

Release date: 25 January 2010  
**Lake Champlain Basin Program Announcement**

**Request for Proposals**

***Identification of Critical Source Areas of Phosphorus Pollution  
within the Vermont Sector of the Missisquoi Bay Basin***

The Lake Champlain Basin Program (LCBP) is pleased to announce a Request for Proposals (RFP) for technical services leading to the identification of critical source areas of phosphorus pollution within the Vermont sector of the Missisquoi Bay Basin. The project is funded through a U.S. federal appropriation to the International Joint Commission, U.S. Office, for implementation by the LCBP. This project will support the goal of reducing phosphorus pollution, as outlined in the Lake Champlain's long-term management plan, *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin*.

This contract seeks to further transboundary cooperative linkages between phosphorus reduction efforts in Vermont and in Quebec in the Missisquoi Bay watershed. It also seeks to reduce phosphorus loading in the Missisquoi Bay watershed through the identification of critical source areas (CSAs) of nonpoint source phosphorus pollution in the Missisquoi Bay Basin of Lake Champlain. The goal of the project is to identify and delineate areas of the Basin that contribute disproportionately large amounts of pollution to Missisquoi Bay, in order to efficiently target limited resources to reduce phosphorus loads.

The RFP is available from the Lake Champlain Basin Program website. Look for the link on our homepage at [www.lcbp.org](http://www.lcbp.org). To receive a copy of the RFP via U.S. 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:**

**Friday, March 5<sup>th</sup>, 2010**

**LATE OR INCOMPLETE PROPOSALS WILL NOT BE CONSIDERED.**

**The successful applicant will be notified by April 9<sup>th</sup>, 2010.**

# Lake Champlain Basin Program Announcement

## Request for Proposals

### ***Identification of Critical Source Areas of Phosphorus Pollution within the Vermont Sector of the Missisquoi Bay Basin***

#### **I. Background**

The Missisquoi Bay watershed within the Lake Champlain Basin is predominantly forested (66%), the remainder of which is mostly agricultural (23%), with some urban (6%) land use interspersed. The Missisquoi basin has one of the highest in-lake phosphorus concentrations of any segment of Lake Champlain. Phosphorus loads to and concentrations in the Bay greatly exceed target levels designated by water quality criteria for phosphorus endorsed by the governments of New York, Quebec, and Vermont. Furthermore, this phosphorus contributes significantly to blue-green algae blooms (cyanobacteria) in Missisquoi Bay during the summer months. These blooms are frequently dense enough to inhibit recreational water contact for many weeks at a time. Loadings of sediment and nitrogen to the Bay are also a concern.

While the governments of Vermont and Quebec have made significant progress in reducing the loads of phosphorus 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 that their relative target contributions of phosphorus in the watershed are 60% and 40%, respectively. The Province of Quebec has undertaken several programs to reduce its share of phosphorus loads. Similarly, Vermont has initiated phosphorus reduction programs, but has found reducing phosphorus to be more problematic in its sector of the Basin. On August 1, 2008, the Governments of the U.S. and Canada, pursuant to Article IX of the Boundary Waters Treaty of 1909, requested the International Joint Commission (IJC) to assist in the implementation of the transboundary initiative to reduce phosphorus loadings. Recognizing the recent advances made by the Province of Quebec within its areas of jurisdiction, the Commission was requested to coordinate a number of tasks on the U.S. side of the border, in close partnership with the Lake Champlain Basin Program (LCBP).

As part of this coordination, the IJC has contracted with the LCBP to identify critical source areas (CSAs) of nonpoint-source phosphorus pollution in the Missisquoi Bay Basin of Lake Champlain. The goal of the project is to identify and delineate areas of the Basin that contribute disproportionately large amounts of pollution to Missisquoi Bay, in order to efficiently target limited resources to reduce phosphorus loads.

The Missisquoi Bay Basin Project consists of three major tasks. The first task was to conduct a series of workshops and meetings to determine research and management objectives and desired outcomes of the project. The second task was to establish a short-term tributary monitoring program to be maintained for the duration of the project (two years); data from the monitoring program is intended to assist the identification of CSAs. The final task of the project is to conduct the CSA identification analysis. This RFP addresses that final task.

## II. Identifying Critical Source Areas of Phosphorus Pollution

The LCBP recognizes a phosphorus Critical Source Area (CSA) as the spatial intersection between a phosphorus source and a transport mechanism. The objective of this project is to **identify predominant types of critical source areas of phosphorus loads in the Vermont Sector of the Missisquoi Bay Basin through modeling, as well as their physical locations, when possible.** The final product of this analysis should **provide resource agencies with a better understanding of the types and locations of areas they should target for better land stewardship in order to significantly reduce the phosphorus loads to Lake Champlain's Missisquoi Bay.**

Management objectives have been identified within the scope of this project that seek to: (1) prioritize tasks and funding to effectively target nutrient sources, and (2) to direct specific management practices toward identified CSAs. A strategic approach will consider the entire Missisquoi Bay Basin and would determine combinations of characteristics or management practices that lead to significant nutrient loading. These combinations will be ranked relatively based on their estimated contributions to loading in order to help prioritize action. A tactical approach will consider the farm-level or micro-watershed scale to locate sites where phosphorus sources and/or transport mechanisms should be mitigated.

The Lake Champlain Basin Program (LCBP) is seeking proposals for technical services to perform the following tasks, using available data and informed by relevant research (for this information, see <http://www.lcbp.org/ijc.htm>):

- *Strategic Analyses*
  1. Prepare a calibrated and validated model(s) and related geospatial analyses that use the highest quality data available to develop and evaluate factors present in the Missisquoi Bay Basin that combine to create phosphorus sources. Applications of this work will:
    - characterize the magnitude of phosphorus sources (such as farmsteads, farm fields, wetlands, back roads, effective impervious surfaces, residential lawns, construction activities, wastewater, stormwater, fluvial processes, channel instability, forestry practices, etc.),
    - prepare a relative ranking of these phosphorus sources,
    - compare user-defined management scenarios and estimate associated reductions in phosphorus loads.
  2. Assess the spatial resolution, precision and accuracy of data to determine its suitability for modeling as well as the modeling assumptions that may affect the model outputs. Assessment will adhere to an EPA-approved secondary data Quality Assurance Project Plan (QAPP).
  3. Perform a sensitivity analysis where appropriate, provide estimates of confidence levels with model results, and describe limitations to selected approach(es), including phosphorus runoff from agricultural lands.

4. Develop and apply objective criteria to rank the importance of phosphorus CSAs to Missisquoi Bay water quality; including, but not limited to:
    - the spatial extent of the source,
    - the severity of phosphorus loading from each source,
    - the urgency of the threat to water quality.
  5. Characterize the importance of spatial and temporal patterns of precipitation, runoff and seasonal flooding to the risk of phosphorus transport from CSAs, considering both historic and projected trends.
  6. At the conclusion of the project, the contractor will provide the LCBP with copies of all materials used to perform the strategic and tactical analyses, as well as the results.
- *Tactical Analyses*
    1. Develop maps of the hydrologic network in the Basin, expanding the existing digital Vermont Hydrography Dataset to include available information on:
      - ephemeral and intermittent streams
      - field and roadside ditching,
      - stormwater outfalls, and
      - other modified surface water features.
    2. Identify physical locations of potential CSAs at the micro-watershed scale based on phosphorus source and transport mechanisms. Information on these locations should utilize information generated by the strategic analysis and LiDAR data where available.
    3. Develop and apply a method to produce annotated maps to illustrate and prioritize potential CSAs, based on the findings of the strategic analysis, for field practitioners to visit and evaluate.

### **III. Summary of Other Requirements for the Selected Proposal**

The final modeling and mapping product(s) must include careful documentation of the steps required to enable future analyses, so they can remain dynamic over time as new data become available. The final product should incorporate results from all available data, including modeling efforts devised in this project as well as available remote sensing data and GIS-based overlays. The modeling product and final report should indicate how changing management practices and improved phosphorus source control will affect CSA locations and suggest an approach to reassess active source areas. To facilitate future applications of this model with updated information, careful documentation of the full modeling exercise and provision of data sets employed are essential deliverables. Deliverables will include a summary and annotated bibliography of related research in the basin that pertains to modeling results and the management of phosphorus load. Project results will be accessible to the public and must be clearly useful to the LCBP and state, provincial and federal agency partners working to decrease nutrient pollution to the Missisquoi Bay.

Additional project status reporting deliverables will be required, as follows:

- For the selected proposal, an approved workplan will be required before a grant agreement can be executed and the work begun. This workplan will detail the logistical elements of the project, including deliverables, project timeline, and budget. This workplan should be approved by May 3<sup>rd</sup>, 2010.
- The contractor will be required to submit a secondary data QAPP for approval prior to selecting and utilizing secondary data of sufficient quality for the future modeling effort. This QAPP must be approved before any modeling exercises can begin.
- The contractor 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 August 1<sup>st</sup>, 2011.
- The contractor also will be required to check-in with LCBP staff approximately every eight weeks to discuss work progress and any challenges encountered.
- When approved, the final report will be edited for content and style in consultation with the contractor and published as part of the Lake Champlain Basin Program's Technical Report Series.
- The contractor 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 is permitted. 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. Technical credentials of the investigator(s). Critical source area identification will require an understanding of geospatial modeling and analysis techniques, such as HSPF, SWAT, SPARROW, AVGWLF, or AnnAGNPS (other modeling approaches such as GIS analysis are also acceptable). This work will also require knowledge of GIS data types and their applications (including LiDAR products and digital orthophotography), data quality evaluation, dataset management and creation/documentation. Investigator(s) must have experience with the development of pollution loading models. Good communication skills are also necessary.
2. Demonstrated understanding of agricultural, developed, and forest land use types and associated water quality issues as well as the management programs in the Lake Champlain Basin, especially those concerning phosphorus pollution.

3. Demonstrated knowledge of best management practices for agricultural and developed nonpoint-source phosphorus pollution and fluvial processes.
4. Technical merit and feasibility of the proposed methods to identify critical source areas of phosphorus pollution.
5. Potential for the project to enhance the technical capabilities and infrastructure within the Lake Champlain Basin. Proprietary products are not acceptable.
6. Clarity, conciseness and adherence to the attached proposal guidelines.
7. Demonstrated ability to create documents and products that are accessible to and can be used by local partners working to decrease nutrient pollution to the Missisquoi Bay.

#### **VI. Available Funds and Match Requirements**

Up to \$300,000 is available for this project, with significant proportions of resources to be allocated to both the strategic and tactical analyses. Match is not required.

#### **VII. Period of Performance**

Work is to be completed within fifteen (15) months of the execution of a grant agreement and no later than August 1<sup>st</sup>, 2011; contract extensions will not be considered. The LCBP will submit its final report on the critical source area analysis to the IJC on September 30<sup>th</sup>, 2011 and may require further assistance from the contractor until this report is approved. This schedule is subject to change at the discretion of the LCBP.

#### **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 **Friday, March 5<sup>th</sup>, 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 **Friday, March 5<sup>th</sup>, 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 of the person who will be the point of contact.

**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 fifteen (15) 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 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.