January 1, 2013

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Re: <u>Request for Input on Results of Prior Research Conducted to Evaluate Nutrient Impacts on Great Bay Estuary</u>

Dear Drs. Pennock, Langan and Jones:

I am writing this letter on behalf of the Cities of Dover, Rochester and Portsmouth. Our communities (as well as the smaller towns throughout the Great Bay watershed) are in desperate need of an objective scientific assessment on the degree to which nutrient loadings have been demonstrated to be the cause of eelgrass population changes and reduced DO in the Great Bay system. As you are aware, EPA has proposed extremely restrictive total nitrogen (TN) reduction requirements for both the Newmarket and Exeter wastewater facilities and plans to impose similar requirements on other facilities throughout the system. In addition, EPA has specified that unless non-point sources of TN are greatly reduced, EPA will likely impose effluent limits on wastewater discharges in the range of 0.3 mg/l TN, which is beyond the capability of any available technology to achieve. Financing the type of improvements being mandated by EPA will easily exceed a billion dollars, literally bankrupt many small communities for decades to come and preclude expenditure of municipal resources on other necessary projects (schools, hospitals, welfare services, technical research, etc.). As an alternative, our communities have supported a proactive approach to (1) ensure TN levels are controlled to prevent future increases,

(2) conduct necessary research on system needs, and (3) implement other ecologically beneficial projects via adaptive management. EPA, however, has thoroughly rejected this concept focusing solely on stringent TN reduction measures as the solution to protecting system ecology.

EPA's regulatory decisions are premised on a number of scientific findings that the Agency claims to be demonstrated by the data and studies developed for the Great Bay estuary. The Jackson Laboratory and UNH were involved in the vast majority of the studies referenced by EPA. The EPA claims include the following:

- Data from the Estuary confirm that TN increases caused a significant increase in phytoplankton growth impairing water column transparency throughout the system.
- Studies demonstrated that water column transparency decreases related to TN induced algal growth caused the major reduction in eelgrass acres that occurred between 2006-2008.
- Studies confirmed that low DO occurring in the Lamprey and Squamscott River was caused by excessive algal growth.
- Studies demonstrate that eelgrass populations in the system are suffering from nitrate "toxicity".
- Macroalgae growth has been confirmed to be a major cause of changing eelgrass populations in Great Bay.
- Studies demonstrated that the floods occurring in 2006 were not the primary cause of eelgrass losses occurring in the system shortly thereafter.

Our communities are keenly interested in protecting the resources of Great Bay and supporting research necessary to ensure future generations will enjoy the same benefits. We understand that there are a wide range of important ecological factors that need to be evaluated and addressed to protect the system's ecology (e.g., oyster restoration, shoreline protection, marsh restoration, etc.). However, EPA's single minded focus on TN reduction will preclude all future investments in such research and restoration efforts as all available resources for decades to come will be committed to the "EPA TN solution." Thus, we are at a crossroads and we need to know whether the claims being made by EPA are reasonably supported by research conducted for this system.

You are three of the most knowledgeable and objective individuals regarding Great Bay research and studies – you have participated on the PREP Technical Advisory Committee and participated in many studies on the key tidal rivers and bay areas EPA is referencing. Attached is a short list of questions regarding the data and research that has been conducted for this system. Your prompt and concise response to these questions would be most appreciated and should help to ensure that future investments in protecting the system are properly directed. Thank you in advance for your assistance, it is most appreciated.

Sincerely,

Attachment

Questions on Prior Research Findings for Great Bay Estuary

Please provide answers to the following question; if you have specific knowledge of the data and studies conducted for the Estuary regarding the topic of concern, please generally identify the information source (e.g., PREP water quality database, State of the Estuary Report , study for a particular area). The answers should avoid speculation and only present positions that represent your personal knowledge of data and research for this system. If there are specific research needs to resolve the question please let us know the type of research that needs to be funded.

Transparency-related issues

1. Has data collected for the estuary confirmed that changing TN levels have caused an increase in phytoplankton growth, significantly lowering water column transparency in Great Bay, Little Bay or the Piscataqua River?

2. Have studies determined the degree to which phytoplankton growth impacts transparency in this system and that it is a significant factor presently limiting eelgrass growth? Do these studies indicate that reducing TN levels is likely to result in a significant improvement in water column transparency for either Great Bay or the tidal rivers?

3. Do studies or available data confirm that water column transparency is a primary factor presently limiting eelgrass growth and restoration in Great Bay, Little Bay and/or the Lower Piscataqua River?

4. Have studies determined that the significant eelgrass declines which occurred systemwide in 2006 were <u>not</u> due to the impacts of excessive rainfall occurring that year but were caused by TN related impacts due to excessive nuisance algal growth?

Nitrate Toxicity

5. Have studies for the Great Bay system demonstrated that eelgrass populations are being adversely impacted by nitrate toxicity and that was a factor in the significant eelgrass decline that occurred systemwide in 2006?

DO Impacts

6. Have studies in either the Squamscott or Lamprey Rivers confirmed that algal growth in those rivers is the major cause of the periodic low DO observe in those rivers?

Macroalgae Impacts

7. Have studies of Great Bay demonstrated that increased macroalgae growth is the primary reason for decreases in eelgrass populations in that water body and that reduction in TN levels will abate such excessive plant growth?

8. Is significant macroalgae growth occurring in the tidal rivers and if so, does it present a significant obstacle to allowing eelgrass restoration in the tidal rivers?