Volunteer Lake Assessment Program Individual Lake Reports

CRYSTAL LAKE, MANCHESTER, NH

MORPHOMETRIC DATA | **TROPHIC CLASSIFICATION** | **KNOWN EXOTIC SPECIES**

Watershed Area (Ac.):	200	**Max. Depth (m):**	6.4	**Flushing Rate (yr^{1}):**	1.8	**Year**	**Trophic class**	
Surface Area (Ac.):	19	**Mean Depth (m):**	2.9	**P Retention Coef:**	0.66	1981	EUTROPHIC	
Shore Length (m):	1,100	**Volume (m^{3}):**	217,000	**Elevation (ft):**	206	1997	MESOTROPHIC	

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)	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	pH	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
	Oxygen, Dissolved	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Dissolved oxygen satura	Slightly Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a small margin.
	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

CRYSTAL LAKE - MELODY PINES DAY CAMP BEACH	Escherichia coli	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
CRYSTAL LAKE-TOWN BEACH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.

VLAP SAMPLE STATION MAP: This map depicts the location of routine sampling stations discussed on page two of the report.

CRYSTAL LAKE
MANCHESTER
VOLUNTEER LAKE ASSESSMENT PROGRAM

STATIONID	STATION NAME
CRYMAND	DEEP SPOT

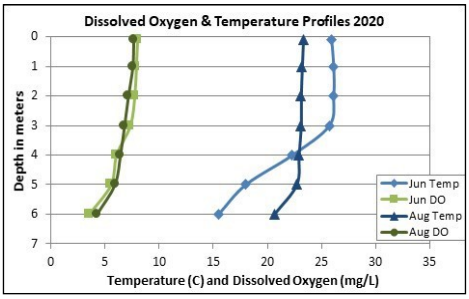
Source: The data layers are derived from NHDES data and are under constant revision. NHDES is not responsible for the use or interpretation of this information. Not intended for legal use.NHDES Watershed Management Bureau Date: 2/17/2021

Volunteer Lake Assessment Program Individual Lake Reports
Crystal Lake, Manchester
2020 Data Summary

Recommended Actions: Great job sampling in 2020! Lake quality is representative of mesotrophic, or average conditions, and the stable water quality trends are a positive sign. Nutrient levels increased in 2020 likely due to drought conditions however algal growth remained low which is a positive sign. Lake conductivity levels decreased from the elevated levels measured between 2016-2019. We hope to see this continue as chloride levels are approaching the state chronic chloride standard and could be toxic to aquatic life. Continue to encourage City and local winter maintenance companies to utilize best practices when applying de-icing materials on roads, parking lots, driveways, and walkways. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll level was moderate in June and decreased to a low level in August. Average chlorophyll level remained stable with 2019 and was slightly less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity and chloride levels remained elevated and much greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- **Color:** Apparent color measured in the epilimnion indicates the water was borderline clear to lightly tea colored, or light brown.
- **Total Phosphorus:** Epilimnetic phosphorus level was low in June and increased to a slightly elevated level in August. Average epilimnetic phosphorus level increased from 2019 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 and Hypolimnetic phosphorus levels were within a slightly elevated range and increased slightly from June to August.
- **Transparency:** Transparency measured without the viewscope (NVS) was below average (worse) in June potentially to due algal growth and then increased (improved) slightly in August despite high wind and wave conditions. Average NVS transparency decreased slightly from 2019 and was slightly less than the state median. Historical trend analysis indicates relatively stable transparency since monitoring began. Viewscope transparency (VS) was also below average but higher (better) than NVS transparency and likely a better measure of actual conditions.
- **Turbidity:** Epilimnetic, Metalimnetic and Hypolimnetic turbidity levels were within a low range.
- **pH:** Epilimnetic, Metalimnetic and Hypolimnetic pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began.



Station Name	Table 1. 2020 Average Water Quality Data for CRYSTAL LAKE - MANCHESTER									
	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	21	4.14	132	25	422.5	14	3.12	3.38	0.64	7.04
Metalimnion					418.0	16			0.71	7.08
Hypolimnion			142		413.0	19			0.81	6.94

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	Stable	Trend not significant; data show low variability.
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 show low variability.