



# SETTLEMENT AGREEMENT QUARTERLY REPORT

April – June 2017

**Jonathan P. Madden, P.E.**

Section Leader

Compliance Assessment & Reporting Section

Water Quality Bureau

Technical Oversight Committee

October 24, 2017



## SUMMARY

Month	Geometric Mean TP Concentration (ppb)	Long-term Level (ppb)	Mean Stage (feet NGVD 29)	Number of Samples	
<b>Arthur R. Marshall Loxahatchee National Wildlife Refuge</b>					
Apr 2017	6.5	12.1	16.06	7	
May 2017	8.3	11.4	16.17	13	
Jun 2017	7.9	7.9	16.93	14	
12-Month Period Ending	Total Flow (kac-ft)	12-Month FWM TP Concentration (ppb)	Long-term Limit (ppb)	Percent of Sampling Events Greater than 10 ppb	
				Guideline	Observed
<b>Everglades National Park – Shark River Slough – <i>PROVISIONAL DATA and RESULTS<sup>a</sup></i></b>					
Apr 2017	680.8 (684.7)	7.8 (7.8)	9.5 (9.5)	49.7 (49.6)	16.0 (15.4)
May 2017	601.4 (605.2)	7.6 (7.6)	10.0 (10.0)	52.0 (51.9)	20.8 (20.0)
Jun 2017	658.3 (662.1)	12.1 (12.0)	9.7 (9.6)	50.3 (50.2)	25.0 (24.0)
<b>Everglades National Park – Taylor Slough and Coastal Basins<sup>b</sup></b>					
Apr 2017	326.0	5.1	11.0	53.1	0.0
May 2017	286.3	5.0	11.0	53.1	0.0
Jun 2017	295.1	5.1	11.0	53.1	0.0

- a. SRS - Method 1 (left values) computed as S12s+(S333+S355A+S355B-S334) and Method 2 (values in parentheses) computed as S12s+(S333+S355A+S355B+S356-S334)  
Neither method excludes S334 flow from the total flow for long-term limit calculations.
- b. TSCB - Method 1 (S332D+S18C) values are presented. As of the last sampling date in June, there was no flow at structures for alternate Method 2 (S332D+G737+S18C) and Method 3 [(S332D-S332DX1-S328)+S328+G737+S18C] calculation.

# Refuge TP Compliance Tracking

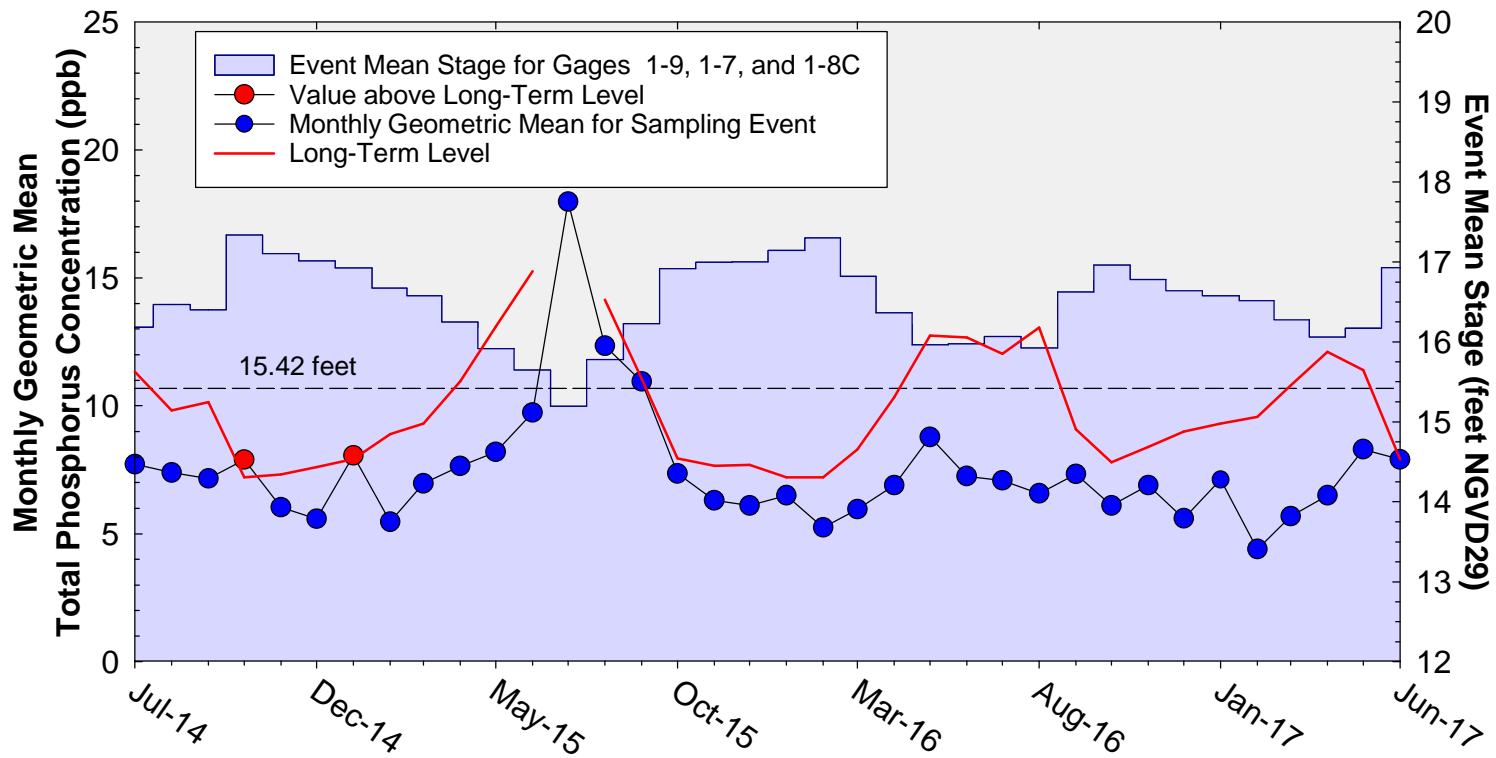
**For April – September 2017**

(July - September 2017 values are preliminary)

Month	Geometric Mean TP Concentration (ppb)	Long-Term Level (ppb) Effective 12/31/2006	Average Stage (feet NGVD 29)	Number of Samples
Apr-2017	6.5	12.1	16.06	7
May-2017	8.3	11.4	16.17	13
Jun-2017	7.9	7.9	16.93	14
Jul-2017	7.9	10.1	16.40	13
Aug-2017	6.7	8.8	16.69	14
Sep-2017	7.5	8.0	16.89	13

**Note: Samples collected only if site water depth is at least 10 centimeters.**

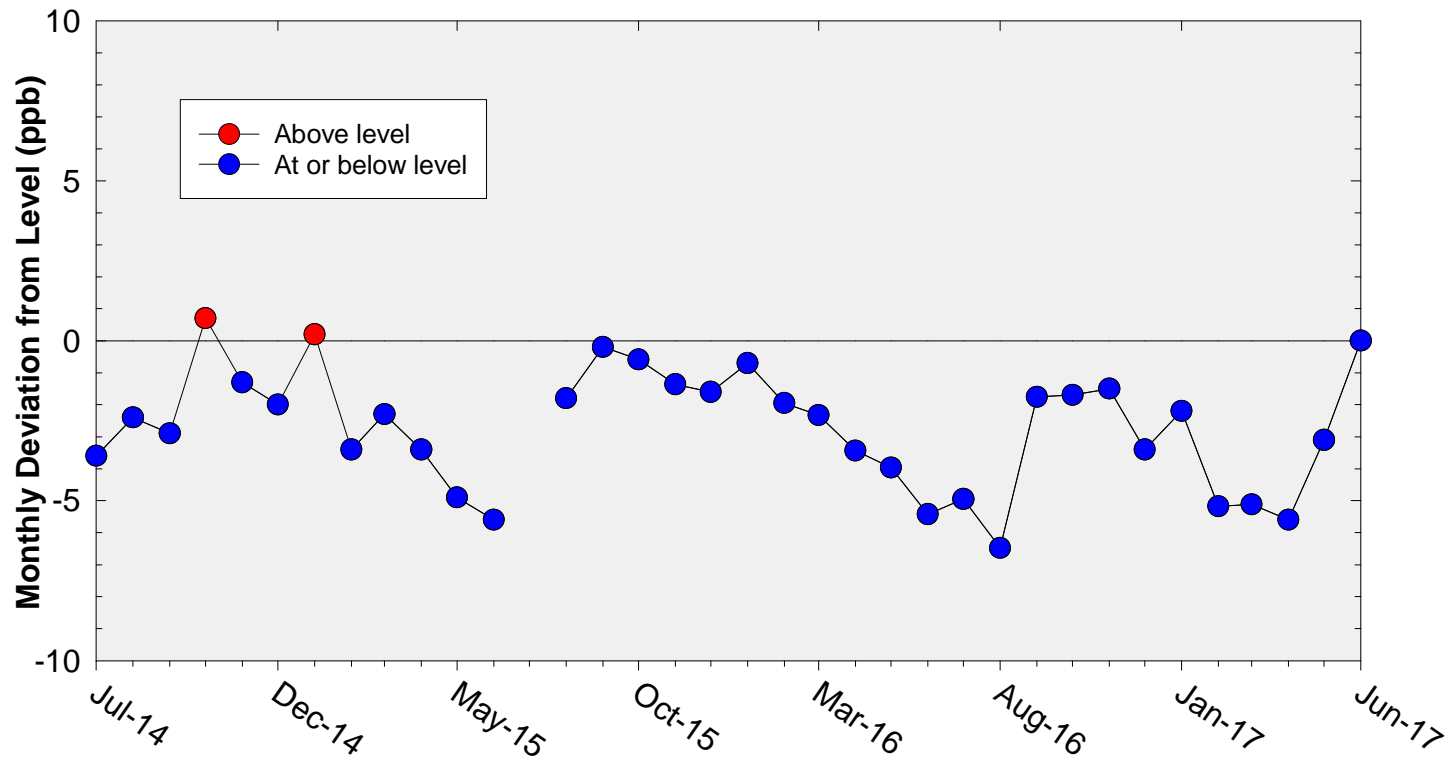
# A.R.M Loxahatchee National Wildlife Refuge Monthly Total Phosphorus Geometric Mean Concentrations



**Average TP geometric mean = 7.2 ppb  
(35 months excluding July 2015)**

# A.R.M Loxahatchee National Wildlife Refuge

## Deviation of monthly geometric mean total phosphorus concentrations with calculated long-term levels



**Average TP geometric mean = 2.7 ppb below the Long-Term Level  
(35 months excluding July 2015)**

## Shark River Slough

### TP Concentration Compliance Tracking (October 2016–June 2017 Flow Data are Provisional)

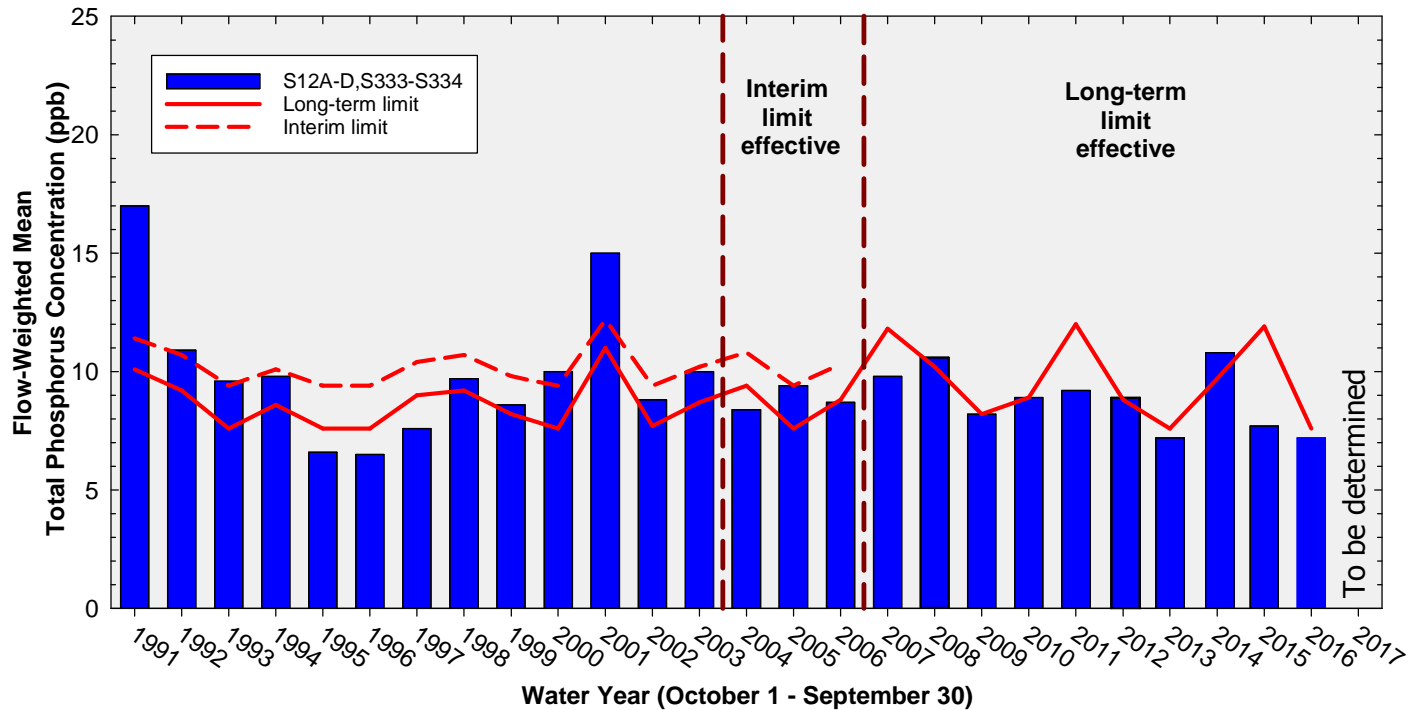
12-Month Period	Total Flow (kac-ft)	Flow-Weighted Mean TP Concentration (ppb)	Long-Term Limit (ppb) <i>Effective 12/31/2006</i>	Percent of Sampling Events Greater than 10 ppb	
				Guideline	Observed
May 2016 - Apr 2017	680.8 (684.7)	7.8 (7.8)	9.5 (9.5)	49.7 (49.6)	16.0 (15.4)
Jun 2016 - May 2017	601.4 (605.2)	7.6 (7.6)	10.0 (10.0)	52.0 (51.9)	20.8 (20.0)
Jul 2016 - Jun 2017	658.3 (662.1)	12.1 (12.0)	9.7 (9.6)	50.3 (50.2)	25.0 (24.0)

#### Shark River Slough PROVISIONAL RESULTS:

Method 1 (left values) FWMC computed as  $S12s+(S333+S355A\&B-S334)$  and Method 2 (in parenthesis) FWMC computed as  $S12s+(S333+S355A\&B+S356-S334)$  using all flow and TP grabs on bi-weekly compliance sampling dates.

Neither method excludes S334 flow from the flow for long-term limit calculations.

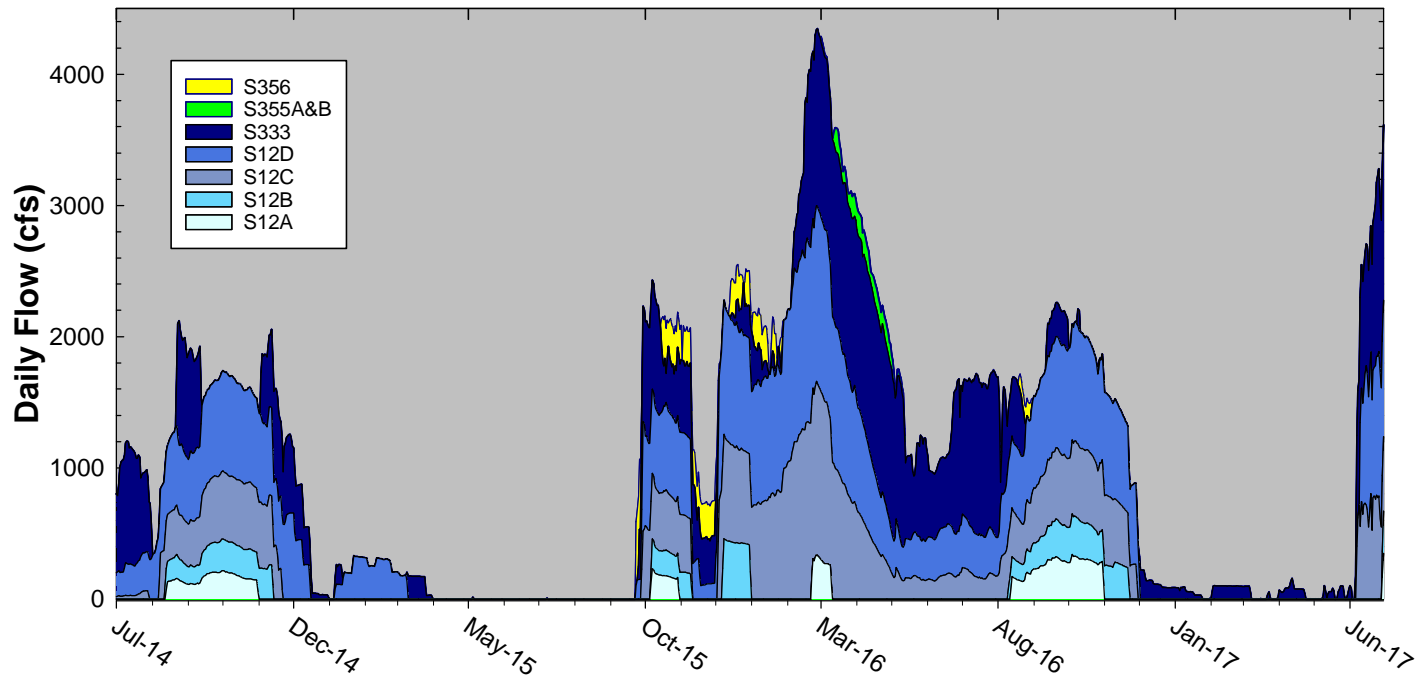
# Annual Flow-weighted Mean Concentrations Inflows to ENP through Shark River Slough



**Water year (12-month) FWMC compared to the TP interim and long-term limits**

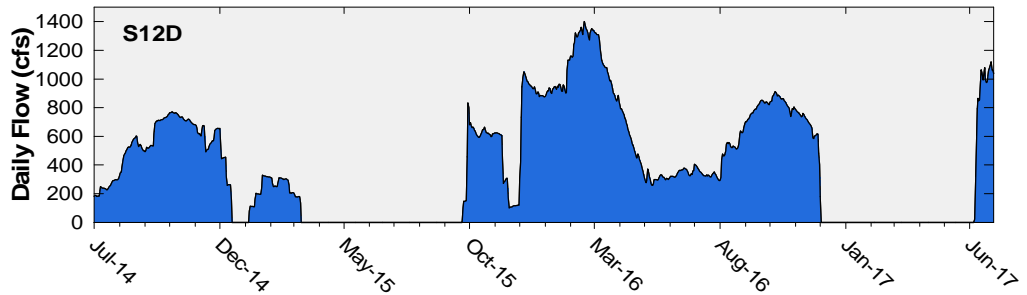
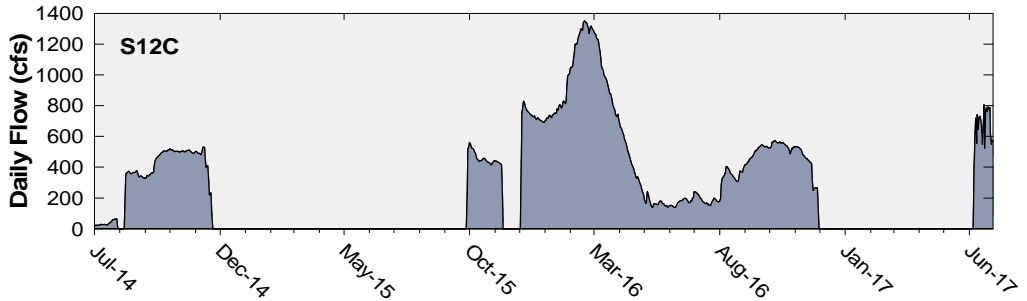
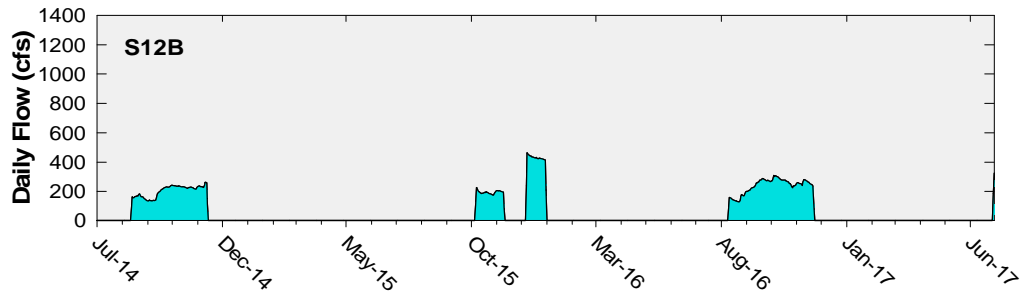
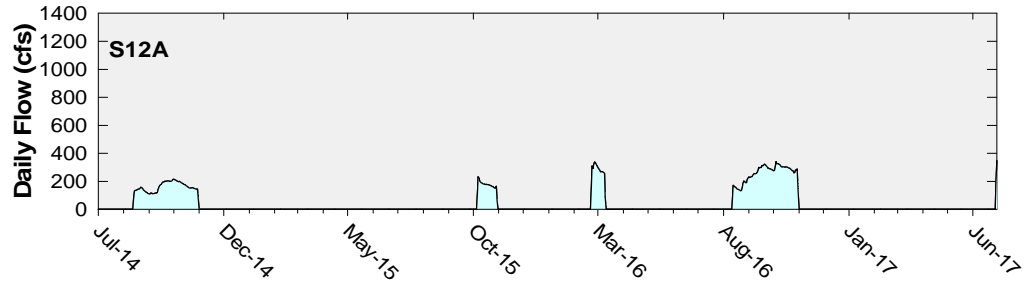
# Shark River Slough Daily Flows

(Flow Data from October 1, 2016 are Provisional)

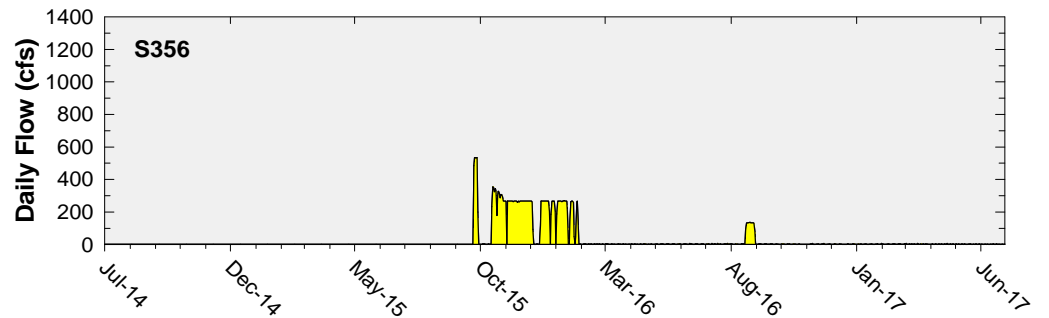
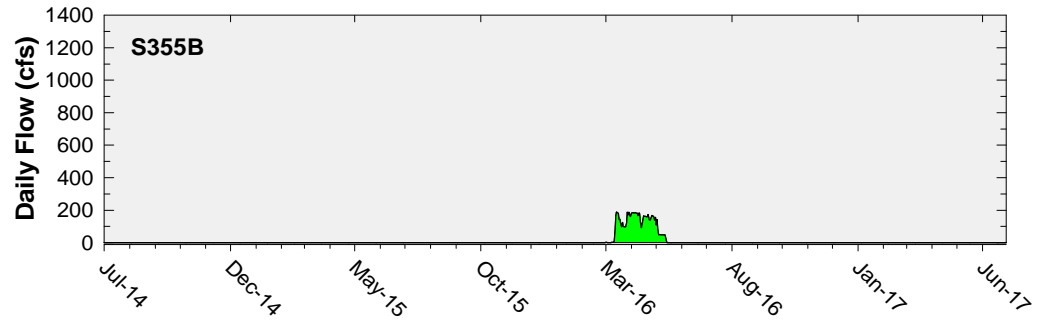
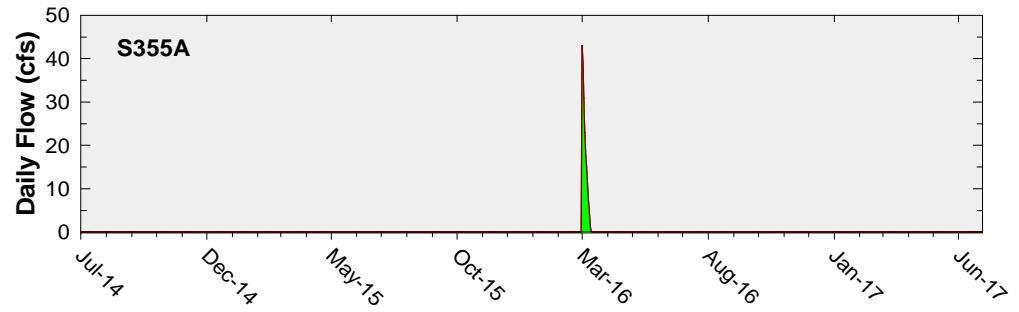
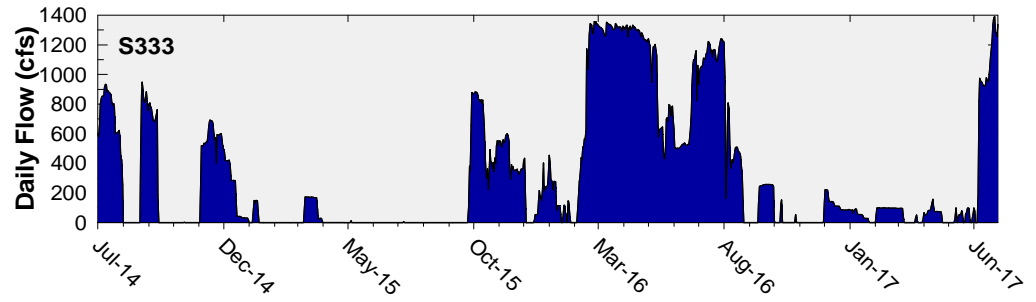




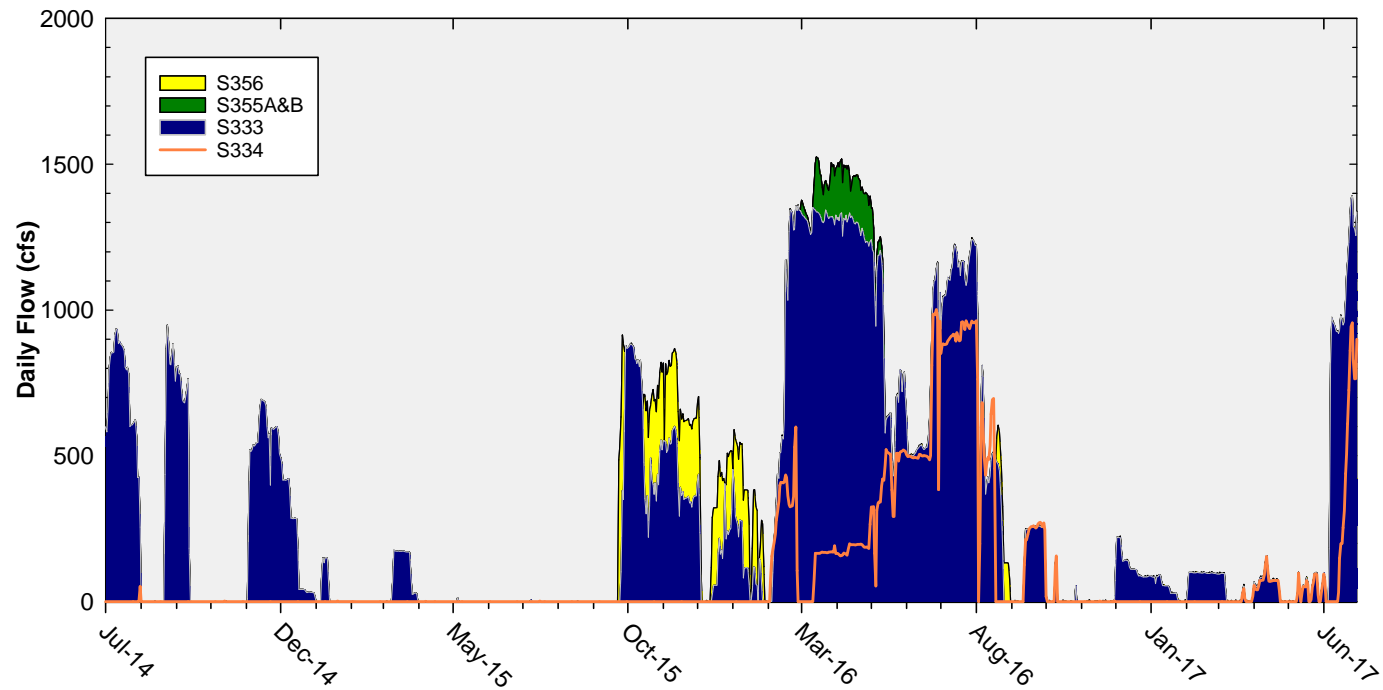
# Daily Flows at S12 Structures to Shark River Slough



# Daily Flows at Individual Inflow Structures to Shark River Slough

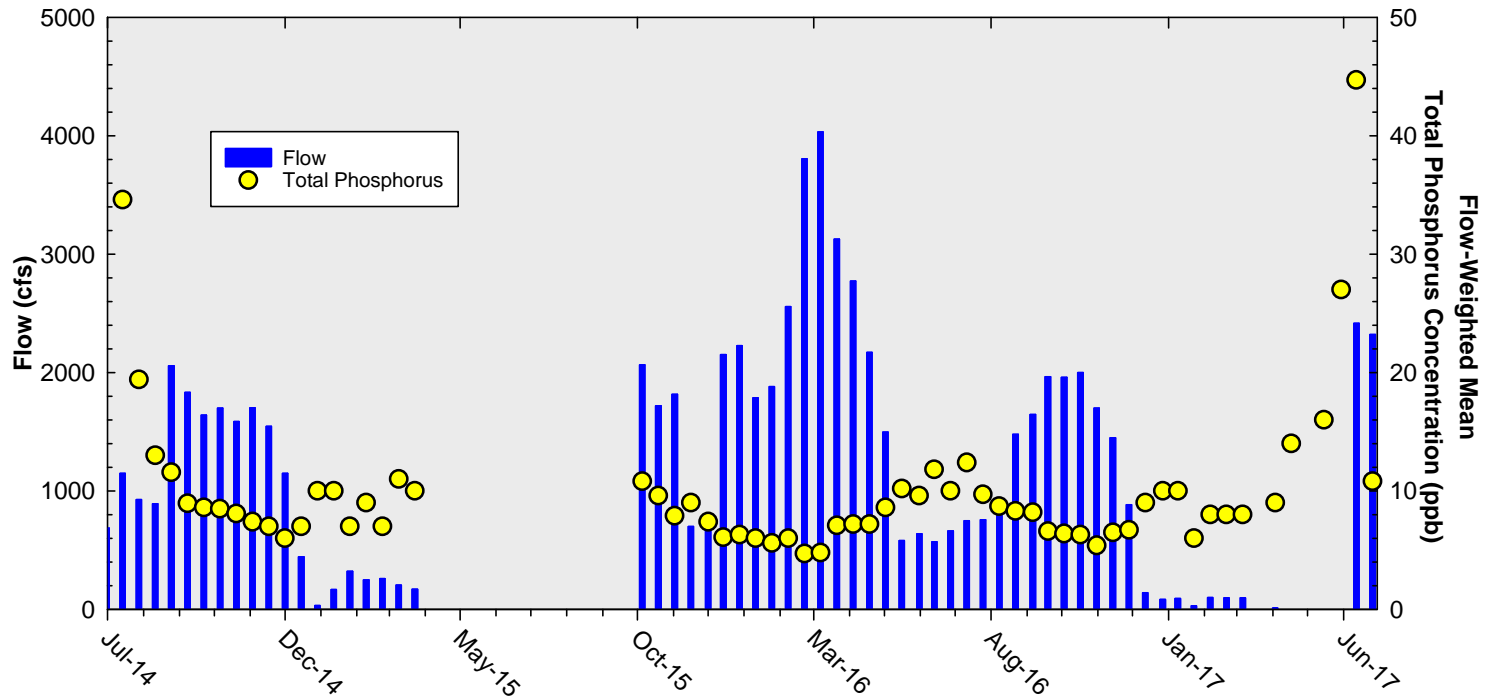


## Daily Flows Into Shark River Slough and Out through S334



# Shark River Slough

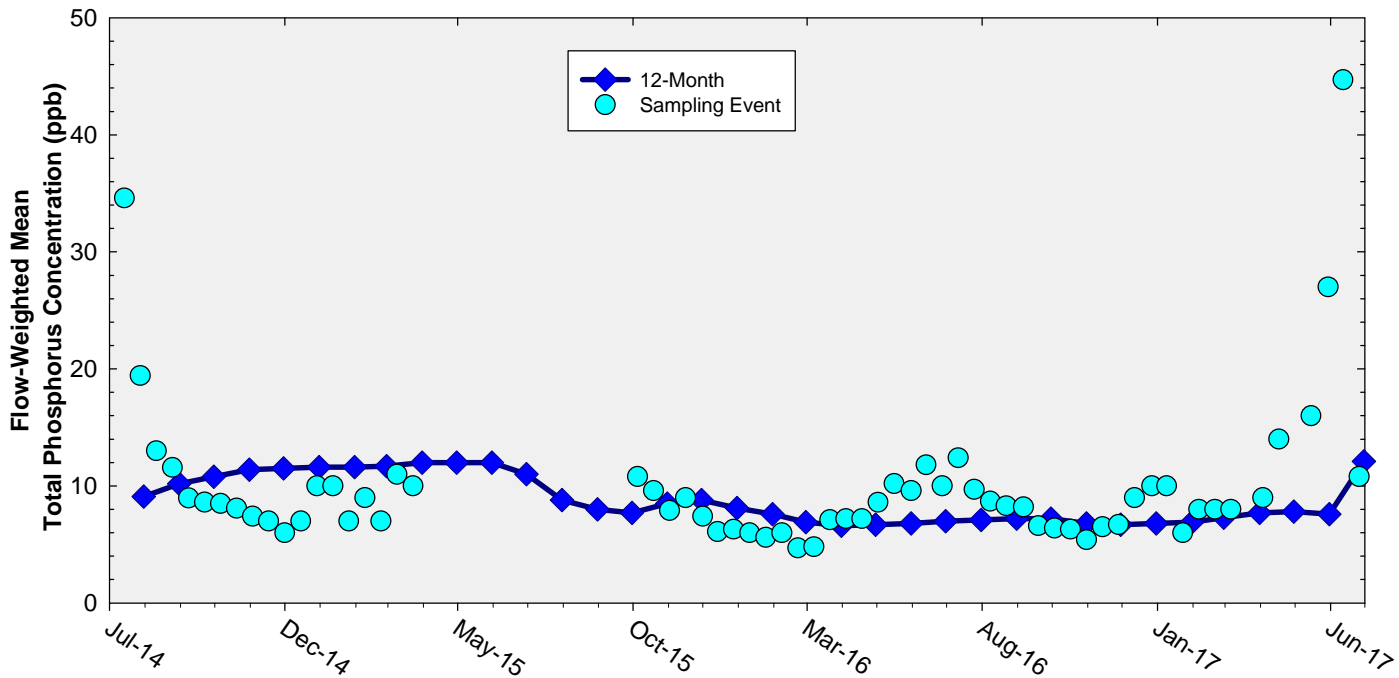
## Sampling Event Flow and FWMC



**Flow at Shark River Slough structures and the corresponding TP FWMCs for individual sampling events**

**Note: Method 1 results illustrated**

# Flow-Weighted Mean Concentrations Inflows to ENP through Shark River Slough



The composite TP concentration and 12-month FWMC at the end of each month for each sampling event

Note: Method 1 results illustrated

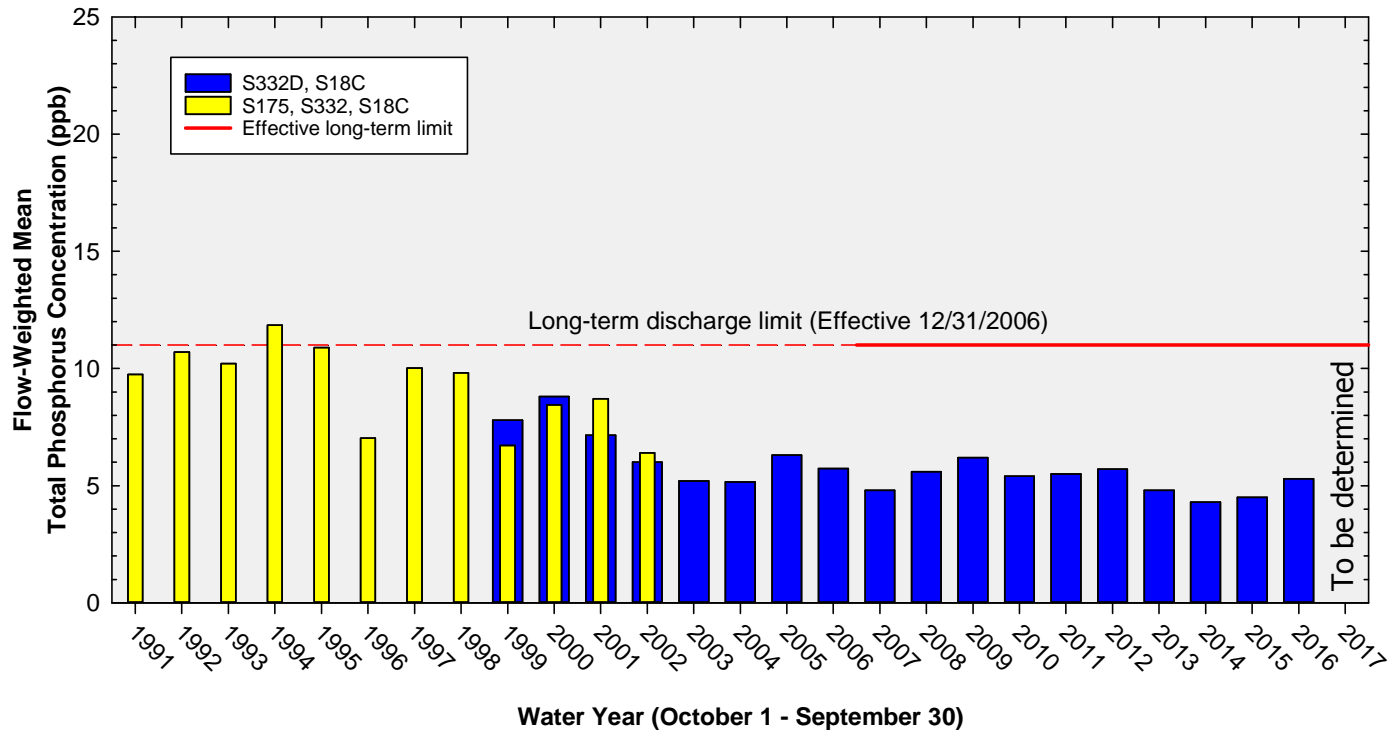
## Taylor Slough and Coastal Basins TP Concentration Compliance Tracking

12-Month Period	Total Flow (kac-ft)	Flow-Weighted Mean TP Concentration (ppb)	Long-Term Limit (ppb) <i>Effective 12/31/2006</i>	Percent of Sampling Events Greater than 10 ppb	
				Guideline	Observed
May 2016 - Apr 2017	326.0	5.1	11.0	53.1	0.0
Jun 2016 - May 2017	286.3	5.0	11.0	53.1	0.0
Jul 2016 - Jun 2017	295.1	5.1	11.0	53.1	0.0

**Method 1 (S332D+S18C) values are presented.**

**As of the last sampling date in June, there was no flow at structures for alternate Method 2 (S332D+G737+S18C) and Method 3 [(S332D-S332DX1-S328)+S328+G737+S18C] calculation.**

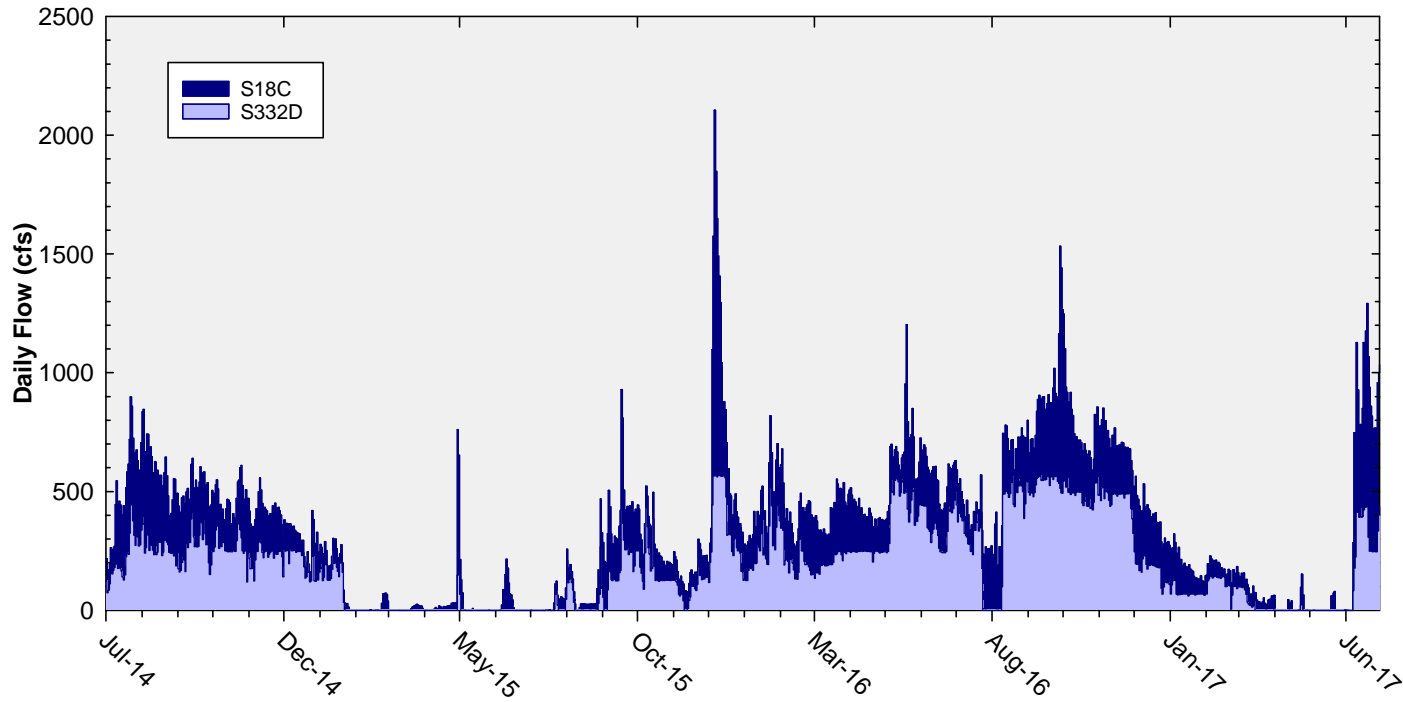
# Annual Flow-Weighted Mean Concentrations Inflows to the ENP through Taylor Slough and Coastal Basins



**The 12-month FWMC at the end of each water year compared to the 11 ppb long-term TP limit**

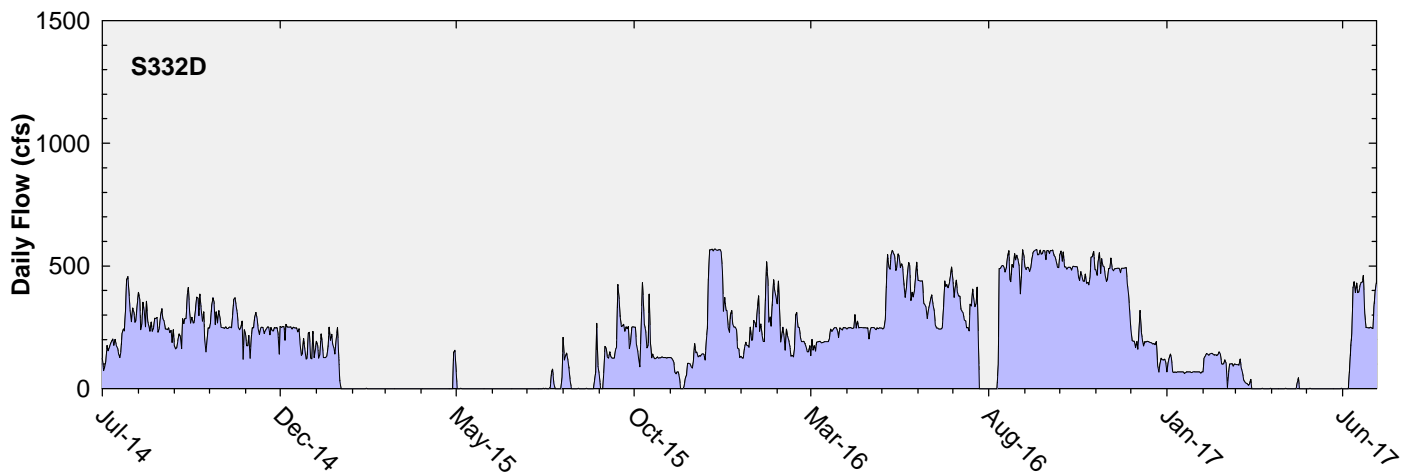
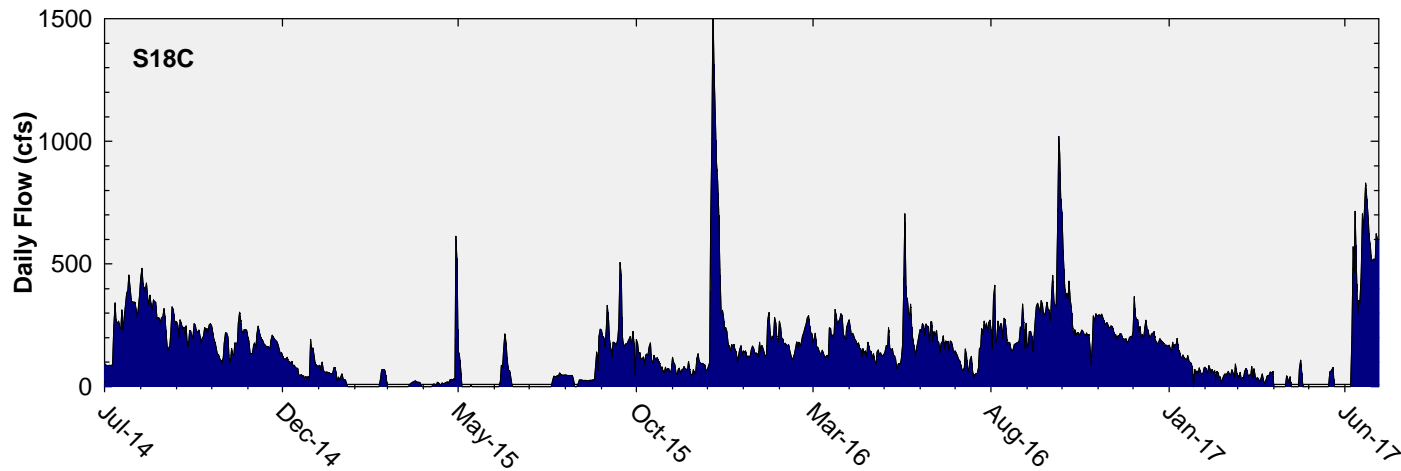
Note: Blue bars show S332D, S18C, & S174 until September 2007 when S174 was plugged.

# Daily Flows at Taylor Slough and Coastal Basins Structures into ENP



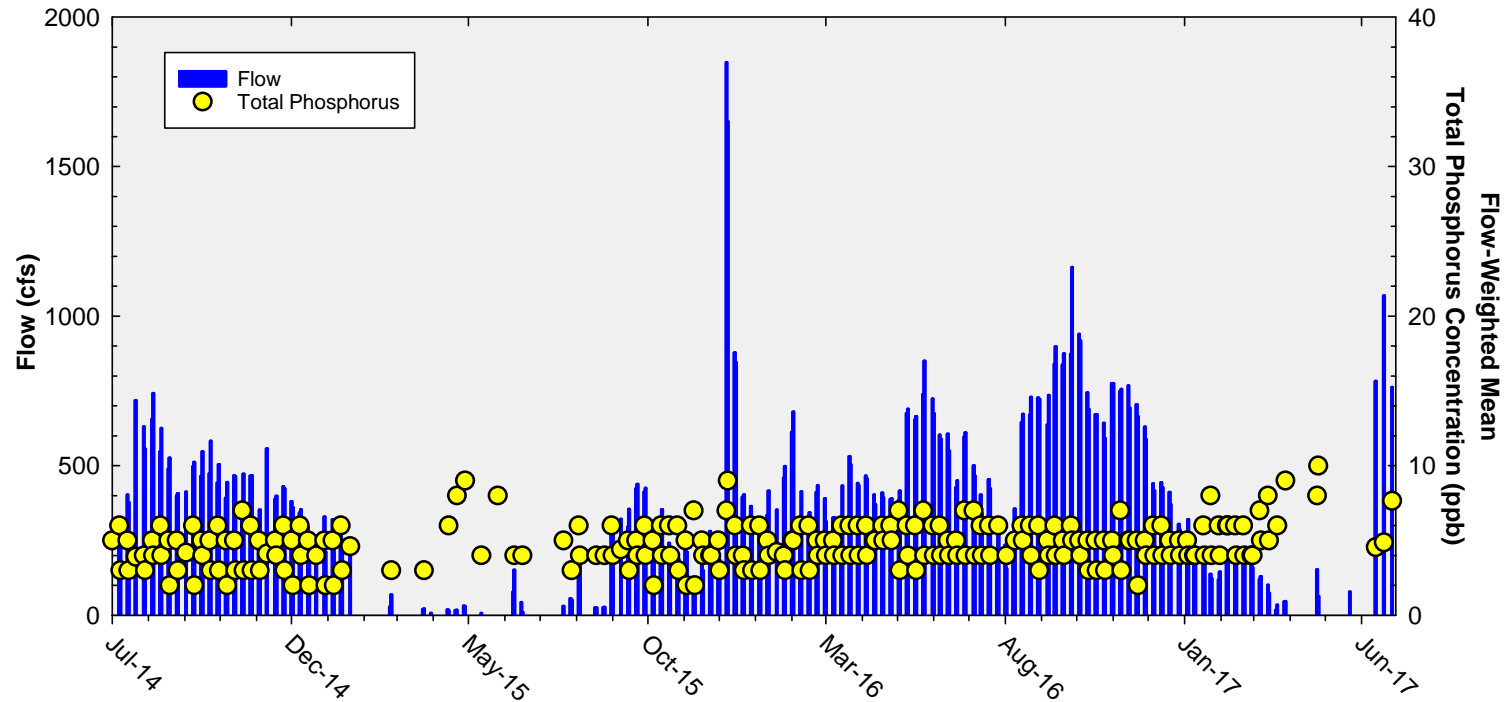


# Daily Flows at Individual Taylor Slough and Coastal Basins Structures into ENP



# Taylor Slough and Coastal Basins

## Sampling Event Flow and FWMC

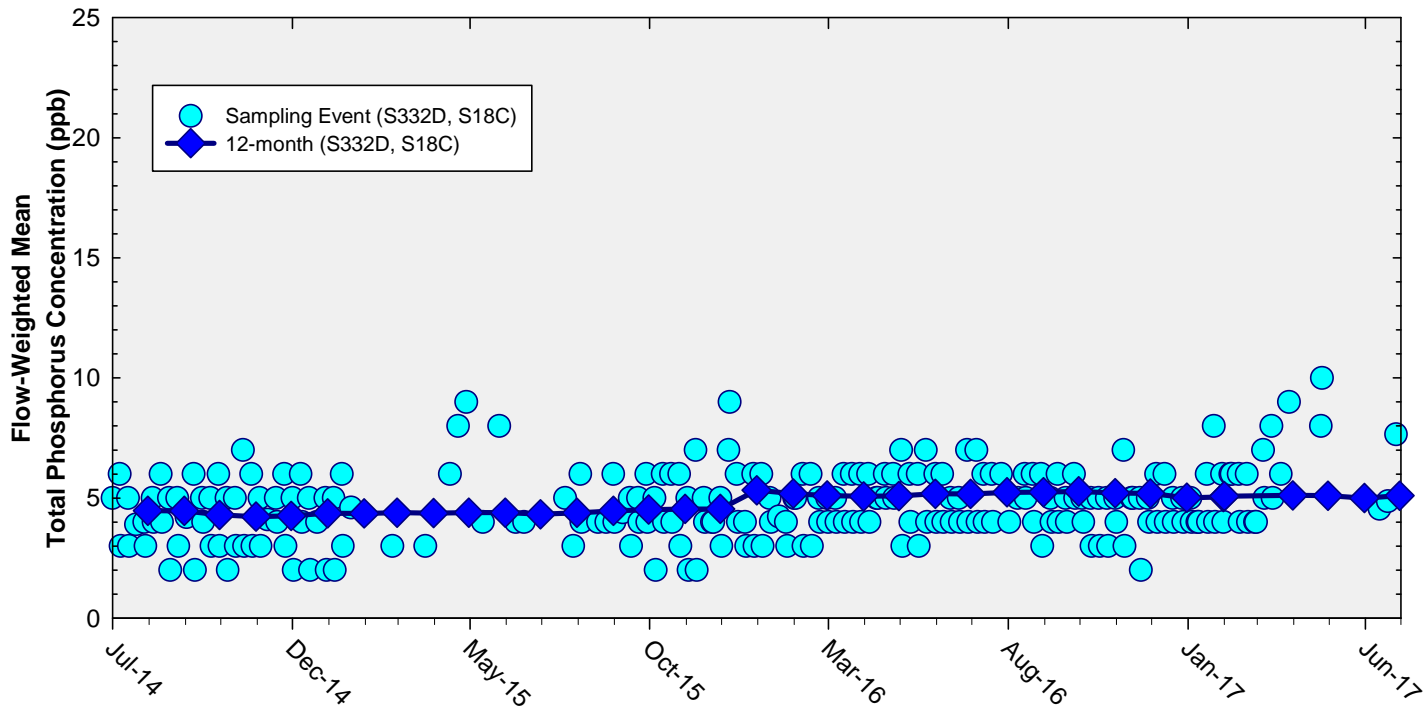


**Flow at Taylor Slough and Coastal Basins structures and the corresponding TP FWMCs for individual sampling events**

**Note: Method 1 results illustrated**

# Flow-Weighted Mean Concentrations

## Inflows to the ENP through Taylor Slough and Coastal Basins



**The 12-month FWMC at the end of each month and the composite TP concentration for each sampling event**

**Note: Method 1 results illustrated**

Thank You

