

EXCERPT
General Comments from NLA 2012 Peer Reviewers

From:

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**Independent External Peer Review (IEPR) Report
of the US EPA National Lakes Assessment Report**

Prepared by

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For

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Independent External Peer Review Report for the U.S. EPA National Lakes Assessment Report Summary Report

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) designed National Aquatic Resource Surveys to assess the condition of the nation's waterbodies using a probability-based approach on a five-year rotating basis, with one waterbody type under assessment in each year. Under the National Aquatic Resource Survey (NARS) program, studies have been completed for Wadeable Streams (2004), lakes (2007), rivers and streams (2008-2009), and coastal waters (2010). This National Lakes Assessment (NLA) Report presents the results of the second national survey on the condition of the Nation's lakes and is a culmination of effort from EPA, States and Tribes. Under the NARS program all of the nation's aquatic resources in the conterminous U.S. have been assessed.

EPA and its state partners conducted field sampling for the first assessment of lakes in 2007. This is the second national survey on the biological, chemical, physical and recreational condition of the Nation's lakes. Lakes were selected randomly using a statistical survey design to represent the population of lakes in their ecological region – the geo-graphic area in which climate, ecological features, and plant and animal communities are similar. To be included in the survey, a water body had to be a natural or man-made freshwater lake, pond or reservoir, greater than 2.47 acres (1 hectare), at least 3.3 feet (1 meter) deep, and with a minimum quarter acre (0.1 hectare) of open water in the 48 contiguous states. Lakes had a minimum retention time of 1 week. The Great Lakes and the Great Salt Lake were not included in the survey, nor were commercial treatment and/or disposal ponds, brackish lakes, or ephemeral lakes. The data analysis and technical reporting has been completed. A summary of the results of the 2012 NLA Report is now available for further review.

The key goals of the NLA are to answer the following questions:

- What is the current biological, chemical, physical and recreational condition of lakes?
 - What is the extent of degradation among lakes?
 - Is degradation widespread (e.g., national) or localized (e.g., regional)?
- Is the proportion of lakes in the most disturbed condition getting better, worse, or staying the same over time?
- Which environmental stressors are most strongly associated with degraded biological condition in lakes?

During the spring and summer of 2012, 89 field crews sampled 1,038 lakes across the country. Each field crew used consistent procedures to sample benthic macroinvertebrates (e.g., insect larvae, snails, and clams) and zooplankton (small, free-floating animals), as well as algal toxins, atrazine, and nutrients and to observe near-shore habitat at all lakes so that results can be compared across the country. These 80 measured values were compared to NLA thresholds to determine the proportion of lakes that are relatively high quality (least disturbed), medium quality (moderately disturbed), and degraded (most disturbed) condition.

EPA is conducting an Independent External Peer Review (IEPR) of the NLA Report. Under Contract No. EP-G14C-00494, EPA engaged Redhorse Corporation (Redhorse) to coordinate the peer review of the technical basis of the hypotheses, design, methods, models, data and analyses, and assumptions supporting the NLA Report. For purposes of this IEPR the **2012 NLA Report** consists of three elements:

- *Narrative Report* that presents the national scale results of the 2012 NLA Report.
- *Web Materials* that provide the ecoregional level results.
- *Interactive Dashboard* that allows the user to explore the survey results in more depth.

Based on the technical content of the NLA Report and the overall scope of the project, Redhorse identified candidates for the peer review who were experienced in the following key areas: water resource monitoring and reporting at a national scale, lake condition assessments using biological, and ecosystem assessments. Three reviewers were selected from a candidate pool of 25 peer reviewers. EPA was provided the list of candidate reviewers, but Redhorse made the final selection of the peer review panel.

Redhorse provided the reviewers with an electronic version of the NLA Report, totaling approximately 40 pages, along with supporting documentation including access to web-based materials and a Peer Review Charge (charge) that solicited comments specifically on the technical content, completeness and clarity, and scientific integrity of the NLA Report. EPA and Redhorse worked together to prepare the charge according to guidance provided in EPA (2012), EPA (2006) and Office of Management and Budget (OMB) (2004).

The peer review panel reviewed the NLA narrative report and summary documents individually in response to the five charge questions. The reviewers provided extensive comments for all questions. Redhorse met with the peer reviewers via teleconference and email to discuss charge questions, any clarifications provided from EPA and their conclusions on the report.

1. SUMMARY OF PEER REVIEW COMMENTS

Peer reviewers agreed with each other on their assessment of the technical basis of the hypotheses, design, methods, models, data and analyses, and assumptions supporting the NLA Report. The peer review panel agreed on the following:

Peer reviewers agreed among one another on many issues and made the following key comments:

- The NLA Narrative Report is placed in proper context of the overall NARS program.
- The NLA Narrative Report accomplished the goal of describing the goals, purpose, and design of the study and the NLA sampling campaign.
- The NLA Summary Report figures and graphics were very clear and conveyed complex information that was easy to follow and elegant in their simplicity.
- The supplemental web materials were easy to use and informative. The ‘size plots’ that present the ecoregion indicator results were especially easy to understand.

The peer reviewers also identified many of the same issues. The following statements provide a summary of the recurring themes or issues from the peer reviewers:

- The 2012 NLA Narrative Report contains excessive subjective terminology and an insufficient use of hard data and clear definitions. There is an overall need to have less subjective use of terms based on simple comparisons.
- The web materials provided were useful but need substantial additional materials added, including supporting data, project design documents, sampling and data analysis methodologies, maps and background documents.
- There are no error estimates for any summary (results/conclusions) statement presented in the report and online is problematic. Error estimate around the value; or a range should be always presented, and is especially useful and needed for online inquiries.
- The peer reviewers consistently commented on the need for more discussion and analysis. Examples include:
 - The selection of the reference lakes;
 - The reference conditions for reservoirs and lakes;
 - The calculation of thresholds; and
 - The calculation of zooplankton indices.

Charge to the Peer Reviewers

Charge Questions and Guidance to the Peer Reviewers for the 2012 National Lakes Assessment (NLA) Report

CHARGE TO PEER REVIEWERS

Prior to its final release, expected in the fall of 2016, the **2012 NLA Report** is being reviewed in three stages. The first is a review by EPA's state partners, conducted simultaneously with the second stage. The second stage of the process, in which Peer Reviewers are being invited to participate, is the peer review. This peer review is important to ensure that the information contained in the reports is scientifically credible. The peer review is important in evaluating whether the **2012 NLA Report** will be easily understood by people who may have a vested interest in water resources nationally or on a local scale. The third stage is the release of the draft **2012 NLA Report** to the general public for comment via the Federal Register.

The draft **2012 NLA Report** is the second report on the ecological condition of fresh water lakes at a national scale and is a culmination of effort from EPA, States and Tribes, and input from lakes experts from various academic and/or scientific institutions. While the subject matter is somewhat technical in nature, the *NLA Narrative Report* itself is intended for the "environmental policy or educated layperson" – the type of person who may work at the policy level in environmental issues, or alternately has a dedicated interest in water resource quality concerns. EPA is also including a Technical Report and access to the *web based NLA results* by ecoregion, and *NLA dashboard*, all intended for those people who would like a more in-depth explanation into the analytical underpinnings of how the assessment was derived. EPA is asking that peer reviewers review comments focused specifically on: technical content, completeness and clarity, and scientific soundness of the *NLA Narrative Report*. EPA is asking that peer reviewers limit their review to an assessment of whether the:

- Methodology is acceptable, even if it may not be the "best" of all possible choices;
- Findings are scientifically reasonable and logical outgrowths of the data and methodology; and
- Presentation is consistent with the scientific underpinnings.

EPA is not requesting comments on:

- Formatting unless it is misleading or apt to be confusing to the reader;
- Indicator selection because it resulted from extensive collaboration with many parties;
- Data selection, other than in the context of the particular analysis (i.e., the focus is on the data that has been collected, not alternatives for collecting additional data); and

- The Technical Report unless it is inconsistent with the NLA *Narrative Report* or presents inappropriate methodologies.

Specific questions for the Peer Reviewers are included in the general charge guidance, which is provided below.

General Charge Guidance

Please answer the scientific and technical questions listed below and conduct a broad overview of the *NLA Narrative Report*. Please focus your review on the review materials assigned to your discipline/area of expertise and technical knowledge. Even though there are some sections with no questions associated with them, that does not mean that you should not comment on them. Please feel free to make any relevant and appropriate comment on any of the sections and appendices you were asked to review. In addition, please note the following guidance.

1. Your response to the charge questions should not be limited to a “Yes” or “No.” Please provide complete answers to fully explain your response.
2. If appropriate, offer opinions as to whether there are sufficient analyses upon which to base a recommendation.
3. Identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods.
4. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable.
5. Please focus the review on assumptions, data, methods, and models.
6. This document should be considered confidential and should not be shared with other individuals or groups, as it is likely to change as a result of state partner and peer review.
7. The questions below use different terms in referring to the draft release. For purposes of the charge, the **2012 NLA Report** consists of three elements:
 - 1) *Narrative Report* that presents the national scale results of the 2012 NLA Report;
 - 2) *Web Materials* that provide the ecoregional level results; and
 - 3) *Interactive Dashboard* that allows the user to explore the survey results in more depth.

Please **do not** comment on or make recommendations on policy issues and decision-making. Comments should be provided based on your professional judgment, **not** the legality of the document.

1. If desired, Peer Reviewers can contact one another. However, Peer Reviewers **should not** contact anyone who is or was involved in the project or prepared the subject documents.
2. Please contact the Redhorse Peer Review Manager (Barbara Toole O’Neil, barbara.tooleoneil@redhorsecorp.com) with requests for additional information.
3. In case of media contact, notify the Redhorse Peer Review Manager (Barbara Toole O’Neil, barbara.tooleoneil@redhorsecorp.com) or Adrienne Taylor (adrienne.taylor@redhorsecorp.com) immediately.
4. Your name will appear as one of the Peer Reviewers in the peer review report.
5. Peer reviewers shall not share findings of the draft NLA *Narrative Report* with any other individuals or groups.

Peer reviewers will be “charged” with responding to specific technical questions. EPA asks that peer reviewers address the following questions in their evaluation and critique of the draft *Narrative Report*.

SPECIFIC CHARGE GUIDANCE

Draft 2012 NLA Peer Review Charge Questions

1. Provide comments on how the organization and content of the NLA *Narrative Report* present the survey findings in an appropriate and understandable manner for the target audience (e.g., federal and state environmental staff and managers, research scientists).

For example:

- a. Are the goals, purpose and design of the study clearly described for the target audience?
 - b. Is the results presentation sufficiently clear and intuitive?
 - c. Are there other approaches for presenting the results that you believe would be more intuitive for the target audience?
2. Provide comments on the NLA *Narrative Report*’s description of approaches used to develop and apply thresholds.
 - a. Are the concepts of reference condition and threshold development explained and clear for the intended target audience in the NLA *Narrative Report*?
 3. Is the relationship between indicators of stress and biological condition adequately explained in the *Narrative Report*?
 4. Provide comments about how the NLA *Narrative Report* and the *Web Materials* meet the stated goals and objectives of reporting on:
 - a. Biological, chemical, physical, and human use condition of lakes in the conterminous US;
 - b. Identifying change over time; and

- c. Identifying which stressors are strongly associated with degraded biological condition.
5. What is the most important concern you have with the report documentation that was not covered in your answers to the questions above?

Please submit your comments in electronic form to:

Barbara Toole O'Neil, barbara.tooleoneil@redhorsecorp.com

No later than May 13, 2016, 8 pm Eastern (5 pm Pacific).
