

Settlement Agreement Report

Fourth Quarter
October – December 2020

Prepared for the
Technical Oversight Committee

April 27, 2021



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 WY2021 (October 1, 2020 – September 30, 2021) results will be 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

cfs	cubic feet per second
ENP	Everglades National Park
ft NGVD29	feet relative to the National Geodetic Vertical Datum of 1929
FWMC	flow-weighted mean concentration
kac-ft	thousand acre-feet
ppb	parts per billion
Refuge	Arthur R. Marshall Loxahatchee National Wildlife Refuge
STA	Stormwater Treatment Area
TOC	Everglades Technical Oversight Committee
TP	total phosphorus
µg/L	micrograms per liter
WCA	water conservation 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 fourth quarter of 2020 (October - December 2020). 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 October, November, and December 2020.
- **Shark River Slough:** Tracking results based on provisional data for the fourth quarter of 2020 are presented. When the final data are available, the final federal Water Year (WY) 2021 (October 1, 2020 - September 30, 2021) 12-month TP flow-weighted mean concentrations (FWMCs) will be published separately as a revision to the third quarter 2021 report.
- **Taylor Slough and Coastal Basins:** All three 12-month TP FWMCs were below the 12-month long-term limit of 11 parts per billion (ppb) during the fourth quarter.

Table 1. Fourth quarter 2020 TP compliance results for the Refuge, TP calculation provisional tracking results for Shark River Slough, and TP calculation tracking results for Taylor Slough and Coastal Basins.

Month	Geometric Mean TP Concentration (ppb)	Long-Term Level (ppb)	Mean Stage (ft NGVD29)	Number of Samples	
Arthur R. Marshall Loxahatchee National Wildlife Refuge					
Oct 2020	6.4	7.2	17.45	14	
Nov 2020	5.3	7.2	17.54	14	
Dec 2020	5.6	7.2	17.39	14	
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 2020	780.2	9.0	9.0	46.9	35.0
Nov 2020	1,129.1	8.2	7.6	40.1	35.0
Dec 2020	1,491.2	7.5	7.6	40.1	31.8
Everglades National Park – Taylor Slough and Coastal Basins					
Oct 2020	357.0	5.4	11.0	53.1	2.1
Nov 2020	416.5	5.8	11.0	53.1	4.3
Dec 2020	449.1	5.8	11.0	53.1	4.2

Notes:

- Key to units: ppb – parts per billion (values are actually in µg/L [micrograms per liter], 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, and 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) August 2020, the compliance calculation results shown are "Method 1.5" for Shark River Slough and "Method 3" for Taylor Slough and Coastal Basins (detailed later in this report).

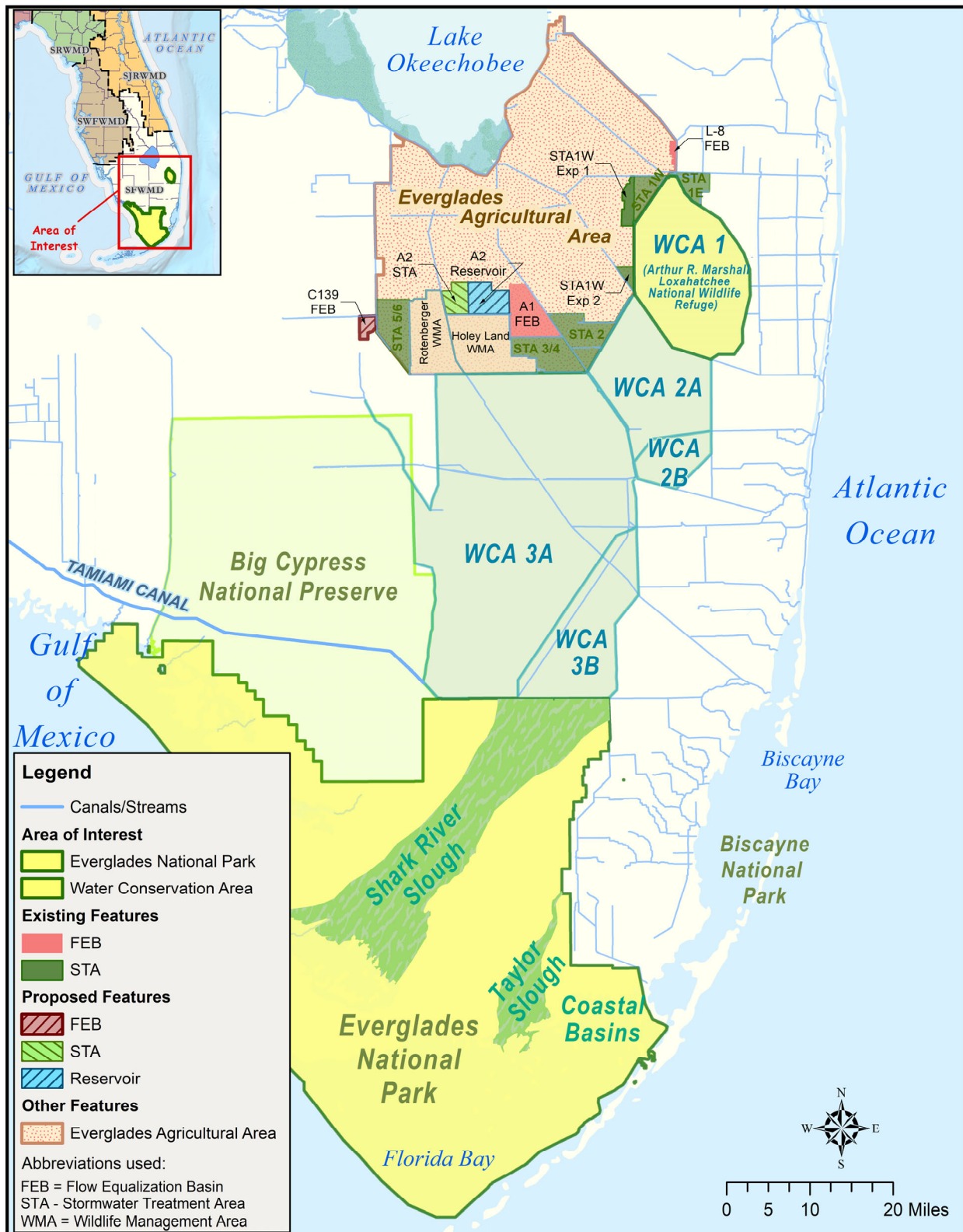


Figure 1. Areas of interest.

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 feet (ft) relative to the National Geodetic Vertical Datum of 1929 (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

In October, November, and December 2020, samples were collected from all 14 stations.

Sampling day average stages in the Refuge were 17.45, 17.54, and 17.39 ft NGVD29 in October, November, and December 2020, respectively (**Figure 3** and **Table 2**). The geometric means calculated from TP concentrations measured in water samples collected in October, November, and December 2020 were 6.4, 5.3, and 5.6 ppb, respectively, which were below the long-term levels.

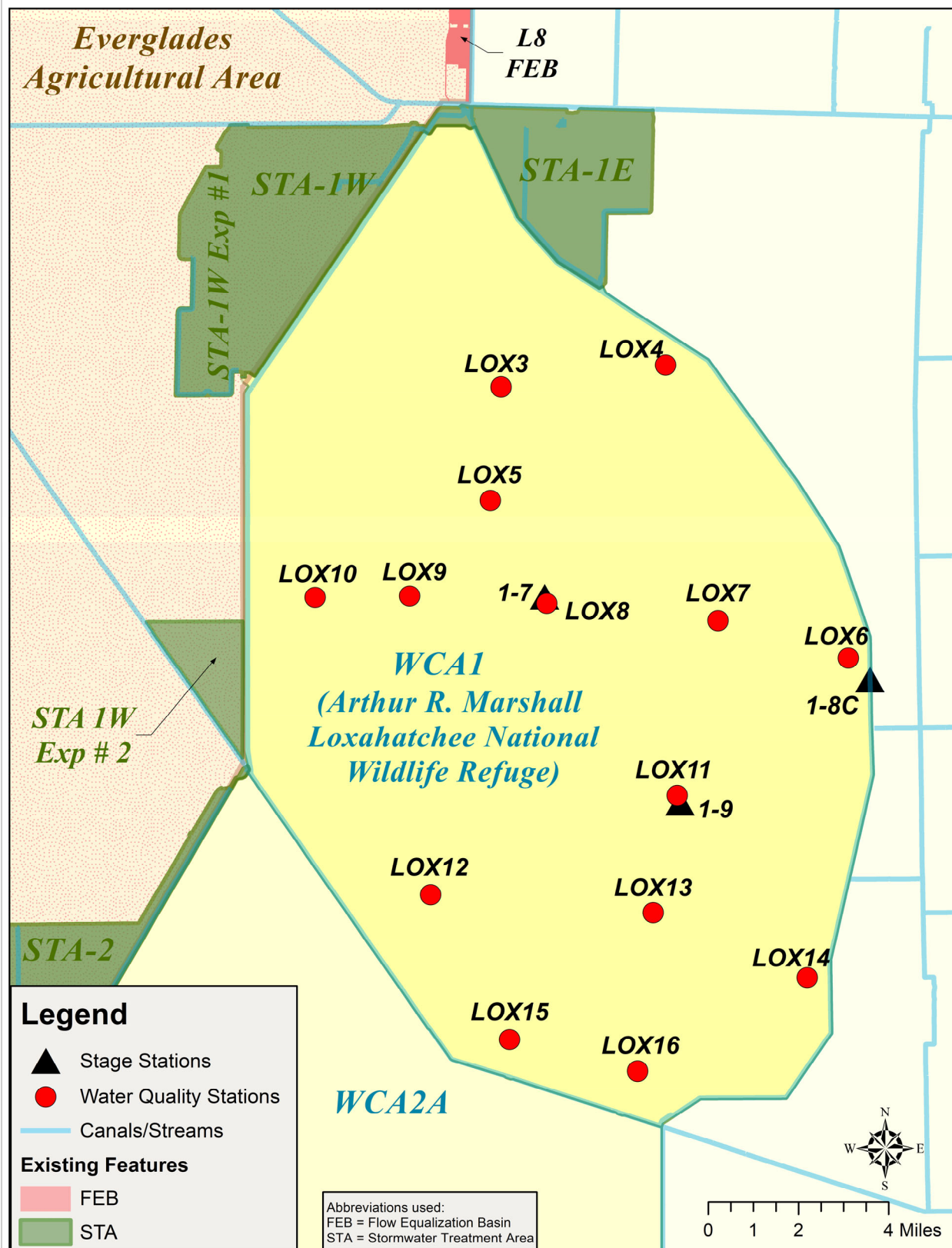


Figure 2. Refuge water quality sampling and stage measurement stations.

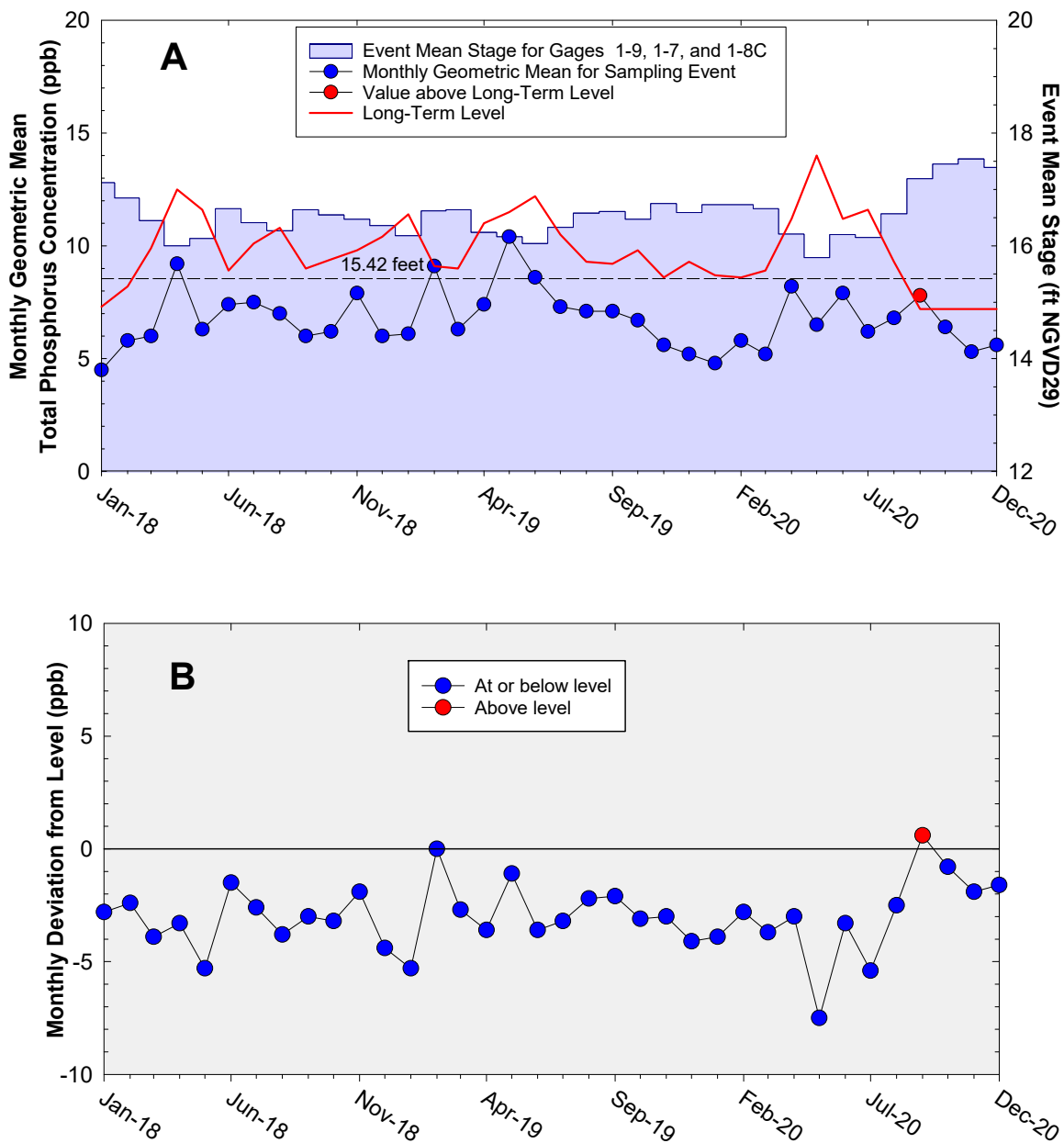


Figure 3. (A) Monthly TP geometric mean concentrations for the Refuge compared to calculated long-term levels, which are adjusted for fluctuations in stage. The geometric mean TP concentration was above the long-term level in September 2020. (B) Deviation of monthly geometric mean TP concentrations from calculated long-term levels. Negative values indicate that the geometric mean was lower than the long-term level.

Table 2. Refuge TP compliance tracking.

Month	Geometric Mean TP Concentration (ppb)	Long-Term Level (ppb)	Average Stage ^a (ft NGVD29)	Number of Samples
Jan-2018	4.5	7.3	17.12	14
Feb-2018	5.8	8.2	16.85	14
Mar-2018	6.0	9.9	16.45	14
Apr-2018	9.2	12.5	16.00	9
May-2018	6.3	11.6	16.13	9
Jun-2018	7.4	8.9	16.66	14
Jul-2018	7.5	10.1	16.41	13
Aug-2018	7.0	10.8	16.27	12
Sep-2018	6.0	9.0	16.64	14
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
Jan-2019	6.1	11.4	16.18	10
Feb-2019	9.1	9.1	16.62	14
Mar-2019	6.3	9.0	16.64	14
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
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
Oct-2019	6.7	9.8	16.47	13
Nov-2019	5.6	8.6	16.75	14
Dec-2019	5.2	9.3	16.59	14
Jan-2020	4.8	8.7	16.73	14
Feb-2020	5.8	8.6	16.73	14
Mar-2020	5.2	8.9	16.66	14
Apr-2020	8.2	11.2	16.21	11
May-2020	6.5	14.0	15.79	6
Jun-2020	7.9	11.2	16.20	12
Jul-2020	6.2	11.6	16.15	12
Aug-2020	6.8	9.3	16.57	14
<i>Sep-2020</i>	<i>7.8</i>	<i>7.2</i>	<i>17.19</i>	<i>14</i>
Oct-2020	6.4	7.2	17.45	14
Nov-2020	5.3	7.2	17.54	14
Dec-2020	5.6	7.2	17.39	14

Notes:

- Key to units: ppb – parts per billion (values are actually in µg/L [micrograms per liter], 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.
 - Highlighted row with bold, italicized text indicates when an excursion over the long-term level occurred.
- a. Average stage is calculated using stage elevations at stations 1-7, 1-8C, and 1-9 for a given sampling date.

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 October 1, 2003, and December 31, 2006, respectively. It was specified that the TP concentrations be presented as 12-month flow-weighted means. Only the TP concentrations for the water year ending on September 30 are evaluated for compliance with the Consent Decree limits (**Appendix D**). The long-term TP concentration limit for inflows to Shark River Slough is represented by concentrations delivered through S12A, S12B, S12C, and S12D during the Outstanding Florida Waters baseline period of March 1, 1978, to March 1, 1979, and is adjusted for variations in flow. Inflow concentrations of TP through S12A, S12B, S12C, S12D, S333, S355A, and S355B are compared to the interim and long-term limits at the end of each water year (October 1 through September 30). The long-term limit went into effect in WY2007.

Routine monitoring was changed to weekly for all Shark River Slough sites beginning in August 2007. In accordance with Appendix A of the Consent Decree, only every-other-week grab concentration data were used for the FWMC calculations from October 2007 forward. 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 fourth quarter report. Based on a vote by the TOC on July 19, 2016, provisional 12-month results are now included in the Executive Summary of this report.

The TOC has recognized that the S356 seepage return pump, which initiated operation under the United States Army Corps of Engineers field test in fall 2015, has the ability to discharge water that originated from the water conservation areas (WCAs) to Shark River Slough. The Appendix A subteam was tasked with recommending an appropriate method for incorporating S356 into the compliance calculation. Since adoption of a single appropriate method had not yet been made by the TOC prior to publication of provisional tracking through the second quarter of WY2020, this report contains results based on two calculation methods (Method 1 and Method 2) through the 12-month tracking periods ending March 2020. 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 the S12s' flow and TP together with each of the TP results and

adjusted inflows through the L-29 Canal to Shark River Slough, including the portion of S356 flow from S335, all reduced by the proportional volume exiting S334. TP grab results at S12A, S12B, S12C, S12D, S333, S355A, S355B, and S356 are applied to the respective flow (adjusted as described) on biweekly compliance sampling dates. S334 flow is not excluded from the total flow for long-term limit calculations.

For the 12-month period ending on September 30, 2020, the 12-month TP FWMC calculated using Method 1.5 was 9.3 ppb, which is below the long-term limit of 9.5 ppb. Therefore, inflows to Shark River Slough did not exceed the TP limit for WY2020 (October 1, 2019 – September 30, 2020).

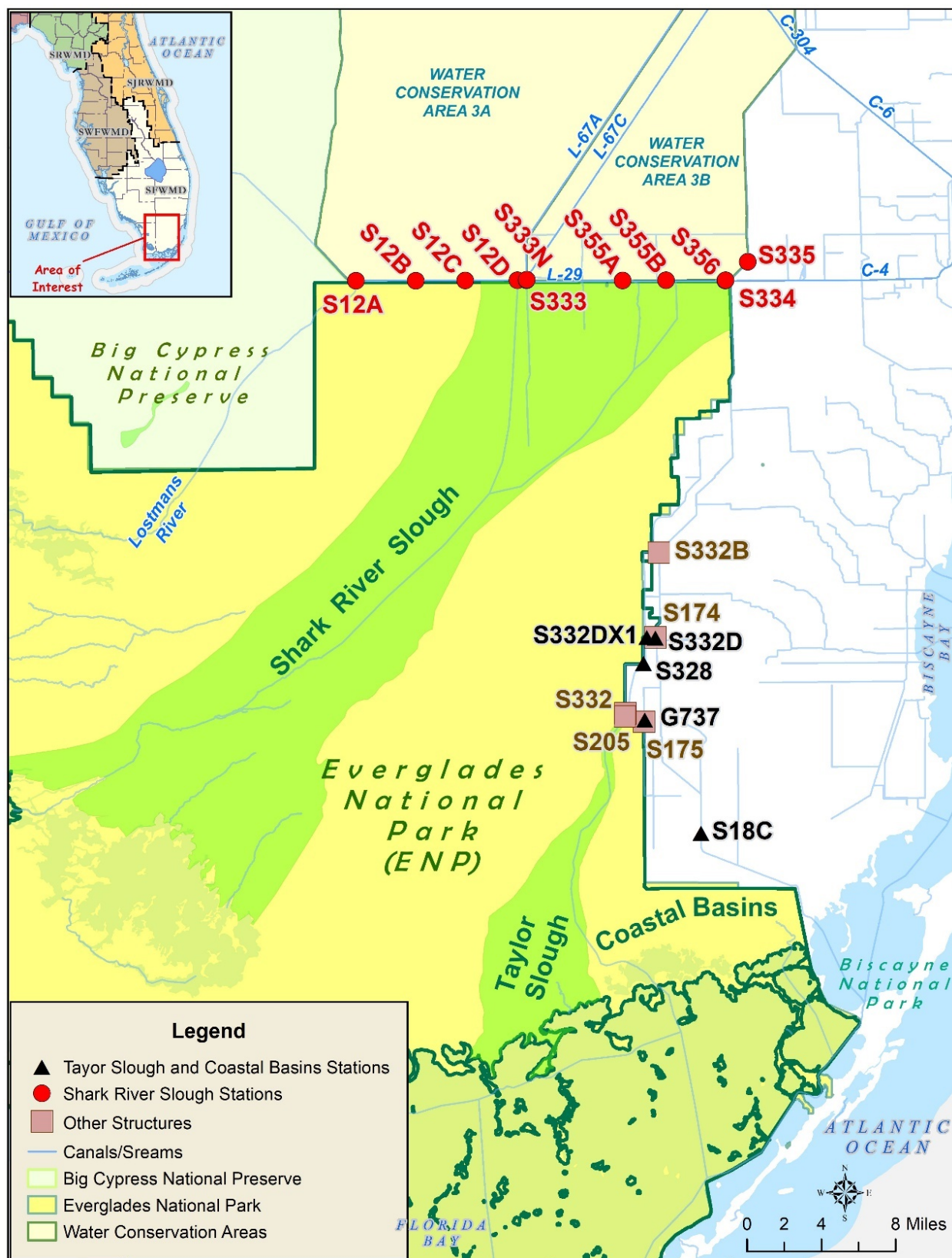


Figure 4. ENP flow structures.

Reporting Period Update

The newly constructed gated spillway S333N, located north of S333, started to discharge water from L-67A to the L-29 Canal east of S333 in November 2020. S333N was integrated into Method 1.5 in the current report for tracking purposes. TP FWMC is computed as $S12s + [S333 + S333N + S355A + S355B + \text{minimum}(S356, S335) - S334]$. The entire S333N flow volume counts toward the annual flow total for long-term limit calculation. Official incorporation of this structure's data into the Appendix A Shark River Slough water year compliance methodology by the TOC is anticipated to occur before the end of this water year.

Table 3 presents the provisional 12-month FWMCs for each month with the corresponding long-term TP concentration limits calculated using the provisional 12-month period flow. Flow data for the S12s from October 1, 2020, are provisional. It is anticipated that the final approved flow data for WY2021 for the S12s will be available in April 2022. The annual 12-month TP FWMC will be calculated to determine compliance with the long-term limit and will be published as a revision to the third quarter 2021 (July – September 2021) report.

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

Table 3. Provisional Shark River Slough TP compliance tracking.

12-Month Period	Total Flow (kac-ft)	Flow-Weighted Mean TP Concentration (ppb)	Long-Term Limit (ppb)	Percent of Sampling Events Greater than 10 ppb	
				Guideline	Observed
Nov 2016 - Oct 2017	1,288.7 (1,292.8)	8.7 (8.7)	7.6 (7.6)	40.1 (40.1)	20.8 (20.0)
Dec 2016 - Nov 2017	1,541.3 (1,545.3)	8.1 (8.1)	7.6 (7.6)	40.1 (40.1)	20.8 (20.0)
Jan 2017 - Dec 2017	1,757.6 (1,761.6)	7.8 (7.8)	7.6 (7.6)	40.1 (40.1)	20.8 (20.0)
Feb 2017 - Jan 2018	1,854.1 (1,858.9)	7.7 (7.7)	7.6 (7.6)	40.1 (40.1)	20.8 (20.0)
Mar 2017 - Feb 2018	1,891.4 (1,896.2)	7.7 (7.7)	7.6 (7.6)	40.1 (40.1)	20.8 (20.0)
Apr 2017 - Mar 2018	1,901.4 (1,906.1)	7.7 (7.7)	7.6 (7.6)	40.1 (40.1)	28.0 (28.0)
May 2017 - Apr 2018	1,911.8 (1,916.5)	7.7 (7.7)	7.6 (7.6)	40.1 (40.1)	34.6 (34.6)
Jun 2017 - May 2018	1,952.0 (1,957.6)	8.4 (8.4)	7.6 (7.6)	40.1 (40.1)	34.6 (34.6)
Jul 2017 - Jun 2018	1,953.5 (1,959.1)	7.1 (7.1)	7.6 (7.6)	40.1 (40.1)	30.8 (30.8)
Aug 2017 - Jul 2018	1,889.8 (1,895.4)	7.3 (7.3)	7.6 (7.6)	40.1 (40.1)	30.8 (30.8)
Sep 2017 - Aug 2018	1,844.6 (1,859.1)	7.3 (7.3)	7.6 (7.6)	40.1 (40.1)	30.8 (30.8)
Oct 2017 - Sep 2018	1,731.8 (1,761.0)	7.3 (7.3)	7.6 (7.6)	40.1 (40.1)	30.8 (30.8)
Nov 2017 - Oct 2018	1,443.9 (1,488.4)	7.8 (7.7)	7.6 (7.6)	40.1 (40.1)	30.8 (30.8)
Dec 2017 - Nov 2018	1,117.7 (1,162.3)	8.5 (8.3)	7.6 (7.6)	40.1 (40.1)	36.0 (36.0)
Jan 2018 - Dec 2018	908.3 (952.9)	9.1 (8.9)	8.4 (8.1)	43.6 (42.6)	36.0 (36.0)
Feb 2018 - Jan 2019	822.9 (866.6)	9.6 (9.3)	8.8 (8.6)	45.8 (44.7)	36.0 (36.0)
Mar 2018 - Feb 2019	813.5 (857.1)	9.7 (9.4)	8.8 (8.6)	46.0 (44.9)	40.0 (40.0)
Apr 2018 - Mar 2019	844.0 (887.6)	9.9 (9.6)	8.7 (8.5)	45.2 (44.1)	37.5 (37.5)
May 2018 - Apr 2019	861.7 (905.3)	10.0 (9.7)	8.6 (8.4)	44.8 (43.7)	37.5 (37.5)
Jun 2018 - May 2019	858.4 (901.0)	8.8 (8.5)	8.6 (8.4)	44.9 (43.8)	37.5 (37.5)
Jul 2018 - Jun 2019	787.9 (838.3)	8.9 (8.6)	9.0 (8.7)	46.7 (45.4)	41.7 (41.7)
Aug 2018 - Jul 2019	707.7 (780.9)	9.4 (8.9)	9.4 (9.0)	48.9 (46.9)	50.0 (45.8)
Sep 2018 - Aug 2019	666.5 (755.3)	9.9 (9.2)	9.6 (9.1)	50.1 (47.6)	54.2 (50.0)
Oct 2018 - Sep 2019	654.1 (748.5)	10.0 (9.3)	9.7 (9.2)	50.5 (47.8)	52.0 (48.0)
Nov 2018 - Oct 2019	666.5 (693.2)	10.1 (9.8)	9.6 (9.5)	50.1 (49.3)	54.2 (50.0)
Dec 2018 - Nov 2019	682.6 (715.2)	10.0 (9.7)	9.5 (9.4)	49.6 (48.7)	48.0 (44.0)
Jan 2019 - Dec 2019	671.4 (704.1)	10.0 (9.7)	9.6 (9.4)	49.9 (49.0)	52.2 (47.8)
Feb 2019 - Jan 2020	666.7 (699.3)	10.0 (9.7)	9.6 (9.4)	50.1 (49.1)	54.5 (50.0)
Mar 2019 - Feb 2020	643.0 (675.6)	10.0 (9.6)	9.7 (9.4)	50.8 (49.8)	52.4 (47.6)
Apr 2019 - Mar 2020	614.7 (647.3)	9.6 (9.3)	9.9 (9.6)	51.6 (50.7)	50.0 (47.8)
May 2019 - Apr 2020	598.3	9.5	10.0	52.1	47.6
Jun 2019 - May 2020	576.4	9.3	10.1	52.8	45.0
Jul 2019 - Jun 2020	603.5	9.1	10.0	52.0	45.0
Aug 2019 - Jul 2020	656.8	9.6	9.7	50.4	40.0
Sep 2019 - Aug 2020	690.7	9.2	9.5	49.4	33.3
Oct 2019 - Sep 2020	692.7	9.3	9.5	49.3	35.0
Nov 2019 - Oct 2020	780.2	9.0	9.0	46.9	35.0
Dec 2019 - Nov 2020	1,129.1	8.2	7.6	40.1	35.0
Jan 2020 - Dec 2020	1,491.2	7.5	7.6	40.1	31.8

Notes:

- Key to units: kac-feet – thousand acre-feet; and ppb – parts per billion (values are in µg/L [micrograms per liter], which, for the purposes of this report, are equivalent to ppb).
- Compliance is evaluated annually based on the 12-month TP FPMC for the federal water year ending on September 30. The compliance periods are shown as highlighted rows with bold, italicized text.
- Results of both Method 1 and Method 2 are presented through the first quarter of 2020 (12-month period ending March 2020):
 - Method 1 (left value) is computed as S12s + (S333 + S355A + S355B - S334).
 - Method 2 (value in parentheses) is computed as S12s + (S333 + S355A + S355B + S356 - S334).
- Starting with the second quarter of 2020 (12-month periods ending April, May, and June 2020), results of Method 1.5 for the corresponding 12-month periods are presented; Method 1.5 is computed as S12s + [S333 + S333N + S355A + S355B + minimum (S356, S335) - S334]. S333N was incorporated from November 2020 in this report (methodology for official water year compliance is pending TOC approval).
- All methods use all flow and TP grabs on biweekly compliance sampling dates and do not exclude S334 flow from the total flow for long-term limit calculations.

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 consistently been lower than the long-term limit of 11 ppb.

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 both the old (S175, S332, and S18C) and new (S174, S332D, and S18C) combinations of structures (**Figure 5**). The narrow bars in **Figure 5** represent the 12-month TP FWMCs from S332, S175, and S18C for WY1991 through WY2002. The wider bars for WY1999 and forward represent the new combination of structures.

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 July 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.

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.

The result of Method 3 for TP FWMCs for the 12-month period ending on September 30, 2020, was 5.3 ppb, which is lower than the 11.0 ppb long-term limit. Therefore, inflows to ENP through Taylor Slough and Coastal Basins did not exceed the TP limit for WY2020.

Reporting Period Update

At the August 11, 2020, quarterly meeting, the TOC adopted Method 3 for Taylor Slough and Coastal Basins as the official method to calculate and report compliance under Appendix A. 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 compliance sampling dates. S332D adjusted flow is S332D - S332DX1 - S328. **Figure 6** presents the 12-month and individual sampling event TP FWMCs at the TP compliance structures. All TP grab sample concentrations taken 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 7**. Daily flows from the S332D pumps and downstream structures are presented in **Figure 8**. Daily flows at individual Taylor Slough and Coastal Basins structures into ENP are presented in **Figure 9**.

For the periods ending October, November, and December 2020, the 12-month TP FWMCs were 5.4, 5.8, and 5.8 ppb, respectively (**Table 4**).

The percent of TP FWMCs greater than 10 ppb from each sampling event in any 12-month period has been much lower than the fixed guideline of 53.1% stipulated by the Consent Decree (**Table 4**). The May 26, 2020, and November 10, 2020, sampling event TP FWMCs were greater than 10 ppb in WY2020 (12.4 and 10.7 ppb, respectively).

Figure 10 shows the relationship between daily inflows and the corresponding TP FWMCs for each sampling event. The sampling event TP FWMCs generally remained low and the average of the fourth quarter sampling event TP FWMCs was 5.7 ppb.

In 1995, the United States Army Corps of Engineers authorized the C-111 Spreader Canal project to restore more natural hydrologic conditions in Taylor Slough and to maintain flood protection east of the L-31N and C-111 canals. The original project facilities consisted of pump stations (S332B, S332C, and S332D), detention cells (Cell 1 through Cell 5), a connector cell between Cell 2 and Cell 3, a flow-way cell originating at Berm B3 of Cell 5, and four diversion structures (DS1 through DS4). DS4 is now known as S328. Since completion of United States Army Corps of Engineers construction contracts 8, 8A, and 9 in 2018, an interconnected detention system exists starting at the S357 discharge to the 8.5 Square Mile Area detention cell and continuing to the S332D detention area.

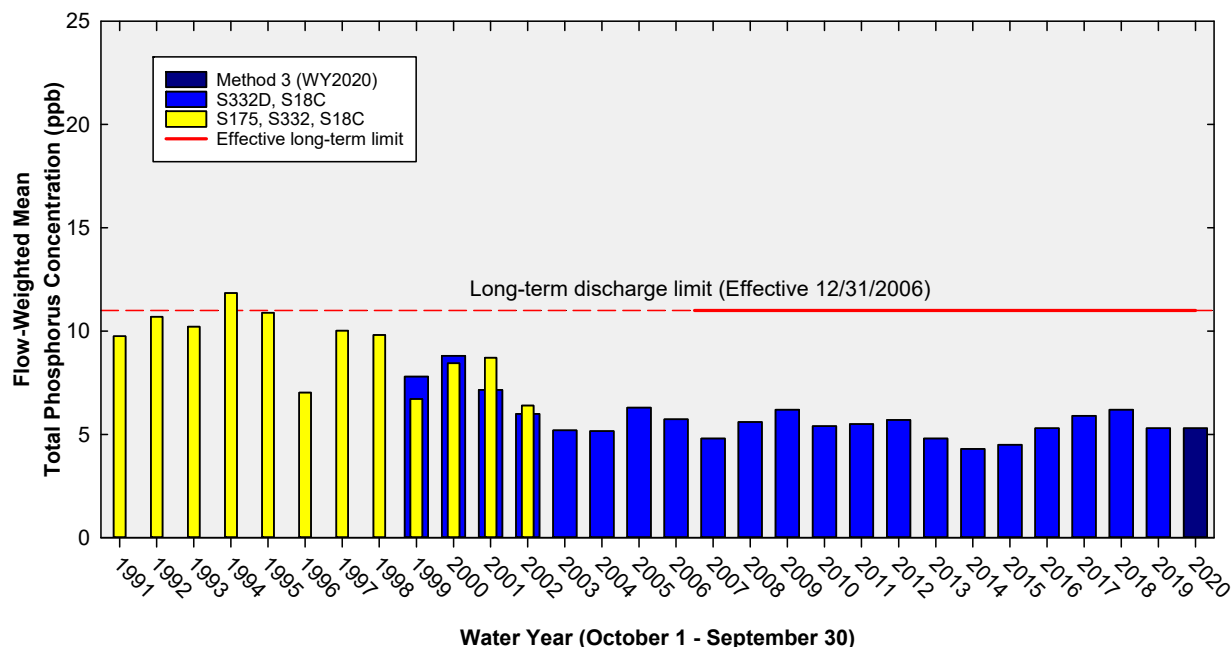


Figure 5. The 12-month TP FWMCs in inflows to ENP through Taylor Slough and Coastal Basins at the end of each water year compared to the 11 ppb long-term TP limit. Blue bars show S332D, S174, and S18C for WY1999 through WY2007, and S332D and S18C (Method 1) from WY2008 to WY2019. Method 3 for WY2020 is $(S332D - S332DX1 - S328) + S328 + G737 + S18C$.

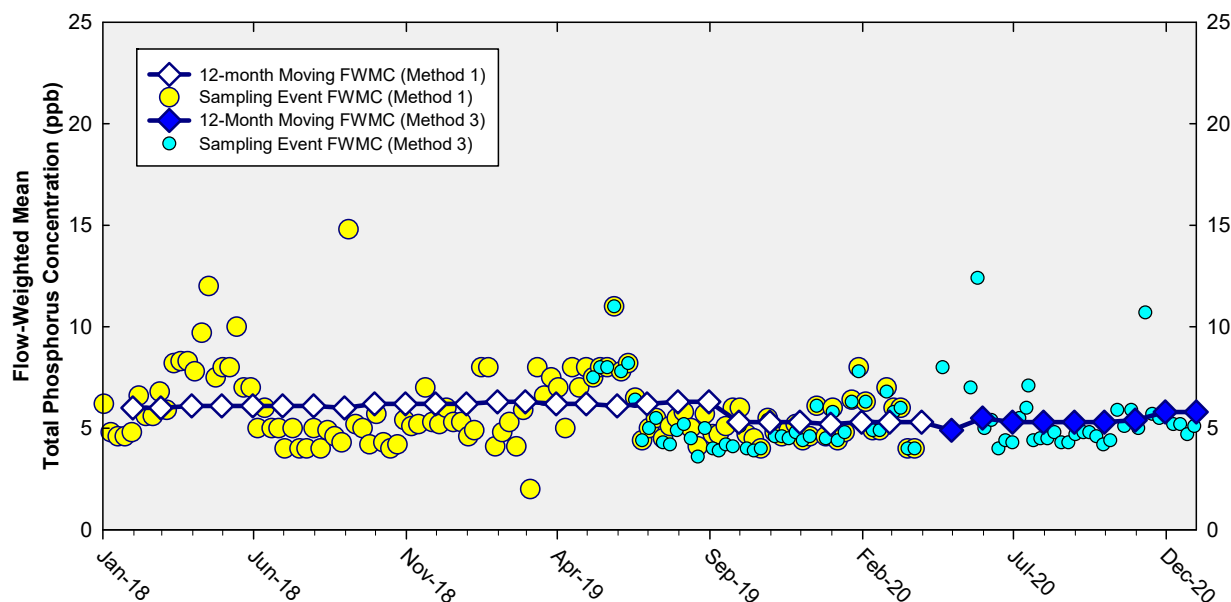


Figure 6. The 12-month TP FWMCs in inflows to ENP through Taylor Slough and Coastal Basins at the end of each month and the TP FWMC for each sampling event. Method 1 sampling event FWMCs and 12-month moving FWMCs are shown to the end of March 2020. Method 3 sampling event FWMCs are shown from May 2019, and Method 3 12-month moving FWMCs are shown from the period ending in April 2020.

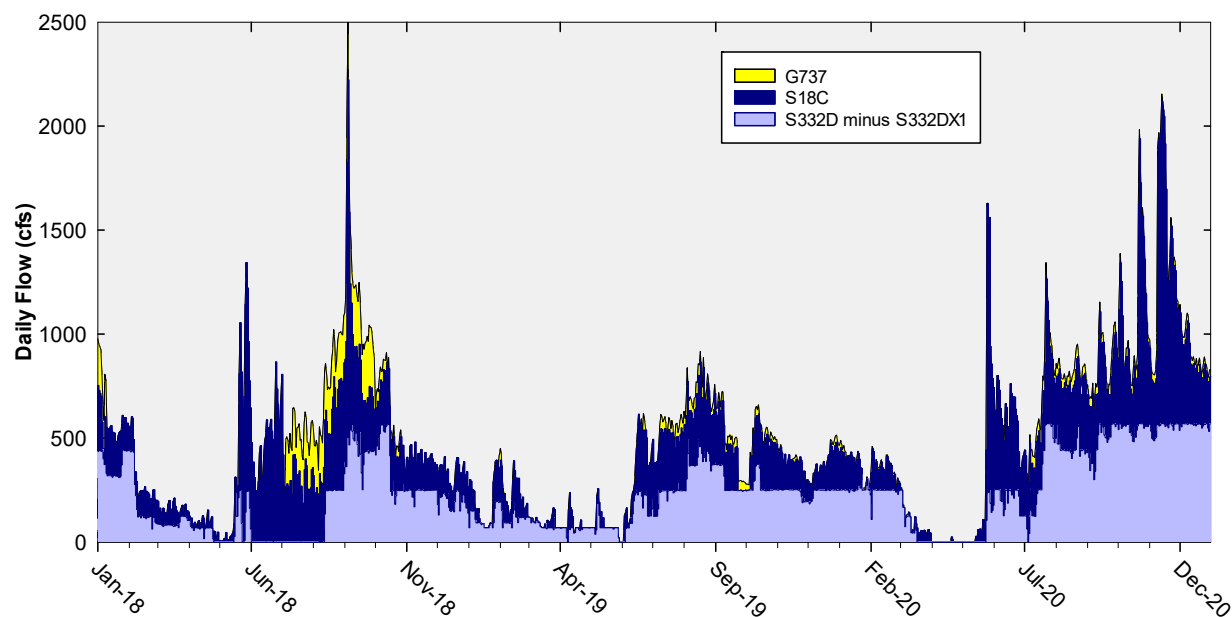


Figure 7. Daily flows into ENP as a stacked sum of Taylor Slough (S332D - S332DX1 - G737) and Coastal Basins (S18C). Daily flow data are missing for S18C from September 23 to September 30, 2019.

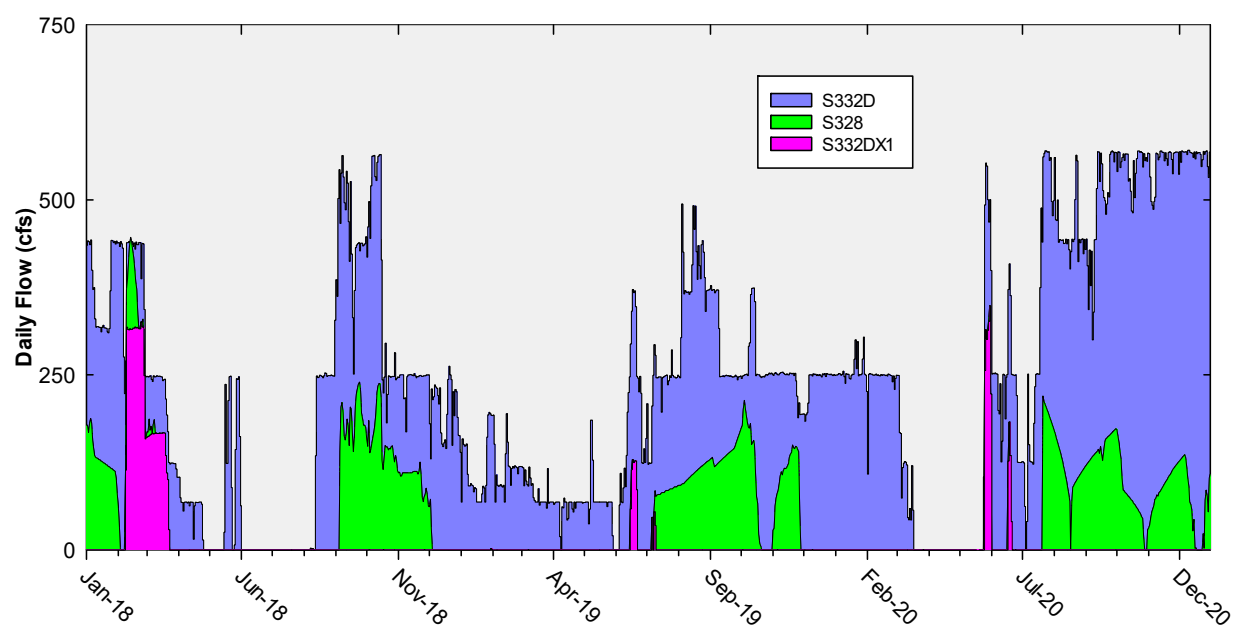


Figure 8. Daily flows from the S332D pumps overlaid with stacked daily flows at the downstream structures.

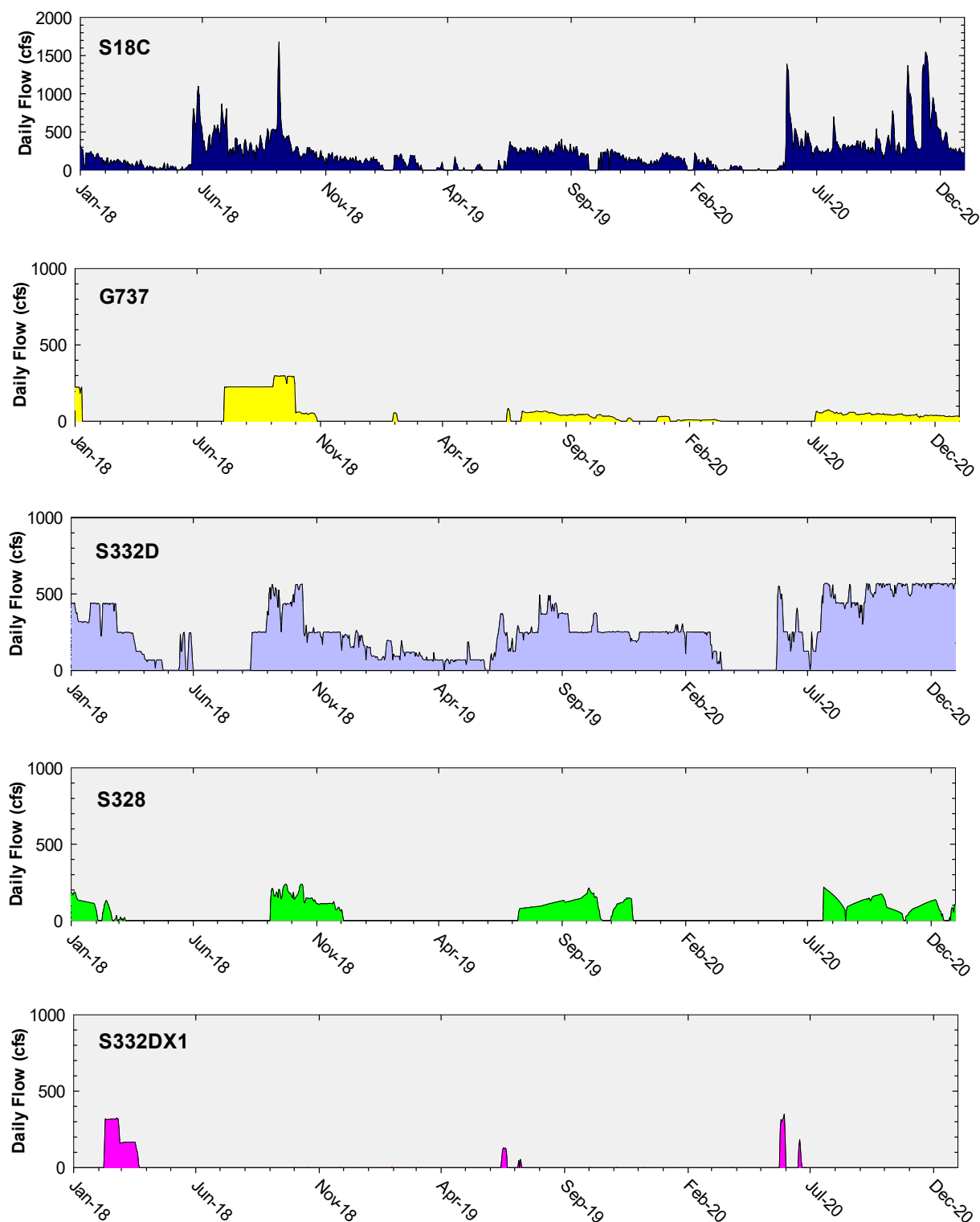


Figure 9. Daily flows at individual Taylor Slough and Coastal Basins structures into ENP. G737 flow prior to October 1, 2018, is based on S200 pump flow on days when the G737 gates were open. Daily flow data are missing for S18C from September 23 to 30, 2019.

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

12-Month Period	Total Flow (kac-ft)	Flow-Weighted Mean TP Concentration (ppb)	Long-Term Limit (ppb)	Percent of Sampling Events Greater than 10 ppb	
				Guideline	Observed
Feb 2017 - Jan 2018	464.4 (545.5, 539.1)	6.0 (6.1, 6.0)	11.0	53.1	2.3 (2.3, 2.3)
Mar 2017 - Feb 2018	485.3 (566.4, 547.9)	6.0 (6.1, 6.0)	11.0	53.1	2.3 (2.3, 2.3)
Apr 2017 - Mar 2018	499.1 (580.1, 555.0)	6.1 (6.1, 6.0)	11.0	53.1	2.2 (2.2, 2.2)
May 2017 - Apr 2018	503.0 (584.1, 559.0)	6.1 (6.1, 6.0)	11.0	53.1	4.3 (4.3, 4.3)
Jun 2017 - May 2018	526.0 (607.0, 581.9)	6.1 (6.2, 6.1)	11.0	53.1	3.8 (3.8, 3.8)
Jul 2017 - Jun 2018	512.2 (592.9, 574.2)	6.1 (6.2, 6.0)	11.0	53.1	3.8 (3.8, 3.8)
Aug 2017 - Jul 2018	476.3 (555.2, 536.5)	6.1 (6.0, 5.9)	11.0	53.1	3.7 (3.7, 3.7)
Sep 2017 - Aug 2018	448.6 (527.5, 508.8)	6.0 (5.9, 5.8)	11.0	53.1	3.8 (3.8, 3.8)
Oct 2017 - Sep 2018	413.3 (500.4, 481.7)	6.2 (6.0, 5.8)	11.0	53.1	3.8 (3.8, 3.8)
Nov 2017 - Oct 2018	371.5 (447.8, 429.2)	6.2 (6.0, 5.8)	11.0	53.1	3.8 (3.8, 3.8)
Dec 2017 - Nov 2018	352.0 (415.0, 396.3)	6.2 (6.0, 5.8)	11.0	53.1	3.8 (3.8, 3.8)
Jan 2018 - Dec 2018	321.1 (370.7, 352.0)	6.2 (6.0, 5.8)	11.0	53.1	3.8 (3.8, 3.8)
Feb 2018 - Jan 2019	298.2 (344.1, 325.4)	6.3 (6.1, 5.9)	11.0	53.1	3.8 (3.8, 3.8)
Mar 2018 - Feb 2019	282.5 (328.7, 322.1)	6.3 (6.1, 5.9)	11.0	53.1	3.8 (3.8, 3.8)
Apr 2018 - Mar 2019	272.3 (318.5, 318.4)	6.2 (6.0, 5.9)	11.0	53.1	3.8 (3.8, 3.8)
May 2018 - Apr 2019	272.1 (318.3, 318.3)	6.2 (6.0, 5.8)	11.0	53.1	1.9 (1.9, 1.9)
Jun 2018 - May 2019	253.6 (299.8, 299.8)	6.1 (5.9, 5.8)	11.0	53.1	3.8 (3.8, 3.8)
Jul 2018 - Jun 2019	246.3 (293.1, 291.6)	6.2 (6.0, 5.8)	11.0	53.1	3.8 (3.8, 3.8)
Aug 2018 - Jul 2019	257.3 (294.8, 293.0)	6.3 (6.1, 5.9)	11.0	53.1	3.8 (3.8, 3.8)
Sep 2018 - Aug 2019	266.2 (293.1, 291.3)	6.3 (6.2, 5.9)	11.0	53.1	3.8 (3.8, 3.8)
Oct 2018 - Sep 2019	237.8 (250.4, 248.6)	5.3 (5.2, 4.9)	11.0	53.1	1.9 (1.9, 1.9)
Nov 2018 - Oct 2019	229.8 (241.6, 239.8)	5.3 (5.2, 5.0)	11.0	53.1	1.9 (1.9, 1.9)
Dec 2018 - Nov 2019	228.4 (240.4, 238.6)	5.3 (5.2, 4.9)	11.0	53.1	1.9 (1.9, 1.9)
Jan 2019 - Dec 2019	231.5 (244.6, 242.8)	5.2 (5.1, 4.9)	11.0	53.1	1.9 (1.9, 1.9)
Feb 2019 - Jan 2020	242.3 (255.6, 253.8)	5.3 (5.2, 4.9)	11.0	53.1	1.9 (1.9, 1.9)
Mar 2019 - Feb 2020	249.4 (262.9, 261.1)	5.3 (5.2, 5.0)	11.0	53.1	1.9 (1.9, 1.9)
Apr 2019 - Mar 2020	248.7 (262.3, 260.5)	5.3 (5.2, 5.0)	11.0	53.1	1.9 (1.9, 1.9)
May 2019 - Apr 2020	255.9	4.9	11.0	53.1	2.1
Jun 2019 - May 2020	268.7	5.5	11.0	53.1	2.2
Jul 2019 - Jun 2020	282.8	5.3	11.0	53.1	2.1
Aug 2019 - Jul 2020	291.6	5.3	11.0	53.1	2.1
Sep 2019 - Aug 2020	297.5	5.3	11.0	53.1	2.1
Oct 2019 - Sep 2020	318.5	5.3	11.0	53.1	2.1
Nov 2019 - Oct 2020	357.0	5.4	11.0	53.1	2.1
Dec 2019 - Nov 2020	416.5	5.8	11.0	53.1	4.3
Jan 2020 - Dec 2020	449.1	5.8	11.0	53.1	4.2

Notes:

- Key to units: kac-feet – thousand acre-feet and ppb – parts per billion (values are in µg/L [micrograms per liter], which, for the purposes of this report, are equivalent to ppb).
 - Compliance is evaluated annually based on the 12-month TP FPMC for the federal water year ending on September 30. The compliance periods are shown as highlighted rows with bold, italicized text.
 - Results of Method 1, Method 2, and Method 3 are presented up to the first quarter of 2020 (12-month period ending March 2020):
 - Method 1 (left value) is computed as S332D + S18C.
 - Method 2 (first value in parentheses) is computed as S332D + S18C + G737.
 - Method 3 (second value in parentheses) is computed as (S332D - S332DX1 - S328) + S328 + S18C + G737.
 - Starting with the second quarter of 2020 (12-month periods ending April, May, and June 2020), results of Method 3 for the corresponding 12-month periods are presented.
- * Daily flow data are missing for S18C from September 23 to September 30, 2019.

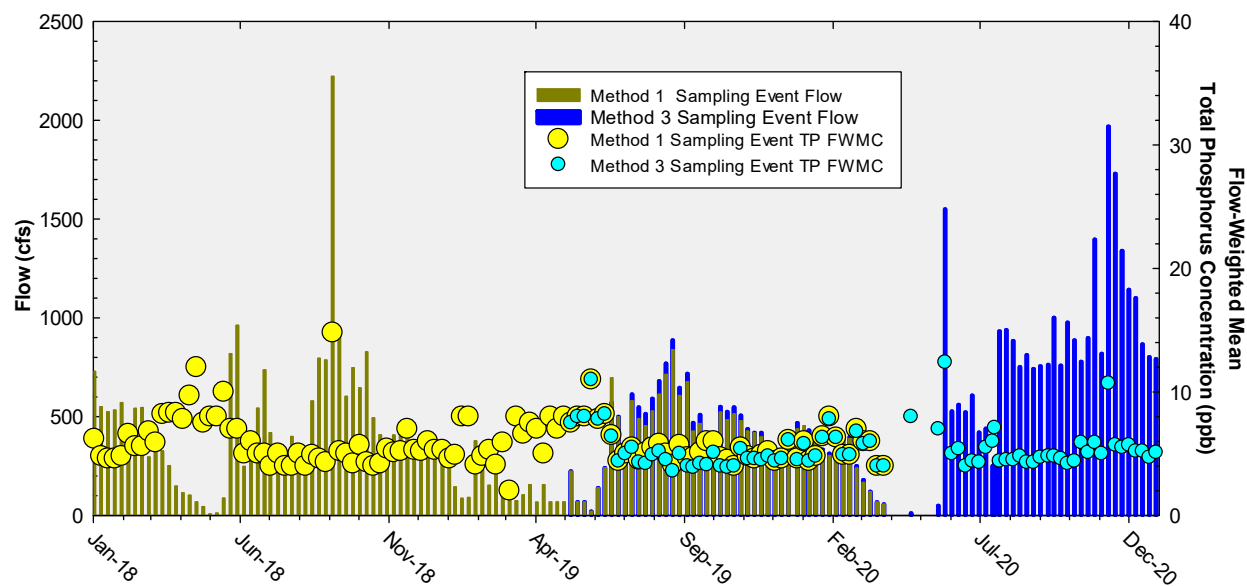


Figure 10. Flow from Taylor Slough and Coastal Basins structures on the days of sampling, and the corresponding TP FWMCs for individual sampling events. Method 1 sampling event flows and FWMCs are shown to March 2020. Method 3 sampling event flows and FWMCs are shown beginning May 2019. For the period of May 2019 to March 2020, the results of both methods are shown overlapping.

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+>='01-OCT-2020'+and+date_collected+<+'01-JAN-2021'+and+sample_type_new+=+'SAMP'&v_target_code=file_csv.](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+>='01-OCT-2020'+and+date_collected+<+'01-JAN-2021'+and+sample_type_new+=+'SAMP'&v_target_code=file_csv.)

The link above only generates data that have not been qualified. 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=20201001&v_end_date=20201231&v_report_type=format7&v_target_code=file_csv&v_run_mode=onLine&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
Jan-2018	4	6	5	4	6	6	5	5	5	4	3	4	3	4
Feb-2018	5	6	6	4	8	8	7	7	6	5	5	6	4	6
Mar-2018	6	5	5	8	5	8	5	6	6	6	6	7	5	7
Apr-2018	---	---	---	7	12	12	---	---	11	9	8	9	7	9
May-2018	---	6	---	5	6	---	---	---	6	9	5	8	6	7
Jun-2018	8	8	9	7	6	12	7	8	6	6	7	8	6	7
Jul-2018	6	10	8	7	8	8	7	---	10	6	6	8	8	7
Aug-2018	6	9	---	7	6	6	5	---	7	9	9	8	6	8
Sep-2018	4	7	4	6	7	7	4	9	5	7	6	6	7	7
Oct-2018	7	8	6	5	8	7	6	6	6	7	5	6	5	6
Nov-2018	---	8	---	8	6	6	12	10	8	9	8	7	7	8
Dec-2018	---	8	---	5	4	10	---	7	6	6	6	5	6	5
Jan-2019	---	8	---	4	6	12	---	---	6	6	6	6	4	6
Feb-2019	16	10	18	7	11	13	10	10	7	7	7	6	6	8
Mar-2019	8	7	7	4	6	9	8	7	6	5	5	6	5	7
Apr-2019	---	---	8	6	7	12	21	6	7	6	6	6	5	7
May-2019	---	9	---	14	9	20	---	---	10	8	10	9	10	9
Jun-2019	---	---	---	8	9	19	---	---	9	6	8	9	7	7
Jul-2019	8	11	7	6	7	4	11	10	4	9	7	7	8	8
Aug-2019	7	9	6	6	6	7	8	7	7	9	6	6	7	9
Sep-2019	6	9	10	5	6	9	7	6	7	7	10	6	6	7
Oct-2019	---	8	6	6	5	12	10	7	8	4	6	6	6	7
Nov-2019	7	6	5	5	5	6	7	7	6	5	4	6	6	5
Dec-2019	6	5	5	4	7	7	7	4	6	5	6	4	5	4
Jan-2020	4	6	6	4	3	6	6	4	6	4	5	5	4	6
Feb-2020	12	6	8	5	5	7	6	5	4	6	5	5	5	6
Mar-2020	6	6	7	5	5	4	5	4	6	5	5	7	4	5
Apr-2020	---	9	---	7	11	16	12	---	8	6	7	7	6	6
May-2020	---	---	---	---	---	---	---	---	7	5	8	8	5	7
Jun-2020	10	8	---	7	10	14	10	---	6	7	8	5	5	9
Jul-2020	7	---	6	5	7	9	7	---	4	5	6	6	7	7
Aug-2020	10	10	6	5	7	6	6	9	6	6	6	6	7	7
Sep-2020	6	11	7	6	8	8	7	8	8	9	7	7	8	11
Oct-2020	6	9	6	5	7	11	7	6	6	4	7	6	5	7
Nov-2020	6	9	6	4	4	8	5	4	4	5	5	6	5	6
Dec-2020	4	6	5	4	5	8	6	5	5	6	6	6	8	6

Notes:

--- indicates sample was not collected due to insufficient water depth.

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+\('S12A','S12B','S12C','S12D','S333','S355A','S355B','S356-334'\)+and+test_number+=+25+and+collect_method+=+'G'+and+date_collected+>='01-OCT-2020'+and+date_collected+<='01-JAN-2021'+and+sample_type_new+=+'SAMP'&v_target_code=file_csv](http://my.sfwmd.gov/dbhydroplsql/water_quality_data.report_full?v_where_clause=where+station_id+in+('S12A','S12B','S12C','S12D','S333','S355A','S355B','S356-334')+and+test_number+=+25+and+collect_method+=+'G'+and+date_collected+>='01-OCT-2020'+and+date_collected+<='01-JAN-2021'+and+sample_type_new+=+'SAMP'&v_target_code=file_csv)

The link only generates data that have not been qualified. Qualified water quality data must be retrieved interactively via the DBHYDRO browser.

For the fourth quarter of 2020, the USGS daily flow data for 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 (fourth quarter of 2020) 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=20201001&v_end_date=20201231&v_report_type=format7&v_target_code=file_csv&v_run_mode=onLine&v_js_flag=Y&v_dbkey=01313/00610/00621/13010/MQ895/MQ896/AM173/40371/64136/91489/15042/FB752

The final WY2020 daily mean flow data 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=20201001&v_end_date=20201231&v_report_type=format7&v_target_code=file_csv&v_run_mode=onLine&v_js_flag=Y&v_dbkey=FE771/FE772/FE773/FE774/MQ895/MQ896/AM173/40371/64136/91489/15042/FB752

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

Date	S12A	S12B	S12C	S12D	S333	S333N	S355A	S355B	S356	Remarks
01/06/2020	8	---	---	---	9	8	9	7	10	Compliance date
01/13/2020	7	---	---	---	8	6	---	---	16	N/A
01/21/2020	12	---	---	---	7	8	---	---	13	Compliance date
01/27/2020	10	---	---	---	8	10	---	---	10	N/A
02/03/2020	11	---	---	---	7	6	9	8	12	Compliance date
02/10/2020	11	---	---	---	6	7	---	---	12	N/A
02/17/2020	10	---	---	---	6	7	8	10	10	Compliance date
02/24/2020	12	---	---	---	8	10	---	---	12	N/A
03/02/2020	8	---	---	---	7	8	10	13	12	Compliance date
03/09/2020	13	---	---	---	10	9	---	---	16	N/A
03/16/2020	26	---	---	---	10	9	---	29	11	Compliance date
03/23/2020	29	---	---	---	11	12	---	---	14	N/A
03/30/2020	38	---	---	---	16	17	---	---	15	Compliance date
04/06/2020	40	---	---	---	23	19	---	---	16	N/A
04/13/2020	37	---	---	---	21	24	---	---	21	Compliance date
04/20/2020	29	---	---	---	19	20	---	---	19	N/A
04/27/2020	20	---	---	---	25	24	38	33	28	Compliance date
05/04/2020	32	---	---	---	25	33	---	---	23	N/A
05/11/2020	26	---	---	---	27	27	---	---	24	Compliance date
05/18/2020	29	---	---	---	26	26	---	---	24	N/A
05/26/2020	25	---	---	---	21	---	22	40	11	Compliance date
06/01/2020	42	---	---	---	22	23	---	---	7	N/A
06/08/2020	24	---	15	17	16	17	---	---	6	Compliance date
06/15/2020	17	---	10	14	14	13	---	---	5	N/A
06/22/2020	14	---	8	12	13	13	10	17	6	Compliance date
06/29/2020	17	---	10	12	15	13	---	---	5	N/A
07/06/2020	14	---	10	10	19	12	---	---	6	Compliance date
07/13/2020	22	---	9	10	9	10	---	---	5	N/A
07/20/2020	9	6	6	10	11	12	22	14	4	Compliance date
07/27/2020	6	5	5	9	9	9	---	---	5	N/A
08/03/2020	7	6	7	13	9	9	8	11	5	Compliance date
08/10/2020	6	6	7	9	9	10	---	---	6	N/A
08/17/2020	6	5	6	9	10	8	---	---	4	Compliance date
08/24/2020	6	5	6	8	9	9	---	---	6	N/A
08/31/2020	8	8	9	10	8	8	---	---	5	Compliance date
09/08/2020	6	5	6	8	8	6	---	---	6	N/A
09/14/2020	6	5	5	8	8	7	---	---	5	Compliance date
09/21/2020	6	7	6	8	9	9	---	---	6	N/A
09/28/2020	7	7	7	8	9	7	6	7	4	Compliance date
10/05/2020	7	7	8	9	7	8	---	---	5	N/A
10/12/2020	6	6	7	8	8	7	---	---	5	Compliance date
10/19/2020	6	5	5	8	8	8	---	---	6	N/A
10/26/2020	7	5	7	9	9	9	6	8	5	Compliance date
11/02/2020	9	6	5	9	8	9	---	---	6	N/A
11/10/2020	6	4	5	10	9	9	---	---	6	Compliance date
11/16/2020	5	4	4	12	10	11	---	---	7	N/A
11/23/2020	5	5	6	8	7	7	5	7	6	Compliance date
11/30/2020	5	4	4	7	7	7	---	---	5	N/A
12/07/2020	6	5	5	6	6	6	---	---	6	Compliance date
12/14/2020	5	4	3	7	5	6	---	---	6	N/A
12/21/2020	4	5	4	6	J5	7	J5	J5	10	Compliance date
12/28/2020	4	4	4	6	6	5	---	---	9	N/A

Notes:

--- indicates water sample was not collected.

"Compliance date" indicates biweekly sampling date for Consent Decree calculation.

"N/A" indicates sampling data presented for informational purposes only.

J5: Precision or accuracy criteria not met due to improper laboratory or field protocol. Samples recorded as having been collected at a depth of 0.05 meters.

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+>='01-OCT-2020'+and+date_collected+<+'01-JAN-2021'+and+sample_type_new+=+'SAMP'&v_target_code=file_csv](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+>='01-OCT-2020'+and+date_collected+<+'01-JAN-2021'+and+sample_type_new+=+'SAMP'&v_target_code=file_csv).

The link only generates data that have not been qualified. Qualified water quality data must be retrieved interactively via the DBHYDRO browser.

The daily mean flow data for stations at Taylor Slough and the Coastal Basins (S332D, S18C, S328, and G737) 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=20201001&v_end_date=20201231&v_report_type=format7&v_target_code=file_csv&v_run_mode=onLine&v_js_flag=Y&v_dbkey=15760/TA413/AN558/AI315.

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

Date	S332DX	S18C	S328	G737	Date	S332DX	S18C	S328	G737
01/02/2020	6	J ²	6	4	07/07/2020	5	6	8	5
01/07/2020	4	5	5	4	07/14/2020	6	--	10	--
01/14/2020	6	3	7	4	07/16/2020	--	8	--	4
01/21/2020	7	4	7	4	07/21/2020	5	4	4	4
01/28/2020	8	5	8	3	07/28/2020	6	4	3	3
02/04/2020	7	5	7	5	08/04/2020	6	4	3	3
02/11/2020	6	3	J ¹	3	08/11/2020	6	4	4	3
02/18/2020	6	3	Y	4	08/18/2020	5	4	3	3
02/25/2020	7	2	7	2	08/25/2020	6	3	3	2
03/03/2020	6	3	10	3	09/01/2020	6	4	3	4
03/10/2020	6	5	14	4	09/09/2020	6	4	4	4
03/17/2020	5	4	J ¹	--	09/15/2020	6	4	4	4
03/24/2020	12	4	46	--	09/22/2020	6	4	3	3
03/31/2020	9	4	30	--	09/29/2020	5	4	3	3
04/07/2020	11	5	--	--	10/06/2020	5	4	3	3
04/14/2020	14	7	--	--	10/13/2020	7	5	4	3
04/21/2020	13	8	--	--	10/20/2020	6	4	4	4
04/28/2020	8	7	--	--	10/27/2020	6	6	4	3
05/05/2020	15	8	--	--	11/03/2020	6	4	3	3
05/12/2020	14	10	--	--	11/10/2020	6	13	4	2
05/19/2020	12	7	--	--	11/17/2020	6	6	3	2
05/26/2020	9	13	19	19	11/24/2020	5	6	5	4
06/02/2020	6	4	12	--	12/01/2020	5	7	5	3
06/09/2020	6	5	11	--	12/08/2020	6	5	5	3
06/16/2020	5	3	8	--	12/15/2020	6	4	5	4
06/23/2020	5	4	12	--	12/22/2020	5	4	4	6
06/30/2020	5	4	7	--	12/29/2020	6	4	4	3

Notes:

-- indicates a water sample was not collected.

"J¹" indicates the sample was collected from a disconnected pool and is not representative of the surrounding water body; the surrounding area was dry."J²" indicates the precision or accuracy criteria were not met.

"Y" indicates the analysis was performed on an improperly preserved sample.

APPENDIX D

CALCULATION METHODS

Long Term Marsh Concentration Levels for Loxahatchee National Wildlife Refuge

Long Term Marsh Concentration Levels:

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

Terms:

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

S = average stage 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)

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 Basin (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.

Page/Date	Original	Revision