

**Lake Champlain Basin Program  
Technical Advisory Committee meeting  
Held Remotely over MS Teams  
Wednesday, November 2, 2022, 8:45 AM – 12:30 PM**

**Approved TAC meeting summary**

**TAC Members:** Jennifer Callahan, Ryan Cunningham, Laura DiPietro, Bryan Dore, Laurie Earley, Michele Fafette, Neil Kamman, Steve Kramer, Margaret Murphy, Bridget O'Brien, Oliver Pierson, Andrew Schroth, Jamie Shanley, Lauren Townley, Daniel Tremblay

**LCBP Staff:** Mae Kate Campbell, Katie Darr, Colleen Hickey, Lauren Jenness, Corrie Miller, Ryan Mitchell, Meg Modley, Matthew Vaughan, Sarah Coleman, Erin Vennie-Vollrath

**Guests:** Aubert Michaud, Abou Niang, Shayne Jaquith

**1. Updates, announcements, public comments**

- Andrew: There is an exciting new project at the University of Vermont (UVM) – an initiative to develop a Center for Research in Hydrology. It might be useful down the line to update the TAC on these projects. The project is formatted around the National Water Model.
- Jamie: A team at USGS will be meeting to discuss how we might contribute to studying groundwater inputs to Lake Champlain and their relationship with phosphorus concentrations.
- Shayne: The Nature Conservancy has been involved in a state-wide working group focused on land and water conservation. One initiative is developing more common messaging around freshwater conservation initiatives. We've been trying to convene a subgroup of communications folks to work on the development of common messaging. Reach out to me, Eve Frankel, or Brenda Bergman if you are interested in joining.
- Matt: LCBP's request for proposals (RFP) for Healthy Ecosystems implementation is open, Clean Water categories have closed. The research request for pre-proposals is now open. Matt reviewed TAC pre-proposal review timelines and responsibilities. Matt introduced Corrie as the new aquatic organism passage restoration specialist.
  - Corrie provided an overview of her new role at LCBP.
- Matt: We have nearly completed the pilot season of the monitoring buoys. We have funds directed from the National Oceanic and Atmospheric Administration (NOAA) that will include the purchase of a new buoy and support UVM-owned platform buoys for next season.
- Lauren: The education and outreach (E&O) team appreciates the time on this agenda for coordination with TAC.

*Review and approve summary of previous TAC meeting*

Motion: to approve the October 2022 TAC meeting summary

Motion by: Jenn

Second: Laurie

Vote: All in favor

Abstentions: Andrew, Margaret

## **2. Full workplan review: Soil health diagnosis of Quebec portion of the Missisquoi Bay Basin following a remote sensing approach (Dr. Aubert Michaud, OBVBM, IRDA)**

- Aubert provided background on soil and water quality conditions in the Missisquoi Bay watershed. He detailed common agricultural practices on the Québec side of the basin, noting that farmers are very concerned about soil compaction and related impacts on crop productivity. Aubert then introduced the objective of this research project: to develop a user-friendly geographic information system for agricultural extension staff and farm managers of the Missisquoi Bay watershed in Québec. This system will be dedicated to the diagnosis of soil physical condition, related crop productivity, and critical zones of surface runoff, sediment, and phosphorus loadings emissions. He provided an overview of the datasets and methodology that will be used to develop this system. Once the system is developed, this project will also include working with 10 farm managers to validate the tool and promote its use among the agricultural community. The project deliverables will include the final report, spatial tool kit, user guide, GitHub site, and a final report presentation to the TAC.
- Neil: Is there anything about remote sensing imagery that would let you know about soil quality?
  - Aubert: If there is a consistent low yield spot then we can go and try to validate the reason. This relates to surface drainage, but also involves soil properties about soil textures that relate to drainage. Using multi-temporal data it has been validated that we have a correlation between the indicators that we have identified and soil properties. Now, we are looking at methods regarding remote sensing and we will be considering soil texture gradients out there.
- Daniel: Thank you Aubert and the rest of the team. The work plan was very complete and positive. The project is very positive and I had a few written comments, but nothing that would change the project.
- Mae Kate: If there are any TAC members with remote sensing expertise, we are looking for participation in the quality assurance project plan (QAPP) review.
- Neil: If you will be on the farm and in the field with Organisme Bassin Versant Baie Missisquoi (OBVBM), will there be a step to go back to the remote sensing tool kit and true it up based on the soil carbon or nutrient information?
  - Aubert: Aubert: The focus is on soil physical condition, not on soil fertility parameters (carbon and nutrient levels). We are focusing on compaction and other deficiencies. We ask farmers what the first response is to limiting productivity and 100% they respond that it is compaction and wetness. We are triggering run-off emissions where there are compacted soils. There are a lot of rented lands and a lot of pressure of manure addition and hauling and spreading.

We are focusing on soil physical condition, but we will not put aside soil fertility data that will be collected for the individual fields of the farm network.

- Jamie: I really like how the remote sensing is being integrated with ground truthing. My question is how you will determine poor crop yield. Do you feel confident you can determine the cause?
  - Aubert: When you are doing renovations, we see that remote sensing is a tool. First, we will identify wet spots and physical conditions and then the second step will be what is the source (look at surface drainage) to see if we can determine wetness source and then secondly look at soil map data to look at nature of the soil and textural gradient and position within the landscape. This is a general picture from the remote sensing tool and then what the farmers and extensionists can determine knowing the land. Remote sensing alone will not provide the reasons.
- Margaret: I'm curious about the modeling aspect and the development of the tool kit. Will this be specific to these two watersheds with ground truthing? Is this approach scalable to other watersheds?
  - Aubert: This is an extension tool development project and the toolbox deliverables will be available to those that work on the land. The showroom platform with the algorithms that produce the maps will be available (program codes) to other teams.
- Andrew: We have some collaborators working on a precision agriculture project using remote sensing data to soil health and water quality if you would like to be connected to those researchers.
  - Aubert: Yes, please connect me and it would be interesting to have some other participants on our advisory committee and others who could come up for visits.

Motion: to approve project work plan

Motion by: Jenn

Second: Margaret

Vote: All in favor

Abstentions: Andrew

### **3. Brief presentation and discussion: LCBP FY23 core projects** (LCBP staff)

- Matt: Core projects are flagship projects that LCBP expects to run every year.

#### *Long-Term Monitoring Program*

- Matt: The Long-Term Monitoring Program (LTMP) science work proposed remains the same, apart from more of a focus on winter sampling.
- Oliver: The big change for the LTMP is a change in personnel as Pete Stangel retires. Kelsey Colbert will be the new Long-Term Monitoring Biologist. There is interest in being involved with deploying a monitoring buoy in the Northeast arm. We are still working to determine if there is a budget surplus associated with the change in personnel following Angela Shambaugh's retirement. The FY23 budget (2024 field season) reflects an

increase in sampling cost, increase in winter sampling, and funding to sample tributaries during high-flow events.

- Matt: This would be a ~\$50,000 increase from last year, just for the Vermont Department of Environmental Conservation (VTDEC)'s portion of the program. There are minimal changes to the science of the program.
- Erin: The New York State Department of Environmental Conservation (NYSDEC) is also seeking a slight increase of \$5,000 to cover adjustments for inflation and increasing salary costs.
- Matt: Does this increase on the VTDEC side include personnel time for buoy deployment and maintenance?
  - Oliver: Correct.
  - Matt: We included that cost separately in previous budgets. We can discuss offline what makes the most sense moving forward.
- Sarah: For context, the LTMP project has been level-funded for several years, but those costs did not reflect true costs due to personnel changes and COVID lags.
- Neil: Lab prices didn't change for over 2 decades. Have they published a new rate sheet?
  - Laura: The State lab is working on a new fee schedule; it hasn't been published yet but it is definitely coming down the pipe.
  - Oliver: We have been told to prepare for an increase in some of the key parameters that we examine, though it hasn't been published yet.
- Oliver: We tried not to exceed the target for the minimum number of samples during COVID times, previously we were exceeding it. As we get into winter sampling, we will need to discuss potential revisions to the QAPP.
  - Andrew: We did sampling with Pete last winter.
  - Matt: The LTMP QAPP is expiring this year, so we will need to go through the full review process.

TAC chose to move the LTMP core project forward without a full budget review.

#### *Lake Champlain Committee Cyanobacteria Monitoring Program*

- Matt: Some of the LTMP funds support VTDEC and the State University of New York – Plattsburgh (SUNY)'s portion of the cyanobacteria monitoring program, but we also funded the Lake Champlain Committee's (LCC)'s visual assessment program. That project has been funded at \$105,000 for the past few years. We do not have the current budget proposal for the LCC program for the upcoming year.

TAC decided that if there are not substantial changes to the proposed science approach or budget, full budget review is not required.

#### *Lake Champlain Boat Launch Steward Program*

- Meg: The boat launch steward (BLS) program budget last year included funds for the purchase of decontamination stations, so this year's budget represents a decrease from last year. We are expanding steward coverage, successfully added a decontamination

station at Mallets Bay, and will be adding a 4<sup>th</sup> decontamination station in Vermont next field season.

#### *Lake Champlain Aquatic Invasive Species Rapid Response Fund*

- Meg: The aquatic invasive species rapid response fund request is \$150,000 this fiscal year; funds are currently low because of round goby early detection, Lake Eden Eurasian watermilfoil response, increased fuel costs for the water chestnut harvesting program.
  - Neil: Are we bumping the funding for the water chestnut project to make up for fuel costs?
  - Meg: The issue is primarily on the NY side, since their contract is 5-years at a time, so there's no flexibility to add funds. We are pursuing additional avenues to replace their mechanical harvester, which is a separate point.

#### *Water Chestnut*

- Meg: The water chestnut harvesting program requests funds for the purchase of a GoDevil boat for harvesting in shallow areas. This represents an increase of \$20,000 over last year's budget request.
- Matt: LCBP staff are open to feedback on the core project presentation process. We want to make sure we are in line with TAC's recommendations on the program direction.
- Neil: The total LCBP budget is going to be somewhere between \$20-\$25 million dollars. The proportion of this funding that goes to the core projects is not very large.

#### **4. Presentation: Update on LCBP-funded NYSDEC projects** (Erin Vennie-Vollrath, LCBP/NYSDEC)

- Erin: NYSDEC has been furthering projects with expanding funding from LCBP. I work closely with Division of Water central office on these projects. Funding for this work comes from the state line-item requests to identify projects that DEC's on both sides of the lake can work on.
  - The first project is wastewater treatment facility (WWTF) optimization: optimization plans for WWTF that offer innovative solutions for reducing phosphorus loads by adjusting internal operations. This is a voluntary opportunity for any facility that has experienced issues, and includes optimization plans and trainings.
  - Rural roads program in NY involves close work with the Champlain Watershed Improvement Coalition of New York (CWICNY) to implement projects to reduce phosphorus loading from roadside erosion. This work is focused largely on county and municipal highway programs. Outputs include an erosion assessment database, digital app, assessments, prioritization, and implementation.
  - Forest loading is a newer project to assess forest lands and inventory and prioritize projects, with a focus on forest roads and associated infrastructure.
  - The New York agricultural engineering trainings project has wrapped up. This project provided two 1-day trainings targeted at engineers seeking to work on farms in the basin.

- The enhanced agricultural best management practices (BMP) project looks at improving soil health. The program includes implementation of cover cropping, and year 2 of the program will focus on soil health.
- Another project is the adaptation of the Lake Champlain Lake Wise infosheets for New York. The long-term goal of this project is to have a similar Lake Wise program on the NY side.
- NYSDEC is working on a watershed implementation plan to fill the gap until the total maximum daily load (TMDL) update. Upcoming projects proposed include:
  - Stormwater master planning for 4 communities not covered by the municipal separate storm sewer system (MS4) requirements.
  - An on-site wastewater treatment education and pump-out program.
  - Issuing a flood resilience implementation request for applications.
- Oliver: Have you connected with the shoreland restoration coordinator at VTDEC to discuss Lake Wise? I will connect you.
- Steve: The engineering training program was a great thing, we'd be happy to stay involved if there are plans for future trainings.
- Neil: Is engineering capacity in NY a bottleneck to accessing Natural Resources Conservation Service (NRCS) funds as it has been on the VT side?
  - Erin: It definitely has been. It can be difficult to find engineers who can work on farm projects.

**5. Presentation: Update on boat launch steward program and latest data review (Meg Modley, LCBP)**

- Meg provided an overview of the 2022 BLS season. The program ran through October 17th this year. The arrival of a new aquatic invasive species (AIS) in Lake Champlain has not been documented since the introduction of the fishhook waterflea in 2018. Species that we are concerned about being introduced due to their presence in nearby waterbodies include the round goby, the quagga mussel, and hydrilla. We are looking to raise the hourly pay rate for boat launch stewards and to expand to 7-day coverage, though recruiting has been difficult over the past 2 years. In 2022, stewards conducted more inspections than last year. Boat launch stewards also participated in more AIS harvests than in past years. This year, the training process included an in-person component for the first time since COVID. Stewards assisted with the ongoing Dartmouth and UVM research project to collect samples for evaluating mercury in fish tissue. Meg reviewed numerical data on the 2022 season, including the number of inspections completed, the number of specimens intercepted on launch and retrieval, and the number of decontaminations recommended vs. completed.
- Margaret: We haven't confirmed its official introduction yet, but there was a single grass carp, which is an AIS not yet documented in Lake Champlain, caught by an angler earlier this year.
- Neil: The refusal rate for decontamination at Mallets Bay seemed high.

- Meg: That's correct. The decontamination station there is still new, so I anticipate it will take years for people to get used to it. We are also interested in developing outreach material to explain the decontamination process and its importance. We'd like to host a summit including VT and NY folks to discuss best practices and challenges with decontamination. Many folks are unaware that water in their motor can be an issue, both for watercraft operation and for AIS spread prevention.
- Oliver: As you look to expand the number of decontamination stations on the Vermont side, please keep VTDEC involved so we can harmonize our communication and coordination.
- Andrew: Is there anything that can be taken away from the experience at Lake George, where decontamination is required?
  - Meg: There are lessons to be learned, but the scale is difficult to compare. Lake George has an organization that is in control of all launch sites in on the lake.

## 6. Presentation: Education and Outreach project highlights (Ryan Mitchell and Colleen Hickey)

- Colleen and Ryan provided an overview of a variety of projects and programs that LCBP's Education and Outreach team has been working on, including traveling exhibits, maintaining the Resource Room at the ECHO Leahy Center for Lake Champlain, the 75-100 education and outreach grants running at any one time, collaborations with Lake Champlain SeaGrant, education programs for K-12 students, college students, and educators, and a watershed stewardship program with Upward Bound students
- Colleen provided two examples LCBP education programs that have synergy with technical programming and scientific data interpretation.
  - The wool and water exhibit features artists that take use scientific data on topics like water quality, Champlain sea ice cover, and cyanobacteria impacts to native zooplankton diversity and integrate them into scarfs, wraps, dresses, etc. This is a unique way to get the public interested in arts and science in the watershed.
  - Another example is a Friends of the North Lake group project to hold shoreline socials. They met and took the bioengineering model that was created with VT state and had Watershed Consulting Associates provide a presentation targeted at landowners who were interested in receiving technical guidance on how to implement restoration projects along shoreline properties.
- Ryan shared information on the LCBP-supported public awareness survey that has been in progress over the past few years. Faculty and staff at UVM and Lake Champlain SeaGrant have been working on a survey and analyzing result about public knowledge around water quality issues and Lake Champlain. We hope to use this as a baseline and then repeat it every 4 or so years to see how the dial moves on engagement on water quality issues. A few of the highlights include:
  - 1,675 substantially completed responses with a confidence level of 95%.
  - Results suggest that the public places a high value on clean water in Lake Champlain and local water bodies. 85.8% of respondents say healthy waterways are a critical part of their community.

- Folks were split on if Lake Champlain is clean. More people believed that local waterbodies were cleaner than Lake Champlain.
- A small majority of respondents reported that they could explain a watershed to someone else (57%). The results suggest that folks farther away from the lake understood the concept of a watershed better than those right on the lake.
- Residents still believe that wastewater treatment plants are more of a source of phosphorus than developed land, and agriculture is the leading source of phosphorus contributions to waterways, according to responses.
- A lot of folks were not sure about where to learn more about water quality. 27% knew where to get that information.
- Most folks are getting their information about the lake from mass media sources (i.e., newspaper, TV, radio). 1 in 10 respondents reported that they had learned about water quality from social media or by attending a municipal meeting. This data may be skewed to an older population of respondents.
- Ryan: With these data, we are trying to get a baseline measure of if folks have taken part in an action to support water quality, and ask folks if they would get involved in certain actions. Based on these data, UVM and Lake Champlain SeaGrant provided recommendations including engaging with broadcast media and newspapers and reinvigorating our outreach messages through those channels.
- Shayne: What was the action that 54% of respondents said they took to support water quality improvement?
  - Ryan: Respondents answered yes to 2 of the 6 questions. The actions that people will more readily take will be covered in the report.
- Ryan shared additional examples of projects the Education and Outreach Team has undertaken recently:
  - LCBP supported a number of initiatives related to the 50<sup>th</sup> anniversary of the Clean Water Act. The Clean Water Act was the theme of the Lake Champlain Research Conference and of World Water Day in March. LCBP supported the development of 6 traveling exhibits interpreting the history of clean water in the basin, provided Heritage Area grants focused on interpreting the impact of the Act, hosted the Patrick Leahy Lake Champlain photo contest, and undertook a social media outreach campaign with video clips trying to explain direct impact of the Clean Water Act to Lake Champlain basin. Ryan shared the LTMP clean water video featuring Matt Vaughan, Pete Stangel, and Peter Isles. More information is available at [lcbp.org/cwa50](http://lcbp.org/cwa50).
  - Round goby is another topic that has needed some more information. The Education and Outreach team worked to create a page on this topic on the LCBP website. The page features a great video of gobies preying on bass eggs. LCBP will expand the information on this page and will include a StoryMap of monitoring efforts.
  - LCBP recently launched a brand-new website, [cleanwatercommitment.org](http://cleanwatercommitment.org), that is focused on using digital media to explain the phosphorus TMDL and the



actions being undertaken to meet its goals. The website features 11 videos and 3 animations on topics like what is phosphorus, what is the TMDL, and how can you get involved. The idea is to share information that is general and approachable for the public in bite sized pieces. More publicity around this website is anticipated soon. We hope to get some of these shorts into movie theaters as advertisements before feature films.

## **7. Presentation: Stream Wise program (Lauren Jenness, LCBP)**

- Lauren showed examples of the Stream Wise promotional materials. Stream Wise's goal is to bring neighbors together to protect and restore our healthy waterways, targeting the phosphorus contribution of streambank erosion. Stream Wise is modeled after the successful Lake Wise program. Phase 1 of the project has been completed, which was to develop branding, education, and outreach materials, as well as an assessment program centered around best practices that are aligned with VT, NY, and QC recommendations. Lauren provided an overview of the Stream Wise website. Lauren then provided a brief overview of the Stream Wise assessment protocol. LCBP is hoping to grow the program and partnership network in the coming years. The project team is starting to plan for the 2023 field season. More information can be found on [streamwisechamplain.org](https://streamwisechamplain.org), or through social media. In this first field season which was just completed in 2022, local assessment partners like the Friends of the Winooski River and the Ausable River Association were oversubscribed in terms of the number of landowners requesting assessments, and both implemented waitlists.

- Neil: This is an amazing resource. I will ensure this resource is passed on to the Clean Water Service Providers. I'd love to see direct engagement to those providers as well.

Lauren: Great point Neil. I've heard from Natural Resource Conservation Districts (NRCDs) that they want to use Stream Wise in the same way as Lake Wise. Another LCBP-funded initiative, the unifying stormwater assessment grant, will also be brought together to discuss better coordination across outreach programs.