

THE VALUE OF WINNIPESAUKEE

In case you missed it, the Nelson A. Rockefeller Center for Public Policy and the Social Sciences at Dartmouth College, completed a policy brief for the Lake Winnipesaukee Association estimating the total value that Winnipesaukee brings to the Lakes Region at over \$17 BILLION!

The report estimates the total economic value of Lake Winnipesaukee considering the value of surrounding property, recreation, and the water itself.

As the largest lake in NH, understanding the impact the lake may have on the state's economy can help inform future policy decisions about the lake. A quantitative methodology was used, integrating data collected from local officials, business owners, and preexisting datasets.

The model has a three-part focus: property values, business revenues, and water revenues.

Property Values

In order to conduct this analysis both the assessed value and the tax revenue generated were collected for the 8 shorefront towns on the lake.

Property values were determined from the Grand list, which lists assessed values of commercial and residential properties. The only exceptions to this are for Center Harbor and Tuftonboro. The values for these two towns were taken from the town's website and town reports. Properties were excluded if they were in close proximity to another lake, such as Squam Lake or Lake Winnisquam. For each town the mill rate was applied to the assessed value resulting in the tax revenue.

Property Assessments - \$16,457,417,397 Town Tax Revenue - \$ 216,502,454

Tourism Revenue

The second major component of the valuation is the money captured in regional business revenues. The primary sources of revenue included tourism, fishing and boating, and summer camps. These categories capture a variety of money generating activities at the lake. Due to time constraints not all revenue from each type of business activity was possible to collect.

Tourism spending in the Lakes Region has increased continuously over time, with summer and fall spending tending to be the highest. 2020 is a bit of an outlier due to COVID.



Total 2020 lakes region tourism revenues = ~400M Lake Winnipesaukee accounts for ~75% = \$300 M (continued on page 2)

Protecting Winnipesaukee through monitoring, education, science, and restoration

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Boating Revenues:

As the largest lake in NH, Lake Winnipesaukee is a popular destination for both boating and fishing. Boat rentals, boat slips, and boat sales are a large source of revenue on the lake. The researchers estimated revenue for the marinas based on size - grouping them into small, medium, and large size categories. A sample of marinas in each size category provided revenue data that was then used to estimate for all other marinas in the size category.

An estimated **\$107,625,000** in annual revenue comes from boating on the lake.

Fishing Revenues:

There are several different types of fishing licenses sold in NH, from 1 day, 3 days, 7 days, to yearly with varying price levels based on resident or non-resident.

In 2018, 156,481 fishing licenses were sold in New Hampshire, 32% of them to tourists, and 68% to NH residents. It was estimated that Lake Winnipesaukee accounts for around 35% of the total licenses (54,768) sold for each year.

Given the 32% to 68% resident/non-resident license breakdown for Lake Winnipesaukee, it was estimated that fishing licenses bring in **\$1,641,944** in revenue for the state of New Hampshire.

Summer Camp Revenues

There are over 12 camps that operate in the Lake Winnipesaukee area. Most of these camps operate from the end of June through August with 'change over days' between sessions involving more visitors and revenue for the region.

Camp Belknap, located in Tuftonboro, and Camp Kabeyun, in Alton, provided insightful information on how camps contribute to the financial health of the region.



Utilizing revenue per camper from camps that provided this data, the estimated revenue from all camps is **\$42,704,856.**

Water Supply

Another area included in the analysis was the value of the water from Lake Winnipesaukee itself. In order to encapsulate this dimension of the analysis, the revenues that the water supply to the individual towns generates was assessed as well as the revenues from the Lakeport Dam which operates in Laconia.

Laconia Water Supply - **\$1,532,410** annual revenue Lakeport Dam - **\$42,209,472** revenue generated from electricity, taxes, and assessed value.

The Value of Winnipesaukee Summary

Property	Revenues
Property Assessments	\$16,457,417,397
Town Tax Revenue	\$216,502,454
Business	
Tourism	\$294,131,000
Boating	\$107,625,000
Fishing	\$1,641,944
Summer Camps	\$42,704,856
Water Supply	
Laconia Water Supply	\$1,532,410
Lakeport Dam	\$42,209,472
Total	\$17,163,764,533

Continued investments in the upkeep and health of Lake Winnipesaukee will be important in maintaining its contributions to the New Hampshire economy.

Water Quality

CYANOBACTERIA

WHAT IT IS AND WHY YOU SHOULD BE CONCERNED

Human activities combined with additional environmental factors are widely accredited to being the main cause of increasing harmful algal blooms (HABs).

Cyanobacteria are prokaryotic organisms that can be found in almost every terrestrial and aquatic habitat throughout the world. Dating back 3.5 billion years, they are able to survive in diverse and extreme habitats.

There are numerous strains of cyanobacteria, many of which are capable of producing nerve and liver toxins. Toxins can cause both acute and chronic health effects that range in severity. Acute health effects include irritation of skin and mucous membranes, tingling, numbness, nausea, vomiting, seizures and diarrhea.

There are a multitude of factors that contribute to the development and persistence of cyanobacteria blooms. The combination and interaction of these components vary, but the predominant factors that most likely contribute to bloom potential are:

- The ratio of nitrogen and phosphorus (nutrients)
- Temperature
- The amount of light received
- The amount of organic matter available



Harmful algal blooms have increased in frequency and severity around the country and locally in New Hampshire.

In Winnipesaukee, phosphorus loading has increased 300% over natural background levels (meaning prior to European settlement). This increase in in-lake phosphorus concentration fuels the growth of algae, including cyanobacteria, and other aquatic plants, both native and non-native, such as milfoil.

From the watershed and water quality analyses that LWA has conducted, we estimate that **approximately 54,000 lbs. of phosphorus enters the lake annually.** A significant amount, as 1 pound of phosphorus can support 500 pounds of algal growth.



1 lb. of phosphorus can support 500 lbs. of algae growth



WEEKLY REPORT & WINNI BLOOM WATCH MAP

As part of our ongoing effort to improve our water quality monitoring program, the LWA has created a Weekly Report card and map to track cyanobacteria sightings. In addition, we have uploaded the last 5 years worth of data to a map on our website so that you can check out how your area of the lake is doing.

The report card includes an overview of the information reported and obtained from the NHDES Dam Bureau's real time data portal. The page contains instructions for what to do if you suspect a bloom, who to report your findings to, educational resources and a map indicating cyanobacteria sightings in the Lake Winnipesaukee watershed. Please note, the map is meant to be used as an informational tool with approximate locations of cyanobacteria sightings. Surface blooms can rapidly change and accumulate in various locations around a waterbody.

Our Winnipesaukee Report Card page paired with NHDES tracking and the BloomWatch app will help to build regional perspectives and identify trends throughout New England.

Lake Winnipesaukee Report Card



Last summer, there were 14 reports of cyanobacteria on Winnipesaukee. However, advisories were only issued for Lake Kanasatka and Mirror Lake. Advisories are issued by the NHDES when there are conditions and cyanobacteria blooming cell concentrations exceed 70,000 cells/ml. Inspections and sampling are conducted weekly by NHDES until the bloom subsides.

This coming summer, LWA will be implementing a cyanomonitoring program on Paugus Bay. As the receiving water for Lake Winnipesaukee, and the drinking water source for the City of Laconia, it is important to monitor and document the occurrence and type of cyanobacteria blooms.



https://www.winnipesaukee.org/weeklyreport-winni-bloom-watch-map/

OBSERVED SIGHTINGS AUGUST-SEPTEMBER 2021 **Pine Island** The Broads **Bear Island** Wolfeboro Bay Winter Harbor Green's Basin **Governor's Island Chase Island Glendale Docks Chestnut Cove** 19 Mile Bay Ash Cove



BUILDING CONNECTIONS, BUILDING CAPACITY, BUILDING OUTCOMES

For the past 10+ years, the LWA has been leading the effort to address the threats and contaminants that stress the lake's natural ecosystem and degrade its water quality.

We have completed lake and watershed studies for 6 of the lake's 10 bays, identifying 255 sites in need of mitigation, and an additional 700 shoreline sites in need of restoration. These sites represent a fraction of the total number of sites in need of restoration, and come with an estimated cost of \$2.7 million.

The studies have found phosphorus concentrations in the 6 lake basin areas to be 100 to 400% above natural background levels. These measurements link to land use change and impacts from human activities, lakewide contributing over 54,000 pounds of phosphorus loading annually to the lake; a 300% increase from pre-development levels.

Excessive amounts of phosphorus come from a variety of sources; from atmospheric deposition, internal loading, watershed runoff, septic systems, and waterfowl. The watershed load from developed land is by far the largest source of pollutants, ranging from 35 to 88% of the total phosphorus load.



Phosphorus Loading by catchment in Moultonborough Bay and Winter Harbor subwatersheds.



Lake Winnipesaukee Watershed Management Plan Status

It's the LOAD that's important! More nutrient loading into the lake will lead to an acceleration in lake aging (eutrophication), which means more plant and algal growth.

LWA continues to work to reduce the nutrient loading to the lake through on the ground mitigation projects and education and outreach.

To date, **40 mitigation projects** have been completed, resulting in a **load reduction of 64,800 pounds of total suspended solids (TSS), and 114 pounds of total phosphorus (TP).**

Best management practices planned for 2022-23, will further reduce nutrient loading by an estimated 28,000 pounds TSS and 13 pounds TP.

LAKE RESTORATION FEATURE PROJECT

The Winnipesaukee Beach Colony Club (WBCC) is a residential community comprising 68 properties located on the shores of Lake Winnipesaukee on Cummings Cove Road, Meredith. The WBCC, in partnership with a landscape architect, has been working for several years to develop a plan to improve their shorefront, including stormwater runoff management, erosion controls, and stabilization of their shorefront property to improve and protect the water quality of Lake Winnipesaukee.

The LWA was successful in obtaining a NHDES 319 Watershed Assistance grant to partially fund the construction of two bio-retention drainage areas to collect stormwater runoff from two road culverts, and allow for the filtration and treatment of the stormwater prior to it entering Cummings Cove in Lake Winnipesaukee.

The project involved the removal of the existing stormwater swale, shown in the Before picture, installing the rip-rap forebay treatment weir, and the installation of the bioretention area down gradient of the forebay treatment weir (After photo).

The second bio-retention area involved extending an existing culvert from Cummings Cove Road 50 feet, installing a small rip-rap forebay treatment weir to receive the stormwater, slow it down for infiltration, and then receive further treatment and filtration in the bioretention area. Bio-retention utilizes soils and herbaceous and woody plants to remove pollutants from stormwater runoff.

Second bio-retention area consisting of a rip-rap forebay and rain garden.







WOLFEBORO BAY ENVIRONMENTAL STUDY

Winnipesaukee is currently found on the EPA's list of threatened or impaired waters for marginal support of plant and animal life in the lake.

Increased levels of in-lake phosphorus (TP) can and have led to water quality problems, such as algal and cyanobacteria blooms, low oxygen, and a decline in aquatic habitat.

Experience shows that the most effective approach for monitoring and protecting valuable water resources like Winnipesaukee is a comprehensive watershedbased management plan. In fact, such plans are a requirement for securing EPA funding for stormwater mitigation and protection projects under the Clean Water Act.

The LWA has successfully developed watershed management and restoration plans for the Waukewan and Winona watersheds, Moultonborough Bay Inlet, and, in 2020, for the Moultonborough Bay and Winter Harbor Watersheds. A watershed plan that focuses on the Wolfeboro Bay watershed is the appropriate next step in this huge protection and preservation effort.

Partnering with the Town of Wolfeboro, Wolfeboro Waters Committee, NH Department of Environmental Services, and the University of New Hampshire Cooperative Extension, the LWA will undertake the development of a management plan that will identify and guide future mitigation and protection efforts.

PROJECT GOALS

Specifically, the study will:

- Quantify the primary sources of phosphorus loading and other identified impairments.
- Prioritize identified pollution sources for further action.
- Undertake an educational effort to make property owners and users of our lakes aware of the sources and consequences of non-point source pollution.
- Develop preliminary mitigation designs to address sources of impairment.
- Develop methods for tracking progress during implementation of the plan recommendations.



PLAN OF WORK

Employ a proven stakeholder-driven process to:

- Identify and hire an experienced environmental consultant to conduct day-to-day activities of the planning process.
- Delineate and map sub-watersheds such as Smith River, Rust Pond, and the immediate Winnipesaukee shoreline.
- Analyze existing water quality data.
- Determine a water quality goal for total phosphorus (TP).
- Determine pollutant loads under existing and future use conditions.
- Conduct on-the-ground watershed and shoreline surveys.
- Provide educational opportunities to inform and engage the community on lake issues.
- Publish the Watershed Management Plan to EPA standards in order to set up future Section 319-eligible implementation phases of the plan.

TIME TABLE AND COST

The planning horizon is to complete the Wolfeboro Bay Watershed Environmental Study by 2024 at an estimated cost of \$120,000. The Town of Wolfeboro will receive a \$100,000 grant from NHDES to help fund this study.



LAKE WINNIPESAUKEE ASSOCIATION P.O. Box 1624 Meredith, NH 03253

BE WINNI BLUE AND LAKESMART



Watershed and shorefront residential development can be a significant threat to Winnipesaukee's water quality. LWA has partnered with NH LAKES to offer a free, non-regulatory program to educate property owners on how to live in a lakefriendly way. Property owners can minimize impacts from stormwater runoff through simple actions such as planting native vegetation along the shorefront, installing gravel driplines along roof edges, and making sure that path and driveway runoff is filtered into the ground rather than running over the land and into the lake.

Last summer, LWA completed 30 assessments on Lake Winnipesaukee and Lake Kanasatka. We continue to provide these free assessments and encourage everyone to learn how they can help reduce pollutant loading to the lake. Call us today at 603-581-6632 to request a site visit with our Winni Blue Crew.



Lake Winnipesaukee Association