

Peer Review (Independent Technical Review) of The Massachusetts Estuaries Project Report on the Pleasant Bay System, Orleans, MA

Project Characteristics:

- *Review of Hydrodynamic and Water Quality Modeling*
- *Assessment of Benthic Flux Measurements and Mechanisms*
- *Evaluation of Health of Eelgrass and Benthic Community*

Woods Hole Group was contracted to complete an independent technical review (peer review) conducted on the Massachusetts Estuaries Project Report for the Pleasant Bay System in the Town of Orleans. This work was conducted under a contract to the Town of Orleans, awarded to the Woods Hole Group after a competitive Request for Proposal (RFP) process.

The objective of the review was to determine the degree of accuracy and level of certainty that may be derived from the MEP report and the efficacy of utilizing the report for watershed based planning. Before committing to a large wastewater infrastructure project, the Town was seeking: (1) A peer review of the School for Marine Science and Technology at University of Massachusetts Dartmouth (SMAST) work to validate that the calculated reductions in nitrogen are required to significantly improve water quality and habitat, and (2) to determine whether the methodology is sufficiently flexible to accommodate refinements and adjustments for unpredictable, naturally-occurring changes in nitrogen concentrations (e.g., effects of the breach that occurred after the MEP report was published).

The review focused on 3 specific topic areas, which included: (1) Benthic Flux Measurements and Analysis of Mechanisms, (2) Hydrodynamic and Water Quality Models, and (3) Health of Eelgrass and Benthic Community.



The peer review provided information that:

- Helped the Town of Orleans optimize its approach to complying with the Total Maximum Daily Load (TMDL) EPA requirement.
- Identified technical limitations of the standard MEP approach for a complex system like Pleasant Bay.
- Clarified the uncertainty regarding the extent and rate of recovery of the Pleasant Bay ecosystem following nutrient load reductions.
- Clarified some of the complex technical matters for the Town when interpreting and acting on the MEP report.
- Provided recommendations intended to help reduce uncertainty, build confidence in the results, optimize the engineering design, and potentially saving public funds, without compromising the wastewater facilities planning process.