

An Exploratory Investigation of Nutrient Bioextraction Opportunities in Long Island Sound

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The EPA Long Island Sound Study has been investigating the potential application of seaweed and shellfish cultivation and harvest specifically for nutrient mitigation in the nearshore estuarine environments of the Sound. A workshop was convened in December 2009 to bring international experts in seaweed and shellfish cultivation, integrated multi-trophic aquaculture (IMTA), resource economics, and coastal modeling together with local partners to discuss the potential benefits of these technologies to the Sound and other urban, estuarine environments. A combination of (i) watershed; (ii) water quality; (iii) ecosystem and farm-scale models explicitly considering shellfish growth; (iv) economic assessment; and (v) pilot-scale implementation approaches, are being used to evaluate the potential effectiveness of nutrient bioextraction in the highly urban western Sound and to inform policy decisions in this ecosystem. NOAA researchers are planning to assess the environmental effects of a standard mussel aquaculture raft installed in the lower Bronx River by a commercial shellfish farmer and local youth development organization. Results will be used in a project funded by the EPA REServ Program where an international team of scientists will model the bioextraction potential of shellfish in Long Island Sound and characterize the ecosystem services that would be provided by this approach. Bioextraction currently is being considered for incorporation into the revision of the LIS Total Maximum Daily Load (TMDL) for nitrogen. Nitrogen trading as an element to attaining water quality objectives can be considered in the strategies that are developed to implement the TMDL. Bioextraction is not seen as a replacement for nutrient control from watershed sources, but as part of an overall ecosystem strategy to attain water quality standards. Preliminary results suggest that bioextraction is a promising and cost effective complement to traditional land-based nutrient management measures.

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