Volunteer Lake Assessment Program Individual Lake Reports

MESSER POND, NEW LONDON, NH

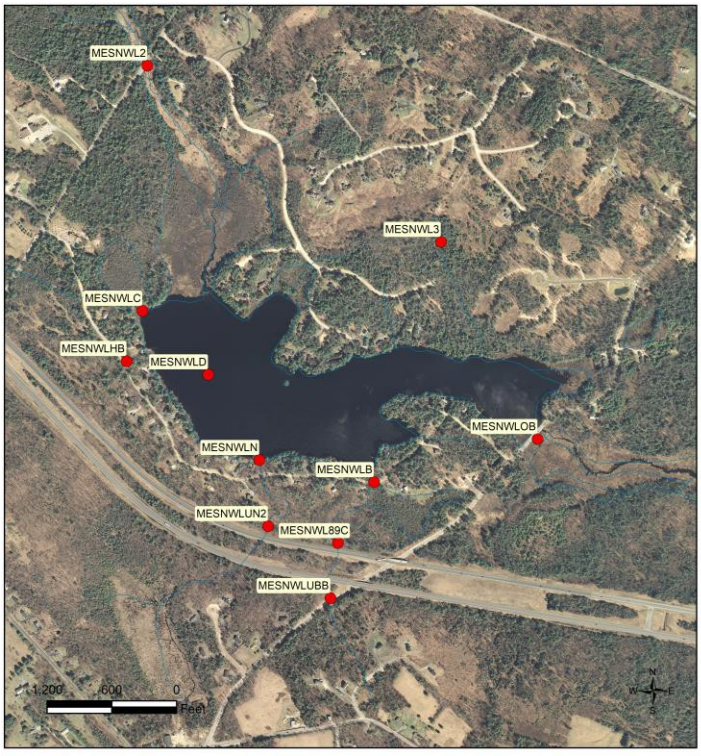
MORPHOMETRIC DATA | **TROPHIC CLASSIFICATION** | **KNOWN EXOTIC SPECIES**

Watershed Area (Ac.):	1,408	**Max. Depth (m):**	7.6	**Flushing Rate (yr^{1})**	4.7	**Year**	**Trophic class**	
Surface Area (Ac.):	67	**Mean Depth (m):**	2.6	**P Retention Coef:**	0.53	1981	MESOTROPHIC	
Shore Length (m):	3,200	**Volume (m^3):**	704,000	**Elevation (ft):**	1105	1996	MESOTROPHIC	

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)	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	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 satura	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.
	Chlorophyll-a	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
Primary Contact Recreation	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Chlorophyll-a	Very Good	All sampling data 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.



MESSER POND
NEW LONDON
VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
MESNWLB	BROWN INLET
MESNWLC	COUNTY RD INLET
MESNWLD	DEEP SPOT
MESNWLN	NUTTER INLET
MESNWLOB	OUTLET
MESNWL2	COUNTY RD 2
MESNWL3	FIELDSTONE LANE
MESNWL89C	89 CULVERT
MESNWLUN2	UPPER NUTTER INLET 2
MESNWLUBB	UPPER BROWN AT BOG RD
MESNWLHB	HAAS BK

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

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Messer Pond, New London
2020 Data Summary

Recommended Actions: Great job sampling in 2020! Pond quality is representative of mesotrophic, or average, conditions and chlorophyll levels have stabilized below the mesotrophic threshold since 2015 which is encouraging. Drought conditions in 2020 caused low water levels and tributary flows resulting in samples with elevated turbidity and phosphorus levels due to organic matter contamination which further resulted in several invalid data points. Do not sample tributaries if flow is not sufficient to collect a sample free of organic debris. The improving pH levels are a positive sign and indicate recovery of surface waters from historical impacts of acid precipitation. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll level was low in June, increased to a slightly elevated range in July, and then decreased to a low level 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), Columbus Ave., County Rd. 2, County Rd. Inlet, and Outlet conductivity and/or chloride levels remained slightly elevated and greater than the state medians. Historical trend analysis indicates relatively stable epilimnetic conductivity levels since monitoring began. Brown Inlet and Nutter Inlet conductivity and chloride levels remained elevated and much greater than the state medians.
- **Color:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown, from June to August. County Rd. 2 and Outlet were highly tea colored, or dark brown, and County Rd. Inlet and Nutter Inlet were moderately tea colored in June during low flow conditions.
- **E. coli:** Brown Inlet and Nutter Inlet E. coli levels were very low and much less than the state standard for surface waters.
- **Total Phosphorus:** Epilimnetic and Metalimnetic phosphorus levels were slightly elevated in June and decreased to a low level in July and August. Average epilimnetic phosphorus level increased slightly from 2019 and was approximately equal to the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus levels were moderate and increased slightly as the summer progressed. County Rd. Inlet phosphorus levels were elevated in August following the tropical storm and during drought conditions. County Rd. 2 phosphorus levels were within an average range for that station in June and August; July data were invalidated due to organic matter. Nutter Inlet phosphorus levels were elevated in July and August during low flows and following a tropical storm. Outlet phosphorus levels were slightly elevated in June and July when pond water levels and tributary flow was low. Brown Inlet phosphorus levels were greatly elevated and June data were invalidated due to organic matter. Columbus Ave. phosphorus data were invalidated due to organic matter.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) in June, increased (improved) to an average range in July, and remained stable in August. Average NVS transparency decreased from 2019 and was less (worse) than the state median. Historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity levels were fairly stable and low. Metalimnetic turbidity level was elevated in July due to algal growth. Hypolimnetic turbidity level was slightly elevated in August. Brown Inlet and County Rd. 2 turbidity levels were elevated on each sampling event and data were invalidated in June for Brown Inlet and July for Country Rd. 2 due to organic matter. Columbus Ave. turbidity data were invalidated due to organic matter. County Rd. Inlet turbidity levels were slightly elevated in July and August during low flows and following a tropical storm. Nutter Inlet turbidity level was elevated in August following tropical storm. Outlet turbidity levels were elevated in June and July during low flows.
- **pH:** Epilimnetic, Metalimnetic, Columbus Ave, County Rd. 2, County Rd. Inlet, Nutter Inlet, and Outlet pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates significantly increasing (improving) epilimnetic pH levels since monitoring began. Hypolimnetic and Brown Inlet pH levels were approximately equal to the low end of the desirable range.

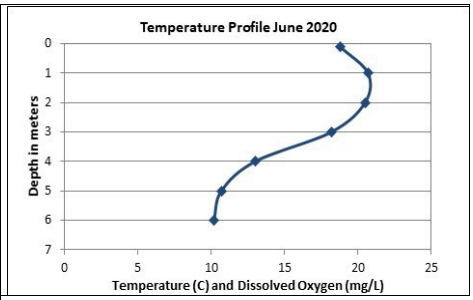

Table 1. 2020 Average Water Quality Data for MESSER POND - NEW LONDON

Station Name	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	E. coli (cts/100 ml)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
								NVS	VS		
Epilimnion	9.07	4.59	34	57	144.4		12	2.43	2.65	0.95	7.10
Metalimnion			31		143.5		12			1.09	6.99
Hypolimnion			31		142.1		15			1.72	6.43
Brown Inlet			91		362.3	6	72			8.72	6.37
Columbus Ave.			25		128.1						6.93
County Rd. 2			22	110	132.3		22			4.02	6.72
County Rd. Inlet			31	70	134.6		22			2.19	6.53
Nutter Inlet			98	70	359.0	0	27			1.47	6.81
Outlet at Bog Rd.			37	90	145.0		14			1.59	6.60

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	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Improving	Data significantly increasing.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.