Practice imperfect: environmental decision-making and management in Lake Champlain's northern watershed shared by Canada and the US

“...I realized that the particular place I'd chosen was less important than the fact that I'd chosen a place and focused my life around it...”

--Richard Nelson, Anthropologist from The Island Within

Abstract

Lake Champlain’s watershed is shared by Vermont and New York in the US and Quebec in Canada. Strong identities and place-centered affiliations exist among citizen-based watershed groups and the underlying natural resource management regimes. Lake Champlain’s northern waters are a place both rich in citizen action and rich in nutrients. The northern waters include Missisquoi Bay, which is shared by Vermont and Quebec and is the most impaired part of the Lake. The actions of small place-based citizen groups working at a micro-level are contributing to watershed protection at a much larger scale. Environmental decision-making and management by Vermont, New York and Quebec is characterized by consensus reached through a continuous sequence of nonbinding, nonregulatory agreements (Stickney, 2008). These agreements support and revolve around engaged government agencies that are integrated with engaged place-based citizen groups, among other organizations.

Since the historic 1988 Memorandum of Understanding on Environmental Cooperation on the Management of Lake Champlain, 16 additional agreements have been signed—averaging nearly one per year. They range from joint declarations and watershed plans to phosphorus standards and toxic spill responses. They are renewable agreements bearing the support and participation of state, provincial, and federal agencies; local government; and businesses with a very strong citizen component (Stickney, 2008). In 2009 and 2010, four of these agreements are scheduled for renewal. This progression of cooperative agreements falls under the purview of the Lake Champlain Basin Program, a quasi-governmental, public-private partnership among Vermont, New York and Quebec that coordinates Lake Champlain’s long-term management plan, Opportunities for Action: an Evolving Plan for the Future of the Lake Champlain Basin.

Use of nonbinding, renewable agreements more easily bridges differences among jurisdictions, whether interstate, intrastate or international. Additionally, these agreements can be updated more immediately as new information and technologies emerge. These agreements can be assembled more quickly than pursuing a traditional regulatory or legislative avenues. Due to this integrated decision-making model, UNESCO designated the Lake Champlain Basin as one of seven demonstration watersheds worldwide within its Hydrology, Environment, Life, and Policy (UNESCO HELP) program in 2005. In 2009, the basin was promoted into the third stage of the HELP program.

Some natural resource management models may portray a pyramid to show top-down management practices utilized by natural resource managers at the top of the pyramid supported by a strong or a pyramid base of citizens. In the Lake Champlain Basin, an inverted pyramid with citizen input driving actions and practices by resource managers or an integrated quilt may be more accurate. In a quilt analogy, the resource management programs comprise a framework or base fabric. The place-based citizen groups, or patches, are what holds the quilt together and depict the character and flavor of the joint management practices. The separate pieces create layers of organization, and by overlapping, strengthen the fabric. This symbiotic relationship is influenced by strong connections to place.
I. INTRODUCTION—DESCRIBING THE LAKE CHAMPLAIN BASIN—the place

Lake Champlain Basin description and place names

Lake Champlain’s watershed is shared by Vermont, New York and Quebec. The Adirondack Mountains in New York border the west side of the basin, and the Green Mountains in Vermont border the east side of the basin. Quebec is to the north. The Richelieu River drains Lake Champlain into the St. Lawrence River where it meets waters flowing out of the Great Lakes. From north to south, the lake spans about 200 km, while it is 19 km at its widest point. The watershed is 21,326 km² and its greatest depth is 122 m. There are many bays and more than 70 islands.

Lake Champlain’s long length and narrow width contribute to the lake being divided into five major segments. Each segment has unique physical characteristics and different land uses in its surrounding sub-basin which influence the water quality of that segment. The public is conversant in and identifies with names of the five major segments: North Lake, South Lake, Broad Lake, the small Malletts Bay, and the interestingly named Inland Sea (Figure 1). The North Lake, which includes Missisquoi Bay shared with Canada, and South Lake have the most eutrophic waters due to predominantly agricultural land uses, although lake-wide, urban land uses contribute a higher percentage of phosphorus to the lake (Troy et al, 2007). Consequently, many concerns for Lake Champlain are location-specific. While extensive blue-green algae blooms are a serious problem in Missisquoi Bay, they have not proved problematic in the South Lake. For phosphorus targeting purposes, especially within the federally required Lake Champlain Phosphorus TMDL, the lake basin is further subdivided into 13 lake segments and 19 subwatersheds or catchments.

A multitude of citizen groups have formed in and around these major lake segments. In an interesting juxtaposition, many watershed residents identify themselves by the place names which are now synonymous as the most polluted regions of the lake, such as the South Lake, Missisquoi Bay, and St. Albans Bay. St. Albans may have been the first town in New England named for a saint, something that puritanical society avoided because of its reference to the papacy.

According to 2000 United States and Canadian census data, the Lake Champlain Basin population is 571,000 people, and as population climbs, evolving impacts on the lake continue to cause concern. The overall watershed land cover is about 66% forested, 14% agricultural, 5% urban and suburban, and 15% water and wetlands (Figure 2).

A new (2007) land use and land cover study of the basin indicates that urban and suburban land (only 5% of land cover) contribute about 46% of phosphorus runoff to Lake Champlain overall and agricultural lands contribute about 38%. However, these proportions vary significantly among the various sub-watersheds. Agricultural land use is still the greatest contributor of phosphorus (about 70%) in the Missisquoi Bay sub-watershed (Troy et al, 2007). While only 7% of the watershed lies in Quebec, Vermont and Quebec share Missisquoi Bay, the single most impaired region of Lake Champlain. Therefore, Quebec’s participation is crucial to the health of the rest of the lake.

To better understand how Vermont, New York and Quebec overcome historical differences, it is helpful to illustrate how their political boundaries, geographic identities and population characteristics are manifested. In Vermont, citizens have significantly stronger political
identities at the town level than at the larger county or state levels. There are high levels of participation and action at the local level regarding Lake Champlain clean up activities. There are 136 Vermont towns in the Lake Champlain Basin and 47% of the state is physically located within the Basin. Most of these towns have populations ranging from 1,000-4,000 people. In New York, citizens tend to have stronger political identities at the county level. There are four major counties in the New York part of the Basin. Quebec citizens often identify themselves by federally designated regions called Regional County Municipalities (MRC). The Montérégie MRC includes the small portion of Quebec in the Basin (Lake Champlain Basin Program, 2004). These radically different geographic identities can challenge the cohesiveness of watershed protection and restoration efforts. However, the structure of the Lake Champlain Basin Program allows various political interests to be thoroughly and openly discussed, and as a result political will supporting watershed protection and restoration is threaded throughout these various local, regional, and federal levels.

Population and urban center locations also affect differences among the three jurisdictions. Vermont is one of the smallest states in the United States. Of the 609,000 Vermont residents, 64% or 390,000 live within the Lake Champlain Basin and there are three major cities with populations ranging between 15,000-39,000 people. Conversely, New York is one of the larger states in the United States with a population of 19 million people, yet the New York portion of the Lake Champlain Basin has only 151,000 people (Lake Champlain Basin Program, 2004). It is common in Vermont to see elected federal and state officials walking down the street, and Vermont’s capital city is located within the Basin, while New York’s capital Albany and economic center of New York City are well outside the Basin. Since most of the Vermont population lives within the Basin, it is easier to engage citizens in Lake Champlain issues, unlike New York, which also contains other internationally recognized waterbodies such as Lake Ontario of the Great Lakes system and the Finger Lakes. While the Montérégie MRC has 1.4 million residents and includes the city of Montreal, only 30,000 people live in the portion of Quebec that lies within the Lake Champlain Basin. Quebec residents use two languages—French and English—with French as the dominant language which requires language interpretation and document translation. With help from our Quebecois partners, the LCBP offers major documents in French to help bridge differences and promote mutual understanding (Stickney, 2008).

**Micro-description of the northern watershed**

The northern watershed in Vermont is enveloped primarily within Franklin and Grand Isle Counties and half of Orleans County. The northern watershed is characterized by a smaller more dispersed population and a higher concentration of agricultural land uses. Franklin and Grand Isle Counties are joined for political purposes. They encompass the northern islands and areas including Carry Bay and the Alburgh Passage, Missisquoi Bay, the Inland Sea, and St. Albans Bay, another highly impaired area in Lake Champlain. According to 2007 Vermont Census figures, Grand Isle County is 637 square miles with a population of about 7600, nearly 5000 housing units and a population density of about 83 people per square mile. Franklin County is 637 square miles with a population of about 48,000, nearly 21,000 housing units and a population density of about 71 people per square mile. There are two major cities: St. Albans and Swanton. St. Albans City, perched on the edge of eutrophic St. Albans Bay has a population of about 9700 people. St. Albans Town, which surrounds the city but is incorporated separately, has a population of about 5100. Swanton, farther to the north near Missisquoi Bay has a population of 6200 (Vermont Census, 2007). Given Northern Lake Champlain’s eutrophic conditions, it has also become plagued with blue-green algae blooms which have seriously compromised recreation uses and property values. Beaches have been closed to recreation
multiple years in a row in Quebec and Vermont and in the past 10 years, there were two or three dog deaths from dogs drinking lake water or eating algae.

II. ENVIRONMENTAL MANAGEMENT AND DECISION-MAKING FRAMEWORK

Overview. The environmental management and decision-making framework presented here has three main levels. The Lake Champlain Basin Program provides an overarching framework for Vermont, New York and Quebec at the regional and international level within the Lake Champlain Basin. The Vermont Agency of Natural Resources, especially through its new Center for Clean and Clear, provides a coordinated complementary framework with the Lake Champlain Basin Program at the state level. The State of Vermont provides leadership on the Lake Champlain Basin Program steering and executive committees. The International Joint Commission of Canada and the US provides an international perspective and support focused on Lake Champlain’s northern waters shared with Vermont and Quebec, specifically Missisquoi Bay. Both the Center for Clean and Clear and the International Joint Commission are engaged and support the Lake Champlain Basin Program’s overarching framework. This framework is brought to life through the engagement of many place-based citizen groups, such as the Northern Waters Partners coalition described in Part III.

Lake Champlain Basin Program—an overarching framework for the regional level and micro-international level

The Lake Champlain Basin Program is a quasi-governmental, public-private partnership among Vermont, New York and Quebec with federal funding that coordinates Lake Champlain’s long-term management plan Opportunities for Action: an Evolving Plan for the Future of the Lake Champlain Basin. The Lake Champlain Basin Program achieves significant watershed improvements through its consensus-based, decision-making policies supported by state-to-state and state-to-province agreements. This incremental approach emphasizes partnerships, local actions and involvement of citizens.

Inclusive committee structure. The Lake Champlain Basin Program committee structure offers opportunities and varying roles for stakeholder participation. Stakeholders from the three jurisdictions of Vermont, New York and Quebec represent local, state, provincial, and federal partners. There is a high level of citizen involvement. The Citizens Advisory Committees of Vermont, New York and Quebec are independent committees representing recreation, tourism, agriculture, business, and cultural heritage interests, environmental advocacy groups, and legislative leaders. They advise the public about lake issues and listen to citizen concerns. The Basin Program also has a Technical Advisory Committee, Education and Outreach Committee and a Cultural Heritage and Recreation Advisory Committee. All six advisory committee chairs have a seat on the Lake Champlain Steering Committee, the governing body for the Lake Champlain Basin Program (Figure 3).

Partnerships. Successful implementation of Opportunities for Action is achieved by developing many partnerships. As a neutral party with the participation and support of scientists, policymakers, citizens, and resource managers, the Lake Champlain Basin Program transcends litigation, political elections, and regulation to offer integrated partnership-based dialogue for solving difficult problems. To implement the plan, the Lake Champlain Basin Program makes grant awards to citizen, watershed, municipal, government, and business groups. Since 1992, more than $3 million have been spent on over 600 projects to reduce phosphorus, prevent the
spread of invasive aquatic species, improve watershed education, and attain lake improvement goals.

**Consensus.** Consensus and trust-building have helped Vermont, New York and Quebec leaders overcome policy conflicts. A consensus approach to decision-making creates a win-win atmosphere where minority opinions are usually incorporated into decisions that pass by majority vote. This process encourages open and public discussion, so that committee members can freely explore decisions before making commitments. The scale at which consensus has been used has worked well within the Lake Champlain Basin and within the various sub-watersheds. While the consensus process minimizes conflict, it does require that they share common goals. The consensus approach gives participants a meaningful role in developing viable solutions and group ownership of decisions unattainable through other means.

**Effective framework.** The Lake Champlain Basin Program forms an effective framework for water policy leaders, water resource managers and scientists to work collaboratively. This proven framework defines watershed management issues according to the needs of the watershed residents or “users.” A user-driven approach requires active involvement of policy and citizen groups to ensure scientific investigations will benefit community needs. Because policy leaders and resource managers contend with legal, institutional, regulatory, and economic interests, they need to understand which scientific information is most needed and communicate these needs to scientists. The Lake Champlain Basin Program annually funds more than $500,000 (US Dollars) for research and education in the basin. Trend analysis of long-term lake monitoring data allows scientists, resource managers and policy leaders to determine whether management goals and targets are on track and being met.

*The Center for Clean and Clear as a response to citizen action—a complementary framework for the state level*

The Lake Champlain Basin Program’s incremental, non-regulatory approach provided the supportive framework for the Governor of Vermont to initiate the *Clean and Clear Action Plan* in 2003 to find the estimated $142 million (USD) that will reduce phosphorus pollution to Lake Champlain. In 2007, the Vermont Agency of Natural Resources established a new office entitled the Center for Clean and Clear which for the first time brought together the Vermont Agency of Natural Resources and Agency of Agriculture, Farms and Markets. One reason this union is unique is that these agencies previously had separate regulatory programs that addressed different aspects of agricultural nonpoint source pollution sources. The Center for Clean and Clear not only implements *Clean and Clear Action Plan* funding, but it is also focused on accelerating the clean up of northern Lake Champlain, the single most polluted reach of the lake. The center places funds and other resources dedicated to improving Lake Champlain’s water quality, previously spread among various state programs, under the control of a single director who works directly for the Vermont Agencies of Natural Resources and Agriculture. The center’s designation is largely due to the mobilization of several organized yet very small citizen groups ranging in size from a few dozen to a couple hundred members, including the Northern Water Partners.

By developing a unique cross-cutting operational structure, the center has solidified strong lines of communication and action across existing programs, departments, agencies, and organizations. By opening a new state office in St. Albans, the center has a new and vital physical presence in the northern lake. The Center for Clean and Clear has energized action by the state in the northern lake through a combination of technical assistance and grant awards.
targeting nonpoint sources of phosphorus runoff from both agricultural and urban land. The center’s close ties with the Agencies of Natural Resources and Agriculture ensure a coordinated approach to regulatory compliance. As the center only has fewer than ten staff, it can be very responsive to the needs to place-based citizen group in the northern watershed. Center staff regularly meet with and assist members of the Northern Waters Partners. Many members of the Northern Waters Partners have been candidates or applicants for center funding to implement projects that will contribute to a cleaner Lake Champlain.

The largest challenge facing the center, as well as the Lake Champlain Basin Program, is how to quantify how much phosphorus pollution has been reduced according to the amount of money spent. Another challenge has been to estimate when the benefits of land-based solutions will change the in-lake phosphorus concentrations. To date, nearly $85 million, roughly half state funds and half federal funds, have been spent implementing the Clean and Clear Action Plan. Despite the significant amount of funds spent, in-lake phosphorus concentrations have primarily stayed the same and in some cases increased. Research conducted worldwide indicates that it may take years before phosphorus runoff reduced by land-based pollution reduction solutions, such as planting buffer strips, installing agricultural best management practices, or retrofitting stormwater control structures, result in a reduction of in-lake phosphorus concentrations. The Lake Champlain Basin Program and the Center for Clean and Clear share many goals in common and their resources and strengths complement one another.

**International Joint Commission of Canada and the US—a complementary framework for the international level**

Canada and the United States created the International Joint Commission because they recognized that each country is affected by respective actions in lake and river systems along the border. The two countries cooperate to manage these waters jointly and protect them for future generations. The 1909 Boundary Waters Treaty established the International Joint Commission, which has six members. Three are appointed by the President of the US and three are appointed by the Governor in Council of Canada, on the advice of the Prime Minister. Commissioners must follow the Treaty as they try to prevent or resolve disputes. They must act impartially, in reviewing problems and deciding on issues, rather than representing the views of their respective governments. While the International Joint Commission is most often involved with water quality and water level conflicts, they are also engaged with capacity building for already existing water-related committees.

The International Joint Commission first became involved with northern Lake Champlain in 2004 due to conflicts dating back to the early 1990s between Vermont and Canada about the Alburgh-Swanton bridge replacement, removal of the existing causeway and excessive phosphorus levels in Missisquoi Bay. The bridge crosses the mouth of Missisquoi Bay. The governments of Quebec and Vermont had previously signed the Missisquoi Bay Agreement in 2002 where each party agreed to reduce phosphorus pollution to Missisquoi Bay by 40% and 60%, respectively. Complete causeway removal was proposed to enhance water circulation between Missisquoi Bay and the Northeast Arm of Lake Champlain, also known as the Inland Sea.

Permits issued for new bridge construction by the Vermont Agency of Natural Resources required that most of the existing 80-year-old causeway be left in place because the causeway provides habitat for the spiny softshell turtle, a state-listed endangered species in Vermont with
similar legislative protection in Quebec. Therefore, causeway removal was limited to only 330 feet in the middle of the causeway. Many members of the public believed that the causeway constricted flow in the bay and trapped excess phosphorus levels. A Missisquoi Bay hydrodynamic model developed by consultants in 1997 indicated that removal of the causeway would reduce average phosphorus concentrations and sedimentation in Missisquoi Bay by about 1%. Despite the scientific modeling presented and results, public perception continued to support the belief that the causeway prohibited the bay from flushing excess nutrients. Vermont and Quebec created the Missisquoi Bay Task Force, which was coordinated by the Lake Champlain Basin Program, to investigate further.

The International Joint Commission issued their study report about transboundary impacts of Missisquoi Bay causeway removal in 2005. The commission affirmed the finding of the Missisquoi Bay Task Force that causeway removal would have a negligible impact on phosphorus levels in the bay. However, the Commission also recognized the prevailing local belief that the causeway contributed significantly to the problems of the bay. The commission found this belief so strong, they thought that as long as the causeway remains, it would continue to distract local citizens from taking the necessary actions to reduce phosphorus pollution into the bay. Therefore, the commission recommended that the causeway be removed under the condition that an amount of money equal to the cost of causeway removal be provided by the governments of Canada and Quebec to be spent roughly equally on both sides of the boundary to reduce phosphorus pollution into the bay and relocate habitat for the spiny softshell turtles. This recommendation was somewhat unexpected form an organization grounded in science-based decisions.

Since 2004, the International Joint Commission has continued to remain involved in northern Lake Champlain issues. As their continued participation must be linked to conflict resolution, they justify their participation as conflict avoidance. Their funds may not be used for implementation, but may be used for planning. They have signed an agreement to work collaboratively with the Lake Champlain Basin Program. Therefore, the commission selects projects in coordination with the Lake Champlain Basin Program. These projects range from nutrient management planning on small farm operations to the identification and mapping of critical sources of phosphorus pollution. By 2009, they will have invested nearly $2 million into protecting Lake Champlain. This collaboration has been a very successful joint venture so far. Since the International Joint Commission has historically worked at macro-levels such as the Great Lakes, it is unusual for them to work at Lake Champlain’s level.

**Decision-making paradigm in the Lake Champlain Basin through the framework provided by the Lake Champlain Basin Program**

The Lake Champlain Basin Program achieves significant watershed improvements through its consensus-based, decision-making policies bolstered by state-to-state, state-to-province agreements. This incremental approach, steeped in multi-level partnerships and institutions, epitomizes the theory of natural resource regimes which emphasize roles of intermediate institutions in environmental management (Drost and Brooks, 1998).

Since the historic 1988 *Memorandum of Understanding on Environmental Cooperation on the Management of Lake Champlain*, 16 additional agreements have been signed—averaging nearly one per year. They range from joint declarations and watershed plans to phosphorus standards and toxic spill responses. These renewable agreements bear the support and participation of state, provincial, and federal agencies; local government; and businesses with a very strong citizen component (Stickney, 2008). In 2009 and 2010, four of these agreements
are scheduled for renewal. They have been signed by governors and premiers, state and federal natural resource policy leaders, senators and mayors, and nongovernmental organizations.

Use of nonbinding, renewable agreements more easily bridges differences among jurisdictions, whether interstate, intrastate or international. Additionally, these agreements can be updated more immediately as new information and technologies emerge. These agreements can be assembled more quickly than pursuing traditional regulatory or legislative avenues (Stickney, 2008). Due to this integrated decision-making model, UNESCO designated the Lake Champlain Basin as one of seven demonstration watersheds within its Hydrology, Environment, Life, and Policy (UNESCO HELP) program in 2005. In 2009, the basin was promoted into the third stage of the HELP program.

The sequence of voluntary renewable agreements is depicted in Figure 4. Several practical practices and recommendations emerged from this sequence.

• **A consensual policy style versus an adversarial policy style results in reliable and evolving commitments by Vermont, New York and Quebec.** Nearly one agreement has been signed each year on average among two or three of the jurisdictions which reaffirms their continuing commitment towards shared management of the Lake Champlain Basin. This approach encourages a higher level of participation in watershed cleanup activities than required by bureaucratic regulation.

• **Less regulation and renewable, flexible agreements result in substantial financial commitments by Vermont, New York and Quebec.** In partnership with the Lake Champlain Basin Program, the three jurisdictions have invested millions of dollars annually, primarily to reduce point source phosphorus pollution and cleanup hazardous waste dumps, and also for aquatic nuisance species control and water quality research. Partnering with the basin program allows the three jurisdictions to proactively plan lake and watershed improvements for their respective geographic regions without being required to do so.

• **Political will supports sustainability of the Lake Champlain Basin Program and observance of its operating principles.** The signatures of the Governors of Vermont and New York, Premier of Quebec and the Regional Administrators of the United States Environmental Protection Agency give the *Opportunities for Action* management plan significant credibility. The nonbinding, voluntary and incremental aspects of signing agreements encourages their participation while still allowing for different implementation styles and creative thinking such as Vermont’s *Clean and Clear Action Plan*, New York’s *Clean Air/Clean Water Bond Act*, and Quebec’s new, model, extensive riparian buffer policies.

• **A built-in renewal schedule for voluntary bilateral and trilateral agreements results in immediacy and accountability.** Voluntary agreements evolve more rapidly than traditional regulation and legislation. Regularly revisiting agreements allows emerging scientific information and public needs to be incorporated quickly to improve accountability. Currently, the emergency spill response and permit exchange agreements, which lack built-in renewal schedules, need updated procedures. There have been a few incidents on Lake Champlain where either the wrong individuals were contacted regarding an emergency spill, or new staff did not follow the procedure because it was out of date.
“Leapfrogging” or developing agreements incrementally keeps them linked together and looking forward. The original 1988 Memorandum of Understanding called for a cooperative approach to lake management and for in-lake phosphorus criteria to be developed in the future. The 1993 Water Quality Agreement established in-lake phosphorus criteria and called for phosphorus loading targets to be developed in the future. The 1996 Phosphorus Reduction Agreement established phosphorus loads and called for Vermont and Quebec to divide responsibility for reducing phosphorus in Missisquoi Bay. The Missisquoi Bay Agreement established the division of responsibility between Vermont and Quebec. Each agreement made progress and set a future target that was met within a few years.

III. PLACE AND DECISION-MAKING INTEGRATED WITHIN THE FRAMEWORK—HOW IT WORKS

Local place-based groups in Lake Champlain’s challenging northern watershed—engaged citizens and engaged resource management agencies

There is a diverse array of citizen groups spanning the northern watershed of Lake Champlain. In Vermont, there are seven major citizen groups with membership ranging from a few dozen to a few hundred volunteers. Interestingly, these small citizen groups affiliate themselves with their immediate surroundings instead of Lake Champlain as a whole. Rather than identify with candidate names such as Save Lake Champlain or Friends of Lake Champlain, their organizations have strong place names: Friends of Missisquoi Bay, St. Albans Area Watershed Association, Franklin Watershed Committee, Missisquoi River Basin Association, Farmers Watershed Alliance, Northern Lake Champlain Citizens Advisory Council, and Friends of Missisquoi National Wildlife Refuge.

Some of these groups are incorporated as non-profit organizations, and some are not. None is more than 10 years old. These groups tend to have one or two part-time staff people or volunteer coordinators. They are not professional organizations, and they do not necessarily have specialized training or knowledge. Yet, they are passionate about the places where they live and work. To gain clout with the Governor and Vermont Legislature, these groups formed an alliance called the Northern Waters Partners. They have released joint statements of recommendations for Lake Champlain and its watershed for three years now. Their coalition building has been successful, inspiring and unique in several ways. These brief snapshots of each group provide a flavor of their interests and strengths.

- **Friends of Missisquoi Bay**—started in ~2003, the friends are driven to find political will and funding to rapidly clean up the bay. A key founding member owns a family resort on the shores of Missisquoi Bay. They are very focused on how to reduce phosphorus runoff pollution that contributes to toxic blue-green algae blooms that negatively influence recreation businesses and close beaches to public access. Membership includes about 50 people.

- **Missisquoi River Basin Association**—created in 2000, the association is an active non-profit group of volunteers dedicated to the restoration of the river, its tributaries, and Missisquoi Bay. The Missisquoi River is a major tributary to Lake Champlain. Activities vary from fieldwork to stabilize stream banks, and planting trees in buffer areas, to assessing stream bank conditions. They clean up trash along the banks, cost-share with farmers on nutrient management planning, and are launching a volunteer-led water sampling program. Membership includes about 150 people.
• St. Albans Area Watershed Association—organized in ~2002, the association operates in a primarily urban sub-watershed of Lake Champlain. The group participates in stormwater flow monitoring, water quality monitoring, and promotion of lake friendly lawn and garden practices. Data from the monitoring and analysis are destined to be used as a decision-support framework. Membership includes about 300 people.

• Northern Lake Champlain Citizens Advisory Committee—created in ~2002, the committee comprises residents in and around Carry Bay and Alburgh Passage area. Carry Bay, a bay within rural North Hero Island, is bounded by an old abandoned railroad causeway. Residents believe that the causeway traps phosphorus pollution in the bay which contributes to nuisance and toxic algae blooms and lower property values. They have been lobbying multiple parties to study and fund causeway removal, which is their single most important issue. Membership includes roughly 40 members.

• Farmers Watershed Alliance—started in ~2006, the alliance has mirrored the Canadian model of Agricultural Clubs. These clubs consist of roughly 30 farmers working with an agronomist to develop nutrient management plans. The Canadian plans are required by the government to reduce nutrient runoff and protect water quality. The Canadian government shares costs with the farmers to hire the agronomists. Nutrient management plans not only reduce phosphorus pollution, they also save farmers money by reducing fertilizer and grain costs. The alliance works primarily with small farm operations in Vermont which are currently unregulated except by practices called “acceptable agricultural practices.” Membership includes roughly about 200 people.

• The Franklin Watershed Committee—formed in ~2004 from the previous Lake Carmi Watershed Committee, they investigate and address sources of phosphorus to the lake. Franklin County covers much of the northern Lake Champlain watershed. The group has addressed phosphorus sources in all categories of land use and has consistently worked under the philosophy that in order to be effective all watershed and shoreland landowners must be involved to build trust and participation. The committee is registered through the state as a non-profit organization and is currently applying for federal status (501c3).

• Friends of Missisquoi National Wildlife Refuge—created in 2005, the friends are a federally registered 501(c)3 focused on fundraising for the national wildlife refuge. Members provide volunteer and financial assistance to the refuge, and they helped fund the new “green” state-of-the-art visitors center.

**Synthesis.** Based on these snapshots of each group included in this paper, it is obvious that they are not united in task or mission. Their primary foci range from causeway removal, agricultural nutrient management and urban storm water flow monitoring to stream bank stabilization, political organizing and natural community interpretation and fundraising. All want to improve their local environments. Their kitchen meeting, front porch style coalition has not only unified them into an educated, savvy entity, but they have been extremely successful in gaining recognition and commitments from the Vermont Legislature and Quebec provincial governments. Even the federal government has become more intimately engaged when the USDA Natural Resources Conservation Service created in 2008 the citizen collaborative regional plan entitled the *Missisquoi Basin Areawide Plan*.

This diverse, collective vision is interesting, because it revolves around an extremely polluted part of Lake Champlain. This strong connection to place is to an impaired place. Many people
consider other parts of Lake Champlain more scenic than the far northern watershed, and other regions within the Main Lake are considered fairly oligotrophic, or fairly nutrient free, waters. Yet, having a clean lake is vital not only to the economy, but also to these local communities in the northern watershed. To better meet the needs of the Northern Waters Partners, the Center for Clean and Clear opened a small office in St. Albans which decentralizes resource management from Vermont Agency for Natural Resources headquarters or regional offices elsewhere.

Collaboration among these groups is evocative of the opening quote to this paper. These groups are focused on their immediate environs rather than seeking out another particular place to protect. The larger story is that they have chosen to focus their efforts and talents on the place where they live. Unique elements include the scales of landscape involved. Many other prominent citizen-based or environmental non-profit groups in Vermont are focused on larger geographic areas. For example, the Green Mountain Club is focused on the Appalachian Trail and the Long Trail which travels the length of the state. The Connecticut River Joint Commissions covers the Connecticut River which separates Vermont and New Hampshire. The Vermont Agency of Natural Resources initiated a river basin planning process in 1999 that covers the 17 major river basins in the state. Even, these new river basin planning groups cover a much larger geographic scale—more of a county or cross-county level—and they tend to work independently rather than as a coalition of smaller groups. While the state’s river basin planning initiative has created citizen groups to engage and inform the planning process, one of the reasons that the Missisquoi River was chosen for action early on is that the region was already rich with these groups.

Local place-based groups in Canada

There are two main Quebecois place-based groups that engage with the Lake Champlain Basin Program, the International Joint Commission and the Northern Waters Partners, as follows.

- **Corporacion bassin versant baie Missisquoi (CBVBM)**—created in ~1999, the corporation is a smaller citizens committee focused on cleaning up Missisquoi Bay in accordance with the Vermont – Quebec Missisquoi Bay Agreement signed in 2002. The French name roughly translates into the Missisqoi Bay watershed association. The CBVBM received funding from the Quebec Ministry of Sustainable Development, Environment and Parks to develop a management plan for Missisquoi Bay. The Corporacion is very engaged with the Missisquoi Bay Agreement signed by Vermont Quebec where each jurisdiction committed to specific phosphorus reduction targets. Membership includes roughly 100 people.

- **Le Comité de concertation et de valorisation du bassin de la rivière Richelieu (COVABAR)**—created in 2000, this committee is better known in the US by the acronym COVABAR which roughly translates into the committee for the protection of the Richelieu River drainage basin. The Richelieu River drains Lake Champlain north to the St. Lawrence. While COVABAR is a citizens committee, they receive funding from the Quebec Ministry of Sustainable Development, Environment and Parks. Funds received are spent on developing action plans to clean up waters in the Richelieu watershed.

How place-based groups engage with the larger decision-making framework

The Northern Waters Partners and the Quebecois place-based groups are familiar to the Lake Champlain Basin Program and to the Lake Champlain Citizen Advisory Committees in Vermont,
New York and Quebec. When the Lake Champlain Basin Program Steering or Executive Committees convene every month or every other month, the meetings begin with nearly a half hour of public comment. Some members of the Northern Waters Partners and the Quebec citizen groups serve on some of the advisory committees to the Lake Champlain Basin Program, in particular the Vermont and Quebec Citizen Advisory Committees and the Education and Outreach Committee. The Lake Champlain Basin Program’s long-term management plan for Lake Champlain, *Opportunities for Action*, was derived from multiple public meetings and working sessions so that the contents of the plan were recognizable and supported by the public. For this reason, the Governors of Vermont and New York and the Premier of Quebec signed the two versions of the plan developed so far. *Opportunities for Action* basically reads as a menu of identified priorities. The Lake Champlain Basin Program awards grant funds to place-based groups, municipalities, universities, and other group to implement priorities of the plan. It is a living document that was created and is being implemented especially by many local place-based groups.

**A quilt or mosaic as a diagram of empowerment and collaboration**

It is interesting to map a diagram of the relationship between the Lake Champlain Basin Program, the Vermont Agency of Natural Resources’ Center for Clean and Clear and the place-based groups in the northern watershed. The Lake Champlain Basin Program provides an overarching framework that allows groups to interact without triggering regulation. The Center for Clean and Clear is a response from the state to place-based groups in the northern watershed to accelerate funding and implementation to clean up the watershed (which will clean other areas as well). The place-based citizen groups engage with both programs, and they are fairly intertwined in purpose and action. One way to map this arrangement might be as a pyramid, where the Lake Champlain Basin Program is at the top of the pyramid as a neutral organizer and funder, the Center for Clean and Clear in the middle with the regulatory part and technical expertise and funding, and the strong base of the pyramid is the network of place-based citizen groups. An inverted pyramid with citizen input driving actions and practices by resource managers may be more accurate. Another model might have the place-based citizen groups at the top of the pyramid since they are connected to action and implementation and they are guiding the LCBP and CCC.

However, the relationships are so entwined and overlapped that it is better to view the relationship as a mosaic or quilt, where different pieces either fit together or overlap, where some pieces are larger and more colorful than others. In this diagram, the Lake Champlain Basin Program and the Center for Clean and Clear provide the base fabric or two-dimensional foundation, but it is the place-based citizen groups that create the character of the quilt. In the quilt analogy, the separate pieces create layers of organization. The separate pieces overlap and strengthen the fabric (Figure 5). This symbiotic relationship is influenced by strong connections to place. Bringing these small groups together through the management framework empowers them and helps mobilize them. The quilt brings their individual actions into a larger collective action to improve Lake Champlain’s watershed, especially by trying to solve the hardest to solve problem first—Missisquoi Bay. The lake quilt concept serves as a good example of citizen empowerment and social justice.

**What happens when the framework breaks down**

There have been several instances in the last few years when place-based citizen groups felt that the overarching framework and collaboration between the Lake Champlain Basin Program and the state agencies did not serve them well. In those instances, these groups took control of
the situation in their own ways instead of relying on the state agencies for answers. While the committees within the Northern Waters Partners may be small, they are well connected and receive regular sit down meetings with the Governor. They also have good media contacts and relationships. They are exerting greater influence and power over the activities of the state resource management offices.

**Citizen interpretation of Lake Champlain monitoring data.** Some citizen groups and newspaper reporters are applying their own interpretations to scientific monitoring information. For example, the Lake Champlain Diagnostic Feasibility Study conducted in 1991-2 designated 1991 as the ‘base year” that was used to establish in-lake phosphorus concentration criteria and acceptable sub-watershed phosphorus loads. The Water Quality Agreement (1993) and the Phosphorus Reduction Agreement (1996) codify these criteria. Basin citizens are extremely frustrated since fifteen years later, after the investment of millions into Lake Champlain cleanup, lake conditions appear to be the same or getting worse in most sections of Lake Champlain. Demands for improvements inspired the Lake Champlain Basin Program and State of Vermont to closely view the monitoring data which suggest that 1991 was an unusually dry year. Since the weather in the Lake Champlain Basin has been unusually wet in the 2000s, data showing trend detections are first flow-adjusted before being released to the public to account for higher than usual water flows and rainfall. The flow-adjusted data show that improvements in phosphorus reductions have occurred, while the raw data does not.

Some citizen groups perceived these adjustments as spin. These groups are also very connected to the media. When they didn’t like the interpretation of lake monitoring data being released by the state agencies, they contacted reporters who took the raw data and rendered a different interpretation. According to a prominent article in a major newspaper, the raw data show that phosphorus levels have been increasing, much to the embarrassment of the Vermont Agency of Natural Resources. Some state employees have perceived the situation as one where data that they collected and interpreted is being held against them.

**Accounting for phosphorus reductions.** The Lake Champlain Basin Program and the State Agencies of Natural Resources and Agriculture have demonstrated national and international difficulties with developing an accounting system to track phosphorus reductions with funds expended. They share the frustrations that citizens have with the slow cleanup of Lake Champlain and the challenges of accounting for the millions invested in cleanup. As some citizen groups believed that the State of Vermont was ignoring or resisting their concerns, they contacted legislators and testified at the Vermont Statehouse. Due to this testimony, the Vermont Legislature has applied pressure to the leadership of the Vermont Agencies of Natural Resources and Agriculture. One result was that in the first year that the Center for Clean and Clear was created, it was audited by an independent contractor. Additionally, the center was required to submit a progress report to the legislature about how funds had been spent through the Clean and Clear Action Plan before the center was even created. This result speaks to a shift in the power balance between citizens and the government resource management agencies that serve them. Some might see it as an end-run around the jurisdictions of the Vermont Agencies of Natural Resources and Agriculture. An even larger jurisdictional shift is being suggested. Vermont is one of only a few states designated by the US Environmental Protection Agency as leading their own compliance with the Clean Water Act. As a “self-designated” state, they initiate compliance among agricultural and commercial sectors. Some citizen groups and non-profit organizations have called for this designation to return to the US Environmental Protection Agency.
V. CONCLUSION

“What makes a place ‘special’ is the way it buries itself inside the heart... every place, like every person, is elevated by the love and respect shown toward it, and by the way in which its bounty is received.”

--Richard Nelson, Anthropologist
from The Island Within

The Lake Champlain Basin presents a very complex ecosystem and poses a very complex network of stakeholders engaged in cleaning up the basin. While many more stakeholders and organizations exist than are included in this chapter, it was important to carefully craft the scope of this chapter. The contents of this chapter focused primarily on the Lake Champlain Basin Program as a framework for interaction among specific groups. Therefore, the framework was defined between the Lake Champlain Basin Program and the Vermont Agency of Natural Resources Center for Clean and Clear, with the International Joint Commission to show the international collaboration and because of their involvement with Missisquoi Bay. The place was defined as northern Lake Champlain, especially Missisquoi Bay. Place-based citizen groups were limited to the Northern Waters Partners and two Quebecois citizen groups, again revolving around Missisquoi Bay. This region is particularly rich in action and opportunities for improving the surrounding ecosystem.

While the focus has been how place-based citizen groups can significantly influence the quality of their environment, there are lessons and examples of how what was done at the local level can be transferred to other regions. An overt message in the chapter is how a larger framework coordinated through a politically neutral organization such as the Lake Champlain Basin Program can support action by small place-based citizen groups. An underlying message is how when those frameworks fail to meet the needs of these groups, they are also capable of finding other ways to stimulate action. Perhaps the message to take away from this chapter is partially summarized in the quote above. Since Lake Champlain’s small place-based citizen groups are connected through their hearts to their places within the larger watershed, that place becomes elevated in their lives.

Literature Cited


