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April 10, 2007

Mr. Tim Carroll  
Executive Secretary to the Board of Selectmen  
Chilmark Town Hall  
401 Middle Road, P.O. Box 119  
Chilmark, MA. 02535

Dear Mr. Carroll:

Please find enclosed with this letter the detailed scope in support of the Massachusetts Estuaries Project budget developed for determination of the nutrient restoration threshold specific to the Tisbury Great Pond embayment system.

Work is proceeding at a rapid pace with field data collection and analyses nearly complete, with modeling and report writing to come next. That being the case, it is necessary for us to establish a formal agreement with both the Towns of Chilmark and West Tisbury such that funds that have already been allocated by each of the Towns can be accessed to complete the Estuaries Project work in the Tisbury Great Pond system.

Please note that the Scope and Budget has been developed for the entire system as a whole. It is assumed that each Town will share the cost of conducting the Estuaries Project work evenly and as such each Town would be responsible for half of the total Town cost to be matched by the Estuaries Project.

Please feel free to call Brian Howes (508) 326-0912 or me (508) 910-6314 should you have any questions regarding the material provided herein.

Respectfully,

Roland Samimy  
Program Manager / Technical Lead Hydrology  
Massachusetts Estuaries Project



The School for Marine Science and Technology

University of Massachusetts Dartmouth

Massachusetts  
Department of  
Environmental  
Protection



## **Assessment & Management Tisbury Great Pond Estuary**

***Project: Quantitative Assessment of the  
Tisbury Great Pond Estuary with the  
Towns of West Tisbury and Chilmark  
to Support Management and Restoration:  
Nutrient Loading and Environment Health***

***Data Collection and Modeling Required for Massachusetts Estuaries Project  
Linked Watershed-Embayment Nitrogen Management Approach***

**Dr. Brian L. Howes & Roland Samimy  
DEP/SMAST Massachusetts Estuaries Project  
Coastal Systems Program  
School of Marine Science and Technology - UMD**

**Overview:** The overall scope of the this project to be performed as a collaborative effort by the Towns of West Tisbury and Chilmark (appropriate departments and committees and citizens groups) and the DEP/SMAST Massachusetts Estuaries Project (MEP). SMAST (School for Marine Science and Technology-UMD) serves as the technical and fiscal coordinator for this effort. It should be noted that though this scope and budget has been developed for the whole of the Tisbury Great Pond system, it is assumed that each town will share the cost of completing this analysis evenly. As such, each Town is responsible for half of the total “Town” budget to be matched by the Massachusetts Estuaries Project.

**The overarching project goal is the protection and restoration of the health of the Tisbury Great Pond Estuary through watershed-embayment nitrogen management planning.** The specific goals of the project are:

- to establish the nutrient related health of the Tisbury Great Pond Estuary through review of existing studies and data from the water quality monitoring efforts (conducted with the Martha’s Vineyard Commission – William Wilcox);
- to conduct data collection, produce field validated hydrodynamic and Nitrogen Models of each embayment of concern;

- to evaluate the spectrum of nitrogen management options on a site specific basis for each embayment, including both soft solutions (ecological manipulations, tidal manipulation, regulatory options, etc) and hard solutions (wastewater facilities, runoff control, etc);
- to test “what if” scenarios to address the efficacy of nitrogen management options recommended from regional and national experience, by the bi-Town (West Tisbury/Chilmark) MEP Committee and any consultants to the Towns;
- to assess hydrodynamic changes and possible water quality changes (preliminary) associated with the opening of Tisbury Great Pond to the ocean;
- to enhance public education as to the health of the Tisbury Great Pond embayment, its future and best practices for protection and restoration.

The project will be conducted over a two year period. The major time limitation is generally the need to collect three years of baseline nutrient data, but MEP has determined that this requirement has been met by the MVC (and historic) monitoring efforts. The “higher level” data (nitrogen recycling, hydrodynamics, etc) will be conducted by the MEP Technical Team.

The overall project (estuarine monitoring and assessment, modeling and synthesis) will be under the direction of the MEP Technical Team, Dr. Brian L. Howes, Manager of the Coastal Systems Program at SMAST-UMD and Technical Director of the Massachusetts Estuaries Project. The University will serve as the prime contractor for this effort, although technical specialists with proven capabilities and experience within the region will be integrated into the project as required.

The project will work with the Towns of West Tisbury and Chilmark and associated groups (for example, Martha’s Vineyard Commission, Tisbury Waterways and Tisbury Pond Riparian Owners Association) to evaluate the Tisbury Great Pond Estuary relative to its tolerance for watershed nitrogen loading (level of “acceptable” nitrogen loading and the spatial distribution of that loading). The goal of this project is to provide information necessary to support both hard and soft approaches to the management and restoration plans for this embayment. A quantitative numerical model will be parameterized using site specific information and field validated using both freshwater inflow, measured tidal flows and present salinity and nutrient distributions. The model to be used has been accepted at the necessary approach by DEP and EPA for southeastern Massachusetts embayments.

The project tasks will include: data collection focusing on watershed source analysis, nutrient distributions, development of a hydrodynamic model, mapping of eelgrass and wetlands, and survey of benthic indicator species. These parameters, when coupled, provide the data base for synthesis of nitrogen dynamics within the system, enabling construction of a water quality numerical model and overall evaluation of the current and potential ecological health of the Tisbury Great Pond System. The synthesis, model and evaluation will then support management and restoration plans for Tisbury Great Pond, at the projects completion and in the short-term,

potential effects on circulation and flushing related to potential changes in the opening of the pond to the ocean.

## **PROJECT TASKS**

Tisbury Great Pond Nitrogen Management and Restoration Project captures the following basic project components:

### **Nitrogen Related Water Quality Monitoring (pre-existing)**

#### **Hydrodynamic Modeling**

- bathymetric survey
- data collection on tidal exchange, salinity distributions, validation by velocity (ADCP)
- quantitative numerical modeling & validation
- assessment of circulation and flushing related to opening of the Pond to the ocean

#### **Watershed Nitrogen Loading**

- confirmation of delineation
- data collection on stream flow & nitrogen load (annual)
- land-use data (from Town Planning and/or MVC)
- watershed nitrogen model (present, buildout and “best case”)

#### **Quantitative Watershed-Embayment Nitrogen Model**

- nitrogen regeneration within embayments
- system predictive model, with validation

#### **Habitat Assessment**

- dissolved oxygen (high frequency measurements in targeted areas)
- macrophyte surveys (eelgrass & macroalgae), with incorporation of historical data
- benthic infauna community (indicators of stress)

#### **Synthesis of Modeling and Habitat Assessments**

- determination of nitrogen loading tolerances (i.e. threshold nitrogen loads)
- projection of embayment health under build-out and best case potential loadings
- evaluation of soft and hard nitrogen management options (initial screening)

#### **Information Transfers**

- presentations and discussions with MEP committee
- public meetings and workshops
- reports and data displays

The tasks required to fulfill all of the data needs and goals of the project are detailed in an expanded Massachusetts Estuaries document and are available on request.



**Tisbury Great Pond - Marthas Vineyard**

**Latest Revision: Jan 10, 2005**

**Towns of West Tisbury and Chilmark**

**Estuaries Project: Assessment, Synthesis, Modeling & Recommendations**

Tentative Budget Proposal:1/10/2005

These are "not to exceed" cost estimates and may be reduced based upon existing data review.

Funds for match can be from Town resources, grants, private sources.

	<b>Task Description</b>	<b>Total Town/Private Funds for Match by Estuaries Project* Tisbury Great Pond (includes Black Pt Pond)</b>	<b>MV Credits</b>	<b>MEP Match \$</b>	<b>Total Project Costs</b>
<b>Task 1</b>	Compilation and review of previous studies/data	<b>\$2,000</b>		\$2,000	\$4,000
<b>Task 2</b>	Cummulative Nitrogen Loading Determination Watershed delineation Land-use	<b>\$4,500</b>		\$4,500	\$9,000
<b>Task 3</b>	River Transport from watershed to estuaries Gauging and nutrient sampling 2 Streams, 14-16 months	<b>\$12,000</b>		\$12,000	\$24,000
<b>Task 4</b>	Nitrogen recycling within the receiving estuaries ~40 sites total	\$18,000		\$18,000	\$36,000
<b>Task 5</b>	Assessment of nutrient related health      Total/Estuary--> Infaunal Animal Survey Eelgrass/Macroalgal Survey & Historical Reconstruction D.O. Moorings (6)	\$14,000		\$14,000	\$28,000
<b>Task 6</b>	Hydrodynamic field data collection and modeling Bathimetry Stage data, moorings Velocity data (validation) Hydrodynamic model Assessment of Inlet/Drawbridge	\$8,000		\$8,000	\$16,000
<b>Task 7</b>	Water Quality Models & Senario Runs	\$10,000		\$10,000	\$20,000
<b>Task 8</b>	Nitrogen Loading, Ecological Health, Management Report	\$14,000		\$14,000	\$28,000
	<b>Total Project Cost (to be matched by Estuaries Project) =</b>	<b>\$82,500</b>		<b>\$82,500</b>	<b>\$165,000</b>
	<b>Credit for previously collected usable data =</b>	<b>TBD</b>			
<b>Task 9</b>	Meetings, Outreach Tools				

\* Estuaries Project Matches \$\$ on ~ 1:1 basis, "Credits" are for existing data sets that support MEP analysis.

