



Volunteer Lake Assessment Program Individual Lake Reports

MESSER POND, NEW LONDON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,408	Max. Depth (m):	7.6	Flushing Rate (yr ⁻¹):	4.7
Surface Area (Ac.):	67	Mean Depth (m):	2.6	P Retention Coef:	0.53
Shore Length (m):	3,200	Volume (m ³):	704,000	Elevation (ft):	1105

TROPHIC CLASSIFICATION

Year	Trophic class
1981	MESOTROPHIC
1996	MESOTROPHIC

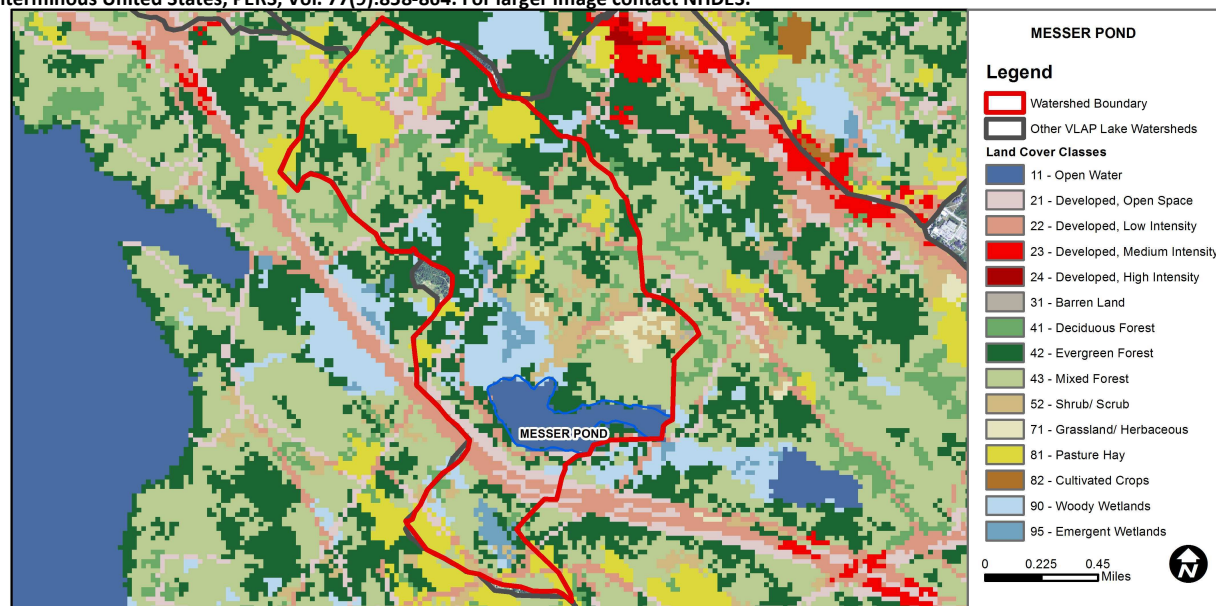
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

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	Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a large 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	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	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	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.

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	6.45	Barren Land	0.1	Grassland/Herbaceous	1.45
Developed-Open Space	6.29	Deciduous Forest	5.19	Pasture Hay	13.19
Developed-Low Intensity	5.96	Evergreen Forest	23.27	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	23.73	Woody Wetlands	6.57
Developed-High Intensity	0	Shrub-Scrub	5.23	Emergent Wetlands	2.16



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

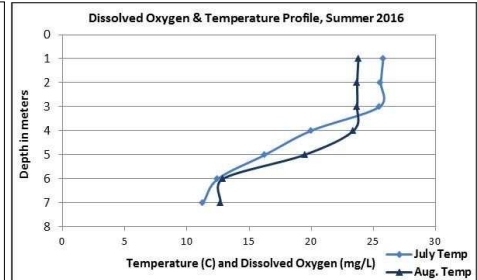
MESSER POND, NEW LONDON

2016 DATA SUMMARY

RECOMMENDED ACTIONS: Great job collecting water temperature profile data at the deep spot! Once you record the information, review the profile and adjust deep spot sample depths to collect a sample from the middle of each thermal layer when possible. Based on the July and August profiles, samples should be collected at 2, 4.5 and 6 meters. This will better represent nutrient levels and conditions of the different layers. These layers may shift slightly based on month of collection, air temperatures and water clarity. Refer to the VLAP field manual for instructions on how to determine the thermal layers. Pond phosphorus levels and algal growth remained within a low to average range in 2016 and pond clarity (transparency) was higher than average. The drought conditions and lack of stormwater runoff and flushing of wetland and tributary systems high in dissolved organic content likely helped pond quality in 2016. This highlights the importance of minimizing stormwater runoff from impervious areas and areas prone to erosion. Manage beaver activity in the Outlet channel to maintain a good flushing rate in the pond. If necessary, install a beaver pipe or flow through device through the beaver dam, or block culvert openings. Keep up the great work!

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

- **CHLOROPHYLL-A:** Chlorophyll levels were slightly elevated in July and then decreased to a low range in August and September. The 2016 average chlorophyll level increased slightly from 2015 and was slightly less than the state median. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Deep spot, County Rd. Inlet, Fieldstone and County, and Outlet conductivity levels remained slightly elevated and greater than the state median. Historical trend analysis indicates stable epilimnetic (upper water layer) conductivity levels with high variability between years.
- **E. COLI:** Little Cove E. coli levels were very low and much less than the state standards of 88 cts/100 mL for public beaches and 406 cts/100 mL for surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus was within an average range in July, increased to a slightly elevated level in August when the turbidity was also elevated suggesting algal growth at the water's surface, and then decreased in September. Average epilimnetic phosphorus increased slightly from 2015 and was slightly less than the state median. Historical trend analysis indicates stable epilimnetic phosphorus levels since monitoring began. Metalimnetic (middle water layer) phosphorus level remained within a low to average range. Hypolimnetic (lower water layer) phosphorus levels decreased from July to September and remained within an average range, however the sample was collected at 5 meters and temperature profile data indicates the sample should be collected at 6 meters to accurately represent the hypolimnion. County Rd. Inlet phosphorus levels were slightly elevated in July and September and lab data note high levels of organic matter in the July sample and sediment in the September sample. County Rd. 2 phosphorus was elevated in July and lab data note organic matter in the sample. Outlet phosphorus levels were elevated in August and September and volunteers noted low flows and beaver activity.
- **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was low and stable from July to August and then increased (improved) to an average range in September. Average NVS transparency increased (improved) from 2015 but remained less (worse) than the state median. Historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began. Transparency measured with the viewscope (VS) was generally higher (better) than NVS transparency and likely a better measure of actual conditions.
- **TURBIDITY:** Epilimnetic and Metalimnetic turbidity levels were slightly elevated in August indicating potential algal growth from 1 to 3 meters in the water column. Hypolimnetic turbidity levels fluctuated within an average range for that station. County Rd. Inlet turbidity levels were slightly elevated in July and September and low flow conditions, colored water and organic matter affected the turbidity. County Rd. 2 turbidity level were elevated on each sampling event and low flows, colored water and organic matter affected turbidity. Outlet turbidity levels were elevated in August and September and low flows and beaver activity could have affected the samples.
- **pH:** Epilimnetic, Metalimnetic and County Rd. 2 pH levels were within the desirable range 6.5-8.0 and historical trend analysis indicates significantly increasing (improving) epilimnetic pH levels since monitoring began. We hope to see this continue! Hypolimnetic, County Rd. Inlet and Outlet pH levels fluctuated below the desirable range on one or more sampling events.



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/m³
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Station Name	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
						Epilimnion	8.9		
Metalimnion			140.3		8			1.05	7.13
Hypolimnion			139.2		12			1.60	6.55
County Rd. Inlet			131.7		23			2.65	6.24
County Rd. 2			147.2		26			6.31	6.71
Little Cove				2					
Outlet at Bog Rd.			146.9		21			2.65	6.68

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data highly 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.

