Appendix 1-5: Final Report of the Peer-Review Panel for the Draft *2010 South Florida Environmental Report –Volume I*

In October 2009, these final comments of the peer-review panel, comprising the final report, were provided publicly on the District's SFER WebBoard 2 (www.sfwmd.gov/webboards). The information was prepared under Purchase Order to the South Florida Water Management District. With the exception of reformatting some information for better readability, this appendix was not edited or spellchecked by the SFER production staff and appears verbatim as posted on the WebBoard.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 1

Subject: BULLET POINTS TO ADD for the presentation:
Posted: 10/20/09 02:10pm

GENERAL

- There is still some integration that can occur between the individual chapters. For example, invasive species and mercury issues should be considered for all the individual chapters.
- Make clear in the beginning of each chapter what agencies or laws that particular chapter is accountable to.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 2

Subject: Final Comments and Bullet Points
Posted: 10/22/09 11:07pm

Closing Comments on Chapter 2 of 2010 SFER

Prepared by: Otto Stein (AA), Neal E. Armstrong (A)

Review is based on accountability (primary) and integrative (secondary)

Conclusions:

1. This chapter continues to be a keystone of the SFER reports because the hydrology of south Florida and the management of water is one of the District's primary missions, and the presence and movement of water influences water quality and ecological resources throughout the District's jurisdiction. Thus, all other chapters of the report relate to some aspect of this Hydrology chapter. As indicted by the stated purposes of the chapter, review at the accountability level is warranted and the chapter successfully presents a defensible account of data and findings that is complete and appropriate.
2. The panel appreciates the District's thoughtful responses to review comments and except as noted below, concurs with those responses.
3. The internal organization of this chapter has progressively improved over the last several years, but presentation and synthesis of information could benefit from additional improvement, especially on the presentation of the overall goals and objectives of water management strategies. The district must balance between many water demands, needs, and desires that are often managed on a sub-unit scale, i.e. Lake Okeechobee, and are equally often in conflict with objectives of other sub-units. Surely the District has a decision hierarchy to balance these competing needs and this chapter is where these should be clearly articulated. Suggestions for improvement are the focus of the recommendations below.

Recommendations:

1. The proposed table simply listing the appropriate SFER chapters focused on specific hydroecological sub-units will not increase the linkage to management goals and objectives. A better approach is to provide a description in layman terms of the issues surrounding water management from the bird's eye view of the entire district. The description should outline the goals under wet, dry and average conditions and provide a decision tree for the entire district along the lines of what is provided for Lake Okeechobee. For example, how will the need to maintain WCA and STA water levels within appropriate ranges be balanced with minimum and maximum flow requirements to the coastal estuaries in both wet and dry years? Will these balances be altered as more STA acreage comes on line? This could be done by development of tables and figures for the whole district analogous to those provided for Lake Okeechobee or by another method of the District's choosing.
2. The panel welcomes the District's willingness to modify the chapter organization and encourages the District to use the format proposed in its response to the panel's review. The District should focus on creation of proposed section 3.1 following guidelines suggested in Recommendation 1. As recommended last year, new section 4.2 should be a description of how well drought or flood conditions, as the case may be, were handled during the year, and how well water supply needs were met; the details of water flowing from water body A

through structure B to canal C, regulation schedules with actual water levels, and so forth can be moved to an appendix.

3. The District should proof the additional text offered in response to panel comments. Several typographical errors are noted.
4. The panel requests that future District responses to chapter review comments repeat the original broad comments so that its responses can be a stand-alone document. This is not necessary for individual editorial and/or page specific comments unless the district disagrees with the proposed change. A simple statement that editorial changes were incorporated will suffice.

Governing Board Bullet Points:

1. Chapter 2 Hydrology is a keystone chapter of the SFER as the population and environmental health of south Florida, and virtually all functions of the District, are dependent on the quantity and movement of water which varies both within the year and from year to year. This chapter effectively summarizes the main natural and human factors influencing this year's movement and use of water on a district-wide scale allowing for "one-stop-shopping" for a key hydrologic data summaries for both the public and internal district use.
2. This chapter offers an opportunity for the District to clearly articulate its water management goals and objectives and offer the public a hierarchy decision tree of how it will balance the competing needs and demands of various users and how water will be allocated between competing goals of District initiatives, i.e. between STAs and WCAs and between either of these and coastal estuaries under normal and extreme wet and dry conditions.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 3A

Subject: Panel's Closing Comments - Chapter 3A
Posted: 10/22/09 02:29pm

Closing Comments on Chapter 3A of 2010 SFER

Closing Comments Prepared by: Robert C. Ward (AA) and Ellen van Donk (A)

Additional Questions:

1. One question that arises from the web board comments from FDEP. The authors of Appendix 3A-8 do not have an affiliation listed. Since there is a comment on this appendix from FDEP, I assume the Appendix 3A-8 authors are not associated with FDEP, as are the authors of Chapter 3A.
2. Will the Germain (1998) report be available on a web link? This question is asked since the reports for the time period surrounding 1998 are missing from the link provided in Chapter 3A.

Conclusions:

1. The Author responses are quite helpful in gaining better insight into the limitations under which they must conduct the annual EPA water quality standards assessment reported in Chapter 3A. The limitations are numerous and need additional highlighting to insure reader understanding and appreciation of complexities involved.
2. After highlighting the District's monitoring re-engineering effort in the 2008 and 2009 SFERs, the omission of an update on the monitoring re-engineering effort in the 2010 SFER is troubling to the Panel. Data consistency and comparability, over time and space, have been a concern to the Panel and the re-engineering effort was an initiative to address this concern.

Recommendations:

1. While all SFER chapters will benefit from more consistency and comparability of water quality data across South Florida, it is critical to Chapter 3A. The monitoring re-engineering effort, discussed in 2008 and 2009 SFERs, was not mentioned in the 2010 SFER! The author responses to Chapters 3A and 7A help the Panel update themselves on this very important effort; however, there should be some update contained toward the beginning of the 2010 SFER, following up the highlighting of this effort in the two previous SFERs.
2. The water quality standard compliance assessment reported in Chapter 3A is conducted under a number of limitations – limitations that need to be clear to understand the information contained in Chapter 3A. A 'scope' section, added to Chapter 3A, in which these limitations are spelled out at the beginning of the Chapter would help readers understand the reasons why, and nature of, the methods developed and the data used. For example, the data are not collected specifically for the standard assessment – data collected for operational and project purposes are employed. This, in turn, requires the authors to define 'annual' compliance when data from more than one year are used to support the assessment. In addition, methods must be developed to screen the data to insure as much consistency as possible; to compute standard compliance in the first place; to combine sampling sites and years in order to obtain sufficient data to support the compliance methods; and to explain that standards are applied at some places where they are inappropriate (e.g. at interior Refuge sites that are rainfall dominated soft water systems). This large number of decisions, needed to address limitations,

can affect the results presented in Chapter 3A. The methods, developed to date, are scientifically sound in addressing the limitations, but there are other ways to address such limitations. Thus, this recommendation is simply to suggest that enhanced transparency regarding assessment strategy is needed to insure that readers appreciate the difficulty faced by the Chapter authors in preparing the water quality standard assessment.

3. As the South Florida restoration efforts proceed, there appear to be growing opportunities to establish a basis for large-scale restoration project/program accountability with water quality data (not just timelines for project completion or project inflow and outflow differences in water quality). For example, as less water quality standard violations occur, it may be possible to associate such a trend with restoration projects coming on line and/or operating successfully.

Governing Board Highlight Items:

The water quality monitoring re-engineering effort needs to be carefully followed and valued, given its ability to enhance the consistency and compatibility of water quality data across South Florida, and, consequently, the scientific soundness of the information provided to management and the public.

The trends in water quality standard compliance reported in Chapter 3A suggest that water quality restoration effects may be revealing themselves in regulatory monitoring results. Such trends need to be further examined and developed as a possible way to have firm data (e.g. from Chapter 3A) integrated into program and project updates in Chapters 4, 5, 7 and 8 in future SFERs.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 3B

Subject: Final Report for chapter 3B
Posted: 10/19/09 03:40pm

CHAPTER 3B MERCURY AND SULFUR MONITORING for 2010 report

Technical Review

The Mercury and Sulfur Monitoring, Research and Environmental Assessment chapter (3B) is an excellent overview of the mercury and sulfur problems in the Everglades, on-going problems with high levels of mercury in bass (a fish consumed by people), how mercury and sulfur interact with other nutrients (and with each other), exceedances of mercury and sulfur, on-going research with biota and mercury, the role of sulfur, and the new initiatives to understand mercury cycling.

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. Appropriate references to the primary literature are a key component of the report. 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 (perhaps with hot links).

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 (although data on a short-lived species such as mosquitofish are also useful), and have one of the longest running such data sets in the country from one region. The lack of temporal and spatial trend data on mercury in birds is problematic.

The major problems are noted, along with new research needed to understand how to reduce mercury levels further, particularly in fish in the Everglades National Park, in the Everglades Protection Area, and in the Kissimmee River Basin. All three are problematic because of the longevity of the fish, and their consumption by people. Further, the sulfur exceedances are problem that may require more interagency interactions.

The data, models and conclusions in chapter 3B reflect the complex problem faced by many agencies dealing with mercury and sulfur in freshwater ecosystems, particularly since often the problem relates to atmospheric deposition (sources of mercury from elsewhere not under their direct jurisdiction). The data generated by the SFWMD are proving useful for other aquatic ecosystems throughout the United States. Hot links to particularly relevant papers or reports mentioned would be useful.

The summary is excellent, and hits the high points. The bulleted summary of all the major findings from the overall mercury program is particularly useful, and gives the reader an indication of the direction of the chapter. However, some of the bulleted items should also provide information on the past water year (eg. the first bullet). Research with mercury and sulfur in the Everglades ecosystem continues to be a productive collaboration between different agencies in understanding the complex issues, and this collaboration should be fostered. Direct interactions of sulfur and mercury remain an important problem requiring additional attention.

The statistically significant increase in Hg along a north–south gradient is telling. Clearly some process(es) are increasing the bioaccumulation as one moves down the general flow path.

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. Integration of sulfur into the models is an important step in understanding chemical dynamics within the Everglades, and should be given high priority. The models would profit from data that examine mercury and sulfur levels in water and biota from the same location at the same time (at greater frequency) and an in-depth and transparent peer-review.

The findings are exciting in that they include four important areas: 1) Continued biomonitoring to explore temporal and spatial trends in mercury (both the bass and sunfish data are extremely important within this context), 2) Results of experiments to determine if the mercury levels are having effects on key bioindicators (wading birds), 3) The relationship between mercury and sulfur, and 4) Assessment of practical approaches to reduce sulfur levels and restore the appropriate hydropattern. The inclusion of previous findings provides a context for the current work, and allows the general reader to get up to speed with previous work (although again, hot links would help). The inclusion of sufficient references in the previous findings was extremely helpful, and continues to be important in each report.

The authors of the chapter were responsive both to comments by the Peer Review Committee, and to those of the general public. This is an important part of the review process, and the responsiveness of the authors is commendable. It is never, possible, however, to address all issues in one report.

Problems that remain mainly include: 1) providing sufficient detail to evaluate the individual studies (although the appendices provide some of the needed information, 2) providing a context for levels in fish with those from other southeastern areas, 3) the lack of temporal trends data for mercury in birds, and 4) Lack of statistical analyses of some trends (see section below). The provision of lakes impaired north of the ENP was extremely useful. The complicated relationship between sulfur and mercury remains a problem, particularly in regard to the sources of sulfur to the system (especially the agricultural sectors). In addition some stakeholders require more information on food-web dynamics and the impact on mercury bioaccumulation in the Shark River Slough.

Mercury in Everglades Fish and Wildlife

This section of the report provides a summary of temporal and spatial trends in mercury levels in key bioindicators, including fish and birds. It is key aspect of the mercury program because it provides both context, fate, and effects of mercury. The historical section provides key temporal information and a context for the monitoring reported in this section. The description of methods is more complete this year, allowing for a more complete understanding of the results. The integration of human health criteria and advisory information into the mercury levels results is an advantage. The same areas of the Everglades Protection Area continue to be a problem with respect to mercury levels in Largemouth Bass.

The inclusion of more data from the Kissimmee Basin is both important and suggestive of the need for a more detailed study of the same fish examined in the EPA overall, including mosquitofish, to try to determine the trophic level effects.

The lack of data on mercury in feathers of fish-eating birds is disturbing, since this was one of the key data sets for the Everglades. It has been one of the key bioindicators, and some mention of it needs to be made.

Additional Statistical Analysis of Mercury Data

While the report presents many tables and graphs that are useful in presenting a picture of mercury variation. There are some additional analyses that might be useful. For example, there is clearly year-to year variability in mercury data, likely due to differences in sampling protocols (number of samples , annual timing, size of fish, etc. etc.), some readily visible trends are discernable. Some of the authors' claims seem to be counter to the data. However, various conclusions made by simply data-plot observation are open to debate. More thorough statistical analysis would minimize this debate (more later).

The authors' claim that concentrations have decreased over time and last year placed a great deal of optimism in lower values in Shark Slough. While it is clear to say that there appears to be a decreasing trend from the beginning of the POR to about 1998 in the WCAs Fig 3B-2 (and perhaps in the Kissimmee, Fig 3B-11) that trend in not repeated at other sites nor is it generally borne out in the age standardized data in Figs 3B-6 to 3B-10.. Additionally, there appears to be no further decline in the WCA or the Kissimmee after 1998 (1999 might be a better cutoff). Last year's decrease in Shark Slough concentration just seems to be within the year-to-year variation. Therefore the text discussion about reductions with time tends to paint a much brighter picture than the data indicate. There appears to be no improvement in LMB mercury levels anywhere from about 1999 to the present and in some cases there appears to be a general increase, i.e. Holeyland. In fact much of the age-standardized data seems to suggest that there was a bottoming out of Hg levels in the general range 1999-2003 (depending on the site, and including the Suwannee R.) and a gradual, but clear increase since. A more thorough analysis of the data is warranted to see if the data trends suggested in this review (or alternatively the authors' interpretations) are valid.

A statistical analysis (such as repeated measures ANOVA) could be used to test for time trends in the data all sites simultaneously, thus ending any debate about "observed" trends in time and location. The authors are strongly encouraged to perform more thorough statistical tests on the collected data. Antidotally, note that a simple observation of the data in Fig 3B-5 certainly suggests no difference between the WCA and areas north, yet the statistical analysis proves a difference. How much more information could be gleaned from the entire data set with better statistical analysis?

Once suspected trends are confirmed, the next step will be to determine why. This is necessary if Floridians have any hope of making long term improvements. Questions in need of answers include but are not limited to:

- What caused the readily observable decline in the WCA up to about 1999?
- Why has there been no improvement since?
- Why have those generally not been repeated in the areas further south in the ENP?
- What causes the general north south increase in mercury?
- Why does STA-1 data seem to show much lower levels?
- Could the mechanism apparently at work in STA-1, be employed elsewhere?
- Do annual concentration variations correlate with annual variations in hydrology?

Sulfur in the Everglades

The extensive section of sulfur levels and effects was extremely useful, as was the expression of unusual sulfur events. The inclusion of a information needs and recommendations sections improves the chapter, highlights the importance of integrating the mercury and sulfur information, and suggests key future research needs. The summary of known information and key

questions provides a context for the District to undertake future studies on the proximate sources of sulfur that are not due to the EAA directly.

Because of the importance of sulfur to mercury methylation and bioaccumulation, it is critical to address the information needs identified in this chapter. This may be one of the most important aspects of the mercury problem, and many of the recommendations should be implemented. The highlighted Information needs and recommendations seems to be right in line with the gaps in the preliminary mass balance results (e.g soil oxidation by hydroperiod). There is a need for a better estimate of the quantity of sulfur removed by crop harvest. Its rather large magnitude relative to others and its apparent estimate by S concentrations in Typha and not the crops of interest suggest further refinement.

Research Progress

This section describes the research undertaken to monitor mercury levels, understand effects of mercury, and revise the mercury cycling models for mercury. The project to determine how mercury is affecting fish-eating birds is very important, and the lack of a report is problematic. The results cannot be analyzed without a full report on the data. Several key questions remain: 1) Is homosexuality the only dependent variable being monitored, 2) Why was this one picked, and 3) how can nest success be so high in light of the homosexuality? The annual decline within treatment groups is as large as the variation between them in a given year, and if there was some sort of cumulative effect occurring one would expect the opposite time trend. Clearly there is an unreported confounding variable (could that be the fact they are in captivity causing social stress?). If males are nesting homosexually at the rate reported, how could so many nests have successful egg production? The unstated answer may be related to mate switching but if that occurs successfully in all groups, what chronic effect is there? Clearer explanation of results is required before continuation of this study can be recommended.

The TMDL study is an important component of the mercury program, and the elements of the study are clearly described. The assignment of particular elements to given agencies, or groups of agencies, is unclear. Thus, it is difficult to determine the process of arriving at the TMDL.

Finally, the Regional sulfur mass balance study is critical to managing sulfur, and thus managing mercury levels in the Everglades. The task of determining the various inputs and soil oxidation processes is both critical and necessary for understanding the mass balance. Data on sugarcane harvest is key, but is not the only input necessary. The data on greater effects during dry years suggests that models should be constructed to understand the possible effect of increasing frequency of dry years or increased duration of dry spells.

CHAPTER 3B - Accountability

This chapter provides the necessary information to evaluate whether mercury levels in the Everglades are meeting appropriate state and federal criteria. The provision of the criteria, and the notations of the locations where mercury levels in fish exceed the EPA level of 0.3 ppm in edible fish tissue is key to understanding the importance and relevance of both past and current levels, and of regions where special consideration should be given. The data provided also help the state and local stakeholders understand the need for and importance of Do Not Eat advisories, and of educational programs to explain the importance of these advisories. It could be improved by having one map (with accompanying table) that shows EPA mercury exceedances for fish. Such a devise could also help the general public and be used in educational programs outside of the report itself.

CHAPTER 3B – Integration

Mercury issues cross-cut several chapters, and this years report makes a better attempt to include mercury in these chapters. However, it is not clear that the integration occurs in the management and recovery decisions, but rather only in the report itself. For example, issues discussed in the mercury section of chapter 5 are not well integrated with 3B, and the role of the STAs in mercury accumulation in the Everglades generally needs to be further explored.

Subject: BULLET POINTS TO ADD for the presentation
Posted: 10/20/09 02:07pm

CHAPTER 3B

- Continue developing an understanding of the relationship between mercury and sulfur, including appropriate models and simulations.
- Develop models that use information on methylation, mercury levels, and sulfur levels from the same location.
- Concentrate on filling data gaps in the preliminary mass balance results (e.g soil oxidation by hydroperiod). T
- Develop a better estimate of the quantity of sulfur removed by crop harvest

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 4

Subject: final recommendations and comments
Posted: 10/16/09 02:07pm

Final comments and recommendations

Level of Panel Review: Accountability: Primary Technical: X

Reviewers: AA: van Donk, A: Armstrong

Recommendations:

- There is a caveat that needs to be addressed at some point, and that has to do with the fate of the phosphorus, and in the future the nitrogen, that is removed by BMPs from waste sources. The phosphorus removed by essentially all BMPs is stored on site in the BMP, and it hence susceptible to release at some point in the future. Also, BMPs that rely on adsorption of phosphorus eventually reach a capacity beyond which more phosphorus is not adsorbed. In other words, the "life" of a BMP is finite unless that stored phosphorus is harvested and removed from the watershed entirely. We recommend that more information must be developed for the SFER to demonstrate how these considerations are being incorporated into the source control strategies for the various watersheds.
- There was not much detail provided for the phosphorus load estimates to judge whether there might be other interpretations. Other information provided was primarily about source control activities underway, laws and rules governing controls, and similar matter that appeared to be interpreted correctly. We acknowledge that there is information and details regarding load estimates in the supporting appendices and we recommend the authors will continue to build upon the appendices information and evaluate if additional detail and/or discussion can be developed regarding the load estimates within the context of the regulatory source control program for all program implementation areas. We recommend that any additional information that can be developed will be considered for inclusion in SFER 2011.

Closing comments:

- There is an impressive array of activities designed to control phosphorus in the Lake Okeechobee watershed now in place as well as the Caloosahatchee River and St. Lucie River watersheds. In addition, controls on nitrogen are being developed with the ultimate goal of protecting the estuaries. The rationale for these source control activities is clearly articulated in the chapter, the engineering approaches sound, and the science incorporated effectively.
- Like last year, this chapter is very well written and an excellent example of how an accountability chapter should be constructed. The text is concise, to the point, and communicated effectively.
- The content of the chapter has been improved significantly through the consolidation of control strategies for the Northern and Southern Everglades watersheds into the chapter. This allows Chapter 4 to be in much better alignment with Chapter 2 Hydrology, Chapter 10 Lake Okeechobee, and Chapter 12 Estuaries.
- The authors have done an excellent job of linking findings to management goals and objectives.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 5

Subject: Chapter 5 Final Comments and Bullet Points
Posted: 10/23/09 10:48am

Closing Comments on Chapter 5 of 2010 SFER

Prepared by: Otto Stein (AA), JoAnn Burkholder (A) and Joanna Burger (A)

Review is based on accountability (primary) and integrative (secondary)

These levels of review were evaluated as appropriate because Chapter 5 has significant technical and accountability aspects. Discharge standards for phosphorus have been set for the STAs, so it is logical to conclude that reporting in this chapter is about the success in meeting these standards and/or reasons why the standards were not met. The chapter authors clearly considered the panel's comments; each was thoughtfully addressed and most of the panel's suggestions are being incorporated into the final chapter.

Conclusions (Technical Review):

1. This lengthy chapter summarizes an impressive array of operation/ maintenance, research, and public education/recreation efforts that are in progress, recently completed, or planned in the District's many efforts to optimally manage six major stormwater treatment areas (STAs), and optimize their performance in phosphorus (P) removal. This year's chapter is again supported by 15 appendices – clearly a great effort by the authors. The District is world-renowned for its leadership in maintaining constructed wetlands to function sustainably in P removal – and these constructed wetlands are huge, relative to the scale of most constructed wetlands elsewhere. As in the previous year's chapter, an enormous amount of work is represented here.
2. The data interpretations contained in this chapter are generally sound and scientifically defensible. The various points are mostly supported by strong and clear rationales and by figures, photos, and tables that mostly are well designed and very helpful. An exception is the latter part of the "Research and Optimization Studies" section, which provides interesting information on various monitoring, field experiments, and mesocosm experiments, but with insufficient information to enable assessment of technical merit. The authors explained that the chapter focused upon only a few of the STA research studies in providing technical details, and included the summaries about other research studies to give an overview of ongoing activities. It would be helpful for the chapter to include this explanation.
3. The panel considers quarterly sampling insufficient to document the pattern of downstream changes in TP, TDP, and SRP concentrations. A large body of peer-reviewed publications recommends at least monthly sampling to assess water quality changes. The panel also considers monthly surveys as inadequate for making interpretations about the reproductive success of black-necked stilts. The time of day when DO samples were taken should be added to Table 5-8 to assist readers, and a column should be added to this table showing the percentage of the total outflow from the particular STA coming from each gate. This would emphasize the text description indicating that most gates with oxygen values below the SSAC limit are those with relatively low flow. The frequency of sampling for mercury should also be included in the chapter. The potential significance of coontail should be described based upon the peer-reviewed, published literature (e.g. coontail thrives under nitrogen-enriched conditions).

Conclusions (Accountability Review):

1. The panel appreciates the District's thoughtful and detailed responses to review comments and, except as noted elsewhere, concurs with those responses.
2. The chapter presents a defensible scientific account of reported data and findings that are clearly and continually linked to management goals and objectives, especially in the first section (STA Performance) wherein the regulations are clearly stated and the compliance results for WY2009 are appropriately reported and discussed. In the second section (Analysis and Interpretation), the findings sometimes did not seem to be clearly linked to needed changes in management and operation of the STAs. The third section (STA Research and Optimization Studies) described as-yet uncompleted research. It would seem appropriate in this section to first describe the issue(s) driving the research, then outline the research methodology, and then present the preliminary results and whatever feedback about the problem those results indicate. The authors noted that in the final chapter writing, the issues driving the research and the linkage to management are being added to each of the research summaries.

Recommendations:

1. The authors provided very helpful responses to the panel's comments on the draft chapter. The revised chapter should include all of this explanation and information, and the editorial suggestions should be incorporated as well.
2. The sampling frequency to document changes in downstream TP, TDP, and SRP concentrations should be increased from quarterly to at least monthly.
3. The District should conduct further studies to validate the findings from the cattail/water depth study, including field observations and more depth measurements to determine narrower depth-duration thresholds for STA cattail vegetation.
4. The District should develop a standardized "research reporting template" for the many research studies presented in the third section (STA Research and Optimization Studies) of Chapter 5. This template should be organized to first describe the issue(s) driving the research, then the methodology, and then the preliminary results and inferences and should be used in future SFERs. In cases where the specific research study is not emphasized in a given year, the template should provide a rationale for the research (description of the issues) and abbreviated methodology and an anticipated time for presentation of results.
5. The second (Analysis and Interpretation), and third sections would be improved by reporting the information by broader concept rather than cell (e.g. the EVA cell did x,y,z while the SAV cell did a,b,c; rather than cell 1A did x,y,z while cell 4B did a,b,c). Data interpretations by readers other than District personnel who are intricately linked with the projects would be much easier if text, tables and figures used the physical attributes rather than cell names to distinguish differences.
6. A table should be added near the beginning of the chapter indicating what cells contain what type of vegetation.
7. If the black-necked stilt is of special concern in South Florida, the District should consider initiating a specific study to assess reproductive success of this species more rigorously.

Governing Board Bullet Points:

1. Chapter 5 STA Performance, Compliance and Optimization is one of the more unique chapters of the SFER in that contains important but perhaps mundane reporting of water quality performance and compliance results but also contains a description of the scientific and technical challenges the District faces in efforts to optimize the STAs. The chapter does

an excellent job of reporting the performance metrics and the compliance (or lack thereof) of the STAs with all applicable water quality regulations.

2. Optimization of what is quite likely the largest scale constructed wetlands project in the world is a continuing scientific and technical challenge for the District. In many instances the District's efforts are one-of-a-kind with no previous examples to emulate and the overall success of the STAs in improving water quality, especially in phosphorous removal, is commendable. However, success is highly dependent on water management and if near-optimal conditions are not maintained, especially in drought years, future performance will be compromised.
3. The STAs will likely play a critical role in management of sulfur and mercury moving through the District's jurisdiction. There is great potential for significant removal of these water quality parameters in the STAs. However, increasing evidence suggests that periodic drawn down of water in the STAs and WCAs exacerbates mercury (especially the more toxic methyl-mercury form) releases to receiving water bodies. If continuing research on STA performance and sulfur and mercury cycling confirms this evidence, optimization of STA performance may have to become a higher priority in water management of south Florida. The governing board should cross reference this point with point 2 made in Chapter 2.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 6

Subject: Final Review Comments from panel
Posted: 10/23/09 12:52pm

CHAPTER 6: ECOLOGY OF THE EVERGLADES PROTECTION AREA

Final Review Comments: assigned to JoAnn Burkholder, Joanna Burger, and Ellen van Donk

Assigned Levels of Review: Primary - Technical; Secondary - Integrative

The level of review for Chapter 6 remains primarily technical because its emphasis is on research. The secondary review as integrative is also appropriate, since the ecology of the EPA affects or is affected by many of the other units (Lake Okeechobee and, indirectly, the Kissimmee basin, STAs, some of the Southern Estuaries, etc.). The overall nature of the chapter is not expected to change within the next five to ten years because many basic research questions about the ecology of the Everglades ecosystem remain to be answered.

Technical Review

This chapter was generally outstanding in conception, content, and technical merit. The findings and interpretations are sound, and supported by the best available information. The panel's technical review of the draft chapter included various suggestions and comments because some studies were not described in sufficient detail to evaluate. The panel's detailed comments all were carefully considered and addressed by the authors, and the excellent information contained in the responses is to be included in the final version, leaving little else for the panel to recommend.

While the authors explained that each section in the chapter is limited by the District to a certain page length, Chapter 6 provides a great example of an outstanding chapter that was too limited in this regard, considering that it is to be evaluated primarily for technical merit. The authors should include the information to address the panel's comments that, thus far, apparently has not been included because of space constraints, including a brief description about the effects of fish composition on food web structure and ecosystem functioning; and a brief description about why PLFAs are being measured, including the methodology. The latter subject was described in the previous year's SFER, but again, too briefly to enable evaluation of technical merit.

Integrative Review

The large research programs addressing the ecology of the EPA were presented so that overall goals were both clear and linked to descriptions across the chapter. With very few exceptions, the projects were presented so that the goals were also clearly linked to management and restoration goals. Table 6-1 again provided an excellent overview framework, and the hydrological setup section also integrated key processes. However, there still was little by way of cross-referencing to other chapters, which would not be difficult (the authors have indicated that this point will be addressed in the final writing), and little by way of integrative data summaries and analyses bridging projects, which would be more challenging. Integration with other areas of South Florida was well demonstrated in some sections, but some opportunities were missed for integration with other chapters. For example, Chapter 10 discusses a major research project on the Florida apple snail, and the apple snail recovery plan, yet the importance of such invasive nonindigenous species was not mentioned in Chapter 6. On the other hand, integration with other areas of South Florida was especially well demonstrated through two Landscape projects.

Recommendations / Highlights

- Chapter 6, Ecology of the Everglades Protection Area, was an outstanding chapter overall and provided a clear, scientifically sound overview of efforts, findings, and significance of progress in WY2009 for each of five areas of emphasis including hydrology, wildlife, plants, the ecosystem, and the landscape, covering 13 projects in total. Overall goals were clear and well-linked to management and restoration goals.
- The responses by the authors to the panel's comments contained very helpful information. The authors indicated that only some of the information would be added to the final chapter, but all of this excellent information should be added to assist readers because it will strengthen the technical caliber of the chapter. Information should also be included that has thus far been omitted: a brief description about the effects of fish composition on food web structure and ecosystem functioning; and a brief description about why phospholipid fatty acids (PLFAs) are being measured, including the methodology. The latter subject was described in the previous year's SFER, but too briefly to enable evaluation of technical merit.
- The chapter should also be strengthened by adding integrative data summaries and analyses bridging projects. This could be accomplished by including an overall "Conclusions" section that integrates the major findings and interpret how they will guide future efforts. It could also include inferences from preliminary findings as appropriate.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 7A

Subject: Chapter 7A Final Panel Comments and Bullet Points
Posted: 10/23/09 11:21am

Chapter 7A: Everglades Restoration Update

Date of Chapter Draft: 09/22/2009; Date of Final Report: 10/22/2009

Authors: Neal E. Armstrong (AA) and Robert Ward (A)

Level of Panel Review: Accountability (Primary) and Integrative (X)

This chapter was to receive review primarily at the Accountability level with consideration at the Integrative level.

Accountability Review

Chapter 7A is well written and provides considerable insight into the overall restoration strategy in South Florida. Its focus is on the Comprehensive Everglades Restoration Plan (CERP) projects because of the many projects in CERP. However, in addition to the CERP projects, the chapter also describes the status and progress of the Kissimmee River Restoration, Northern Everglades and Estuaries Program projects, Lake Okeechobee initiatives such as Lakeside Ranch and Lake Point, Herbert Hoover Dike repairs, changes to the Lake Okeechobee Regulation schedule, Critical Restoration Projects (predecessors to CERP), and non-CERP projects in the Caloosahatchee Basin.. Of particular note is the discussion of the River of Grass land acquisition toward the end of the chapter.

The chapter provides a project by project summary of the goals of the projects as well as the progress being made to complete those projects. Progress in the chapter is related to construction status and contract completion rather than the success resulting from the project because the District has completed few restoration projects other than the Stormwater Treatment Areas and the Critical Restoration Projects. It is, however, at a stage at which key CERP and non-CERP projects are authorized by Congress, funding is now available, and the Corps of Engineers and the South Florida Water Management District are poised to begin construction on the Modified Water Deliveries to the Everglades, the C-44 Reservoir, Picayune Strand, Site 1 Impoundment, C-111 Spreader Canal Western Features, and Biscayne Bay Coastal Wetlands projects.

The Chapter 7A authors' answer to the question about the monitoring re-engineering effort, contained in this Chapter, provides the update that is missing in other chapters and/or, more importantly, in the introduction to the report (Chapter 1).

Integrative Review

Given that there are a number of major initiatives working to restore the Everglades, at the same time Chapter 7A attempts to clarify how the initiatives' various projects interface. The listing of initiatives and partnerships presented in Lines 99-106 could be more informative if the chapters discussing each initiative were also listed. For example, CERP, the first listing, is discussed in Chapter 7A. State of Florida expedited projects, apparently, is Chapter 7B. Kissimmee River Restoration is Chapter 11. Everglades Forever Act is Chapter 3 and Long-Term Plan is Chapter 8. Lake Okeechobee in Chapter 10 and coastal estuaries in Chapter 12.

Table 8-1, in Chapter 8, contains a list of RECOVER projects citing chapters where more detail is provided. CERP projects, likewise, are further discussed in various chapters. A listing of where such discussions occur, for the 50 CERP projects (Line 1194), would be helpful as a way

to assist readers in understanding the integration of CERP projects with other restoration initiatives.

Recommendations

The following recommendations are made for Chapter 7A:

1. The panel recommends that all author responses be incorporated into the body of the chapter.
2. The listing of initiatives and partnerships presented in Lines 99-106 should include the chapters where the initiatives were also listed.
3. A listing identifying where in the SFER discussions about the 50 CERP projects (Line 1194) would assist readers in understanding the integration of CERP projects with other restoration initiatives.
4. SFERs update and discuss each year numerous environmental restoration and management programs and projects. Separate chapters appear to be devoted to different legal mandates to restore and protect the environmental health of the South Florida's ecosystems. There is need for a well defined explanation of the history and relationships among the restoration initiatives, to be placed in the SFER or to be easily referenced via a web link, and the panel recommends that such a document be prepared.
5. The panel recommends that the District add an update on the monitoring re-engineering study to Chapter 7A and/or to Chapter 1 and provide a link to the WCA-2 Monitoring Re-engineering Pilot study that was recently completed.
6. Consistency and comparability of water quality data across South Florida is critical to tracking water quality constituents, in a scientifically sound manner, over time and space. The monitoring re-engineering effort, described in the 2008 and 2009 SFERs, is not mentioned in the 2010 SFER. This effort should be carefully followed and encouraged.

Highlights

1. Each year, this chapter of the SFER contains listings of the CERP and other restoration activities. These are very important activities, and the SFER should facilitate readers being able to understand their interrelationship and being able to locate in the SFER more information about these activities.
2. Also, separate chapters appear to be devoted to different legal mandates to restore and protect the environmental health of the South Florida's ecosystems. There is need for a well defined explanation of the history and relationships among the restoration initiatives, to be placed in the SFER or to be easily referenced via a web link.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 7B

Subject: Chapter 7B Final Panel Comments and Bullet Points
Posted: 10/23/09 11:19am

Chapter 7B: RECOVER Activities Update

Date of Chapter Draft: 09/22/2009; Date of Final Report: 10/22/2009

Authors: Neal E. Armstrong (AA) and Robert Ward (A)

Level of Panel Review: Accountability (Primary) and Integrative (X)

Accountability and Integrative

As defined in Chapter 7A, RECOVER provides essential support to CERP in meeting its goals and purposes by applying a system wide perspective to program planning and implementation. Its role in organizing and applying scientific and technical information and eventually doing evaluations and assessments is critical to the implementation of all CERP projects. Because this chapter is devoted to RECOVER activities, it would be helpful to introduce and define the RECOVER program before launching into an update of activities during 2009. Introductions to other project update chapters specify the law, purpose, and connections to other programs as a background to the following project updates. Given the complex interwoven nature of environmental programs and activities in South Florida, such an introduction is necessary for Chapter 7B.

Comments have been made in other chapters about the monitoring programs being used, sampling procedures, key indicators of water quality and ecosystem health, and so forth. It is important that the District provide a mechanism for those comments to find their way to the RECOVER team.

The interactive web reporting system being developed is an innovative approach to not only view the District's systems but also to serve the District's stakeholders who wish to know more about the progress being made in restoring the Everglades.

The description of MAP 2008 is not adequate to understand the strategic nature of this monitoring initiative, especially as to how MAP relates to the operational monitoring that supports the assessments reported in Chapters 2 and 3A. Neither Chapter 7A nor 7B provide this information.

Recommendations

The panel has the following recommendations for Chapter 7B:

1. SFERs update and discuss, each year, numerous environmental restoration and management programs and projects. Separate chapters appear to be devoted to different legal mandates to restore and protect the environmental health of the South Florida's ecosystems. There is need for a well defined explanation of the history and relationships among the restoration initiatives, to be placed in the SFER or to be easily referenced via a web link.
2. Likewise, there is a need to describe how the monitoring initiatives, both those that have existed for many years and those newly initiated in South Florida, relate to each other and the overall information needs of the District's environmental management goals.

Highlights

1. RECOVER provides essential support to CERP in meeting its goals and purposes by applying a system wide perspective to program planning and implementation. Its role in organizing

and applying scientific and technical information and eventually doing evaluations and assessments is critical to the implementation of all CERP projects. Because this chapter is devoted to RECOVER activities, it would be helpful to introduce and define the RECOVER program before launching into an update of activities during 2009.

2. Consistency and comparability of water quality data across South Florida is critical to tracking water quality constituents in a scientifically sound manner over time and space. The monitoring re-engineering effort, described in the 2008 and 2009 SFERs, is not mentioned in the 2010 SFER, but this effort should be carefully followed and encouraged.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 8

Subject: Panel's Closing Comments - Chapter 8
Posted: 10/22/09 02:24pm

Closing Comments on Chapter 8 of 2010 SFER

Panel Closing Comments Prepared by: Robert C. Ward (AA) and Otto Stein (A)

Conclusions:

1. Chapter 8 is a very brief Chapter with ties to a number of other SFER chapters where additional Long-Term Plan detail is provided.
2. Water quality data records in South Florida are extending to decades while restoration initiatives are maturing to the point where management data, such as standard compliance trends, may be used as an accountability measure for the large scale restoration initiatives. While individual projects have completion deadline compliance and input and output data to confirm success/performance, there may be an opportunity developing by which long-term trends in standard compliance, as reported in Chapter 3A, can be used as a measure of overall success of the larger initiative.

Recommendation:

1. SFERs update and discuss, each year, numerous environmental restoration and management programs and projects. Separate chapters appear to be devoted to different Federal and State legal mandates to restore and protect the environmental health of the South Florida's ecosystems. There is need for a well defined explanation of the history and relationships among the restoration initiatives, to be placed in the SFER or to be easily referenced via a web link.
2. Large restoration initiatives, such as the Long-Term Plan, have as their major goal ensuring improvement in an environmental condition (for the Long-Term Plan it is compliance with water quality standards for discharges to the EPA). The data records in Chapter 3A are reaching a length such that trends in compliance with water quality standards should be investigated as a large-scale measure of successful implementation and operation of major restoration initiatives. Chapter 8, with its goal closely related to Chapter 3A's standard compliance reporting, may be a good place to test this hypothesis.

Governing Board Highlight:

1. Chapters 7A, 7B, and 8 (with references to other SFER chapters) describe large-scale initiatives to restore environmental health in South Florida using completion schedules and/or project input and output data as success measures. As the restoration efforts mature in South Florida, long-term management data is reaching lengths that may be able to document large-scale environmental improvements. For example, Chapter 3A presents improving long-term trends in water quality standard compliance that should be examined in terms of relationships to the large-scale restoration initiatives (e.g. using trends in water quality standard compliance to measure success of the Long-Term Plan's implementation and operation).

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 9

Subject: Final Report for Chapter 9
Posted: 10/19/09 03:42pm

CHAPTER 9: The Status of Nonindigenous Species in the South Florida Environment

ACCOUNTABILITY REVIEW

Although the presence of nonindigenous species is an old problem, recognition of its severity and impacts on ecosystems is relatively new. CERP and the RECOVER programs for the Everglades have the potential to respond to new and emerging problems that the overall ecosystem faces. The Everglades group is well ahead of other groups nationally in trying to understand, catalogue, and evaluate the effect of nonindigenous plants. An overall approach of examining all nonindigenous plants and animals that seem to be a problem in the Everglades is a daunting task, but an essential one, and past chapters have been more inclusive of all invasive plants, or at least the major ones. This chapter does not include all nonindigenous species for which there is information (the reader is referred back to the 2008 report), it does include the ones considered to pose the greatest threat. Thus, The chapter provides an excellent overview of the species biology of several nonindigenous invasive species that pose the greatest threat to ecosystem structure and function within the Everglades. As such its accountability is very high.

The chapter focuses on the species of highest priority, based on previous work (and summarized in previous chapters in this series). This is an important aspect as it will provide managers, public policy makers, the public, scientists and others with the key information required NOW to move forward with critical invasive species problems.

The inclusion of stoplight approach to key nonindigenous and invasive animals is an excellent start and focuses appropriate attention on the most severe problems. The application of the stoplight approach to each of the eight main regions is also extremely useful because it provides public policy makers with the information to decide where key time, personnel and costs should be applied, and allows managers to make comparative decisions about invasive species within their regions.l

The addition of several sections this year will be extremely useful to a wide audience, and is responsive to review comments in the past. These include:

1. A section on invasive plant control tools (which will be useful for work elsewhere as well).
2. An excellent table of the District's invasive species program
3. An in-depth table of management actions by the district that also identifies district subdivision, agency partners, and the mandates involved. This provides a holistic picture of actions and collaborators.
4. Appendix 9-1 on the Recover modules for all nonindigenous species is an excellent idea.

This chapter is an excellent extension of previous work with nonindigenous species. Unlike past years, there is no discussion of the relative potential for threats within each module. Instead, the approach is to select priority nonindigenous species and provide an overview of each, including the key issues, with stoplight information on each species. The selections include both plants and animals of concern. This approach is very useful for managers, public policy makers and the public to obtain and quick and readable account of the species of concern, management, and current severity of the problem. However, there is no general discussion or evaluation of either the effect of climate change on invasive species, nor of the species that are felt to provide the greatest threat to ecosystem structure and function within the Everglades.

Appendix 9-1 bears special comment as it is the one place where a broader approach to nonindigenous species is discussed. It provides information on the modules where these species are of special concern. This could be more useful if there was some overall indication of the severity generally for the Everglades, and perhaps which module they present the greatest threat. Moroever, the Table summary is useful, but it would be helpful to identify in one place the species found in all modules since this indicates a greater threat (this information is in the table, but would be helpful to have it in one place).

The conclusion section places the problem of nonindigenous species within the context of restoration in the Everglades, and appropriately indicates the overall lack of knowledge for many of these species. For the general public, it would be useful to have some overall observations or conclusions about the impacts of these species (and some indication of the key invasive and problematic ones) in the summary.

Recommendations:

- Provide more quantitative information on both the extent of concern and of management. While the stoplight approach provides an excellent overview, it does not provide specifics of the spatial and temporal problem.
- The Summary should mention the worst exotic species problems (plant and animal), as well as some (albeit few) "success stories" in their management, control or eradication to show that, at least for some species, with concerted effort it can be achieved.
  Include a flow chart of agencies/entities engaged in assessment and management of which nonindigenous species within each module.
- Develop a companion document that has the latest information on all nonindigenous species so that the public and public policy makers can find the latest information on all species.
- Summarize the District's major accomplishments with respect to management of invasive species.
- Consider making a table like Appendix 9-1 that summarizes the status of each of the species in 9-1 (e.g. how severe are they or how widespread).

TECHNICAL REVIEW

This year's report is a summary of the most severe nonindigenous and invasive species, rather than an attempt to include as many as possible. The approach addresses the accountability aspect of this work, but the authors and organizations involved should consider a summary document that each year includes all the species so that public policy-makers, scientists, managers, the public, and other stakeholders do not have to go through several South Florida Environmental Reports to find this information. This chapter is sufficiently new that this could be done and updated each year. That is, the group could review and summarize the previous chapters, and add new information could be added each year for the key species.

The inclusion of both plants and animals remains an important aspect of this chapter, and the authors are to be commended. Table 9-2 of the 2008 Environmental Report was excellent, and was missing from this years report. It provided an excellent overview and should be reconsidered for inclusion in this and future reports.

The introduction provides an excellent statement of the problem of invasive species, the problem in the Everglades, the SFWMD role, and the agencies involved. The expansion of the species accounts to include those species that require the highest level of control or are research priorities is an excellent focus. The key issues section rightly identifies most of the key issues, and the inclusion of the tools for control of both plants and animals is both necessary and

informative. Some mention should be made of the commercial aspects of the nonindigenous species problem (garden shops, landscapers, pet stores).

Overall, the descriptions of priority nonindigenous species are excellent, and include a short history, effects, and where it occurs, the control measures. Where possible, some quantification of both the problem and its solution would be useful. For example, Australian Pine occurs over 100 % of the Everglades in appropriate habitats, and has been removed from ?? %. The quantitative indications of severity and management success would be useful.

The establishment of a tracking system for the large constrictor snakes and other exotic reptiles is an excellent step forward in understanding the problem for these species that are increasing rapidly and have the potential to drastically affect the Everglades ecosystem. The District is making strides in tracking invasive species and is to be commended, given the enormity of the situation, the agencies involved, and the rapidly changing landscape of invasive species.

The conclusion section summarizes the main findings in terms of issues, documented impacts, and needs for future control and management. The use of the early detection and rapid response system is excellent, and has the potential to prevent future problems, but this will only work if the gardening, landscaping, and pet trades are onboard and cooperate with agencies. Providing information on successes (e.g. Melaleuca) is an excellent tool for engaging both the public and managers. Since the issue of non-indigenous snakes has been so prominent in the news, some indication of success (not just how many have been removed), would be useful.

The authors of this report were responsive to the comments and questions of the Peer Review Panel, and are to be commended for their attention to the questions. Within the constraints of their authority, and the page limits of the report, the authors added information to address the outstanding questions. The consolidation of all information in previous SFWMD reports in a web-base will improve its usefulness for a wide range of stakeholders, including the public.

INTEGRATIVE REVIEW

Non-indigenous species have the potential to drastically affect almost every aspect of the structure and function of the Everglades area. Yet many of the other chapters, including Ecology of the Everglades (6), Comprehensive Everglades Restoration Plan (7A), Lake Okeechobee (10) and Kissimmee Basin (11) make little mention of their effects. Further, since non-indigenous species affect the efficacy of the performance measures, they can potentially have a great effect on evaluation of restoration progress.

The biggest integrative task for this chapter, however, remains the integration of efforts by different agencies that monitor, manage, and provide expertise on non-indigenous species.

Recommendations

- Integrate the presence and effects of non-indigenous species into the overall research plans, for the relevant RECOVER modules. This might involve holding a workshop between the scientists and managers for invasive species with the relevant managers of each RECOVER module.
- Examine the effect of invasive species on performance measures, and on the other ecology studies (Chap 6).
- Relate nonindigenous species management and control to specific recovery goals, which relates to a management strategy and evaluation of the overall critical species to control. Integrate invasive species concerns in relevant chapters when a given invasive species affects ecosystem structure or function.

- Maintain a website that holds the latest species accounts (with stoplight information) for all species that have so far been examined. The latest species evaluation should be included, but the site should contain all species that have been so evaluated (with dates of these evaluations).
- Web sites are included for many lists, but additional ones should be added wherever they exist.
- Consider, evaluate, and discuss methods of evaluating potential impacts before species reach such critical stages of invasive effects.
- Consider developing a permanent document that has the stoplight approach for all species. This would entail adding new ones as they occur, substituting those priority species that are updated each year, and placing all this information in one place (on a website or searchable document). This document should have a reference list associated with each species. If started now, this would not be so impossible to achieve.
- Provide a listing of the species to be discussed (with pages) so the reader can find them. Consider organizing the species accounts in some reasonable order (taxonomic or severity). As it is, the chapter skips around from plant to lizard, to weevil, and then back to lizards.
- Develop a plan for performance measures for success or management of nonindigenous species.
- Consider giving some overall indication of the management success for each species or of the magnitude. This is, the Brazilian Pepper eradication program has removed ?? % of the stands from the whole system, or it has been eradicated from ??
- Add a “critical needs” and “regulatory tools” section to each species account.
- Consider having a short section for each species that says why it is of such high importance to the RECOVER modules.
-

Subject: BULLET POINTS TO ADD for the presentation:
Posted: 10/20/09 02:08pm

CHAPTER 9

- Make clear which species can have the greatest effect on the structure and function of the Everglades system.
- Clearly identify which species can be controlled successfully
- Provide spatially-explicit information on both the threat and risk to Everglades structure and function for key invasive species.
- Develop summary information on the hazard and risk from the major invasive species.

FINAL PEER-REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 10

Subject: Final recommendations and comments
Posted: 16 Oct 2009 02:09 PM

Chapter 10: Lake Okeechobee Protection Program – State of the Lake and Watershed
Level of Panel Review: Accountability: X, Technical: Primary
Reviewers: AA: Van Donk, A: Armstrong, A: Ward

Recommendations:

- The Panel recommended in the 2009 SFER cycle that the assessments of watershed and in-lake management activities begin to include costs so that in addition to performance being measured in terms of nutrient removal that performance can also be measured as capitol and operating costs per unit (e.g., metric ton) nutrient removed. Ultimately, BMPs in the watershed and lake will need to be assessed in terms of nutrient removal and cost effectiveness, so there should be efforts in this direction now. Also, per unit costs permit one to compare waste treatment systems, BMPs, and strategies on a common basis, which it would appear would be valuable information when selecting control strategies to apply in a given situation. Because cost data are updated every three years when updating the LOWPP and the next update will be completed by January 1, 2012 the authors should be able to include the cost data in the 2011 or 2012 SFER report.
- The Panel recommends that the District develop a theoretical framework that describes verbally and graphically the structure and function of the natural system, that is Lake Okeechobee and its watershed, so that a better understanding of how the system operates is available, so that the efficacy and consequences of management decisions are more apparent, and so that the rationale and benefits of those management decisions can be shown to support those decisions.
- The Chemical Treatment Study, described on page 10-13 in lines 390-396, was completed as of July 2009. The Panel recommends presenting the key conclusions from this study and a reference to the final report in which chemical treatments for phosphorus removal in the watershed are evaluated in detail.
- If the TN/TP ratio is used to support nutrient removal management decisions, then it must be used properly. The Panel therefore recommends that in every instance in which the TN/TP ratio is reported and used to support a management decision that the average TN and TP concentrations used to calculate the ratio also be reported as well as the nutrient concentrations considered to be not limiting to phytoplankton growth rate (normally 5 times the Michaelis Constants). Based on published data, these non-limiting concentrations are about 0.050-0.10 mg TN/L and 0.005-0.025 mg TP/L.

Closing comment:

- Compared to the SFER 2009 report the watershed research and lake research-oriented sections in Chapter 10 are now more integrated. In the management section there is a closer link between watershed management and lake management. Still the integration can be made stronger.

REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 11

Subject: Final review comments from panel
Posted: 23 Oct 2009 12:54 PM

CHAPTER 11: KISSIMMEE BASIN
Final Review Comments: assigned to JoAnn Burkholder and Joanna Burger
Assigned Levels of Review: Primary – Technical; Secondary – Integrative

Technical review is appropriate for Chapter 11 because there is a major research component and new data are being analyzed for unique interpretation. The chapter is also strongly integrative as it should be, since the Kissimmee River watershed is a major source of water, pollutants, and other materials to Lake Okeechobee and downstream ecosystems. Thus, District activities in this key watershed directly or indirectly influence restoration efforts throughout South Florida.

Considering that the four phases of construction in the Kissimmee River Restoration Project (KRRP) will not be completed until 2013 (projected initiation of implementation of the Headwaters Revitalization Schedule), and various research projects are ongoing or planned to evaluate restoration success, primary technical review and secondary integrated review likely will be appropriate for this chapter until sometime after 2013 when research projects are completed and the final assessment monitoring programs become routine.

Technical

Chapter 11 is generally excellent in technical caliber. The technical information, research approaches, and findings and interpretations are generally sound and supported by the best available information. The authors addressed many of the panel's previous comments in this year's version. Technical information about the monitoring and research studies that were just initiated in WY2009 was not provided, but it is assumed that the methodological details will be included when data are presented in future SFERs. The technical review of this year's chapter included many suggestions and comments because some studies were not described in sufficient detail to evaluate. The panel's detailed comments were carefully considered by the authors, and many of the panel's suggestions are being incorporated into the final chapter.

The chapter is well organized in several major sections (Summary, Introduction and Background, Cross-Watershed Activities, Hydrologic Conditions, and Project Updates), complete with helpful maps and graphics. An excellent subsection added for the first time this year assessed the potential threat to restoration efforts from nonindigenous, invasive plant and animal species that occur in the Kissimmee River and floodplain within the KRRP area of the lower basin, including 17 plants and 6 animals. Information about each species includes areas of occurrence within the Kissimmee watershed, effects of the construction activities, previous or ongoing treatment actions, prognosis, and recommendations.

The chapter authors indicated in their responses to panel comments that Table 11-2 has been modified for the final chapter version to clarify the studies for which formal restoration expectations do vs. do not exist. This information will strengthen the table. Nevertheless, while Table 11-2 is an excellent list of Kissimmee River Restoration Evaluation Program Phase I monitoring studies in Chapter 11 of the 2005-2010 SFERs, it has been five years since the District has completed a comprehensive update on the status of responses to Phase I reconstruction. This effort in next year's SFER would go far toward helping readers to understand the overall success of Phase I reconstruction, and would seem valuable for the D istrict to undertake as a milestone as a tool for assessing the effectiveness of its efforts thus far.

The panel remains concerned that no attempt has yet been made (since 2004? 2005?) to evaluate aquatic macroinvertebrate drift composition under the interim regulation schedule in the Phase 1 construction area. The panel is in accord with the District that macroinvertebrate drift is a key functional attribute of healthy river systems, but planning to wait until approximately 2013 to reassess this important attribute again is counterproductive and will not help the District to achieve its goal of tracking restoration efforts. This key attribute should be being applied to help guide restoration; waiting ten years to reassess it is too long.

Regarding dissolved oxygen (DO) performance measures, a metric for minimum daily DO is needed. It would seem, for example, that component 4 of Expectation 8 (DO concentration within 1 m of the channel bottom will be more than 1 mg/L for more than 50% of the time annually) would poorly protect sessile bottom-dwelling aquatic life. As another problem related to this parameter, the chapter states that the mean daytime DO concentration in the river channel at 0.5-1.0 m-depth was expected to increase from less than 2 mg/L to above 3 mg/L (3-6 mg/L) during the wet season. A target of more than 3 mg/L does not seem protective of many aquatic species, since it is still in the range of hypoxia (less than 4 mg/L). Moreover, the mean DO concentration in the reference streams was given as 4.2 mg/L. The chapter authors suggested that the expected target could be improved if more reference data could be collected. As a third point related to DO, although the progress on DO conditions is encouraging, in WY2009 for about 20% of the time, minimum daily water-column DO was approaching anoxia, which can kill sensitive aquatic life. The chapter authors hypothesized that fish and other aquatic life use the floodplain, where DO is higher, as a refuge from low DO (and high flow velocities) in the Kissimmee River. This hypothesis merits testing to help guide restoration efforts.

The District has a strong management program including exotic nonindigenous plant species but, because other agencies lead efforts to control exotic nonindigenous animal species, the District engages only in feral hog management on District lands and a limited Burmese python management program in the WCAs.

Integrative

Chapter 11 does a masterful job of both internal integration and integration across chapters. The authors also describe excellent efforts by the District to partner with many other agencies toward the goal of restoring the Kissimmee watershed. The KCOL LTMP also remains an important tool that is being developed as a collaborative framework for use by partner agencies in managing the KCOL and adjacent/connected lands. As in last year's chapter, the major section "Cross-Watershed Activities" squarely addresses how the District's activities in the Kissimmee watershed are affecting or projected to affect downstream ecosystems, focusing especially on water management, water quality, and water supply. It describes how the operation of water control structures in the Kissimmee watershed are coordinated with all of the rest of the Kissimmee-Okeechobee-Everglades (KOE) system that is regulated by the Central and Southern Florida (C&SF) Flood Control Project, including an interagency team, an emergency modeling team to guide operations during flood events, temporary deviation requests involving an interdepartmental team and an interagency review, and permanent revisions of the stage regulation schedules that must consider the potential for impacts on downstream systems.

Last year's chapter contained extensive information about mercury monitoring in the Kissimmee watershed, and for this SFER, the results were updated and moved to Chapter 3B to better integrate these findings with other mercury studies in the District.

An important remaining area for improved integration of efforts in the Kissimmee watershed is coordination of monitoring with other agencies, and intercalibration of the various monitoring programs and methodologies. Obviously the District cannot achieve this goal alone, but it has expended considerable efforts to encourage all entities involved to work toward it.

Recommendations

The following recommendations for Chapter 11 are prioritized beginning with those considered the most important.

1. The District should undertake a comprehensive update on the status of responses to Phase I reconstruction efforts, as it has been about five years since such an evaluation was completed.
2. A full-scale reassessment of aquatic macroinvertebrate drift composition in the Phase I construction area should be completed as soon as possible, preferably in WY2010, because this key attribute is important in guiding progress in restoration efforts.
3. The District should prioritize developing a more rigorous metric for minimum daily DO, and should also collect more reference stream data for DO so that the target of "more than 3 mg/L" during the wet season can be improved to strengthen protection of aquatic life in restoration efforts. In addition, the hypothesis that fish and other aquatic life use the floodplain as a refuge from low DO in the Kissimmee River should be tested, because the information would be valuable in helping to guide restoration efforts.
4. Increased phosphorus levels at the southern end of Lake Kissimmee are as-yet unexplained and could confound management goals. As recommended previously, the steps being taken to identify the sources of this elevated phosphorus should be clarified if hydrological conditions permit, and progress assessed in the 2011 SFER.
5. The District should continue to encourage the important goal of improved coordination of monitoring with other agencies, including intercalibration of the various monitoring programs and methodologies.
6. The District should also work in partnerships with other agencies to encourage active management of established invasive fish populations in South Florida ecosystems, which remains a major gap in efforts to assess, mitigate, and control invasive species in these systems.
7. The authors provided very helpful responses to the panel's comments on the draft chapter, but indicated that only portions of the writing would be added to the final chapter. The chapter should include this helpful explanation and information, for example, the explanations in response to the panel's comments about exotic nonindigenous species.

Highlights

- Chapter 11, Kissimmee Basin, was an outstanding chapter overall, and clearly outlined progress on the District's goals within the Kissimmee Watershed Program – to restore ecological integrity to the river and its floodplain, evaluate the success of the Kissimmee River Restoration Project through ecological monitoring programs, and develop a long-term management strategy for the Kissimmee Chain of Lakes the Kissimmee Chain of Lakes Long-Term Management Plan, while also maintaining flood control in the basin. It has been about five years, however, since the District completed a comprehensive update on the status of responses to Phase I reconstruction. This effort in next year's SFER would go far toward helping readers to understand the overall success of Phase I reconstruction, and would be valuable for the District to undertake as a milestone as a tool for assessing the effectiveness of its efforts thus far.
- Aquatic macroinvertebrate drift composition is a key attribute in tracking restoration in the Kissimmee River, but it has not been evaluated in the Phase I construction area since ~2004. A full-scale reassessment of aquatic macroinvertebrate drift composition in the Phase I construction area should be completed as soon as possible, preferably in WY2010, because this key attribute is important in guiding progress in restoration efforts.

- The parameter dissolved oxygen (DO) is also very important in assessing environmental conditions for healthy aquatic life. The District should prioritize developing a more rigorous metric for minimum daily DO during the wet season than "more then 3 mg/L", considering that 3 mg/L is still hypoxic and stressful to many aquatic species. This effort would be assisted by collecting additional reference stream data to assess the mean DO concentration in reference streams during the wet season. In addition, the hypothesis that fish and other aquatic life use the floodplain as a refuge from low DO in the Kissimmee River should be tested, because the information will be valuable in helping to guide restoration efforts.
- Increased phosphorus levels at the southern end of Lake Kissimmee are as-yet unexplained and could confound management goals. The steps being taken to identify the sources of this elevated phosphorus should be clarified if hydrological conditions permit, and progress assessed in the 2011 SFER.

REVIEW PANEL COMMENTS ON THE DRAFT 2010 SFER – VOLUME I, CHAPTER 12

Subject: Chapter 12 Final Panel Comments and Bullet Points
Posted: 23 Oct 2009 11:22 AM

Chapter 12: Management and Restoration of Coastal Ecosystems
Date of Chapter Draft: 09/22/2009
Date of Final Report: 10/23/2009
Authors: Neal E. Armstrong (AA), JoAnn Burkholder (A), and Robert Ward (A)
Level of Panel Review: Technical (Primary) and Integrative (X)

Technical review was considered appropriate for this chapter because there was a major research component and new data are being analyzed for unique interpretation. Secondary review at the Integrative level was also appropriate, because of the integrative response of estuarine water quality and biota to freshwater inflows across South Florida.

Technical Review

The primary role of the District's Coastal Watersheds Program is identified as providing the information needed to design effective restoration and protection measures for the District's nine identified priority coastal ecosystems. Following a format recommended by the panel in previous years, Chapter 12 in the 2010 draft SFER summarizes progress in WY 2009 on all nine ecosystems and highlights two of them, the St. Lucie River and Caloosahatchee River estuaries within the Northern Everglades and Estuaries Protection Program. Watershed Protection Plans for each of these two systems (structure, purpose, and updating schedule), completed by the District this year, assess existing monitoring and needs, describe science strategies for restoration, and recommend additional modeling. These are the same two Coastal Ecosystems that were emphasized in the SFER for WY2008, because the coverage of these systems in the previous year was inadequate for sound technical evaluation, leading to their selection for reanalysis in the present SFER. The authors incorporated many of the panel's suggestions from the previous year to strengthen this year's Chapter 12.

Two years ago the Panel was asked to review the Coastal Ecosystems Division (CED) Science Plan (2008 SFER Appendix 12-1), and it was the Panel's first glimpse of the overarching approach being used to guide the research, management, and restoration of the District's coastal systems. It was noted that the Coastal Ecosystems Program (CEP) had constructed an approach for coastal ecosystem management that was basically sound as a solid starting point for managing the coastal ecosystems, the waters that flow to them, and their watersheds, but it was incomplete. It was further noted that the Plan was an integration of science, engineering, and management within the District and perhaps most importantly it began to elevate the value of freshwater inflows (and their needed spatial and temporal variability) to Florida's southern estuaries to a level commensurate with municipal, industrial, and agricultural water supply. Last year the Panel commented further on this Plan noting that nutrients had been added, and this year the Panel is pleased to see that simplified water quality models to address immediate study needs are now planned. None could be found in the 2010 SFER draft, however, so this is apparently a work in progress.

In general, the findings and conclusions in Chapter 12 were supported by "best available information", but it sometimes was not possible to evaluate technical merit because insufficient information was given. The chapter summary did not do justice to the efforts described in the chapter for the Coastal Ecosystems, and needs to be strengthened, even for the two estuaries that were highlighted in WY2009. Table 12-2 included many "NA" gaps under Ecological Models,

and it would be helpful to indicate District priorities within each Coastal Ecosystem toward filling these information gaps. Without such information, the central purpose of Table 12-2, to adequately summarize the "big picture" status of modeling in the Coastal Ecosystems, falls short of that goal.

Dissolved oxygen (DO) was omitted from consideration in parts of this Chapter, despite the fact that data were indicated as available. The authors repeated response to this comment was that they had yet to determine how much discussion about DO is really necessary. Regardless, since DO is important to various VECs and PMs, DO needs more careful consideration in this Chapter. In addition, the point was made several times in the writing that low DO concentrations are often linked to excess nutrient loading, but low DO is much more often associated with discharge of organic materials in wastewater discharges. Excessive inorganic N concentrations were indicated for the Miami River region of Biscayne Bay, so nutrient over-enrichment should be added to the major issues identified for this Coastal Ecosystem. As a more general comment, inorganic N is often the most important nutrient controlling phytoplankton production in estuaries, but, surprisingly, it was largely missing from the discussion about the Coastal Ecosystems, despite the fact that the District has data for inorganic N in many of these systems, or has access to such data from other entities.

Overall, the chapter was well written and well organized, with units given in both metric and English. Improvements over previous years' versions were noted in general presentation as well as in the strengthening of certain sections. A brief but solid history of each human alterations of each coastal ecosystem is included. As for last year's chapter, Tables 12-1 and 12-2 are very helpful. Minimum Flows and Levels rules and salinity envelopes, where established, are clearly defined. Progress in monitoring, research, and modeling is described, including some innovative new projects designed to fill important data gaps. While the organization of material in the section for each estuary followed the same format as in WY2008, the components mostly were more clearly presented.

The sections on the Coastal Ecosystems describe some serious problems in failing to meet the MFL criteria for WY2009, and progress in various monitoring, research, and modeling activities. Some sections of this chapter are well referenced (e.g., Florida Bay), whereas others are poorly referenced. Consistency is needed.

The District is encouraged to be very cautious about applying batch bioassay growth rate studies (as opposed to flow through steady-state bioassays) to any natural system, for they rarely apply unless the natural system structure and function is similar to that bioassay, i.e., a closed system with no inflow or outflow in which nutrient concentrations are reduced by nutrient uptake by phytoplankton to concentrations that become growth rate limiting. That is certainly not the case for estuaries. The appropriate bioassays are continuous flow bioassays. A simpler and much less costly approach is to use the TN and TP Michaelis Constant concentrations from continuous flow bioassays using phytoplankton common to estuarine systems, estimating from them the concentration at which growth rate is no longer limiting (usually estimated to be 5 times the Michaelis Constant concentration), and comparing that number to concentrations observed in the estuary of concern. Based on the TN and TP concentrations reported in Table 12-7 and Figures 12-24 and 12-25, neither the TN nor the TP concentrations in the Caloosahatchee River and Estuary system are limiting the growth rate of the phytoplankton. If TN and TP concentrations in the Estuary fall below the 5xMichaelis Constant levels, then and only then can one begin to refer to nutrients as limiting nutrients.

The point is made in several places in this chapter that low dissolved oxygen concentrations are often associated with excess nutrient loading. They are much more often associated with the discharge of organic material found in wastewater discharges, both point source and non-point sources, which happen to contain nitrogen. The organic material is readily degraded by bacteria

which consume dissolved oxygen in the process and thereby lower the dissolved oxygen concentration in the water. For nitrogen to be associated with low dissolved oxygen requires either nitrification to be a significant sink for dissolved oxygen or for nitrogen to be consumed by phytoplankton which die and become a source of organic material for decomposition by bacteria which consume dissolved oxygen in the process. Thus, the District should be looking for point and non-point sources of wastewater rather than just an association with nitrogen.

Integrative Review

The District's overarching strategy within each of the Coastal Ecosystems is to apply an integrated modeling and assessment framework to help structure and organize priority needs and to help construct detailed science plans. As an ongoing problem, some coastal ecosystems continue to remain far behind others in restoration and lack realistic plans or timelines. This problem is the more difficult to resolve because the District is not the main agency in addressing water quality degradation or other issues in some of these systems. The District has clearly expended a great deal of effort to forge partnerships with federal, state, and local entities toward the goal of restoring these systems, a major challenge in particular for Coastal Ecosystems draining highly urbanized watersheds.

Information about water quality monitoring efforts being conducted in "non-District" projects seemed to be only cursorily considered throughout the chapter. Table 12-1 mentioned that Charlotte Harbor has been designated as an area for special study by the Charlotte Harbor National Estuary Program, but no information was given as to what that means.

There were various missed opportunities for integrating Chapter 12 with other chapters such as Chapters 9 and 10. In addition, as for last year's SFER, the panel also noted that integration of the Coastal Ecosystems would be strengthened by adding a section to the chapter that considers linkages between them, such as wading birds and exotic species. The authors responded that it was unclear as to whether wading birds or exotic species link the Coastal Ecosystems because habitats vary considerably among them; and that the primary linkage is the regional water system. Yet, the Coastal Ecosystems have not been linked by regional water, either, in this chapter. Integration of the Coastal Ecosystems should be strengthened.

Recommendations

The Panel's recommendations for this chapter are listed below. All are considered to be important and worthy of implementation with the most important being listed first and the rest in decreasing order of importance.

1. It is recommended that the District complete, publish, and have peer reviewed the Coastal Ecosystems Division (CED) Science Plan as its guiding document on coastal ecosystem management to enhance the credibility of its approach to coastal system research and its management of them.
2. Preparation of a common, scientifically sound status-and-trends report for the Coastal Ecosystems could serve as a focus for ensuring data consistency and comparability, and a context "anchor" for research and short-term measurement programs. Considering the potential value of such a report, the District should explore the willingness of agencies outside the FDEP and DFACS coordinating agencies to participate in developing a status-and-trends progress report for the Coastal Ecosystems on an annual or five-year basis.
3. Incorporating Dissolved oxygen (DO) into Chapter 12 should be considered essential because this parameter has been considered historically and is still considered a universal measure of estuarine ecosystem health. Similarly, inorganic N controls phytoplankton growth in many estuarine systems and should also be more strongly considered throughout this Chapter.

4. The Chapter should include descriptions of the District's efforts to address the effects of warming trends in global climate change on the Coastal Ecosystems.
5. Lack of accounting for the effects of exotic species on VECs could threaten restoration efforts. Therefore, the District should address the effects of exotic species on VECs in the Coastal Ecosystems, such as the effects of green mussels on oysters.
6. The District should examine linkages not only between low DO and nutrient enrichment, but also between low DO and point/non-point sources of wastewater.
7. Inorganic N should be more strongly considered throughout Chapter 12.
8. The responses by the chapter authors to the panel's comments contained very helpful information, but the authors indicated that only some of the information would be added to the final chapter. All of this information should be added to assist readers.
9. Additional studies of floodplain fish assemblages in the Loxahatchee ecosystem should be undertaken, considering that additional observations are needed to assess the responses of floodplain fish assemblages to changes in freshwater flow (lines 1875-1876).
10. The District should use statistical models to determine the goodness of fit of water quality model predictions compared to observed data to add to the credibility of the numerical models (e.g., Figure 12-19).
11. The District should assess why, in the Caloosahatchee River Estuary, chlorophyll *a* concentrations appear to be decreasing while TN and TP concentrations are increasing.
12. The Chapter should clarify how "non-District" water quality information is being integrated with the District's water quality information in efforts to manage and restore the Coastal Ecosystems.
13. Two additional tables are needed for the "Introduction": (i) a table showing the VECs that have been developed (versus where they are lacking) for each Coastal Ecosystem, and (ii) a table identifying the major concerns or issues in each Coastal Ecosystem.

Highlights

1. The primary role of the District's Coastal Watersheds Program is to design effective restoration and protection measures for the District's nine identified priority coastal ecosystems. This Program produced the Coastal Ecosystems Division (CED) Science Plan which the Panel reviewed in the 2008 SFER as the overarching approach being used to guide the research, management, and restoration of the District's coastal systems. The Panel viewed the approach as basically sound as a solid starting point for managing the coastal ecosystems, the waters that flow to them, and their watersheds, but it was incomplete. It was further noted that the Plan was an integration of science, engineering, and management within the District and perhaps most importantly it began to elevate the value of freshwater inflows (and their needed spatial and temporal variability) to Florida's southern estuaries to a level commensurate with municipal, industrial, and agricultural water supply. Last year the Panel commented further on this Plan noting that nutrients had been added, and this year the Panel is pleased to see that simplified water quality models to address immediate study needs are now planned. No mention of this Plan could be found in the 2010 SFER draft, but because of the importance of this Plan it is recommended that the District complete, publish, and have peer reviewed the Coastal Ecosystems Division (CED) Science Plan as its guiding document on coastal ecosystem management to enhance the credibility of its approach to coastal system research and its management of them.
2. In general, the findings and conclusions in Chapter 12 were supported by "best available information", but it sometimes was not possible to evaluate technical merit because insufficient information was given. Given this continued situation as evidenced in the past few SFERs, preparation of a common, scientifically sound status-and-trends report for the Coastal Ecosystems could serve as a focus for ensuring data consistency and comparability, and a context "anchor" for research and short-term measurement programs. Considering the

potential value of such a report, the District should explore the willingness of agencies outside the FDEP and DFACS coordinating agencies to participate in developing a status-and-trends progress report for the Coastal Ecosystems on an annual or five-year basis.

3. Dissolved oxygen (DO) and inorganic N were omitted from consideration in parts of this Chapter despite the fact that data were indicated as available. The authors repeated response to these comments was that they had yet to determine how much discussion about DO is really necessary and that inorganic nitrogen data might be added in future SFERs. Regardless, both DO and inorganic N are important to various VECs and PMs, and these two parameters need more careful consideration in this Chapter. Incorporating DO into Chapter 12 should also be considered essential because this parameter has been considered historically, and is still considered, a universal measure of estuarine ecosystem health.