

Lake Carmi Coordination Team Meeting – 11/12/20 Notes

Attendees: Oliver Pierson, Karen Bates, Julia Boyles of DEC; Laroses, Ryan Patch of AAFM; Tucker Wehner, Pete Benevento, Rob Evans, Paul Stanley of FWC; Peter Lafley, Ernie and Angela Englehart, Amanda Holland of NRPC, Andrew Schroth of UVM; Bruce McGurk, Dave Braun of Stone Environmental, Jeff Sanders of UVM Ext., Jon Costa, John Tucci of EverBlue; Kris Stepenuck of UVM Sea Grant;

Oliver's response to questions about Ticklenaked Pond's recovery – DEC-funded alum application occurred in 2014 after completion of strategies in the lake's action plan. The resulting water quality improvement in lake will allow it to be taken off states impaired waters list. A Ticklenaked watershed action plan was developed by ANR with help of community to address sources in watershed, including road runoff, septic and the few farms located in watershed. It's a small pond with a small watershed, which helped its success. (Link to [ANR announcement](#) and [plan](#)).

Ernie Englehart and Diane Larose – Need to ban manure application in watershed for one year.

Oliver – Agency heard comments during Clean Water Board meeting and has decided it's time to update the 2-year-old Lake Carmi Lake in Crisis plan because majority of projects have either been completed or begun. So need to put on thinking caps, pull together experts and develop next list of projects. Remember lake recovery will take time. More to come on this point in 2021.

Success to date: modeling of practices completed show a 40 % of P loading, If modeling doesn't result in BG reduction, then also need to make adjustments

Paul Stanley – has money been received to start culvert replacement on State park road?

Oliver – will look into this and report back

Ryan Patch – TMDL goal is not zero loading from landscape. There can still be good water quality, need to look at P load goal. P loading is a historic issue, that we are making progress on. We also know that some practices implemented in watershed do not have a P reduction coefficient, so haven't been accounted for in modeled P reduction. From his perspective, see incredible participation from agricultural community. There are some physical challenges, and we should be expecting a decade to see results. Remember there is a winter spreading ban, but spreading of manure is compatible with water quality if RAPs followed. Think with improved stewardships, and Manure injection, there will be positive progress.

Oliver, once these modeling coefficients developed, we'll see even more P reduction calculated from existing work that has been already completed. Has also seen that agric community has done a lot, but understand frustration that in spite of this work, still see problems

Rob – question about point of order. Can we hold public comment to ensure we get through briefing material.

Oliver, let's have a few questions from public at the end of each section

Pete B – What were some of things they did at Ticklenaked Pond to tamp down loading

Oliver – very small pond and very small watershed, so easier: identified septic, road and agricultural problems and addressed all of them methodically. He will include link to Ticklenaked Pond action plan.

J. Costas – what if modeling is incorrect, then we are not getting to address the objectives.

Oliver = The modeling used comes out of peer-reviewed studies, so represents the best modeling out there. But should quality that it is based on modeling and there is always a margin of error. But don't think our efforts are best spent on redoing model but rather looking at how to support additional projects, including a measurement of stream loading, that will be explained by Dave Braun at Stone Environmental later in meeting.

John Tucci – not perfect year for system. The worst event was an electrical problem early in year, despite efforts by all involved to address. It took time to figure out source, and then COVID increased time it took to get new equipment. So good 2 to three week period, but not able to increase oxygen levels in July, so resulted in more internal loading of legacy P, possibly causative factor for those moving blooms along shoreline. Not all problems can be anticipated, but we have focused on moving towards an error proof system, so once error happens, they have worked to reduce chance it will happen again. The result has been an upgrading of the system. Next year, spare compressors and controller drive ready to deploy just in case an unforeseen problem occurs. We need to get to point where system can work well all year. It's a bigger system, more complicated than others they have installed and they have learned a few lessons, and will continue to error proof the system.

Oliver – There were Herculean efforts to address problems. The costs were shared by multiple partners. Oliver has also secured funds to keep Tucci's company around for another two year to do service and maintenance.

Ernie – what extend of manure coming into lake affects ability of system to work.

John = your experts should be able to look at data to be able to look at legacy P against the watershed loading. It would have been a good year to see how a perfectly run system worked on lake, because watershed runoff would have been lower due to lower precipitation. The data analysis this winter should be able to help figure out legacy vs external.

Oliver – starting to work up data. Because dry summer, didn't get as much data from tributary sampling, but was able to look at dissolved P as well as Total P.

Jeff Sanders – Anyone with evidence of direct discharge of manure to surface waters should contact DEC and if there is one, there should be a significant fine. He is in watershed all the time and has not seen any evidence of manure runoff to lake. Should be very careful how we approach manure issue.

Oliver – as an example, when concern was heard, we contacted Jeff.

Jeff - went out directly and found that it was mistake of hired man who spread on wrong field. But it didn't rain that period, as well as entire summer, so can't see how manure runoff would be problem. I don't want to discourage farmers, and they are doing a lot. Where are farmers suppose to go with manure. The manure moratorium would cause hardship

Paul Stanley – would be complicated to move manure in another direction and there would be a cost to move it further away from source. The nutrient management plan would be a better focus for watershed and everywhere else. It works with application on field specific basis, and could use some work helping farmers implement plans. He is working with one producer in watershed with GPS and GIS

precision technology that uses info from plan to help direct producer to exactly where to spread and how much.

John = his observation is that these forested woodland soils around Marsh Brook and around state camp could be a much more problematic nutrient source if its similar to what he sees around other lakes around the country. Need watershed wide added to agric. effort around lake integrated approach to recognize all sources

Ryan Patch – If there are manure spreading violations also contact AAFM, as they will focus on RAP violations that may not results in a source reaching surface waters

Oliver – Report on Preliminary In – lake data – from a platform on lake. Weekly data collection that was then augmented by weekly and biweekly data collection by DECs’ Pete Stangel. He showed screen – slide presentation : Preliminary Summer 2020 Lake analysis – pulled together by Stangel. More analysis is needed.

Results:

Station 1 – See stratification in June to July, as aeration system started when system not working. As a result the dissolved Oxygen levels decreased at lower levels mid July to mid august. Reduced Oxygen/anoxic conditions will allow sediment to release P to water column.

Station 2 – not as deep, but same story

The UVM data measured oxygen levels that also supported this reduction of oxygen. Oxygen was high in September to November, but perhaps more external loading to support the later blooms.

The measurements of Total phosphorus, saw uniformity of P levels throughout water column, and it ramped up as temperatures increased. A big spike in October, may have been a bloom that then died and released nutrients.

Dry June and July and increased temperatures may have been driving phosphorus concentrations.

Andrew S, UVM data taken from sediment graph – see more detail of P concentrations from internal loading signature. First spke in early July and August, where lake had low O levels at sediment water interface. Once lake was mixed, concentration decreased. Could see internal loading then when aeration system was down.

Oliver – continues:

Dissolved P at station 1 – see spike in September and October which suggest bloom from external loading???

Graph of chlorophyll data, saw big spike in beginning of September. One pigment that is unique to bluegreen algae – see big bloom in late July (closure of system) and then low level signal that continues through fall. Will look at composition of algae blooms to possibly see what factors they are responding to. This was taken from middle of lake, so wouldn’t have measured algal at shoreline, where people saw blooms in fall.

Confident that we can extend UVM grant to continue data collection over next year. More formal report will be provided in February which will include higher level of analysis

Jeff Sanders – Agricultural work in watershed – Did get grassland injector used in watershed, continuing now. Logistics slowed start, and also hoped to have field day to show community how it worked, but couldn't because of COVID. Hoping to have one next spring. 600 acres injected, although hope was 700 acres. Challenges around coordinating use, and weather at end.

Fields were seeded down with DEC funds. A large barn yard cleaned up to reduce erosion.

Some set backs: one farmer had agreed to two staged ditch, but then wetland violation found, so that eliminated that project for now.

With DEC grant, using Eric ROY, UVM, to do some assessment on North and South end of lake to try to estimate environmental value to justify a better pricing to offer landowner. Hoping to work with other partners to meet that price

Cover crop = all corn fields cover cropped by all but one farmer.

Overall – farmers are engaged with DEC , AAFM to do projects. And want to make sure that apple cart isn't upset. Saying that we don't want manure in watershed, is like farmers telling campers that they don't want camps on lake. Things take time. He thinks manure management has improved even over last year, not perfect, but we need to keep working on it. This year was good year for watershed because there wasn't much rain, and crops did well, so they were able to take up a lot of nutrients.

Pete B. = two parcels, near North and south, was this for conservation easement?

Jeff S – Parcels would be sold. It needs to be decided who would buy them. This was based on interest of landowners.

Pete B – what is status of upper Marsh Brook wetland restoration

Karen – Collecting additional data now. Provided overview of Marsh Brook walk – Staci will be writing up a report. With regard to tributary sampling, there was significant dissolved P compared to P associated with sediment.

Pete L – full stream restoration in Chesapeake Bay, would be good approach here.

Karen – recently read report on restoration of urban streams in Chesapeake Bay, and agrees that its good work. On Marsh Brook walk, just don't see the incision and failing banks that were addressed in CB report.

Andrea – at wagner farm – has worked with Norwich University, did we take water samples there?

Karen – no, we focused on larger south branch. North branch water quality has historically been better than South branch

Diane – based on her history of lake – she sees delta as much larger than it use to be. Why?

Karen B = Staci will be able to provide a report on Marsh Brook in February that will include potential sources of sediment that could have added to the delta.

Tucker – saw that the stream did look good, but based on their recommendations based on initial review, pulled together a grant application to do riparian planting and a full geomorphic assessment and watershed assessment

Julie Boyles, Vermont Geology (works with Jon Kim) – Report on ground water study - Showed map of sampling of ground water and lakes sites. Sampling for P and 39 chemical constituents. Still looking for more volunteers. Also done geologic mapping (bedrock and surficial, in progress) to answer question how ground water interacts with surface water.

Oliver – thanks to all the landowners who allowed use of their land for a temporary well to support this study.

Andrea – would be willing to have their well water sampled.

Andrew S. – will you get at relative surface water to ground waters to understand water budget of Lake Carmi? He would be interested to see how it could help them in development of their lake model.

Julia – first just looking to see what's going on, but may go further to answer additional questions, so stand by. (see hand out on Restoring Lake Carmi webpage)

Dave Braun- Report on Feasibility study to look at tributary loading

Provided an update on culverts on Rte 236/State Park Road: They are in design phase, with work expected next summer.

Supporting AAFM in this assessment. Explained flow versus concentration. Its ideal to use flow to calculate loading, pounds per unit of time. This is a planning exercise to ensure any subsequent study is well thought out. 1. Looked at all 10 significant tributaries to lake; and assess conditions for sampling including close proximity to lake and reasonable access. Culverts on shoreline roads are the best choice in many cases, or downstream or upstream, where stream channel is stable, and culvert won't be replaced during study. Found reasonably good place at 8 of 10 streams and ok spots for the other 2. Landowners response pretty good. Would need small box with solar panels. Any reluctance is associated with landowners not wanting people on their land.

Next stage is to look at monitoring methods, including instrument type. They will give cost to AAFM as well as maintenance requirements. Big thanks to Peter, Tucker and Rob for help in field and also helping with landowner contacts.

Bruce McGurk – who, is on study's partner team representing FWC - emphasis that goal is to run study for 3-5 years to ensure inclusion of different precip years. Allows to wed concentrations to loads. These stations are temporary, although it would be nice to have longer term sampling for Marsh Brook

Tucker Wehner– FWC watershed coordinator, hired in August. Able to join in Marsh Brook walk and use info to write application for grants to complete projects. He has been helping with sampling and hopes to begin in April. Also uploading bg algal blooms pictures for website. He also met other watershed partners and heard what everyone was up to. Good connections for future grants. He has applied to grants: for assessments to look at sources of nutrients in Marsh Brook; increase forested riparian buffer and also applied to replace culverts on Towle Neighborhood Street; to support his time; and to support boat greets to reduce introduction of aquatic invasive species at boat access sites.


Bruce M. – emphasized importance of addressing flows from roads, ditches and culverts that cause erosion of stream channel. Sediment all makes it way to lake

Oliver – legislative priorities – FWCs outreach to legislature has helped support funding to lake. Oliver has focused on finding funding to support John Tucci’s works, and UVM’s continued sampling.

Paul Stanley – talked about mediation to address comments about manure, and lack of interest of landowners to have people walk across their property. Need it to bring people together. Need to come together to get this work done.

Oliver – agreed to need community to share their concerns, perspectives. Saw this when talking to selectboard. He is open to helping make this happen and would like to hear other people’s ideas about how to make this happen.


John T. Anabranh solutions has used process based restoration practices. Doing some neat work. Will send link:



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Pete B. – thanked everyone for coming. Didn’t want to alarm community with comments about manure management. Thanked Jeff for his work. Never thought that he would see manure injection in wastershed.