



# South Florida Water Management District

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## PRO ERG

October 26, 1998

Dr. Garth Redfield  
Lead Environmental Scientist  
Water Resources Evaluation Department  
South Florida Water Management District  
P.O. Box 24680  
West Palm Beach, FL 33416-4680

Dear Dr. Redfield:

**SUBJECT: Second Quarter 1998 Report to Technical Oversight Committee**

Enclosed please find the second quarter 1998 graphs displaying:

- 1) the geometric mean of the total phosphorus (TP) concentration levels measured from June 1995 through June 1998 at 14 stations within the Arthur R. Marshall Loxahatchee National Wildlife Refuge compared to the interim and long-term TP concentration levels;
- 2) the Shark River Slough 12-month moving flow-weighted mean TP concentration data for water years 1987 through 1997 compared to the interim and long-term discharge limits and, for the last 24 months, the 12-month moving average with the composited TP sample concentration for each sampling event;
- 3) the Taylor Slough and Coastal basins 12-month moving flow-weighted mean TP concentration data for water years 1987 through 1997 compared to the long-term 11 ppb discharge limit and, for the last 24 months, the 12-month moving average with the composited TP sample concentration for each sampling event.

The geometric means calculated from the TP concentrations measured in water samples collected in the Arthur R. Marshall Loxahatchee National Wildlife Refuge in April, May and June 1998 were 12.4, 9.8 and 7.9 ppb, respectively (Figure 1). There were samples collected from only two stations in June due to low water levels. Average water stage was 16.17 feet in April, decreased to 16.07 feet in May and continued decreasing to 15.29 feet in June. Since the June stage is less than the minimum stage of 15.42 feet specified in the Settlement Agreement, the interim and long term concentration levels did not apply. The April total phosphorus geometric mean exceeded the long-term limit of 11.4 ppb, whereas the interim concentration level of 13.9 ppb was met. In May both the calculated interim and long-term concentration levels of 14.8 and 12.1 ppb, respectively, were met.

The 12-month moving average for the flow-weighted mean concentration (fvmc) of TP entering Shark River Slough was 8.6 ppb in April, and 8.7 ppb in May and 8.8 ppb in June (Figure 2). These values were below the interim discharge limits of 9.6, 9.4 and 9.3 for April through June, respectively, but were above the long-term discharge limits of 7.9, 7.7 and 7.9, respectively, for this same period.

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The 12-month moving average for the fwmc of TP entering Taylor Slough and the Coastal Basins was 10.3 ppb in April and May and 6.6 ppb in June (Figure 3). These flow-weighted mean concentrations, which met the 11 ppb limit, have been slowly decreasing since a maximum value of 11.2 ppb was calculated for the period ending November 1997.

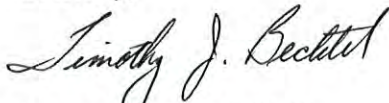
The frequency of composited samples for each sampling event exceeding 10 ppb within a given 12-month period was included in the Settlement Agreement as an additional aid in tracking compliance. For Shark River Slough a frequency or percentage limit for samples greater than 10 ppb is based on observed flow. Taylor Slough and the Coastal Basins have a fixed limit of less than 53.1%. The following table indicates for Shark River Slough and Taylor Slough the actual frequency exceedance and the calculated frequency limits for the previous twelve 12-month moving averages.

| <u>Year</u><br><u>Ending</u> | <u>Shark River Frequency Exceedance</u> |              | <u>Taylor Slough Frequency Exceedance</u> |              |
|------------------------------|---|--------------|---|--------------|
|                              | <u>Actual</u>                           | <u>Limit</u> | <u>Actual</u>                             | <u>Limit</u> |
| Jul 1997                     | 27.3                                    | 47.6         | 9.5                                       | 53.1         |
| Aug 1997                     | 31.8                                    | 47.6         | 9.5                                       | 53.1         |
| Sep 1997                     | 31.8                                    | 46.7         | 9.1                                       | 53.1         |
| Oct 1997                     | 33.3                                    | 46.3         | 9.1                                       | 53.1         |
| Nov 1997                     | 33.3                                    | 47.2         | 9.1                                       | 53.1         |
| Dec 1997                     | 25.0                                    | 47.4         | 9.1                                       | 53.1         |
| Jan 1998                     | 30.0                                    | 45.9         | 13.6                                      | 53.1         |
| Feb 1998                     | 25.0                                    | 44.7         | 13.6                                      | 53.1         |
| Mar 1998                     | 22.7                                    | 43.4         | 16.7                                      | 53.1         |
| Apr 1998                     | 29.2                                    | 41.4         | 16.0                                      | 53.1         |
| May 1998                     | 36.0                                    | 40.3         | 15.4                                      | 53.1         |
| Jun 1998                     | 42.9*                                   | 41.2         | 11.5                                      | 53.1         |

\*exceeded frequency limit

If you have questions regarding the reported results please call me at (561) 682-6392.

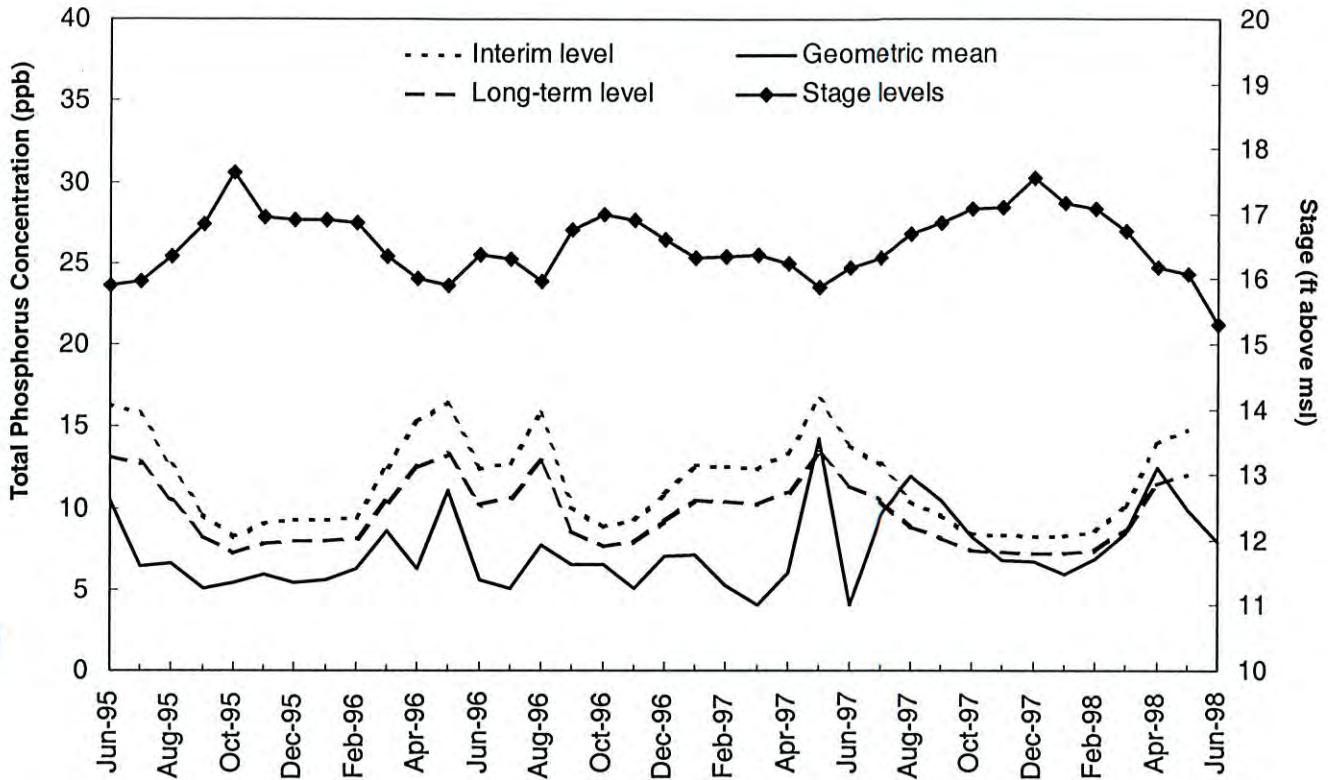
Sincerely,



Timothy J. Bechtel, Ph.D.  
Senior Supervising Environmental Scientist  
Resource Assessment Division  
Water Resources Evaluation Department  
South Florida Water Management District

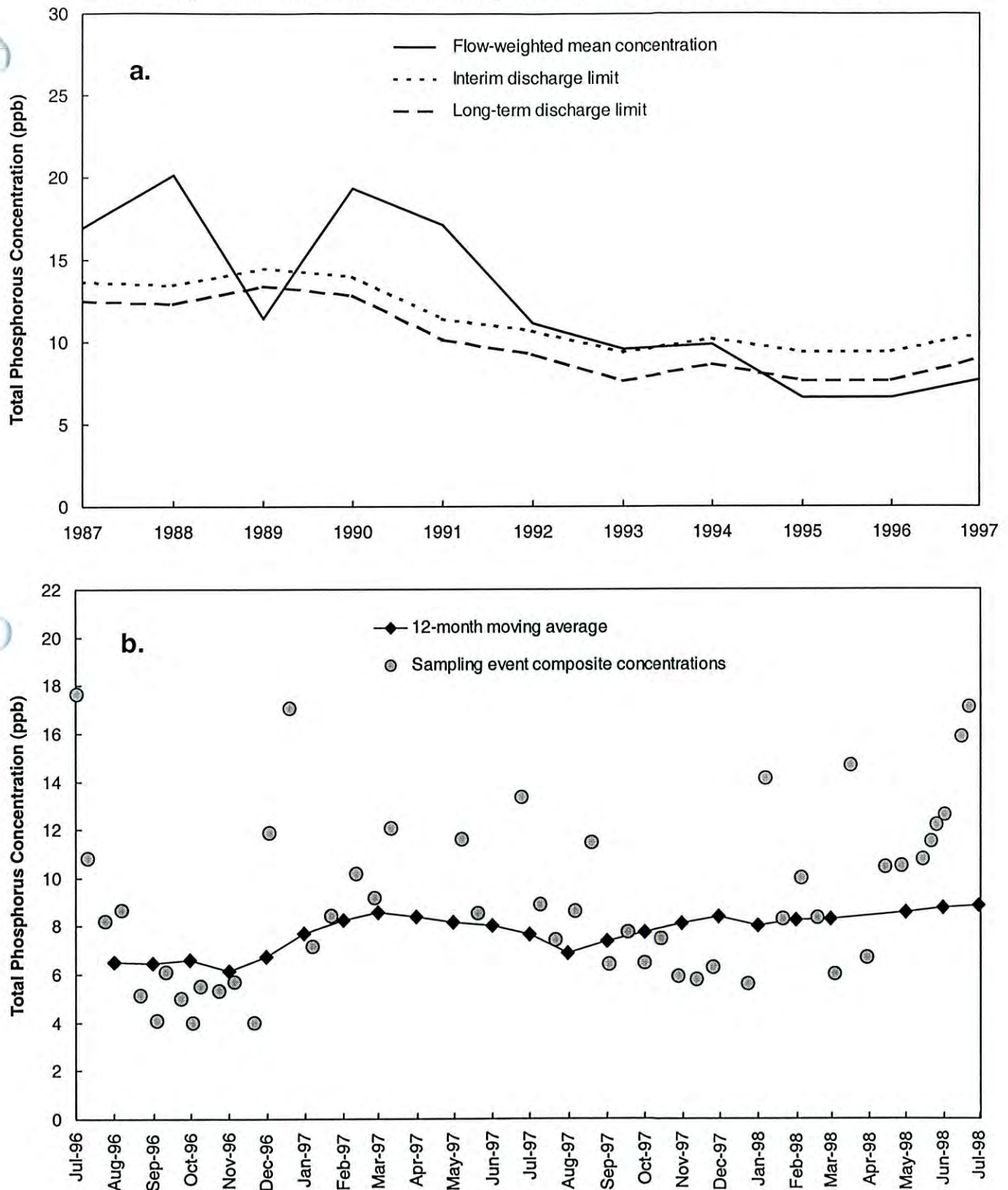
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### Monthly Total Phosphorus Concentration Levels for Loxahatchee National Wildlife Refuge



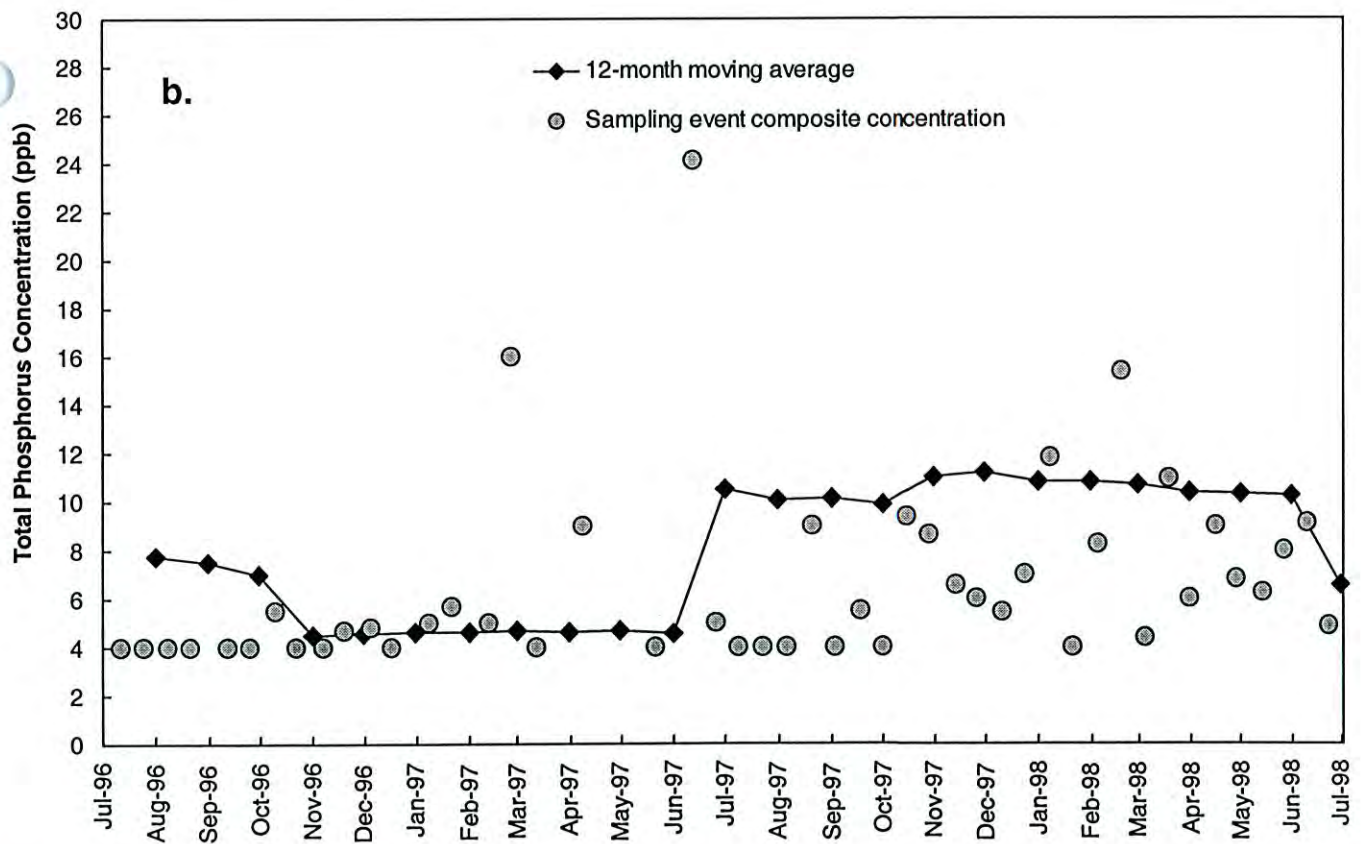
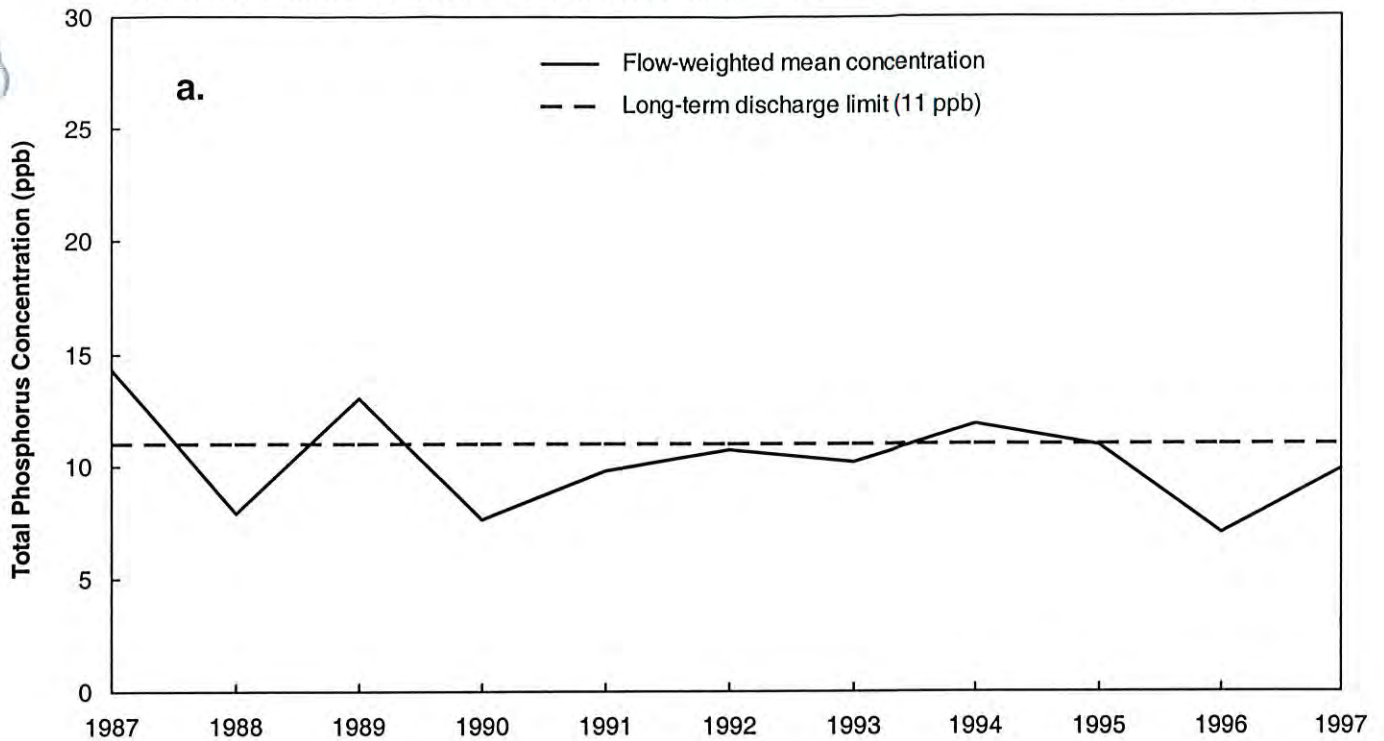
**Figure 1.** Observed monthly total phosphorus concentration levels for the Loxahatchee National Wildlife Refuge compared to the interim and long-term targets. The geometric means and targets are adjusted for fluctuations of water elevation.

### Discharge Limits for Shark River Slough (S12A, S12B, S12C, S12D, and S333)



**Figure 2.** 12-month moving flow-weighted mean total phosphorus concentrations in the inflows to Everglades National Park (ENP) through Shark River Slough compared to the interim and long-term targets. **a.** Concentrations at the end of each water year. **b.** 12-month moving average concentration at the end of each month and the composite concentration for each sampling event.

### Discharge Limits for Taylor Slough (S332 and S175) and the Coastal Basins (S18C)



**Figure 3.** 12-month moving flow-weighted mean total phosphorus concentrations in the inflows to Everglades National Park (ENP) through Taylor Slough and the Coastal Basins compared to the long-term target. **a.** Concentrations at the end of each water year. **b.** 12-month moving average concentration at the end of each month and the composite concentration for each sampling event.