



Volunteer Lake Assessment Program Individual Lake Reports

DANFORTH POND, LOWER, FREEDOM, NH

MORPHOMETRIC DATA
TROPHIC CLASSIFICATION
KNOWN EXOTIC SPECIES

Watershed Area (Ac.):	11,776	Max. Depth (m):	16.8	Flushing Rate (yr¹)	31.6	Year	Trophic class	Variable Milfoil
Surface Area (Ac.):	32	Mean Depth (m):	7.1	P Retention Coef:	0.07	1983	MESOTROPHIC	
Shore Length (m):	1,400	Volume (m³):	918,500	Elevation (ft):	408	2001	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)	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	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
	Dissolved oxygen satura	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
	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	Good	Sampling data commonly 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.



**LOWER DANFORTH POND
FREEDOM
VOLUNTEER LAKE ASSESSMENT PROGRAM**

STATIONID	STATION NAME
DANLFRED	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





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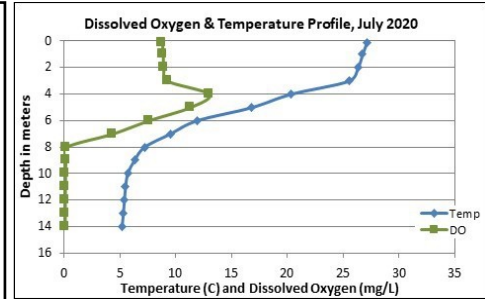
Lower Danforth Pond, Freedom

2020 Data Summary

Recommended Actions: Great job sampling in 2020! Pond quality is generally representative of mesotrophic, or average conditions, with chlorophyll levels occasionally exceeding the threshold for mesotrophic lakes. The improving phosphorus levels in surface waters is a positive sign, however hypolimnetic phosphorus levels have significantly increased. The pond experiences severe depletion of dissolved oxygen in hypolimnetic waters which causes a release of phosphorus from bottom sediments, decreased pH, and increased conductivity and turbidity. The internal load has increased in severity particularly since 2018. This has likely fueled elevated algal/cyanobacteria growth. This highlights the importance of minimizing nutrient loads and sediment erosion from the watershed, particularly from stormwater runoff. Consider partnering with the NH DES Soak Up the Rain program to implement stormwater management projects within the watershed. Encourage shoreline property owners to be certified LakeSmart through NHLAKES lake-friendly living program www.nhlakes.org/lakesmart/. Keep up the great work!

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

- ◆ **Chlorophyll-a:** Chlorophyll level was within a low range in July, decreased from 2019, and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- ◆ **Conductivity/Chloride:** Epilimnetic (upper water layer) and Metalimnetic (middle water layer) conductivity levels were within a low range for NH lakes and slightly greater than the state median. Epilimnetic chloride level was also within a low range for NH lakes and slightly greater than the state median. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Hypolimnetic conductivity levels were slightly elevated and greater than the state median due to the release of dissolved compounds from bottom sediments under anoxic (low dissolved oxygen) conditions.
- ◆ **Color:** Apparent color measured in the epilimnion indicates the water was lightly tea colored, or light brown.
- ◆ **Total Phosphorus:** Epilimnetic and Metalimnetic phosphorus levels were within a low range in July. Epilimnetic phosphorus level decreased from 2019 and was much less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. We hope to see this continue! Hypolimnetic phosphorus level was greatly elevated due to the release of phosphorus from bottom sediments under anoxic conditions. Historical trend analysis indicates significantly increasing (worsening) hypolimnetic phosphorus levels since monitoring began.
- ◆ **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was within an average range for the pond in July. NVS transparency increased (improved) slightly from 2019 and was higher (better) than the state median. Historical trend analysis indicates relatively stable NVS transparency since monitoring began.
- ◆ **Turbidity:** Epilimnetic and Metalimnetic turbidity levels were within a low range in July. Hypolimnetic turbidity level was greatly elevated due to the formation and accumulation of organic compounds under anoxic conditions.
- ◆ **pH:** Epilimnetic pH level was within the desirable range 6.5-8.0 units and historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Metalimnetic and Hypolimnetic pH levels were slightly acidic and potentially critical to aquatic life.



Station Name	Table 1. 2020 Average Water Quality Data for LOWER DANFORTH POND - FREEDOM									
	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	2.4	2.73	12	30	56.8	6	4.10	4.50	0.34	6.95
Metalimnion					57.6	7			0.92	5.94
Hypolimnion					128.9	31			24.9	5.44

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 moderately variable.
pH (epilimnion)	Stable	Trend not significant; data show low variability.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.

