



Volunteer Lake Assessment Program Individual Lake Reports

WAUKEWAN, LAKE, NEW HAMPTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	7,551	Max. Depth (m):	21.4	Flushing Rate (yr ⁻¹)	0.6
Surface Area (Ac.):	913	Mean Depth (m):	6.7	P Retention Coef:	0.7
Shore Length (m):	13,000	Volume (m ³):	24,809,000	Elevation (ft):	539

TROPHIC CLASSIFICATION

Year	Trophic class
1982	OLIGOTROPHIC
1994	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

Variable Milfoil

The Waterbody Report Card tables are generated from the DRAFT 2016 305(b) report on the status of N.H. waters, and are based on data collected from 2006-2015. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm

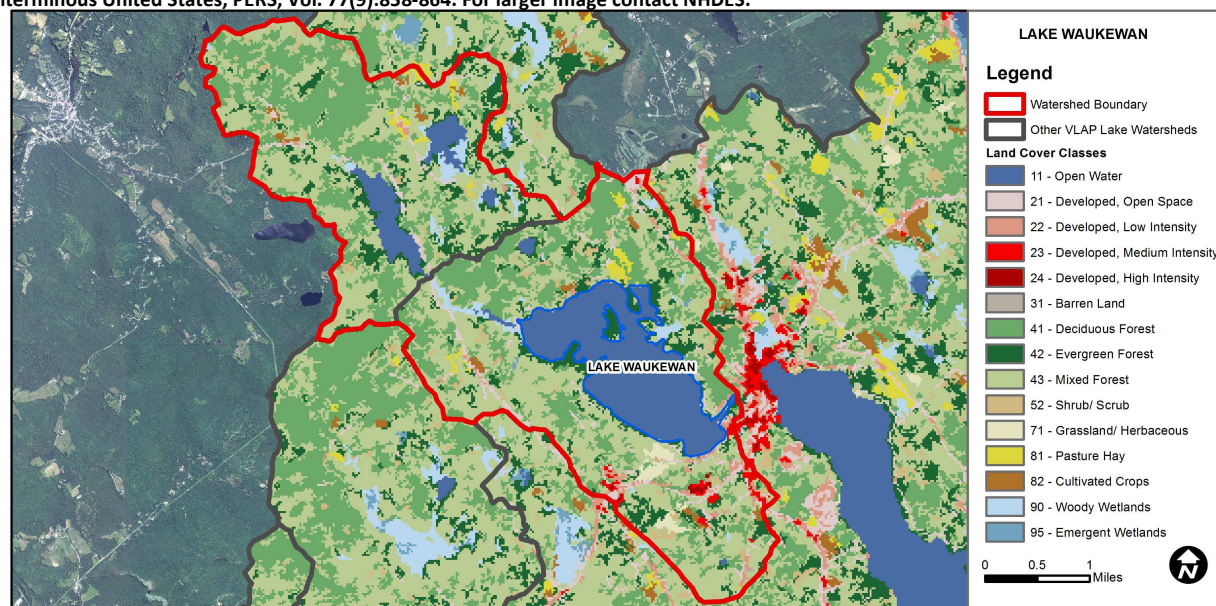
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
	Dissolved oxygen saturation	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	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.
	Cyanobacteria hepatotoxin	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.
----------------------------	------------------	------	---

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	14.6	Barren Land	0.02	Grassland/Herbaceous	0.79
Developed-Open Space	3	Deciduous Forest	25.15	Pasture Hay	1.08
Developed-Low Intensity	1.29	Evergreen Forest	9.6	Cultivated Crops	0.74
Developed-Medium Intensity	0.56	Mixed Forest	39.35	Woody Wetlands	1.81
Developed-High Intensity	0.14	Shrub-Scrub	1.83	Emergent Wetlands	0.05



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

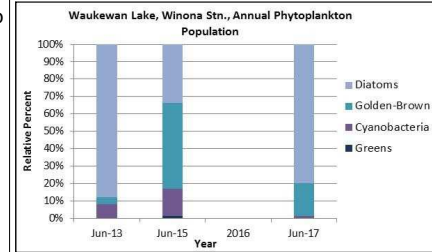
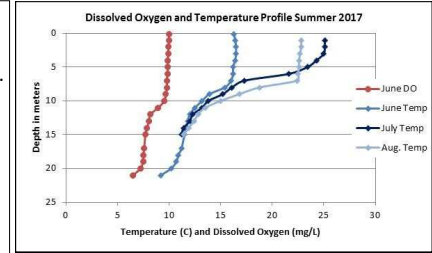
WAUKEWAN LAKE, WINONA STN., MEREDITH

2017 DATA SUMMARY

RECOMMENDED ACTIONS: Lake quality is representative of oligotrophic, or high quality, conditions. Conductivity has increased in the lake likely due to the application of winter de-icing materials on roads, parking lots, driveways, and walkways. Encourage local road agents and winter maintenance companies to obtain a NH Voluntary Salt Applicator License through UNH Technology Transfer Center's Green SnowPro Certification program. Boat Launch chloride and phosphorus levels were greatly elevated during spring snowmelt and runoff. Encourage road agents and homeowner's to clean up roadside ditches and culverts of any leftover sand/salt mixtures applied 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 levels were moderate in June and then decreased to low levels in July and August. Average chlorophyll level increased slightly from 2016, was less than the state median and was slightly less than the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity and chloride levels were slightly elevated and greater than the state medians. 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 in April during spring snowmelt and runoff.
- **COLOR:** Apparent color was measured in the epilimnion and indicates the lake water is clear and has very little dissolved organic matter that imparts a tea color to the water.
- **TOTAL PHOSPHORUS:** Epilimnetic, Metalimnetic and Brookside Lane Stream phosphorus levels were within a low range. Average epilimnetic phosphorus level decreased from 2016, was much less than the state median, and was slightly less than the threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus levels were elevated in August and the turbidity of the sample was also slightly elevated suggesting potential dissolved oxygen depletion in the hypolimnion. Boat Launch phosphorus levels were greatly elevated in April during runoff and then decreased to a low level by May.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average (low) in June due to wave conditions, and then increased (improved) to within a high range as the summer progressed. Average NVS transparency decreased from 2016 and remained higher (better) than the state median. Historical trend analysis indicates stable transparency since monitoring began.
- **TURBIDITY:** Epilimnetic, Metalimnetic, Boat Launch, and Brookside Lane Stream turbidity levels were within a low range. Hypolimnetic turbidity levels were low in June and July and slightly elevated in August.
- **pH:** Epilimnetic, Metalimnetic, Boat Launch, and Brookside Lane Stream pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Hypolimnetic pH levels fluctuated below the desirable range in July and August.



Station Name	Table 1. 2017 Average Water Quality Data for WAUKEWAN LAKE-WINONA STN.									pH
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color PCU	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	
Epilimnion	8.3	2.69	27	20	116.5	6	5.81	6.05	0.56	7.07
Metalimnion					117.7	7			0.78	6.64
Hypolimnion					123.4	13			1.34	6.46
Boat Launch			74		288.6	31			0.34	6.55
Brookside Lane Stream			69		267.0	3			0.24	6.55

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

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m³

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 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 moderately variable.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.

