

## **Comments and Agency Responses on the Revised Draft 2016 Methods Document (dated March 2017)**

---

This constitutes the New Jersey Department of Environmental Protection's (Department) response to comments submitted during the public comment period for the document entitled "2016 Integrated Water Quality Monitoring and Assessment Methods" (Methods Document), March 2017, which was published on the Department's website at [http://www.state.nj.us/dep/wms/bears/docs/2016\\_draft\\_methods.pdf](http://www.state.nj.us/dep/wms/bears/docs/2016_draft_methods.pdf) on March 20, 2017. A public notice seeking comments on the draft 2016 Methods Document was also published in the New Jersey Register on that date. The draft 2016 Methods Document was also made available upon request. The following organizations (listed alphabetically) submitted written comments on the draft 2016 Methods Document:

1. L. Stanton Hales, Barnegat Bay Partnership, Ocean County College, College Drive, PO Box 2001, Toms River, NJ 08754 (**BBP**)
2. Jacqueline Rios, U.S. Environmental Protection Agency, Region 2, 290 Broadway, New York, NY 10007 (**EPA**)

The following is a summary of comments on the draft 2016 Methods Document, March 2017 and the Department's responses to those comments. The initials in parentheses at the end of each comment identify the corresponding commenter(s) from the list above.

### **General Comments**

**Comment 1:** NJDEP should provide Assessment Scoring Criteria information documentation for the new Barnegat Bay Biological Index as well as the Headwaters Index of Biotic Integrity similar to what is offered for the other multimetric indices and regulatory thresholds for benthic macroinvertebrate data that can be found at: [http://www.state.nj.us/dep/wms/bfbm/download/AMNET\\_SOP.pdf](http://www.state.nj.us/dep/wms/bfbm/download/AMNET_SOP.pdf). (EPA)

**Comment 2:** The 2016 Integrated Assessment Methods revised draft document does not provide information on the methods metrics or data used to develop the NJDEP's Headwaters Index of Biotic Integrity. The NJDEP's Headwaters Index of Biotic Integrity website pages for HIBI Methods, HIBI Metrics and HIBI Data all link to a page (<http://www.state.nj.us/dep/wms/bfbm/ibicomingsoon.htm>) indicating that these items are coming soon. While an outline of the methods and metrics is included in a PowerPoint presentation by Brian Henning dated March 16, 2016 available at:

<http://www.nj.gov/pinelands/science/pinesseries/>, the public cannot be expected to have to search for the information to understand the derivation of the index without a website citation. NJDEP should post its methods, metrics and data on the appropriate website pages and provide links in the Methods documentation. (EPA)

**Response to Comments 1 and 2:** The Department elected to include the new indices into the 2016 Methods Document before publishing a metrics development document and standard operating procedures (SOP) for the Barnegat Bay and Headwaters Indices because the new indices provide vital information where previously there were no assessments or the analysis of biological conditions were significantly improved over a previous index. In the meantime, the metrics, policies, procedures, and techniques for field, lab and assessment methods will be collected and published in a user friendly format that will be available on the DEP website similar to the benthic macroinvertebrate SOP currently posted at [http://www.state.nj.us/dep/wms/bfbm/download/AMNET\\_SOP.pdf](http://www.state.nj.us/dep/wms/bfbm/download/AMNET_SOP.pdf). Currently, a powerpoint presentation on the development and implementation of the Headwaters Index of Biotic Integrity can be found at the website <http://www.nj.gov/pinelands/science/pinesseries>. Information on the M-AMBI for the Barnegat Bay Benthic Macroinvertebrate Index can be found at the following references:

Borja A., Mader J., Muxika, I. 2012. Instructions for the use of the AMBI index software (Version 5.0). *Revista de Investigacion Marina, AZTI-Tecnalia* 19:71-82.

Muxika I., Borja A., Bald J. 2007. Using historical data, expert judgement and multivariate analysis in assessing reference conditions and benthic ecological status, according to the European Water Framework Directive. *Marine Pollution Bulletin* 55:16-29.

**Comment 3:** NJDEP failed to include complete reference citations used in the report for Borja, et. al, 2012 and Muxika et al, 2007. (EPA)

**Response:** The references cited have been added to the Section 11.0, “Literature Cited and Additional References” of the Methods Document.

**Comment 4:** The Barnegat Bay biological metric is derived from M-AMBI, a European system that describes the moderate status as “The values of the biological quality elements for the surface water body type deviate moderately from those normally associated with the surface water body type under undisturbed conditions. The values show moderate signs of distortion resulting from human activity and are significantly more disturbed than under conditions of good status.” New Jersey’s 2016 Integrated Assessment Methods revised draft document states, “The ‘Moderate’ category represents transitional conditions that are undetermined for assessment purposes, but characterize situations that warrant further study.” The document does not provide a basis for the conclusion that the conditions are transitional or warrant further study. New Jersey must provide justification for characterizing the Barnegat Bay Biological Metric threshold of “moderate” as “undetermined” instead of “impaired”. (EPA)

**Comment 5:** It is our understanding, that for waters that are classified as having exceptional ecological significance, the biological metric thresholds for meeting this standard must minimally be good, with anything less being non-supportive of its narrative standard. The Rutgers report upon which the index is based is itself derived from the M-AMBI framework, which describes the moderate status as "significantly more disturbed than under conditions of good status." Thus, it would appear that for the purposes of the Integrated Report assessments, a moderate rating would signify an impairment, not "transitional conditions that are undetermined for assessment purposes" as currently proposed. (BBP)

**Response to Comments 4 and 5:** The Department is currently refining the M-AMBI to determine the extent of "fully supporting" conditions within the scoring system. For the development of freshwater biometrics, the Department defined the reference (undisturbed) condition within the metric scale either through the use of a biological condition gradient or other equivalent method in order to develop assessment thresholds. Currently biologists are undecided as to what portion of the assessment categories ("High" and "Good") of the M-AMBI encompass reference conditions. This is required to determine the assessment threshold between "fully supporting" and "impaired" status in the intermediate conditions defined in the "Moderate" category. The Department's strategy is to continue sampling in the Barnegat Bay and expand its research into other estuarine waters. The additional research is expected to define reference conditions that will lead to a use support decision applicable to estuarine waters represented by the M-AMBI "Moderate" category. Once this is defined, we will establish use attainment thresholds we regard as applicable to Barnegat Bay and remove the "undetermined" assessment for the "Moderate" category.

The Department adopted this approach of postponing the assessment of intermediate conditions when implementing the Southern Fish IBI. The index initially deemed the "Fair" assessment category as "Insufficient Data" because there was inadequate consensus within the committee of biologists developing the index as to the degree of use support the classification reflected. Not until additional research and information was provided did the evidence confirm the category as "Fully Supporting" and the index was updated.

**Comment 6:** How frequently will benthic macroinvertebrate sampling occur; moreover, will the Department sample the entire Barnegat Bay during each 2-year report? Will the Department continue to collect 100 random samples during each effort, and will it be on a stratified basis to be sure that all 9 assessment units (AU) are covered? Is there a minimum number of samples required per AU for a valid determination of impairment? Will the Department rely on data collected by other entities, including volunteer/citizen science data? Until these details are provided it will not be clear if the index is being utilized properly. (BBP)

**Response:** As stated for Comments 1 and 2, the Department is in the process of developing a Barnegat Bay benthic macroinvertebrate monitoring and assessment protocol. Details on how it will be implemented into the Department's monitoring network in Barnegat Bay have not been finalized. When completed the protocols will be available through the Division of Water

Monitoring and Standards website. Although the sampling methods used during the research to assess the ecological health of the benthic macroinvertebrate community is not expected to change, the number of sampling sites and frequency of sampling will change for a benthic macroinvertebrate network in the bay. The research project required intensive monitoring to verify the applicability of the M-AMBI index, however, a monitoring network will not require the equivalent intensity or frequency to determine ambient water quality conditions. Additionally, the selection of stations may be a combination of a random and targeted process. Continuing with current practices, benthic macroinvertebrate data by other stakeholders that meet a Department-approved Quality Assurance Project Plan (QAPP) will be used for any assessments of water quality.

**Comment 7:** The 2016 Integrated Assessment Methods revised draft document states, “Additional information describing the development of the volunteer indices will be posted on the Bureau of Environmental Analysis, Restoration and Standards web page under ‘Citizen Science.’” NJDEP should include the link for the website ([http://www.state.nj.us/dep/wms/bears/citizen\\_science.htm](http://www.state.nj.us/dep/wms/bears/citizen_science.htm)) in the final document and populate the citizen science page with details on the volunteer benthic macroinvertebrate indices prior to finalizing the 2016 methods document. (EPA)

**Response:** The link to additional information describing the volunteer indices has been added to the Methods Document under Section 4.3 “Volunteer Benthic Macroinvertebrate Data.” The web page includes the biological assessment protocols and habitat assessment protocols needed to develop a volunteer benthic macroinvertebrate monitoring program. The new link is [http://www.state.nj.us/dep/wms/bears/cwm\\_protocols.htm](http://www.state.nj.us/dep/wms/bears/cwm_protocols.htm).

**Comment 8:** The document does not describe the NJDEP’s process for reconciling assessments where a NJDEP evaluation produces one assessment rating and a volunteer benthic macroinvertebrate index determines a conflicting assessment. For instance, would the NJDEP use a volunteer metric of healthy to delist an assessment unit? NJDEP should provide details on its process for evaluating conflicting data from volunteer monitoring. (EPA, BBP)

**Response:** As stated in Section 4.3 under “Additional Considerations When Evaluating Biological Data”, the NJDEP genus level indices provide a significantly more accurate assessment of biological conditions than the volunteer order/family level indices. Whenever, conflicting results between the two types of indices occurs, the NJDEP index will override a volunteer index. Additionally, this implies that the more general volunteer indices would not delist any assessment units listed by any of the NJDEP indices. This situation will prioritize additional sampling using the appropriate genus level index. Section 5.0 “Weighing Data” also provides examples to determine how data results can override conflicting results within an assessment unit.

**Comment 9:** At the top of page 23, the table for the HIBI has the following index score categories: 82-100 (Excellent) and 51-80 (Good). The cutoffs need to be adjusted, since a

score of “81” would not be included. Based on Mr. Henning’s document, the index scores of 51-81 belong in the “good” category. (EPA)

**Response:** The Headwaters Index of Biotic Integrity (HIBI) in Table 4.4 was corrected to reflect a “Good” score from 51 to 81.

**Comment 10:** Tables numbers in Section 4.3 were changed and the text of 2016 Integrated Assessment Methods revised draft document was not changed to reflect the correct Table numbers. For instance, Table 4.4 was previously referred to as Table 4.3c. On page 22, the text still refers to Table 4.3c. For the final methods document, NJDEP should take care to ensure that Table references are accurate. (EPA)

**Response:** The reference to Table 4.3c was corrected to Table 4.4 on page 22.

**Comment 11:** Although NJDEP did not specifically ask for comments on the bullets at the end of Section 4.3 under the heading “Additional Considerations When Evaluating Biological Data”, defining some of the terms or cross-referencing areas that provide more detail or define these terms, would provide clarity with respect to NJDEP’s assessment determinations. NJDEP should consider defining the term “recent” in the first bullet (or provide a link to the NJDEP website that includes the reporting period coverage). NJDEP appears to describe drought conditions on its website at: <http://www.nj.gov/dep/drought/index.html>. NJDEP should consider defining drought conditions in the methods document or provide a link to the drought website. NJDEP should also clarify the meaning for the term “very high flows” in Section 4.3. (EPA)

**Response:** Under Section 4.3, “Additional Considerations When Evaluating Biological Data”, thresholds were added to define low flow conditions and very high flows. The low flow threshold was established as the MA7CD10 flow, minimum average seven consecutive day flow with a statistical recurrence interval of 10 years. This threshold is also used for minimum flows for many surface water quality standards. The high flow threshold was based on the 25 year recurrence interval for flow. This is considered an extreme event with only a 4% chance of occurrence in any given year. These conditions are explained in Section 4.1 “Excursions.” Additionally, a definition for “recent” was clarified to coincide with the last five years to characterize current conditions to coincide with Section 3.1 “Data Age.”