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| ***Name of Project*** | **Protecting Coastal Waters through Watershed-Wide Permitting and Nutrient Trading in Three Massachusetts Estuaries** |
| ***Project Manager*** | Claire I. Barker, Massachusetts Department of Environmental Protection (DEP), Bureau of Resource Protection<br>One Winter St, Boston, MA 02108 Phone (617) 556-1128. Fax (617) 292-5696. Email Claire.Barker@state.ma.us |
| ***Award Amount*** | $188,800 |

## *EPA Project Areas Addressed*

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| **Program Innovations** | Use three pilot estuaries to integrate watershed-wide permitting and nutrient trading with integrated water resources planning. Develop roadmaps for innovative watershed-based approaches to nutrient control. |
| **NPDES Strategies to Implement Watershed- Based Efforts** | Evaluate nutrient trading and comprehensive watershed permitting as TMDL implementation strategies. |
| **Impacts of Wet Weather Flows** | Develop tools to incorporate the impact of wet weather flows on nutrient loading, and help communities comply with requirements of Phase II permitting. |

## *Project Narrative*

**The Problem**

Estuaries throughout the United States are increasingly at risk from excess nutrient contamination. Treatment plants and onsite wastewater systems contribute 75-85% of the nitrogen load in southeastern Massachusetts coastal watersheds. Many estuaries have already been ecologically impaired, resulting in declining finfish spawning and shellfishing, decreases in tourism, and lower property values.

The Massachusetts Estuaries Project (MEP) was established in order to address the impact of excess nutrient loading in Massachusetts coastal watersheds. The MEP is a multi-year, $12 million collaboration among coastal communities, DEP, the University of Massachusetts School of Marine Science and Technology (SMAST), EPA Region 1, the Massachusetts Executive Office of Environmental Affairs (EOEA), and the Cape Cod Commission to provide a consistent, economical approach to address nitrogen pollution in 89 estuaries from Duxbury, Massachusetts, to the Rhode Island border. Website: http://www.state.ma.us/dep/smerp/smerp.htm. The MEP will model nitrogen reduction scenarios and provide a technical assessment for each estuary,

which will form the basis for its Total Maximum Daily Load (TMDL). Coastal communities will then face the complex challenge of developing and implementing a watershed-based nutrient management plan. DEP and communities will also face the challenge of integrating watershed-wide issues into existing NPDES and ground water permitting frameworks.

**The Solution: Case Studies on Watershed-Based Permitting and Massachusetts Roadmap for Regulatory Change**

Past wastewater planning in communities typically has considered only wastewater discharges and has been limited to single towns or small portions of them. A more holistic approach is needed to evaluate all nitrogen sources in a watershed, both point and nonpoint, and to integrate a broad range of infrastructure and management solutions into existing permitting programs for surface and ground water discharges.

This project will be based on the results of TMDLs developed through the MEP, and will not replace TMDL work already underway or scheduled to take place through the MEP. The project will use case studies in three watersheds to provide MEP communities with more creative nutrient management tools, specifically, approaches to watershed-wide permitting and nutrient trading that can be incorporated into TMDL implementation. The project communities will use the case studies to guide subsequent facilities planning under the Commonwealth's Integrated Water Resources Management Planning process.

The project also will assist DEP in evaluating its statutory and regulatory framework and in developing a roadmap for changes in laws, regulations, and policies to encourage watershed-wide NPDES and ground water permitting and nutrient trading.

**Project Goals**

The project goals are to develop guidance and permitting tools in four areas:

1. Watershed-based Permitting: Many watersheds in the MEP area are defined by ground water hydrology, with significant contributions to surface water quality from ground water point source discharges (POTWs) and nonpoint discharges from onsite treatment systems, in addition to surface water discharges from POTWs and stormwater. This project will develop case studies of three estuaries to represent the range of nutrient sources and discharge conditions and how they can be incorporated into watershed-based NPDES and Massachusetts ground water discharge permitting.

Population size and density, freshwater sources, existing infrastructure, sources of nitrogen pollution, and level of nitrogen reductions required will also be factored into the selection of the case study estuaries. We will select estuaries in communities that have demonstrated their ability to support the MEP and their commitment to a Project Team of local officials and citizens to participate in the project.

2. Cross-Community Interaction and Regulation: Municipal home-rule authority in Massachusetts is strong, and historically, environmental permitting and enforcement have occurred within municipal boundaries. However, many MEP watersheds cross municipal boundaries. At least one of the case studies will be chosen to demonstrate inter-municipal issues likely to arise in developing watershed-based permits and in implementing a TMDL across

municipal boundaries. The final project report will include guidelines for multi-community implementation of watershed-wide nitrogen reduction plans and permits.

3. Nutrient Trading: Several existing DEP permits have incorporated nitrogen offsets for increases in flow from POTWs (for details, see the Implementation Guidance at the MEP website). This grant will build on the Massachusetts experience to date as well as EPA's recent Policy Statement on Watershed-Based NPDES Permitting and other EPA publications. The case studies and final project report will provide Massachusetts-specific guidance to communities on nitrogen trading issues such as trading mechanisms, monitoring, and compliance.

4. DEP Policy and Regulation: DEP has begun evaluation of permit models appropriate for watershed-based nutrient control, including general watershed permits, permits issued to new watershed entities, and watershed-based permits issued to towns. New management and permitting mechanisms for onsite wastewater disposal are also being explored by DEP. DEP will use the case studies to evaluate appropriate permitting mechanisms and develop a roadmap and timetable for changes in state policy and regulations needed to coordinate regulation of watershed-wide impacts from surface and ground waters.

The final grant report will highlight the challenges faced by the case study communities, the process followed to develop their implementation plans, and lessons learned. Other MEP communities will use the case studies and final report during their integrated water resources management planning to help determine which strategies are most likely to address their needs, thereby reducing their overall time and effort needed to determine how to incorporate watershed-wide permitting into TMDL implementation.

**Communication Strategy to Transfer Results to Other Interested Parties**

The MEP's existing relationship with communities and local groups will ensure successful community-based outreach and planning. The final report will be structured to help communities with their own TMDL implementation and integrated water resources management planning. The lessons learned will inform the MEP and will be used to refine subsequent work with the other MEP estuaries. DEP and SMAST will invite all MEP communities to a presentation of the case studies, and the case studies and final report will be available on DEP's website.

DEP will also provide results to other Massachusetts watersheds facing excess nutrient loading. Inland watersheds now addressing phosphorus pollution are good candidates for transfer of this information.

Through EPA Region 1, DEP will transfer results to other New England communities in similar circumstances, for example, communities in the Lake Champlain watershed dealing with excess phosphorus loadings.

The project will require a total of 24 months.

## *Project Tasks and Schedule*

**Case Studies on Watershed-Wide Permitting and Nutrient Trading**

| **Project Task** | **Months** |
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| Identify MEP communities with nitrogen discharges from various sources. | 1-3 |
| Identify watersheds that cross municipal lines. | 1-3 |
| Quantify nitrogen flows; NPDES and state permit status, and local regulatory systems. | 1-3 |
| Identify all existing trading/offset arrangements in MEP communities. | 1-3 |
| From this list, determine most appropriate estuaries for case studies. | 1-3 |
| Establish participation agreements with case study communities. Local officials and citizens determine community representation and establish Project Teams for each case study watershed. | 3-8 |
| Meet with Project Teams to present MEP technical assessments. | 6-12 |
| Run additional modeling scenarios for case study watersheds based on preliminary nutrient reduction plans in TMDL reports. | 7-18 |
| Based on TMDL reports, other documents, and discussions with case study communities, determine:<br>• Changes in NPDES permitting approach and other state permits needed to incorporate watershed-wide permitting.<br>• Local concerns about watershed permits that cross municipal boundaries.<br>• EPA policies and practices on nutrient offsets and trading that apply to case study watersheds. | 10-18 |
| Develop process for communities to follow in addressing inter-municipal concerns. | 19-20 |
| Write case studies. | 12-23 |

**Review of Massachusetts Statutes, DEP Policy, and DEP Regulations**

| Project Task | Months |
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| Evaluate permit models appropriate for watershed-based permitting and nutrient trading. | 1-24 |
| Identify barriers to watershed permitting and nutrient trading in local regulations, state statutes, regulations, and policies and develop roadmap to address them. | 1-24 |

**Final Grant Deliverables and Information Transfer**

| Project Task | Months |
|---|---|
| Complete final project report. | 20-23 |
| Transfer information to case study communities, other MEP communities, and other Massachusetts communities addressing nutrient loading. | 23-24 |
| Through EPA Region 1, transfer information to appropriate communities and watersheds outside Massachusetts. | 23-24 |

## *How the Project Meets the Specified Evaluation Criteria*

- *Relationship to Priorities identified in this notice:* Addresses four priority areas and adds value by demonstrating connections between priority areas.
- *How well it addresses a nationally important need, issue, or interest:* Addresses nonpoint and point source pollution, and advances knowledge of watershed-wide permitting and nutrient trading.
- *Communication plan:* The target audience for results is clearly defined. Project will provide MEP communities with guidance they have sought from DEP on TMDL implementation and provide other Massachusetts and New England communities with roadmaps for watershed-based permitting and nutrient trading.
- *How well the project furthers the goal of the Clean Water Act:* Provides practical roadmaps for improving water quality in embayments and improving the health of coastal ecosystems.
- *Leverage of other resources:* DEP staff time beyond that supported by the grant and participation from case study communities.
- *Cost effectiveness:* Builds on MEP work already underway and existing commitment by communities to reduce nitrogen loading.