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 2018 305(b) report on the status of N.H. waters, and are based on data collected from 2008-2017. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm

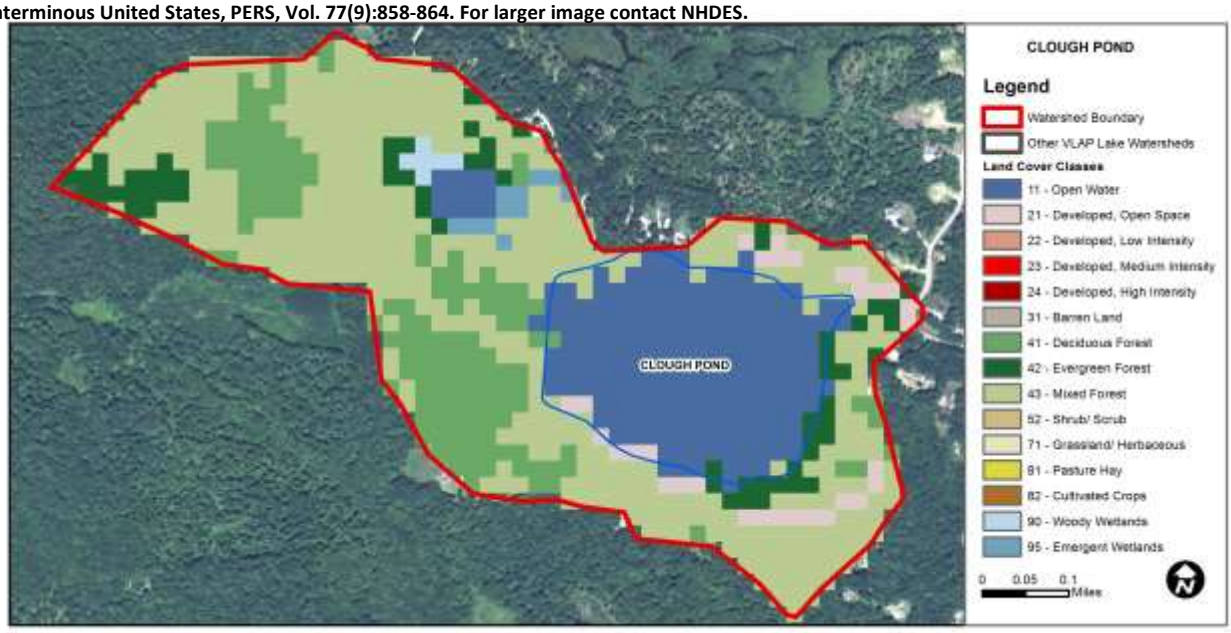
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	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.
	Dissolved oxygen satura	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	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.

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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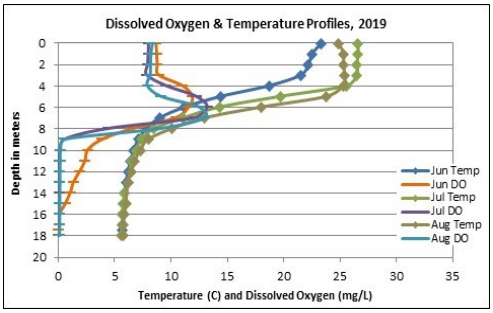
2019 Data Summary

Recommended Actions: Pond quality generally remains representative of mesotrophic, or average conditions, and the improving chlorophyll levels are encouraging. However, Metalimnetic phosphorus and turbidity levels were elevated and the dissolved oxygen profile indicated super-saturated conditions within the Metalimnion on each sampling event. These factors indicate layers of algae and/or cyanobacteria were present in the Metalimnion throughout the summer, and in late June an advisory was issued for a cyanobacteria bloom. Inlet phosphorus and turbidity levels were also elevated and have remained high since 2017. Investigate potential sources of phosphorus in the Inlet and if beaver activity is present consider installing a flow through device allowing water to flow through the dam. Water quality data also suggest potential impacts from groundwater inputs. Proper maintenance of septic systems is important in reducing groundwater inputs of phosphorus. For more information, refer to NHDES fact sheet WD-SSB-13 *You and Your Septic System*. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll level was low in June, increased to a moderate level in July, and then decreased to a low level August. Average chlorophyll level increased slightly from 2018 but remained less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since 2002.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water level), Inlet, and Outlet conductivity and/or chloride levels remained greater than the state medians, yet were less than a level of concern. However, historical trend analysis indicates significantly increasing (worsening) conductivity levels since 2002.
- **Color:** Apparent color measured in the epilimnion indicates the water was lightly tea colored, or light brown.
- **Total Phosphorus:** Epilimnetic and Outlet phosphorus levels fluctuated within a low range and were highest in June. Average epilimnetic phosphorus level decreased slightly from 2018 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable, yet variable, epilimnetic phosphorus levels since 2002. Metalimnetic phosphorus levels were slightly elevated on each sampling. Hypolimnetic phosphorus levels fluctuated within an average range for that station. Inlet phosphorus levels were slightly elevated in July and moderate in June and August.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was slightly below average (worse) in June and then increased (improved) in July and August. Average NVS transparency decreased slightly from 2018 and was higher (better) than the state median. Historical trend analysis indicates relatively stable transparency levels since monitoring began.
- **Turbidity:** Epilimnetic and Outlet turbidity levels fluctuated within a low range for those stations. Metalimnetic turbidity level was elevated on each sampling event likely due to cyanobacteria and/or algal growth. Hypolimnetic turbidity levels were within a moderate range for that station. Inlet turbidity levels were also elevated and samples generally contained sediment.
- **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 acidic and less than desirable.



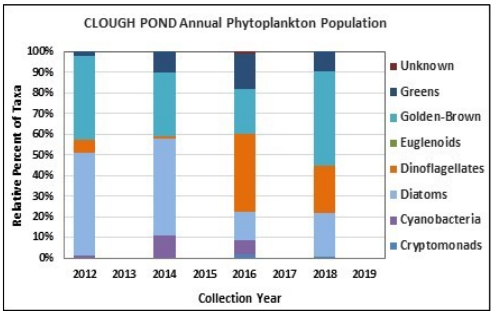


Table 1. 2019 Average Water Quality Data for CLOUGH POND - LOUDON

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	Total P mg/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	8.4	3.85	17	33	88.1	9	4.10	4.55	0.73	6.88
Metalimnion					87.2	18			2.29	6.97
Hypolimnion					96.1	20			2.34	6.24
Inlet			16		84.3	17			6.37	6.80
Outlet			17		88.0	7			0.92	7.04

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.5 mg/L
Chlorophyll-a: 4.39 ug/L
Conductivity: 42.3 uS/cm
Chloride: 5 mg/L
Total Phosphorus: 11 ug/L
Transparency: 3.3 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	Improving	Data significantly decreasing.
pH (epilimnion)	Improving	Data significantly increasing.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.