Volunteer Lake Assessment Program Individual Lake Reports

WAUKEWAN, LAKE, NEW HAMPTON, NH

MORPHOMETRIC DATA

						TROPHIC CLASSIFICATION		**KNOWN EXOTIC SPECIES**
Watershed Area (Ac.):	7,551	**Max. Depth (m):**	21.4	**Flushing Rate (yr^{1})**	0.6	**Year**	**Trophic class**	Variable Milfoil
Surface Area (Ac.):	913	**Mean Depth (m):**	6.7	**P Retention Coef:**	0.7	1982	OLIGOTROPHIC	
Shore Length (m):	13,000	**Volume (m^3):**	24,809,000	**Elevation (ft):**	539	1994	OLIGOTROPHIC	

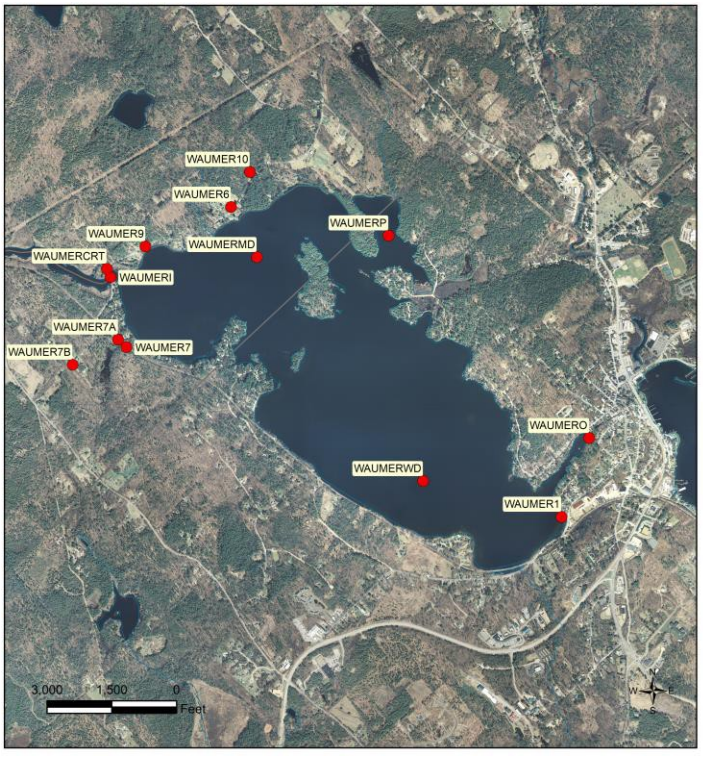
The Waterbody Report Card tables are generated from the DRAFT 2020 305(b) report on the status of N.H. waters, and are based on data collected from 2010-2019. Detailed waterbody assessment and report card information can be found at NHDES' Water Quality Assessment Website.

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	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
	Dissolved oxygen satura	Slightly Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a small margin.
	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Cyanobacteria hepatoto	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

LAKE WAUKEWAN - TOWN BEACH	Escherichia coli	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.

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



LAKE WAUKEWAN
MEREDITH
VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
WAUMERO	OUTLET
WAUMERP	PERKINS COVE
WAUMERWD	WINONA STATION S
WAUMERI	INLET
WAUMERMD	MAYO STATION N
WAUMER7	SAYWARD BK
WAUMER9	EE BROOK
WAUMER6	MAYO FARM BK
WAUMER10	BROOKSIDE LANE STREAM
WAUMER1	BOAT LAUNCH
WAUMERCRT	CAMP RD TRIB
WAUMER7A	SAYWARD BK UPPER
WAUMER7B	SAYWARD BK AT ROCK RIDGE

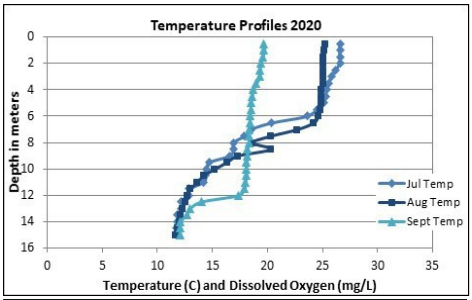
Source: The data layers are derived from NHDES data and are under constant revision. NHDES is not responsible for the use or interpretation of this information. Not intended for legal use NHDES Watershed Management Bureau Date: 2/17/2021

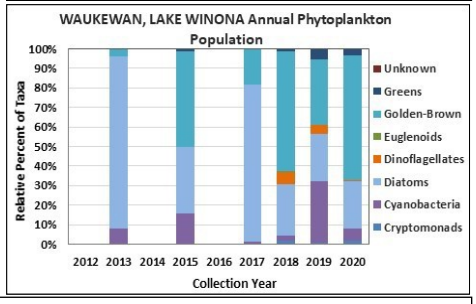
Volunteer Lake Assessment Program Individual Lake Reports
Waukewan Lake, Winona Stn., Meredith
2020 Data Summary

Recommended Actions: Great job sampling in 2020! Lake quality remained representative of oligotrophic, or high quality conditions, and the improving trends are a great sign. Algal growth (chlorophyll) was elevated in August likely due to drought conditions, warmer water temperatures and above average clarity. Monitor the increasing conductivity and chloride trends as chloride can negatively impact drinking water and aquatic life. Encourage local and private winter maintenance companies to obtain NH Voluntary Salt Applicator License through the Green SnowPro Certification program. Clean up roadside ditches and culverts of any leftover sa nd/salt mixtures applied to roads during winter months. Continue watershed management efforts to reduce nutrient loads and stormwater runoff. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll level was low in July, increased to a slightly elevated level in August, and then decreased in September. Average chlorophyll level increased slightly from 2019 and was 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 and/or chloride levels remained slightly elevated and greater than the state median. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Boat Launch and Brookside Lane Stream conductivity and chloride levels were elevated and much greater than the state medians and Boat Launch chloride levels approached the state chronic chloride standard.
- **Color:** Apparent color measured in the epilimnion indicates the water was clear, with little to no tea, or brown, coloring.
- **Total Phosphorus:** Epilimnetic phosphorus level was moderate in July and decreased to a low level in August and September. Average epilimnetic phosphorus level increased slightly from 2019 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates stable, yet variable, epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level fluctuated within a moderate range and was highest in August when algal growth was elevated. Hypolimnetic phosphorus level was slightly elevated on each sampling event and was highest in September potentially indicating release of phosphorus from bottom sediments under anoxic (low dissolved oxygen) conditions.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope fluctuated within a high (good) range for the lake and was lowest (worse) in September. Average NVS transparency increased (improved) from 2019 and was much higher (better) than the state median. Historical trend analysis indicates significantly increasing (improving) NVS transparency since monitoring began.
- **Turbidity:** Epilimnetic and Metalimnetic turbidity levels fluctuated within a low range. Hypolimnetic turbidity level was slightly elevated in August and September potentially due to the formation and accumulation of organic compounds under anoxic conditions. Boat Launch turbidity levels were slightly elevated and lab data noted colored water with organic material. Brookside Lane Stream turbidity levels were low.
- **pH:** Epilimnetic and Metalimnetic pH levels were within the desirable range 6.5 -8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Hypolimnetic, Boat Launch and Brookside Lane Stream pH levels were slightly less than desirable.





Station Name	Table 1. 2020 Average Water Quality Data for LAKE WAUKEWAN - WINONA STN.									
	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	8.1	2.76	32	10	110.7	7	8.55	8.28	0.26	7.01
Metalimnion					110.5	10			0.32	6.79
Hypolimnion					113.5	22			1.97	6.09
Boat Launch			135		410.0	23			5.60	6.29
Brookside Lane Stream			68		193.6	3			0.35	6.44

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)

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

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	Improving	Data significantly increasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.