

Reference Study in Lake Memphremagog

NETWORKING REPORT

**Prepared for the
International Joint Commission**

**By
Memphremagog Conservation Inc. & Memphremagog Watershed
Association**

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Introduction

On October 19, 2017, the IJC received a reference from Global Affairs Canada (GAC) and the U.S. Department of State (DOS) regarding water quality in “Lakes Champlain and Memphremagog”¹. In the reference, IJC was asked to “... identify the range of nutrient loading issues that are of concern in the Lake Memphremagog basin and make recommendations on how current efforts can be strengthened...” As outlined by the reference request, this project includes four major components: 1) networking with key stakeholders; 2) drafting the preliminary Memphremagog Report; 3) reviewing findings, conducting a gap analysis, and drafting initial recommendations (includes a binational science and policy workshop); 4) finalizing recommendations by the IJC to strengthen current efforts.

This report details the networking process and methodology and provides an overview and analysis of the stakeholder responses to the online survey. Survey responses and results are also cited throughout the Memphremagog Report.

1. Methodology

To begin the networking process, key stakeholders from Quebec and Vermont were identified (Appendix 1), and their contact information was compiled. Stakeholders include staff and volunteers from: municipalities, state/provincial government, NGOs, the private sector, universities, as well as national and international governments.

A list of binational common questions was produced in French and in English. The majority of the survey questions were multiple choice or ranking questions, while a few questions were open-ended or short answer. The stakeholders were contacted initially by e-mail and were given two weeks to answer the online survey developed using Survey Monkey; stakeholders were also sent an email reminder one week after receiving the initial survey. For each question, respondents were given the option of responding anonymously, meaning that their answers would not be attributed to them by name and organization in either this report or the Memphremagog Study. Stakeholders were also asked to provide additional contacts and suggestions for individuals that should receive the survey. After the initial stakeholders responded, additional surveys were sent to those suggested individuals if they had not received the survey in the first round. A total of 161 stakeholders received the survey. Some of the stakeholders were contacted after by phone or email to clarify answers or provide additional information. The responses to the survey were then compiled and analyzed in this Networking Report.

¹ International Joint Commission, 2017. *Reference Letters from Governments*.
http://ijc.org/en/_LCLM/Reference

2. Results and Analysis

Survey results are presented in this report for questions 2-5 and question 7 as aggregate data for both Canada and the United States. Results for questions 8-15 are separated by country to allow for cross country comparison of responses and for analysis of responses by country.

Question 6 was a short answer question asking respondents to explain the actions and programs of their organization to reduce nutrient loading. Answers to question 6 are cited primarily in Chapter 3 of the Memphremagog Report and are not listed in the Networking Report, as it is simply a list of current projects.

Graphs of responses are included where applicable. For short answer questions, over all themes are presented in this report. Specific interview responses and statistics are used throughout the Memphremagog Report to support research and conclusions in Chapters 3, 4 and 5.

Responses to question 1 and questions 16-20 of the survey are not presented in the Networking Report, as those questions were intended to collect contact information, additional research materials, and additional contacts.

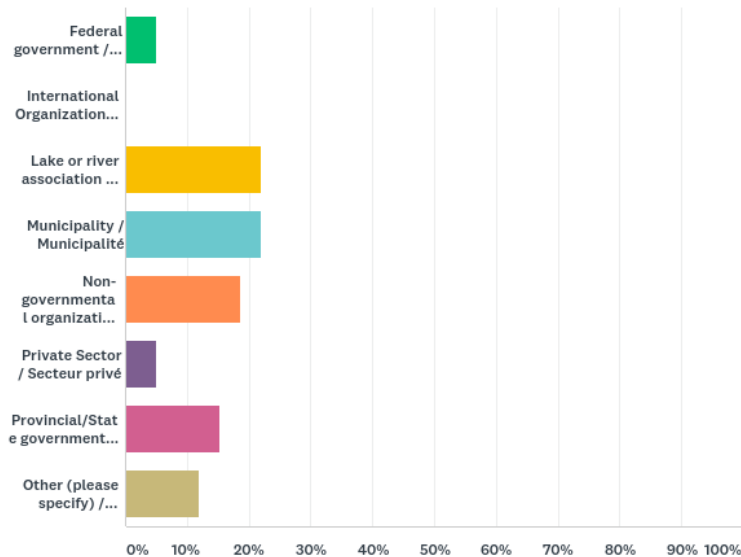
Appendix 2 includes response graphs by sector type for question 5, 8, 10, and 13 for in depth analysis.

2.1. Who are the respondents?

Questions 2-7 of the stakeholder survey were asked to gather background information on the survey respondents regarding area of work, interests, and current efforts to reduce nutrient loading. The survey was sent to 161 stakeholder and in total, 59 stakeholders responded to the survey.

a) Question 2

Q2 In which type of organization do you work? / Au sein de quel type d'organisation travaillez-vous?

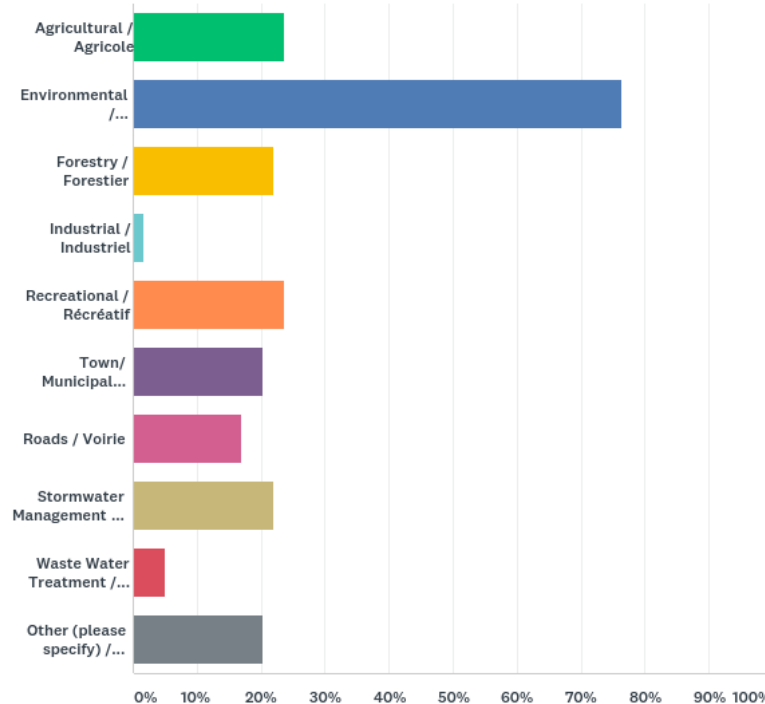


Question 2 in the survey asked respondents to identify the type of organization for which they work. 22% of the survey respondents were affiliated with a river or lake association, closely followed by 20% working for a municipality. 19% of the survey respondents indicated that they were representing a non-governmental organization, and 15% stating that they were representing state/provincial government. The Canadian non-governmental organizations included two agriculture organizations, one watershed organization, one wetland management organization, one conservation group, and one forestry organization.

Of the 12% that selected “other”, four respondents indicated affiliation with an educational institution such as a college or university. Two respondents selected a municipal planning organization, and one respondent indicated affiliation with a cooperative of river and lake associations.

b) Question 3

Q3 In which field are you working? (check all that apply) / Dans quel domaine travaillez-vous? (cochez toutes les cases qui s'appliquent)

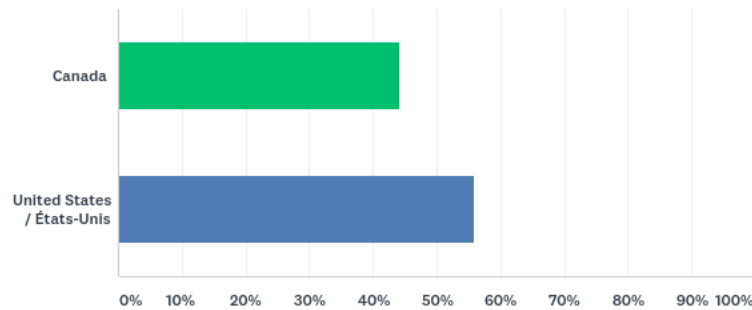


For question 3, respondents were asked to check all fields that apply to their work. There were 137 responses to question 3, meaning that of the 59 respondents, each respondent selected an average of 2.32 relevant fields. 45 respondents indicated that they are working in the environmental field, representing 76% of the total responses. As such, it can be inferred that the majority of respondents selected environmental field as well as at least one additional field. All fields were well represented in the survey except for industrial, as only 1 survey respondent selected this field.

In the other category, responses included “management of surface waters”, “education,” “natural resources,” “planning,” “conservation,” and “wildlife.”

c) Question 4

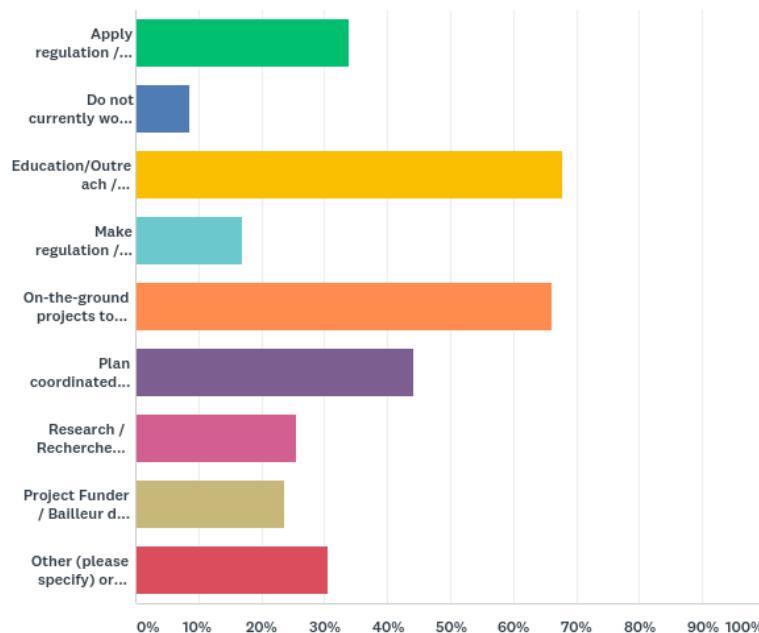
Q4 In which country do you primarily work? / Dans quel pays travaillez-vous principalement?



Responses to question 4 indicate that 44% or 26 of the survey respondents primarily work in Canada while 56% or 33 of the survey respondents primarily work in the US. The survey was sent to 161 stakeholders in total, this includes 56 US stakeholders (59% response rate from the US) and 105 Canadian stakeholders (25% response rate from Canada).

d) Question 5

Q5 What is your organization's role(s) in the reduction of nutrient loading to Lake Memphremagog and its tributaries? (Check all that apply) / Quel est votre rôle (vos rôles) dans la réduction des apports d'éléments nutritifs au lac Memphrémagog et à ses tributaires? (Cochez toutes les cases qui s'appliquent)



For question 5, respondents were asked to select all roles that apply to their organization's work to reduce nutrient loading. 187 answers were recorded. Response graphs by organization type and country are included in Appendix 2.

Overwhelmingly, respondents indicated that their organization's role included education/outreach, which received 40 selections, as well as on-the-ground projects which had 39 selections. 26 individuals indicated that their organization has a role in planning coordinated actions, while 20 respondents selected apply regulation.

Eighteen respondents selected "Other." Short answer clarifications to this selection included supporting other organizations, providing training, conservation, road work, and water quality sampling.

2.2 What are the actions to reduce nutrient loading?

e) Question 6

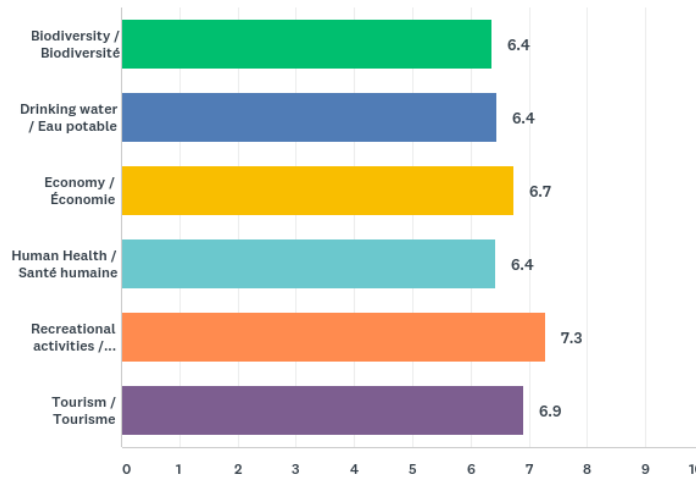
Q6 What are the actions or programs that your organization undertakes to reduce nutrient loading to Lake Memphremagog and its tributaries?
/ Quels sont les actions ou les programmes que votre organisation met en oeuvre afin de réduire les apports d'éléments nutritifs au lac Memphrémagog et à ses tributaires? (Please indicate in your response if you do not want us to attribute your answer to you in the report / Svp, indiquez dans votre réponse si vous ne voulez pas qu'on attribue cette réponse à vous dans le rapport)

Question 6 was a short answer question asking respondents to explain the actions and programs of their organization to reduce nutrient loading. Answers to question 6 were used primarily to support sections in Chapter 3 of the Memphremagog Report regarding current best management practices and are not listed in this report.

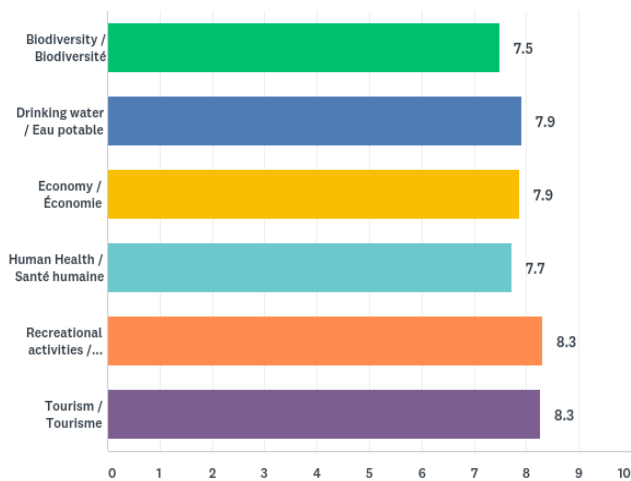
2.3 What are the opinions on the problem?

f) Question 7

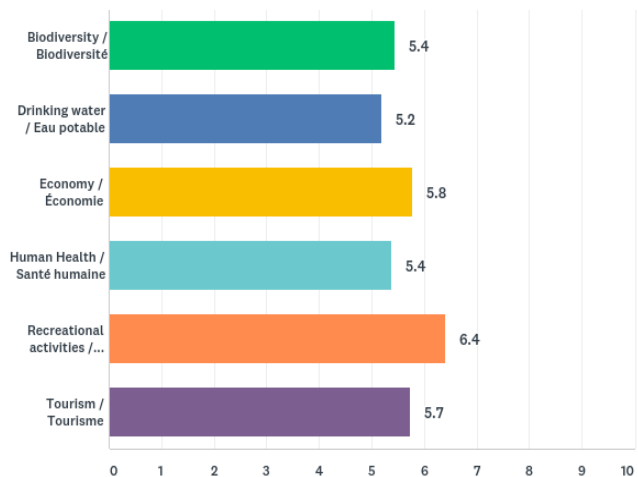
Q7 In your opinion, on a scale of 1 to 10, where 1 is not impacted and 10 is significantly impacted, please rate the impact nutrient loading has had in the Lake Memphremagog Basin in the following areas./ Selon vous, sur une échelle de 1 à 10, où 1 est Pas d'impact et 10 est Impacts significatifs, évaluez l'impact des apports d'éléments nutritifs sur le bassin versant du lac Memphrémagog dans ces différents domaines.



Canadian Stakeholder Results



United States Stakeholder Results



For question 7, respondents were asked to rate the impact of nutrient loading on six separate areas on a scale of 1 to 10, with each impact rated independently. The summary graphs for Question 7 display the averaged responses.

When all survey responses are analyzed together, results indicate that, of the six areas, recreational activities, tourism, and economy were rates as being slightly more impacted than the areas of

biodiversity, drinking water, and human health by nutrient loading. However, on average, all areas were rated as being similarly impacted by nutrient loading, with impact ratings ranging from 6.4 to 7.3 out of 10.

When responses are broken down by country, the average impact rating across all sectors for Canadians is 7.93 and the American average is 5.65. The difference between the two averages is 2.3. This suggests that the Canadian respondents perceive greater impacts of nutrient loading on Lake Memphremagog than US respondents. The largest differences between the two countries are the impact on the drinking water (a difference of 2.7) and on the tourism (a difference of 2.6).

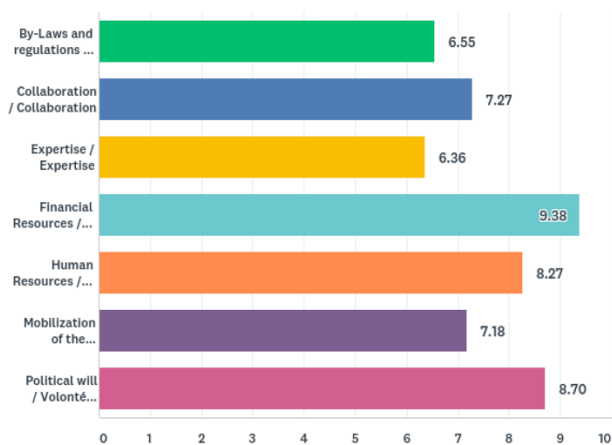
Comments to question 7 indicate that many respondents felt they did not have the expertise to answer the question and did not respond to this question. Short answer responses also indicate that impacts on the areas of recreation, tourism, and economy are of the greatest concern to survey respondents.

2.4. What are the challenges?

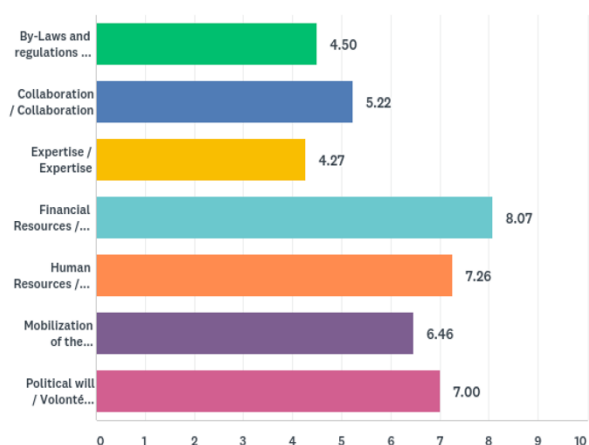
g) Question 8

Q8 On a scale of 1 to 10, where 1 is not significant and 10 is most significant, please rate the significance of the following barriers to nutrient management project implementation in the Lake Memphremagog Basin. / Sur une échelle de 1 à 10, où 1 est Aucune importance et 10 est Importance significative, évaluez l'importance de ces obstacles dans la mise en œuvre de projets limitant les apports d'éléments nutritifs dans le bassin versant du lac Memphrémagog.

Canadian Stakeholder Results



United States Stakeholder Results



Question 8 of the survey asked respondents to rate on a scale of 1 to 10 the significance of seven barriers to the implementation of nutrient management projects, with each impact rated independently. The summary graphs for Question 8 display the averaged responses. Response graphs by organization type and country are included in Appendix 2.

On average, US and Canadian stakeholders both rated financial resources as the most significant barrier to project implementation. For US stakeholders, this was followed by human resources and political will, for Canadian stakeholders, political will was rated second, followed by human resources. On average, stakeholders from both countries rated expertise as the least significant barrier to project implementation, just behind by-laws and regulations. Although both countries rated the barriers in nearly the same order of significance, all barriers were rated more significant for Canadians. The average Canadian significance rating was 7.6 compared to 6.11 for US respondents.

For the US stakeholders, when responses for each barrier are analyzed individually, 37% of respondents rated financial resources as a 10 or a most significant barrier, followed by 20% rating political will as a 10 or most significant, and 13% rating human resources as the most significant barrier. Interestingly, expertise was rated by 10% of respondents as a 0 or not a significant barrier at all.

For the Canadian stakeholders, 64% of respondents rated financial resources as a most significant barrier, followed by 48% for political will, and 29% for human resources. Expertise was the only barrier rated by some Canadian stakeholders as not significant at all (for 9% of the Canadian respondents); however, at the same time, expertise was a significant barrier for two stakeholders who work in the field of agriculture (rated as an 8 and a 9).

h) Question 9

Q9 What nutrient management project opportunities have you been interested in implementing in the Lake Memphremagog Basin but have been unable to? Why? / Quels sont les projets que vous avez voulu mettre en oeuvre dans le bassin versant du lac Memphrémagog afin de réduire les apports d'éléments nutritifs, mais que vous avez été incapables de mettre en oeuvre? Pourquoi? (Please indicate in your response if you do not want us to attribute your answer to you in the report / Svp, indiquez dans votre réponse si vous ne voulez pas qu'on attribue cette réponse à vous dans le rapport)

Question 9 was a short answer question asking respondents if there were any projects in the Memphremagog Watershed to reduce nutrient loading that they have wanted to implement but have not been able to. If respondents identified a project they had not been able to implement, they were asked to explain why. This question was intended to elicit responses to aid in Chapter 4 and Chapter 5 of the Memphremagog Report for both the science and policy analysis and recommendations.

Twenty-four of the US survey respondents answered the question, nine of which or 38% of respondents indicated that they had no response, it was not applicable, or did not have any projects that they were unable to implement.

Five US respondents indicated desire to implement riparian buffer, wetland restoration, or small-scale green stormwater infrastructure projects, but that a lack funding and partners to implement

those projects was the major impediment. Three respondents indicated that support for municipal roads projects are needed, while three suggested that support for private shoreland protection, small scale projects on individual homes, and private roads is needed.

By far the greatest number of US suggestions came from four respondents and were for specific agricultural projects, suggesting that there is a lot of opportunity, ideas, and interest for agricultural projects in the watershed, but significant barriers in regulation, funding, and staff resources to provide direct assistance to farmers for implementation and follow up. Suggestions for agricultural projects that respondents have wanted to implement but have been unable to ranged from funding and assistance for on-farm BMPs such as manure injections, tillage methods, upgrades in waste containments, and managing farm runoff, to more staff and capacity for organizations to provide direct assistance programs for nutrient management plans, feed management plans, and long-term follow up.

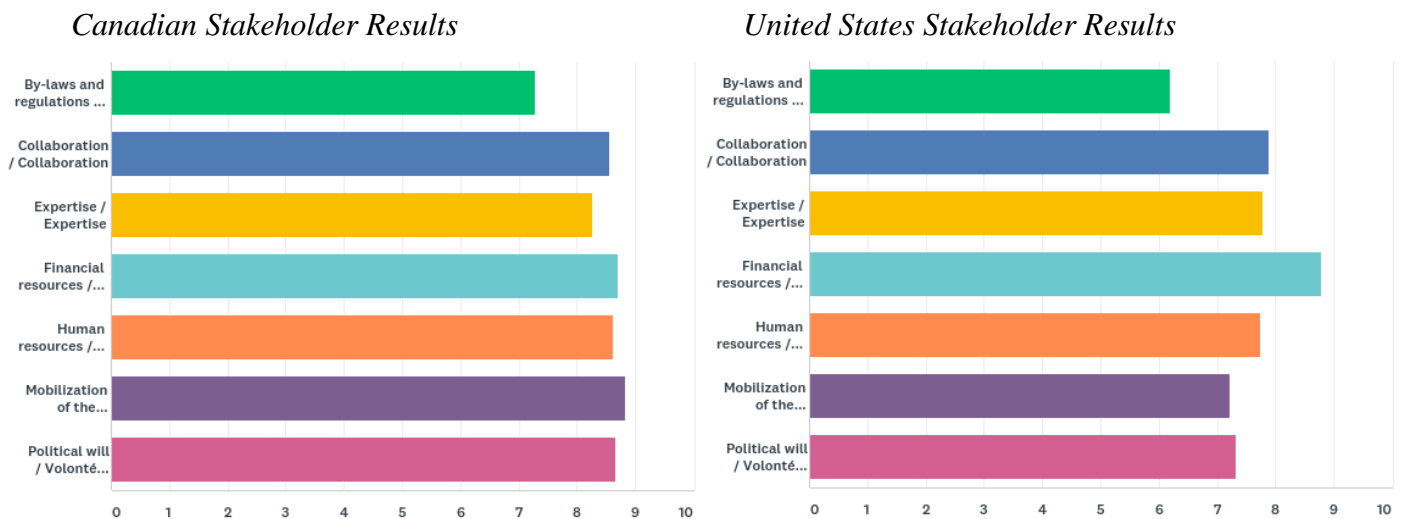
Eighteen of the Canadian respondents answered the question, three of which indicated that it was not applicable and 3 of which indicated that they have never been unable to implement a project.

Canadian respondents indicated a desire to realize erosion management projects, small-scale stormwater management projects, and territory assessments, but that a lack funding to implement those projects was the major impediment.

Two Canadian respondents indicated that it was difficult to implement voluntary conservation projects in Memphremagog Watershed. They explained that because the properties around the lake have high property values, it is difficult for conservation organizations to buy a conservation easement or land for conservation. Two respondents indicated that they have been unable to implement agricultural projects because it has been difficult to mobilize farmers, and BMPs are undertaken on a voluntary basis. One respondent said that the MAPAQ needs more human resources. Finally, COGESAF lacks funding and human resources to support partners to implement projects in the watershed.

i) Question 10

Q10 Reflecting on past projects to reduce nutrient loading to Lake Memphremagog and its tributaries, please rate the following factors on a scale of 1 to 10, where 1 is not helpful and 10 is the most helpful, for past project success / En vous basant sur vos précédents projets mis en oeuvre afin de réduire les apports d'éléments nutritifs au lac Memphrémagog et ses tributaires, évaluez les facteurs suivants sur une échelle de 1 à 10, où 1 est N'aide pas et 10 est Aide significativement, pour le succès de ces projets.



Similar to question 8, question 10 asked respondents to rate on a scale of 1 to 10 how helpful the same seven factors have been in past project implementation, with each impact rated independently. The graph of question 10 responses represents the averaged responses. Response graphs by organization type and country are included in Appendix 2.

Similar to question 9, on average, US respondents indicated that financial resources were the most helpful, followed by collaboration, expertise, and human resources.

Analyzing the US responses for each individual factor, 50% of the respondents rated financial resources as a 10 or most helpful, followed by 20% rating collaboration and 20% rating political will as 10 or most helpful as well.

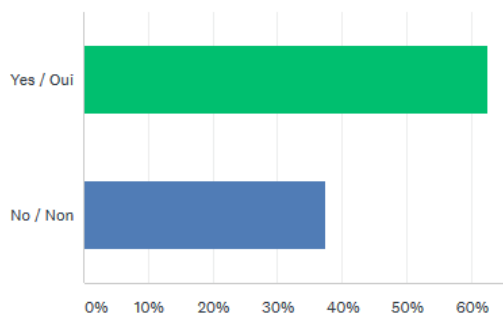
Canadian respondents indicated that all the factors were very helpful in past project success, though by-laws and regulations rated the lowest. Analyzing the individual responses for each factor, 67% of the respondents rated financial resources as a most helpful and 50% rating political will as most helpful. Comments from lake associations indicated that support from municipal government was very helpful (Appendix 2). The MELCC indicated that clear legislation easy to apply and political will are the most helpful (Appendix 2).

2.5 What are the opportunities?

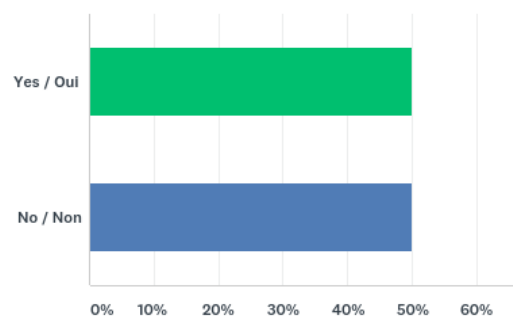
j) Question 11

Q11 Are you currently engaged in any projects to reduce nutrient loading to Lake Memphremagog or its tributaries that you think should be upscaled, replicated, or strengthened in order to increase the impact of that project? / Êtes-vous actuellement engagé dans certains projets de réduction des apports d'éléments nutritifs au lac Memphrémagog et à ses tributaires qui, selon vous, doivent être étendus, reproduits, ou renforcés afin d'augmenter les impacts de ce projet?

Canadian Stakeholder Results



United States Stakeholder Results



Question 11 was a short answer question asking respondents if there any nutrient loading projects they are currently working on that could be upscaled, replicated, or strengthened. This question was intended to elicit responses to aid in writing Chapter 4 and Chapter 5 of the Memphremagog Report.

Interestingly, exactly half of the US respondents indicated that they did not have a project that they were currently working on that should be upscale, replicated, or strengthened to increase the impact of the project. Of the 50% of respondents that indicated they were working on projects to upscale, there were sixteen substantive short answer responses given, the following categories of project were enumerated in short answers:

- Expand Lake Wise assessments and project implementation on private properties
- Further harmonize road, sewer, and required agricultural practices between Quebec and Vermont
- Implement projects already identified in stormwater mapping and stormwater master plans
- Expand outreach and education to farmers, as well as expand participation in current no-till and cover cropping programs.
- Expand Memphremagog RCPP to include all farmers in the watershed
- Expand riparian/buffer planting programs
- Expand tributary monitoring program

Fifteen or 63% of the Canadian respondents indicated that they were currently working on projects that should be upscale, replicated, or strengthened to increase the impact of the project. These respondents were 6 lake or river associations, 1 conservation organization, 4 municipalities, 2 provincial departments, 1 MRC, and 1 lake and river associations cooperative.

The following categories of project were enumerated in short answers:

- Provide funding to implement projects from subwatershed assessments and action plans
- Expand municipal septic system monitoring annual programs, replicate municipal regulations on septic system conformity and municipal programs to finance septic system replacement
- Expand municipal phosphorus source identification programs for example, near farms.
- Expand municipal water management plans
- Upscale erosion management projects, roadside ditch stabilization, and retention berm projects
- Continue outreach and education to owners of natural lands to expand voluntary conservation projects and to keep forest cover on their property
- Replicate a municipal regulation to prevent logging in residential areas
- Expand awareness on the lakes and artificial ponds of the watershed
- Upscale Healthy Fitch Bay Project, which has an action plan involving key stakeholders, to include the entire Canadian side of Memphremagog watershed. This project can also be strengthened with more human resources and funds to succeed to realize the actions
- Increase participation and request for agro-environmental programs

k) Question 12

Q12 Reflecting on your work to reduce nutrient loading to Lake Memphremagog and its tributaries, what lessons have you learned about project implementation or project prioritization? / En vous basant sur votre travail pour réduire les apports d'éléments nutritifs au lac Memphrémagog et à ses tributaires, quelles leçons avez-vous apprises au sujet de la mise en œuvre et de la priorisation de projets? (Please indicate in your response if you do not want us to attribute your answer to you in the report / Svp, indiquez dans votre réponse si vous ne voulez pas qu'on attribue cette réponse à vous dans le rapport)

Question 12 was a short answer question asking respondents to reflect on lessons learned about nutrient loading project implementation and project prioritization. This question also was intended to elicit responses to aid in Chapter 4 and Chapter 5 of the Memphremagog Report for both the science and policy analysis and recommendations.

There were twenty-five US responses to this question which included the following common themes and lessons:

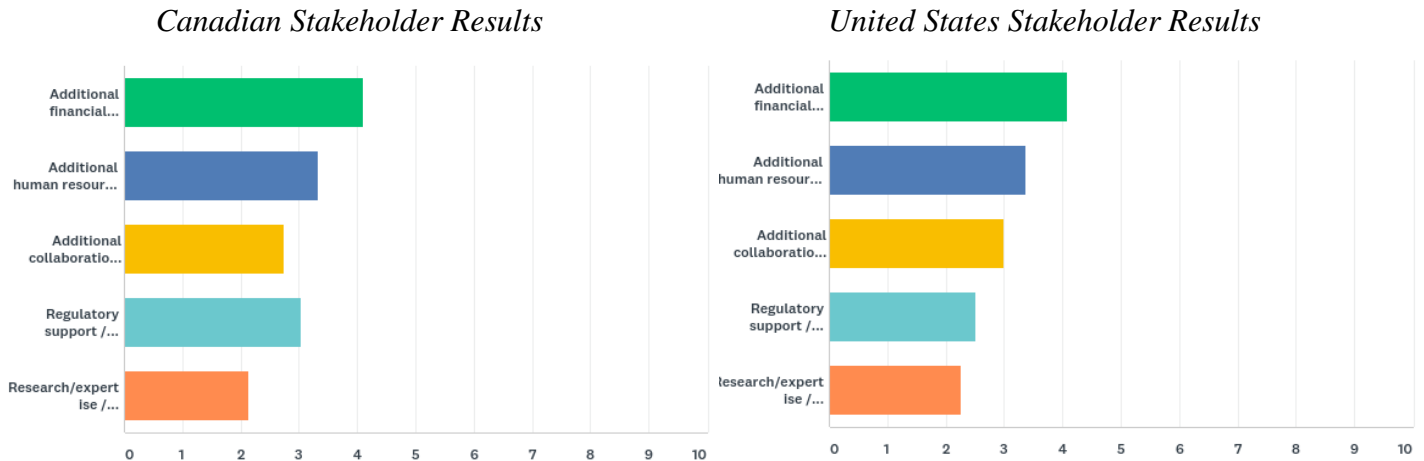
- Funding to support project development before design and implementation is key
- Comprehensive management approaches are needed; regulations and projects should include enforcement, technical support, and financial support
- Agricultural solutions and support should help farmers through complicated and often numerous funding sources
- Outreach and education is necessary to inform individuals of the importance of project implementation, regulations, or practices will lead to adoption
- Targeted water quality sampling is helpful to identify sources of nutrients, direct funding to projects, identify BMPs to install, and show successes over time
- Because of our limited human resources and funding, collaboration is needed to complete projects

There were nineteen Canadian responses to this question which included the following common themes and lessons:

- Projects are chosen to minimize necessary staff time and resources or built off existing programs, rather than merits of the project.
- Collaboration, budget, and political will are essential to implement projects
- Political will is essential, followed by regulation implementation
- To get municipal buy-in, project cost must be well justified in terms of resources and staff time
- The key stakeholders must get involved in the project for its implementation.
- The key stakeholders are mobilized but we are missing the resources for project implementation. Memphremagog Watershed should have a team working to implement the actions already targeted by all the existing committees.
- Environmental assessments of large watersheds identify too many actions ending with no implementation. Working on smaller watersheds helps to implement concrete actions.
- In Austin, several projects have been implemented because of their political will.
- We have to prioritize entrepreneurs whose work respects the environment and understands the objectives of the municipal regulations. From the beginning of the project, construction work must take into account impacts and seek to limit nutrient loading.
- Project with the greatest impacts on reducing nutrient loading must be prioritized.
- Projects are laborious and political decisions take too much time
- The concerned stakeholders (those who have an impact on the water quality) must believe in the proposed solutions and a personal interest must be seen.

1) Question 13

Q13 Please RANK your organization's greatest needs to remain sustainable and engaged in projects to reduce nutrient loading to Lake Memphremagog and its tributaries over the long term, where 5 is the greatest need and 1 is the lowest need. / CLASSEZ les besoins les plus importants de votre organisation afin de perdurer et de rester engagée à long terme dans la réduction des apports d'éléments nutritifs au lac Memphrémagog et ses tributaires, où 5 est le besoin le plus important et 1 le besoin le moins important.



Question 13 asked respondents to rank the organizations greatest need to remain sustainable with five options. The five options were ranked in relation to each other and response graphs represent the averaged response. Response graphs by organization type and country are included in Appendix 2.

Responses from US stakeholders to question 13 support responses to earlier questions. Additional financial resources was ranked as the greatest need, followed by additional human resources, and additional collaboration. When responses to individual factors are analyzed, 50% of US respondents indicated that additional financial resources was the greatest need by ranking it as 5, followed by human resources. Both additional collaboration and regulatory support were ranked a 5 or the greatest need by 13% of respondents, with research and expertise ranked the greatest need or 5 by only 3%. Results to question 13 support the US stakeholder responses to earlier questions indicating further that funding, human resources, and regulatory support, in that order, are needed in the Memphremagog Watershed for successful nutrient loading reduction projects.

Similar to US results, 54% of Canadian respondents indicated that additional financial resources was the greatest need, followed by human resources. This result differed by type of organization: for the Canadian municipalities, additional human resources was the greatest need and for the provincial government, regulatory support was the greatest need (Appendix 2). In general, regulatory support was a greater need than additional collaboration to remain sustainable and engaged in projects to reduce nutrient loading. This result was different for the NGO's (except lake associations) which ranked additional collaboration in second position (Appendix 2).

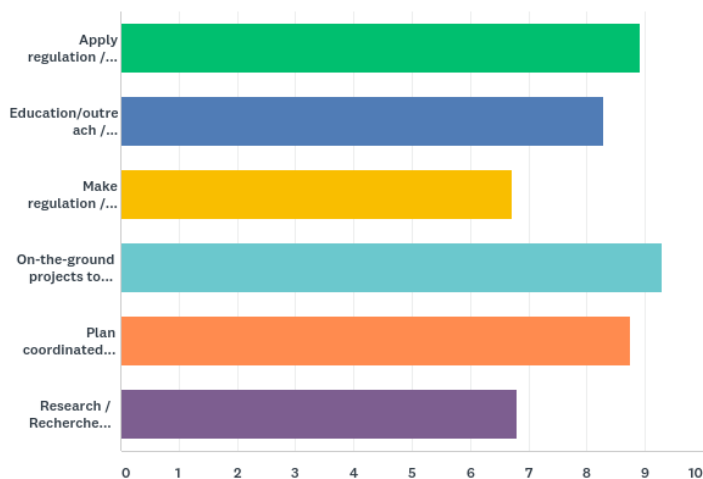
Research and expertise is the lowest need for the Canadian stakeholders but the greatest need for the stakeholders working in the agricultural field only.

2.6 What are the solutions and the strategies to adopt?

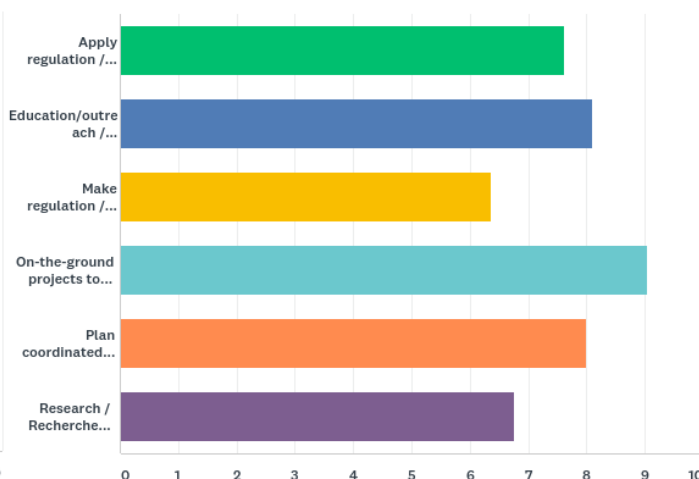
m) Question 14

Q14 On a scale of 1 to 10, where 1 is no impact and 10 is significant impact, please rate the impact of the following types of actions on reducing nutrient loading to Lake Memphremagog and its tributaries / Sur une échelle de 1 à 10, où 1 est Pas d'impact et 10 est Impact significatif, évaluez l'impact des types d'actions suivants sur la réduction des apports d'éléments nutritifs au lac Memphrémagog et à ses tributaires.

Canadian Stakeholder Results



United States Stakeholder Results



Question 14 asked respondents evaluate, on a scale of 1 to 10, the impact of 6 project types on reducing nutrient loading, with each impact rated independently. The graph of question 14 responses represents the averaged response.

The responses to question 14 reveal that overwhelmingly, US stakeholders believe that on-the-ground projects have the greatest impact on reducing nutrient loading. 50% of US respondents rated on-the-ground projects as a 10 or significant impact, giving it an average rating of a 9.0. This was followed by education/outreach and plan coordinated actions.

Similar to US stakeholders, Canadian stakeholders believe that on-the-ground projects have the greatest impact on reducing nutrient loading, just before apply regulation, plan coordinated actions, and education/outreach.

n) Question 15

Q15 Are there any other aspects of the nutrient enrichment problem in the Lake Memphremagog Basin that you feel need to be prioritized. If so, which problems and why? / Est-ce qu'il y a d'autres aspects de la problématique des apports d'éléments nutritifs dans le bassin versant du lac Memphrémagog qui devraient être priorisés? Si oui, lesquels et pourquoi? (Please indicate in your response if you do not want us to attribute your answer to you in the report / Svp, indiquez dans votre réponse si vous ne voulez pas qu'on attribue cette réponse à vous dans le rapport)

Question 15 was a short answer question asking survey respondents to explain any other aspects of the nutrient enrichment problem that they feel need to be prioritized.

20 US stakeholders responded to this question. Responses were similar and included:

- Conservation of undeveloped land
- Additional work to control runoff, riparian buffers, and streambank restoration to control sedimentation.
- Promotion of best management practices, peer-to-peer learning opportunities
- Public and political buy-in to projects and practices, including promoting the concept of all-in for clean water
- Increased enforcement

12 Canadian stakeholders responded to this question. Responses included:

- Address the threats of climate change on the increase of nutrient loading in Lake Memphremagog
- Control runoff and better road management to control erosion
- Increase forest cover and protection in the watershed
- Study the impact of the Coventry landfill and the leachate on the water quality
- Increased knowledge of the impacts of the 4000 boats on lake Memphremagog
- Increased knowledge of the origin of the phosphorus, for example of the agriculture lands.
- Implement an action plan for the Canadian portion of the watershed

3. Discussion

3.1 Respondents description

The email survey was sent to 161 stakeholders, 59 responses were received in total which is a 37% response rate. Table #X provides a concise overview of the total survey respondents by organization type and country.

Table X: Overview of the total survey recipients and respondents by organization type and country

| Organization Type | Number of Canadian Survey Recipients & (Respondents) | Number of US Survey Recipients & (Respondents) | Total Survey Respondents |
|-----------------------------|---|---|---------------------------------|
| International Government | 2 (0) | 1 (0) | 0 |
| Federal Government | 3 (0) | 3 (3) | 3 |
| State/Provincial Government | 8 (2) | 11 (7) | 9 |
| Municipalities | 26 (7) | 15 (6) | 13 |
| Lake/ River Association | 18 (8) | 7 (5) | 13 |
| Non-Governmental | 28 (6) | 9 (5) | 11 |
| Private Sector | 11 (0) | 3 (3) | 3 |
| Other | 9 (3) | 7 (4) | 7 |
| Total Respondents | 105 (26) | 56 (33) | 59 |

Unfortunately, no international government stakeholders responded to the survey from either country, and there were no private sector or federal government respondents from Canada. As such, there is no cross comparison of responses from federal US and Canadian employees or US and Canadian private stakeholders. The distribution of responses by country is skewed towards US respondents with 56% and 44% from Canada. However, there was a surprisingly similar number of respondents from each country, with 26 from Canada and 33 from the US, especially given the fact that the survey was sent to 105 Canadians and 56 Americans. This does present a balanced representation of both countries. The greatest difference in response rates by organization type between the US and Canada was in State/Provincial Government, where the US had 7 survey responses and Canada, 2.

Overall, the 37% response rate for this email survey is the higher than the US national average for responses to email surveys in 2018, which is 30% (SurveyAnyplace, 2019). With the exception of the Canadian federal government, Canadian private stakeholders, and international government officials, the general distribution of responses by organization provides a broad representation of Memphremagog stakeholders.

The majority of the survey respondents were from lake associations, municipalities, and non-government organizations. Together, these three categories alone account for 37 respondents or 63% of the responses. These are the organizations and stakeholders that are engaged in on-the-ground work in the watershed and this response rate provides the survey with rich comments and data on local challenges.

3.2 Opinions on the problem

Both US and Canadian survey respondents expressed strong concern regarding the effect of nutrient loading on the areas of recreation, tourism, and economy. In comments to question 7 of the survey, respondents made connections between the decline in the health, beauty, and cleanliness of the lake and the resulting negative impact on tourism, the local-area economy, and property values.

Several US and Canadian respondents were also concerned about the effect of nutrient loading on native aquatic and exotic invasive species growth and the resulting impact of excessive plant growth on recreation. This was specifically linked to impeding boating and swimming, and the negative impacts on tourism and local economy resulting from a loss of tourism dollars and declining property values in water becomes unnavigable. Further, respondents were concerned about the effect of cyanobacteria blooms on the recreational and aesthetic value of the lake.

Canadian economic concerns were also ranked high due to the cost of filtration and treatment of lake water that is contaminated with cyanobacteria or has high levels of phosphorus to drinking water standards.

Furthermore, Canadian stakeholders rated nutrient loading as having a more significant impact on all areas compared to US stakeholders. This suggests that the Canadian respondents currently perceive a greater impact of nutrient loading on Lake Memphremagog, with the largest differences between both countries regarding drinking water, tourism and human health. There are a few possible reasons for these differences. Lake Memphremagog is an important drinking water source for around 175 000 citizens from four Quebec municipalities, whereas the lake is not a drinking water source for any Vermont municipalities. Furthermore, from 2006 to 2018, 145 cyanobacteria blooms were reported in the Quebec portion of the lake compared to 11 blooms reported from 2006 to 2017 in Vermont. Also, although the lake is a major tourist draw and recreational destination for residents and visitors in both countries, the scale of tourism and recreational economy in Quebec is greater than in the US, representing CAN \$170 million in economic benefits and 3,400 jobs in the MRC Memphremagog (Statistic Canada, 2013).

The differences between the uses of the lake and the visible impacts of nutrient loading in the Quebec portion of the lake may explain the greater concern expressed by Canadian stakeholders. This conclusion is supported by comments, as two US stakeholders suggested that they are not seeing significant impacts of nutrient loading currently, but said there will be in the future if action is not taken now. Lastly, one US stakeholder compared the conditions of Lake Memphremagog to Lake Champlain, which may account for the lower concern for Lake Memphremagog.

3.3 Challenges

Limited funding was cited as the main barrier to project implementation for both countries followed by a lack of human resources and lack of political will. It is also clear from survey comments that both limited human resources and lack of political will were connected to limited funding. Both Canadian and US stakeholders indicated that there is no shortage of project possibilities, but rather the challenge is finding the resources and the political will to commit resources to accomplish those projects.

US and Canadian respondents indicated that a lack of human resources in the Memphremagog watershed in general is hindering work, but still linked this back to limited funding that restricts staff time and that a lack of solid, consistent annual funding for clean water work restricts organizational capacity to hire and retain paid staff. Specifically, survey respondents indicated that a lack of funding to support staff in project development can stall, delay, or hinder project implementation. For smaller non-governmental organizations and lake associations, limited funding also results in a reliance on volunteers which can lead to inconsistent work results as volunteers either move on or burn out. A few survey respondents also indicated that this also applies to limited local funding, as often state or federal grants require local matches, either in-kind or monetary, and this local commitment can be hard to obtain.

Lack of political will and buy-in was cited a challenge to overcome for successful project implementation. Several US stakeholders stated that Vermont has strong state regulation, but there is not enough staff or resources to enforce state laws. Further, US stakeholders cited a lack of political will at the local level to enforce state regulation or adopt municipal environmental protections. This presents an interesting combination of strong state laws but lack of local implementation due to limited state enforcement, limited local buy-in, and again, a lack of funding for implementation and enforcement.

Further, both US federal and state stakeholders who indicated early in the survey that their roles included being project funders, also ranked financial resources as the most significant barrier. For federal stakeholders, this was closely followed by lack of political will as the second most significant barrier. For VT State Government stakeholders, the second most significant barrier was human resources. This suggests that agencies which not only implement projects but also distribute federal and state dollars to on-the-ground projects do not have adequate funding to disseminate to local projects or to support in-house projects and internal systems. Both federal and state agency budgets and grant programs are dependent on legislative acts, suggesting that part of this problem could be solved through legislative appropriations and increased political will of state and federal legislatures to invest in government agencies.

Canadian stakeholders also cited lack of political will as a barrier and indicated in comments that this was referring to the lack of funding from federal, provincial, and some municipal governments. While lack of political will was the greatest barrier for Canadian municipalities, several stakeholders, particularly organizations working in the municipality of Austin, commented that the municipal political will has been helpful in implementing projects. Difficulties in mobilizing

farmers and lack of regulations for agricultural lands and boating were other barriers mentioned by Canadian stakeholders.

Interestingly, the only US stakeholder group to not rank financial resources as the greatest barrier were Lake Association. Responses indicate that this group views lack of human resources as the greatest barrier, followed by mobilization of concerned stakeholders and political will. Financial resources were ranked fourth. This might be due to the fact that the majority of these organizations are run entirely by volunteers with few programs paid for through grant initiatives. Lake association programs in Vermont are mainly funded by membership dues and donations, meaning that the greatest challenge for these organizations to implement projects is to find volunteers to run the organization, to staff programs/projects, and to increase membership.

Survey respondents were also asked to identify the factors that had been most helpful in past project success. 50% of US stakeholders indicated that financial resources had been most helpful, which corroborates the needs for additional funding. This was followed by collaboration and political will. Non-governmental organizations were most united with 100% of respondents indicating that financial resources have been key to past project success. This is not surprising, as most non-governmental organizations are funded through grants and without that funding, projects could not occur. Interestingly, expertise was ranked as the second most important factor for project success by US federal and municipal stakeholders and first by lake associations and private sector. However, *lack of* expertise was not ranked as a significant barrier by these groups, indicating that expertise is not only important, but is being already utilized to implement projects in the watershed. Finally, while Canadian respondents indicated that all the factors were very helpful in past project success, the provincial ministry of environment indicated that clear legislation that is easy to apply and political will were particularly helpful.

3.4 Opportunities

Broadly, survey respondents presented opportunities for the Memphremagog watershed in two ways: 1) project opportunities and 2) process opportunities. In comments throughout the survey, most of the suggestions for new projects came from the expansion of current projects and initiatives. Process opportunities focused on how we can approve our approach to projects. Many of the comments and opportunities were also qualified by the statement- if funding was available.

Most of the US responses regarding project opportunities fell into four broad categories: 1) riparian buffers and stream bank restoration; 2) agricultural on-farm projects; 3) Lake Wise assessments and implementation; and 4) road improvements. It is interesting that these broad categories of projects were mentioned by different stakeholders throughout the survey, this suggests that these types of projects are perceived as important and as a priority by many.

By far the greatest number of project opportunities suggested by US stakeholders were for agricultural projects including: on-farm BMPs, increased staffing for agricultural service providers, or increased direct service programs for agricultural producers. These comments and suggestions for projects were also qualified by explanations of barriers to agricultural project implementation from limited by-in, funding, capacity, and the economic realities farming. It is

clear that the Vermont agricultural service providers responding to the survey see incredible opportunities for work with farmers and for increasing and expanding the scope, reach, and impact of current initiatives, but are currently unable to reach those project goals.

Two lakes in the US portion of Memphremagog watershed have received a Lake Wise Gold Award, meaning that 15% of the properties along the shoreline are certified Lake Wise (see Chapter 3 Section #x for program explanation). US survey respondents from non-governmental organizations and lake associations see the benefit of this past work, and there were multiple recommendations to expand and continue this program in the watershed. Currently, Lake Wise is a voluntary program, and there are limited to no funding opportunities for local lake associations and organizations to conduct the on-site assessments or to work with landowners through the adoption or installation of new practices. As such, the opportunity to expand this program could be tied in with funding for project development.

50% of US stakeholders also identified on-the-ground projects as having the greatest impact on reducing nutrient loading. This fact, coupled with the project opportunities that build off of current initiatives supports the conclusion that US stakeholders are looking towards more effective, efficient, and widespread implementation of current projects and initiatives, but need the funding and political support to make this happen. It is no surprise that 50% of US respondents also indicated that funding was their greatest need.

In addition to project opportunities, US stakeholders also suggested opportunities to improve how projects are approached and the process by which projects occur. These suggestions included: 1) increased collaboration between organizations and agencies; 2) wholistic approach to problems and solutions; 3) flexibility in prioritization of projects and seizing opportunities that arise; 4) celebrating and showcasing successes.

Showcasing and celebrating successes was brought up in a few different ways. One respondent suggested increasing water quality monitoring and outreach to show the improvement associated with specific projects. Another US respondent indicated that increased local knowledge, outreach, and public engagement is key on project needs and successes, drawing a line from an informed local public on the water quality concerns affecting politicians, political will, and funding opportunities. Another respondent suggested that there are also opportunities for increased public engagement and “take home-scale” action for individuals to protect and preserve the environment and show local successes. Especially in Vermont, disseminating information in the rural area is challenging, but is potentially part of the project process that has been overlooked and underfunded. Sharing project needs and successes presents an opportunity for increased public engagement, knowledge sharing, and buy-in, as well as a method to increase political will and make funding a political priority.

Most of the Canadian responses regarding project opportunities also fell into four categories: 1) to implement or upscale existing action plans; 2) to improve roads and ditches; 3) to conserve natural lands and forest cover in the watershed; 4) to replicate existing municipal regulations on individual septic systems. Several Canadian stakeholders indicated that environmental assessments and action plans have been done in different areas of the watershed, as for Castle Brook and Cherry

River sub-watersheds, but that these plans are missing the financial resources to implement these actions. The specific project opportunities suggested by the Canadian stakeholders were related to the reduction of erosion in the watershed by improving roads and conserving natural lands, forest cover, and shorelines. It was suggested that various projects of the municipality of Austin be upscaled or replicated to reduce nutrient loading including a Green Fund to finance projects, regulation and funding to improve individual septic system, regulation to keep forest cover in the territory, and the environmental management of ditches. It was also suggested that a project from the City of Magog to monitor phosphorus sources be upscaled.

To improve how projects are approached and the process by which projects occur, Canadian stakeholders had the following suggestions: 1) work in collaboration with all stakeholders; 2) present the projects with detailed plan and budget to the municipality to get municipal political will and funds; and 3) invest financial resources to implement existing projects or upscale action plans. The importance of collaboration in the process by which projects occur was mentioned several times and the necessity to involve different types of stakeholders was highlighted (experts, local populations, municipalities, etc.).

3.5 Solutions and strategies to adopt

US stakeholders were clear that in the Memphremagog watershed, not only do on-the-ground projects have the greatest impact on reducing nutrient loading, but there are on-the-ground projects and initiatives that are ready and waiting to be implemented. Additional planning or studies is not the greatest need in the US. What is needed is assistance in implementing projects within existing plans, such as the Tactical Basin Plan and TMDL released in 2017, stormwater master plans, and Lake Wise assessments. In order to move projects forward in the Vermont, US survey responses presented four broad categories of solutions: 1) additional funding; 2) increased outreach, education, and public engagement; 3) increased enforcement of state environmental regulations; and 4) increased collaboration and coordination. None of these four initiatives are mutually exclusive, in fact, investing time and resources into all four simultaneously may result in a wholistic and comprehensive management approach to reducing nutrient loading suggested by survey respondents.

Funding is the greatest barrier to project implementation for US stakeholders and additional federal, state, and local investment in clean water projects is needed. This funding will help overcome the barrier of limited human resources and close the gaps in projects and programming.

Vermont Act 76, “An act relating to the provisions of water quality services” was signed by the Vermont Governor in June 2019. Act 76 establishes a long term and dedicated funding source for clean water projects in the state of Vermont from the Rooms and Meals Tax, equating to \$7.1 million available in 2020 and \$12 million available annually starting in 2021. The bill also mandates the establishment of a new distribution model for funding from 17 regional clean water service providers, new grant making programs, and pollution reduction targets, all of which will be developed by the Vermont Agency of Natural Resources (VANR).

With a long-term and dedicated source of funding, as well as a mandate to update grant making, funding distribution, and pollution reduction targets, the state of Vermont has the opportunity to address some of the challenges and gaps in project funding raised by the United States and Vermont stakeholders. This could include funding categories for all stages of projects including project development and general community engagement, collaborative efforts, education and outreach, as well as capital projects. Currently, the VANR also has the opportunity to include a wide array of stakeholders in the rulemaking process and/or development implementation guidelines for Act 76. It is especially important to include project implementors in the rulemaking process, as that input is vital to matching funding priorities to project necessities and realities.

Increasing education, outreach, and community engagement for projects, water quality needs, and successes can hopefully lead to more local, state, and federal buy-in. Further, showcasing local successes and projects adds value to the work for the individuals participating as early adopters and community leaders and can lead to additional participation in projects.

Simultaneously, it was suggested by a few stakeholders that Vermont needs increased state enforcement of environmental regulations, likely coupled with increased assistance to landowners to come into compliance with state regulations. As survey respondents indicated, Vermont has strong environmental regulations in Act 64, the Shoreland Protection Act, and Act 250; however, there are not enough enforcement officers or permit specialists to assist landowners with understanding and complying with regulation. VT State Government stakeholders indicated that the greatest barriers for them are limited financial resources and limited human resources, meaning that potentially additional funding for state agencies is needed to increase capacity and improve enforcement and permitting operations.

Lastly, additional collaboration and coordinated actions was cited by US stakeholders as a solution to overcoming limited human resources, limited funding, and providing wholistic approaches the nutrient loading problem, as various types of organizations and sectors bring different skills and resources needed to approach the nutrient management problems. There are currently coordinated working groups for agriculture and stormwater in the Vermont portion of the watershed that work to increase project collaboration and knowledge sharing, however, funding for this type of work is limited. This includes additional coordination with Canadian stakeholders and engagement in the Quebec Vermont Steering Committee.

Similar to US stakeholders, Canadian stakeholders indicated that on-the-ground projects have the greatest impact on reducing nutrient loading and that there are on-the-ground projects that are ready to be implemented because several action plans and assessments have already been done in different parts of the watershed. Unlike the US, the Canadian portion of the lake doesn't have a general action plan based on a model, like a TMDL, and some stakeholders indicated that a global action plan is needed for the watershed.

In order to move projects forward in the Canadian portion of the lake, three main categories of solutions were presented by survey responses: 1) additional funding and human resources; 2) increased collaboration and coordination; 3) increased environmental regulations and application.

Like US, additional and long-term funding was broadly the main solution mentioned by Canadian stakeholders to reduce nutrient loading in Lake Memphremagog. This was also linked to the necessity to get additional human resources to coordinate and implement actions in the watershed and to the necessity to plan collaborative and coordinated actions.

Several solutions linked to an improvement of regulations were also suggested by Canadian stakeholders. It was suggested that the federal government needs to make easier the process to regulate boats on a lake, that the provincial government must increase regulations on agriculture and that some municipalities must increase environmental regulations and reinforce zoning laws, likely coupled with increased human resources and assistance to come into compliance with the regulations.

Conclusion

Between November and December of 2018, an online survey was sent to 161 Canadian and US Memphremagog watershed stakeholders. The purpose of the survey was to gather information on current practices, projects, and initiatives in the watershed to reduce nutrient loading, to assess impacts of nutrient loading, understand barriers to project implementation, and identify opportunities. Responses and statistics from the survey were used and analyzed not only in this networking report, but also in support of research and conclusions of the Memphremagog Report.

59 stakeholders responded to the survey for a 37% response rate. This included 26 Canadian stakeholders and 33 US stakeholders. The survey respondents represented a wide array of organization types, with 22% from lake or river associations, 20% from municipalities, 19% from non-governmental organizations, and 15% from state/provincial government. Unfortunately, there were no private sector or federal respondents from Canada, and no international government respondents. The survey respondents also primarily identified as outreach/education or on-the-ground project organizations, and as working in the environmental field.

Overall, stakeholders were concerned with the impacts of nutrient loading on recreational activities, tourism, and the economy of the area. Stakeholders made links between high levels of phosphorus increasing native and exotic aquatic species growth and increasing the frequency and duration cyanobacteria blooms. This degradation in water quality could impede boating, swimming, and overall aesthetics of the lake, affecting tourism, property values, and the local economy. Canadian stakeholders were also concerned with the effect of nutrient loading on the cost and treatment of drinking water, as Lake Memphremagog is a drinking water source for around 175,000 Canadians.

Not surprisingly, both US and Canadian Stakeholders rated lack of financial resources as the greatest barrier to project implementation. For US stakeholders, this was followed by a lack of human resources and then lack of political will. For Canadian stakeholders, lack of political will was rated the second greatest barrier, followed by lack of human resources. However, even with these barriers, survey respondents identified numerous opportunities.

US and Canadian survey respondents indicated that on-the-ground have the greatest impacts. Further respondents explained that studies and crafted plans have already been conducted which outline projects and initiatives to be implemented if funding and human resources can be made available. Some Canadian stakeholders indicated that a global action plan is needed for the Quebec portion of the watershed.

Opportunities suggested by the stakeholders came in two forms: project opportunities and process opportunities. Most of the US responses regarding project opportunities fell into four broad categories: 1) riparian buffers and stream bank restoration; 2) agricultural on-farm projects; 3) Lake Wise assessments and implementation; and 4) road improvements. By far the greatest number of suggestions were for agricultural projects. To improve process, stakeholder suggestions included: 1) increased collaboration between organizations and agencies; 2) wholistic approach to problems and solutions; 3) flexibility in prioritization of projects and seizing opportunities that arise; 4) celebrating and showcasing successes. Most of the Canadian responses regarding project opportunities fell into these categories: 1) to implement or upscale existing action plans; 2) to improve roads and ditches; 3) to conserve natural lands and forest cover in the watershed; 4) to replicate existing municipal regulations on individual septic systems. To improve process, Canadian stakeholders had the following suggestions: 1) work in collaboration with all stakeholders; 2) present the projects with detailed plan and budget to the municipality to get municipal political will and funds; and 3) invest financial resources to implement existing projects or upscale action plans.

In order to release the specific projects to reduce nutrient loading, US stakeholders identified a four way path: 1) additional funding from federal, state, and local sources; 2) increased outreach, education, and public engagement to increase individual and political will; 3) increased enforcement of state environmental regulations; and 4) increased collaboration and coordination to leverage existing resources and expertise. In order to move projects forward in the Canadian portion of the lake, three main categories of solutions were presented by survey responses: 1) additional funding and human resources; 2) increased collaboration and coordination; 3) increased environmental regulations and application. None of these initiatives are mutually exclusive, in fact, investing time and resources into all simultaneously may result in a wholistic and comprehensive management approach to reducing nutrient loading suggested by survey respondents.

Appendix 1

Memphremagog Watershed Stakeholder List

1. International Organizations

International Joint Commission

Website: <http://www.ijc.org/en/>

2. Canadian Stakeholders

Municipalities

Austin

Website: www.municipalite.austin.qc.ca

Bolton-Est

Website: www.boltonest.ca

MRC de Memphrémagog

Website: www.mrcmemphremagog.com

Ogden

Website: <http://www.munogden.ca/>

Orford Township

Website: www.canton.orford.qc.ca

Potton Township

Website: www.potton.ca

St-Benoît-du-Lac

Website: www.abbaye.ca

Stanstead Township

Website: www.cantonstanstead.ca

Town of Magog

Website: www.ville.magog.qc.ca

Town of Sherbrooke

Website: www.ville.sherbrooke.qc.ca

Quebec State Government

Orford County - Gilles Bélanger

Website: <https://coalitionavenirquebec.org/fr/blog/equipe/gilles-belanger/>

Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC)

Website: www.environnement.gouv.qc.ca

Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ)

Website: www.mapaq.gouv.qc.ca

Ministère des Forêts, Faune et Parcs (MFFP)

Website: mffp.gouv.qc.ca/

Canadian Federal Government

Compton-Stanstead County - Hon. Marie-Claude Bibeau

Website: <http://mcbibeau.liberal.ca/>

Brome-Missisquoi County - Hon. Denis Paradis

Website: <http://dparadis.liberal.ca/>

Environment and Climate Change Canada (ECCC)

Website: www.ec.gc.ca

First nations

Conseil des Abénakis d'Odanak

Website: <https://caodanak.com/>

Regional organisations

Agence de mise en valeur des forêts privées de l'Estrie (AMFE)

Website: www.agenceestrie.qc.ca

Association forestière du sud du Québec (AFSQ)

Website: <https://afsq.org>

Aménagement forestier et agricole des Sommets inc.

Website: <http://www.afasommets.qc.ca/>

Club agroenvironnemental de l'Estrie (CAEE)

Website: www.caestrie.com

Conseil de gouvernance de l'eau des bassins versants de la rivière Saint-François (COGESAF)

Website: www.cogesaf.qc.ca

Conseil régional de l'environnement de l'Estrie

Website: www.environnementestrie.ca

Corridor appalachien

Website: www.corridorappalachien.ca

Fédération Québécoise des chasseurs et pêcheurs de l'Estrie :

Website: <http://fedecp.com/communaute-evenements/05-estrie/conseil-d-administration>

Union des producteurs agricoles (UPA) – Estrie

Website: <https://www.estrie.upa.qc.ca>

Local organisations and lake associations

Association du Marais-de-la-Rivière-aux-Cerises (LAMRAC)

Website: <https://maraisauxcerises.com/lamrac/general/association-du-marais-de-la-riviere-aux-cerises.php>

Association pour la protection et l'aménagement du ruisseau Castle (APARC)

Association de protection du lac Gilbert

Association des propriétaires de la baie des Aulnes

Association des propriétaires du lac Malaga

Association des propriétaires du lac Miller

Association des propriétaires du lac Nick

Association des propriétaires de la Pointe-Gibraltar

Association des propriétaires de Southière-sur-le-Lac

Association des propriétaires du lac des Sitelles

Association des propriétaires des Villas de l'Anse

Association des riverains du lac à la truite

Fondation Marécage Memphrémagog (FMM)

Memphrémagog Conservation inc. (MCI)

Website: www.memphremagog.org

Parc du Mont-Orford

Website: www.sepaq.com/pq/mor/index.dot?language_id=2

RAPPEL – Coop

Website: www.rappel.qc.ca/

Société de conservation du lac Lovering

Website: www.lacloving.org

Universities and investigation groups

Groupe de recherche interuniversitaire en limnologie et en environnement aquatique (GRIL)

Website: https://oraprdnt.uqtr.quebec.ca/pls/public/gscw030?owa_no_site=543

Université du Québec à Montréal (UQAM) - Département des sciences de la Terre et de l'atmosphère

Website: <https://scta.uqam.ca>

Université Laval - Faculté des sciences et de génie

Website: <https://www.fsg.ulaval.ca/accueil/>

Université McGill - McGill School of Environment

Website: <https://www.mcgill.ca/mse/>

Wilder and Helen Penfield Nature Conservancy

Website: <https://www.mcgill.ca/penfieldreserve/>

Université de Montréal (UdeM) - Faculté des arts et des sciences

Website: <https://fas.umontreal.ca/accueil/>

Université de Sherbrooke (UdeS) - Centre universitaire de formation en environnement et développement durable (CUFE)

Website: <https://www.usherbrooke.ca/environnement/>

Université de Trois-Rivière (UQTR) - Centre de Recherche sur les Interactions Bassins Versants - Écosystèmes Aquatiques (RIVE)

Website: https://oraprdnt.uqtr.quebec.ca/pls/public/gscw030?owa_no_site=2137

Institut de recherche et de développement en agroenvironnement (IRDA)

Website: <https://www.irda.qc.ca/en/>

Private industries

J.F. Sabourin et associés inc. (JFSA)

Website: <http://www.jfsa.com/fr/>

Natur'Eau-Lac

Le Club Hermitage

Club Memphrémagog

Golf et Mont de ski Owl's head

Golf Mont-Orford

Club de Golf Manoir des sables

Ski Orford

Marina Merry

Marina Daniel Viens

Marina Fitch Bay

Hydro-Magog

3. United States Stakeholders

Municipalities

Town of Albany

Town of Barton

Town of Brighton

Website: <http://brightonvt.org/>

Town of Charleston

Website: <http://charlestonvt.org/town-office/>

Town of Coventry

Website: <http://www.coventryvt.org/>

Town of Craftsbury

Website: <https://www.townofcraftsbury.com/>

Town of Derby

Website: <https://derbyvt.org/>

Town of Glover

Website: <http://townofglover.com/>

Town of Greensboro

Website: <http://www.greensborovt.org/>

Town of Irasburg

Newport City

Website: <https://www.newportvermont.org/>

Newport Town

Town of Morgan

Website: <http://townofmorgan.com/>

Town of Westmore

Vermont State Government

Vermont Fish and Wildlife

Website: <http://www.vtfishandwildlife.com/>

Vermont Agency of Natural Resources

Website: <https://anr.vermont.gov/>

Vermont Department of Environmental Conservation

Website: <http://dec.vermont.gov/>

Vermont Agency of Transportation

Website: <http://vtrans.vermont.gov/>

Vermont Department of Health

Website: <http://www.healthvermont.gov/>

Vermont Agency of Agriculture Food and Markets

Website: <http://agriculture.vermont.gov/>

Vermont Department of Forests Parks and Recreation

Website: <https://fpr.vermont.gov/>

Lake, River, and Watershed Associations

Echo Lake Protection Association

Website: <http://www.echolakeassociation.net/>

Lake Parker Association

Website: <http://lakeparker.org/contact-us/>

Memphremagog Watershed Association

Website: www.mwavt.org

Salem Lakes Association

Website: <http://www.salemlakesvt.org/>

Seymour Lake Association

Website: <http://seymourlake.org/>

Shadow Lake Association

Website: <http://shadowlakeassociation.org/>

Westmore Association

Website: <https://westmoreassociation.org/>

Non-Governmental Organizations**Essex County Natural Resources Conservation District**

Website: <http://essexcountynrcd.org/>

Federation of Vermont Lakes and Ponds

Website: <http://vermontlakes.org/>

Northern River Land Trust

Website: <http://www.northernriverslandtrust.org/index.html>

NorthWoods Stewardship Center

Website: <https://www.northwoodscenter.org/wordpress/>

Orleans County Natural Resources Conservation District

Website: <https://www.vacd.org/conservation-districts/orleans-county/>

Vermont Land Trust

Website: www.vlt.org

Vermont Forests Products Association

Website: <http://www.vtfpa.org/>

Vermont Reptile and Amphibian Atlas

Website: <https://www.vtherpatlas.org/>

Watersheds United Vermont

Website: <https://watershedsunitedvt.org/>

Colleges and Universities**Community College of Vermont**

Website: <http://ccv.edu/location/ccv-newport/>

Sterling College

Website: sterlingcollege.edu

University of Vermont, Rubenstein School of Environment and Natural Resources

Website: <https://www.uvm.edu/rsenr>

Federal Agencies

Environmental Protection Agency Region 1

Website: <https://www.epa.gov/aboutepa/epa-region-1-new-england>

USDA Natural Resource Conservation Service

Website: <https://www.rd.usda.gov/vt>

US Fish and Wildlife Services

Website: <https://www.fws.gov/>

Private Industry

Beck Pond LLC

Casella Waste Management

Website: <https://www.casella.com/locations/waste-usa-landfill-coventry-landfill>

Newport Marine Services

Other

Northeastern Vermont Development Association

Website: <http://www.nvda.net/>

Appendix 2

Responses by organization type to questions 5, 8, 10, and 13

1. Question 5

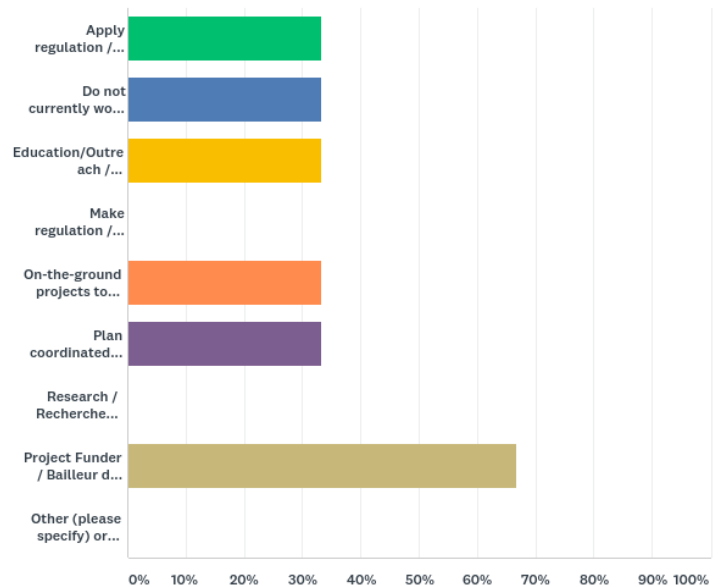
Q5 What is your organization's role(s) in the reduction of nutrient loading to Lake Memphremagog and its tributaries? (Check all that apply) / Quel est votre rôle (vos rôles) dans la réduction des apports d'éléments nutritifs au lac Memphrémagog et à ses tributaires? (Cochez toutes les cases qui s'appliquent)

Results by type of organizations

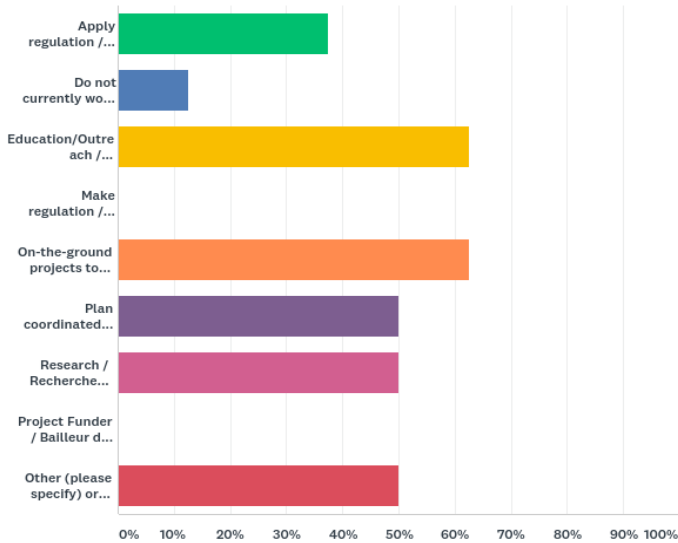
a) CAN Federal Government Results

NA

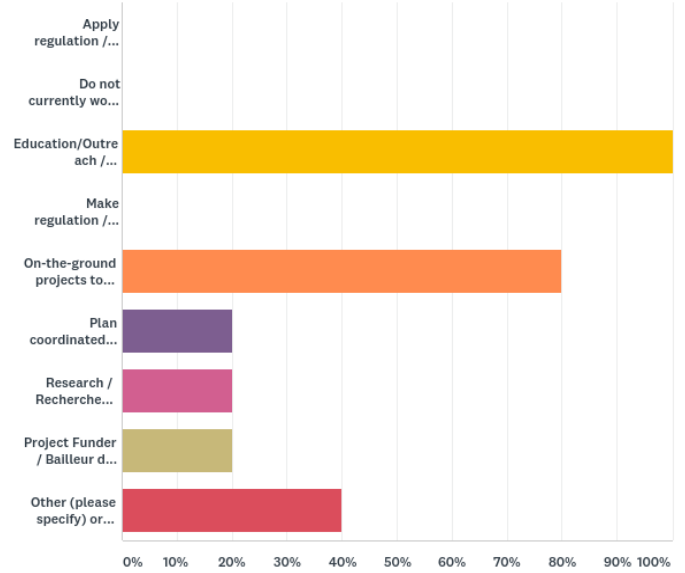
US Federal Government Results



b) CAN Lake or River Associations Results



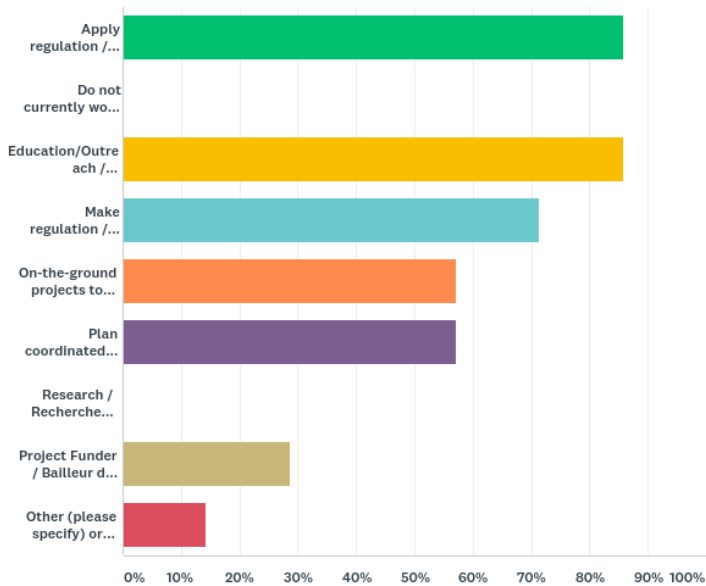
US Lake or River Associations Results



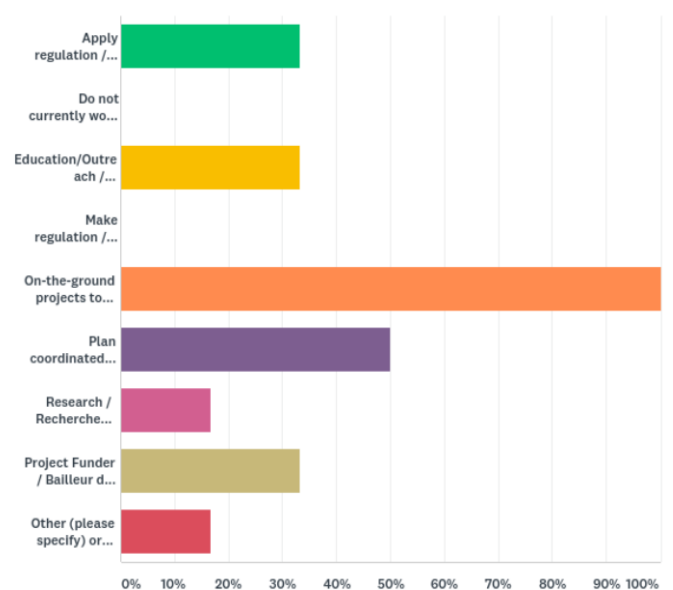
Comments received:

- Two Canadian comments added two roles: ‘*On-the-ground project to reduce nutrient accumulation*’ in the bottom of a bay in Lake Memphremagog and ‘*Conservation of natural lands in perpetuity*’ in Lake Memphremagog Watershed.

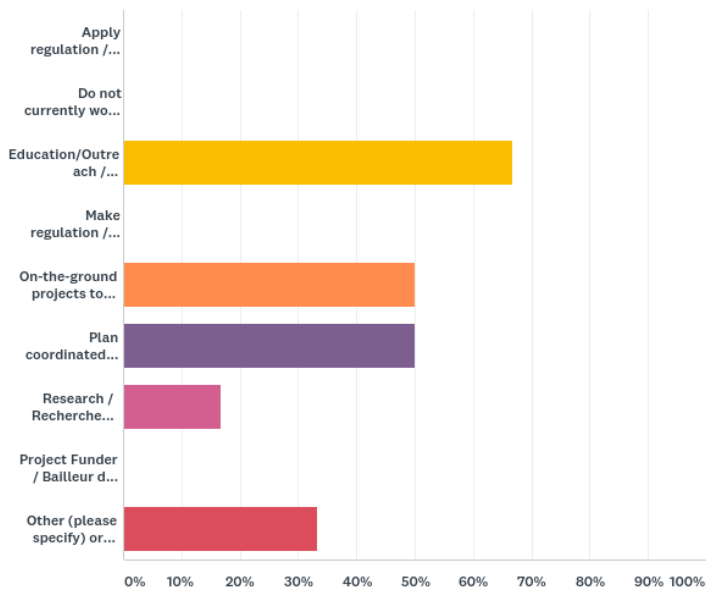
c) CAN Municipalities Results



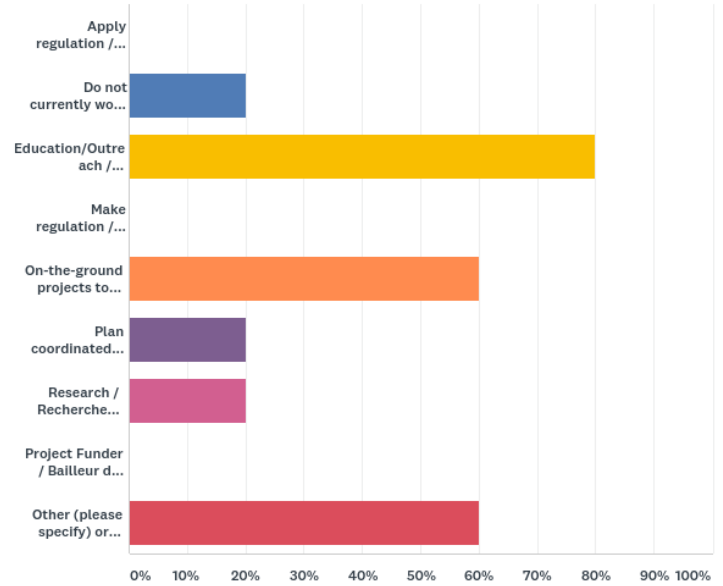
US Municipalities Results



d) CAN NGOs Results (Except Lake Associations)



US NGOs Results (Except Lake Associations)



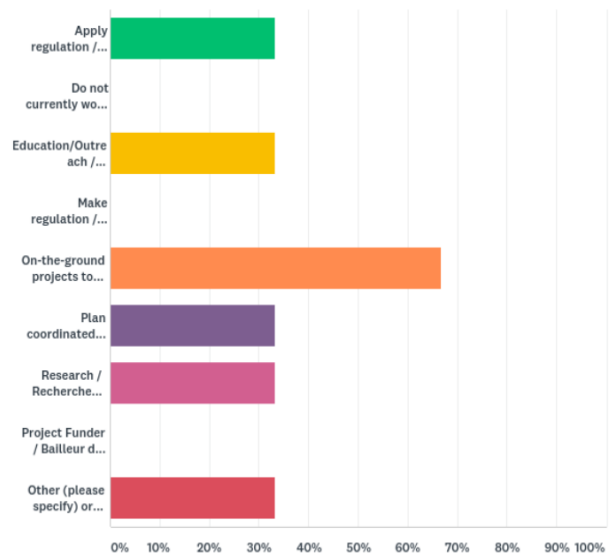
Comments received:

- One Canadian comment and one American comment added one role: ‘*Conservation of natural lands in perpetuity*’ in Lake Memphremagog watershed.

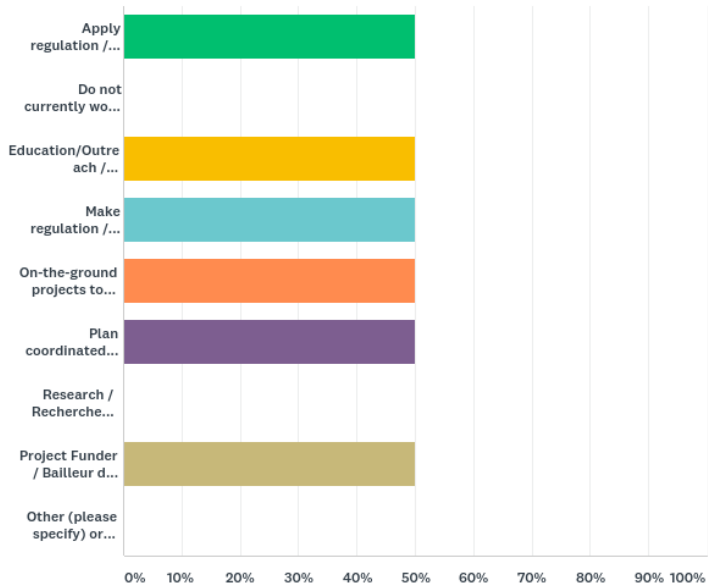
e) CAN Private Sector Results

NA

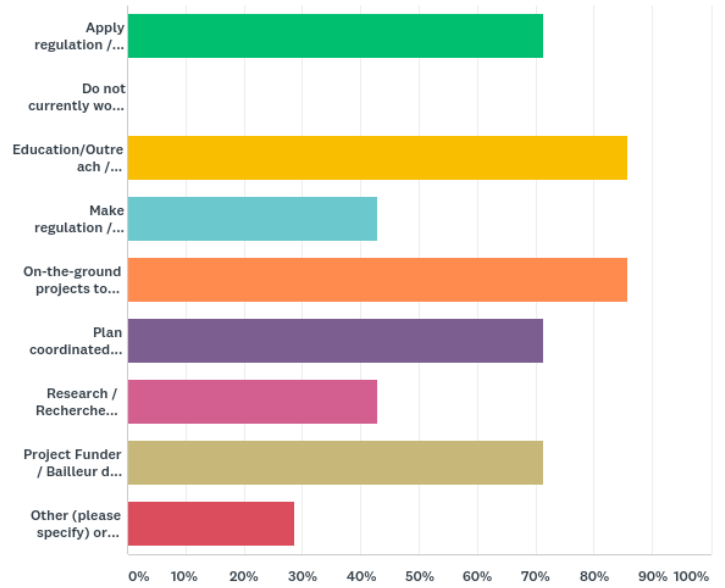
US Private Sector Results



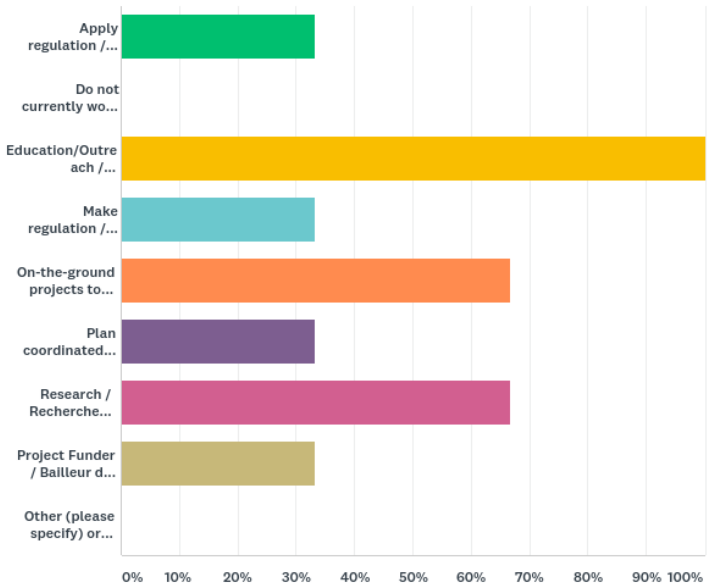
f) Quebec Provincial Government Results



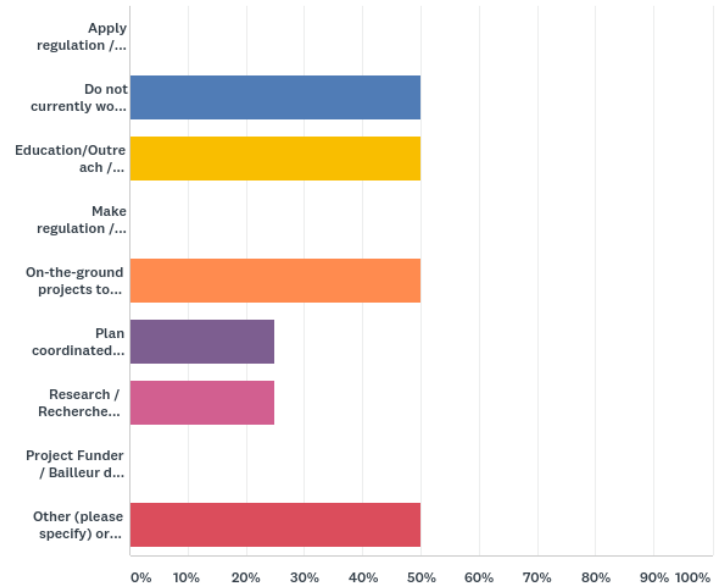
Vermont State Government Results



g) CAN Other Organizations Results



US Other Organizations Results



2. Question 8

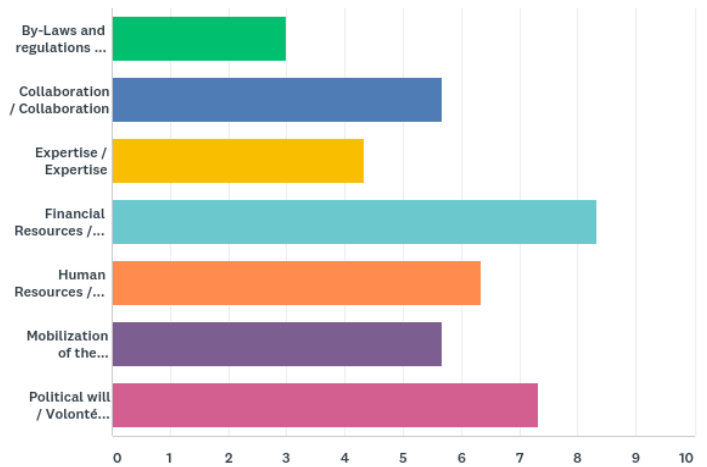
Q8 On a scale of 1 to 10, where 1 is not significant and 10 is most significant, please rate the significance of the following barriers to nutrient management project implementation in the Lake Memphremagog Basin. / Sur une échelle de 1 à 10, où 1 est Aucune importance et 10 est Importance significative, évaluez l'importance de ces obstacles dans la mise en œuvre de projets limitant les apports d'éléments nutritifs dans le bassin versant du lac Memphrémagog.

Results by type of organizations

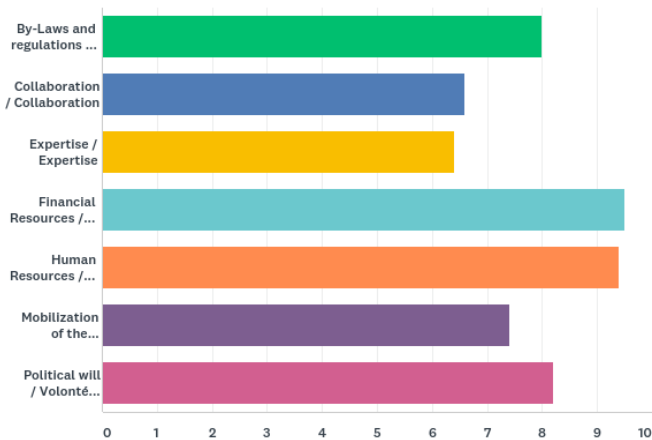
a) CAN Federal Government Results

NA

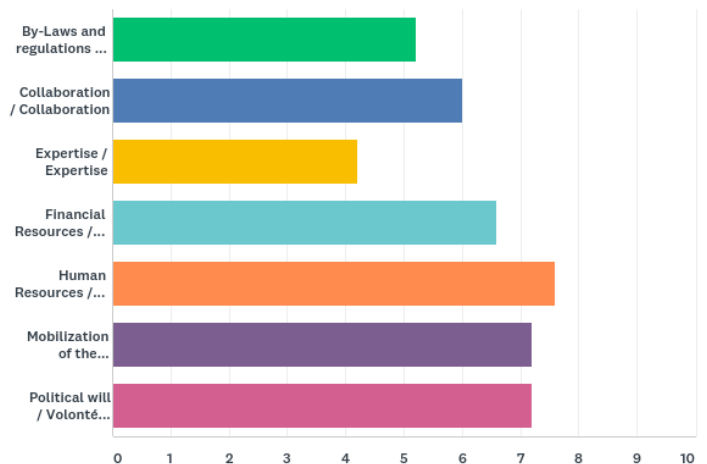
US Federal Government Results



b) CAN Lake or River Associations Results



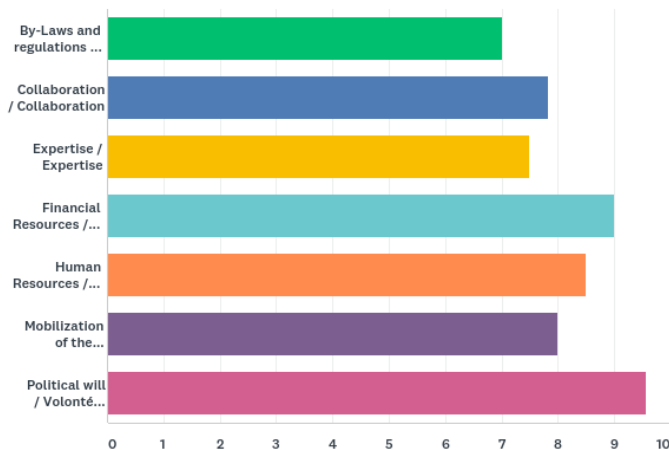
US Lake or River Associations Results



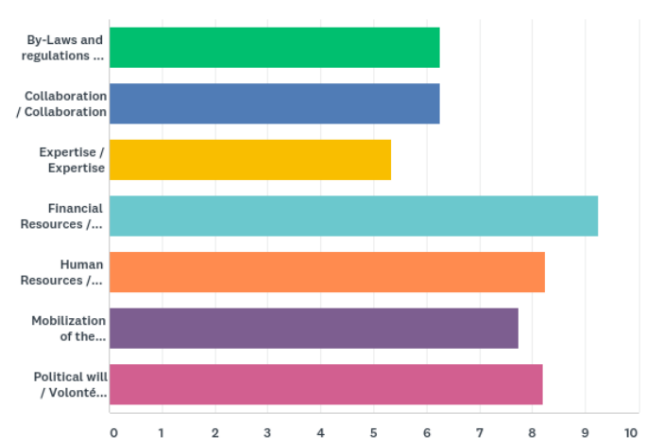
Comments received:

- CAN Stakeholder: I think that the greatest barriers, is that our type of organizations always have to look for funds and apply for programs which takes time and human resources, things that we are missing. The programs often give only a part of the total needed. Because we never know if we will have funds, it is difficult to keep our human resources because the job is not sure. For example, sometimes, we know in the mid-summer that we have funds to make a one-year project, when the field work must be done in summer. We need volunteers for the board which is not always easy to find.
- CAN Stakeholder: There is considerable collaboration between non-profits, but they lack the resources to carry out the multiple tests and regulatory means to reduce the flow of nutrients into the lake. Governments need to be part of this collaboration and funding. Often government levels tend to put the responsibility on other levels of government.
- US Stakeholder: Must get a solid base of finances to be committed each year. Can't rely on volunteers, must have paid personnel. Continue to reach out to engage public.

c) *CAN Municipalities Results*



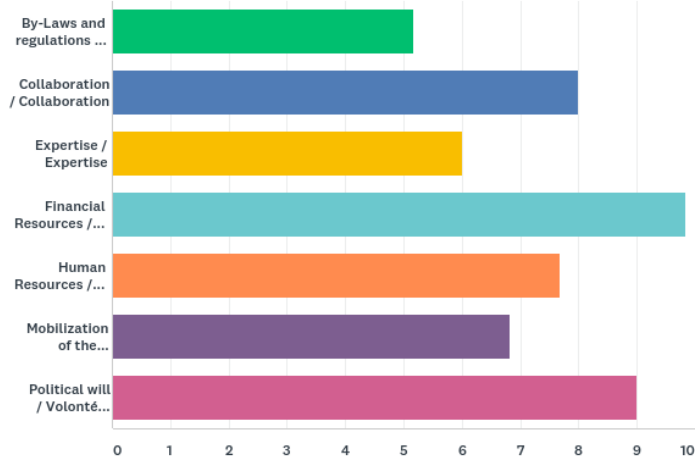
US Municipalities Results



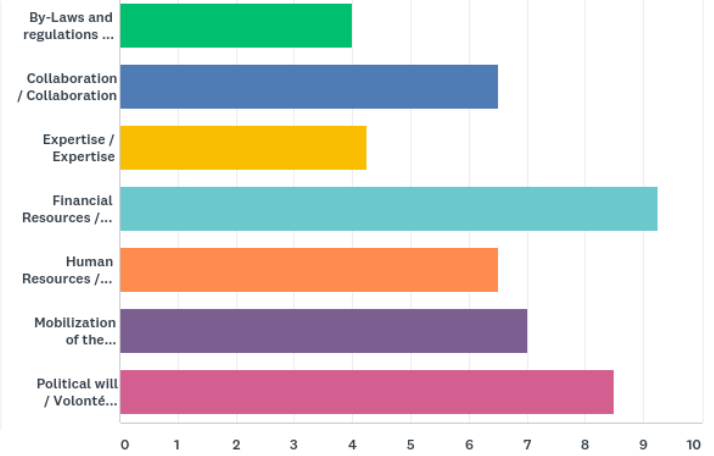
Comments received:

- US Stakeholder: There are a lot of regulations but not enough staff to enforcement them. There is a lot of collaboration but not enough "soft" funding sources to fully actualize the potential. There is a need to additional agronomic assistance in the watershed. There is a lot of grant money right now but not enough local money for voluntary implementation, match and operation and maintenance. The milk market in the US is hindering work on farms. There isn't enough staff time to adequately incorporate new regulations, standards and knowledge into already full workloads on farms and in municipalities. Mobilization of stakeholders happens, Ben does a great job of this! Act 64 proved that political will is in VT.
- US Stakeholder: Money needs to be allocated for the preservation and promotion of natural resources. There should be plentiful opportunities to engage the public to take home-scale action to improve the health of their local ecosystem.

d) *CAN NGOs Results (Except Lake Associations)*



US NGOs Results (Except Lake Associations)



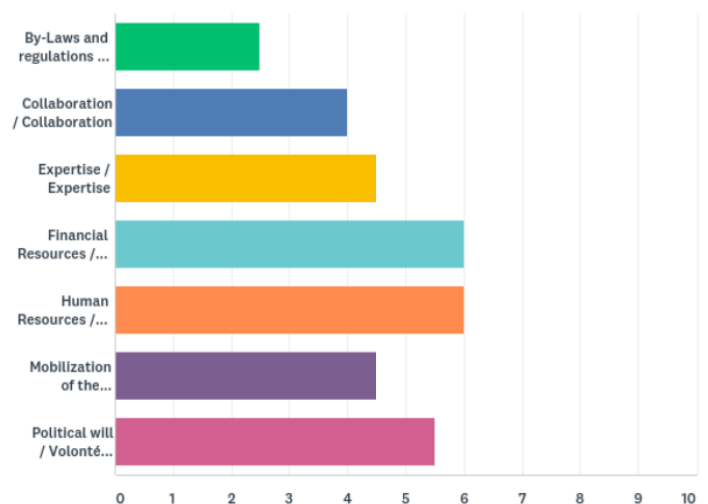
Comments received:

- US Stakeholder: Increasing widespread concern about this issue can help to take down some of these barriers. With enough people behind a clean water movement, we can change political will and thereby change regulation and thereby affect the financial resources available to help remediate the problem and mitigate future problems.
- US Stakeholder: Again, I feel like we can't speak to the specifics, but limitations in by-laws come up as significant barrier across the state in nutrient runoff. Also limited financial resources and human resources in the Memphremagog region has been a barrier. This limits the number of projects that can be accomplished.

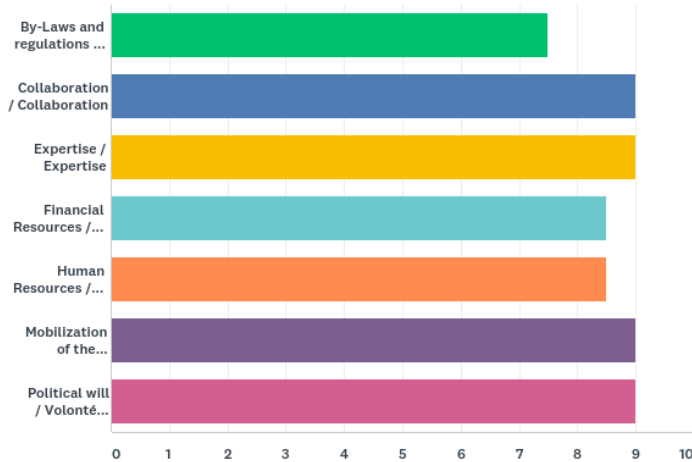
e) *CAN Private Sector Results*

NA

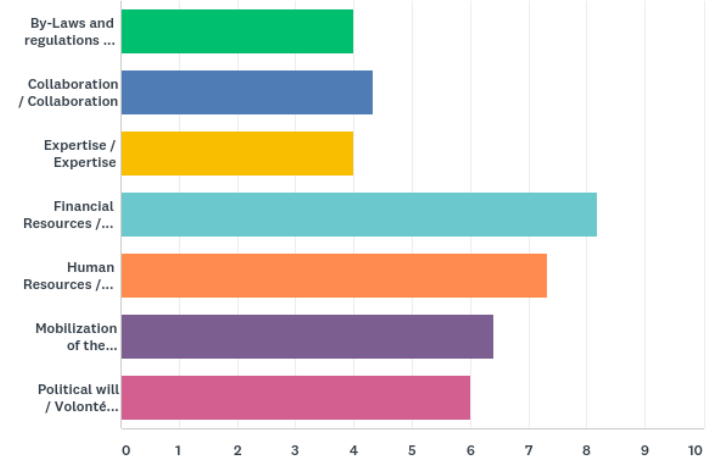
US Private Sector Results



f) Quebec Provincial Government Results



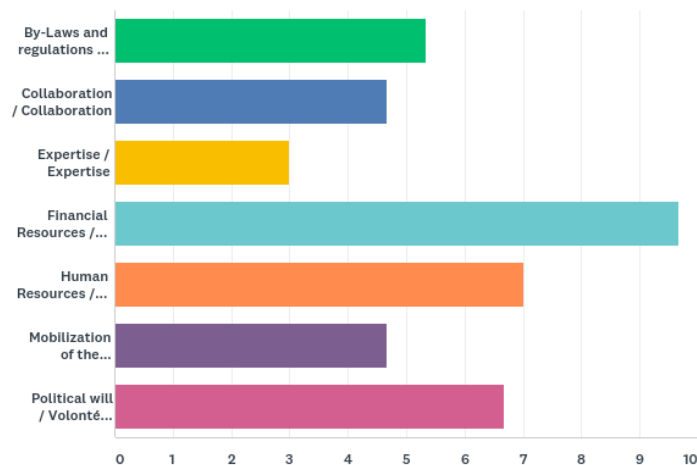
Vermont State Government Results



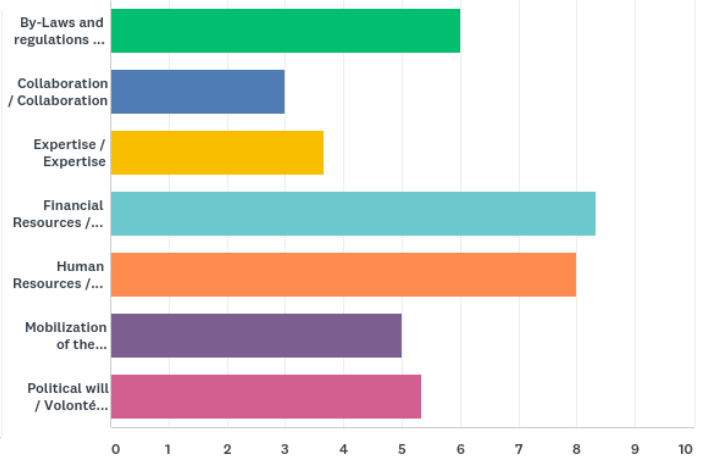
Comments received:

- CAN Stakeholder: These are all essential elements for a real change. In Quebec, a new *PAPA Program* to investigate individual septic system would be an asset. A reinforcement of the *Regulation on agricultural exploitations* to ban spraying in the 10 m shoreline would also be an asset, in concert with UPA to have a chance of success.
- US Stakeholder: Lake Memphremagog benefits from a fantastic partnership of actors whom are working collectively in a shared vision and method to achieve water quality goals.
- US Stakeholder: I think we are limited in this region as to the people on the ground necessary to implement practices need to reduce nutrient loading - closely followed by limitations in the funding necessary to do this work. I feel like in Vermont we have strong laws at the state level and are just beginning on the implementation of many of the regulations included in Act 64. However at the local level there is not a strong desire for strict local bylaws and so this is a barrier when it comes to river corridor protections.

g) CAN Other Organizations Results



US Other Organizations Results



3. Question 10

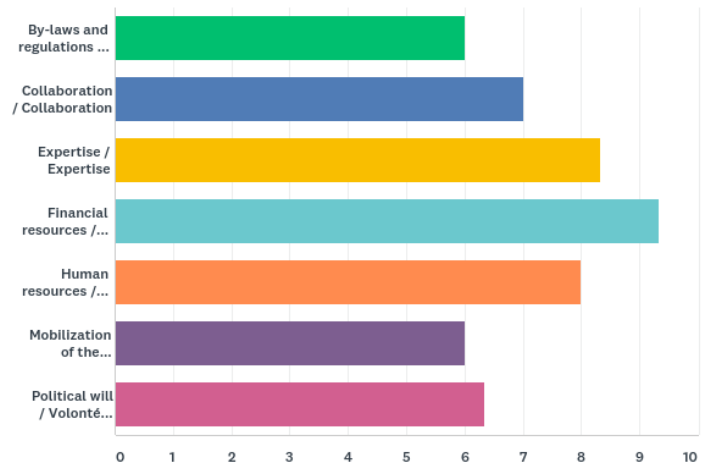
Q10 Reflecting on past projects to reduce nutrient loading to Lake Memphremagog and its tributaries, please rate the following factors on a scale of 1 to 10, where 1 is not helpful and 10 is the most helpful, for past project success / En vous basant sur vos précédents projets mis en oeuvre afin de réduire les apports d'éléments nutritifs au lac Memphrémagog et ses tributaires, évaluez les facteurs suivants sur une échelle de 1 à 10, où 1 est N'aide pas et 10 est Aide significativement, pour le succès de ces projets.

Results by type of organization

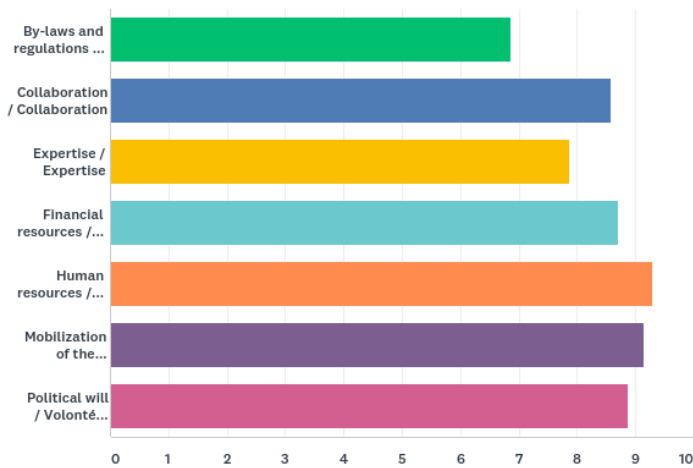
a) CAN Federal Government Results

NA

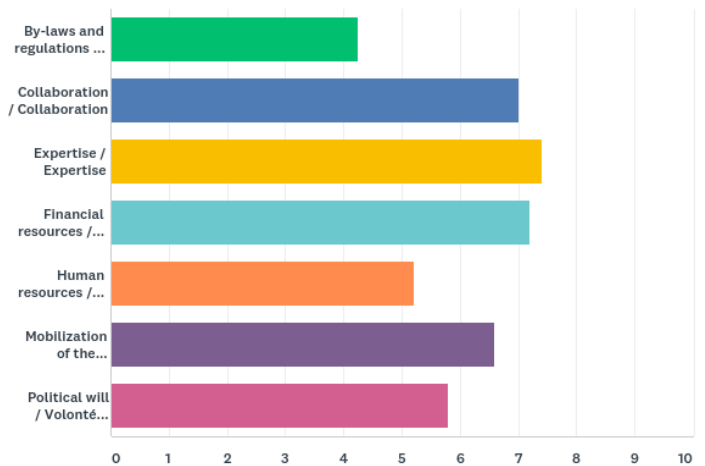
US Federal Government Results



b) CAN Lake or River Associations Results

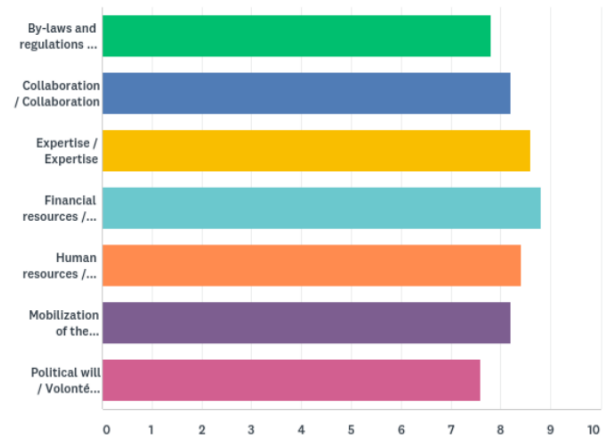


US Lake or River Associations Results

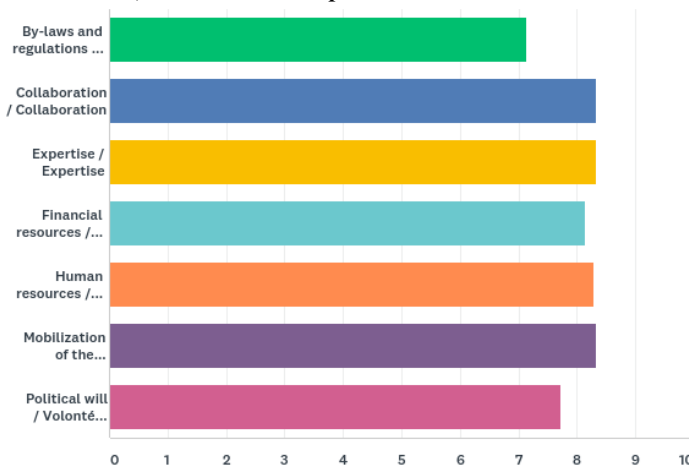


Comments received:

- CAN Stakeholder: Our project had a great support from the municipal and provincial governments.
- CAN Stakeholder: Volunteers, green funds and municipal policies.
- CAN Stakeholder: Financial resources and human resources are what helped the most our past project but the collaboration and the mobilization are also very important. The political will of the municipalities helped us a lot also.
- US Stakeholder: My observation is that while several lake associations in the Memphremagog Watershed have devoted human resources, funding, mobilization of concerned stakeholders and the political will to carry out programs and processes to improve water quality in the individual lakes, the same has not happened on the USA shores of Lake Memphremagog. Northwoods Stewardship Center (NWSC) has also be proactive in collaborating with MWA to plant stream bank buffers in the Memphremagog Watershed. NWSC has worked extensively with lake shore owners at Seymour to plant lake shore buffers. I do not know how successful the NWSC buffer programs have been on other lakes in the Memphremagog watershed.

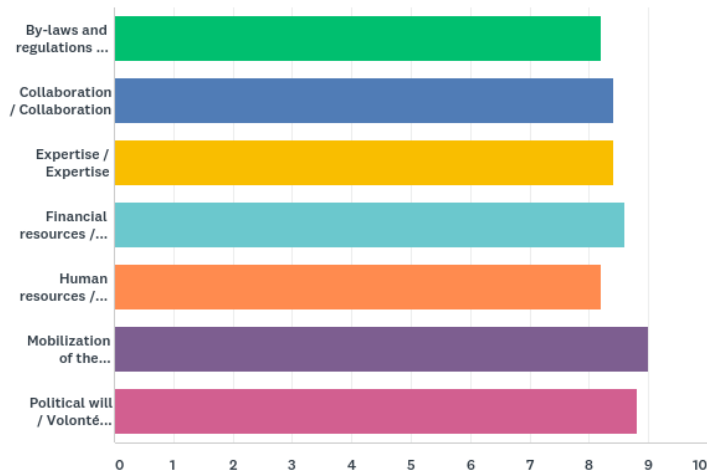


c) CAN Municipalities Results

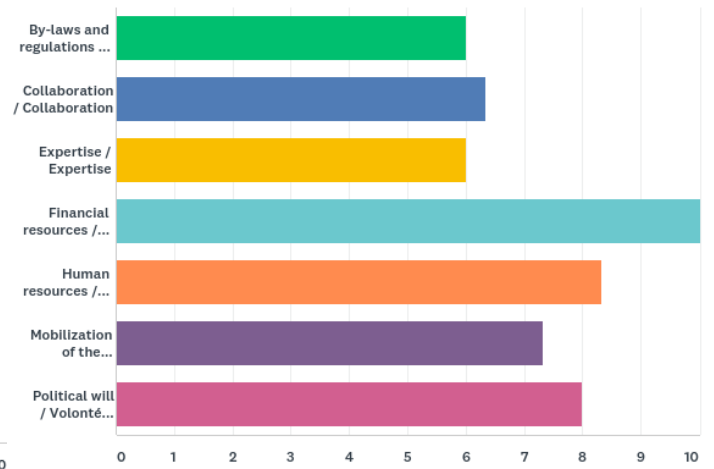


US Municipalities Results

d) *CAN NGOs Results (Except Lake Associations)*



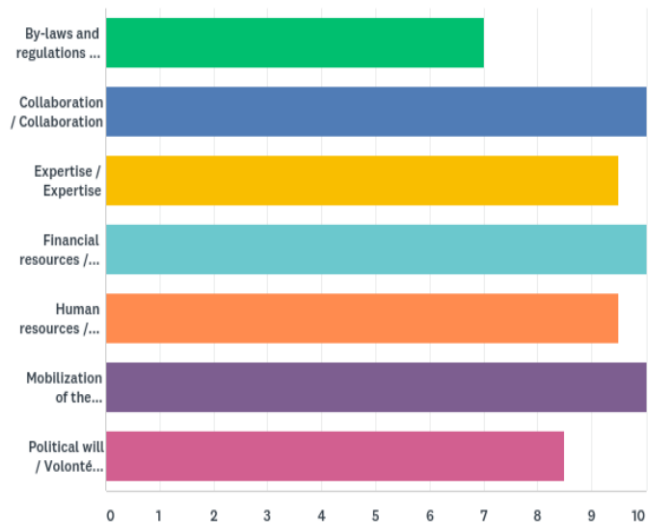
US NGOs Results (Except Lake Associations)



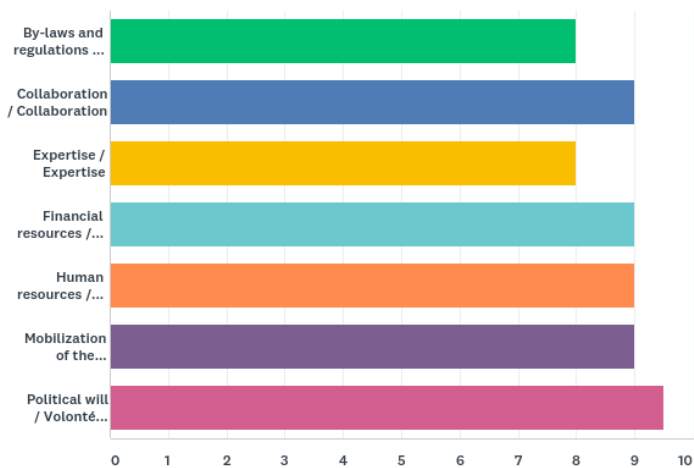
e) *CAN Private Sector Results*

NA

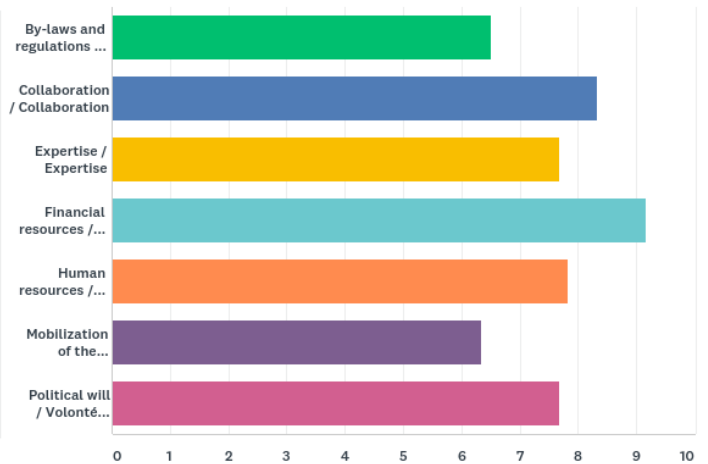
US Private Sector Results



f) *Quebec Provincial Government Results*



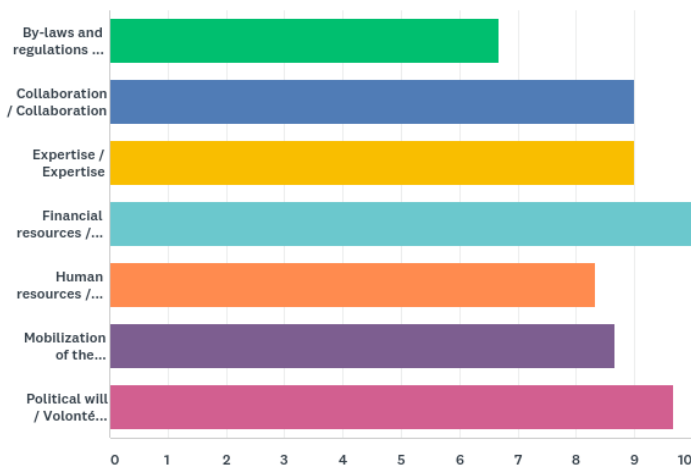
Vermont State Government Results



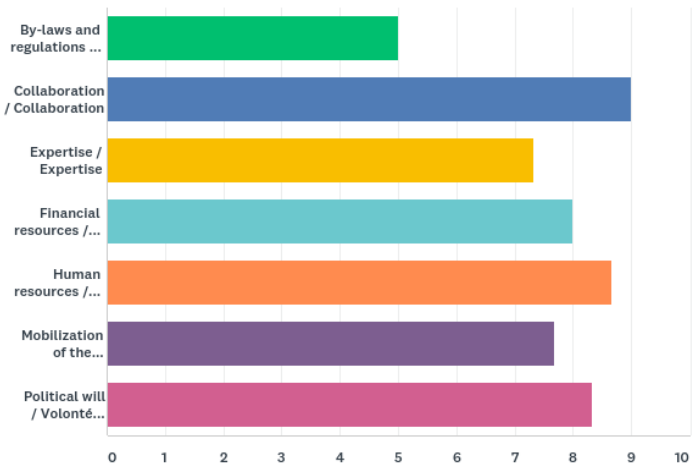
Comments received:

- CAN Stakeholders: We gave several authorisation in the watershed making sure these projects reach the requirements of the *Quebec Environment Quality By-Law* and its regulations. We initiated judicial remedies against individual and companies who violated the law and its regulations. For the regional direction, the essential tools are a clear legislation easy to apply and a political will during project refusals and proceedings at the Quebec Court.

g) CAN Other Organizations Results



US Other Organizations Results



Comments received:

- CAN Stakeholder: This is based on my general knowledge of these types of issues in lakes generally (not specific to Lake Memphremagog). We are not lacking general scientific knowledge (sometimes for specifics but not generally). It is usually political and social will.
- US Stakeholder: Obviously having the will to support change is a difficult task ...especially when those changes are costly ...I may be incorrect but I don't think it's very difficult to know what to do...it just costs money...the debate is about who pays

4. Question 13

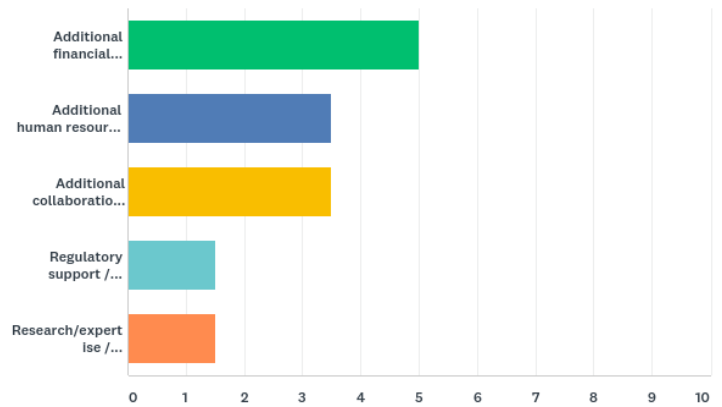
Q13 Please RANK your organization's greatest needs to remain sustainable and engaged in projects to reduce nutrient loading to Lake Memphremagog and its tributaries over the long term, where 1 is the lowest need and 5 is the greatest need. / CLASSEZ les besoins les plus importants de votre organisation afin de perdurer et de rester engagée à long terme dans la réduction des apports d'éléments nutritifs au lac Memphrémagog et ses tributaires, où 1 est le besoin le moins important et 5 le besoin le plus important.

Results by type of organizations

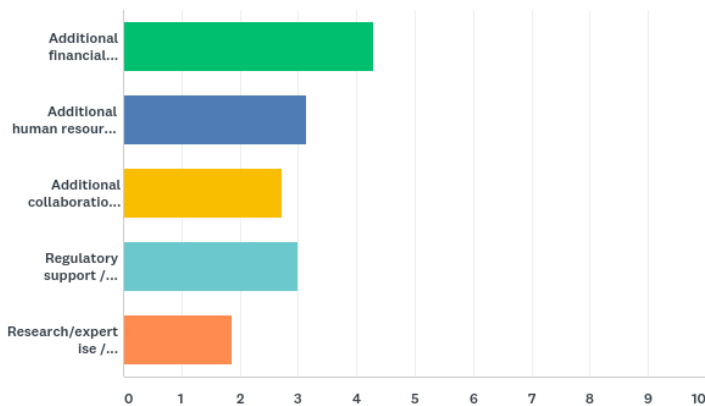
a) CAN Federal Government Results

NA

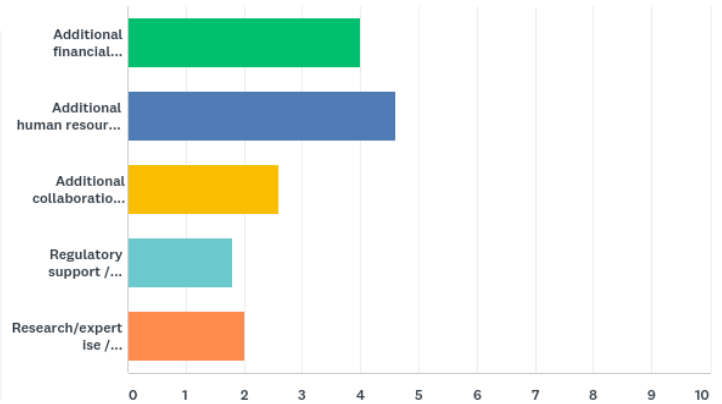
US Federal Government Results



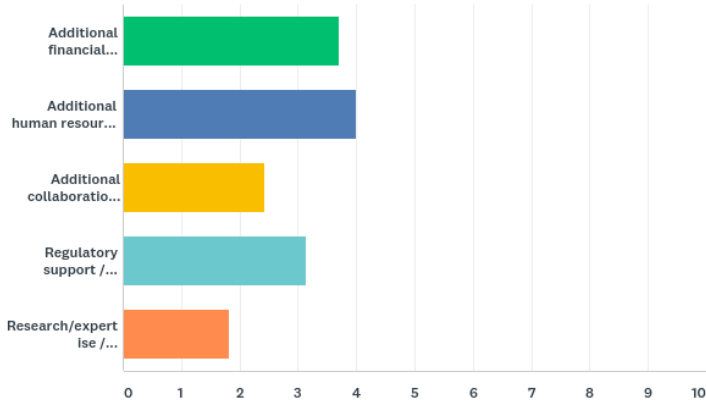
b) CAN Lake or River Associations Results



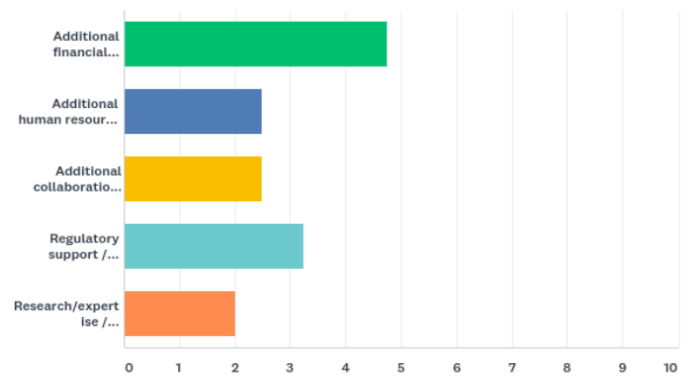
US Lake or River Associations Results



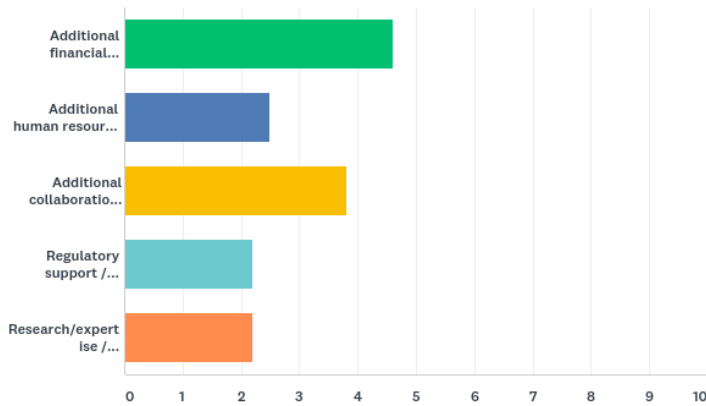
c) *CAN Municipalities Results*



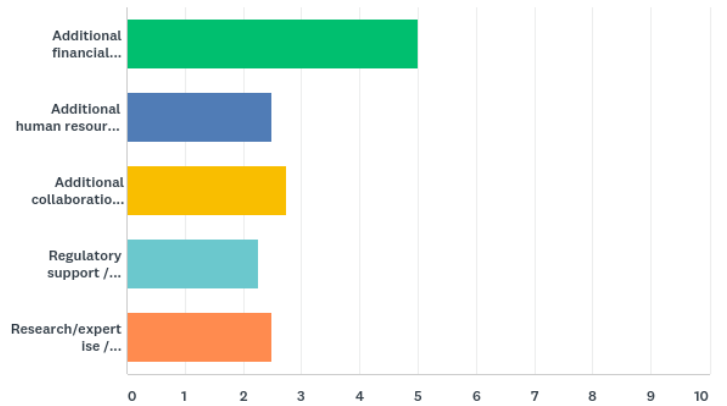
US Municipalities Results



d) *CAN NGOs Results (Except Lake Associations)*



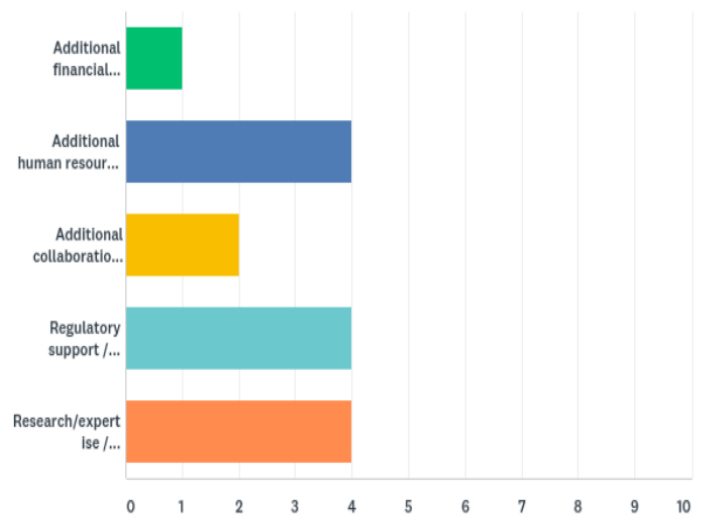
US NGOs Results (Except Lake Associations)



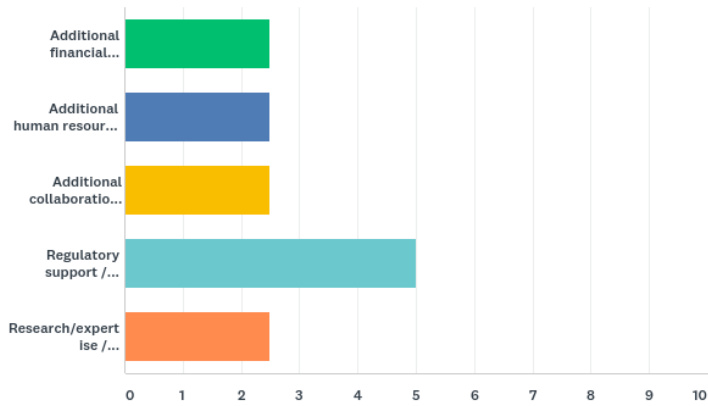
e) *CAN Private Sector Results*

NA

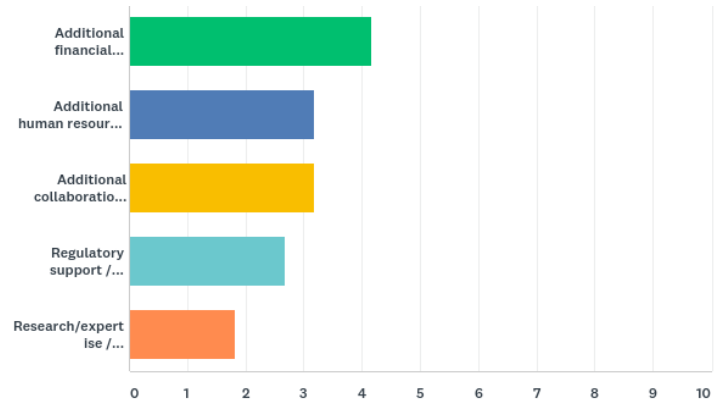
US Private Sector Results



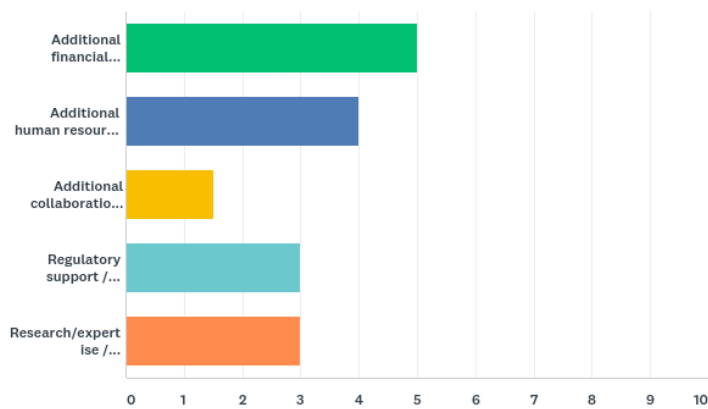
f) Quebec Provincial Government Results



Vermont State Government Results



g) CAN Other Organizations Results



US Other Organizations Results

