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

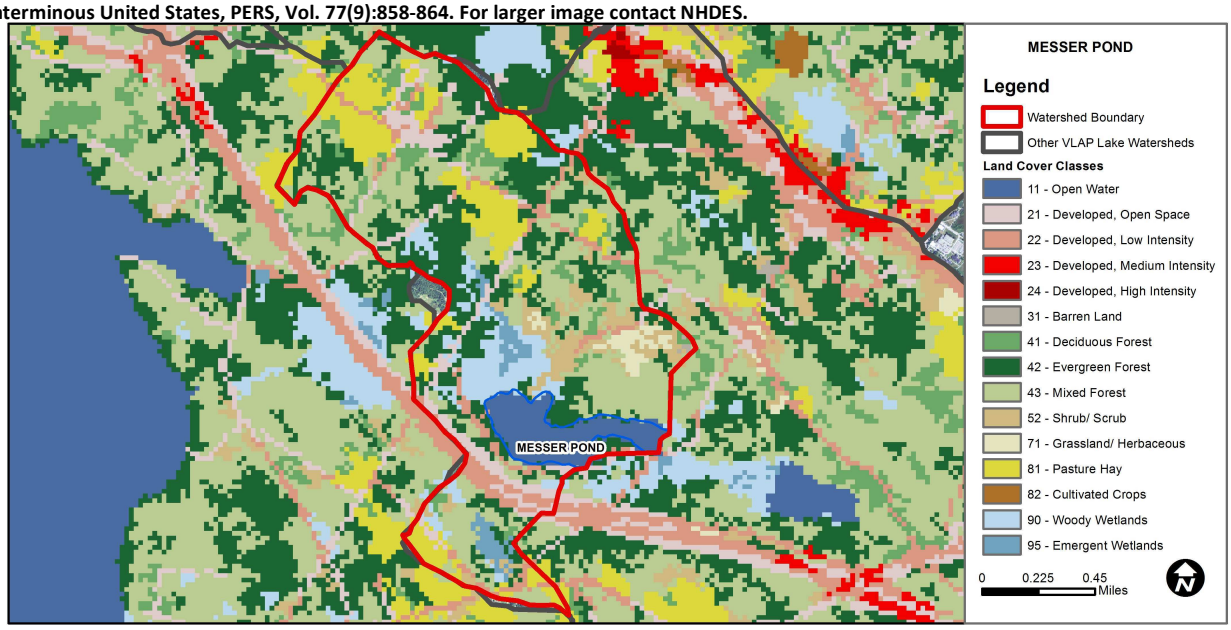
KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

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.

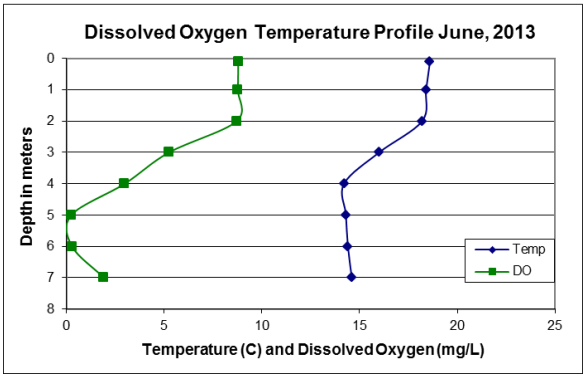


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	6.45	Barren Land	0.1	Grassland/Herbaceous	1.45
Developed-Open Space	6.29	Deciduous Forest	5.19	Pasture Hay	13.19
Developed-Low Intensity	5.96	Evergreen Forest	23.27	Cultivated Crops	0
Developed-Medium Intensity	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, NH
2013 DATA SUMMARY

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

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated in June and September. The 2013 average increased greatly from 2012 and was the second highest measured since monitoring began. Historical trend analysis indicates relatively stable chlorophyll with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Conductivity levels were elevated at all stations, but particularly high in Brown and Nutter Inlets which receive runoff from Interstate 89 (a salted highway). Chloride levels were also elevated at all stations except County Rd. Inlet and Fieldstone Lane. Historical trend analysis indicates epilimnetic conductivity is highly variable between years.
- **TOTAL PHOSPHORUS:** Deep spot phosphorus levels were average for most lakes and epilimnetic phosphorus decreased from 2011 and 2012. Historical trend analysis indicates stable epilimnetic phosphorus with low variability between years. Brown and Nutter Inlet phosphorus was slightly elevated on each sampling event; however the 2013 averages were the lowest measured since monitoring began. We hope to see this continue!
- **TRANSPARENCY:** Transparency decreased slightly from 2012 likely due to the increased algal growth. Historical trend analysis indicates significantly decreasing (worsening) transparency.
- **TURBIDITY:** Epilimnetic turbidity was slightly elevated in September likely due to the increased algal growth. Brown Inlet turbidity was also elevated in September likely due to low stream flow.
- **PH:** pH levels were lower than desirable range 6.5 – 8.0 units in the hypolimnion and many tributaries.
- **RECOMMENDED ACTIONS:** Spring bracket sampling of Brown and Nutter Inlets indicated chloride levels were higher below the highway; however were still elevated upstream indicating potential impacts from road salting on town roads as well. Phosphorus levels increased downstream in Brown Inlet, however there were no major phosphorus differences in Nutter Inlet. The Messer Pond Protective Association has embarked on developing a Watershed Management Plan to identify and quantify phosphorus sources in the watershed to better inform where to focus remediation activities. Keep up the great work!



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

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: 6.5-8.0 (unless naturally occurring)

Table 1. 2013 Average Water Quality Data for MESSER POND

Station Name	Alk.	Chlor-a	Chloride	Cond.	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	ug/l	m		ntu	
						NVS	VS		
89 Culvert			80		7			0.81	
Brown Inlet			86	317.0	30			2.84	6.15
County Rd Inlet			12	92.0	12			0.68	6.38
Epilimnion	8.20	8.18	30	116.6	10	2.36	2.75	1.06	6.83
Metalimnion				125.0	9			0.73	6.51
Hypolimnion				119.0	14			2.63	6.36
Fieldstone Lane			11	53.0	5			0.23	5.62
Nutter Inlet			55	188.8	18			0.95	6.57
Outlet At Bog Rd				114.6	10			1.08	6.62
Upper Brown At Bog Rd			65		11			1.29	
Upper Nutter Inlet 2			40		28			0.78	

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
Conductivity	Stable	Trend not significant; data highly variable.	Transparency	Degrading	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.