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

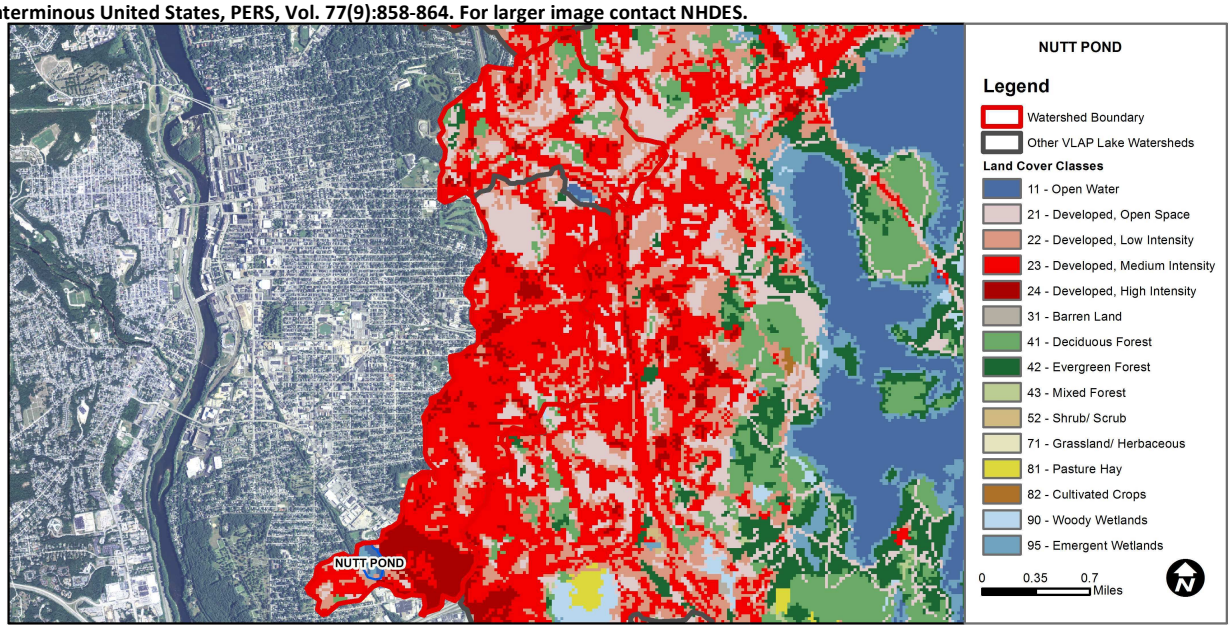
Brazilian Elodea

The Waterbody Report Card tables are generated from the DRAFT 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	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Bad	There are >10% of samples (minimum of 2), exceeding indicator with one or more samples considered large exceedance.

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

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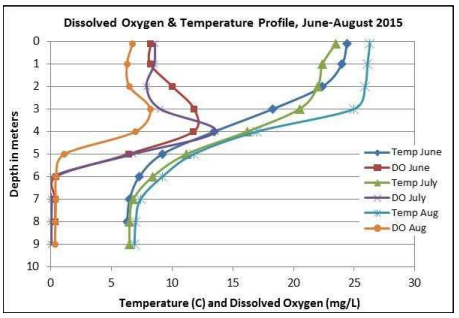
Nutts Pond, Manchester

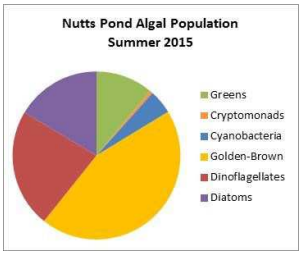
2015 Data Summary

Recommended Actions: The improving deep spot and Outlet phosphorus levels as well as the improving chlorophyll levels are encouraging and we hope to see this continue! 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, into the pond which in turn contribute to elevated plant and algal growth, and low dissolved oxygen. However, the improving trends are a positive sign and reflect management activities in the watershed. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll levels remained stable from June to July and then decreased slightly in August and remained within an elevated range. The 2015 average chlorophyll level decreased slightly from 2014 and was much greater than the state median. However, historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began. We hope to see this continue!
- **Conductivity/Chloride:** Deep spot, Inlet and Outlet chloride and conductivity levels remained elevated and much greater than the state medians. Epilimnetic (upper water layer), Inlet and Outlet chloride levels exceeded the state chronic chloride standard of 230 mg/L on each sampling event and epilimnetic conductivity increased sharply in 2015 during the dry weather conditions and following a harsh winter with above average snowfall and snowmelt. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began.
- **Total Phosphorus:** Epilimnetic phosphorus was average in June, increased to slightly elevated levels in July and then decreased to an average level in August. Average epilimnetic phosphorus increased slightly from 2014 and was slightly greater than the state median. Metalimnetic (middle water layer) phosphorus levels were elevated in June, decreased to average levels in July, and then increased to slightly elevated levels in August. Hypolimnetic phosphorus levels were elevated and increased as the summer progressed under anoxic conditions. Historical trend analysis indicates significantly decreasing (improving) epilimnetic, metalimnetic and hypolimnetic phosphorus levels since monitoring began. We hope to see this continue! Inlet phosphorus levels were slightly elevated on each sampling event. Outlet phosphorus levels were within an average range on each sampling event and historical trend analysis indicates significantly decreasing (improving) Outlet phosphorus levels since monitoring began.
- **Transparency:** Transparency was average in June, decreased (worsened) in July, and then increased (improved) to average level in August. Average transparency increased (improved) slightly from 2014 and was slightly less than (worse than) the state median. Historical trend analysis indicates highly variable transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity was average in June and increased to slightly elevated levels in July. Metalimnetic turbidity was slightly elevated on each sampling event, and hypolimnetic turbidity was greatly elevated on each sampling event due to the formation and accumulation of organic compounds in hypolimnetic waters under anoxic conditions.
- **pH:** Epilimnetic, Inlet and Outlet pH levels were within the desirable range 6.5-8.0 units, however metalimnetic and hypolimnetic pH fluctuated below the desirable range.





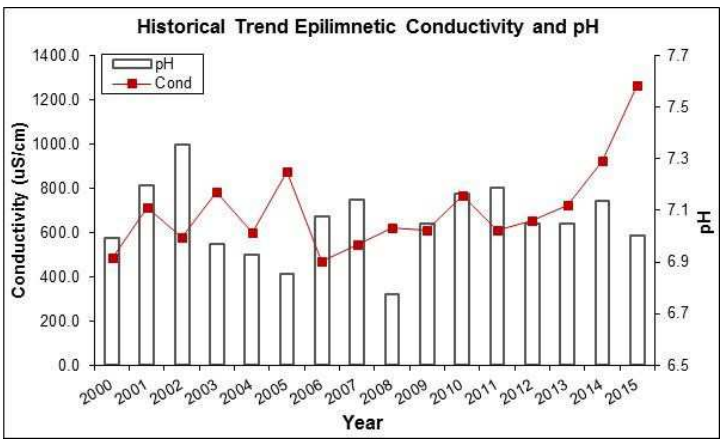
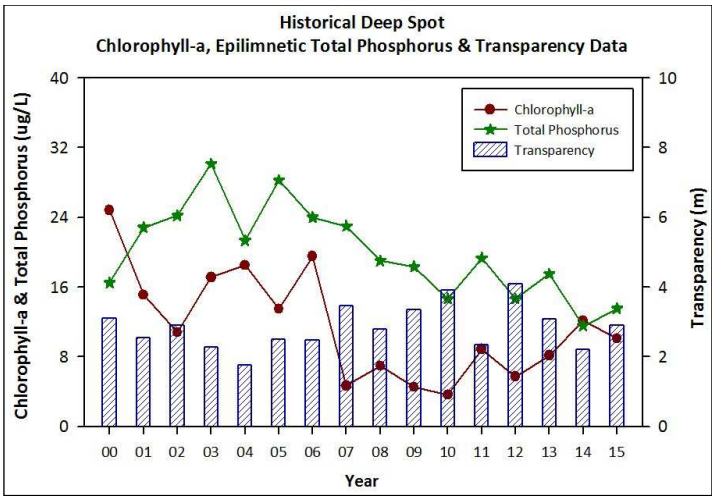
Station Name	Table 1. 2015 Average Water Quality Data for NUTT POND								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	22.6	10.05	370	1265.0	14	2.89	2.89	1.86	7.00
Metalimnion				1986.3	22			4.01	6.65
Hypolimnion				2796.7	72			78.93	6.45
Inlet			447	1577.3	24			0.97	6.80
Outlet			373	1258.3	14			1.82	6.96

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/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

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 moderately variable.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.