

**Lake Champlain Basin Program
Technical Advisory Committee meeting
Held remotely due to COVID-19
Wednesday, May 5, 2021, 8:45 AM – 2:30 PM**

Approved TAC Meeting Summary

TAC Members: Bill Ardren, Jennifer Callahan, Ryan Cunningham, Bryan Dore, Curt Gervich, Neil Kamman, Steve Kramer, Margaret Murphy, Bridget O'Brien, Mario Paula, Ryan Patch, Oliver Pierson, Andrew Schroth, Jamie Shanley, Lauren Townley, Ryan Waldron

LCBP Staff: Mae Kate Campbell, Lauren Jenness, Matthew Vaughan, Sarah Coleman, Myra Lawyer, Pete Stangel, Pete Isles

Guests: Eric Perkins, Lori Fisher, Laura Medalie, Patti Casey, Linda Bocuzzo, Cary Giguere, Nat Shambaugh, Serena Matt, Vic Putman, Mark Naud, Pierre Leduc, Joseph Ayotte, Rick Levey, Les Carver, Meghan Arpino, Tom Berry, Zack Porter, Luke Myers, Joseph Ayotte, Ann Chalmers, Serena Matt, Kanika Gandhi, Dave Braun

1. **Cyanobacteria Monitoring Final Report** (Lori Fisher [Lake Champlain Committee, LCC] Oliver Pierson and Peter Isles, Vermont Department of Environmental Conservation, VTDEC)
 - Oliver provided an overview of VTDEC's 2020 data analysis. Peter detailed the differences in the 2020 monitoring season that were caused by COVID. Lori provided an overview of the volunteer monitoring program's operations in 2020.
 - Andrew: I like the idea of developing an index to look at interannual variability and severity of blooms across the lake. Sentinel 3 data could be useful for that. I'd be happy to talk about it/partner.
 - Bridget: We wanted to develop an index using volunteer data. Last year's report included a blurb on that which tried to incorporate a couple different metrics. One was using an indicator for a given week - whether that week had an alert report - an effected week. We encourage you to check out the report from last year as we would love more input. I didn't see that index in this year's report but I am interested in using volunteer data to do.

Motion: to provisionally approve the final report with time for review - 1 week.

By: Jenn Callahan

Second: Ryan Patch

Discussion: Neil: members review and provide input to Matt within 1 week.

Vote: all in favor

Abstentions: Bridget O'Brien, Oliver Pierson,

2. **Long-Term Monitoring Program Interim Report + Workplan (Pete Stangel, VTDEC)**
 - Pete presented the data from the 2020 season (29th year) of the LTMP. The lake level was over a foot below normal over most of the summer, making site access difficult at

some locations. The border closure reduced the amount of sampling that could occur in Québec. COVID stay at home efforts prevented the team from reaching high flow sampling targets this year.

- Neil: Is there a backwater effect at Jewett 1?
 - Pete: It would be rare. That's something to think about, especially with the proposed pesticide monitoring.
 - Matt: Where's the gauge?
 - Pete: Right at Jewett 2.
- Neil: The sampling location in Little Otter Creek has been moved. I think it's a much better location now. What do the comparison data look like?
 - Pete: I did comparison sampling the year before last. I can get those data for you. They were pretty similar.
- Eric P: On the Rock River project, I think it'd be good to include in the background discussion a note that it's part of the National Water Quality Initiative. This was the first watershed in Vermont to be designated in that program. Angela used to do a trends analysis for the data at that station. Now that it's just the one station, is there a plan for the trends analysis going forward? It would need to incorporate flow normalization.
 - Pete: That's not something I could do, maybe Oliver or Peter could.
 - Matt: Oliver has presented WRTDS models on the Rock River. I'm planning to add the St. Albans Bay tributaries to the analyses I've done. The Rock River record is a bit short for flow normalization. It is something I could include in the tributary analysis.
 - Oliver: We did it for the Rock River a few months back. I have no objection to you including the Rock in your tributary analysis if there are enough years of data. Alternatively, Peter Isles or I can do it – let's discuss what would be simplest. We can't recreate the above/below site approach since now we are only monitoring at one site, but we can continue to look at loading with what we have.
 - Matt: Rock, Mill, Stevens, and Jewett have a different timeframe than the others. I would love to share the results with TAC at some point.
 - Neil: Marli Rupe is interested in a deeper dive data analysis. We could convene a group to talk about that.
- Andrew: For the Canadian Missisquoi Bay station, I had a good phone conversation with Canadian border patrol. If you are going into Canadian waters for work and not going on shore, that's allowed. That's the first positive exchange I've had on that topic in a while.
 - Oliver: Vermont Fish and Wildlife (VFW) is planning on using that approach for Memphremagog.
- Erin: I just wanted to give a quick update on the quality assurance project plan (QAPP). The QAPP for this project is valid for 5-years, it was most recently approved in 2018, so we are covered until 2023. We will be updating the QAPP this year with new names in the organizational chart and distribution list.
 - Neil: Is the target for replication 5 or 10%? Eric: Unsure, I can check. Neil: Wondering if report from this year met the QAPP. Pete: It's 10%.

Motion: to conditionally approve the interim report + workplan, pending a week for TAC members to submit comments

By: Jenn

Second: Andrew

Discussion: Margaret: Do we conditionally approve this interim report and wait for the final?

Matt: this is the final report for the year; all data are up on the VTDEC website if you want to review. Pete and the team have summarized high-level conclusions in this interim report.

Vote: All in favor.

Abstentions: Oliver

3. Overview of the VTCAC resolution on pesticide/herbicide monitoring and charge to the TAC from the Steering Committee (Neil Kamman, TAC Chair)

- Neil: The Vermont and New York Citizens Advisory Committees (VTCAC and NYCAC) asked TAC to investigate means of conducting and/or improving pesticide monitoring on Lake Champlain and its tributaries.
- Mark: We acknowledged that the resolution was somewhat broad and that we didn't have the technical expertise to suggest a program or path forward. The resolution was an invitation for support from the Steering Committee and to see how TAC could take up the issue and address it. Both Neil and Matt agreed that having a meeting and getting an update on the status of pesticide monitoring nationally, and in Vermont/regionally, would be a good first step. We can start to determine what do we know, what don't we know, and begin to develop the opportunity to frame our response. Thank you everyone for being here.
- Neil: The Steering Committee did give us a charge. After we learn what we learn today we will have some discussion. A breakout group over the summer for what may or may not be necessary for investment and approach could be determined. We may determine that we do not need anything, or we may propose something different. The technical experts we've invited here today that can help with that conversation.

4. USGS National Pesticide in Surface Waters Monitoring Program (Laura Medalie, USGS)

- Laura introduced the USGS pesticide in surface water monitoring program, referred to as the USGS National Water Quality Network (NWQN). She shared a description, objectives, and scope of the NWQN. The NWQN regularly monitors 82 compounds (pesticides, insecticides, fungicides, and herbicides) that were prioritized based on how commonly they are found and human health concerns. 110 sites will be monitored in 2021. Laura reviewed data availability and provided examples from the St. Lawrence River and the Connecticut River.
- Jamie: You spoke about sampling not being entirely representative, isn't a lot of the transport of many pesticides event driven? Aren't storms a big factor?
 - Laura: Absolutely. Unfortunately, this study precluded using samples that can be triggered by storms. This sampling strategy is time-based, and weighted towards the growing season. There are results from a companion program (Regional Stream Quality Assessment, RSQA) which is more regionalized. RSQA objectives are different; it's not a broad survey, but targeted, in-depth analysis

based on land use or region. The program targets smaller streams. They have produced results that might capture more high-flow events. One study in the Midwest compared atrazine and glyphosate, results show that collecting samples during storms demonstrated higher concentrations. NWQN strives to present an annual value, the other study examines factors in more detail.

- Jamie: If Aminomethylphosphonic acid (AMPA) has no health guideline, is that because it's known not to be toxic?
 - Laura: I don't think so. Most of the degradate products don't have benchmarks. I think we just haven't established those yet. Pesticides are constantly changing – it's just a matter of resources not being devoted to establishing them. Jamie: With a median occurrence of 100%, it seems like we should know.
- Matt: I was also going to ask about degradates and why we don't have benchmarks. Even though we don't, has there been an effort to lump what they are degrading from?
 - Laura: That's another area USGS has done some work on. Some research on mixtures, common mixtures used by farmers. Not necessarily parent and degradate, but sometimes. I can pass those on.
- Matt: I'm also wondering about the network; do you know the future of that network and if there are opportunities to add stations in the Basin?
 - Laura: Casey Lee coordinates it. Adding new sites might be nearly impossible, most often they are looking at cutting back. The Lake Champlain Basin hasn't been represented. I will send along that question to him.
 - Matt: If we are thinking of making an investment in this type of monitoring, it could be a good opportunity to build on this existing network. There'd be an opportunity for cost share as well.
- Erin: I'm curious, you mentioned the role of tile drains and how quickly these compounds get to the water. Is there a lot of research looking at that?
 - Laura: That might be more of an area for the RSQA studies. That wasn't an in-depth analysis in the glyphosate studies, but there were some associations. There have been studies looking more at tile drains that focus on that possibility.
- Rick: AMPA is in the EPA aquatic life benchmarks – there are acute criteria for fish and invertebrates. They are quite high.

5. VTAAFM pesticide monitoring program/groundwater monitoring (Patti Casey, VTAAFM)

- Cary: Thanks for inviting us. I'd like to introduce Patti, who manages our pesticide monitoring program which covers surface waters and groundwater. Surface waters are the focus of the program.
- Patti introduced the VTAAFM pesticide and groundwater monitoring program. From 2016-2020, VTAAFM undertook an ambient surface water study (ASWS). The objective of the ASWS is to evaluate statewide levels and monitor for the presence of neonicidionds, glyphosate, and other compounds. The focus of the monitoring is on areas of heavily agricultural land in Vermont. Since 2016, the project has taken 560 samples.

6. VTAAMF pesticide monitoring program data analysis (atrazine, glyphosate, neonicotinoids) (Linda Bocuzzo and Cary Giguere, VTAAMF)

- Linda provided an overview of how the data collected in the VTAAMF pesticide monitoring program are evaluated, and the standards by which they are compared to. She discussed aquatic life benchmarks, which are not regulatory frameworks but provide an approach to identifying and prioritizing work. In this program, metolachlor ethanesulfonic acid is the most commonly detected degradate compound, but it has not been detected above the aquatic life benchmark (data from 2016-2020). In 2020, glyphosate was detected in surface waters monitored through the program for the first time. Linda also shared information on the cost of sample analysis. Takeaways: Atrazine and metolachlor are detected most frequently, generally samples fall below the most conservative aquatic life benchmarks.
- Neil: The one glyphosate detection doesn't necessarily square up with what we heard from Laura. Is there a difference in detection limits?
 - Linda: Our detection limit is 10. Cary: We'd potentially like to go lower, but the drinking water level is in the hundreds. We could push lower but it would mean a resource push.
- Matt: I think the USGS detection limit was an order of magnitude or two lower. I am wondering about data availability – are the data available for download or sharing?
 - Linda: We are working on finalizing the data, and are looking forward to posting a report with all data included.
- Rick: There is a tremendous amount of information that goes into the benchmarks. If you look at where the 0.5 comes from for chronic invertebrates, it's a 40-day toxicity test using a midge, measuring differences in weight. Within that report, you can see what the other aquatic toxicity test were for other invertebrates. The next was 22 ppb. It's important to know if you are using a chronic, non-vascular benchmark or a chronic invertebrate benchmark for decreased reproduction. Let's look at where the benchmark was derived from to see if it's environmentally relevant. We might have the bar set too low in some cases. These aren't National Water Quality criteria.
 - Linda: When we start to draft our report, I'll include more detail on the benchmarks. Rick: I think it's important looking at these results to be transparent with what benchmark we use and to discuss how environmentally relevant the results are. Jewett Brook is our most at-risk surface water for pesticides, silt, sedimentation, nutrients, aquatic biota. There's a density of macroinvertebrates, lots of animals there. By sampling there, there's pretty good assurance that there's not a lot of acute toxicity and perhaps not a lot of chronic toxicity. I think these results are pretty good news. The team is doing a good job executing a robust sampling program.
 - Cary: Thanks Rick for pointing that out. Benchmarks are like a caution flag -- that's something that doesn't come across well when you put data on the screen and highlight it next to the benchmark. Sounds like he has done the deep dive.

7. Current monitoring coverage for Lake Champlain/tributary surface waters (Nat Shambaugh)

- Nat shared information on the patterns of pesticide use in Vermont. There has been a gradual upward trend in the usage of glyphosate and atrazine since 2007. Atrazine has been measured in the lake water – in the spring there is an increase in the concentrations of atrazine and metolachlor, the magnitude of the increase depends on how much rain falls after the planting season begins. Nat shared a surface water potential hazard index based on how commonly specific pesticides are used on corn in Vermont. The index incorporates the leachability of the compound and a ranking of how toxic it is to aquatic organisms. Based on this index, atrazine is a compound that would merit surveillance.
- Neil: Your risk analysis focuses on corn application, but I notice that soybeans are being grown commonly in Addison County. Should we be paying attention to soybean cultivation as well?
 - Nat: Glyphosate is used on corn crop termination. For soy, neonics are used.
 - Cary: There are roughly 100,000 acres of corn cultivation in Vermont, but only 10,000 acres of soy.

8. 2021 agricultural/urban glyphosate study (Serena Matt, USGS)

- Jamie introduced Serena Matt. Serena has been with USGS for a year, and is working with Jamie on Sleepers River.
- Serena introduced the pilot study that USGS is undertaking to measure glyphosate, AMPA and neonicotinoids in surface waters in 2021 from representative agricultural, urban, and wastewater treatment facility sources. There is an opportunity for the TAC to provide feedback, as sampling plans are being made currently. The study plan is to collect 22-28 water samples, targeting at least 1 high flow and low flow event. Samples will be spread across 3 seasons. Potential sampling sites were discussed.
- Neil: E Coli and nutrients in sampling design, is that needed based on the watersheds you're showing as prospective locations? There's lots of state-sponsored monitoring or citizen science in all those locations.
 - Serena: Removing E. Coli would make the sampling simpler. Neil: Less expensive ways to accomplish that. Joe: It's a discussion item for sure. Funders and collaborators were interested in it; relatively inexpensive. Thinking about things that Nat has said, maybe we could eliminate those and get an extra sample or 2 for neonics or glyphosate. If we could get the same kind of nutrient/bacteria info from other sources, that'd be great. Neil: If you are looking for coincidence data, it may make sense to collect them. If it's more general site characterization, you can use existing data. In terms of expediency, not sure whether Vael lab could handle E. Coli in a slightly easier manner. Having to FedEx stuff to Michigan when it could be done locally seems inefficient. Joe: Can discuss further with funders, but we get a good deal on FedEx.
 - Jamie: That's true of every analyte on the list. They are all analyses we could do in state. But we weren't involved in the creation of this project. Neil: Detection limits are different, also.

9. Questions for all presenters

- Dave: What is the anticipated timeframe for the USGS study? Serena: 1 season, with sampling occurring from spring to fall this year.
 - Dave: I want to point out that that funding for continuing the municipal separate stormwater permit (MS4) flow monitoring program is due to end December. If you are going to be using those data for flow calculations, that could be a problem.
- Matt: Serena, since you were around for the earlier presentations, can you let us know how the USGS study would complement current sampling with VTAAFM and VTDEC? Looks like the coverage of land use types is different.
 - Serena: There's also an opportunity for overlapping sites, Jewett Brook and Stevens are on our list. There's quite a bit of overlap, but Potash and Englesby do not overlap. One advantage is confirming sampling, standard operating procedures and methods. The other big difference between the studies is detection limits. There's a couple degrees magnitude of difference. That's nice to leverage and paint another picture.
 - Neil: Detection limits have a lot to do with what you report out on to the public. What chemical are out there and how they relate to benchmarks. What LCBP can do is assisting with communicating this information to the public, and communicate the charge of VTCAC. Can unpack more after lunch. Fully expect to see different detection profile. Whether that means LCBP will set up long term program that is the difference.
 - Serena: Also, the suite of neonicotinoids to be analyzed matches up between the studies.
 - Cary: They are the same and the detection limits are the same. The detection limits for glyphosate differ.
- Nat: I understand that the sampling and analysis VTAAFM and Pete do is on hold while TAC discusses this topic. If that continues, then the USGS study becomes more important.
 - Cary: I still have to have conversations, but based on what we've heard from DEC, since funding for Pete's position comes from a federal source, it might not be appropriate for him to work with VTAAFM without VTAAFM providing something back in return. For now, the sampling is on hold.
 - Oliver: Just to clarify what Cary said, DEC advised that data collected using federal funding should be made publicly available. VTAAFM had objections to making the data in its current form public. As it stands, anyone can get the data through a Freedom of Information Act request, but it's not being posted to the DEC website despite Pete collecting the data. VTAAFM has agreed to put further water quality sampling on hold until this discussion is resolved. Currently, per VTAAFM's request, Pete is not collecting water samples this summer.
- Pierre: I will be meeting with Isabelle Giroux, who is in charge of a Québec-wide pesticide sampling campaign. She mentioned that she'd be willing to work on an advisory basis for TAC if TAC decides that would be useful. She has data on the Pike River for pesticides and data from a pilot project from Castle Brook, which flows into the Pike River. Data are from 2020 and the current sampling season for 2021.

10. Discussion on presentations, charge from Steering Committee, next steps

- Neil: There is a monitoring program occurring, which is tuned to current use. Detection limits are a conversation we can have, public data accessibility is also of interest. We could consider the cost-benefit of lower detection limits. The charge to TAC from the Steering Committee is to contemplate a low, medium, or high investment approach we might take. Initial reactions?
- Mark: It seems like there is some monitoring going on, but it is not coordinated, and the data are not accessible to the public in many cases. Not a lot of national studies have included Vermont or the Basin. I left still trying to understand, what do we and what don't we know? It seems like there's some we don't know. To the extent that there's testing, it sounds like we're using a 'red-flag' threshold to indicate if we should be looking harder in other places. We've seen high detects and levels in places like Jewett Brook, but we seem to have some gaps in what that means in terms of human health. It feels like we still have a lot we don't know; I'd be more comfortable if studies were better coordinated. It could be a role for LCBP to coordinate and assist with communication. I love the idea of bringing in the experts from Québec, Nate's offer to assist. I defer to the scientists to see if it's meaningful to propose to enhance the monitoring and provide better information.
- Neil: The USGS design is simple, the added context that it will provide will be presenting data against a different set of detection limits. This issue is complex – detection limits, analytes, what the impact on biota might be. I think there's space to explain this to people. I do want to explore what some of the challenges to making the coordinated data that have been collected available publicly are.
- Nat: I think one of the important aspects of LCBP's involvement would be to formalize the process. For the last 20 years, the collaboration between VTAAFM and VTDEC has been informal. There has been no formal sampling protocol, and the samples were analyzed at the lab on an irregular basis when they had the time. USGS has very clear sampling protocols; none of that was developed prior to this. I think that's an important contribution -- making sure all this happens in the best way possible going forward.
- Cary: Regarding data availability on the DEC website, there's already a lot of public confusion about where to reach out to with a pesticide complaint. I don't want to add to the confusion. The timeline for pesticides data is different from the streams of data being posted on the DEC website currently. Some of the USGS data will be useful, some won't. Data from the 82-analyte screening method wouldn't be data we use because it's not compared against a standard. That's an important piece to consider.
 - Neil: Regulatory relevance is whether we have a baseline, right?
 - Cary: Not necessarily. Of the 82 analytes, we only have a direct analysis of 7. We use these as surrogates to see if the methods are working. Those data are fine for survey data and screening, but not for regulatory decisions.
 - Neil: I understand what you are saying. However, I don't interpret the charge from the Steering Committee as a request to create regulatory action. It's more for informational purposes.
- Rick: I thought a good next step would be to take what Linda presented today and basically summarize and point out how they overlay with the benchmarks to protect

aquatic resources. I pointed out that it's not enough to present data and exceedances of benchmarks – you need to say which benchmarks we have exceedances on - like non-vascular plant, etc. To collect data for surface water is to relate to environmentally relevant benchmark data. Benchmarks aren't water quality standard criteria; they are more like lines in the sand. If levels are exceeding those, take a closer look. Taking a closer look could be examining how these benchmarks are derived. Getting back to the data from 35 sites+, you could look at how many of those datapoints have exceeded invertebrate or fish benchmarks, then dig in more. Do risk assessment on data. See that 95-98% of time, the pollutant isn't detected. Look at where we have relevant exceedances. Push plants off, look at invertebrate and fish data, look at studies used for those benchmarks, see if we agree with the benchmark. We also have the ability to collect fish and macroinvertebrate data. Then we create messaging about what the data mean. We want to try and reduce pesticide and nutrient runoff, which is what we are doing. I think we have enough information to discuss what these findings mean and how they relate to potential risk to aquatic resources. How often have levels exceeded benchmarks? Is it once a year, once every 5? Frequencies are important.

- Pierre: If I had to say what the concern is for the public in Québec, it would be the total use of pesticides in the environment, and residuals on or in food for animals or people. I am wondering, given the likely strong correlation between use and residuals, do we have data on pesticide use and would it be easier to look at trends there instead of concentrations in surface water?
 - Neil: That's a different level of inquiry. Food for consumption versus the impact to aquatic biota, which is what Rick was discussing. I saw some usage statistics presented. I think those data are synthesizable. I'm not sure if the Steering Committee wants us to get into other fate and transport pathways that don't affect the Lake Champlain ecosystem.
 - Pierre: I didn't mean to take a side street, but it's something to think about. We have to work at the source of these things
- Nat: In response to Pierre, the presentation showed what's used in Vermont on corn; we are trying to decide which compounds are of concern based on how much they are used and are a risk to aquatic organisms. I agree with what Rick said about benchmarks and digging in. I have to disagree slightly with concentrating on animals and plants. Plants are the basis of the food chain, and LCBP tried to address the question of that in a general way by deciding if atrazine is influencing the aquatic biota of algae. If these compounds are preferentially killing off green algae, then blue green algae may be more competitive.
- Vic: The Steering Committee summit is coming up and the first topic is clean water. Everything I heard so far this morning and afternoon doesn't address clean water necessarily. What happens to the cocktail of compounds that are being mixed into the lake? Are they becoming part of sediment, evaporating into the air, combining with other chemicals to create new pollutants, or something else? There are 150,000 people in Vermont who rely on the lake for drinking water, 25,000 in New York, and many more along the Richelieu. Are the drinking water systems capable of neutralizing compounds that are being placed in the water? Is it clean water with a caveat? So far, I haven't

heard anything about why should be drinking the water out of Lake Champlain. Maybe we shouldn't be drinking water out of Lake Champlain. As a water quality resource, it's obviously being degraded, not improved. How do the chemicals impact the quality of the water for human and animal consumption? Water is the new oil, everyone lives downstream. I don't know how you overcome that in a public statement. "We're detecting that stuff, but it's not going to hurt you"?

- Neil: VT, NY, and QC have regulations. To the degree we produce statements about the data that are available, we should be communicating what we do and don't know.
- Erin: Within NYDEC, I asked what monitoring has been done. Up until 2016, a program had been collecting and testing fish tissue for herbicides and pesticides. There is not much water quality monitoring for these compounds through DEC. More background information in our waters would be helpful, I agree with that. I want to learn more before making decisions.
- Mark: I wanted to follow up with Vic and Pierre. For VTCAC, the usage and lack of clarity around coordinated monitoring was a concern. There's been a clear increase in the use of pesticides, and that was an impetus for our resolution. It's clear there's this chemical soup; industrial and agricultural chemical soup in streams. I'm not aware if there are any meaningful analysis studies of the compounding impacts of these multiple chemicals, whether it's on fish, humans, etc. That's something we don't know that should be communicated, or taken as opportunity to share information on the extent to which we are trying to figure it out. This is why we asked the Steering Committee and TAC to take a look in the watershed, form a coordinated assessment. This clearly was a key priority in my outreach to folks for the summit priorities – a better understanding of toxics in Basin.
 - Neil: I'm unsure of the current state of the literature on chemical mixtures, but it's out there.
- Margaret: Thinking this through, trying to figure out a sampling program or going bigger picture, we'd need to think about the ultimate goal of future work. Based on Nat's presentation and what Rick was saying, narrowing it down to key pesticides seems important. We need a cohesive idea of what we are trying to accomplish with this program and how we will know we've achieved that. There's lots of work already going on, lots of different programs LCBP could start to coordinate or pull together. For this program, having a solid goal and outcomes would be critical to ensure we can do it properly.
- Neil: We've heard a lot; we need to coordinate this input into something. A few questions—do we need additional monitoring, or do we need to learn from the aggregate body of data from VTAAFM and the upcoming USGS study? Also, how we communicate this to our citizens, and what is LCBP's role in that? Should we try to get a group together to work on this over the summer, and contemplate some of the large unknowns (e.g., mixtures)? We may have additional indication of direction after the Steering Committee summit meeting.
- Matt: The larger unknowns to me is along with data we already have and synthesizing them together, a literature review on those topics. Bringing that together in

communication. Do we need to do more? And when, and how? We talked about detection limits, groups of contaminants, geographic and land use coverage, and expanding more into NY and QC.

- Eric: For me, starting at the high level, what are the questions we want answered? We need enough information to inform management around public health impacts – fish, recreation, and drinking water. Following that, we can consider the ecological impacts. These 2 different concepts will require different levels of monitoring. 2nd question, is there need for support for additional monitoring? My thought from today is somewhere between I think so and definitely yes. We have monitoring in some parts of basin, not across whole watershed. Some places might be at greater risk. At a high level, that's where I'm at. I like the idea for a literature review outlining what we have today. The minutes from this meeting are a good start at summarizing what's been happening. Then, we can form recommendations about where to go from there, and can think about subsequent steps beyond that.
 - Neil: Should we convene a subgroup, or wait until after the Steering Committee summit? I feel like we don't have the answers to their charge yet, though we have parameters for a guided conversation.
 - Matt: It's been dormant for a while, but we do have a toxics subgroup of TAC.
 - Eric: either way, at this point I don't see much happening between now and June 2nd.
- Neil: From members of TAC who haven't spoke up, are there any who would like to be part of further conversations around this subject?
 - Jamie: It's not really my area of expertise, but USGS should be at the table.
 - Vic: Laura Medalie noted that are no USGS testing sites in the Basin. I think there is an opportunity to network with some additional monitoring with USGS as a partner. I would be remiss if I didn't mention that what is being proposed for the UGSG study excludes NY.
 - Ryan Patch: I'd be happy to participate. To share some comments on what we have seen today, I think it is a pretty dispersed sampling network across the state which is finding good results. I support collaboration and information sharing. I could serve as a liaison to Cary's shop.
 - Margaret: I've done a lot of toxic ecology work; I'd be happy to participate.
 - Sarah: I'd also be happy to participate, especially in terms of how this question relates to trends in agriculture.
 - Erin: I can talk with Lauren about who from NYDEC would be the best contact.

[From Matt: Erin Vennie-Vollrath and Ryan Cunningham later volunteered by email for the toxics workgroup.]

- Matt: It resonates with me what Nat saying for LCBP to serve as coordinating body to get everyone on the same page. If we have this focused USGS study, VTDEC and VTAAFM work, TAC can look at holistically, standardized protocols, getting results among programs.
 - Andrew: If we are going down the line of LCBP's role, facilitating/conducting a literature review seems important. Sounds like there's a lot of different datasets

- and studies that haven't been compiled and synthesized. If LCBP is leading, it could be a combined literature review plus data synthesis. That could be a cool role that would fall in line with the program's mandate.
- Neil: Both sound like good steps and integrating them sounds good.
 - Neil: Thank you everyone. This was a super informative discussion; I appreciate the engagement. We can expect interest for wider stakeholders to remain high.

11. NY Agronomy Program Update (Myra Lawyer and Erin Vennie-Vollrath, LCBP/NEIWPCC)

- Myra provided an update on the NY Agronomy program. She described projects that were undertaken in 2020, and upcoming work for 2021. In 2021, goals include returning to public outreach work, BMP implementation, and holding engineer training workshops.
- Ryan P.: In terms of reducing phosphorus inputs, is reducing fertilizer use a focus?
 - Myra: Yes, but a bigger focus of the program is on cover cropping and reducing tillage to keep sediment from moving off fields. These tactics go hand-in-hand with nutrient management plans.

12. Updates, announcements

- Ryan Davies (via email to Matt): Clinton County was recently awarded with \$250,000 from NYSDEC for Round 2 of the Septic System Replacement Program. The priority waterbody is the Isle La Monte Watershed area of Lake Champlain "North" – Cumberland Head to Rouses Point on the NY Side of the lake. To be eligible, residents have to be within 250 ft of the lake. Residents are eligible to receive up to 50% of projects costs, up to \$10,000.
- Neil: Marty Illick, executive director of the Lewis Creek Association, passed away in a tragic boating accident. VTDEC is actively thinking about ways to show respects to Marty.
- Oliver: The permit to reef the Adirondack vessel in Lake Champlain, in the Burlington Bay area, was issued in late March. VTDEC responded to comments that organizations made. Now, the permit is being appealed. The environmental court in Vermont will work with the appealing parties, permit applicants, and the state. For now, the project is on hold.
- Oliver: A citizens group has been circulating a permit to name Lake Memphremagog a lake in crisis due to the detection of PFAS. The petition was submitted to VTDEC, and a determination was just made that we are unable to designate it a lake in crisis because it does not pass the statutory test – there is not sufficient evidence to demonstrate that the impairment impacts the environment and poses health risks, and that the impairment impacts property values.
- Oliver: VTDEC just completed awards of aquatic nuisance species grants. We awarded \$450,000 for ~40 projects, consistent with previous years. We prioritized greeter programs, management projects that would eradicate new invasives or monitor for new, and projects that would harvest Eurasian watermilfoil.
- Oliver: In June, VTDEC, the Department of Health, and the Lake Champlain Committee will be holding a webinar about cyanobacteria and cyanotoxins. We've had a lot of public interest coming to us, particularly after the story about airborne toxins.

- Oliver: There's investigations going on in Lake Amherst in terms of water levels in order to reduce the pressure on the dam: whether the dam can be repaired, if its ownership can be transferred, or if the dam needs to be removed.
- Neil: The state is finishing up the budget development process including how to appropriate the funding from the American Rescue Plan. There will be substantial appropriations for water and wastewater. Feel free to contact me for more information.
- Eric H: The Steering Committee approved the \$16 million FY21 budget last month – many thanks once again to all of you for your time and effort put into developing the technical elements of that budget. New workplans will be coming up in the fall TAC meetings. TAC members should have received an email for the June 2nd summit. We are trying to get as many members on committees as we can in one virtual room to brainstorm themes for upcoming budget and to think about priorities for discussion for the 2022 *Opportunities for Action*.
 - Neil: This is a great opportunity for TAC to interact with other LCBP committees.
- Meg: The mudpuppy project has been postponed by 1 year. We have an approved QAPP in place.
- Andrew: We are working to get out the Carmi monitoring buoy, we are going to Carmi tomorrow and Missisquoi on Friday. Data are now online and available for review.
- Matt: The organizations involved in deploying buoys for the Long-Term Monitoring Program (SUNY, NYDEC, VTDEC, and LCBP) are moving forward with purchasing. Additionally, the partners involved with the Lake Champlain Cyanobacteria Monitoring program wrote a journal article which is in review currently. It's a nice summary of the success of the program and helps communicate best practices.

Public comments

- No public comments were made.

Review and approve summary of previous TAC meeting

- Motion: to approve the meeting summary from the 4/7 TAC meeting
- By: Ryan Patch
- Second: Andrew Schroth
- Discussion: Neil made a couple of minor edits to the online version.
- Vote: all in favor