



Volunteer Lake Assessment Program Individual Lake Reports

CLEMENT POND, HOPKINTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,530	Max. Depth (m):	15.5	Flushing Rate (yr ¹):	0.9
Surface Area (Ac.):	119	Mean Depth (m):	6.6	P Retention Coef:	0.63
Shore Length (m):	3,200	Volume (m ³):	3,153,500	Elevation (ft):	417

TROPHIC CLASSIFICATION

Year	Trophic class
1979	EUTROPHIC
1990	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

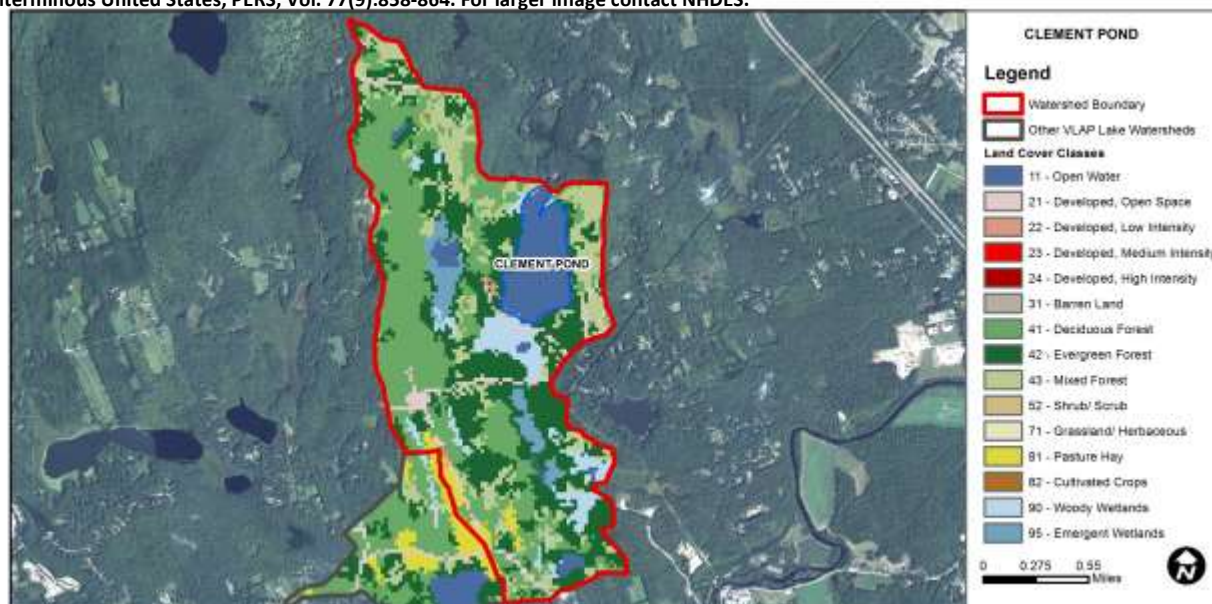
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	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.
Primary Contact Recreation	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	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	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

CLEMENT POND - CAMP MERRIMAC 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	8.73	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	3.14	Deciduous Forest	30.71	Pasture Hay	1.68
Developed-Low Intensity	0.25	Evergreen Forest	30.05	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	15.8	Woody Wetlands	6.1
Developed-High Intensity	0	Shrub-Scrub	0.14	Emergent Wetlands	3.48



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

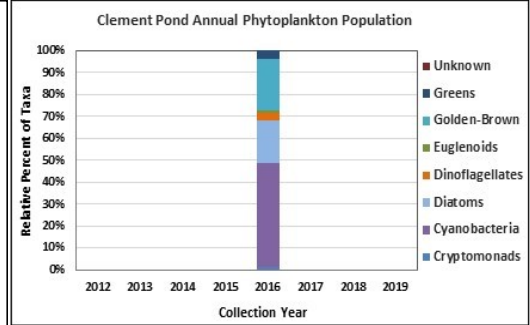
CLEMENT POND, HOPKINTON

2019 DATA SUMMARY

RECOMMENDED ACTIONS: Pond phosphorus levels were concerning, particularly in the metalimnion where levels were generally elevated all summer. However, the elevated levels did not appear to cause elevated algal growth or impact water clarity. Volunteers noted above average spring and early summer rainfall, followed by low water levels suggesting stormwater runoff caused an increase in nutrients early in the season that were retained in the pond due to low water levels later in the season. Evaluate shoreline areas, dirt/gravel roads, and watershed properties to identify areas prone to stormwater runoff and implement best practices to mitigate impacts to the pond. NHDES' "NH Homeowner's Guide to Stormwater Runoff" is a great resource. Consider applying for a grant through DES' Watershed Assistance Section to develop a Watershed Management Plan to help identify and quantify pollutant loads to the pond and make recommendations on ways to reduce nutrient loading. Keep up the great work!

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

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels fluctuated within a low range from June through September. Average chlorophyll 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, chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Outlet, and Inlet conductivity and/or chloride levels were low and approximately equal to the state median. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately tea colored in June following above average spring rainfall, and then decreased to a lightly tea colored range from July through September.
- ◆ **E. COLI:** Inlet E. coli levels were less than the state standard of 406 cts/100 mL for surface waters.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were low in June and July, increased to an elevated level in August, and then decreased to a low level in September. Average epilimnetic phosphorus level increased from 2018 and was greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level was generally elevated on each sampling event, particularly in June and August. Hypolimnetic phosphorus level was moderate from June through August and elevated in September when the turbidity of the sample was also elevated. Inlet turbidity levels fluctuated within a normal range for that station. Outlet phosphorus level was elevated in August.
- ◆ **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was within an average range in June, remained relatively stable through August, and then increased (improved) in September. Average NVS transparency decreased slightly from 2018 and was slightly higher (better) than the state median. Historical trend analysis indicates stable transparency since monitoring began. Viewscope transparency (VS) was generally higher (better) than NVS transparency, increased (improved) steadily as the summer progressed, and is likely a better measure of actual conditions.
- ◆ **TURBIDITY:** Epilimnetic, Inlet and Outlet turbidity levels fluctuated within low to average ranges for those stations. Metalimnetic turbidity levels were slightly elevated in July and were generally above average all summer. Hypolimnetic turbidity levels were slightly elevated in September.
- ◆ **pH:** Epilimnetic and Outlet pH levels were within the desirable range 6.5-8.0 units, however historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH levels since monitoring began. Metalimnetic, Hypolimnetic and Inlet pH levels were slightly acidic and 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
> 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. 2019 Average Water Quality Data for CLEMENT POND - HOPKINTON										
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	E. coli mpn/100ml	Total P mg/l	Trans. m		Turb. ntu	pH
Epilimnion	10.4	3.43	5	40	47.3	14	14	3.55	4.32	0.57	7.05
Metalimnion					48.7	20				1.06	6.22
Hypolimnion					48.6	16				1.26	6.14
Hardy Brook Outlet			5		46.3	15				0.51	7.10
Hopkinton Inlet			7		53.4	201	19			1.08	6.14

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

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)	Worsening	Data significantly decreasing.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.

