SOUTH FLORIDA WATER MANAGEMENT DISTRICT

# SETTLEMENT AGREEMENT QUARTERLY REPORT

April – June 2019

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Section Leader
Compliance Assessment & Reporting Section
Water Quality Bureau

**Technical Oversight Committee**

**November 5, 2019**

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** | | | | |
| Apr 2019 | 7.4 | 11.0 | 16.24 | 12 |
| May 2019 | 10.4 | 11.5 | 16.16 | 10 |
| Jun 2019 | 8.6 | 12.2 | 16.04 | 9 |

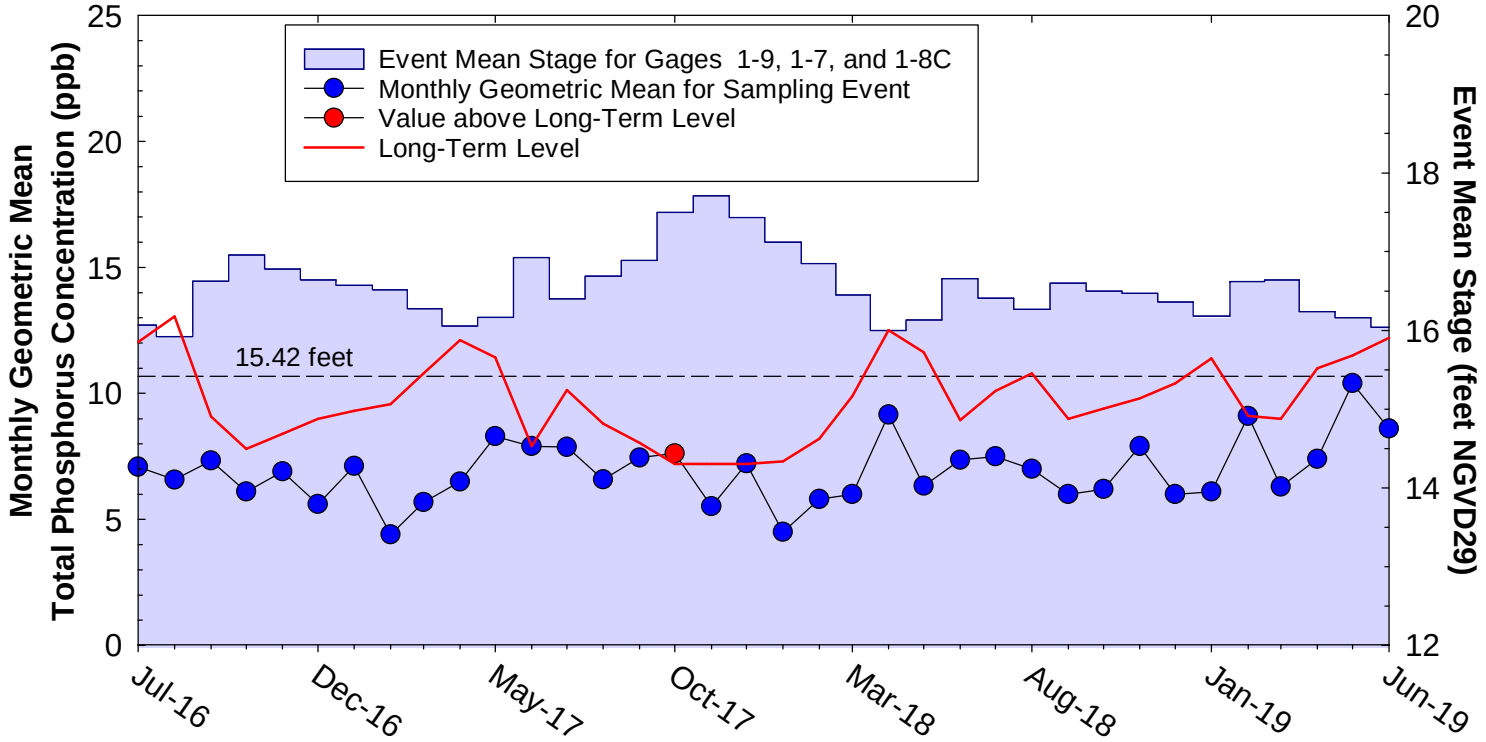
| 12-Month Period Ending | Total Flow (kac-ft) | 12-Month TP FWMC (ppb) | Long-Term Limit (ppb) | Percent of Sampling Events Greater than 10 ppb | |
|---|---|---|---|---|---|
| | | | | Guideline | Observed |
| **Everglades National Park – Shark River Slough – *PROVISIONAL DATA and RESULTS*** | | | | | |
| Apr 2019 | 863.1 (906.7) | 10.0 (9.7) | 8.6 (8.4) | 44.7 (43.7) | 37.5 (37.5) |
| May 2019 | 859.7 (902.3) | 8.8 (8.5) | 8.6 (8.4) | 44.8 (43.8) | 37.5 (37.5) |
| Jun 2019 | 790.3 (840.7) | 8.9 (8.6) | 9.0 (8.7) | 46.6 (45.3) | 41.7 (41.7) |
| **Everglades National Park – Taylor Slough and Coastal Basins** | | | | | |
| Apr 2019 | 268.5 (314.6, 314.6) | 6.2 (6.0, 5.9) | 11.0 | 53.1 | 1.9 (1.9, 1.9) |
| May 2019 | 249.4 (295.5, 295.5) | 6.2 (5.9, 5.8) | 11.0 | 53.1 | 3.8 (3.8, 3.8) |
| Jun 2019 | 237.5 (284.3, 282.7) | 6.3 (6.0, 5.9) | 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

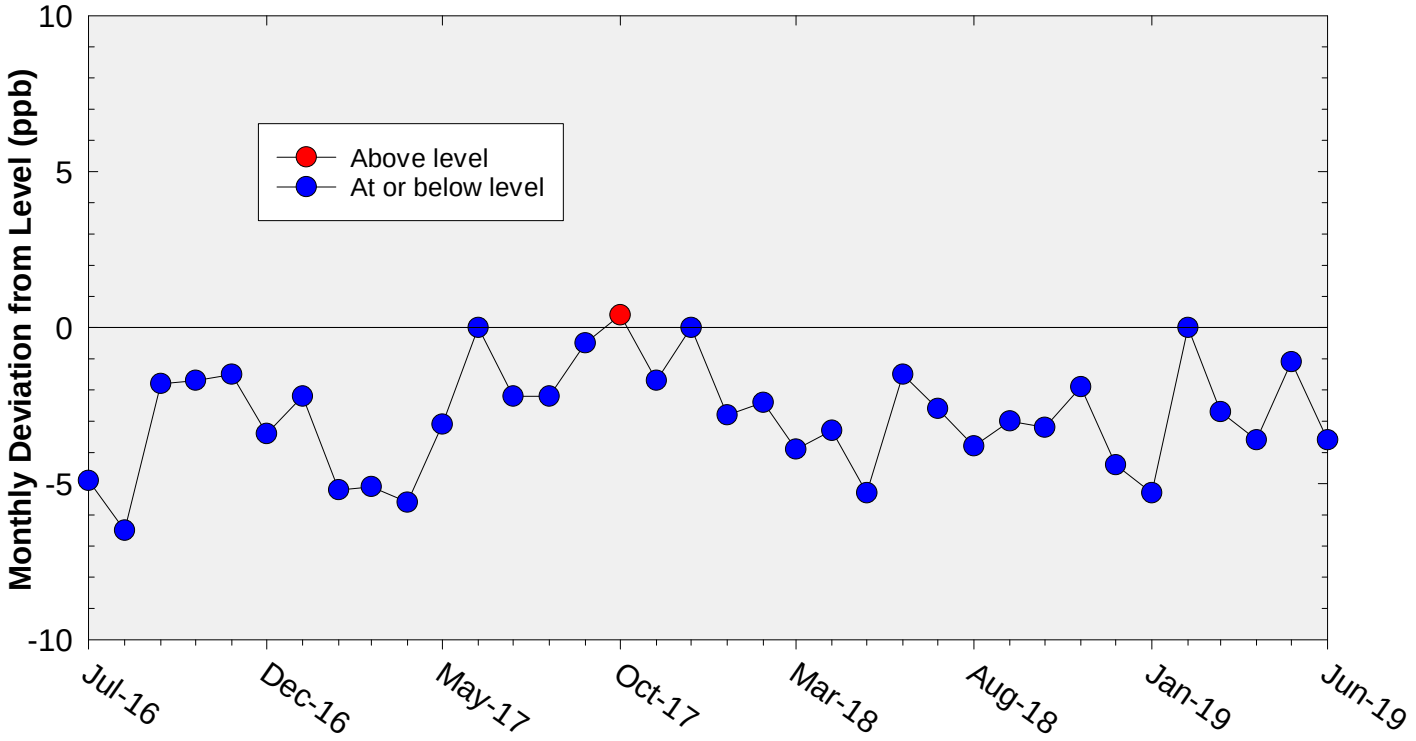
## Monthly Total Phosphorus Geometric Mean Concentrations




**36 Month Average TP Geometric Mean = 6.9 ppb**

# A.R.M Loxahatchee National Wildlife Refuge

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




**Average TP geometric mean = 2.9 ppb below the Long-Term Level**

# Refuge TP Compliance Tracking

## For April 2019 – September 2019

| Month | Geometric Mean TP Concentration (ppb) | Long-Term Level (ppb) Effective 12/31/2006 | Average Stage (feet NGVD 29) | Number of Samples |
|---|---|---|---|---|
| **1st Quarter 2019 Compliance Tracking** | | | | |
| Apr-2019 | 7.4 | 11.0 | 16.24 | 12 |
| May-2019 | 10.4 | 11.5 | 16.16 | 10 |
| Jun-2019 | 8.6 | 12.2 | 16.04 | 9 |
| **Preliminary Data Outlook** | | | | |
| Jul-2019 | 7.3 | 10.5 | 16.33 | 14 |
| Aug-2019 | 7.1 | 9.3 | 16.58 | 14 |
| Sep-2019 | 7.1 | 9.2 | 16.61 | 14 |

**Note: Samples not collected if site water depth is less than 10 centimeters or the site does not represent contiguous water body.**

# Shark River Slough
# TP Concentration Compliance Tracking

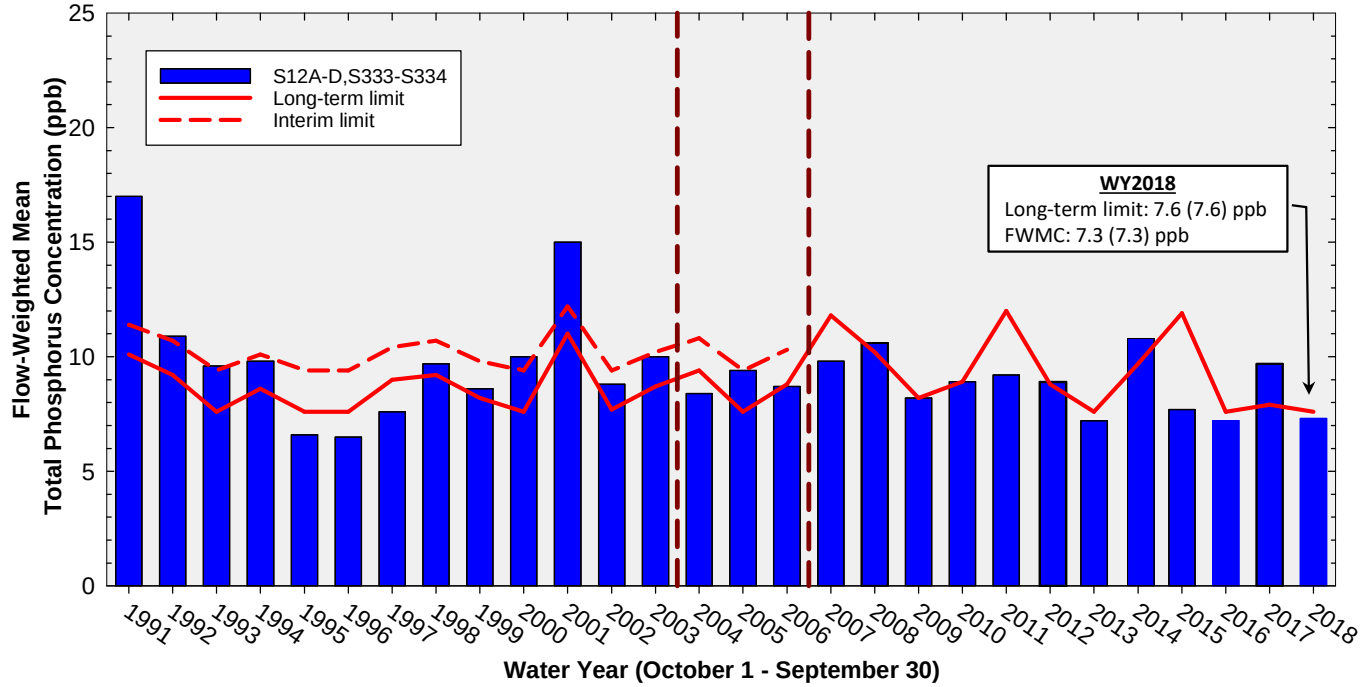
**Water Year 2019 (October 1, 2018 – September 30, 2019) Flow Data are Provisional**

| 12-Month Period | Total Flow (kac-ft) | Flow-Weighted Mean TP Concentration (ppb) | Long-Term Limit (ppb) *Effective 12/31/2006* | Percent of Sampling Events Greater than 10 ppb | |
|---|---|---|---|---|---|
| | | | | Guideline | Observed |
| May 2018 - Apr 2019 | 863.1 (906.7) | 10.0 (9.7) | 8.6 (8.4) | 44.7 (43.7) | 37.5 (37.5) |
| Jun 2018 - May 2019 | 859.7 (902.3) | 8.8 (8.5) | 8.6 (8.4) | 44.8 (43.8) | 37.5 (37.5) |
| Jul 2018 - Jun 2019 | 790.3 (840.7) | 8.9 (8.6) | 9.0 (8.7) | 46.6 (45.3) | 41.7 (41.7) |

**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

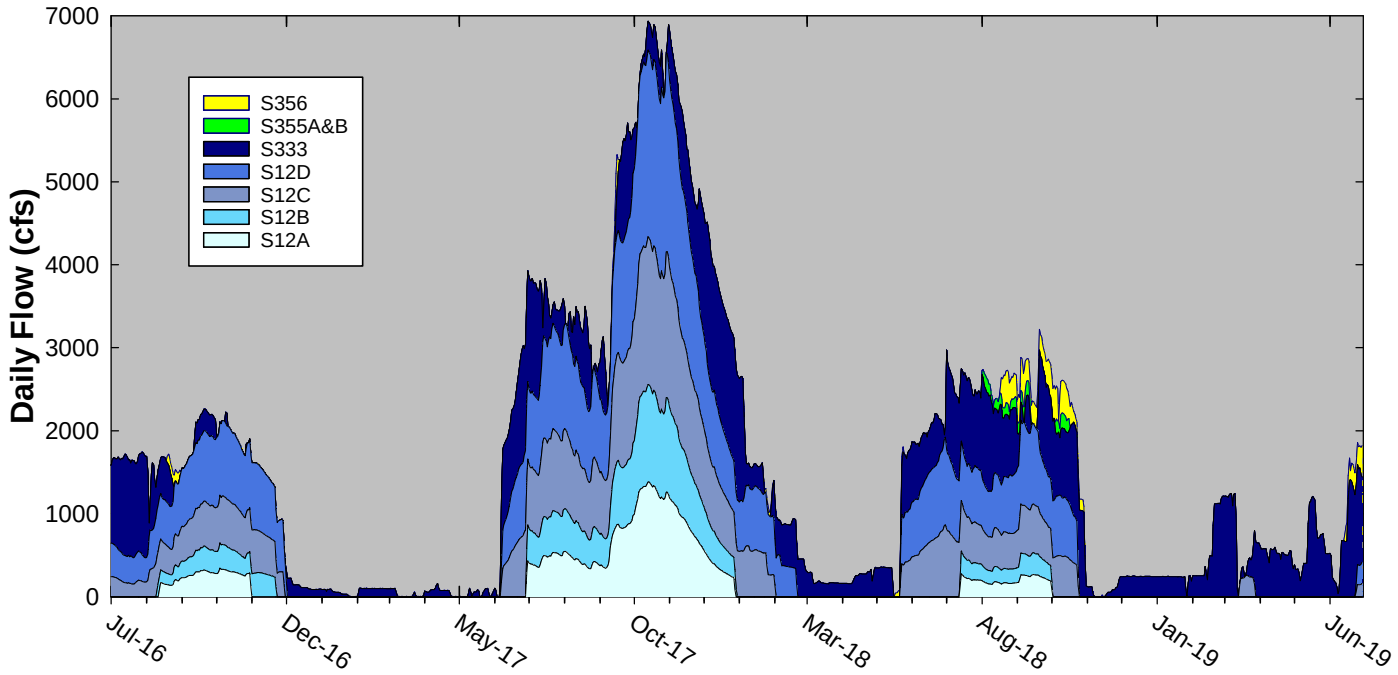
## Inflows to ENP through Shark River Slough




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

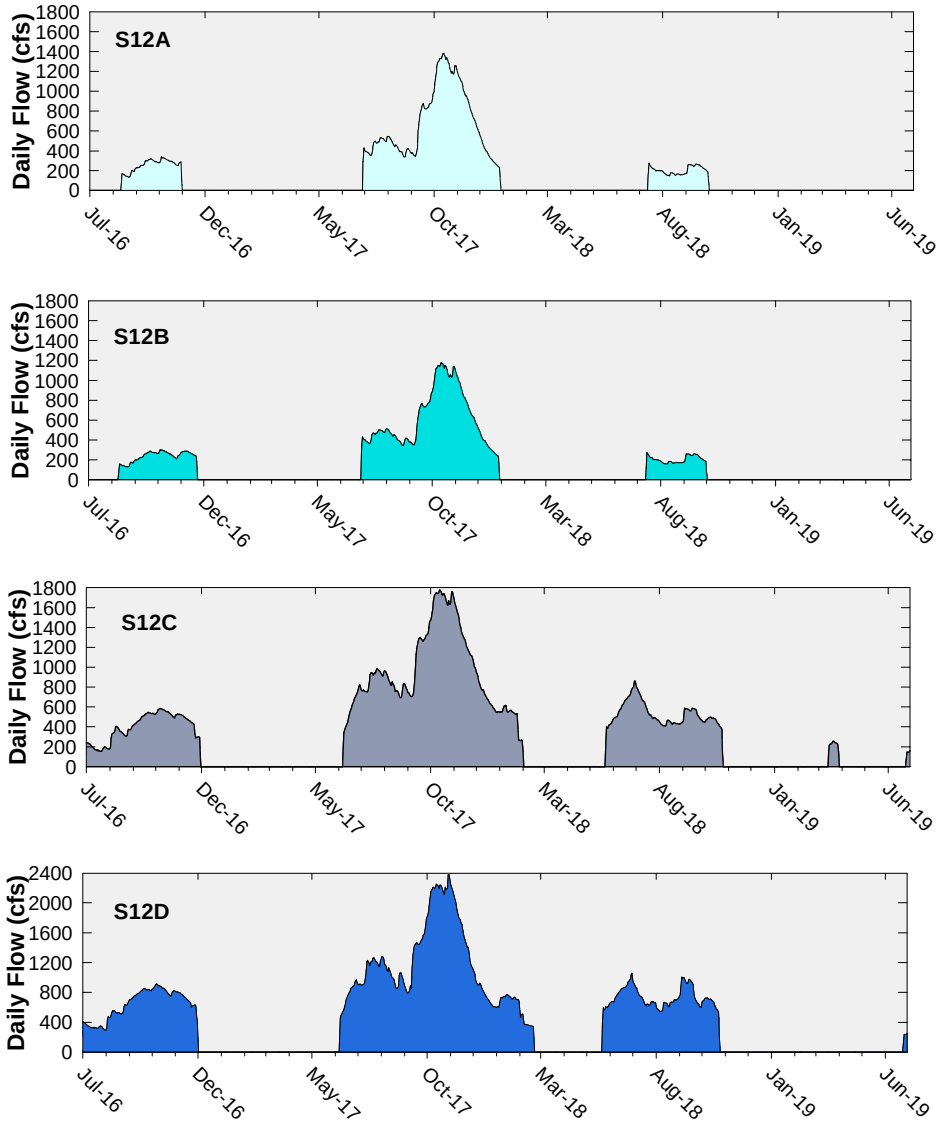
# Shark River Slough Structure Daily Flows

## WY2019 (October 1, 2018 – September 30, 2019) Flow Data are Provisional

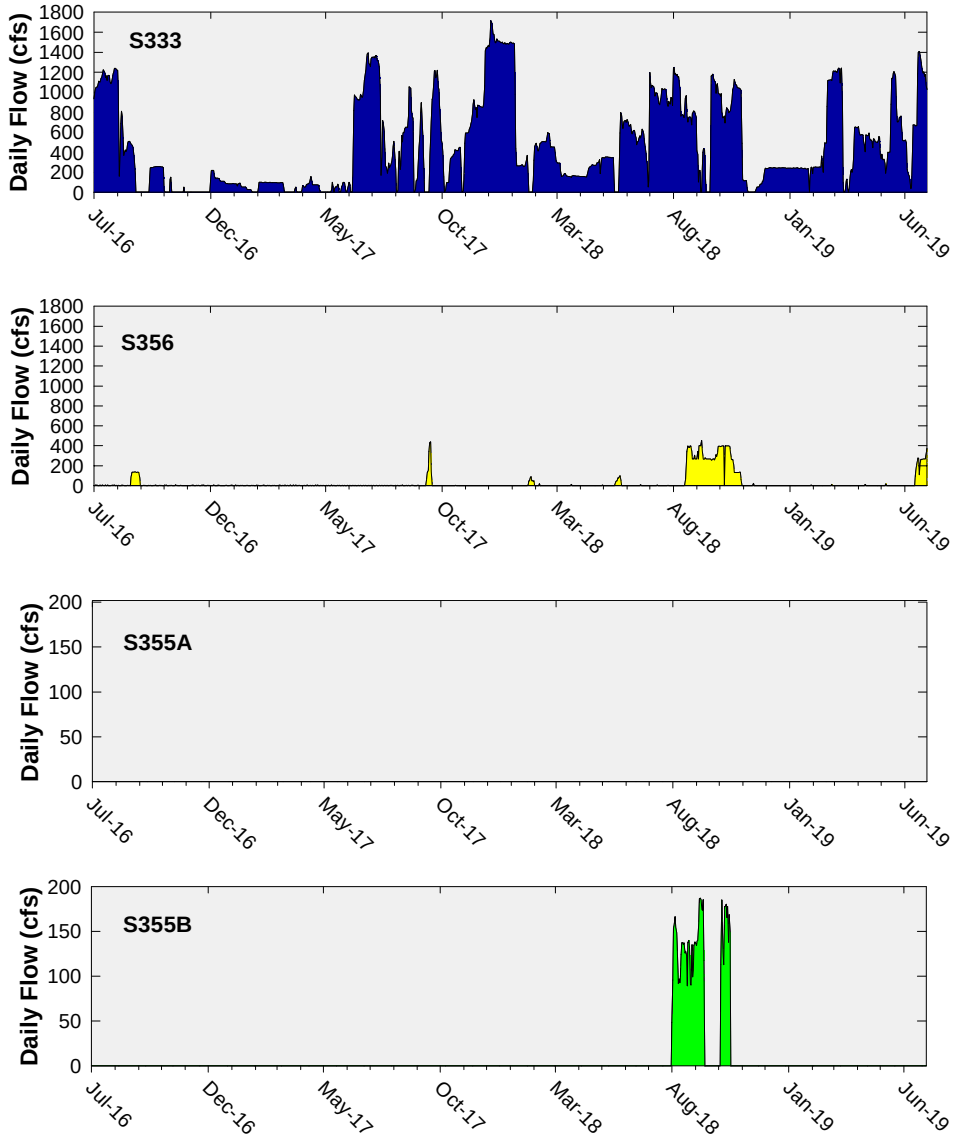


# Daily Flows at S12 Structures to Shark River Slough

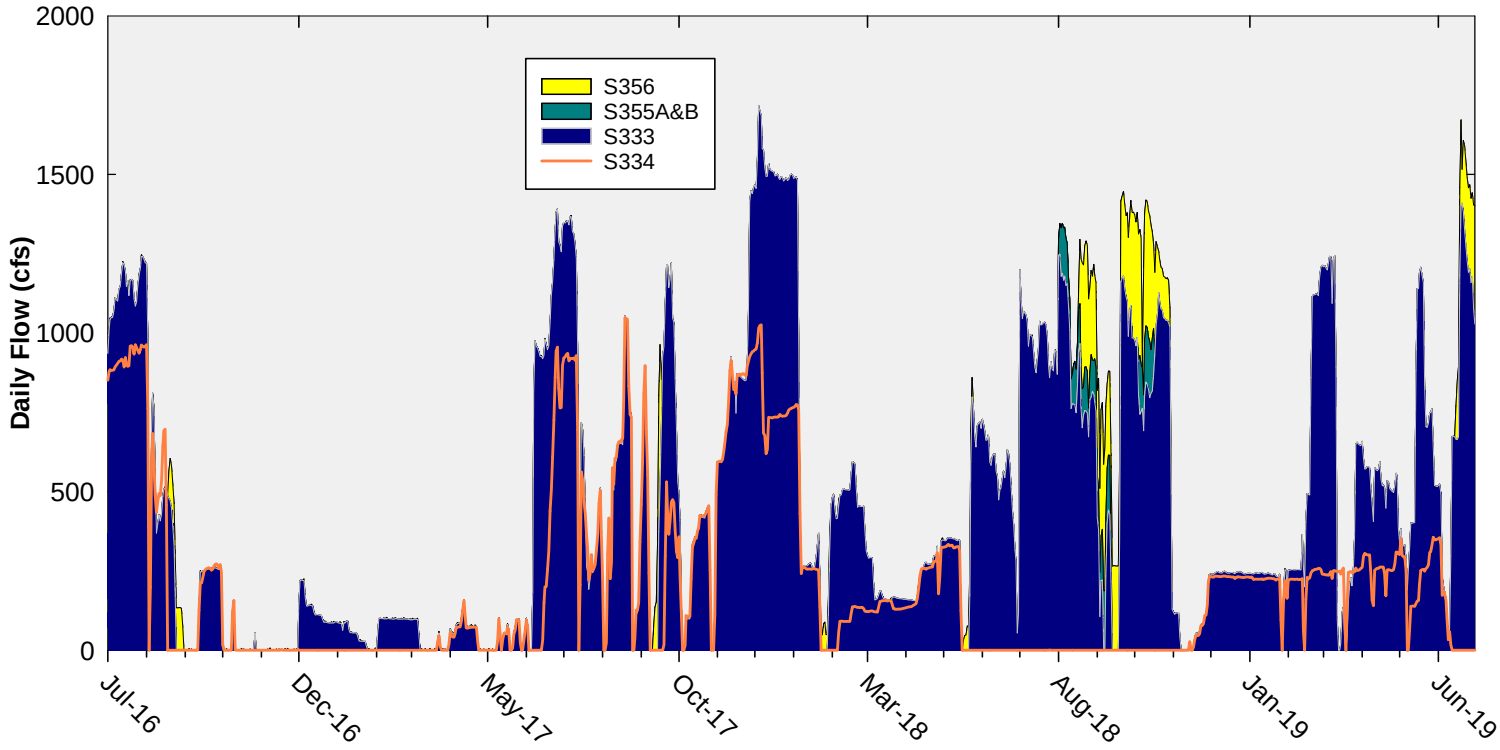
## (WY2019 Flow Data are Provisional)



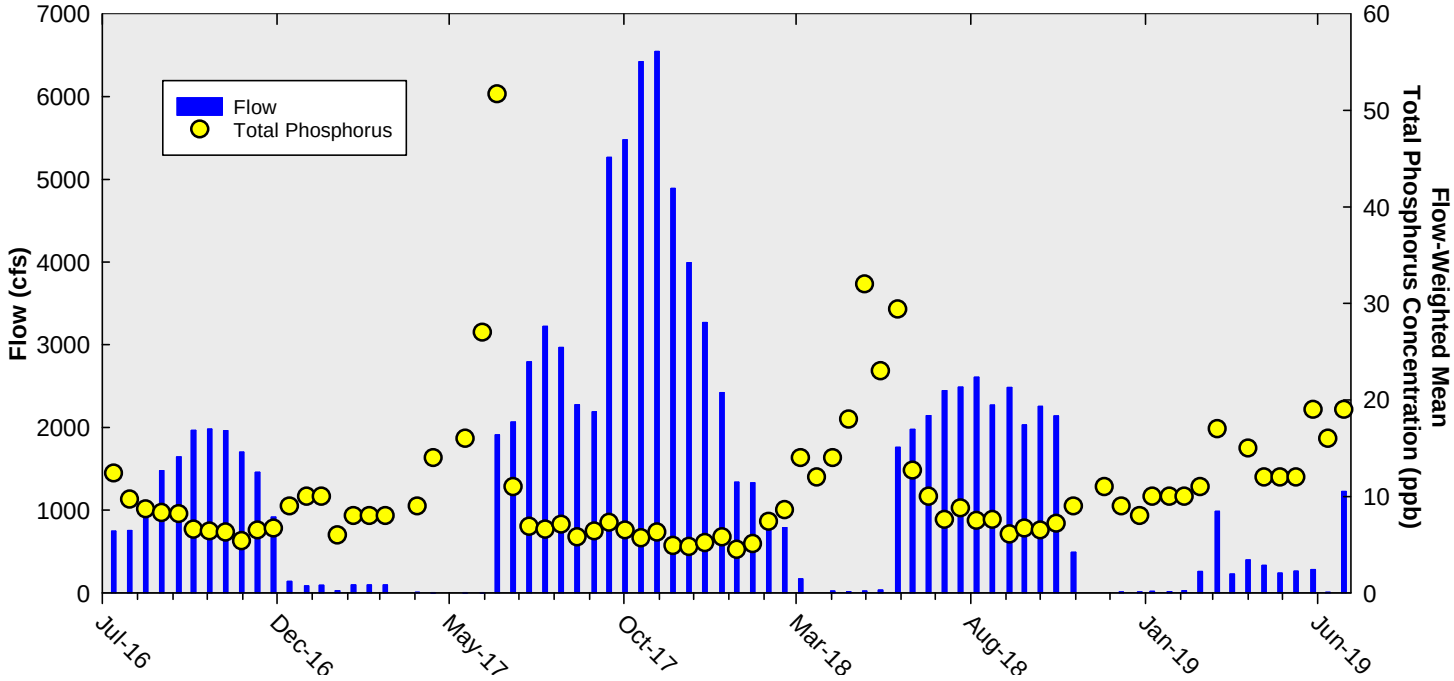
# Daily Flows at Individual Inflow Structures to Shark River Slough



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



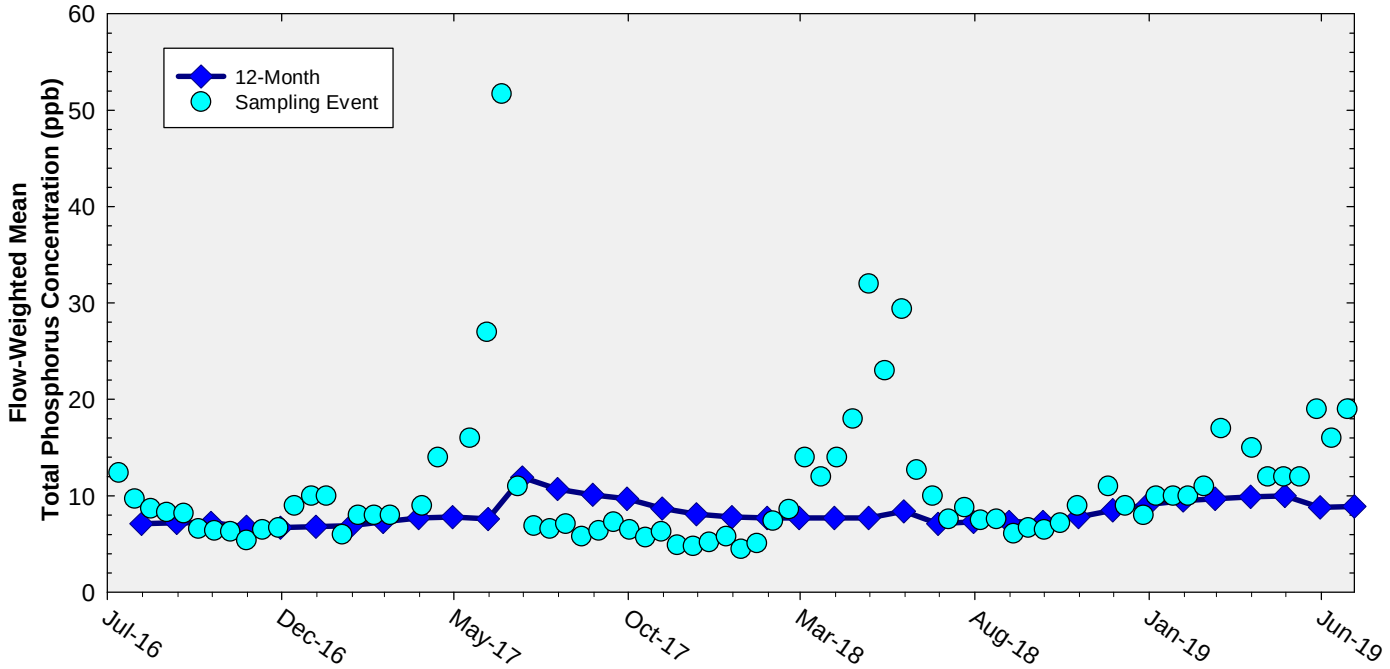
# Shark River Slough
# Sampling Event Flow and FWMC




**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<br>LTL = 11.0 ppb<br>Effective 12/31/2006 | Observed Percent of Sampling Events Greater than 10 ppb<br>Guideline = 53.1% |
|---|---|---|---|
| May 2018 - Apr 2019 | 268.5 (314.6, 314.6) | 6.2 (6.0, 5.9) | 1.9 (1.9, 1.9) |
| Jun 2018 - May 2019 | 249.4 (295.5, 295.5) | 6.2 (5.9, 5.8) | 3.8 (3.8, 3.8) |
| Jul 2018 - Jun 2019 | 237.5 (284.3, 282.7) | 6.3 (6.0, 5.9) | 3.8 (3.8, 3.8) |

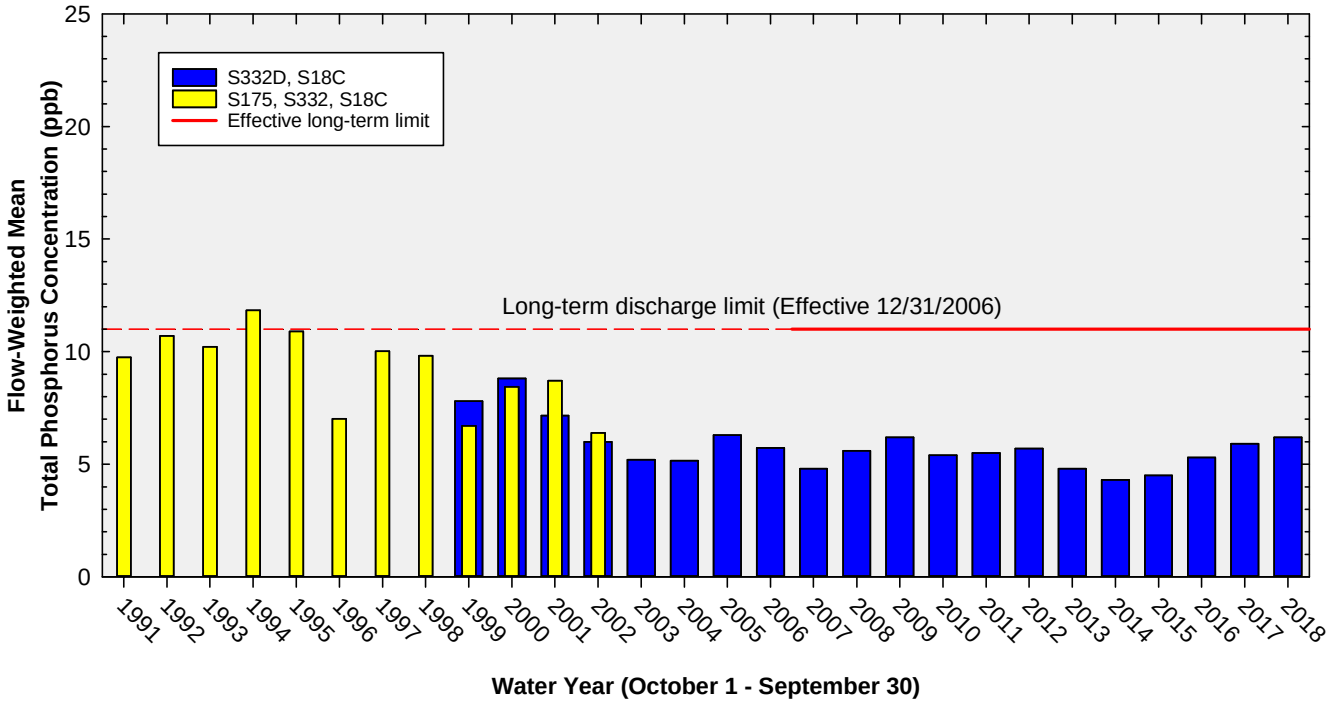
**Method 1 (S332D+S18C) results are the left most values.**

**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

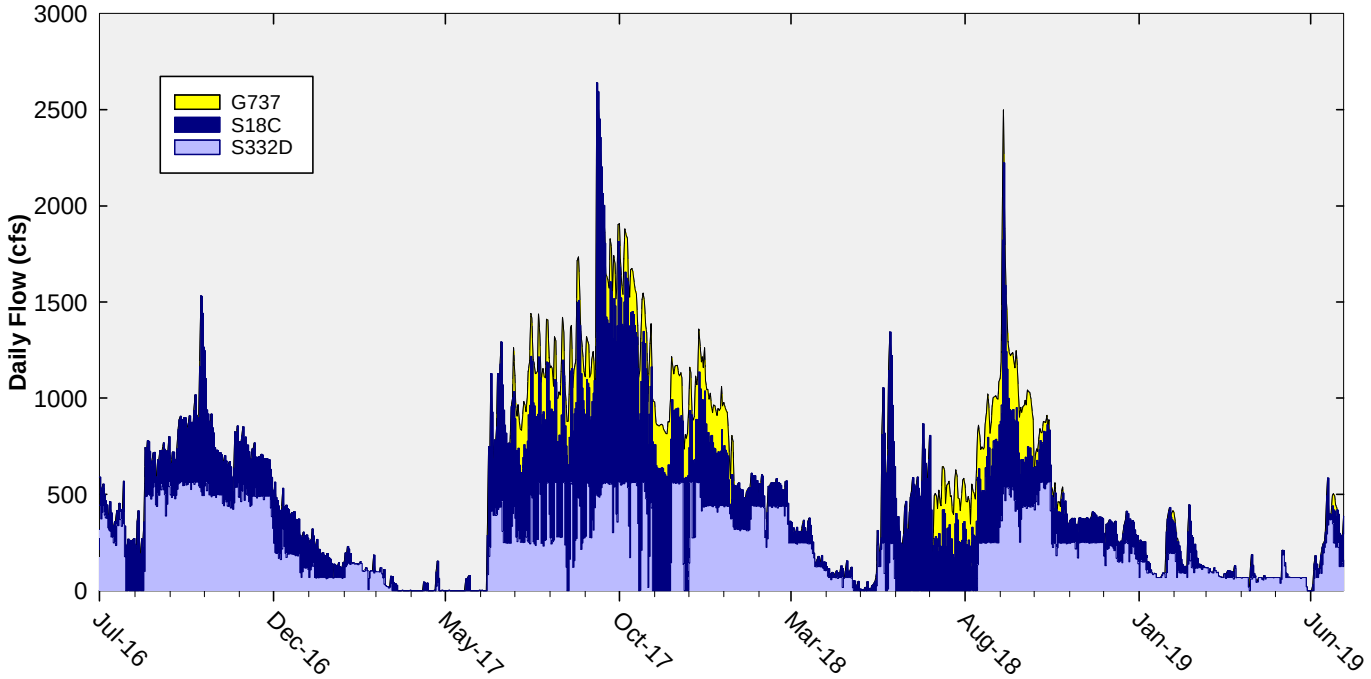
## Inflows to the ENP through Taylor Slough and Coastal Basins




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

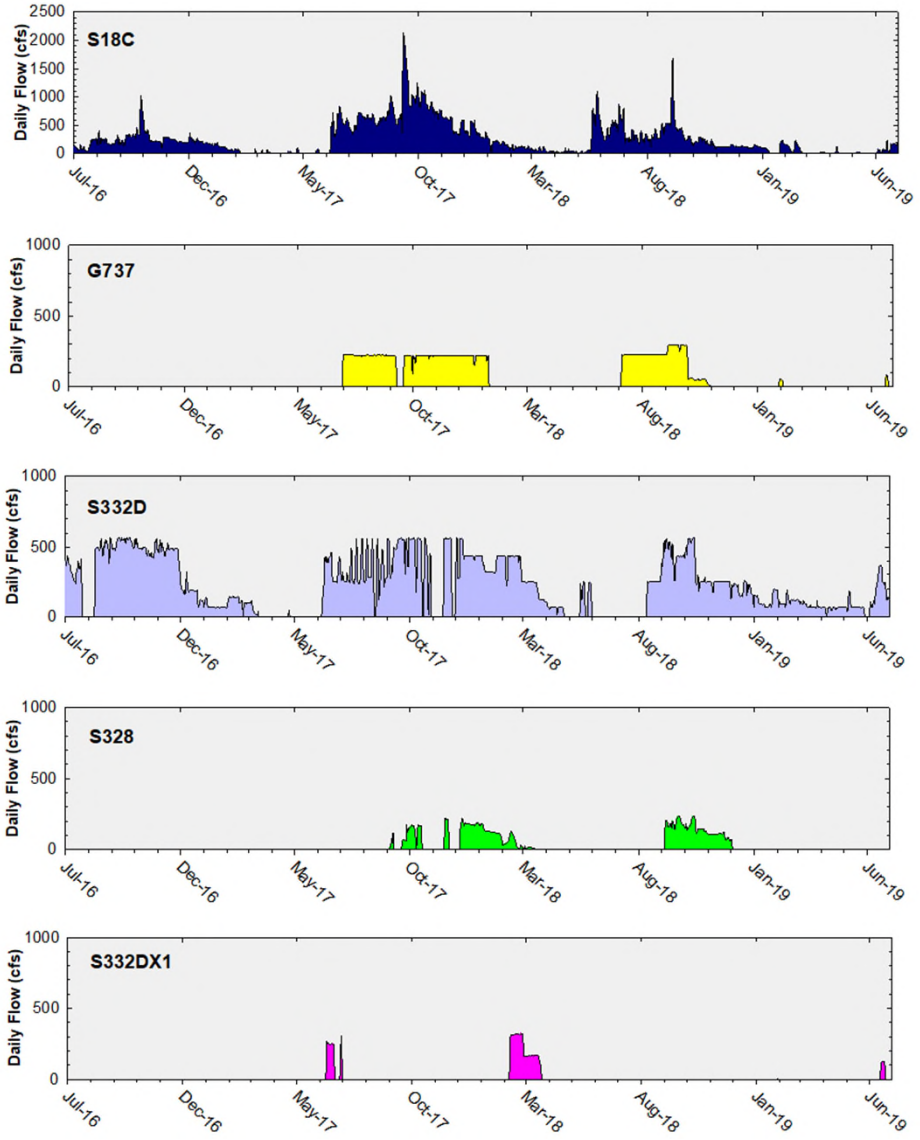
Note: Blue bars show S332D, S18C, & S174 until September 2007 when S174 was plugged.

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

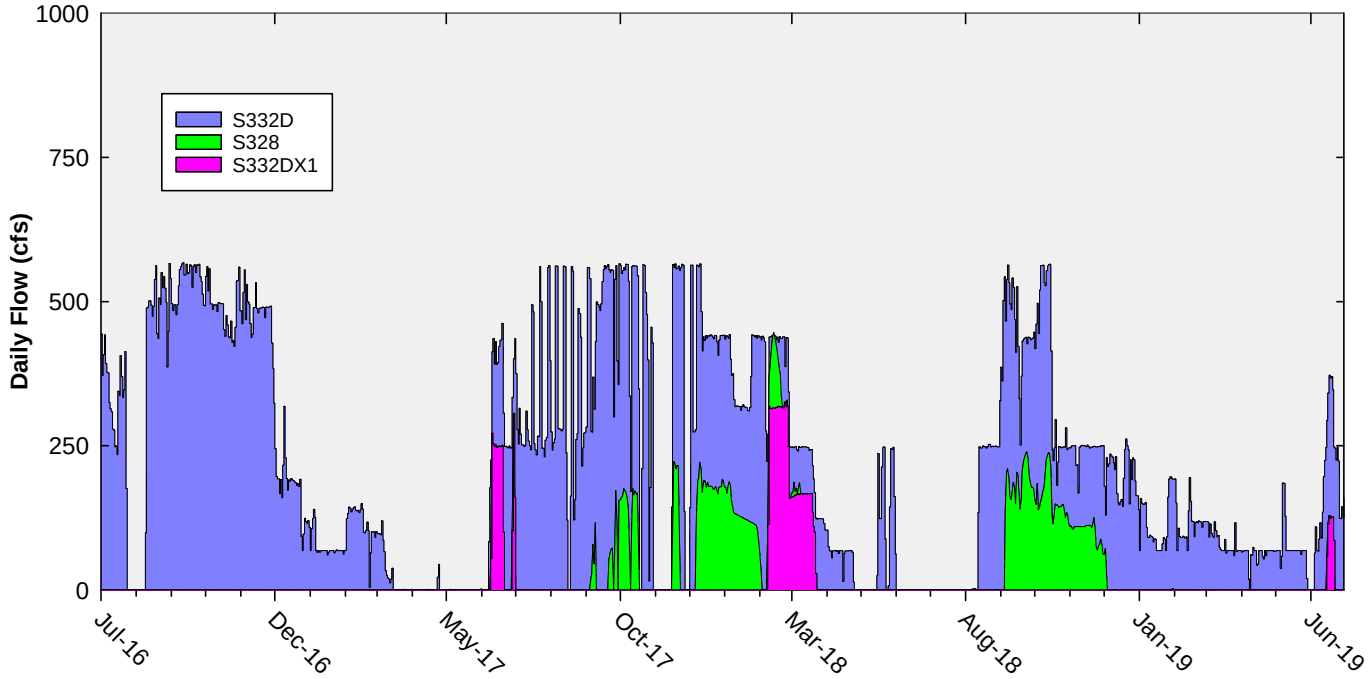


# Daily Flows at Individual Taylor Slough and Coastal Basins Structures into ENP

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

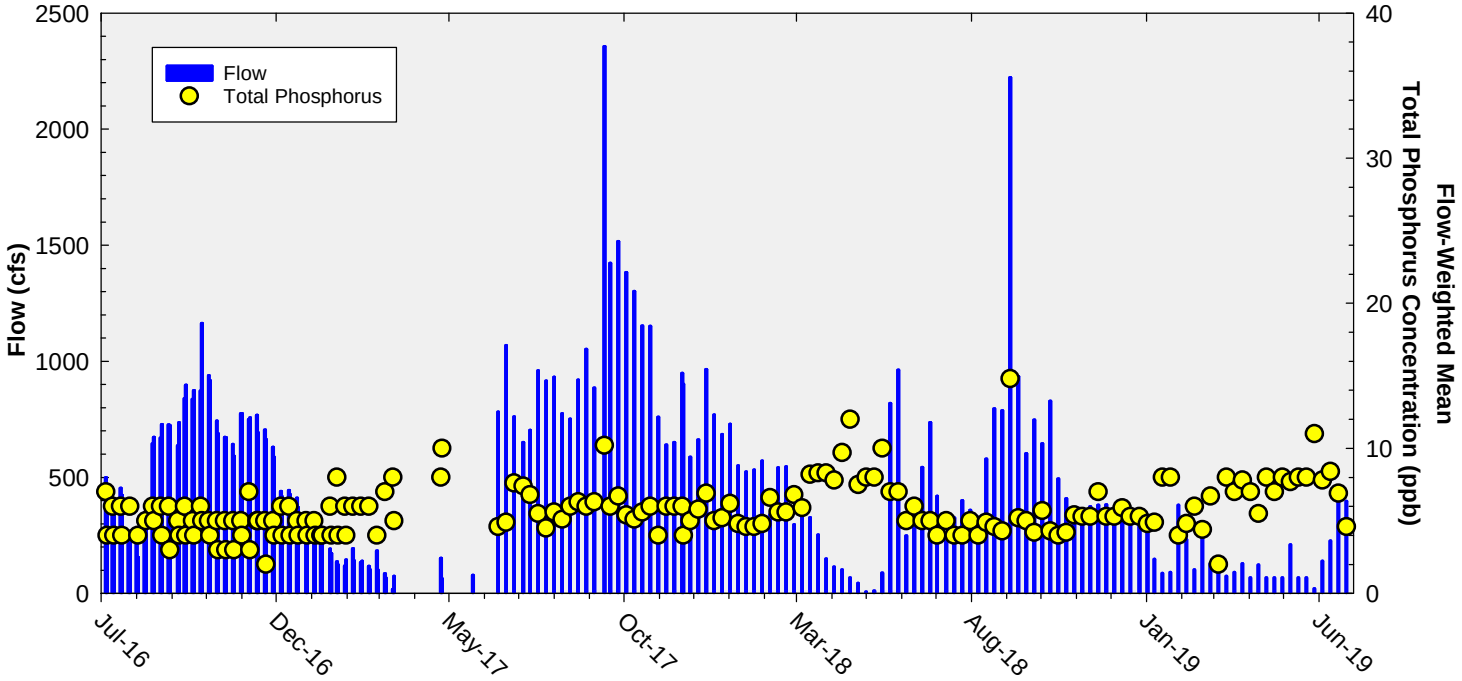


# Daily Flows Into and Out of C-111 Detention Area



# Taylor Slough and Coastal Basins

## Sampling Event Flow and FWMC

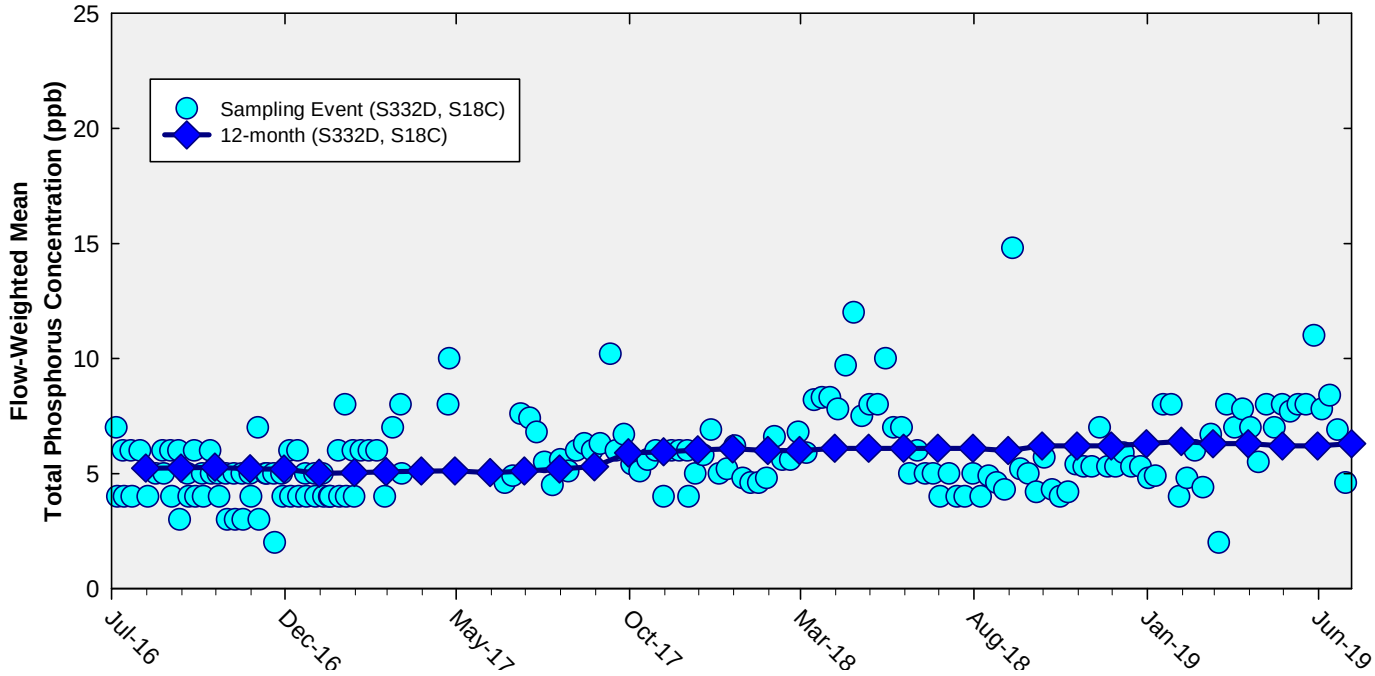



**Flow at Taylor Slough and Coastal Basins structures and the corresponding TP FWMCs for individual sampling events**

**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