Appendix 1A-2: Peer Review Panel Comments on the *2006 South Florida Environmental Report – Volume I*

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

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

Topic: General comments from Ward on whole report (1 of 1), Read 33 times
NEW
Conf: VOLUME I: THE SOUTH FLORIDA ENVIRONMENT
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Monday, September 19, 2005 10:42 AM

Suggestions for 2007 Report

In responding to the request in the Panel's Statement of Work for suggestions to optimize the SFER reporting process, the following comments are offered. First, the SFER is a compilation of a number of reporting requirements, many of them legally mandated. The following comments are offered as a way to improve the effectiveness of the reporting associated with managing water and water-related resources in South Florida, without regard for legal requirements. Thus, it is realized that the legal practicality may doom many of the suggestions.

The reporting consolidation initiated with the 2005 SFER, as well as the maturation of a number of sections of the SFER reporting process, suggests that it is possible to better target and streamline the conveyance of information in the SFER. By maturation it is meant that some Chapters in the report are taking on a rather routine reporting nature after being developed and peer reviewed over a number of years. Thus, some aspects of water and water-related resource management in South Florida may now lend themselves to simply updating readers on current year goal accomplishment rather than presenting each chapter as exploring unknown aspects of water management in South Florida. This realization hints are dividing the 2007 SFER into two reporting modes:

1. Where reporting is taking on a routine character, perhaps it would be possible to identify tables or graphs, contained in past reports, that could be refined to readily and quickly convey an understanding of the current year's performance against management goals, established legally or otherwise. The tables and graphs could be prepared each year without peer review – the methods employed in their production are well documented and tested, thus annual peer review is not needed. Perhaps every fifth year, a peer review of the methodology could be conducted to insure that the information continues to represent the latest science has to offer.

2. Where there is still a major research component (i.e. collecting data to define water-related processes that are critical to SFWMD meeting a management goal), the SFER should continue to report as in the past, with methodological detail and explanations of the new findings, subject to an annual peer review process.

Exploring this division further, the more routine reporting can be developed where data collection and analysis protocols have been developed, tested, and peer reviewed. In some ways, these portions of water management are operating in an 'accountability' mode – known goals are held up against data for the past year. In other words, did the

attribute being managed meet the goals set for it?

Furthermore, where the protocols are well defined, data handling, analysis, and reporting lends itself to fitting within modern 'information technology' applications, thus enhancing the efficiency of staff time in preparing the annual report. In other words, as noted above, the activities required to produce the charts and tables can be automated.

Chapters 2 and 5 appear to contain portions that are becoming rather routine. Both are summarizing and analyzing routinely collected data from fixed monitoring networks that are compared to established management goals (e.g. water quality standards in Chapter 2 and water supply, flood control, and rain-driven water delivery goals in Chapter 5).

Tables 2A-2 and 2A-3 represent the type of table/graph that could be considered for reporting annual monitoring results for the information contained in Chapter 2. For Chapter 5, there may need to be developed a new reporting format, such as a 'snake' diagram of flows for the year compared to goals, each in a different color. Figures 3.3, 3.4, and 3.5 are examples of presentation formats that could be further refined to quickly present annual results on ECP permit compliance and trends in performance. Following the graphic presentations, there will need to be an interpretation of the findings (i.e. explanation of excessive standard violations or below goal deliveries in the rain-driven plan. It would be helpful if representative users of the SFER information could assist in identifying the reporting format that best meshes with their responsibility for ultimate performance of the District in meeting its water management obligations.

Chapter 2C represents a portion of the SFER that describes new developments in water management of South Florida, thus this chapter would continue to receive close, annual scientific peer review. Chapter 7 describes new project development, but it is not as obvious that it needs scientific peer review in the same manner as Chapter 2C, but rather might be subject to a peer management review.

With the SFER in management goal 'accountability' and exploratory 'research' modes, the organization of the report must be considered. The accountability portion of the report, in providing brief and to the point information, could appear first in the annual SFER (and would not be subject to annual peer review). The more detailed research presentations could follow and be subjected to annual scientific peer review.

Chapter 7 uses four terms to describe the responsibility of the SFWMD – providing the right amount of water, at the right quality, at the right place and at the right time. The accountability portion of the report could be organized in the order above – quantity of water supplied and flooding controlled, quality of water, and timing and distribution of water for ecosystem health. This order represents the core purpose of the District – meet water management needs while lightening footprint on environment – and work toward a sustainable relationship between human and ecosystem in South Florida.

Post New Topic | Reply to: "General comments from Ward on whole report"
Watch this TopicStop Watching this Topic

Topic: Review by JoAnn Burkholder (1 of 1), Read 27 times NEW
Conf: Chapter 1A: Introduction to the 2006 South Florida Environmental Report – Volume I
From: JoAnn Burkholder joann_burkholder@ncsu.edu
Date: Tuesday, September 13, 2005 06:57 PM

Line 16 – 13 chapters?

Lines 98-102 – Please describe the STAs at least briefly; the only information given is that they are constructed wetlands. What level of treatment of nutrients, toxic substances, suspended solids etc. is achieved by STA-1W, as an example?

P.1A-4 map – Please clarify the location of C-11W, and WMAs.

Line 192 – STA-5 treated water being discharged into the Rotenberger WMA to restore the natural hydrology; how well is this succeeding? What about the quality of the water being discharged into the WMA?

Lines 209-210 – Please clarify how far back the "pre-BMP baseline period" extends.

Line 210-212 – Baseline period P discharges adjusted for annual precipitation differences: it would be interesting to also include the P discharges without such adjustment.

Line 321 – How was the IRL's status as the estuary with highest species diversity determined? – what estuaries were included in the comparison?

Line 327 – disturbance and destruction seems more accurate wording.

Pp.1A-9 – 1A-14 – Please add a map to this chapter that shows the nine major coastal areas; would be a great help to readers.

Lines 429-430 – Please alter this sentence to also reflect the associated problems contributed by high nutrients in the inflows (e.g. the recent National Academy of Sciences panel findings).

Lines 489-491 – Considering the urban influence, is a dataset also available for toxic substance inputs?

Lines 552-560 – Is any co-management of N being considered? Why/why not? And, please briefly address the problems from "internal loading" (re-suspension).

Lines 574-579 – Please clarify – is the KRPP proceeding on schedule? (14 projects complete thus far, etc.)

Line 592 – Key indicator #4 seems redundant – suggest omitting; indicators #1-3 are all

designed with this point as the overarching goal.

Lines 604, 898 – Based on the facts that (1) the District's mandate includes water quality (lines 535-542), and (2) repeatedly (Ch.12), nutrient over-enrichment and increased sediment loading are identified as major problems for most if not all of the Coastal Areas, why is there no mention of nutrients, SS, or other key water quality variables as among the major variables of emphasis? ("Scientific focus is primarily on salinity, seagrass, and other biological indicators"). Also, please clarify the major other biological indicators (seagrasses were the only group mentioned). [note: please change seagrass to seagrasses]
(The writing on line 604 also does not seem to support the last paragraph on p.1A-17: "… management actions build on a philosophy of environmental management that addresses the manifestations of excess nutrient inputs;" or the long-term goal described on lines 710-712)

Line 610 – Based on my reading, this was the first time that CERP was mentioned in this chapter; therefore, please define.

Line 649 – Discrepancy – previously in this chapter, the channelization of the Kissimmee River was described to have occurred from 1962-1971.

P.1A-17, last paragraph – The examples of classic restoration case histories do not, however, include polymictic, shallow lakes (such as many of those targeted for restoration by the District) – please clarify this point in the writing, and include a success story for such lakes if available.

Lines 686-687 – Although P has been identified as "the nutrient most responsible for changing the Everglades" (and although P is the target of the EPA), the clear need for co-management of P and N has been shown for many systems (e.g. for Chesapeake Bay, sited on p.1A-17, last para. as a model for restoration efforts of the District; also important for controlling cyanobacteria blooms, for example). Please address the issue of co-management of P and N, and clarify for readers.

Lines 729-730 – please clarify the EFA's requirement of 50 ppb; the previous writing referred to P loadings rather than concentrations.

Lines 729-746 – please briefly describe the nature of these constructed wetlands, and how they are being checked for function, needed renewal, etc.

Line 762 – please define WRDA.

Line 818 - …necessary to achieve…

Lines 820, 821 – Does this TMDL account for the potentially high internal loading of TP? (please briefly clarify)

Lines 828-829 – It would help the reader to include a brief description, or to briefly list a few examples, of the alternative technologies mentioned.

Lines 863, 875, 877 – please change hectares (ha) to square kilometers or square miles for consistency with the rest of this chapter. Otherwise, confusing to readers.

Line 954 – please define RECOVER.

Post New Topic | Reply to: "Review by JoAnn Burkholder"
Watch this TopicStop Watching this Topic

Topic: Comments from Meganck (1 of 1), Read 18 times NEW
Conf: Chapter 1A: Introduction to the 2006 South Florida Environmental Report – Volume I
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Friday, September 16, 2005 11:21 AM

I do not have any specific questions regarding this chapter at this time. I found it to be clear and well organized, concise and a very strong contribution to generating understanding and support for the CERP process on the part of the general public. As written, this chapter is both a stand-alone contribution to understanding the CERP and related components / processes as well as a summary-guide to an in-depth reading of any specific chapter.

Post New Topic | Reply to: "Comments from Meganck"
Watch this TopicStop Watching this Topic

Topic: Commetns from Jordan (1 of 1), Read 15 times NEW
Conf: Chapter 1A: Introduction to the 2006 South Florida Environmental Report – Volume I
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Friday, September 16, 2005 11:32 AM

For the second year this report is streamlined and consolidates previous effort. As we noted last year, this new process, as described in Chapter 1 is a welcome change to the reporting. Chapter 1A offers a good description of the geographic features of the South Florida environment, particularly the expanded discussion of coastal ecosystems. The overview of the Everglades management and restoration projects is also helpful. The more comprehensive perspective offered in this report (following the 2005 SFER change) produces a very useful document of the efforts in South Florida.

Post New Topic | Reply to: "Commetns from Jordan"
Watch this TopicStop Watching this Topic

Topic: Comments from Dr. Armstrong (1 of 1), Read 14 times, 1 File Attachment NEW
Conf: Chapter 1A: Introduction to the 2006 South Florida Environmental Report – Volume I
From: Linda Davis ldavis@sfwmd.gov
Date: Monday, September 26, 2005 07:10 AM

CHAPTER 1 COMMENTS NEA 09252005.PDF (10KB)
Comments from Dr. Armstrong

Post New Topic | Reply to: "Comments from Dr. Armstrong"
Watch this TopicStop Watching this Topic

CHAPTER 1: INTRODUCTION (A, Neal Armstrong)

Chapters 1A and1B provide an excellent introduction to the 2006 SFER in terms of describing the content of Volume I, the geographic features of the study area, the specific areas that make up the study area and their structure and function, the roles these areas play in water quality management. In additional, the roles of the SFWMD, FDEP, and other government agencies in managing and restoring these areas are described.

Particularly helpful in understanding the many and what appears to be overlapping legislatively-mandated programs for managing and restoring these areas is the section on environmental alteration and restoration of the South Florida environment.

Finally, Chapter 1B is very interesting and helpful in understanding the impacts of the four hurricanes that crossed the study area in 2004. It is fortunate that the SFWMD was able to monitor the physical, chemical, and biological impacts of these hurricanes during and after their passage. Not only are the impacts themselves of interest, but phenomena observed "downstream" both in space and time can appropriately related to the hurricanes and management alternatives designed to account for them as well.

As this chapter and others are read, it is clear that one addition to this chapter or to an appendix of this chapter would be a glossary of all the acronyms used throughout the report.

Comments from Meganck (Jeff Jordan) 9/16/2005
Comments from Jordan (Jeff Jordan) 9/16/2005
Comments from Dr. Armstrong

Topic: Comments from Meganck (1 of 1), Read 19 times NEW
Conf: Chapter 1B: Cross-Cutting Issues in the 2006 South Florida Environmental Report - Impacts of the 2004 Hurricanes on the South Florida Environment
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Friday, September 16, 2005 11:22 AM

1. Is there actually a dividing line of impact (regardless of the parameters being measured) between the north and south regions of South Florida as a result of the series of hurricanes studied as the text seems to indicate (natural areas “suffering” less)? If so, is this really related to any measurable degree to the more natural state of the southern region of the State being able to absorb more impact from such an event? The chapter noted that “Everglades marshes showed little change in water quality or ecosystem health” associated with hurricanes (line 231), but lines 246-248 noted the “massive physical disturbance over large areas of native vegetation.” Are these statements compatible?

2. Is there any known correlation between hurricane direction and the impact to the EPA (given any number of parameters such as TP releases, DO levels, etc.)? In other words, do hurricanes running across the State (either from the east or west) at the level of the EAA tend to cause a greater impact to downstream areas than a storm approaching from the south or south east? The reasons I raise this issue relates to the mention of water depth and absorptive capacity to storms and that it seems like a rich area for research.

3. Are there any particular BMPs that mitigate the impacts of hurricanes on natural habitats in South Florida? For example, will deeper STAs sequester P at deeper levels and thereby reduce the churning and re-suspension effects of P in downstream areas?

4. Are sewage treatment systems in communities adjacent to the WCAs and the EPA able to handle the surge of runoff during extreme storm events or is there by necessity a large release of untreated sewage or runoff to these areas?

Topic: Comments from Jordan (1 of 1), Read 18 times NEW
Conf: Chapter 1B: Cross-Cutting Issues in the 2006 South Florida Environmental Report - Impacts of the 2004 Hurricanes on the South Florida Environment
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Friday, September 16, 2005 11:36 AM

This part of chapter 1 is in response to the Panel's suggestion last year that a cross-cutting, system-wide issues section be added. Although their impacts were huge, this part of the chapter could benefit from a bit more discussion about why the hurricane issue was chosen. I think the Panel had other, less temporal issues in mind when suggesting this section. This chapter certainly did a good job of describing the impacts of the hurricanes---now, are there any system-wide policy changes, program/project changes, or new perspectives that will be explored due to the hurricanes?

Post New Topic | Reply to: "Comments from Jordan"
Watch this TopicStop Watching this Topic

Topic: Comments from Dr. Armstrong (1 of 1), Read 13 times, 1 File Attachment NEW
Conf: Chapter 1B: Cross-Cutting Issues in the 2006 South Florida Environmental Report - Impacts of the 2004 Hurricanes on the South Florida Environment
From: Linda Davis ldavis@sfwmd.gov
Date: Monday, September 26, 2005 07:13 AM

CHAPTER 1 COMMENTS NEA 09252005(1).PDF (10KB)
Comments from Dr. Armstrong

Post New Topic | Reply to: "Comments from Dr. Armstrong"
Watch this TopicStop Watching this Topic

CHAPTER 1: INTRODUCTION (A, Neal Armstrong)

Chapters 1A and1B provide an excellent introduction to the 2006 SFER in terms of describing the content of Volume I, the geographic features of the study area, the specific areas that make up the study area and their structure and function, the roles these areas play in water quality management. In additional, the roles of the SFWMD, FDEP, and other government agencies in managing and restoring these areas are described.

Particularly helpful in understanding the many and what appears to be overlapping legislatively-mandated programs for managing and restoring these areas is the section on environmental alteration and restoration of the South Florida environment.

Finally, Chapter 1B is very interesting and helpful in understanding the impacts of the four hurricanes that crossed the study area in 2004. It is fortunate that the SFWMD was able to monitor the physical, chemical, and biological impacts of these hurricanes during and after their passage. Not only are the impacts themselves of interest, but phenomena observed "downstream" both in space and time can appropriately related to the hurricanes and management alternatives designed to account for them as well.

As this chapter and others are read, it is clear that one addition to this chapter or to an appendix of this chapter would be a glossary of all the acronyms used throughout the report.

Joanna Burger; OVERALL COMMENTS ON 2A (Joanna Burger) 9/14/2005
- *Comments from Ward* (Jeff Jordan) 9/19/2005
- *DOI Technical Comments* (DOI Everglades Program Team) 9/23/2005
- *Additional DOI Technical Comments* (DOI Everglades Program Team

Topic: Joanna Burger; OVERALL COMMENTS ON 2A (1 of 1), Read 17 times
NEW

Conf: Chapter 2A: Status of Water Quality in the Everglades Protection Area

From: Joanna Burger jeitner@biology.rutgers.edu

Date: Wednesday, September 14, 2005 01:31 PM

This chapter is clear, well-done, and I appreciate the references to past reports and to the literature.

1. Page 2A-10: line 167-168. How much above background is the MDL. Are the stated anywhere. Has the MDL changed over the course of these studies.
2. Page 2A-11: lines 173: Do you have a reference for using half the MDL?
3. Page 2A-11: lines 189-192: are the known chronic toxicity values published anywhere? Where? Could add a reference.
4. Page 2A-14:line 380-: the summary of past reports is an excellent idea.Might have a table showing the frequency or areas of exceedances in past years (could be useful in evaluating this years).
5. Page 2A-16 and 17: Tables are excellent.
6. Page 2A-20.lines 428-231: Is it being addressed?
7. Page 2A-21, lines 489-90: are the low alkalinity values a problem for any of the biota?
8. Page 2A-24. the investigations suggested on lines 574- should be conducted.
9. Page 2A-29. line 652 - is there any plans for a sulfate criterion?
10. Page 2A-32. What is being done about atrazine?

Topic: Comments from Ward (1 of 1), Read 20 times NEW
Conf: Chapter 2A: Status of Water Quality in the Everglades Protection Area
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Monday, September 19, 2005 10:40 AM

Chapter 2A is an evaluation of water quality in the Everglades Protection Area (EPA) based on 18 water quality constituents that did not meet water quality standards applicable to the EPA (per Section 62-302.530 Florida Administrative Code); a number of pesticides that exceeded acute and chronic toxicity levels; and a summary of sulfur status and trends. Thus, Chapter 2A provides a summary of water quality 'problems' in the EPA, not an overview of water quality status, as the Chapter title implies. As the authors state in Chapter 2A, the contents are a synoptic view of water quality standards compliance in the EPA.

The draft Chapter provides a defensible scientific evaluation of water quality standard compliance using data obtained from the SFWMD's DBHYDRO database. The binomial test, employed to determine standard compliance in the EPA, was suggested by the National Research Council (2001). Where there are insufficient data to support scientifically correct use of the binomial test, appropriate modifications are made. Use of the methods with different data sets is clearly explained in the evaluation.

Explanations of the reasons for standard violations are logical. Where explanations are not readily available, the authors clearly, and correctly, note the need for further evaluation. The discussion of the constituent-by-constituent standard violations is thorough and well presented, as it has been for several years now. This fact, as noted elsewhere in the 2006 SFER, suggests that portions of the water quality monitoring program have reached a consistency and maturity the warrants looking for ways to reduce the year-to-year descriptions of methods and simply report findings. This opportunity will be discussed in more detail later in the review.

In noting that the standard violation evaluation is limited to data located in the DBHYDRO, Chapter 2A highlights the importance of the database. This limitation also raises questions about DBHYDRO. First, why are there insufficient data to support the chosen standard compliance method in some locations? The reason appears to be due to the fact that the standard compliance evaluation reported in Chapter 2A is based on 'found data' – data not collected for the purpose for which it is being used. The authors have made adequate adjustments to scientifically accommodate inconsistencies in the data available for the assessments employed in Chapter 2A. However, the fact remains that the water quality evaluation presented in Chapter 2A is assembled from available data and, thus, is based on sampling networks and sampling processes not scientifically tailored to the information goal of standard compliance (as will be the case with the phosphorous compliance monitoring system currently being developed).

Upon closely reading Chapter 2A regarding DBHYDRO, there are assurances that the data in DBHYDRO meet a variety of QA/AC requirements, but those requirements are not explained in Chapter 2A nor are they formally referenced in the Chapter. Also, it is not clear where the data in DBHYDRO originate. The data used in the standard evaluations appear to be a subset of DBHYDRO sampling stations used for standard evaluation – is this true? Why are not all stations used? How are the selected ones chosen? Is this water quality network defined and documented? Can the network design be referenced? There is a web page noted where a reader can find a description of water quality monitoring projects – are all project data input to DBHYDRO? Would it be possible to list formal references to all the sampling and laboratory methods employed in placing water quality data in DBHYDRO and summarize, via a list, the different sources of water quality data in the database and that subset employed in Chapter 2A? Can the standard violation evaluation network design be referenced?

The methods employed in the standard compliance evaluation appear to be used consistently and, if not, changes are noted and accounted for in the conclusions presented. Assumptions, where they could potentially impact findings, are noted. For example, the assumption of a constant exceedance rate is noted on page 2A-13.

Given that WY2005 was a very unusual year in South Florida (four hurricanes and yet below average rainfall in South Florida), this reviewer wonders if the assumption of a constant exceedance rate was valid for WY2005? Chapter 5 presents a picture of a seven-week period of intense rainfall preceeded, and followed, by very low rainfall. This rapid swing between wet and dry conditions has the potential to impact standard compliance; however, there was no discussion of the strange hydrologic year on water quality standard compliance in Chapter 2A. There is a discussion of this situation in Chapter 1B.

In Chapter 2A there is reference to violations occurring where there was no flow at a station (e.g. specific conductance at sites F1, F2, and F3 – line 546) which may have been caused by the unusual hydrologic year, but this fact was not mentioned in Chapter 2A. Is it possible to discuss implications of the unusual WY 2005 hydrology to the standard compliance assessment? Chapter 1B indicates there were not many implications - why? The standard compliance trends presented do not appear to reflect much, if any, impact from WY2005 extremes. This seems unusual, especially given the impact the extreme hydrology had on phosphorous concentrations, described in Chapter 2C. Given the emphasis on the extreme hydrology condition during WY2005 in other parts of SFER, it seems strange that Chapter 2A does not discuss implications to standard compliance, if only to justify why there was little impact.

More specific questions are:

1. Is the ‘clearly documented’ (page 2A-11) excursion analysis protocol mentioned on line 179 to same protocol described in Chapter 2A? There is no reference beside the statement in line 179, thus the question.
2. In lines 186 and 187, it is not clear what are ‘other sources’? The point being made here is not clear.
3. What is the main reason(s) for excluding 1.9 percent of the data from the WY2005

Chapter 2A evaluation? Is this number higher or lower that previous years? Are efforts undertaken to reduce the data exclusion rate?
4. Is there a data screening and handling protocol that can be referenced? For example, it would help to know exactly how ‘contamination’ becomes a fatal qualifier? How is ‘matrix interference’ used as a fatal qualifier?
5. Lines 571-573 note increased variability of specific conductance measurements at interior sites in the Refuge from 2001 to 2005, but not outside the variability of the baseline years. Has the occurrence of hurricanes been correlated with the variability of specific conductance?
6. Why does the pesticide evaluation not compare WY2005 results to those of WY 2004 and a baseline period, as was done with the other constituents?

Post New Topic | Reply to: "Comments from Ward"
Watch this TopicStop Watching this Topic

Joanna Burger; OVERALL COMMENTS ON CHAPTER 2B (Joanna Burger) 9/14/2005
- *Questions & Comments* (Donald Kent) 9/21/2005
- *DOI Technical Comments* (DOI Everglades Program Team) 9/23/2005
- *Pin Hsieh* (Ping Hsieh) 9/23/2005
- *No Topic* (Donald Kent) 10/14/2005

Topic: Joanna Burger; OVERALL COMMENTS ON CHAPTER 2B (1 of 1), Read 29 times NEW
Conf: Chapter 2B: Mercury Monitoring, Research and Environmental Assessment in South Florida
From: Joanna Burger jeitner@biology.rutgers.edu
Date: Wednesday, September 14, 2005 01:36 PM

OVERVIEW

This year's Mercury Monitoring, Research and Environmental Assessment chapter (2B) is an excellent overview of the mercury problem in the Everglades, how mercury interacts with other nutrients, how the SFWMD has addressed concerns about environmental problems in the Everglades, on-going research with biota and mercury, and the new initiatives to understand mercury cycling. It clearly delineates the major problems, and what new research is needed to understand how to reduce mercury levels further, particularly in fish. 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 throughout the United States. In many areas, the mercury research program is a leader that is providing testable paradigms for other aquatic systems. The summary is excellent, and hits the highpoints. It continues to be a productive collaboration between different agencies in understanding the complex issues.
The authors are to be commended on writing a chapter that is very readable and accessible to a broad range of readers. It is written in a style that can be easily followed, and that make the main points clear. This year's summary will be particularly useful to a wide range of stakeholders, including those new to the Everglades process, although there should be more references to where naive readers can find the full documentation for some of the past conclusions and research. This year's report is readable, concise, and presents clear data. Further, the report makes the data readily accessible to scientists not previously familiar with the Everglades. They have effectively used bass and Great Egrets as bioindicators of mercury exposure, and have one of the longest running such data sets in the country from one region. The chapter accurately and fairly reflects the state of the knowledge about mercury fate and effects in wildlife.
Unlike many models to understand the fate and effects of mercury, the Everglades Mercury Cycling Model is dynamic and makes use of additional data as it becomes available. This is a key point that will increase our general understanding of mercury cycling. The suggestion that further modeling is required to understand how to reduce mercury still further is a move in the right direction.
The "previous findings" in the summary is particularly useful to provide an overview of the past mercury cycling and effects research conducted as part of the SFWMD work and reports. It highlights the critical issues and findings, especially noting the role of new atmospheric depositional mercury, the role of drying events, and the long-term trends of mercury in bass and wading birds.
The summary section on new findings is helpful to a wide range of stakeholders, from the

scientist to the general public, and highlights key issues of concern for the rest of the report. One issue identified is the importance of tracking potential mercury hotspots (even while the mercury in 3A-15 has declined). The high mercury levels in Everglades National Park continue to be a problem, and requires additional, targeted research. This clearly illustrates the importance of continued mercury biomonitoring throughout critical areas of the Everglades system. The continued high levels of mercury in bass suggest the importance of toxicokinetic modeling of mercury bioaccumulation in the fish themselves, including uptake and bioavailability.
Key issues for the mercury research program continue to be understanding the spatial pattern of mercury deposition and methylation, along with the failure of mercury levels to drop in Largemouth Bass. This problem is a more general one to some aquatic systems, and every attempt should be made to further understand this pattern. The main topics are:

1) Research Progress
2) Trends in Atmospheric Deposition of Mercury
3) Mercury in Fish
4) Sulfur Pollution

RESEARCH PROGRESS
This years research progress report is a little brief, without providing enough details on the research itself. The methods of dosing birds require more explanation, since individual birds eat different amounts of food, and thus can acquire different doses of mercury. I wonder whether breast feathers should be regularly taken to provide some indication of overall dose over the years of individual birds. Similarly, the way the atmospheric mercury studies will be supported is not clear, but this is an important and critical aspect of the overall plan. Any planned research for understanding the relation ship between mercury levels and sulfur are critical for understanding the Everglades at this point.

TRENDS IN ATMOSPHERIC DEPOSITION OF MERCURY
Understanding of the atmospheric deposition of mercury is particularly important given the role of "new" versus old mercury in the cycles of mercury. Further, understanding mercury dynamics within the system (as opposed to from external sources) continues to be a critical component of understanding mercury in biota.

MERCURY IN FISH
Understanding mercury trends in Everglades fish is one of the key bioindicators for the Everglades, and continues to be particularly important. Such information is necessary not only for understanding (and managing) the risk to fish consumers (both people and other wildlife), but to the fish themselves, as well as ecosystem dynamics. The group is to be commended on continuing this program.
A fuller discussion of the EPA 0.3 mg/kg criterion for fish should be included, along with ways to reach this goal for the Everglades. This is particularly relevant to the ENP, which continues to show high mercury levels in fish. While it makes sense the fish-eating birds and mammals are still at risk, some overall discussion of the biota particularly at risk, along with levels in these organisms should be added here. The continued high levels in

ENP require additional, targeted studies, and should be explored, particularly the role of sulfate.

SULFUR POLLUTION

The identification this year of the importance of sulfur pollution in the Everglades is an important addition. Since this dynamic is influencing mercury levels within the ecosystem, it should be highlighted with a series of studies to understand fully the dynamics. Since this problem affects nearly 30% of the Everglades, it requires additional study, including the development of a criterion and management goals to reach safe levels.

The problem of sulfate-induced eutrophication of the Everglades has risen to the fore only because many of the more pressing problems have been addressed. Yet sulfur pollution appears to be leading the changes in the internal mercury cycling, and to overall eutrophication of the Everglades, has been identified as one of the critical biogeochemical cycling issues within the Everglades. The role of sulfur in phosphorus releases should be integrated into the modelling efforts for the Everglades.

FUTURE DIRECTIONS

This years mercury chapter (2B) clearly delineates not only past findings, and current research findings, but outlines the mercury program for the future. The major issues remain high levels of mercury in fish, possible effects on wading birds, and the overall cycling of mercury in the Everglades. This requires a series of small scale (internal dynamics, species-specific studies) as well as larger scale mercury modelling (Third generation analysis of mercury transport and fate). These studies are essential to both our understanding of mercury dynamics within the Everglades, and to the maintenance of healthy animal populations. This will also require studies on particular problems, such as the high levels of mercury in the ENP, this high levels of mercury in fish, and the possible effects on wading birds.

The identification of mercury in coastal waters is an important new direction, particularly since the waters of the Everglades flow into the coastal systems. Understanding the dynamics of this interface are critical not only for the Everglades, but for the coastal ecosystems of South Florida.

QUESTIONS

2B-4, lines 119-123: Any reasons for the THg concentrations in rainfall were elevated?

2B-5, lines 160. I am not sure saying the hotspot has re-located is correct, since the mercury did not move somewhere else, but rather conditions changed so that there is now a hotspot there.

2B-5, lines 166-169: Is there any way to predict the sulfate concentrations and limit the amount of New water to the ENP?

2B-5, lines 182-187: Who has the final authority on mercury-related decisions?

2B-6: lines 198-202. What is the causal relationship here; it is correlational that breeding bird numbers follow patterns methylmercury is it not?

2b-6, lines 213-218. Exactly how is dose being calculated, since the dose in the prey fish may be controlled, but not how much food the individual birds eat. Birds vary, and some measure of dose for the birds has to be determined on a regular basis.

2B-7. lines 250: What is the scale
2B-7, lines 281-282: What is the basis for the statement that sulfate trends have a greater effect than atmospheric mercury, this needs to be explored, references, and discussed further.
2B-14. lines 376-377. Need a fuller description of the USEPA 0.3 mg/kg criterion, and how this could be met.
2B-18. What additional studies will be undertaken to examine the continued high levels of mercury in ENP. The role of sulfate needs further examination.
2B-20. lines 468-469. Exactly what is meant by an imbalance of flora and fauna. This requires both references and data. What are the trends in the "balance" and how can this be measured in the future.

RECOMMENDATIONS
1. The long-term data sets on mercury in bass and wading birds is important and invaluable monitoring dada for the Everglades, and should continue. However, a similar monitoring plan for sunfish and other prey fish would be helpful in understanding the patterns of these higher trophic levels.

2. A micro-emissions inventory of South Florida should be encouraged.

3. Increase studies aimed at understanding further the relationship between sulfur and mercury concentrations.

4. Devote resources to studies of the eutrophication of the Everglades, particularly the sulfate-induced eutrophication.

5 The research reported should clearly state the hypotheses being tested, the methods, the expected outcomes, and how it will help manage the Everglades system.

Post New Topic | Reply to: "Joanna Burger; OVERALL COMMENTS ON CHAPTER 2B"
Watch this TopicStop Watching this Topic

Topic: Pin Hsieh (1 of 1), Read 23 times NEW
Conf: Chapter 2B: Mercury Monitoring, Research and Environmental Assessment in South Florida
From: Ping Hsieh yhsieh@famu.edu
Date: Friday, September 23, 2005 04:20 PM

Chapter 2B is one of the most organized and informative chapters of the report. The mercury study of the EPA contributes significantly to our understanding of mercury cycles in the EPA. This year's report basically is an update to the previous findings and present supporting data and information on the mercury findings in the EPA.

L26-29. Do you know why newly deposited Hg is more bioavailable than the native (old) Hg? By what criteria you define new and old? Or when a 'new" Hg turns to "old"?

L68-69. What are the sources of Hg originated from South Florida?

L417 Stable isotopes of S may be a useful tracer to the source and pathways of Hg cycles. What are the delta S34 values of the surface water, atmospheric deposition and sediments?

L428-429, 474-475. Sulfur is also a major nutrient following N and P.

L472, Does drying and wetting cycles in the EPA cause also "internal eutrophication" of P? Oxygen is a much more powerful electron acceptor than sulfate.

Joanna Burger; COMMENTS ON CHAPTER 2C (Joanna Burger) 9/14/2005
- *Comments from Ward* (Jeff Jordan) 9/19/2005
- *Ping Hsieh* (Ping Hsieh) 9/20/2005
- *DOI Technical Comments* (DOI Everglades Program Team) 9/23/2005
- *Additional DOI Technical Comments* (DOI

Topic: Joanna Burger; COMMENTS ON CHAPTER 2C (1 of 1), Read 22 times NEW
Conf: Chapter 2C: Status of Phosphorus and Nitrogen in the Everglades Protection Area
From: Joanna Burger jeitner@biology.rutgers.edu
Date: Wednesday, September 14, 2005 01:38 PM

Overall this is a clear chapter that describes information on phosphorus and nitrogen. The summary is clear, although it would be helpful to synthesize the information on phosphorus, nitrogen, sulfur and mercury within the Everglades. The information on the Total Phosphorus (TP) criterion is very helpful, and will be an excellent starting point for future analyses of overall water quality, and status and trends within the Everglades. The group is to be commended for clearly defining and describing this process. Some of the main points could be more clearly made with some summary tables, and in places, references to past findings from the Everglades or elsewhere should be added. However, the monitoring program or network is essential to understanding TP levels, and it would help readers if there were a general description of the planned program. The inclusion of web sites where information can be obtained is very helpful, and should be encouraged for various aspects of the overall program. Some further explanation of the very large TP exceedances under hurricane conditions may need some further explanation, as well as the short-term effects that might have long-term consequences. This leads to the issue of the placement of monitoring stations, which at present do not provide adequate coverage of the EPA because they are not evenly distributed. The district should consider whether there are places where such monitoring is required, and additional stations are needed.

QUESTIONS FOR CHAPTER 2C
page 2C-2. lines 51-53. When will the monitoring network be set up and described.
page 2C-7, line 242. Where is the justification for use of the geometric mean (it is a very good idea, but future readers will want to see an overall description).
page 2C-10. lines 361-378. The opposite effect is clear, but a little more explanation would be helpful.
page 2c-15. lines 392-395. How are you going to deal with these very large exceedances?

page 2C-19. I wonder if a table with the relative TP values and exceedances would be useful.
page 2c-23. the question of atmospheric deposition of phosphorus should be references, and described more fully.
page 2c-26. line 625. How often are there years where compliance will not be tested. How often are these limits true?
page 2C-27, line 649. How significant, for what, and what are the implications.

Topic: Comments from Ward (1 of 1), Read 21 times NEW
Conf: Chapter 2C: Status of Phosphorus and Nitrogen in the Everglades Protection Area
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Monday, September 19, 2005 10:41 AM

Given the critical role phosphorus plays in the Everglades ecosystem, the constituent has been singled out for the establishment of a site-specific numeric phosphorous (P) criterion for the EPA. Thus, Chapter 2C is an update on P criterion development as well as an overview of the status of phosphorous and nitrogen levels in the surface waters within the EPA during WY2005.

A phosphorous (P) criterion has been proposed for the EPA, debated and reviewed extensively, and finally approved by the U.S. Environmental Protection Agency in July 2005. The criterion includes an assessment methodology that carefully and logically defines a violation of the criterion, given the current understanding of the role of P in the Everglades ecosystem. A monitoring program is currently being designed to implement the P criterion assessment.

The status of P levels reported in Chapter 2C does not address whether the new P criterion is met (since the new criterion assessment methodology is tied to a specific monitoring program design which is not yet operational – the P assessment will not use 'found' data, apparently). Rather the P assessment utilizes some of the provisions of the criterion as a basis for the evaluation. The effort of Chapter 2C authors to bridge the annual P assessment, using previous methods, to the new P criterion methodology is helpful and appreciated. The opportunity to examine the results of Chapter 2C, using some provisions of the new criterion, assist in understanding the challenges facing those designing the P monitoring program. For example:

1. The 32 percent of sites over the entire EPA, being at or below 10 µg/L P, indicates that the current sample site locations, included in the 2006 update, emphasize areas with high concentration of P (relative to the monitoring program that will determine criterion compliance in the future).
2. On page 2C-21, it is noted that WY2005 P concentrations across all areas and classes of sites were higher than those for WY 2004 and were within the range exhibited during the historical record.
3. The two observations above indicate the importance and sensitivity to designing the P monitoring program to check compliance with the new P criterion. Is it possible to provide an update on progress in designing the P criterion compliance monitoring program?
4. Given the comparison of P levels with historical trends, will the stations in the new P monitoring program include some existing stations, to take advantage of historical trends, or will they all be new stations?

The data used in Chapter 2A and 2C come from two separate databases: DBHYDRO and

the SFWMD's Everglades Research Database. What is the distinction between the two databases? Is DBHYDRO storing only operational data while the research database stores all research data, or does the research database store only data from the nutrient gradient sampling stations?

The explanation of the extreme hydrologic events of WY2005 on P concentrations and trends is well done and helpful.

The TP loads to the EPA during WY2005 are noted as being significantly lower than the 1979-1988 baseline period (lines 632-634), yet the loads to the Refuge during WY 2005 are 252% greater than the previous year (lines 653-655). Did reductions in loadings between 1988 and 2004 cause the differences in the above two statements?

Appendix C of the Settlement Agreement identifies several assumptions expected to reduce 80% of TP loads from the EAA to the WCAs (lines 592-597). Would it be possible to develop a table that concisely states progress on each desired performance result, using P concentrations? This would streamline conveying the information regarding load reductions.

When a TP load to the Refuge increases 252% percent in one year, what are possible long-term consequences to future P concentrations in the Refuge?

At several places in Chapter 2C there is a statement that future evaluations of P status in the EPA will result in an expansion of Chapter 2C to provide a more detailed evaluation of P levels in the EPA, consistent with the requirements of the final criterion rule. Question 5 in the Peer Review Panel's Statement of Work requests guidance on how to optimize the reporting process and maintain value at minimal cost. Thus, the question arises – is it possible to include in the new P monitoring program design a carefully developed, streamlined method for reporting the resulting information about P criterion compliance. It appears that the extensive efforts behind developing the P criterion produced well developed and documented protocols for defining criterion compliance. Such specificity permits automation of data analysis, interpretation, and reporting of compliance, thus possibly reducing the staff time required to prepare the current Chapter 2C. There is still a need for the staff to explain the violation findings, but more time can be devoted to this very important interpretation task if time performing more routine tasks is automated. In addition, the monitoring design could be peer reviewed further insuring that the automation of the process is well grounded in science and is well understood and transparent.

If the above streamlining of P reporting could be achieved, perhaps the need for a separate nutrient sub-chapter in the SFER could be eliminated.

Post New Topic | Reply to: "Comments from Ward"
Watch this TopicStop Watching this Topic

Topic: Ping Hsieh (1 of 1), Read 17 times NEW
Conf: Chapter 2C: Status of Phosphorus and Nitrogen in the Everglades Protection Area
From: Ping Hsieh yhsieh@famu.edu
Date: Tuesday, September 20, 2005 02:43 PM

The material in this chapter is quite important in my view, because phosphorus concentration is the focal point of the Everglades restoration. The authors did a good job on presenting an overview of the status of P and N in the surface water of EPA. The chapter gives the account of how the 10 ppb P criterion was approved (and challenged) on a legal and administrative aspect but not on a scientific aspect. It would be good to discuss more on the scientific aspect of the criterion as well. Following are my specific comments:

1. What is “geometric means”? Is there any advantage to use geometric means over arithmetic means? Why do you use geometric means on P but arithmetic means on N?
2. The Summary is too lengthy (4.5 single-space pages) to serve the purpose of a summary. Could it be shortened to half a page?
3. L367, This and other places in the chapter explain the increase of P in the inflow during dry out period was due to the oxidation of the peat. Is there any evidence for that? Other factors, e.g. ET could also concentrate P in water.
4. Why didn’t P concentration of inflow and interior water synchronize? Does it mean that interior water do not mix well with inflow water? (i.e., inflow water short circuit to the outflow?) Or does it mean that the volume of inflow is relatively small compared to the total storage of the interior water? Notice that the P concentration in ENP was synchronized in the inflow and the interior.
5. Is it possible to calculate the mass-balance of P fluxes among different components of EPA, including the interior? P flux in the interior, in comparison to the inflow and out flow fluxes, is quite important to gain a better picture of the P status in the EPA.
6. L417-434. Dry out could increase P concentration simply by ET.

7. L653-667, How does this amount of TP compare to the total storage of P in the water column of whole EPA?

8. N/P ratios in the EPA indicate that even under the high P concentration conditions, N is still highly excessive. What does this imply to the N transportation in the EPA?

9. Fig. 2C-8-10, Why didn’t N follow the trend of P in the WCAs?

Comments by Ward (Jeff Jordan) 9/22/2005
Comments from Dr. Armstrong (Linda Davis) 9/22/2005
DOI Technical Comments (DOI Everglades Program Team) 9/23/2005
FDEP Comments on Chapter 3 (Ken Weaver) 9/29/2005

Topic: Comments by Ward (1 of 1), Read 39 times NEW
Conf: Chapter 3: Phosphorus Controls for the Basins Tributary to the Everglades Protection Area
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Thursday, September 22, 2005 08:34 AM

1. Chapter 3 provides an update on progress of the Everglades Program in controlling P in discharges tributary to the EPA. On page 3-14, the Basin Compliance Determination seems to have been based on data from a subset of 39 water control structures, which during this past year were reduced by 18. Were any of these 18 sampling sites part of the sampling used in the past to measure compliance? How did the removal of possible sampling sites impact the compliance determination? It is not clear how the sampling sites might have changed due to the changes in the control structures.
2. Is the monitoring program used to determine Basin Compliance documented? Is there a reference to this design?
3. How are the EEA Basin TP loads (presented in Table 3.5) determined – average all samples together for one mean load?
4. How was consistency between WY2004 and WY 2005 maintained in the compliance determination with STA-3/4 omitted in the WY 2005 calculations (per the note at the end of Table 3.5)?
5. How is the consistency maintained for all assessments in Chapter 3 if changes in the monitoring system are occurring? How do you know that the changes you are seeing are not measuring changes in the monitoring program and not changes in EP?

Topic: Comments from Dr. Armstrong (1 of 1), Read 41 times, 1 File Attachment NEW
Conf: Chapter 3: Phosphorus Controls for the Basins Tributary to the Everglades Protection Area
From: Linda Davis ldavis@sfwmd.gov
Date: Thursday, September 22, 2005 12:47 PM

CHAPTER 3 COMMENTS NEA 09222005.PDF (24KB)
Comments from Dr. Armstrong

Post New Topic | Reply to: "Comments from Dr. Armstrong"
Watch this TopicStop Watching this Topic

CHAPTER 3: PHOSPHORUS CONTROLS IN BASINS TRIBUTARY TO THE EVERGLADES PROTECTION AREA (AA, Neal Armstrong)

This chapter provides a summary of the progress being made in controlling phosphorus in discharges tributary to the Everglades Protection Area through the use of BMPs and other means in the Everglades Agricultural Area and the C-139 basins, the largest tributary sources to the EPA. Significant progress has been made in reducing phosphorus loading leaving the EAA with the implementation of BMPs, and, based on this report and previous SFER reports, the District appears to be continuing an aggressive program to reduce phosphorus loads as needed to meet regulatory provisions. The BMP "equivalents" program continues to be an innovative way to incent BMP implementation to achieve necessary phosphorus load reductions, and it is maturing with use and experience gained through application. Further, the District has mounted a research program to determine the effectiveness of BMPs for phosphorus control so that the scientific basis for future decisions is strengthened.

Phosphorus load reductions have been most impressive within the EAA, and the C-139 basin is showing hints that TP reduction is being achieved there as well. Still, the TP management approach the District is using appears to be effective.

As suggested in the reviews of the 2004 and 2005 SFERs, the District has added information about other sources of phosphorus in the source basins and phosphorus control activities for them. This information is helpful to understand the major and minor sources of TP and the priorities for dealing with them.

Specific comments are below for the major sections noted.

SUMMARY

SECTION I: EVERGLADES REGULATORY PROGRAM – ECP BASINS

OVERVIEW

EVERGLADES REGULATORY PROGRAM: EAA BASIN

EAA Basin Best Management Practice Plans

p. 3-13, Table 3-4: The BMP "equivalents" were the subject of much discussion in 2004 for the 2005 SFER. While an innovative basis for BMP implementation, it would be useful to periodically review the "equivalents" assigned to each BMP in light of additional experience gained with and effectiveness found for each BMP. Have there been any attempts to validate the "equivalents" for any of the BMPs or to revise the Appendix 3-1 list based on data gathered and a re-evaluation by an expert panel?

EAA Basin Compliance Determination

p. 3-16, Table 3-5: As was found when reviewing the 2005 SFER, there is still confusion over the baseline period used in this table and in Figure 3-7. In Table 3-5, the baseline period is 1979-1988 whereas in Figure 3-7 it is shown as 1978-1988. Can this be clarified?

p. 3-16, Table 3-5: The actual WY2005 TP concentration of 124 ppb is significantly above the three-year flow-weighted mean TP concentration. Has an explanation for this high value been developed? There are a number of references to the point that the hurricanes experienced in 2005 did not produce much effect in the study area, so is there some other explanation for this high TP concentration?

p. 3-17, lines 446-449: It is noted that the TP concentrations leaving Lake Okeechobee for the EAA are typically higher than those leaving the EAA. This is a somewhat remarkable observation assuming that agricultural activities within the EAA would generate significant TP loads and concentrations, and I would assume it is due to the effectiveness of the BMPs being applied within the EAA as well as to TP loads to and/or processes within Lake Okeechobee that result in TP concentrations that are perhaps elevated more than might be expected.

p. 3-19, Table 3-6: More information is needed to be able to replicate the calculations that result in the data presented in this table. For example, the Three-Year Average Phosphorus Load % Reduction is apparently not based on the WY Annual Calculated Phosphorus Load % Reduction; thus, how is it calculated. How is the three-year averaging done – is it a simple or weighted three-year average? does the average represent the current and previous two years, the current, previous, and next year, etc.? is it flow-weighted? More elaboration (including equations as appropriate) in the text for these calculations is desirable.

p. 3-20, Table 3-7: The 59% TP reduction for WY2005 cannot be reproduced using the 124 mt observed TP load. Apparently the 124 is actually the TP concentration (in ppb, see Table 3-6), and the TP load should be the 182.3 mt shown in Fig. 3-4.

p. 3-20, Table 3-7: Can an explanation be added to the text that would clarify how the Predicted TP load is calculated? Again, equations would help.

p. 3-22, Fig. 3-4: Text appears to be missing in the label box that contains “Base Line 444”. Also, “Base Line” should be “Baseline”.

p. 3-23, Fig. 3-5: Text appears to be blocked by the outline of the box surrounding the label “WY05 59% 182 mtons”.

p. 3-24, Fig. 3-6: What are the units on the “Y” axis? If it is cumulative percent reduction, it will be hard to conceptualize. An alternative would be to use cumulative mt of TP actually removed vs. the minimum amount that must be removed – units that can more easily be conceptualized.

p. 3-26, lines 530-537: Is there enough information available from the audits performed by FDEP on the various laboratories performing laboratory analyses so that some QA/QC statistics could be provided? For example, what is the distribution of laboratory performance on known constituent standards? on TP? What percent of the laboratories do not meet QA/QC requirements

of FDEP? For laboratories that are out of compliance, what action is taken by FDEP to bring them into compliance?

p. 3-27, Fig. 3-8: There is no discussion in the text of the lb/acre (these are really lb/acre yr) TP load values for farms in the EAA compared to values found elsewhere both in Florida and out of state. Yet my impression is that TP loads of 1 lb/acre and lower are quite good. Thomann and Mueller (1987) report agricultural loads of TP at 1.0 lb/mi^2 yr (or 1.75 lb/acre yr). Clearly there is more to be done to lower the TP loads from some of the farms. Adding some more recent data for TP loads from agricultural areas for comparison would be useful

Long-Term Plan Update for the EAA Basin

p. 3-32, lines 654-670: the long-term plan objectives for the EAA basin appear to be very sound and a good approach.

Update on BMP Research

p. 3-32, lines 692-702: Research results on BMP efficacy is yielding important results based on this information. Water management would naturally be important since flow drives load, but information about crop management, and the role of particulates in TP export are also very important. Regarding the latter (in-stream biological growth), this may be the District's biggest challenge. Significant experience has been gained in this country by the U.S. Army Corps of Engineers on controlling vegetation in canals and abroad in England and Europe where these problems persist as well, and it may benefit the District to mount an aggressive review of the experience elsewhere to learn control methods that may be of benefit.

p. 3-33, lines 703-743: The proposed research program to continue learning about BMPs and their effectiveness is applauded. While no mention is made of looking at experience elsewhere, I assume that the research team will indeed take advantage of the extensive experience gained with BMPs across the country. To be sure, on-site BMP experience will be the more valuable, there is still much to be learned about BMP effectiveness in agricultural areas elsewhere.

EVERGLADES REGULATORY PROGRAM: C-139 BASIN

C-139 Basin Best Management Practice Plans

p. 3-36, lines 772-782: It is not clear here and in the text elsewhere in this section whether the use of BMPs is a periodic implementation or whether once a BMP is put into place it must be maintained permanently.

C-139 Basin Compliance Determination

C-139 Basin-Level Monitoring Results

p. 3-37, lines 851-859: It is not clear how "target" and "limit" loads are to be used.

p. 3-40, Table 3-11: The 80% Confidence Interval in % values need to be checked. Minus confidence interval % values are difficult to comprehend.

p. 3-41, Table 3-12: Shouldn't the WY03 through WY05 period be shown as the BMP Implementation period? It is shown that way in Figure 3-12.

C-139 Permit-Level Monitoring Results

Long-Term Plan Update for the C-139 Basin

p. 3-43, lines 943-993: the long-term plan objectives for the C-139 basin and the comprehensive plan for WY2005 appear to be sound and should yield very useful information for controlling TP.

SECTION II: EVERGLADES STORMWATER PROGRAM – NON-ECP BASINS

OVERVIEW

p. 3-45, lines 1036-1041: The Everglades Stormwater Program appears to be an excellent approach for the non-ECP areas, and the balance of this section reflects a significant amount of work being done to control TP.

WATER QUALITY IMPROVEMENT PLANS

SCHEDULES AND STRATEGIES OF WATER QUALITY IMPROVEMENT PLANS IN ESP BASINS

ACME Improvement District Basin (Village of Wellington)

North Springs Improvement District Basin

C-11 West Basin

North New River Canal Basin

p. 3-67, lines 1690-1693: What is the purpose of the aquatic vegetation removal, and, given that purpose, how effective is mechanical harvesting in achieving that purpose?

L-128 Basin

Boynton Farms Basin

C-111 Basin

WATER QUALITY MONITORING AND ANALYSIS FOR QY2005

EVERGLADES STORMWATER PROGRAM FINDINGS AND FUTURE DIRECTIONS

p. 3-85, lines 2262-2269: Achievement of very low TP levels is very difficult, especially for stormwater flows which are high and which generate high particulate and hence high TP concentrations. At some point, the desired levels of TP will be achieved or the District and FDEP will have to decide whether such low TP concentrations are achievable and at what cost. What thought has been given to the basis for making such a decision?

Joanna Burger; OVERALL COMMENTS ON CHAPTER 4 (Joanna Burger) 9/14/2005
Ping Hsieh (Ping Hsieh) 9/16/2005
DOI Technical Comments (DOI Everglades Program Team) 9/23/2005
Comments from Dr. Armstrong (Linda Davis) 9/26/2005
FDEP Comments on Chapter 4 (Ken Weaver) 9/29/2005

Topic: Joanna Burger; OVERALL COMMENTS ON CHAPTER 4 (1 of 1), Read 28 times
NEW

Conf: Chapter 4: STA Performance, Compliance and Optimization

From: Joanna Burger jeitner@biology.rutgers.edu

Date: Wednesday, September 14, 2005 01:40 PM

1. Table 4-1 is very useful, and where possible, similar tables should be presented for other operations aspects (e.g. pesticide and mercury levels).
2. What effect did the hurricanes have on pesticide and mercury levels in the STAs?
3. References to the web pages to find particular documents is very helpful.

Topic: Ping Hsieh (1 of 1), Read 24 times NEW
Conf: Chapter 4: STA Performance, Compliance and Optimization
From: Ping Hsieh yhsieh@famu.edu
Date: Friday, September 16, 2005 04:47 PM

This chapter is a well written factual description of the performance, compliance and optimization of the STA. The general performance of the STA in removing P loading is surprisingly good in my opinion. That is, operation of the STA has been a success in that P has been effectively and continuously removed from the water column and stored in the sediment. The central questions need to be answered now are: What is the main mechanism responsible for the P removal process of STA? And can this P removal process be continuous and effective on a long-term basis? As the experience of operating the STA grows, more data critical to the answers of the above mentioned questions should be available for analysis. The task should be achievable in the near future with well-planed research and analysis. Following are my specific comments on the chapter:

L84, add “of water” to the end of the sentence.

L133, Table 4-4, Is there a safety range of parameters build in to the design of the STA? If the answer is “yes”, what are the values?

L166-180, It seems to me that the vegetation management in the STA is geared toward the establishment of SAV. Is SAV more desirable than emergent AV? Is there any explanation to that effect? Also, what is the diurnal pattern of pH and DO associated with SAV establishment and how does that affect the P removal efficiency of the STA?

L587, Table 4-8, Does the establishment of SVA increase the DO during day light?

L755, The blank needs to be filled.

L883-889, How does the patchiness of vegetation affect the flow in STA? Is this vegetation factor on flow characteristics being considered in the optimization of STA?

L1018-1026, STA-3/4 seems to perform very well on P removal. Is STA-3/4 passed the stabilization period? It isn’t it just operational not long ago?

L1196-1203, What is the goal of vegetation management in STA-5?

L704, Fig. 4-44, Are those points from just one year’s data? How does the figure look if all available data is plotted?

Fig. 4-45, The P load removal decreases significantly in recent years in the STA-1W. What is the explanation? Is it due to aging or other factor(s)?

L1764-1769, As far as I understood, most wetlands are extremely flat. What is the resolution and precision of your vertical survey? mm or cm?

L1816-1825, It is critical, with regard to the long-term operation of STA, that you find out the main mechanism that controls the P removal in STAs.

L1815-1848, It is very important and critical to find out the major mechanism that control the P load removal in STAs. The task should not be taken lightly. The answer to the question could have great impacts on the constructed wetland technology and wetland ecology in general.

L1863-1866, Why? I thought intense increase in photosynthesis of SAV should increase pH by reducing the dissolved CO2 in the water column. This pH increase has nothing to do with alkalinity because changing CO2 concentration in water does not change alkalinity (it changes only pH). Changing cation concentration, such as that of Ca, Mg or Na, does.

L1899, Table 4-21, The expression of column 5 (Inflow TP stored in floc, %) is kind of misleading. In a matter of mass balance, I do not understand how can you store 23% more than what you have deposited? (I would like to learn how to play this trick on my checking account.)

Post New Topic | Reply to: "Ping Hsieh"
Watch this TopicStop Watching this Topic

Topic: Comments from Dr. Armstrong (1 of 1), Read 19 times, 1 File Attachment
NEW

Conf: Chapter 4: STA Performance, Compliance and Optimization

From: Linda Davis ldavis@sfwmd.gov

Date: Monday, September 26, 2005 07:14 AM

CHAPTER 4 COMMENTS NEA 09252005.PDF (11KB)
Comments from Dr. Armstrong

Post New Topic | Reply to: "Comments from Dr. Armstrong"
Watch this TopicStop Watching this Topic

CHAPTER 4: PERFORMANCE, COMPLIANCE, AND OPTIMIZATION OF THE STORMWATER TREATMENT AREAS (A, Neal Armstrong)

It is clear from the information presented that the District is using STAs in an effective manner, that the STAs are performing well overall, that continual attention is being given to the maintenance f these facilities, and that significant research is being done to better understand the performance of each STA and to use that information to improve the design and operation of them all.

As noted in comments submitted last year, the STAs are essentially wet detention ponds being used to remove phosphorus from flows from the EAA and other areas. For phosphorus, these systems rely on physical, chemical, and biological mechanisms to achieve removal. The mechanisms are affected by flow and volume management in the ponds, dissolved oxygen conditions at the sediment/water interface, and other factors. There is considerable literature information on the principles of detention ponds, their application to stormwater treatment, and their design and operation. It was recommended that the design principles the District uses to establish these STAs originally and the operational principles being followed to insure their continued performance at levels and efficiencies expected be included in this chapter, and much of that type of information has been added.

It was also noted that while these STAs are being operated, it seems that information such as hydraulic, organic material, and nutrient areal loading rates, dissolved oxygen concentrations within the STAs, water depths, detention times, and other operational information could be gathered and related to phosphorus removal. Such information would enhance the design and operational basis for these ponds and future ones and assist the District in managing these ponds effectively. This information was being gathered and is presented in some detail in this chapter.

There is now the opportunity to relate areal loading data to STA TP removal performance, and this can be done for example with the data in Table 4-1. Plotting TP loading rate vs. percent removal of TP, there is a trend of decreasing removal with increasing loading. This trend can be tested with WY2005 TP loadings which were significantly higher than WY2004.

Based on removal trends shown in Figure 4-45, there is also an opportunity to examine STA TP removal efficiency over time as the sediments reach their sorptive capacity. STA-1W and STA-5 both show consistent trends downward in their ability to remove TP. It is good to see that studies are beginning to look at this possibility (Lines 1815-1825).

- *Comments from Ward* (Jeff Jordan) 9/19/2005
  - *Comments from Ward* (Wossenu Abtew) 9/23/2005
- *Ping Hsieh* (Ping Hsieh) 9/20/2005
  - *Ping Hsieh* (Wossenu Abtew) 9/23/2005
- *DOI Technical Comments* (DOI Everglades Program Team) 9/23/2005

Topic: Comments from Ward (1 of 2), Read 24 times NEW
Conf: Chapter 5: Hydrology of the South Florida Environment
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Monday, September 19, 2005 10:41 AM

Chapter 5 presents an excellent overview of South Florida's hydrology for WY 2005. The year's extreme hydrologic events challenged the authors of Chapter 5, but the description is well developed and documented.

Four hurricanes impacted South Florida in WY 2005 but the average rainfall was below average! The timing of the rainfall varied greatly over the year and District area.

Is documentation for the SFWMD hydrometeorologic monitoring presented in the report by Crowell and Mtundu (2000). The title of the reference is noted as being QA/QC, not a full monitoring program design, thus the question. Is the hydrometeorologic monitoring design based on regulation schedules (line 1121-1123) that guide operation of the pump facilities? Has the hydrometeorologic monitoring design been peer reviewed? How does one access the design? Does the design describe the monitoring network (measuring where, when, and how)? Or are the multiple designs, each project with its own hydrometeorologic network?

Why are the outflows of Lake Okeechobee for WY 2004 and 2005 so much above average (2,832,700 ac-ft and 2,617,958 ac-ft, respectively, compared to the historical annual average of 1,445,558 ac-ft) when the rainfall for WY2004 and WY2005 is close to average? Is it due to the timing of the rainfall over the water year?

Did the ENP flows in WY2005 satisfy the 'Rain-Driven Water Deliveries Plan'?

In the spirit of streamlining the 2007 SFER, the authors of Chapter 5 have reduced their descriptions to current data and findings. It is hard to see how Chapter 5 could be reduced further and still achieve its information goals. However, there are graphing devices that might help convey water flow information more concisely, such as the snake diagrams denoting flow volumes between areas of South Florida where the width of the snake indicates flow volume. There also may be some background hydrology explanations that could be removed to a common location if they were readily available on the web, thus shortening the descriptions.

Conclusions

The South Florida Water Management District manages water quantities, as well as related attributes such as water quality and ecosystem health. It appears that water quantity management (i.e. water supply and flood control) are the core operations of the District. Thus, Chapter 5 is a key description related to the core function of the District.

Furthermore, a number of times during the discussion in 2C there are explanations of the extreme hydrologic events and the impacts they had on P concentrations. Unfortunately, Chapter 5 is where the explanation of the hydrologic events is presented. In reviewing the two Chapters, it was necessary to read Chapter 5 first. In support of putting more logic into the sequencing of the Chapters, would it be possible to move the hydrology discussion before the water quality findings are presented?

Topic: Ping Hsieh (1 of 2), Read 16 times NEW
Conf: Chapter 5: Hydrology of the South Florida Environment
From: Ping Hsieh yhsieh@famu.edu
Date: Tuesday, September 20, 2005 02:46 PM

This year's chapter is well written and containing a lot useful information available to various users. For example, Fig. 76 is a great summary for a large part of the chapter and would be very useful to many end users. One important information missing in the chapter that came to my mind was the mean residence time (MRT) of the surface waters. I imagine that MRT of various part of the EPA would be quite different. Significant variation in MRT of surface water could explain many phenomena observed in the EPA. Understand MRT of various parts of an area could also provide important clues for understanding flow anomalies and improved management practices. Determining MRT may be a difficult task though. Tracer study such as that conducted in the STA may be able to help solving the problem.

Joanna Burger; OVERALL COMMENTS ON 6 (Joanna Burger) 9/14/2005
General comments by J. Burkholder (JoAnn Burkholder) 9/16/2005
Ping Hsieh (Ping Hsieh) 9/21/2005
Don DeAngelis's comments (Donald DeAngelis) 9/23/2005
DOI Technical Comments (DOI Everglades Program Team) 9/23/2005
Additional DOI Technical Comments (DOI Everglades Program Team) 9/23/2005

Topic: Joanna Burger; OVERALL COMMENTS ON 6 (1 of 1), Read 22 times
NEW

Conf: Chapter 6: Ecology of the Everglades Protection Area

From: Joanna Burger jeitner@biology.rutgers.edu

Date: Wednesday, September 14, 2005 01:44 PM

This is an extremely useful chapter, much improved over last year. It could be improved by making the connections to the CERP clearer for each project. Overall the report is clear and concise, and addresses the concerns raised in the 05 report. In response to comments from the 05 report, there is substantial documentation (citations) to previous work. There is still a need to relate the specific research to the goals of CERP - how are the data used in short and long-term goals? how are the data used in the "weekly" management meetings? what operations depend on ecological data?

The restoration of the Everglades has as a primary objective the establishment of an ecosystem with appropriate structure and functions. One goal of restoration was to restore, to the extent possible, the natural hydrology of the Everglades, which in turn would restore appropriate structure and function. The SFWMD operations, regulations, monitoring, and science are directed toward restoring the Everglades within the human-dominated South Florida ecosystem, including understanding and managing the hydrology, ecology, nutrient and contaminant patterns. The ecology research group conducts studies on wildlife ecology, plant ecology, ecosystem ecology, and landscape ecology within a framework of the hydrology of the Everglades. The organization of the last several reports around these four topics has resulted in continuity and allowed building on previous studies to understand the Florida Everglades.

This chapter summarizes their on-going work in these disciplines. The overall research program is excellent, and the studies are key to improving understanding of the function and structure of the Everglades. The authors are to be congratulated on an excellent series of studies, and on their attention to all levels of biological organization from individuals to landscape issues. Understanding the natural ecological processes in the Everglades is an extremely important aspect of the overall work, particularly since so many of the chapters address contaminants and other human-induced changes, or management aimed at correcting anthropogenic forces. Basic ecological work is now essential to understanding the structure and function in its pristine form.

Further, their continued interest in designing experiments within each discipline to move the science and management further along is to be commended. This scientific strategy leads to adaptive management whereby experiments move the science forward at the same time as answering mechanistic questions that can be used for planning and management. The addition of 31 benchmarkers is an important step forward and will provide a method of examining a whole range of ecological questions that should be explored more fully now, at the beginning.

Ecology by its very nature involves involved and complex relationships, making it difficult to demonstrate clear-cut cause and effect relationships. Thus the SFWMD approach of addressing particular indicators of the health of the system is appropriate, although a full

description of this rationale would help (this information is in previous reports, but difficult for someone to find as it is in several places). 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: hydrological patterns for 2005, wading birds, prey species for wading birds, flood tolerance of tree seedlings, tree islands, and soil mapping. Restoration of the Rotenberger Wildlife Management Area continues to be a key project.
Since hydrology is the underlying driver for many of the ecological processes in the Everglades, it is described in some detail. 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 field and in the laboratory. Further, a long-term data set for the Everglades provides the opportunity to evaluate long term effects of hydrology. Experiments and data collection to understand the prey base for wading birds provides another level of understanding of the effects of hydrology on wading birds. Seedling tolerance to flooding is a key factor for ecosystem management. Tree islands are important features of the Everglades that must be preserved and re-established, and further examination of elevation and hydrology will help predict future tree island presence and ecology. Finally, understanding of soil types is a critical component of the hydrology and ecology.

The chapter examines four key areas:

Wildlife
Plants
Ecosystem
Landscape

SUMMARY AND INTRODUCTION
The summary and introduction of Chapter 6 are well-done, and provide both an excellent overview of the research, as well as an introduction to the details that follow. While the summary states that the research relates to SFWMD operations, regulations, permitting, environmental monitoring, Everglades Forever mandates, CERP, it is not clear how. It would be useful to know how the data from the ecology group is used in the "weekly" management meetings and decision-making.
Within each research section in the summary, it might help to give the reasons for the findings. For example, why (in once sentence) did wading birds decline. Explaining the relationship between some variables would help - such as explaining the relationship between nonindigenous fish/indigenous fish/wading bird foraging.

WILDLIFE
This years wildlife section not only focuses on numbers, dispersion, and nesting success of wading birds, but begins to explore the underlying mechanisms of dispersal and success. Three topics were examined: crayfish habitat selection by water levels, distribution of macro-invertebrates in hard and soft water marshes, and nonindigenous fish. All are critical to understanding wading bird ecology, and the group is to be commended for this research. Another aspect that should be explored in the future is the causal relationship between indigenous and nonindigenous fish (i.e. are the nonidigenous fish filling different niches or taking over those of the indigenous fish).

Wading birds have always been a key indicator group for the Everglades, in the minds of scientists, regulators, and the general public. Further, there is extensive data for the East Coast. Nesting waders, and their reproductive success, are used as indicators of the progress of the Everglades restoration effort, and will continue to be so in the future. There was a general decrease in the number of waders nesting in the Everglades, partly because of poor foraging conditions in the water conservation areas. Although there is clearly a relationship between these factors, it should be more clearly examined. The timing of the apparent switch of nesting wading (White Ibis) from Alley North should be correlated with increases elsewhere to examine the question of movement - incorrect estimates of the number of nesting waders is a problem for understanding the effects of long-term status and trends.

The study of dispersal of crayfish is an excellent beginning to understanding the mechanisms of how hydrology impinges on ecology of wading birds. It is well designed, with clear objectives and methods. The question of the threshold or lag-time between the movement of crayfish from the ridges to the sloughs is critical to understanding their availability to wading birds, and should be explored further with research. The group is to be commended on this study, it is well-done and leads to further research questions (which could be mentioned briefly).

The study of macro-invertebrate use of soft and hardwater marshes is also an important potential factor in wading bird success and dispersion. However, the factors entering the PCAs are unclear, making it difficult to interpret the findings.

Finally, the study of nonindigenous fish is an important one, and should be continued into the foreseeable future. It is critical to understand the relationship between weather variables, hydrology, and nonindigenous fish not only for understanding wading bird ecology, but fish ecology. This would be an excellent bioindicator to add to the SFWMDs suite of indicators for the Everglades.

PLANT ECOLOGY

Plants are the critical base for the Everglades ecosystem, and are thus should be a very important component of all ecological studies. The experiments undertaken in this section are excellent, and are aimed at understanding the factors that contribute to tree island health and well-being. The two main projects include 1) tree island seedling studies, and 2) plant distribution on tree islands. Both are key to understanding the functioning and structure of the Everglades. Restoration of tree islands in the Everglades is important for overall functioning of the Everglades, and for many different species groups of animals. While the susceptibility of seedlings of tree island species to flooding is a critical series of studies, the overall objectives should be more clearly stated, as well as the length of the study and plans for field experimentation. The rationale for selection of species for study should also be included (perhaps in a table).

ECOSYSTEM ECOLOGY

As studies of the Everglades mature, considerably more attention is understandably being devoted to ecosystem and landscape studies. This reflects an increase in our knowledge at the individual and population level, and is an indication of a maturing research program. Major topics of this section include Hydropattern restoration downstream of STAs, Rotenberger WMA, and Tree island ecology. Understanding the complexity of both structure and functioning of the STAs and tree islands is critical for Everglades

restoration.
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. Continued monitoring of phosphorus into the system is important, as is continued monitoring of the spatial and temporal extent of fires. The information on tree island ecology presented in several sections of the report is beginning to form a pattern to understand the mechanisms of tree island dynamics. Increasing the number of different parameters examined is an excellent idea. The differences in TP on different parts of tree islands is critical to our understanding, as are patterns of leaf fall and root biomass.
LANDSCAPE ECOLOGY
The SFWMD landscape scale work in the Everglades is landmark work that provides a paradigm for other very large aquatic ecosystems. The soil mapping in the water conservation areas will have understand the ecology of the Everglades at all levels of biological organization. The objectives, rationale, and management use of this data could be more clearly stated. The construction of 31 benchmarks is an excellent accomplishment that will greatly aid in our understanding of hydrology and tree island life cycles. This is potentially an extremely powerful tool to use in understanding not only tree islands, but other aspects of the Everglades ecology and ecosystem. The goals, rationale, and future work should be more clearly examined and designed to ensure maximum use of this tool.

RECOMMENDATIONS FOR CHAPTER 6:
1. Relate the objectives/outcomes of each research project to the long-term goals of CERP.
2. Add a diagram showing how each project is related to the other ecological projects, and to the recovery goals of CERP.
3. Add a table showing how each project relates to SFWMD operations, regulations, permitting, environmental monitoring, Everglades Forever mandates, CERP.
4. Add a section near the beginning of the chapter that explains how data from each of the projects is being used in management decisions.
5. Model the relationship between water levels, rainfall and wading bird nesting.
6. Add a graph to the wildlife section showing the number of wading birds by management region, especially for ENP.
7. Add a graph showing the relationship between abandonment and movement of ibis from one section of the Everglades to another.
8. Add a table of the rationale for target levels of each species.
9. Continue experiments with crayfish to understand the threshold or lag-time between the movement of crayfish from the ridges to the sloughs.
10. Explore the causal relationship between macro-invertebrate dispersion and wading bird nesting/foraging areas.
11. Explore the causal relationship between indigenous and nonindigenous fish (i.e. are the nonidigenous fish filling different niches or taking over those of the indigenous fish).

12. Continue the development of an index of indigenous/nonindigenous fish as a useful bioindicator for the future.
13. Continue the tree seedling experiments, describing status and trends in future years to the overall effects of experimentation can be clearly examined.
14. Add a section on burning of the specific parts of the Everglades that shows temporal and spatial trends (perhaps related to water levels).
15. Model the physical and biological parameters that relate to tree island structure.
16. Develop a more extensive rationale and long-term research plan for the use of the benchmarks so that the same data are gathered each year on tree islands.

QUESTIONS:
6-1. How do the objectives of each research project relate to the long-term goals of CERP?
6-1 and throughout. What parts of this research have been peer-reviewed, and what was the outcome?
6-1. What are the major reasons for the decline in wading birds (need only one sentence here).
6-5. What is the relationship between rainfall, hydrology and wading bird nesting?
6-6. and rest of section: for many water conservation areas the statement is made that it created poor foraging conditions. Can this be documented?
6-9. Should document with citations statements in the second paragraph.
6-9. When you define only 5 species as part of the performance measures, do you then mean that the total estimated number of wading birds comprised only these 5, or is this a total for other species as well?
6-10. What was the pattern of White Ibis increases in nesting in regions other than White Alley, when it was abandoned?
6-11. Are modelling efforts underway?
6-11. Might give a rationale for the targets for the 5 species. Why is Great Egret so low?
6-11. What were the relative species numbers in 1940 (if data exist as is mentioned).
6-14, line 340. Do you mean approached significance?
6-16, lines 375-394. Define the PCAs more clearly? What does it mean?
6=16, lines 400-end. What is the relationship between these factors and wading bird foraging?
6-19.line 425. Define highly abundant.
6-19-20. What is the temporal relationship between indigenous/nonindigenous fish? Are there some nonindigenous species that are worse than others? less used by wading birds?
6-23. line 525-6: When you refer to past ECRs, you should list the specific one so someone could find it.
6-23, line 555. What year were these planted?
6-30, line 711. Is it a loss of numbers or extent? Is this typical?
6.42. line 848. Why were targets not met? With heavy rains it would seem they should have been.
8-42. lines 857-862. These statements seem to be contradictory. Need to explain. Why did so much burn in 2004?

6-44, middle paragraph. Can the tree island information be correlated with soil characteristics/nutrient patterns?
6-49. Will this work be peer-reviewed?
6-53. How are the cost savings calculated, and for what time period?
6-56, second paragraph. Are there plans to model the elevation of tree islands?

Post New Topic | Reply to: "Joanna Burger; OVERALL COMMENTS ON 6"
Watch this TopicStop Watching this Topic

Topic: General comments by J. Burkholder (1 of 1), Read 27 times
NEW

Conf: Chapter 6: Ecology of the Everglades Protection Area

From: JoAnn Burkholder joann_burkholder@ncsu.edu

Date: Friday, September 16, 2005 01:38 PM

This well-written, nicely designed chapter focuses on the wildlife ecology (wading birds, their prey, and impacts of exotic species), plant ecology, ecosystem ecology, and landscape ecology of the Everglades Protection Area. Additional efforts this year, in comparison to WY 2004, were two new programs to improve evaluation of hydrologic/ aquatic biota interactions: (a) Loxahatchee Impoundment Landscape Assessment, a study of crayfish behavior in response to seasonal dry conditions (findings: as the dry season progresses, crayfish leave safer refuge habitats and move into sloughs where they are more vulnerable to predation by wading birds); and a detailed survey of exotic fish species near the L-67 canal (findings suggest that 2, and perhaps 3, species are becoming established). Another interesting and important focus of this chapter is tree island ecology and value to the Everglades fauna; the District's efforts emphasize vegetation assessments for a baseline dataset, examination of hydrologic influences, and evaluation of performance measures for preservation and restoration. Tree islands previously have been in decline, which is a serious problem for prospects of maintaining the biodiversity of the Everglades. The authors expressed the concern that information needed to design and implement a tree island restoration or creation project generally is not available (lines 547-548) – a very worthy future goal. In WY 2005, drought and flood tolerances of 8 abundant tree island species (seedling age) were examined, and a vegetation analysis of tree islands in WCA-3B was completed. Root mass of moderate- to long-hydroperiod islands (with standing water 7-12 months/yr and mean depth > 20 cm) was significantly higher than that of short-hydroperiod islands (inundated < 6 months/yr, with mean depth < 20 cm), suggesting a successful adaptive response to flooding stress. Soil nutrient analyses (upper 30 cm) were also completed for the Everglades Protection Area in WY 2005, for comparison with earlier datasets.

In WY 2005, attributed to adverse conditions created by the timing of precipitation vs. drought events, there was a major decline in nest numbers among all wading bird species examined (46% lower than WY2004, and 58% lower than the best year on record, WY 2002).

General comment – Please provide maps, throughout this chapter, of the areas discussed – this would be a great help to readers (e.g. WCA-1,2,3 of Table 6-1; Alley North [p.6-10],).

Lines 50-52 – P was described as elevated – please clarify here (summary information) whether N was elevated as well?

Lines 71-73 – Please clarify when the peer review of this new elevation contour is

planned for completion?

Lines 79-80 – Pollution accompanying some of the hydrological changes should also be mentioned, as it is not only the changes in hydrology, alone, but also contaminants in some of the altered inflows, that are contributing to the overall problem.

Lines 99-101 – Please alter wording: …how to manage the hydrology and, in some areas, the incoming pollutants so that…

Line 218 – Bulbulcus ibis should be italicized.

Lines 250-253 – Good point – please provide a little more description of the circumstantial evidence.

Crayfish study, pp.6-12 to 6-15 - Selection of crayfish as the prey species of focus was well justified; the experimental design was well-conceived; the results were clearly explained, with appropriate statistical analyses – a nice study.

Macro-invertebrates from a relatively softwater marsh (T Alk 4-221 mg/L, mean 120 + 56 mg/L in comparison to a hardwater marsh (T Alk 186-278 mg/L, mean 250 + 24 mg/L) –
Overall, another very solid study that produced valuable information about differences in abundance and species composition of the softwater vs. hardwater habitats. Included appropriate use of statistics and insightful evaluation of data, along with a solid, interesting conclusion directing future efforts. A few suggestions -
Lines 368-369 – clear presentation; suggest rounding the SEs to the nearest integer.
Lines 376-376 – please briefly describe the standardized sweep-net protocol for readers here.
Lines 393-394 – was the first mention of sulfate and TKN – please mention above, including brief description of sampling and methods.
Figure 6-7 – please add the information about N values, and references for the indices used.
Figure 6-8 – please add supporting references for the functional groups considered.
General suggestion – the insights provided on lines 699-718, especially about the historic softwater habitat, would be helpful to make earlier in the chapter – suggest moving up to this area.

Non-indigenous fishes in the central Everglades (WCA-3A) –
Again, a well conceived and clearly presented study; and solid interpretations (e.g. lines 499-503).
Lines 437-441 – excellent points and insights, from careful consideration of the available data.
Line 448 – please include supporting statistical reference.
Line 455 – good approach – but are similar data available for the warmer season, for comparison?
Line 456 – should read: …a range of NIF sizes and ages were…

Tree Islands effort –

Seedling experiment – well designed and clearly described, with what appears to be a solid preliminary conclusion (lines 589-590).
Vegetation analysis (12 fixed tree islands in WCA-3B, and 4 in WCA-3A) – Clearly described, interesting study - Please describe the selection criteria (current island condition and potential for change in response to hydrological modifications) in more detail (lines 608-610). Are two adjacent plots in each area (head, neartail) sufficient for statistical inferences? (please clarify; good point on lines 651-652).
P.6-31 – map provided, helpful to readers.
Lines 744-797 – Please include information on the number of replicates (line 744). Also, please provide several sentences of background information, with supporting references, on the rationale for focus on P. It would strengthen the writing to add comparable information for N (especially inorganic N forms), if available, and for TOC if available.
Figures 6-14, 6-15 – please include a little more statistical description of these box plots, with supporting reference, in the legend.
Lines 798-804 – Are similar experiments completed or planned for nitrogen fluxes (including tracking of organic and inorganic N)? Strongly encourage that this important information is obtained in future work, if not already in hand, for reasons given above.
Line 823 – please describe the sampling (frequency, locations, number of replicates) for soil and water quality in more detail.
Overall, the information provided by this study is in parallel with findings of Wetzel et al. (2005), with important ramifications (given in lines 916-930) – very valuable research that needs to be continued with as much support as possible.

Landscape ecology – characterization of soil nutrients in WCAs
Some excellent points made here. In addition to mapping the TN and TP, is similar information available for inorganic N forms? Although P appears to be more important in causing shifts in Everglades flora based on previous research, tracking the concentrations (and fluxes) of N in Everglades soils could be important for questions about eutrophication in “downstream” estuaries (e.g. line 975).

Vegetation mapping (lines 1024-1025) – please describe groundtruthing or other accuracy evaluations techniques.

Post New Topic | Reply to: "General comments by J. Burkholder"
Watch this TopicStop Watching this Topic

Topic: Ping Hsieh (1 of 1), Read 12 times NEW
Conf: Chapter 6: Ecology of the Everglades Protection Area
From: Ping Hsieh yhsieh@famu.edu
Date: Wednesday, September 21, 2005 05:35 PM

This chapter is in a style of writing similar to a technical paper that is orderly and easier to understand. The authors present some quite interesting research and observations pertaining to the ecology of the EPA. Although results of many studies presented here are still premature to be conclusive, the research directions and objectives are relevant. Some material in this chapter should have been mentioned in Chapter 9, i.e., indigenous invasive species, and vise versa. Followings are my comments:

The tree seedling experiment: How big were those tree seedlings? This experiment probably is more relevant to the germination rather than the survival of adult trees because the tolerance of drought or flooding of trees is related to the size and age of trees.

Tree islands seem to align with the water flow direction. Balance of substrate building (by detritus and sediment trapped) and oxidation (re-mineralization and erosion) probably decide the size and shape of a tree island. Is there any study done in this direction to determine the life cycle of a tree island? Or tree islands are relatively permanent. I think using tree island as an indicator to hydrologic condition of the EPA is a good idea. A lot research needs to be done before one can take advantage of tree islands as an indicator to hydrological conditions.

Fig. 6-19. Why root TP concentration of sawgrass increases as the water TP decreases? How about the relationship between the total root TP content (i.e, TP concentration x root biomass) of sawgrass and the water TP concentration?

L916-930, TP concentration may be higher in tree islands but the total amount accumulation may not be that significant because the relatively small area of tree island occupied in comparison to the marsh.

Fig. 6-27. Due to the possible big BD difference among different types of sediment in a wetland, it is better to express TP on an area basis (mg/m2) than in weight basis (mg/kg). Do you think Fig. 6-27 would be different, if it is expressed in an area basis? Does the pattern of TP coincide with that of the flow? (i.e., more flow more TP accumulated)

Fig. 6-29, What is the scale of Y-axis? Linear of ln? Also notice that TN is not responsive to TP increase beyond ln (TP) = 2.3.(200 ppm?) Does it mean that beyond ln (TP0=2.3, or, 200 ppm) P is no longer a limiting factor?

Fig. 6-33. It is interesting to notice that the pattern of elevation is similar to that of TP in

Comments by Jordan (Jeff Jordan) 9/22/2005
DOI Technical Comments (DOI Everglades Program Team

Topic: Comments by Jordan (1 of 1), Read 17 times NEW
Conf: Chapter 7A: Comprehensive Everglades Restoration Plan Annual Report
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Thursday, September 22, 2005 10:19 AM

As in the past, this description of the 30-year, multi billion dollar effort is key to the SFER program. This chapter includes an interesting write-up on the new Acceler8 program.

This is a breathtaking effort that must be producing many externalities and public concern---a description in this chapter about stakeholder response would be useful.

For example, what has been the response to the ASR plan?

Page 7A-3: define economic and environmental equity. On page 30 there is a brief paragraph about it but it is still rather vague.

Overall, I remain troubled by much of what is here. The projects seem more to do with water supply than Everglades Restoration. It is clear (on page 7A-4) that the authors believe that the key to CERP is "getting water right"----so the key to CERP is another massive engineering project to fix the years of massive engineering projects that got you to this point to begin with. Frankly, a bit more humility in your ability to "get water right" is called for, given a decades long track record of getting it wrong. Is massive "re-plumbing" really the key to Everglades health? Or is it instead really the key to providing water to urban and ag areas?

In the plan, CERP pilot projects "will resolve technical uncertainties" (page 7A-4). This sure does sound the the people at NASA. What if projects (like ASR) show the basis of the whole CERP is not technically feasible? On page 7A-30 water storage is the predominant feature of CERP---what if ASR's don't work or are economically not feasible?

Page 7A-10 says the "quantity of water first must be increased". How about working on decreasing the demand for water?

Page 7A-10: "Optimum timing and distribution of water...must be refined?"
This reminds me of economists who think they can fine-tune the economy---the results are almost always wrong.

In short--CERP appears to be more about water to urban areas, tourism, agriculture and less about the health of the Everglades. If this is not the case, as I suspect you would think, then a much better job of reporting on CERP and its overall context needs to be considered.

Topic: Comments from Meganck (1 of 1), Read 22 times NEW
Conf: Chapter 7A: Comprehensive Everglades Restoration Plan Annual Report
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Friday, September 16, 2005 11:23 AM

1. Was the rationale for the State launching Accerler8 science-based or more of a management policy decision (line 967)? Both are justifiable in my opinion and the overall decision positive, but one may leverage more support over the long-term.

2. Is there currently a sufficient level of coordination of the activities of CERP, RECOVER, Acceler8, etc., particularly considering the number of individual actions being undertaken by the State, the District, the various Federal agencies, and private sector stakeholders? What, if any, actions could be undertaken to improve the existing situation?

3. Have Certificates of Participation revenue bonds in support of Acceler8 actually been issued? If so, what has been the response from the general public? Does the District directly mange the funds raised?

4. When will the figures for FY2005 CERP activities be available (lines 193-195)?

5. What has been the experience of the Project Delivery Teams (PDT) and the Design Coordination Team (DCT) as compared to the old method of separate District and USACE teams?

6. The CERP 470 report procedures are noted in lines 562-565 and mentions that the act took effect in July, 2005. Yet in line 599, November 30, 2000 is noted as the submission date for the initial report (both dates apparently referring to the same section of the law [373.036(7)]. Please clarify.

7. Are Certificates of Participation revenue bond funds reported in the CERP annual report – part A, B, or C? This is not clear in the section of chapter 7 beginning on line 622, or in table 7A-2.

Comments from Meganck (Jeff Jordan) 9/16/2005
Comments by Jordan (Jeff Jordan) 9/22/2005
DOI Technical Comments (DOI Everglades Program Team) 9/23/2005

Topic: Comments from Meganck (1 of 1), Read 13 times NEW
Conf: Chapter 7B: Update on RECOVER Implementation and Monitoring for the Comprehensive Everglades Restoration Plan
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Friday, September 16, 2005 11:23 AM

1. What is the role of the Project Design Team or the Design Coordination Team in RECOVER activities?

2. Has there been any reaction from the general public to the adaptive management program? It seems that an understanding of this program would help build support when changes in specific actions are warranted by new information.

3. In previous panel discussions, it has been acknowledged that the stated goals of maintaining natural systems often times conflict with the goal and legal rights of developers (water supply and flood protection for new or expanded communities east of the Everglades). How is this debate being managed at the State level and should the Consolidated Report make specific note of the status of this issue?

4. I am not clear as to the need for the interim goals and targets referred to in line 114, given the use of the adaptive management program (AMP). The AMP allows decision-makers to make changes as new information becomes available. Perhaps release of implementation funds is tied to meeting interim milestones. Can you explain?

5. In 2004 a report by The National Academy of Sciences noted that the CERP process might negatively impact water quality in the Florida Bay. I provided the District with the specific reference last year. Has the District addressed this issue in this year's report?

Topic: Comments by Jordan (1 of 1), Read 12 times NEW
Conf: Chapter 7B: Update on RECOVER Implementation and Monitoring for the Comprehensive Everglades Restoration Plan
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Thursday, September 22, 2005 08:59 AM

Again, this chapter shows the strength of an adaptive management approach to long-run planning, given uncertainties: the result of which is project level flexibility.

The 4-box explanation of adaptive management was a helpful tool.

As a management and communication strategy, the list of key uncertainties in table 7B was well done.

In the list of newly implemented projects, it may be helpful to provide a brief paragraph on the overall aim of this package of projects (if an overall strategy exists, rather than just a bunch of unrelated projects). Or the projects could be organized by type, if possible.

Also, it would help if the projects were cross-referenced with issues raised in the rest of the SFER. For example, which projects (if any) are related to the TP source issue.

I am always impressed by the breadth and ranges of the work being done at the District. I also appreciate that many of these projects are the result of suggestions made by past panels.

- *Comments from Meganck* 9/16/2005 (2, 1 New) NEW
- *Comments by Jordan* 9/22/2005 (2, 1 New) NEW
  DOI Technical Comments (DOI Everglades Program Team) 9/23/2005
- *Comments from Dr. Armstrong* 9/26/2005 (2, 1 New) NEW

Topic: Comments from Meganck (1 of 2), Read 27 times NEW
Conf: Chapter 8: Implementation of the Long-Term Plan for Achieving Water Quality Goals in the Everglades Protection Area
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Friday, September 16, 2005 11:24 AM

1. Table 8-1 presents a summary of projects underway throughout South Florida as part of the Long-Term Plan. These projects were developed under the broad headings as presented in the table. Is it therefore logical that, as results are known, they will form part of the suite of BMPs that will be applied, where appropriate, throughout the entire project area as part of a long-term management strategy?

2. Is there a strategy as to how the State of Florida, the District and the USACE will coordinate the application of the results of such a range of projects (noted in table 8-1) currently being implemented overtime to ensure that the overall goal for all discharges to the EPA, including TP inflows is maintained?

3. A reading of the post-2006 strategy seems to imply that criteria will be used to assess specific recovery actions (source controls). Does the experience of the District indicate that you can actually determine the effect of specific measures given the physical and biological variance in each site where a water quality problem appears?

4. What is meant by the statement in lines 95, 96 "...including final implementation of the hydropattern restoration activities directed by the EFA once water quality standards (including phosphorus criterion) are achieved"? It seems to imply that certain restoration activities will not be initiated until water quality standards are met. This does not seem logical given that additional actions should positively impact water quality. Can you please clarify this statement?

5. Several challenges to achieving long-term water quality as defined in the law were noted in the 2005 report including regulatory issues, uncertainty in terms of the long-term performance of new technologies, and unknowns related to the CERP. What can the District report in terms of progress to address these issues?

6. How are the baseline data sets for the Basin-Specific Feasibility Studies, noted in lines 180-187, validated in relation to the goal of improving the level of confidence in the TP loads when so many variables can potentially influence water quality?

Post | Reply | Reply/Quote | Email Reply | Delete | Edit | Move
Previous | Next | Previous Topic | Next Topic | Entire Topic

Topic: Response to Comments from Meganck (2 of 2), Read 26 times NEW

Topic: Comments by Jordan (1 of 2), Read 17 times NEW
Conf: Chapter 8: Implementation of the Long-Term Plan for Achieving Water Quality Goals in the Everglades Protection Area
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Thursday, September 22, 2005 08:42 AM

This is an important chapter, given all of the efforts that have gone into establishing the 10ppb phosphorus criterion. The chapter describes the use of source controls in the EAA and STA's in the ECP and how they have so far exceeded expectations.

Table 8-1 is a good summary reference for projects discussed throughout the SRER.

Achieving these goals have been helped tremendously by the use of an adaptive management approach. as seen in the 2004 request to the FDEP, such an approach keeps information current and allows flexibility in long-term planning. The requested $36 million over four years seems appropriate to the task.

The biggest challenge facing long term planning is noted on page 12----controlling TP loads at the source. This is an important and unsettled economic issue. This is particularly tough issue for agriculture in terms of source pollution. The District could do important and pioneering work on identifying and designing policies in conjunction with agriculture to get at these issues. This should be the focus and a sustained and substantial effort in future SFER's.

Topic: Comments from Dr. Armstrong (1 of 2), Read 16 times, 1 File Attachment NEW

Conf: Chapter 8: Implementation of the Long-Term Plan for Achieving Water Quality Goals in the Everglades Protection Area

From: Linda Davis ldavis@sfwmd.gov

Date: Monday, September 26, 2005 07:15 AM

CHAPTER 8 COMMENTS NEA 09252005.PDF (10KB)
Comments from Dr. Armstrong

CHAPTER 8: IMPLEMENTATION OF THE LONG-TERM PLAN FOR ACHIEVING WATER QUALITY GOALS IN THE EVERGLADES PROTECTION AREA (A, Neal Armstrong)

This chapter is a summary of the Long-Term Plan and how it is being implemented and how it is presented throughout the 2006 SFER. The chapter includes sections dealing with the Plan's overview, revisions to it, challenges to achieving long-term water quality goals, and conclusions. The importance of the Plan is clear because its purpose is to guide the achievement and maintenance of water quality standards in the EPA, including the new phosphorus criterion. The complexity of the area is a significant challenge for a Plan like this, but it incorporates the basic elements of water quality management and adaptive management that can make the Plan successful.

The numerous and diverse regulatory requirements that have been implemented over the years present unique challenges to the regulators and well as those regulated. The 2006 SFER, like those before it, have addressed these requirements and how the District has responded to them. In doing so the District has brought together in the SFERs the various initiatives and projects underway, the results achieved so far, and the conclusions that can be reached and lessons learned to take to the next level of activities. There is, however, in this process a certain fragmentation in a report like this that is inherent because of the many regulatory requirements that must be responded to.

The Long-Range Plan is one that can integrate the regulatory requirements with the water quality management activities undertaken and planned and identify the scientific studies needed to underpin management actions. This chapter provides some information about those regulatory and management plans, but it could be enhanced considerably with an elaboration of the management process, the overall results to date, and progress in achieving the water quality goals.

Comments from Meganck (Jeff Jordan) 9/16/2005
Ping Hsieh (Ping Hsieh) 9/16/2005
General comments by J. Burkholder (JoAnn Burkholder) 9/16/2005
DOI Technical Comments (DOI Everglades Program Team) 9/23/2005

Topic: Comments from Meganck (1 of 1), Read 21 times NEW
Conf: Chapter 9: Invasive Exotic Species in the South Florida Environment
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Friday, September 16, 2005 11:25 AM

1. It is not yet clear as to how the District or the Federal government prioritizes investments in research and/or control actions of exotic species. Apart from the initial preference for plant studies, criteria for selecting specific plants or animals need to be clarified.

2. I noted last year that public education and support in the control of exotics will be essential, yet I found only a very brief mention of these types of activities in this chapter; that being a reference to the CERP and RECOVER processes which, of course have more formal consultative mechanisms. Can any comment be made on this point?

3. Are baseline data for priority exotic animals being gathered in a systematic manner? In reading the chapter it is apparent that investments are being made, but it was difficult to ascertain the programmatic logic of the numerous efforts underway, with the exception of the python.

4. I am still confused as to why 15 federal and state agencies have some degree of jurisdiction relating to the management of exotics. This seems like an unmanageable situation to say the least.

5. This chapter indicates that basic research in controlling exotic plants has been underway for sometime. Has funding increased or remained flat? The Long-Term plan includes sufficient support to address some of the more complex questions included in the management of 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, among many other issues. What has been the response from budget holders?

6. I have not yet received a clear response to the question of a possible increase in the research effort 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?

7. The SFERTF (line 146) refers to the need for control methods at entry, distribution, and landscape levels and makes note of the inadequate level of funding at this point. What is the District's strategy to turn this situation of "we don't yet know enough about the impacts but we don't have sufficient funds to find out" around?

8. Is there a specific requirement that proposed restoration activities include an analysis

of impacts on exotics?

9. Last year it was noted that exotic species are spread during hurricanes and flooding (as well as by fires). The issue of funding research was raised. Is there currently any research being conducted on these issues? 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?

Post New Topic | Reply to: "Comments from Meganck"
Watch this TopicStop Watching this Topic

Topic: Ping Hsieh (1 of 1), Read 25 times NEW
Conf: Chapter 9: Invasive Exotic Species in the South Florida Environment
From: Ping Hsieh yhsieh@famu.edu
Date: Friday, September 16, 2005 04:50 PM

This year's chapter marks a major improvement over the last year's report in that lot of relevant and specific information about the monitoring, assessment, status and management of non-indigenous invasive species in south Florida is provided. This is especially true in the second half of the report. The first part of the chapter that describes the various task forces, committees and programs that involve in the invasive species control in South Florida is, however, not as well-written. It is hard for a reader to get an idea about why so many programs were established (e.g., SCG, NETT, FIATT, SFERTF, NEWTT, SFERWG, CRSFFRPEIS, ISWG, USACE and ANSTF, just to name a few) by various agencies, to do the job of invasive species control. Is there a lead program that is responsible for coordinating the effort of invasive species management in SF? If there is, which one is? and how does it perform? What are the working relationships among all the programs? Is there any overlapping and redundant effort? Moreover, which of them are only advisory in functionality and which of them have the actual executive power and budget to carry out the management job? What programs are directly funded by SFWMD? What is the role of SFWMD in the invasive species management? I got an impression that quit a bit of attention and funding has been put to this endeavor, but the results are still unsatisfactory. I know those questions may be difficult to answer but they need to be addressed, at least to certain extent, to make this chapter comprehensive and more like an annual report rather than just a literature review. Is there any way that the structural and working relationships among those programs can be depicted in an administrative diagram? That will really help to convey the message of this kind. I also notice that none of the authors are directly affiliated with SFWMD. Is this report representative to the viewpoint of SFWMD?

Following are some specific questions:

L 63, Why is a patchwork habitat easily invaded by non-indigenous species?

L101-106, Can't SFWMD take up the leadership?

L126, Please list the web site.

L142-145, Is this program being established? Which one? How does it work?

L150-153, How much money is needed? What is the current funding level?

L160-162, Isn't the information provided in this chapter meaningful?

L183-184, Need to mention that FIATT was established in 1993 . The paragraph of (L328-335) needs to be moved here.

L206-210, What has happened to the plan?

L225, Is $7 million an appropriate number?
L323-327, That was in 1998, how about the SFERTF today?

L384, What has caused coyotes to move to Florida? Is coyote a problem species in Florida?

L396, Isn't the insect imported for biological control non-indigenous? Could it become invasive later on?

All the figures presented after p.9-16 have no figure No. and legend. They all need figure No. and legend.

Post New Topic | Reply to: "Ping Hsieh"
Watch this TopicStop Watching this Topic

Topic: General comments by J. Burkholder (1 of 1), Read 31 times NEW
Conf: Chapter 9: Invasive Exotic Species in the South Florida Environment
From: JoAnn Burkholder joann_burkholder@ncsu.edu
Date: Friday, September 16, 2005 06:13 PM

This chapter contributes an impressive, comprehensive evaluation of terrestrial, wetland, and aquatic nonindigenous species throughout eight ecological regions ("conceptual ecological models or CEMs" identified by RECOVER), including the Florida Keys, Florida Bay and the Southern Estuaries, the Greater Everglades, Western Big Cypress, Lake Okeechobee, the Northern Estuaries East, the Northern Estuaries West (= the Caloosahatchee Estuary), and the Kissimmee River Basin. Almost equally impressive, the authors present a comprehensive inventory of the labyrinth of the many, many agencies, plans, control programs, interactions, and limitations/flaws/concrete vs. vague responsibilities of sometimes-conflicting management efforts to control nonindigenous species. Having researched this topic previously, I realize that the situation seems jumbled because it just plain is – there often and historically has been little effective coordination (despite numerous attempts) among the many agencies and other entities involved. Apparently, there is no one lead program/ entity responsible for coordinating the overall attempts to manage nonindigenous species in South Florida – a typical problem in some environmental issues. The authors document the major need for improved coordination.

Among its major contributions, the writing represents the first complete listing with species annotations for those species either known or believed to be a serious threat to Everglades restoration efforts. The authors politely and effectively call for improved coordination among agencies/entities (beyond the tracking of NEWTT's ECOSTEMS), and a coordinated state database that spans taxa. While noting that the potential impacts of invasive species has only recently become a high priority for CERP planning, nevertheless, many efforts of the District and partner agencies to inventory and control invasive species are described. One clarification that would be useful to add would be to list (table format) the programs with direct District involvement, and associated District funding. I am also uncertain as to whether the chapter format, which is on the order of a major review of the entire issue rather than an annual report, was followed because of CERP's only recently having prioritized potential impacts in its planning? The only other suggestion that comes to mind is that perhaps the authors could add a figure that depicts the relationships / parallel efforts of the various agencies/entities involved in this issue in South Florida.

Although the contents of the writing are very disturbing, this chapter was extremely interesting. The authors provided a brief national perspective on damages caused by bioinvasive species, and a summary perspective on Florida's vulnerability to bioinvasive species. They explained, as well, the history of various agencies in the nonindigenous

species issue, the stepped-up introductions and routes within the past decade, and the historic lack of adequate funding to address the problem. Also included was extensive discussion of “management tools” or mechanisms/ techniques that have been used in attempts to control bioinvasive plants and animals.

Lines 137-162 – these two paragraphs contain some repetitive information – please cull.
Line 161 – change effect to effects
Lines 169-170, “restoration of lower salinity levels” – please describe in more detail, or omit – does “lower salinity” refer to marine salinities (~30-35 ppt), which were the historic norm when Thalassia testudinum was the dominant seagrass? If it refers to brackish conditions, then the authors need to document that the historic norm was brackish rather than marine.

Lines 206-210 – What does/will this plan effectively accomplish?
Lines 272-273 – Secretaries, Agriculture, Commerce, and the Interior should be capitalized.

Lines 355-356 – Are any efforts being undertaken to strengthen documentation of marine impacts? Would be helpful, if so, to mention them here.

Lines 670-672 – excellent point about the limitations of remote sensing technologies.

Lines 772-775 – should be moved to the first introductory paragraph of this chapter – great, and sobering, information.

Lines 818-820 – excellent cautionary point.

Lines 827-829 – The “win, lose, or draw” system (lines 850-852) should be described a little more here – a nice, innovative approach.

Use of personal communication – please also include the institution of affiliation (e.g. lines 892-893, 966, 1186, 1273, 1957, 2184).

Line 1090 – should read: …Estuaries are poorly …
Line 1182 – should read: …early 1990s, Lygodinium occurred…

Page 9-38 – please reverse the order of the two figures (1993 on left, 2003 on right).

Lines 1213-1214 – briefly, what has the effect of the biocontrol agent mentioned? (also, please include the species used).

Lines 1278-1281 vs. lines 1218-1284 – was a sentence omitted between these two sentences? Seems to be a “jump” in the writing.

Line 1296 – please briefly describe the “certain characteristics that concern scientists.
Line 1420 – should read: …game of “cat and mouse” causes…

Line 1486 – what biological agent did the USDA release? Please describe the effects so far?

Lines 1540-1545 – excellent and ironic points.

Lines 1655-1656 – use of the native mangrove tree crab as an indicator species for measuring the increase or loss of functionality of the mangrove system was not mentioned in the Coastal Ecosystems chapter (chapter 12) – should be added.

Line 1703 – should read: …to manage. Intensive mechanical…
Line 1949 – should read: …killing it, the macroalga is reducing [alga is singular; algae is plural]
Lines 1754, 1755, 1768 – please replace macroalgae with macroalgal.
Lines 1786, 1974 – please clarify here the species of fish and marine invertebrate to help readers.
Line 1812 – should read: …hosts symbiotic photosynthetic algae, zooxanthellae….

Lines 1822-1824, sentence beginning “Spotted jellyfish…” – please further clarify. Does this refer to one spotted jellyfish? of what size?

Line 2125 – replace semicolon with comma.
Line 2129 – doves should be plural.
Lines 2245-2260 – nice, insightful analysis.

Table 9-17 – I could not find where this table was referred to in the text? Also, please describe this interesting study in more detail: How many trees were included? How many species? How was the study designed?

Post New Topic | Reply to: "General comments by J. Burkholder"
Watch this TopicStop Watching this Topic

Review by JoAnn Burkholder (JoAnn Burkholder) 9/14/2005
comments by Ellen van Donk (Ellen Van Donk) 9/18/2005
DOI Technical Comments (DOI Everglades Program Team) 9/23/2005
Comments from Dr. Armstrong (Linda Davis) 9/28/2005

Topic: Review by JoAnn Burkholder (1 of 1), Read 26 times NEW
Conf: Chapter 10: Lake Okeechobee – State of the Lake and Watershed
From: JoAnn Burkholder joann_burkholder@ncsu.edu
Date: Wednesday, September 14, 2005 10:00 AM

This chapter, like the introductory chapter that I first reviewed (Ch.1A), presents a very helpful synopsis of activities by the District in WY2005 for the Lake Okeechobee Protection Program. The following questions and comments are offered in the spirit of strengthening the writing and providing additional clarification on some points for readers.

Lines 38-39 – Was there an effort to quantify the P contribution from the “large amounts of P-laden sediments [that] were resuspended from the central lake”?

Line 71 – Please briefly describe the in-lake remediation activities.

Lines 99-101 – Please clarify the targets for water clarity and frequency of algal blooms; also please clarify what constitutes an algal bloom (Table 10-1 was very helpful, but given later).

Lines 107, 472, 477, 509, 511, 535, etc., Fig. 10-22 – Please change ha to km2 for consistency. Also (line 107), change semicolon to comma.

Line 188 – Please briefly describe alternative technologies for nutrient reduction (or briefly mention examples).

Lines 268-269 – Please add SEs or SDs, n values.

Maps p.10-16 – It doesn’t seem that the map keys (scales) match the report text (p.10-13); please check the maxima indicated in the keys (scales) for Dec. 2004 (TSS), Jan. 2004 (TP). Also, the scales are too small to see well; please enlarge.

Lines 283-284, 286-288 – Previous studies (e.g. Zimba et al. work) indicated that periphyton (e.g. benthic algal mats in the littoral zone) are major primary producers of L. Okeechobee. Are any measures for periphyton considered? – why/why not?

Map p.10-23 – Did Phlips et al. consider only TP, or TP along with other nutrients as indicated?

Map p.10-24 – The littoral zone stations seem very sparse; please clarify to help readers?

Lines 331-338 – It would also be helpful to describe how the amount of P resuspended / yr (i.e., “internal loading”) was estimated to support Fig. 10-19 (very interesting figure, and important to include).

Line 339 – Please briefly mention why calcium may be decreasing.

Lines 351-352, and P.10-28 – It should not be expected that a simple Vollenweider-type model would work, or should be applied, to systems such as Lake Okeechobee – that model has been successfully applied to the clear, dimictic lakes with low abiotic turbidity (the model was developed based upon such lakes), not highly turbid, polymictic lakes with high abiotic turbidity.

Lines 356-357 – Please see comment for Lines 331-338. There likely is both "tremendous inter-annual variability of inflow to the lake (with associated P loads) and high inter-annual variability of "internal" loading from mixing / resuspension. It would be helpful to readers for the comparison to be included, if estimates of the internal source are available.
Also, excluding internal re-suspension, what comprises the other 20%? – direct atmospheric deposition? Please clarify (e.g. please add the information from lines 617-619 here, to help readers).

Lines 358-364 – I assume (based on mention in Ch.1A) that these numbers are "flow-weighted." Please clarify the confidence intervals around these numbers; and, how did the actual data compare to these numbers? P.10-28 – are the "observed concentrations" "flow-weighted" in this (lower) figure? Again, please clarify – what are the CIs? And, how were the trend lines determined? (the reader is referred to Vol. 1 of previous year's report, but please briefly mention the statistical model(s) used here, and for Fig. 10-18).

P.10-29 figure legend, line 3 – please change to …between water year external phosphorus loading…
[Assumption - the actual P loading available to phytoplankton and other biota would have been from external + internal resuspension sources, considering TP rather than SRP in order to account for luxury uptake.]

Lines 367-374 – Please further clarify; what did the references cited actually report, and what periods (years) were analyzed?

Figure 10-19 – Why is the information restricted only to inorganic P, when the writing throughout refers to total P? Please clarify. Also, please comment on the organic P fraction if the information is available (is anything known about the percentage that is bioavailable, and potential importance to the phytoplankton? I would assume that there should be arrows representing the use of at least a portion of the organic P by the phytoplankton, based on amassing literature supporting the importance of some organic P moieties as P supplies).

Line 389 – Please clarify – what other two algal groups?

Line 411 – Please reword (periphyton are not SAV).

Line 431 – no hyphen in macroalgae.

Line 451 vs. line 107 – Discrepancy in the SAV acreage; please check.

Lines 498, 506 – please move the scientific name on line 506 up to line 498.

Line 493 – please briefly describe the extensive groundtruthing.

Lines 489-490 – Please briefly describe how it was determined that 5-7 yr (most recent, 7 yr apart) is sufficient.

Line 536 – Please mention how treated.

Line 566 – Define CPUE (catch per unit effort).

Line 607 – Alter as: …percent of the total external loading…

Line 610 – Weekly to monthly collection is a major difference; please further clarify.

Lines 617-619 – It would be helpful (e.g. back ~lines 356-357) to clarify the estimated amount of atmospheric deposition loading to the watershed, as well.

Lines 624-628 – Did JGH Engineering's budget include atmospheric sources? Based upon Table 10-4 (p.10-50), apparently not? If not, please clarify; and also clarify in the Table 10-4 legend.

Lines 665-669 – Please restructure sentence.

Line 904 – Why was the Green-Cycle/QED canceled? – Please clarify.

Lines 1001-1003 – Why are only 7 classified as NPDES facilities?

Lines 1008-1023 – Have pathogenic microbes been considered? Data available?
P.10-67, third project in Table 10-7 – Will long-term maintenance questions also be addressed by this project or elsewhere?

P.10-67, last project in Table 10-7 – How can it be that cattle stocking rates have no measurable effect on nutrient loads from the pastures?

P.10-68, first project – one year ("a full dry/wet cycle") does not seem to be an adequate period for assessment, based upon the high inter-annual variability in precipitation/runoff described in this chapter.

P.10-68, last two projects listed– Where will the dredge spoils be discarded?

Lines 1160-1165 – What is the frequency of the USGS sampling? (please include).

Lines 1355-1357 – It would be helpful to readers to know the extent of occurrence/ abundance of each of these species in Lake Okeechobee (e.g. exotic, Hydrilla).

Figure 10-34 – Why is there no mention of periphyton other than epiphytes? Haven't benthic periphyton mats been shown to be important contributors to the primary production of Lake Okeechobee?

Lines 1375-1385 – The rationale of only two treatments seems weak; are there plans to test more treatment levels?

Lines 1386-1391, Figure 10-36 – were these experiments just +/- light, or were light levels also tested?

Line 1409 – Please clarify benthic algae – macroalgae only? Periphyton (if so, which?)?

Nice insight on lines 1418-1420.

Figure 10-38 – Include periphyton?

Post New Topic | Reply to: "Review by JoAnn Burkholder"
Watch this TopicStop Watching this Topic

Topic: comments by Ellen van Donk (1 of 1), Read 18 times NEW
Conf: Chapter 10: Lake Okeechobee – State of the Lake and Watershed
From: Ellen Van Donk e.vandonk@nioo.knaw.nl
Date: Sunday, September 18, 2005 04:33 PM

This chapter is a very clear summary of limnological conditions and plans for recovery of Lake Okeechobee. It is well written (and technically sound) and the authors should be commended for making efforts to draw linkages among all the different pieces of information presented. The illustrations and tables used are pretty clear overall, and useful. It is also well referenced, with a good mix of peer-reviewed journal articles, and agency publications.

Some comments and questions:

Page 10-1, line 29. Make clear that the phosphorus goal of 40 parts per billion is a total phosphorus goal.

Page 10-5, line 221-222. Widespread inundation of urban and agricultural lands resulted not only in an increase in phosphorus runoff during and after the storms. I think you have to mention here that also other nutrients like nitrogen and pollutants like pesticides may have an increased runoff during and after storms.

Page 10-25, line 349. Why is there a reduction of water-column calcium??? And when calcium is important in sequestration of phosphorus in the sediment of the lake, why is it not an option to add calcium to the lake sediment? In the Netherlands addition of calcium is used as a measure to restore acidified lakes.

Page 10-31, line 388. Only here and in table 10-1 page 10-21, nitrogen is mentioned as an important nutrient in determining algal growth in particular the presence of toxic cyanobacteria. One major technical comment about the chapter is that water quality is virtually synonymous with phosphorus only. In Lake Okeechobee (not true of other parts of the Everglades, though), phosphorus does appear to be the major water quality issue. Except for nitrogen, other potential water quality issues are essentially ignored in this chapter. For example, what about organic contaminants (herbicides and pesticides) and their impacts on lake aquatic organisms? How do high levels of sulfate in the lake water affect sediment redox chemistry, sulphide build-up, trace metal micronutrient cycling, methylmercury production in the lake, and what are the impacts on biota? Increased sulfur loads originating from polluted surface water and groundwater, and from enhanced atmospheric input, are a major threat to the biogeochemical functioning and biodiversity of freshwater wetlands.

Page 10-33, line 409-413. In the summary of the processes through which SAV is influencing the biomass of phytoplankton and transparency of the lake water I miss the

role of SAV as refuge for zooplankton against predation by fish. A higher biomass of zooplankton may lower the phytoplankton biomass and consequently increase the transparency. Also allelopathic substances excreted by submerged plants like Characeae (dominant plant in the lake) may lower the growth of phytoplankton and periphyton. Further may SAV around their roots stimulate denitrification by bacterial communities.

Page 10-35, line 458. 2005 instead of 2006

Page 10-41, line 542. I miss in this paragraph some information about the impact of the fish on the food web in the lake. Are some of these fish planktivorous or herbivorous?? A high biomass of planktivorous fish may have an impact on the transparency of the lake by a decrease of the zooplankton biomass resulting in an increase of the phytoplankton biomass.

Page 10-55, line 779. What is a baffle box??

Page 10-57, table 10-6. What was the chemical treatment of the runoff at the Davie Dairy 1 and 2?

Post New Topic | Reply to: "comments by Ellen van Donk"
Watch this TopicStop Watching this Topic

Topic: Comments from Dr. Armstrong (1 of 1), Read 9 times, 1 File Attachment
NEW

Conf: Chapter 10: Lake Okeechobee – State of the Lake and Watershed

From: Linda Davis ldavis@sfwmd.gov

Date: Wednesday, September 28, 2005 07:11 AM

CHAPTER 10 COMMENTS NEA 09272005.PDF (9KB)
Comments from Dr. Armstrong

Post New Topic | Reply to: "Comments from Dr. Armstrong"
Watch this TopicStop Watching this Topic

CHAPTER 10: LAKE OKEECHOBEE PROTECTION PROGRAM – STATE OF THE LAKE AND WATERSHED (A, Neal Armstrong)

This chapter is an excellent update to the similar chapter in the 2005 SFER. It includes data on the effects of the 2004 hurricanes on Lake Okeechobee and integrates that information into the much longer term record that has been compiled for this lake.

The focus is on TP, it loading (external and internal) to the lake, the physical, chemical, and biological mechanisms that operate to cycle TP within the lake, the biology of the lake supported by and influenced by TP, and the various ways that TP loading to the lake is being controlled to bring the loadings in line with TMDL limits set for it. Lake Okeechobee and eutrophication processes associated with it have been studied extensively for a long period of time, and more may be known about Lake Okeechobee than most lakes in the world. The hydraulic and TP loads imposed on the lake in 2004 with the hurricanes have provided a unique opportunity to study the impacts of short-term major loads to a lake like Lake Okeechobee and the downstream impacts associated with that loading as well as the major disruption to the biota and sediments caused by the currents generated during the seiche created by the hurricane winds.

While an excellent database exists for Lake Okeechobee on which to base management decisions, there is still much to learn about the lake and managing its water quality. Noticeably absent from this chapter is a presentation on one of the basic elements of water quality management, namely the water quality modeling that has been ongoing for so many years. Simplified models such as Vollenweider's models have been applied with success, but more sophisticated models such as the EPA model WASP were being applied to the lake. Are these efforts ongoing? If various management scenarios are to be offered and tested, a series of models from the simple to the complex will need to be available for the lake to understand the consequences of those scenarios.

Specific points to be addressed in this chapter are as follows:

Line 343: Should 187 mt/yr be 197 mt/yr as given in Table 10-2? Also, why are the Net Sedimentation Coefficient's given as negative values. If the TP mass balance equation used for the Vollenweider model is used here, then these values should be positive; a negative value would imply that the lake is a source of TP rather than a sink. Finally, how the Net Change in Lake Content values were obtained is not clear, for the differences in Lake P Mass from year to year do not match the Net Change in Lake Content values.

Lines 351-352: It is not clear whether the 1975 or the 1976 Vollenweider model is being applied here or what is meant by a Vollenweider-type model. Further, has the loss rate coefficient in the models been adjusted for Lake Okeechobee's conditions?

Figure 10-19: Please explain the TP flux values between the water and Active Sediment Layer; it's not clear how a flux balance can be attained without knowing the direction of the fluxes.

Figure 10-26: What caused the large upturn of catch rate in 1984-89? It appears that the catch rate was steadily declining in the 1970s and in the 1990s and 2000s.

Line 646, Table 10-3: It is not clear whether the 35 mt TP for Rainfall represents only the wet flux of whether it is wet flux + dry flux. Please clarify.

Joanna Burger; CHAPTER 11 (Joanna Burger) 9/14/2005
Review by JoAnn Burkholder (JoAnn Burkholder) 9/14/2005
comments by Ellen van Donk (Ellen Van Donk) 9/18/2005
DOI Technical Comments (DOI Everglades Program Team) 9/23/2005

Topic: Joanna Burger; CHAPTER 11 (1 of 1), Read 23 times NEW
Conf: Chapter 11: Kissimmee River Restoration and Upper Basin Initiatives
From: Joanna Burger jeitner@biology.rutgers.edu
Date: Wednesday, September 14, 2005 01:46 PM

OVERALL: This chapter is well written, and provides both an overview of historical conditions, and present work. The background material presented in extremely useful in developing a picture of past anthropogenic effects. The description of hurricane effects should include information on how effects could be managed or minimized.
It is unclear how the management of the Kissimmee relates to management of the rest of the Everglades system, and this should be addressed early on. In what ways are the management options coordinated, and how do the actions in the Kissimmee affect the rest of the Everglades?
The conceptualization of parameters affecting this region, such as the effect of hurricanes on DO, is extremely useful, and can serve as a model for adaptive management.
The 10-year storm event for flood control of the Kissimmee Basin seems too short, given changing land use, climatic conditions and possible global warming events. The role of increased runoff due to urbanization seems to require extensive modelling and data collection. There is an excellent discussion of the factors affecting hydrology of the Basin, and could be more information about possible solutions or comanagement options.
Determining ecosystem water needs is a high priority, especially in light of increased human development of the region.
Establishing evaluation programs is extremely important to the overall project, and the care given to this aspect should be commended. This is one of the few restoration projects that has built in evaluation as a part of the project, including the establishment of performance measures. A key element is monitoring the effects of the restoration methods: that is, how does the methodology employed in the restoration impact the system.
The use of reference streams to evaluate conditions in the Kissimmee River is an extremely important aspect of the study, given that no historical information exists. It would be useful, however, to see a table with a matrix of the evaluation measures that are going be used to evaluate progress. The authors are also to be congratulated on liberal use of references to understand and document aspects of the system.
The inclusion of stakeholders in the plans for the Kissimmee Chain of lakes is an excellent idea, and they are obtaining the necessary information to understand both the biological and human dimension of the system. It may help to also have stakeholders involved in the development of brochures and for performance measures.

QUESTIONS:
11-1: line 20: Since this is a relatively new section, you might consider saying something about the usual pattern of hurricanes in this region.
11-4, line 73: how long were indicators monitored?

11.5, lines 104-: I assume you mean foraging wading birds? any data on the relationship of indigenous to nonindigenous fish?
lines 117: are these reports available?
11-6, line 160. How are stakeholders defined, and how are interactions managed?
11-7: line 215 - are these breeding wading birds? Need to be specific in terms used.
11-8, line 250. What are the problem exotic plants?
11-14. line 392. How could these effects be managed? And what are the biological effects and implications?
11-23, lines 507-end: what studies are being done to address these possibilities, and when will they be completed?
11.25: lines 541-549. What data were used for this, over what time period?
11-28, lines 585: Are there wildlife objectives for the Kissimmee Basin - how do they relate to the Everglades generally?
Were the objectives met (described on bottom half of page)?
11-29: might add a sentence or two about what problems were identified.
11-30, lines 672. On what basis was the 10 year storm even chosen as the basis for flood control?
lines 684-: are there any indications of the degree that urbanization has changed this pattern?
11-31. Are other methods of Hydrilla management being examined - different times of treatment or other options?
11-35: could present a table of the restoration/revitalization projects.
11-38. It might help to state what each phase was.
11-47. A little more information could be provided on how the reference streams/rivers were chosen.
11-50. What accounted for the baseline differences in TP?
11-52, line 1260, where were the control sites and remnants, how many were there?
11-53 top: Do you feel that the conditions should have been similar between the study area and reference site?
11-55, top. With what frequency are you evaluating changes in invertebrates.
11-55. Line 1361 - what is meant by long-lived? Which species will make up the indices?
11-55, line 1377-: It is extremely important to get this baseline data before restoration and to be able to evaluate different aspects of the restoration.
11-56: What month were that data taken, and does this matter in this system.
11-60- What is happening with nonindigenous fish in this region?
11-62. top. It might help to plot DO against the fish diversity and numbers.
11-62, lines 1522. It seems essential to carefully define terms here. By bird assemblage do you mean foraging or breeding birds, or both. You could have healthy foraging populations without having any breeding colonies.
11-62, 1529- It might be useful to briefly summarize the goals that pertain especially to the Kissimmee.
11-63, lines 1584-91. Are there appropriate nesting colony sites? Were the herons present only after the breeding season (i.e. wanderers rather than residents)?
11-66, line 1592. Was there any indication that the breeding colonies were of younger birds?
11-66, line 1595 - this may suggest that surveys of invertebrates and prey fish should be initiated now to correlate with breeding (if it occurs).

11-70, bottom. What were the seven stakeholder groups, and could a person opt out?
11-71. It might be useful to have a table showing some of the quantitative data concerning the survey.
11-72. top. Stakeholders should be involved in the design and content of the brochure.
11-72, 1742-47. More information needs to be presented concerning how the FWC intends to identify bioindicators.
11-72. lines 1750-54. Need to present the conceptual model for how stressors interact.
11-73-73. Who will develop these performance measures?
11-74. line 1866. Will the mercury information be part of the overall Everglades evaluation of mercury? This might be a useful idea.

Post New Topic | Reply to: "Joanna Burger; CHAPTER 11"
Watch this TopicStop Watching this Topic

Topic: Review by JoAnn Burkholder (1 of 1), Read 17 times NEW
Conf: Chapter 11: Kissimmee River Restoration and Upper Basin Initiatives
From: JoAnn Burkholder joann_burkholder@ncsu.edu
Date: Wednesday, September 14, 2005 05:37 PM

This chapter, like the introductory chapter that I first reviewed (Ch.1A), presents a very helpful synopsis of activities by the District in WY2005 for the Kissimmee River Restoration and Upper Basin Initiatives. The following questions and comments are offered in the spirit of strengthening the writing and providing additional clarification on some points for readers.

Lines 99-100 – The information on mean DO concentrations is helpful, but it would also be very helpful to know how the minima DO levels (and the bottom-water concentrations) have changed in the restored river, relative to pre-restoration values. Please provide that information.

Line 115 – Please include the reference citation for the conceptual lake ecosystem publication. (Note: this information was confusing when compared to the information contained in lines 1748-1768; please clarify.)

P.11-7 – Nice information on the history given here.

Lines 296-300 – Confusing – please clarify further (13 water control structures; 9 structures and 7 regulation schedules, etc.).

Lines 323-324 – Please include the species of floating plant islands (tussocks).

Line 403 – When will these data be ready?

Lines 438-439 – Please explain more about how this potentially important inference/ evaluation was made ("…suggested that discharges could be reduced rapidly to 3,000 cfs without known impacts to the system").

Line 464 – Please clarify whether/how DO concentrations in the lakes were also monitored?

Lines 484-485 – What is known about the groundwater contribution of low-DO water (data)?

P.11-22, legend of Fig. 11-12, last line - please change to: DO dynamics and can be directly managed.

Lines 509-510 – Has there been any monitoring of periphyton (any quantification of abundance changes)?

P.11-24, Fig. 11-13 – Very nice, clear figure with much information. Please also plot (as a second panel, below this one) the change in the minimum DO levels over time.

Lines 527-532 – Please clarify how DO and floodplain stage were continuously monitored (instrumentation used, frequency of data points, depth(s), etc.). Also, please clarify why this data collection effort was not initiated earlier than 14 Oct. (e.g., difficulty in getting to the sites because of high water?).

Lines 616-617 – Please explain briefly why these five sub-watersheds were selected for analysis.

Line 674 – It seems clear that the current flood control capacity IS less than stated in the original design (which was based, in the 1950s-early 1960s, on only a 10-yr storm event). Please alter wording (change may be to is).

Line 682 – Should read: …to the modeled extent of 5-year …

Lines 693-715 – These two paragraphs contain repetitious information – please restructure.
Line 874 – Please define SAS.

Lines 889-890 – Please add a map of the 21 stage, 11 flow, and 5 SAS monitoring stations, and a map of those that are/were also being maintained.

Lines 1020-1021 – Please add some information about the control sites. Was only one control site monitored per study and if so, why? Which studies did not have control sites, and why?

Lines 1038-1053 – Is publication of the two volumes on schedule?

Lines 1082-1084 – Please add a map of the DO continuous monitoring sites. How were they selected?
3 remnant river runs in Pools A and C: Please add a map of the DO continuous monitoring sites. Also, additional explanation is needed: How deep were the sites (mean depth, ranges)? Why was DO monitored at only one depth (1 m)? Depth profilers are strongly recommended, or at least additional monitoring of bottom-water DO, unless DO in these sampling sites is known to be at a ~consistent level with depth. Also, what time of day were the DO measurements taken?
7 remnant river runs and two canal stations in Pools A and C: monthly data cannot provide meaningful information about DO problems. A sampling frequency is needed that will allow the District to detect DO sags. What time of day were the measurements taken? Were depth profiles taken or was DO monitored only at a depth of 1 m? If the latter is the case, then the same comments as for the 3 remnant river runs (above) apply here.

Lines 1111-1112 – Please identify (here or, more appropriately, above) the four metrics used to evaluate DO response, and the three metrics that are being met. Is minimal DO, which is much more important than mean DO, included as a metric?

P. 11-43, Figure 11-20 – Please provide further explanation about the reference streams, here or in the accompanying text. Also in this legend, please clarify the time of day / depth(s) when/where samples were taken.

P.11-44, Figure 11-21 - Please clarify the time of day / depth(s) when/where samples were taken.

Line 1119 and pp. 11-46 to 11-48 – A detection limit of 3 mg SS/L seems very high – please provide information on the method used.

Lines 1121, 1133 – Are data available on the phytoplankton (abundance, dominant taxa)? And, were these phytoplankton (i.e. true potamoplankton, characteristic of large, slowly flowing lower river systems) or suspended microalgae?

Pp.11-46 to 11-48 – Please clarify the number of replicates.

Lines 1202-1203 – Weekly to monthly represents a big difference in frequency. Please explain.

Lines 1205-1208, Figure 11-23 – Flow-weighted or flow-adjusted concentrations ideally can help to account for flow variability and provide a more accurate estimate of monthly concentrations in riparian systems (USGS 2001). Although this is likely a good approach, it should be used with caution and further clarified: How much of the variance in nutrient concentrations at these stations is explained by flow-weighted models? (please add this information; if only a small amount of the variance is explained, then such models should not be used). How do the flow-weighted mean concentrations (Fig. 11-23) compare to the non-flow-weighted mean concentrations?

Line 1209 – Please clarify why these years were used as the baseline period.
Line 1225 (typo) - ….schedule, the floodplain in…

Lines 1245-1246 – Please remind readers here of changes (land use etc.) that have occurred in the past decade at the southern end of Lake Kissimmee – might provide some insights as to the nature of the sources mentioned.

Lines 1261-1264 – Please briefly describe the methods used.

Lines 1265-1273, Fig. 11-24, and lines 1335-1337 – Based upon the data/description given, it is not readily apparent as to whether medians would be more appropriate to report than means. Please provide clarification; and in Fig. 11-24, please add error bars.

Fig. 11-24, legend, last 2 lines - …Reference data are from Benke et al. (1984), and represent the…

Lines 1459-1470; also line 1933 – Please see above questions regarding DO measurement and consideration of minima as well as mean data, depths, timing and frequency of sample collection etc. Given the information presented thus far, it is difficult to evaluate the strength of the argument that DO levels are higher.

Line 1466 – problem with sentence structure (…in the resorted likely has…)

Figure 11-25 – Please explain here, as earlier, why there are no error bars (only 1 year sampled, not multiple years yet).

Lines 1437-1507 – Suggest rounding the percentage values to the nearest integer, or explain why not.

Figure 11-29 – I may have missed it, but did not see previous explanation of methods/ approach for assessing the thickness of the river bed organic layer. Please add. Also, please explain “vegetation mat” – does that mean the littoral zone?
This is an innovative, interesting figure. It would be instructive, as well, to add a similar figure depicting effects of the hurricanes.

Lines 1854-1860 – Please at least briefly describe the frequency of sampling and the number of stations per lake and per tributary. This information should be added to provide insights about the strength of supporting information for the statement on line 1860.

Post New Topic | Reply to: "Review by JoAnn Burkholder"
Watch this TopicStop Watching this Topic

Topic: comments by Ellen van Donk (1 of 1), Read 13 times NEW
Conf: Chapter 11: Kissimmee River Restoration and Upper Basin Initiatives
From: Ellen Van Donk e.vandonk@nioo.knaw.nl
Date: Sunday, September 18, 2005 04:38 PM

This chapter provides an update of activities within the Kissimmee watershed during Water Year 2005 as well as an overview of watershed hydrology and effects of the 2004 hurricanes. As a major source of water and materials to Lake Okeechobee and downstream ecosystems, activities and conditions in the Kissimmee basin can have substantial effects throughout South Florida.
As already mentioned last year by the panel, an outline of the chapter's contents at the beginning may help to read this chapter. It consists of many paragraphs and it is therefore difficult to get an overview.
Page 11-22 – How does the low DO influence the phosphorus release from the sediments??? See also page 11-49. Have there been some measurements on the possible higher release of P ? Also denitrification may increase.
Page 11-31. line 749. Is there no other treatment than chemical treatment possible against Hydrilla?? How will future management of water levels in the lakes affect Hydrilla? Will it increase or decrease the problem?

Page 11-49, line 1233. Why have neither loads nor concentrations of total phosphorus declined and are even higher?? What are the plans to achieve a reduction of P?

Review of Chapter 12 by J. Burkholder (JoAnn Burkholder) 9/15/2005
Comment by Ward (Jeff Jordan) 9/22/2005
DOI Technical Comments (DOI Everglades Program Team) 9/23/2005
Comments from Dr. Armstrong (Linda Davis) 9/28/2005

Topic: Review of Chapter 12 by J. Burkholder (1 of 1), Read 37 times
NEW

Conf: Chapter 12: Management and Restoration of Coastal Ecosystems

From: JoAnn Burkholder joann_burkholder@ncsu.edu

Date: Thursday, September 15, 2005 09:53 PM

Lines 116-117 vs. lines 135-142 – The report states, “Perhaps the severest threat to estuarine water quality is eutrophication by [anthropogenic] nutrient inputs.” Yet this statement, supported by studies worldwide, is not reflected by the coastal ecosystem management and restoration efforts as stated in lines 135-142. Oddly, nowhere in what is identified as the key areas of the District’s coastal ecosystem management and restoration efforts is there mention of nutrients or cultural eutrophication. In a pattern that is repeated throughout this lengthy chapter, the foremost variable considered by the District is salinity (a few examples among many: line 135; performance measures for seagrasses given in the supporting information as the draft Northwest Fork report, p.4-31, and this chapter; salinity-based evaluation of eastern oyster habitat - draft Northwest Fork report, p.7-51, and this chapter). Surely nutrient pollution (as reflected by lines 116-117 of this writing; or other pollutants as appropriate, e.g. suspended solids; or other conditions as appropriate, such as low dissolved oxygen) merits emphasis along with salinity? Nevertheless, it is recognized that a major focus of the District must, of course, be water supply, flood control, and the hydrological alteration of watersheds and consequences for the associated estuaries.

Second general comment: This chapter, encompassing nine major ecosystems, represents a huge undertaking – moreso than any other chapter – and must have been extremely difficult to write. As an apparent result of attempting to summarize such an immense amount of materials, unfortunately key information needed for readers’ understanding is not included in the present draft. In particular (and in most sections), maps are inadequate to show many of the sites, sampling stations, and other key features/locations mentioned. In addition, there is extremely sparse information on water quality, yet strong conclusions are presented based upon water quality data that are neither described nor shown. The following review is offered in the spirit of strengthening the writing, recognizing the immense amount of effort, including much excellent information and insights, that already is represented by the draft of this chapter.

INTRODUCTION

Lines 120-121 – Other publications indicate that additional coastal ecosystems within the District’s boundaries, not only the St. Lucie and the Caloosahatchee estuaries), also have shown signs of eutrophication; in fact, nutrient pollution (and other pollutants) was cited as one of the three major issues identified by the District for South Florida’s coastal ecosystems in general (lines 64-67). Elsewhere in this chapter or in referenced supporting materials, the Lake Worth Lagoon (line 812 – turbidity and sedimentation), NW Fork of the Loxahatchee River (draft report p. 2-14), and most of the other systems included have been described as degraded by nutrient pollution (and other pollutants).

Please alter this writing accordingly.
Line 136 – The writing in this chapter repeatedly emphasizes seagrasses and oysters as the main (in some of the nine coastal ecosystems, the only) biological indicators that are considered as VECs. This sentence should be altered to reflect that fact; or the chapter writing in general should be altered to clarify. Other biological indicators should be mentioned for clarification as "lesser" or secondary indicators, as well, to help readers' understanding. Another point that merits clarification is that eastern oysters are regarded as very hardy in contending with anthropogenic stressors, relative to other shellfish species. Consideration of a second, more sensitive shellfish species, insofar as funding and other constraints permit, and if such organisms still exist in some of these systems, would strengthen the approach.
Line 145 – Suggest rewording: …Florida Bay and the Florida Keys, …

S. INDIAN RIVER LAGOON AND ST. LUCIE RIVER AND ESTUARY
Line 171 – Suggest rewording: …tolerances of eastern oysters… [eastern oyster as on p.12-30]
Line 174 – Suggest rewording: literature, for oyster populations in areas other…
Line 175 – Suggest rewording: …to include recent studies of salinity…
Line 177 – Suggest rewording: …utilized to estimate the timing…
Line 184 – Suggest rewording: …the traditionally used sampling device…
Figure 12-2 – It would be helpful to add Stuart (mentioned on p.12-12).
Table 12-1 – Please change to: …history of the eastern oyster.
In this table, please also include information on the optimum ("no stress") salinity range.

A stated goal of the District is to identify key water quality parameters that most influence seagrass health. The text (and referenced supporting information) clarified that water quality parameters which are believed to most influence seagrass health are suspended solids, turbidity, color, chlorophyll a, total P, dissolved phosphate, and total N. Actually, however, inorganic N forms (Ni: nitrate/nitrite and ammonium) rather than TN are important (see review by Touchette and Burkholder 2000a, JEMBE 250:133-167). Carbon, and C:Ni, C:P, and Ni:P supply ratios are also important (see reviews by Touchette and Burkholder 2000, JEMBE 250:169-205, and JEMBE 250:133-167).
Line 194 – is this alone, or with other stressor(s)? Please clarify, with supporting literature.
Line 198 – Should read: Environmental Conditions
Lines 199-218 – Please clarify frequency of measurement.
Line 231 – Please clarify how mean daily salinity was calculated (basis).
Line 265 – Please change to: Eastern Oysters
Line 266 – Please change to: In WY 2004, eastern oysters …
Line 267 – Please explain why these two locations were selected.
Line 272 – What extent of mortality of adult oysters? moderate? high? Percentages involved?
Lines 274-279 –
Why were these two sites emphasized? Without further explanation, consideration of only two sites would seem inadequate to assess seagrass health in the St. Lucie Estuary. There also may be a site selection problem? - the map seems to show that neither site was located in an area which received direct inputs/impacts of the St. Lucie River. [these

problems may be directly related, again, to the loss of two of the four former sites because of hurricane damage; if so, that should be clearly stated]
Epiphytes are one type of attached algae. What is meant here by attached algae? – epipelic? And, the writing indicates that only macroalgal epiphytes and [other] attached algae were monitored – is that the case and if so, why? Many publications have shown that macroalgal as well as macroalgal epiphytes can be important in controlling seagrass survival (e.g. Sand-Jensen 1977, Aquatic Botany 3:55-63).
Please briefly describe what the seagrass monitoring included: percent cover? transects? quadrat size? destructive/nondestructive sampling? etc.
Editorial suggestions – please make all tenses parallel. Omit hyphen in macroalgae. "Data" is plural.
Line 308 - …seagrass recolonization was underway at…
Lines 313-315 – What about natural dehiscence? Please include clarification of whether/ when that occurs for the seagrass species present. (e.g. Figure 12-10 invokes extreme low tides and hurricanes, but how do these data compare to a more average weather year?) And, what about nutrient increases that may have been co-associated with the low salinities? Again, please provide clarification.
Overall for pp. 12-14 to 12-16 – a map of previous and post-hurricane distributions would be very helpful.
Lines 331-336 – Please provide more information on the monitoring station locations, parameters, frequency, etc. Also, please describe how the monitoring data are being linked to the health of seagrasses, eastern oysters, and other biological variables.
Line 334 - …intensive three-year…
Line 337 – Suggest: Routine monitoring of eastern oysters is…
Lines 345-346 - …These data allow evaluation…
Please provide more information on the "limited groundtruthing". It also would be helpful to include the most recent map.
Lines 358-364 – What are bottom-water DO conditions in these areas? Please briefly explain why these areas were selected?
Lines 397-405 – Where was the other > ½ of the funding directed? How much of the funding mentioned came in during this water year?

The website supplementary information also included description of an analysis of 10 core samples (collection locations?) from the IRL for % solids, heavy metals, nutrients (TKN, TP, nitrate/ nitrite), PCBs, and PAHs. Various constituents (Cd, Hg, Ni, Ag, nitrate/nitrite, PCBs, PAHs) were described as below MDL; higher concentrations of Cu, Pb, TP, and TKN occurred in upper sediments. In general, the data were described as suggesting "significant anthropogenic contribution of Pb, Cu, and Cr." How will these data be considered in designing improved management strategies?

LOXAHATCHEE RIVER AND ESTUARY
Overall, the summary provided in this chapter is lacking large areas of important information – which probably occurred, I realize, because the chapter's authors already have had to cover so much. In any case, as examples, nuisance animal species were not mentioned (Ch.3, NW Fork draft), nor were endangered/ threatened species, or macroinvertebrates, or fish. What do the macroinvertebrate data show over time? (important question since macroinvertebrate community composition/abundance is

generally used to assess river ecosystem health).
Line 421 – Although this is explained later in the writing, it would be helpful to mention here how the permanent opening of Jupiter Inlet occurred.
Figure 12-12 – This map should be enlarged and clarified (seems a bit blurred). It is extremely difficult to see many of the important features (e.g. Boy Scout Camp, Kitching Creek, Lainhart Dam – many other examples could be listed). Also, please indicate the location of the pristine subtropical riverine cypress swamp. And, it would be helpful to include in this chapter Table 1-1 from the draft Northwest Fork report.
Lines 445-446 – It would be helpful to mention what the tentatively selected VECs are, and to briefly explain the justification.
Line 447 - …More information can be found in…
Lines 476-477 – Please describe the locations, frequency etc. for collection of the flow and salinity data.
Lines 480-481 – Unfortunately, this is woefully inadequate information for evaluation. Concrete information on parameters sampled, frequency, locations, and data summaries are needed.
Lines 506-518 – How long are these transects? [elsewhere the transects were describes as 10 m wide; both dimensions should be included here] The website to which readers were directed for further details did not provide that basic information. Line 515: When is this future monitoring planned?
Figure 12-14 – This map must be enlarged and made clearer – for example, the transect locations cannot be clearly discerned, only the names. Are the first six transects in floodplain areas, as stated on p.12-25? (if so, that is not reflected by the map labeling – confusing).
Lines 521-531 – It would be desirable to add measurements of nutrients as well (e.g. TP, N series at minimum; and DOC if funding permits). Such data would provide a valuable baseline.
Line 561 – please change the verb (“may” does not seem appropriate, since on line 425 it was stated with certainty).
Line 563 – It would be helpful to clarify when (year) the District contracted with USGS.
Line 568 – What were the other water quality constituents? Please clarify.
Lines 575-577 – Please clarify: will this be done once? more often? replicated? design of this cypress seedling study?
Line 582 – this website was extremely general, and unfortunately not very helpful with respect to biota (likely still being constructed?)
Line 593 – Suggest: …being studied. The research will…
Lines 608-618 – Unfortunately, this information is insufficient to evaluate the effort. [From the Northwest Fork draft report (Ch.2, p.11, to which readers were referred), however, the following information was obtained: LRD (1992-) – 35 stations bimonthly, including 18 sites in the Northwest Fork. Based upon the sparseness of these data (bimonthly), the data offer weak support for the statements on p.2-15 of the draft report. Caution should also be used in applying words such as “trends.” Elsewhere (draft report p.2-13), it was stated that the LRD sampled two stations in the NW Fork [only] twice per year between 1992 and 1997. Such extremely sparse data cannot be used to discuss trends, or to “indicate a water quality rating of good.”]
It would be helpful to include a map of the station locations. It would also be helpful to include in this chapter the maps on p.3-11 of the NW Fork draft report, the information in

para.1 of draft report p.3-14, and the information in the last two paragraphs of draft report p.3-29.
Please describe these “elevated water quality values” and please describe the “historic norms.”
Lines 619-627 – What was the rationale for selecting these three sites? (no information is given)
Line 625 – This would appear to be somewhat limited in scope – why is freshwater discharge the only impact considered? Why not changes in the light regime and changes in nutrient concentrations, as well?
Line 657 – Please briefly describe related groundtruthing efforts.
Line 687 - …the eastern oyster…
Lines 697-698 – Again, mention only of “water quality monitoring” provides insufficient information for evaluation of the effort. The planned frequency and station locations etc. need to be described. Why are suspended solids, fecal bacteria, and key nutrients not planned for monitoring?
Lines 731-737 – The LSMM is described as useful in estimating nutrient loading. However, the model is based on very unbalanced data – extremely sparse data for nutrients, and copious data for salinity and flow. This point, and the resulting uncertainties inherent in estimating nutrient loading from such a dataset, should be mentioned in clarification. [Example: Was salinity continuously monitored as in Biscayne Bay (p.12-43), at 15-min intervals? If so, this would be a very detailed data set “matched” with extremely sparse WQ data.]
Line 786 – Again, use of the word “trends” should be avoided with respect to water quality, since the datasets as described appear to be very sparse.

Additional comments, based upon the supplementary information (NW Fork draft report) - Seagrasses - NW Fork draft report, Table 4-4 – It would be helpful to add information about dominant and subdominant species. P.4-29 – it would be helpful to provide more information about the detailed groundtruthing.
Oysters – NW Fork draft report, Figure 4-5 – Why the big jump in distance between stations 1-3 and stations 4-5? In-between is an area of ~dense population growth. Why weren’t oysters sampled in this area? (please clarify).

LAKE WORTH LAGOON
Lines 809-812 – It would appear that in this highly urbanized area, the LWL also must receive high inputs of other pollutants such as nutrients, fecal bacteria etc. These merit mention; otherwise the writing otherwise could be misconstrued.
Line 836 – Literally no information is provided on water quality, other than that “Water quality was consistent with previous years.” Further description and, at least, brief data summaries should be included (notwithstanding the plan for full description in 2006, mentioned on lines 858-859). The website to which readers are referred contained the following information: Water quality data were described as including 26 yr of monitoring by the county health dept.; and the PBC ERM (1988). In 1998 (in accord with NPDES compliance), 27 “core” water quality stations were selected in Palm Beach County (map not available), including 5 in LWL. Unfortunately, these stations are monitored only quarterly, and there was no mention of parameters included. PCB ERM Sub-Project 1.0 includes bimonthly sampling (still quite sparse), and proposed inclusion of additional

stations. However, DEP then expanded its monitoring in LWL (parameters unspecified) to include 6 sites (selection of locations not explained, no map provided) with monthly sampling frequency to conform with CERP and TMDL needs. DEP is now leading the monitoring effort in LWL.
In addition, LWL was described as having a major problem from sediment loading, accumulated as thick muck deposits (sediment accumulation rates ~0.1-0.9 cm/yr). This system also receives high quantities of untreated stormwater and other nonpoint pollution. Are there sewage bypasses as well? Please alter lines 809-812 accordingly.
Lines 837-841 – What is the basis for the evaluation of the LWL as having "rebounded" from the effects of the hurricanes? Please include explanatory information.

BISCAYNE BAY

Line 909 – Please provide supporting data/information for this statement ("In general, water quality within the bay is good to excellent except within a few tributaries).
Lines 917-922 – Describes a somewhat unconventional use of salinity as "conservative indicator of ecosystem health." Salinity is formally defined as a conservative parameter, meaning that it is not influenced or affected by biological activity (Day et al. 1989, Estuarine Ecology, John Wiley & Sons). However, it generally is not used as an "indicator of ecosystem health" per se (?). It is innovative and instructive for the District to so consider it, as long as other more standard indicators of ecosystem health (e.g. nutrient pollution, turbidity and SS concentrations) are also carefully considered.
Figure 12-19 – The major tributary names should also be included.
How frequently does the county (DERM) monitor, and for what parameters? [P.12-47 included information on DERM monitoring, monthly, of salinity, from 1979-. Have nutrients been monitored monthly, at least in 13 canals and [other] tributaries? (suggested based on p.12-51)]
Table 12-5 – It would be helpful to include literature data for sensitive larval stages, where not available from SFWMD (2004).
2nd category – should be Eastern Oyster (not American Oyster).
Regarding H. wrightii (please use lower case for species name) and R. maritima (note spelling of species name), large ranges such as 6-40 ppt or 0-39 ppt should not be given as "preferences" (see draft NW Fork report of the Loxahatchee River for a better approach). Please alter accordingly.
P.12-43 – Environmental Condition surely should not consider only salinity. Please add other information.
Figure 12-22 – again, is only salinity being monitored at these stations? And, it would be helpful to show the 32 additional meter sites on a map.
Line 974 – should be …1979, data are…
Figure 12-24 – should be numbered, and needs a legend and a key.
Pp. 12-49 –12-52, 12-54 – There appears to be a major problem here with description of dissolved phosphate as total phosphorus (e.g. lines 1012-1013 "total phosphate phosphorus" versus the table heading TP which is supposed to mean total phosphorus, not just phosphate). Did the authors mean
PO4-3-P? That is not the same as TP, and TP should not be used to designate phosphate. Please alter these pages accordingly. Were any TP measurements made? (such data would be much more helpful in assessing water quality than phosphate data)

The statistical models used to obtain the described trends should be briefly mentioned. (Is the report mentioned on line 1025 available?) It would also be helpful in Table 12-7 to include medians.

P.12-52 – The evaluations described do not appear to be well supported by the data, and therefore, a reworking/ reanalysis of this information is strongly recommended.
Examples:
1st white bullet – the target mentioned must be extremely high, because ammonia averaged 800 µg/L – surely the "change from red to yellow" for Arch Creek is overly optimistic?
2nd white bullet – although no increasing trend in NOx was noted, concentrations were high (avg. 270 µg/L).
3rd white bullet – again, the target set must be awfully high, since ammonia concentrations averaged 240 µg/L). Overly optimistic in presentation/evaluation?
5th white bullet – no trend may have been detected, but NOx in the Coral Gables Waterway was high (avg. 260 µg/L).
Lines 1045, 1055-1057 – very problematic, given that it does not appear that data on total phosphorus were taken – only phosphate data appear to be available. Trends in phosphate have little meaning; trends in TP are needed. Hopefully this is simply a problem of confusing presentation, and TP data are available? Please alter/clarify.

Appendix 12-2 –
1st para. - Please clarify: did DERM sample the 71 sites monthly? And, 1858 results of a total of how many? exceeded Florida water quality criteria?
The data given are from water-column samples. Are any data for sediments available? If so, please include.

Appendix 12-3 –
1st para., line 3 – Please change TP to phosphate (basis: chapter 12 – Biscayne Bay text and accompanying comments).
"annual water quality trends" – Please clarify the statistical models used for trend analyses.
Figure 1 – this helpful map should be included in the main chapter, along with the map that is already provided.
P.12-3-4, 2nd para. – "ammonium concentrations have steadily increased…Mean NOx, total phosphorus [please change to phosphate], and turbidity all exhibited slight decreasing long-term trends…" –
What is meant by steady increasing and slight decreasing trends? Are these trends statistically significant? If not, they should not be mentioned; if so, please add the information to clarify for readers.
Figure 3, p.12-3-6 – Please change Y-axis label for 3rd panel to Phosphate.

Lines 1053-1054 – not good news; suggests a possible sewage signature. What happened to Miami's WWTPs during the hurricanes?
Lines 1055-1057 – wording problem, so please change to: …concentrations generally were lower than …
Lines 1058-1059 – wording problem, so please change to: levels generally were lower

than the … [if I understood correctly what the authors meant to say?]
Figure 12-25 – There seems to be a discrepancy between the 2nd panel on the left and the description on p.51 (avg. given there was 240 µg/L) (?).
Figure 12-26 – There seems to be a discrepancy between the 2nd panel on the left and the description on p.51 (avg. given there was 20 µg/L) (?).
Line 1163 – Where were the dredge spoils deposited?
Lines 1179-1180 – ADCP is an excellent approach – how long has it been in operation?
P.12-62 – Have fish and macroinvertebrates been monitored previously?
Lines 1232-1241 – please fix italics (only the genus and species names should be italicized).
Lines 1242-1247 – Again, please consider variables other than salinity: The findings reported here underscore the importance of doing so.
Lines 1267-1282 –
The cores should also be examined for information on eutrophication history, and toxic substance inputs.
Lines 1283-1293 – Please briefly describe the statistical models used for trend analyses.

FLORIDA BAY AND THE FLORIDA KEYS
General comment: Although the Florida Keys are mentioned, little information appears to be provided about them (?). This chapter would be strengthened by adding more information about the Keys: what stressors are they facing, for example (much literature available)? and what plans does the District have for assessing some of these problems?
Line 1307 – should read: …Starting in the …
Lines 1311-1313 – This statement must be altered for accuracy and balance: Causes of seagrass declines in Florida Bay were reviewed by the Committee on the Restoration of the Greater Everglades Ecosystem (National Research Council 2002 – Florida Bay Research Programs and Their Relation to the Comprehensive Everglades Restoration Plan. Committee on the Restoration of the Greater Everglades Ecosystem, Water Science and Technology Board, Board on Environmental Studies and Toxicology, Washington, DC). That review supported a role of eutrophication (nutrient over-enrichment) in contributing to the problem (please also see review by Lapointe and Barile 2004, Estuaries 27:157-178; and earlier review by the reference, Boesch et al. 1993, contained therein). Thus, I do not know of general consensus, as of yet, among scientists about whether elevated salinities and/or nutrient pollution caused the widespread seagrass dieoffs, algal blooms etc.
Additional, related comment: throughout the draft writing of chapter 12, salinity is emphasized while other factors generally go unmentioned. Tracking salinity declines because of increased freshwater inflows is an important consideration, but freshwater inflows also carry with them many pollutants that are recognized as causing degradation to the coastal ecosystems. Please consider this point throughout.
For example, lines 1442-1443 could be altered as: …and the salinity and water quality of these basins is strongly influenced by this flow.
As another example, lines 1464-1465 could be altered as: …the post-1998 trend may be associated with a lagged response to the relatively high rainfall and flow, with relatively low salinity, in the mid-1990s, and with water quality changes accompanying the freshwater inputs.

Figure 12-30 – Appears blurred; please enhance clarity.
Lines 1421-1424 – Here and elsewhere in this chapter, the reader is repeatedly referred to the previous year's report. This is not very helpful for readers; I strongly suggest that at least a brief summary of the pertinent information and some key data graphics from the previous year should be included in this year's report, either in the chapter 12 text or in supporting appendices.
Moreover, examination of the previous year's report did not reveal the information in question – here, examination of the 2005 SFER-Volume 1, chapter 12, pp. 12-72 to 12-79 did not provide information on the statistical models used in trend analyses of TN, TP, and chlorophyll a concentrations. Thus, please add this information to the 2006 SFER – Volume 1 report, including the "p" values and the change in slope (% decrease for statistically significant trends).
Lines 1426-1427 – This TN concentration is described as only slightly higher than the minimum annual average, but actually is substantially higher: 41 µM N = 574 µg N/L, versus 34 µM = 476 µg N/L, or ~100 µg/L higher. Please alter this statement accordingly. Also, most of this report contains information on nutrient concentrations given in units of ppb (µg/L). Marine/estuarine science typically uses units of µM instead, but to help readers and for consistency, please include ppb values in parentheses throughout Chapter 12.
Lines 1440-1443 – Why were only these two basins along the northeast Florida Bay coast considered? It would be helpful to include a brief description of District efforts being conducted elsewhere in Florida Bay, if such efforts have been possible given the already-great demands on the District, and (likely) funding constraints.
Lines 1450-1451 – Thalassia testudinum actually grows well over a broad salinity range (e.g. high salinities - Tomasko et al. 1999, in Seagrasses: Monitoring, Ecology, Physiology, and Management, by Bortone (ed.), CRC Press; and low salinities < 5 to > 30 psu - Tomasko and Hall 1999, Estuaries 22: 592-602).
Figure 12-33, 1st panel – Historically, was Thalassia testudinum higher in Joe Bay? Please clarify.
Lines 1492-1494 – Please further clarify where these stations are; a map would be very helpful.
Line 1499 – Is the first time that periphyton is mentioned in the discussion of Florida Bay. Please add information about the monitoring of this component preceding this page.
Lines 1508-1511 – These statements are important. They need to be supported by accompanying information on the statistical analyses used, or data summaries/graphics, so that readers understand the basis-in-data for the statement that water quality is "good", and that plant and periphyton communities are in "good health." It would also be helpful shift to further describe (at least briefly) the basis for the apparent shift from Cladium to Eleocharis.
Lines 1512-1513 – Where is this monitoring occurring? A map would be very helpful. Please describe the monitoring in more detail (number of stations, frequency, parameters).
Line 1538 – no hyphen in macroalgae.
Lines 1540-1542 – Please describe the major parameters included in the "dynamic model of the seagrass community" (the reader is referred to the MFL section below, but that section only contains the quoted passage – lines 1587-1588).
Lines 1543-1544 – Please briefly describe how productivity and respiration are being

assessed (method).
Line 1548 – Please change seagrass to seagrasses. And, please clarify the species that are being considered.
Lines 1553-1556 – Is similar information being obtained for N and C, with/without enrichment conditions? Such information would be of value to further understanding of eutrophication influences on this important seagrass species. (Alternatively, it would be helpful to mention such information, where available, from the published literature.)
Line 1653-1654 – Ruppia maritima (note species spelling) may be appropriate as an indicator species for the transition zone, but it may not be an appropriate indicator species for [the entirety of] the seagrasses of Florida Bay, which have very different physiological characteristics (there is a wealth of supporting literature on this topic). It would be helpful if Thalassia testudinum (which has high habitat value, different from that of Ruppia) or other seagrass species can be used as a second indicator species.
Line 1656 – What other SAV species are in this transition zone? Please provide further information about their salinity tolerances.
Lines 1684-1685 – Again, please clarify the SAV species present in the transition zone. If the statement given here is accurate, then species with higher salinity optima must not be present; and if not, again see the concern presented in the comment for lines 1653-1654.
Lines 1704-1706 – Thalassia testudinum is known to have lower tolerance to eutrophication (directly, or mediated by epiphytic and macroalgal overgrowth) than Halodule wrightii, and freshwater inflows generally are accompanied by (co-associated with) nutrients and other pollutants. In contrast, the high salinities would be associated with lower pollutant inputs (lower freshwater inflows). Therefore, it seems overly simplistic to state that there were “clear responses of seagrasses [only] to salinity”, when nutrients and other pollutants could also have played a role in the patterns observed. Please restructure the writing to include consideration of this point.
Lines 1744-1746 – The writing, considered together with the previous page’s writing, implies that Halodule wrightii is a more valuable habitat species than Thalassia testudinum; is that a misimpression on my part? Please clarify (the statement as written does not mention T. testudinum, and states only that fauna benefit from H. wrightii [or other seagrass?] cover). If this is not a misimpression, then along with restructuring the sentence so that its meaning is clearer, please provide published literature supporting the premise that Halodule wrightii provides better habitat for faunal species, overall, than Thalassia testudinum. Do other studies show the opposite?

NAPLES BAY
Lines 1772-1775 – These sentences present conflicting information – please restructure: there is one station actually within Naples Bay, not two.
Lines 1786-1791 – Please include the statistical models and p values that support this statement. Without such analyses, it cannot be stated that TN “has decreased” in the lower bay, or that TP has decreased in the upper bay, because it is not possible to know whether the apparent decrease is statistically significant.
Lines 1793-1795 – Throughout this chapter, means are considered rather than medians. Please include explanation as to why median data are considered here?
Line 1859 – Where will the bypass divert water?

ESTERO BAY
General comment – A better map of this system is needed, or an additional map, showing Bonita Spring and the five major tributaries.
Line 1896 – Should read: …of the eastern oyster…
Lines 1899-1900 – Please add supporting references.
Line 1908 – Please change seagrass to seagrasses.
Line 1935 – Should read: …8,269 acres of…
Lines 1937-1938 – Suggest clarifying as: …was available. The present 60 acres of oysters translates to…
Lines 2002-2004 – Very interesting point.

CALOOSAHATCHEE RIVER AND ESTUARY
General comment – An additional map of this system is needed. It should include the sampling stations mentioned in the writing (e.g. for SAV; the stations mentioned in lines 2185, 2221, 2230-2235, 2237-2242), the locations mentioned in Figure 12-41, Fort Myers Yacht Bain, and the continuous salinity monitoring stations. Such a map would be extremely helpful to readers.
Lines 2095-2096 – Please alter this writing, or add explanation of the supporting data used in support of invoking decreased salinity and water clarity over various other factors.
Lines 2110-2113 – Please include information of salinity tolerance/optima for Vallisneria americana, and its general ecology. [Also would be helpful regarding lines 2141-2147, since it is my understanding that this species is predominantly freshwater with brackish tolerance (?).]
Line 2127 – Please change to: …these are eastern oysters and…
Lines 2167-2168 – The recovery was described as “remarkable” but actually appears to be modest – please clarify, or alter writing. Also, as for lines 2095-2096, again no basis is given for the attribution of the partial recovery only to favorable salinity conditions. Please provide data in support, or alter the writing.
Line 2175 – Please change to Eastern Oysters
Line 2177 – Suggest dropping the decimals and reporting as 3 acres. (Clearly, District efforts are needed here!)
Lines 2185-2192 – Please provide a brief description of the monitoring methods (e.g., for eastern oyster health?). First sentence – suggest: Monitoring of eastern oyster health… Also, please clarify the reference to Volety (affiliation?).
Lines 2201-2204 – Please at least briefly summarize the results of the previous surveys, or include such a summary as an appendix to this chapter.
Line 2205 – Please provide more information about this manual monitoring effort (stations, locations, frequency, parameters; approach – quadrat size? number? transects? N values?
Figure 12-41 – Are data available for species other than Halodule wrightii? If so, please mention in the figure legend, and clarify whether the other species appeared to change similarly over time. Are data from only 4 of the 8 stations (clarified in lines 2237-2240) included because H. wrightii did not occur at the other 4 stations? – please clarify.
Lines 2230-2235 – This information is too depauperate. Please provide summary information (here or appendixed to this chapter) – frequency, parameters.
Lines 2237-2238 – Actually, the Sanibel-Captiva Conservation Foundation Marine Laboratory was briefly mentioned previously; suggest that this information be moved to

lines 2208-2212.
Line 2242 – Is this technology groundtruthed?
Lines 2243-2244 – Is the internal reviewed draft publication by Chamberlain et al. available?
Line 2247 – Hunt et al. (2005) is missing from the reference list.
Line 2261, Lines 2278-2285 – Are associated water quality conditions also considered, or only salinity? Please clarify.
Lines 2286-2298 – It appears that very little of the variance in chlorophyll a concentrations is explained by TN loading. Have relationships between chlorophyll and Ni (inorganic N) species also been examined? Or between dominant problematic phytoplankton taxa and Ni concentrations/loadings? Such analyses could yield potentially valuable information.
Lines 2300-2317 – A map would be very helpful for readers.
Lines 2319-2331 – Please mention when this project is targeted for completion?

SOUTHERN CHARLOTTE HARBOR
General comments –
An additional map of this system is needed, that shows the major riverine influences mentioned, the continuous salinity monitoring stations (lines 2457-2460), etc.
The writing in this section is confusing because it also includes information on the Caloosahatchee River and Estuary. These should be better separated; for example, the map with sites 1-6 (Figure 12-44) should be moved to the section on the Caloosahatchee.
Line 2422 – Should read: …at this time, although…
Figure 12-44 – Please provide a description of this monitoring program (frequency, parameters, methods used).
Figure 12-45 – Please include N values and error bars. (I assume that the points represent means?)
Line 2472 – Should read: In southwest Florida, eastern oysters (Crassostrea virginica) have … [then omit scientific name in line 2476]
Line 2479 – How is health assessed? Please clarify.
Line 2481 – Please clarify the water quality parameters measured.
Figure 12-46, in support of lines 2495-2496 – thank you for this map! Very nice.

Post New Topic | Reply to: "Review of Chapter 12 by J. Burkholder"
Watch this TopicStop Watching this Topic

Topic: Comment by Ward (1 of 1), Read 25 times NEW
Conf: Chapter 12: Management and Restoration of Coastal Ecosystems
From: Jeff Jordan jjordan@griffin.uga.edu
Date: Thursday, September 22, 2005 08:35 AM

1. On page 12-6 the introduction states several conclusions that are not referenced. Who says the Indian River Lagoon is one of the most biologically diverse ecosystems in North America? [Similar conclusions are made at the beginning of other estuary evaluations that also need references to indicate the source of the statements.]

2. The following sentence states that the ecological health of the two estuaries depends largely on the quantity, quality, timing, and distribution of stormwater runoff. No reference is provided. This statement seems to be contradicted by the statement on Page 12-2 that notes there are many assumptions and uncertainties regarding the dynamics necessary for the long-term sustainability of coastal ecosystems.

3. On page 12-28, the following statement indicates a water quality monitoring program has been designed – is it documented and referenced? What 'parameters' are measured? How are long-term trends to be calculated?

"The Loxahatchee River District (LRD) has established a comprehensive water quality monitoring network in the freshwater and tidal segments of the Loxahatchee River. Nutrients and other parameters are monitored. The District is working together with the LRD to determine the long-term trend of water quality in the Loxahatchee River and Estuary."

Topic: Comments from Dr. Armstrong (1 of 1), Read 15 times, 1 File Attachment
NEW

Conf: Chapter 12: Management and Restoration of Coastal Ecosystems

From: Linda Davis ldavis@sfwmd.gov

Date: Wednesday, September 28, 2005 07:12 AM

CHAPTER 12 COMMENTS NEA 09272005.PDF (8KB)
Comments from Dr. Armstrong

Post New Topic | Reply to: "Comments from Dr. Armstrong"
Watch this TopicStop Watching this Topic

CHAPTER 12: MANAGEMENT AND RESTORATION OF COASATAL ECOSYSTEMS (B, Neal Armstrong)

This chapter provides a very good summary of the District's efforts to manage and restore the coastal ecosystems within its jurisdiction. Of major concern are the freshwater inflows to these coastal systems, the quantity, quality, timing, and distribution of freshwater.

While the District's program is functioning well, it is recommended that the team take advantage of work done elsewhere to guide some of its efforts. There is substantial expertise in this field and considerable literature available.

Specific comments follow:

Tables 12-2 and 12-5: Salinity tolerances are presented for seagrasses, shellfish, finfish, and reptilians. There is data available from studies in Texas estuaries, particularly Baffin Bay, that will cause some of the values presented in these tables to be modified.

Figure 12-4: why are releases from Lake Okeechobee delivered in pulses rather than steady flow?

Figure 12-20: No water quality sampling stations are located in the near shore waters just offshore of Biscayne Bay to define salinities of the boundaries for any water quality model that might be developed for Biscayne Bay.

Figure 12-23: What is the cause of hypersaline conditions in the southwest portion of Biscayne Bay? Are the flow units correct in this figure (as compared to those in Figure 12-21?

Lines 965-970: Required flows to maintain lower salinities in Biscayne Bay will have to be substantial given the size of the Bay. Are such flows available and sustainable?

Lines 991-995: If the anticipated hypoxia or anoxia in Biscayne Bay results in increased TP flux from the sediments, will this be of concern in a bay the size of Biscayne Bay?

Lines 1028-1047: Ammonia and NOx changing from "red to yellow" obviously refers to the table shown on p. 12-50, but perhaps this text could be rewritten so that no chemical properties in these nutrient forms are implied.

Review of Appendix 12-1 by JoAnn Burkholder (JoAnn Burkholder) 9/14/2005
Comments from Dr. Armstrong (Linda Davis) 9/26/2005

Topic: Review of Appendix 12-1 by JoAnn Burkholder (1 of 1), Read 25 times NEW
Conf: App. 12-1 Modeling Freshwater Inflows and Salinity in the Loxahatchee River and Estuary
From: JoAnn Burkholder joann_burkholder@ncsu.edu
Date: Wednesday, September 14, 2005 05:43 PM

Summary

Appendix 12-1 describes the hydrologic and salinity models used to evaluate restoration alternatives for the project. The purpose of this section of the 2006 South Florida Environmental Report is to document the calibration and validation results of these models and to provide a description of how these models are used in the evaluation of the Northwest Fork restoration alternatives. The study area is highly dynamic, i.e. coastal ocean—tidal influences, significant anthropogenic influence due to urban and irrigated agricultural areas, and the changing nature of groundwater due to recharge/discharge from various sources. The three major model components in this study are as follows.

1. A watershed model (WaSh) based on HSPF that simulates surface water and groundwater hydrology in watersheds with high groundwater and drainage canal networks. This model was calibrated and validated using long-term flow data acquired at various sites. It is important to note that the basis for the base condition and flow restoration scenarios were provided by the daily flow outputs from a 39 year simulation.

2. A hydrodynamics/salinity (RMA) model developed to simulate the influence of freshwater flow on salinity in the study area. This is a 2-D model based on the RMA-2 and RMA-4 models developed by the U.S. Army Corps of Engineers (USACE). The model was calibrated against field data from 5 locations and provided salinity predictions where field data were not available.

3. A Long-Term Salinity Management Model (LSMM) was developed to perform long-term predictions of daily salinity. It will also calculate other performance parameters under various ecosystem restoration scenarios. Field data, regression analyses, and results from multi-dimensional hydrodynamic models were integrated into the LSMM as a system simulation and management tool. This model contains management tools to be used to calculate additional freshwater demand for salinity management and nutrient loading under various restoration scenarios.

Specific comments concerning the WaSh model.

The WaSh model is well constructed and robust. The investigators have included all possible sources for freshwater input that is a necessary feature if one is to address freshwater input in this geographical area. Modifications to the WaSh modules (e.g. groundwater module—line 151, irrigation, high water table—line 181) are significant improvements that allow the accounting of evaporation from groundwater and the linking

of irrigation and high water table modules. Also, the study area drainage canal network and routing is well designed. These noteworthy changes permit interactions within the model that allow the end-user maximum freedom in scenario simulations.

The delineation of the 12 drainage basins in the study area is very detailed and complete. The investigators used a variety of data (i.e. hydrology, land use, topography, aerial photography, field observations) in the delineation of the 12 drainage basins. The investigators approach is scientifically sound and strengthens the usefulness of the model in allowing the choice of various reduction scenarios.

Attention to detail in describing the 12 basins of the study area is observed in Appendix 12. The investigators detail important features of each basin and note areas where uncertainty might exist, for example, in the lack of discharge gauge data at specific sites. This information is useful in focusing on areas where improvement might be made in future monitoring and modeling efforts.

The single groundwater monitoring station used in WaSh calibration is of concern. Do the investigators think that the data from this station is indicative of the groundwater regime in the northern Pal-Mar-Grove section? Would model results be significantly improved with other groundwater monitoring stations. Are there any plans to install other groundwater monitoring sites?

The investigators used the metrics defined by the ASCE Task Committee on Definition of Criteria for Evaluation of Watershed Models (1993) to assess model calibration and performance. The changes made in these metrics were justified (line 509). These methods provide an accurate basis for the comparison of model results with environmental data.

Specific comments concerning the hydrodynamic/salinity (RMA) model

The implementation of the RMA-2 and RMA-4 models, both, which are 2-D depth averaged models, will not adequately capture any salinity changes due to stratification. The investigators did note this shortcoming in the text (line 791 to 807). Also, later in the text they stated that "there are other driving forces that affect salinity including tide, wind, flux between river and groundwater, precipitation, and evaporation" (lines 875-876). One other important driving force is coastal ocean subtidal water level effects, especially storms and meteorological events on the scale of days to week, which can add or subtract from the astronomical tide due to offshore/onshore movement of water. It is noted that the investigators have been building this extensive and impressive model application for the Loxahatchee River over many years. The inclusion of a 3-D model (e. g. RMA-10 or EFDC) to address depth dependent salinity changes is no doubt a future improvement.

It would be very helpful to the reader if a bathymetric map (or maps) were included in this Appendix. For example, is there a significant channel near the inlet with the ocean? If so, what is the extent of the channel in the study area. The presence of a channel might provide some insight into areas where model output does not match measured values. Figure 12-15 would be an appropriate place to put a bathymetric contour map.

In any modeling effort it is important to define exactly what is to be modeled and to choose the most appropriate method. To this end, the investigators state that "The objective of the RMA model application is to establish a relationship between the amount of freshwater inflow and tidally averaged salinity" (lines 848-849). Also, "......these results reflect the daily averaged salinity under and average tidal condition." (line 851). With this in mind, the model simulation results in this study clearly capture the variability in the daily averaged salinity values (see tables 12-11 through 12-13). It is noted that more variability is observed between model results and measured data as one progresses upriver (see Figs. 12-14). Future model refinements and the acquisition of more data for model calibration would address these discrepancies.

The freshwater flow vs. salinity relationships plotted in Figs. 12-16 and 12-17 are very helpful and informative in describing the mixing curves associated with each study site. This information will be helpful to other researchers investigating salinity effects on the biology of the study area, for example, in the examination of bio-geographical changes.

Specific comments concerning the Long-Term Salinity Management Model

The Loxahatchee Estuary Long-Term Salinity Management Model (LSMM) was developed to predict tidally averaged salinity in response to restoration scenarios using the freshwater/salinity relationship developed by the RMA models. This tool is innovative and provides managers and researchers the ability to examine the dynamic aspect of the system under varied freshwater inputs. The fixed time step of 24 hours provides managers with more than adequate resolution. It is also stated that "This model also calculates the amount of freshwater demand for salinity management and nutrient loadings assuming a target concentration for inflows." (lines 1010-1011). Are there any nutrient scenarios/data to be presented? If not, the authors might want to address this discrepancy.

The statement that the ".....simulated data matches well with the observed salinities statistically." (lines 1020-1021) is supported by Tables 12-11 to 12-13. It is also noted that the statistical examination of model predictions vs. field data is investigated in the context of seasonal variability, i.e. dry vs. wet periods. The inclusion of this statistical examination of climatic variability on the study area is very important in addressing salinity management scenarios.

Upon examination of Figs. 12-24 to 12-27, it is noted that when progressing upriver, predictions do not closely match observed data. This is to be expected and future model refinements and more field data would tighten predictions. It is suggested that the investigators address future model refinements, if any are planned, in the text of Appendix 12. This suggestion holds for the complete package of models and it might provide an overture for more funding.

It would be helpful if the data presented in Table 12-16 were also plotted as a multi-line graph. It would be interesting to see if there are common or diverse deflection points in the salinity gradient under the various restoration scenarios. It is mentioned in the text and Table 12-15 where the approximate 2 ppt salinity front position is located, however

other salinity concentrations vs. river mile locations would be of interest to biologists and chemical oceanographers.

Specific points concerning graphs and tables

Fig. 12-8. The inclusion of a graph of the residuals between predicted and observed water levels would be helpful to the reader. There appear to be events that were not captured by the model (e.g. near 7/94, 10/95). Is there any explanation for these discrepancies?

Fig. 12-12 (and any others dealing with tides) - It would be useful if a graph of the residuals remaining between predicted and observed values was plotted allowing the reader to see the magnitude of any model error.

Table 12-3. In addition to total acreages, the percentage amount representing each land use type should be added to this table.

Post New Topic | Reply to: "Review of Appendix 12-1 by JoAnn Burkholder"
Watch this TopicStop Watching this Topic

Topic: Comments from Dr. Armstrong (1 of 1), Read 16 times, 1 File Attachment NEW
Conf: App. 12-1 Modeling Freshwater Inflows and Salinity in the Loxahatchee River and Estuary
From: Linda Davis ldavis@sfwmd.gov
Date: Monday, September 26, 2005 07:18 AM

APPENDIX 12-1 COMMENTS NEA 09242005.PDF (16KB)
Comments from Dr. Armstrong

Post New Topic | Reply to: "Comments from Dr. Armstrong"
Watch this TopicStop Watching this Topic

APPENDIX 12-1 Modeling Freshwater Inflows and Salinity in the Loxahatchee River and Estuary

In this Appendix, the authors describe the hydrologic and salinity models used in the Northwest Fork of the Loxahatchee River restoration alternative evaluations. Three models were developed: (1) a hydrologic model watershed model (WaSh) to develop flows into the River based on rainfall, infiltration, and transport processes occurring in the watershed; (2) a hydrodynamics and salinity model to relate freshwater inflows to salinity in the Northwest Fork; and (3) a long-term salinity model used to forecast salinities for several decades. The first model is a derivative of the well-known HSPF model modified to include a groundwater component that coupled surface water and groundwater – a feature essential for Florida's soils. This model has a water quality component that was not utilized in this study. The second model is based on the RMA-2 and RMA-4 models, again well known finite element models used for simulating water transport in rivers and estuaries. The third and final model is a management model that incorporates rather straightforward algebraic equations.

The authors present a good account of the work performed, and the work itself has been for the most part performed in a scientifically defensible way. What could be made clearer in the document is a statement of purpose of the effort and how the models were selected for the tasks to be performed and the purpose to be achieved. For the results presented here, some rather sophisticated models have been used to generate some summary results that could have been obtained with simpler finite segment models in a much shorter time and less expense. There are well known mass balance-based, finite segment models that have been used for many decades that could have been applied here and the same overall results obtained.

If the purpose of the work was to model constituents beyond salinity, if time-dependent flows and velocities are needed for later work, and if time-dependent constituent concentrations were indeed needed then the models used were indeed appropriate.

Specific comments follow below:

A map of the area showing the geographic features, sampling stations, streams, etc. mentioned in the text is needed.

Lines 454–466, 475, 483-484: To calibrate and validate the watershed model, relatively few stations on streams/canals were available and only one groundwater station (a well) was used. Because the HSPF model was being used to model groundwater as well as surface water flow, using only one groundwater station for calibration appears to be inadequate. Were other wells not available in the area? Line 475 says "wells" so apparently there were. The sensitivity analysis showed that evaporation coefficients and infiltration parameters were the most sensitive model parameters in completing the water budget calibrations. If this is the case, then the groundwater model calibration is the most important for the hydrologic estimations. Calibration of the HSPF model using only one direct groundwater measurements appears to be the weakest part of the calibration/validation process.

Lines 467-471: It would be helpful to list the performance criteria being used and the values of those measures that would demonstrate that the models were indeed calibrated and validated.

Lines 506-612: The DV, NS, and R^2 measures of performance are interesting ones to use. It would help the reader to have the relevance of these measures to the modeling performed in this study explained up front as well as the goals for these performance measures and why they were set the way they were. The Nash-Sutcliffe coefficient, for example, is said to vary between 1.0 indicating a perfect fit (i.e., when Qs = Qm in every case, which is obvious) to 0 indicating the model is predicting no better than the average of observed data (i.e., when Qs = Q in every case, again obvious). But in the application of the model, it is the average that is desired; this permits the average freshwater inflow to be related to average salinity at a given location. Thus, is the goal 1.0 or 0? For the coefficient of determination (R^2), the authors should indicate whether it is being used in a statistical sense (with independence of X and Y) or strictly as a measure, and for the latter what is the desired level?

In Table 12-5, there is considerable difference between the DV values for calibration and validation at almost every station. Why should such a large difference occur between the calibration and validation periods or is this typical of the results for two different periods? Does the difference observed affect the believability of the results from the model?

In Figure 12-6, there are significant differences between observed and modeled runoff in summer and fall 1997, in winter 1998, and in fall 1999. The text implies that the differences were related to the quality of the rainfall data. Was there clear reason to suspect the rainfall data? What analysis of other model parameters and/or field data was done to explain the model results?

The text indicates that calibration of groundwater level was conducted as the last step of the WaSh model calibration. It is curious that groundwater calibration was not done first given the sensitivity of the model results to vertical movement of water through evaporation and infiltration as noted earlier. Further, the results given in Figure 12-8 indicate significant lag and overprediction of the observed results. Can the authors provide some explanation of these results, analysis with the three measures used for the canal/reach flows, and evaluation of impact of the errors in these results on the freshwater inflow vs. salinity relationships?

Lines 665-967: It is not clear why the RMA models were needed for this work. A finite segment model could have produced the same results in a much shorter time and less expense. Clarification for the choice of these two models for this work is needed.

Boundary conditions both at the freshwater inflow end and the ocean end of the system will have considerable impact on the salinities calculated at stations within the estuary. At what boundary was the tidal record entered and how well did it match the actual record at some gauging station? What was the basis for choosing 35.5 ppt salinity as the boundary concentration in the RMA-4 model? What was used in the RMA-2 model?

In Figure 12-14, what is the fixed elevation value – 0.2 or 0.8 depth?

Lines 1036-1072: There is discussion of scenarios and the ecological benefits of each and the freshwater flows needed to realize those benefits. The flows needed for each scenario are presented in Table 12-15. Where are these scenarios presented or what it beyond the scope of this particular appendix to present and discuss them? The feasibility of the flow regimens specified for the scenarios are not presented; again, is this beyond the scope of this particular appendix?