

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA
CASE NO. 88-1886-CIV-MORENO**

UNITED STATES OF AMERICA,

Plaintiff,

vs.

SOUTH FLORIDA WATER MANAGEMENT
DISTRICT, et al.,

Defendants.

**UNITED STATES' RESPONSE TO THE STATE PARTIES' AND U.S.
SUGAR'S OBJECTIONS TO THE REPORT OF THE SPECIAL MASTER
(JULY 5, 2005)**

TO U.S. DISTRICT JUDGE MORENO:

The Plaintiff United States of America hereby submits its response to the objections filed September 26, 2006, by the State of Florida (Florida Department of Environmental Protection and South Florida Water Management District),^{1/} and by the U.S. Sugar Corporation, to the Report of the Special Master (July 5, 2006). In their objections to the Master's Report ("Objs."), the State Parties seek to overturn the findings and conclusions of the Special Master with respect to exceedances of the Interim Levels of Appendix B of the Consent Decree, contending that the Master should have determined that the exceedances were due to "statistical error," and thus assertedly not a violation of the Decree. Concerning remedies, both the State Parties and U.S. Sugar argue that the Court lacks the authority to impose remedial measures beyond the Best Management Practices ("BMP") program and stormwater treatment areas ("STAs") already prescribed in the existing Consent Decree, absent findings and conclusions that the State Parties are in contempt for non-compliance with the Decree.

As explained below, the United States disagrees with the State Parties that an exceedance-related violation could, as a matter of Consent Decree interpretation, be excused on account of

^{1/} On September 27, 2006, the West Palm Beach Farm Bureau, and their agricultural co-intervenors (collectively, "Farm Interests"), filed a joinder supporting the State Parties' sub-arguments 3 and 4, *i.e.*, the State Parties' objections to the Master's Report insofar as they relate to the Type I error, model error, and statistical bias claims and other arguments that the past exceedances were "caused by" statistical error.

alleged “statistical error” inherent in the Appendix B Interim Levels. Moreover, even assuming that “statistical error” included by design in the Appendix B compliance equation could somehow prevent exceedances from becoming violations, the United States disagrees that the evidence submitted by the State Parties establishes that the 1999-2004 exceedances were, in fact, caused by statistical error. In addition, while it is unnecessary for the Court to order the State Parties to implement the remedies set forth in Appendix A of the Special Master’s July 5, 2006 Report (because the State Parties have already voluntarily committed to do so), the United States urges the Court to reject the State Parties’ and U.S. Sugar’s arguments that additional remedies could not be ordered by the Court absent contempt hearing procedures, and the introduction of sufficient evidence of willful noncompliance with the Decree to justify a determination that the State Parties are in contempt of Court.

ARGUMENT

I. THE STATE PARTIES’ CONTENTION THAT THE PAST EXCEEDANCES OF THE INTERIM LEVELS IN THE REFUGE WERE DUE TO “STATISTICAL ERROR” IS UNSUSTAINABLE

A. The State Parties’ Geometric Means Averaging And Other Purported Statistical Comparisons Of Recent Water Quality Samples With 1978-79 Water Quality Samples Does Not Establish That The 1999-2004 Exceedances Were Due To Statistical Error In The Appendix B Compliance Equation

As explained in the United States’ motion to adopt the Special Master’s Report, the State Parties’ case for attributing the past exceedances to “error” did not involve any assertion or attempt to substantiate that any of the past exceedances of the Interim Levels in the Refuge was attributable to improper collection of samples, tainted water samples, mishandling or mislabeling of samples, or mistakes in the laboratory analysis or reporting of data based on water quality samples collected from the 14 interior stations in the Refuge between February 1999 and August 2004. Instead, relying exclusively on an alleged comparison of averages of interior Refuge phosphorus concentrations, an alleged comparison of annual data with respect to phosphorus inflow concentrations and loads, and an alleged decrease in Refuge phosphorus retention rates in the 1999-2004 period relative to 1978-79, the State Parties, joined by the Farm Interests, argue that “water quality in the Refuge is as good now, if not better, than it was back in the 1978-79 baseline period.” State Objs. at 11. Taking this statistically-based inference a step further, the State Parties would have the Court deduce that if water today is as clean or cleaner than it was during the 1978-79 “Outstanding Florida Waters” (“OFW”) baseline period, then the exceedances reported by the

Interim Levels equation must be attributable to “statistical error” inherent in the design of the Appendix B compliance formula. As we now explain, these contentions must fail as a defense to the exceedance-related violations of the Interim Levels between 1999 and 2004.

There are several problems with the State Parties’ “statistical error by inference” showing. First, when this purported defense is examined under close inspection, it becomes clear that the State Parties are attempting to substitute comparisons of geometric means (“geomeans”) data averaging, of annualized inflow concentration and loading data, and of phosphorus retention rate differentials, as between the OFW period and the post-February 1999 period, for the compliance formula that the Settling Parties agreed would be the exclusive method of assessing the State Parties’ achievement of the water quality requirements of the Decree. If the Settling Parties wished to determine compliance on the basis of geomeans data averaging, annualization of inflow concentration and loading data, and retention rate differences, they could have specified these methodologies in the Decree. They did not do so. In these circumstances, as the Special Master correctly observed:

Dr. Redfield’s definition of “error” has a surface appeal but, it too is inconsistent with the terms of the Consent Decree. Dr. Redfield is, in effect, urging that an excursion should be ignored if overall geometric means for a period of time before and after an excursion compare favorably to the levels derived in 1978-79. That would have been very easy for the parties to say. They knew the 1978-79 data and presumably could have calculated an average concentration or a geometric mean of what data were available in 1992 and could have easily said that the result would be compared to the average of the geomeans of the 14 interior stations, and only when that average was lower than the 1978-79 average would the TOC have to evaluate the existence of a “violation.” But the Consent Decree does not say this. To ignore an excursion on this basis is to use the word “error” at page B-5 of the Consent Decree to modify the definition of a “violation” rather than to represent a factual inquiry into the cause of an exceedance. Such a usage of “error” would also eliminate the Interim Level from consideration. Both consequences represent an impermissible effort to change the terms of the parties’ agreement.

Special Master’s July 5, 2006 Report (“SMR”) at 28-29.

Aside from the foregoing legal infirmities, which preclude the State Parties from relying on average geomeans and annualized 1999-2004 inflow concentration and loading data comparisons with 1978-79 era data as a defense to exceedance-related violations, the factual inferences that the State Parties urge the Court to draw from such data comparisons -- i.e., that water in the Refuge is as clean, if not cleaner, than during the 1978-79 period -- are also unsupported by substantial evidence in the record.

The State Parties purport to rely on Dr. Redfield’s testimony for the propositions that

Average phosphorus concentrations in the Refuge are lower now (9.1 ppb vs. 9.4 ppb) and below the long term 10 ppb average contemplated by the Settlement Agreement. Annual phosphorus inflow concentrations are also lower (~80 ppb vs. ~117 ppb); so, too, are annual loads (~43 tons vs. ~76 tons). Finally, annual phosphorus retention in the Refuge is much lower now than during the baseline period (~20 tons vs. ~48 tons).

State Objs. at 11, citing SFWMD Exhibits 156, 157, and 159.

In our motion to adopt in part the Special Master's Report (U.S. Mem. at 19), the United States has already refuted the State Parties' assertion that an intelligent water quality comparison of the 1999-2005 interval with the 1978-79 OFW baseline period can be achieved simply by contrasting the average geometric means of the water quality samples collected during the respective periods. As we explained (*id.*), the State Parties' simple comparison of the average geomeans data from the two intervals (1978-79 versus 1999-2004) is meaningless as an indicator of relative cleanliness of the water quality between the two periods because the State Parties' comparison omits a critical component -- the stage (or water depth) at which samples were collected. The State Parties' attempted comparisons neglect to account for the inverse correlation between phosphorus concentration and stage that existed in the 1978-79 data. See U.S. Exh. 89 at 5; 3-15-2006 Tr. at 1846.

Dr. Redfield's data averaging testimony and exhibits are misleading because the geomeans data on which he relied in his comparisons does not account for the differences in stage at which the two sets of geomeans data were measured, and, in fact, fails to account for the fact that there was a greater percentage of stations sampled at low stage (when marsh concentrations are higher) during the 1978-79 OFW period than during the post-February, 1999 Interim Levels period.² Finally, as also mentioned in the U.S. motion to adopt (U.S. Mem. at p.19), there was a dramatic change in the way samples were collected between the 1978-79 era and the post-February 1999 period (collection methods were much more crude in the late 1970s than the post-February 1999 period), rendering impossible a true apples-to-apples comparison of water quality collected in samples during the two intervals. See U.S. Exh. 89 at 4-5 (Walker Rebuttal Rpt.).

² As U.S. Expert Dr. William Walker explained: "If we limit Dr. Redfield's direct comparison of recent and historical data to a stage range that is represented in both the time periods (15.9 to 16.6 ft) and to months when at least 13 sites were sampled in both time periods, the 1999-2005 geometric mean (9.1 ppb, 12 months) exceeds the 1978-1979 geometric mean (7.8 ppb, 3 months)." U.S. Exh. 89 at 5. Thus, in this true apples-to-apples comparison, water quality in the 1999-2004 period was not as clean as the 1978-79 period.

The State Parties nonetheless cite the testimony of Dr. William Walker, the United States' expert, for the proposition that "the goal of the Appendix B compliance equation is achieved when phosphorus levels in the Refuge are returned to those that existed during the 1978-79 baseline period." State Objs. at 11, citing 3-15-2006 Tr. at 1813-1815. The State Parties go on to assert that they have accomplished this goal as demonstrated by their average geomeans comparisons. *Id.* This contention is misleading, however, because Dr. Walker made it emphatically clear in his testimony that, because of stage differences between the two periods (the 1999-2004 measurements were generally taken at higher stages),^{3y} and contamination from 1978-79 era sampling (samples collected by bucket dropped from hovering helicopter), a successful return to phosphorus levels that existed during the 1978-79 baseline period cannot be declared accomplished by making a simple comparison of

concentrations that were measured in the marsh in that time frame because of the potential contamination problems. And that's one of the major reasons why I have problems with Dr. Redfield's direct comparison of the data, because the data from low stage are affected by contamination and different spatial coverages, and if we compare data from the high stage when the marsh is completely flooded, the concentrations now are higher than they were in '78 and '79.

3-15-2006 Tr. 1815-16; see also U.S. Exh. 89 at 5.^{4z}

B. The State Parties' Reliance On Dr. Goforth's Over-Simplistic Correlation Test To Show A Purported Causal Disconnect Between External Loading And Interior Refuge Concentrations Is Likewise Misplaced

Apart from asserting that exceedances must be due to statistical error given the average and annualized comparisons of water quality data between the 1978-79 era and the post-February 1999 periods, the State Parties' objections reprise their claim that a correlation analysis developed by

^{3y} Dr. Redfield conceded that "overall, the marsh is being held deeper now than it was in 1979-1980." SFWMD Exh. No. 134.

^{4z} The State Parties also suggest that their position that the past exceedances were caused by "statistical error" is somehow advanced by Dr. Goforth's testimony that the annual phosphorus retention rate in the Refuge is lower now than during the 1978-79 baseline period. State Objs. at 11 citing SFWMD Exhibits 156, 157, and 159. Upon cross examination, however, Dr. Goforth conceded that the State Parties do not know whether the greater amounts of phosphorus leaving the Refuge (reflected in a lower phosphorus retention rate for the 1999-2004 interval relative to the 1987-79 base period) originated from rainfall as opposed to external loading, that the phosphorus retention model was "simple," and that a more sophisticated hydrodynamic model of the Refuge would advance a common basis for understanding by the parties. 3-13-2006 Tr. at 1105-06. The Special Master did not find Dr. Goforth's retention rate testimony to be convincing or probative of error being caused by the Appendix B equation, and neither should the Court.

SFWMD expert, Dr. Gary Goforth, demonstrates that there is, assertedly, no more than a weak causal relationship between external loading to the Refuge and changes in interior Refuge concentrations. According to the State Parties, because this correlation exhibit (SFWMD Exh. 135 at 2-3) allegedly demonstrates that there is only a tenuous relationship between external loading and excursions above the Interim Levels, it compels an inference that the past exceedances were to “statistical error.” Thus, the State Parties argue:

The existence of error is further supported by the analyses of Dr. Goforth who examined the relationship between external phosphorus levels entering the Refuge and resulting changes in water quality at the 14 Refuge monitoring stations. These studies, based on 11 years of monthly data (i.e., 132 monthly values), and considering a comprehensive range of environmental conditions (droughts, hurricanes, periods of rapidly rising stages, etc.), demonstrated a weak correlation of approximately 5%, at best, between external loads and interior water quality in the Refuge. Because only 5% of the variability in phosphorus levels at the 14 monitoring stations can be attributed to external loading, these analyses provide quantifiable proof that something other than external phosphorus inputs are causing the excursions, i.e., error.

State Objs. at 11-12, citing Tr. at 1022, 1025, 1031-32; SFWMD Exh. 35 at 2-5, and 138 at 1-3. As we now explain, Dr. Goforth’s correlation analysis does not advance the State Parties’ case for statistical error because it purports to quantify a linear relationship between two variables -- external loading and interior concentrations -- that the state parties have already acknowledged have no quantifiable relationship to one another, and because the analysis does not negate the causal association between loading to the Refuge and increased phosphorus concentrations.

It is unclear why the State Parties rely on Dr. Goforth’s correlation analysis to support the State’s contention that the past exceedances are due to statistical error. There is no evidence that the Settling Parties developed the Appendix B equation based on an assumed statistical correlation between external loading and changes in interior concentrations.⁵⁷ Moreover, during the hearings before this Court in December 2004, Dr. Goforth conceded that, due to the complexities of marsh ecology, he would not expect there to be any linear relationship between external loading and

⁵⁷ To the contrary, the State Parties have indicated that, from their perspective, the equation was developed as a surrogate for meeting Florida’s “Outstanding Florida Water” component of state water quality standards under the Clean Water Act. Indeed, in seeking to rebut a nearly identical challenge to the statistical validity to the Appendix B equation mounted by the Farm Interests in 1995-96 (see Farm Interests’ January 30, 1996 Post-Hearing Memorandum, DE 1423, at 30), the State Parties defended the Appendix B equation on the ground that establishes compliance levels that act as a “surrogate” for the anti-degradation requirement under state law that applies to “Outstanding Florida Waters” (“OFW”) such as the Refuge. See U.S. Mem. in support of Motion To Adopt, at p. 17, citing FDEP’s January 30, 1996 Post-Hearing Brief, DE 1424, at 17-20.

interior phosphorus concentrations. In testifying about Refuge topography, Dr. Goforth explained:

The Loxahatchee refuge has a levee around it, but on the inside it has what is referred to as a rim canal. This is where the material from the levee came from is a borrowed pit, if you will, a rim canal, a borrowed canal. However, it also serves to move water around the edge of the refuge, as opposed to sheets flowing across the center of it. It is a moat that goes around the refuge and serves to protect the interior marsh.

12-13-04 Tr. 140-41. Dr. Goforth also testified to a relationship between rim canal stage (i.e., the elevation of water in the rim canal) and the “hydraulic gradient” as affecting the ability of water from the rim canal to enter the interior portion of the refuge, instead of bypassing the Refuge before being discharged to the south.⁶⁹ As he acknowledged: “From a hydraulic standpoint, if the rim stage is lower than the water level in the interior of the marsh, then there is a hydraulic gradient that would [prevent] the water in the canal from moving into the marsh.” 12-13-04 Tr. 141-42. Thus, as Dr. Goforth effectively conceded, during those parts of the year when the rim canal stage is lower than water levels in the interior Refuge (negative hydraulic gradient), external loads will not enter the Refuge interior, but will move around its periphery.

Dr. Goforth’s correlation analysis is defective because it includes, on the “load” side of the correlation equation, phosphorus loads that never penetrate the interior of the Refuge. The analysis thus correlates with changes in interior concentrations all of the loads that enter the rim canal through the Refuge intake structures regardless of whether, due to a negative hydraulic gradient between the rim canal and the interior, the loads never enter the interior Refuge. The irremediable defect in Dr. Goforth’s so-called correlation coefficient analysis is that it fails to measure and correlate loads that actually enter the interior marsh, i.e., which happens during times when there is a positive hydraulic gradient from the edge of the Refuge to the interior (i.e., rim canal stage is higher than interior marsh water elevation). In sum, there is no information in Dr. Goforth’s analysis or in the record quantifying the actual loads penetrating the interior Refuge with changes in interior phosphorus concentration, even assuming Refuge ecology, hydrology, and topography would allow a meaningful quantification of some linear relationship between external loading and changes in interior phosphorus concentrations.

Dr. Goforth’s correlation analysis is also deficient because it fails to account for external

⁶⁹ As Dr. Redfield explained, the Refuge has an elevation gradient that is higher in the north and lower in the south, 12-13-2004 Tr. 206, and the northern end of the Refuge tends to dry out first. Id. at 208.

loads which actually reach the interior Refuge, yet escape detection in laboratory analysis of monthly sample collections. As Dr. Walker explained:

[t]he correlation model used by Dr. Goforth is too simple to capture the complex hydrodynamics and phosphorus cycling dynamics of the marsh. Variations in stage and other complexities of the marsh ecosystem could easily mask effects of external loads on interior marsh concentrations, as assessed using Dr. Goforth's direct correlation analysis. The absence of correlation using an over-simplified model does not demonstrate that there is no cause-effect relationship between external loads and interior marsh concentrations.

U.S. Exh. 89 at 20 (citations omitted). As examples of the complexities that would frustrate attempts to draw intelligent inferences from Dr. Goforth's correlation study about a quantifiable linear relationship between external loading and excursions, Dr. Walker cited the following factors:

- Episodic transport [of phosphorus loads] may occur in brief periods between monthly water quality sampling when inflow pumping and hydraulic conditions are conducive. These spikes in phosphorus input would be rapidly taken up by the marsh and potentially recycled back to the water column months or years later.
- Local variations in marsh topography and vegetation promote transport along channels, sloughs, or other paths of least hydraulic resistance (e.g., air-boat trails) that may not be captured by the monitoring network.
- Phosphorus transport also occurs along the bottom in the form of loose particulates (floc) that are not collected in the water quality samples. Floc was found to be an important transport mechanism in ENP experimental dosing studies (U.S. Exhibit 82 at 3-4, Gaiser et al, 2005). This additional transported phosphorus would be retained in the marsh vegetation and soils without being detected in the water quality data, except through subsequent recycling processes enhanced by dry-out and rewetting.
- Spatial patterns in phosphorus concentration are sometimes confounded with spatial variations in water depth. Higher concentrations at interior sites as opposed to exterior sites on some dates may reflect the fact that interior sites tend to be shallower (Harwell et al, 2005, U.S. Exh. 52, Appendix E).

U.S. Exh. 57 at 16-17.

Further undermining Dr. Goforth's purported correlation study is the fact that there is no foundational testimony from any expert establishing how or why quantifying a simple linear relationship between loading and changes in interior concentrations is even possible. During the December 2004 hearings, Dr. Goforth acknowledged that, due to the complexities in the Refuge's ecology, there is "not a simple linear relationship between the amounts of phosphorus that goes into the Refuge and those interior concentrations." 12-13-2004 Tr. 157 (emphasis added). Dr. Goforth further conceded that these ecological complexities and their effects on interior concentrations were

beyond his expertise. See id. (Dr. Goforth acknowledging that he does “not have the expertise to try to understand or at least explain to you those ecological complexities, and that is the type of questions that the Federal monitoring and enhanced modeling program will attempt to gain.”).

Yet during the March 2006 hearings, Dr. Goforth purported to understand the hydrodynamics and complexities of Refuge ecology well enough to suggest that a simple linear relationship between external loading and interior concentration could be quantified. There is no explanation from Dr. Goforth why, in March 2006, he was able to quantify a simple linear relationship between the amount of phosphorus that goes into the Refuge and changes in interior concentrations, when, according to Dr. Goforth’s testimony in December 2004, the complexities of Refuge ecology defied such quantification. The lack of foundation testimony for a correlation of loads and concentrations further diminishes the probative value of Dr. Goforth’s so-called correlation analysis.

Finally, Dr. Walker explained why Dr. Goforth’s correlation analysis contributes nothing to the State Parties’ effort to show that exceedances were due to statistical error. As Dr. Walker explained, there are too many variables affecting the transport of phosphorus loads across the Refuge -- such as “potential interferences due to annual cycles of hydrology, meteorology and ecology” -- that can “affect the time lag correlations” as between external loading and changes in interior phosphorus concentrations “for lags less than 12 months.” 3-16-2006 Tr. 1947. Referring to Dr. Goforth’s correlation exhibit (SFWMD Exh. No. 135, at 2-3), Dr. Walker expounded:

the only reason they're able to say the weak correlation is because they're using a weak model. The marsh is much more complicated than just doing a linear regression analysis at different flag points. If you start off with a poor model, oversimplified model, and get a poor correlation, it tells you nothing. If you had a good model that had the dynamics of the marsh captured, variations in stage and so forth and seasonality and all the other things that we know affect the marsh, and then if you found no correlation, there would be real information in that test. But I mean if you start off with a poor model you just don't get any information, it doesn't matter what correlation you get.

3-16-2006 Tr. 1711-1712 (emphasis added). In sum, Dr. Goforth’s overly simplistic correlation purporting to quantify a relationship between external loading and changes in interior concentrations does not advance the State Parties’ effort to show inferentially that the past exceedances were due to statistical error.

C. The State Parties’ Argument That The Master Erred By Failing To Consider Evidence That Appendix B Type I Error, Model Error, And/Or Bias, Are Assertedly The Causes Of The Past Exceedances Is Not Well Taken

At page 9 of their response, the State Parties, joined by the Farm Interests, object to the

Special Master's adherence to this Court's prior ruling that the term "error" as used in Appendix B means something other than the margin of statistical error inherent in the regression equation from which the Interim Levels are derived. The State Parties assert that the Master erroneously failed to

to consider evidence showing that in each case of an exceedance, there was a 34% likelihood that phosphorus levels were, in fact, meeting the requirements of the Decree and only violated the Decree due to a statistical process employed in Appendix B. (This is called a false positive or Type I error.)

Id. The State Parties similarly fault the Master's failure to credit expert testimony sponsored by the State Parties purporting to establish

that the data set used to create the Appendix B equation was extremely limited and, as a result, caused the equation to erroneously predict [sic] phosphorus levels lower than those contemplated by the Decree, especially at higher water levels. (This is known as model bias).

State Objs. at 10.⁷ As we now explain, the Special Master properly ruled that the statistical error inherent in the Interim Levels was not within the scope of the "error or extraordinary natural phenomena language" of the Appendix B. Moreover, even assuming arguendo that exceedances could be excused if they were traceable to statistical error, the State Parties have not, in any event, proffered substantial evidence establishing that the exceedances were due to Type I error, model error, or statistical bias inherent in the Appendix B equation.

Contrary to the State Parties' objections, the Master correctly refused to credit the State Parties' proffer of evidence of alleged structural flaws in the Appendix B equation, including the testimony by the SFWMD's statistical expert, Dr. Ronald Marks, that the equation allegedly generates a 34% annual risk of an exceedance being falsely reported, that the equation allegedly was based on an inadequate dataset, and that the statistical model is biased seasonally, i.e., allegedly did not factor in spikes in phosphorus concentrations that allegedly occur during rapidly rising stage at the onset of the annual wet season in South Florida. In the U.S. motion to adopt the Master's report (Mem. at 11-18), we explained why the Special Master correctly rejected Dr. Marks' testimony on these subjects as impermissible collateral attacks on the Consent Decree, and why the Master should have also barred the testimony under parol evidence rule and the doctrine of judicial estoppel. Rather than repeat those arguments, we incorporate them by reference here.

⁷ The United States does not believe that it is the function of the Appendix B equation to "predict" what future phosphorus levels in the Refuge would be. Rather, it is our view that the Interim Levels derived from the Appendix B equation describe what the water quality conditions in the Refuge were in 1978-1979. See 3-16-2006 Tr. 1937 (Dr. Walker testimony).

Even assuming that the State Parties were entitled to raise Type I error claims and challenges to the statistical validity of the Appendix B equation as a defense to exceedances, those claims are substantively without merit. Dr. Walker testified that the Type I error component in the equation would produce a maximum 10% risk of a falsely reported excursion only if the State Parties had actually improved water quality in the Refuge to the point where it replicated the pristine 1978-79 conditions. If that had actually been achieved, the geomeans of the water quality samples since the Interim Levels went into effect would likely have been clustered around the 50th percentile of the historic (1978-79) phosphorus values at a given stage. See U.S. Exh. 57 at 10; U.S. Exh. 60, lower figure. The 1999-2005 monthly geomeans data in the Refuge, however, were above the 50th percentile expected at the corresponding stage relative to 1978-1979 conditions in 82% of the tested months. Dr. Walker explained, “[t]hese deviations from the OFW 50th percentile indicate that the objective of the Interim Levels had not been achieved in the 1999-2005 period.” U.S. Exh. 57 at 10.

As part of a separate inquiry into the accuracy of the State Parties’ contentions that they had achieved water quality in the Refuge consistent with 1978-1979 OFW era conditions, Dr. Walker examined the State Parties’ 1999-2004 water quality management performance in relation to the Consent Decree’s requirement (in Paragraph 8.A.) that, by the time the Interim Levels went into effect in February 1999, the State Parties were required to reduce loads to the Refuge by approximately 85% relative to what were the average loads to the Refuge during a 1979-1988 base period. If the State Parties had achieved compliance with the 85% load reduction requirement, that would, in Dr. Walker’s opinion, be more of a reason to assume that the State Parties might be achieving water quality in the Refuge consistent with 1978-1979 OFW era conditions. Upon analyzing recent loading data for the Refuge, however, Dr. Walker determined the State Parties had not met the 85% load reduction requirement, and that, in his opinion, lessened even further the likelihood that the past exceedances could be attributable to Type I error. U.S. Exh. 57 at 12-13; U.S. Exh. 62.[§]

[§] As part of his focus on the State Parties’ achievement of load reduction requirements, Dr. Walker also examined, in particular, the recent phosphorus reduction performance of STA 1-West, which discharges directly into the Refuge. If the state parties had been operating STA 1-West within its design range, and achieving the expected reductions in phosphorus concentrations in the discharges from STA 1-West, that could be a possible basis for inferring that the State Parties might be achieving performance results closer to 1978-1979 OFW era conditions. Upon evaluating the recent STA 1-West performance data, however, Dr. Walker concluded that such was not the case. As Dr. Walker explained:

(continued...)

As part of yet another inquiry into whether 1999-2004 water quality conditions were equivalent to 1978-79 OFW conditions, Dr. Walker examined the differences in sampling methodologies between the 1978-79 period and the 1999-2004 periods. Dr. Walker expressed the opinion that it was unlikely that the 1999-2004 exceedances were influenced by Type I error in the Appendix B compliance equation in light of improved sampling methodologies involved in the collection of the recent (1999-2005) water quality data. See U.S. Exh. No. 89 at 13; U.S. Exh. 57 at 22-23. As Dr. Walker explained, “[d]ifferences in sampling methodologies [i.e., between the OFW period and the post-January 1999 period], if anything, are likely to increase the risk of Type II error (i.e., causing exceedances to become under-reported) and decrease the risk of Type I error (reporting exceedances that did not actually happen) in determining compliance.” Id. (emphasis added). Dr. Walker also expressed an opinion that a lower-than-expected variance around the phosphorus concentrations at a given stage (a .24 standard deviation instead of the expected .31 standard deviation) reflected in the post-January 1999 geomeans data, relative to the OFW period data, has had “the effect of reducing the frequency of excursions and increasing the risk of Type II error,” and correspondingly further reduced the likelihood that any of the past excursions above the Interim Levels was influenced by Type I error. U.S. Exh. No. 57 at 22-23.

Because there is no evidence that the State Parties have met the load reduction requirements of the Decree, and no credible evidence that the water quality in the Refuge during the period of the 1999 - 2004 exceedances was just as clean as it was during the 1978-79 OFW period, it would require a leap of faith for this Court to conclude that water quality conditions in the Refuge replicated 1978-1979 OFW era conditions when the 1999-2004 exceedances occurred, such that Type I error, as a purported cause of the past exceedances, could be thought of as anything but an abstract possibility. Based on all of the above evidence, the Court should conclude that the State Parties have failed to establish, by substantial evidence, that the 1999-2004 exceedances were

^{8/}(...continued)

Inflow loads at STA 1-West remained above the design basis from September 2001 through May 2005 and outflow concentrations reached approximately 100 ppb. Over the entire period, 12-month rolling-average outflow concentrations from STA 1-West increased from 20 to 100 ppb and load reductions decreased from 80% to 55%. . . . Until the overloading problem is solved and STA 1-West is restored, attainment of existing and future treatment goals is unlikely, and the risk of marsh exceedances will remain high.

U.S. Exh. 57 at 14.

caused by Type I statistical error.

The State Parties' separate contentions (joined in by the Farm Interests) that the exceedances were due to structural flaws in the Interim Levels, such as inadequate data inputs and seasonal bias allegedly inherent in the Appendix B regression equation, are likewise devoid of substance. Though Dr. Marks asserted that the sample of 1978-1983 water quality data inputs used in the Appendix B model was too small because it assertedly involved only 14 data points (instead of his preference for at least 30 data points), Dr. Marks' position lacks substance because the Appendix B model was not restricted to 14 data points, or even 30 data points. Rather, as Dr. Walker pointed out, the data in the Appendix B model, though derived from 14 months of data, "related back to almost 200 actual data points. So there's some aggregation of the data beforehand that I think makes the model a little bit more robust than it would have been if it were just literally 14 measurements." 3/15/06 Tr. 1768.

At page 10 of their response, the State Parties assert that the Special Master improperly disregarded State expert testimony that the statistical model underlying the Interim Levels equation is flawed, because it allegedly fails to capture seasonal influences, and thus is too biased to be useful as a compliance test. In the proceedings before the Master, the State Parties maintained that if the Appendix B equation were not biased, there should have been excursions observed randomly across both wet and dry season cycles. Instead, they assert, excursions have tended to occur only during rapidly rising stage events which normally happen during the late summer-fall months in South Florida. While the Special Master properly rejected that testimony as an impermissible collateral attack on the Consent Decree (SMR at 22), the State Parties would not prevail on this claim even if were appropriate to address its merits.

Dr. Walker's testimony on behalf of the United States laid to rest any doubts about whether there may be seasonal bias inherent in the Appendix B model. As he explained, the compliance equation in Appendix B is not biased seasonally, and is not biased by failing to account for rapidly rising stage events, because the equation incorporates into its random variability component the rate by which phosphorus concentration levels changed during the baseline period in response to changes in stage. As Dr. Walker pointed out:

Whatever effect changing stage has on the concentrations would be part of the random variability term. Most of the data points are on the rising limb which would tend to cause the interim levels to be higher. The model reflected whatever effect that phenomenon had on the data.

3/16/06 Tr. 1857.

Dr. Walker also explained why the fact that excursions have tended to occur only in the initial month of a rapid rise in stage, but not during subsequent months of elevated stage, does not reflect bias in the model. 3-15-2006 Tr. 1684. During an event or rainy season when there are heavy discharges to the Refuge, such as storm or flood-control discharges, a hydraulic gradient develops along the rim canal which forces high phosphorus canal water from the canal toward the interior Refuge. *Id.* at 1684-85. In the early period of such a rise in stage, there is high phosphorus in the incoming canal water that, depending on the extent of penetration of canal water into the marsh, can trigger excursions. *Id.* With such penetration, residual phosphorus in dried soils in the inner Refuge, including phosphorus left over from prior years' external loading events, may also re-suspend in the water column, adding to the surge in phosphorus levels. *Id.* Although such elevated phosphorus concentration levels in the water column during penetration will cause long-term disruption of native flora and fauna, the elevated concentrations themselves do not persist for long -- they quickly dissipate due to absorption by vegetation, sediments and soils. 3-15-2006 Tr. 1685. Although the stage in the interior Refuge may remain elevated for months during the wet season, it may not implicate further excursions because the water column during ensuing months of elevated stage would be much cleaner after the water has been scrubbed by vegetation,⁹ and this may explain why concentrations are lower when stage, though still elevated, is in decline and water is draining out of the marsh. See also U.S. Exh. 80, at 2 (lower figure); U.S. Exh. 89 at 18. In these circumstances, it is not bias in the Appendix B model, but rather aquatic biology and external loading, that explains why excursions tend to occur during the beginning of a rise in stage, but not in subsequent months of elevated stage.

II. THE STATE PARTIES' AND U.S. SUGAR'S ARGUMENT THAT CONTEMPT IS THE SOLE REMEDY AVAILABLE FOR EXCEEDANCE-RELATED VIOLATIONS UNDER THE CONSENT DECREE IS WITHOUT MERIT

At page 3 of their objections, the State Parties assert that, in entering upon the Settlement Agreement, the Settling Parties "recognized that if the need arose to take additional measures" to remedy exceedances of the Appendix B levels, "there would have to be a flexible self-implementing process by which they could fashion appropriate remedies based on the site-specific conditions that

⁹ This scientific phenomenon of aquatic vegetation lowering concentrations by removing phosphorus from the water column was explained by the District's expert during the December 2004 hearings, and is the concept behind stormwater treatment area technology using emergent aquatic vegetation and submerged aquatic vegetation. 12-13-2004 Tr. 122-23 (testimony of Dr. Goforth).

arose.” The United States agrees with the foregoing statement to the extent it acknowledges that, in the event of exceedance-related violations of the Consent Decree Levels, the State Parties are obligated to implement additional remedial measures consistent with Paragraph 10B of the Decree, preferably through a mutually cooperative approach by the Settling Parties to fashioning appropriate remedies without the need for court intervention. The United States believes that this is where matters currently stand. The State Parties indicate that they “have already formally committed to implement and complete” the “projects identified on Appendix A of the [Master’s] Report.” State Objs. at 1-2. These were the sole projects recommended by the Special Master for inclusion in a court remedial order. No party responding to the Master’s Report has urged additional remedial measures. In light of the unanimity among the parties, including the Tribe, about the appropriateness of the remedial measures in Appendix A, and the State Parties’ self-acknowledged commitment to complete them, the United States believes that no court remedial order is necessary at this time.

The State Parties and U.S. Sugar raise other arguments, however, which suggest that, were it not for the State Parties’ self-imposed commitment to implement and complete the projects in Appendix A of the Master’s Report, the Court would lack the legal authority to impose an order for those additional remedies unless the State Parties could be held in contempt of Court. More specifically, the State Parties argue that the Consent Decree “does not contemplate the incorporation of subsequent remedial measures into an order.” State Objs. at 4. They also contend that any remedial order issued pursuant to this Consent Decree “must be premised upon a showing of the necessary elements to support . . . a finding of contempt.” State Objs. at 5. The State Parties then go on to assert that because no party has “sought entry of an order requiring the State Parties to show cause as to why they should not be found in contempt, it would be legally improper for the Court to place the State under an order directing it to implement the projects in Appendix A.” Id. at 5-6. We respectfully disagree, and urge rejection of these arguments on the merits because they are contrary to the plain language used in the settlement agreement adopted by the Court as a consent decree.¹⁰

¹⁰ The United States does not disagree that the Court has inherent authority to directly enforce, through its contempt power, aspects of the consent decree that require the state parties “to act in some defined manner.” See Chairs v. Burgess, 143 F.3d 1432, 1436 (11th Cir. 1998), citing Mercer v. Mitchell, 908 F.2d 763, 768 (11th Cir. 1990). However, the United States does dispute (continued...)

The United States believes that the foregoing arguments should be dismissed because they disregard the function reserved for the Court under the Settlement Agreement to order the State Parties to implement appropriate additional remedies in circumstances (not applicable at this time) where the Court is called upon to resolve a dispute over the need for additional remedies following exceedances of the Interim and Long-Term Levels in Appendix B of the Decree. The State Parties' position that no additional remedial order may issue absent a motion for contempt (or for an order to show cause) has no merit because the Consent Decree does not contemplate that Settling Parties' disputes over the need for additional remedies must be resolved through the Court's contempt procedures. To the contrary, in paragraph 10B, the Settling Parties reciprocally committed to the judicial enforcement of additional remedies in the event of a violation, without any need for the Court to resort to contempt powers and/or injunctive authority. Thus, Paragraph 10B provides:

Notwithstanding the implementation of these [Stormwater Treatment Area and Best Management Practices] control programs, if the concentration limits and levels are violated, **then the State Parties will implement additional remedies**, such as any necessary expansion of STAs, more intensive management of STAs, a more stringent EAA regulatory program, or a combination of the above. **The State Parties shall not implement more intensive management of the STAs as the sole additional remedy.**

(Emphasis added.)

In the Settlement Agreement, the Settling Parties further agreed upon a three-step process by which any disagreements over the need for the State Parties, in the event of an exceedance, to implement additional remedies would be resolved. The first step is set forth in Paragraph 19 of the Decree, and provides:

The Party seeking relief shall first notify the other Parties to this Agreement in writing by certified mail, return receipt. Representatives of the Parties shall arrange to meet within 15 days of receipt of such notice for the purpose of consulting and resolving the concern."

Paragraph 19 of the Decree provides that "[i]f after meeting the Parties cannot resolve the concerns within a reasonable time," the dispute resolution process proceeds to the second step: "any Party may require mediation." Finally, if and when consultation and mediation become unsuccessful, the dispute resolution process, as prescribed in the settlement agreement, reaches its third and final step: judicial resolution of the disputed need for additional remedies. Paragraph 19

^{10/}(...continued)

the State Parties' and U.S. Sugar's assertions that contempt is the **sole** procedural mechanism available to the Court to order remedies.

of the Agreement specifies:

If consultation or mediation has failed to resolve the concerns, any Party shall be entitled to apply to the Court for judicial resolution of the disagreement. Such application shall be by motion setting forth the matter in disagreement and the relief being requested to address the disagreement.^{11/}

Thus, under the Consent Decree, the State Parties have made an enforceable commitment to submit to the Court's authority to resolve disputes over the need for additional remedies. In these circumstances, the State Parties' assertion that the Consent Decree "does not contemplate the incorporation of subsequent remedial measures into an order," State Objs. at 4, is unsustainable.

The State Parties' separate argument that "any remedial order issued pursuant to this Consent Decree must be premised upon a showing of the necessary elements to support . . . a finding of contempt," State Objs. at 5, fares no better. For the reasons stated above, when this Court presides over remedial disputes among the Settling Parties – and initially orders additional remedies acting under the explicit provisions of the consent decree – the Court is merely carrying out the function reserved for the Court by the parties through contract. Although any remedial order the Court might enter through this process would itself be enforceable through the Court's contempt power (and subject to the prerequisites for its exercise), the entry of the initial remedial order itself is not a contempt power or process, or an exercise of injunctive authority. It is not a "proceedin[g] brought to enforce a court order that requires [a party] to act in some defined manner." Cf. Chairs v. Burgess, 143 F.3d 1432, 1436 (11th Cir. 1998), citing Mercer v. Mitchell, 908 F.2d 763, 768 (11th Cir. 1990). The State Parties' argument that additional remedies may be imposed only upon a finding of contempt erroneously blurs this important distinction. While contempt may be relevant in the event a court order for additional remedies is entered pursuant to Paragraph 19 of the Decree – and then subsequently is violated (which is not the case here) – the contempt process is not a prerequisite to the Court exercising its initial authority under Paragraph 19 to resolve disagreements over the need for additional remedies pursuant to Paragraph 10B of the Agreement.^{12/}

^{11/} And the Settling Parties ensured that this Court would possess retained authority to enforce Paragraph 10B of the Settlement Agreement (additional remedies) by expressly stipulating that "the Court shall retain jurisdiction over this action for the purpose of enabling any of the Parties to this Agreement to apply to the Court at any time for such further orders or directives as may be necessary or appropriate for enforcement or modification of this Agreement." See CD at ¶ 22.

^{12/} This explicit contractual authorization for judicial resolution of disputes over the need for additional remedies is what distinguishes this case from all the other contempt cases cited by the
(continued...)

In these circumstances, all of the State Parties' arguments about why there is no factual basis for holding them in contempt are beside the point. No party has sought to hold the State Parties in contempt. It is thus entirely academic whether the State Parties' asserted defenses to a hypothetical case for contempt would be valid. The Court should decline to be drawn into addressing the State Parties' arguments about the legal prerequisites for contempt, and whether in the abstract the activities undertaken by the State Parties pursuant to state law to improve water quality could somehow constitute a defense to contempt, because those questions are not before the Court presently.

The State Parties separately argue that, were it not for their voluntary commitment to implement the remedies set forth in Appendix A of the Master's Report, the Court would lack the authority to order them because, according to the State Parties,

nobody knows exactly what reduction in phosphorus levels will be necessary to prevent future violations. At the hearing, the State presented substantial evidence demonstrating that only a small correlation exists between changes in inflow concentrations to the Refuge and resulting changes in water quality at the 14 interior monitoring stations where compliance is measured. It also obtained the admission from the United States' expert witness that he never quantified the relationship between phosphorus inflows and resulting changes in water quality inside the Refuge, or the rate by which phosphorus levels will change, or their sensitivity. (Tr. at 1768-71.) As result, he conceded that he has not determined how much STA-1W would have to be expanded to prevent future excursions in the Refuge. (Tr. at 1879.) (The Tribe presented no evidence concerning the amount of additional STA acreage that might be necessary to prevent exceedances.)

State Objs. at 8 . The above arguments suffer from a myriad of flaws. Initially, there is nothing in

^{12/}(...continued)

State Parties and U.S. Sugar. Thus, in each of the major cases cited by the State Parties, Newman v. State of Alabama, 683 F.2d 1312 (11th Cir. 1982); Reynolds v. McInnes, 338 F.3d 1201 (11th Cir. 2003), the proceedings had advanced to a stage where plaintiffs sought to enforce violations by defendants of explicit provisions and obligations imposed in consent decrees. Rather than using the show cause motion procedure required to invoke the Court's contempt jurisdiction, however, the plaintiffs instead filed motions for temporary restraining orders, preliminary injunctions, or the district courts sua sponte granted these equitable remedies, prompting the Eleventh Circuit to remind the litigants and the lower courts, that the show cause procedure is the required process for invoking or exercising the judiciary's contempt authority. Moreover, unlike the Consent Decree in this case, the consent decrees at issue in Newman, Reynolds, et al., did not specify that plaintiffs would be entitled to additional remedies (as opposed to enforcement of existing remedies) in the event that requirements of the Decree were not achieved, and did not contain a prescribed process for resolving disputes over the need for such remedies. Here, in contrast, the Consent Decree provides for additional remedies in the event its requirements are not achieved, and the parties have specifically agreed on a process for judicial resolution over the need for additional remedies outside the context of the contempt process. That, coupled with the fact that this Court is not confronted with a scenario whereunder the State Parties are alleged to be in violation of a court order for additional remedies, makes all of the contempt cases cited by the State Parties and U.S. Sugar inapposite.

the Consent Decree that requires the parties to know in advance the precise amount of phosphorus reduction will result in achievement of the Interim or Long-Term Levels, before implementing additional remedial measures. That was never a standard used in establishing the initial phosphorus reduction facilities (STAs) agreed upon in the Settlement Agreement. And Paragraph 10B of the Settlement Agreement does not impose such a requirement before additional remedial measures may be ordered.

Second, the question about how much phosphorus reduction is needed to achieve the Interim or Long-Term Levels is not even ripe for consideration because the State Parties have yet to achieve the independent requirements of the Consent Decree, Paragraph 8A, that their control programs reduce phosphorus loads to the Refuge by approximately 85% (relative to the 1979-1988 base period). See U.S. Exh. 57 at 5, 12; U.S. Exh. 62.^{13/} Until the State Parties actually achieve the current requirements of the Decree, it is premature to worry that they might be required to achieve the Decree's Interim or Long-Term Levels by too wide a margin.^{14/}

Third, the State Parties' argument relies, in part, on Dr. Goforth's correlation analysis -- which purports to measure the short-term effects of external loading on changes in interior Refuge concentrations -- to suggest that there may be no further need for additional load reduction remedies if it cannot be shown, by a simple linear quantification, that external loading effects on exceedances are direct and immediate. As explained supra, state experts, Dr. Goforth and Dr. Redfield, both understand that the complexities of marsh ecology in general, and in the Refuge in particular, defy any linear measurements of the relationship between external loading to the Refuge and interior

^{13/} After December 2006, the State Parties will be required to achieve a load reduction to the Refuge that exceeds 85% of annual average loads to the Refuge during the 1979-1988 period. See Consent Decree, Appendix C ("The control program is designed to achieve . . . [a] greater than an 85% reduction in phosphorus loads to the Refuge by December 31, 2006, relative to average annual loads measured in Water Years 1979 through 1988.")

^{14/} The State Parties' argument that additional remedies could not be ordered because Dr. Walker did not quantify how much STA-1W would have to be expanded to prevent future excursions in the Refuge suffers from the same defect. Dr. Walker testified that to reach the state goal of a 10 ppb discharge, the State Parties definitely need to increase STA acreage -- the 10 ppb discharge objective could never be achieved by optimization of existing STAs alone. 3-16-2006 Tr. 1887, 1888-89. Dr. Walker also testified that the discharge concentrations for STA 1-East and STA 1-West were nowhere close to the 50 ppb level anticipated by the Decree for STAs, as the recent discharge concentrations from both of those STAs were 111 ppb; the flow-weighted mean concentration in untreated by-pass was 343, and the combined flow-weighted mean from those sources was 163 ppb. 3-15-2006 Tr. 1698. The amount of needed expansion of STA 1-West was supposed to have been evaluated by the State Parties in a second-phase of the EAA Regional Feasibility Study, which has yet to occur. 3-16-2006 Tr. 1887.

concentrations. Given that there is abundant evidence that phosphorus loading cause phosphorus concentrations eventually to rise, see SMR at 46; U.S. Exh. 72 at 6, U.S. Exh. 82, the State Parties should not worry about the inability to quantify a linear relationship between loading and changes in concentrations in the Refuge, and wait for the exceedance problem to worsen, before undertaking additional phosphorus removal measures.

Fourth, the State Parties fault the United States' expert, Dr. William Walker, for failing to quantify "the relationship between phosphorus inflows and resulting changes in water quality inside the Refuge, or the rate by which phosphorus levels will change, or their sensitivity." State Objs. at 8. This argument suffers from the same faulty assumption that a linear relationship between external loads and interior concentrations must be established before additional phosphorus reduction measures can be ordered in the event of exceedance-related violations. That premise flies in the face of the plain language of Paragraph 10B of the Decree.

III. CONCLUSION

Accordingly, for the foregoing reasons, and the reasons set forth in the United States' September 25, 2006 Memorandum In Support of its Motion to Adopt in Part, and Modify in Part, the Report of the Special Master (July 5, 2005), the Court should adopt the Special Master's July 5, 2006 Report to the Court pursuant to Rule 53 of the Federal Rules of Civil Procedure, except as noted in Section II.C and II.D, of the U.S. September 25 memorandum.

Respectfully submitted this 12 th day of October 2006,

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/s/

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **UNITED STATES' RESPONSE TO THE STATE PARTIES' AND U.S. SUGAR'S OBJECTIONS TO THE REPORT OF THE SPECIAL MASTER (JULY 5, 2005)** was served by first-class mail on this 12th day of October, 2006 upon the following:

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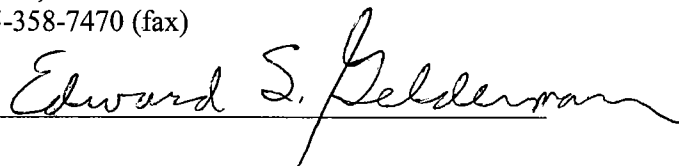
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