Settlement Agreement Report

First Quarter 2025
January - March

Prepared for the
Technical Oversight Committee

September 5, 2025

Shark River Slough compliance results are published annually in this report when the final approved flow data for a federal water year (WY) are available. The WY2025 (October 1, 2024 – September 30, 2025) results are published at that time.

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PURPOSE

The South Florida Water Management District has prepared this report to provide a quarterly update to the Everglades Technical Oversight Committee on the compliance status with total phosphorus levels or limits defined in the 1991 Settlement Agreement, entered as a Consent Decree in 1992, and modified in 1995. The areas of interest in this report include the interior marsh stations in the Arthur R. Marshall Loxahatchee National Wildlife Refuge and two discharges to Everglades National Park: inflows to Shark River Slough and inflows to Taylor Slough and Coastal Basins.

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ACRONYMS AND ABBREVIATIONS

ug/L	micrograms per liter
cfs	cubic feet per second
EAA	Everglades Agricultural Area
ENP	Everglades National Park
Exp.	Expansion
FDEP	Florida Department of Environmental Protection
FEB	flow equalization basin
ft NGVD29	Elevation in feet relative to the National Geodetic Vertical Datum of 1929
FWMC	flow-weighted mean concentration
kac-ft	thousand-acre feet
kac-ft/yr	thousand-acre feet per year
NGVD29	National Geodetic Vertical Datum of 1929
OFW	Outstanding Florida Waters
ppb	parts per billion
Refuge	Arthur R. Marshall Loxahatchee National Wildlife Refuge
STA	stormwater treatment area
TOC	Everglades Technical Oversight Committee
TP	total phosphorous
USACE	United States Army Corps of Engineers
WCA	water conservation area
WMA	wildlife management area
WY	water year

EXECUTIVE SUMMARY

This report fulfills the South Florida Water Management District's reporting requirements under the 1991 Settlement Agreement, entered as a Consent Decree in 1992 and modified in 1995, for the first quarter of 2025 (January – March 2025). Total phosphorus (TP) compliance highlights for this period are summarized below for the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge) and inflows to Everglades National Park (ENP) (**Table 1** and **Figure 1**):

- **Refuge:** The geometric mean TP concentrations were below the long-term levels for January and March 2025, but above the long-term level for February 2025.
- **Shark River Slough:** Tracking results based on provisional data for the first quarter of 2025 are presented. When the final data are available, the 12-month TP flow-weighted mean concentrations (FWMCs) will be published separately as a revision to the third quarter 2025 report.
- **Taylor Slough and Coastal Basins:** Provisional tracking results for all three 12-month TP FWMCs were below the 12-month long-term limit of 11 parts per billion (ppb) during the first quarter.

Table 1. First quarter 2025 TP compliance results for the Refuge, TP calculation provisional tracking results for Shark River Slough and Taylor Slough and Coastal Basins.

Month	Mean Stage (ft NGVD29)	Long-Term Level (ppb)	Geometric Mean TP Concentration (ppb)	Number of Samples	
Arthur R. Marshall Loxahatchee National Wildlife Refuge					
Jan-25	16.65	9.0	6.8	14	
Feb-25	16.61	9.1	9.4	13	
Mar-25	16.40	10.2	8.6	12	
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 – *PROVISIONAL DATA and RESULTS*					
Jan-25	1,444.4	7.6	8.0	40.1	15.4
Feb-25	1,375.3	7.6	8.3	40.1	20.0
Mar-25	1,294.9	7.6	8.7	40.1	28.0
Everglades National Park – Taylor Slough and Coastal Basins – *PROVISIONAL DATA and RESULTS*					
Jan-25	432.9	11.0	5.3	53.1	0.0
Feb-25	423.0	11.0	5.4	53.1	0.0
Mar-25	403.9	11.0	5.4	53.1	0.0

Notes:

- Key to units: ppb – parts per billion (values are in micrograms per liter [µg/L], which, for the purposes of this report, are equivalent to ppb); ft NGVD29 – elevation in feet relative to the National Geodetic Vertical Datum of 1929; and kac-ft – thousand-acre feet.
- Compliance for inflows to ENP (Shark River Slough; Taylor Slough and Coastal Basins) is evaluated annually based on the 12-month TP FWMC for the federal water year ending on September 30. As adopted by the Everglades Technical Oversight Committee (TOC) in August 2020, the compliance calculation results shown used "Method 1.5" for Shark River Slough and "Method 3" for Taylor Slough and Coastal Basins. Details about these calculation methods are provided later in this report.

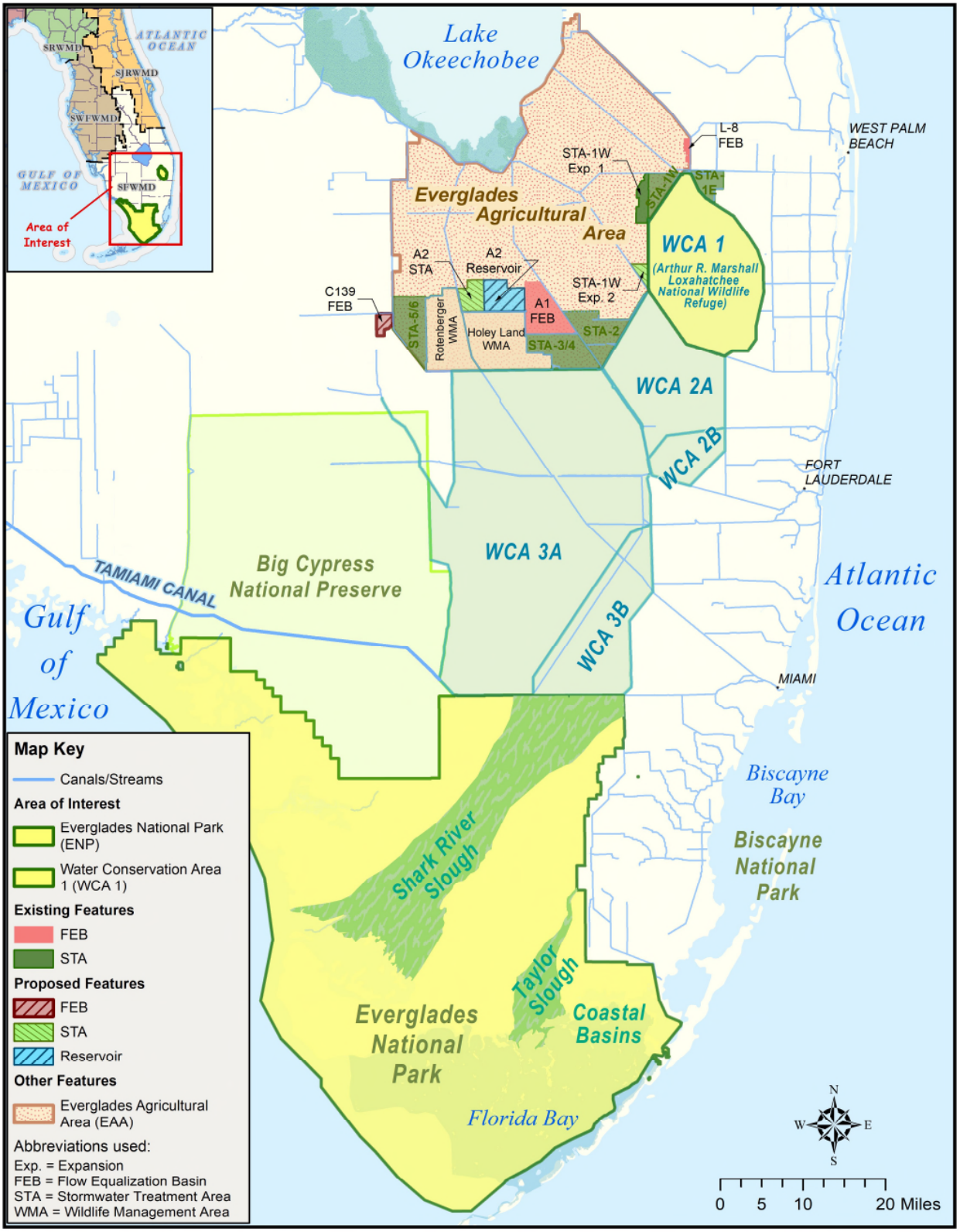

Figure 1. Areas of interest.

ARTHUR R. MARSHALL LOXAHATCHEE NATIONAL WILDLIFE REFUGE

Background

The 1991 Settlement Agreement ended the Everglades lawsuit and was entered into by the federal government, the State of Florida, and the South Florida Water Management District. The subsequent Consent Decree, as modified in 1995, specified that interim and long-term TP concentration levels for the Refuge must be met by February 1, 1999, and December 31, 2006, respectively. Both the interim and long-term concentration levels vary monthly because they are calculated as a function of water stage measured at gaging stations 1-7, 1-8C, and 1-9, within the Refuge. The stage range within which the interim and long-term concentration levels are applicable is 15.42 to 17.14 elevation in feet relative to the National Geodetic Vertical Datum of 1929 (ft NGVD29). The monthly TP concentrations are determined from water samples collected at 14 interior marsh stations, LOX3 through LOX16 (**Figure 2**). As required in the Consent Decree, the concentrations are converted to a geometric mean, which is compared to the long-term concentration level. Monthly TP data for each station for the past 36 months are provided in Appendix A. The calculation methods specified in the Consent Decree are provided in Appendix D.

Reporting Period Update

All 14 samples were collected in January 2025. In February, 13 samples were collected, and in March, 12 samples were collected. (Table A-1).

Sampling day average stages in the Refuge were 16.65, 16.61, and 16.40 ft NGVD29 in January, February and March 2025 (**Figure 3** and **Table 2**). The geometric means (ppb) calculated from TP concentrations measured in water samples collected for January and March , were 6.8, and 8.6, and below the long-term levels. The geometric mean calculated for February was 9.4 ppb, which was above the long-term level.

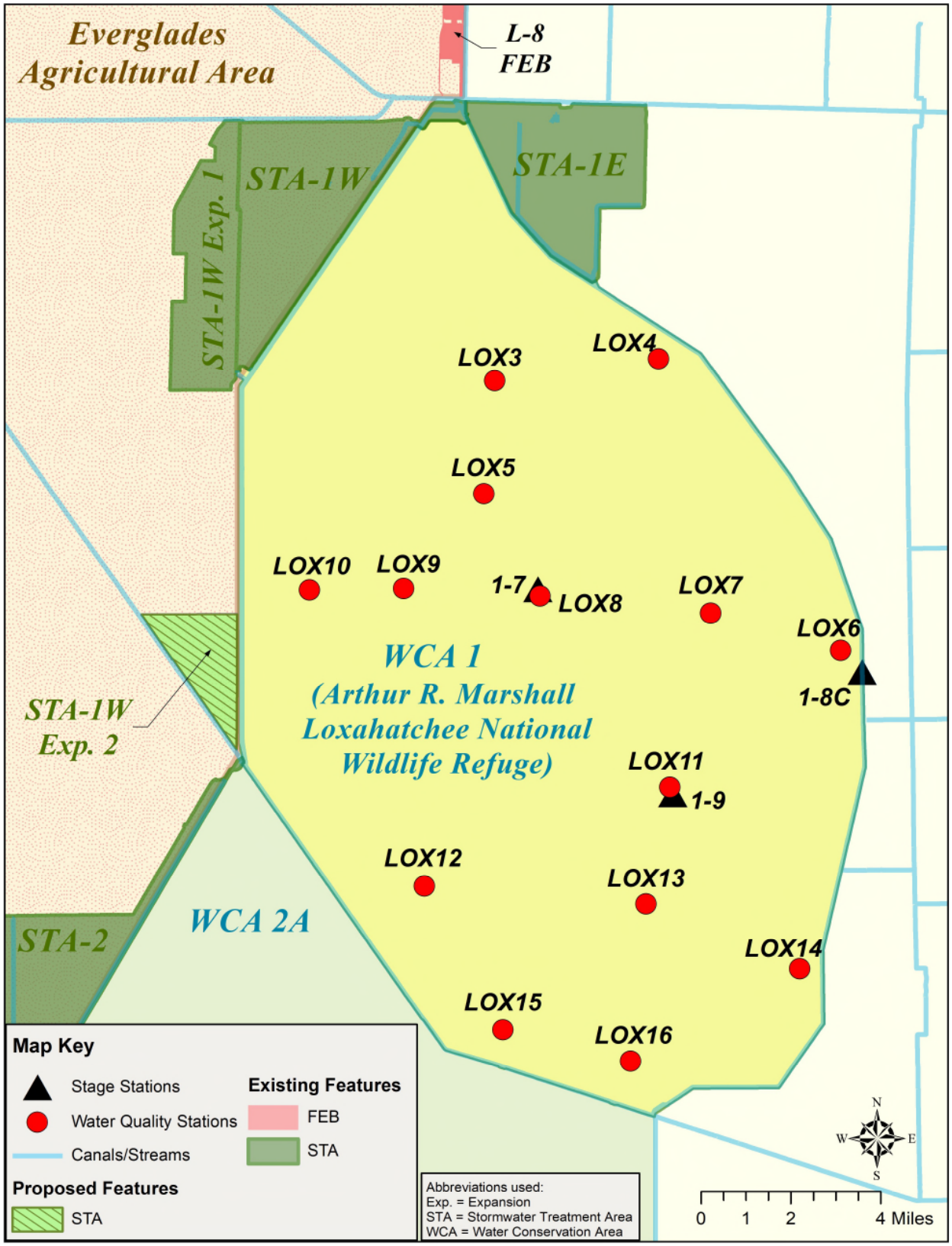

Figure 2. Refuge water quality sampling and stage measurement stations.

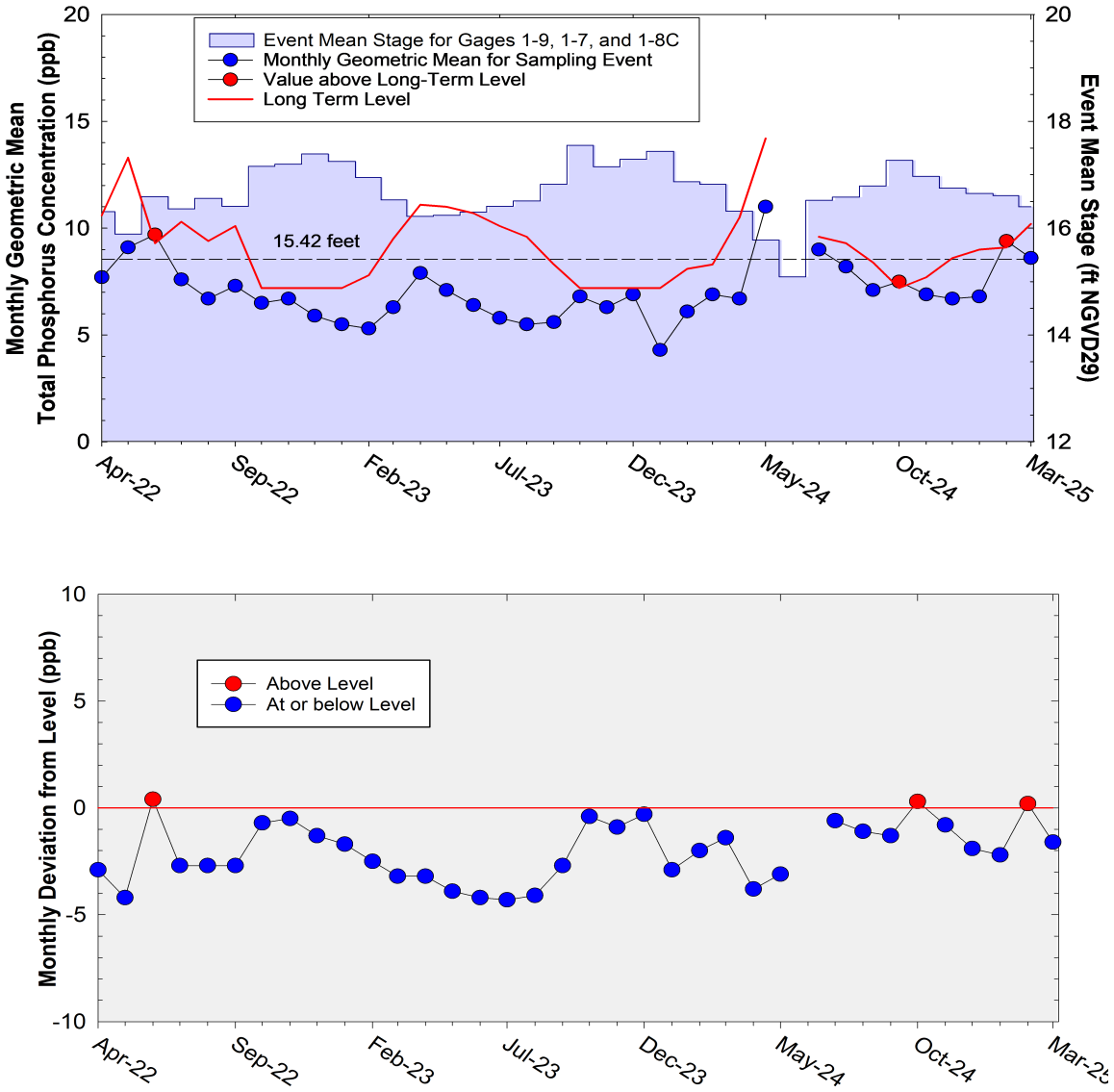

Figure 3. Top: Monthly TP geometric mean concentrations for the Refuge compared to calculated long-term levels, which are adjusted for fluctuations in stage. The geometric mean TP concentration was above the long-term level in June 2022, October 2024, and February 2025. Bottom: Deviation of monthly geometric mean TP concentrations from calculated long-term levels. Negative values indicate that the geometric mean was lower than the long-term level. The 14 samples were not collected for the month of June 2024, due to the sites being too shallow for collection.

Table 2. Refuge TP compliance tracking.

Month	Average Stage (ft NGVD29)	Long-Term Level (ppb)	Geometric Mean TP Concentration (ppb)	Number of Samples
Apr-2022	16.31	10.6	7.7	13
May-2022	15.89	13.3	9.1	7
Jun-2022	16.59	9.3	9.7	14
Jul-2022	16.36	10.3	7.6	12
Aug-2022	16.56	9.4	6.7	13
Sep-2022	16.41	10.1	7.3	11
Oct-2022	17.16	7.2	6.5	14
Nov-2022	17.20	7.2	6.7	14
Dec-2022	17.39	7.2	5.9	14
Jan-2023	17.25	7.2	5.5	14
Feb-2023	16.95	7.8	5.3	14
Mar-2023	16.53	9.5	6.3	13
Apr-2023	16.22	11.1	7.9	10
May-2023	16.24	11.0	7.1	14
Jun-2023	16.30	10.7	6.4	14
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
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
Feb-2024	16.87	8.1	6.1	7
Mar-2024	16.82	8.3	6.9	14
Apr-2024	16.32	10.5	6.7	12
May-2024	15.78	14.2	11.0	6
Jun-2024	15.09	N/A	No data	0
Jul-2024	16.52	9.6	9.0	14
Aug-2024	16.58	9.3	8.2	13
Sep-2024	16.79	8.4	7.1	14
Oct-2024	17.27	7.2	7.5	14
Nov-2024	16.97	7.7	6.9	14
Dec-2024	16.75	8.6	6.7	14
Jan-2025	16.65	9.0	6.8	14
Feb-2025	16.61	9.1	9.4	13
Mar-2025	16.40	10.2	8.6	12

Notes:

- Key to units: ppb – parts per billion (values are in micrograms per liter [µg/L], which, for the purposes of this report, are equivalent to ppb); and ft NGVD29 – elevation in feet relative to the National Geodetic Vertical Datum of 1929.
- Average stage is calculated using the stage elevations at stations 1-7, 1-8C, and 1-9 for the given sampling dates.
- The yellow shading indicates an excursion over the long-term level for the month.
- The green shading indicates that the Long-Term Level for the month is not applicable (N/A) because the average stages were below 15.42 feet NGVD29.

EVERGLADES NATIONAL PARK

Shark River Slough

Background

The Settlement Agreement/Consent Decree (1995) specified that interim and long-term TP concentration limits for discharges into ENP (**Figure 4**) through Shark River Slough be met by December 31, 2006, respectively. It was specified that the TP levels be presented as 12-month FWMCs. Only the TP concentrations for the water year ending on September 30 are evaluated for compliance with the Consent Decree limits (Appendix A). Inflow concentrations of TP through S12A, S12B, S12C, S12D, S333, S355A, and S355B were compared to the interim and long-term limits at the end of each federal water year (October 1 through September 30). The long-term limit went into effect in WY2007.

The frequency of routine monitoring was changed from bi-weekly (every other week) to weekly for all Shark River Slough sites beginning in August 2007. However, in accordance with Appendix A of the Consent Decree, only grab concentration data from every other week were used for the compliance calculations from October 2007 forward. All weekly TP data for each station for the past 12 months are provided in Appendix B.

Pursuant to agreement among all Everglades Technical Oversight Committee (TOC) members at the May 14, 2013, TOC meeting, the following three changes were made to the quarterly Settlement Agreement Report: (1) publishing of the quarterly 12-month TP FWMCs for Shark River Slough is discontinued, (2) provisional quarterly 12-month TP FWMCs are posted separately to the TOC website, https://www.sfwmd.gov/our-work/toc, and (3) the annual 12-month TP FWMC for the water year ending on September 30 will be published once the final approved flow data for the S12A, S12B, S12C, and S12D structures become available. These changes were implemented beginning with the January – March 2013 first quarter report. Based on a vote by the TOC on July 19, 2016, provisional 12-month results are now included in the report.

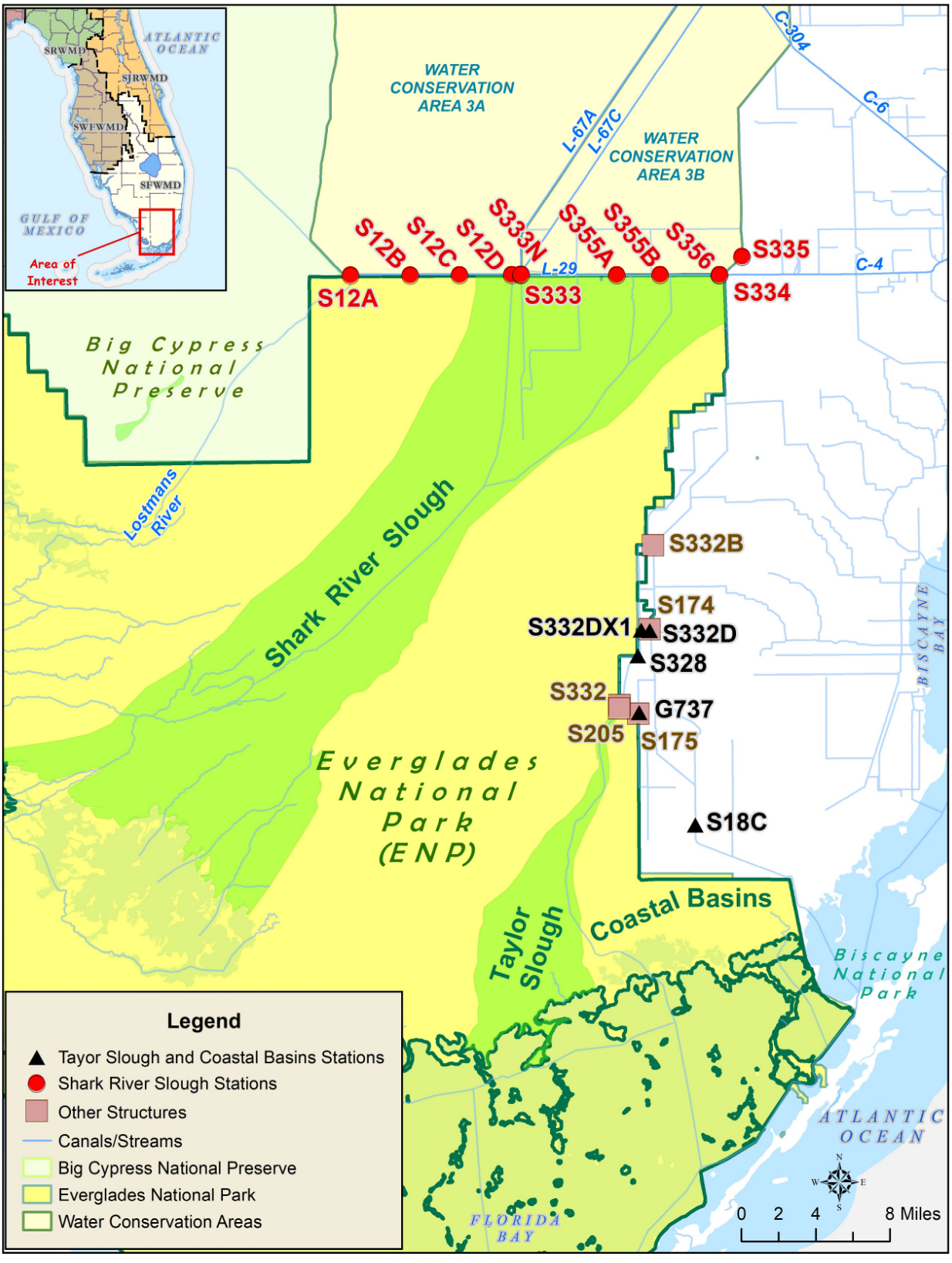

Figure 4. ENP flow structures.

The TOC has recognized that the S356 seepage return pump, which initiated operation under the United States Army Corps of Engineers (USACE) field test in fall 2015, is able to discharge water that originated from the water conservation areas (WCAs) to Shark River Slough. The Appendix A Sub-team was tasked with recommending an appropriate method for incorporating S356 into the compliance calculation. On August 11, 2020, the TOC voted to accept Method 1.5 as the official reporting method for evaluating compliance for Shark River Slough under Appendix A. Method 1.5 describes a collective TP FWMC computed as the flow-weighted combination of each of S12A, S12B, S12C, and S12D's flow and TP together with each of the TP results and adjusted inflows through the L-29 Canal to Shark River Slough. The inflow structures include the S333, S355A, S355B, and the portion of S356 flow from S335, all reduced by the proportional volume exiting S334. The gated spillway S333N, located north of S333, discharges water from L-67A to the L-29 Canal east of S333, and is integrated into Method 1.5 as additional inflow to the L-29 Canal. Method 1.5 with the addition was approved by the TOC at the May 2021 quarterly meeting.

TP FWMC is computed as S12A + S12B + S12C + S12D + [S333 + S333N + S355A + S355B + minimum (S356, S335) – S334] using the concentration values of the biweekly compliance sampling events. S334 flow is not excluded from the total flow for long-term limit calculations. **Figure 5** represents the 12-month TP FWMCs from WY2007 through WY2024.

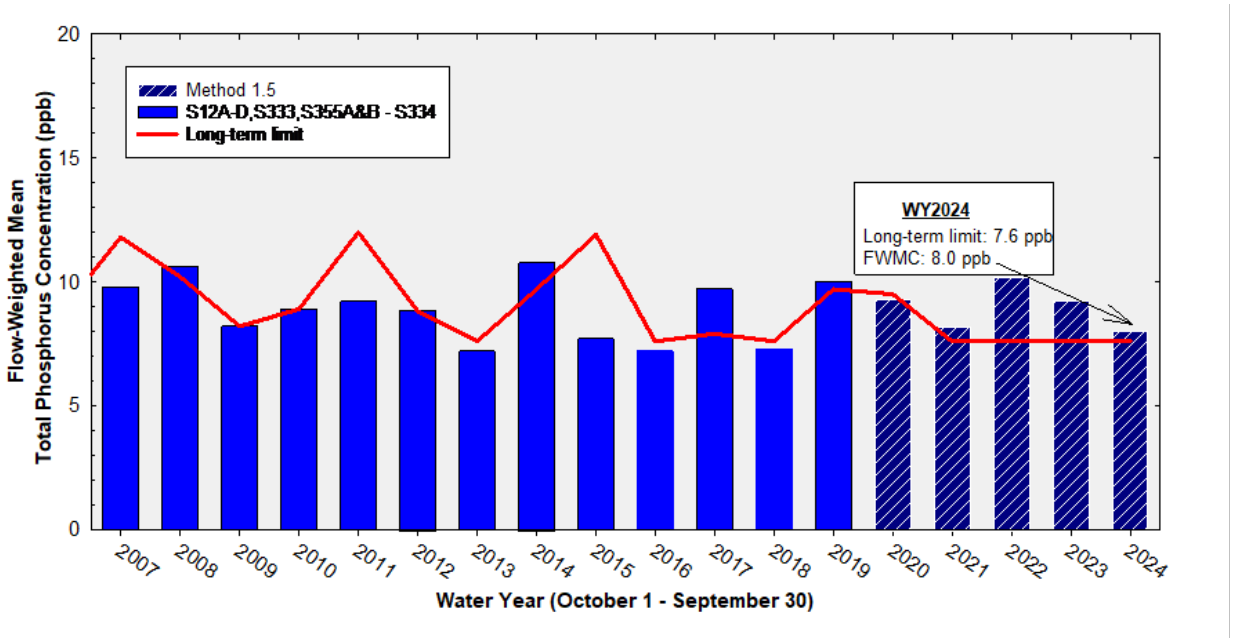

Figure 5. The 12-month TP FWMCs at inflows to ENP through Shark River Slough at the end of each water year compared to the long-term total phosphorus limits through WY2024.

Reporting Period Update

Table 3 presents the provisional 12-month FWMCs with the corresponding long-term TP concentration limits calculated using the 12-month period flow.

Flow data for the S12A, S12B, S12C, and S12D from October 1, 2024, to March 31, 2025, are provisional.

The 1st quarter water quality data for Shark River Slough are available in Appendix B of this report.

Table 3. Shark River Slough TP compliance tracking provisional values for the 12-month tracking periods.

12-Month Period	Total Flow (kac-ft)	Long-Term Limit (ppb)	Flow-Weighted Mean TP Concentration (ppb)	Percent of Sampling Events Greater than 10 ppb	
				Guideline (%)	Observed (%)
May 2021 - Apr 2022	954.1	8.1	10.9	42.5	57.7
Jun 2021 - May 2022	932.8	8.2	10.6	43.0	57.7
Jul 2021 - Jun 2022	974.2	8.0	10.6	42.1	57.7
Aug 2021 - Jul 2022	1,055.7	7.7	10.4	40.2	53.8
Sep 2021 - Aug 2022	1,082.5	7.6	10.2	40.1	46.2
Oct 2021 - Sep 2022	***1,066.0***	***7.6***	***10.2***	***40.1***	***50.0***
Nov 2021 - Oct 2022	1,090.7	7.6	9.9	40.1	50.0
Dec 2021 - Nov 2022	1,096.6	7.6	9.8	40.1	50.0
Jan 2022 - Dec 2022	1,088.7	7.6	9.8	40.1	50.0
Feb 2022 - Jan 2023	1,080.9	7.6	9.7	40.1	50.0
Mar 2022 - Feb 2023	1,080.1	7.6	9.7	40.1	50.0
Apr 2022 - Mar 2023	1,078.7	7.6	9.7	40.1	50.0
May 2022 - Apr 2023	1,099.8	7.6	10.0	40.1	50.0
Jun 2022 - May 2023	1,149.6	7.6	10.3	40.1	50.0
Jul 2022 - Jun 2023	1,156.3	7.6	10.0	40.1	50.0
Aug 2022 - Jul 2023	1,146.3	7.6	9.9	40.1	51.9
Sep 2022 - Aug 2023	1,175.1	7.6	9.6	40.1	50.0
Oct 2022 - Sep 2023	***1,246.5***	***7.6***	***9.2***	***40.1***	***42.3***
Nov 2022 - Oct 2023	1,267.8	7.6	9.0	40.1	42.3
Dec 2022 - Nov 2023	1,268.8	7.6	9.1	40.1	46.2
Jan 2023 - Dec 2023	1,295.6	7.6	9.1	40.1	48.0
Feb 2023 - Jan 2024	1,339.4	7.6	8.9	40.1	48.0
Mar 2023 - Feb 2024	1,396.3	7.6	8.6	40.1	44.0
Apr 2023 - Mar 2024	1,459.2	7.6	8.3	40.1	36.0
May 2023 - Apr 2024	1,507.8	7.6	7.9	40.1	28.0
Jun 2023 - May 2024	1,499.9	7.6	7.7	40.1	28.0
Jul 2023 - Jun 2024	1,500.1	7.6	8.0	40.1	28.0
Aug 2023 - Jul 2024	1,531.0	7.6	7.9	40.1	20.0
Sep 2023 - Aug 2024	1,534.3	7.6	8.0	40.1	20.0
Oct 2023 - Sep 2024	***1,521.8***	***7.6***	***8.0***	***40.1***	***20.0***
Nov 2023 - Oct 2024	1,529.3	7.6	8.1	40.1	20.0
Dec 2023 - Nov 2024	1,536.0	7.6	7.9	40.1	16.0
Jan 2024 - Dec 2024	1,495.7	7.6	7.9	40.1	15.4
Feb 2024 - Jan 2025	1,444.4	7.6	8.0	40.1	15.4
Mar 2024 - Feb 2025	1,375.3	7.6	8.3	40.1	20.0
Apr 2024 - Mar 2025	1,294.9	7.6	8.7	40.1	28.0

Notes:

- Key to units: kac-feet – thousand acre-feet and ppb – parts per billion (values are in micrograms per liter [µg/L], which, for the purposes of this report, are equivalent to ppb).
- Compliance is evaluated annually based on the 12-month TP FWMC for the federal water year ending on September 30. The compliance periods are shown as highlighted rows with bold, italicized text.
- FWM TP calculations based on biweekly compliance sampling dates do not exclude S334 flow, which contrasts with the flow calculation method used for long-term limit assessments.

Taylor Slough and Coastal Basins

Background

Under the Consent Decree, a single TP long-term limit of 11 ppb, to be met by December 31, 2006, was set for the two points of inflow to Taylor Slough (S332 and S175) and the inflow point to Coastal Basins (S18C) (see Appendix C). The 12-month TP FWMCs have been consistently lower than the long-term limit of 11 ppb.

TP and flow data from both sets of structures presented in prior editions of this report through December 2001 (April 2002 report) showed that, beginning in October 2000, the 12-month moving total flow for S332D, S174, and S18C was consistently greater than flow at S332, S175, and S18C. There was also a shift in TP FWMC data whereby S332D, S174, and S18C concentrations became equal to, and then consistently lower than, the concentrations at S332, S175, and S18C. These changes reflected the switch from S332 to S332D for water delivery to Taylor Slough between July 3 and 5, 2000. Furthermore, the S174 site was plugged in September 2007, preventing any additional flow. Consequently, for WY2002 through WY2007, compliance tracking was represented by S332D, S174, and S18C. Since WY2008, S332D and S18C have represented the compliance tracking structures until Method 2 and Method 3 were developed in WY2017.

To facilitate tracking and comparison of the operation of the improved conveyance and delivery system to Taylor Slough and Coastal Basins, three alternative methods were proposed for the 12-month TP FWMC compliance tracking calculation for Taylor Slough and Coastal Basins. Method 1, computed as S332D + S18C; Method 2, computed as S332D + S18C + G737; and Method 3, computed as (S332D – S332DX1 – S328) + S328 + S18C + G737. Tracking of these three methods spanned June 2017 through March 2020. At the August 11, 2020, TOC meeting, the TOC representatives voted to use Method 3 as the official compliance method moving forward. Beginning with the second quarter of 2020, only Method 3 results are calculated and presented for Taylor Slough and Coastal Basins. Method 3 calculates FWMCs as [(S332D TP and S332D adjusted flow) + (S328 TP and flow) + (G737 TP and flow) + (S18C TP and flow)] using all flow and TP grabs on weekly sampling dates. S332D adjusted flow is S332D – S332DX1 – S328. Inflow TP concentrations to ENP through Taylor Slough and Coastal Basins are compared to the 11-ppb limit at the end of each water year using data from the new combinations of structures**(Figure 6)**.

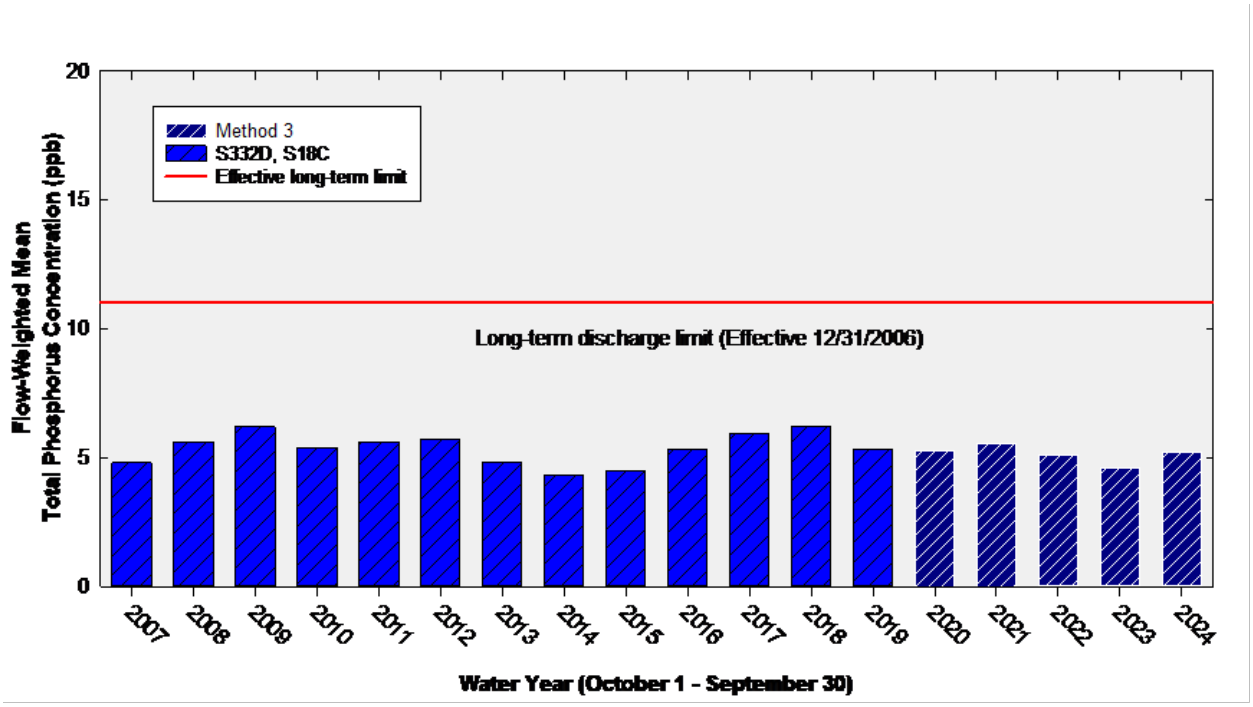

Figure 6. The 12-month TP FWMCs in inflows to ENP through Taylor Slough and Coastal Basins at the end of each water year compared to the 11-ppb long term TP limit. Blue bars show S332D and S18C (Method 1) from WY2007 to WY2019. Method 3 for WY2020 through WY2024, represented by hatched bars, is (S332D – S332DX1 – S328) + S328 + G737 + S18C.

Reporting Period Update

Figure 7 presents 12-month and individual sampling event TP FWMCs at the TP compliance structures. All TP concentrations measured in grab samples collected on positive flow days reported for surface water monitoring at the sites were used for the compliance calculations.

The daily flows toward ENP through S332D (minus S332DX1 flow), G737, and S18C are presented in **Figure 8**. Daily flows from the S332D pumps and downstream structures are presented in **Figure 9**. Daily flows at individual Taylor Slough and Coastal Basins structures into ENP are presented in **Figure 10**.

For the periods ending in January, February, and March, the 12-month tracking TP FWMCs were 5.3, 5.4, and 5.4 ppb, respectively, much lower than the LTL of 11 ppb (**Table 4).** No sampling event FWMC has been higher than 10 ppb since June 7, 2022(10.2 ppb). **Figure 11** shows daily inflows and the corresponding TP FWMCs for each sampling event.

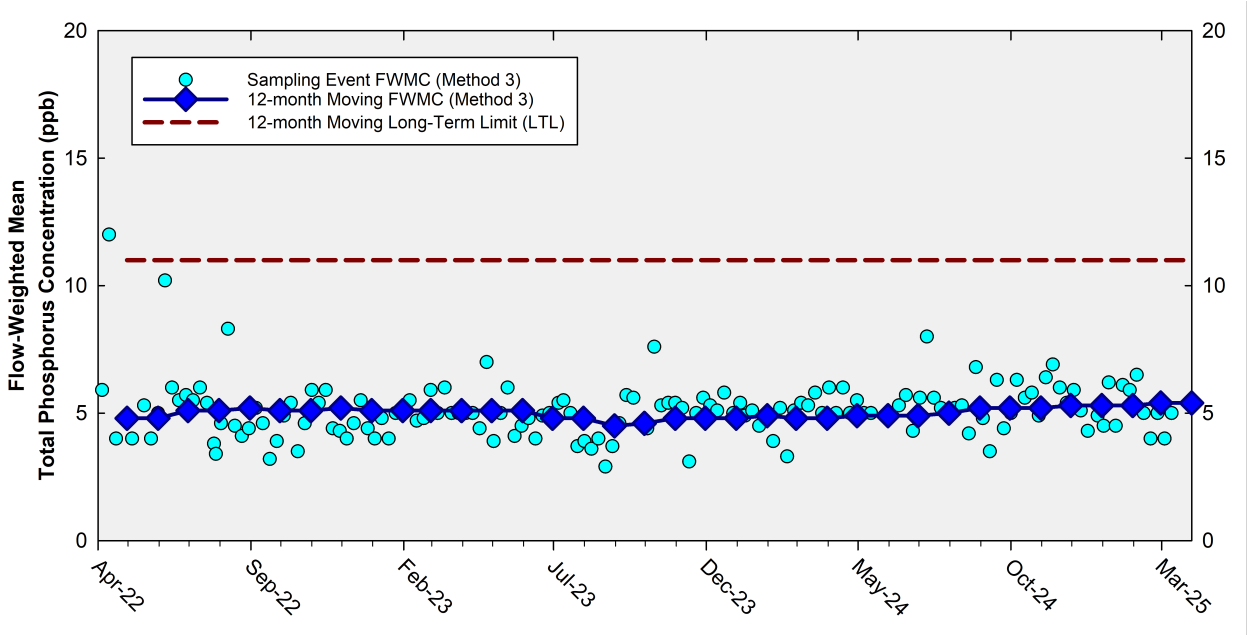

Figure 7. The 12-month moving TP FWMCs in inflows to ENP through Taylor Slough and Coastal Basins at the end of each month and the sampling event TP FWMCs.

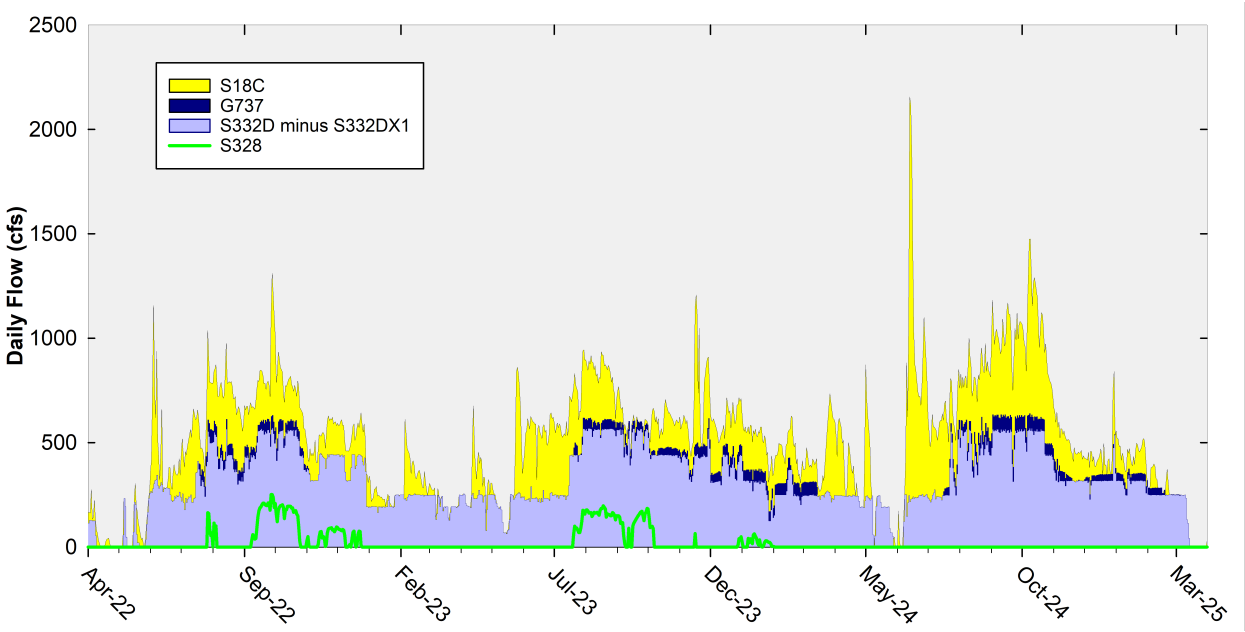

Figure 8. Daily flows into ENP as a stacked sum of Taylor Slough (G737 and S332D minus S332DX1) and Coastal Basins (S18C). S328 flow is shown as an overlaid line, and flow at this station downstream of S332D is associated with its own TP data.

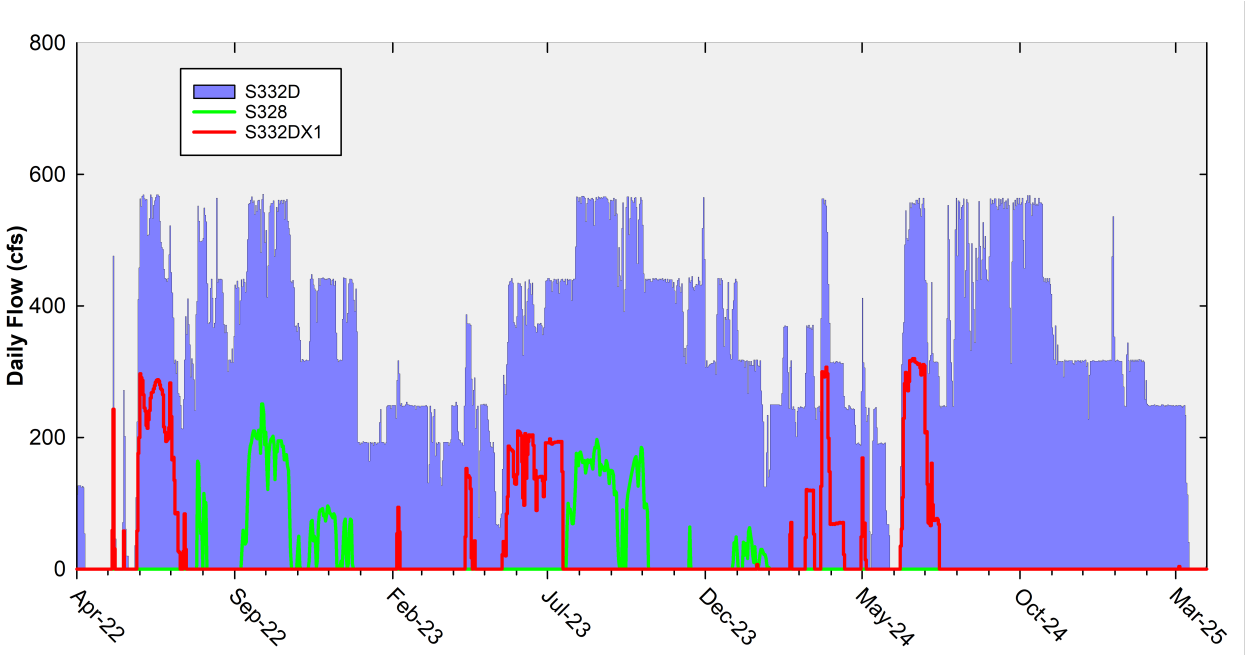

Figure 9. Daily flows into the detention area from the S332D pumps and monitored flow out of the detention area at two downstream structures.

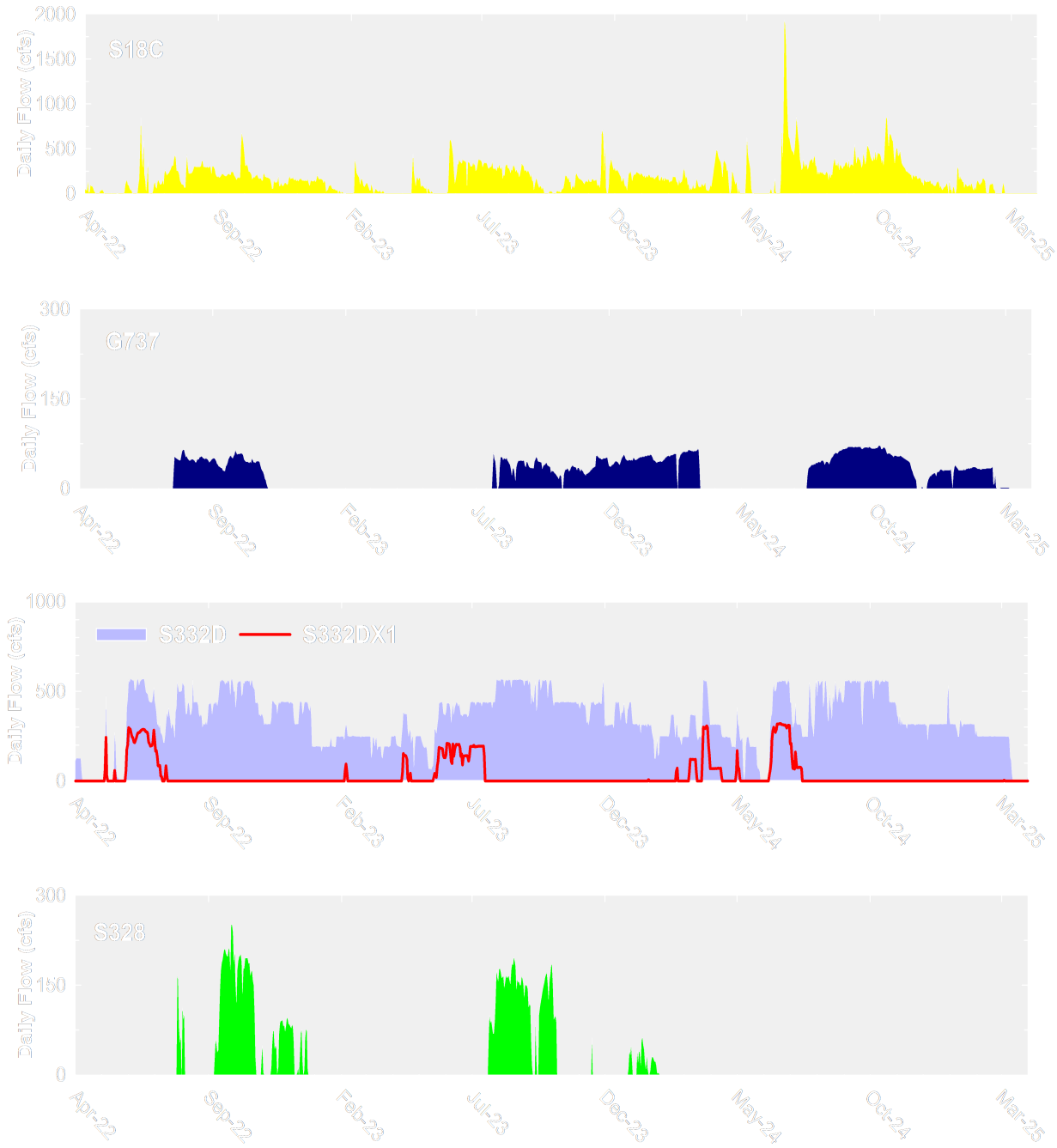

Figure 10. Daily flows in cubic feet per second (cfs) at individual Taylor Slough and Coastal Basins structures into ENP.

Table 4. Taylor Slough and the Coastal Basins TP compliance tracking.

12-Month Period	Total Flow (kac-ft)	Long-Term Limit (ppb)	Flow-Weighted Mean TP Concentration (ppb)	Percent of Sampling Events Greater than 10 ppb	
				Guideline (%)	Observed (%)
May 2021 - Apr 2022	273.2	11.0	4.8	53.1	2.3
Jun 2021 - May 2022	271.0	11.0	4.8	53.1	2.2
Jul 2021 - Jun 2022	288.6	11.0	5.1	53.1	4.3
Aug 2021 - Jul 2022	300.2	11.0	5.1	53.1	4.2
Sep 2021 - Aug 2022	315.2	11.0	5.2	53.1	4.2
Oct 2021 - Sep 2022	***323.0***	***11.0***	***5.1***	***53.1***	***4.2***
Nov 2021 - Oct 2022	329.3	11.0	5.1	53.1	4.2
Dec 2021 - Nov 2022	321.3	11.0	5.2	53.1	4.1
Jan 2022 - Dec 2022	321.5	11.0	5.1	53.1	4.1
Feb 2022 - Jan 2023	309.1	11.0	5.1	53.1	4.0
Mar 2022 - Feb 2023	317.4	11.0	5.1	53.1	4.0
Apr 2022 - Mar 2023	322.0	11.0	5.1	53.1	3.9
May 2022 - Apr 2023	337.2	11.0	5.1	53.1	1.9
Jun 2022 - May 2023	350.7	11.0	5.1	53.1	1.9
Jul 2022 - Jun 2023	357.3	11.0	4.8	53.1	0.0
Aug 2022 - Jul 2023	362.7	11.0	4.8	53.1	0.0
Sep 2022 - Aug 2023	368.8	11.0	4.5	53.1	0.0
Oct 2022 - Sep 2023	***357.3***	***11.0***	***4.6***	***53.1***	***0.0***
Nov 2022 - Oct 2023	347.8	11.0	4.8	53.1	0.0
Dec 2022 - Nov 2023	358.2	11.0	4.8	53.1	0.0
Jan 2023 - Dec 2023	363.3	11.0	4.8	53.1	0.0
Feb 2023 - Jan 2024	380.1	11.0	4.9	53.1	0.0
Mar 2023 - Feb 2024	386.7	11.0	4.8	53.1	0.0
Apr 2023 - Mar 2024	398.3	11.0	4.8	53.1	0.0
May 2023 - Apr 2024	402.0	11.0	4.9	53.1	0.0
Jun 2023 - May 2024	397.1	11.0	4.9	53.1	0.0
Jul 2023 - Jun 2024	409.5	11.0	4.9	53.1	0.0
Aug 2023 - Jul 2024	406.3	11.0	5.0	53.1	0.0
Sep 2023 - Aug 2024	405.7	11.0	5.2	53.1	0.0
Oct 2023 - Sep 2024	***430.5***	***11.0***	***5.2***	***53.1***	***0.0***
Nov 2023 - Oct 2024	458.2	11.0	5.2	53.1	0.0
Dec 2023 - Nov 2024	447.3	11.0	5.3	53.1	0.0
Jan 2024 - Dec 2024	436.7	11.0	5.3	53.1	0.0
Feb 2024 - Jan 2025	432.9	11.0	5.3	53.1	0.0
Mar 2024 - Feb 2025	423.0	11.0	5.4	53.1	0.0
Apr 2024 - Mar 2025	403.9	11.0	5.4	53.1	0.0

Notes:

- Key to units: kac-ft – thousand acre-feet and ppb – parts per billion (values are in micrograms per liter [µg/L], which, for the purposes of this report, are equivalent to ppb).
- Compliance is evaluated annually based on the 12-month TP FWMC for the federal water year ending on September 30. The compliance periods are shown as highlighted rows with bold, italicized text.

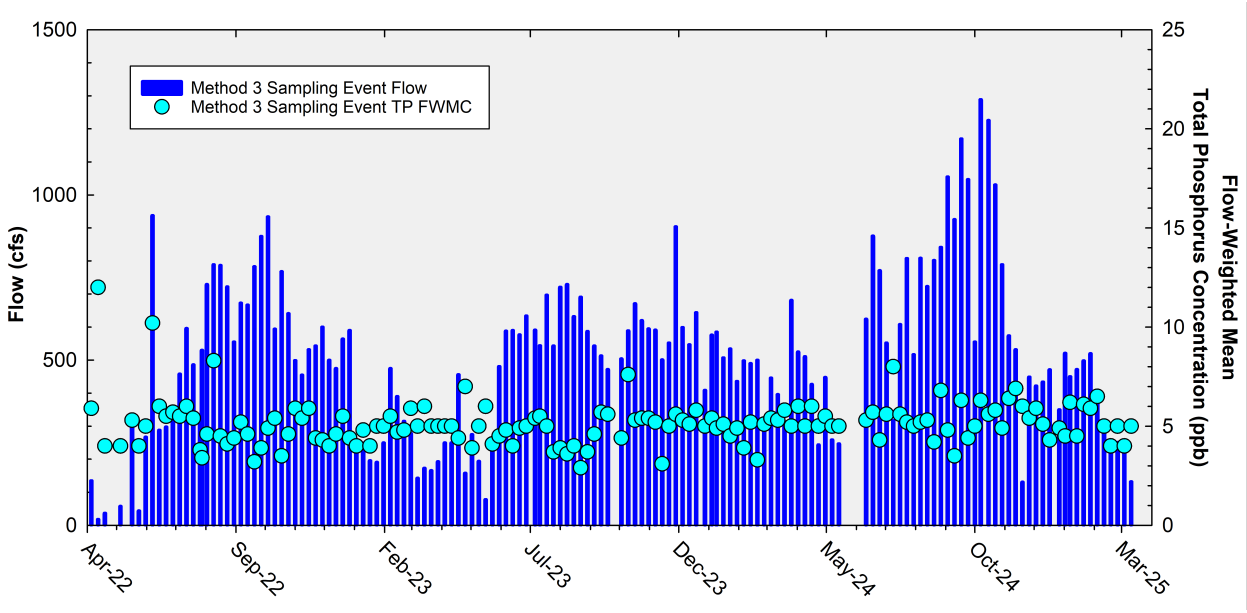

Figure 11. Flow from Taylor Slough and Coastal Basins structures on the days of sampling and the corresponding TP FWMCs for individual sampling events. Method 3 sampling event flows and FWMCs have been used since May 2019.

APPENDIX A

MONTHLY TOTAL PHOSPHORUS CONCENTRATION DATA FOR THE ARTHUR R. MARSHALL LOXAHATCHEE NATIONAL WILDLIFE REFUGE

TP concentration data used in this report can be directly retrieved from the South Florida Water Management District's DBHYDRO database by copying and pasting the following link into the address field of a web browser:

http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+station_id+like+('LOX%25')+and+station_id+not+like+('LOXA%25')+and+test_number+=+25+and+date_collected+%3e=+'01-JAN-2025'+and+date_collected+%3c+'01-APR-2025'+and+sample_type_new+=+'SAMP'&v_target_code=file_csv

The link above only generates data that have not been qualified via the District's QA/QC process. Qualifiers may be added to the data as stipulated in the Florida Department of Environmental (FDEP) Quality Assurance Rule (Chapter 62-160, F.A.C.). Qualified water quality data must be retrieved interactively via the DBHYDRO browser.

Stage data for stations 1-7, 1-8C, and 1-9 from the reporting quarter can be retrieved by copying and pasting the following link into the address field of a web browser:

http://my.sfwmd.gov/dbhydroplsql/web_io.report_process?v_period=uspec&v_start_date=20250101&v_end_date=20250331&v_report_type=format7&v_target_code=file_csv&v_run_mode=onLine&v_datum=1&v_js_flag=Y&v_dbkey=FE775/FE776/FE777

Table A-1. Arthur R. Marshall Loxahatchee National Wildlife Refuge monthly TP data (in parts per billion).

Month - Year	LOX3	LOX4	LOX5	LOX6	LOX7	LOX8	LOX9	LOX10	LOX11	LOX12	LOX13	LOX14	LOX15	LOX16
Apr-2022	---	8	6	8	8	9	7	8	9	7	7	9	6	9
May-2022	--- [1]	---	---	15	---	---	---	---	9	8	9	6	8	11
Jun-2022	12	26	9	14	12	12	10	10	8	7	6	7	7	7
Jul-2022	---	9	4	10	6	7	6	11	---	9	8	8	7	9
Aug-2022	---	10	4	7	6	7	6	9	4	9	5	8	7	9
Sep-2022	---	8	---	13	5	5	---	8	10	7	6	6	8	8
Oct-2022	9	7	7	6	6	6	7	7	6	6	5	6	7	7
Nov-2022	7	9	6	7	7	6	5	8	7	6	6	6	5	10
Dec-2022	4	7	5	7	5	6	6	6	6	6	10	4	6	7
Jan-2023	6	5	6	6	5	6	7	5	6	5	4	6	4	7
Feb-2023	6	6	7	6	5	4	6	6	4	5	4	5	4	7
Mar-2023	8	---	5	7	7	5	4	9	5	6	7	6	6	9
Apr-2023	---	---	---	8	9	9	17	---	4	6	8	7	7	9
May-2023	7	9	6	6	6	8	8	12	7	6	5	7	7	7
Jun-2023	7	9	6	6	6	6	7	8	6	5	6	6	6	7
Jul-2023	7	9	4	6	5	4	4	7	7	6	7	5	7	6
Aug-2023	5	7	6	6	4	4	6	6	6	5	6	5	6	6
Sep-2023	5	8	4	4	5	4	5	9	6	6	6	7	5	7
Oct-2023	6	11	6	5	8	5	7	9	8	8	6	6	6	7
Nov-2023	5	11	5	---	5	8	5	6	---	8	---	---	---	---
Dec-2023	12	13	5	6	5	10	7	8	5	6	6	6	6	6
Jan-2024	4	6	4	6	3	4	5	4	4	6	4	4	4	4
Feb-2024	---	---	---	6	---	---	---	---	6	6	6	6	5	8
Mar-2024	4	11	5	8	5	7	6	7	6	8	6	8	6	15
Apr-2024	---	8	---	7	7	7	6	6	8	5	7	5	8	8
May-2024	---	---	---	---	---	26	---	---	10	7	---	10	9	11
Jun-2024	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Jul-2024	7	13	5	11	8	10	14	10	11	8	8	8	8	9
Aug-2024	---	10	6	9	10	8	8	9	10	7	6	8	8	9
Sep-2024	7	10	6	6	8	7	7	8	7	6	6	7	7	8
Oct-2024	7	8	9	8	7	7	7	8	7	7	7	8	7	8
Nov-2024	6	8	5	7	7	9	7	7	6	8	9	7	6	6
Dec-2024	10	9	6	5	7	6	6	6	5	10	7	6	7	6
Jan-2025	7	7	10	6	7	9	9	6	6	8	5	6	6	5
Feb-2025	---	10	8	8	8	21	12	8	10	7	13	8	7	8
Mar-2025	---	10	---	6	8	10	11	6	9	9	15	6	7	10

Notes:

- "---" indicates sample was not collected due to insufficient water depth or dried out/ponding conditions at the site.
- "--- [1]" TP samples collected at LOX3 in February 2022 were not analyzed because a live aquatic insect was found in the composite bucket.
- 7 TP samples collected in February 2024 were G qualified because analyte was detected above the method detection limit in both the sample and the associated field blank, equipment blank, or trip blank, and the blank value was greater than 10% of the associated sample value.

APPENDIX B

WEEKLY GRAB TOTAL PHOSPHORUS CONCENTRATION DATA FOR SHARK RIVER SLOUGH

TP concentration data used in this report can be directly retrieved from the South Florida Water Management District's DBHYDRO database by copying and pasting the following link into the address field of a web browser:

http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+station_id+in+(%27S12A%27,%27S12B%27,%27S12C%27,%27S12D%27,%27S333%27,%27S333N%27,%27S355A%27,%27S355B%27,%27S356-334%27)+and+test_number+=+25+and+collect_method+=+%27G%27+and+date_collected+%3e=+%2701-Jan-2025%27+and+date_collected+%3c+%2701-Apr-2025%27+and+sample_type_new+=+%27SAMP%27&v_target_code=file_csv

The link above only generates data that have not been qualified via the District's QA/QC process. Qualifiers may be added to the data as stipulated in the FDEP Quality Assurance Rule (Chapter 62-160, F.A.C.). Qualified water quality data must be retrieved interactively via the DBHYDRO browser.

For the first quarter of 2025, United States Geological Survey daily flow data for the S12s were used for the report; some of these data were still provisional. The provisional daily mean flow data for stations S12A, S12B, S12C, S12D, S355A, S355B, S355B temporary pumps, S333N, S356, and S335, and the "Preferred DBKEY" daily mean flow data for stations S333 and S334 for the reporting quarter (first quarter of 2025) can be retrieved by copying and pasting the following link into the address field of a web browser:

http://my.sfwmd.gov/dbhydroplsql/web_io.report_process?v_period=uspec&v_start_date=20250101&v_end_date=20250331&v_report_type=format7&v_target_code=file_csv&v_run_mode=onLine&v_js_flag=Y&v_dbkey=01313/00610/00621/01310/MQ895/MQ896/AM173/40371/64136/91489/15042/FB752

Table B-1. Shark River Slough weekly grab TP data (in parts per billion).

Date	S12A	S12B	S12C	S12D	S333	S333N	S355A	S355B	S356	Remarks
04/02/2024	6	8	6	9	9	9	--	--	6	N/A
04/09/2024	10	7	4	10	9	9	6	8	5	Compliance date
04/16/2024	12	9	6	9	8	10	--	--	6	N/A
04/23/2024	13	9	8	10	10	10	--	--	8	Compliance date
04/30/2024	15	9	7	10	11	10	--	--	6	N/A
05/07/2024	17	11	7	12	12	11	8	15	8	Compliance date
05/14/2024	17	16	17	14	14	14	--	--	6	N/A
05/21/2024	16	16	19	15	16	16	10	16	6	Compliance date
05/28/2024	16	15	17	13	19	21	--	--	10	N/A
06/04/2024	20	14	14	13	19	22	15	19	13	Compliance date
06/11/2024	27	19	16	15	15	24	--	--	6	N/A
06/18/2024	24	13	12	21	23	21	6	10	6	Compliance date
06/25/2024	14	9	8	10	14	12	--	--	6	N/A
07/02/2024	13	10	7	13	11	10	7	11	6	Compliance date
07/09/2024	13	9	7	10	11	10	--	--	6	N/A
07/16/2024	10	7	6	14	10	10	7	9	6	Compliance date
07/23/2024	6	5	7	9	8	9	--	--	6	N/A
07/30/2024	6	6	6	8	10	10	8	8	6	Compliance date
08/06/2024	6	5	7	9	9	8	--	--	5	N/A
08/13/2024	6	6	7	9	9	8	6	9	6	Compliance date
08/20/2024	5	5	6	8	8	8	--	--	5	N/A
08/27/2024	7	6	6	9	9	9	7	8	7	Compliance date
09/03/2024	5	5	6	8	8	8	--	--	6	N/A
09/10/2024	5	5	7	8	8	7	7	10	5	Compliance date
09/17/2024	4	5	8	Y	8	6	--	--	5	N/A
09/24/2024	5	5	6	8	8	7	6	9	5	Compliance date
10/01/2024	5	6	6	8	7	8	--	--	6	N/A
10/08/2024	6	5	7	9	8	8	7	8	8	Compliance date
10/15/2024	6	5	7	9	7	8	--	--	6	N/A
10/22/2024	6	4	6	8	7	6	5	7	7	Compliance date
10/29/2024	7	4	6	8	12	7	--	--	5	N/A
11/05/2024	9	6	6	7	7	7	7	7	6	Compliance date
11/12/2024	10	6	6	8	9	9	--	--	6	N/A
11/19/2024	8	6	5	8	7	7	6	7	6	Compliance date
11/26/2024	8	6	6	7	6	7	--	--	5	N/A
12/03/2024	8	6	5	7	7	7	5	5	6	Compliance date
12/10/2024	7	6	6	6	7	6	--	--	6	N/A
12/17/2024	9	7	5	6	6	6	7	6	6	Compliance date
12/27/2024	8	8	5	7	6	7	--	--	6	N/A
01/02/2025	10	7	7	9	8	8	5	7	7	Compliance date
01/07/2025	7	6	6	8	8	8	--	--	6	N/A
01/14/2025	8	7	5	7	8	7	8	6	6	Compliance date
01/21/2025	10	10	6	7	9	8	--	--	6	N/A
01/28/2025	8	7	5	6	8	8	5	6	6	Compliance date
02/04/2025	18	11	10	10	11	11	--	--	8	N/A
02/11/2025	G	G	G	G	G	G	G	G	G	Compliance date
02/18/2025	18	14	11	14	17	15	--	--	10	N/A
02/25/2025	19	14	13	14	15	15	10	14	11	Compliance date
03/04/2025	22	17	16	15	16	18	--	--	12	N/A
03/11/2025	28	20	16	17	22	20	10	21	10	Compliance date
03/18/2025	36	20	18	42	23	22	--	--	11	N/A
03/25/2025	48	33	26	22	25	26	16	25	10	Compliance date

Notes:

- "---" indicates a water sample was not collected because the gate was closed and there was no flow at the site.
- "Compliance date" indicates biweekly sampling date for Consent Decree calculation.
- "N/A" indicates sampling data are presented for informational purposes only.
- "G" indicates the analyte was detected at or above the method detection limit in both the sample and the associated field blank, equipment blank, or trip blank, and the blank value was greater than 10% of the associated sample value.

APPENDIX C

WEEKLY GRAB TOTAL PHOSPHORUS CONCENTRATION DATA FOR TAYLOR SLOUGH AND COASTAL BASINS

TP concentration data used in this report can be directly retrieved from the South Florida Water Management District's DBHYDRO database by copying and pasting the following link into the address field of a web browser:

http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+station_id+in+('S332DX','S18C','S328','G737')+and+test_number+=+25+and+collect_method+=+'G'+and+date_collected+%3e=+'01-JAN-2025'+and+date_collected+%3c+'01-APR-2025'+and+sample_type_new+=+'SAMP'&v_target_code=file_csv

The link above only generates data that have not been qualified via the Districts QA/QC process. Qualifiers may be added to the data as stipulated in the FDEP Quality Assurance Rule (Chapter 62-160, F.A.C.). Qualified water quality data must be retrieved interactively via the DBHYDRO browser.

The daily mean flow data for stations at Taylor Slough and Coastal Basins (S332D, S18C, S328, G737, and S332DX1) during the reporting quarter can be retrieved by copying and pasting the following link into the address field of a web browser:

http://my.sfwmd.gov/dbhydroplsql/web_io.report_process?v_period=uspec&v_start_date=20250101&v_end_date=20250331&v_report_type=format7&v_target_code=file_csv&v_run_mode=onLine&v_js_flag=Y&v_dbkey=15760/TA413/AS254/AS257/AS259

Table C-1. Taylor Slough and Coastal Basins weekly grab TP data (in parts per billion).

Date	S332DX	S18C	G737	S328
4/2/2024	6	6	--	4
4/9/2024	5	5	--	--
4/16/2024	6	6	--	4
4/23/2024	5	5	--	--
4/30/2024	6	5	--	14
5/7/2024	5	5	--	--
5/14/2024	5	6	--	J
5/21/2024	Y	4	--	--
5/28/2024	8	--	--	J
6/4/2024	11	7	--	--
6/11/2024	4	6	--	22
6/18/2024	5	6	6	--
6/25/2024	5	G	G	7
7/2/2024	5	6	4	--
7/9/2024	G	8	4	G
7/16/2024	5	6	5	--
7/23/2024	5	6	3	6
7/30/2024	5	G	G	--
8/6/2024	5	6	4	6
8/13/2024	5	6	3	--
8/20/2024	4	5	2	3
8/27/2024	6	9	3	--
9/3/2024	5	5	2	4
9/10/2024	4	3	2	--
9/17/2024	7	6	3	5
9/24/2024	5	G	G	NOB

Date	S332DX	S18C	G737	S328
10/01/2024	5	G	G	6
10/07/2024	7	6	3	--
10/15/2024	6	5	7	7
10/22/2024	6	6	3	--
10/29/2024	5	5	3	5
11/05/2024	7	6	4	--
11/12/2024	6	9	3	6
11/19/2024	J	6	4	--
11/26/2024	6	4	2	8
12/03/2024	6	6	4	--
12/10/2024	5	6	4	10
12/17/2024	4	5	5	--
12/27/2024	5	5	4	J
01/02/2025	5	4	2	--
01/07/2025	7	5	2	7
01/14/2025	4	6	4	--
01/21/2025	6	7	3	6
01/28/2025	6	6	4	--
02/04/2025	7	6	4	J
02/11/2025	5	5	5	--
02/18/2025	4	4	3	26
02/25/2025	5	8	4	--
03/04/2025	4	18	4	J
03/11/2025	5	--	4	--
03/18/2025	9	--	--	J
03/25/2025	7	--	--	--

Notes:

- "--" indicates a water sample was not collected because the gate was closed and there was no flow, or the water depth was too shallow.
- Blank cell for the site indicates that it was not the sampling week. "NOB" (No Bottle Sample) indicates the water sample was not collected because of the non-representative surrounding area condition.
- "G" indicates the analyte was detected at or above the method detection limit in both the sample and the associated field blank, equipment blank, or trip blank, and the blank value was greater than 10% of the associated sample value.
- "Y" indicates the sample was improperly preserved.
- "J" indicates the analysis yielded an estimated value.

APPENDIX D

CALCULATION METHODS

Long Term Marsh Concentration Levels for Loxahatchee National Wildlife Refuge

Long Term Marsh Concentration Levels:

$$C = 10.7172 - 0.541156S + 1.372\sqrt{7.5819 - 0.9310S + 0.02902216\,S^2}$$

Terms:

C = the natural log of the geometric mean total phosphorus concentration across 14 marsh stations.

S = average stage[1] measured at gauges CA1-9, CA1-7, and CA1-8C on sampling date (feet).

This equation is applicable over a stage range of 15.42 to 17.14 feet. If the stage on any sampling date exceeds 17.14 feet, a stage of 17.14 feet should be used in calculating the long-term concentration levels. The equation shall not apply to dates when the average stage is less than 15.42 feet.

(1991 Settlement Agreement entered as a Consent Decree in 1992 and modified in 1995, Exhibit B, Appendix B, Attachment II, page B-7)

[1] Referenced to NGVD29.

Discharge Limits and OFW Standards for Shark River Slough

Interim Discharge Limit:

$$C = 11.16 - 0.00465\ Q + 1.397\ \sqrt{6.377\ - 0.00591\ Q + 0.00000436\ \ Q^2}$$

Long-Term Discharge Limit & OFW Standard:

$$C = 11.38 - 0.00538\ Q + 1.397\ \sqrt{2.493\ - 0.00231\ Q + 0.00000170\ \ Q^2}$$

Frequency Exceedance:

$$F = 48.411 - 0.02896\ Q + 1.397\ \sqrt{330.1 - 0.3071\ Q + 0.0002254\ \ Q^2}$$

Terms:

Water Year = October through September

Q = total inflow to Shark River Slough for water year, S-12s + S-333 + any additional inflow from the WCAs established in the future, thousand acre-feet per year (kac-ft/yr).

C = limit on maximum flow-weighted-mean inflow concentration for any water year, composite of all inflows to Shark Slough (ppb).

F = exceedance for maximum frequency (percent) of inflow concentrations exceeding 10 ppb, computed from the time series of concentrations composited across all inflow structures on each sampling date with positive flow in a given water year.

The range of flow (Q) used in deriving the limits is 117 to 1,061 kac-ft/yr. If the total flow for any water year exceeds 1,061 kac-ft/yr, a flow of 1,061 kac-ft/yr should be used in calculating the discharge limits.

(1991 Settlement Agreement entered as a Consent Decree in 1992 and modified in 1995, Exhibit B, Appendix A, Attachment I, page A-5)

Discharge Limits and OFW Standards for Taylor Slough and Coastal Basins

Long-Term Flow-Weighted Discharge Limit & OFW Standard = 11.0 ppb

Frequency Exceedance:

Frequency of values > 10 ppb must be less than 53.1%.

Terms:

Limits are defined on a water year basis, October through September.

Basin flow is the total flow through structures S-332, S-175, and S-18C, plus any new release points from this basin established in the future, thousand acre-feet per year (kac-ft/yr).

Limits apply to the flow-weighted-mean concentration for any water year, composite of all inflows to Taylor Slough (S-332) and Coastal Basins (S-18C).

Frequency exceedance is the exceedance for maximum frequency (percent) of inflow concentrations exceeding 10 ppb, computed from the time series of concentrations composited across all inflow structures on each sampling date with positive flow in a given water year.

(1991 Settlement Agreement entered as a Consent Decree in 1992 and modified in 1995, Exhibit B, Appendix A, Attachment II, page A-6)

APPENDIX E

DOCUMENT REVISIONS

Table E-1. Revisions to this report since initial publication.

Version	Date	Section & Page (s)	Change/Reason
00	06/18/2025	All	Original Settlement Agreement Report Created