Cyanobacteria Mitigation Fund and Related Project/Case-Study Updates
LMAC Meeting- 5/30/24
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Cyanobacteria Mitigation Fund (CMF)
In November of 2023, the New Hampshire Department of Environmental Services (NHDES) released the New Hampshire Cyanobacteria Plan: A Statewide Strategy, in an effort to control cyanobacteria blooms in New Hampshire's inland surface waters. Under Strategy 1, NHDES seeks to develop the policies and practices to reduce, control and prevent the nutrient inputs that cause cyanobacteria blooms. An important premise is that nutrients are a significant factor that contribute to bloom occurrence. A reduction in the quantity of nutrients that enter our surface waters either through policy or engineered solutions is an important step to controlling cyanobacteria blooms.

The CMF assists with the costs of implementing nutrient control practices designed to reduce the number of chronic and extended cyanobacteria blooms that NHDES considers a threat to the long-term health of waterbodies. The CMF enables NHDES to fund projects, provided applicants are eligible and meet the specific criteria outlined within Env-Wq 2300 (effective January 29, 2024). Municipalities, community water systems, and non-profit lake and river watershed associations are eligible to receive CMF assistance.

Projects submitted by eligible entities must involve surface waters that have chronic and extended cyanobacteria blooms that are considered by NHDES to be a threat to the long-term health of recreational waterbodies, drinking water supplies, and the subsequent risks posed to people, pets, livestock, and wildlife that depend upon them. Proposed projects must be justified nutrient load reduction practices identified within a department-approved watershed-based plan. Additionally, projects must be cost-effective, measurable and include an operations and maintenance plan to be considered eligible.

To apply for funding, the required information must be sent to the CMF Program regarding the project of interest. Details regarding the necessary information and the application process can be found within the rules Env-Wq 2300. Additionally, application guidance can be found within the eligibility request, which became available February 29, 2024.

Below is a list of the applicants to date for funding under the CMF:

CMF Applications/Projects to Date

Waterbody/Town	Project	Status
Lake Kanasatka/Moultonborough	Aluminum treatment to bind phosphorus in lake sediments	Project completed- Alum treatment took place mid-May 2024

Tucker Pond/Salisbury	Watershed work to reduce sedimentation and nutrient loading from a major tributary to the lake	Pending funding- grant paperwork routing
Partridge Lake/Littleton	Aluminum treatment to bind phosphorus in lake sediments	Application received for funds, pending additional field work this summer to finalize plan for treatment acreage and dose

CMF - Looking Ahead

- There is currently a list of 18 waterbodies, and counting, that could be eligible for CMF support based on the degree and extent of cyanobacteria blooms in recent years, that can or will soon meet eligibility requirements for a CMF award.
- To meet the needs of those waterbodies, and address any other waterbodies added to the list in the future, dedicated annual funding would be needed to support these projects.
- While a $1M appropriation was helpful to start the ball rolling, half of that funding is gone on one project, and the rest will be spent of the other two projects in the queue, most likely.
- Regular funding, that is continuously appropriated and non-lapsing, will help to ensure that those waterbodies that need it most will have the financial resources available to help kick-off rehabilitation efforts.
- Other funding sources, like federal, local or state, would be useful to help support lake and watershed studies, development of watershed-based plans, and rehabilitation efforts.

Case Study- Lake Kanasatka Project Overview

Lake Kanasatka is a 353-acre waterbody located in the Town of Moultonborough, NH, which outlets to Blackey Cove on Lake Winnipesaukee in Moultonborough. Lake Kanasatka is situated in the Lakes Region, along a major roadway, and as such, it receives transient boaters and has numerous private residences around the shoreline. Additionally, there is an overnight children's summer camp located on the shores of the lake.

Lake Kanasatka has experienced severe and chronic cyanobacteria blooms since 2020, limiting recreational activity and posing a threat to human health and aquatic life. In total, NHDES has issued cyanobacteria advisories for 259 days for primary contact recreation (swimming). Last year, NHDES issued cyanobacteria advisories on the lake for a total of 121 days. These blooms were first observed in June and continued at varying degrees of intensity (based on cell density) through December. Given the increasing trend in both bloom density and duration since 2020, there are significant concerns about public health and safety due to potential toxins released by the cyanobacteria, and the lake will be listed as impaired in the 2024 303(d) assessment cycle.

It is estimated that watershed sources of phosphorus account for 71% of the phosphorus loading to Lake Kanasatka (198 kg/year). The Lake Kanasatka Watershed Association (LKWA) worked with the town of Moultonborough to fund the development of a watershed-based plan (completed in 2022) and has worked with contractors and NHDES to install structural best management practices (BMPs) in the watershed to reduce external nutrient loading and replace old or failing septic systems. To date, completed watershed work has resulted in a 12 kg/year reduction on phosphorus loading to the lake, with an additional 2 kg/year planned for future watershed work.

LKWA self-funded the development of the alum treatment plan to address the internal phosphorus loading. The investment includes costs related to sediment coring as well as design and permitting of the project with their consultant. Additionally, LKWA applied for and received a 2023 EPA s319 Watershed Assistance Grant from NHDES, which requires a 40% cost-share from the association, to address top priority BMPs identified in their watershed-based plan.

According to the watershed-based plan, approximately 20% of the phosphorus load to the lake originates from lake bottom sediments, necessitating reduction of the internal nutrient load in conjunction with the external nutrient load reduction projects.

The aluminum treatment that was conducted in mid-May 2024 is conservatively estimated to be 80% effective and will reduce the internal load by 44 kg/year. Combined with the external phosphorus load reductions of 12 kg/year that have already occurred, the total reduction in phosphorus loading to Lake Kanasatka is estimated to be 56 kg/year, exceeding the load reduction identified in the watershed-based plan of 48 kg of phosphorus per year as necessary to improve water quality to its expected condition.

Through the combined implementation of watershed BMPs and conducting in-lake treatment, the phosphorus loading into Lake Kanasatka will be significantly reduced, which will reduce or eliminate harmful algal blooms and improve water quality.

Based on discussions with LKWA, over $600,000 has been invested to date from the LKWA, and private and municipal sources on watershed-based plan development and project implementation. This does not include the $500,000 CMF grant awarded for aluminum treatment.

The Realities of Lake and Watershed Management – No Shortcuts!

- Before any rehabilitation work can take place in the watershed or the lake, sources of nutrients and sediments need to be quantified, usually through a watershed study and development of a watershed-based plan.
- These studies and plans are completed by professional consultants who specialize in this type of work, and they yield an assessment of total nutrient and sediment loading to a waterbody and include strategic plans with predicted measurable reductions in nutrient and sediment load to the lake. The plans also estimate internal nutrient loading from lake sediments, if applicable.

- These plans prioritize rehabilitation steps and set a timeline for watershed and nutrient load reduction, to meet a new target for nutrient loading to the lake, aimed at reducing lake productivity (cyanobacteria blooms).
- Watershed plans can cost $150,000+ to develop, but they are the road map to lake rehabilitation, and are necessary. CMF funds cannot be obtained without a solid plan in place.
- Watershed and in-lake management are expensive and require careful planning, implementation and routine follow-up monitoring.

Important Lake and Watershed Realities:

- Impacts to our lakes have been accumulating over decades to hundreds of years, but we need to act wisely and together to slow those impacts now and continuously, in the face of a changing climate. We can't make development go away, but we can work harder to make it better and more lake friendly.
- Lake and watershed rehabilitation work takes time, and lake responses will not be immediate. Often both watershed and in-lake methods need to be used to reduce nutrient load and associated impacts to lakes.
- There is no quick fix, and expensive work done out of appropriate sequence or timing will not work for the long-term, and the lake could revert to blooms once again.
- Stormwater is a significant contributor of nutrients and sediments to our lakes and ponds, accounting for at least 50% of surface water quality impairments in New Hampshire. Most, if not all, lake rehabilitation projects need watershed work as a priority.
- Lake "restoration" is a dream term - we can rehabilitate, but we can't set lakes back to what they were or fully restore them, so we need to work harder to slow or prevent impacts and rehab where we can.
- Aluminum treatment is ***not*** a solution for every lake, and for the ones where it is appropriate, a long process is involved in getting to that point.
- Anyone can research "lake rehabilitation" methods online – it is not a one-sized fits all, and professionals who are versed in lake and watershed management should make the determine of what and when for implementation. We base decisions on proven science, documented examples in peer review literature, and real case studies with data from reputable professionals and scientists. It is all too easy to find a solution online and want to use it, but those quick fixes often backfire if not used correctly or in a timely manner.