



Volunteer Lake Assessment Program Individual Lake Reports

WINNISQUAM, LACONIA, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	291,649	Max. Depth (m):	53	Flushing Rate (yr ⁻¹)	2.2	Year	Trophic class	Variable Milfoil
Surface Area (Ac.):	4264	Mean Depth (m):	15.2	P Retention Coef:		1984	OLIGOTROPIC	
Shore Length (m):	45,400	Volume (m ³):	262,306,500	Elevation (ft):	482	1994	OLIGOTROPIC	

TROPIC CLASSIFICATION

KNOWN EXOTIC SPECIES

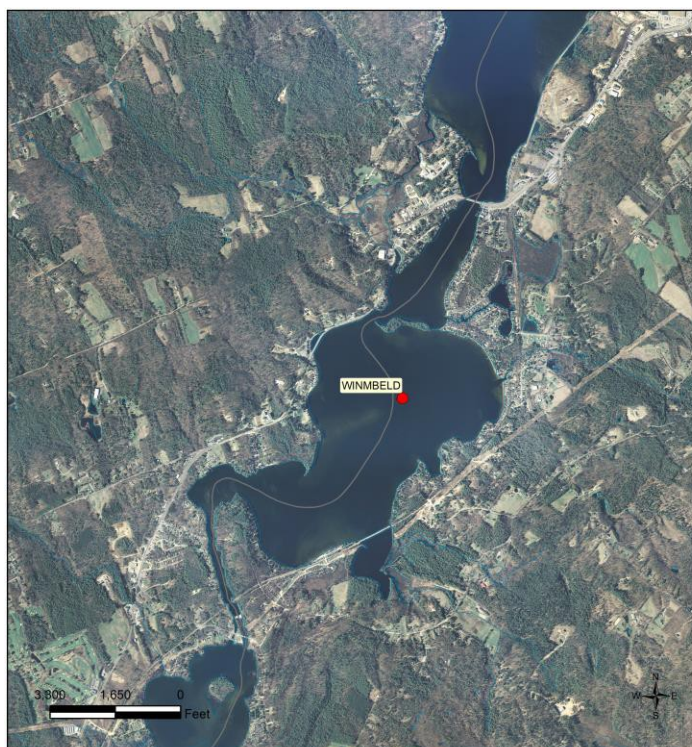
The Waterbody Report Card tables are generated from the DRAFT 2020 305(b) report on the status of N.H. waters, and are based on data collected from 2010-2019. Detailed waterbody assessment and report card information can be found at [NHDES' Water Quality Assessment Website](#).

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	Encouraging	Limited data for this parameter predicts water quality standards or thresholds are being met; however more data are necessary to fully assess the parameter.
	Dissolved oxygen saturation	Encouraging	Limited data for this parameter predicts water quality standards or thresholds are being met; however more data are necessary to fully assess the parameter.
	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	Encouraging	Limited data for this parameter predicts water quality standards or thresholds are being met; however more data are necessary to fully assess the parameter.
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

LAKE WINNISQUAM - BELMONT TOWN BEACH	Escherichia coli	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
LAKE WINNISQUAM - AHERN STATE PARK	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
LAKE WINNISQUAM - BARTLETTS BEACH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
LAKE WINNISQUAM - SANBORNTON TOWN BEACH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.

V LAP SAMPLE STATION MAP: This map depicts the location of routine sampling stations discussed on page two of the report.



LAKE WINNISQUAM MOHAWK ISL
LACONIA
VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
WINMBELD	DEEP SPOT





Volunteer Lake Assessment Program Individual Lake Reports

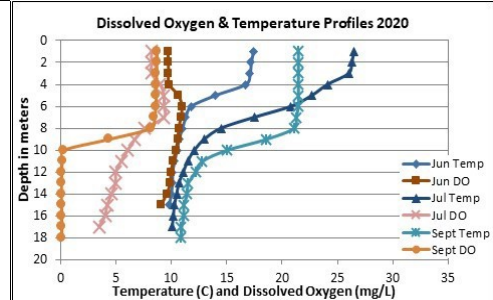
Lake Winnisquam, Mohawk Isl., Belmont

2020 Data Summary

Recommended Actions: Great job sampling in 2020! Lake quality remained representative of high quality conditions, however Hypolimnetic phosphorus levels indicate a potential internal load of phosphorus that is released from bottom sediments as the summer progresses. This could potentially fuel algal and cyanobacteria growth which highlights the importance of reducing phosphorus inputs from external sources such as fertilizers, stormwater runoff and agricultural practices. Consider partnering with Soak Up the Rain NH to identify areas prone to stormwater runoff and implement projects designed to capture and infiltrate stormwater prior to reaching the lake. For more information visit www.soaknh.org. Keep an eye on chloride levels which indicate road salt is likely impacting the lake. Encourage local winter maintenance companies that apply de-icing materials to roads, parking lots, walkways, and driveways to obtain NH Voluntary Salt Applicator licenses through UNH Technology Transfer Center's Green SnowPro certification program. Evaluate culverts and roadside ditches close to the lake in the spring and identify areas in need of cleanup from application of winter salt/sand mixtures. Encourage clean up of these areas to prevent runoff into the lake. Keep up the great work!

Observations (Refer to Table 1 and Historical Deep Spot Data Graphics)

- ◆ **Chlorophyll-a:** Chlorophyll level was very low in June, increased slightly in July and remained stable in September. Average chlorophyll level decreased slightly from 2019 and was much less than the state median and the threshold for oligotrophic lakes. Visual inspection of historical data indicates variable chlorophyll levels since monitoring began.
- ◆ **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity levels were slightly elevated and greater than the state median. Epilimnetic chloride levels were greater than the state median, yet less than a level of concern. However, visual inspection of historical data indicates increasing (worsening) epilimnetic conductivity levels since monitoring began.
- ◆ **Color:** Apparent color measured in the epilimnion indicates the water color fluctuated within a clear range, with little to not tea, or brown coloring and was darkest in June and lightest in September.
- ◆ **Total Phosphorus:** Epilimnetic phosphorus level was within a low range in June and decreased gradually as the summer progressed. Average epilimnetic phosphorus level remained stable with 2019 and was less than the state median and the threshold for oligotrophic lakes. Visual inspection of historical data indicates variable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level was elevated in June and decreased to a moderate level in July and September. Hypolimnetic phosphorus level was elevated on each sampling event indicating potential internal loading when phosphorus is released from bottom sediments under anoxic (low dissolved oxygen) conditions.
- ◆ **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was within an average range in June, decreased (worsened) in July, and then increased (improved) to an above average range in September. Average NVS transparency increased (improved) slightly from 2019 and was higher (better) than the state median. Visual inspection of historical data indicates relatively stable NVS transparency since monitoring began. VS transparency was generally higher (better) than NVS transparency and likely a better measure of actual conditions.
- ◆ **Turbidity:** Epilimnetic and Metalimnetic turbidity levels fluctuated within a low range. Hypolimnetic turbidity level was elevated in September and lab data noted colored water with iron precipitate.
- ◆ **pH:** Epilimnetic pH level was within the desirable range 6.5-8.0 units and visual inspection of historical data indicates relatively stable epilimnetic pH levels since monitoring began. Metalimnetic pH level was approximately equal to the low end of the desirable range. Hypolimnetic pH level was slightly less than desirable.



Station Name	Table 1. 2020 Average Water Quality Data for LAKE WINNISQUAM -MOHAWK ISL									
	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
							NVS	VS		
Epilimnion	7.9	1.32	24	10	91.7	7	5.97	6.20	0.28	7.06
Metalimnion					90.9	12			0.56	6.49
Hypolimnion					92.4	38			3.28	6.12

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.5 mg/L

Chlorophyll-a: 4.39 ug/L

Conductivity: 42.3 uS/cm

Chloride: 5 mg/L

Total Phosphorus: 11 ug/L

Transparency: 3.3 m

pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: > 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: between 6.5-8.0 (unless naturally occurring)

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	N/A	Ten consecutive years of data necessary for analysis.	Chlorophyll-a	N/A	Ten consecutive years of data necessary for analysis.
pH (epilimnion)	N/A	Ten consecutive years of data necessary for analysis.	Transparency	N/A	Ten consecutive years of data necessary for analysis.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary for analysis.

