



## 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 <sup>1</sup> )	
Surface Area (Ac.):	46	Mean Depth (m):		P Retention Coef:	
Shore Length (m):	1,600	Volume (m <sup>3</sup> ):		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 2016 305(b) report on the status of N.H. waters, and are based on data collected from 2006-2015. Detailed waterbody assessment and report card information can be found at [www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm](http://www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm)

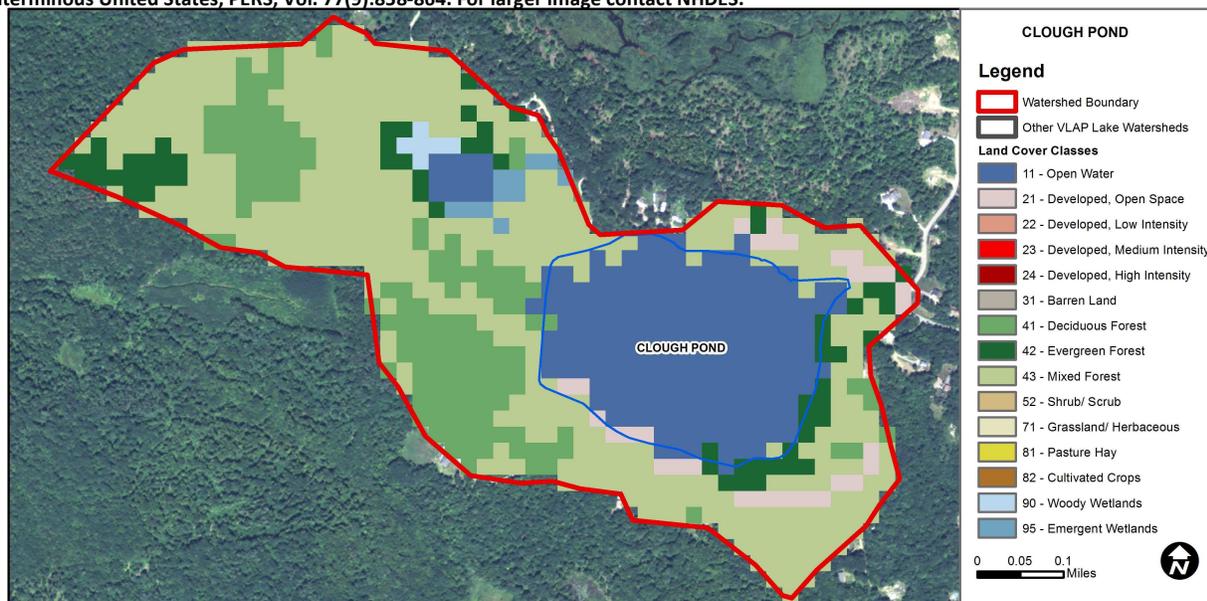
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, 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	No Data	No data for this 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	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
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#### 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

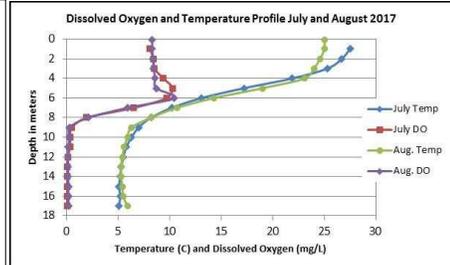
## CLOUGH POND, LOUDON

### 2017 DATA SUMMARY

**RECOMMENDED ACTIONS:** Pond quality was representative of mesotrophic, or average, conditions in 2017. Above average spring and early summer rainfall likely flushed nutrients in from the surrounding watershed resulting in higher phosphorus levels in early summer. Inlet phosphorus and turbidity levels were elevated, particularly following storm events this summer. This may indicate beaver activity and damming upstream of the inlet that withholds waters rich in nutrients. Strong storm events and/or human activity can temporarily cause an influx of nutrients and sediments from beaver dam destruction. If this is the case, try installing a flow through device through the beaver dam that continually allows water through the dam without destroying it. Continue watershed management efforts aimed at reducing stormwater runoff and encourage local road agents to obtain NH Voluntary Salt Applicator Licenses through UNH Technology Transfer Center's Green SnowPro Certification Program to try and reduce chloride loads from winter road salting practices. Keep up the great work!

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

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels were low in June, increased to a moderate level in July, and then decreased slightly in August. Average Chlorophyll level increased from 2016, was approximately equal to the state median, and was slightly less than the threshold for mesotrophic lakes. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Inlet, and Outlet conductivity and/or chloride levels were slightly elevated and greater than the state medians, yet not above a level of concern. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since 2002.
- ◆ **COLOR:** Apparent color was measured in the epilimnion and indicates the pond water is clear and has little dissolved organic matter that imparts a "tea" or brown color to the water.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were slightly elevated in June following a significant storm event, and then decreased to low levels in July and August. Average epilimnetic phosphorus level increased from 2016 and was slightly less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates highly variable epilimnetic phosphorus levels since 2002. Metalimnetic phosphorus levels were slightly elevated in June and July potentially due to a layer of algae and settling from surface waters. Hypolimnetic phosphorus levels were elevated due to phosphorus release from bottom sediments under anoxic conditions. Inlet phosphorus levels were elevated on each sampling event and the turbidity of the samples was also elevated, particularly after significant storm events in June and August. Outlet phosphorus levels fluctuated within a low range.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was lower (worse) in June and then increased (improved) as the summer progressed. Average NVS transparency remained stable with 2016 and was much higher (better) than the state median. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- ◆ **TURBIDITY:** Epilimnetic turbidity levels were within a low range and decreased as the summer progressed. Metalimnetic turbidity levels were slightly elevated in July and elevated in August likely due to algal growth. Hypolimnetic turbidity levels were elevated in June and July. Inlet turbidity levels were slightly elevated in June and July and elevated in August following a significant storm event and field data note sedimentation in the stream. Outlet turbidity levels fluctuated within a normal range.
- ◆ **pH:** Epilimnetic, Metalimnetic, Inlet, and Outlet pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates significantly increasing (improving) epilimnetic pH levels since 2002. We hope to see this continue! Hypolimnetic pH levels were slightly less than desirable.



**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)

Station Name	Table 1. 2017 Average Water Quality Data for CLOUGH POND-LOUDON									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color PCU	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	7.4	4.58	18	20	98.0	10	4.42	5.00	0.74	7.21
Metalimnion					101.9	15			4.44	6.63
Hypolimnion					121.9	44			4.62	6.29
Inlet			18		90.3	20			3.44	6.66
Outlet			19		98.5	8			0.80	6.84

**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<sup>3</sup>

**Conductivity:** 40.0 uS/cm

**Chloride:** 4 mg/L

**Total Phosphorus:** 12 ug/L

**Transparency:** 3.2 m

**pH:** 6.6

### 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)	Improving	Data significantly increasing.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.

