



Volunteer Lake Assessment Program Individual Lake Reports

WHITE OAK POND, HOLDERNESS, NH

MORPHOMETRIC DATA

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

TROPHIC CLASSIFICATION

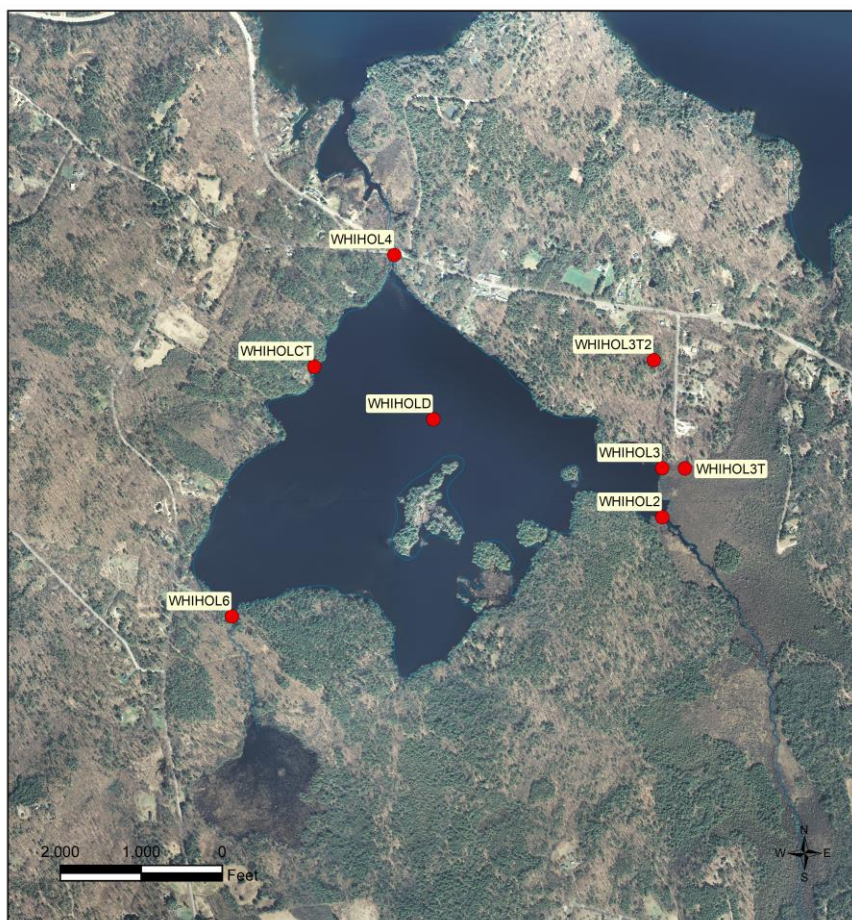
Year	Trophic class
1979	MESOTROPHIC
1990	MESOTROPHIC

KNOWN EXOTIC SPECIES

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	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 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	No Data	No data for this parameter.
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

VLAP SAMPLE SITE MAP



WHITE OAK POND HOLDERNESS VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
WHIHOL2	#2 LAMB SWAMP INLET
WHIHOL3	#3 DUMP INLET
WHIHOL4	#4 OUTLET (DAM)
WHIHOL6	#6 STONE BRIDGE
WHIHOLD	DEEP SPOT
WHIHOLCT	COCCHIARO TRIB
WHIHOL3T	#3 DUMP TRIB
WHIHOL3T2	#3T2 DUMP TRIB 2

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

WHITE OAK POND, HOLDERNESS

2020 DATA SUMMARY

RECOMMENDED ACTIONS: Great job sampling in 2020! Pond quality is representative of mesotrophic, or average, conditions however chlorophyll levels tend to fluctuate above the threshold for mesotrophic lakes and cyanobacteria blooms have occurred in the fall for the past three years. This suggests phosphorus release from bottom sediments as the summer progresses and dissolved oxygen levels are depleted in the hypolimnion, a process called internal loading. These nutrients are then readily available for cyanobacteria uptake during the summer and fall turnover. A significant storm event and high wind conditions in late August likely caused a brief period of de-stratification between the metalimnion and hypolimnion mixing nutrients from hypolimnetic waters into upper layers. This was the likely catalyst for the cyanobacteria bloom in early September. Consider development of a watershed management plan to identify and quantify nutrient loading to the pond and make recommendations on implementing best practices to reduce stormwater runoff. Contact the NHDES Watershed Assistance Section for more information. Encourage shoreline property owners to become certified LakeSmart through NHLAKES lake-friendly living program www.nhlakes.org/laksmart/. Keep up the great work!

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

- **CHLOROPHYLL-A:** Chlorophyll level was within a low range in July and decreased slightly in August. Average chlorophyll level increased slightly from 2019, was approximately equal to the state median, and was slightly less than the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), #2 Lamb Swamp Inlet, #3 Dump Inlet, #4 Outlet, and #6 Stone Bridge conductivity and/or chloride levels were within a low range and approximately equal to or slightly greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. #3T Dump Trib. and #9 E Holderness Rd. Trib. conductivity and chloride levels were elevated but chloride levels were much less than the state chronic chloride standard.
- **COLOR:** Apparent color measured in the epilimnion indicates the water was lightly tea colored, or light brown in July and August.
- **TOTAL PHOSPHORUS:** Epilimnetic and Outlet phosphorus levels were low in July and increased slightly in August but remained within a low range. Average epilimnetic phosphorus level decreased slightly from 2019 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Metalimnetic and Hypolimnetic phosphorus levels were moderate in July and elevated in August following a significant storm event and high wind conditions suggesting temporary mixing or de-stratification of these thermal layers. #2 Lamb Swamp Inlet and #3T Dump Trib. phosphorus levels were elevated in July following a significant storm event during drought conditions. #3 Dump Inlet phosphorus level was low in July and slightly elevated in August following a significant storm event. #6 Stone Bridge and #9 E Holderness Rd. Trib. phosphorus levels were elevated on each sampling event following significant storm events that flushed stagnant waters during drought conditions.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in July and then decreased in August due to high wind and wave conditions. Average NVS transparency increased (improved) from 2019 and was higher (better) than the state median. Historical trend analysis indicates stable NVS transparency since monitoring began.
- **TURBIDITY:** Epilimnetic, #2 Lamb Swamp Inlet, #3 Dump Inlet, #4 Outlet, #6 Stone Bridge Inlet, and #9 E Holderness Rd. Trib. turbidity levels fluctuated within a low range. Metalimnetic and Hypolimnetic turbidity levels were elevated in August following a significant storm event and high wind conditions. #3T Dump Trib. turbidity levels were slightly elevated in July.
- **pH:** Epilimnetic pH levels were within the desirable range 6.5-8.0 units and historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began. #4 Outlet, #6 Stone Bridge Inlet and #9 E Holderness Rd. Trib. pH levels were slightly less than the low end of the desirable range. Metalimnetic, Hypolimnetic, #2 Lamb Swamp Inlet, #3 Dump Inlet, and #3T Dump Trib. pH levels were slightly acidic and potentially critical to aquatic life.

Station Name	Table 1. 2020 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 (ug/L)	Trans. (m)		Turb. (ntu)	pH
							NVS	VS		
Epilimnion	6.9	4.38	10	40	43.6	8	3.82	4.44	0.28	6.91
Metalimnion					45.5	20			1.27	5.83
Hypolimnion					47.2	19			2.06	5.78
#2 Lamb Swamp Inlet			11		56.2	31			0.41	5.25
#3 Dump Inlet			10		47.6	19			0.42	5.94
#3T Dump Trib.			55		204.0	61			2.04	5.98
#4 Outlet (Dam)					44.0	10			0.27	6.36
#6 Stone Bridge Inlet			9		42.2	27			0.73	6.40
#9 E Holderness Rd. Trib.			33		120.8	32			1.14	6.32

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

