Appendix 1-1: Peer Review Panel Comments on the *2004 Everglades Consolidated Report*

These comments were provided to the public
on the District's WebBoard.

With the exception of reformatting some information for better readability, the Chapter 1 appendices were not edited or spellchecked by the ECR production staff. They appear as posted on the District's WebBoard.

Topic:
Message to Review Panel (1 of 1), Read 25 times
Conf:
2004 Draft Consolidated Report
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Friday, September 05, 2003 10:15 AM

Hello All:

As always, I look forward to working with you again during the review process. As you can see, the District has improved this web site making it easier to post messages.

Prior to the workshop on the 23rd, we need to provide the authors of the chapters our initial review. Please have your review posted by September 16. All you need do is click on the appropriate chapter on the left and enter the review. If you need any assistance, you can send me your review by email and I will format it and post it.

See you on the 23rd.

Jeff Jordan

Topic:
Meganck review (1 of 1), Read 22 times
Conf:
Chapter 1
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Tuesday, September 16, 2003 11:41 AM

I do not have any specific questions regarding this chapter at this time. I found it to be clear, concise and a strong contribution to generating understanding and support for the CERP process from the general public.

Topic:
Chapter 1 review-Jordan (1 of 1), Read 16 times
Conf:
Chapter 1
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Tuesday, September 16, 2003 02:49 PM

This is a well-written overview of both the issues facing the Everglades and the ECR. It provides and clear and concise explanation of the scientific, governmental and legal context of the ECR.

Of interest in this chapter is the notation of the remarkable success of BMP's in reducing P loads by 50%, or 1,100 tons of P that would otherwise have entered the Everglades. It is also interesting to note the success of the four operational STA's, accounting for 325 tons of P removal.

Of further interest, by way of introduction, is the discussion of the long-term plan to achieve water quality standards by 2006 and the simulations of the pre-2006 STA enhancements that predict a P range of 10-14 ppb (geometric mean).

Overall, a fine introduction to the ERC, one that will be helpful for public use.

Topic:
Review for Chapter 2A (1 of 1), Read 31 times
Conf:
Chapter 2A
From:
Joanna Burger jeitner@biology.rutgers.edu
Date:
Wednesday, September 10, 2003 02:13 PM

OVERALL COMMENTS ON CHAPTER 2A by Joanna Burger

OVERVIEW:

This chapter is well written, very clear, and generally discusses all the important aspects of water quality in the Everglades. The development of a Site-specific Alternative Criterion for DO seems reasonable, and will aid other freshwaters where similar problems exist. It may also be worthwhile to consider a SSAC for alkalinity as well. The importance of alkalinity in both water quality, and its implications for wildlife, is important for the Everglades. The effect of the sharp gradients in alkalinity within some sections, such as Loxahatchee NWF bears further examination in light of effects on aquatic organisms (including amphibians). Methodology should always include percent of data excluded, and the number of samples below the MDL. Making procedures in line with other EPA methodology is excellent. However, I am worried about the assumption of the binomial hypothesis of equal exceedances across all monitoring units. This should be discussed more fully. It may be that gathering data for only one year may be a problem for the SSAC, given the great variations in hydrology in different parts of the Everglades. Similarly, seasonal data on specific conductance may also be required to understand the problem. The issue of non-compliance also deserves a bit more discussion.

QUESTIONS FOR 2A:

Page 2a-1: what is the response of regulators to changing the DO standard? It seems a good idea, but more documentation should be listed in the summary.
-One might consider a change in standard for alkalinity also.

Page 2a-2: Do the regulators consider the excursions in alkalinity in violation?

Page 2a-4: What has been the effect of the changes in classification of inflow stations?

Page 2a-10: what percent were removed from analysis? What percent were below the detection limit?

Page 2a-13. Discuss more fully the assumption of equal exceedances across all monitoring areas.

Page 2a-16. It would help to have a summary table of the excursions by water quality variable and overall (plus key areas).

Page 2a-20: Again, a summary table for DO would be useful. Is one year enough to gather the data for the SSAC model.

Page 2a-21: the issue of non-compliance deserves more attention.

Page 2a-25. Is there a need for a new standard for specific conductance as well? May also need data for different seasons.

Page 2a-31: the further discussion of sulfate here is an excellent idea.
-Any idea why sulfate concentrations in the interior marsh were high this year?

Topic:
Robert Ward review (1 of 1), Read 29 times, 1 File Attachment
Conf:
Chapter 2A
From:
Trudy Morris -Webboard Manager tmorris@sfwmd.gov
Date:
Thursday, September 11, 2003 11:19 AM

This is a review of Chapters 2A and 2C by Robert Ward. It is a 142kb PDF file.

WARDREVIEW_2A_2C.PDF (146KB)

Topic:
Pesticide Section (1 of 3), Read 18 times
Conf:
Chapter 2A
From:
Richard Pfeuffer rpfeuff@sfwmd.gov
Date:
Thursday, September 18, 2003 08:58 AM

Since several errors occurred, I would appreciate if the author(s) of this section contact me, so I can determine how the data was obtained. Hopefully measures can be implemented to prevent a reoccurrence. Specifically, the notation of diazinon at L3BRS is actually a value of below the detection limit (value is 0.059 not 0.056 also). Additionally, the aldrin values are all flagged data (J4 = matrix interference or J5 = improper lab or field protocol). The other values reported are correct/accurate.

Topic:
Pesticide Section (2 of 3), Read 23 times
Conf:
Chapter 2A
From:
Ken Weaver kenneth.weaver@dep.state.fl.us
Date:
Thursday, September 18, 2003 11:48 AM

Richard,

Thank you for your feedback and review of the pesticide results. Unfortunately, these discrepancies were not caught and corrected in the earlier internal review process.

Apparently, the discrepancies you note are related to database updates and quality assurance. The data were obtained as an export of the District's DBHYRO database. The entire database was exported on June 4, 2003 and therefore does not reflect database changes after that date. Aldrin values in the June 4th database were not fatally flagged in the manner you indicated nor was the diazinon result qualified as less than the detection limit (note: the MDL in the database was reported as 0.019 ppb). I queried the data from DBHYDRO via BDHYDRO Browser. The aldrin results in question are now both flagged with “J4”. The diazinon MDL is still reported as 0.019. Does this reflect a data entry error? Thank you for catching our diazinon typo. The reported value was indeed 0.059 rather than 0.056. The next draft of the report will reflect these changes; i.e., aldrin will no longer be listed as concern.

Topic:

Pesticide Section (3 of 3), Read 3 times
Conf:
Chapter 2A
From:
Richard Pfeuffer rpfeuff@sfwmd.gov
Date:
Tuesday, September 23, 2003 01:49 PM

Ken,
Thanks for responding. The diazinon data reflects some of the unique nuances of DBhydro.The diazinon value is 0.059 and the MDL is 0.019. However, the value is BDL and not a detection/positive. The lab confirmed that this can happen.
During the data loading process, certain checks were implemented to determine which values are BDL and should receive the negative sign. However, this situation was not envisioned when the checks were implemented. Hence a negative sign was not added to the value, although the remark code of "U" (indicating the value is BDL) was in place. The negative sign is something unique for the SFWMD data base and is not a common reporting format. Based on this situation and the fact that there are water quality parameters now which have a negative value, the negative sign may have out lived its usefulness. The best method for data retrieval is obtaining the remark code along with the data value. The remark code can indicate whether the value is BDL ("U") and/or of acceptable quality.
Thanks
Richard

Topic:
Review for Chapter 2B (1 of 1), Read 23 times
Conf:
Chapter 2B
From:
Joanna Burger jeitner@biology.rutgers.edu
Date:
Wednesday, September 10, 2003 02:17 PM

OVERALL COMMENTS ON CHAPTER 2B by Joanna Burger

OVERVIEW

This year's Mercury Monitoring, Research and Environmental Assessment chapter (2B) is an excellent overview of the mercury problem in the Everglades, how the SFWMD has addressed concerns about environmental problems in the Everglades, and the new initiatives to understand mercury cycling. The data, models and conclusions in chapter 2B reflect the complex problem as faced by many agencies dealing with mercury in freshwater ecosystems. The data generated by the SFWMD are proving useful for other aquatic ecosystems. The authors are to be commended on writing a chapter that is very readable and accessible to a broad range of readers. This years report is more readable than previous reports, an important aspect for stakeholder involvement. Further, it makes the data readily accessible to scientists not previously familiar with the Everglades. The glossary of mercury-related terms is excellent. The chapter accurately and fairly reflects the state of the knowledge about mercury fate and effects, mercury cycling in the Everglades, and the potential for receptor problems, including humans who consume fish from these waters. While, the risk to human consumers initially drove the lowering of mercury in the Everglades system, concern for piscivorous wildlife quickly came to the fore, especially given the new research by G. Heinz. It suggests that some herons and egrets (the top predators in the ecosystem) might be more vulnerable than once thought. Dr. Heinz's research indicates that wading birds may be seven times more sensitive to mercury as ducks and other species previously examined in a laboratory. However, the species of wading bird he examined is not given, and there are likely to be great differences among wading birds, particularly given their size and differences in sizes of fish eaten. Specific results should be presented in the chapter as this is a critical point. Further, the initiation of a multigenerational feeding study of fish-eating birds is important because, even in ducks, multigenerational effects were found. This year the report is organized to more directly address the major concerns of agencies and stakeholders regarding the sources, fate and effects of mercury (and methylmercury) on the food chain in the Everglades. It is much clearer, more readable, and easier to follow than previous chapters, and the authors have done a good job with it. The initial summaries and conclusions fairly represent both the current state of knowledge, as well as unanswered questions and research needs.
The report is a very scholarly treatment of the problems of mercury, and would be well-served by more citations to the original reference. It is not always clear to the reader, and certainly not to the public, which statements are fact versus conjecture, and which come from Everglades research vs other research. As has been mentioned previously, in some places references to the published literature would aid the reader. Many of the research needs as

suggested by the Review Team in 2003 have been initiated. While it is intriguing that results are available on the work at Patuxent Wildlife Research Center on the in-ovo effects of methylmercury, details of this research were not presented, and it is critical to do so. In addition to hatchability and viability, future work should include sublethal behavioral effects in young chicks that might lead to their decreased survival in wading birds in the wild. The continued study of the relative contribution of global versus local sources of mercury continues to be key to management and reduction of mercury to the Everglades. These efforts should continue as a major thrust for the SFWMD. The collaboration between state and federal agencies is key, and an important component to understanding mercury cycling in the Everglades and elsewhere. The modeling and data collection phase should continue beyond 2004 as the problem is ever changing. The data suggesting that the mercury signal is largely local atmospheric transport deserves continued study. Further, the finding that newly deposited mercury is converted to methylmercury over a period of hours to days deserves special note because it illustrates the importance of continuous monitoring of atmospheric (particularly local) deposition. The other on-going research projects are important, particularly refinement of mercury cycling models that are dynamic rather than static. Continued examination of mercury trends in indicator wildlife is critical to continued management of the Everglades as this will provide early warning if there is a new or continuing problem. The emphasis on using organisms as the endpoint of concern for mercury is an important decision. Continued monitoring of mercury levels in bass and great egrets provides data essential for continued research, ecosystem management, and possible human risk. Declines are noteworthy, but the lack of a decline in Everglades National Park is reason for concern. The declines in mercury in wildlife track mercury load reductions, and indicate that declines occur more rapidly than once thought. The research emphasis on effect of water quality on methylmercury production is also key to understanding the risks to humans and wildlife from mercury. Many of the findings in this section are at the forefront of research and our understanding of methylmercury dynamics, and the SFWMD is to be commended for its overall research program. The main body of the chapter accurately reflects the three main issues with mercury in the Everglades. This reorganization makes the report easier to read, and much for informative for stakeholders.

Key issues discussed this year are similar to the 2003 Report, and include:

1) the relative contribution of local vs long-distance atmospheric transport of mercury into the Everglades system; whether load reduction has resulted in reductions in mercury in wildlife.
2) the factors that affect the transformation of mercury into methylmercury, and the removal of mercury from the system (through biodilution).
3) the effect of source reduction on receptors, notable piscivorous fish and wildlife.

THE ATMOSPHERIC MERCURY CYCLE

Discussion of atmospheric mercury cycling is key to understanding the mercury problem in the Everglades, and this section states the problem clearly. The graphics are clear, yet show the complexity. In this regard, the continued monitoring and modelling of local versus long-distance atmospheric deposition is critical to continued understanding of both the mercury cycle and management of mercury levels in the Everglades. Continued refinement of the models to understand the time lag between decreases in mercury emissions and abatement of the mercury problem in the Everglades continues to be an important issue worth examining.

Of all the issues in 2B, mercury cycling is one of the most controversial, largely because it is difficult and time-consuming to obtain the data necessary to answer the key questions. The complementary study in dated sediment cores is very important because it shows the increase in atmospheric deposition in the Everglades. The work should continue so that the possible downtrend can be verified. While most of the information presented to examine local vs global sources for the atmospheric mercury deposition is straight-forward, I am uneasy with some aspects. There is still no discussion of atmospheric data from the southern US. The percent of deposition from regions other than South Florida should be quantified. The ability of aquatic biomass to remove mercury through biodilution was a key issue in previous years. The 2004 report clearly addresses it, noting that biodilution hypothesis does not reflect reality. Providing data to illustrate this point was very important.

SULFUR CYCLING AND METHYLMERCURY PRODUCTION

The role of sulfur and methylation of mercury has been a key issue in the Everglades for some time. Sulfate entering the Everglades (mainly from the can waters of the EAA, combined with new mercury entering the ecosystem (from atmospheric deposition) controls the rate of mercury methylation. Sediments are the primary source of methylation in the Everglades. The excess in sulfide concentrations suppresses methylation in the northern Everglades. The variations in sulfide and sulfate concentrations account for a variation in mercury concentrations of nearly two orders of magnitude across the Everglades. While this section is quite clear and easy to read, it would profit from more references because of the controversial nature of the information. Further, the section needs to directly address the issue: would reductions in sulfate in the northern Everglades result in higher mercury concentrations in fish in these regions?

RESPONSES OF EVERGLADES ECOSYSTEMS AND WILDLIFE TO SOURCE REDUCTION

The organization of the 2004 Consolidated Report makes the key questions obvious. The discussion about receptors is addressed this year in terms of its relationship to source reduction. Ecological risk to wildlife is the primary driver, and to address it directly is ideal. Dealing directly with the species (or species groups) at risk is critical. Top-level predatory fish, wading birds, alligators, and humans are the species at risk, and examining both mercury levels and effects in these species is important.

Mercury concentrations in bass in most of the Everglades show clear declines in mercury concentrations from 1990 to the present. However, there is not a clear decline in Everglades National Park is cause for concern. There are also declines in mercury in the feathers of Great Egret chicks; since chicks are fed entirely of food obtained from the local area, levels in the feathers of chicks are a good indication of local exposure. The inclusion of historical data is important because it demonstrates what was believed to be the case; mercury levels have increased. Correlation of these data with sediment cores would be useful. It is important that governmental agencies, the SFWMD, and stakeholders recognize that continued monitoring is key, both to spatial and temporal patterns.

QUESTIONS AND SPECIFIC COMMENTS FROM 2B from J. Burger

Page 2b-1: The conversion rate of newly deposited mercury to methylmercury is an extremely important aspect.

Page 2b-2: The overall summary is excellent.
-the lack of decline in Hg in bass in Everglades National Park bears further comment and research. -I am not sure I would say there is a strong relationship between mercury load and mercury in top level predators; it seems to track it, but is delayed.

Page 2b-3: The glossary is an excellent idea.

Page 2b-4: The long-awaited research of Dr. Heinz is most interesting, but more specific details need to be listed. What wading bird species? This is important since there is likely to be differences among wading birds as well. Conducting a multigenerational study is very important. -Are there any data on the speciation of mercury in atmosphere from the study?

Page 2b-5: The continued work with the mesocosms is very important to understanding the overall cycling within the Everglades.

Page 2b-10. The relative contribution of atmospheric deposition from other than South Florida needs to be shown clearly.

Page 2b-11. A figure showing the relationship between sulfate and microbial MeHg production might be helpful. More data are needed to establish sulfur's role in methylation.

Page 2b-12: the discussion of biodilution is clear and to the point. This was needed because of questions raised previously.

Page 2b-16. The sulfur section is extremely important, both as an issue for understanding mercury cycling in the Everglades, and for stakeholders. Given the concerns about the loads from the EAA, it would be wise to use more references from the scientific literature for this section.

Page 2b-19-20. The information on declines in mercury in bass and egret feathers is encouraging, but the lack of decline in parts of Everglades National Park is still cause for concern. More work should be conducted to determine the cause: are fish larger there (and thus older)?

Page 2b-21. The conclusions would profit from some additional references so that stakeholders who read only this section can find the literature (i.e. 90 % decline in mercury usage in the US).

GENERAL: There is no mention of the EPA surface water criteria of 0.3 ppm in fish - this should be mentioned.

Topic:
Mercury (1 of 1), Read 9 times
Conf:
Chapter 2B
From:
Ping Hsieh yhsieh@famu.edu
Date:
Thursday, September 18, 2003 10:51 AM

This chapter contains very valuable and comprehensive information concerning mercury monitoring, research and environmental assessment of EPA. This is probably the most complete mercury monitoring and research program for wetland ecosystems in the world and can be expected to set the standard for other similar programs. The chapter clearly states the recent mercury problem in EPA and the effort of identifying sources and causes of the mercury problem. The effort of identifying sources and causes of the mercury problem in EPA through research has advanced significantly in the past few years although certain obscurities are still there. Description in several sections, especially pertaining to the roles of sulfate, sulfide and organic carbon on mercury methylation, could be more quantitative than statements such as: "Increasing sulfate concentrations stimulate sulfate reduction and methylmercury production. However, when these sulfate concentrations get too high, the build up sulfide inhibits methylmercury production." (page 2B-15). Ambiguous qualitative statements do not provide much useful information to the readers. The response time of mercury methylation and mercury bioaccumulation in food chain are important information. The application of that information to the mitigation of the mercury problem in EPA probably needs to be addressed in the report. The clarification of P and mercury problem in the EPA (Appendix 2B-3) is quite important but not elaborated in the chapter (Is it because the results are preliminary?).

Everglades Consolidated Report
Chapter 2A
Review Comments

Prepared by:
Robert C. Ward

Overview Comments

Chapter 2A of the Everglades Consolidated Report (ECR) is a well written and documented description of both the *data analysis* methods employed in assessing water quality impairment in the Everglades Protection Area for Water Year 2003 and the results of the data analysis. The Chapter also provides a connection to previous ERC annual assessments, noting in particular changes in the methods over time and providing a comparison of results.

The 'status of water quality' is defined in Chapter 2A as excursions beyond 'criteria' that have been legally established for the Everglades (i.e. Chapter 2A is an assessment of water quality impairment rather than an assessment of the broader status of water quality in the Everglades). The Everglades water quality 'criteria', in essence, establish management goals for water quality conditions sought in the Everglades. Chapter 2A examines excursions beyond 'criteria', at sites where sampling occurs, 'using available data and findings'. The data are stored in two databases: (1) The South Florida Water Management District's (SFWMD) DBHYDRO, and (2) SFWMD's Everglades Research Database (a nutrient gradient sampling program).

Thus, the Chapter 2 assessment of water quality is both guided and, from a scientific point-of-view, limited by available data and legal goals. The authors of Chapter 2A employ the latest scientific methods to estimate compliance with Everglades water quality 'criteria'. The 'Excursion Analysis' section of Chapter 2A, as the authors note, is a balance between a number of methods currently employed in the field of water quality impairment assessment (e.g. the latest scientific literature, previous ECR reports, Impaired Waters 303(d) computations, and U.S. Environmental Protection Agency exceedence frequency recommendations) and the limits imposed by available data. Maintaining this balance forces the Chapter's authors to be in a constant search for the 'best fit' analysis methodology.

The authors are to be commended for the manner in which they account for the statistical uncertainty that arises when an area the size of the Everglades EPA is assessed for 'criteria' excursions using limited samples taken at limited sites. In attempting to employ statistics correctly, with limited data, the authors employ a suite of methods to assure scientific integrity with each situation. For example, when the number of samples at a site is 28 or larger, the binomial hypothesis test is employed – a test that evaluates the statistical significance of the frequency of excursions. When the number of samples available is less than 28, the above test is not deemed properly supported. Instead, the 'raw score' approach is employed.

With the state-of-the-art expanding in the field of assessing water quality impairment, new methods and extensions of existing methods are appearing in the scientific literature. For example, the Smith et al (2001) approach to assessing excursions beyond a water quality standard (utilized in the ECR report), has been extended by Gibbons (2003) by incorporating the actual measured concentration into the analysis rather than using only the binary determination of whether or not an observed measurement exceeded the regularly standard.

Chapter 2A clearly states the hypothesis being tested – unlike many similar reports employing statistical tests of water quality 'criteria' excursions (Griffith, et al. 2001). Also, excursion categories are clearly defined for each method employed to compute excursion frequency.

The following points are raised to explore possible areas of improvement.

Context for Reporting Excursion Findings

Only constituents classified as a concern or potential concern are discussed in detail in the report. By focusing detailed discussions in Chapter 2A only on problems, there is concern that the broader overview of water quality conditions in the Everglades is not communicated – i.e. placing the problem areas in proper context. The title of the Chapter is "Status of Water Quality in the Everglades Protection Area" but the information provided tends to focus on problems.

To elaborate further, Chapter 2A includes in its analysis 19 water quality variables and 62 pesticides measured at 160 sites (not all variables are measured at all sites), if the separate numbers presented are assembled correctly into one number. The reader must progress a number of pages into Chapter 2A before obtaining a brief summary of water quality in the EPA (page 2A-16, second paragraph).

> "Comparison of WY2003 water quality data with applicable Class III water quality criteria resulted in excursions for six identified water quality variables. These excursions were localized to specific areas of the EPA, with the exception of DO, which exhibited excursions in all regions."

Five of the 19 pesticides were classified as 'concerns'. Natural conditions are deemed to be the cause of the dissolved oxygen excursions and an alternative criterion is being recommended – one that accounts for the natural conditions of the Everglades. The summary that introduces Chapter 2A does not include this broader overview of water quality status/conditions, but rather presents the specific constituents that are of concern.

Following the brief overview provided on page 16, Chapter 2A proceeds to discuss, in detail, identified problems areas, further elaborating on the nature of the excursion and potential causes. These discussions are not based on acquisition of additional data as part

of a scientific evaluation of each problem area and/or constituent, but rather on further evaluation of existing data and additional interpretation.

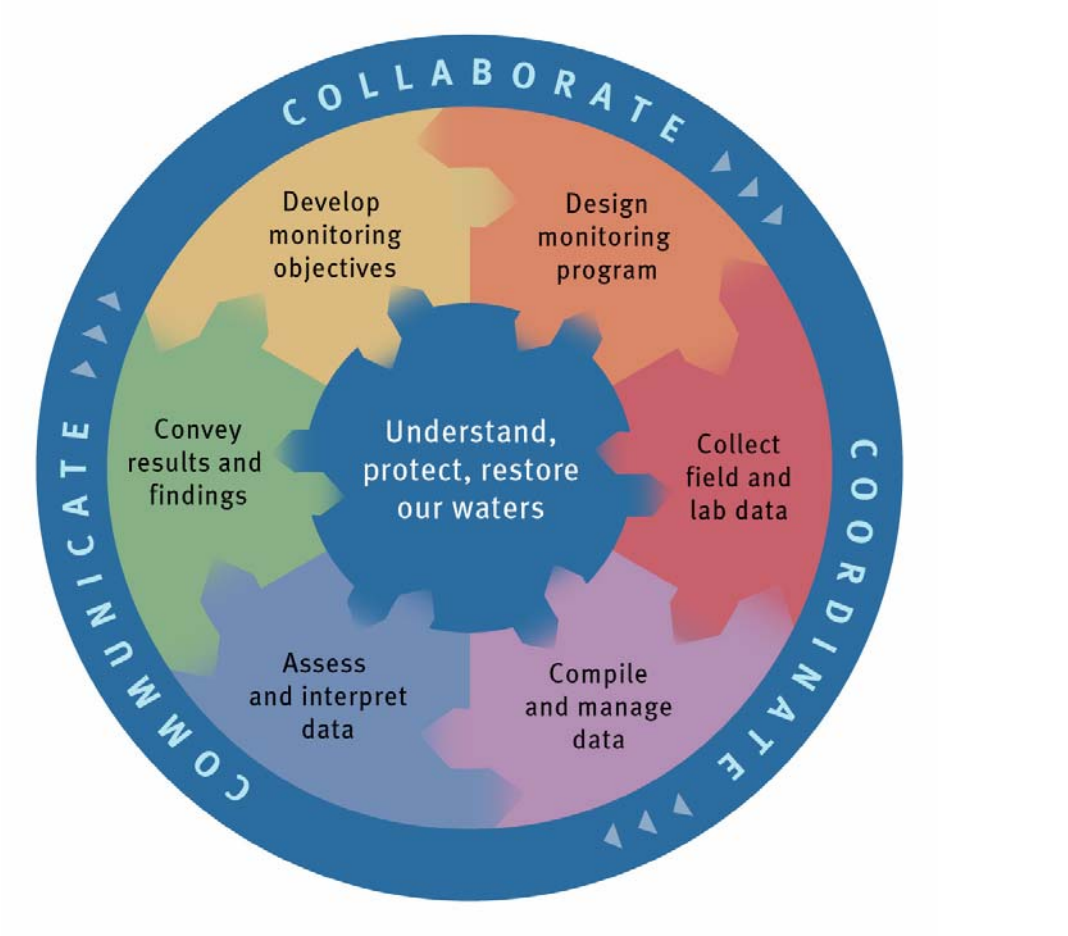
It is recommended that the broad overview of water quality status be stated in the opening 'Summary' section in order to better context the focus on problem areas.

Monitoring Design Documentation

While the above review of Chapter 2A recognizes the efforts of the authors to document *data analysis* methods and acknowledges that references documenting sampling and laboratory methods are available, the ERC report does not document the design of the sampling programs that generate the data placed in the database. Readers of Chapter 2A are referred to a webpage (http://www.sfwmd.gov/org/ema/envmon/wqm) to review information about current SFWMD monitoring programs.

It is acknowledged, on the webpage, that sampling frequency varies by site depending on site classification, variable group, and hydrologic conditions. Monthly sampling is, generally, associated with interior sampling sites while biweekly sampling is associated with control structures (when flowing). These frequencies (12 and 24 per year), by definition, do not match the frequencies required by the data analysis methods discussed in the report (minimum of 28 per year). Nor does the Chapter 2A or the webpage discuss why the monitoring design fails to provide sufficient data to support the selected water quality excursion methodology. There seems to be a disconnect between the design of the water quality monitoring programs and the ultimate use of the data for excursion analysis.

The National Water Quality Monitoring Council has recently published a description of its proposed 'Monitoring Framework' (September 2003 issue of Water Resources IMPACT). The framework is presented below to facilitate further review of the monitoring program elements supporting the excursion analysis in Chapter 2A.



The framework consists of six tasks ('cogs') deemed critical to the creation of a scientifically sound, information goal-oriented, water quality monitoring program. The first task is to identify information objectives. The second task is to design the monitoring program (e.g. sampling locations, sampling frequencies and variables to measure). The third task is to clearly document the methods used to conduct sampling and laboratory analysis while the fourth task is to manage the data in a manner that facilitates creation of data records ready for data analysis and interpretation (the fifth task – the task described in detail in Chapter 2A). The sixth task is to report findings.

From reading Chapter 2 and reviewing the webpage, it is not possible to understand the logic that connects the monitoring design (12 to 24 samples per year) to the data records needed to support the chosen data analysis and interpretation used in the excursion analysis (at least 28 samples per year). It is recommended that the monitoring design behind the excursion analysis reported in Chapter 2 be examined to determine if it is possible to develop a more integrated and connected monitoring design – a design that provides consistent and comparable data and information over time and space.

'Found' Data Complications

As a reader of Chapter 2A progresses through the well documented 'Excursion Analysis' descriptions (pages 2A-11 through 2A-14), one is struck by the scientific hoops the authors are having to jump through in order to overcome the limitations created by using 'found' data (or 'secondary data sources') to perform a scientifically sound excursion analysis. In other words, there is no uniquely designed and operated monitoring program to measure standard compliance! The authors are attempting to use, in a scientifically sound manner, data collected for other purposes to perform an excursion analysis. The excursion analysis in the Everglades Consolidated Report (ERC) is 'piggy backed' on other monitoring programs.

Of course, in the management of an ecosystem as large as the Everglades, it may not be possible to design and operate a water quality monitoring program that is used for only one purpose. It should be possible, however, to coordinate the design of monitoring programs to insure that sufficient data is available to support the multiple information goals associated with each sampling site. The National Water Quality Monitoring Council's 'Monitoring Framework' is suggested as a starting point to begin to establish a stronger connection between the data collected and that needed to support the chosen data analysis methods. The U.S. Environmental Protection Agency (2003a) recently published a list of 10 elements of a monitoring program, operated by a State agency, which includes considerable emphasis on monitoring strategies that carefully connect information goals with the monitoring design and operations.

The issue of 'found data' is being addressed by the U.S. Environmental Protection's Office of Information Analysis and Access. A report on the topic is currently being finalized and should be released soon. Hopefully, the report will provide insight into the procedures to be followed to insure that 'secondary information products' (information produced from data collected for other purposes) are as scientifically sound as possible. The question remains: Is it possible to design a more coordinated monitoring system to provide a stronger foundation for a scientifically sound compliance evaluation? Such an approach appears to be planned for measuring compliance with a new TP criterion, discussed below.

Chapter 2C
Review Comments

Chapter 2C, addressing two constituents, total phosphorus (TP) and total nitrogen (TN), provides, in the summary section, a broad overview of the status of TP and TN. A separate nutrient gradient monitoring program, designed specifically to track nutrients, augments the SFWMD's DBHYDRO database. Devotion of a separate section of the water quality status chapter to two constituents emphasizes the special importance given to nutrient impacts on the health of the Everglades ecosystem.

Chapter 2C describes the 'holding pattern' surrounding the development and implementation of a phosphorus criterion in the EPA. Given the uncompleted process to establish a TP criterion, Chapter 2C chooses to not evaluate proposed TP criterion compliance due to the absence of a well designed monitoring program with evenly

spaced monitoring sites (noted on page 2C-8, fourth paragraph). Rather the Chapter examines trends in TP over time using the default TP criterion, searching for patterns that may be of concern. The ECR, in this case, is not willing to use 'found' data to perform an assessment of proposed criteria compliance, but will wait until the criteria are formally approved *and* 'the required monitoring networks' have been established.

Is the reference to a new monitoring program design (top of page 2C-7), specifically tied to measuring compliance with the new TP criterion, implying that a dedicated monitoring program will be established solely for TP compliance purposes? Is the special treatment phosphorus receives in implementing the Everglades Forever Act the reason for creating a compliance monitoring program separate from other water quality constituents? It appears from reading Chapter 2C that the TP criterion compliance monitoring strategy is fundamentally different from the compliance 'monitoring' strategy employed in Chapter 2A where 'found' data is used to determine compliance. Will the TP and water quality monitoring program designs be coordinated?

Final Observations

The data analysis protocol to be followed in analyzing data to check TP criterion compliance (five-year geometric mean) utilizes a different method from that described for other water quality variables in Chapter 2A (binomial hypothesis test). The reasons for this difference are explained (short term fluctuations higher than criterion do not create long-term biological impacts) and scientifically justified. Concern develops regarding future ECR reporting to portray 'water quality status' - when each variable is treated quite differently. Has any thought been given to how the different data collection and compliance assessments will be integrated into an overall view of water quality status, as the title of Chapter 2 indicates? Everglade water quality monitoring and assessment, in its efforts to be scientifically correct in portraying each variable, must also be able to integrate information about all the variables into a more concise reporting format that carefully meshes with the policy setting and management decision-making context.

References

Gibbons, R.D. 2003. A statistical approach for performing water quality impairment assessments. Journal of the American Water Resources Association, Vol. 39(4):841-849, August.

Griffith, L.M., R.C. Ward, G.B. McBride, and J.C. Loftis. 2001. Data Analysis Considerations in Producing 'Comparable' Information for Water Quality Management Purposes. Technical Report No. 01-01, National Water Quality Monitoring Council, USGS, Reston, Virginia (Final Report for USGS Award Number HQ96GR02660, submitted by Colorado State University).

U.S. Environmental Protection Agency. 2003a. **Elements of a State Water Monitoring and Assessment Program**. EPA 841-B-03-003 (Available on the web at: http://www.epa.gov/owow/monitoring/repguid.html

U.S. Environmental Protection Agency. 2003b. **A Summary of General Assessment Factors for Evaluating the Quality of Scientific and Technical Information**. EPA 100/B-03/001.

Topic:
Spatial and temporal variation of TP (1 of 1), Read 10 times
Conf:
Chapter 2C
From:
Ping Hsieh yhsieh@famu.edu
Date:
Wednesday, September 17, 2003 12:55 PM

TP concentration in the Everglades exhibited clear spatial and temporal trends as described in this chapter. Could you describe how those gradients and variation are factored into the consideration of setting one numeric TP criterion for the whole EPA? (Is one numeric TP criterion for the whole EPA a reasonable choice? Why?) Current evidence indicates that pollution from EAA contributes to TP gradients and variation in the EPA. Is there a natural component of spatial and temporal variation in EPA? Since the sampling sites and timing would affect the outcome of observed TP concentration, readers may want to know how you handle the problem specifically.

Middlebrooks Review Chapter 3

Review of Chapter 3: Performance and Optimization of Agricultural Best Management Practices

An excellent summary is presented of the best management practices implemented in the Everglades Agricultural Area and the C-139 basin, as has been the case in the past. These practices have been very effective in reducing phosphorus mass and concentration emanating from the EAA and appear to have equal potential in the C-139 basin. A description of the progress being made with the municipalities and other contributing areas would be helpful. Have similar reductions in phosphorus occurred in the municipalities and other contributing areas? With the implementation of similar programs throughout the area, much greater improvement in water quality entering the Everglades would be expected.

An attempt should be made to explain the significant drop in phosphorus mass being discharged from the EAA. As suggested in the past reviews a significant part of the decrease in phosphorus mass discharge may be attributable to the decline in the phosphorus fertilizer industry. Has an attempt been made to quantify the reasons for the declines in the past and the reduction in percentage removal this year? Apparently, it is not necessary for farmers to add phosphorus annually; therefore, some of the decline in phosphorus discharges from the EAA may be attributable to economic conditions.

It is realized that space is limited, but a sentence here and there explaining the results would be helpful to the reader rather than simply stating, "here are the data." An extensive analysis is not needed, but a comment or two about obvious variations would enlighten the reader and add some pizzazz.

Questions of interest follow.

What impact on compliance can be expected from the results of the University of Florida/Institute of Food and Agricultural Science On-Farm Research program? Does evidence exist to show the relationship between particulate phosphorus, soluble phosphorus, organism growth, subsidence and mineralization of organic matter or from application of inorganic fertilizers?

Is the biogeochemical relationship between mercury and sulfur to be considered in the BMPs?

It is understood that conformance requirements are defined by the EFA and are based on the background data, but just out of curiosity have statistical analyses been performed to determine if the differences in base and BMP years are statistically significant? .

A brief statement or two about the variables influencing the annual percent variations in load would be helpful. More discussion of impacts of other phosphorus contributors would be helpful in interpreting the impact of BMPs.

Has any thought been given to the long-range implications of basing the survival of the Everglades on one constituent?

Specific Comments

General comments for various sections of the chapter are presented in the following paragraphs.

SUMMARY

An excellent summary and the presentation of TP concentrations and loadings improve the value of the summary.

BASIN-LEVEL MONITORING RESULTS

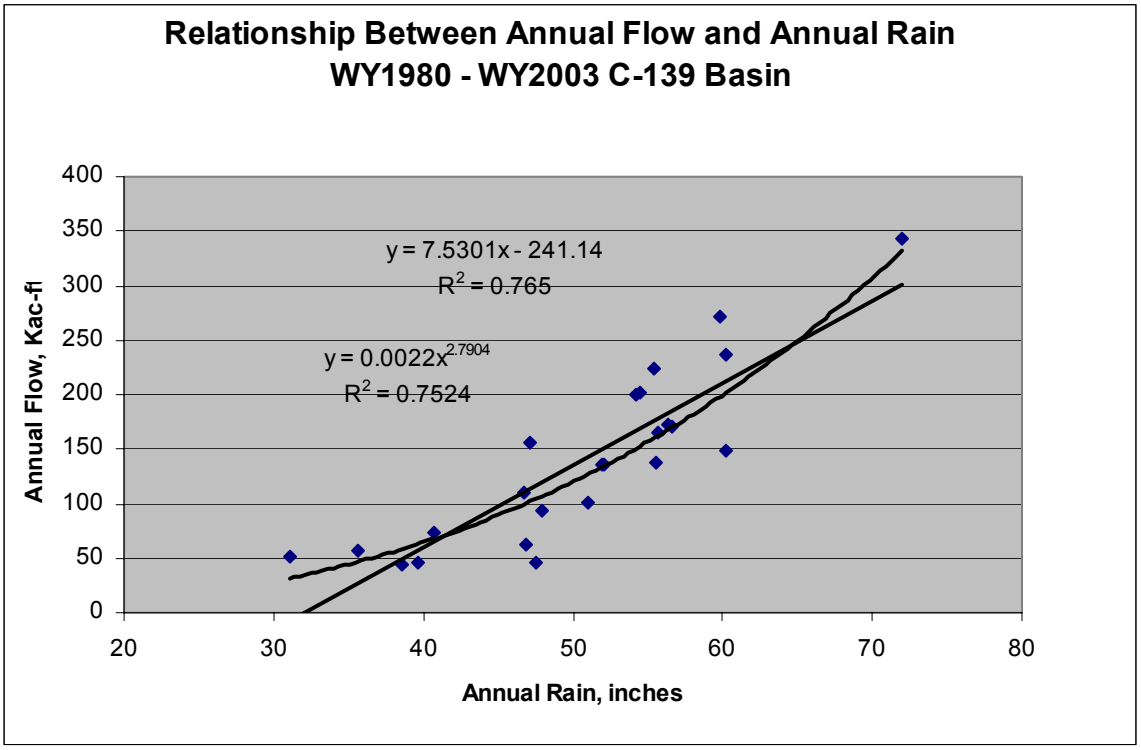
EAA Basin

Please explain why there was such a decrease in load reduction for WY2003 (Table 3-2). Is this related to the decline in projected input? What is the basis for the predicted total phosphorus load shown in Figure 3-5?

C-139 Basin

In Table 3-6 it would be desirable to add a footnote that the three-year Actual WY2003 loads and concentrations are for only one year.

Please explain briefly why in Table 3-9 it appears that rainfall does not vary significantly from year to year; however, the annual flow appears to increase disproportionately as shown in the following figure.



A few sentences explaining the results in Figure 3-9 would be helpful, i.e., why the significant drops in TP Loading occurred in 2001.

Why is the 3 yr rolling average trending upward as shown in Figure 3-10? Just a brief sentence or two will suffice.

PERMIT-LEVEL MONITORING RESULTS

A brief description of how relative comparisons are use would be helpful.

For the EAA Basins

Have evaluations been made of the effect of holding samples for 21 days before analyzing for phosphorus. What type of container is used for storage? Sampling techniques are probably discussed elsewhere in the Report, but a brief statement pointing out that you are cognizance of the potential problem would make the reader comfortable (at least me).

It is realized that it is extremely difficult to sort out the discrepancies in flows emanating from the EAA. What are you doing to quantify the discrepancies in flows?

UPDATE ON EVERGLADES BMP RESEARCH

As mentioned in the past, the update would have been improved by presenting a summary of the results from the studies in tabular form. It is realized that reports are available or are being prepared, but most readers are not going to search for additional documents. After 10 years of study, there should be many interesting results that could have been summarized in tabular or graphical format. Although much of the particulate phosphorus is in the form of biological growth, is there any indication as to how much of this growth is attached growth and transported due to turbulence or the mass that reproduces in the water body by extracting phosphorus?

FINDINGS AND FUTURE DIRECTIONS

Are future reductions in TP from the EAA to be modified, i.e., a cumulative percent reduction with some maximum reduction at which point further reduction is not expected?

PANEL CONCLUSIONS

The BMP program has been very successful in reducing the TP mass and concentrations reaching the Everglades.

To improve on the present program, it appears that phosphorus budgets are needed along with reduction of particulate phosphorus from the EAA.

RECOMENDATIONS

Continue the good work, and attempt to involve the communities and rural areas to participate in the BMP program. If restoration of the Everglades is to be achieved, it appears to be essential that all parties participate in the BMP program.

Attempt to differentiate between the various contributors to the reductions in phosphorus from the EAA.

Middlebrooks Comments 4A

Review of Chapter 4A: STA Performance
and Compliance

The STA investigators are to be commended for collecting and analyzing significant quantities of data for the various STAs evaluated. The inclusion of summary tables helps the reader only interested in a quick overview of the STA results..
The lack of detail about the data presentations leaves the reader wanting more information to fully understand the results. Without reading Chapter 4B it is difficult to interpret the performance and compliance data. It is realized that space is limited and there are numerous results from numerous experiments that warrant the entire chapter and more, but the chapter leaves one wanting more information without having to read additional Chapters. Perhaps one reading this chapter should be expected to read additional chapters; thereby, making my comment irrelevant.
General Comments and Questions

By discussing mercury, DO, and Vegetation management for all STAs in one section, considerable redundancy could be eliminated.
Where hydraulic loading rates (HLR) are given, it would be helpful if the hydraulic residence times (HRT) or flow rates and depths were presented, because mean depths may have had an influence on the performance.

How much phosphorus can the STAs retain without eventually discharging slugs of TP, or require some form of maintenance? As TP accumulates, is it possible that a new ecosystem will evolve that may be nitrogen, carbon or whatever limiting?

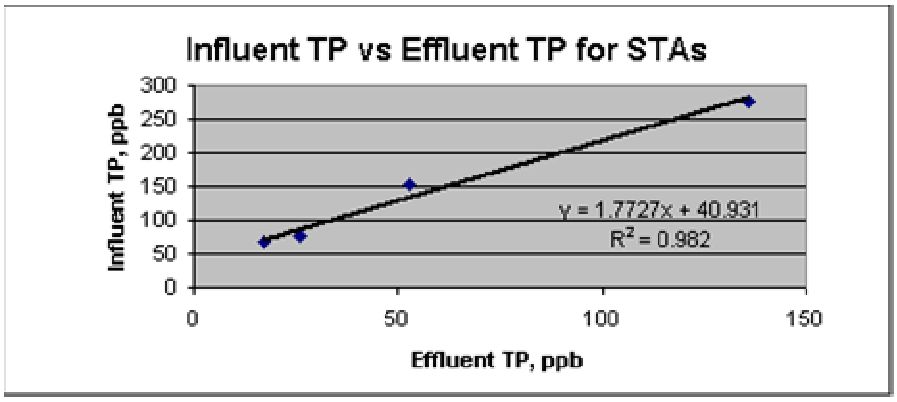
When stating that fish concentrations of mercury exceeded the limit, why not report the concentration?

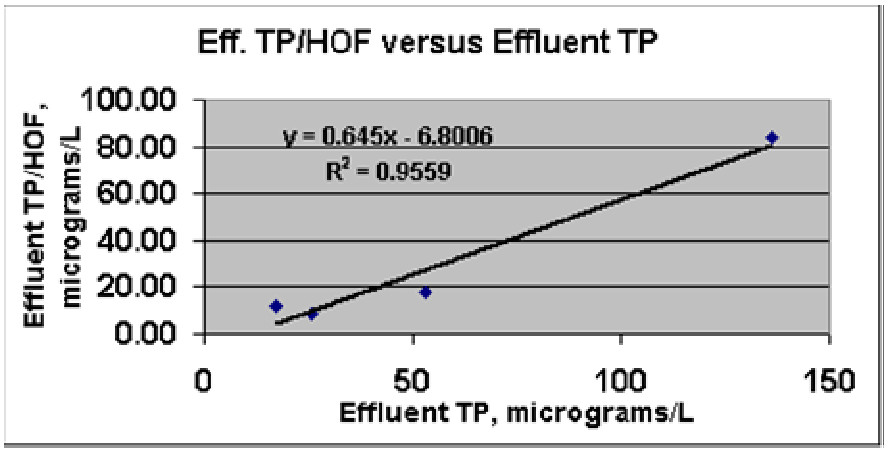
All of the STAs were overloaded hydraulically and with TP. How soon, if ever, are the loads to be reduced to the design level?

It appears that phosphorus removal in the STAs is directly related to the influent TP concentration and the hydraulic overload. The following graphs illustrate this.

Relationships Between Hydraulic Loading Rate, Effluent TP,
Influent TP and the Hydraulic Overload Factor

STA	HLR cm/d	Eff TP ppm	Inf TP ppm	Hydraulic Overload Factor	Eff TP/HOF
1W	7.4	53	154	3	17.67
2	3.67	17	67	1.4	12.14
5	3.45	136	277	1.62	83.95
6	5.4	26	77	3	8.67





The relationship between influent and effluent TP is shown in the first plot, and the effect of hydraulic overload on the effluent TP concentration is shown in the second plot. Although purely subjective, it appears that correcting the overload would result in considerable improvement in the performance of the STAs.

If feasible, consideration should be given to operating more of the cells in the various STAs in series. This will definitely improve the hydraulic characteristics.

Section Comments

Comments and questions for each section of Chapter 4A are presented in the following paragraphs.

STA-1 EAST UPDATE

Assuming that I am reading the figure correctly, with water flowing from Cell 7 into Cell 6, there is a considerable opportunity for severe short-circuiting to the first one or two outlet structures. If feasible, it would be advisable to discharge from Cell 6 at the lower two or three outlets at the southern end of the cell. For the uninitiated, it may be desirable to identify the blue squares as inlet and outlet structures. Having multiple cells in series should improve the hydraulics of the STA considerably.

STA-1 WEST OPERATIONS

What is the phosphorus concentration in the Lake Okeechobee diverted water?

STA-2

Have economic studies been conducted comparing the costs of improving the hydraulics in the STAs with costs associated with other forms of treatment and vegetation management?

STA-2 VEGETATION MANAGEMENT

What was the undesirable vegetation?

STA-2 PERMIT WATER QUALITY MONITORING

The decision to move as much water as possible through STA-2 to control mercury discharges sounds like simple dilution. What am I missing?

STA-2 TOTAL PHOSPHORUS

The results indicate that the STAs receiving high concentrations of TP are overloaded or have poorly designed hydraulic characteristics. It appears that the STAs are operating at less than optimum. It is likely that significant improvement in performance would be obtained by simply reducing the loading rates.

A kinetic analysis of the various STAs is needed.

STA-2 OTHER WATER QUALITY PARAMETERS

In the future, it may be desirable to cover the DO issue in a separate section for all STAs. This would result in reducing the repetition.

STA-3/4

In the detailed design what are the enhancements referred to in the last paragraph on page 4A-31?

How much space will be taken up by the PSTA demonstration project? Will it be large enough to affect the performance of the STA or is a cell to be replaced?

STA-5

When making reference to a concentration or flow as being “considerably” lower or higher, why not show the mean and some statistical inference.

ROTENBERGER WILDLIFE MANAGEMENT AREA

Is the wildlife area essentially the equivalent of a large STA that could be used in a kinetic analysis of TP removal?

Middlebrooks review 4B

Review of Chapter 4B: STA Optimization and
Advanced Treatment Technologies

Chapter 4B is concise, clear and easily understood for the most part. An occasional detail and clarification is needed, but overall, an excellent Chapter. General and specific comments are presented for various sections of the Chapter.

SUMMARY

See the figures presented in the section "Long Term Trends in the STAs." It is likely that the figure is based on inadequate and incomplete data, but it does show a significant relationship between effluent TP concentrations and hydraulic overload.

In the fifth paragraph, it is stated that phosphorus can be stored for long periods. Do you have any idea for how long? Determining this factor would give an indication of the design life for the STAs.

STA-1 West

It is good to see the implementation of the compartmentalization study to improve the hydraulic characteristics. It has been established for many years that one of the most influential variables associated with biological treatment systems is the hydraulic residence time. Of the hundreds of biological treatment systems that I have evaluated that were not functioning as designed was the hydraulic residence time, excluding the introduction of toxics or overloading.

Water depths are given for the STA-1W test cells, but an estimate of the depths in the various cells of the STAs are not given. Are there differences in mean depths between the individual STAs or the Cells within an STA? If so, what effect on performance do you anticipate or have determined?

TREATMENT PERFORMANCE

Why not identify the northern flow-way by Cell number?

It appears that the inflow from G-303 and G-255 comes from essentially the same source. How far apart are the two inlet structures? Could this distance account for the differences in influent concentration of TP?

Is it possible that the large mass of SAV improved the hydraulics of Cell 4; therefore, increasing the contact time with the plants and other organisms removing phosphorus?

Rather than say "greater' why not use a percentage change or multiple factor to describe observed differences?

What is the estimated error in flow measurements? I realize that this will vary for the various methods that are used, but just a rough estimate would be useful.

VEGETATION

Submerged and Floating Aquatic Vegetation

Again, rather than use vague terms such as "more pronounced", why not show ranges or values.

What would vegetation control cost if all STAs were operated as SAV based systems?

STA-6

If all of the inflow enters the STA from G-601, G-602 and G-603, what happens at G-604?

VEGETATION

Has a materials (nutrients) balance been attempted to determine if sawgrass took up more TP than the other plants?

Sediment

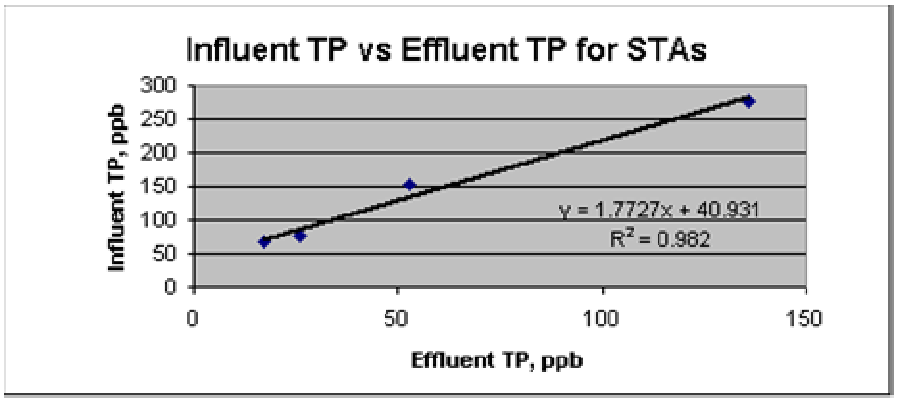
It appears that the flow was distributed to Cells 3 and 5 in portion to their surface area; therefore, the last sentence on page 4B-11 appears to be incorrect. Cell 5 apparently did not receive a higher hydraulic load, perhaps a larger mass of TP.

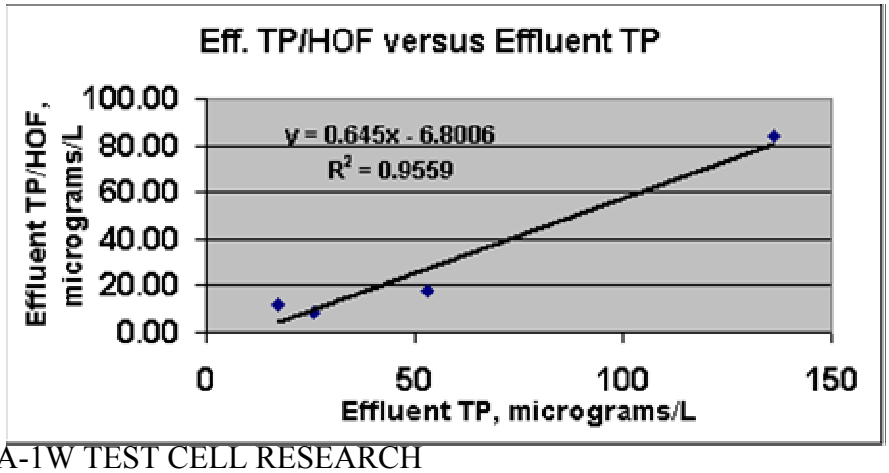
LONG-TERM TRENDS IN THE STAS

As mentioned in the Summary discussion, an examination of the TP effluent concentrations and the overload factor reported (i.e. 3 times design flow, etc.) results in a significant relationship between the two factors. It is likely that the figure is based on inadequate and incomplete data, but it does show a significant relationship between effluent TP concentrations and hydraulic overload.

Relationships Between Hydraulic Loading Rate, Effluent TP, Influent TP and the Hydraulic Overload Factor

STA	HLR cm/d	Eff TP ppm	Inf TP ppm	Hydraulic Overload Factor	Eff TP/HOF
1W	7.4	53	154	3	17.67
2	3.67	17	67	1.4	12.14
5	3.45	136	277	1.62	83.95
6	5.4	26	77	3	8.67





STA-1W TEST CELL RESEARCH

It is true that the chemical treatment processes would alter the water quality parameters and may adversely affect the ecosystem; however, creating a single controlling factor such as phosphorus may also alter the ecosystem in ways not yet understood. I must add that the "green' technology offers less risk and great potential to allow the recovery of the Everglades.

In the second paragraph on page 4B-14, AlCl should be changed to reflect the correct chemical formula.

NORTH TEST CELLS

Does the infrequent production of an effluent TP of 10 micrograms/L indicate that the "green" treatment processes without some form of chemical pre-treatment cannot be expected to reach the "magic" level of 10 ppb?

Why not use a uniform set of Test Cell Designations? Redefining designations in the text differently than those given in Table 4B-7 makes it difficult to follow your presentation.

SOUTH TEST CELLS

Were there differences in the dominant plant species in Cells E-1 and E-2 that may have contributed to the differences in performance?

ADVANCED TREATMENT TECHNOLOGY

This section is a good concise summary of the PSTA field-scale test work.

PSTA FIELD-SCALE TEST FACTILTY

Nature can be cruel! The best-laid plans are frequently distorted by the demon nature. Even with nature's fickle intrusion, useful results were obtained.

Mesocosms

It would be useful to report the thickness of the low and high application rates of the three chemicals used.

STA-3/4 PASTA DEMONSTRATION

A summary table outlining the major components of the demonstration project would be useful.

LINKAGE OF RESEARCH AND MONITORING TO STA MANAGEMENT

The sequencing of the various treatment methods will have a positive effect on the hydraulic residence times in the overall systems. At the expense of sounding like a broken record, I hope that considerable attention is given to the flow patterns and HRT in the planned demonstration project.

Topic:
Chapter 4B: STA optimization and advanced treatmen (1 of 1), Read 10 times
Conf:
Chapter 4B
From:
Ping Hsieh yhsieh@famu.edu
Date:
Thursday, September 18, 2003 10:36 AM

Chapter 4B of this year's report is quite exciting in that it reports the new sediment and vegetation monitoring program and the long-term performance evaluation of the STAs. This new approach of study signifies the departure from the "black box" and "snap shot" approach used in the past to a more comprehensive and in-depth understanding of the temporal and spatial function of wetlands as sinks of nutrients. I honestly think that this new study will shed important light and add new dimensions to the wetland function research not only pertaining to the EPA but all wetlands in general. Although the data is still accumulating and any result preliminary at this stage, the data presented indicate that plant biomass and floc layer accumulation probably are the main mechanism for P sink in the STAs. Different species seem have different capability to remove P from water column but the difference seem to be secondary in comparison to the biomass and floc accumulation. The biomass ad floc differences between the inflow and outflow areas indicating that the STAs are not reaching a steady state after five years of operation. SAV is quite promising in the advance treatment of P to a very low level. However, maintaining SAV requires control of FAV to a minimum level. STAs seem have better efficiency to remove P when the inflow P concentration was below 150 ppb (Fig. 4B-2C in p. 4B-13). The plant community change and succession in theSTAs are interesting and valuable data for understanding wetland ecology. The structure and distribution of plant community could be good indicators to changes in nutrient and hydrological status and the development stage of wetlands, if we have a good understanding of the mechanism. Not much data are available now, however. When sufficient data of this study are collected, quantitative models that predict long-term performance of STAs probably can be developed.

The authors should be commended for a job well done in their presentation of such interesting and important data for the STAs.

Topic:
No Topic (1 of 1), Read 16 times
Conf:
Chapter 5
From:
Ping Hsieh yhsieh@famu.edu
Date:
Tuesday, September 16, 2003 09:01 PM

It is encouraging to see that hydrology appears as an independent chapter in this year's report. Hydrology and hydrodynamics are two fundamental drivers that shape the function and structure of a wetland. The hydrological information would be much more clear and useful, if it is treated in a separated chapter. The information of this chapter should be used extensively throughout the whole report. The problem is: We may understand hydrology and wetland biology separately, we understand relatively little about the linkage of the two. This may be my personal opinion but it shows, more or less, in the whole report. Chapter 5 is well done as a hydrological database, i.e., it has useful hydrological data, although not as user-friendly as I would hope for. The interpretation and discussion of the data are also lacking. For example, there is a rather detailed description of the surface water inflows and outflows in all the areas. For people that are not familiar with the geographic relationship of the areas, the information does not help much. It would be much more clear and useful, if the information is represented in a diagram form with arrows to indicate directions and magnitudes of the flow among areas. A flow chart of water transport all the way from Lake Okeechobee to the Florida Bay with mass-balanced quantities during the water year of 2003 would be very desirable because it would help readers to get a holistic picture about the water mass flow and the associated soluble material transportation. Comparison between seasonal means and annual means or between annual means and historical means would greatly enhance the general understanding of the hydrological trends. People may interested in the relationship between the amount of rainfall input and evapotranspiration loss of the whole area in order to calculate the dilution (rain) and concentration (evapotranspiration) factors of the soluble materials from one area to another. Water depths are reported but no water retention times are given. Water retention time is as important as (or, may be more important than) the water depth to determine DO, nutrients and microbial activity. Water flow rates observed or estimated from the existing data) in various areas are desirable because there may be hydrodynamically controlled processes in ENP and other areas. More interpretation and discussion of the data certainly would enhance the importance and usefulness of the chapter.
5-2 Pa 1, L4, 2 million ac-ft per year?
L5, 1.3 million ac-ft per year?

Topic:
Review for Chapter 6 (1 of 1), Read 30 times
Conf:
Chapter 6
From:
Joanna Burger jeitner@biology.rutgers.edu
Date:
Wednesday, September 10, 2003 02:19 PM

COMMENTS ON CHAPTER 6 by Joanna Burger

The restoration of the Everglades has as a primary objective the establishment of an ecosystem with appropriate structure and functioning. One goal of restoration was to restore, to the extent possible, the natural hydrology of the Everglades. The SFWMD operations, regulations, monitoring, and science are directed toward examining wildlife ecology, plant ecology, ecosystem ecology, and landscape ecology within a framework of the hydrology of the Everglades. This chapter summarizes their on-going work in these disciplines. Ecology by its very nature involves involved and complex relationships, making it difficult to have clear-cut cause and effect relationships. Thus the SFWMD approach of addressing particular indicators of the health of the system is appropriate. Since it is not possible to examine all species, species assemblages, and processes, indicators must be selected for examination and monitoring. Five key indicators are examined in some detail in this chapter: wading birds, food webs, tree islands, Lycodium (an invasive species), and the Loxahatchee Impoundment Assessment. Wading birds were selected because they are top level predators, are visible and of interest to the public, and can be observed and studied in the laboratory. Tree islands, and ridges and sloughs, are important features of the Everglades that must be preserved and re-established. Lycodium is an invasive species that can be tracked as an indicator of environmental impact, and the Loxahatchee Impoundment Assessment is an expansion of the mesocosm work, provides an opportunity to test hypotheses about hydrology, and to communicate with the public about water management issues. The latter project is an exciting project of the SFWMD.

The chapter examines four key areas:

Wildlife Ecology (Wading birds, food webs, wildlife on tree islands)

Plant Ecology (below-ground biomass of tree islands)

Ecosystem Ecology (vegetation on tree islands)

Landscape Ecology (temporal changes in tree islands, spatial patterns in ridge and sloughs,spread of Lygopodium, Loxahatchee impoundment assessment)

Wildlife Ecology
Wading birds have always been a key indicator group for the Everglades, in the minds of scientists, regulators, and the general public. Nesting waders, and their reproductive success, are used as indicators of the progress of the Everglades restoration effort. There was a

general decline in the number of waders nesting in the Everglades, and an increase in asynchrony of nesting. Some of these changes may have been due to heavy rains during the nesting season, as happened in many places along the Atlantic coast during this past year. Asynchrony in nesting often occurs either because of heavy rains or because food supplies are sporadic or difficult to obtain. While the Report notes that water level reversals may have been the cause, it is more likely that heavy rains and food supply differences were the proximate cause. Further, since most of the waders breeding in the Everglades are not long-distance migrants, late fledging chicks may still be recruited into the breeding population. While the running year averages for number of nesting birds is useful because it dampens out large shifts from year to year, it might be useful to actually see the data. Food web studies are extremely important in determining the basis for population changes, it appears that significant research is required to understand the basis of the web. Understanding the relative role of detritus may be key - and there may be both seasonal and yearly differences requiring extensive study.The use of stable isotopes is promising and will be useful, both in understanding the Everglades
food web generally, and in examining different parts of the system. This method has proven useful in a number of other regions, and comparative data will be useful. While these studies are being designed, both spatial and seasonal parameters should be incorporated. The institution of a non-invasive camera trapping technique to monitor wildlife on tree islands is an important step in understanding how wildlife use these islands. The only drawback is that it cannot be used at night. This innovation will increase overall knowledge of wildlife use oftree islands, especially for nesting by reptiles.

Plant Ecology
The Rotenberger Wildlife Management Area has been the focus of study for some time, and is now experiencing an improved wet-dry season cycle that more closely resembles a natural hydrology. The plant composition has changed, but requires considerably more time to understand the nature of the changes. Wetland plants persist indicative of a high nutrient condition, and information on the lag time for changes is critical to understanding plant ecology on the area. The studies of belowground biomass on tree islands is aimed at understanding the how hydrology affects biomass production on different tree islands. This is critical to understanding how changes in hydrology will affect composition, diversity, and biomass of tree islands.

Ecosystem Ecology
The focus of this project completes the examination of tree islands, and involves examination of tree island vegetation and succession. It forms the basis for understanding the ecology and ecosystem structure and function of the tree islands, and as such, is extremely important and long overdue. Looking for one index of tree island health will be difficult because of the inherent problems with most indices. For example, species diversity often includes exotic species (obviously a problem). Understanding ecosystem structure and function of tree islands will be complex, time-consuming and will require many years. Setting up islands to study for a period of time will help understand both succession and the effect of varying hydrology. The overall statistical methodology (CCA) might need some additional explanation in terms of hypotheses to be tested, what the data will mean, and what the implications are for management. It is extremely important to understand the role of exotic plants, fire and other human activities on tree islands, and this approach will begin to examine these factors.

Landscape Ecology

One of the advantages of the work done by the SFWMD is that all levels of biological organization can be examined, from laboratory studies of organ/reproductive effects to landscape ecology. This is one of the strong points of the SFWMD work and the Everglades restoration plan. Examining tree island changes from 1945 to 1995 completes the overall study of tree islands, giving a temporal perspective. This is a massive project, when human activities are added to the ecology of the tree islands, yet it is essential to do this. The massive change that occurred from the 1950 to the 1970s should receive further comment. While tree islands are an indicator feature of the health of the Everglades, the spatial patterns of ridge and sloughs is another that bears examination. Study of these features is key to management of the Everglades, including developing a method to identify intact from degraded ridge/slough landscapes. The methodology is appropriate to the problem, but the specific questions being addressed should be more clearly stated. Understanding the invasion of exotics into the Everglades is a key indicator of ecosystem health. While IKONOS will be very useful, the District should consider ground-truthing, especially for parts of the Everglades where the understory cannot be assessed. The Loxahatchee Impoundment Landscape Assessment is an exciting and timely project that applies adaptive management. While the project involves sculpting the physical features of two existing impoundments (followed by water level manipulation), operations can be modified as conditions dictate. The chapter should make the methodology of monitoring during the operations much clearer, both in scope and details. Further, references to other similar anagement/studies should be described and referenced. It must be documented that there is increased wildlife use, and such studies should be initiated before the project begins. This project integrates some of the other key projects, such as wading birds, tree islands, and ridge/sloughs. Table 6.7 is extremely important for the overall understanding of this project.

Although the plan calls for establishment of a public kiosk for dissemination of information during the project, it seems that public involvement should start immediately, both to prepare the public and to get their comments and suggestions. Loxahatchee is a well-used park, and there will be heavy public involvement.

SPECIFIC QUESTIONS FOR CHAPTER 6:

Page 6-5: What about food supply and rain as the cause, rather than water level reversals. This needs to be discussed. Since many of the birds do not migrate long distances, late nesting may still result in some young fledging.

Page 6-6: May need a bit more information on the stable isotope approach for the general public. This approach is not intuitive, yet is very important.

Page 6-7: a food web diagram of the hypotheses you wish to test might be useful for the public, particularly since the mid-trophic level fish are often the prey fish for the wading birds.

Page 6-8: Seasonal studies are required as well, since food webs will vary both spatially and seasonally.

Page 6-10. Is the tripping mechanism sensitive enough for amphibians or lizards?

Page 6-15. Are the three tree islands otherwise the same?
-Could you determine whether the root sizes and types differed, and did their placement relative to the surface differ?

Page 6-17: what is the r2 for fig. 6.6?
-What is the relationship between biomass and carbon? any differences?

Page 6-20: Isn't there a relationship between basal area and stem densities (inverse)?

Page 6-21: Is Brazilian pepper being removed from any islands as another kind of treatment?

Page 6-23: what hypotheses are you testing, and how will this affect management?

Page 6-24: Do we know the fire frequency in these islands - will cores be used to examine fire frequency?

Page 6-26: What happened between the 1950s and the 1970s - a brief description would help understand Table 6-6.

Page 6-29: Need to more clearly state the objectives of this research - why are you doing it and how will it help restoration?

Page 6-30 1st sentence of section on Lycodium should be changed, it sounds like the SFWMD is establishing this exotic
-What season is it being monitored.

Page 6-31: for many landscape traits, ground truthing is essential, and should be considered here.

Topic:
Meganck review (1 of 2), Read 15 times
Conf:
Chapter 7
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Tuesday, September 16, 2003 11:42 AM

1. RECOVER-WIDE Conceptual Ecological Models—This effort is highly commendable. However, the method for weighting and including the results of project-level research activities into such models is not clear. How, for example, will total P levels at a project scale affect a broader goal of water quality at the system-wide CERP scale?

2. Performance Measure Documentation Report/Adaptive Management Program—The authors' contribution is noted as clarifying the interaction between scales of study / application as well as the quantitative and qualitative aspects of decision-making processes. A question remains as to how "science-based management adjustments to the implementation of CERP programs and projects" will be applied. Perhaps future workshops will further define this process, but it is unclear at present.

3. Interim Goals and Interim Targets—In previous Panel discussions, it has been acknowledged that the stated goals of maintaining natural systems often times conflicts with the goal and legal right of the continued development (water supply and flood protection for new or expanded east communities. How is this debate being managed at the State level and should the Consolidated Report make note of the status of this issue apart from the discussion (cold and somewhat institutional) on page 7-8?

4. Regional Evaluation and Report Process—How have the Project Delivery Teams been trained to ensure consistency in evaluation techniques and outcomes?

5. General Issue--Last year the issue of a report by The National Academy of Sciences noting that the CERP might negatively impact water quality in the Florida Bay was raised. Has the District addressed this issue in the 2004 Draft Consolidated Report?

Topic:

Meganck review (2 of 2), Read 16 times
Conf:
Chapter 7
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Tuesday, September 16, 2003 02:14 PM

I have read Chapter 7 and Dr. Maganck's review and concur.

Jeff Jordan

Topic:
Review for Chapter 8B (1 of 1), Read 14 times
Conf:
Chapter 8B
From:
Joanna Burger jeitner@biology.rutgers.edu
Date:
Wednesday, September 10, 2003 02:23 PM

OVERALL FOR CHAPTER 8 B by Joanna Burger

It might be useful in the summary to acknowledge other interested parties or stakeholders since it seems to refer only to regulators and signing parties. Further, this chapter (as well as 8A) seem to be less "public friendly" in terms of providing context initially, and making the data presented come alive.

Questions for chapter 8b

Page 8b-7: What happened to specific conditions 1-3 in Table 8b-2?

Page 8b-12: What exactly are the financial arrangements for lands with higher loadings of pollutants (or at least the percent difference).

Page 8b-12: The extent of the outreach program is unclear: Is it just the couple of projects mentioned?

Page 8b-16: The first sentence of the Findings seems problematic - do they really mean 7 of 8 are exceedances? What water quality measures do they need to implement?

Topic:
Meganck review (1 of 1), Read 6 times
Conf:
Chapter 8B
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Tuesday, September 16, 2003 11:44 AM

1. The text did not address the outstanding issue of why a comprehensive BMP program has not been designed and implemented for all farm areas included in table 8B-1. Location and access issues are the only problems alluded to in the text, but it would be helpful to the public if an indication was provided as to how the District plans to deal with this in the future.

2. Can the District explain in greater detail why the QA/QC plan failed for pump station NSIDSPO1?

3. Why haven't the high TP levels noted for certain areas reported in table 8B-1 been addressed in the context of the long-term planning effort? In spite of the public outreach efforts and the BMP program implemented to date, other actions are apparently required.

Topic:
Meganck review (1 of 2), Read 6 times
Conf:
Chapter 8C
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Tuesday, September 16, 2003 11:45 AM

I do not have any questions on this chapter at this time. The progress noted in acquiring critical parcels of land seems to be on course. Perhaps the presentation at the public review will identify issues of concern.

Topic:
Meganck review (2 of 2), Read 7 times
Conf:
Chapter 8C
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Tuesday, September 16, 2003 02:18 PM

I have read Chapter 8C and Dr. Maganck's review and concur.

Jeff Jordan

Topic:
chapter 8D (1 of 1), Read 18 times
Conf:
Chapter 8D
From:
Trudy Morris -Webboard Manager tmorris@sfwmd.gov
Date:
Tuesday, September 16, 2003 04:00 PM

The link was created and the Chapter was posted at 2:17 pm.

Topic:
Meganck review (1 of 1), Read 11 times
Conf:
Chapter 8D
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Thursday, September 18, 2003 08:36 AM

1. How are project cost increases (material costs and labor, etc.) projected so as to have a valid projection of either a surplus or deficit?

2. Has the Joint State Legislative Committee on Everglades Oversight reacted in any way to the method the District has chosen to analyze and present fiscal data?

3. Does the District feel the public has a reasonable understanding of the costs of implementing the CERP and the Long-Term Plan as well as the long-term commitment that is required?

4. What is the position of the Legislature in terms of the costs to Florida taxpayers as opposed to the U.S. Government?

Topic:
Meganck review (1 of 1), Read 11 times
Conf:
Chapter 8E
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Tuesday, September 16, 2003 11:53 AM

1. This chapter indicates that basic research in controlling exotic plants has been underway for sometime. However, is there sufficient funding included in the Long-Term plan ($451 million) to begin to address some of the more complex questions included in the management of exotics such as animal exotics, interactions of plant and animal species with an evolving hydrologic regime, the relationship between initial control of exotics and long-term management needs and funding, continued expansion of urban areas and the intensity of agricultural management and invasive plants and animals?

2. It seems logical that a substantial increase in the research effort is also warranted in the STAs given the changing water regime in these areas and the fact that they discharge directly into the EPA. What priority has been assigned to this issue?

3. Public education and support in the control of exotics will be vital. Is the Governing Board of the District supportive of this need?

4. Exotic species are obviously spread during hurricanes and flooding as well as by fires. Is there any research being conducted on these issue currently? Are there measures that can be taken after such an event to minimize long-term impacts and reduce loosing ground each time a flood or other disaster occurs?

5. The NEWTT Assessment will provide a platform of data to assist managers in the control of exotic plants. Is there any similar effort planned for animals?

Topic:
No Topic (1 of 1), Read 6 times
Conf:
Chapter 8E
From:
Ping Hsieh yhsieh@famu.edu
Date:
Tuesday, September 16, 2003 05:16 PM

This chapter deals with a broad topic of invasive exotic species. It is quite informative in my opinion. I have very limited professional knowledge on the subject matter. However, this is an important issue of the Everglades restoration that we can not afford to overlook. Biological control of weeds or invasive exotic species is cost-effective, environmentally safe (if conducted properly) and self-sustaining. Based on my colleague Dr. O'Brien, the use of weevils as biological control agents against aquatic and terrestrial weeds has been demonstrated to be highly successful in many instances in North America and throughout the world. (O'Brein, C. W. 1995, Curculionidae, premiere bio-control agents (Coleoptera: Curulionodae). Memoir Entomol. Soc. Wash. Pp. 119-128). The increased diversity of introduced and native species also increases the complexity and difficulty of environmental impact assessment on introduced species. In other words, the tasks of exotic species control in Everglades require dedicated effort and expertise. Followings are my specific editorial comments:

8E-2, Pa1, L3. What do you meant by "species .. can be prohibited by law"?
L7 add "knowledge"
8E-2, Pa 3, L16. Add "s" to "effect"
L 17 on "the ecosystems" of South Florida.
8E-2, Pa 4, L8 replace "fishes" with "fish"
L 9 replace "and this" with "which", and "during" with "under"
8E-3, Pa 1, L1 some "of the" CERP.
L 3 replace "should" with "could"; "fishes" with "fish"
8E-4, Pa 3, L11 replace "in" with "throughout"
8E-6, Pa 1, L 2 Biological control not controls; replace "herbicides" with "chemical control"
8E-7, Pa 2, L1 Melaleuca "weevils" not "snout beetles"; replace "damaging" with "considered a useful biological control agent against"
8E-8, Pa 6, L3 Start a new sentence: They have…;
L4 (0.87 ppm) should move following triclopyr ester.
L7 replace "are" with "but"
L8 add "to fish" after "exposure"
8E-11 Melaleuca quinquenervia should be italics.
8E-12, Pa 2 L5 "threat" not "thread"
8E-13, Pa 2, change all "snout beetle" to "weevil"
8E-13, Pa 3, L2 add "insects" after the species name.
L3 replace "agent" with "species"
8E-14 use italics for Lygodium microphyllum.
8E-14, Pa 4, L2 insert species name for the old world fern.
8E-15, Pa. 2, L1 and L2 add parentheses to the year 1968 and 1978.

8E-16, use ilatics for Schinus terebinthifolius
8E-18, -19, -21, -22, use italics for the species names.
8-E-27, L5 replace “control” with “management”.
L6, replace “monies” with “funding”
L7 add “biological” in front of “control”

Topic:
Meganck review (1 of 1), Read 8 times
Conf:
Chapter 8F
From:
Jeff Jordan jjordan@griffin.peachnet.edy
Date:
Tuesday, September 16, 2003 11:54 AM

No specific questions on this section of Chapter 8