Minutes – Lake Carmi Coordination Team Meeting
January 26, 2023 at 4:00 PM

Introduction

- Rob – shout out to DEC and partners, including UVM that are passionate about assisting with Lake Carmi. He and Pete will work on educating other about everything that is going on.
- Pete – looking to support project development this winter
- Oliver – acknowledged that the mobilization of the Lake Carmi community to contribute to the Clean Water Board meeting and other work contributed to funding directed to lake.
- New DEC staff person hired to replace Pete Stangel who retired to assist with sampling from boat – Kelsey Colbert

Aeration System & Lake Water Quality Monitoring Results

- Andrew Schroth, UVM
- Oliver secured funding for 2023 summer monitoring from the platform again.
- Paper to be released by Ashton will compare Lake Carmi and Missisquoi Bay processes that he'll forward to us when published.
- Summary of monitoring results that show results when system is running all year.
    - Decrease # days that oxygen level depleted, but still many days with depletion and oxygen below the 2.5 mg/L target.
    - Aeration systems make lake more prone to mixing and circulation of phosphorus from internal loading up into the water column where it can fuel cyanobacteria growth
    - The cycles of anoxia at lake bottom and mixing is a challenge for water quality as they work together to mix P released from sediment throughout column and along with low wind days - drove algal blooms
    - Before aeration, natural for Lake Carmi to mix just in Spring and Fall (dimictic lake)

Aeration System Reconfiguration for 2023

- John Tucci, Everblue Lakes
- In light of challenges mentioned above and lake not responding to aeratin as hoped, Everblue Lakes have proposed new approach for aeration, namely to reconfigure the system and place more aerators in the deeper parts of the lake more prone to anoxia
- DEC has agreed to try this aeration system reconfiguration as a "last chance" for the system and will fund the necessary work to reconfigure the system in the spring
- The system is delivering 20% more air than original specification required but not resulting in desired oxygen levels. In other lakes this is working with only difference in system is that diffusers are spread further apart at Lake Carmi.

- Cost effective change to help understand if aeration effective tool for Lake Carmi - Next summer move 15 diffusers deeper where most important to have the air. It will result in less air overall, but thinks it will still work.
- Andrew suggested moving them more south where there are anoxia issues and related internal loading.

Alum Diagnostic Feasibility Study Update

- Oliver Pierson, DEC
- Increased funding for 2023 work at the lake, including $120k of Lake in Crisis available for monitoring, support aeration and reconfiguration, and splitting electricity cost with Franklin.
- DEC has some remaining funds from the aeration system capital investment and those will be used most likely to add funding to increase FNRCD BMP identify and design work.
- Alum study funds are available starting July 1 when SFY24 begins
- While waiting, Oliver put out a request for information about controlling phosphorus and
  resulting algal blooms. Oliver received three responses – 1. Environmentally friendly approach where treatment is floating algal processing vehicle (wouldn't address the legacy P); lake guard treatment kills cyanobacteria with hydrogen peroxide slow release; Use of alum and described rough costs that would be refined with necessary feasibility study that included an initial application following by subsequent doses over few years.
- Oliver – Thinks we can aerate in 2023 and still collect sediment core for alum study, but will discuss with contractor once they are hired; will also ask about impact of keeping aeration diffusers in place for potential use after alum treatment
- Timing – will be a challenge to see treatment in 2024 though; see next steps below

Next Steps

- DEC is reviewing the responses to determine suitability for our needs at Lake Carmi and intent of Clean Water Board
- Funding for the Alum Diagnostic Feasibility Study in in SFY24 Clean Water Budget, available on 7/1/23
- The Terms of Reference for the Diagnostic Feasibility Study will be drafted by end February and we aim to advertise the study in March/April, with the goal of signing a contract on or around July 1, 2023; DEC will use Quality Based Selection procurement approach so study can tap into multiple potential funding sources (CWSRF-EC, Clean Water Funds)
- Study will be carried out thereafter, with conclusions in hand by early fall to influence SFY25 budgetary process as needed, for a potential future treatment
- Will timing work for a treatment in 2024? ***Maybe***
- ***Cost: See previous slide***

Missisquoi Basin Clean Water Service Provider Update

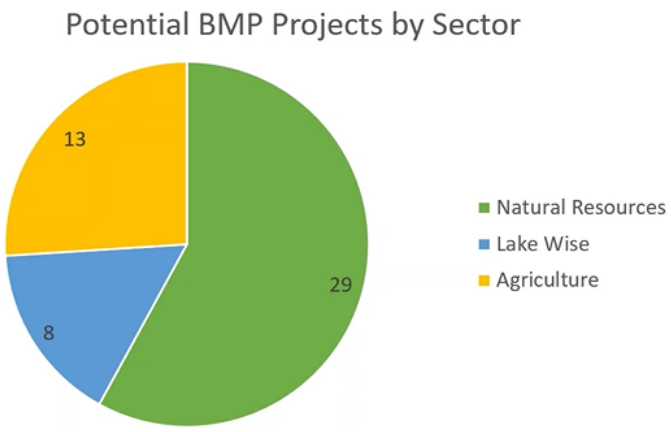
- Dean Pierce, NRPC
- Regarding funding that will address phosphorus in watereshed. He described CWSP as managing a block grant funding from the State Clean Water Funds. Lauren Weston is the chair of the Basin Water Quality Council this is made up of community members.
- They are tasked with reducing specific amount of phosphorus with funding provided. They are developing a prioritization system, released a request for proposals, and hoping to release list of projects by March 16th.
- The BWQC will prioritize projects for CWSP to award contracts and manage funding. Hoping to get projects started this construction season.
- 1.6 million to spend this year. The types of projects include assessment as well as project design and implementation.
- Oliver made quick point that Karen and he would be working with landowners on west shore to implement private road projects, which we can talk about more at next meeting.

Lake Carmi BMP Identification & Development Contract Update

- Katy Dynarski, Franklin NRCD
- Identified 47 projects across sectors that have been completed 36, and are ongoing
    - Some of projects crossed multiple properties so doesn't represent extent
    - The agricultural projects are limited to natural resources restoration and many more completed by UVM extension, AAFM and NRCS.
    - Provided an example of a shoreline renaturalization project – remove cement and reshape shoreline using bioenginnering design to be able to plant native species along shoreline to stabilize soil along with encapsulated lifts.

- Identified 24 potential projects through desk top and another 25 during site visits for total of 50 potential projects. During 17 lake tributary walks and 14 lake wise visits did see that streams and shoreline was in good condition overall.

Potential Projects – *What else needs to be done?*



- 50 potential projects identified
  - 28 from desktop review
  - 22 additional from field work
- 14 Lake Wise Evaluations, walks on 7 lake tributaries
- Biggest opportunities:
  - Lakeshore buffer plantings
  - Infiltration trenches around camps
  - Stream and floodplain restoration

- Please reach out to Katy if you have project ideas for your property. She suggest that no mow zones is an easy practice to implement on residential properties along with increase of natural vegetation along shorelines, including trees and shrubs. Also infiltration trench around house will help direct roof runoff to infiltration and slow it down, reducing any erosion of soils by flows. IF you are interested, contact Julia Crocker, FWC about benefiting from free labor by VYCC crew to help implement the above projects.
- They will reach out to agricultural community to identify additional with help of UVM extension and fund some designs.

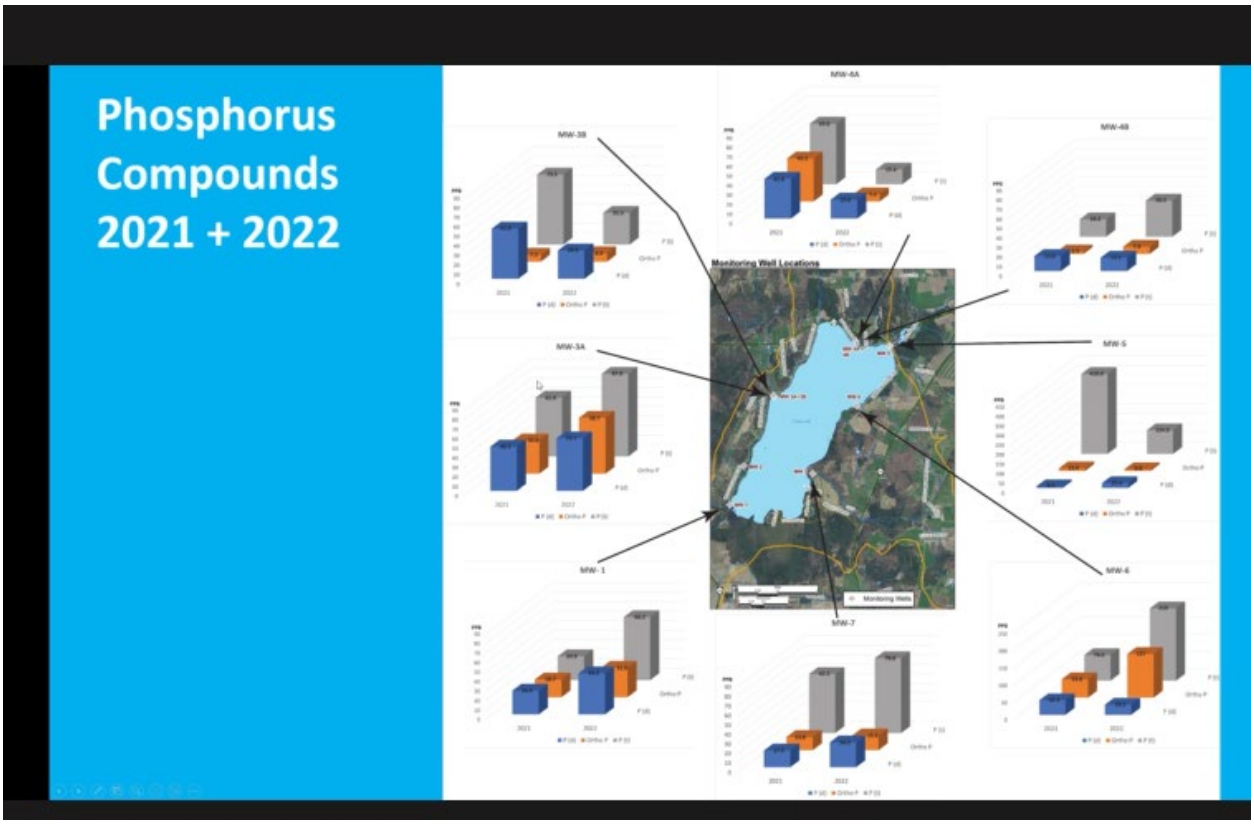
Get Involved - Be Lake Wise!

- Learn about Lake Wise tips for lakeshore camps: https://dec.vermont.gov/watershed/lakes-ponds/lakeshores-lake-wise
- Common areas for improvement: no-mow zones, vegetated shoreline buffers, infiltration trenches or gutters around camp buildings
- Does your camp need shoreline vegetation or infiltration trenches?
  - Contact Julia Crocker at Franklin Watershed Committee with shovel-ready 2023 projects
  - FWC working to secure VYCC summer 2023
- Don't know where to start? Get a Lake Wise assessment in summer 2023!

- Wayne Fiske asked about if work identified failing septic systems.
- Oliver – For people interested in understanding how their septic system works, contacts him - They are working on using caffeine tablets to add to toilet that then sampling for caffeine along adjacent shoreline. But not expecting wastewater from septic is a significant source.
- Jeff Sanders suggested that data could be kept confidential. Oliver – wouldn't publish, but if information requested, state needs to release. Would be best for camp owner who wanted to address any issues.

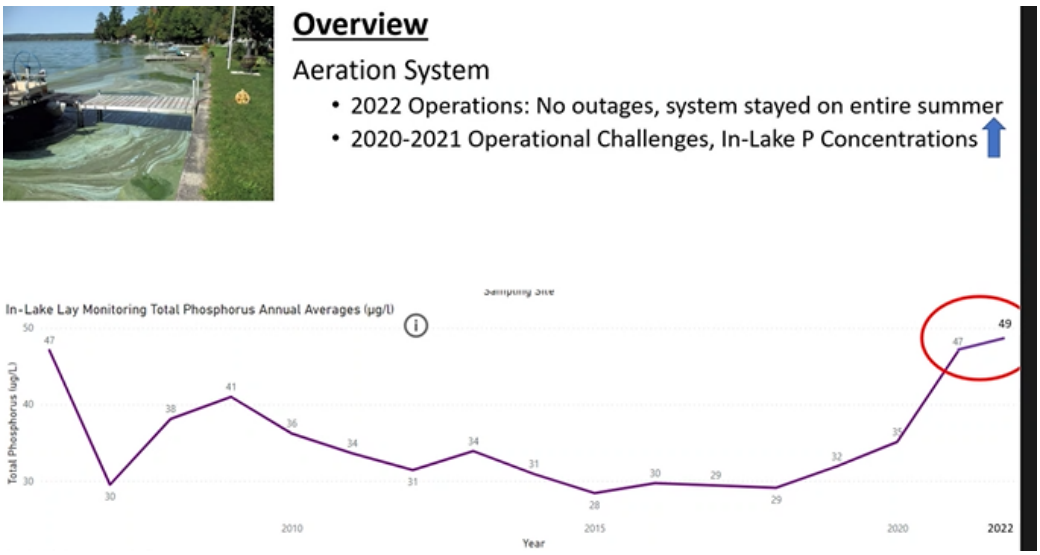
Update on the groundwater monitoring wells

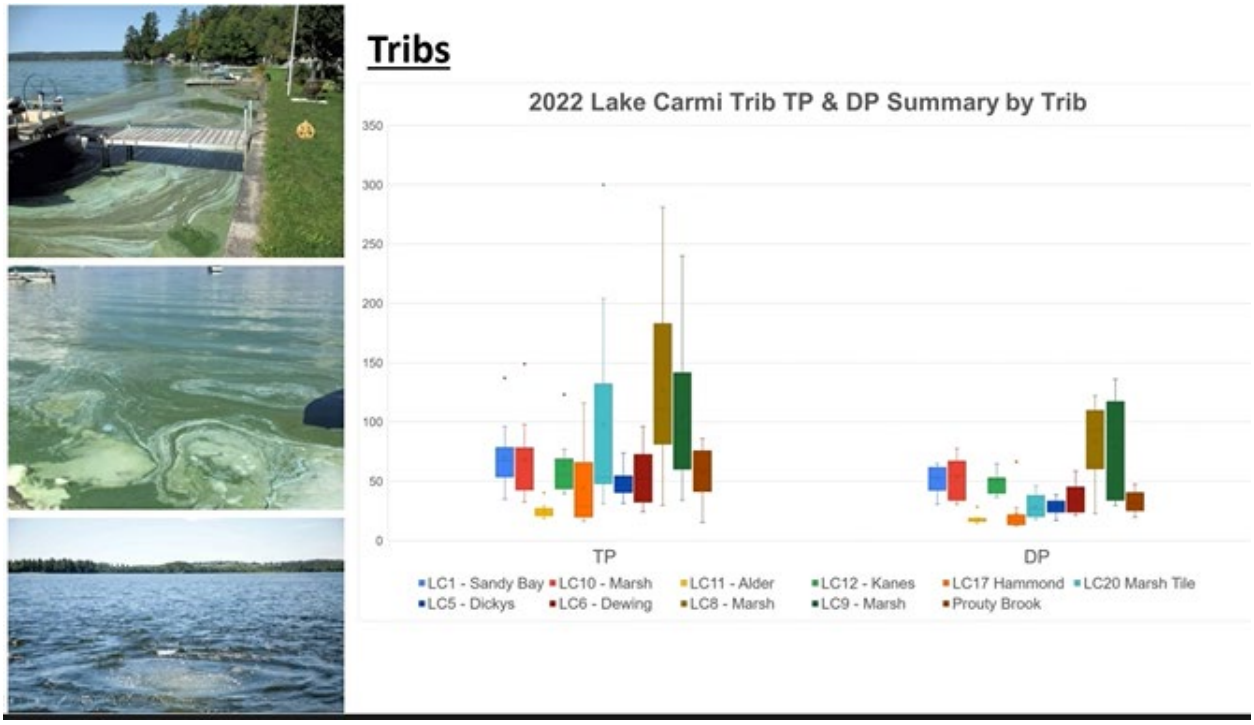
- Jon Kim, DEC
- Previous study shows ground water minor contribution to internal loading. Also sampling of 9 ground water monitoring wells since 2020 – and review of cores of sediment by Middlebury college to see how soil held on to P,
- Study also comparing water level in well and in lake – to see direction of flow
- And chemistry of ground water over several years, and two future years, see below. Important to see patterns over these 4 years. There will be variability based on weather patterns and other.



Quick Summary of 2022 In-Lake and Tributary Monitoring Data

- Oliver Pierson, DEC
- Lay monitoring data analysis shows that Total Phosphorus and Chlorophyll A values have increased over the last 3 years and moving away from our TMDL targets while the aeration system is operating





- The data collected by Julia Crocker from tributaries, see Marsh Brook as highest concentration at 3 sites of phosphorus and dissolved phosphorus. The DP can happen with low oxygen condition of wetlands, but also potential contribution of fertilizer.
- Jeff Sanders – wondered if manure injection activity in Marsh Brook watershed and data showed any relationship? Because of wet soil, didn't use manure injector until July.
- Oliver - Adding a simple staff gauge in Marsh Broolkcould provide more information about load of nutrients. Perhaps getting help from DEC hydrologist. Would need a lot of readings to understand overall loading.
- Bruce M – offered to help locate gauges.
- The AAFM study resulted in AAFM deciding not to fund the proposed the sampling design due to expense and complexity

Any Other Business

- Carmi Ice Cream Social at Legislature on 2/15, from 2:30 to 4:30 PM
- Rob Evans, FWC/CCA to share the good work.