

Minutes – Lake Carmi Coordination Team Meeting

Thursday April 20, 2023, at 4:00 PM

0. Introduction

- Rob Evans update: Busy winter with lots of things going on in the Legislature regarding lakes and ponds issues, Julia has been up 2 or 3 times for sampling, earliest sampling in some years, along roads being accessed, ice out a couple weeks ago.
- Oliver Pierson (DEC) thanked partners from AADM, VTRans, ANR, and other organizations represented here today. Busy agenda with lots of useful updates coming.

1. Lake Monitoring Update from UVM Extension – Andrew Schroth, UVM

- **Andrew** noted that UVM will be using the same monitoring approach and equipment as last year on the platform, and working with DEC (Kelsey) to get the platform installed during the first week of May (with the 2nd week as back up) so that it can be used to determine when the aeration can get turned (based on DO values). As in years past, all data will be streamed to the web site 3 times per day with bi-weekly water and algae sample collection. UVM has past data from prior years on the platform website (<https://epscor.uvm.edu/LakeCarmi/>) as well.
- **Oliver** noted that this is the last season that DEC has funding for the aeration monitoring platform and perhaps the aeration system. The web site will be available for information on monitoring. Will be looking for age/size of walleye that is at stage when safe to turn on system.

2. Aeration System Explanation of Changes for this Summer – John Tucci, Everblue Lakes

- **Aeration - John Tucci** - past platform data suggest that the lake does not seem to get in trouble with DO before end of June. So for 2023, we will try to get the system on as soon as possible, which means we need to get the reconfiguration done before the 2nd week of June, and then have some time while the lake is well mixed and cool to test the efficacy of the reconfiguration before water warms more. Will be coming to Carmi May to June, depending on when can start the system, then have to get air-line materials from Michigan and crews to VT, then can go to work. Not sure if changing the seals on the systems is needed or not, but what is needed to make that decision is to start the system up and get it running for a couple weeks and see what it looks like, which can be done as part of the reconfiguration process. The original plan had looked at doing the repair before starting up the system but it seems better to only fix it if needed and use the trial running of the reconfigured system to see there is an issue or not.
- **Oliver** said to take this conversation off line - and want to make sure the system is up and running, don't want an outage, so it is therefore worth being proactive and making the fix sooner rather than later.

- **Rob Evans** asked about that needed to bring in more pipe to change the system. What happens if not going to use next year what happens to all that infrastructure?
- **Oliver** says that it is permitted for a few years and perhaps leave it in place and see what is needed later, after the alum is used; and that State owns this asset and it could perhaps be used elsewhere;
- **John** mentioned town selectboard asked about what is needed to store the system if it is not being used, and in that case we will need to move compressors to dry storage when not in use. Everblue would help with this storage set up, hopefully somewhere near the lake to reduce travel, using maintenance funds in their contract, could call it winterization, and would work with the town to do that.
- **Oliver** mentioned that at a talk he gave last week, the question had come up about why aeration is still in use given the poor performance from 2020 to 2022, and the answer is that looking back at 2019 data, the system seemed to be effective, and if 2023's weather is similar to 2019 or if the system does better after reconfiguration, we could find that it may be effective in 2023.
- **Albert Perry** asked what is target date for turn on - John asap, but from platform data that suggest that from about May 15-June 20th window is when the work on the system should not set the lake up for failure (i.e.: coming up and turning off and having it release p from the bottom).
- **Oliver** reminded that last April was warm, and we turned the system on May 10th;
- **John** suggested that it looked like the data from last year may show that turning on the system started early did provide some benefit for reducing early blooms. This is still a new system in this lake and not been fully designed/tested for the lake - how do you try the different scenarios/configurations that are needed to get the right balance for it to work well. Aeration one part of the potential strategy in the lake to address the issues.

3. Update from AAFM on Agricultural BMP Work in the Watershed – Nina Gage, AAFM

- Noted the Clean Water list serve talk that Oliver did
- Showed a picture of the "squid" or manure injector that was installed a couple years ago
- Good work with the farmers
 - 720 acres of grassland manure injection projects in the watershed - about ~ 1/2 the land in the watershed under that practice
 - P reduction in the watershed - good investments and farmers putting in the effort to do the work
 - ~ 1/2 what have been able to model BMPs - manure injection, cover crop, conservation tillage (state funded supported projects and does not count other agency/federal funded projects)

- New initiatives
 - VT Pay for Performance program (\$7 M) -
 - Allows for farmer and partner to review each APEX model from USDA, FARM Pre (Stone)
 - VT Farmer Ecosystem Services Program - a payment incentive that allows the use of other existing programs to pay for existing ecosystem services and allows farmers to participate in that effort, have seen (Conservation Stewardship Program - have seen huge increase in this program - a hole farm program of 5 years for things above/beyond the regs/min
 - Northeast Dairy Business Innovate Center - lots of innovation in dairy industry/investment in dairy business; allows for funding to support services to point farmers to for the business planning and
 - Overview of Ongoing Initiatives
 - Ag. Clean Water Initiative program (AGCWIP)
 - UVM Extension
 - FNRCD
 - MRBA
 - On Farm Implementation grant programs
- **Jeff Sanders** did work over the winter to secure funds for work on forage quality and how that helps with reducing bringing in nutrients in the watershed. UVM Extension has 2 grants in Carmi that have improved feed storage , funds from VHCB, finding new ways to help reduce p loading in the watershed, if we can maintain good quality feed that reduces the need to import grain/nutrients into the watershed. Will be looking to do injection after first cut if weather allows. Will continue to do work in the watershed even as some grants run out, but Extension is vested in the watershed and helping. One farmer working to continue to do no till and got funds to help purchase that equipment. Still a lot of farmers working hard to contribute to improvements.
 - **Nina** - noted that the improvements in feed and reduction is a new and now supported BMP strategy for reducing nutrients in the watershed.
 - **Rob Evans** asked if there is still interest in getting more acres included.
 - **Jeff** said yes, and there was interest last year ,but weather prevented it.
 - **Nina** did note that those numbers are for just UVM acres, but that there are other farms also doing that work on their own and those acres not captured here but are known. Need to continue to do this work as annual practices need to be done to continue to support.
 - **Brendan O'Shea** -asked if there is any CAFO in the watershed, **Oliver** noted that none in the state, but there are some that may go into affect eventually as different size farms look at this.

4. Groundwater Well Monitoring Update – Pete Ryan (Middlebury College)

- **Pete Ryan** is covering for John as he is out in the field.
 - Background on the project
 - Peter comes at this as a geochemist - brought into this project by John; interest in the Carmi project as work has been done but problem exist. Mentioned "Complexity of Coupled Human & Natural Systems" paper as how the system is responding through this lens.
 - Initial TMDL did not include ground water as an important source of nutrients to the lake
 - Have late May early June monitoring coming up of existing 7 monitoring wells
 - Have a mix of well type, have a very small load if 14.9 kg/year from all sites.
 - Look at internal load - look at through experimental modeling
 - Data showed that upper sediments in bottom of the lake that is available.
 - Data suggest that between June and Aug. there is likely a very high amount of annual loading. The focus on the change is looking at temperature and how that affects internal loading.

5. Update on Middlebury College Temperature vs. Phosphorus Loading Study – Essa Moodie

- **Essa Moodie** (Middlebury Student) gave an overview of her research on how temperature affect p-loading at the sediment layer.
 - Redox release of phosphorus
 - Research showing that some shallow lakes shows that temperature and ph may also affect release, and not just DO levels
 - Tested sediment / water in test tube and changed temp. variable. - study does suggest that more temps. Then have more p-release. Type of temp range that showed more release seem to reflect those in the lake when seeing in the lake
 - Organic matter may also be a factor in the process
 - Calcium and Aluminum may also be a factor as can absorb the p, but during certain temps may also cause it to be released
 - Suggest that it is temp. is a factor that is important in understanding p loading
- **Rob Evans** noted that aeration does affect the temperature as it changes the mixing of the lake temperatures more even. Essa's work may suggest that helpful not to mix as deeply and/or recognize importance of changing water temperatures.

6. Quick update of Franklin County NRCD's planned work in the watershed this upcoming season including Lake Wise– Alison Marchione (DEC) and Katy Dynarski (Franklin NRCD)

- **Alison Marchione** - update on Lake Wise effort - Overview of program and reasons for the need for Lake wise

- **Katy Dynarski** - FNRCD update on Lake Wise work they've been doing - 14 lake , awarded 4 signs
 - Have a week of VYCC time this summer for Lake Carmi for planting shoreline watershed and drip-line trenches around the building
 - Julia Crocker, FWC, point of contact for the work w/ VYCC 2023 shovel ready projects.
 - Offering a workshop series for Lake Wise practices this summer (TBD) - funded by LCBP education/outreach grant.
 - Update on FNRCD BMP funded grant
 - Types of BMPs focusing on natural resource projects in different sectors

7. Northwest Regional Planning Commission - CWSP Update 'private roads' project update – Dean Pierce, NRPC

- **Dean Pierce** - NRPC CWSP - update on their work.
 - Lake Carmi roads project - private road assessment and project ID funded by LCBP, last year Black Woods road project done, work on Patten shore road next and having the work done this summer
 - CWSP funded the FNRCD for doing development work on Marsh Brook, Prouty Brook, Sandy Bay road tributary
 - More application requests to come and hope projects from the work come forward as development continues
- **Oliver** mentioned Karen B. and Jim R. recently walked Mullen Shore Road and another road to work with the landowner to see if additional work can be done on Mr. Mullen to improve those roads.

8. Knapp Environmental Solutions Behavioral Science Program and how it relates to improving water quality across watersheds – Tyler Knapp

- **Tyler Knapp** (Agriculture) and **Katri Haanterä** - **Paul Stanley** had requested an update from Tyler on behavioral science on to create changes in agricultural practices. Their work looked at how to approach soil health BMP adoption through looking at behavioral science. **Paul Stanley** noted the importance of this work, and also need to bring in the landowners who rent their land to farmers and the farmers that rent those lands.

9. Alum Feasibility Study (timeline) and Next Steps – Oliver Pierson

- **Oliver** gave an update on the Alum feasibility study in Lake Carmi - funds become available July 1, getting a May 1 request for contractor to get prepared for the work as soon as funds become available. Will be looking at loading, sediment, treatment design, alternatives, costs, potential impacts, etc. Looking to have that study late 2023 to help for prep funding for SFY2025 (July 2024) if makes sense to move forward with implementation of an in-lake treatment.