



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 ⁻¹):	3.1
Surface Area (Ac.):	16	Mean Depth (m):	4	P Retention Coef:	0.53
Shore Length (m):	950	Volume (m ³):	260,500	Elevation (ft):	237

TROPIC CLASSIFICATION

Year	Trophic class
1981	EUTROPHIC
1995	MESOTROPHIC

KNOWN EXOTIC SPECIES

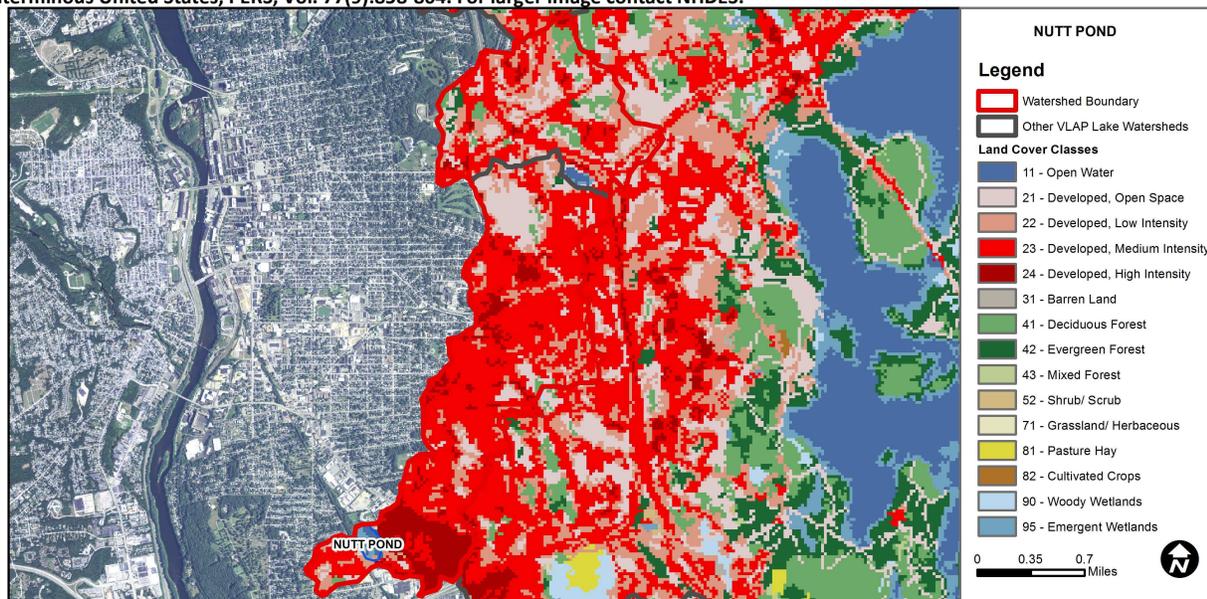
Brazilian Elodea

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/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	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	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

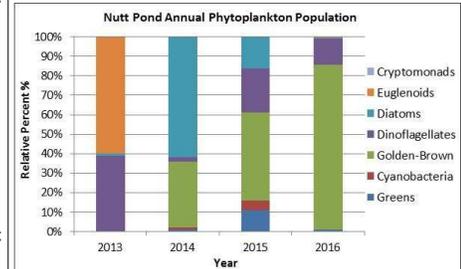
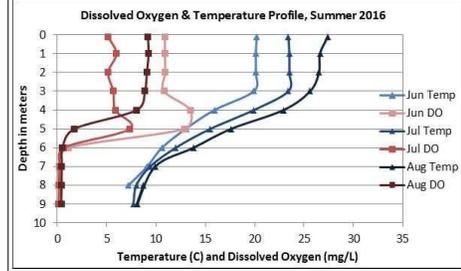
NUTTS POND, MANCHESTER

2016 DATA SUMMARY

RECOMMENDED ACTIONS: The improved phosphorus levels are encouraging however algal growth has steadily increased in the pond since 2011 and is not correlated with the decreased phosphorus concentrations. It is recommended to add nitrogen sampling in future years to evaluate total phosphorus and total nitrogen ratios as nitrogen may be contributing to the algal growth in the system. 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. Keep up the great work!

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

- CHLOROPHYLL-A:** Chlorophyll levels were elevated and indicative of algal blooms in June and August. The 2016 average chlorophyll level increased sharply from 2015 and was much greater than the state median. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- CONDUCTIVITY/CHLORIDE:** Deep spot, Inlet and Outlet conductivity and chloride levels remained greatly elevated and much greater than the state medians. Epilimnetic (upper water layer) and Outlet chloride levels exceeded the state chronic chloride standard of 230 mg/L. Inlet conductivity and chloride, while still elevated, decreased as the summer progressed. Average epilimnetic conductivity was the highest measured since monitoring began and historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- TOTAL PHOSPHORUS:** Epilimnetic phosphorus was average in June, increased to slightly elevated levels in July and then decreased to average levels in August. Average epilimnetic phosphorus level increased slightly from 2015 and was slightly greater than the state median. Metalimnetic (middle water layer) phosphorus was greatly elevated in June, decreased to average levels in July and then increased to slightly elevated levels in August. The June phosphorus spike likely was a result of a thick layer of algae as indicated by the dissolved oxygen profile which indicates a layer of algae between 4 and 5 meters. Hypolimnetic phosphorus levels remained elevated and increased as the summer progressed under anoxic conditions. Historical trend analysis indicates significantly decreasing epilimnetic, metalimnetic and hypolimnetic phosphorus levels since monitoring began. We hope to see this continue! Inlet phosphorus levels were elevated and increased from June to August. Outlet phosphorus levels also increased slightly from June to August but remained within an average range for that station.
- TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was low in June, increased (improved) in July when algal growth was lower, and then remained fairly stable in August. Average NVS transparency remained stable with 2015 and was slightly less than the state median. Historical trend analysis indicates highly variable transparency since monitoring began.
- TURBIDITY:** Epilimnetic turbidity was slightly elevated in June when algal growth was high, and during strong wind and wave conditions. The slightly elevated level continued in July following a significant storm event and then decreased to a low level in August. Metalimnetic turbidity levels were slightly elevated in June and July and increased slightly in August. Hypolimnetic turbidity levels were elevated and increased as the summer progressed due to the formation and accumulation of organic compounds under anoxic conditions. Inlet turbidity was low in June and then increased to average levels in July and August. Outlet turbidity levels were slightly elevated in June and July and decreased in August.
- PH:** Epilimnetic, Metalimnetic, Inlet, and Outlet pH levels remained within the desirable range 6.5-8.0 units while Hypolimnetic pH levels fluctuated below the desirable range. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began.



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:** 4.9 mg/L
- Chlorophyll-a:** 4.58 mg/m³
- Conductivity:** 40.0 uS/cm
- Chloride:** 4 mg/L
- Total Phosphorus:** 12 ug/L
- Transparency:** 3.2 m
- pH:** 6.6

Station Name	Table 1. 2016 Average Water Quality Data for NUTT POND-MANCHESTER								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	23.8	18.40	390	1355.3	17	2.92	3.04	1.82	6.93
Metalimnion				1451.3	80			2.87	7.05
Hypolimnion				2463.3	78			110.37	6.51
Inlet			224	862.0	46			1.24	6.67
Outlet			387	1369.3	18			2.00	7.46

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.

