Lake Carmi Quarterly Coordination Meeting
Thursday 10/6/2022 @ 4:00 PM
Meeting Minutes

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
LAKES & PONDS PROGRAM

Agenda

1. Rob Evans – Opening Remarks
2. VT DEC - Assessment of Carmi Water Quality Improvement Efforts and Next Steps
3. Andrew Schroth, UVM - Preliminary Aeration System Monitoring Results from 2022
4. John Tucci – Thoughts on Tweaks to the Aeration System to Improve Performance in 2023
5. Linda Blasch, NRPC – Carmi Private Roads Project
6. Laura DiPietro, AAFM - Update on VAAFM work in the watershed
7. Kate Dynarski, Franklin NRCD - Progress with BMP Identification Project
8. Jon Kim, VT Geological Survey – Update on Lake Carmi Watershed Groundwater Study
9. Ashton Kirol, UVM - Analysis of Satellite Data Carmi to understand blooms pre-aeration
10. Dean Pierce, NRPC - Missisquoi CWSP Update
11. VT DEC Staff – Update on 2022 Carmi Clean Water Progress Report

Participants

- 42 People Attended, See Annex One for a list of participants

1. Opening Remarks (Rob Evans)

- Thanks to all stakeholders for their efforts in the lake and its watershed
- Please put presentations up on VTDEC Lake Carmi website after the meeting

2. VT DEC: Carmi Improvement Efforts Assessment

- Summary: Lake status, next steps
  - Lake temperature well mixed due to aeration for most of summer (good)
  - Dissolved oxygen: goal is above 2.5 mg/L
  - DO data shows readings above 2.5 mg/L for most of summer (Pete Stangel Data)
  - UVM data shows DO readings below 2.5 mg/L at 9m
  - Aeration system: no outages, operating entire summer
  - In lake TP concentrations: increased over summer (high values at end of August; 60's – 90's ug/L)
- 2022 Cyanobacteria blooms
  - Below average precipitation
  - Indication that conditions have worsened in past three years
- DEC progress reports indicates that BMPs are leading to decrease in external P loading
  - Lag time for in-lake signal (why blooms are still severe)
  - Need to continue BMP work in watershed
- Now what?
  - Not seeing improvement based on P reduction in watershed and aeration in lake
  - 2023: continue BMP implementation, Lake Wise, ag BMPs, road improvement projects
  - Alum feasibility study: determine if conditions are conducive to treatment, and identify and address any cost/health/environmental concerns
  - Try to maintain UVM platform
- **Discussion**
  - Do alum health concerns compare to cyanobacteria concerns?

        - Health & environmental impacts for both alum and blooms; need to be able to answer questions regarding alum concerns
        - Ongoing cyanobacteria health concerns may outweigh alum concerns
    - Funding for "fixing" Lake Carmi
        - Clean water funding is potentially available
        - Good time to ask for increase of funding due to strength of clean water fund
        - Being worked on
    - Talk to landowners/Lake Wise
        - Continue shoreland restoration projects
    - Air quality/human health concerns from cyanos: does this warrant different funding?
        - Important to get VT Dept. of Health's attention, try to get Dr. Sarah Vose at December meeting
    - P loading: prioritize sediment load reduction. Need more communication about projects from town/state. State Park contribution?
        - Modeling shows reduction goal for external P loading for 2021
        - Culvert assessments have been done; results on DEC Lake Carmi page
    - Too much water in and not enough out?
        - More out than we have had
        - BMPs are to figure out how to slow water down, particularly stormwater runoff
    - Why not monitoring gauges for tribs? Also, Phragmites in Dewing Road culvert; can we eliminate them and increase flow into Mill Pond?
        - Gauges: no AAFM staff capacity now to pursue installation of gauges in carmi tribs
        - Phragmites Removal in Culvert: good idea, need to look into it

3. **Andrew Schroth UVM**
    - 2022 DO and P Update
    - Thermal stratification: aerator good at warming up bottom water but DO decreases
    - Internal loading and mixing causes cyanobacteria blooms
    - Bottom water anoxic mid July-periods in September
    - Total phosphorus trends similar to previous years
        - Start at mg/L goal and increases throughout summer
    - Bottom TP similar to previous years
        - Concentrations at surface getting higher earlier due to aerators
        - Phosphorus contained in the cyanobacteria blooms themselves
    - **Discussion**
        - Sampling of bottom sediment to test phosphorus levels?
            - Two years of sediment core phosphorus sampling
            - Results in UVM DEC 2021 Interim Report

4. **John Tucci EverBlue**
    - Lake conditions not responding typically to aeration system compared to other water bodies
    - Proxy continuous monitoring in drinking water reservoirs
        - Consistent Manganese reduction
    - Near flawless system operation in 2022
        - Still something wrong w/ aeration system function in Lake Carmi, What can we do?
    - Oxic conditions better than anoxic conditions at bottom
        - Adding oxygen to lake should continue

- Diffusers are farther apart on Carmi than other lakes (500ft between diffusers)
    - 300ft on other lakes – no fluctuations in conditions that we have
    - Reposition some diffusers to different depth ranges
- 3-5% below maximum run rate of compressors this year
    - More important to reposition than increase run rate
- Oxygen alone does not guarantee no cyanobacteria blooms

5. **Linda Blasch, NRPC – Carmi Private Roads Project**
    - Linda unable to make meeting

6. **Laura DiPietro Agricultural Agency**
    - Funding for Franklin NRCD and UVM Extension to do work around VT – including Lake Carmi
    - Ag projects include various BMP implementation on farms in watershed
    - Inspect farms every 1-7 years based on farm size
    - Complaints
        - Important for understanding things happening in real time
        - Complaints are shared by DEC and Agency of Ag
        - Challenge: vague complaints
            - Make sure complaints are specific and accurate
            - Can submit photos
    - **Discussion:**
        - How long does it take to look at site after complaint?
            - Depends but ASAP (within 24 – 48 hours)
            - AAFM prioritizes complaints and tries to respond to ongoing issues within 1 day
        - Would it make sense to stop putting manure on fields near lake until its fixed?
            - Farmers are doing a good job of achieving goals
            - Not fair to tell farmers they cannot be in business
            -

7. **Katy Dynarski FCNRCD – BMP Assessment Update**
    - Focusing on shoreland/stream projects
    - Summer 2022 progress
        - Kickoff meeting July 29th
        - Boat tour of Lake Carmi
        - 14 Lake Wise evaluations
        - 7 tributary walks
            - Mostly looking healthy
        - Gap in septic improvement funding/resources
        - Prioritization matrix for potential projects
        - BMP project inventory of completed, potential, and in-progress projects
    - Next steps
        - Identify potential ag, stream, and wetland projects
        - Additional Lake Wise evaluations
        - Finalize BMP project database
        - Prioritize identified projects
        - 30% designs
        - Look at tribs in spring to observe peak flow

8. **Jon Kim – Groundwater Survey**
    - Monitoring wells around Lake Carmi – Oct 2020, sampled in August 2021 and 2022
        - Collected and analyzed sediment cores for phosphorus
        - Important to show internal loading in lake
    - Sampled surface and groundwater for herbicides
    - More to come at next meeting
    - **Discussion**
        - What were conclusions of study?
            - Deep and shallow groundwater have P
            - " " " " flow towards lake
            - Groundwater and surface water mix
            - Both should be considered in overall loading to lake
            - Need to account more for P loading from lake sediments

9. **Ashton Kirol – UVM**
    - Assessing blooms w/ satellite data
        - Measures phycocyanin and chlorophyll
    - Blooms tend to increase in late August-September (2018 images)
    - Peak for 2016-2018 was in the same week
    - Post-aeration years
        - Blooms started earlier but peaks were at similar times
        - 2022- blooms started early and stayed high
    - **Discussion**
        - Would higher res drone surveys be useful?
            - Could look at daily images to see variation
            - No distinct area where bloom originates each year in Lake Carmi

10. **Dean Pierce NRPC – Carmi private roads project & Missisquoi CWSP update**
    - Private Roads Project Update
        - Part of LCBP funded work in Carmi Response plan
        - First construction project completed at Sandy Bay road & Black Woods intersection
            - Came after initial landowner was uncooperative
            - Highlights importance of cooperative landowners
        - Patton Shore Road project is in progress
            - Design is complete
            - Landowners being contacted
    - CWSP
        - NRPC designated as CWSP for Missisquoi River Basin
        - Working on project ID prioritization
            - Contract has been signed and updates on when funding is available coming soon
            - Process being sped up by requests for qualifications (pre-qualification)
        - Important source of funding for Lake Carmi watershed
        - Many categories of projects will be considered
    - **Discussion**
        - Do we know total figure for Missisquoi Bay watershed?
            - No sub-basin division
            - Hopefully $1.9 mil per year on ongoing basis

Meeting Summary

Total Number of Participants 42
Meeting Start Time 10/6/2022, 3:58:57 PM
Meeting End Time 10/6/2022, 8:47:46 PM

Participants:

Pierson, Oliver
Abernethy, Maria
John Costa (Guest)
Peter Lafley
ALbert Perry (Guest)
Bruce McGurk (Guest)
John Tucci
Bob Richard (Guest)
Diane Larose (Guest)
Ryan Archibald (Guest)
Kim, Jon
Dave Bennion Franklin Select Board
Paul (Guest)
Mitchell, Mark
Weston, Lauren
Bates, Karen
Jones, Kaitlyn (she/her)
Andrew Schroth
Julia Crocker (she/her) (Guest)
Debbie
Dynarski, Katherine - FPAC-NRCS-NRCD, St. Albans, VT
Rob Evans
Lisa Hango
Anne Ewins Larivee (Guest)
Dean Pierce (Guest)
Simard, Lee
Mike Pelz
Rupe, Marli
Joanne shea
Sheryl Garala (Guest)
Schumacher, Elijah
Sue Prasch - Lake Carmi (Guest)
Peter Benevento (Guest)
Suzanne Hull-Parent
Randy Brock
Stangel, Pete
Ruh
DiPietro, Laura
Rob and Judith Cormier (Guest)
Ashton Kirol
Mark Larivee (Guest)