

WINNIPESAUKEAN

A PERFECT STORM: FACTORS FUELING RECORD-BREAKING BLOOMS

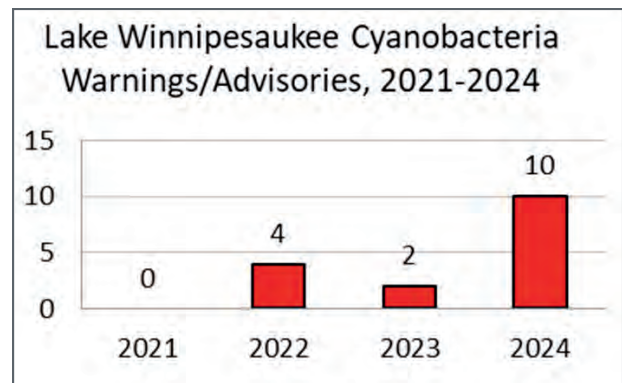
With unprecedented rainfall and record warmth, New Hampshire endured one of its most extreme weather years on record in 2023. Heavy storm events led to increased polluted stormwater runoff, erosion, and sedimentation, all of which contribute to water quality issues like cyanobacteria blooms. Coupled with minimal ice coverage—just 37 days, another record—the changing climate is leaving a visible and concerning impact on Lake Winnepesaukee.



Cyanobacteria are naturally occurring and play a crucial role in our ecosystems. However, certain conditions—such as elevated water temperatures, abundant sunlight, and excess nutrients like phosphorus and nitrogen—can trigger harmful blooms. These blooms disrupt aquatic ecosystems, threaten wildlife, and pose health risks to humans, making it critical to reduce the inputs that fuel their growth. After the rainy season last year, lake-goers eagerly anticipated the 2024 forecast of a dry, warm summer, promising plenty of opportunities for recreation on the big lake. However, their plans were disrupted by cyanobacteria blooms that impacted Lake Winnepesaukee in late June, late August, and early September—with an unusually late bloom reported on October 30.



There were 10 cyanobacteria warnings issued on Winni, lasting a total 64 days, another record. A cyanobacteria warning is issued by the New Hampshire Department of Environmental Services (NHDES) when cyanobacteria cell concentrations exceed the recreational threshold of 70,000 cells/mL. Warnings are not based on toxin evaluation but are intended as a precautionary measure for when short-term exposure to cyanotoxins is likely.



Tackling water quality issues requires a multifaceted approach. LWA will continue to focus on implementing watershed management plans, expanding water quality monitoring, and strengthening outreach to property owners and businesses. Partnerships with municipalities, state agencies, and local stakeholders will be essential to reducing nutrient pollution and preventing future blooms.

MESSAGE FROM THE PRESIDENT



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Dear Lake Ally,

At the beginning of October, the Lake Winnepesaukee Association announced a name change, a small one with big impact, the **Lake Winnepesaukee Alliance**. This change reflects the organization's renewed focus on broadening community partnerships to address the growing challenges threatening the lake today and in the future.

Why "Alliance"? For years, the term "association" has been misinterpreted, often associated with a homeowners' group. Our work, however, reaches far beyond any one community; we are dedicated to lake-wide efforts that impact everyone who values the health of Lake Winnepesaukee. The word "Alliance" more accurately reflects our partnerships with property owners, businesses, municipalities, and recreational users – all of whom play a critical role in safeguarding this important resource. Lake Winnepesaukee is an exceptional resource of statewide, regional, and even national importance. Now, more than ever, we must intensify efforts and work together to preserve its water quality and, in some cases, restore it.

As part of this rebranding, we've also adopted a new tagline: **"Our lake. Our future"**, which reinforces the shared responsibility we all have in ensuring the lake remains clean and healthy.

With the increase in cyanobacteria blooms this past summer, public awareness about the lake's vulnerabilities has risen significantly. If we are going to effectively address this threat, we need to galvanize public concern into effective action. LWA's proven science-based approach to water quality protection has been successful in guiding advocacy and action to date, but we need to expand our efforts and attract broader support to tackle the challenges Lake Winnepesaukee faces.

As a first step, this summer, we hired 2 more staff to help expand and improve our outreach, water quality monitoring, lake and watershed restoration efforts. With the support of \$650,000 in congressionally-directed grants, we have begun the water quality and watershed analyses to address nutrient and sediment pollution in Center Harbor Bay, the Broads, and Alton Bay.

In 2025, we will also begin to update obsolete watershed managements plans for Meredith Bay, Paugus Bay, and Sanders Bay. The results of these studies will provide a road map to guide future restoration activities at the local level.

I am grateful for the support we have received from the community. Together, we will achieve successful outcomes and make progress in protecting this beautiful lake.

Sincerely,

A handwritten signature in blue ink that reads "Pat".

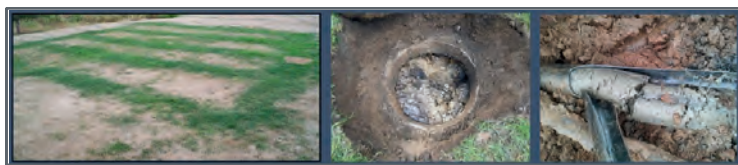
Pat Tarpey, President

LAKE FRIENDLY LEGISLATION

The 2024 legislative session brought forward numerous bills focused on safeguarding New Hampshire's waterbodies and natural resources. At LWA, we monitor key legislation, provide timely updates to our supporters, testify on bills at the State House and encourage the public to speak out for the health of our lakes.

Two important bills that passed will address nutrient loading from septic systems, and fertilizer use.

NEW SEPTIC LAW TO PROTECT NH WATERWAYS



Effective September 1, 2024, House Bill 1113 requires septic systems within 250 feet of any New Hampshire waterbody, including Lake Winnepesaukee, to be inspected before a property sale. A state-licensed septic system evaluator must assess the system, and if the system lacks current state approval or was approved before September 1, 1989, an additional evaluation by a licensed septic designer is required to determine if the system is failing.

If a system is found to be in failure, it must be replaced within 180 days of the property transfer. This law is aimed at reducing nutrient and bacteria pollution, which can harm water quality, ecosystems, and impact recreational activities.

NEW LAW LIMITS FERTILIZER USE

Efforts to safeguard New Hampshire's lakes and rivers took a significant step forward with the recent passage of House Bill 1293, which addresses nutrient pollution from turf fertilizers.

The legislation outlines specific restrictions on fertilizer use, including prohibiting application during rain, on frozen ground, or near storm drains and paved surfaces. Additionally, retailers will be required to post educational signage about the environmental impacts of fertilizer runoff.

After being passed by the Legislature in June 2024, the bill initially faced a setback when it was vetoed by Governor Sununu in July. Undeterred, lawmakers returned in October to reconsider the measure.

On October 10, the House and Senate achieved the necessary two-thirds majority to override the veto, with votes of 232-99 and 22-1, respectively.

House Bill 1293 will officially take effect on **January 1, 2025**.



2025 LEGISLATION SNEAK PEEK

The 2025 Legislative Session in New Hampshire includes several key bills focused on environmental protection.

- 2025-0016 proposes a new conservation license plate, with the additional fee directed to the Cyanobacteria Mitigation Loan and Grant Fund.
- 2025-0181 seeks to prohibit the intentional disposal of yard waste into surface waters, aiming to reduce nutrient pollution.
- 2025-0182 aims to increase penalties for violations of the Shoreland and Water Quality Protection Act, strengthening enforcement of water protection regulations.

The LWA will be monitoring these bills and others, and will provide you with updates as needed.

PAUGUS BAY ASSESSMENT RESULTS

Paugus Bay, the drinking water source for the City of Laconia, faces growing threats from cyanobacteria and nutrient pollution. LWA was awarded a New Hampshire Department of Environmental Services Source Water Protection grant to complete an assessment of the areas nearest to the drinking water intake. **Over the last four decades, phosphorus levels in Paugus Bay have increased 80%, from 4.0 parts per billion (ppb) in 1979 to 7.2 ppb in 2023.**

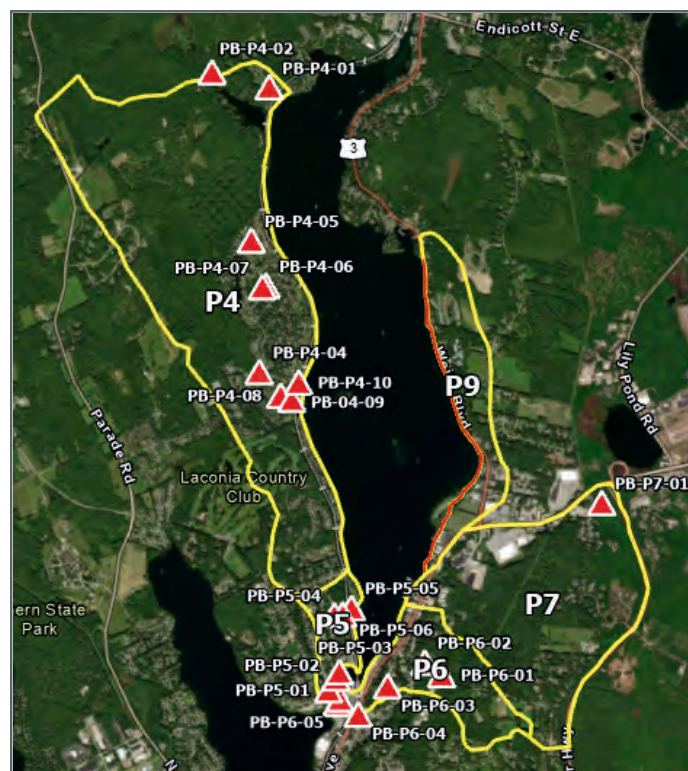
LWA's assessment focused on the five catchments closest to the water intake pipe, identifying the areas contributing the most sediment and nutrients to the bay. **Urban areas, which comprise 40% of the surrounding land, are a major source of pollution, accounting for 74% of the total pollutant load. In contrast, forested areas, which cover 58% of the land within the five catchments, contribute only 21% of the total pollutant load.**

Our assessment found that 52% of shoreline properties lack sufficient vegetated buffers, while 84% of properties are highly vulnerable due to erosion and steep slopes. These factors can exacerbate pollutant loading into the Bay, especially during heavy rain events.

**154 Stormwater Outlets
were identified within
250 feet of the shoreline
protection zone**



Stigonematales, a type of benthic cyanobacteria, found on the western shores of Paugus in August 2022



Map of catchments (yellow boundary) with BMP sites identified (red triangles)

23 sites were identified as in need of some form of best management practice (BMP). Different types of BMPs target various remediation efforts. We identified 14 vegetated buffer/swale projects, 3 culvert repair and maintenance projects, 3 filtration systems, and 3 road repair and maintenance projects. Some of these project types overlap, as BMPs can be combined for greater effectiveness. LWA will continue to work with local partners to address these issues in the future.

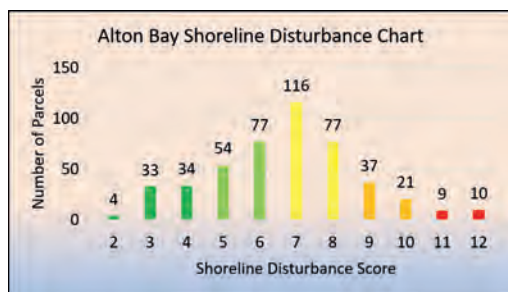
One of the simplest and most cost effective solutions is to plant vegetation along the shore, which helps stabilize the shoreline, slow down stormwater runoff, and reduce the amount of sediment and nutrient loading to the bay.



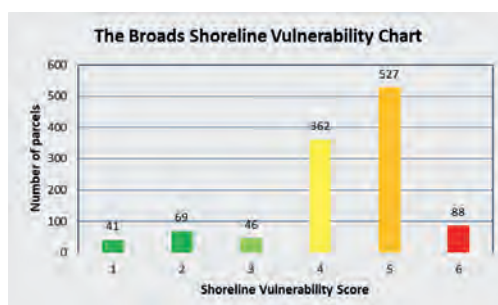
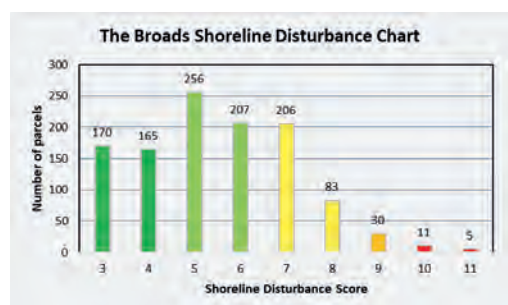
Southdown residential community, Laconia, NH

PROGRESS CONTINUES ON THE ALTON BAY, CENTER HARBOR AND THE BROADS WATERSHED MANAGEMENT PLANS

LWA staff conducted shoreline surveys for Center Harbor Bay, the Broads, and the Alton Bay subwatersheds from July 16, 2024 to October 3, 2024. **With the assistance of volunteers who provided boat transportation, a total of 2,700 shorefront parcels were evaluated.** Each parcel was assessed and scored based on amount of vegetational buffer, bare soil coverage, shoreline erosion, proximity to the water, and slope. The scores were then used to calculate two metrics for each property: Shoreline Disturbance Score (based on vegetation buffer, bare soil, and erosion) and Shoreline Vulnerability Score (based on slope and proximity to the water). The scores are used to identify which properties pose the greatest risk of contributing to lake contamination and which are likely to become significant contributors in the future.

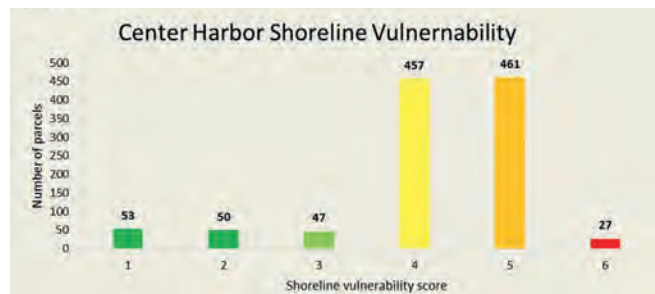
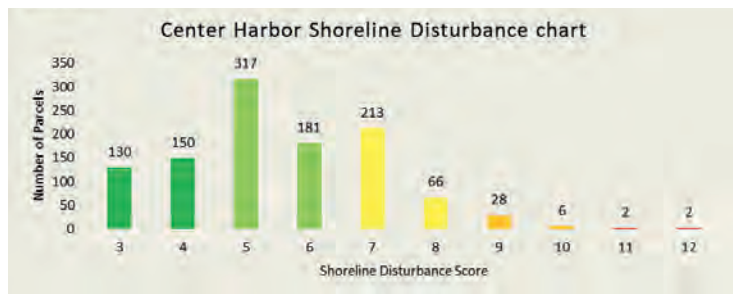


For Alton Bay, 472 parcels were evaluated, resulting in an average shoreline disturbance score of 7. Scores range from 0-12, with scores over 6 considered having a medium to high impact. The average shoreline vulnerability score was 5, a very high score, recorded for 210 parcels.



1,095 parcels were evaluated in the Center Harbor Bay subwatershed, resulting in an average shoreline disturbance score of 5, recorded for 317 parcels. The average vulnerability score was 4, observed in 457 parcels.

In the Broads, 1,133 parcels were assessed, resulting in an average shoreline disturbance score of 5, observed in 256 parcels. However, 335 parcels scored a 7 or higher. The average vulnerability score was also 5, recorded for 527 parcels.



The Shoreline Disturbance Score and Shoreline Vulnerability Score address different aspects of shoreline health. The Disturbance Score can be improved by increasing the vegetated buffer, addressing bare soil, and mitigating areas prone to erosion. In contrast, the Vulnerability Score evaluates factors such as the distance of structures from the water and the steepness of slope—elements that are generally difficult to change. **This distinction underscores the importance of properties with high Vulnerability Scores striving for low Disturbance Scores to help mitigate pollution risks to the lake.**

CAMP BELKNAP'S RESTORATION PROJECT

The history of Camp Belknap's intricate relationship with Lake Winnepesaukee and the surrounding lands has evolved over the past 121 years. Belknap was founded in 1903 and originally located on Timber Island on the western part of the lake. Four years later, Belknap purchased a modest parcel of land, 17 acres, the first section of what is now 300 acres owned by Camp Belknap.

At the time of purchase, there were three structures on the property, one of which was a barn. The barn was subsequently transformed into a dining hall, which served as the central gathering spot for both campers and staff to enjoy meals as a community from 1907 until 2023. At that time, the building sat just 25 feet from the water line, far closer than current regulations allow along the lakefront. When the new dining facility was designed beginning in 2019 and eventually constructed for the 2024 summer, it was a unique opportunity for Camp Belknap to introduce additional protections for the lake, which has been a central component of our camp programming for the last century. Thousands of boys have learned to swim, sail, waterski and have fun on Lake Winnepesaukee!

In 2015, Belknap developed a comprehensive 10-year vision designed to provide a framework for protecting, preserving, and strengthening Belknap for years to come. The cornerstone of this strategic plan was recognizing the importance of preserving and maintaining our home on the shores of Lake Winnepesaukee. Over the course of 121 years, our use and impact on both the land and water here in Mirror Lake, New Hampshire has changed. In the summer of 2024, we will serve over 1,300 boys – far more than the original group of 15-20 boys.

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Over the years, Belknap has taken steps to mitigate its impact on the lake. In the 1990's, gravel was added around the dining hall to reduce stormwater runoff into the lake. While this was effective in some respects, it did not completely mitigate the runoff and added semi-impervious materials creating other dynamics in stormwater management. When the Camp's Master Site plan was written in 2019, it was an unprecedented opportunity to introduce long-term solutions to protect the watershed. The new dining hall plans included fire code adjustments, a safer kitchen design and a sophisticated bioswale system. Belknap worked with the New Hampshire Department of Environmental Services to design a footprint that would help to minimize camp's impact on our natural resources, specifically Lake Winnepesaukee.



Through careful planning, Belknap was able to push the new dining hall structure out of the 50-foot setback from the lake. In addition, over 5,000 square feet of gravel that was within 50 feet of the lake was removed and restored to vegetative and woodchipped ground. The building was designed to protect the stream that runs north/south on the property and deter stormwater run-off from directly going onto the beach and into the lake.

There were 5 main components to Belknap's dining hall construction specifically included to protect our shores. We continue to monitor our progress to ensure that the upgrades are handling ongoing environmental changes.

- A bioswale system was installed to collect stormwater runoff, soak it into the ground and filter out any organics and nutrients, before it reaches the lake. The system has design features to help handle runoff from bigger storms.
- The entire area surrounding the dining hall and the bioswale system was revegetated with the planting of over 350 trees, shrubs and saplings, as well as the addition of woodchips surrounding all of the plantings.
- The dirt driveway into the main entrance of camp was stabilized also to prevent runoff.
- The grades and pitches of the main driveway into Camp were redesigned to mitigate the flow of water downward towards the lake.
- A retention wall was added along the west side of the building to protect the stream bed.

One of the Woodcraft Lamps that guides our work here at Camp Belknap is The Lamp of Love, which reads **"Be helpful: do your share of the work."**

Through our commitment to the preservation and maintenance of the land and lake that surround Camp, we are hoping to help preserve the natural resources that surround us here on the shores of Lake Winnepesaukee for future generations.



Retention Basin to collect and filter runoff



Revegetated Area to soak up runoff



Bioswale System



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OUR LAKE. OUR FUTURE.

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WINNI'S FALL CLEAN UP MAKES A BIG SPLASH!

Lake Winnepesaukee Alliance (LWA) recently hosted its first Fall Winnepesaukee Cleanup Day on October 12th, bringing together over 100 volunteers to clean up trash and debris from every community around the lake.



The volunteers gathered for a well-deserved lunch at Ames Farm Inn in Gilford to celebrate their hard work. Raffle prizes, delicious food, and outdoor games were enjoyed along the beautiful shores of Winnepesaukee.

LWA extends its sincere gratitude to all the volunteers, sponsors, community members, and municipalities that contributed to the success of this year's cleanup. A special thank you to Ames Farms for their wonderful hospitality!

