



SETTLEMENT AGREEMENT QUARTERLY REPORT

July - September 2023

Chelsea Qiu, P.E., Ph.D.

Lead Engineer

Compliance Assessment & Reporting Section

Water Quality Bureau

Technical Oversight Committee

February 27, 2024



sfwmd.gov

SUMMARY

Month	Mean Stage (ft NGVD29)	Long-Term Level (ppb)	Geometric Mean TP Concentration (ppb)	Number of Samples	
Arthur R. Marshall Loxahatchee National Wildlife Refuge					
Jul-23	16.41	10.1	5.8	14	
Aug-23	16.51	9.6	5.5	14	
Sep-23	16.82	8.3	5.6	14	
12-Month Period Ending	Total Flow (kac-ft)	Long-Term Limit (ppb)	12-Month TP FWMC (ppb)	Percent of Sampling Events Greater than 10 ppb	
				Guideline (%)	Observed (%)
Everglades National Park – Shark River Slough – <i>PROVISIONAL DATA and RESULTS</i>					
Jul-23	1146.2	7.6	10.0	40.1	51.9
Aug-23	1175.0	7.6	9.7	40.1	50.0
Sep-23	1246.4	7.6	9.2	40.1	42.3
Everglades National Park – Taylor Slough and Coastal Basins					
Jul-23	362.7	11.0	4.8	53.1	0.0
Aug-23	368.8	11.0	4.5	53.1	0.0
Sep-23	357.3	11.0	4.6	53.1	0.0

FWMC for SRS - computed as $S12s + [S333 + S333N + S355A + S355B + \min(S356, S335) - S334]$.

S334 flow is not excluded from the total flow for long-term limit calculations.

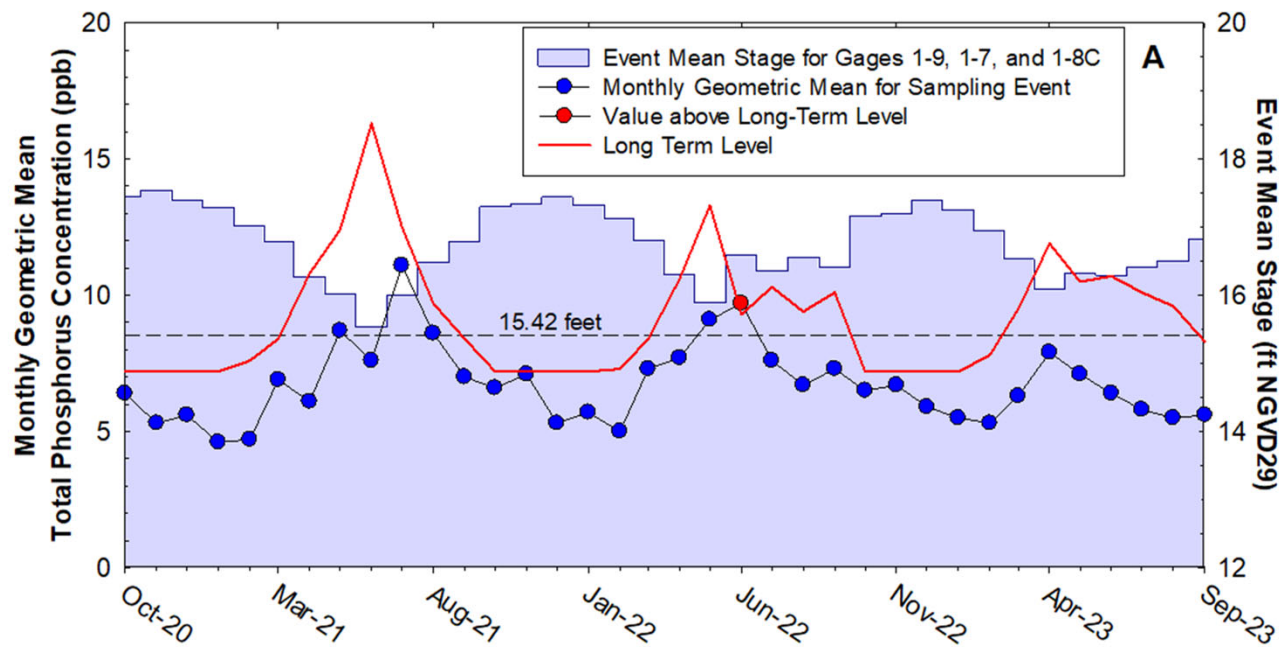
FWMC for TS and CB – computed as $(S332D - S332DX1 - S328) + S328 + G737 + S18C$.

Refuge TP Compliance Tracking with Outlook

Month	Average Stage (feet NGVD29)	Long-Term Level (ppb) Effective 12/31/2006	Geometric Mean TP Concentration (ppb)	Number of Samples
3rd Quarter 2023 Compliance Tracking				
Jul-2023	16.41	10.1	5.8	14
Aug-2023	16.51	9.6	5.5	14
Sep-2023	16.82	8.3	5.6	14
Preliminary Data Outlook				
Oct-2023	17.55	7.2	6.8	14
Nov-2023	17.15	7.2	6.3	8
Dec-2023	17.29	7.2	6.9	14
Jan-2024	17.44	7.2	4.3	14

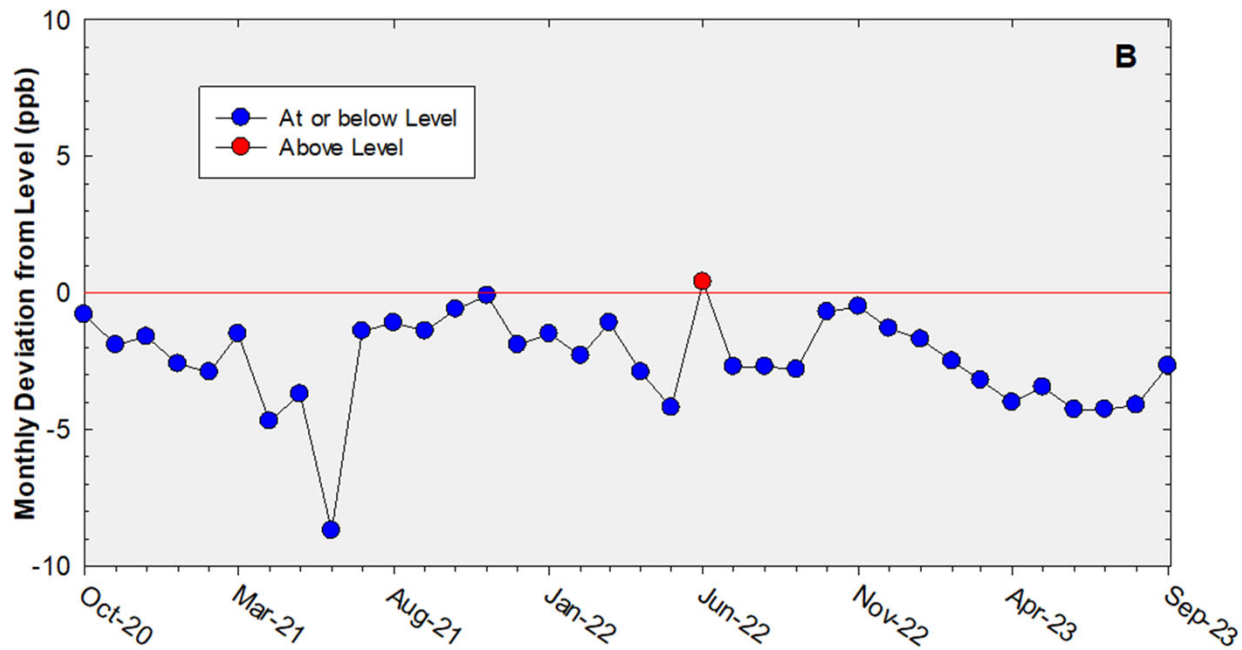
Note: 17.14 ft NGVD29 was used for the long-term level calculation when the average stage of the month exceeded the threshold of 17.14 ft.

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



36-Month Average TP Geometric Mean = 6.7 ppb
36-Month Average TP Long-term Level is = 9.2 ppb

A.R.M Loxahatchee National Wildlife Refuge Deviation of monthly geometric mean total phosphorus concentrations with calculated long-term levels



36-Month Average TP geometric mean = 2.4 ppb below the Long-Term Level

Shark River Slough

TP Concentration Compliance Tracking and Outlook

WY2023 Flow Data for S12s are Provisional.

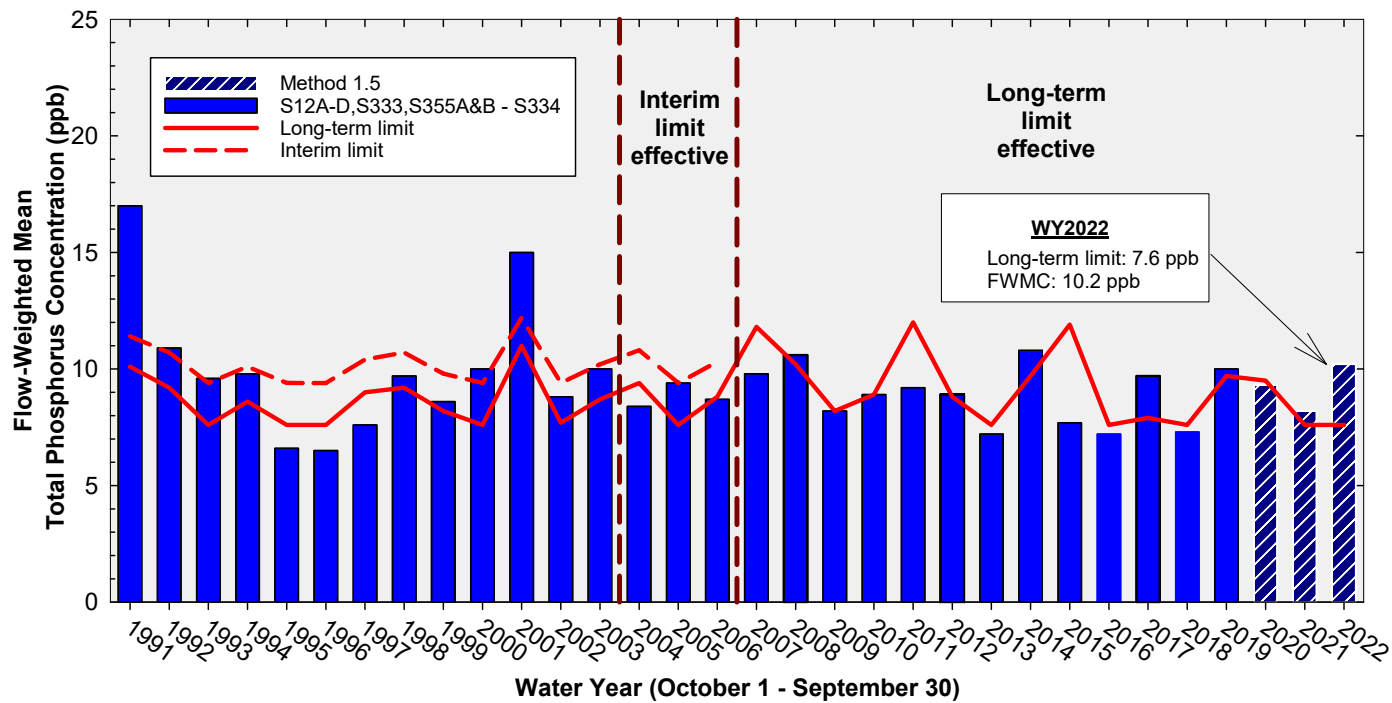
12-Month Period	Total Flow (kac-ft)	Long-Term Limit (ppb) <i>Effective 12/31/2006</i>	Flow-Weighted Mean TP Concentration (ppb)	Percent of Sampling Events Greater than 10 ppb	
				Guideline (%)	Observed (%)
3rd Quarter 2023 Compliance Tracking					
Aug 2022 - Jul 2023	1,146.2	7.6	10.0	40.1	51.9
Sep 2022 - Aug 2023	1,175.0	7.6	9.7	40.1	50.0
Oct 2022 - Sep 2023	1,246.4	7.6	9.2	40.1	42.3
Preliminary Data Outlook					
Nov 2021 - Oct 2022	1,250.3	7.6	9.0	40.1	42.3
Dec 2021 - Nov 2022	1,249.8	7.6	9.1	40.1	46.2
Jan 2022 - Dec 2022	1,277.0	7.6	9.0	40.1	46.2
Feb 2022 - Jan 2023	1,321.5	7.6	8.7	40.1	48.0

Shark River Slough PROVISIONAL RESULTS:

FWMC computed as S12A + S12B + S12C + S12D + [S333 + S333N + S355A + S355B + minimum of (S356, S335) – S334] using all flow and TP grabs on bi-weekly compliance sampling dates.

S334 flow was not excluded from the flow for long-term limit calculations.

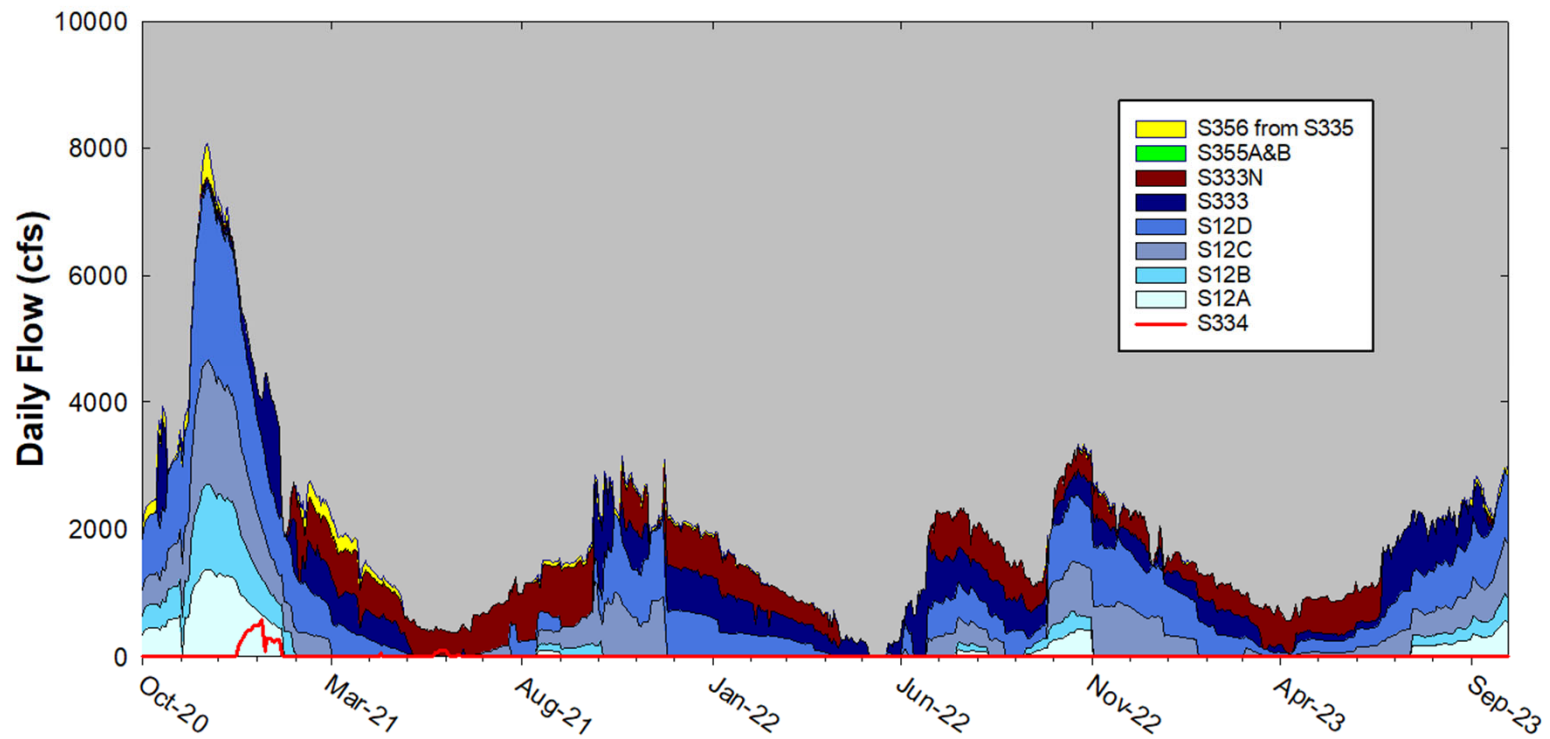
Annual Flow-weighted Mean Concentrations of Inflows to ENP through Shark River Slough



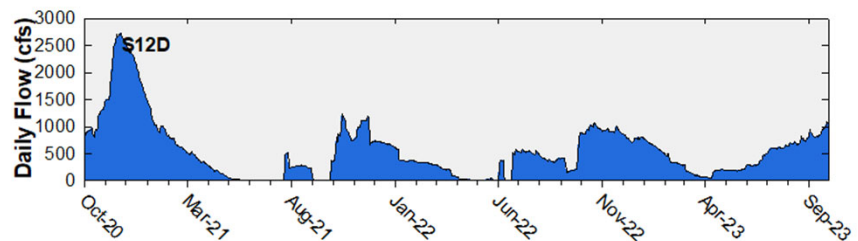
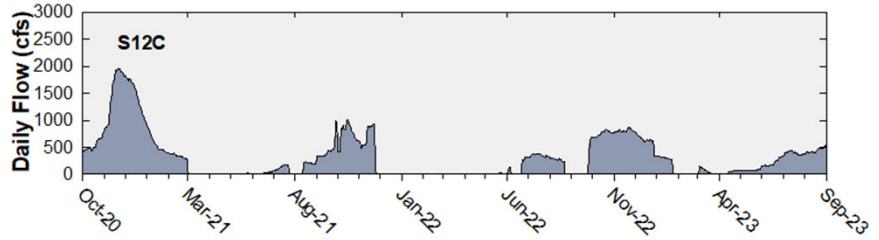
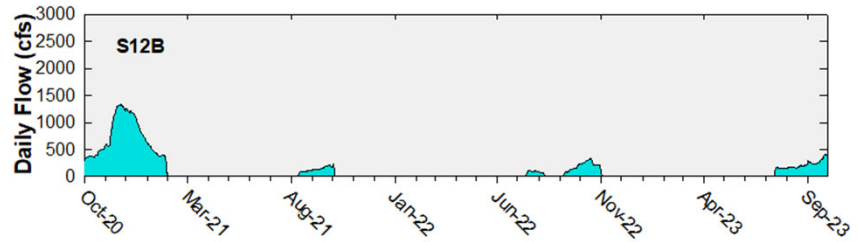
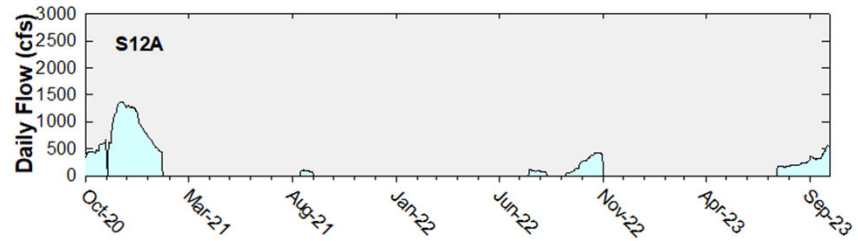
12-month FWMC at the end of each water year compared to the TP interim and long-term limits

Shark River Slough Structure Daily Flows

WY2023 Flow Data for S12s are Provisional.

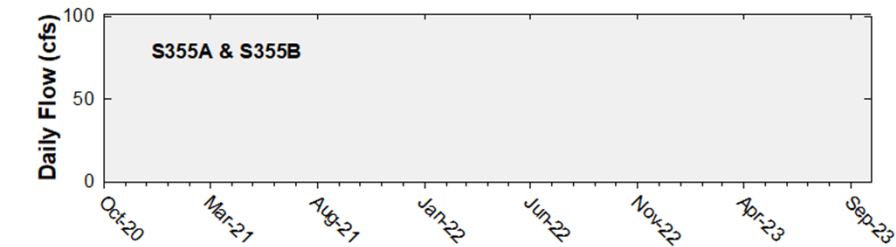
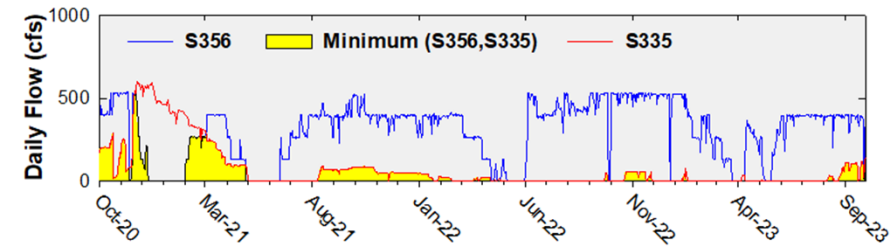
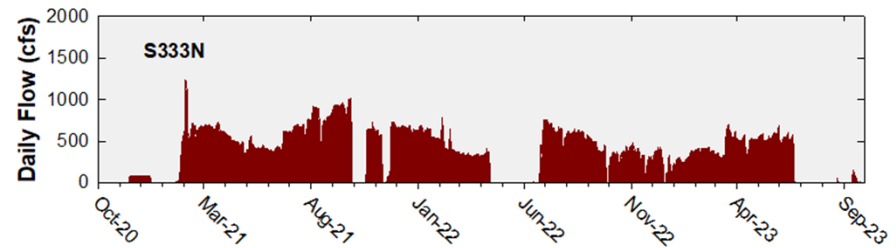
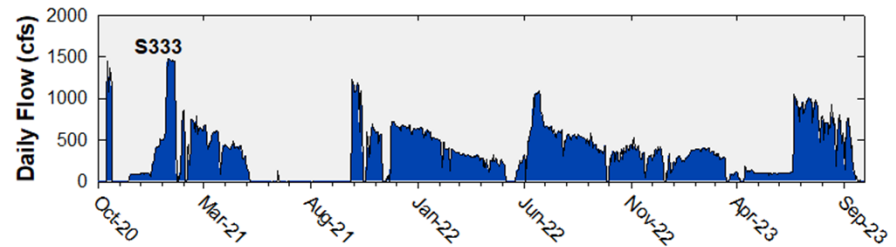


Daily Flows at S12 Structures to Shark River Slough

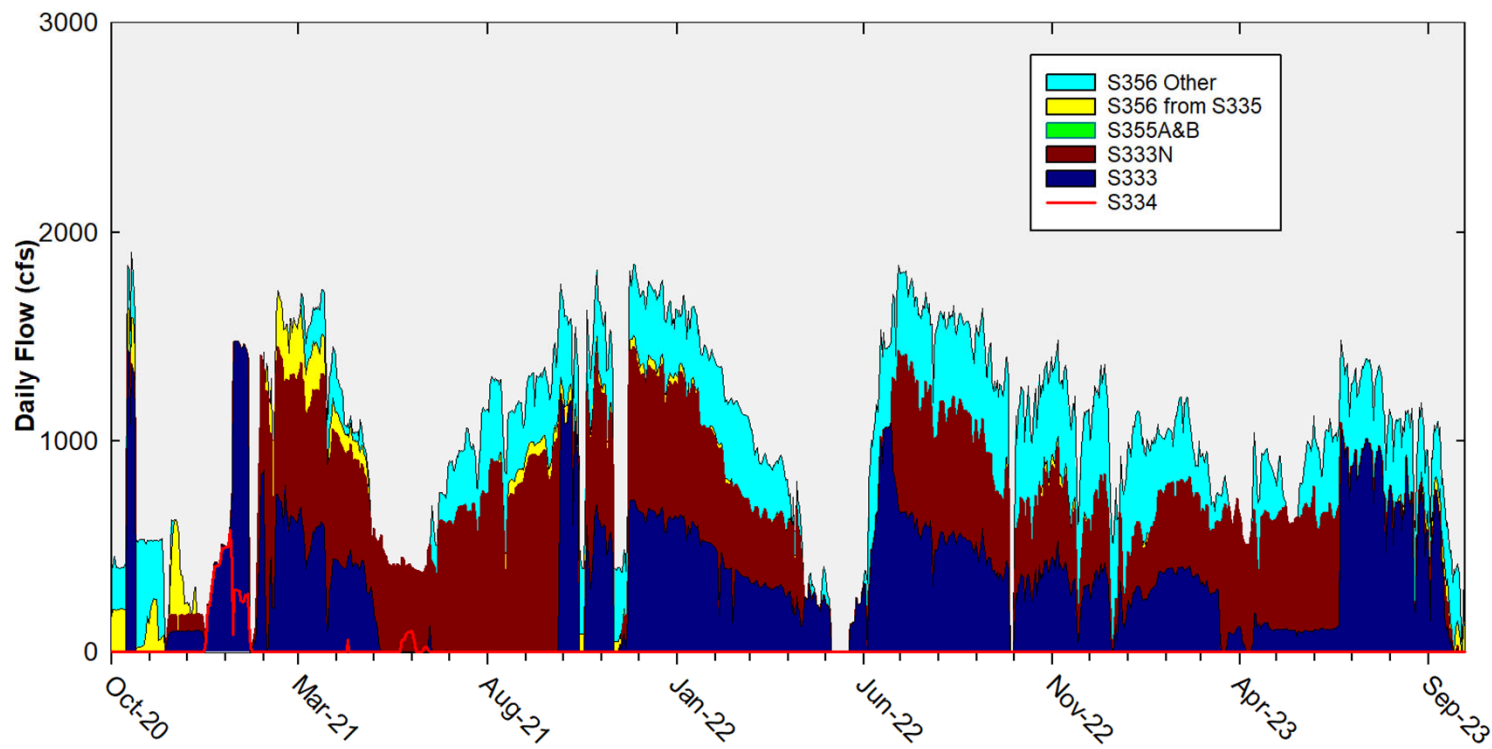


Daily Flows at Individual Inflow Structures to Shark River Slough

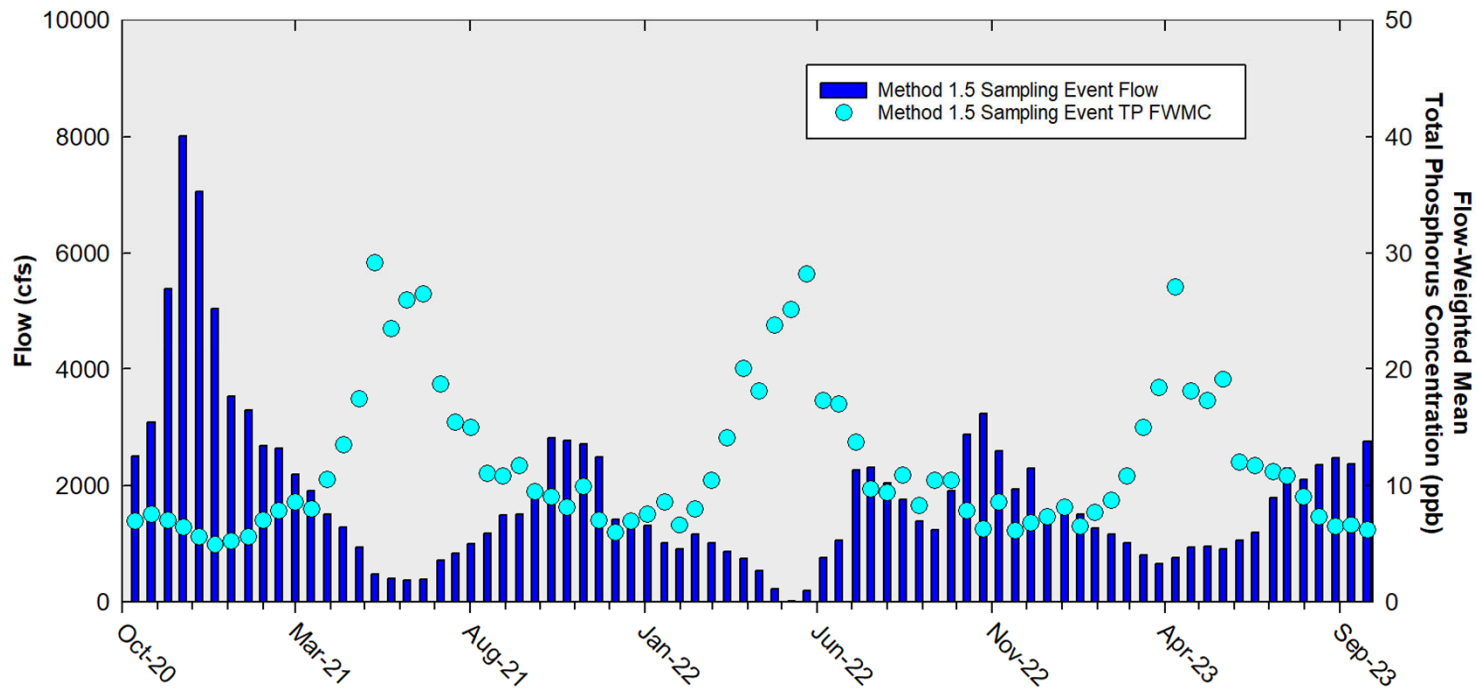
(Note: There was no flow at S355A or S355B during the period)



Daily Flows Into Shark River Slough through S333&S333N, S355A&B, and S356 and Out through S334

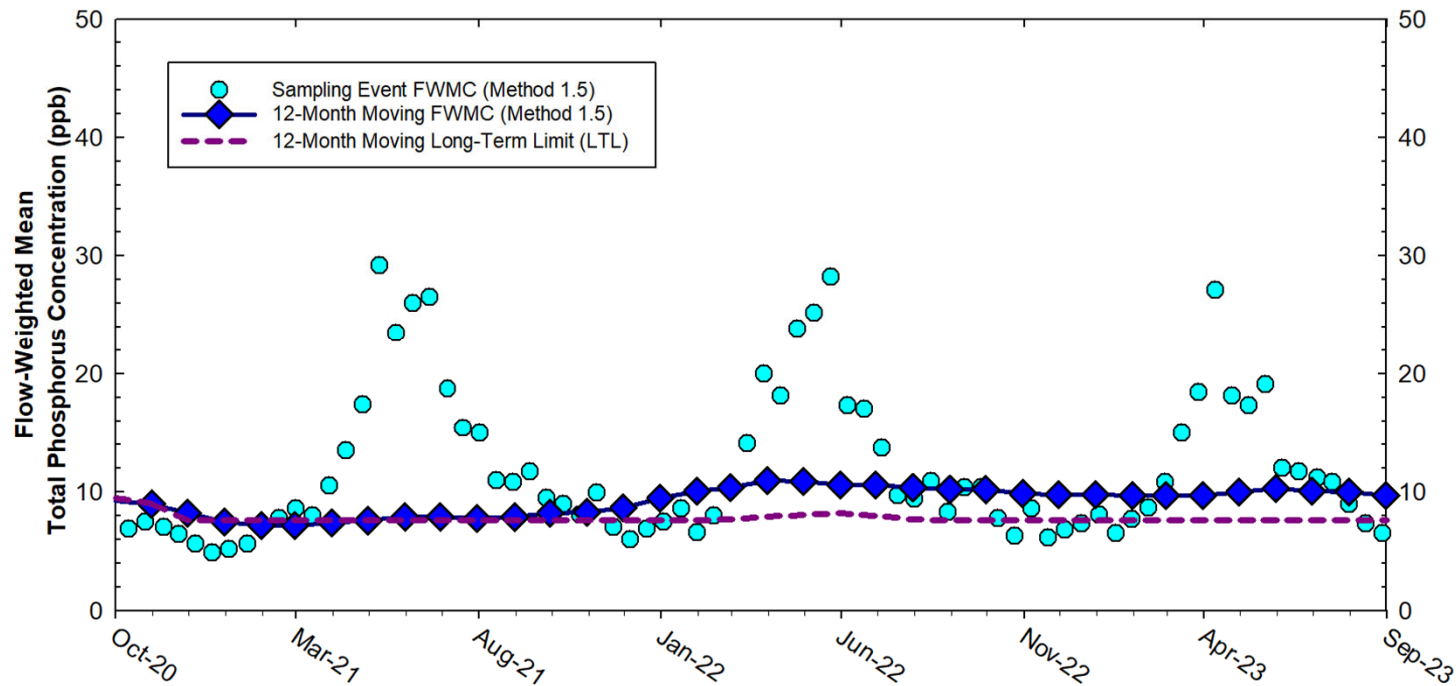


Shark River Slough Sampling Event Flow and FWMC



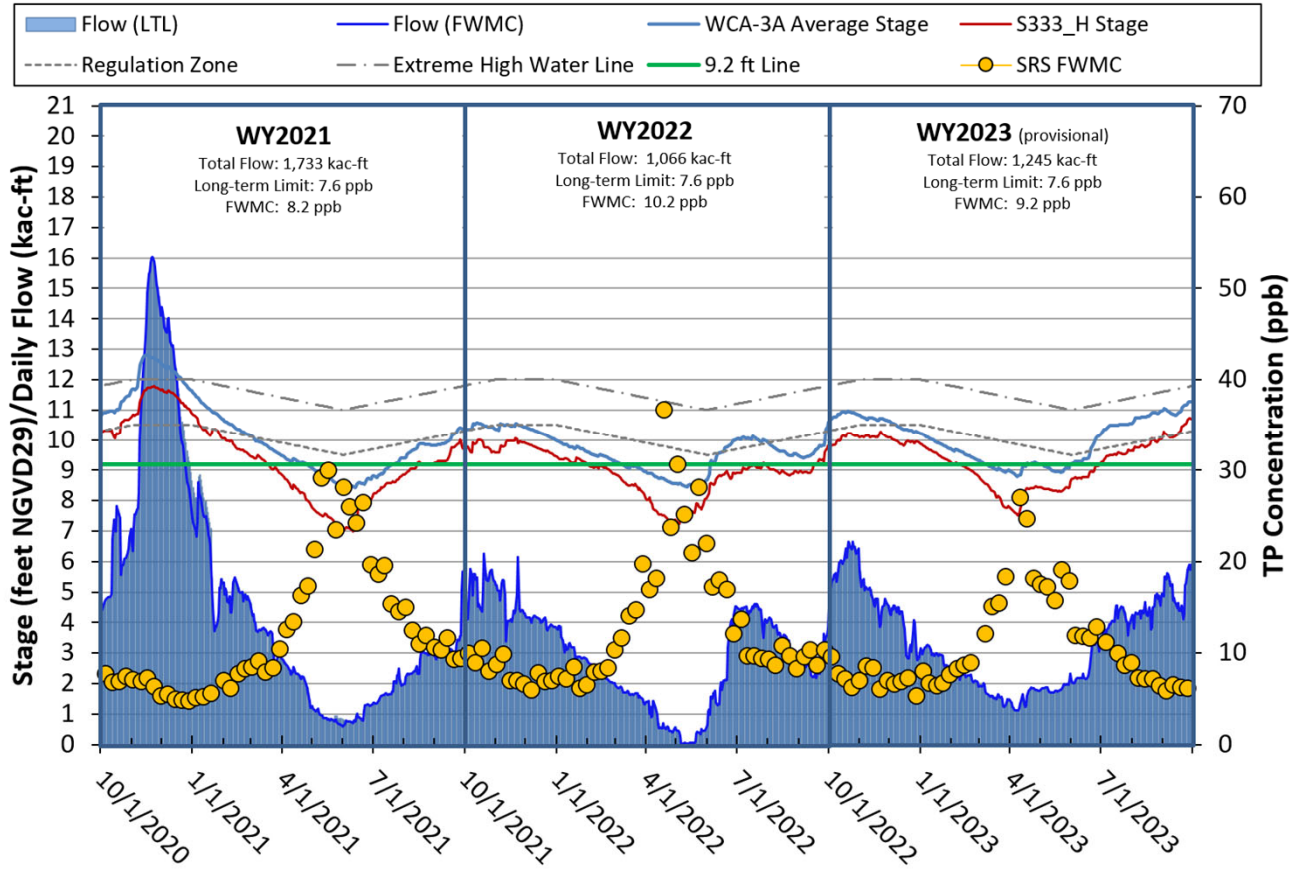
**Flow to Shark River Slough and the corresponding TP FWMCs
for individual sampling events**

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

Stage, Flow, and TP FWMC Inflows to ENP through Shark River Slough



* WY2023 results are Provisional

Taylor Slough and Coastal Basins

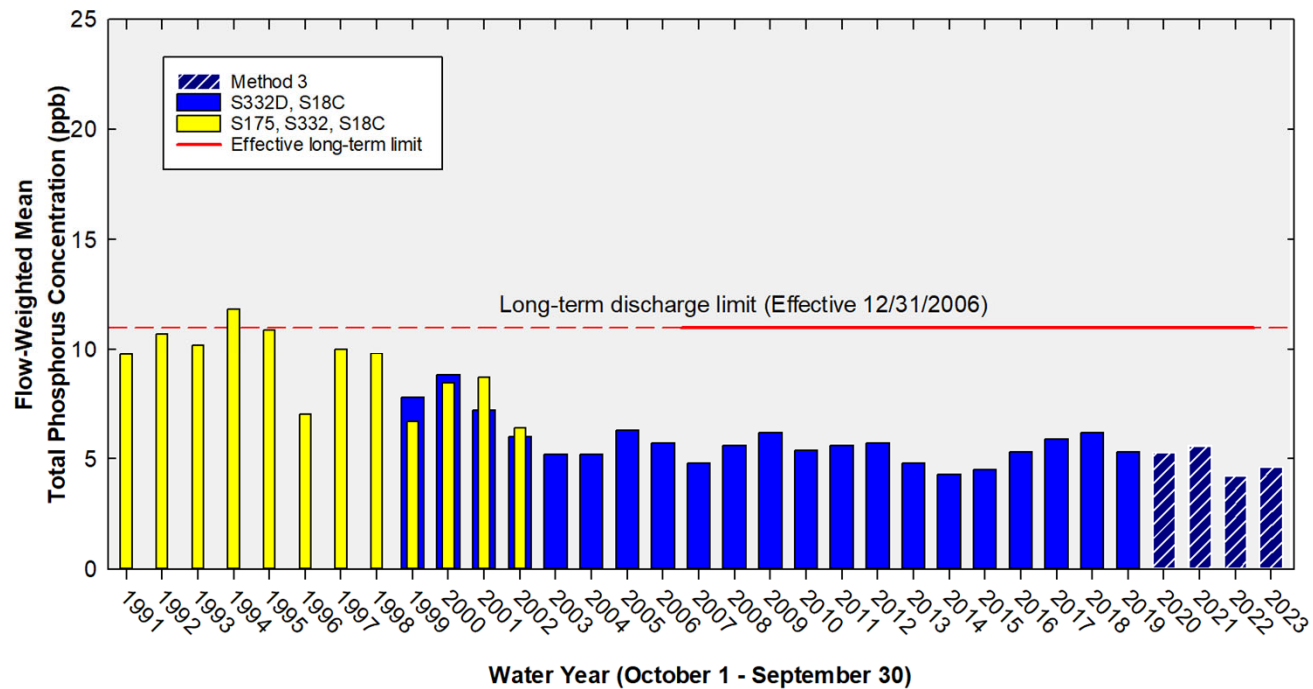
TP Concentration Compliance Tracking

12-Month Period	Total Flow (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%
Aug 2022 - Jul 2023	362.7	4.8	0.0
Sep 2022 - Aug 2023	368.8	4.5	0.0
Oct 2022 - Sep 2023	357.3	4.6	0.0

FWMC computed as [(S332D-S332DX1-S328)+S328+G737+S18C] using all flow and TP grabs on weekly sampling.

Total flow is (S332D-S332DX1)+G737+S18C]

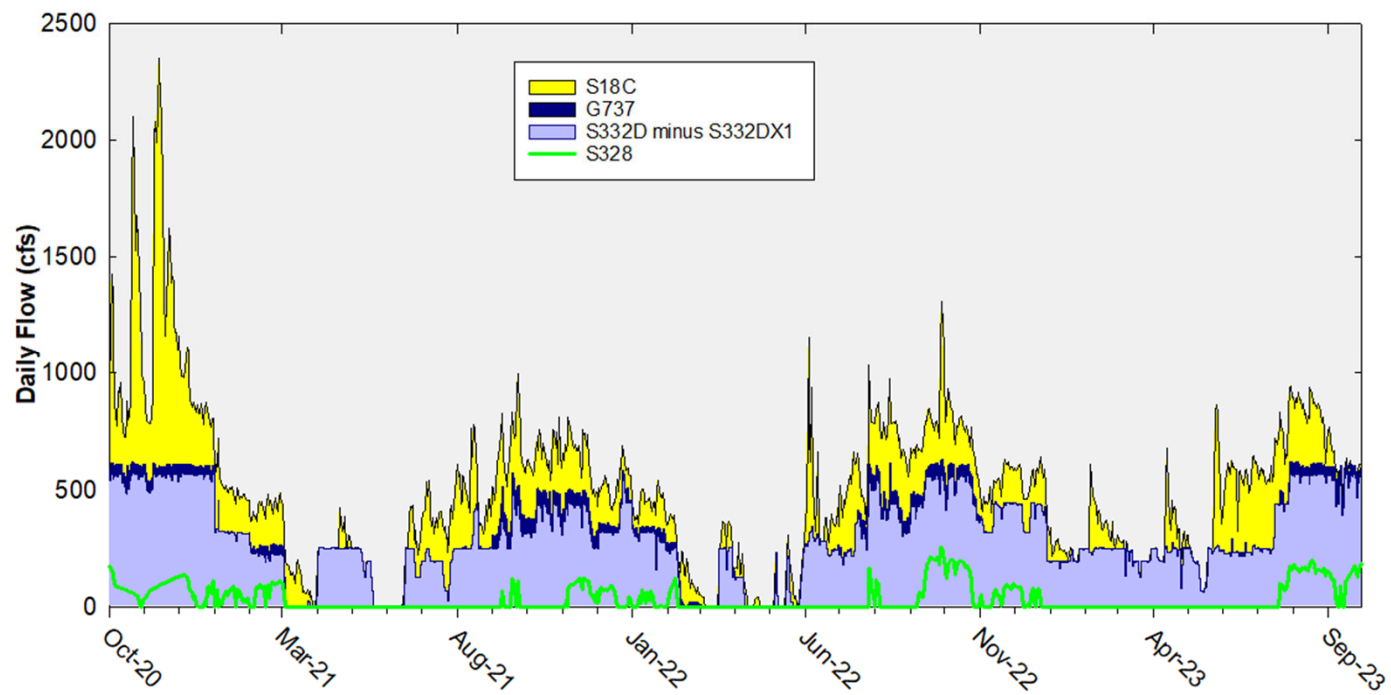
Annual Flow-Weighted Mean Concentrations of Inflows to the ENP through Taylor Slough and Coastal Basins



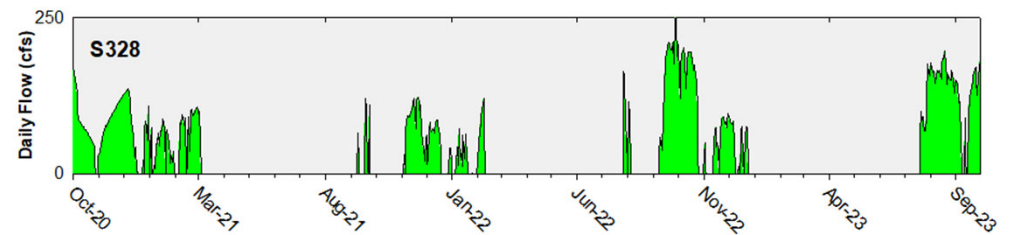
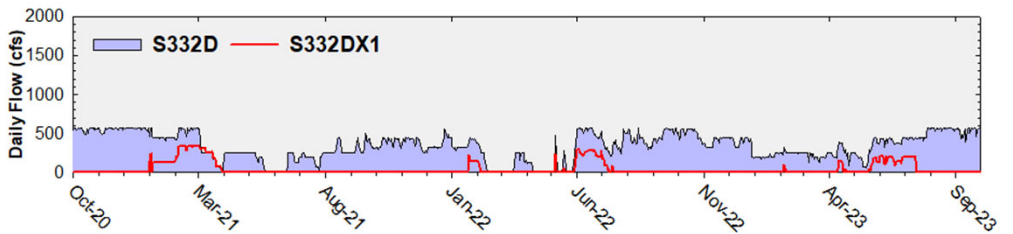
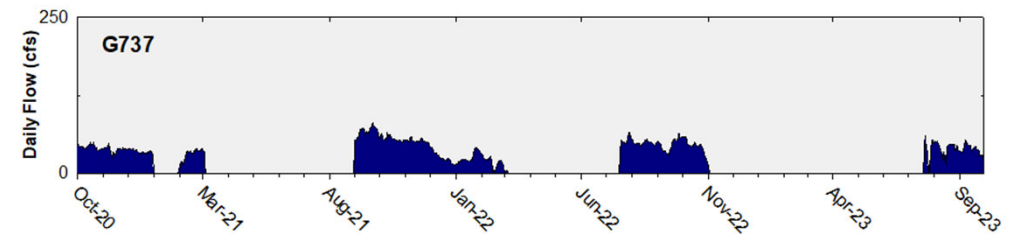
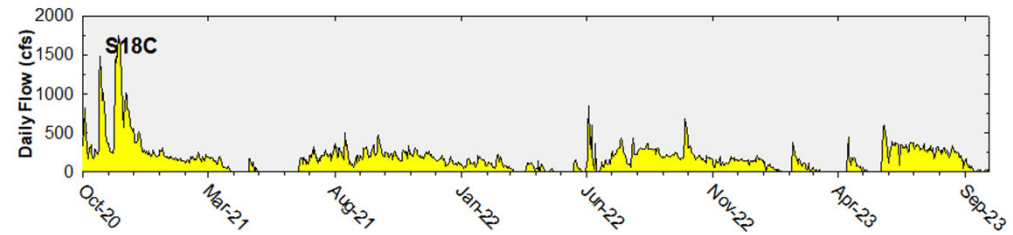
The 12-month FWMC at the end of each water year compared to the 11 ppb long-term TP limit

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

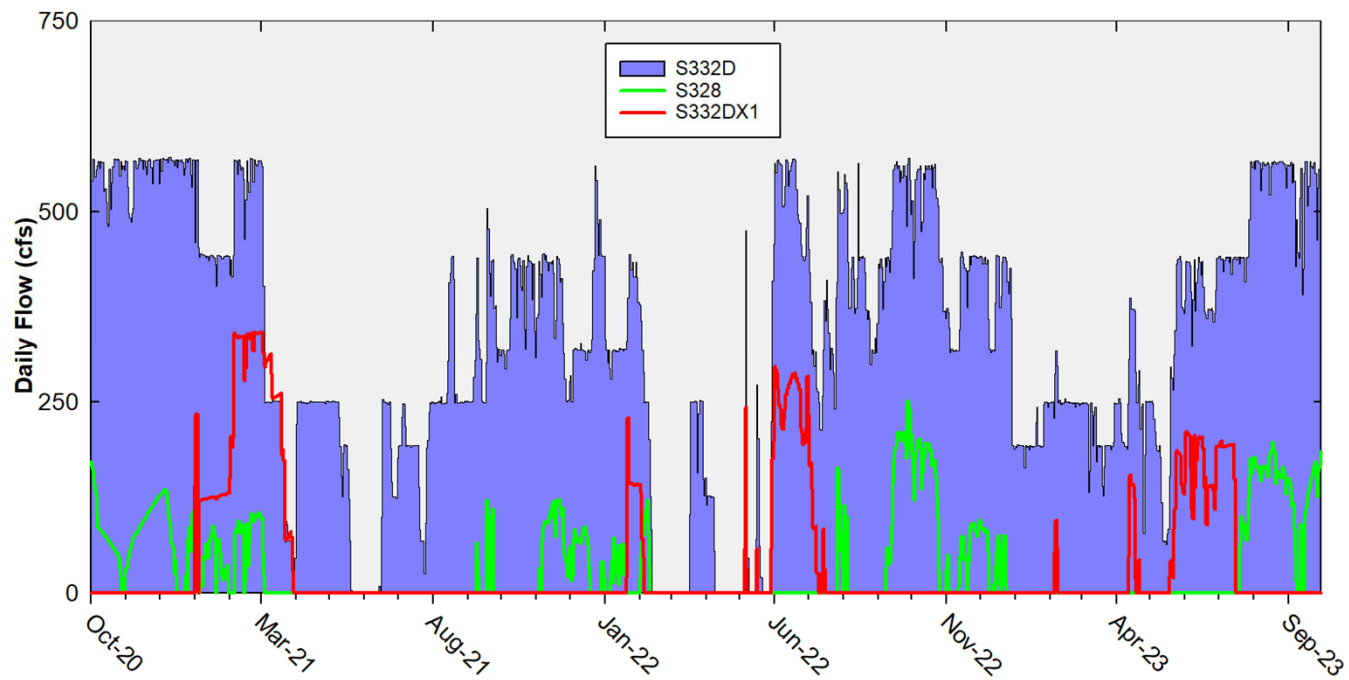
Daily Flows at Taylor Slough and Coastal Basins Structures into ENP



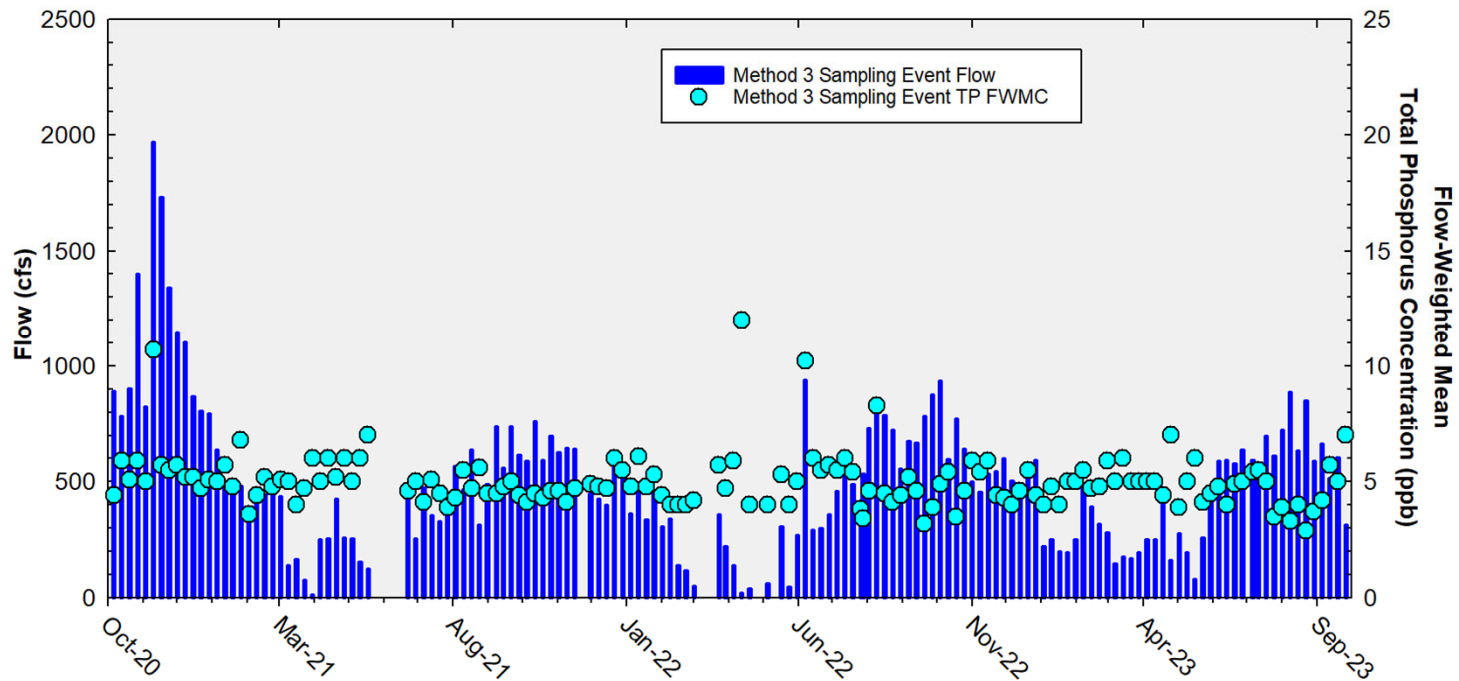
Daily Flows at Individual Taylor Slough and Coastal Basins Structures



Daily Flows In and Out of S332D Flowway

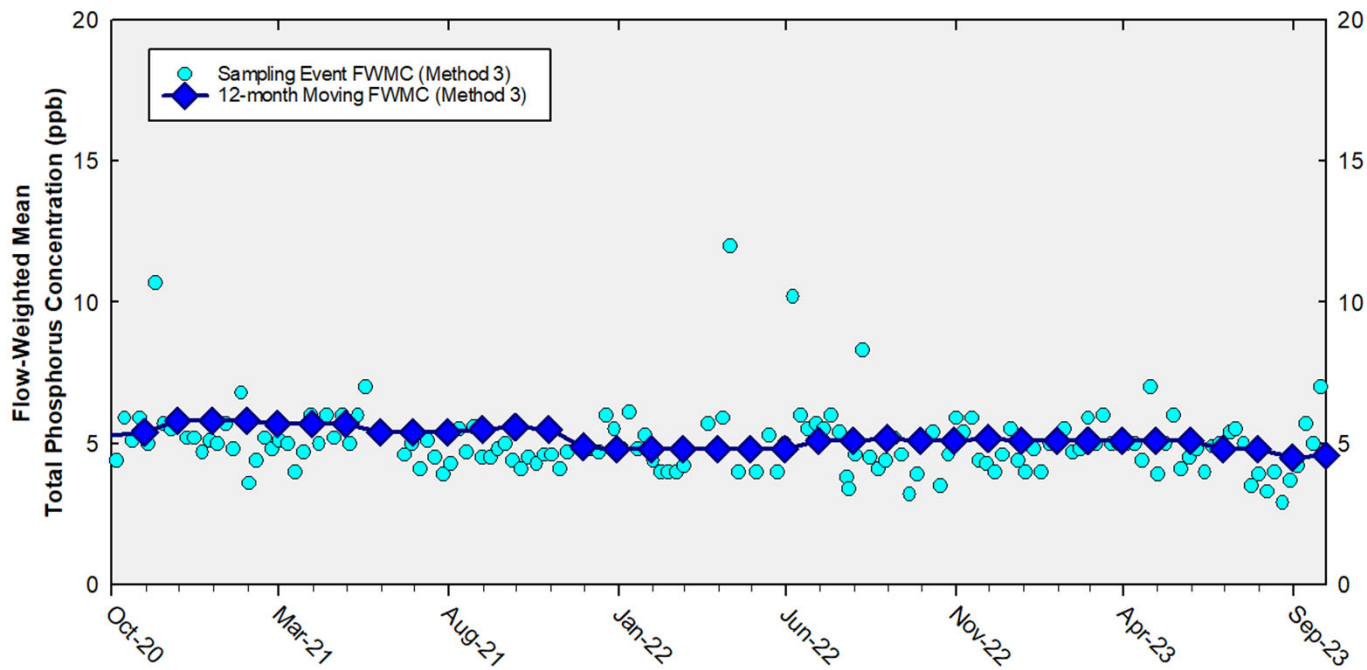


Taylor Slough and Coastal Basins Sampling Event Flow and FWMC



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

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

Thank You

