**FINAL MEETING Summary**

**LAKE CHAMPLAIN PUBLIC MEETING ON MISSISQUOI BAY WATER QUALITY IMPROVement INITIATIVES**

**TUESDAY, JUNE 13, 2023**

**2:15-3:30 PM**

In Person/Hybrid Teleconference

Location: St. Albans City Hall, 100 N Main St, St Albans City, Vt 05478

**In-person Attendees\*:** Andrzej Barwicz (OBVBM Board Member, Lake Parker Association), Aubert Michaud (OBVBM), Nathalie Fortin (OBVBM Citizen Board Member), Sarah Coleman (VTDEC), Karen Bates (VTDEC), Dean Pierce (NWRPC), Don McFeeters (FNLC Board Member), **Denise Smith (VTCAC), Bryan Dore (EPA),** Kent Henderson (FNLC), Lindsey White (MRBA), Matthew Vaughan (LCBP), Katie Darr (LCBP), Mae Kate Campbell (LCBP), Lauren Jenness (LCBP), Meg Modley (LCBP) Rebecca Ellis (Sen. Welch’s office), Erin Vennie-Vollrath (NYSDEC/LCBP), Marcus Flynn (Citizen, Town of Stanbridge East, Québec), Christiane Biondi (Citizen, Town of Stanbridge East, Québec), Nicholas Mesly (Agricultural reporter, QC), **Mark Naud (VTCAC), Pierre Leduc (OBVBM, QCCAC), Daniel Tremblay (QC MELCCFP)**, **Pete Laflamme (VTDEC),** Eric Howe (LCBP), **Mel Cote (EPA), Craig DiGiammarino (VTrans)**, Ken Sturm (USFWS), **Chris Smith (USFWS**), Claire Madden (VTDEC), Logan Devaney (LCBP), **Neil Kamman (VTDEC**), Colleen Hickey (LCBP), **Sarita Croce (NEIWPCC),** Ryan Mitchell (LCBP), Emily Bird (VTDEC), **Nathalie Provost (QC MELCCFP),** Maggie Gendron (VT ANR).

\*Names highlighted in boldface are representatives of groups that are members of the Lake Champlain Steering Committee.

**Virtual Attendees**: Beth Torpey (NVDA), Chad Tyler (FNLC), Charles Greer (QC, formerly with National Research Council Canada), Cynthia Sherrer (East Bolton, Township of Potton), Chase Novello (VTDEC), Jim Dawson (NY CAC, SUNY Plattsburgh), Jim Pease (VTDEC retired, LNRCD, Missisquoi Bay IDDE contractor), Bridget Butler (FNLC), Ethan Swift (VTDEC), Parker Eversoll (FNLC), Dea Devlin (Water Quality Americorps member NWRPC), Lauren Weston (Franklin County NRCD), Alison Spasyk (LCSG), Corrina King (MRBA), unknown number (409) area code,  Abagael Giles, David Largy-Nadeau (MRC Memphremagog), Guy Parenteau (QC Ministry of Environment), Hilary Solomon (VTCAC), Francis Mailloux (OBVBM Board Member), Julie Silverman (CLF), Pat Bradley (WAMC Northeast Public Radio), Roger Bergeron (VTDEC), Wayne Elliot (VTCAC)

**Program**

Maggie Gendron, Deputy Secretary of the Vermont Agency of Natural Resources, shared opening remarks acknowledging the water quality challenges facing Missisquoi Bay, and the strength and potential of ongoing collaboration between partners. A round of introductions were made between the in-person attendees, and virtual attendees were asked to introduce themselves via the chat. Maggie introduced Nathalie Provost, General Director of Analysis and Expertise for Central and Southern Quebec at the Québec Ministry of the Environment, the Fight Against Climate Change, Wildlife and Parks (MELCCFP). Nathalie welcomed participants and thanked them for their interest in this topic.

**Québec MELCCFP Presentation: Phosphorus in Missisquoi Bay​**

Nathalie shared the context of the binational memorandum of agreement for phosphorus reduction in Missisquoi Bay between Québec and Vermont, which was re-signed last year. She [shared a presentation](https://lakechamplainbasinprogram.sharepoint.com/%3Ab%3A/s/shared/EVH0Jge4UaBGhoYT5V12T_IB6k3ioQyacOkboy8dJehNxA?e=YO6bIp) to provide an overview of the current efforts towards phosphorus reduction in Missisquoi Bay in Québec, and the plan for the next 5 years.

**Questions from participants on the MELCCFP presentation**

* Kent: Is it possible for us to access the measurements that have been collected on phosphorus loads from the 11 stations you referenced?
	+ Nathalie: We will publish a report by the end of the year or by the latest the beginning of 2024.
	+ Daniel: Data will be available online as soon as they are released as part of the water atlas Québec, which are public data. Previous years are available currently.
	+ Kent: How can I access it now?
	+ Daniel: I will find you the link.
	+ Nathalie: We will send you the information through the LCBP team.
* Mel: Do you have a general idea of a percentage reduction target for phosphorus loads for this project?
	+ Nathalie: No, that was an issue when we renewed the agreement. We have fixed a level we would like to reach, but we did not fix a reduction objective at this time. The fact that Missisquoi Bay is in the state it is in right now, it is very difficult for us to fix a clear objective. We have a level we want to maintain or reach.
	+ Pete: It is the same as it is for the US, 25 parts per million.
* Aubert: Regarding the monitoring of phosphorus loadings, there’s been a report already published online with the last 5-year’s data.
	+ Nathalie: That is correct, but the new one is in preparation.
	+ Aubert: There were interesting trends regarding the Pike River entering Québec and Missisquoi Bay, a significant reduction in phosphorus fluxes and concentration.
* Aubert: You mentioned $15 million in cost sharing investment in agriculture, can you give us a picture of where those funds have been invested?
	+ Nathalie: Mainly, these funds have been directed towards OBVBM.
	+ Daniel: It’s mainly by the agriculture department, who distributes them directly to producers, and some to OBVBM. Most of the $15 million is direct financial help to producers.
* Karen: With regard to the specific practices that were identified, the strategies like encouraging healthy soils, how manure is applied, working with the river, and so on, was there, before that, some sense of where work needed to be done to address the most phosphorus? Was that identified from research, how were those picked?
	+ Nathalie: Those were included in Québec regulation. Those are ideas that were introduced through Québec regulation, regulation from the agriculture department or the environment department. We have many targets and levels that have to be reached or data that has to be evaluated before we decide which kind of practice we focus on. These practices are applicable everywhere in Québec, not just in Missisquoi Bay.
* Karen: I believe there was another slide where you had more general objectives in the plan?
	+ Nathalie: This is the Québec Water Strategy, so that is applied to all of Québec. There are 7 priorities: ensure public access to quality water, protect and restore aquatic environments, better prevent and manage water-related risks, harness the economic potential of water, promote sustainable water use, acquire and share the best knowledge on water, and ensure and strengthen integrated water resources management. Within all of these objectives, there are many projects that represent many millions of dollars in investment from the Québec government involved in the Québec Water Strategy. The first action plan, between 2018 and 2023, that report will be made available this fall and will contain all the activities that have been made in Québec regarding that. I was, with my team, because of the initiative of Daniel Leblanc, involved in the last objective, which is ensure and strengthen integrated water resources management within the action 7.2.1 (support Québec-Vermont-New York cooperation for the integrated management of Lake Champlain, Lake Memphremagog, and the Richelieu River).
* Nicholas shared a question in French.
	+ Nathalie: From 2012 to 2022.
* Nicholas: Is there any budget for 2022 to 2023, for example?
	+ Nathalie: Yes, but I cannot tell you clearly what we are expecting, because that number, the $15 million there, is aggregated between what was given by the environment department, what was given by the agricultural department, and the agricultural department is the main contributor to that $15 million. But, it’s linked with the subsidies that are given to farmers who request or are applying for their many kinds of projects. So, we don’t know, from now, what their projections are for the next 10 years.
	+ Nicholas: I understand. So a total budget, if we calculate it quickly, would be $32 million? For the next 5-10 years?
	+ Nathalie: It will be more. If everything stays the same we already know it will be more because we have more funds linked through the Québec Water Strategy. We won’t double that, but it’s a bit more. Now, one of my actions as a Québec representative is to make sure that my colleagues from the agricultural department have a more specific involvement within Missisquoi Bay. Right now, people in Montérégie, for like they are doing everywhere in Québec. But, if they are made aware of the agreement we have between Québec and Vermont to reduce phosphorus load, we hope that they will be able to have a better impact on Missisquoi Bay and the region.
	+ Nicholas: So, if I understand well, you might have designed programs which would be more specific for Missisquoi Bay?
	+ Nathalie: I cannot make promises for my colleagues. We never know what will be in the budget, because that is a government decision. From now on, we know that we have more money for the next 3 years in order to have better coordination of all our efforts, including the municipal affairs and agriculture departments. But, we hope that we will be able to bring our colleagues from the agriculture department to have a better impact on the territory, considering the fact that we have an agreement, which is unique in Québec.
* Nicholas: When will this budget be public?
	+ Nathalie: The Québec government budget is made public in May or April when it is applied. To have the data for a specific region, we can only know after the fact, not before.

**Vermont DEC Presentation: Clean Water Restoration in the Missisquoi Bay**

Eric Howe introduced Claire Madden from the Vermont Department of Environmental Conservation (VTDEC). Claire [shared a presentation](https://lakechamplainbasinprogram.sharepoint.com/%3Ab%3A/s/shared/ESjM_VRepahDohVn6Ertf3kBbGcNGknSNJkS6Ao-xfHCOg?e=hrmjtO) about Vermont’s efforts to restore clean water in Missisquoi Bay. She provided a brief recent history of Vermont’s approach to clean water restoration efforts, shared information on how Vermont tracks and publicizes progress towards clean water goals, and provided a summary of recent clean water investments and their results.

**Questions from participants on the VTDEC Presentation**

* Dean: I am curious, could you say anything more about the bullet point you shared referencing “new initiatives through adaptive management”? Just expand on that.
	+ Claire: I can give one example, and there are colleagues in this room who might be able to chime in with other examples. The example I will share is the state’s work on investigating treatments for legacy phosphorus in Missisquoi Bay. Legacy phosphorus bound up in the lakebed sediments is contributing to internal loading; the state is in the early stages of investigating possible treatments to address that source of phosphorus in addition to reducing the amount of new phosphorus entering the system.
	+ Emily: Great question. I think that’s the beauty of adaptive management: there’s always new lessons to be learned. A big piece of this work is being able to apply the tracking and accountability lessons learned to continue to identify where there are gaps, where we need to make adjustments to the technical and financial resources we are providing to our partners, and filling those gaps. I would also make the leap to say that Act 76 is a form of adaptive management, where we started with Act 64 that set into place a lot of the foundational programs that were necessary to achieve our water quality goals. Act 76 takes it a step further by establishing our long-term funding sources and building on the programs that are necessary to achieve those goals. We are interested in continuing to apply the tracking and accounting to identify where there’s gaps that need to be addressed and how we design our programs and allocate resources. Like the example Claire mentioned, there is a lot of great research and development that’s happening across the partners involved in this work and being able t apply those findings to target further actions. I also want to give a shoutout to Karen Bates, our Basin Planner for Missisquoi Bay. This planning process is really important to iteratively check-in on what we are doing and to apply new strategies as we learn more information as part of this collaborative effort.

* Nicholas: We saw that agriculture is really involved in the phosphorus story. I was wondering, how are the agricultural producers involved, how are the services given to them? Are they bound legally, like Québec is? Is that an issue? Can you explain a little more how that works?
	+ Claire: Great question. I do not think anyone from the Vermont Agency of Agriculture, Food, and Markets was able to join us today, but the Agency of Agriculture is really running the show on that front. There are some required agricultural practices that are the regulatory side of agricultural management in the state, and there is also a lot of state support, funding, and technical assistance that goes towards non-regulatory, voluntary practices on farms. That is one major component that’s supported by our education and outreach efforts to increase adoption and provide the information and technical assistance needed to increase adoption.
* Nicholas: So, the $27.5 million dollars assigned to Missisquoi Bay is mostly going to producers, in your budget?
	+ Claire: That number is a picture of investments made so far. I can’t speak specifically to what portion of that funding that goes to the agricultural sector is going directly to producers, but definitely some of it is.
* Nicholas: Is it part of the thinking on this subject to pay producers for ecological services, like clean water, clean air? Is that on the mind here?
	+ Claire: Yes again, I may call on my colleagues who have been here longer, but my understanding is that particularly on the non-regulatory side of things, payment to producers for their efforts in things like putting in a cover crop or planting a riparian buffer is meant to incentivize that type of behavior among partners, yes.
* Nicholas: Including carbon in the soil?
	+ Claire: Yes.
* Mark: Thank you, Claire. So, in your accounting you mentioned, I think it was 74,000 acres of farm practices implemented, and you said that was annual, so it’s not clear how they are accounted for. As I understand it, they are cover-crops, primarily, conservation practices that are not mandatory, so in any given following year, that producer can go back to non-cover crop management. And yet, a significant portion of the reductions are projected, modeled, verified. So, to reach the goals without having some level of mandatory conservation practices that are a critical piece of meeting phosphorus reduction, how does that work in the accounting? How do you verify your accounting, and then the fact that a lot of those practices are simply annual, and are not long-term commitments?
	+ Claire: I can speak to a couple of those points. The numbers shared in the presentation are achievements thus far, so that metric, 74,000 acres of annual practices on agricultural lands is cover crops, manure injections, that type of thing that you are absolutely right, the effective lifespan of those practices is one year. So we take that lifespan into our accounting of phosphorus reductions. There is an effort among the Agency of Agriculture to expand support for practices that treat agricultural lands that function for more than one year, so there is an acknowledgement definitely that it’s not just annual practices that we can rely on in order to meet our goals.
* Mark: So, the 74,000 is cumulative over that 6-7 year period?
	+ Claire: Correct
* Mark: Do you keep data about the average annual implementation? Data that shows the annual increment? Something like so for the first year there was 10,000, the second year there was 10,000 plus a few more thousand, so now we’re up to, maybe 50,000? Do you keep the increments, or an average annual acres under conservation practices?
	+ Claire: Yes, we do keep those data, and it’s available under the clean water interactive dashboard. We track things on an annual basis. What I presented today, for brevity, was data rolled-up through our whole reporting period, but we do have those data on an annual basis, so we can see the shift in, for example, cover crop adoption through the years. The Agency of Agriculture also keeps track of all of these data.
	+ Emily: Great question, Mark. One additional point of clarification, the graphic that shows the estimated phosphorus load reduction, that is only displaying data for the best management practices known to be active in that year. The project output metrics for acres was presented cumulatively, but we are making sure not to double-count on the phosphorus reduction.
* Chris: So, just to tie together the early slides here, one of the things for Missisquoi Bay that is identified is that over 30% of the load is attributed to stream banks, or streams, but I believe most of that is attributed to stream banks. That’s called out in the plan. Also, forestry is another one that’s a large part of that. Those two land uses were kind of lumped together as natural resources at the tail end of the presentation. My question is, are the resources in Missisquoi for stream banks, or streams, commiserate with the funding? Are we really putting that funding for stream banks, given that that’s a third of the load? We talk about passive restoration, and I think that the river corridor easement program is one of the best in the country, other places wish they had that. However, it’s passive, so that work is not necessarily correcting that input of phosphorus then and there. So, can you talk to the stream part of this work, because I feel like we are missing that a little bit, in the grand scheme of things, when we discuss this issue.
	+ Claire: That’s a great question, and maybe speaks to adaptive management and emergent priorities. One thing that I think really fills that gap and meets that need is the work, supported by the Lake Champlain Basin Program, of the functioning floodplains initiative. The program has done an impressive amount of analysis in quantifying the amount of phosphorus reduction attributable to various streambank stabilization and river and floodplain project types. When I mentioned that we are working on expanding our accounting abilities, that’s one gap that we are hoping to fill in order to be able to provide a more representative picture of what that work is contributing to our overall phosphorus reductions.
	+ Karen: I think the important thing to remember is that we are trying to develop a system to account and track, and there are some things we can’t track. For example, when a stream meets or achieves equilibrium, when it’s no longer eroding, when the excess sediment that’s coming out is what you would expect from that stream. There’s going to be some assumptions that, as we try to protect areas of stream, it would be allowed to meet equilibrium on its own time, and we know it’s going to take some decades, and we’re not going to be able to account for every form of phosphorus that is now not going to be released because we’ve allowed it an area to move and we haven’t confined it with rip-rap, or what not. Because of the functioning floodplains initiative, we will be able to add some more phosphorus accounting to work that we do, we can actually come up with a number and say this is work we’ve done, and then we can better identify where we need to put more money. At this point, I think we’ve got to realize that we know we do a good job by allowing the river to move towards equilibrium. In the future, maybe we can say that we aren’t going to meet equilibrium in that area, we aren’t going to make that goal of equilibrium.
* Chris: I was trying to get at that high percentage. When you look at other watersheds, sometimes agriculture accounts for 50% of the phosphorus load, but 30% in streams is a big number. How do we direct and get where we need to with that?
	+ Karen: That’s where initiatives like the functioning floodplains initiative is going to help us understand if we have enough resources directed to that sector.
	+ Emily: Just to add on that, we have a new formula grant as well that targets the non-regulatory actions needed to meet the total maximum daily load’s targets. That funding is based on what is going to be the most effective option, and we are finding that stream and floodplain restoration projects are highly cost effective, so we are hoping that these formula grant programs will provide an additional work that’s already gotten started in Missisquoi and basin-wide.
* Aubert: Thank you for your presentation. 74,000 acres, in cost share, is wow, great. I was wondering if you have detailed data on where the cost share measures have been supported. You mentioned cover cropping, riparian buffers, floodplains, and manure injections. So, I was wondering, is there some data source showing where the preferred actions that were put in place by the farms are? Do you have a projection on the efficiencies, the effects on phosphorus loading, or the cost efficiencies of these individual practices? I think that would be very inspiring for farmers and organizations, as well as the public.
	+ Claire: Thank you, two great questions. To your first, we keep track of the project output measures, so that 74,000 acres is just one of many measures that we track in the agricultural sector. The Agency of Agriculture also does their own data analysis and reporting, which is available on their website. To your second question on cost effectiveness, we do assess cost-effectiveness of all the practices that the state funds across all sectors, and the agricultural sector is absolutely cost effective as compared to some other sectors in terms of dollars spent per pound of phosphorus reduced, so that’s an important communication tool to help farmers with adoption of these practices.
	+ Karen: I’d like to add, one of the tools that we’ve recently supported development of is a Power BI dashboard, which shows how agricultural practices, and also the phosphorus loading from implementation or installation of those practices show up in the basin, but by smaller streams. So, I’m thinking like, Hungerford Brook, of Beaver Creek. The best way to find it would be to search for Vermont DEC basin 6, since that’s Missisquoi. You’ll have then your choice of basin plan, and in chapter 4 of the basin plan, under agriculture, there’s an explanation of what we are seeing in terms of what’s popular, where we need to push maybe more education and outreach, more installation of certain practices. You’ll see in the Power BI, and I think you’ll be quite impressed. I am.
* Pierre: You showed that Missisquoi Bay achieved 14% reduction of phosphorus compared to the target, so far, in 6 years. Given that in most projects people grab the low hanging fruit first, what needs to happen to increase rate of reduction? Do you foresee some big change happening in the next few years that could increase the rate of reduction?
	+ Claire: Great question, and sort of the million dollar question, I think. Several of the points that I went through at the end of the presentation are newer initatives, approaches that are responsive to our goal of adaptive management, including build-outs and identifying needs that aren’t covered by current programs. I think the floodplain and stream sector has a lot of potential to increase our progress towards phosphorus reduction goals in Missisquoi. The Agency of Agriculture is working on expanding and incentivizing the adoption of longer-term agricultural practices to treat agricultural lands for 5, 10, 15 years as opposed to a reliance on annual practices. We have the water quality restoration formula grant, which is directing funds towards basin-specific partners that are really in-the-know in terms of what projects need to happen, where gaps need to be filled. With that combination, we are hopeful that we see that progress uptick in the years to come.
	+ Karen: Two of our partners in that initiative are Kent Henderson from the Friends of Northern Lake Champlain, and Lindsey Wight from the Missisquoi River Basin Association.