

Release date: 27 January 2010
Lake Champlain Basin Program Announcement

Request for Proposals

Determining the contribution of internal phosphorus loading to Missisquoi Bay

The Lake Champlain Basin Program (LCBP) is pleased to announce a Request for Proposals (RFP) for a project to determine the contribution of the internal phosphorus load to the phosphorus in the water column of Missisquoi Bay. Up to \$125,000 is available for this project, which supports the over-arching goal of reducing phosphorus pollution into Lake Champlain, as outlined in the LCBP long-term management plan, *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin*.

The LCBP seeks proposals for development of a predictive model of phosphorus responses to changes in external loading in the Missisquoi Bay watershed. Output from this model should allow the award recipient to characterize temporal dynamics and internal sediment interactions on a seasonal basis. The model should investigate the importance of legacy sediments and internal phosphorus cycling mechanisms to identify the critical point at which external phosphorus load reduction will no longer be a driving factor in the Bay's water quality. Ultimately, information from the predictive model developed under this scope will be used to inform a eutrophication model (to be developed outside of this RFP) for Missisquoi Bay in order to predict algal responses to seasonal nutrient dynamics within the Bay. Funding for this RFP is from the US EPA.

This Request for Proposals is available from the Lake Champlain Basin Program website. Look for the link on our homepage at www.lcbp.org. To receive a copy of the RFP via US Postal Service, contact the Lake Champlain Basin Program office at (802)372-3213 or toll free at (800)468-LCBP in New York and Vermont.

To facilitate the review process, applicants must submit proposals in both paper and electronic format. Please see the RFP and the attached proposal format information for complete details.

DEADLINE NOTICE:

Hardcopy (8 copies) and electronic versions (no facsimiles) of proposals must be RECEIVED by the Lake Champlain Basin Program office by 4:30pm on:

March 5th, 2010

LATE OR INCOMPLETE PROPOSALS WILL NOT BE CONSIDERED.

The successful applicant will be notified by **April 30th, 2010**.

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I. Background

Missisquoi Bay is a 8,077 hectare embayment located in the northeast corner of Lake Champlain. Approximately 57% of the Bay is located in Quebec, Canada and the remaining 43% is located in Vermont, USA. Annual problems with cyanobacterial (blue-green algae) blooms often inhibit contact recreation in the Bay for large portions of the summer months. High levels of nutrient loading into the Bay, particularly in the form of phosphorus and nitrogen pollution, have been identified as the most critical and controllable cause of the algal blooms. Phosphorus loads to and concentrations within the Bay greatly exceed target levels designated by water quality criteria for phosphorus endorsed by the governments of New York, Quebec, and Vermont.

While the governments of Vermont and Quebec have made significant efforts to reduce phosphorus loads delivered to the Bay, more needs to be done in order to meet the target loads. A 2002 agreement between the governments of Vermont and Quebec established Vermont's responsibility at 60% of the total phosphorus load reduction needed and Quebec's responsibility at 40% of the total reduction. Both the Province of Quebec and the State of Vermont have undertaken phosphorus reduction programs to minimize phosphorus loading from tributaries into the Bay. Multiple workshops have been conducted over recent years to discuss these programs and other sources of phosphorus, such as the extent of internal nutrient loading within Missisquoi Bay.

The Lake Champlain Research Consortium (LCRC) developed a statement of research priorities for cyanobacteria and nutrient dynamics in Missisquoi Bay and its watershed in a workshop held in April 2005 (http://www.lcbp.org/PDFs/Cyanobacteria_meeting_summary_4.9.05.pdf); these priorities were reaffirmed during a joint LCBP/LCRC conference held in January 2008. The six critical research questions identified included:

- **What is the contribution of the internal phosphorus load to available phosphorus in the overlying water column?**
- Why are cyanobacteria dominant in the bay?
- What is triggering toxin production by the dominant species?
- What are realistic and achievable load allocations for the subwatersheds in the Missisquoi River basin?
- What is the most efficient way to reduce phosphorus concentrations in Missisquoi Bay (considering both the watershed and in-lake options that might be feasible)?
- What are the predominant water flow patterns in Missisquoi Bay and what are the hydrodynamic connections to the northeast arm and Alburg passage?

Answering the full suite of questions above would involve development of a eutrophication model for Missisquoi Bay that is grounded in field measurements and simulates the spatial and temporal (seasonal and long-term) response of cyanobacteria in the bay to watershed and lake management actions. Because of the extensive work that will be required to develop a eutrophication model, the effort has been divided into phases. **The first phase, to evaluate internal phosphorus loading in the context of a phosphorus mass balance model for Missisquoi Bay, is the scope of this RFP.**

Determining internal loading is important to current management efforts because it will help quantify realistic time lags in the Bay's response to external phosphorus load reduction. This understanding will complement concurrent efforts to identify critical source areas and the most efficient ways to reduce phosphorus loading from the Missisquoi Bay Watershed. The initial phase of the project will therefore focus on phosphorus dynamics in the bay and the development of a detailed phosphorus mass balance model.

New field data collection for this project should focus on internal processes, rather than external loadings. External loads of phosphorus to Missisquoi Bay from its tributaries and bay water column concentrations have been systematically monitored for 20 years by the LCBP's Lake Champlain Long-Term Water Quality and Biological Monitoring Program. These data are available to support this project from the monitoring program website: http://www.anr.state.vt.us/dec/waterq/lakes/htm/lp_longterm.htm
A recent summary of phosphorus concentrations and loading rates for Lake Champlain is available at: http://www.lcbp.org/publication_detail.aspx?id=221.

II. Internal Phosphorus modeling and tasks.

The Lake Champlain Basin Program (LCBP) is seeking proposals for technical services to perform the following tasks:

1. Develop a time-dependent phosphorus mass balance model specific to Missisquoi Bay that will reflect seasonal dynamics and interactions with the benthic environment mediated by physical, chemical, and biological processes.
2. Identify the key internal loading processes and assess the impact internal loading has on the overall phosphorus concentrations in the water column of Missisquoi Bay.
3. Provide an understanding of a realistic timeframe in which phosphorus concentrations in Missisquoi Bay may respond to watershed-based phosphorus load reduction practices.
4. Provide recommendations toward application of the modeling results in the development of a eutrophication model for Missisquoi Bay that would predict the response of the phytoplankton community to changes resulting from phosphorus management efforts.

III. Summary of Other Requirements for the Selected Proposal

- For the selected proposal, following initial notification of the award, an approved workplan will be required before a grant agreement can be executed and the work begun. This workplan should be submitted to the LCBP for review by **June 15, 2010**.

- A Quality Assurance Project Plan will be required (after the grant agreement has been executed) for all components of the project that involve collection of data, including secondary data from literature that are to be used in modeling exercises.
- The successful applicant will be required to prepare brief quarterly reports documenting progress on each objective and task in the project (see attached Proposal Format Requirements). A final report fully documenting the project's results will be required at project completion, no later than **September 1st, 2012**.
- When approved, the final report will be edited for content and style in consultation with the successful applicant and published as part of the Lake Champlain Basin Program's Technical Report Series, located here: http://www.lcbp.org/publication_search.aspx.
- The consultant will be required to present interim and final project results to the appropriate Lake Champlain Basin Program committees, such as the Technical Advisory Committee and/or the Lake Champlain Steering Committee, for their review.

IV. Eligibility

Eligible organizations include colleges, universities, nonprofit organizations, for-profit companies, and government agencies. The selected contractor will be responsible for the completion of all project tasks, though subcontracted work may be permitted by the LCBP Project Officer upon request. Individuals and representatives from organizations that participated in the development or review of this RFP and its contents are ineligible to apply.

V. Proposal Evaluation and Selection Criteria

Proposals will be judged according to how well they address the following points:

1. Demonstrated knowledge of existing phosphorus cycling models pertaining to temperate lake basins, and the interpretation of their output as applied toward the Lake Champlain Basin.
2. Demonstrated knowledge of existing nutrient data currently available for the Lake Champlain Basin.
3. Technical merit and applicability of the proposed product toward priority objectives identified within the Internal Phosphorus Modeling tasks listed in this RFP.
4. Potential for the project to enhance the technical capabilities within the Lake Champlain Basin. Proprietary products are not acceptable project deliverables.
5. Clarity, conciseness and adherence to the proposal guidelines.
6. Demonstrated ability to create documents and products that are accessible to and can be used by local partners working to address nutrient cycling issues within the Lake Champlain Basin.

7. Competitive proposals will investigate dynamics of all potentially important internal loading processes in Missisquoi Bay (biological, physical, chemical).

VI. Available Funds and Match Requirements

A total of \$125,000 is available for this project. Match is not required.

VII. Period of Performance

Work is to be completed within twenty-four (24) months of the execution of a grant agreement and no later than September 1st, 2012.

VIII. Schedule and Requirements for Proposal Submission

- Please follow the format outlined in the attached Technical Proposal Format Requirements.
- Eight (8) paper copies of each proposal must be RECEIVED by the LCBP office by 4:30pm on **MARCH 5th, 2010**. Please submit paper copies bound only with a single staple or binder clip.
- *In addition*, an ELECTRONIC VERSION of the proposal, either on disk or via e-mail must be submitted. Electronic versions must also be RECEIVED by 4:30pm on **MARCH 5th, 2010**.

IX. Contact Information

Direct all proposals and other inquiries to:

Eric Howe
Technical Coordinator
Lake Champlain Basin Program
54 West Shore Road
Grand Isle, VT 05458
(802)372-3213
ehowe@lcbp.org

Technical Proposal Format Requirements

Proposals should adhere to the following format and should not exceed a 10 page maximum length (font size 12), NOT including budget information, references cited and investigator resumes.

TITLE: Concise and descriptive.

POINT OF CONTACT: Name, position, organization, address, telephone, fax and email.

AUTHORIZED REPRESENTATIVE: Name, position, organization address, telephone, fax and email of the person who is authorized to sign the contract.

ABSTRACT: Brief description of proposed work.

INTRODUCTION: Overview of what the project is and what it will accomplish in relation to the RFP.

OBJECTIVES AND TASKS: List the project's objectives and describe in detail the tasks that will be performed relative to each objective, including methods and approaches.

DELIVERABLES: Detailed description of the planned products from each task of the project. Quarterly progress reports and a final report are required deliverables.

SCHEDULE: Timeline showing anticipated dates for completion of the major tasks and deliverables. Quarterly progress reports are due on the last day of December, March, June, and September. Work is to be completed within twenty-four (24) months after the execution of a contract or grant.

DETAILED BUDGET JUSTIFICATION: Cost breakdown by major budget categories (i.e. personnel, equipment), linking costs to specific tasks/deliverables wherever possible. Breakdown should show costs to be covered by the LCBP award and other sources (if applicable), as well as the any match amounts and totals. (1 page, not included in the 10 page maximum total for the proposal).

TECHNICAL REFERENCES CITED: List all references used for the proposal (not included in the 10 page maximum total for the proposal).

CURRICULUM VITAE/RESUME OF PRINCIPAL INVESTIGATORS: Include up to 3-5 references for prior work pertinent to the proposed project. Please limit to one page per investigator, not included in the 10 page maximum total for the proposal.