

**Pre-meeting Comments from Members of the Chartered SAB on the report,
*Review of EPA's draft Approaches for Deriving Numeric Nutrient Criteria for
 Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters***

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Comments from lead reviewers

Comments from Dr. Ingrid Burke

Review from Indy Burke on Nutrient Criteria report

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Yes, at length and very well.

I am a little concerned with the length of the Executive Summary, which does indeed summarize the report well. I make some suggestions below under the “clear and logical” question for how to address this. My suggestion would be to make sure that all of, and only, the major recommendations land in the Executive Summary, or, that this be the home for a Summary Table of Recommendations (as described below).

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee’s report?

I don’t think so.

3. Is the Committee’s report clear and logical?

The report is clear and logical, with the exception that I can’t tell which of the many issues the Panel raises have a very high priority for implementation.

There are quite a few suggestions/recommendations/concerns/comments from the panel about the nutrient criteria report, as driven by the charge questions. My concern is that the level of comment or concern varies throughout the report, and there are so many it is hard to track what the *n* most important recommendations are (unless one uses the cover letter to figure that out). And then, one is led to wonder what EPA should do with the suggestions that are *not* in the cover letter. I started to count the number of recommendations but lost track about half way through. There are excellent philosophical concerns with implications for implementation of the nutrient criteria measurement (for instance, the difference between “causal” factors and “driving” factors, the lack of some of the driving factors, and the problems with the diagram that do not always clearly connect the “causal” factors with endpoints. There are comments that EPA should consider, for instance the complexities associated with reference conditions in areas where there is not an adequate understanding of historic conditions, or in the cases of canals, which are not natural features in any case, and the “additional comments” at the end of the document (p. 43). There are possible alternatives, such as the alternative statistical approach for determining numeric criteria, or the linking of seagrass extent with nutrient loading. Then there are real recommendations, such as changing some of the sub-classifications, better defining “healthy” and “balanced”, etc.

I wonder if a formal approach of numbering the suggestions/comments/recommendations/concerns would assist EPA in receiving this report, and assist with evaluating the extent to which recommendations were incorporated. I would very much have appreciated 1) numbers, 2) statements about whether this is a recommendation, suggestion, comment for consideration, etc , 3) a priority designation (Very Important, Important, etc), and 4) finally, a “requested response type” (e.g. add field measurements to your plan, draw a better diagram, get rid of the words healthy and balanced and use more specific terminology, etc). I think this would shorten some of the length of the Executive Summary, as well.

Miscellaneous comments:

Top of page 3, summary, Line 4, beginning with “The Panel Recommends”. This is unclear here, but not in the rest of the report. It’s a bit hard to tell in this abbreviated version and the language here if the Panel is recommending two new categories for the marine category, as well as two new categories for the inland flowing waters.

I agree that the 3-mile designation is a bit arbitrary, and was hopeful for a bit more text describing the reasons we might care about a longer distance, from an ecological viewpoint. The terms “healthy” and “balanced” are so subjective that I wonder if the Panel would consider recommending that they be removed completely, rather than recommending that they be defined. I understand that the terms convey something to the lay person, but they are really loaded with value that is probably not real, definable, or measurable, so just defining them makes “health” or “balance” seem to be real. They aren’t, I don’t think, especially given all the spatial and temporal variability and complexity in interacting driving variables.

I had to read the last bullet on page 34 numerous times to have any idea what it said. I recommend a re-write.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee’s report?

Yes.

Comments from Dr. Duncan Patten

Comments on Review of EPA's draft Approaches for Deriving Numeric Nutrient Criteria for Florida's Waters

From Duncan Patten

This is a well written, comprehensive report addressing not only the issues raised by the charge questions but offering alternatives and precautions to several of the approaches suggested by the EPA report.

Throughout the report, the ad hoc panel raises issues as to why certain approaches suggested in the EPA draft are (1) inadequate, (2) inappropriate for the particular body of water, and/or (3) may be improved by considering other or additional approaches. In many cases the ad hoc panel makes a precautionary recommendation, suggesting that if EPA were to use a particular method for deriving a numeric criteria that potential problems may arise and make the criteria not as robust as original thought. An example of a precautionary comment is that when using simulation models, EPA should be aware that the models for the Chesapeake Bay have been worked on for 25 years and still cannot predict inter-annual hypoxic volumes well. In all cases where the ad hoc panel makes recommendations for change, alternative approaches or precautionary statements, it also backs these recommendations with several to many appropriate references.

Most of the issues of concern raised by the ad hoc panel are mentioned in the letter to the administrator. However, because in nearly every case where the panel responds to it has offered alternatives or advised caution in proceeding with a particular approach, it would seem advisable to recommend to the administrator that any future draft for deriving numeric nutrient criteria be reviewed again by an external panel. This recommendation is made because there are few approaches suggested by EPA's report that didn't have some major issue with suggested alternatives.

Two overriding concerns of the ad hoc panel were (1) a need for a clearer description of the types of waters being addressed in Florida and awareness that some, such as canals, are man-made and managed, and (2) a clearer description of what is meant by "balanced" as applied to the various endpoints. The panel suggests some alternatives for "balanced" and these are emphasized throughout the review and in the letter. These points are also the foundation on which the EPA criteria are based and therefore are critical to any future effort to derive nutrient criteria. Another issue that the panel raises and which may drive future efforts by EPA to develop criteria was the panel's concern that nutrient contamination occurs over time based on watershed loading and isn't just a point in time measurement. This was one of the many precautionary points made by the panel.

Also, the panel suggests that looking for convergence of multiple methods for deriving nutrient criteria might be best for coming up with the best metric. This is a point that perhaps needs to be reemphasized in the letter and elsewhere in the review.

Overall I don't find any problems with the ad hoc panel review. At times it is repetitive when discussing types of water, use of chl a in different waters, etc. But this repetitiveness is appropriate because the charge questions also are often repetitive as they apply to different bodies of water in Florida and thus addressing them must take in account how the same issue applies to several cases.

Some other specific points:

RE: Figure 1. Should the ad hoc panel when discussing Figure 1 (conceptual diagram) point out that the diagram does not address the different water types or how the arrows or flows within the diagram relate differently to inland fresh, estuary, and coastal waters? Relative to the diagram, the panel needs to ask for more information on what are the processes implied by each flow arrow. Overall, Figure 1 seems very "inadequate".

Below are responses to the four questions, most of them are also addressed in part above.

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

The charge questions were well addressed with comprehensive responses, recommendations, precautions and literature.

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

Not to my knowledge.

3. Is the Committee's report clear and logical?

The report is clear but somewhat repetitive relative to issues that may apply to different types of water and therefore to charge questions related to these different waters.

The text was orderly and followed a general pattern of identifying issues of concern and then making recommendations to address the issue and supporting these with appropriate references. Because the panel often made similar recommendations or precautionary statements as it addressed the charge questions, it might have been useful to create some "bottomline" findings, but for EPA to respond to the panel and its recommendations, it also needed to understand what the issues were relative to each water type and each potential criteria for each water type and the combined problems of N and P contamination.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

There are many recommendations for future drafts of the EPA nutrient criteria report made throughout the ad hoc panels report. These are supported by logical explanations (with

references) of why these are critical issues that need to be addressed in order for a future criteria report to be accurate and appropriate for the several types of waters in Florida.

Comments from Dr. Amanda Rodewald

SAB Quality Review of “*Review of EPA’s draft Approaches for Deriving Numeric Nutrient Criteria for Florida’s Estuaries, Coastal Waters, and Southern Inland Flowing Waters*”.

1. Were the original charge questions to adequately addressed?

Yes. Responses were thorough, detailed, and clear.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel’s report?

No, with one exception that I could find: Page 25 – the charge question for 3.41 is missing.

3. Is the Panel’s draft report is clear and logical?

As a whole, yes, the report was clearly written and well-organized. The panel gives clear guidance to EPA on revisions and improvements to the criteria.

Below I offer a few suggestions for places to improve clarity.

Page 1, line 40: “TN and TP should be considered driver (rather than causal) variables;” Please clarify this. The word “driver” is often used as a synonym for “causal”, and causal variables are not necessarily alone in their influence (i.e., there can be multiple causal variables). The distinction between “driver” and “causal” is not clear to me.

Page 2, line 27: “its limitations need to be explicitly recognized” – is this exclusive to the limitations stated in the preceding sentences or are there others?

Page 13, section on Phytoplankton Production and Biomass. The position of the Panel regarding the use of Chl-*a* as an endpoint is unclear to me. In the first sentence, it is said to be a reasonable endpoint, but in the following few sentences the problems with its use as an endpoint are articulated. The second-to-last sentence then says it “cannot be used to assess the biological endpoint of production”. This is followed with a summary statement that the Panel supports its use as an endpoint, but limitations need to be recognized. This seems contradictory to me. I’m also unclear what it means to “recognize” the limitations. In a regulatory context, it seems like it is used or not. Are there only certain conditions under which it should be used? Later in the document (page 18, lines 19-21), for example, the Panel more directly identifies the “terms” of use: “*If EPA is not referring to species composition and relative abundance, but rather the entire phytoplankton or benthic microalgal communities, then Chl-a or other indicators of biomass will suffice. If EPA is referring to species diversity or some other index of biological diversity, then more specific techniques will have to be employed...*” Perhaps a more direct statement like that is needed on page 13.

Page 24, section 3.3.3: it would be helpful to first have a simple direct response to the question. It seems that the answer is “no”.

Page 28 section 3.4.3 and page 31, section 3.4.4. There seems to be some incongruence between these two sections. For the first (3.4.3), the Panel raises a number of concerns about how artificially created systems (i.e., canals) can be assessed and, in particular, what is an appropriate reference, if any. On page 29, the text includes suggestions for other data that should be examined relative to assessing South Florida canals. In contrast, on page 31, the Panel explicitly “*recommends against the application of either approach for the human-controlled canal systems, as these inland waters are more appropriately thought of as hydrologic conduits...*”.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee’s report?

Yes.

Other comments.

1. Is the approach used to develop numeric nutrient criteria for these Florida systems consistent with the guidance provided by the recent SAB review of “*Empirical Approaches for Nutrient Criteria Derivation*”? Consistency between the reports is important. As two examples, (a) the language in the previous report seemed much more negative as related to the appropriateness of the stressor-response approach for nutrient criteria derivation and explicitly recommended that stressor-response not be used as a stand-alone criterion. Although the Florida document advocates use of 3 approaches, the language about stressor-response approaches seems more hedged and somewhat encouraging even (e.g., page 20). (b) Also, in the previous report, the SAB criticized that the Guidance was overly focused on nutrient-response pathways driven by autotrophic processes and should consider pathways driven by nutrient effects on heterotrophic microbes and decomposition processes. The Florida report also seems to focus on autotrophic processes. Is this appropriate and consistent with the previous SAB advice?
2. In Figure 1 (the conceptual model), the causal variable is shown to be “Proposed TN/TP Criteria” and the response variable is the “Chlorophyll *a* Criteria”. Use of the word “criteria” in those contexts seems awkward because the criteria would seem to be the actual decision rules about certain levels. The actual variables would seem to be TN/TP and Chlorophyll *a* metrics.
3. Should the criticisms of reliance upon Chl-*a* be specifically highlighted in the cover memo?
4. Page 14, line 18 – missing a period.

Comments from other SAB Members

Comments from Dr. Terry Daniel

Quality review of SAB draft report entitled *Review of EPA's draft Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters* (04/08/11 draft).

Terry C. Daniel
5/11/2011

This review of the EPA's proposed methods for deriving numeric criteria for nutrients in Florida's waters was very thorough and seemed to uphold high professional standards for both the underlying science and for the operational methods proposed. However, the bottom line, that "much work remains to be done" and the admonition that "the Agency not sacrifice quality work for the sake of a schedule" may put the Agency in a difficult situation given the court-ordered time line. A number of specific suggestions for extending and improving the proposed approaches are offered, but it is not clear which of these are essential (i.e., the Agency should not under any circumstances proceed before implementing these) and which are highly desirable from a scientific perspective, but might be negotiable if the courts were to hold firmly to the current time line. In this context, some clear indication of the Panel's priorities for the changes and extensions suggested (e.g., which would be most likely to make significant policy-relevant differences) would be useful to the Agency and the scientists involved in the development of methods for deriving the numeric nutrient criteria.

The Panel's call for greater distinctions between "canals" and natural streams in developing appropriate criteria for South Florida inland flowing waters seems very appropriate. However, the Panel may have gone too far in dismissing the potential for instream protective values (IPV) for these human developed and controlled waterways. Given that these canals account for 90% of South Florida's inland flowing waters it would seem a shame not to attend to their potential "ecosystem services" (in addition to primary flood control and drainage functions).

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Yes

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

No, with the possible exception of the general concerns indicated in the general comments above.

3. Is the Committee's report clear and logical?

Yes, though a clearer specification of priorities for suggested changes and extensions in the proposed approaches would be helpful to the Agency given the current court-ordered time line.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

Yes, the Panel did an excellent job of establishing the foundations for their criticisms and suggestions.

Comments from Dr. George Daston

Quality Review for the Report on Approaches for Deriving Numeric Nutrient Criteria for Florida Waters

George Daston
May 5, 2011

Overall, I found this report to be well written, with the conclusions well supported by the information contained in the review. It is clear that the review panel has a great deal of expertise in risk assessment methodology and their comments will improve an already good process developed by EPA staff.

We were asked to address four specific questions as part of the quality review.

1. whether the original charge questions to SAB Standing or Ad Hoc Committees were adequately addressed;
2. whether there are any technical errors or omissions in the report or issues that are inadequately dealt with in the Committee's report;
3. whether the Committee's report is clear and logical; and
4. whether the conclusions drawn or recommendations provided are supported by the body of the Committee's report.

Question 1: The charge questions posed to the review panel were all adequately addressed.

Question 2: I found no technical errors or omissions in the report, but there is one recommendation that should be justified a little more fully.

P. 5, first paragraph, the committee needs to better justify why IPV nutrient criteria are not appropriate for canals. The only justification I could find was that they are artificial. Artificial or not, they constitute the majority of inland water in the region. A better justification needs to be found for treating them differently than inland streams and rivers.

Question 3: On p. 1, line 40, the committee recommends that EPA consider TN and TP to be "driver" variables. It's possible that driver variable is a term of art that is known in other fields, but it isn't clear to me what is meant by it. Please define it here. From the context, I assume that they are among many factors that contribute to plant growth; if so, perhaps this is a clearer way to make the point.

Question 4: The conclusions and recommendations are supported by the committee's very comprehensive report.

Comments from Dr. Costel Denson

Responses to Quality Review Questions
Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and
Southern Inland Flowing Waters
Costel D. Denson

General Comments

A wide array of suggestions are made by the committee and written into the report. These do not appear to be either recommendations or conclusions, yet they seem to offer nearly as much instruction as recommendations and conclusions. Does the committee expect EPA to act on these in some way?

Were the original charge questions to the SAB committee adequately addressed?

Six charge questions were presented to the SAB committee for its review, with most of these consisting of subsidiary questions. The committee addressed each of these questions adequately and in detail. Conclusions and recommendations were both offered, along with a wide array of suggestions.

Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the committee's report?

Ecological studies that deal with nutrients, Phosphorus and Nitrogen are not within this reviewer's area of expertise.

Is the committee's report clear and logical?

The committee's report is laid out in a clear and logical way. Each charge question (and its subsidiary components) is presented and discussed, and the associated conclusions, recommendations and suggestions are presented with that particular question.

Are the conclusions drawn or recommendations provided supported by the body of the committee's report?

Both are judged to be supported by the body of the report.

Comments from Dr. Otto Doering

My brief review comments;

1. Were the original charge questions adequately addressed?

Yes, but also recognize that many of the original charge questions were extremely broad/open ended. I believe that the panel did an excellent job of addressing the most critical issues in the charge questions.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the panel report?

I did not see any.

3. Is the panel's draft report clear and logical?

Yes

4. Is the committee's report clear and logical?

Yes

Are the conclusions drawn or recommendations provided supported by the body of the committee report

Yes

Comments:

I am very supportive of the panels comments with respect to expanding the assessment endpoints. Realizing that some things are more measurable than others, this situation cries out for the use of multiple metrics wherever feasible.

Small point, I missed what the LSPC model is that is referenced in the last paragraph of the executive summary. I found it on page 41. It might be helpful to have a sentence in the executive summary that briefly says what it does. Initially I thought it might relate to the Land Use Model.

Comments from Dr. David Dzombak

Comments of David Dzombak on SAB Review of EPA's draft report "Methods and Approaches for Deriving Numeric Nutrient Criteria for Nitrogen/Phosphorous Pollution in Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters"

May 15, 2011

1. Were the original charge questions adequately addressed?

The charge questions were adequately addressed.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel's report?

I found no technical errors or omissions in the report. I believe that the discussion of water quality model development and application in response to Charge Question 2(c) needs to be strengthened, as described in part 3(b) below.

3. Is the Panel's report clear and logical?

The report is clearly written and is well organized. I have identified two specific places where improved clarity is needed, one minor and the other more substantive.

- (a) Letter to the Administrator, p.1: In the subject line of the header, the complete and accurate title of report reviewed should be given.
- (b) Response to Charge Question 2(c), p.20, lines 31-39: The sustained Chesapeake Bay modeling effort, involving the coordinated effort of seven states with the EPA, has spanned more than two decades. It represents a very large investment by the nation in learning how to do large watershed nutrient loading and response model calibration and forecasting. Model development and improvement has been conducted continuously, and has evolved to adapt to new science, advancements in modeling approaches, and modified objectives and questions. The models are where the science relevant to a watershed system is integrated. The panel urges "caution" and offers an example of how Chesapeake Bay model forecasts have not achieved a high degree of accuracy. There are so many issues with respect to the complex Chesapeake Bay modeling effort that the import of the particular example is unclear. Further, it is unclear what the Panel suggests as an alternative to model development. Unless the Panel believes that watershed system modeling should be abandoned, which I expect is not the case, I suggest that the Panel offer some suggestions for how the experience with the Chesapeake Bay modeling effort can be leveraged for the model development needed for Florida waters.

4. Are the conclusions drawn or recommendations provided supported by the body of the Panel's report?

The conclusions and recommendations generally are adequately supported by detailed discussion in the body of the report. However, one of the recommendations, discussed below, is not well justified in my view, and I ask the panel to remove it.

Letter to the Administrator, p.2, lines 3-4: I cannot support the recommendation that EPA not be concerned about meeting a court-ordered schedule. I believe that the statement "the Panel is concerned that the Agency not sacrifice quality work for the sake of a schedule" is inappropriate in several ways, including lack of respect for the law, lack of recognition for the legal framework in which the EPA is operating, and implication that low quality work would be acceptable to EPA in trying to meet the challenge of establishing nutrient criteria. I request that this statement be removed from the Letter to the Administrator and where it appears in the Executive Summary and main body of the report.

Comments from Dr. James K. Hammitt

1. Were the original charge questions adequately addressed?

Yes.

2. Are there technical errors or omissions?

Not that I see.

3. Is the panel's draft report clear and logical?

Yes, except I found some passages in need of clarification (page/line):

10/24-27 not a clear sentence

14/39-41 What is the difference between loading and concentration? "would make water column concentrations of both TP and TN explanatory or response variables" is confusing. To my mind, a quantity can be an explanatory variable or a response variable, not both. Is the word "both" misplaced in the quoted sentence?

16/11 Proposing that "marine" be replaced with "estuarine and coastal" seems confusing given that two of the other three categories are labeled "estuarine" and "coastal."

18/36-37 "is (or was)" is not parallel to "were (or are)". Better to replace second phrase with "are (or were)"?

19 Response to charge question 2(c) might be better organized. The question asks about various approaches. The response includes multiple subheadings, but no clear introduction. I infer that reference condition, stressor-response models, and water quality simulation models are alternative approaches EPA describes. The remaining headings (hydrologic forcing, groundwater & surface water withdrawals, climate & temperature changes, threshold changes) do not sound like approaches, but rather like issues that merit particular attention.

4. Are the conclusions supported by the body of the report?

Yes.

Comments from Dr. Bernd Kahn

I reviewed the committee review of Nutrient Criteria for Florida's Estuaries etc. It is extremely well written and cogent, and I have no corrections.

My responses to the four questions are: 1) yes, 2) no, 3) yes, and) yes, respectively.

Comments from Dr. Madhu Khanna

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Yes the committee has responded adequately and thoughtfully to the charge questions.

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

The committee's report is comprehensive and well-substantiated. My only suggestion is to elaborate some more on the need to consider uncertainty and its implications for setting the nutrient criteria. The committee has mentioned at several places the importance of recognizing the uncertainty associated with measuring the relationship between stressors and responses. They might also consider mentioning/emphasizing the need to develop nutrient criteria that are responsive to these uncertainties. In particular, it may be necessary to specify some probabilistic goals for meeting the specified nutrient criteria and based on that set thresholds for N and P loadings accordingly to ensure that the criteria are met with a desired level of confidence.

3. Is the Committee's report clear and logical?

Yes

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

Yes

Comments from Dr. Nancy Kim

This is not my area of expertise. Because of that, some of my comments may not be relevant.

1. Were the original charge questions adequately answered?

Yes, for the most part.

In some cases I had a hard time determining if the question was answered directly. One example is the response to Charge Question 1a. The last sentence in the first paragraph responding to the charge question states, “Although the general conceptual model (Figure 1, below provides a starting point for choosing numeric criteria, the Panel has numerous concerns about how the causal variables will be linked to biological endpoints.” The Panel critiques the model/diagram over the next several pages. It isn’t clear to me if the Panel thinks the model is okay, but the diagram/description of the model needs a lot of work or if the Panel thinks the conceptual model/diagram should be discarded.

Another question arose about the words such as “the Panel is concerned” or it would be useful or a statement of an issue. Should these be accompanied by a recommendation? Here are a couple of examples: p. 14, line 13; p. 14, line 21, p. 14, line 37, p. 15, line 6. These particular statements occur in responding to 1a and recommendations may occur in the body of the report. If so, it may be useful to remind the reader that recommendations occur further on and that could easily be done by adding a phrase about recommendations to the sentence on p. 11, line 23.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel’s report?

Not that I am aware of.

3. Is the Panel’s draft report clear and logical?

Yes.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee’s report?

Yes.

Minor Comments.

Letter to the Administrator

p. 2., line 23. This paragraph appears disjointed. The first sentence, generally the topic sentence, doesn’t appear to be related to the rest of the paragraph.

Report

p. 1, line 46. If the sentence beginning on this line is important, the point being made gets lost with its being the last sentence in the paragraph.

p. 2, line 34. Does the Panel want a recommendation coming out of this paragraph rather than just raising a concern?

p. 10, line 20. I would move the first sentence of this paragraph to the previous paragraph since the next sentence is the true topic sentence for this paragraph.

p. 32, line 32. Is the paragraph that begins on this line and the one that follows in the correct place? They seem out of context.

p.18, sections beginning on line 18 and on line 34. Does the Panel have a recommendation for either of these sections?

p. 22, lines 26 and 28. Further should be farther.

Comments from Dr. Kai Lee

The SAB review raises a large number of questions about the work done so far to establish quantitative nutrient criteria. These comments would appear to provide ample basis to set aside implementation of the criteria until the defects identified by SAB are cured. It would appear likely that any potential regulated party with stakes larger than the expected cost of a lawsuit would find this review a useful resource. I do not know if the EPA analysis estimates the cost of failing to regulate, but it would be reasonable to think that it is higher than the cost to resist regulation.

The review appears, to a lay reader, to be wide-ranging and sensible. What is missing is advice to EPA that could help to address the deadline that approaches later this year--a deadline that was itself set by litigation. SAB may be able to make order of magnitude estimates of the cost and time needed to support a scientifically credible and environmentally effective rule to address nutrient pollution in the waterways of Florida. By identifying the cost of information, even in rough terms, SAB would inform a vexed public debate.

The non-scientific elements of this case seem to be leading to a use of public resources that is hard to defend, a process that consumes resources but does not move toward solving an environmental problem. That is not the responsibility of the Board, but in a time when taxpayers are told by mendacious voices that government is worthless, citizens may grieve.

Comments from Dr. Cecil Lue-Hing

May 9, 2011.

Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters. For May 17, 2011 teleconference meeting.

Review of SAB Nutrient Criteria Review Panel (NCRP) Report on the EPA's **Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and southern Inland Flowing Waters.**

In a charge to its NCRP Panel members, the SAB requested that they review the EPA's draft report with attention directed to 15 charge questions included as Appendix A to the Panel Review/report.

General Comments

The NCRP has done an excellent job of responding to the many thoughtful comments, suggestions, and recommendations received on this report. The Panel report offers a brief but informative presentation of the issues associated with the translation of Florida's current narrative criterion into numeric nutrient criteria.

Specific Comments

Letter to the Administrator

The letter is well written, it delineates the areas of agreement and of justifiable concerns by the SAB Panel, and highlights important specific recommendations e.g., the need to properly define "balanced" with respect to assessment end points.

I pose the following question at – Page 1, line 26 to 28; **In 2009, EPA determined that numeric nutrient criteria were needed ----**

Question:

Is this statement in conflict with the statement at, page 1, Executive Summary lines 26 to 30, **Under a court-ordered consent decree, the Agency has committed to proposing nutrient criteria for estuaries, coastal waters ----- by November 14, 2011 and final criteria by August 14, 2012. ----- ???**

Was the EPA's action visionary or driven by the court-ordered consent decree?

Executive Summary

The executive summary is well written, easy to read, and represents the highlights of the text. It treats all of the charge questions individually with brief statements of support or disagreement as warranted without being too lengthy.

The Text

The text is well written, and is made easy to follow by the way it identifies and comprehensively treats each of the charge questions relative to support and or concerns.

Charge Questions

All charge questions were satisfactorily answered.

Comments from Dr. L.D. McMullen

1. I feel the original charge questions were adequately addressed. In fact I was very impressed with the detail the committee provided not only on the science they reviewed but also the added science they provided for each question. It was an excellent report and should provide EPA with valued advise.
2. I did not find any errors or omissions in the report, although this subject is not in my area of expertise.
3. I feel the report is very clear and logical. I liked the organization of the report by using the charge questions as the bullet points for the report. There were so many questions and approaches, with this organization, it helped the reader by grouping comments to specific questions. I thought the letter to the administrator was the correct length and to the point. The executive summary seemed long but I didn't know how to shorten it without losing the important points. I finally came to the realization that due to the number of questions, the length of the executive summary was acceptable.
4. I feel the conclusions drawn or recommendations provided where supported by the body of the report. I feel that with each concern expressed there was a recommendation on how to remove that concern. In most all concerns, there was documented science to support the concern. In areas where there was no documented science to support the concern, it was opinion of the committee using their best scientific judgment, which is acceptable, such as on page 14 line 27. I don't feel this needs to be changed.

Finally, I feel the committee did a great job and will provide EPA valued advice.

Comments from Dr. James R. Mihelcic

May 9, 2011

Comments by James R. Mihelcic

Review of EPA's draft *Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters* (04/08/11 draft)

1. Were the original charge questions adequately addressed?

The charge questions were adequately addressed. I have two comments.

In regards to Charge Question 1(a), I support the Panel recommendation that EPA should consider a stressor-response approach to link nutrient loading with seagrass areal extent for protecting seagrass communities."

In the discussion for Charge Question 4(a), the report reads as follows (page 28, lines 20-23) "The proposed classification scheme appropriately incorporates surface and subsurface flow regimes and flow lines, as well as soil types and human agricultural and urban impacts (i.e., land use)." In this sentence, I think that "sanitation technology selection" should be added after the wording of "land use" used at the end of the sentence. I mention this because deployment of specific sanitation technology in Florida ranges from centralized treatment that uses advanced treatment for removal of nutrients, use of reclaimed water, much of it applied to land for irrigation (Florida is one of the largest users of reclaimed water), and the state also houses 2.6 million decentralized and unregulated septic tanks (many which are located along man-made canals). Selection of sanitation technology has a great impact on level of treatment and/or recovery of nutrients; for example, decentralized land treatment systems that employ septic tanks and drainfields do nothing to remove nitrogen and in fact actually transform the nitrogen to more readily available forms. Selection of a sanitation technology or reclamation strategy also impacts how specific nutrient are discharged to the environment, including decisions on whether discharges should be to surface or subsurface water, all of which has further altered nutrient cycles.

2. Are there any technical errors or omissions in the report or issues that are inadequately dealt with in the Panel's report?

I do not agree 100 percent with the Panel in their conclusion that for South Florida inland waters, the nutrient criteria based on instream protection values is not meaningful for man-made and managed canals. While man-made and managed canals have been traditionally designed and managed to serve mostly societal purposes related to flood control, water management is moving slowly towards a new paradigm where associated water infrastructure would be designed and managed to have multiple benefits beyond traditional measures of stormwater management such as flood control that include environmental benefits. I suggest it would be best for EPA to manage these canals in a similar fashion as other in-land waters; otherwise, this new paradigm

(that the Agency is a strong supporter of) will never be implemented. That is, we will remain stagnant in a world of primarily grey water infrastructure, and not begin the transformation towards deploying and managing green infrastructure that serves multiple end points.

3. Is the Panel's draft report is clear and logical?

I found the draft report to be clear and logical. It is very well organized in my opinion. Two small editorial comments are:

Pg 26, lines 36 and 38, groundwater is spelled as two words, ground water.

Page 40, Figure 2 needs a caption, it currently has none.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

The conclusions and recommendations are supported by the body of the report.

Comments from Dr. H. Keith Moo-Young

Science Advisory Board Review of EPA's draft Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Yes. The original charge questions were sufficiently addressed by the committee.

2. Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

No technical error or omissions in the report are identified.

3. Is the Committee's report clear and logical?

The committee's report is clear and logical.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

Yes. The committee's conclusion and recommendations support the body of the report.

Comments from Dr. Eileen Murphy

Responses to Quality Review Questions

Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters

Were the original charge questions to the SAB committee adequately addressed?

Yes.

Are there any technical errors or omissions in the report or issues that are not adequately dealt with in the committee's report?

There were no technical errors or omissions apparent in the report.

Is the committee's report clear and logical?

The report was well-written, thorough and easy to follow.

Are the conclusions drawn or recommendations provided supported by the body of the committee's report?

Yes.

Comments from Dr. Kathleen Segerson

Comments on Deriving Numeric Criteria for N and P, May 2011
From Kathy Segerson

Responsive to charge questions? Yes, the Panel has been very responsive and done a very thorough job of responding to each individual charge question.

Technical errors? I cannot judge the report's technical accuracy.

Clear and logical? In general, the report is clear and logical, although I have the following comments on content:

1. The letter to the administrator states that the "Panel is concerned that the Agency not sacrifice quality work for the sake of a schedule." This statement also appears in the executive summary and main report. In my view, such a statement is not helpful to the Agency. The deadline they face is not self-imposed; rather, they face a court-imposed deadline. The statement seems to suggest they should change or ignore the deadline in order to achieve a high level of quality, but clearly this is not possible. I think it would be preferable to say something like "the Panel is concerned that the Agency will not be able to achieve a high level of quality within the allotted time" (although this begs the question of what constitutes a "high level of quality" – see next comment).
2. The letter, executive summary, and main report also state "much work remains to be done." Again, I am not sure this statement is helpful. What "remains to be done" depends on the specific task or goal. If that is simply defined as the development of numeric criteria, this could presumably be done with little additional work. They wouldn't be "good" or "high quality" criteria, but they would be criteria. So, how much "remains to be done" depends on the quality standard that one sets for these criteria. In order for this statement/phrase to be meaningful, I think we need to say something like "much remains to be done in order to" or "much remains to be done to ensure that...."
3. The letter has a statement "The Panel reached the following broad conclusions:" followed by five bullets. Some of these bullets are conclusions (findings) while others are recommendations. If possible, I think it would be helpful to distinguish findings from recommendations.
4. The Panel has urged EPA to define "balanced". On p. 1 of the executive summary, it states that the State of Florida narrative criterion is defined in terms of an "imbalance" in natural populations. Given that this is a state-level criterion for nutrients, is EPA free to define "balanced" in any way that it thinks is appropriate?

5. The letter, executive summary, and main report also all include a statement about using “cross-tributary nutrient trading to achieve the necessary load reductions.” First, I am not sure this belongs in the letter or executive summary, given that it appears to be mentioned in only one sentence in the report (p. 39). While this might be a reasonable recommendation, I don’t see the support for it in the report, and it does not appear to be the most important part of the response to charge question 6(a) or a “broad conclusion” (one of the five most important conclusions from the report, which is presumably what the five bullets in the letter represent).

Second, I am not sure what this statement means in this context. Typically, nutrient trading programs would involve two parts: (i) the allocation of some sort of allowances across sources, and then (ii) a provision/system that allows sources who receive those allowances to buy and sell (trade) them under terms defined by the trading program (e.g., using designated trading ratios). Is that what the Panel has in mind here? It seems instead that the panel simply has in mind using a flexible allocation scheme (which is not the same as using a “trading” approach), but this isn’t clear since it is not discussed in any detail in the report (the only reference to this that I could see is the sentence on p. 39). I would suggest that the Panel either develop, explain and support the statement about trading (if it believes this is an important point) or delete it.

6. The executive summary is fairly long and, in some places, fairly technical. Perhaps this is necessary and appropriate for this report, but it seems somewhat more technical and detailed than typical SAB executive summaries.

Conclusions/recommendations well-supported? In general, the conclusions and recommendations are well-supported, with the exception of the conclusion about nutrient trading (see comment above).

Comments from Dr. John E. Vena

1. Were the original charge questions to SAB Standing or Ad Hoc Committees adequately addressed?

Yes, I was impressed with the thoroughness and careful thought that went into the response to each of the of the charge questions.

2. Are there are any technical errors or omissions in the report or issues that are not adequately dealt with in the Committee's report?

None that I can tell based on my expertise.

3. Is the Committee's report clear and logical?

Yes. In particular I found that the letter to the administrator was succinct and summarized the issues and recommendations in an excellent manner. In addition the executive summary in my view was artfully crafted and gave a direct and thoughtful overview of the response to each charge question with a notation of the recommendations when necessary.

On page 15 the issues of uncertainty in the model estimates are raised. These are important issues that should be expanded and clarified.

Climate and temperature changes are briefly mentioned on pages 21-22. It seems to me that the implications of global warming on water usage, ecological dynamics etc and effects on the models for developing nutrient criteria needs to be addressed in more detailed fashion.

Although the panel raised legitimate concern about the timetable to develop the criteria it would be helpful to be more explicit as to what the priority should be in development of the criteria prior to the stated deadlines.

4. Are the conclusions drawn or recommendations provided supported by the body of the Committee's report?

Yes. It was easy for me to follow the logic of the conclusions and recommendations due to the superb job in developing the background and explaining their rationale.

Comments from Dr. R. Thomas Zoeller

The following comments are provided in response to the April 8th, 2011 memo by DFO Dr. Tom Amitage concerning the Quality Review of the SAB workgroup's document of the same date entitled, "*Review of EPAs Draft Approaches for Deriving Numeric Nutrient Criteria for Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters*". This memo asked contributing SAB members to specifically address the four quality review questions from the vantage point of our own expertise. These questions are:

1. whether the original charge questions to SAB Standing or Ad Hoc Committees were adequately addressed;
2. whether there are any technical errors or omissions in the report or issues that are inadequately dealt with in the Committee's report;
3. whether the Committee's report is clear and logical; and
4. whether the conclusions drawn or recommendations provided are supported by the body of the Committee's report.

Quality Review Question #1: whether the original charge questions to SAB Standing or Ad Hoc Committees were adequately addressed.

The charge questions to the committee were complex.

1. General Approach

a) EPA has introduced a general conceptual model in Chapter 2, including the selection of assessment endpoint and indicator variables. What is your perspective of the general conceptual model?

b) EPA has delineated the State of Florida into 4 general categories of waters—Florida estuaries, Florida coastal waters, South Florida inland flowing waters, and South Florida marine waters—for purposes of considering approaches to numeric nutrient criteria development. Are these categories appropriate and scientifically defensible? (Note that the details of segmentation of waters within these categories is addressed in subsequent charge questions.)

2. Estuaries

a) Are the data sources identified appropriate for use in deriving numeric criteria in Florida's estuaries (as discussed in Sections 2.4 and 3.2)? Is the SAB aware of additional available, reliable data that EPA should consider in delineating estuaries or deriving criteria for estuarine waters? Please identify the additional data sources.

b) Are the assessment endpoints identified in Sections 2.3 and 3.2 (healthy seagrass communities; balanced phytoplankton biomass and production; and balanced faunal communities) appropriate to translate Florida's narrative nutrient criterion (as cited above) into numeric criteria for Florida's estuaries, given currently available data? Does the SAB suggest modification or addition to these assessment endpoints? A literature review of endpoints considered can be found in Appendix B.

c) EPA describes potential approaches in Section 3.3 (reference conditions, stressor response relationships, and water quality simulation models) for deriving numeric criteria in Florida's estuaries. Compare and contrast the ability of each approach to ensure the attainment and maintenance of natural populations of aquatic flora and fauna for different types of estuaries, given currently available data?

3. Coastal Waters

a) Are the data sources identified in Sections 2.4, 4.1.1 and 4.2 appropriate for use in deriving numeric criteria in Florida's coastal waters? Is the SAB aware of additional available, reliable data that EPA should consider in delineating coastal waters or deriving criteria for coastal waters? Please identify the additional data sources.

b) Is the assessment endpoint identified in Section 4.2 (chlorophyll-a to measure balanced phytoplankton biomass and production) appropriate to translate Florida's narrative nutrient criteria (described above) into numeric criteria for Florida's coastal waters, given currently available data? Does the SAB suggest modification or addition to this assessment endpoint?

c) Does the approach EPA describes in Section 4.2 appropriately apply remote sensing data to ensure attainment and maintenance of balanced natural populations of aquatic flora and fauna in Florida's coastal waters? If not, please provide an alternate methodology utilizing available reliable data and tools, and describe the corresponding advantages and disadvantages.

4. South Florida Inland Flowing Waters

a) Are the data sources identified in Section 2.4 and 5.4 appropriate for use in deriving numeric criteria in South Florida's inland flowing waters (as discussed in Chapters 2 and 5)? Is the SAB aware of additional available, reliable data that EPA should consider in delineating or deriving criteria for South Florida's inland flowing waters? Please identify the additional data sources.

b) Are the assessment endpoints identified in Section 5.4 (balanced faunal communities, i.e., aquatic macroinvertebrates, and balanced phytoplankton biomass and production) appropriate to translate Florida's narrative nutrient criteria (described above) into numeric criteria for South Florida's inland flowing waters, given currently available data? Does the SAB suggest modification or addition to these assessment endpoints?

c) EPA describes two approaches in Section 5.4 (reference conditions and stressor-response relationships) for deriving numeric criteria in South Florida inland flowing waters. Compare and contrast the ability of each approach to ensure attainment and maintenance of balanced natural populations of aquatic flora and fauna in different types of flowing water or geographical areas, given currently available data?

5. South Florida Marine Waters

a) Are the data sources identified in Section 2.4 and 5.5 appropriate for use in deriving numeric criteria in South Florida's marine waters (as discussed in Chapters 2 and 5)? Is the SAB aware of additional available, reliable data that EPA should consider in delineating or deriving criteria for South Florida's marine waters? Please identify the additional data sources.

b) EPA describes two methods in Section 5.6 for using a reference condition approach for deriving numeric criteria in South Florida marine waters (least-disturbed sites or bionomial test). Compare and contrast the ability of each approach to ensure attainment and maintenance of balanced natural populations of aquatic flora and fauna in South Florida marine waters, given currently available data?

6. Downstream Protection Values for Florida Estuaries and South Florida Marine Waters

a) Are the methods EPA is considering for deriving downstream protection values (DPVs) for estuaries (excluding marine waters in South Florida) as described in Section 6.1-6.4 appropriate to ensure attainment and maintenance of downstream water quality standards, given available data? Please describe additional approaches and their advantages and disadvantages that EPA should consider when developing numeric criteria to protect these downstream estuarine waters (excluding marine waters in South Florida), given available data?

b) Are the methods that EPA is considering for deriving downstream protection values (DPVs) for marine waters in South Florida as described in Section 6.5 appropriate to ensure attainment and maintenance of downstream water quality standards, given available data? Please describe additional approaches and their advantages and disadvantages that EPA should consider when developing numeric criteria to protect downstream marine waters in South Florida, given available data?

In general, the charge questions were clearly addressed.

2. whether there are any technical errors or omissions in the report or issues that are inadequately dealt with in the Committee's report;

I did not detect technical errors or omissions.

3. whether the Committee's report is clear and logical; and

In general, the report is clear and logical. However, minor comments are provided below:

Page 11, line 15: "or as many as possible". My reading of the manuscript would support the recommendation to develop all three approaches unless the Agency can scientifically defend limiting the approaches.

Page 13, line 6: "breakpoints" seem jargonistic here.

Page 13, line 40: Final sentence is vague. "...needs to be recognized..." might be rephrased to say should be explicitly developed.

Page 14, Line 20: Paragraph on dissolved oxygen might have a more focused set of recommendations. This paragraph appears to be saying that the EPA should articulated the weaknesses in the use of dissolved oxygen and develop approaches that would limit these weaknesses. This isn't clear.

Page 15, Line 22; Likewise, this conclusion paragraph should be more specific. The discussion up to this point seems to indicate that TN and TP loading should be used instead of concentration. But this isn't clear.

Page 15, line 35: "Ground-truthed" is not clear.

Page 16, Line 6: These two paragraphs are not clear. “Grab bag” is also not clear....

Page 20, Line 27: “Encourage thorough consideration” should be more clearly developed. It might be reasonable to recommend the Agency to develop the stressor-response approach unless specifically defended.

Page 21, Line 2: This first paragraph seems to conclude that “these conditions” represent a specific challenge. Is there a recommendation in this?

Page 23, Line 1: “may wish to consider” could be changed to “should”

Page 27. The response to charge question 4(a) is not clear. The question itself is about the data sources, but this is not specifically or clearly addressed.

Page 29, Line 35: Should the committee be making a recommendation about how the methods could be validated or effectiveness demonstrated?

Page 31, “reference Conditions”: This paragraph isn’t clear. I think it is recommending using categories rather than a threshold?

Page 36, Line 31: The panel is recommending “more thought”? This could be more clear.

Page 37, Line 14: This first paragraph isn’t making a recommendation

4. whether the conclusions drawn or recommendations provided are supported by the body of the Committee’s report.

The conclusions drawn appear reasonable.