



## 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

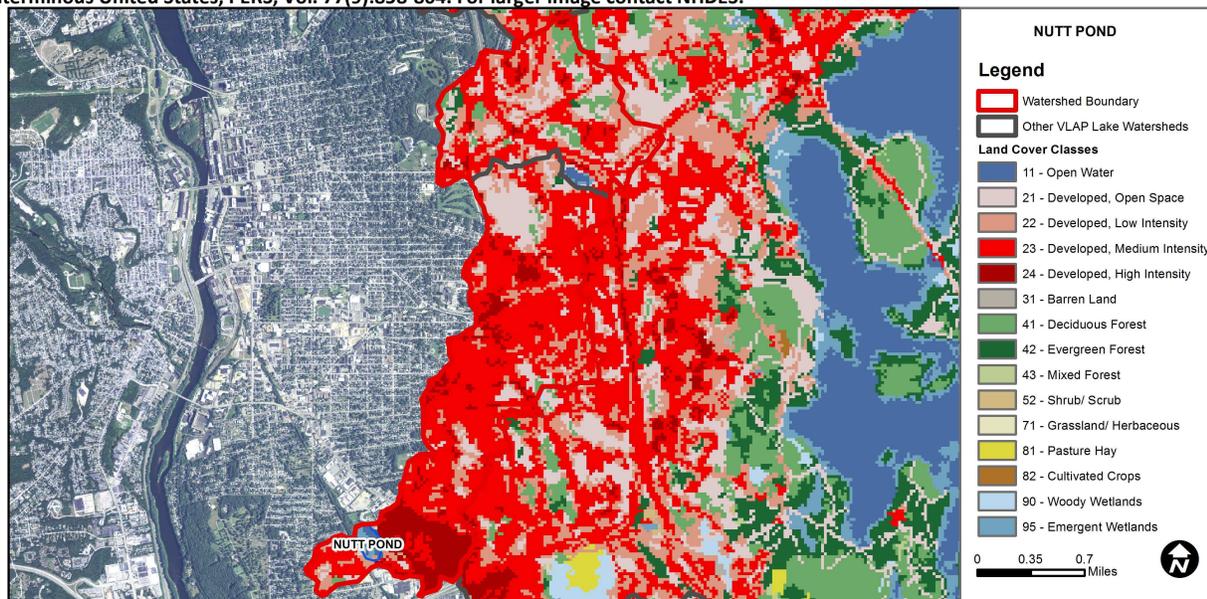
Brazilian Elodea

The Waterbody Report Card tables are generated from the DRAFT 2016 305(b) report on the status of N.H. waters, and are based on data collected from 2006-2015. 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	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large 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

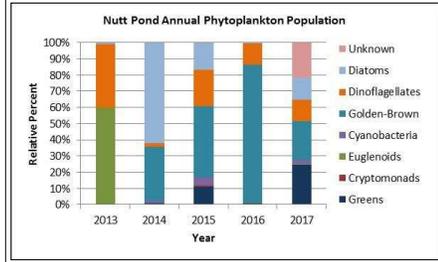
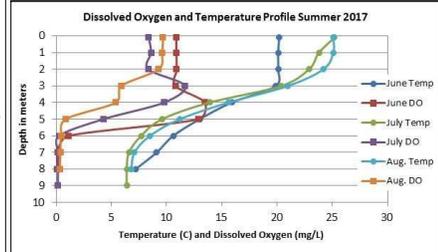
## NUTTS POND, MANCHESTER

### 2017 DATA SUMMARY

**RECOMMENDED ACTIONS:** The improved phosphorus levels are encouraging however levels remain higher than desirable for a mesotrophic lake and often feeds excess algal growth. 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 to determine why there has been a spike. 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 levels were moderate in June, increased to an elevated level indicative of an algal bloom in July, and then decreased back to a moderate level in August. Average chlorophyll level decreased from 2016 but remained much greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Deep spot, Inlet and Outlet conductivity and chloride levels were greatly elevated and chloride levels exceeded the state chronic chloride standard of 230 mg/L. Historical trend analysis indicates significantly increasing epilimnetic (upper water layer) conductivity levels since monitoring began, particularly since 2013.
- **COLOR:** Apparent color was measured in the epilimnion and indicates the pond water is moderately tea colored, or brown.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were within a moderate to slightly elevated range and remained stable from June to July, and then decreased slightly in August. Average epilimnetic phosphorus decreased slightly from 2016 and remained greater 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! Metalimnetic (middle water layer) phosphorus levels were low in June and increased to slightly elevated levels as the summer progressed. Hypolimnetic (lower water layer) phosphorus levels were elevated on each sampling event. Inlet phosphorus levels were within an average range for that station in June and August and were slightly elevated in July. Outlet phosphorus levels fluctuated within a moderate range.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in June, decreased (worsened) slightly in July, and decreased again in August. Average NVS transparency remained stable with 2016 and was slightly less than the state median. Historical trend analysis indicates highly variable transparency since monitoring began.
- **TURBIDITY:** Epilimnetic and Metalimnetic phosphorus levels fluctuated within a low to moderate range and were within an average range for those stations. Hypolimnetic turbidity levels were greatly elevated on each sampling event. Inlet and Outlet turbidity levels were low in June and August and slightly elevated in July.
- **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 fluctuated slightly below the desirable range.



Station Name	Table 1. 2017 Average Water Quality Data for NUTT POND-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	20.8	8.02	305	47	989.3	16	3.00	3.08	1.61	7.29
Metalimnion					1820.0	17			2.26	6.64
Hypolimnion					2570.0	54			105.9	6.45
Inlet			512		1646.0	31			1.38	6.86
Outlet			299		964.0	18			1.74	7.17

**NH Median Values:** Median values for specific parameters generated from historic lake monitoring data.  
**Alkalinity:** 4.9 mg/L  
**Chlorophyll-a:** 4.58 mg/m<sup>3</sup>  
**Conductivity:** 40.0 uS/cm  
**Chloride:** 4 mg/L  
**Total Phosphorus:** 12 ug/L  
**Transparency:** 3.2 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 highly variable.
pH (epilimnion)	Stable	Trend not significant; data show low variability.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.

