



# SETTLEMENT AGREEMENT QUARTERLY REPORT

October – December 2018

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

Section Leader

Compliance Assessment & Reporting Section

Water Quality Bureau

Technical Oversight Committee

June 25, 2019



[sfwmd.gov](http://sfwmd.gov)

## SUMMARY

Month	Geometric Mean TP Concentration (ppb)	Long-Term Level (ppb)	Mean Stage (feet NGVD29)	Number of Samples	
Arthur R. Marshall Loxahatchee National Wildlife Refuge					
Oct 2018	6.2	9.4	16.55	14	
Nov 2018	7.9	9.8	16.47	12	
Dec 2018	6.0	10.4	16.36	11	
12-Month Period Ending	Total Flow (kac-ft)	12-Month TP FWMC (ppb)	Long-Term Limit (ppb)	Percent of Sampling Events Greater than 10 ppb	
				Guideline	Observed
Everglades National Park – Shark River Slough – <i>PROVISIONAL DATA and RESULTS</i>					
Oct 2018	1,445.2 (1,489.6)	7.8 (7.7)	7.6 (7.6)	40.1 (40.1)	30.8 (30.8)
Nov 2018	1,119.0 (1,163.5)	8.5 (8.3)	7.6 (7.6)	40.1 (40.1)	36.0 (36.0)
Dec 2018	909.6 (954.1)	9.1 (8.9)	8.4 (8.1)	43.6 (42.5)	36.0 (36.0)
Everglades National Park – Taylor Slough and Coastal Basins					
Oct 2018	371.5 (447.8, 429.2)	6.2 (6.0, 5.8)	11.0	53.1	3.8 (3.8, 3.8)
Nov 2018	350.5 (413.5, 394.8)	6.2 (6.0, 5.8)	11.0	53.1	3.8 (3.8, 3.8)
Dec 2018	319.4 (368.9, 350.2)	6.3 (6.0, 5.8)	11.0	53.1	3.8 (3.8, 3.8)

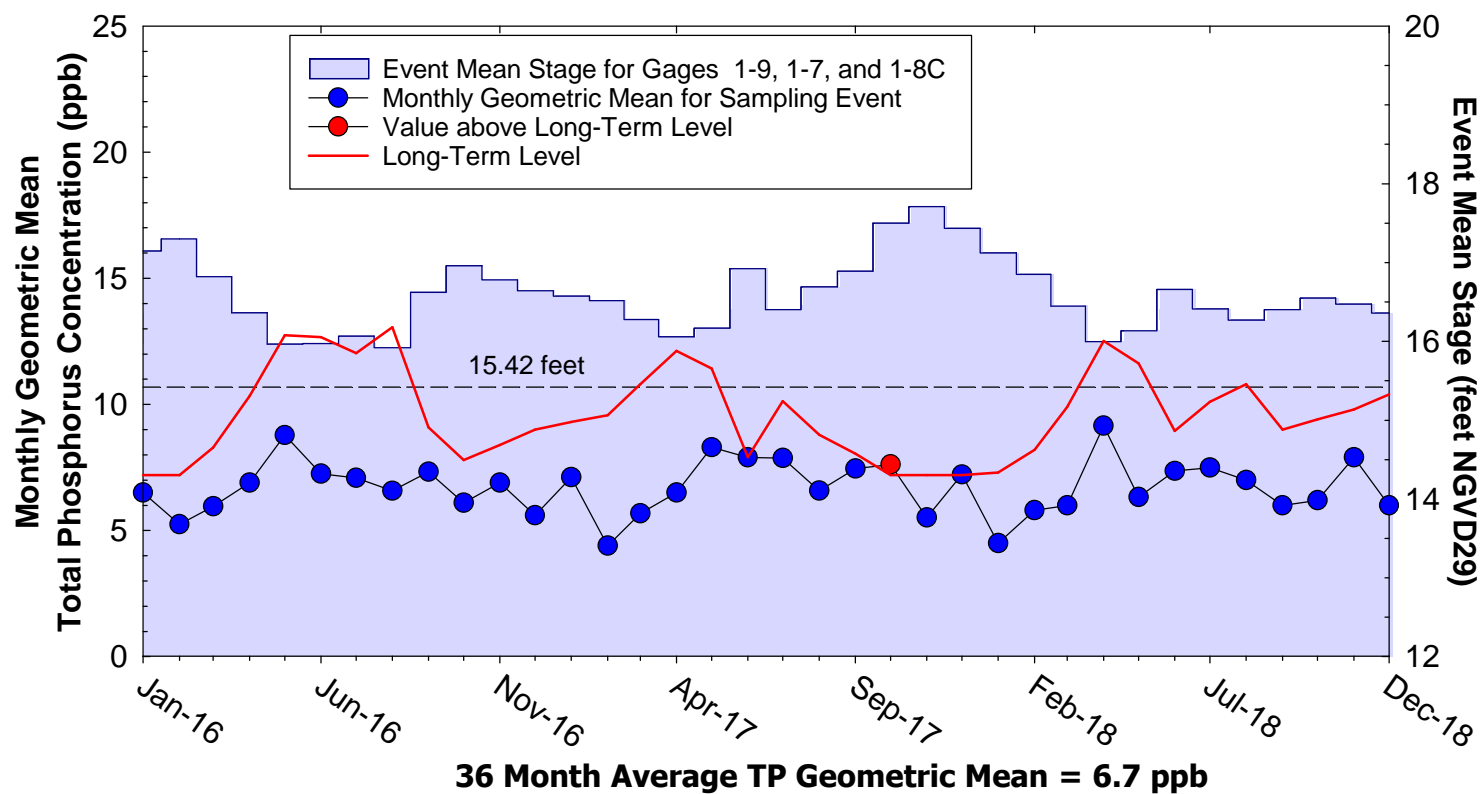
SRS - Method 1 (left values) computed as S12s+(S333+S355A+S355B-S334) and Method 2 (values in parentheses) computed as S12s+(S333+S355A+S355B+S356-S334)

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

TS and CB - Method 1 (left values) computed as S332D+S18C, Method 2 (first values in parentheses) computed as S332D+S18C+G737, and Method 3 as (S332D-S332DX1-S328)+S328+G737+S18C.

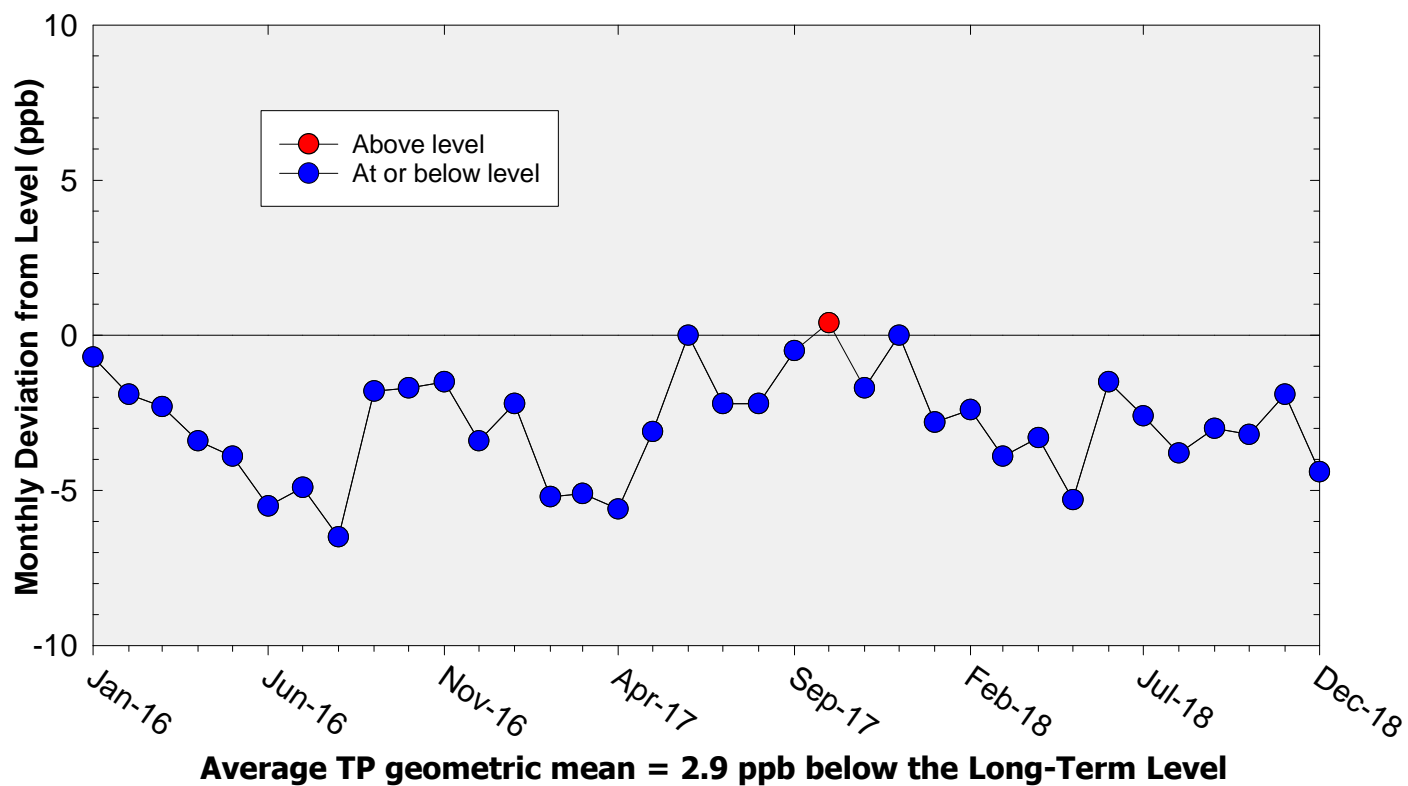
## A.R.M Loxahatchee National Wildlife Refuge

### Monthly Total Phosphorus Geometric Mean Concentrations



## A.R.M Loxahatchee National Wildlife Refuge

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



## Refuge TP Compliance Tracking

For October 2018 - April 2019

Month	Geometric Mean TP Concentration (ppb)	Long-Term Level (ppb) Effective 12/31/2006	Average Stage (feet NGVD 29)	Number of Samples
<b>3rd Quarter Compliance Tracking</b>				
<b>Oct-2018</b>	<b>6.2</b>	<b>9.4</b>	<b>16.55</b>	<b>14</b>
<b>Nov-2018</b>	<b>7.9</b>	<b>9.8</b>	<b>16.47</b>	<b>12</b>
<b>Dec-2018</b>	<b>6.0</b>	<b>10.4</b>	<b>16.36</b>	<b>11</b>
<b>Preliminary Data Outlook</b>				
<b>Jan-2019</b>	<b>6.1</b>	<b>11.4</b>	<b>16.18</b>	<b>10</b>
<b>Feb-2019</b>	<b>9.1</b>	<b>9.1</b>	<b>16.62</b>	<b>14</b>
<b>Mar-2019</b>	<b>6.3</b>	<b>9.0</b>	<b>16.64</b>	<b>14</b>
<b>Apr-2019</b>	<b>7.4</b>	<b>11.0</b>	<b>16.24</b>	<b>12</b>

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

## Shark River Slough TP Concentration Compliance Tracking

(Water Year 2019 (October 1, 2018 – September 30, 2019) 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
Nov 2017 - Oct 2018	1,445.2 (1,489.6)	7.8 (7.7)	7.6 (7.6)	40.1 (40.1)	30.8 (30.8)
Dec 2017 - Nov 2018	1,119.0 (1,163.5)	8.5 (8.3)	7.6 (7.6)	40.1 (40.1)	36.0 (36.0)
Jan 2018 - Dec 2018	909.6 (954.1)	9.1 (8.9)	8.4 (8.1)	43.6 (42.5)	36.0 (36.0)

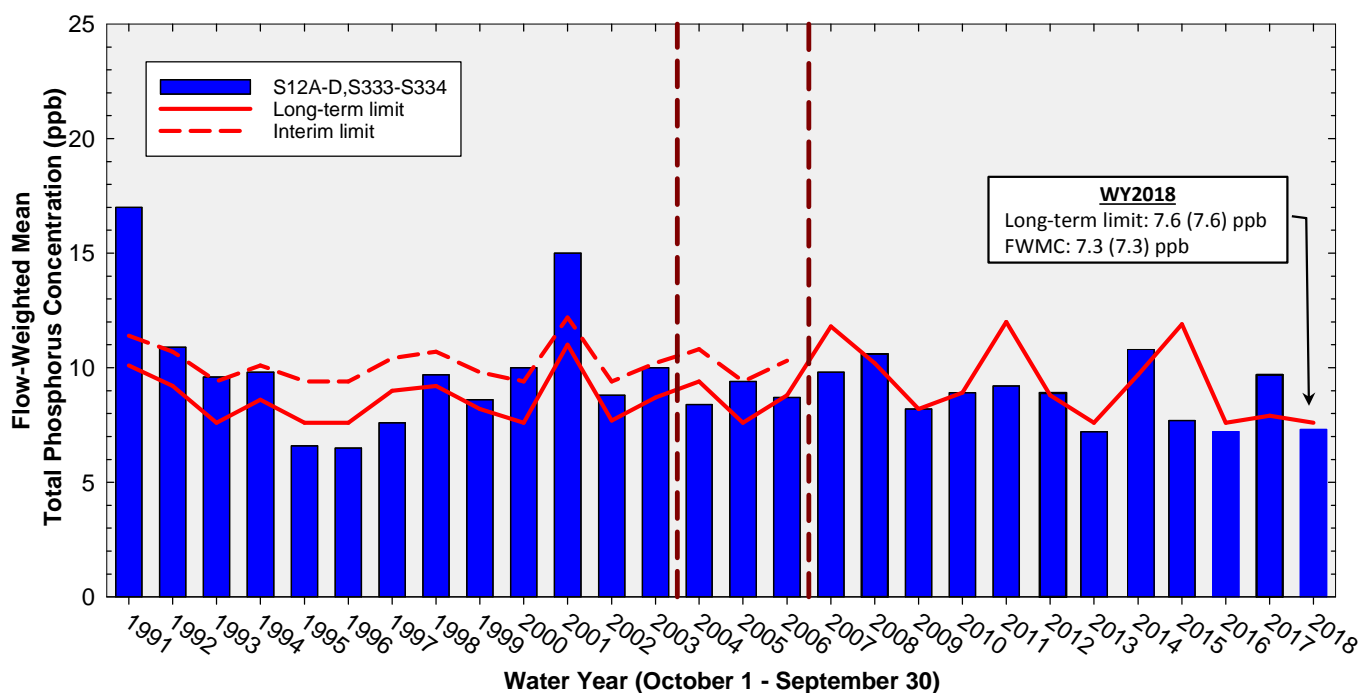
### Shark River Slough PROVISIONAL RESULTS:

**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.**

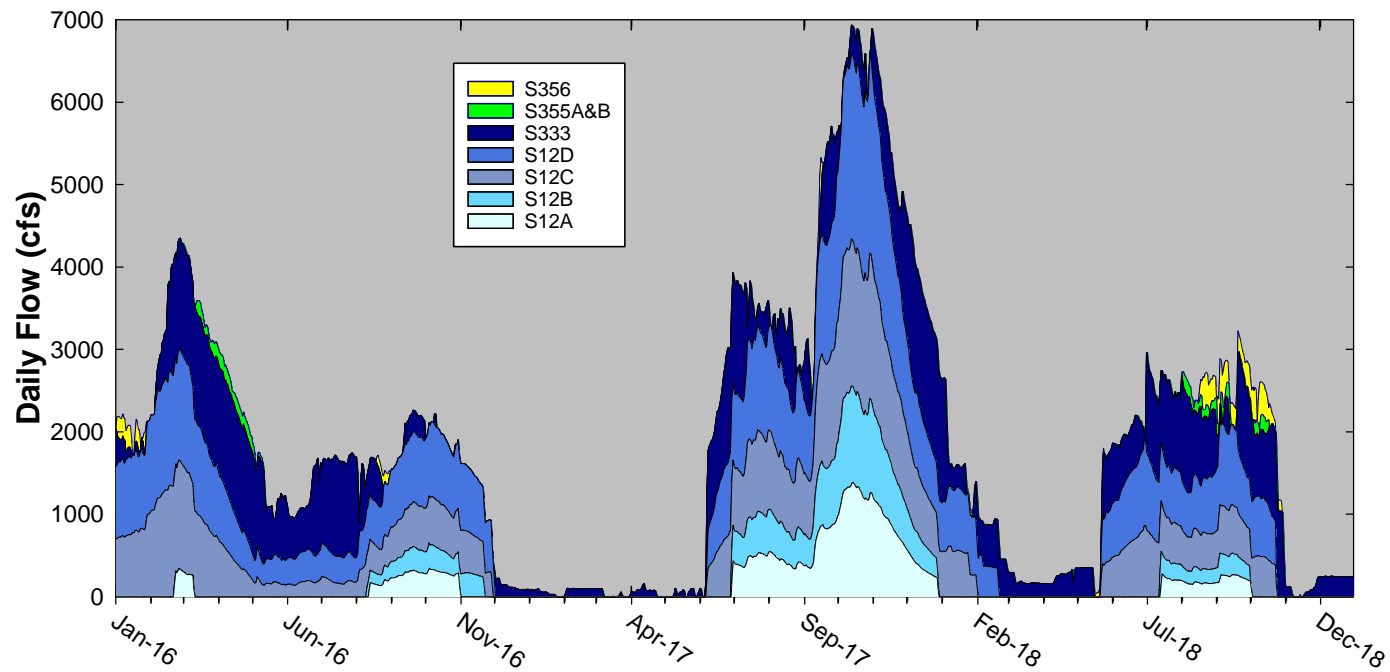
## Annual Flow-weighted Mean Concentrations Inflows to ENP through Shark River Slough



**12-month FWMC at the end of each water year  
compared to the TP interim and long-term limits**

## Shark River Slough Structure Daily Flows

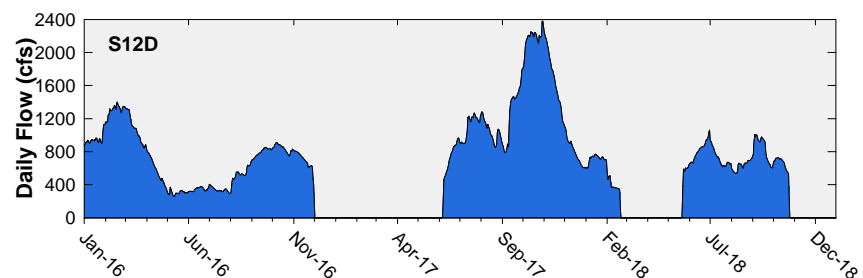
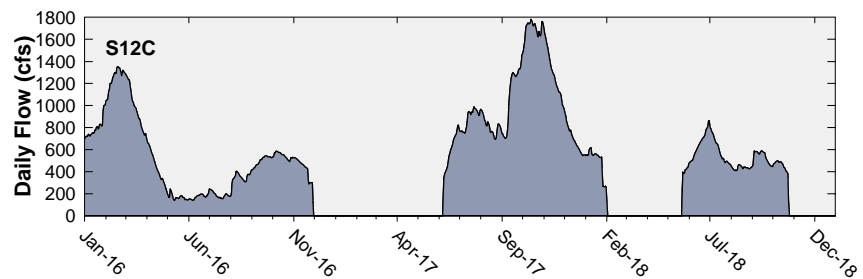
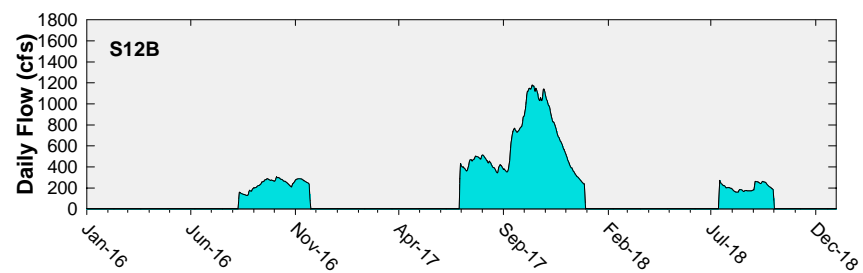
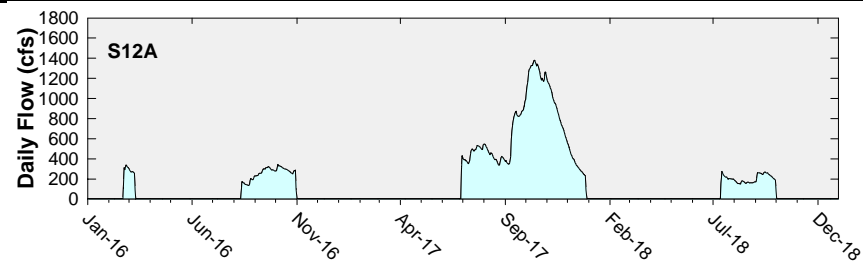
(4<sup>th</sup> Quarter 2018 Flow Data are Provisional)



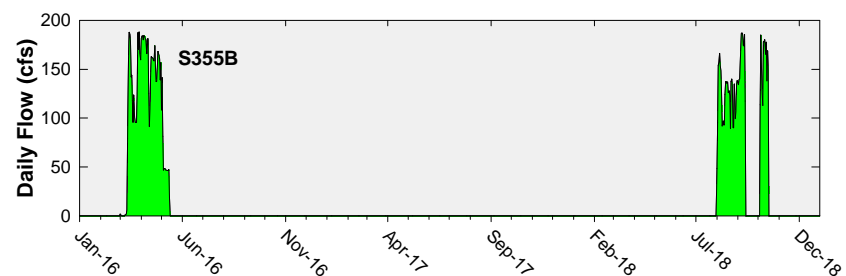
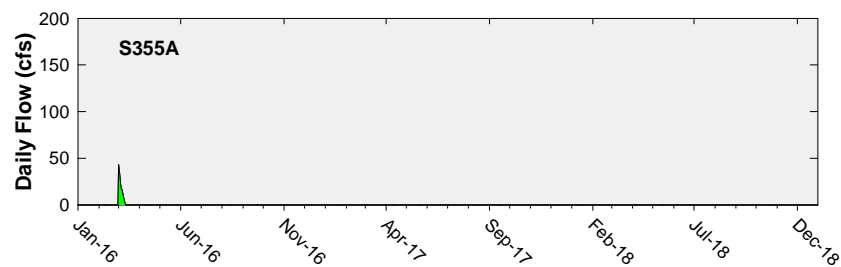
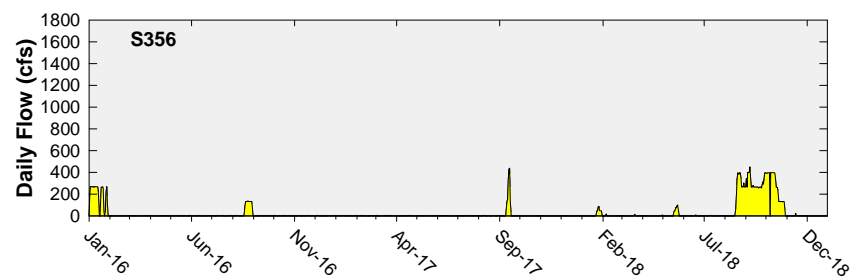
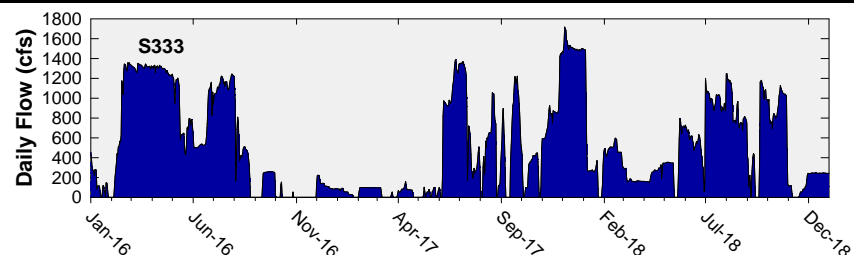


## Daily Flows at S12 Structures to Shark River Slough

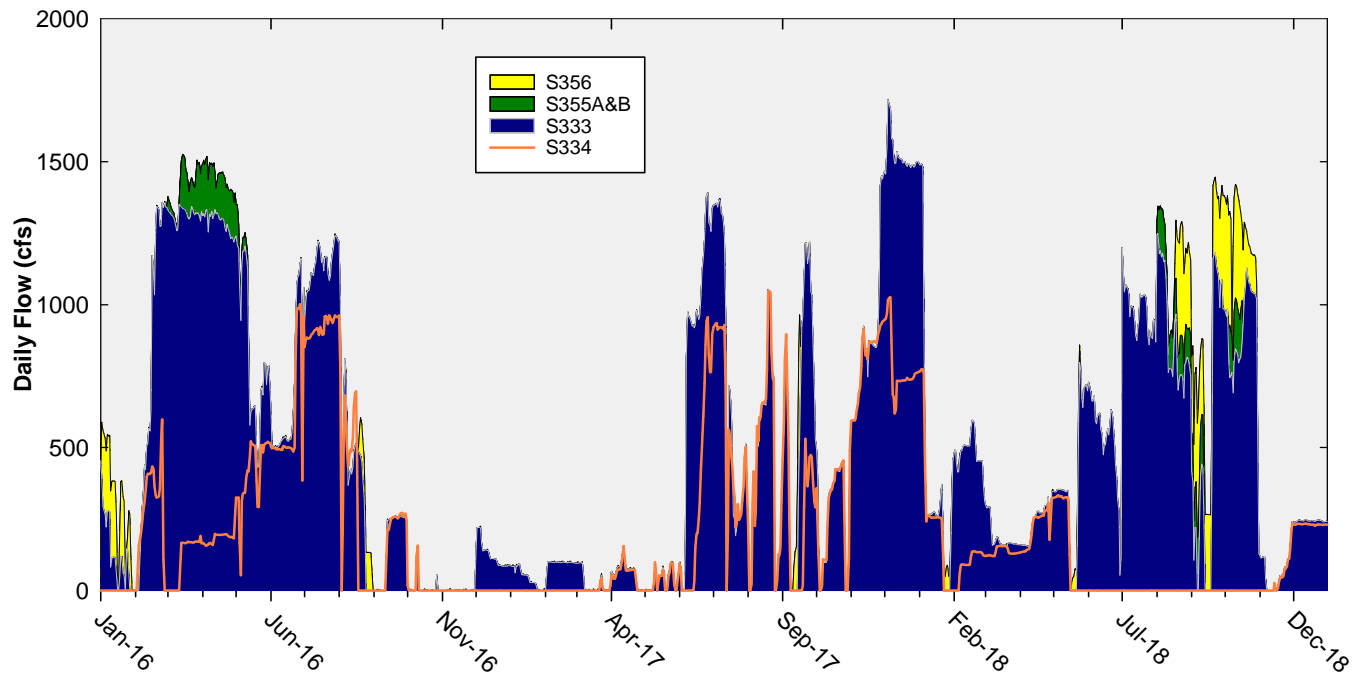
(4<sup>th</sup> Quarter 2018 Flow Data  
are Provisional)



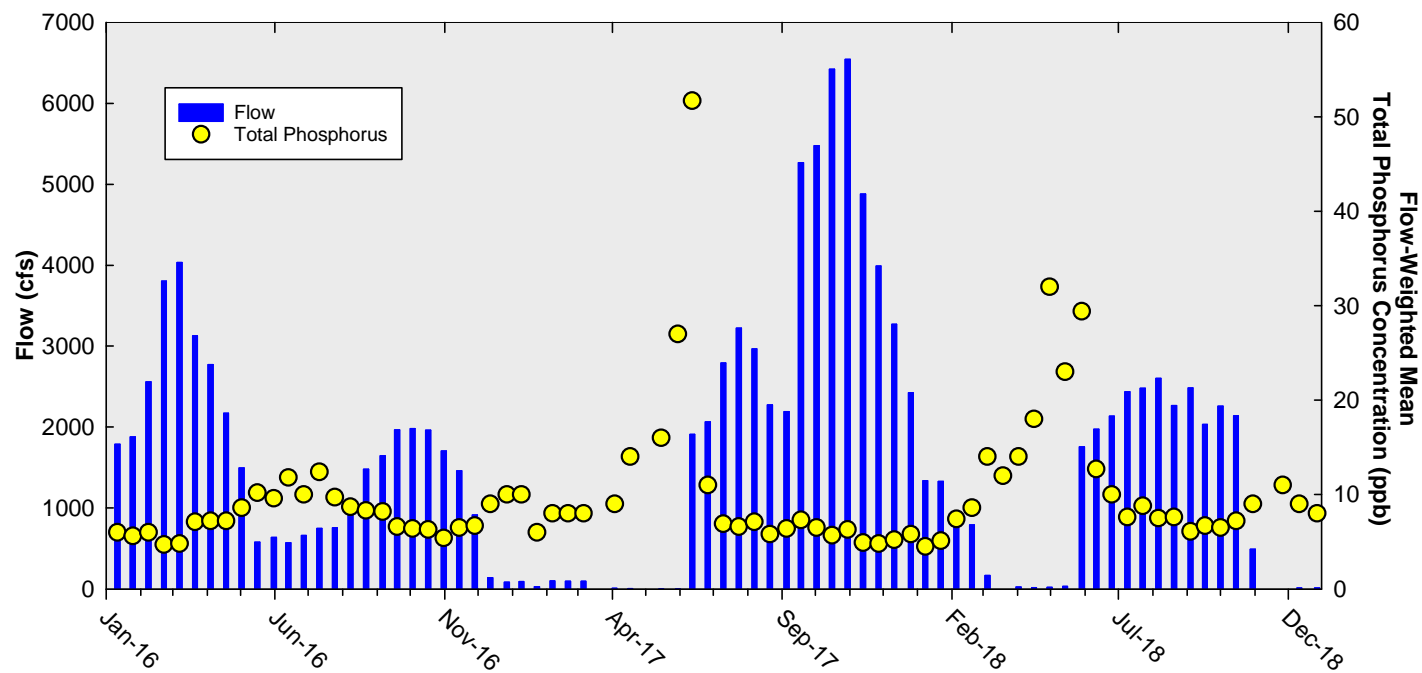
## Daily Flows at Individual Inflow Structures to Shark River Slough



## Daily Flows Into Shark River Slough through S333, S355A&B, and S356 and Out through S334



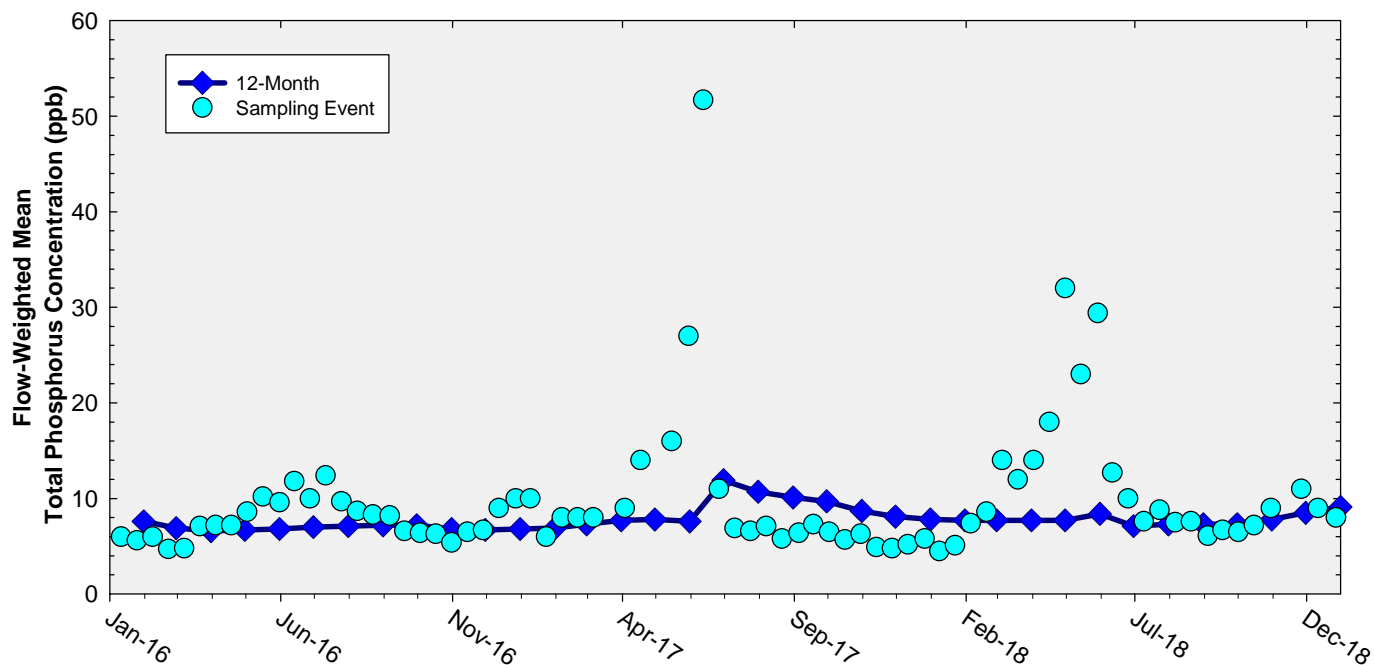
## Shark River Slough Sampling Event Flow and FWMC



**Flow to Shark River Slough 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

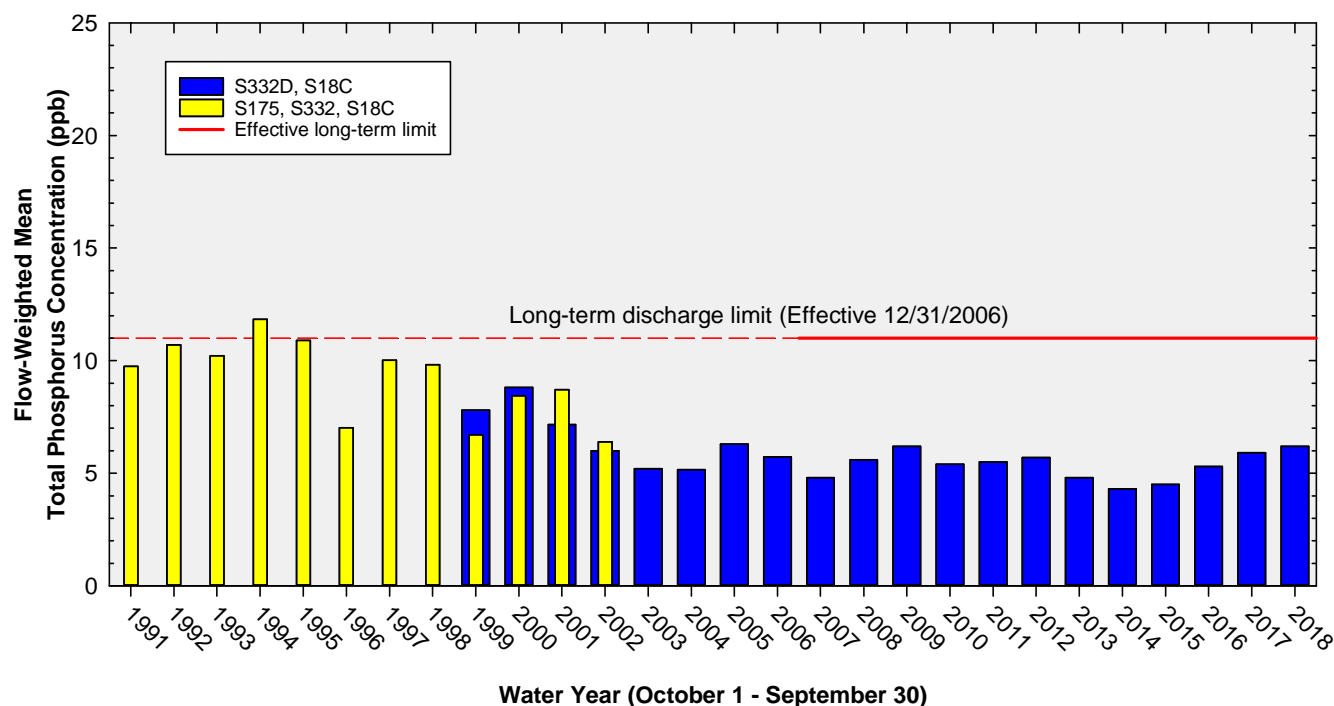
12-Month Period	Total Flow in kac-ft	Flow-Weighted Mean TP Concentration in ppb LTL = 11.0 ppb Effective 12/31/2006	Observed Percent of Sampling Events Greater than 10 ppb Guideline = 53.1%
Nov 2017 - Oct 2018	371.5 (447.8, 429.2)	6.2 (6.0, 5.8)	3.8 (3.8, 3.8)
Dec 2017 - Nov 2018	350.5 (413.5, 394.8)	6.2 (6.0, 5.8)	3.8 (3.8, 3.8)
Jan 2018 - Dec 2018	319.4 (368.9, 350.2)	6.3 (6.0, 5.8)	3.8 (3.8, 3.8)

Method 1 (S332D+S18C) results are the left most values.

Method 2 (S332D+S18C+G737) results are the first values in parentheses.

Method 3 [(S332D-S332DX1-S328)+S328+G737+S18C] results are the second values in parentheses.

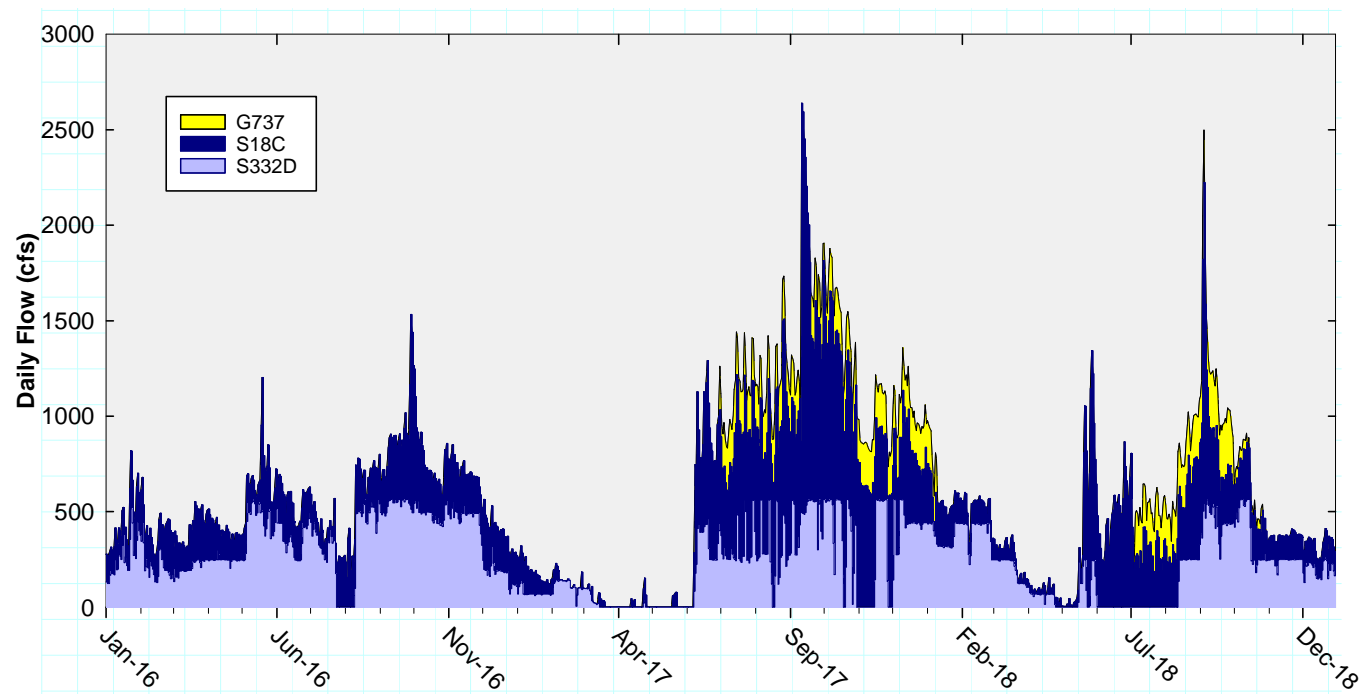
## Annual Flow-Weighted Mean Concentrations Inflows to the ENP through Taylor Slough and Coastal Basins



**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.

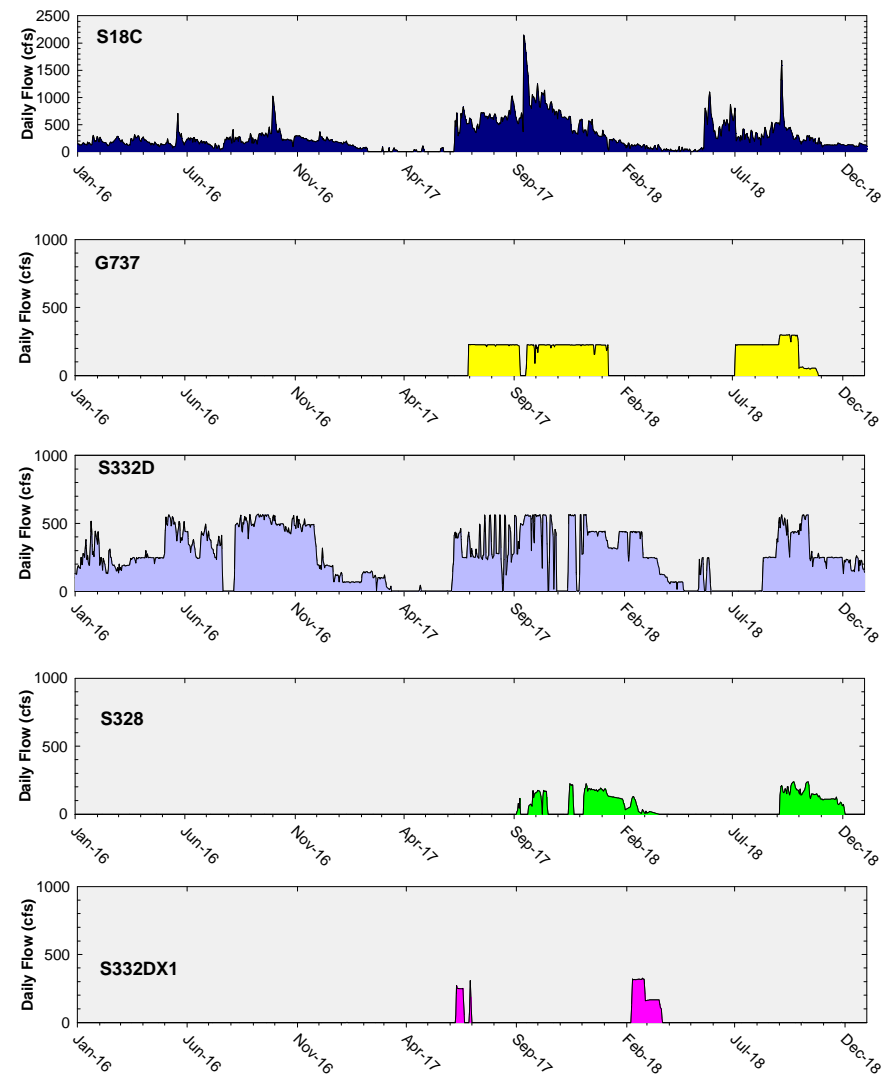
## Daily Flows at Taylor Slough and Coastal Basins Structures into ENP



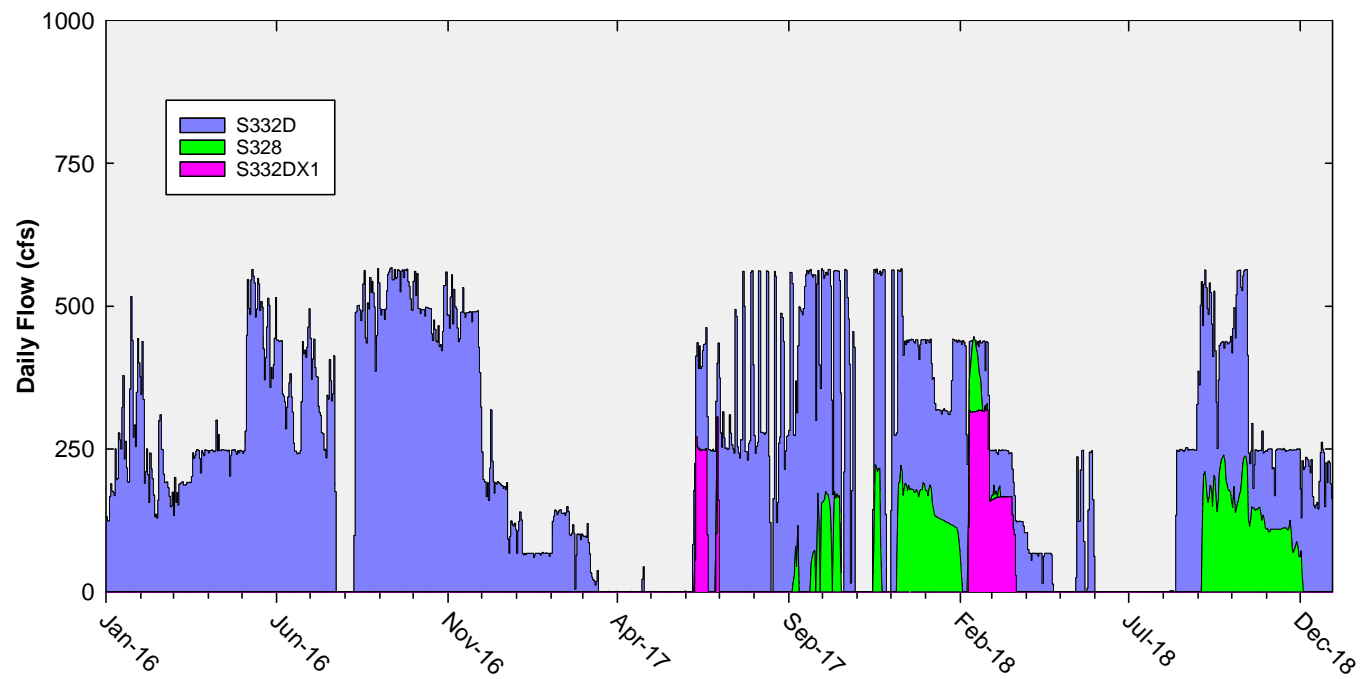


## Daily Flows at Individual Taylor Slough and Coastal Basins Structures into ENP

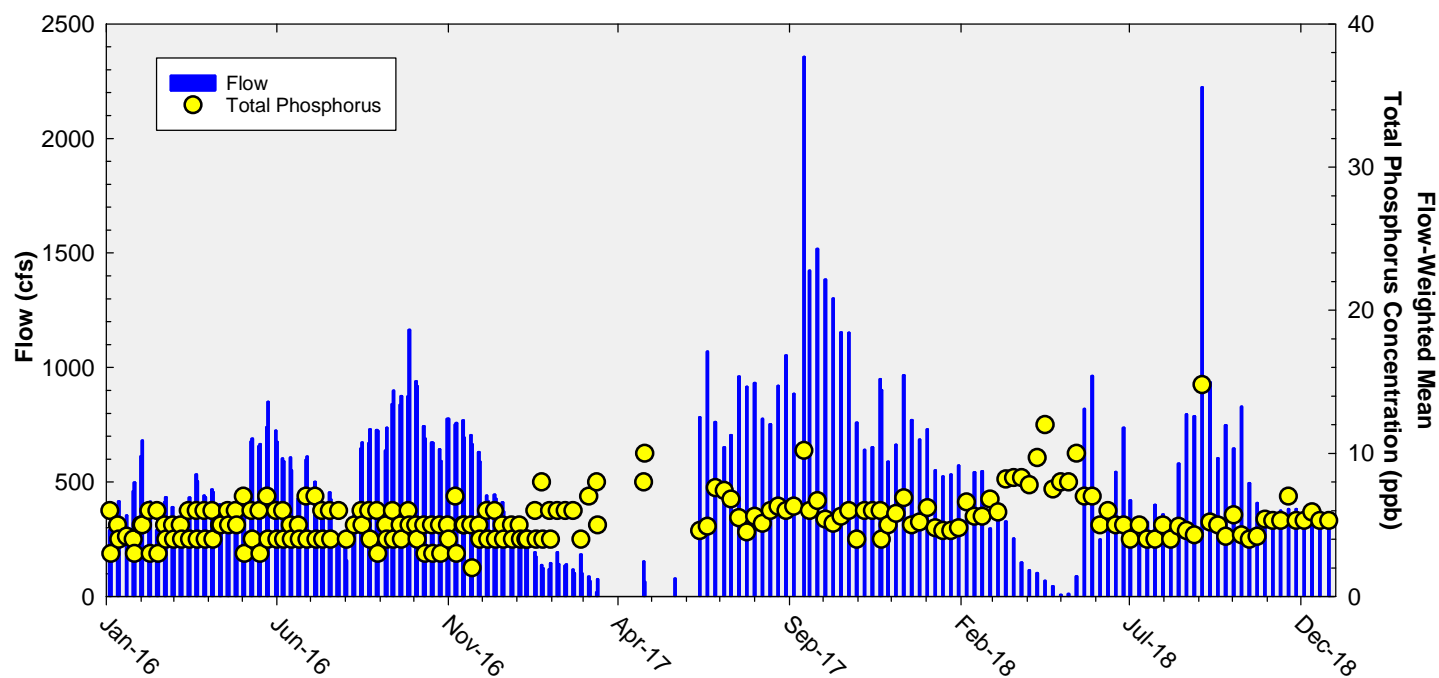
**Note: G737 flow prior to October 1, 2018, is based on S200 pump flow on days when G737 gates are open.**



## Daily Flows Into and Out of C-111 Detention Area



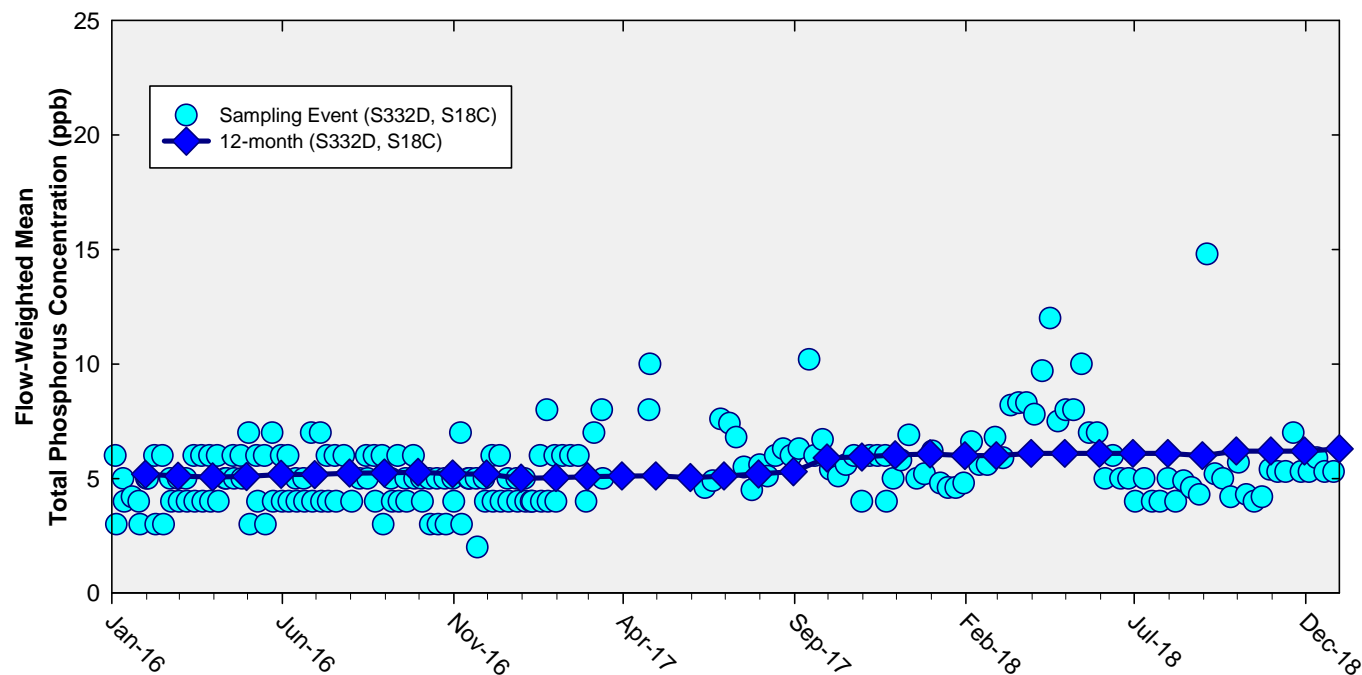
## Taylor Slough and Coastal Basins Sampling Event Flow and FWMC



**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

