



Volunteer Lake Assessment Program Individual Lake Reports

FOREST LAKE, WINCHESTER, NH

MORPHOMETRIC DATA

TROPHIC CLASSIFICATION

KNOWN EXOTIC SPECIES

Watershed Area (Ac.):	4,480	Max. Depth (m):	9.8	Flushing Rate (yr ⁻¹)	5	Year	Trophic class	Variable Milfoil
Surface Area (Ac.):	87	Mean Depth (m):	4.8	P Retention Coef:	0.46	2005	EUTROPHIC	
Shore Length (m):	3,500	Volume (m ³):	1,645,000	Elevation (ft):	443	2009	MESOTROPHIC	

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

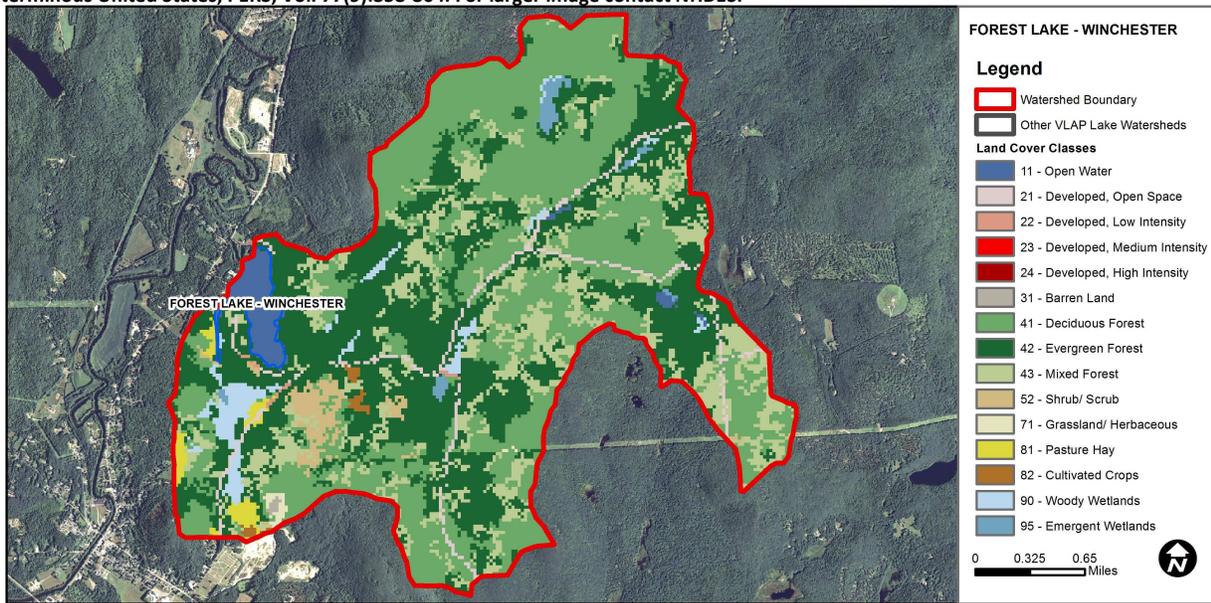
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen saturation	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Cyanobacteria hepatoto	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Slightly Bad	There are >10% of samples (minimum of 2), exceeding indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

FOREST LAKE - TOWN BEACH	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
FOREST LAKE - TOWN BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).

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	2.22	Barren Land	0.08	Grassland/Herbaceous	0.23
Developed-Open Space	2.21	Deciduous Forest	37.28	Pasture Hay	1
Developed-Low Intensity	0.14	Evergreen Forest	35.08	Cultivated Crops	0.34
Developed-Medium Intensity	0	Mixed Forest	16.47	Woody Wetlands	2.28
Developed-High Intensity	0	Shrub-Scrub	1.74	Emergent Wetlands	0.76



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

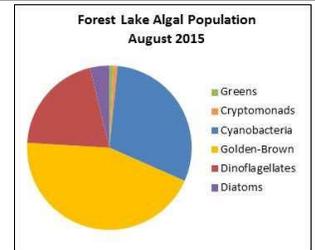
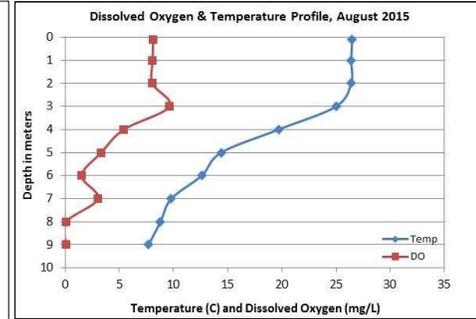
FOREST LAKE, WINCHESTER

2015 DATA SUMMARY

RECOMMENDED ACTIONS: The improving lake and tributary conductivity and Sandy Point Inlet phosphorus trends are encouraging, however phosphorus levels in Campground Inlet and Dump Branch have significantly increased, NE Branch turbidity has significantly increased, and epilimnetic pH has significantly decreased. The increased frequency and intensity of storm events may be flushing wetlands contributing to increased phosphorus, highly colored water and increased turbidity, and acidity of the water. This highlights the importance of reducing stormwater runoff from lake and watershed properties. There are many references and programs available to assist with those efforts. Keep up the great work!

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

- CHLOROPHYLL-A:** Chlorophyll levels were within an average range for lakes in August. However, field duplicate data did not meet acceptance criteria and data were invalidated. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Campground Inlet, NE Branch, and Outlet conductivity and chloride levels were slightly greater than the state medians but not above a level of concern. Historical trend analysis indicates significantly decreasing (improving) epilimnetic conductivity since monitoring began. We hope to see this continue! Dump Branch conductivity levels were slightly elevated, however conductivity has also significantly decreased (improved) in Campground Inlet and Dump Branch since monitoring began.
- E. COLI:** Campground Inlet C. E. coli levels were very low and much less than the state standard of 406 cts/100 mL for surface waters.
- TOTAL PHOSPHORUS:** Epilimnetic and Metalimnetic phosphorus levels were low in August, decreased from 2014 and were less than the state median. Historical trend analysis indicates highly variable epilimnetic phosphorus levels since monitoring began. Campground Inlet and NE Branch phosphorus levels were slightly elevated. Dump Branch and Sandy Point Inlet phosphorus levels were moderate. Outlet phosphorus levels were low. Historical trend analysis indicates significantly increasing (worsening) phosphorus levels in Campground Inlet and Dump Branch, while Sandy Point Inlet has significantly decreasing (improving) phosphorus levels.
- TRANSPARENCY:** Transparency was high (good) in August, was better than the state median, and was the best measured since 2010. The dry weather conditions and lack of stormwater runoff and wetland flushing may have contributed to the improved transparency. Historical trend analysis indicates highly variable transparency since monitoring began.
- TURBIDITY:** Epilimnetic and Metalimnetic turbidities were within average ranges for those stations. Campground Inlet and NE Branch Inlet turbidity was slightly elevated and historical data analysis indicates significantly increasing turbidity levels in NE Branch. Outlet and Sandy Point Inlet turbidities were within average ranges for those stations.
- pH:** Epilimnetic pH was within the desirable range 6.5-8.0 units however historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH since monitoring began. Metalimnetic, hypolimnetic (lower water layer) and Campground Inlet pH levels were less than desirable and slightly acidic. NE Branch, Outlet and Sandy Point Inlet pH levels were within the desirable range.



Station Name	Table 1. 2015 Average Water Quality Data for FOREST LAKE								
	Alk. mg/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	9.8	8	51.67		8	4.55	4.73	1.24	6.79
Metalimnion			48.78		10			1.38	6.08
Hypolimnion									6.12
Campground Inlet		9	69.29		34			3.13	6.31
Campground Inlet C				10					
Dump Branch			103.80		15			36.80	6.50
NE Branch		5	56.83		25			3.20	7.03
Outlet			46.79		9			1.00	6.82
Sandy Point Inlet			26.81		17			1.52	6.72

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

HISTORICAL WATER QUALITY TREND ANALYSIS

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

