

EXCERPT
General Comments from Peer Reviewers

From:

**External Peer Review of EPA's Draft
"National Lakes Assessment: A Collaborative
Survey of the Nation's Lakes"**

Peer Review Comments

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Submitted to:

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Peer Reviewer 1

I believe the NLS is well organized, such that the intended goals are supported (communication to lay people and managers concerning the status and relative of lakes nation wide). The introduction is well conceived as to explain the concept of the sampling approach, and how this related to generalizations about lake conditions among regions and types (natural and human made).

I believe the report does meet the intended goals overall, and that the metrics used here appear to adequately reflect the conditions of a broad range of lakes in the United States. As such, the report is both important and very relevant. However, I believe the actual calculation of the metrics should be explicitly stated and demonstrated in the body of the report (an example may be helpful).

Peer Reviewer 2

The organization and content of this document does seem appropriate for the stated audience (the type of person who may work at the policy level in environmental issues, or alternately has a dedicated interest in lake water resource quality concerns). The goals, purpose and design of the study are clearly described for the target audience with the exception of the concept that this is an analysis of a population of lakes and not individual lakes. This could be clarified with a paragraph in the introduction stating this concept with an example of individual lake analysis (e.g., increased TP in Lake Okeechobee over 30 years) and an analysis of a population of lakes (any of the individual states Ecoregion papers). Additionally, the concept of temporal variability within lakes and among lakes should be described.

The report meets its stated goals and objectives and with the available data from the sampling design used, have described the current condition of the nation's lakes. The relationship between the selected stressors and biological and biological indices is adequately explained.

Peer Reviewer 3

Overall, the organization of the document is clear and logical. The authors are especially commended for the bulleted series of study findings within the Executive Summary section. However, within the individual sections, this reviewer found that the presentation was occasionally confusing, especially to a lay audience. For example, most of the text within individual sections (i.e. “Stressors to Lake Biota”, “Trophic State of Lakes”, etc.) consists of narrative descriptions of raw results, relying heavily on simple statements of percentages of lakes with x or y characteristics. A suggestion for better readability would be more emphasis on interpretations of these percentages, conclusions and inferences from the results, followed by more targeted narrative statements of supporting data.

The goals and purpose of the study are sufficiently described in the Introduction. A general overview of the methods is provided, and these appear to be sufficient for the target audience. A stronger statement of linkage between the study goals and purpose within the first paragraph would be appropriate, and would bring these concepts to the fore of the document. As is, the reader must get to page 3 for this information.

The document is clear that the NLA is not targeted at individual lakes, and the concept of geographic scales or regional assessments is clear. However, no explanation of Omernik ecoregions was found, although these are noted in figure legends (see later comments). It is suggested that the utility of the NLA conclusions in guiding lake users and managers in decision-making should be more clearly emphasized. For example, the data show potential linkages between littoral or riparian vegetation and lake biotic integrity and diversity. For lake managers, this should be taken as guidance and justification on study designs that might examine these linkages in an individual lake assessment or management plan.

In large part, the NLA report does meet the state goals and objectives of reporting on indicators of the condition of the nation’s lake resources. However, there is a major omission attributable to the sampling methodology. A known and widespread problem in dimictic lakes, associated with cultural eutrophication, is loss of dissolved oxygen (DO) in the summer hypolimnion during stratification. This loss of DO leads to increased internal phosphorus recycling, increased risk of higher and accelerating trophic status, and reduced cold-water fish habitat. Because only a single, mid-lake surface DO measurement was taken, there is no information provided on actual DO status of the lakes. The methodology also provides little to no information on potential DO problems in shallow, polymictic lakes (see later discussion as well).

Peer Reviewer 4

- 1) The organization of the report is appropriate and presents the material in a logical order. Some of the content should be revised to make it easier for the reader to understand. This is particularly important in the Executive Summary (ES). For example, the bullets in the ES should be carefully reviewed because this will likely be the primary source of information for “Congress, environmental groups, and concerned citizens” (audience cited in ES, page 8, 1st para, line 6) on the National Lakes Assessment (NLA). There are several terms that are used but not defined, such as hypertrophic and trophic state, littoral habitat, Relative Extent and Relative Risk of stressors, and planktonic O/E. The ES is key to this document. Although the ES must be short, concise, and succinct, the messages must be clear and understandable to a non-technical audience. The ES will likely be the most widely read section of the entire document. You might select a few representatives of your target audience and have them review and comment only on the ES.
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Subsequent revision can then address any misperceptions or misunderstandings that are likely to arise in the target audiences.

- a) You might consider a subheading, ***Implications***, following the Key Findings that includes bullets created from the text provided on page 11 of the ES. Bullets capture the reader's attention. Some of the important points made in the text can get lost on the reader without highlighting. For example, a significant implication of the NLA is that, for the first time, a national baseline of lake condition has been established. Another key implication, from my perspective, is that lake managers (and environmental policy analysts) should pay more
 - b) attention to the role habitat alteration plays in the degradation of lake condition. Without bullets, I think these important points will be overlooked.
- 2) The goals, purpose and design of the study are clearly described for the target audience. It was clear in my reading that this study is NOT designed for assessing individual lake attributes, but rather populations and subpopulations of lakes at large scales (e.g., national, ecoregional, basin, EPA Regions, state, etc.).
- 3) The NLA does meet its stated goals and objectives of reporting on indicators that reflect the stressors to the nation's lake resources. However, I am concerned about statements on the overall biological condition of lakes based solely on plankton indicators, and particularly the phytoplankton/zooplankton O/E model as the major indicator of lake biological condition for several reasons. First, phytoplankton and zooplankton are one indicator of lake biological condition, and taxa loss is one metric of biological condition. The ES presents only the plankton O/E results, which implies this is the most important indicator of lake biological condition, even though the diatom index is also an indicator of biological condition. Because the benthic assemblage analyses are not yet complete, I would couch these statements carefully to indicate that additional biological condition indicators will be forthcoming. Given the importance of habitat condition in many lakes, I suspect the benthic indicators will provide a different perspective on lake condition than the plankton. Second, the time and space scales for phytoplankton and zooplankton indicators are not conducive to assessing lake biological condition based on single measurements in space and time. These assemblages average conditions over very small space and time scales, compared to benthic and fish assemblages, and might not reflect overall lake biological condition. Third, the O/E model expresses only one attribute of biological condition – taxa loss. The diatom index, from my perspective, is a more informative indicator of biological condition and the one I would discuss first, rather than second, in the text. The diatom index includes five attributes of biological condition and sediment diatoms provide some integration over time because the sediment samples likely reflect several years of deposition and accumulation of diatoms; albeit, the spatial scale is still small. Lake circulation focusing might provide some spatial averaging, but the spatial scale is still small. I noted the contributors to this report and know many of the investigators, so I am confident these concerns were addressed, but I am not aware of how the authors and collaborators resolved this issue, or how they plan to integrate these results with the benthic results.
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