



GREAT BAY MUNICIPAL COALITION

April 6, 2018

VIA FEDERAL EXPRESS & EMAIL

Alexandra Dunn, Regional Administrator
USEPA Region 1 – New England
5 Post Office Square
Mail Code: ORA01-4
Boston, MA 02109-3912

Re: Great Bay Research Coordination Meeting– An Emphasis on Water Quality

Dear Regional Administrator Dunn:

The Great Bay Municipal Coalition greatly appreciated the opportunity to meet and discuss the ongoing research occurring in the system and to explore its utility for resolving any outstanding concerns related to nutrient effects in the system. Ms. LeClair did an excellent job of hosting the discussion which revealed that there are a wide range of evaluations occurring on a very broad range of topics. As noted by DES, however, much of the research, though academically interesting, is not well-connected to the pressing issues facing the regulators and regulated community. To that end, we would suggest that future research be focused on resolving the following questions to better understand the important system ecology endpoints and the factors that have the greatest influence on them so that municipal resources may be efficiently directed.

Eelgrass Issues – Great Bay

Open issues remain regarding a number of factors affecting the growth of eelgrass in Great Bay proper, accurate reporting with respect to eelgrass populations and the effect of anthropomorphic activities, as well as other factors (invasive species) on the extent of eelgrass in the system. We would suggest that the following issues deserve to be prioritized for funding and resolution, if possible, including:

- *Evaluation of the ability to distinguish eelgrass from other seagrasses and macroalgae in historical aerial photography surveys.* This is important as new analyses are inspecting eelgrass beds more closely, and finding that macroalgae and eelgrass co-inhabit many areas. Their “balance” often changes over the growing season. It was presumed that prior aerial reconnaissance was representing only eelgrass, but it is apparent that this may not have been the case. The ability to distinguish between eelgrasses and other forms of plant growth in subtidal areas from these historical photos needs to be determined to avoid potential mistaken comparisons in the future.



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- *Need for a $K_d \leq 0.75/\text{meter}$ in Great Bay to protect eelgrass growth.* Presently, DES still uses this K_d value (generated by Chesapeake Bay research) to classify Great Bay as transparency impaired under a theory that “deep edge” eelgrasses (2 meters deep on average) require this level of light for survival. Such “deep edge” accounts for a very small percentage of the existing potential eelgrass habitat because of the shallow nature of the system and wide tidal variation that brings light to the submerged eelgrass daily. It’s not apparent that eelgrass ever grew in waters averaging 2 meters deep in Great Bay given their location. Thus, the true relevance of this K_d level to maintaining eelgrass is the Great Bay system is actually not known. Discussions at the April 2nd meeting indicated that eelgrasses in the system are acclimated to low light conditions. Our long term data analysis indicates that this transparency level was virtually never met as a growing season average in the system, including when eelgrass populations were far greater than they are today. This issue needs to be resolved so that monies are properly directed toward pollution reduction measures that could meaningfully improve eelgrass habitat.
- *Evaluation of the cause (e.g., substrate) of eelgrass loss in areas in the southwest corner of the Bay that supported eelgrass prior to 2006 but have been devoid of measurable eelgrass for over a decade.* Rather than focus on “deep edge” concerns, which effects minimal acreage, determining the cause of ongoing eelgrass losses in this 150 acre area could produce a restoration strategy that would allow the system to no longer be considered eelgrass impaired. It is expected that some change in the sediment bed, post Mother’s Day storm, has occurred. If this is true and can be remediated, eelgrass repopulation of this area should occur as it has done in the past.

Tidal Rivers - Chl a and DO

- *What causes tidally fluctuating chlorophyll-a levels in the tidal rivers?* The data sonde probes for the system have reported major variations in total chlorophyll-a levels in response to tidal exchange. That is, as the tide goes out, the “measured” chlorophyll-a value can increase by an order of magnitude. Some believe that this may be phytoplankton growth increasing during every low tide event. Due to this possibility, DES has tentatively classified some tidal rivers as algal and nutrient impaired. However, as noted during the research meeting, this phenomena may just be natural sloughing of plants growing on the mud flats as the tide recedes. Whether this is a nutrient induced or natural mechanical condition, it needs to be resolved to ensure further system restoration efforts are properly directed. The Great Bay Municipal Coalition is currently preparing a work scope to implement this summer to address this question.
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- *Literature surveys in support of DO criteria update.* The state legislature has directed DES to update the current DO standards that are about 40 years out of date. Accurate DO standards are essential to the evaluation of system health. A survey of fishes present and their spawning cycle is needed to allow this effort to move forward.
- *Routine monitoring to document TN reductions and the effect on key parameters (DO, chlorophyll-a, nitrogen series).* As additional nutrient reduction wastewater facilities are implemented and come on line (Exeter, Newmarket and Portsmouth) substantial additional reduction in available (inorganic) nitrogen will occur. Monitoring this succession of improvements is needed to supplement the systems biological research that rarely also measures these parameters.

Thank you for your consideration of these observations. The Coalition looks forward to continued collaborative efforts with EPA in furtherance of protecting the Great Bay system through systematic and well directed expenditures.

Sincerely,

A handwritten signature in cursive script that reads "Dean Peschel".

Dean Peschel