

2014 CCCR national summit case studies

Research design

The implemented community-based research methods are very innovative. They allowed for such unique actions as the formation of monitoring committees and the hiring of a community researcher by the Parole d'excluEs organization. This person acts as a mediator between the team of academics, the team of professionals and the team of residents. In terms of methodology, we see a hybridization or combination between traditional methods and community-based research methods. Overall, these practices of research design diverged from previous methods used at IUPE and allowed for new connections between university research and the community to be formulated.

Indicators important for assessing research design:

- Presence of university researchers in the field and on committees
- Hiring of a community researcher
- Methodological hybridity between traditional and community-based research approach

Research Program: Issues related to cyanobacteria in Bromont Lake

Institution	Incubateur Universitaire Parole d'excluEs (IUPE), Université du Québec à Montréal (UQAM)
Researchers	Laurent Lepage, Dolors Planas, Beatrix Beisner; Professional staff dedicated to partnership: Claire Vanier; Post doctoral fellow: Alexandrine Pannard; Graduate students : Mathieu Charland-Faucher, Kathleen McMeekin, Myriam Jourdain, Paola-Andrea Cabal Gomez, Zuzana Hrivnakova; Interns : Estelle Lavirotte, Annick St- Pierre, Simon Laberge-Godin, Julien Ceré, Elizabeth Vigean
Location	Bromont, Eastern townships, Québec
Dates	2006—2013
Partners	Action conservation du bassin versant du lac Bromont; Bromont Municipality; Stakeholders group : ministère de l'Agriculture, des Pêcheries et de l'Alimentation (MAPAQ), ministère du Développement durable, de l'Environnement et des Parcs (MDDEP), Ville de Lac-Brome, Ski Bromont, agricultural producers, construction entrepreneurs, Regroupement d'associations de riverains et de citoyens préoccupés par la préservation de l'eau (RAPPEL), Conseil de gestion du bassin versant de la Yamaska (COGEBY), Plages et Loisirs du Paradis de Brome inc.
Funders	Bromont Municipality; UQAM (SAC-GRIL); Ministère du Développement durable de l'environnement et des parcs (MDDEP); Environnement Canada; NSERC; Fonds de recherche du Québec – nature et technologies (FQRNT); Organisme de bassin versant de la Yamaska
Methods	Action research, quantitative and qualitative approach

Purpose of the research

The increasing presence of toxin-producing cyanobacteria (blue-green algae) in the waterways of several lakes in Quebec has raised the concerns of shoreline residents. Essentially, nutrient influxes, mainly phosphorus, are responsible for excessive algae growth which can have toxic effects on humans.

In Eastern Canada, the composition of rock and soil leads to low natural phosphorus input in the waterways. Anthropogenic activities such as: 1) fertilizer application, 2) deforestation of the watershed, 3) inadequate waste water and sewage management, and 4) use of maintenance products containing phosphorus, contribute to increasing phosphorus influx to the watersheds and waterways (Planas et al, Cahier 1, 2014).

Lakes are able, to a certain extent, to regulate occasional overload of nutrients by accumulating phosphorus surplus in the sediments. However, recurring inputs resulting from anthropogenic activities, can overload the regulating mechanisms and the storage capacity of the sediments. Under specific conditions, sediments can release the accumulated phosphorus into the water column. As a result, high levels of phosphorus promotes the growth of several species of algae; amongst these is the blue-green algae, which produces cyanobacterial toxins. These toxins fall into various categories; some are known to attack the liver (hepatotoxins) or the nervous system (neurotoxins); others simply irritate the skin (Chevalier et al., 2001).

In the last ten years, Quebec's Public Health Agency and Ministry of Environment had to close several public beaches as the levels of cyanobacterial toxins in these lakes were of potential adverse effect to humans. Beach closures and health advisories were likely the wake-up call for residents, municipality and other stakeholders that become involved in local research projects. Lake Bromont was one of these lakes (Bromont, 1997).

In 2006, members of a local NGO (Action Conservation du Bassin Sersant du Lac Bromont - ACBVLB), whose focus in the past years was to be watchdog over the municipality, repositioned their mission (ACBVLB, 2007). This proactive repositioning aimed to create a dialogue between different stakeholders in order to find solutions for restoring the health of

the lake and its ecosystem, watershed and tributaries. This would ensure the sustainability of recreational usages and water quality.

As a result of their concern, a new partnership with the municipality of Lake Bromont was created and a stakeholders group was set up with the purpose of monitoring perceptions, comprehension and needs for restoring the health of the lake. Overall, this project aimed to document: 1) the regional and local context, both at the bio-physio-chemical and the socio-political levels, and 2) stakeholders' perspectives and proposed solutions to this environmental problem.

Key stakeholders included:

- Municipal and Provincial Governments: MAPAQ, MDDEP, Ville de Lac-Brome
- Businesses: Ski Bromont, agricultural producers, construction entrepreneurs
- NGOs: RAPPEL, COGEBY, Plages et Loisirs du Paradis de Brome Inc.

Specific objectives of the project:

Document the regional and local context in order to:

- Measure the nutrients loading into and distributing from the watershed
- Quantify the amount of phosphorus in the lake (water and sediments) and its tributaries
- Quantify the quality and quantity of algae bloom
- Understand the stakeholders' individual points of view

Document stakeholders' solutions in order to:

- Acknowledge the process of knowledge mobilization between stakeholders
- Understand the process of consensual dialogue; what we know
- Recognize the process of building consensual solutions and shared responsibilities

The specific needs of the shoreline residents were brought to our attention by the ACBVLB through the UQAM's Service aux collectivités. UQAM, an urban comprehensive public French-language university, was founded with the mandate of increasing accessibility and democratization of higher education. Accessibility was defined in a broad sense to

2014 CCCR national summit case studies

encompass sectors of the community not usually served by universities, but mainly by NGOs involved in collective advancement. An Institutional Policy on Community Services, which promotes the democratization of access for these groups was adopted in 1979, and concrete means were implemented to facilitate and encourage university-community partnership (<http://www.instances.uqam.ca/ReglementsPolitiquesDocuments/Pages/Politiqueno41.aspx>).

This Institutional Policy was developed based on several founding principles:

- Recognition of NGOs as full and effective partners of the University in terms of training and research activities
- Recognition that this strategic partnering, based on intellectual inputs and knowledge-sharing, would enable all partners to pool their resources to achieve results they could not attain alone
- A project-by-project approach in which the identification of partners, objectives and methods must be agreed upon prior to the development of each project
- The necessity of setting up institutional procedures and criteria to ensure both the social relevancy and the scientific quality of projects
- The recognition that training as well as research or creative activities carried out with NGOs would be integrated into regular duties of a faculty member, and not be relegated solely to a third mission promoting the diffusion of knowledge
- The importance of knowledge mobilization to achieve the engagement and social responsibility standards of UQAM

The operationalization of the university-community engagement is rendered possible through the Community Services Unit (Service aux collectivités). Its mandate is to promote and coordinate training and research activities to be carried out by faculty members in collaboration with NGOs. The coordinator's role, acting as the main intersection between community and the university, is critical to implement collaborative and equitable relationships between stakeholder parties. They provide the main entry point for NGOs into the university, and act as animators, conciliators and facilitators of the partnership, helping to build the bridges between the scientific and experiential knowledge, assisting in

writing the memorandum of understanding (MOU), and facilitating knowledge mobilization.

Research design and methodology

Different research methods were used to cover all aspects of this project. Both the regional and local context needed to be documented, which included both the lake's bio-physico-chemical aspects and also the stakeholders' individual points of view. Two teams started this work: one was composed of limnologists and biologists and the other one was composed of sociologists and political scientists.

Characterization of nutrient loading and algae levels were made using quantitative methodology (Planas et al., Cahier 3, 2014). Samples of water and sediments were collected in the lake and tributaries in 2007-2008, 2008-2009, 2009-2010 and 2010 from different sites. Nutrients and algae biomass were quantified. Several contributing variables were also measured such as temperature, oxygen, stream flow, etc. (Planas et al., Cahier 3, 2014).

Alternatively, stakeholders' individual points of view, perceptions and knowledge were collected through qualitative, structured interviews at the beginning of the project. The subsequent step was to build solutions based on the data and knowledge originating from both the stakeholders and the research team of limnologists and biologists. This process allowed a critical analysis of the scientific evidence.

The processes of ensuring consensual dialogue and subsequently building consensual solutions were realized through several steps. The first step in building solutions with different stakeholders was to allow the expression of the diversity of influences, values, motivations, perceptions and knowledge from each group (Canada, 2000). Using a qualitative focus-group approach, each stakeholder group was able to present their views on different aspects of the lake and the research project. The second step was to build connections between these different perspectives (Gangbazo, 2004; James & Lahti, 2004; Amblard et al., 2005; Beuret, 2006; Brassard, 2007; Brassard et al., 2007). This collaborative approach needed to be conducted in a framework highly cognizant of the power relations that could emerge between the stakeholder parties (Fortier, 2009).

2014 CCCR national summit case studies

Within the second step, the creation of a consensual agreement occurred through several stakeholder workshops. These workshops were organized and conducted by a member of the research team.

Themes of the workshops:

- Identifying the challenges
- Sharing visions
- Choosing possible actions
- Prioritizing solutions and implementation
- Finalizing the concerted plan, activities, responsibilities, and timeframe

Domains of research excellence

Community relevance

The needs (restoring the health of the lake) were expressed by the local community. The project was built with them; a first diagnostic on knowledge gaps (bio-physico-chemical aspects) led to the design of the characterization phase. Finding sustainable solutions for all stakeholders were the other objectives identified by the community. The project was built with the community representatives to answer both aspects.

Equitable participation

The project was carried out from 2006 to 2013. This represented a certain burden on NGO representatives. For them, without the engagement of a coordinator from the Service aux collectivités, it would have been very difficult to keep the momentum. The role of the coordinator acting as the intersection between community and the university, is critical to implement collaborative equitable and sustainable relationship between parties. The knowledge that was mobilized helped the members of ACBVLB to pursue their mission and to be active partners with the Municipality in this project. Throughout the projects, a lot of highly technical aspects were shared; members of ACBVLB and other stakeholders were able to appropriate this knowledge allowing them to be collectively and equally involved in finding sustainable solutions.

One major issue was to keep a collective leadership in the project. The municipality representatives were not comfortable, at the beginning of the process, with this collaborative framework. Their usual way of collaboration was based on government-sponsored research, which is slightly different.

Action and change

The project led to clear commitment for actions and changes. Several axes of interventions were proposed by all stakeholders and for each, specific activities, designated the party accountable for its implementation, along with a timeframe. Yearly, a meeting with stakeholders is organized to report on progress and challenges faced with conducting interventions and proposed activities.

Examples of axes of interventions are provided:

- To harmonized and review regulatory framework (municipal and provincial levels);
- To limit deforestation;
- To protect, stabilize and re-naturalize the lake banks;
- To control erosion while building new houses near the lake;
- To improve road infrastructures management.

We are currently working to set up another phase of the project based on scientific findings generated by the limnologist-biologist team. This pilot-project will be designed to remediate sediments by lowering accumulated phosphorus surplus. One indicator of success of the process is that this new project has been proposed by the ACBVLB and municipality representatives to the MDDEP. Parties are actively involved in fund raising. Also, the purpose of this project –restoring the health of the lake- after all these years, remains a shared priority for both parties (ACBVLB and Municipality) and coordinated efforts are still being made to pursue the work.