



Volunteer Lake Assessment Program Individual Lake Reports

SPOFFORD LAKE, CHESTERFIELD, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	2,880	Max. Depth (m):	19.5	Flushing Rate (yr ⁻¹)	0.2
Surface Area (Ac.):	707	Mean Depth (m):	9.1	P Retention Coef:	0.82
Shore Length (m):	8,400	Volume (m ³):	26,020,500	Elevation (ft):	716

TROPIC CLASSIFICATION

Year	Trophic class
1988	OLIGOTROPIC
1995	OLIGOTROPIC

KNOWN EXOTIC SPECIES

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.

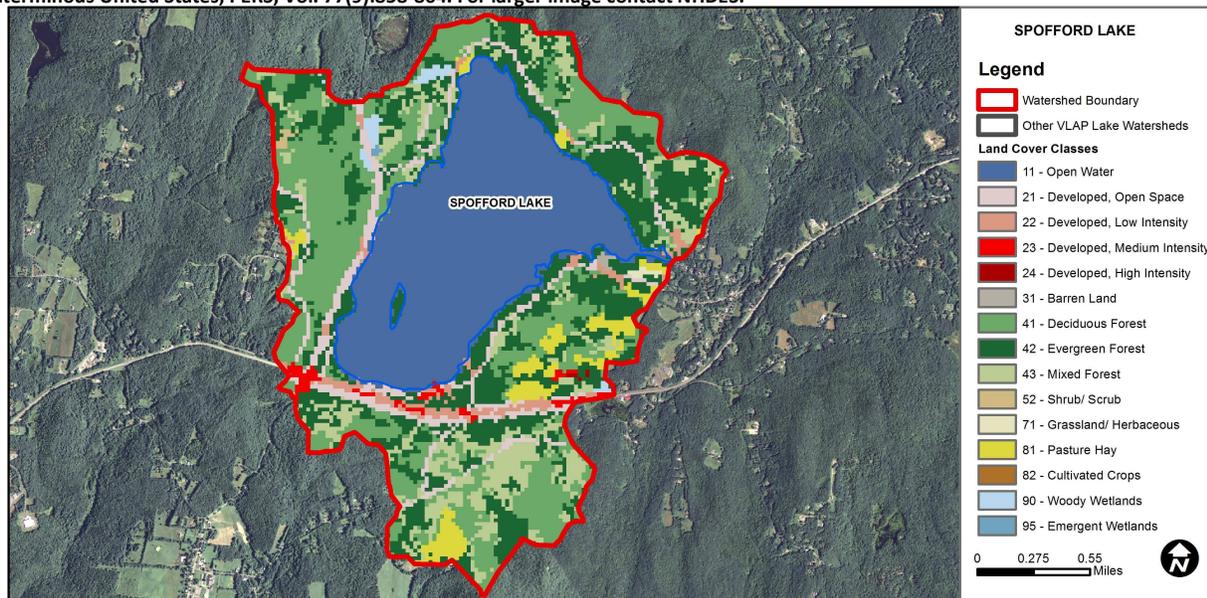
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

Beach Name	Parameter	Category	Comments
SPOFFORD LAKE - ROADS END FARM BEACH	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
SPOFFORD LAKE - CAMP SPOFFORD BEACH	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geometric mean. No single sample exceedances. More data needed.
SPOFFORD LAKE - WARES GROVE TOWN BEACH	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
SPOFFORD LAKE - N SHORE RD TOWN BEACH	E. coli	Cautionary	One exceedance of single sample criteria but not enough data to calculate geometric mean. More data needed.
SPOFFORD LAKE - ACCESS RD TOWN BEACH	E. coli	No Data	No Data for this parameter.

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	29.9	Barren Land	0.12	Grassland/Herbaceous	0.13
Developed-Open Space	5.92	Deciduous Forest	23.2	Pasture Hay	3.44
Developed-Low Intensity	2.06	Evergreen Forest	23.48	Cultivated Crops	0
Developed-Medium Intensity	0.92	Mixed Forest	9.89	Woody Wetlands	0.71
Developed-High Intensity	0.05	Shrub-Scrub	0.13	Emergent Wetlands	0.05



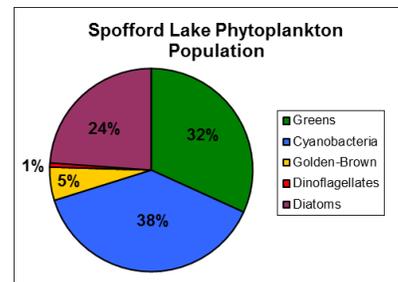
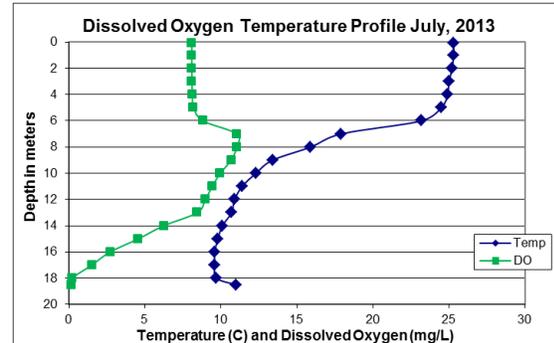
VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

SPOFFORD LAKE, CHESTERFIELD, NH

2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (Refer to Tables 1, 2 and Historical Deep Spot Data Graphics)

- ♣ **CHLOROPHYLL-A:** Chlorophyll levels were low throughout the summer and much less than the state median. Historical trend analysis indicates relatively stable chlorophyll with moderate variability between years.
- ♣ **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity and chloride levels were elevated, particularly in Seamans Inlet. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity since monitoring began.
- ♣ **E. COLI:** E. coli levels were well below state standards for public beaches and surface waters at all stations.
- ♣ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus was slightly elevated in June potentially due to high water levels and stormwater runoff, but remained low in July and August. Hypolimnetic phosphorus increased as the summer progressed, potentially due to phosphorus released from bottom sediments under anoxic conditions. Historical trend analysis indicates relatively stable epilimnetic phosphorus with moderate variability between years. Camp Spofford Inlet phosphorus levels were elevated in June and July; Outlet phosphorus was elevated in July and Seamans Inlet phosphorus was elevated in August.
- ♣ **TRANSPARENCY:** Transparency decreased slightly as the summer progressed, however remained much greater than the state median. Viewscope transparency was generally better than non-viewscope transparency and likely a better representation of actual conditions.
- ♣ **TURBIDITY:** Deep spot turbidity was relatively low. Clarkdale pipe turbidity was elevated on each sampling event likely due to iron bacteria precipitate. Turbidity was slightly elevated in Shield Inlet in June and Seamans Inlet in July and August.
- ♣ **PH:** Hypolimnetic pH was less than desirable range 6.5 -8.0; however within acceptable ranges at all other stations. Historical trend analysis indicates stable epilimnetic pH with low variability between years.
- ♣ **DISSOLVED OXYGEN:** Dissolved oxygen levels had decreased below 1.0 mg/L in the few meters above the lake bottom in July. This indicates the potential for further oxygen depletion as the summer progresses and subsequent release of phosphorus from bottom sediments.
- ♣ **RECOMMENDED ACTIONS:** The significant early summer storm events resulted in high water levels and elevated epilimnetic phosphorus. Identify areas in the watershed prone to stormwater erosion and runoff and implement best management practices to capture and infiltrate stormwater before it enters tributaries and the lake. The DES' "Homeowner's Guide to Stormwater Management" is a good resource. Camp Spofford Inlet phosphorus continues to be elevated. Work with Camp owners to identify and reduce phosphorus inputs to the tributary. Keep up the great work!



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)

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. 2013 Average Water Quality Data for SPOFFORD LAKE								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m	Turb. ntu	pH
Boat Launch				119.1	20	11	NVS	0.46	6.75
Camp Spofford Inlet			49	234.6	75	57		0.32	6.73
Clarkdale Pipe			58	281.0	33	24		8.47	6.76
Epilimnion	9.00	1.79	22	117.6	9	8.12	8.85	0.46	6.91
Metalimnion				118.7		8		0.56	6.84
Hypolimnion				121.5		17		0.98	6.32
Outlet			23	126.5	10	21		1.02	6.81
Seamans Inlet			177	709.0	10	22		1.59	7.09
Shield Inlet			34	170.5	10	8		1.94	6.97
Wares Grove Inlet			30	165.3	10	8		0.54	6.59

Station Name	E. Coli #/100ml
	B + K Beach
Camp Spofford Beach	8
Clarkdale Beach	9
Family Rec Beach	2
Island North East	10
Island North West	10
Island South East	10
Island South West	10
North Shore Beach	4
Wares Grove Beach	2
Yacht Club Beach	2

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
Conductivity	Degrading	Data significantly increasing.	Transparency	Degrading	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.

