



# South Florida Water Management District

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## PRO ERG

January 15, 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: Third Quarter 1997 Report to Technical Oversight Committee**

Enclosed please find the third quarter 1997 graphs displaying:

- 1) the geometric mean of the total phosphorus (TP) concentration levels measured from January 1994 through September 1997 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 25 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 25 months, the 12-month moving average with the composited TP sample concentration for each sampling event.

A geometric mean of 9.6 ppb was calculated for the TP samples collected in the Arthur R. Marshall Loxahatchee National Wildlife Refuge in July 1997. This value was less than the interim and long-term concentration levels (Figure 1). As water stage increased from 16.33 to 16.85 feet between July and September, total phosphorus levels also increased, exceeding both the interim and long-term levels in August and September. Generally, total phosphorus levels in the Refuge decrease as a function of increasing water stage. The geometric means were 11.9 ppb in August and 10.5 ppb in September. In comparison, the calculated interim and long-term limits for August were 10.4 and 8.8 ppb, respectively, and, in September the limits were 9.6 and 8.2 ppb, respectively.

The 12-month moving average for the flow-weighted mean concentration (fwmc) of TP entering Shark River Slough was 6.9 ppb in July, 7.3 ppb in August and 7.7 ppb in September. These values were all below the interim and long-term discharge limits (Figure 2).

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The 12-month moving average for the fwmc of TP entering Taylor Slough and the Coastal Basins was 10.0 ppb in July, 10.4 ppb in August and 11.7 ppb in September. Although the TP concentrations of only two composite samples exceeded 10 ppb during the 1997 Water Year, *i.e.* 16.0 ppb on February 25, 1997 and 24.1 ppb on June 12, 1997, the 12-month moving average of 11.7 ppb was significantly influenced by these two values (Figure 3).

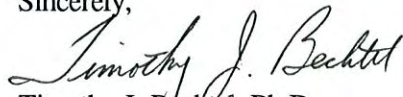
The frequency of composited samples for each sampling event exceeding 10 ppb within a given 12-month period was included in the Settlement Agreement as an additional aid in tracking compliance. For Shark River Slough a frequency or percentage limit for samples greater than 10 ppb is based on observed 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 exceedence and the calculated frequency limits for the previous nine 12-month moving averages.

Year Ending	Shark River Frequency Exceedance		Taylor Slough Frequency Exceedance	
	Actual	Limit	Actual	Limit
Jan 1997	44.4	46.3	0.0	53.1
Feb 1997	50.0*	47.2	4.2	53.1
Mar 1997	43.7	47.5	4.2	53.1
Apr 1997	36.7	47.7	8.3	53.1
May 1997	35.7	47.4	8.3	53.1
Jun 1997	29.6	47.5	12.5	53.1
Jul 1997	23.1	47.5	12.5	53.1
Aug 1997	26.9	47.5	12.5	53.1
Sep 1997	29.2	46.7	13.0	53.1

\* Exceeded limit for this time period

If you have questions regarding the reported results please call me at 561-687-6392.

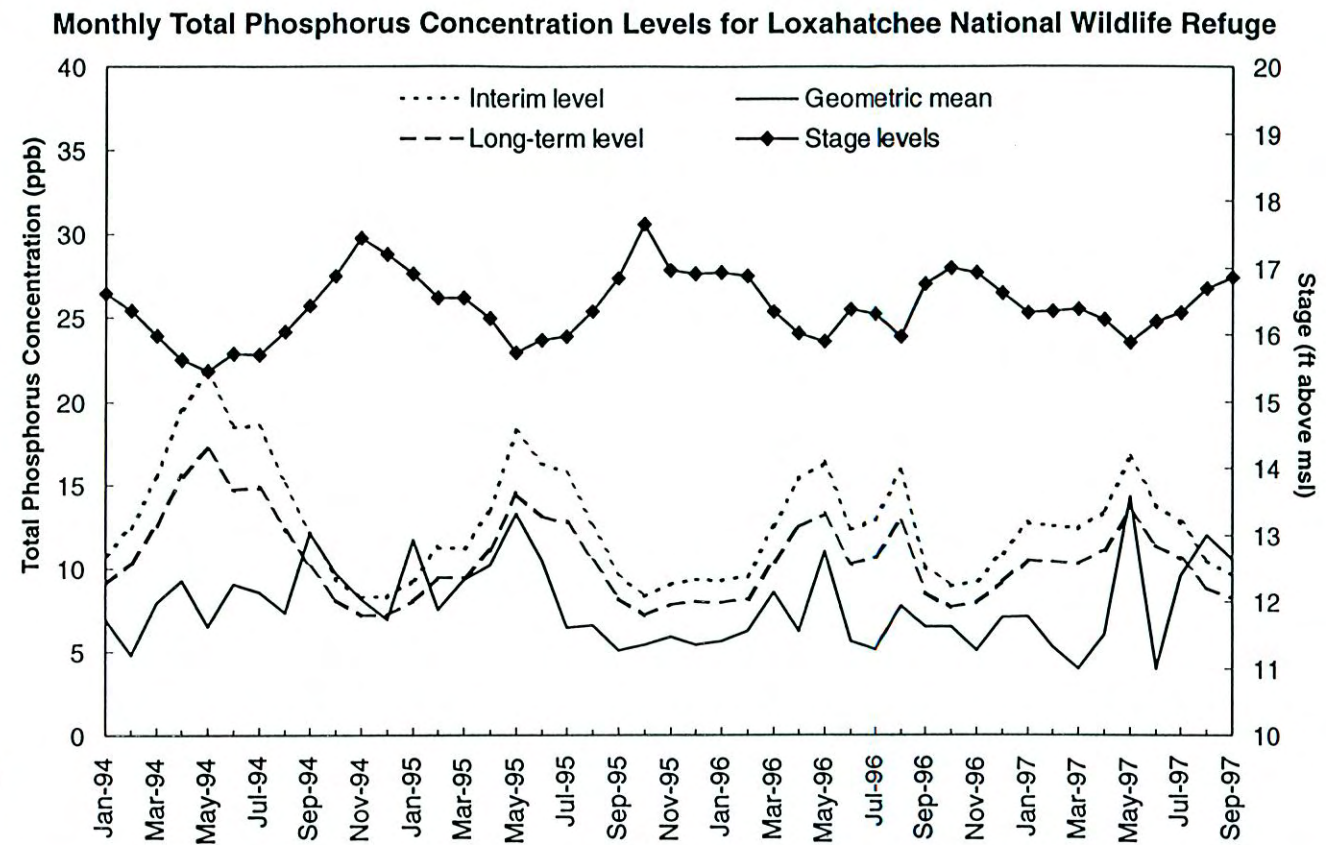
Sincerely,



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

Enclosure  
TB/dwp

c: M. Cheesman, WRE  
G. Goforth, ERD  
L. Lindstrom, WRE  
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**Figure 1.** Observed monthly 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)

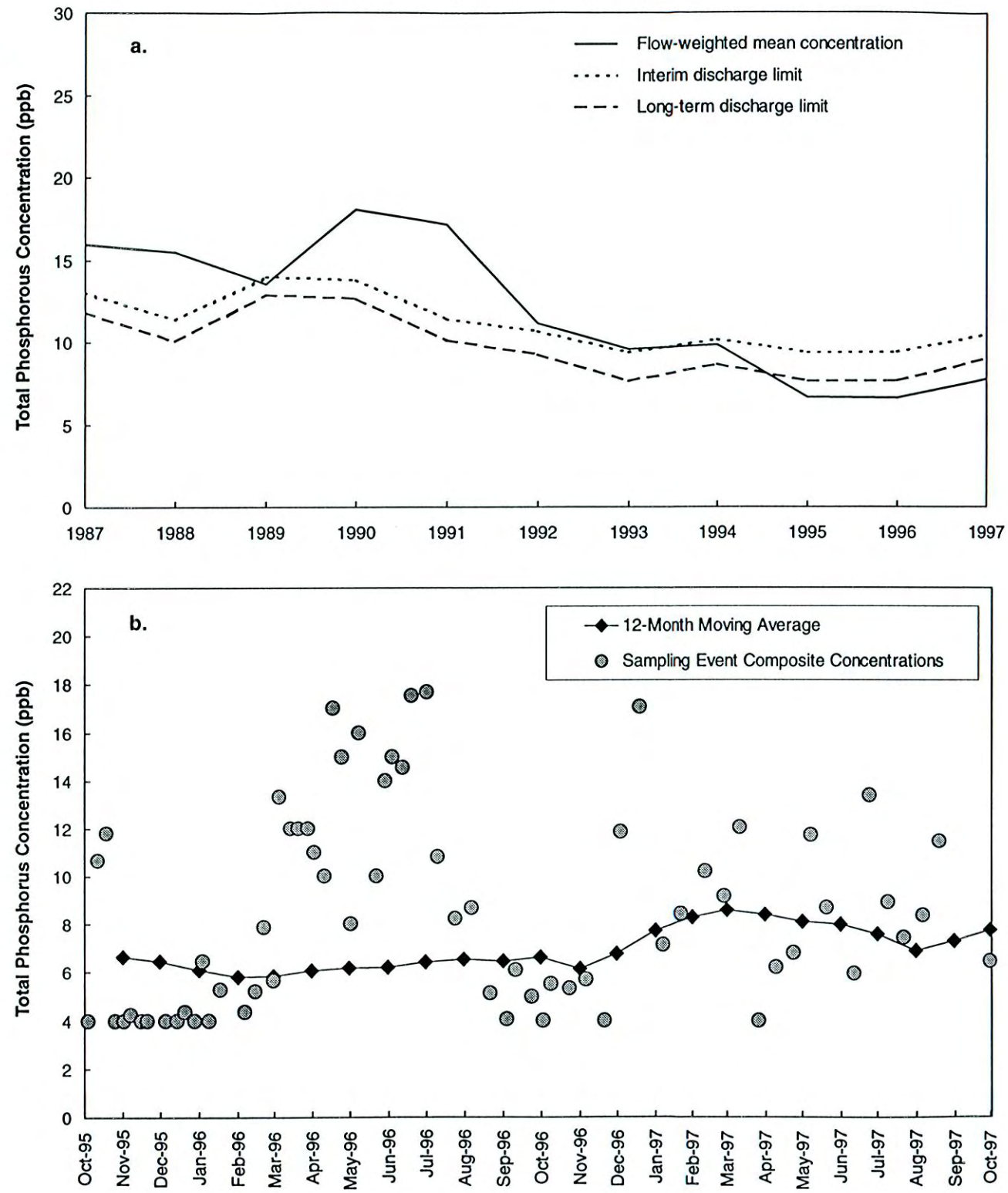
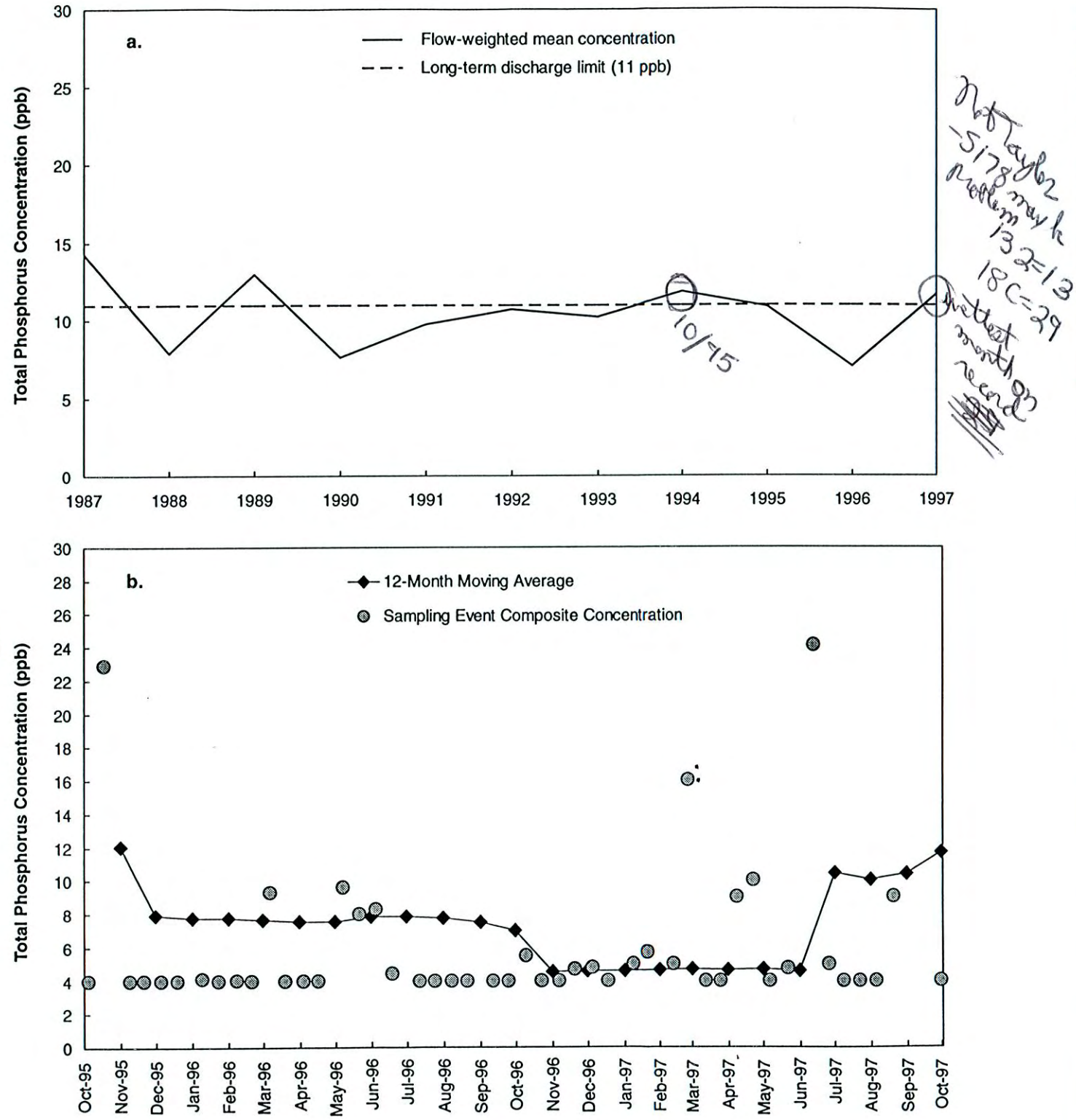


Figure 2. 12-month moving flow-weighted mean total phosphorus concentrations in the inflows to Everglades National Park (ENP) through Shark River Slough compared to the interim and long-term targets. a. Concentrations at the end of each water year. b. 12-month moving average concentration at the end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