



Lake Champlain Basin Program Announcement

Request for Proposals

An Evaluation of Herbicides and Other Factors that Have the Potential to be Contributing to Cyanobacterial Blooms in Lake Champlain

The Lake Champlain Basin Program (LCBP) is pleased to announce a Request for Proposals (RFP) for projects that will evaluate factors other than phosphorus alone that have the potential to be contributing to toxic cyanobacterial blooms in Lake Champlain. The project will support the goal of protecting humans from water-related health hazards, as outlined in Lake Champlain's long-term management plan, *Opportunities for Action: An Evolving Plan for the Future of the Lake Champlain Basin*.

The risk of adverse human health impacts is increased with exposure to toxic cyanobacteria in surface waters through drinking water consumption, swimming, and other contact recreation. Cyanobacterial blooms in some parts of the Lake appear to have increased in duration and intensity, far exceeding concentrations of concern for the protection of human health. In several documented cases, pet exposure to cyanobacterial blooms has resulted in adverse consequences. While the relationship between nutrients, primarily phosphorus, and algal blooms, has been well documented, other factors that may be contributing to primary production dynamics in Lake Champlain have been less well studied. Concurrent with recent observations of cyanobacterial blooms and toxins, zebra mussels have become established in many parts of the Lake. Additionally, trace levels of herbicides have been detected in areas of the Lake, with highest concentrations measured in areas where the most intense cyanobacterial blooms have been observed. This RFP seeks a qualified individual(s) or institution(s) to evaluate and investigate related factors, other than phosphorus alone, with the potential to contribute to recently observed toxic cyanobacterial blooms in Lake Champlain, with special emphasis on Missisquoi Bay.

The RFP 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 (10 copies) and electronic versions (no facsimiles) of proposals must be RECEIVED by the Lake Champlain Basin Program office by the close of business:

Monday, May 17, 2004

LATE OR INCOMPLETE PROPOSALS WILL NOT BE CONSIDERED

**Lake Champlain Basin Program
Request for Proposals**

***An Evaluation of Herbicides and Other Factors that Have the Potential
to be Contributing to Cyanobacterial Blooms in Lake Champlain***

I. Background

The Lake Champlain Basin Program is a partnership between state, provincial, and federal government agencies, as well as many local community and business groups, all working together to protect and enhance the environmental integrity and the social and economic benefits of the Lake Champlain Basin. In 2003, the Lake Champlain Basin Program revised *Opportunities for Action: An Evolving Plan for the Future of Lake Champlain*, a comprehensive management plan for Lake Champlain, addressing a range of issues from water quality to cultural heritage protection. The four highest priorities in the plan are reducing phosphorus pollution, protecting human health, reducing pollution from toxic substances, and controlling nonnative aquatic nuisance species.

Cyanobacterial blooms have occurred in Lake Champlain for many years. However, it is only since the late 1990's that the presence of significant amounts of cyanobacterial toxins has been noted in conjunction with these blooms. Cyanobacterial blooms in some parts of the Lake appear to have increased in duration and intensity. Recent monitoring, particularly in Missisquoi and St. Albans Bays, has documented intense blooms with accompanying concentrations of cyanobacterial toxins exceeding "concentrations of concern" for the protection of human health. Monitoring has not demonstrated a clear correlation between cyanobacterial toxin densities and nutrient concentrations. Concurrently with recent observations of cyanobacterial blooms and toxins, zebra mussels have become well established in many areas of Lake Champlain. Additionally, trace levels of herbicides have been detected throughout the Lake, with highest concentrations measured in areas of the Lake where the most intense cyanobacterial blooms have been observed. While the relationship between nutrients (primarily phosphorus) and algal blooms has been well studied, other factors contributing to phytoplankton community dynamics in Lake Champlain have been less well studied. Such factors include, but are not limited to, ecosystem changes resulting from the zebra mussel invasion of Lake Champlain and the potential effects of herbicides on the species composition of phytoplankton populations in the Lake. The Vermont Agency of Agriculture, Food, and Markets (VTAAF) has confirmed that atrazine is present in Lake Champlain (ppb concentrations). Other herbicides may be contributing factors, such as triazines, amides, chloroacetanilides, sulfonyleurea, and phenoxy herbicides. A full listing of agricultural pesticides and quantities applied annually in Vermont by County can be found at the VTAAF website: <http://www.vermontagriculture.com/pidpestuse2002.htm>.

II. Required Proposal Elements

The Lake Champlain Basin Program (LCBP) is seeking proposals for projects that will evaluate and investigate factors, other than phosphorus alone, with the potential to contribute to recently observed toxic cyanobacterial dynamics in Lake Champlain with special emphasis on Missisquoi Bay.

The successful proposal will address the following specific elements:

1. The project will conduct bioassays to characterize the potential for herbicides detected in Lake Champlain to cause changes in the relative distribution of algal species in the Lake. The primary question of concern is whether or not these herbicides may be preferentially affecting non-cyanobacterial components of the algal community to the advantage of cyanobacteria, resulting in their relative proliferation.
 - 1.1. Specifically, the primary objective of this bioassay will be to determine what concentrations of herbicides known or likely to occur in Lake Champlain affect the growth and viability of phytoplankton species known to be common components of the algal assemblage in Lake Champlain.
 - 1.2. The herbicides to be tested will be selected based on the likelihood of use in the Missisquoi Bay watershed and of their relative bioactivity and toxicity. The VTAAFMM has offered to assist in the identification of herbicides to be tested. They will provide 1000 ppm stock solutions of herbicides and quantify the exact amounts of the selected herbicides for use in bioassay testing. They will help identify appropriate concentrations (ie ppb or ppt) to be used in the analyses. The VTAAFMM will also help determine the list of herbicides to be used in the assays based upon aggregate use as reported and relative toxicity. Potential herbicide candidates include the triazines, amides, chloroacetanilides, sulfonyleurea, and phenoxy herbicides. The selected herbicides are to be tested at different concentration levels against different algae concentrations to determine at what levels these chemicals affect green or blue-green algae populations.
 - 1.3. The algae to be tested should be species known to be a significant component of ambient algal assemblages in Lake Champlain, particularly in Missisquoi Bay.
 - 1.4. Results of the bioassay should allow investigators to draw some conclusions regarding the potential for ambient concentrations of herbicides to shift algal dynamics, such that growth and proliferation of cyanobacteria are enhanced over other algal components of the ambient assemblage.
2. The project will summarize what is known and unknown about potential causes of recent toxic cyanobacterial blooms in Lake Champlain, with a focus on Missisquoi Bay. This summary should address items 2.1 and 2.2 below. A selection of relevant research papers is available from the Lake Champlain Basin Program using the contact information listed in Section IX below.
 - 2.1. Address the issue of whether or not recent observations represent a real change in historical patterns of toxin-producing cyanobacterial blooms and, if so, what recent changes in the ecology of the Lake may be contributing to those changes.
 - 2.2. Address potential driving forces other than phosphorus or herbicides alone.

III. Summary of Other Requirements for the Selected Proposal

1. To be eligible, the selected project is required to show a non-federal match equal to 25% of the total project cost (i.e., award plus match – see Section VI for more information).
2. For the selected proposal, an approved workplan will be required before a grant agreement can be executed and the work begun.
3. Prior to conducting bioassays, a Quality Assurance Project Plan (QAPP) consistent with USEPA guidelines for the bioassay methods and procedures must be submitted to the Lake Champlain Basin Program for review and approved by the USEPA before analyses begin. Project schedules should allow at least eight weeks from the time of QAPP submission for review and approval.
4. The consultant 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 describing all data, methods, results, and Quality Assurance and Quality Control procedures, and fully documenting the project's results will be required at project completion.
5. When approved, the final report will be edited for content and style in consultation with the consultant and published as part of the Lake Champlain Basin Program's Technical Report Series. The author(s) also is(are) encouraged to submit one or more articles resulting from the project for publication in a peer-reviewed scientific journal.
6. 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.

V. Proposal Evaluation and Selection Criteria

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

1. Demonstrated knowledge of the historical and current conditions of Lake Champlain as they relate to toxic cyanobacterial dynamics.
2. Demonstrated knowledge of environmental and ecological factors affecting

phytoplankton dynamics in lentic environments.

3. Knowledge of the principles and methods involved in conducting algal response bioassays.
4. Technical merit and feasibility of the proposed methods to conduct bioassays that will determine what concentrations of herbicides known or likely to occur in Lake Champlain affect the growth and viability of phytoplankton species known to be common components of the algal assemblage in Lake Champlain, as described in Section II.
5. Extent to which the proposed project leverages additional resources by developing partnerships with other projects, as described in Section II. Proposals that leverage additional resources by developing partnerships with related water quality and natural resources management initiatives, including sharing project sites, sampling crews, etc., will be evaluated more favorably.
6. Suitability of laboratory facilities for conducting the proposed testing procedures.
7. Technical credentials of the investigators.
8. Potential for the project to enhance the technical capabilities and infrastructure within the Lake Champlain Basin.
9. Provision of a public education element (at minimum, a project summary intended for lay audiences is required).
10. Clarity, conciseness and adherence to the attached proposal guidelines.
11. Demonstrated ability to create documents and products that are accessible to and can be used by local natural resource managers.

VI. Available Funds and Match Requirements

A total of \$25,000 is available for this project. A 25% match (\$8,333) of the total project cost (award + match) is required, either as funds or in-kind services. Budget proposals should clearly document the intended use(s) and source(s) of matching contributions. Federal funds may not be used as a source of matching funds.

VII. Period of Performance

Work is to be completed within 24 months of the execution of a grant agreement.

VIII. Schedule and Requirements for Proposal Submission

- Please follow the format outlined in the attached Technical Proposal Format Requirements.
- Ten (10) paper copies of each proposal must be RECEIVED by the LCBP office by the close of business on **Monday, May 17, 2004**. Please submit paper copies bound only with a single staple or binder clip.
- In addition, please submit an ELECTRONIC VERSION of your proposal, either on diskette or via e-mail. Electronic versions must also be RECEIVED by close of business on **Monday, May 17, 2004**.

IX. Contact Information

Direct all proposals and other inquiries:

Michaela Stickney
Vermont Lake Champlain Coordinator
Lake Champlain Basin Program
PO Box 204
54 West Shore Road
Grand Isle, VT 05458
(802)241-3619
(802)372-3213

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, organization, address, telephone, fax, and email.

ABSTRACT: Brief description of proposed work.

INTRODUCTION: Overview of what the project is, how it relates to past projects (in the Basin and elsewhere), 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.

Note: If the selected proposal involves environmental data collection, the investigator(s) must submit a Quality Assurance Project Plan (QAPP) to the US Environmental Protection Agency (USEPA). The QAPP must be approved prior to the start of data collection. The QAPP review may require 8 weeks or more to be completed once it is submitted to USEPA.

DELIVERABLES: Detailed descriptions 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 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 required match amounts and totals. A non-federal match equal to 25% of total project costs is required, either in funds or in-kind services (e.g. for \$30,000 the match equals \$10,000 which is 25% of \$40,000). (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 5 references for publications pertinent to proposed project. Please limit to one page per investigator, not included in the 10 page maximum total for the proposal.