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DEPARTMENT OF ENVIRONMENTAL PROTECTION
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August 10, 2012

Susannah L. King
Director of Water Quality Programs
New England Interstate Water
Pollution Control Commission
116 John Street, Lowell, MA 01852

Dear Ms. King:

The New Jersey Department of Environmental Protection (Department) appreciates the opportunity to review and comment on the draft report entitled: Assessment of Nutrient Loading and Eutrophication in Barnegat Bay-Little Egg Harbor, New Jersey in Support of Nutrient Management Planning. This report culminates work that began with a Request for Proposals in 2008 from the New England Interstate Water Pollution Control Commission (NEIWPCC) to develop site-specific nutrient management plans, including the determination of appropriate numeric criteria or endpoints in New Jersey and New York. The technical review team selected the proposal submitted Rutgers University and the United States Geological Survey. The expectations of this project were to:

- Produce a tool for the assessment of the biotic condition (independent of any premise regarding causation), which could be applied to conditions measured in the past, present, and future.
- Determine the degree to which various stressors were responsible for the observed condition of the Barnegat Bay
- Establish Threshold levels for each relevant stressor that would result in an impaired vs. unimpaired condition.
- Recommend management strategies for restoring Barnegat Bay

The report consists of five components that address the bullets above, however, there are really two major thematic sections to the report; the USGS nutrient loadings and modeling study and the Rutgers University model of biotic condition based on a number of water quality and biological indicators, especially submerged aquatic vegetation (SAV). The USGS part of the report provides new watershed information on nutrient loadings to the bay. USGS documents that urban land use, and specifically that lawns or "turf" areas within the Barnegat Bay watershed may contribute more nutrients than these urban areas. It worth noting that on January 5, 2011Governor Chris Christie signed legislation that established the most restrictive standards in the nation for controlling nitrogen content in fertilizer and application rates for use. These standards will reduce the turf contribution to nutrient loading in Barnegat Bay.

The Rutgers part of the report is more problematic. It attempts to create a biological condition model of the bay linked to the outputs of the USGS model. However, difficulties arose because of incomplete data records for some parameters going back over twenty years. The report also highlights limitations encountered using the available water quality and biological monitoring data to evaluate eutrophic conditions as well as a need for more targeted, comprehensive and cohesive monitoring. As shown in Figure 3-2 on page 140 of draft report, there are significant data gaps, both temporal and spatial. To address this concern, in 2011, the Department initiated a monitoring program authorized in Governor Christie's ten point plan for Barnegat Bay. Under this plan, the Department and its partners launched a new comprehensive ambient water quality monitoring network in the Barnegat Bay watershed on June 6, 2011.

This two year monitoring effort along with the ten funded research projects in the Governor's plan, is designed to fill the gaps and provide the data necessary to fully evaluate the biotic condition of the bay. The Department's effort focuses on obtaining synoptic water quality data throughout the bay, thus defining the areas which differ in salinity and other physical attributes, which can influence the biological communities which thrive in the bay. Additionally, the comprehensive monitoring effort will be used to populate a water quality model, which can simulate conditions in the Bay to allow management scenarios to be tested. At the same time, through a set of 10 research projects focused on biological communities, the Department hopes to be able to obtain additional information about the ecological relationships and other potential stressors. These projects are expected to be completed in 2014. The Department hopes to enhance and refine the thresholds and metrics developed to assess the current conditions and direct actions, including the possible establishment of a TMDL (Total Maximum Daily Load), needed to restore the bay.

The consistent research premise throughout the draft report is that nutrients alone are responsible for Barnegat Bay's observed biotic condition (e.g., decline of eelgrass beds, decline of hard clam). Other factors that occur in the bay that can have potential impact on eelgrass habitat as well as hard clams include boat/personal watercraft usage, bulkheading and the use of new types of pesticides and herbicides.

The expectation for this project was that the study would first produce a tool for the assessment of the biotic condition (independent of any premise regarding causation), which could be applied to conditions measured in the past, present, and future. The Department understands that analytical methods have changed over time but in comparing the results found during the 1960s and 1970s for such biological indicators as macroalgae, phytoplankton, Chlorophyll a, hard clams and nutrients, there does not seem to be a great deal of change over the past forty years as claimed in the draft report (See: Kennish and Lutz, 1984).

The Department's general and specific comments to the Rutgers part of report are attached. Key concerns are as follows:

- The results highlighted in report often exclude the serious caveats as to the model and index's poor predictability due to uneven quality of input datasets and how these affect model outputs, giving a false sense of accuracy.

- Report is heavily weighted toward SAV (due to absence of other data) and conclusions are not in line with data.

- Thresholds chosen for model are not clearly defined. As a result the development of raw and weighted scores as well as the overall index of eutrophication can't be properly evaluated

- The report does not document the levels for the evaluated stressors that would indicate a "good" condition for Barnegat Bay.

We did not provide comments on the Executive Summary as that will need to be written based on the revisions to the body of the report. In addition, many of the findings included in the report are based upon complex statistical analysis. We expected that the statistical methods would be peer reviewed by the statistician engaged by the United States Environmental Protection Agency. We have not seen this review so we are now requesting our in-house statistician review the work and will provide additional comment by August 24, 2012.

We look forward to discussing our comments with the technical committee. If you or the investigators have any questions concerning the comments provided by the Department, please let us know and we will be happy to clarify our concerns.

Sincerely,

Debra Hammond, Chief
Bureau of Water Quality Standards and Assessment
Division of Water Monitoring and Standards

Thomas Belton, Research Scientist
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cc: Jill Lipoti, WM&S
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