



## Volunteer Lake Assessment Program Individual Lake Reports

### NUTT POND, MANCHESTER, NH

#### MORPHOMETRIC DATA

Watershed Area (Ac.):	415	Max. Depth (m):	9.2	Flushing Rate (yr <sup>1</sup> )	3.1
Surface Area (Ac.):	16	Mean Depth (m):	4	P Retention Coef:	0.53
Shore Length (m):	950	Volume (m <sup>3</sup> ):	260,500	Elevation (ft):	237

#### TROPHIC CLASSIFICATION

Year	Trophic class
1981	EUTROPHIC
1995	MESOTROPHIC

#### KNOWN EXOTIC SPECIES

Brazilian Elodea

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](http://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 this parameter by a small margin.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a small margin.
	Oxygen, Dissolved	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
	Dissolved oxygen satura	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Chlorophyll-a	Slightly Bad	Data exceed water quality standards or thresholds for this parameter by a small margin.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.

#### 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	0.8	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	14.4	Deciduous Forest	3.22	Pasture Hay	0
Developed-Low Intensity	18.4	Evergreen Forest	0.59	Cultivated Crops	0
Developed-Medium Intensity	50.9	Mixed Forest	0	Woody Wetlands	0.01
Developed-High Intensity	10.9	Shrub-Scrub	0	Emergent Wetlands	0.52



# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

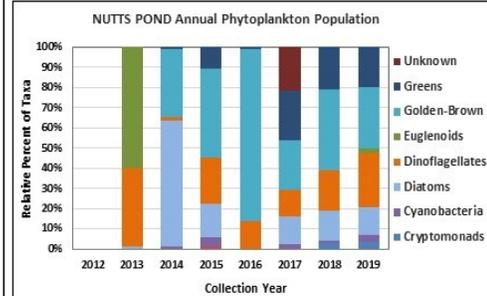
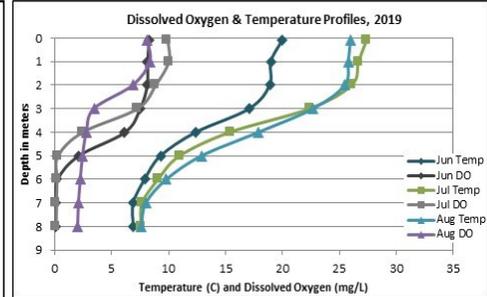
## NUTTS POND, MANCHESTER

### 2019 DATA SUMMARY

**RECOMMENDED ACTIONS:** The improved phosphorus and chlorophyll levels are encouraging however levels remain higher than desirable for a mesotrophic lake. Conductivity and chloride levels have significantly increased, particularly since 2013. Evaluate management activities related to the application of winter de-icing materials on parking lots and roadways. Continue to measure apparent color as the pond experiences large fluctuations in color which also impacts water clarity. Nutts Pond is surrounded by a highly urbanized watershed which contributes to poor water quality. As the percentage of impervious surfaces increases (paved roads, driveways, rooftops) with development, so does the volume of stormwater runoff entering the pond. Stormwater runoff carries pollutants and nutrients, such as phosphorus and nitrogen, into the pond which in turn contribute to elevated plant and algal growth, and low dissolved oxygen levels. 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 slightly elevated level in July, and then increased to an elevated level in August. Average chlorophyll level increased slightly from 2018 and was greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Deep spot, Inlet and Outlet conductivity and chloride levels remained elevated and chloride levels exceeded the state chronic chloride standard on each sampling event. Historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity levels since monitoring began.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was lightly tea colored, or light brown, in June and became darker as the summer progressed.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were within a moderate range and remained stable from June to August. Average epilimnetic phosphorus level remained stable with 2018 and was greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. Metalimnetic (middle water layer) phosphorus levels were slightly elevated in June and July and increased greatly to elevated levels in August when algal growth was elevated. Hypolimnetic (lower water layer) phosphorus levels were elevated but remained stable from June to August and historical trend analysis indicates significantly decreasing (improving) hypolimnetic phosphorus levels since monitoring began. Inlet phosphorus levels were elevated in June, decreased to a moderate level in July, and then increased to an elevated level in August and was the highest measured since monitoring began. Outlet phosphorus levels fluctuated within a moderate range.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in June when algal growth was low, and decreased (worsened) as the summer progressed and algal growth increased. Average NVS transparency remained stable with 2018 and was less than the state median. Historical trend analysis indicates highly variable transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic and Outlet turbidity levels were low in June and July and elevated in August due to algal growth. Metalimnetic turbidity increased from low to elevated as the summer progressed and algal growth increased. Hypolimnetic turbidity levels were greatly elevated on each sampling event but decreased as the summer progressed. Inlet turbidity levels were slightly elevated in June and August and low levels of sediment were noted in the samples.
- ◆ **pH:** Epilimnetic, Metalimnetic, Inlet, and Outlet pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Hypolimnetic pH levels fluctuated around the low end of the desirable range.



**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)

**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

Station Name	Table 1. 2019 Average Water Quality Data for NUTTS POND - MANCHESTER									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	Total P mg/l	Trans. m		Turb. ntu	pH
Epilimnion	24.1	6.89	304	63	1011.3	18	2.38	2.67	1.77	7.21
Metalimnion					1687.0	44			3.20	6.68
Hypolimnion					2780.0	64			39.60	6.43
Inlet			461		1477.7	77			1.58	7.06
Outlet			307		1007.3	19			1.86	7.14

### HISTORICAL WATER QUALITY TREND ANALYSIS

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

