

Nitrogen Work Group RFP Committee

Request for Proposals Data Synthesis and Nitrogen Effects Analysis October 2015

The Nitrogen Work Group (NWG) RFP Committee is inviting proposals for the synthesis of nutrient related data from a long term data set collected on the Niantic River Estuary (NRE), its tributaries, and Niantic Bay; and to conduct a nitrogen effects analysis. The project site is located in southeastern Connecticut. This project is intended to aid resource managers (federal, state, and local municipal) in the implementation of actions and best management practices in order to minimize the negative impacts of excess nutrient loading on the Niantic River Estuary ecosystem.

This Request for Proposals (RFP) includes information on the following:

1. Background
2. Project Overview, Tasks, Outcomes, and Deliverables
3. Award General Guidelines
4. Proposal Requirements
5. Submission Process
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Attachment A: Niantic River Estuary Data Sources

Attachment B: Proposal Title Page

Attachment C: Overall Budget Form

Attachment D: Task Based Budget Form

1. Background

The link between nitrogen loading and ecosystem health of coastal estuaries is well established and nitrogen has been suggested as a key factor contributing to ecosystem changes observed in the NRE. Given this, considerable monitoring data on ambient nitrogen concentrations in the NRE have been gathered since at least 1970 (Attachment A). Sources of nitrogen to the NRE (and other similar coastal embayments) include direct surface runoff from land-based sources (e.g., septic wastewaters, polluted stormwater, fertilizers) to the river and its tributaries, groundwater inputs derived from these land-based sources permeating through river sediments into the estuary, inputs from Long Island Sound (LIS) through tidal exchange, and atmospheric deposition to the river and its associated watershed. While these nitrogen sources have been generally recognized for some time, recent and ongoing studies have produced relevant data that will aid in more precise identification of specific sources and their respective nitrogen loads.

Other recent studies in the NRE suggest that periodic declines in eelgrass populations and episodes of hypoxia, two important indicators of ecosystem health, may be the result of excess nitrogen loading. These events raised the level of concern by resource managers, the general public, and other stakeholders. To better address concerns over the relationship between nitrogen loading and ecosystem health in the NRE, a Nitrogen Work Group (NWG), described below, was formed in 2010.

Nitrogen Work Group

The NWG represents a partnership comprised of federal, state, and local managers, research scientists, non-government entities, and members of the Niantic River Watershed Committee (NRWC). This partnership's focus is relative to nutrient loading and its impact on ecosystem functions, such as water column dissolved oxygen, plant growth, and eelgrass health and survival. The NWG meets quarterly to exchange research results and information, to provide guidance and advisement on studies, to identify gaps and data needs, and to help guide a path forward towards improved resource management.

The award recipient will work with the NWG and possibly other partners to:

- Integrate available data and information
- Quantitatively demonstrate the relationship between nitrogen inputs, cycling & dynamics and ecosystem response (on eelgrass and dissolved oxygen)
- Develop an estimate of nitrogen loads that would be consistent with healthy eelgrass and dissolved oxygen conditions (i.e., resource based nitrogen objectives)
- Make recommendations for improving the data upon which the analysis is based and identify data gaps, if applicable
- Recommend low cost implementation strategies for environmental managers
- Determine the potential transferability of this approach to other embayments

2. Project Overview, Tasks, Outcomes, and Deliverables

Studies relative to nutrient tributary loading, internal cycling of nitrogen, and denitrification have occurred in the Niantic River Estuary, its tributaries, and Niantic Bay since the 1970s (Attachment A). The Nitrogen Workgroup was initiated in 2010 to identify data needs, provide a means for data and information sharing, and provide a forum for research collaboration. One key project of the group is the contributory work of water quality data collection and eelgrass mapping conducted by Dominion's Millstone Environmental Laboratory (MEL). A summary of this work is included in the annual reports produced by MEL.

Eelgrass is a rooted, submerged vascular plant which grows in shallow coastal waters. Its presence is typically used as an indicator of good water quality as it requires sunlight to penetrate through clear water to grow. Eelgrass provides an extremely valuable habitat and nursery ground for numerous commercially important fish and shellfish species, serves as an important food source for many species, aides in coastal nutrient and carbon cycling, and dampens and absorbs wave energy. The plant itself and the ecosystem services it supports are

critical to productive coastal environments. Eelgrass survival in the NRE has been variable over the last thirty years, with the most recent die-off occurring in 2012. Although, this particular die-off event was likely the result of increased temperatures, excess nitrogen loading to estuarine systems is believed to be the greatest cause of eelgrass loss world-wide. Understanding nitrogen dynamics (i.e. loading and internal cycling) to the NRE is of interest to continued eelgrass success. Excess nutrients cause phytoplankton, epiphyte, and macrophyte growth which can negatively affect the growth and survival of eelgrass.

Recent studies (Gaines 2003, Vaudrey 2014*) indicate that hypoxic conditions (water column dissolved oxygen concentrations less than 3.0 mg/L) do occur in NRE. One such event occurred in 2009 and involved the turn-over and transport of hypoxic water in the upper arm of NRE which resulted in a documented fish kill. It is expected that the natural bathymetry of the upper river lends itself to isolated areas of hypoxia. However, hypoxia is believed to be exacerbated by nitrogen loading. Based on CT DEEP's 2014 Integrated Water Quality Assessment report, NRE is not meeting water quality standards for aquatic life use, recreation, and direct shellfish consumption.

Additionally, water from the NRE discharges to Long Island Sound (LIS). LIS has a Total Maximum Daily Load ([Long Island Sound TMDL](#)) to meet water quality standards for dissolved oxygen. In order to achieve water quality standards for dissolved oxygen, the TMDL requires reductions in nitrogen from both point sources and nonpoint sources (including regulated and non-regulated stormwater). The reduction for nitrogen from nonpoint sources and stormwater is 10%. This applies to the entire LIS watershed, which includes the NRE watershed. In addition, the Long Island Sound Study has circulated a revised version of the Comprehensive Conservation Management Plan (CCMP). This plan establishes implementation actions relating to water quality (e.g., use of Best Management Practices to reduce nitrogen loading and assess nutrient contamination to embayments), and habitat (ex. promote eelgrass management).

In 2006, the CTDEEP administered grant funding provided by the National Oceanic Atmospheric Administration for the preparation of the Niantic River Watershed Protection Plan (Watershed-wide Strategies to Prevent Nonpoint Source Pollution). This plan was developed under the advisement of a steering committee to address the greatest threat to water quality in NRE, nonpoint source pollution (including nitrogen). The plan identified key findings and presented recommendations to address these findings. Land use and regulatory options were considered and discussed with local town planners. These recommendations consist of educational activities, promotion of low impact development and homeowner best management practices, protection and restoration of vegetated riparian buffers, financial strategies and specific stormwater management measures. The plan is available on the following website: [Niantic River Estuary Watershed Plan](#)

Other studies that apply to the entire sound or Southeastern Connecticut and include NRE are:

Establishing restoration objectives for eelgrass in Long Island Sound - Part I: review of the seagrass literature relevant to Long Island Sound, 2008a. Vaudrey, J.M.P.

Website: <http://www.lisrc.uconn.edu/eelgrass/index.html>

Establishing restoration objectives for eelgrass in Long Island Sound - Part II: case studies, 2008a. Vaudrey, J.M.P.

Website: <http://www.lisrc.uconn.edu/eelgrass/index.html>

Development and Application of a GIS-based Long Island Sound Eelgrass Habitat Suitability Index Model, 2013. Vaudrey, J.M.P., Brousseau, L., Eddings, J., Kim, JK., Pickerell, C., Yarish, C.

Website: <https://cornell.app.box.com/s/o05mmldbi1vkj6b3dg0y8anr4bp7yz7l>

A Comparative Analysis of Eutrophic Condition and Habitat Status in Connecticut and New York Embayments of Long Island Sound, 2013. Vaudrey, J., Yarish, C.

Website: <http://longislandsoundstudy.net/research-monitoring/lis-research-grant-program/2010-research-project-descriptions/>

Comparative Analysis of Eutrophic Condition and habitat Status in Connecticut and New York Embayments of Long Island Sound, in progress. J. Vaudrey, Yarish, C., Kim, JK., Pickerell, C., Brousseau, L.

Website: <http://longislandsoundstudy.net/research-monitoring/lis-research-grant-program/2012-research-project-descriptions/>

To conduct the synthesis portion of this project, the grant recipient will need to use the above data and information, as well as other relevant natural resource information (Attachment A). Synthesis will involve data integration and help to identify and quantify linkages among variables over space and time (Kemp and Boynton, 2012). The quantification of the effects of nitrogen on eelgrass health and dissolved oxygen concentrations and establishment of nitrogen objectives for NRE will take place following data synthesis. The project may also identify data gaps and help to guide further water quality and eelgrass monitoring. Although historical data on NRE reaches as far back as 1970, the project team (in consultation with the NWG) may choose an appropriate time frame to assess the effects of nitrogen on eelgrass and dissolved oxygen.

Observations relevant to climate change (increased river flow and temperature, decreased pH, increased eutrophication) that may be garnered from the project will be important to future planning and the potential impact of climate change should be considered in management recommendations.

* Gaines, A.G. and S.D. Pratt 2003, Oxygen Depletion in Connecticut Estuarine Waters, The Coastal and Harbor institute, Woods Hole, Massachusetts
Vaudrey 2014, http://longislandsoundstudy.net/wp-content/uploads/2011/03/Vaudrey2014_FinalReport_R-CE-32-CTNY.pdf

Project Tasks

The project team will meet regularly with project partners (such as the NWG) on the direction and conduct of the project. The award recipient should expect to work closely with the NWG and other partners and potential sources of information in an iterative process to:

- Obtain relevant data and important information that will serve to successfully complete the project.
 - Incorporate the above references and other relevant resources into the project methodology.
 - Synthesize and integrate data and information.
 - Develop an approach to quantitatively demonstrate the relationship between nitrogen inputs, cycling and dynamics, and ecosystem response (on eelgrass and dissolved oxygen).
 - Develop an estimate of nitrogen loads that would be consistent with healthy eelgrass and dissolved oxygen conditions (i.e., resource based nitrogen objectives).
 - Recommend cost effective implementation actions for managers (and link such actions to the LISS CCMP where possible).
 - Recommend actions for improving the data upon which the analysis is based and identify data gaps, if applicable.
 - Determine the potential transferability of this approach to other embayments.
- ***Input from members of the NWG must be considered throughout this project.

Desired Outcomes

- Improved understanding of the habitat and water quality characteristics determined by nitrogen loading and the impact on eelgrass establishment and dissolved oxygen concentrations.
- Nitrogen loading estimates consistent with healthy ecosystem targets.
- Cost effective implementation recommendations for environmental managers.
- Assessment of the potential transferability of this approach to other embayments.
- Increased understanding of data needs to improve the relationship between nitrogen objectives and ecological response indicators for NRE (if applicable) and other embayments.

Deliverables

- An approved Quality Assurance Project Plan (QAPP)
- Project start-up meeting
- Documented report of data synthesis (methods and results) including an outline of the nitrogen effects analysis method and next steps in the project
- Presentation of data synthesis results and nitrogen effects methodology to the NWG
- Draft report of data synthesis and nitrogen effects analysis for review and comment
- Finalized report of data synthesis and nitrogen effects analysis, including the desired outcomes listed above.
- Attend NWG meetings and provide updates on progress, as well as final project presentation

- Frequent communication via conference calls, email, and other venues not requiring travel

All deliverables will be submitted in draft Microsoft Word format for review by project partners and approval by the project manager. All final deliverables will be submitted in Adobe PDF format upon approval by the project manager. Compensation is on a deliverables-based payment schedule and contingent upon approval of final deliverables (see Section 4 of this document under “Budget”).

3. Award General Guidelines

This funding award will be administered by Millstone’s Environmental Laboratory located at Dominion’s Millstone Power Station in Waterford, CT. This RFP solicits project proposals that support the needs of the NWG. Project proposals submitted in response to this RFP must address the desired outcomes in Section 2. This project is intended to improve the NWG’s understanding of nutrient loading in the Niantic River Estuary and aid managers in the selection of nutrient mitigation strategies. Specifically, the impact of nutrients on the ecosystem, the degree of impact, establish nitrogen load objectives (i.e., a load that does not produce an adverse impact on the ecosystem), and recommended cost effective implementation efforts to reduce nitrogen loads. Proposals that do not address the specific outcomes desired will not be considered for funding. Applicants are encouraged to review reference materials identified in Section 2 and Attachment A. Applicants may also discuss their project plans with the technical contact identified in Section 8.

Eligibility

Applicants that are eligible to submit proposals in response to this RFP include: federal, state, or local government agencies, interstate agencies, private non-profit organizations and institutions, for-profit organizations, and academic or educational institutions.

Timeline

Proposals Due	December 1, 2015
Applicants Notified of Funding Decision	January 28, 2016
Detailed Project Work Plan Due	March 1, 2016
Project Start Date	April 4, 2016

Funding

There is \$58,000 available for this project. Proposals with budgets that exceed the identified funding need to provide justification for why the funding request is warranted to accomplish the stated objectives. Awarded funds may be used for expenses directly related to the proposed project, including wages and consultant fees. Non-expendable equipment and the purchase of high-cost items (e.g., computers, boats, etc.) will not be considered for funding.

Match

Although cost share or match is not required, projects providing cost share or match will receive favorable consideration over projects without cost share or match. Cost share may be in the form of cash or in-kind contributions, but must be clearly explained in the proposal and must be verifiable.

Quality Assurance & Quality Control Requirements

The project involves the collection, analysis, and/or manipulation of existing environmental data and therefore, will require a Quality Assurance Project Plan (QAPP). No work by the award recipient can begin before the QAPP is approved by quality assurance managers from both CTDEEP and EPA. Keep in mind that the preparation of a QAPP requires an additional level of planning, documentation, and time. While preparing your budget and work plan, please account for the additional time and resources necessary for QAPP development. For more information about QAPPs, please visit http://www.epa.gov/quality/qa_docs.html#noneparqt; and <http://www.epa.gov/region1/lab/qa/pdfs/QAPPProgram.pdf>.

Notification of Award

Award notification to applicants is expected by January 28, 2016. Funding recipients may be asked to submit a revised work plan, timeline and budget at this time. Projects cannot start until the contract is signed by both parties. Reimbursement for any expenses incurred prior to the contract start date will not be permitted. Recipients will be required to submit two reports documenting the project's progress to date, as well as a final project report. Guidelines for preparing the reports may be provided by the NWG to award recipients. Recipients will be asked to make presentations on the project results at the NWG and NRWC meetings after the conclusion of the project. Recipients may be asked to prepare a public-friendly article on the project results for consumption by the general public.

4. Proposal Requirements

Proposals should include a cover letter, title page, abstract, narrative (10-page maximum), timeline, citations, budget, budget justification, description of qualifications and letters of commitment or support. Proposals that do not contain all of the information requested and/or do not meet the format requirements will be eliminated from consideration.

Cover Letter

Please include a one-page cover letter, printed on official letterhead and signed by an authorized representative of the lead agency, with each proposal.

Title Page

For your convenience, an electronic version of the title page (in Microsoft Word format) can be accessed at <http://www.nianticriverwatershed.org/niantic-river-estuary-rfp/>. The title page must adhere to the format provided in Attachment B and include all of the following information,

using a maximum of one single-spaced, one-sided, typed 8.5" x 11" page with 11-point font and 1-inch margins:

- **Title:** Use the exact project title as it appears throughout the proposal.
- **Project Leader:** Provide the name, title, and affiliation of the project leader (i.e., lead principal investigator).
- **Project Financial Contact:** Provide the name of the individual responsible for financial/contractual negotiations.
- **Contact Information:** Provide the complete contact information for the Project Leader, and Project Financial Contact, including mailing address, phone and fax numbers, email address, and web site address.
- **Project Support:** Provide the names, titles, affiliations, and complete contact information for each of the additional investigators or support staff who will significantly contribute to the project.
- **Project Cost:** Provide the total project cost (i.e., funding request), as well as total project match (if any).
- **Abstract:** The abstract must accurately describe the project being proposed and include: (1) the objectives of the project, (2) the methodology to be used (which should give an accurate description of the project as described in the proposal), and (3) the expected outputs and outcomes of the project and how it addresses this RFP. **The abstract must fit within the title page.**

Proposal Narrative

The proposal narrative must not exceed 8 consecutively numbered, single-spaced, typed 8.5" x 11" pages with 11-point font and 1-inch margins. The 8 page narrative must include all of the following information and must cite sources where appropriate:

- **Problem Description:** Briefly describe the proposed project and its relevance to the objectives of the NRE RFP. This section can also include brief background or introductory information.
- **Objectives:** Outline how the project will achieve the goal of this RFP.
- **Methodology:** Outline the project's design and describe the methods and techniques that will be used to meet the project's goal and tasks.

- **Expected outputs and outcomes:** Describe the project’s expected outputs and outcomes. List and describe each of the specific deliverables and end-products. An example environmental output/outcome table is provided below.

EXAMPLE Environmental Outputs/Outcomes Table				
Project Element	Work Plan Activity/Task	Target Date(s)	Environmental Output	Environmental Outcome
Prioritization and design of culvert retrofits for enhanced aquatic organism passage (AOP)	QAPP	Month 1-3	Digital and hard copies of QAPP approved by quality assurance managers for NEIWPCC and EPA.	Adherence to strict quality control standards with respect to the collection, analysis and/or manipulation of environmental data.
	Inventory of municipal culverts	Months 3-6	Inventory municipally owned culverts including: geographic coordinates, design characteristics, and maintenance needs.	Database of municipally owned culverts to create GIS shape file.
	GIS map of AOP and culverts	Months 5-10	Create GIS map layers incorporating inventory of culverts and pre-existing biological monitoring data.	Identify waterways of significant biological importance where culvert structural design restricts AOP.
	Prioritized list for culvert retrofit	Months 8-12	Indicate cost/benefit individual culverts for retrofit to enhance AOP and prioritize culvert retrofits for maximum AOP benefit and minimized cost.	List of culverts by priority to improve AOP within the watershed with 5 highest priority culverts for retrofit design.
	Culvert retrofit design	Months 12-15	Design culvert retrofits for including budget needs.	Deliver culvert designs to municipalities to support stormwater infrastructure and improve AOP within the watershed.

- **Evaluation:** Briefly discuss the process to be used to evaluate the effectiveness and success of the project.
- **Roles and Responsibilities:** Define the roles and responsibilities of all project participants.

Citations

Include references as appropriate.

Timeline

Provide a detailed timeline for meeting project objectives and identified tasks and listed deliverables. Projects should be completed within the period identified for this RFP. All timelines should be stated in terms of Month #1, #2, #4, etc. rather than specific dates, e.g., "July 19, 2015." Although project start dates are anticipated to be April 4, 2016, this date may change based on the time the actual agreement is established.

Budget

The project budget must be provided in two formats. First, provide a complete, detailed budget using the format provided in Attachment C. For your convenience, an electronic version of the budget form is available at <http://www.nianticriverwatershed.org/niantic-river-estuary-rfp/>. The budget must be no more than one 8.5" x 11" page with 1" margins and 11-point font. Along with this budget, provide a brief justification for the proposed costs in terms of meeting project objectives. Include an explanation of how indirect costs are calculated. Justify subcontracts, if any. Identify and describe current and pending financial resources (including the source) for non-federal cost share or matching funds that are intended to support the project.

Second, prepare a budget that is broken down by project tasks as shown in Attachment D. **Contractual payments will be made based on this budget (i.e., a deliverables based payment schedule).** This budget must be no more than two 8.5" x 11" pages with 1" margins and 11-point font. An electronic version of the budget form is also available at <http://www.nianticriverwatershed.org/niantic-river-estuary-rfp/>.

5. Submission Process

Applicants must submit both an electronic and hardcopy of their proposal as follows:

- i. An electronic submission as an e-mail attachment sent to **john.t.swenarton@dom.com** no later than **Midnight, EST, on Monday, December 1, 2015**. There are two acceptable electronic formats (both forms may be submitted):
 - A PDF document is highly preferred. This requires Adobe Acrobat or similar Adobe product (the free Adobe Reader does not allow the conversion of documents into PDF format).
 - Microsoft Word format (Office 2003 or 2007 versions) are also acceptable.
- ii. Two signed hard copies (single-sided, unbound, and unfolded) with a post mark no later than **Monday, December 1, 2015**. Please mail the hard copies to **John Swenarton at Dominion's Millstone Environmental Laboratory**. The complete contact information is provided in Section 8 of this RFP.

6. Proposal Evaluation Process

All proposals will be screened to ensure that they meet the requirements of this RFP. If a proposal is found to be incomplete, the proposal will be eliminated from the competition. The applicant will be notified of this. Complete and eligible proposals will be reviewed by a panel composed of scientists and managers involved with the NWG and NRWAC. The review team will evaluate the proposals based upon the following criteria:

1. **Addresses Desired Outcome (0-25 points).** Degree to which the proposal can accomplish the desired outcomes. Clarity and measurability of deliverables/outputs within specific and reasonable time frame(s), including relationship of expected results/benefits to addressing this RFP's topic and improving management of the NRE.
2. **Technical Merit (0-25 points).** Adequacy of the proposed methodology, project design, and/or technical approach to accomplish stated project objectives. If appropriate, inclusion of a technically valid, specific performance assessment plan describing measurement and reporting of outputs and outcomes.
3. **Performance Capability (0-15 points).** Ability of the applicant to accomplish the proposed project given its history of past performance, experience, qualifications, facilities, and resources.
4. **Appropriate and Cost-Effective Budget (0-15 points).** Proposals with costs up to \$58,000 will be considered, but cost and the relative value of work products will be a major factor in evaluating submissions. Adequacy of the proposed budget to accomplish objectives, and adequacy of justification in explaining the need for resources for this project. If reviewing similar projects, is this project cost-effective compared with other similar projects under review? Indication of leveraged funds from other organizations? Provision of matching funds?
5. **Transferability of Results to Similar Projects and/or Dissemination to the Public (0-10 points).** Degree of transferability of project results and recommendations to the NWG and NRWC. Potential transferability to other embayment systems (if applicable). Inclusion of a public outreach or public education component that documents and/or distributes results of the project to the appropriate audience or summarizes results and recommendations for distribution.
6. **Coordination with Ongoing Efforts (0-10 points).** Degree to which the project builds upon existing efforts. Demonstration of knowledge of linked efforts occurring in the watershed. Proposals will be ranked and evaluated based upon the review teams' recommendations

7. Notification of Award

Award notification to applicants is expected by **Thursday, January 28, 2016**. Award recipients may be asked to submit a revised work plan, timeline, and budget at this time. Projects cannot start until the contract is signed by both parties and the QAPP is approved. The NWG will not pay for expenses incurred prior to the contract start date. Payment for costs incurred will be on a reimbursement basis per the contract payment schedule and contingent upon completion of quarterly progress reports and project deliverables.

8. Contacts

For administrative information regarding the application process, please contact **John Swenarton**, at:

Millstone Environmental Laboratory
Dominion – Millstone Power Station
PO Box 128, Rope Ferry Road
Waterford, CT 06385
(860) 447-1791 x4534
John.T.Swenarton@dom.com

For technical information regarding the data synthesis/nitrogen effects analysis, please contact **James S. Latimer**, at:

EPA Atlantic Ecology Division/ORD
27 Tarzwell Drive
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