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})**	
Surface Area (Ac.):	46	**Mean Depth (m):**		**P Retention Coef:**	
Shore Length (m):	1,600	**Volume (m^3):**		**Elevation (ft):**	466

TROPHIC CLASSIFICATION

Year	Trophic class
1983	MESOTROPHIC
2002	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

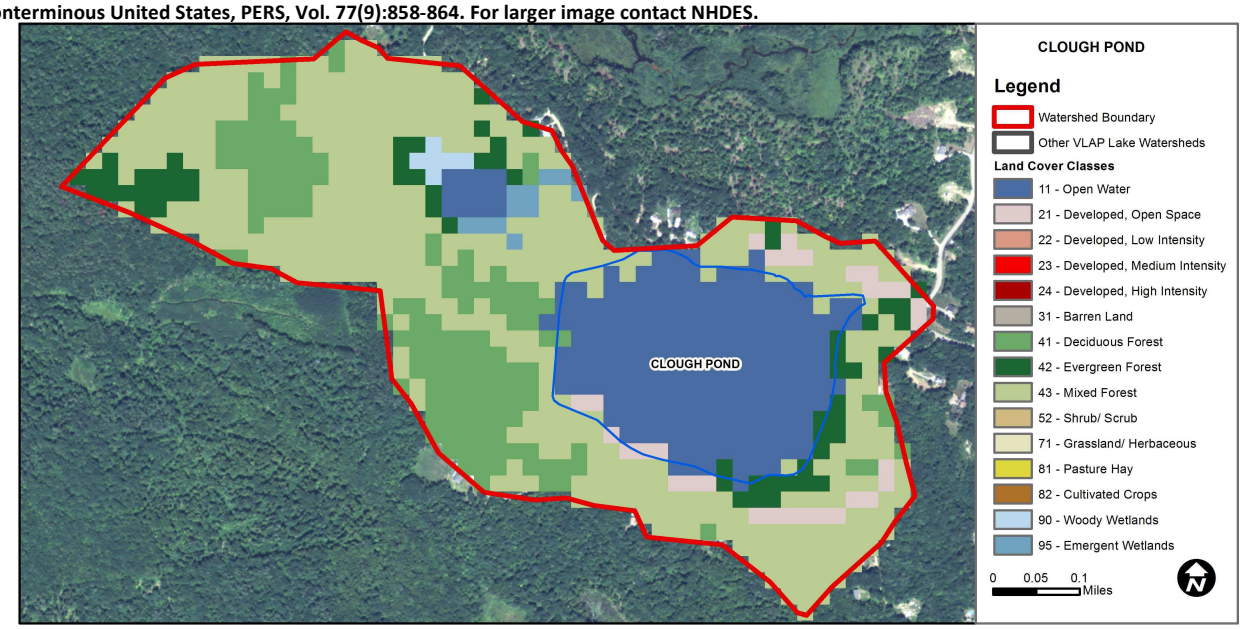
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	Dissolved oxygen satura	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; 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	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	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

CLOUGH POND - TOWN BEACH	Escherichia coli	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.

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

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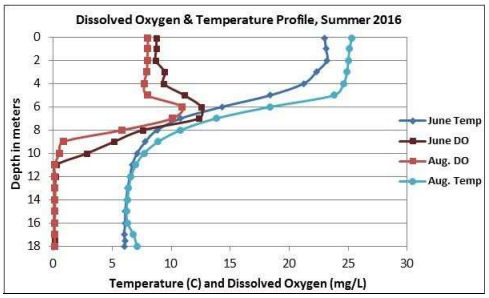
CLOUGH POND, LOUDON

RECOMMENDED ACTIONS: Pond water quality, and the overall phosphorus, chlorophyll and clarity (transparency) conditions, remained stable with that measured in 2015, and has generally remained stable since 2010. We hope to see these stable trends continue! The installation of stormwater management controls will likely help to maintain these stable trends and potentially improve conditions. The worsening conductivity trend is concerning and likely the result of winter de-icing materials applied to roads, parking lots, driveways and walkways in the watershed. Educate local residents on best management practices associated with salt application, and encourage local road agents and winter maintenance companies to obtain a Voluntary N.H. Salt Applicator License through UNH's Technology Transfer Center's Green SnowPro Certification. Educational materials can be found at http://www.t2.unh.edu/salt-reduction-bmps. Keep up the great work!

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

- **CHLOROPHYLL-A:** Chlorophyll levels were very low in June and then increased slightly in July and August. The 2016 average chlorophyll level remained stable from with 2015 and was much less than the state median. Historical trend analysis indicates stable chlorophyll levels with high variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot, Inlet and Outlet conductivity and chloride levels remained slightly elevated and greater than the state medians. Average epilimnetic (upper water layer) conductivity was the highest measured since monitoring began likely due to the drought conditions, and historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was low and decreased from June to August. Historical trend analysis indicates stable epilimnetic phosphorus levels with high variability between years. Metalimnetic (middle water layer) phosphorus was within an average range in June and then decreased to low levels by August. Hypolimnetic (lower water layer) phosphorus levels were slightly elevated in June and August, but low in July. The July sample was collected at a slightly shallower depth which likely influenced the phosphorus level. Inlet and Outlet phosphorus levels were low on each sampling event.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in June when algal growth was the lowest, decreased in July as algal growth increased, and the increased (improved) in August. Average NVS transparency decreased slightly from 2015 but was higher (better) than the state median. Historical trend analysis indicates stable transparency with moderate variability between years.
- **TURBIDITY:** Epilimnetic and Metalimnetic turbidities were slightly elevated in June and July. Pollen and/or algal growth could have contributed to the slightly elevated levels. Hypolimnetic turbidity levels were slightly elevated in June and August, and low at the shallower sample depth in July. The increased turbidity closer to the bottom is likely due to the formation and accumulation of organic compounds under anoxic conditions. Inlet turbidity was low in June and August and elevated in July. The sample receipt checklist indicated a moderate amount of sediment in the sample. Outlet turbidity was within a low range for that station.
- **PH:** Epilimnetic, Metalimnetic, Inlet, and Outlet pH levels were within the desirable range 6.5-8.0 units, however epilimnetic pH has historically fluctuated below the desirable range. Hypolimnetic pH was slightly less than desirable. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began.



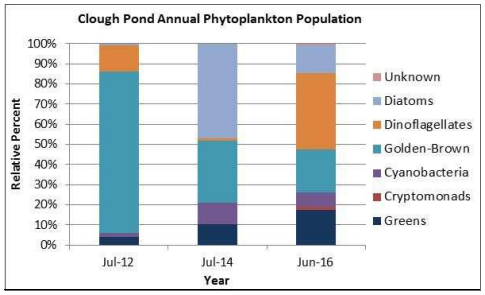


Table 1. 2016 Average Water Quality Data for CLOUGH POND-LOUDON

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	9.1	2.25	19	107.8	8	4.42	4.48	1.31	7.12
Metalimnion				105.7	11			1.57	6.95
Hypolimnion				114.8	22			3.38	6.39
Inlet			20	106.5	9			7.42	6.93
Outlet			19	108.0	9			1.14	7.11

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: between 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

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