Volunteer Lake Assessment Program Individual Lake Reports

CLOUGH POND, LOUDON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	230	**Max. Depth (m):**	18.2	**Flushing Rate (yr^{-1})**	0.4
Surface Area (Ac.):	46	**Mean Depth (m):**	5.9	**P Retention Coef:**	0.78
Shore Length (m):	1,600	**Volume (m^3):**	1,045,000	**Elevation (ft):**	466

TROPHIC CLASSIFICATION

Year	Trophic class
1983	MESOTROPHIC
2002	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.

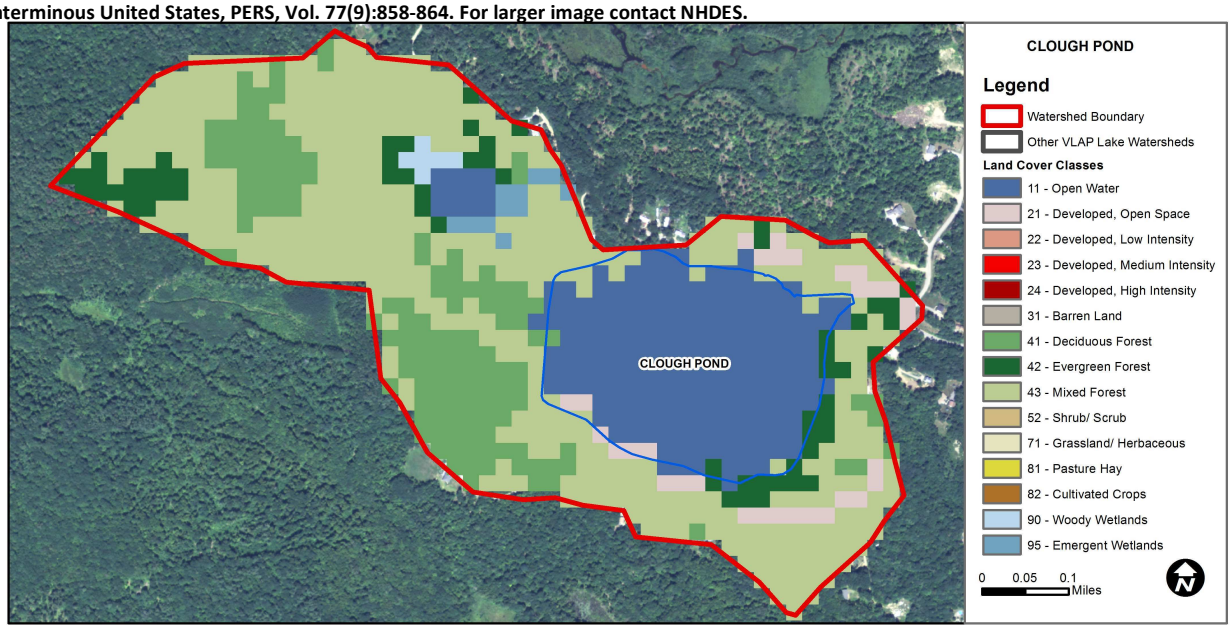
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	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	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.
	Chlorophyll-a	Good	At least 10 samples with 1 sample but < 10% of samples exceeding criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

CLOUGH POND - TOWN BEACH	E. coli	No Data	No Data 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.

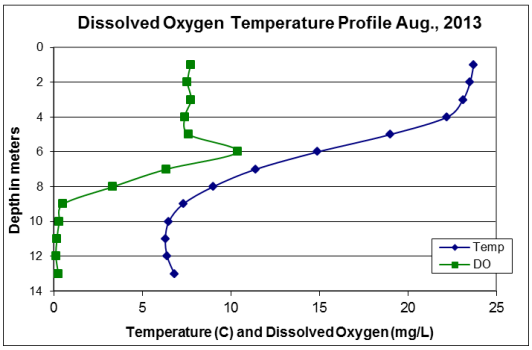


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	22.7	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	3.52	Deciduous Forest	16.13	Pasture Hay	0
Developed-Low Intensity	0	Evergreen Forest	7.04	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	48.4	Woody Wetlands	0.68
Developed-High Intensity	0	Shrub-Scrub	0	Emergent Wetlands	1.25

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
CLOUGH POND, LOUDON, NH
2013 DATA SUMMARY

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

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated in July and then decreased to average levels in August. The 2013 average chlorophyll level increased from 2012 and was greater than the state median. Historical trend analysis indicates highly variable chlorophyll between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride were slightly greater than the state medians. Hypolimnetic conductivity was elevated due to the release of organic compounds from bottom sediments under anoxic conditions. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began.
- **TOTAL PHOSPHORUS:** Phosphorus levels were low in the epilimnion (upper water layer), average in the metalimnion (middle water layer), and elevated in the hypolimnetion (lower water layer). The elevated hypolimnetic phosphorus was likely the result of phosphorus being released from bottom sediments when dissolved oxygen levels deplete to less than 1.0 mg/L (anoxic). Historical trend analysis indicates highly variable epilimnetic phosphorus between years. Inlet and Outlet phosphorus levels were low in July and August.
- **TRANSPARENCY:** Transparency was stable between July and August, however decreased from prior years and was the lowest measured since 2002. Historical trend analysis indicates stable transparency with low variability between years.
- **TURBIDITY:** Epilimnetic turbidity was low, metalimnetic turbidity was slightly higher in July likely due to the elevated algal growth and a layer of algae, and hypolimnetic turbidity was elevated likely due to the release of organic compounds from bottom sediments under anoxic conditions.
- **PH:** Hypolimnetic pH levels were less than desirable range 6.5 – 8.0 units. Historical trend analysis indicates significantly increasing (improving) epilimnetic pH since monitoring began. We hope to see this continue!
- **RECOMMENDED ACTIONS:** High water levels and associated stormwater runoff from above average rainfall likely contributed to the elevated algal growth in July and decreased transparency in July and August. The increased frequency and intensity of storm events highlights the importance of implementing additional stormwater management projects in the watershed. The increasing epilimnetic conductivity trend is concerning and we encourage local road agents and winter maintenance crews to obtain a NH Voluntary Salt Applicator License through the UNH Technology Transfer Center's Green SnowPro Certification. 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 CLOUGH POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m NVS	Turb. ntu	pH
Epilimnion	6.45	6.86	16	80.5	8	3.50	0.82	6.86
Metalimnion				83.9	16		1.43	6.57
Hypolimnion				107.6	35		5.25	6.24
Inlet			15	78.7	8		0.91	6.74
Outlet			16	81.5	7		0.78	6.85

HISTORICAL WATER QUALITY TREND ANALYSIS

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