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

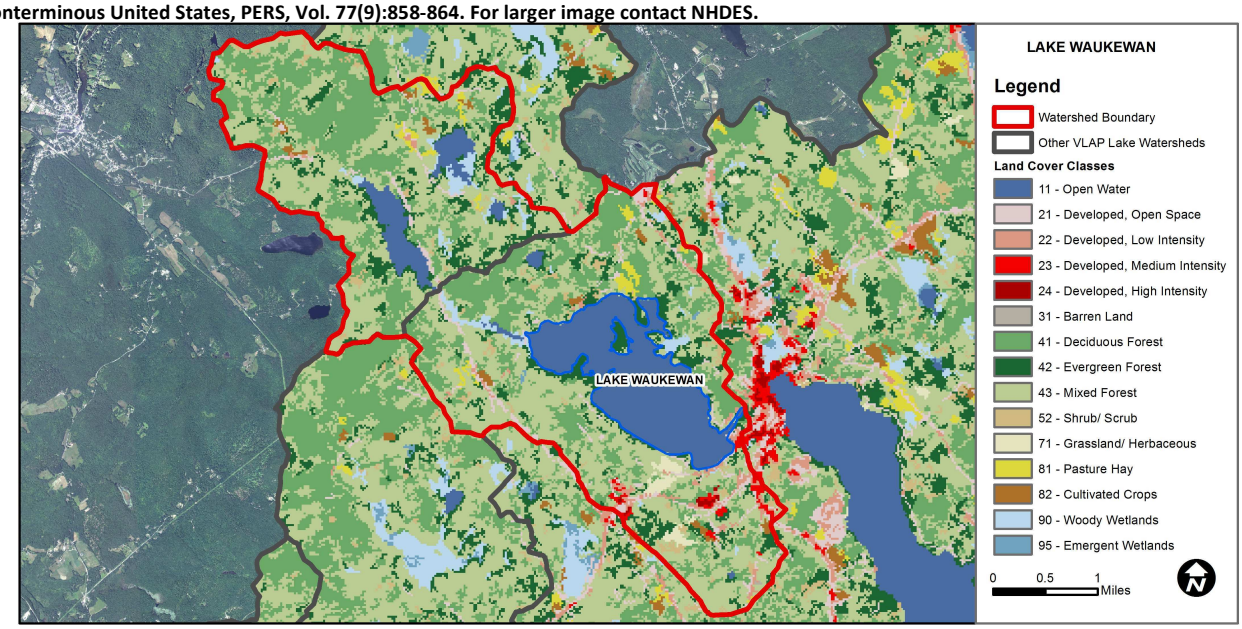
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved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

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.



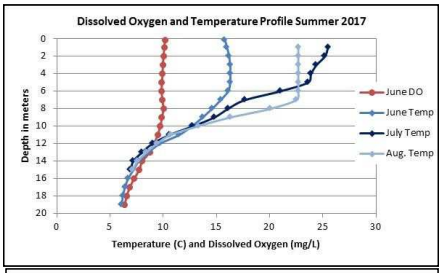
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	14.6	Barren Land	0.02	Grassland/Herbaceous	0.79
Developed-Open Space	3	Deciduous Forest	25.15	Pasture Hay	1.08
Developed-Low Intensity	1.29	Evergreen Forest	9.6	Cultivated Crops	0.74
Developed-Medium Intensity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

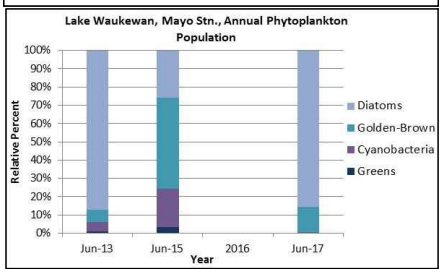
Volunteer Lake Assessment Program Individual Lake Reports
Waukewan Lake, Mayo Stn., Meredith
2017 Data Summary

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 Applicators License through UNH Technology Transfer Center's Green SnowPro Certification program. 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, decreased to a low level in July and remained stable in August. Average chlorophyll level remained stable 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 since monitoring began.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Outlet, Perkins Cove, Sayward Bk., and Sayward at Rock Ridge 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. Camp Rd. Trib., EE Brook and Mayo Farm Bk. conductivity and chloride levels were very low and less than the state medians.
- **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 Hypolimnetic phosphorus levels fluctuated within a low range. Average epilimnetic phosphorus level decreased from 2016 and was much less than the state median and threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. Tributary phosphorus levels were within low to moderate ranges and were within normal ranges for those stations.
- **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:** Deep spot and tributary turbidity levels fluctuated within a low range at each station.
- **pH:** Epilimnetic, Metalimnetic, Inlet, Mayo Farm Bk., Outlet, Perkins Cove, Sayward Bk., and Sayward at Rock Ridge pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Hypolimnetic, EE Brook and Camp Rd. Trib. pH levels were slightly less than the desirable range.





Station Name	Table 1. 2017 Average Water Quality Data for WAUKEWAN LAKE-MAYO STN.								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	7.4	2.91	29	116.7	4	6.29	6.37	0.49	7.13
Metalimnion				121.1	7			0.57	6.59
Hypolimnion				124.7	7			0.63	6.36
Camp Rd. Trib.			3	31.8	9			0.64	6.27
EE Brook			3	32.7	9			0.26	6.43
Inlet			21	91.7	6			0.68	6.60
Mayo Farm Bk.			3	31.6	11			0.29	6.60
Outlet			29	119.5	9			0.52	6.88
Perkins Cove			26	122.6	7			0.56	6.79
Sayward Bk.			17	93.2	14			0.82	6.61
Sayward Bk. at Rock Ridge			19	95.9	19			0.93	6.72

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: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 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	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.