Volunteer Lake Assessment Program Individual Lake Reports
WINNISQUAM, LACONIA, NH

MORPHOMETRIC DATA

|						TROPHIC CLASSIFICATION		KNOWN EXOTIC SPECIES
Watershed Area (Ac.):	291,649	Max. Depth (m):	53	Flushing Rate (yr¹)	2.2	Year	Trophic class	Variable Milfoil
Surface Area (Ac.):	4264	Mean Depth (m):	15.2	P Retention Coef:		1984	OLIGOTROPHIC	
Shore Length (m):	45,400	Volume (m³):	262,306,500	Elevation (ft):	482	1994	OLIGOTROPHIC	

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 satura	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	Ba	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.

VLAP SAMPLE STATION MAP: This map depicts the location of routine sampling stations discussed on page two of the report.
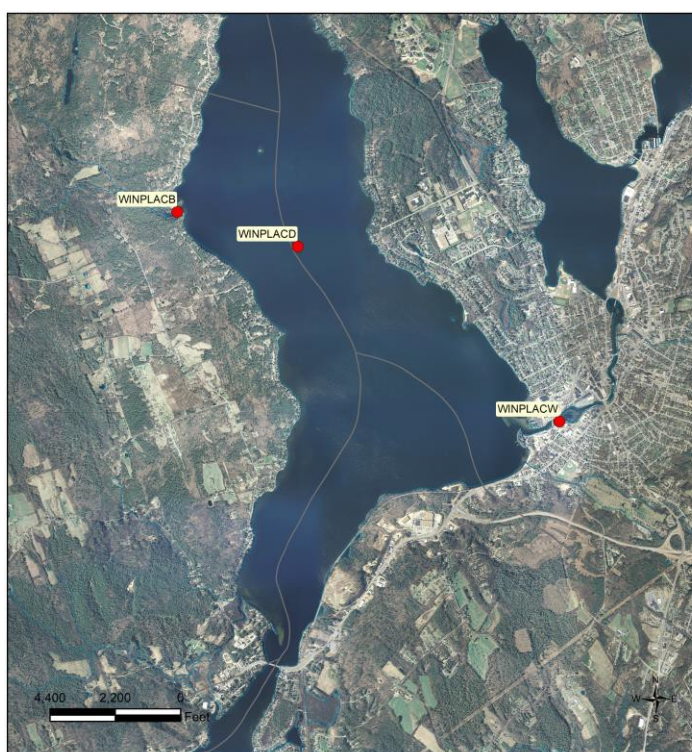
LAKE WINNISQUAM POT ISL
LACONIA
VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
WINPLACW	WINNIPESAUKEE R
WINPLACB	BLACK BK
WINPLACD	DEEP SPOT

Source: The data layers are derived from NHDES data and are under constant revision. NHDES is not responsible for the use or interpretation of this information. Not intended for legal use. NHDES Watershed Management Bureau. Date: 2/17/2021

Recommended Actions: Great job sampling in 2020! Lake quality remained representative of high quality conditions. The improving phosphorus levels, particularly since 2010, are encouraging. However, phosphorus and turbidity levels have historically increased following storm events. This highlights the importance of managing stormwater runoff throughout the watershed. 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. Conductivity levels have increased since monitoring began and chloride levels 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, remained stable in July, and increased in September but remained within a low range. Average chlorophyll level decreased slightly from 2019 and was much less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.

◆ **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity levels remained slightly elevated and greater than the state median. Epilimnetic chloride level was also greater than the state median yet much less than a level of concern. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.

◆ **Color:** Apparent color measured in the epilimnion indicates the water was clear, with little to no tea, or brown, coloring and remained stable from June to September.

◆ **Total Phosphorus:** Epilimnetic phosphorus level was low in June, decreased in July, and increased slightly in September. Average epilimnetic phosphorus level decreased slightly from 2019 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level was low in June, increased to a slightly elevated level in July, and decreased to a low level in September. Hypolimnetic phosphorus level was moderate in June and decreased to a low level by September.

◆ **Transparency:** Transparency measured without the viewscope (NVS) was below average (worse) for the lake in June due to wave conditions, increased (improved) to an average range in July and September. Average NVS transparency decreased from 2019 but remained higher (better) than the state median. Historical trend analysis indicates stable NVS transparency since monitoring began. Viewscope (VS) transparency was much higher (better) than NVS transparency and a better measure of actual conditions.

◆ **Turbidity:** Epilimnetic, Metalimnetic and Hypolimnetic turbidity levels fluctuated within a low range.

◆ **pH:** Epilimnetic, Metalimnetic and Hypolimnetic pH levels were within the desirable range 6.5 -8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began.

Dissolved Oxygen & Temperature Profiles 2020
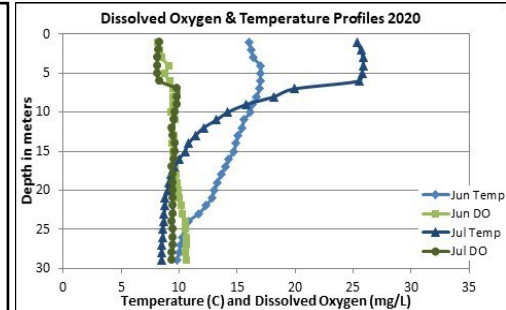
Station Name	Table 1. 2020 Average Water Quality Data for LAKE WINNISQUAM - POT ISL									
	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
							NVS	VS		
Epilimnion	9.0	1.17	24	7	90.0	5	5.98	7.77	0.23	6.95
Metalimnion					89.5	8			0.24	6.84
Hypolimnion					90.5	8			0.31	6.50

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	Worsening	Data significantly increasing.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data show low variability.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.

Historical Trend Epilimnetic Conductivty and pH

Historical Chlorophyll-a, Epilimnetic Phosphorus & Transparency Data