



Volunteer Lake Assessment Program Individual Lake Reports

WHITE OAK POND, HOLDERNESS, NH

MORPHOMETRIC DATA

TROPHIC CLASSIFICATION

KNOWN EXOTIC SPECIES

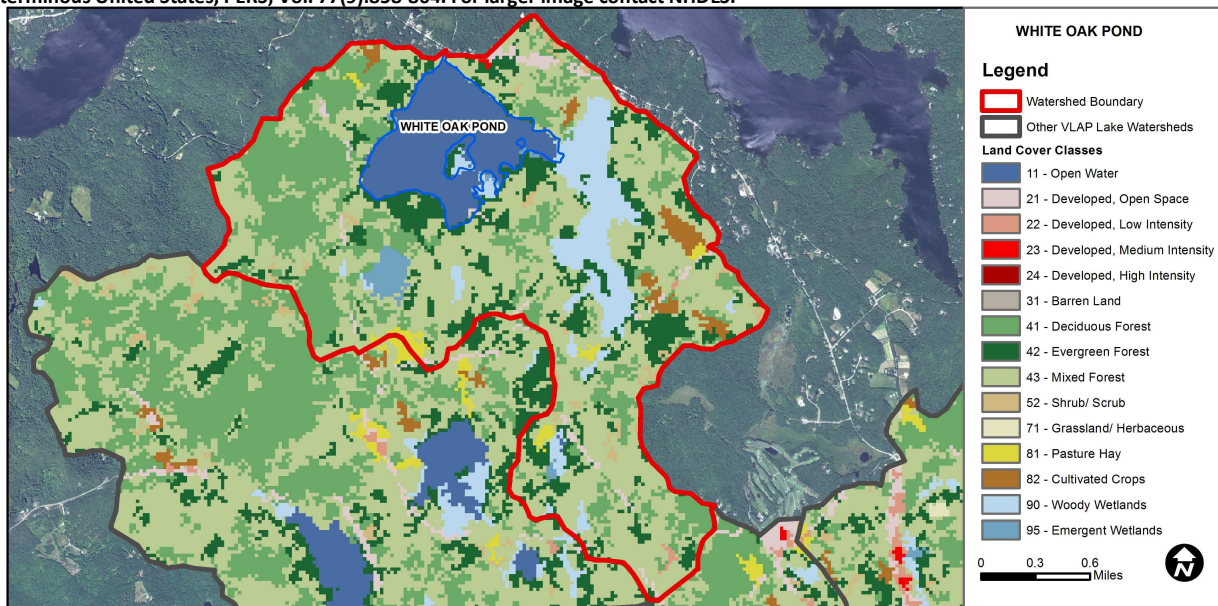
Watershed Area (Ac.):	3,008	Max. Depth (m):	10.7	Flushing Rate (yr ¹):	1.3	Year	Trophic class	
Surface Area (Ac.):	291	Mean Depth (m):	4	P Retention Coef:	0.66	1979	MESOTROPHIC	
Shore Length (m):	5,100	Volume (m ³):	4,697,500	Elevation (ft):	583	1990	MESOTROPHIC	

The Waterbody Report Card tables are generated from the DRAFT 2018 305(b) report on the status of N.H. waters, and are based on data collected from 2008-2017. 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 a given parameter by a small margin.
	Oxygen, Dissolved	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	Dissolved oxygen satura	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
Primary Contact Recreation	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Very Good	All sampling data 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	9.79	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	1.52	Deciduous Forest	19.95	Pasture Hay	0.9
Developed-Low Intensity	0.14	Evergreen Forest	13.33	Cultivated Crops	1.7
Developed-Medium Intensity	0.04	Mixed Forest	42.43	Woody Wetlands	7.71
Developed-High Intensity	0	Shrub-Scrub	1.26	Emergent Wetlands	1.3



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

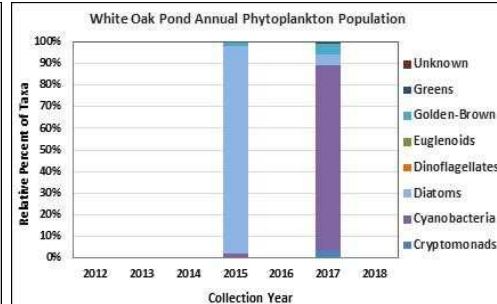
WHITE OAK POND, HOLDERNESS

2018 DATA SUMMARY

RECOMMENDED ACTIONS: Pond quality was representative of mesotrophic conditions however chlorophyll levels tend to fluctuate above the threshold for mesotrophic lakes highlighting the delicate balance between nutrients and algal growth. A cyanobacteria bloom occurred in the fall resulting in a lake warning. The increased frequency and intensity of storm events and resulting stormwater runoff can transport excess nutrients the pond. Consider development of a watershed management plan to help identify and quantify nutrient loads to the pond and make recommendations on implementing best practices to reduce stormwater runoff. Contact the NH DES Watershed Assistance Section for more information. Elevated conductivity and chloride levels were once again identified in #3 Dump Trib. and #9 E Holderness Rd. Trib. indicating these tributaries are disproportionately contributing to the chloride load. Educate watershed residents on ways to reduce the application of de-icing products containing sodium chloride on their walkways and driveways and make sure salt storage piles are properly covered. Encourage road agents to obtain NH Voluntary Salt Applicator Licenses through UNH T2 Center's Green SnowPro Certification Program. Great work!

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

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels were slightly elevated in early July and decreased to low levels in late July and August. Average chlorophyll level decreased from 2017 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates moderately stable chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (bottom water layer), #2 Lamb Swamp Inlet, #3 Dump Inlet, Outlet, and #6 Stone Bridge Inlet conductivity and/or chloride levels fluctuated within an average range throughout the summer. #3 Dump Trib. and #9 E Holderness Rd. Trib. conductivity and chloride levels were elevated and much greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- ◆ **COLOR:** Apparent color was measured in the epilimnion and indicates pond water is moderately tea colored or brown.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic, #3 Dump Inlet, Outlet, and #6 Stone Bridge Inlet phosphorus levels fluctuated within a low range throughout the summer. Average epilimnetic phosphorus level decreased from 2017 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus levels were stable and within a moderate range. Hypolimnetic phosphorus levels were moderate in July and increased to a slightly elevated level in August and the turbidity of the sample was also elevated. #3 Dump Trib. Phosphorus levels were elevated in August. #9 E Holderness Rd. Trib. phosphorus levels were elevated in July and decreased in August.
- ◆ **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was high (good) in early July, decreased to average levels in late July, and increased (improved) in August. Average NVS transparency increased (improved) slightly from 2017 and was slightly better than the state median. Viewscope transparency (VS) was generally higher (better) than NVS transparency and likely a better measure of actual conditions. Historical trend analysis indicates stable transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic, #2 Lamb Swamp Inlet, #3 Dump Inlet and Trib., #4 Outlet, and #6 Stone Bridge turbidity levels fluctuated within low to average ranges for those stations. Metalimnetic turbidity was slightly elevated in early July when algal growth was higher. Hypolimnetic turbidity levels were slightly elevated in August. #9 E Holderness Rd. Trib. Turbidity levels were elevated in July and field data noted sediment in the late July sample during high flows suggesting erosion upstream.
- ◆ **pH:** Epilimnetic, #2 Lamb Swamp Inlet, #3 Dump Inlet and Trib., #4 Outlet, #6 Stone Bridge Inlet, and #9 E Holderness Rd. Trib. pH levels were within the desirable range of 6.5–8.0 units. Metalimnetic and Hypolimnetic pH levels were slightly acidic and less than desirable. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began.



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)

Station Name	Table 1. 2018 Average Water Quality Data for WHITE OAK POND - HOLDERNESS									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	Total P mg/l	Trans. m		Turb. ntu	pH
							NVS	VS		
#2 Lamb Swamp Inlet			8		57.2	28			0.67	6.54
#3 Dump Inlet			9		56.1	9			0.58	6.83
#3 Dump Trib.			60		260	24			1.01	6.70
#4 Outlet (Dam)					54.9	8			0.81	6.93
#6 Stone Bridge Inlet			9		55.4	9			0.67	6.78
#9 E Holderness Rd Trib.			30		151.1	32			3.03	6.62
Epilimnion	8.7	3.54	9	53	54.5	8	3.58	4.48	0.52	7.08
Metalimnion					56.5	13			1.44	6.19
Hypolimnion					58.7	18			4.42	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 mg/m³

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 moderately variable.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.

