

May 3, 2005

Mr. E. Timothy Oppelt  
Acting Assistant Administrator  
Office of Research and Development  
U.S. Environmental Protection Agency  
Washington, DC 20460

Dr. William Farland  
Acting Assistant Administrator  
for Science  
Office of Research and Development  
U.S. Environmental Protection Agency  
Washington, DC 20460

Re: BOSC Review of the Coastal Condition Report

Dear Mr. Oppelt and Dr. Farland:

At its September 2004 meeting, the Board of Scientific Counselors (BOSC) agreed to review EPA's *Second National Coastal Condition Report* in the context of other recent, related reports such as the Pew Oceans Commission's *Americas Living Oceans: Charting a Course for Sea Change* and the Preliminary Report of the U.S. Commission on Ocean Policy, and provide this Letter Report of the Board's findings. At the September meeting, the BOSC formed a work group to review the report. Dr. Jim Clark agreed to serve as the Chair, and Drs. Herb Windom and Clifford Duke completed the work group. EPA staff provided copies of the Coastal Condition Report and other materials required for the review and responded promptly to inquiries and requests for information from the work group.

The following comments were developed as a result of the review, a *inter alia*, to:

- ❖ Evaluate consistency/leverage of ideas, recommendations, and contrasts among the reports.
- ❖ Assess the EPA report as a communication tool in the light of the Office of Management and Budget's Performance Assessment Rating Tool (PART) expectations and evaluate the conclusions, recommendations, and ideas presented in terms of a research and development (R&D) output with potential to impact environmental outcomes.
- ❖ Assess the appropriateness of integration/utilization of other state and federal data on coastal conditions, and the rationale for the approaches taken by EPA in the report.
- ❖ Assess whether the report provides a perspective on the future of the monitoring program (e.g., Are goals for the future stated? How will the program address advances in technology and science as the monitoring efforts continue?).

**Consistency of Ideas, Recommendations, and Contrasts Among the Reports**

A preliminary comparison of the reports, based simply on their Executive Summaries as well as additional reading, demonstrates clearly that their intended audiences are quite different. The Coastal Condition Report attempts to provide a science-based comparison of conditions of the nation's coast, as required of EPA under Section 305(b) of the Clean Water Act (CWA), which serves local, regional, and national decision-makers. Section 305(b) requires that each state submit to EPA a biennial

U.S. EPA  
Board of  
Scientific  
Counselors

EPA  
600  
2005-4

6286867/17987829

B

O

S

C

report describing the quality of the state's navigable waters and the extent to which those waters support recreational uses and balanced populations of shellfish, fish, and wildlife.

The other reports address ocean policy, both at the national and international levels. The EPA Coastal Condition Report focuses specifically on the coastal environment, while the reports from the Pew Ocean Commission and the U.S. Commission on Ocean Policy extend into the U.S. economic zone and adjacent seas and oceans. These latter documents are both comprehensive, in that they use the data to inform a set of specific policy recommendations. These documents translate research outputs into needs for outcomes reflecting the charge to those commissions that authorized the reports. As stated above, the Coastal Condition Report was not intended for such purpose.

### **Report as a Communication Tool**

The writing style and level of detail in the EPA Coastal Condition Report raise questions regarding intended audience. Stretches of fairly technical prose, understandable primarily by scientists, combined with simple graphics (e.g., pie charts) and simplified language about poor, fair, and good conditions are combined in a disconcerting manner. It appears that the writers are attempting to create one report for multiple audiences. This information can be communicated more clearly through development of different products (e.g., an extended executive summary, a general-audience main report, and technical appendices) for different audiences, with some thought given to the needs of a range of potential users of the report. Regardless, each future Coastal Condition Report should state clearly its intended audience(s). Nevertheless, the second Coastal Condition Report as a whole is a useful compendium of information on the condition of the nation's coastal environment with respect to human uses and to some extent with respect to ecological condition.

The Coastal Condition Report is very effective in communicating the factual findings of coastal monitoring efforts nationally. With regard to PART, the Report provides a clear example of the outcome of monitoring efforts. The figures, tables, and text boxes clearly and concisely report summary data and complement the text. Future reports, however, could go a step further by indicating how the information provided can be incorporated in planning and strategies for continued efforts. For example, it would be useful if these data were used to identify and prioritize research and regulatory needs to improve poor conditions and to prevent good conditions from deteriorating. The current report tends to leave the "so what?" question hanging. Chapter 9, focusing on an assessment of a specific ecosystem's ability to meet societal uses, begins to address this question, with the important third bullet on page 9-1 asking "... how might improving one or more of the indicators affect a particular use?" This question should be woven throughout the national assessment, along with two others:

- (1) How might more extensive or complete data affect the conclusions?
- (2) What gaps do the data reveal in our understanding of the links between existing monitoring programs and the quality of the ecosystem services we receive?

Future reports will be more useful, and better address PART, if the authors tailor the reports to their intended clients (audiences), and address how to use the research outputs to affect outcomes and environmental results. If there are additional, related documents that address ways to act on information in the Coastal Condition Reports, it would be useful to reference them in the text of future reports.

### Integration/Utilization of Data From Various Sources

With regard to the data used, the report indicates, where appropriate, how data outside the Environmental Monitoring and Assessment Program (EMAP) have been incorporated, or not. For example, National Oceanic and Atmospheric Administration (NOAA), U.S. Fish and Wildlife Service (FWS), and state data are used throughout the report and their use and utility are explained. The "highlights" sections provide useful pointers to data sets that can inform future editions of the report. This report is a good example of successful cooperation and coordination among environmental agencies to develop a dataset where information can be pooled to meet common objectives. The discussions of the eight regional monitoring programs in text boxes at the end of Chapter 2 provide good examples of both EPA's leveraging with other monitoring activities, and the differences in what can be done for a fixed budget on a national scale versus a smaller scale. These text boxes also point out how monitoring programs designed to identify causative agents for poor environmental conditions can differ from a higher level assessment program in both sampling strategy and assessment tools. It would be useful to provide a paragraph introducing the eight other monitoring programs, explaining the overlaps or leverage points, but also why they exist outside of the data input for the *Second National Coastal Condition Report*, rather than being integrated.

Although the Coastal Condition Report does a good job of integrating data, it does not address the issue of uncertainty in these data and the evaluations resulting from their use. The relatively general conclusions of the report are probably robust to the uncertainty that exists, but future reports should have, at the least, an appendix that explains limitations of the data, uncertainty contributed by natural variability, and uncertainty contributed by sampling protocols. The discussion of shortcomings of available data in the Executive Summary and Chapter 1 offers explanations of the challenges EPA has addressed and is still working to overcome. The BOSC members are pleased to see that quality assurance (QA) was considered important enough by the Agency to merit its own chapter, even if it was an appendix. This appendix is a great overview of how QA is handled in the program. It provides readers with an understanding of why QA is important, what is contained in a QA plan, and how the QA plan is designed and implemented. This serves as a great reference to get environmental scientists and managers focused on QA as a cornerstone for sound science.

### Perspective on the Future of the Monitoring Program

In its use of Section 305(b) information, the report implicitly highlights the added value that national standards for collecting and reporting of these data would provide with respect to national assessments of water quality. Based on the discussions in the Coastal Condition Report, the BOSC encourages EPA to work with the states to have the key EMAP monitoring strategies adopted by the states on a national scale. It is clear that the efforts to date by states that adopt the use of the EMAP tools have improved the quality of the data and gained efficiencies in environmental monitoring programs at all levels. As noted on page ES-14 of the Report, "Only through the cooperative interaction of the key federal agencies and coastal states will the next effort to gauge the health of the coastal ecosystems in the United States be successful." The Report also highlights the need for expanded monitoring programs, particularly in Alaska (page 1-6). However, future Coastal Condition Reports would be greatly improved by developing explicit recommendations for strengthening the Section 305(b) program. For example, it would be informative for those following the evolution of the monitoring report series to understand what efforts are planned to develop greater multi-agency cooperation on monitoring efforts. On the top half of page ES-14 of the report, limitations and shortfalls are discussed and the case is

made for cooperative interaction of key agencies if the effort is to be successful. What assurances or examples offer hope that the next effort will be more successful?

#### Additional Comments/Suggestions Regarding the Report

In addition to the above, the BOSC provides the following more specific comments with regard to the *Second National Coastal Condition Report*:

- (1) Future reports would benefit by providing a context for addressing degradation causes/remedial action to rectify the condition, or leading the reader to such discussions in other reports. The brief discussions of the monitoring criteria and assessment indices provide sufficient background information on how the data were gathered and their ecological relevance. The Report does not make clear, however, the source of the stresses that lead to poor index values, and what could be done to reduce these stresses. The Report also could provide some reference (by brief mention of other reports or forums) where the reader can find a discussion of actions that may be useful to change the trends or improve the condition of the coastal areas. Perhaps this could be done within a couple of paragraphs in the introductory chapter, and certainly should be referenced in the Executive Summary. The results of monitoring activities are not merely for scientific curiosity, but they are intended to assist EPA in determining what is working and what is not working in environmental controls in this country. The reader should be provided an understanding (either in this report or elsewhere) of how to take the available data and make decisions that will improve environmental quality.
- (2) A continued effort to make comparisons with past reports is worthwhile. The comparison of current data to those in the first Coastal Condition Report is important for the credibility of the program. The second Coastal Condition Report documents, with sufficient brevity in the Executive Summary and with adequate detail in the appendix, the cautions invoked around meaningful trend analyses. The BOSC was encouraged to see ORD, as indicated in the Report, take the risky road of generating comparisons in light of all the potential pitfalls. Including a trend analysis is an indication that ORD understands its audience and their expectations. The discussion in Appendix B surrounding the changes made in the indices and monitoring approaches demonstrated the responsiveness of ORD to comments and its commitment to get sound, scientific data that meet stakeholders' expectations. The BOSC would have preferred a bit more analysis and explanation of how those changes (e.g., going from fillet data to whole fish residue data) impacted the indices. This could be done in future reports using text boxes, or citing references to technical papers or reports where such discussions could be found.
- (3) Although what is written in Chapter 1 on selection and shortcomings of monitoring data (pages 1-6 and 1-7) provides a sufficient overview of what was done, the discussion could be enhanced to describe the cost or logistical constraints that limited the use of other more sophisticated, intensive, or emerging sampling or analytical approaches. ORD is justified in staying with its core set of indicators based on standardized sampling and analytical approaches. The program has had to strike a balance among costs, data quality, and data utility. Additional text would be justified to develop a pre-emptive defense of current approaches against a continuing expectation that the monitoring program might adopt the latest, most sophisticated, more technologically advanced approaches that come out each year. In part, this is accomplished by the discussions surrounding the data used for benthic assessments, differentiating the triad approach from that in use. Similar expectations/criticisms by specialists in each of the other assessment areas have been voiced,

and may deserve addressing as part of a more comprehensive discussion of what is in the program, what is out of the program, and why these difficult choices were made.

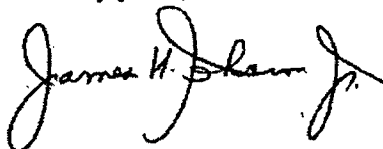
- (4) The chapters summarizing regional data and ongoing activities are very informative. Chapters 3 through 9 provide useful summaries of the data, ongoing monitoring and environmental assessment programs in these regions, and EPA's ability to work within these geographic areas to make more detailed assessments of environmental conditions and key stresses. These chapters offer opportunities for readers to expand their awareness of environmental trends and coordinated activities in a region and locate sources of additional information. The text also comes closer to identifying causative agents where indicators show poor conditions, but lacks the specificity of leading resource managers to key remedial considerations.
- (5) The consolidation of turbidity into a more general water quality criterion is a great improvement from the first National Coastal Condition Report. This de-emphasizes a condition that is dominantly controlled by natural processes in many coastal areas.
- (6) The report could do a better job explaining, particularly to the general public, why the criteria for assessing dissolved inorganic nitrogen (DIN), dissolved inorganic phosphorus (DIP), and chlorophyll (pages 1-10 to 1-11), differ across regions. The text of the water clarity discussion on page 1-11 provides a useful model.
- (7) The discussions of sediment quality (pages 1-14) are confusing. The third paragraph indicates that some researchers prefer to use a sediment triad, which includes sediment toxicity, to assess sediment condition (i.e., condition is a complex variable that includes toxicity). The fourth paragraph states that the Coastal Condition Report's sediment quality index focuses on sediment condition, not just sediment toxicity, as if one were not a component of the other.
- (8) The discussion of total organic carbon (TOC) (pages 1-18), speaks to the question of the intended audience. The oversimplification of the statement "Sediment toxicity from organic matter is assessed by measuring TOC" seems to imply that TOC is by definition toxic. High TOC may be associated with poor water quality, and TOC can alter the availability of toxins, but that is not the same thing.
- (9) The difficulty in determining the audience for this report is reflected on pages 2-5, particularly in the first full paragraph with the simplification of the statement regarding lower nutrient concentrations expected in summer due to phytoplankton uptake. Nutrient concentrations are dependent on rainfall and on temperature-limited nutrient regeneration rates, and the "expectation" of lower summer concentrations is highly dependent on local conditions and weather. The discussion in this paragraph may be difficult for a nonscientist to follow, while at the same time raising questions on the part of a knowledgeable reader.
- (10) It is not at all clear what assessment or policy purpose is served by combining Great Lakes and coastal estuary data (pages 2-31) to arrive at an improved estuarine condition (increasing the "national ranking" from poor to fair). The utility of these assessments would seem to be in what they tell us about conditions in local places, so that we can set priorities for research (to fill data gaps) and to improve conditions (so that we can concentrate resources on locations with poor conditions). A "national" ranking, based on combining data from disparate locations is simply not useful.

**Findings and Recommendations:**

- ◇ The Coastal Condition Report, as a whole, is a useful compendium of information on the condition of the nation's coastal environment with respect to human uses and to some extent with respect to ecological condition. Nevertheless, future reports should state clearly the intended audience(s) and strive to develop communications commensurate with audience desire for amplification.
- ◇ The relatively general conclusions of the report are probably robust to the uncertainty that exists, but future reports should have, at the least, an appendix that explains limitations of the data, uncertainty contributed by natural variability, and uncertainty contributed by sampling protocols. The discussion of shortcomings of available data in the Executive Summary and Chapter 1 offers explanations of the challenges EPA has addressed and is still working to overcome.
- ◇ This report is a good example of successful cooperation and coordination among environmental agencies to develop a dataset where information can be pooled to meet common objectives. The discussions of the eight regional monitoring programs in text boxes at the end of Chapter 2 provide good examples of both EPA's leveraging with other monitoring activities, and the differences in what can be done with a fixed budget on a national scale versus a smaller scale.
- ◇ In its use of 305(b) information, the report implicitly highlights the added value that national standards for collecting and reporting of these data would provide with respect to national assessments of water quality. Based on the discussions in the Coastal Condition Report, the BOSC encourages EPA to work with the states to have the key EMAP monitoring strategies adopted and implemented on a national scale.
- ◇ Future Coastal Condition Reports, however, could go a step further by indicating how the information provided can be incorporated in planning and strategies for continued efforts. This could be accomplished through the use of text boxes or citations of other reports or publications.
- ◇ A similar use of citations or text boxes could be used in future reports to provide other discussions of data interpretations or significant topics that are outside of ORD's intended scope of the Coastal Condition Report, but are germane to data interpretations or to the environmental and regulatory implications of the report findings.

In conclusion, the members of the BOSC believe that EPA's *Second National Coastal Condition Report* provides useful information on the condition of the nation's coastal environment and ORD appears to be on the right track for improving future reports. The BOSC is pleased to provide advice on this important report and is available to respond to any questions ORD might have regarding this letter report.

Sincerely yours,



James H. Johnson, Jr.  
Chair, Board of Scientific Counselors