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

TROPHIC CLASSIFICATION

Year	Trophic class
1981	EUTROPHIC
1995	MESOTROPHIC

KNOWN EXOTIC SPECIES

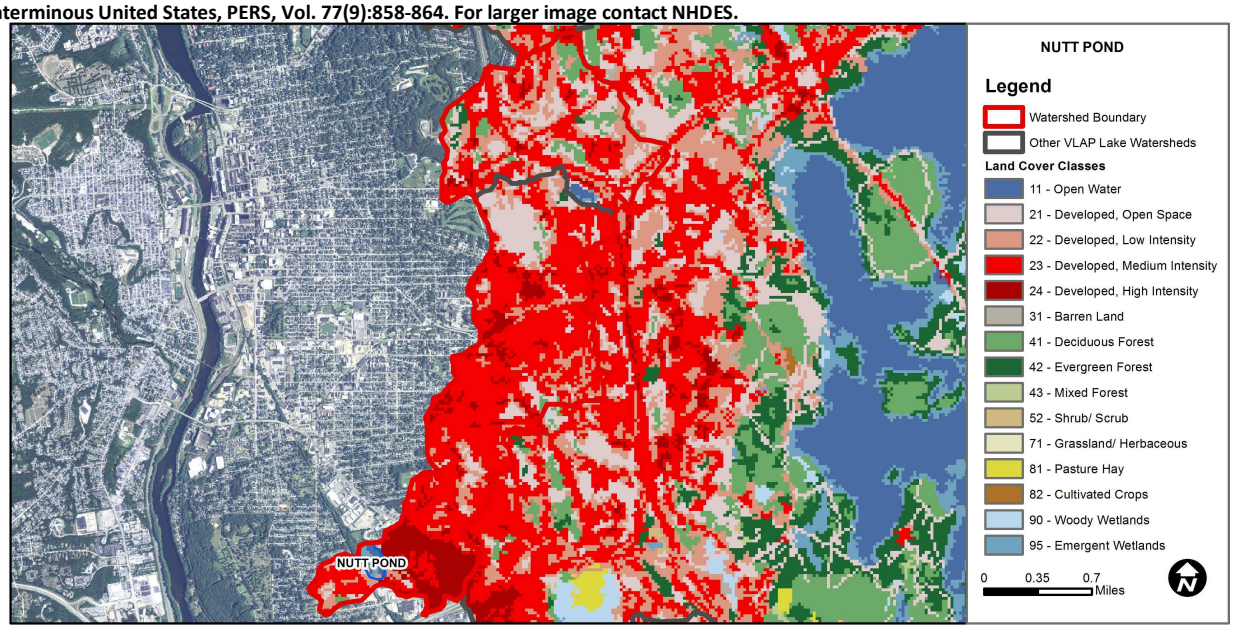
Brazilian Elodea

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

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	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	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.



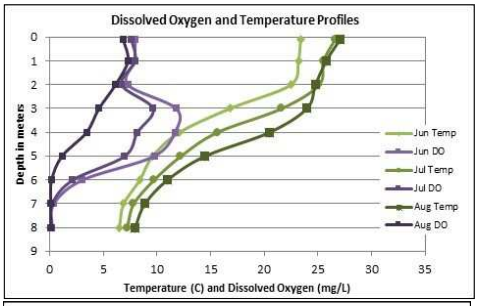
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	0.8	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	14.4	Deciduous Forest	3.22	Pasture Hay	0
Developed-Low Intensity	18.4	Evergreen Forest	0.59	Cultivated Crops	0
Developed-Medium Intensity	50.9	Mixed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

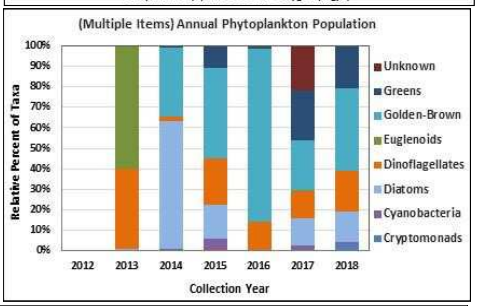
Volunteer Lake Assessment Program Individual Lake Reports
Nutts Pond, Manchester
2018 Data Summary

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 to determine why there has been a spike. 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 levels were low in June, increased to slightly elevated levels in July, and then decreased slightly in August. Average chlorophyll level decreased from 2017, was slightly greater than the state median, and was approximately equal to 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. Historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity levels since monitoring began. The above average rainfall prior to sampling resulted in a significant decrease in conductivity and chloride levels in August.
- **Color:** Apparent color was measured in the epilimnion and increased from lightly tea colored in June to highly tea colored in August following the significant rainfall.
- **Total Phosphorus:** Epilimnetic phosphorus levels were low in June, remained stable in July, and increased to elevated level in August. Average epilimnetic phosphorus level remained stable with 2017 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 low in June and increased to a moderate range as the summer progressed. Hypolimnetic (lower water layer) phosphorus levels were slightly elevated in June and increased to elevated range as the summer progressed. Inlet phosphorus levels were slightly elevated in July and August, and Outlet phosphorus levels were slightly elevated in August.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in June and then decreased (worsened) as the summer progressed and was particularly low in August following the storm events. Average NVS transparency decreased slightly from 2017 and was less than the state median. Historical trend analysis indicates highly variable transparency since monitoring began.
- **Turbidity:** Epilimnetic and Outlet turbidity levels were elevated in August. Metalimnetic turbidity levels were slightly elevated in July and August likely due to algal growth. Hypolimnetic turbidity levels were greatly elevated in July and August. Inlet turbidity levels were 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 levels were approximately equal to the low end of the desirable range.

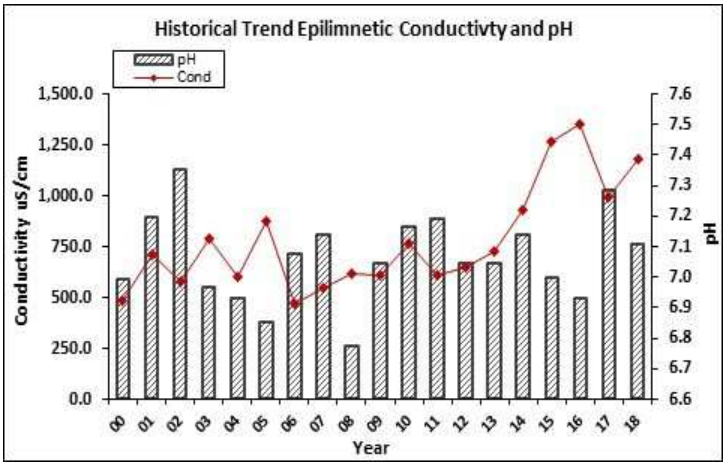
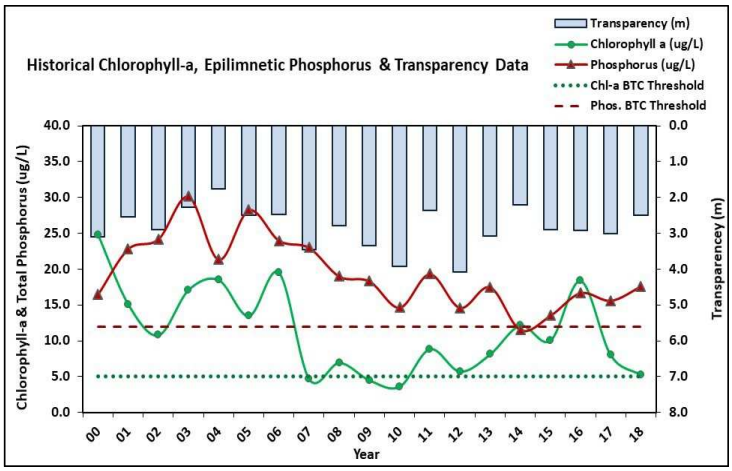




NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 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 mg/m^3
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. 2018 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 mg/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	21.2	5.23	353	63	1181.7	18	2.50	2.79	1.88	7.11
Metalimnion					1745.7	17			2.49	6.97
Hypolimnion					2773.3	69			37.53	6.48
Inlet			500		1661.3	36			2.20	6.99
Outlet			350		1162.0	22			1.75	7.10

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.