Volunteer Lake Assessment Program Individual Lake Reports
LONG POND, LEMPSTER, NH

MORPHOMETRIC DATA

						TROPHIC CLASSIFICATION	KNOWN EXOTIC SPECIES

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Watershed Area (Ac.):	1,154	Max. Depth (m):	20.3	Flushing Rate (yr¹)	12	**Year**	**Trophic class**
Surface Area (Ac.):	120	Mean Depth (m):	4.8	P Retention Coef:		1984	OLIGOTROPHIC
Shore Length (m):	4,500	Volume (m³):	2,249,500	Elevation (ft):	1548	2002	OLIGOTROPHIC

The Waterbody Report Card tables are generated from the DRAFT 2020 305(b) report on the status of N.H. waters, and are based on data collected from 2010-2019. Detailed waterbody assessment and report card information can be found at **NHDES' Water Quality Assessment Website.**

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	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.
	pH	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large 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	Very Good	Sampling data is 50 percent better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

VLAP SAMPLE STATION MAP: This map depicts the location of routine sampling stations discussed on page two of the report.
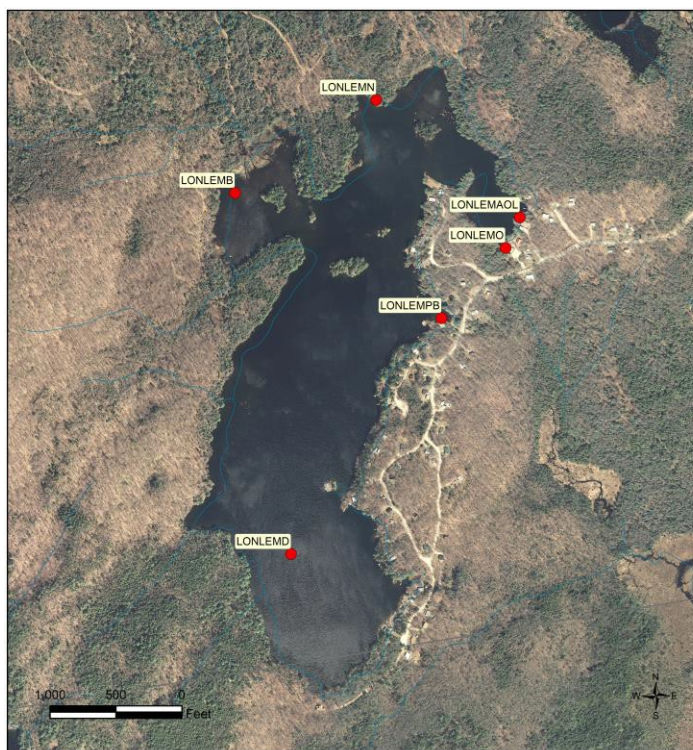
LONG POND LEM
LEMPSTER
VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
LONLEMB	BACK COVE
LONLEMD	DEEP SPOT
LONLEMN	NORTH INLET
LONLEMO	OUTLET IN STREAM
LONLEMPB	PUBLIC BEACH
LONLEMAOL	NEAR OUTLET IN LAKE

Source: The data layers are derived from NHDES data and are under constant revision. NHDES is not responsible for the use or interpretation of this information. Not intended for legal use. NHDES Watershed Management Bureau   Date: 2/17/2021

Recommended Actions: Great job sampling in 2020! Pond quality is representative of oligotrophic, or high quality conditions. Epilimnetic pH levels have steadily increased (improved) since 2008 and we hope to see this continue! Pond clarity or transparency has declined since monitoring began and may be due to an increase in algal growth within the Metalimnion or thermocline of the pond. Or, it could be a result of the pond becoming darker, or more tea colored, over time as measured by apparent color. Hypolimnetic phosphorus levels have been elevated in late summer potentially due to the release of phosphorus from bottom sediments as dissolved oxygen levels decrease, a process called internal loading. This internal load could fuel late season algal/cyanobacteria blooms or surface scums. A cyanobacteria scum was reported at Long Pond in 2020. Continue to report any blooms or scums to NHDES' Harmful Algal Bloom Program HAB@des.nh.gov. If possible, increase monitoring frequency to once per month, typically June, July and August, to better assess seasonal variations and historical trends, particularly in hypolimnetic dissolved oxygen and phosphorus levels. Keep up the great work!

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

⬥ **Chlorophyll-a:** Chlorophyll sample was not collected in 2020; we apologize for the error. 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), and Back Cove conductivity and/or chloride levels were very low and less than the state medians. Historical trend analysis indicates significantly decreasing (improving) epilimnetic conductivity levels since monitoring began.

⬥ **Color:** Apparent color measured in the epilimnion indicates the water was clear with no tea, or brown, coloring in August.

⬥ **Total Phosphorus:** Epilimnetic and Metalimnetic phosphorus levels were within a low range. Epilimnetic phosphorus level remained stable with 2019 and was much less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates stable, yet variable, epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus level was elevated potentially indicating the release of phosphorus from bottoms sediments under anoxic (low dissolved oxygen) conditions.

⬥ **Transparency:** Transparency measured without the viewscope (NVS) was below average (worse) for the pond in August. NVS transparency decreased (worsened) from 2019 but remained much higher (better) than the state median. However, historical trend analysis indicates significantly decreasing (worsening) NVS transparency since monitoring began. Transparency measured with the viewscope (VS) was much higher (better) than NVS transparency, however historical trend analysis indicates significantly decreasing (worsening) VS transparency since 2006.

⬥ **Turbidity:** Epilimnetic, Metalimnetic, Hypolimnetic, and Back Cove turbidity levels were within a low range.

⬥ **pH:** Epilimnetic pH level was within the desirable range 6.5-8.0 units and historical trend analysis indicates significantly increasing (improving) epilimnetic pH levels since monitoring began. We hope to see this continue! Metalimnetic, Hypolimnetic and Back Cove pH levels were slightly acidic and less than desirable.

Dissolved Oxygen & Temperature Profile 2020
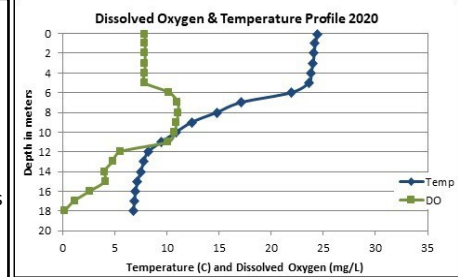
Station Name	Table 1. 2020 Average Water Quality Data for LONG POND - LEMPSTER								
	Alk. (mg/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
						NVS	VS		
Epilimnion	1.2	3	0	11.1	3	7.10	9.35	0.15	6.54
Metalimnion				11.3	7			0.41	5.98
Hypolimnion				13.7	16			0.40	5.57
Back Cove				11.3				0.20	6.06

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	Improving	Data significantly decreasing.	Chlorophyll-a	Stable	Trend not significant; data highly variable.
pH (epilimnion)	Improving	Data significantly increasing.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.

Historical Trend Epilimnetic Conductivty and pH

Historical Chlorophyll-a, Epilimnetic Phosphorus & Transparency Data