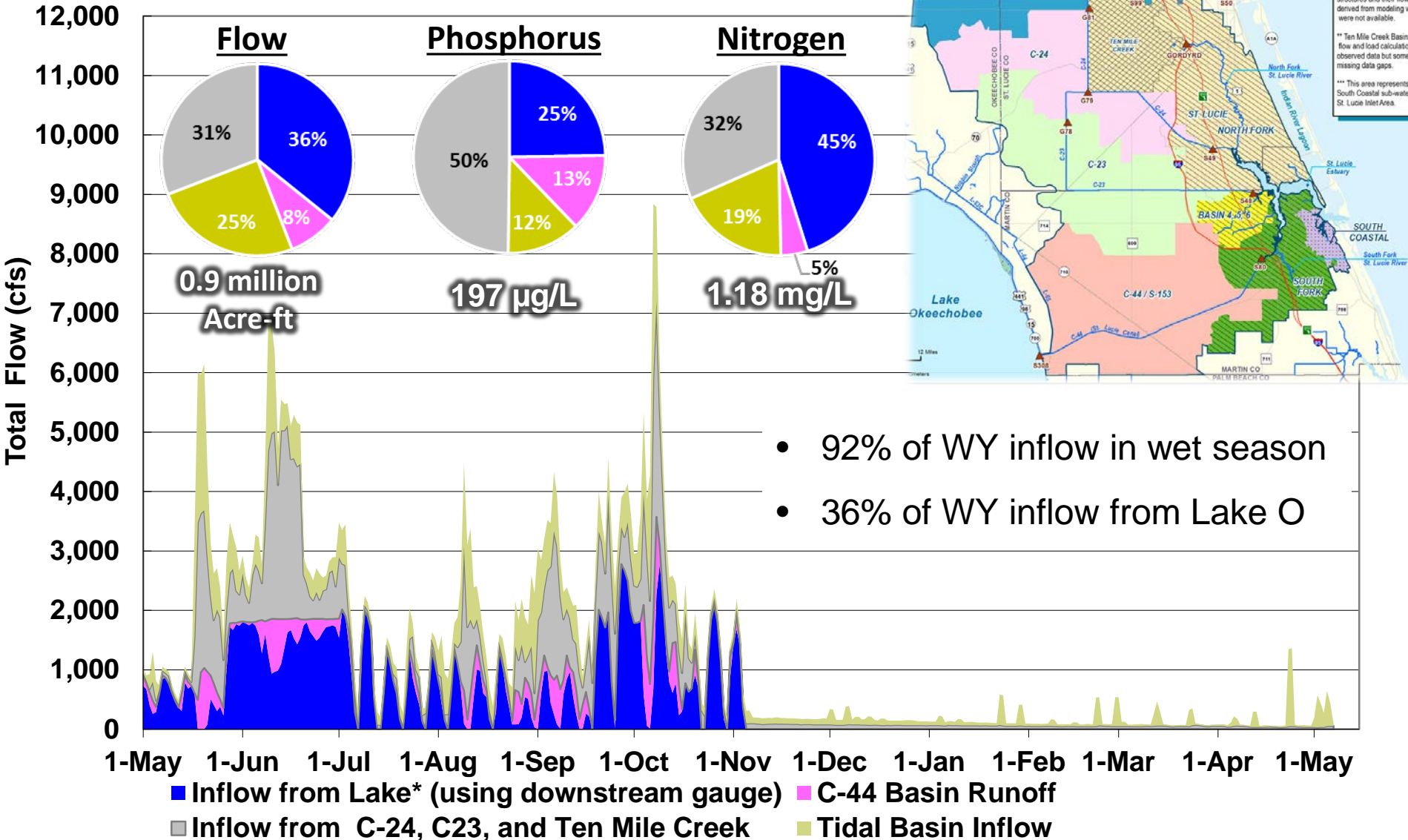
Lake Okeechobee Inflows

Water Year 2017



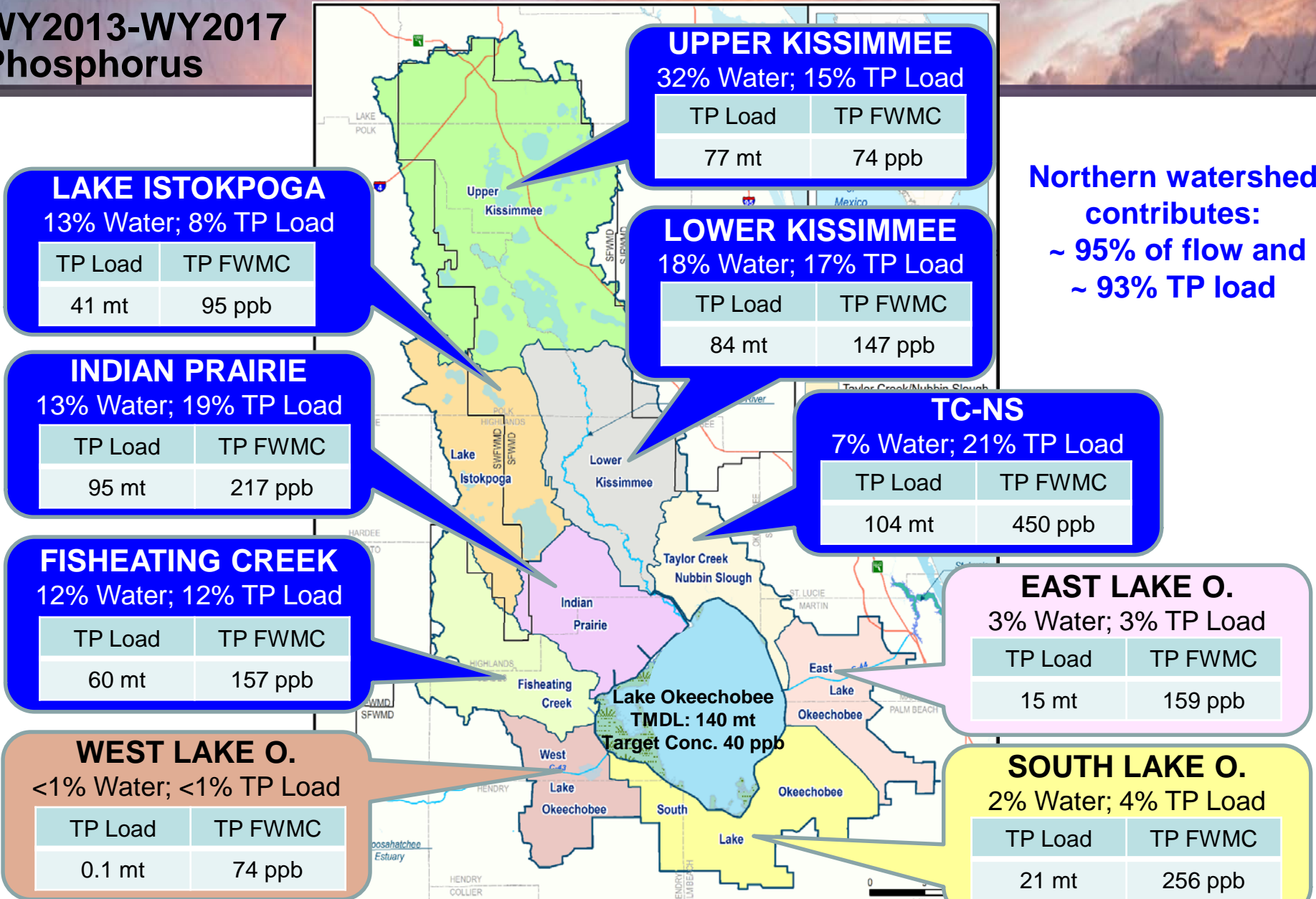
St. Lucie Estuary

Water Year 2017



Lake Okeechobee Inflow

WY2013-WY2017
Phosphorus

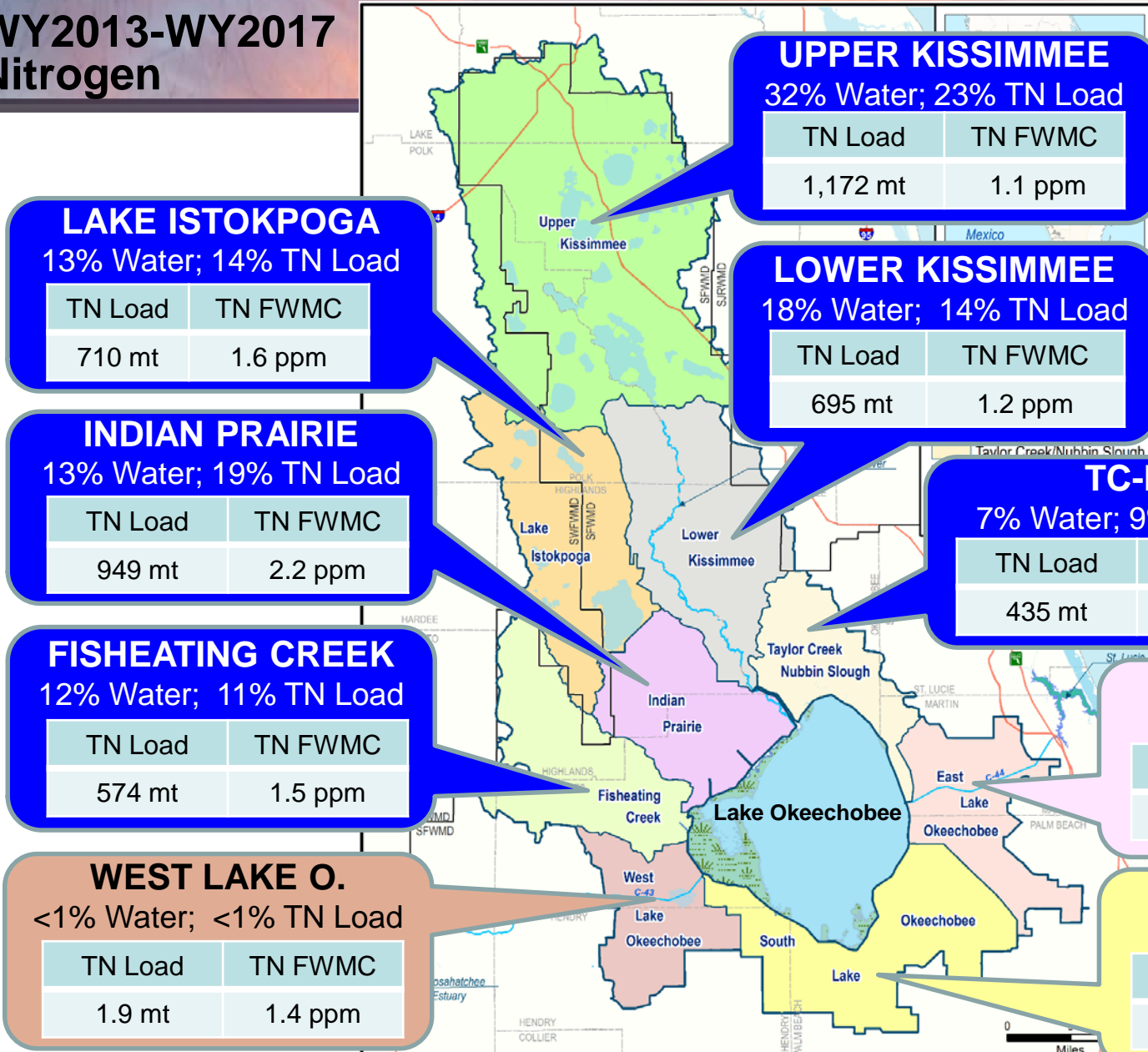


Source: Draft 2018 South Florida Environmental Report, Appendix 8B-2

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Lake Okeechobee Inflow

WY2013-WY2017
Nitrogen



Northern watershed contributes:
~ 95% of flow and
~ 89% TN load

Source: Draft 2018 South Florida Environmental Report, Appendix 8B-2

St Lucie Estuary Inflow Phosphorus WY2013-WY2017

Local Basin Runoff accounted for about 74% of flow and 82% of TP load to Estuary.

TEN MILE CREEK

10% Water; 12% TP Load

TP Load	TP FWMC
32 mt	263 ppb

C-24

13% Water; 17% TP Load

TP Load	TP FWMC
46 mt	304 ppb

C-23

11% Water; 21% TP Load

TP Load	TP FWMC
57 mt	433 ppb

LAKE OKEECHOBEE

26% Water; 18% TP Load

TP Load	TP FWMC
47 mt	150 ppb

TIDAL BASINS (ESTIMATED)

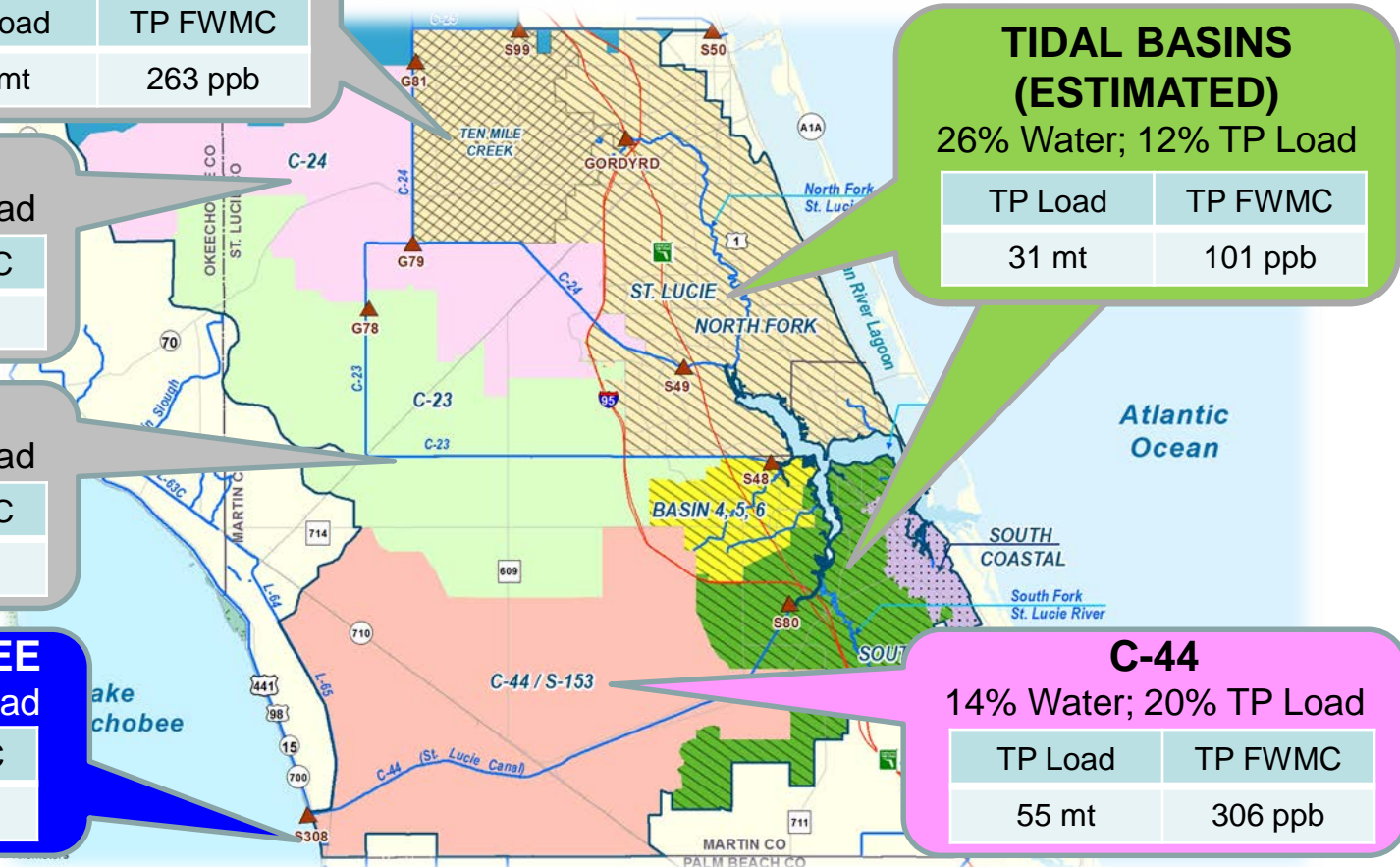
26% Water; 12% TP Load

TP Load	TP FWMC
31 mt	101 ppb

C-44

14% Water; 20% TP Load

TP Load	TP FWMC
55 mt	306 ppb



Source: Draft 2018 South Florida Environmental Report, Appendix 8C-1

St Lucie Estuary Inflow

Nitrogen WY2013-WY2017

Local Basin Runoff accounted for about 74% of flow and 71% of TN load to Estuary.

TEN MILE CREEK

10% Water; 8% TN Load

TN Load	TN FWMC
121 mt	0.99 ppm

C-24

13% Water; 15% TN Load

TN Load	TN FWMC
225 mt	1.49 ppm

C-23

11% Water; 14% TN Load

TN Load	TN FWMC
212 mt	1.62 ppm

LAKE OKEECHOBEE

26% Water; 29% TN Load

TN Load	TN FWMC
445 mt	1.42 ppm

TIDAL BASINS (ESTIMATED)

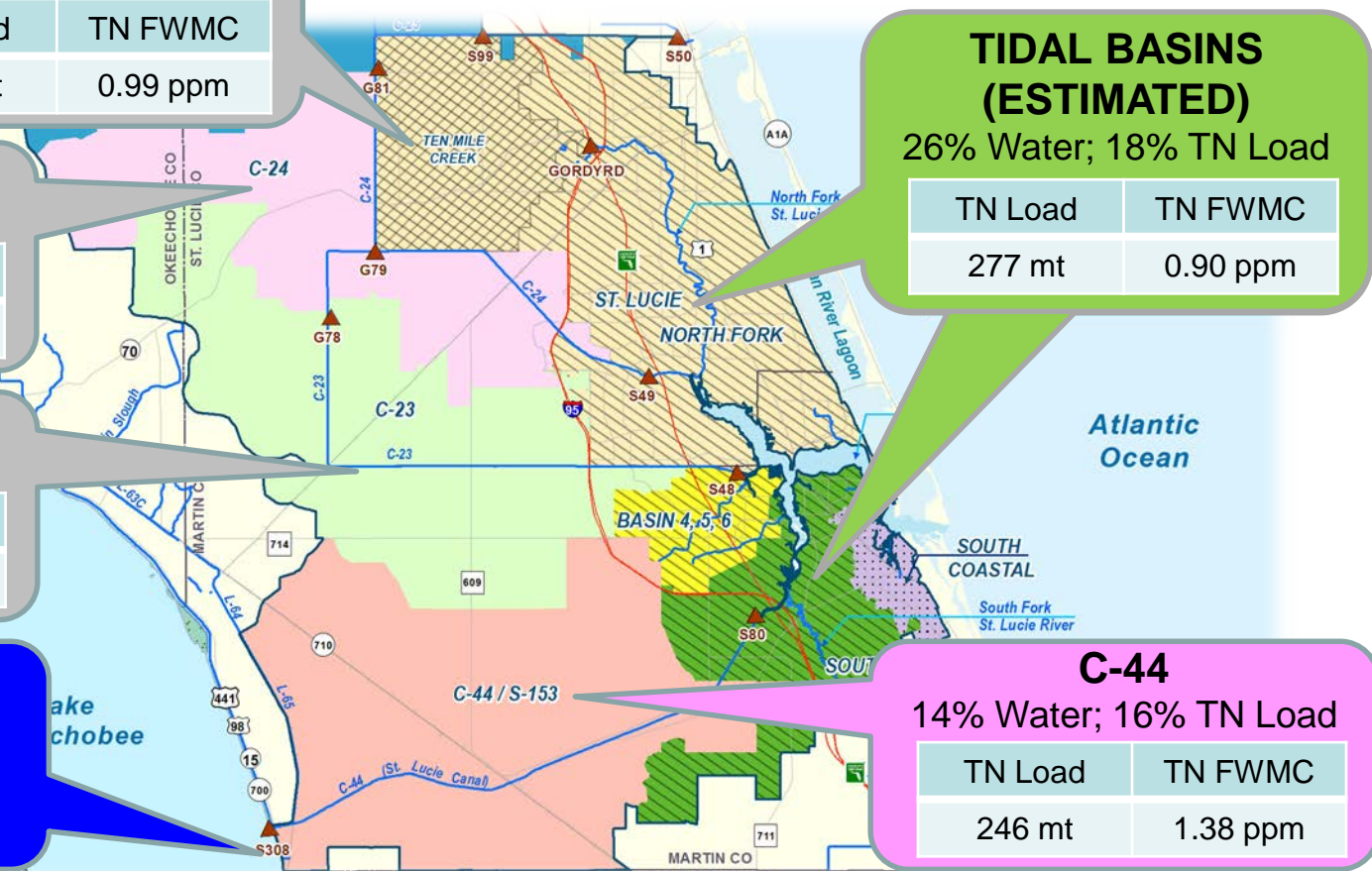
26% Water; 18% TN Load

TN Load	TN FWMC
277 mt	0.90 ppm

C-44

14% Water; 16% TN Load

TN Load	TN FWMC
246 mt	1.38 ppm



Source: Draft 2018 South Florida Environmental Report, Appendix 8C-1

Caloosahatchee Estuary Inflows

Phosphorus WY2013-WY2017

Local Basin Runoff accounted for about 65% of flow and 72% of TP load to Estuary

TIDAL BASIN (ESTIMATED)
23% Water; 13% TP Load

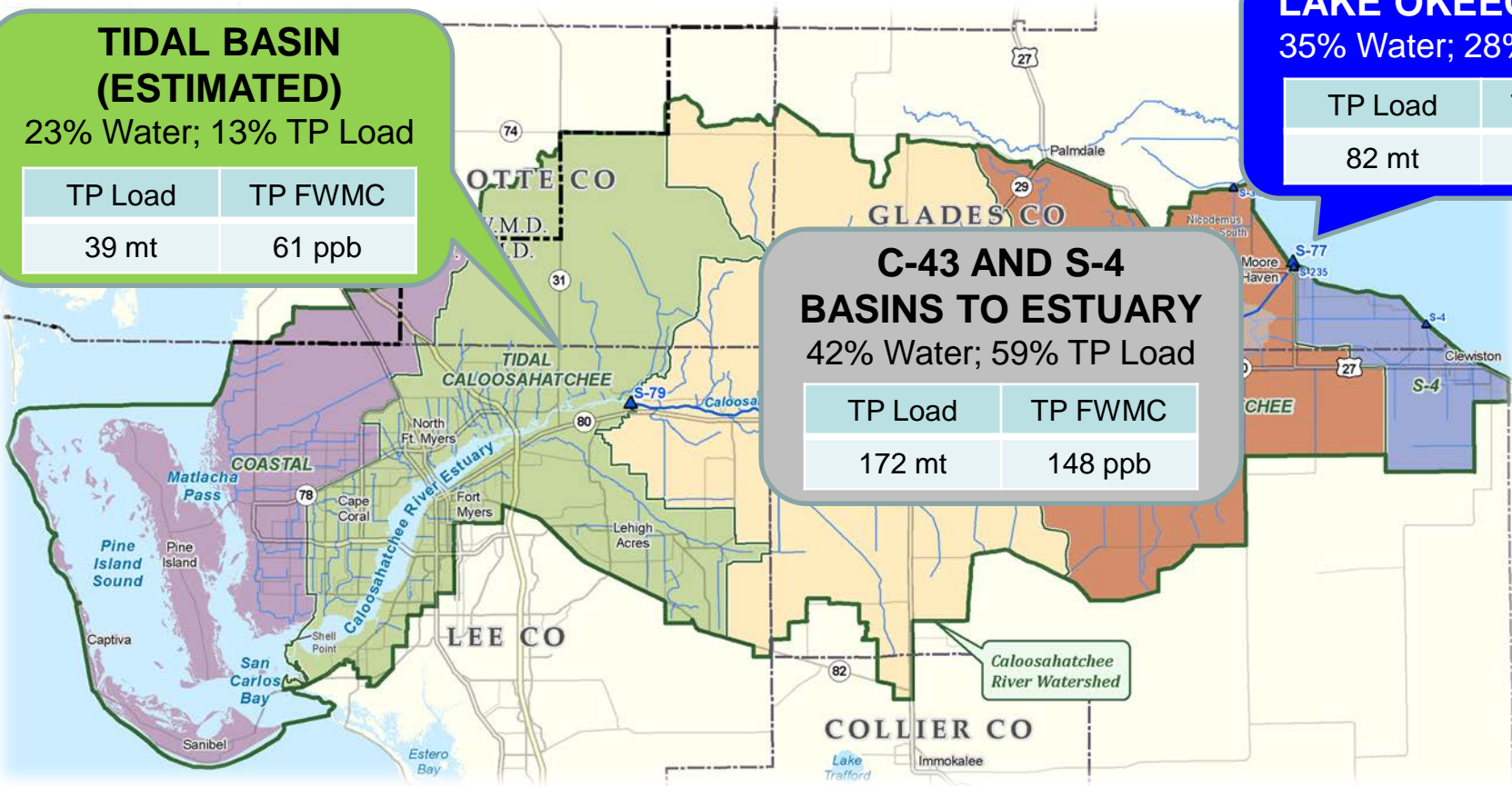
TP Load	TP FWMC
39 mt	61 ppb

LAKE OKEECHOBEE
35% Water; 28% TP Load

TP Load	TP FWMC
82 mt	85 ppb

C-43 AND S-4 BASINS TO ESTUARY
42% Water; 59% TP Load

TP Load	TP FWMC
172 mt	148 ppb



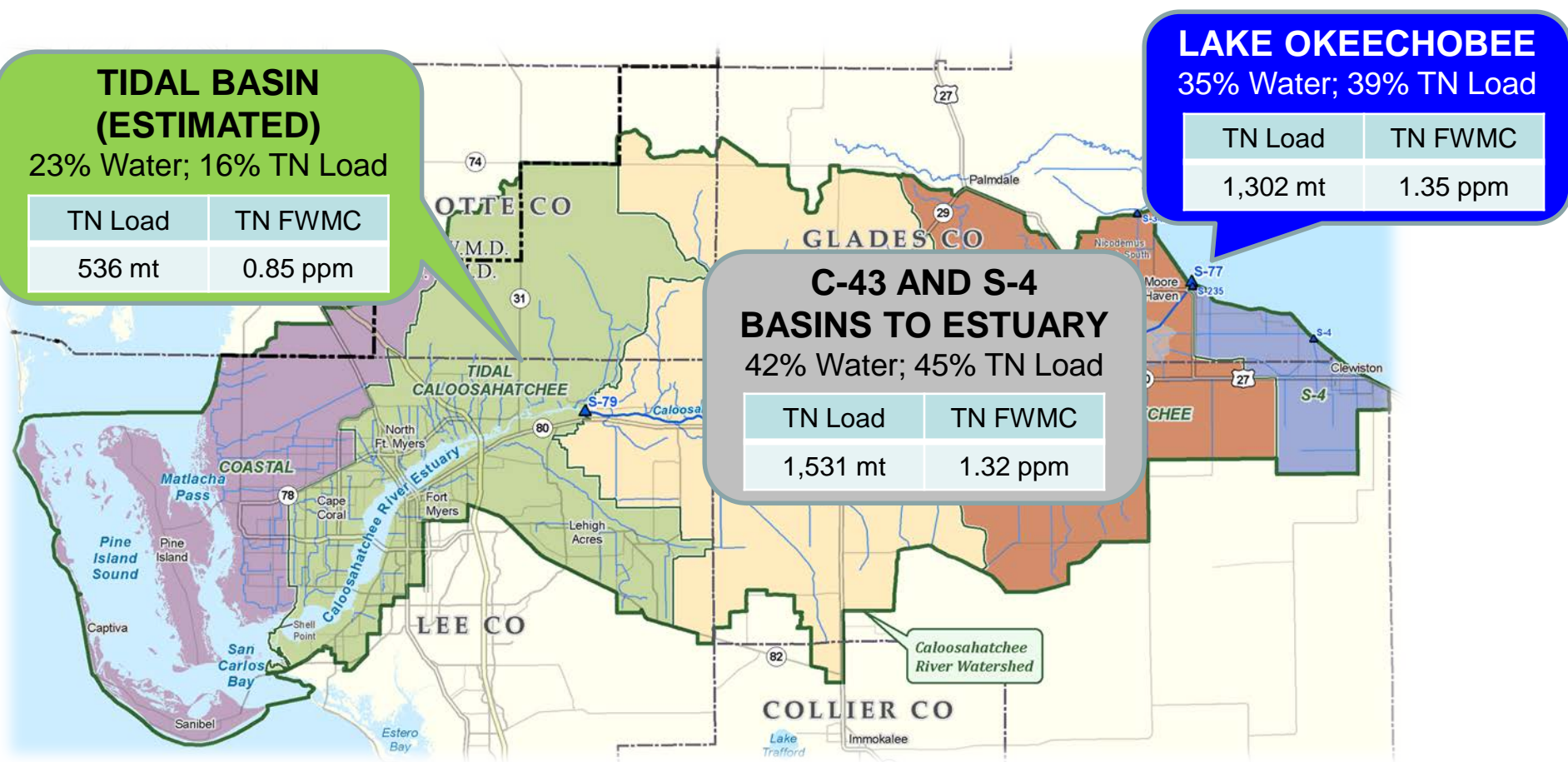
Note: Coastal Basin runoff (west of Shell Point) is not included as Estuary contribution.

Source: Draft 2018 South Florida Environmental Report, Appendix 8C-1

Caloosahatchee Estuary Inflows

Nitrogen WY2013-WY2017

Local Basin Runoff accounted for about 65% of flow and 61% of TN load to Estuary



Note: Coastal Basin runoff (west of Shell Point) is not included as Estuary contribution.

Source: Draft 2018 South Florida Environmental Report, Appendix 8C-1

Flow and Nutrient Loads to Lake Okeechobee, St Lucie and Caloosahatchee Estuaries

Summary

- **Wet conditions prior to and early in WY2017 resulted in significant wet season runoff**
- **99% of WY2017 Lake Okeechobee inflows were from basins north of the lake**
- **No significant change in 5-year averages
~70% of estuary flow from local basins**
- **Annual sub-watershed data WY2013-2017 available at www.sfwmd.gov/sfer (Ch. 8B & 8C)**



Questions?