Volunteer Lake Assessment Program Individual Lake Reports

FOREST LAKE, WINCHESTER, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	4,480	**Max. Depth (m):**	9.8	**Flushing Rate (yr^{1})**	5
Surface Area (Ac.):	87	**Mean Depth (m):**	4.8	**P Retention Coef:**	0.46
Shore Length (m):	3,500	**Volume (m^3):**	1,645,000	**Elevation (ft):**	443

TROPHIC CLASSIFICATION

Year	Trophic class
2005	EUTROPHIC
2009	MESOTROPHIC

KNOWN EXOTIC SPECIES

Variable Milfoil

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

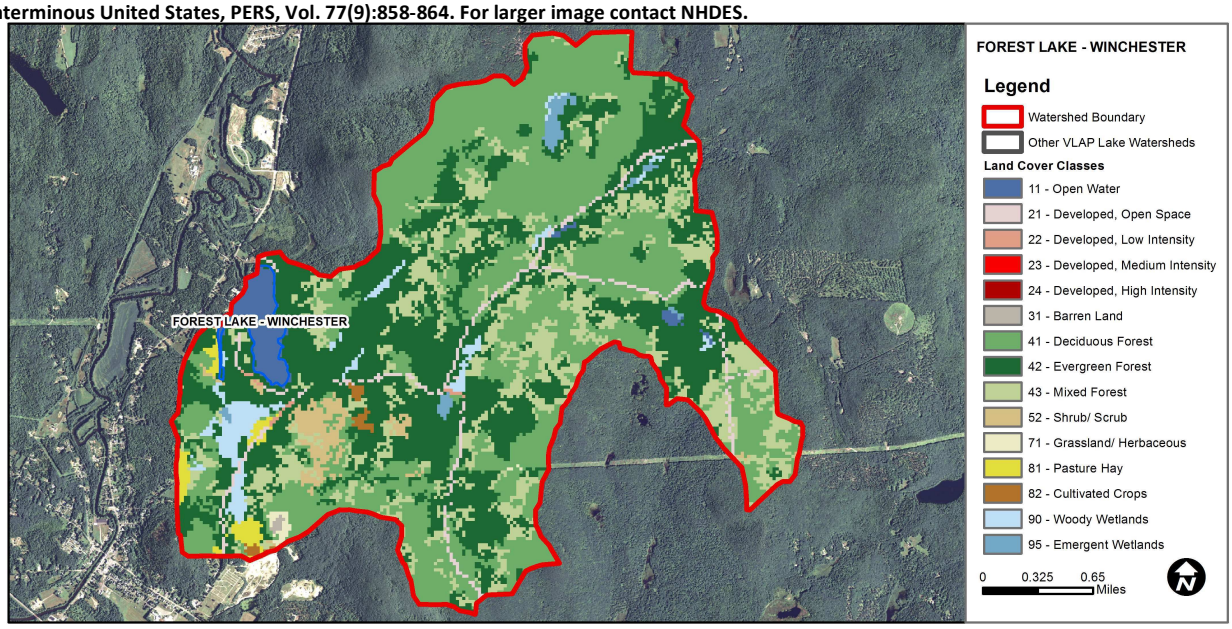
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Very Good	At least 10 samples with 0 exceedances of criteria.
	D.O. (% sat)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than geometric mean criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).

BEACH PRIMARY CONTACT ASSESSMENT STATUS

FOREST LAKE - TOWN BEACH	E. coli	Very Good	All bacteria samples <75% of geometric mean criteria, but not enough to calculate geometric mean. Or, all bacteria samples are < single sample criteria and calculated Geometric means are less than 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.



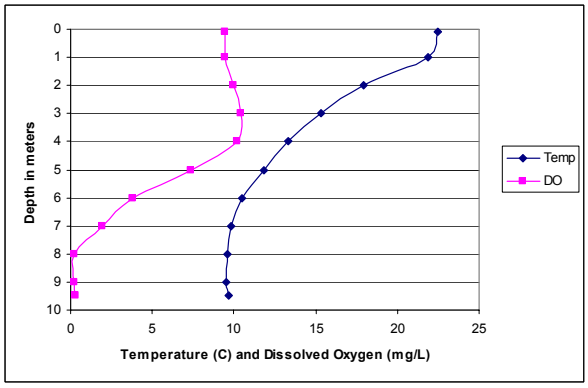
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	2.22	Barren Land	0.08	Grassland/Herbaceous	0.23
Developed-Open Space	2.21	Deciduous Forest	37.28	Pasture Hay	1
Developed-Low Intensity	0.14	Evergreen Forest	35.08	Cultivated Crops	0.34
Developed-Medium Intensity	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, NH
2012 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic)*

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated in August, however average chlorophyll levels decreased in 2012. Historical trend analysis indicates chlorophyll levels fluctuate annually.
- **CONDUCTIVITY/CHLORIDE:** Deep spot conductivity increased in the hypolimnion (lower water layer) due to the release of organic compounds from sediments. Dump Branch and Campground Inlet conductivity were elevated, however conductivity levels have decreased in the tributaries and lake since monitoring began.
- **E. COLI:** E. coli levels were well below state standards for surface waters.
- **TOTAL PHOSPHORUS:** Hypolimnetic (lower layer) phosphorus levels were elevated as the summer progressed due to a lack of dissolved oxygen and subsequent release of phosphorus from lake sediments. Phosphorus levels were elevated in Campground Inlet and Dump Branch in July. Turbidity levels were also elevated indicating potential sediment contamination. Campground Inlet was also chemically treated for variable milfoil and decaying milfoil was noted which also could contribute to a short-term elevation in phosphorus levels.
- **TRANSPARENCY:** Historical trend analysis indicates a significantly improving (increasing) lake transparency since monitoring began. We hope to see this continue!
- **TURBIDITY:** Campground Inlet and Dump Branch turbidities were elevated in July potentially due to a moderate amount of rainfall that occurred 24 hours prior to sampling.
- **pH:** Average pH generally decreased to below desirable levels in the metalimnion (middle water layer), hypolimnion (lower water layer) and Dump Branch tributary.
- **RECOMMENDED ACTIONS:** Implement watershed management activities aimed at reducing phosphorus and sediment loading. Utilize and distribute "A Homeowner's Guide to Stormwater Management" to assist watershed residents in reducing stormwater impact from their properties. Work with Campground owners and patrons to contain the spread of Variable milfoil and to control stormwater runoff.

Dissolved Oxygen & Temperature Profile



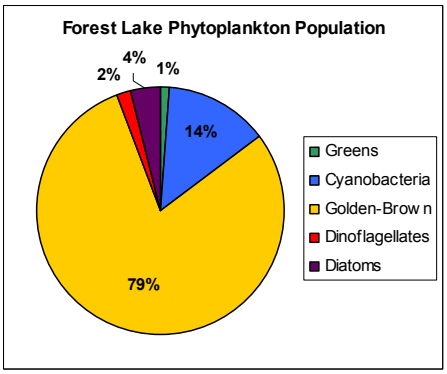


Table 1. 2012 Average Water Quality Data for FOREST LAKE

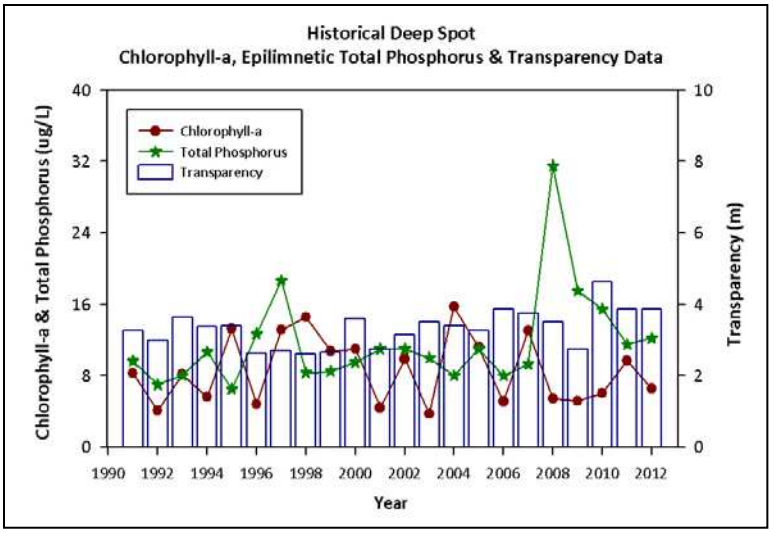
Station Name	Alk.	Chlor-a	Chloride	Cond.	E. Coli	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	#/100ml	ug/l	m		ntu	
							NVS	VS		
Campground Inlet			7	76.9	10	109			3.08	6.47
Campground Inlet A					10					
Dump Branch				132.3		37			7.1	6.39
Deep Epilimnion	6.45	6.52	6	55.4		12	3.87	4.63	0.94	6.84
Deep Metalimnion				65.4		15			1.77	6.25
Deep Hypolimnion				78.8		35			9.89	6.24
Ne Branch			4	53.7		19			2.61	6.67
Outlet				55.3		11			1.12	6.82
Sandy Point Inlet				30.8		19			1.85	6.58

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

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: 6.5-8.0 (unless naturally occurring)

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	Variable	Data fluctuate annually, and are not significantly increasing or decreasing.
Transparency	Improving	Data significantly increasing (improving) since monitoring began.
Phosphorus (epilimnion)	Variable	Data fluctuate annually, and are not significantly increasing or decreasing.



This report was generated by the NH DES Volunteer Lake Assessment Program (VLAP). For more information contact:
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