

**Missisquoi Bay Basin Project:
Identifying Critical Source Areas of Pollution**

**Short-term Tributary Monitoring Program: Second Interim Report
IJC Deliverable for Task 3, Subtask 2: 15 November 2010
Executive Summary**

Project Status

The first full season of short-term tributary water quality monitoring conducted by the Lake Champlain Basin Program (LCBP) began on March 22, 2010. LCBP staff has sampled five tributaries in the Missisquoi Bay Basin – Hungerford Brook, Black Creek, Tyler Branch, Trout River, and Mud Creek – in accordance with the approved Quality Assurance Project Plan (QAPP) for this project. LCBP staff will continue sampling until early winter of 2010, when the tributaries freeze. To date in 2010, 12 high-flow (storm event) and 4 low-flow (base flow) samples were collected at each site and analyzed for: water temperature, pH, conductivity, alkalinity, total and dissolved phosphorus, total nitrogen, total suspended solids, chloride, and earth metals (sodium, magnesium, potassium, calcium, and total calculated hardness). As part of the sampling protocol, 8 field quality control samples were collected and analyzed for all parameters. Additionally, 38 samples were collected from an automated sampler (ISCO) installed at Hungerford Brook and analyzed for total phosphorus and suspended solids. LCBP staff also collected one base-flow sample at each site on December 18, 2009.

LCBP staff also collaborated with staff of the Québec Ministère du Développement durable, de l'Environnement et des Parcs (QC MDDEP) in order to compare laboratory testing results. Partners met in Highwater, Québec on September 8, 2010 to split samples that each group had collected from sampling sites in the Missisquoi Bay Basin; these samples were submitted to the Vermont and Québec laboratories for analyses of total suspended solids and total phosphorus. Samples were representative of low-flow conditions and results from these analyses will be evaluated in terms of relative percent difference to identify discrepancies between the two laboratories. Sample splits from a high-flow event will be collected in spring 2011 to identify laboratory discrepancies at higher flows.

To date, the Lab has finalized results for all samples collected prior to September 1, 2010; all other results will be submitted to the LCBP upon completion and approval by the Laboratory Director. Few data are currently available for a rigorous statistical analysis; a complete data analysis will be provided with the final report for this project, per the contractual requirements.

Challenges Encountered

The QAPP states that “Water quality samples will be taken following precipitation events with a target of 20 high-flow total phosphorus samples per year. In addition, 4 low-flow total phosphorus samples will be taken each year.” The high-flow target has been challenging to meet due to the lack of large storm events this year, and due to the timing of high-flow events that did occur. LCBP staff is working to collect additional storm events before the tributaries freeze, but it is unlikely that the target of 20 sampling dates in 2010 will be met. The low-flow target has been met for 2010.

The QAPP also recommends a target for automated sample collection: “The United States Geological Survey (USGS) will install an automated sampler (ISCO) on Hungerford Brook... A total of 40 samples per year will be collected between the months of March and November.” To date, 38 samples have been collected for analysis, so it is likely that this target will be met before the end of November.