Volunteer Lake Assessment Program Individual Lake Reports

LEES POND, MOULTONBORO, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	17,664	**Max. Depth (m):**	11.3	**Flushing Rate (yr^1)**	12.9
Surface Area (Ac.):	179	**Mean Depth (m):**	3.7	**P Retention Coef:**	0.37
Shore Length (m):	4,000	**Volume (m^3):**	2,675,000	**Elevation (ft):**	508

TROPHIC CLASSIFICATION

Year	Trophic class
1992	MESOTROPHIC
2009	EUTROPHIC

KNOWN EXOTIC SPECIES

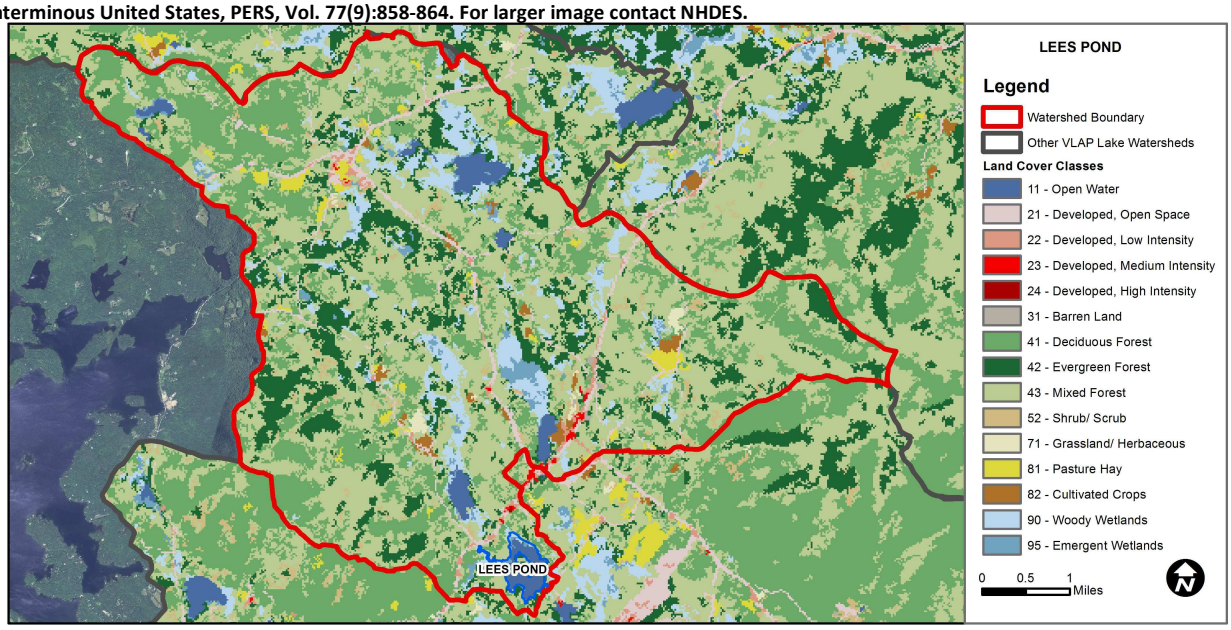
Variable Milfoil

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)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

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	2.39	Barren Land	0.08	Grassland/Herbaceous	0.38
Developed-Open Space	2.69	Deciduous Forest	22.71	Pasture Hay	1.25
Developed-Low Intensity	0.63	Evergreen Forest	13.64	Cultivated Crops	0.75
Developed-Medium Intensity	0.15	Mixed Forest	45.77	Woody Wetlands	6.36
Developed-High Intensity	0.01	Shrub-Scrub	1.77	Emergent Wetlands	1.34

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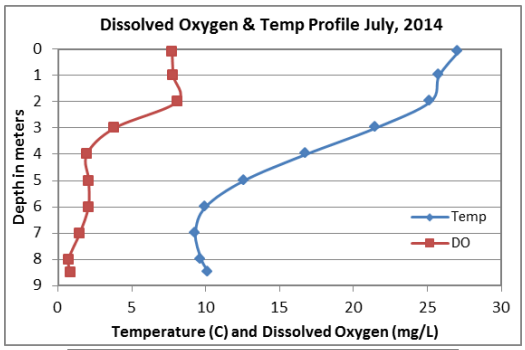
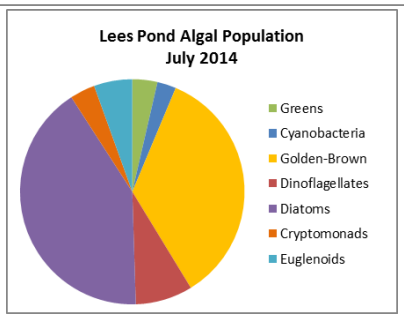
Lees Pond, Moultonborough

2014 Data Summary

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

- **Chlorophyll-a:** Chlorophyll levels were low in June, increased sharply in July and remained elevated in August. Average chlorophyll levels were greater than the state median the highest measured since 2008. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **Conductivity/Chloride:** Deep spot and tributary conductivity and chloride levels were relatively low and only slightly greater than the state medians. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity since monitoring began. Inlet conductivity has increased slightly since monitoring began as well, although not significantly. Outlet conductivity has significantly increased (worsened) since monitoring began.
- **E. coli:** The E. coli level at Nelson Beach was much less than the state standard of 88 cts/100 mL for public beaches.
- **Total Phosphorus:** Epilimnetic phosphorus levels were slightly higher in June and August, but low in July. Average epilimnetic phosphorus was equal to the state median. Historical trend analysis indicates highly variable epilimnetic phosphorus since monitoring began. Metalimnetic (middle water layer) phosphorus increased from June to August and was elevated in July and August during the periods of elevated algal growth. Hypolimnetic (lower water layer) phosphorus was slightly elevated on each sampling event but within an average range for that station. Inlet phosphorus decreased from June to August and was within an average range. Outlet phosphorus was elevated in June and it was noted that large amounts of pollen were on the water's surface which likely contributed to the elevated phosphorus.
- **Transparency:** Transparency was good in June and then decreased in July and August. The elevated levels of algae along with difficult viewing conditions contributed to the lower late summer transparencies. Average transparency improved slightly from 2013 and was approximately equal to the state median. Historical trend analysis indicates highly variable transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity was elevated in August likely due to wind and wave action stirring up the water column and particulates within the layer. Metalimnetic turbidity increased from June to August likely due to algal growth. Hypolimnetic turbidity was elevated in August potentially due to the accumulation of organic compounds when dissolved oxygen levels decreased to below 1.0 mg/L in hypolimnetic waters. Inlet and Outlet turbidities were elevated in June due to pollen accumulation on the water's surface.
- **pH:** Epilimnetic pH was within the desirable range of 6.5—8.0 units in June and July but decreased slightly in August. Historical trend analysis indicates highly variable epilimnetic pH since monitoring began. Metalimnetic and hypolimnetic pH were consistently less than desirable and could become potentially critical to aquatic life.
- **Recommended Actions:** The increasing conductivity at the deep spot and Outlet may be a result of winter road maintenance activities such as road salting or exotic plant management activities. The addition of chloride monitoring may help to determine if winter maintenance activities might be contributing to the elevated conductivity. Overall, water quality remains average for most NH lakes with no emerging trends, except for the increasing conductivity. Keep up the great work!



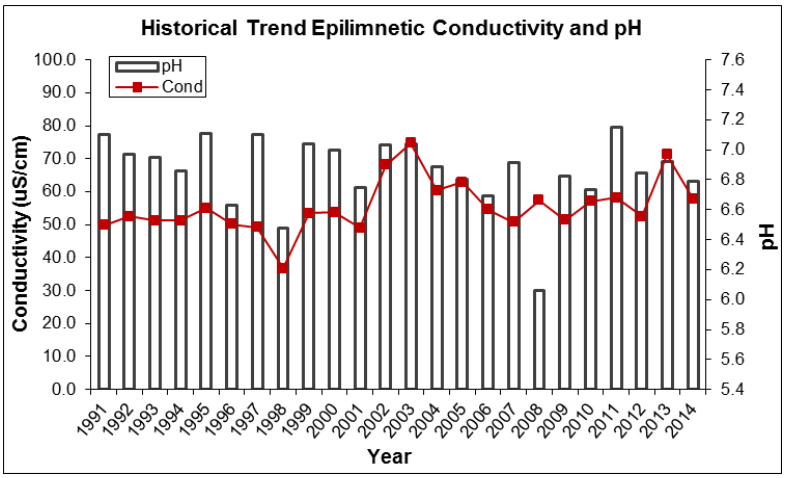
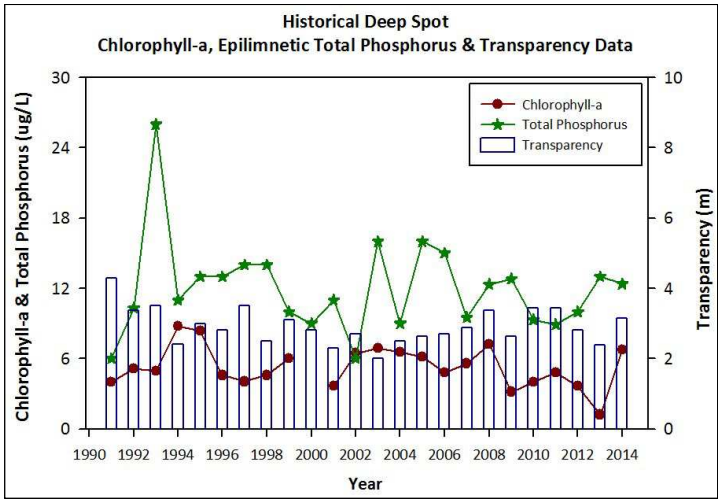


NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 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/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2014 Average Water Quality Data for LEES POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Epilimnion	9.63	6.74		57.9		12	3.14	3.27	1.24	6.79
Metalimnion				52.4		15			1.24	6.15
Hypolimnion				49.0		23			4.73	6.11
Inlet			9	60.7		15			1.18	6.78
Nelson Beach					8					
Outlet				64.4		14			2.35	6.90

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 highly variable.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.