

## Lake Champlain Basin Program

### Technical Advisory Committee

Remote meeting due to COVID-19 social distancing

June 3<sup>rd</sup>, 2020, 9:00 AM-2:00 PM

### Approved Meeting Summary

**Attendance:** Bernie Pientka, James Shanley, Leigh Walrath, Ryan Waldron, Kevin Behm, Jennifer Callahan, Eric Perkins, Mark Malchoff, Angela Shambaugh, Bryan Dore, Bridget O'Brien, Ryan Davies, Ryan Cunningham, Andrew Schroth, Jean-François Cloutier (for Stéfanos Bitzakidis), Breck Bowden, Neil Kamman, Oliver Pierson, Ryan Patch, Curt Gervich, Mario Paula, Bill Ardren

**LCBP Staff:** Matthew Vaughan, Mae Kate Campbell, Lauren Jenness, Cynthia Norman, Sarah Coleman (VTDEC), Meg Modley, Heather Radcliffe (NEIWPC), Eric Howe, Colleen Hickey, Elizabeth Lee, Hannah Weiss

**Guests:** Margaret Murphy, Tom Berry, Rebecca Diehl, Beverly Wemple, Rob Evans, Jesse Gourevitch, Ethan Swift, Carrienne Pershyn, Ellen Marsden, Andrew Bahrenburg, Michaud Aubert, Frédéric Chouinard, Pierre Leduc

**Interim report / article manuscript to review and approve: Improving flood risk datasets using a low-complexity, probabilistic floodplain mapping approach, *Rebecca Diehl and Beverley Wemple (UVM)***

Rebecca Diehl presented an interim report focused on a piece of their larger project which is on evaluating the floodplain potential for sediment and nutrient retention in the Lake Champlain Basin. The presentation focused on their floodplain mapping approach. The output was a GIS layer that indicates the relative inundation rate of floodplains in the Vermont portion of the Lake Champlain Basin. The information can be used in DEC's Functioning Floodplain Initiative and in communicating flood risk. The research team is developing a manuscript on the modeling efforts, and plan to make the model code and input data available.

- Jamie Shanley asked how the elevation point to channel is determined within the HAND model. Rebecca replied that it was done based on flow path. They processed from DEM to HAND to route water through the watershed. Some different outputs used infinity distances, measuring distance from that point to the channel, vertical distance.
- Kevin Behm asked if they had an opportunity to look at existing stream channel data and match it up with existing stream flow data as he has noticed differences when using LiDAR versus USGS data, etc. Rebecca answered that they used the NHD dataset as the baseline of data, but the data that goes into the model is based on the DEM interpretation of where the stream is.
- Breck Bowden asked how the Manning's n coefficient was used and obtained. Rebecca answered that they have coded it into the model and use a table of values to determine it. They extract distribution of LULC points within each reach and assign a roughness value to each class. The assigned values are based on work done in Otter Creek. Then you calculate Manning coefficient weighted value. Beverly Wemple pointed to slide 15 of the presentation. Rebecca added that she doesn't believe focusing on creating a robust

calibration dataset is where you should put your resources as studies have shown investing in the Manning coefficient isn't worth the effort, especially if you don't have good topography.

- Matt Vaughan asked about the maps Rebecca has generated and if she has thought about applying the probabilities together to create a map of flood probability for a given year, and estimates of inundation duration. Rebecca answered that they started using percentile maps because it was confusing otherwise and have considered it, especially as they take information and apply it to function floodplains initiative. This would include taking a point on the landscape and determining the probability of inundation there, but it has not been discussed as a deliverable to LCBP. It may be a good way of having a map, not linked to flood events, just flood inundation. The study team doesn't believe they could capture duration as there is no time in there except for flood frequency and that is annual.
- **Jenn Callahan made a motion to approve the submission of the manuscript for publication, pending any additional comments by TAC members. Andrew seconded. All in favor, none opposed. Breck abstained.**

### **Interim report and workplan presentation: Lake Champlain Basin Program Boat Launch Steward Program, *Meg Modley (LCBP)***

Meg shared an overview of the Boat Launch Steward Program, which is entering its 14<sup>th</sup> field season this year. She highlighted the accomplishments of the Program, including an interception of hydrilla last year. She also detailed the changes that had to be made to the program to ensure COVID safety, including holding online trainings, and requiring stewards to wear masks at all times.

- Bill Ardren thanked Meg for working through the COVID logistics. He emphasized that it is a big accomplishment to have stewards out on the launches this year. Meg noted that there has been an increase in fishing license purchase and vessel registration, so they are expecting higher traffic this season.
- Mark stated that it is interesting that the stewards will not be able to distribute handout materials this year due to COVID concerns, and suggested that it could be useful to try to track the impact of that decision.
- Oliver asked if the trainings were given as live sessions, or pre-recorded videos. Meg responded that the training included both, stating that it was helpful to have online, narrated videos that stewards can watch on their own time, which were paired with quizzes to confirm completion of the material, but that those trainings were supplemented with live discussions.

### **Updates, announcements, review and approve summary of previous TAC meeting**

#### LCBP Updates

- **Environmental Sensitivity Index Mapping** - During our May meeting we saw Jason Scott's presentation on Lake Champlain's Oil Spill Response Planning. One of his recommendations is moving forward led by our Federal Partners Workgroup which is to develop Environmental Sensitivity Index Maps for the Lake Champlain Shoreline. Thank you for considering participating in the initial meeting to discuss the approach to be

taken. We have gotten a good group together and we hope to have our first meeting within the next few weeks before Jason leaves for DC in July. Please let us know if you'd like to participate if you haven't done so.

- **Video Development Training** - Registration is currently open for local partners in the Lake Champlain Basin to participate in a series of online workshops hosted by LCBP and a professional videographer. These workshops will cover best practices for video production and are being created in response to an increase in the production of video content and online presence during the pandemic. If there is interest Matt can circulate the link to the registration form.
- **Grant Writing Workshop** - LCBP will host a series of grant writing workshops for local partners in order to level the playing field and provide tips and tricks on how to write good grant proposals. We are working to confirm a consultant to host at least two workshops which will be held in virtually August, one geared primarily to VT organizations and one to NY organizations to coordinate with State grant program tips as well. Please let us know if you would like more information.
- The Steering Committee asked for a budget development process review. The review is in progress and an update will be provided at the Steering Committee meeting, let Matt know if you want to join.
- The LTMP Upgrade subgroup came up with list of priority locations, work will continue in Fall.
- Fred Dunlap has officially retired. We are sorry to see him go and we hope he enjoys retirement. We are working with NYDEC until we have full time replacement sometime in the Fall or early next year.
- NY invasive species awareness week starts June 11th, they are offering special trainings (check websites).
- Eric and Meg have been participating in calls with EPA on VIDA to identify projects they can start to initiate; priorities are to create a NOAA GLANSIS like database for the Lake Champlain Basin. LCBP is collaborating Sea Grant to support VIDA initiatives

#### Other Updates

- Angela - IRTC HAB document has been released for external review. If anyone wants to take a deep dive and provide comments, email Angela. Comments are due in 45 days.
- Leigh - Park agency has received an application from DEC to renew the water chestnut harvesting permits. We are working through that process.
- Breck - National Sea Grant has made special funding available to state programs, we are going to use it to enhance the watershed alliance program and diversity inclusion scholarships. We are also exploring the development of small-scale aquaculture as a food production system. Funds will be used to build connections and provide introductory workforce opportunities.
- Tom Berry –We are working on FY21 appropriations, for now those remain more or less on schedule. Sen. Leahy has made Lake Champlain a priority. The Senator will look to supporting the Army Corps, Sea Grant, and the EPA at same level, maybe higher. The Senator made a request for funding to respond to hydrilla in the Connecticut Basin, and is working to support the UVM Spatial Analysis Lab to increase their HAB and AIS tracking work. The Senator wants Congress to give the USACE specific guidance. He is looking to increase Sea Grant's focus nationally on green stormwater infrastructure, and is pushing for the Gordon's Landing breakwater to be repaired.

- Neil stated that he has heard of a substantial transportation stimulus package- if so, could water infrastructure be included? Andrew responded that the House is set to unveil its own transportation infrastructure bill. He noted that has failed to gain too much momentum in the last couple years, and stated that a more likely outcome would come from the Senate introducing a bipartisan bill.
- Tom added that there is also a bill that would fully fund the land and water conservation fund which could see action within the foreseeable future in the Senate, and would be a significant bill for funding natural resource conservation and recreation.
- Jamie stated that there are potential USGS gauge closings because of funding shortfalls. Five gauges in Vermont are vulnerable: Rock River, Jewett Brook, Poultney River, New Haven River, and Barton River. State's rationale can be sent for why these are lowest priority. They would close at the end of July. No gauges in the New York portion of the basin are at risk currently, the La Chute River and Putnam Creek gauges in NY were discontinued in October, 2019.
  - Oliver raised a concern about the Barton River gauge, stating that it is important for phosphorus loading into Lake Memphremagog, and for keeping our international agreements.
  - Matt stated that he is concerned about Jewett, Rock River, and Poultney.
  - Kevin asked if this is a long term or temporary commitment to closure? Jamie responded that the closures are year to year, pending additional funds.
  - Matt asked what the ballpark amount to keep a gauge running for a year is? Jamie responded that it is about 15K per year per gauge, currently 58% state and 42% federal. Federal funding is secure so it's up to the State.
- Oliver – the Lake Carmi aeration system will be turned on by the end of the week.
- Neil – The USACE Section 542 project in St. Albans Bay to reduce sediment P release is looking at new aeration techniques. They have a contractor selected, though fieldwork is delayed due to COVID. Hoping to start in the fall. Four agreements to support dam removal are being issued by FY20 Clean Water Fund. These provide co-funding in some instances to LCBP funded removal support to VNRC.

#### Review and Approval of Meeting Summary

- **Bill moved to approve the May TAC meeting summary. Bernie seconded. Neil and Jamie provided minor edits and the document was updated. All in favor, none opposed. Angela and Kevin abstained.**

#### **Informational presentation: The growth evaluation and standardized assessment of juvenile lake trout in Lake Champlain, *Ellen Marsden (UVM)***

Ellen Marsden presented on her lab's lake trout research and forage fish assessment. She provided an overview of the research methodology, data collected, and results.

- Mark Malchoff asked about Ellen's knowledge of natal fidelity in other systems as not much is known about it in Lake Champlain. Ellen responded that it is difficult to tag fish as they leave their spawning ground so it would be a guess, but it is something we can do with genetic studies. Mark then asked about the differences in the genetics between wild and stocked lake trout, are there subtle differences between the two populations? Ellen replied that this something they are talking about studying. It was studied in the Great Lakes in the 1980s. The Seneca strain is a large part of what we are stocking in

Lake Champlain. It would be difficult to figure out strain, but if we saw a large difference in genetics, we would be able to study.

- Bill Ardren whether wild lake trout population has adapted to a different ecotype and are using different habitat/spawning ground and whether there may be greater genetic difference than what is being caught in net pens and studied. Ellen responded that they probably are. We have every reason to believe they are spawning using different reefs. However, we don't believe there was a deep-water strain in the past 100 years that has gone unnoticed. Bill asked if they have considered tagging older wild fish with individual acoustic tags to follow them. Ellen replied that they started putting depth tags in them last year.
- Breck Bowden noted that in the oldest class of fish there is a difference in diet of wild versus stocked lake trout with the wild trout eating a more mixed diet. He asked if Ellen thinks that is due to behavior, size, or a luck of sampling. Ellen replied it could also be preference. The wild lake trout could be taking advantage of a different forage base. They hope to study and track diets in future years of study.

## **Discussion: State of the Lake 2021**

The TAC reviewed the State of the Lake online report section by section, focusing on the bolded terms that are intended to be key takeaway messages.

### Drinkable, Swimmable, Fishable Water

- Neil - Fish contaminants: we're not going to have new data but we want to keep the focus on fish so maybe we should consider things we are thinking about when we consider these data. Matt - maybe we can come up with messages for TAC to consider in the fall.

### Pathogens and Bacteria

- Neil - good to make sure this accurately reflect the narrow geographic scope that these issues affect.
- Breck - tweak it, continues to impair water quality locally. It's currently written as if it affects the entire Lake. Same with cyanobacteria, it only affects parts of the Lake.
- Bridget - would like to see some version of an indicator of the severity of cyanobacteria blooms, at either the regional or lake level.
  - Matt - a severity index perhaps? Bridget - yes. Matt - we do have the frequency of low vs high bloom graphic.
- Neil - stacked cyanobacteria graphic could be misconstrued. Bridget - could think about adding a climate view on this issue also. Worse frequent storms, warmer water.
- Concerning the beach closures graph, blue dots in Québec give false information on actual water quality. Beaches are not "officially closed", but swimming is in reality impaired every year at most beaches in Missisquoi Bay. OBVBM can provide more local/precise information.

### Phosphorus

- Angela - still a key message, should be prominent.
- Neil - need to revisit first sentence, second clause in 2nd bolded statement. Propose that we might include metrics on accomplishments, clean water performance report on VT

side. Management programs have changed dramatically since the last State of the Lake Report.

- Jamie - first statement - “influences” is a wishy-washy word, understates importance of phosphorus. Could change to drives.
  - Andrew - could add follow-up sentence about human activity impacting phosphorus.
  - Breck - be more direct and say some phosphorus is necessary but too much causes problems AKA blooms.
- Neil - update last bullet.
- Neil - stream channel erosion: we’ve got some new modeling that extends and downscales in tributaries, might be nice place to consider presenting that.

### Toxics

- Leigh - Add road salt into toxics category.
  - Andrew - agree that public needs to make connection about how we manage snowfall and water quality.
  - Could change “Dive In” section with a “what you can do” graphic to focus on road salt and what people can do on a personal level.

### Biodiversity

- Neil - keep first bold statement.
- Angela – The lake freeze over graphic is one of the most powerful takeaways in this report. Keep it and add another year!
- Neil - probably have more info to share on dam removals in this report.

### Fish Health

- Angela - is there opportunity to get something about wetlands in here?
  - Matt - we talk about them in clean water/flooding impacts. Highlight Otter Creek study. Angela - maybe plant diversity or something in this section. Neil - and restoration, value of restored wetlands and we’re doing a big investment in that.
- Kevin - is this a good place to have steward info?
  - Matt – that is currently covered in informed and involved public, but we could reconsider placement.
- Breck - related to Angela’s comment, keeping in mind Beverley’s presentation, do we have a place where we call out the value of riparian areas/floodplains? Matt - we have some but could be bolstered, bring it in to the healthy ecosystems section.

### AIS

- Add the fishhook water flea invasion.
- Angela - Some of the graphics that NY DEC and SUNY have put together in terms of population fluctuations might be useful here. Along with images of fishing lines covered in AIS. Maybe something about population boom and bust.
- Breck - following up on Jamie’s comment about vague words, if we could think of a way to clarify “altered” in 3rd AIS bold statement?
- Leigh - with regards to this section you’re speaking only about Lake Champlain, but the lead in language includes rivers and streams, should there be more of an understanding of what’s being done in the Basin as a whole and not about the Lake proper?

- Matt – Good point. Previous versions of the report were more focused Lake Champlain only, so this is something we are trying to improve.
- Mark - food web statement, should consider food web graphic? Lots of people might not know what they are. They can get really busy though. Make a cartoon, make it simple.
- Breck - keep last bullet, this is a good example of precise wording. Neil - would like to see focus on new drone technology usage? Jamie - would switch order of clauses to put good news first.

**Discuss recommendations from the International Joint Commission Report, *Nutrient Loading and Impacts in Lake Champlain – Missisquoi Bay and Lake Memphremagog* (Links to report: [English](#) and [French](#))**

- Eric Howe presented the recommendations from the IJC report and requested a discussion of the priorities in relation to the FY21 Technical RFPP priorities. The first recommendation is to create a bi-national task force and LCBP is asking TAC members to help populate the group. Another recommendation is to develop a binational mass balance model for phosphorus imports and exports in the Missisquoi Bay watershed, a current opportunity to develop this exists in Québec.
- Pierre Leduc stated that OBVBM has the opportunity to apply for a grant to develop this model and would like to make the mass balance model for the whole watershed. They are looking for a US scientific partner to join their proposal and they will also be forming an advisory team. Aubert Michaud would be the technical lead for Québec. The timeframe is short, the application needs to be sent by June 12th. A grant award decision should be announced by the end of this year and work will start January 2021 in a 15-month duration.
  - Neil Kamman asked if OBVBM is looking for a US partner for the grant money or also looking for funding support. Pierre responded that they are looking for a partner to strengthen the proposal who is also able to provide \$20-25,000 in funded time.
- Breck requested that a short paragraph description be created about the need and ask that then can be considered with a timeline that the group can respond to. Pierre stated that he would be able to do that and that this decision doesn't need to be made today, although the proposal needs to be in next week. Matt Vaughan said that he can circulate the description to TAC.
- Neil replied that there would be an entire partnership in VT that is interested, but the timing seems short to develop the partnerships.
- Aubert stated that it seems like receiving the grant funds to do this project and create this tool would be a good foundation. We want to get clear pictures in time and space of the phosphorus input to Missisquoi Bay. It is a 15-month timeframe, which is limited but we see it as an opportunity to get information together. Look back at what has been done in the past, 15 years ago we have been working with the US using SWAT data modeling and high-resolution data. Now on the Black River, we have seen spontaneous collaboration that went nicely. We have everything on hand to go ahead and build this foundational tool and this grant funding is a good opportunity that we will be going for. We would be happy to have a strong partnership with a transboundary perspective.
- Neil stated that he can provide names and can encourage participants that would allow you to build out the application from VTDEC, VTA AFM, NRCS, UVM Extension, and LCBP.

## Discussion: FY21 technical budget priorities

Matt introduced the technical budget development process. LCBP will begin soliciting projects for the FY21 technical priorities this fall that would start in October 2022. He reviewed the FY20 priorities and awarded projects.

- Neil noted that his role at TAC chair is to carry recommendations to the Steering Committee, and then hear from the Steering Committee about what partner organization priorities are and bring that back to TAC.
- Breck stated that the road de-icing alternatives priority was not covered with FY20 awards. A priority focused on ESI mapping could be worthwhile, depending on how the project develops.
- Eric stated that he'd like to suggest the mass balance analysis for Missisquoi Bay. He noted that it's great that Québec is perhaps going to fund initial work on modeling, but we don't know if that's going to happen for sure, and it would be great to supplement that work through this process. Sounds like Québec would only address modeling, 2nd part is to develop management solutions, identify options for reducing imports. Note that it should be done in coordination with ongoing research on this topic.
- Neil stated that regarding Missisquoi Bay, the TAC will soon discuss convening a new LCBP committee that will look at the Bay specifically, and could consider arming that committee with research or implementation project dollars. Second thought is that Missisquoi Bay sediment hotspot analysis project going on now, that project could line us up well if we wanted to line up a phase 2 with the FY22 priorities.
- Andrew stated that given the conversations about modernization of the monitoring network, we should try to motivate people to use those data, emphasize combining new data streams with long-term monitoring DEC data to learn more about particular systems.
  - Neil added that Andrew's suggestion fits with the suggestion he made to Matt, making investment in modernization, might want to give placeholder dollars to communicate new learning.
- Kevin brought up barriers to social adoption. For example, are we not educating people enough? Not putting the data out there in an easy format? Not holding enough workshops?
  - Eric asked which techniques?
  - Kevin said specific BMPs. In his mind it could be people who are implementing them or not implementing them, what are the rationales for not participating?
  - Eric stated that LCBP actually has a project getting going in the near future with UVM to conduct a public awareness survey. These are good questions that we might be able to incorporate that into the survey now. Kevin stated that he thinks UVM has done some work that has concluded about the social aspect of some of these technologies. Breck noted that he is fairly sure that was part of social gaming work in EPSCOR project.
  - Andrew added that Chris Koliba was spearheading that research, and that the takeaway was that extension works when people get out there and educate people about why these BMPs are effective, though he might be simplifying these results.

- Ryan stated that thinking of the New York context, non-regulated farms tend to not get enough attention. Getting a solid nutrient management program on small farms can be a big bang for the buck.
- Ryan also stated that the PES working group's recommendations #3 and 4 are likely going to be funded. It's looking likely the initiative will be re-authorized with a more refined but expanded scope focusing on soil health. The General Assembly probably won't be able to fund the 2-step phased research to review evaluate PES tools.
- Angela noted that conservation, restoration research, and implementation to support water quality, flood resilience, native species and their habitat could be a worthy priority.
- Neil stated that he liked seeing the New York-specific priority on stream equilibrium and geomorphic assessment, he thinks that's a great management direction for NY if they agree, would propose continuing that as well.
- Tom Berry brought up emerging contaminants, stating that it has been a while since people have looked at the impact of plastics, and it could be worth discussing if TAC would see value in looking at plastics and emerging contaminants in general. We could get more information on emerging contaminants, plastics come to mind as well as atmospheric mercury.
  - Neil stated that the Steering Committee wasn't interested in supporting microplastics work in the past, and he is concerned that could happen again. PFAS is also an interesting area throughout the basin.
  - Andrew added that PFAS will be an upcoming focus for Vermont EPSCoR.
- Andrew said that he recalled Leslie Matthews gave a presentation on blooms in oligotrophic lakes in the Basin, but we are missing data on drivers of that. It would be nice to know more about that in oligotrophic parts of the Lake as well.
  - Angela stated that Mindy Morales is working with inland lakes team. She added that Leslie's work is focused on phosphorus trends, not blooms in particular.
  - Several TAC members voiced support for this idea.

### **Discussion: TAC membership**

This agenda item was tabled until TAC's next meeting in September.