Volunteer Lake Assessment Program Individual Lake Reports
WEBSTER LAKE, FRANKLIN, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	11,136	Max. Depth (m):	11.8	Flushing Rate (yr¹)	1.5	
Surface Area (Ac.):	612	Mean Depth (m):	5.5	P Retention Coef:	0.58	
Shore Length (m):	6,900	Volume (m³):	13,586,500	Elevation (ft):	401	

TROPHIC CLASSIFICATION

Year	Trophic class
1979	MESOTROPHIC
1993	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2016 305(b) report on the status of N.H. waters, and are based on data collected from 2006-2015. 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)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
	Dissolved oxygen satura	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	Encouraging	Limited data for this parameter predicts water quality standards or thresholds are being met; however more data are necessary to fully assess the parameter.
	Cyanobacteria hepatoto	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

WEBSTER LAKE - LAGACE TOWN BEACH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
WEBSTER LAKE - GRIFFIN TOWN BEACH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
WEBSTER LAKE - LAGACE TOWN BEACH	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
WEBSTER LAKE - GRIFFIN 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.
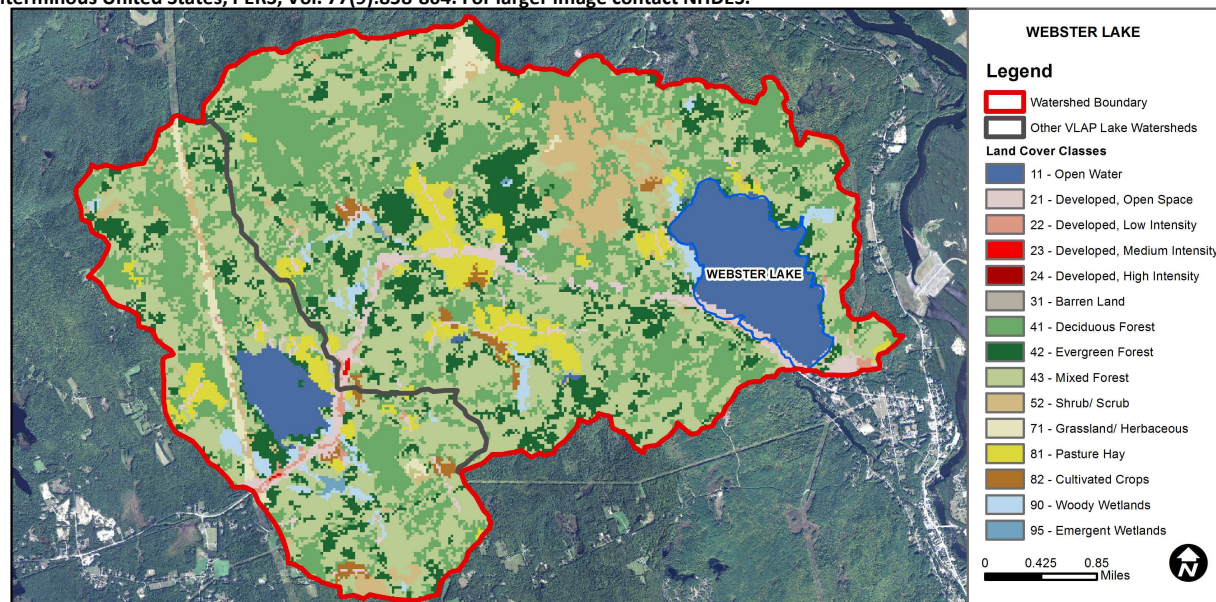
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	7.45	Barren Land	0.03	Grassland/Herbaceous	1.31
Developed-Open Space	3.01	Deciduous Forest	26.81	Pasture Hay	4.8
Developed-Low Intensity	0.42	Evergreen Forest	11.42	Cultivated Crops	0.86
Developed-Medium Intensity	0.04	Mixed Forest	37.07	Woody Wetlands	1.8
Developed-High Intensity	0	Shrub-Scrub	4.61	Emergent Wetlands	0.18

# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
WEBSTER LAKE, FRANKLIN
2017 DATA SUMMARY

RECOMMENDED ACTIONS: Lake phosphorus and algal growth returned to more normal levels in 2017 which is good news. Above average spring and early summer rainfall and a significant storm event in June likely caused elevated phosphorus and turbidity levels at the deep spot indicating significant stormwater runoff and flushing of tributaries and wetland systems rich in dissolved organic matter that imparts a tea color to the water. The increased frequency and intensity of high volume storm events highlights the importance of further addressing stormwater runoff and erosion in the watershed, as well as maintaining flow in the Outlet channel to flush the pond and reduce nutrient retention that could fuel algal and cyanobacteria blooms. Continue implementation of recommendations outlined in the Watershed Management Plan. Contact the VLAP Coordinator for a sampling refresher in the spring of 2018.

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, decreased back to low levels in August, and then increased to slightly elevated levels in September. Average chlorophyll level decreased sharply from 2016 and was slightly greater than the state median and threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Gagnes Bk., Lake Ave Trib. and Upstream, Rte. 11 Inlet, and Sucker Bk. conductivity and/or chloride levels fluctuated within a low to moderate range and were less than or approximately equal to the state medians. Historical trend analysis indicates stable epilimnetic conductivity levels since monitoring began.
- **COLOR:** Apparent color was measured in the epilimnion and indicates the lake water is lightly tea colored, or light brown.
- **E. COLI:** Gagnes Bk., Rte. 11 Inlet and Sucker Bk. E. coli levels were less than the state standard of 406 cts/100 mL for surface waters on each sampling event. Lake Ave Trib. E. coli levels exceeded the state standard in August following a significant storm event.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were slightly elevated in June and then decreased to within a low to moderate range through September. Average epilimnetic phosphorus level decreased slightly from 2016 and was slightly less than the state median and threshold for mesotrophic lakes. Historical trend analysis indicates highly variable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus levels were greatly elevated in June suggesting a thick layer of algal growth and/or stormwater runoff/sedimentation fallout from the significant storm event 3 days prior to sampling. Metalimnetic phosphorus levels decreased to within a moderate range through September. Hypolimnetic phosphorus levels were also elevated in June and September. Gagnes Bk. phosphorus levels fluctuated between moderate and slightly elevated levels but were within a normal range for this station. Lake Ave Trib. phosphorus levels were slightly elevated in June and increased to elevated level and remained stable through September. Rte. 11 Inlet phosphorus levels were low. Sucker Bk. phosphorus levels fluctuated within a low to moderate range for that station.
- **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was below average (worse) in June and then increased (improved) and remained stable through September. Average NVS transparency decreased from 2016 and was approximately equal to the state median. Historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began. Transparency measured with the viewscope (VS) was also below average in June but then increased to within a good level and was much higher (better) than NVS transparency and likely a better measure of actual conditions.
- **TURBIDITY:** Epilimnetic, Metalimnetic and Hypolimnetic turbidity levels were slightly elevated in June following a significant storm event and then fluctuated within a low to moderate range. Gagnes Bk., Rte. 11 Inlet and Sucker Brook turbidity levels fluctuated within low to moderate ranges. Lake Ave Trib. turbidity levels were elevated in September during low flow conditions.
- **PH:** Epilimnetic, Metalimnetic, Hypolimnetic, Rte. 11 Inlet, and Sucker Brook pH levels were within the desirable range 6.5-8.0 units, however epilimnetic pH has historically fluctuated below the desirable range. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began. Gagnes Bk. and Lake Ave Trib. pH levels were slightly acidic and less than desirable.

Dissolved Oxygen and Temperature July 2017

Webster Lake Annual Phytoplankton Population
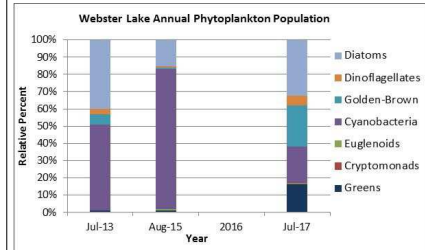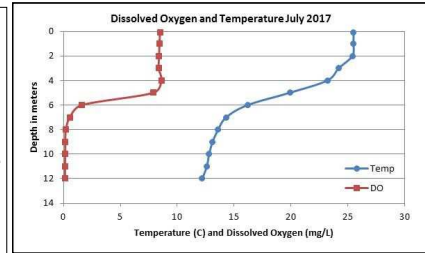
NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

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)

Station Name	Table 1. 2017 Average Water Quality Data for WEBSTER LAKE-FRANKLIN										
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color PCU	Cond. uS/cm	E. Coli MPN/100ML	Total P ug/l	Trans. m		Turb. ntu	pH
								NVS	VS		
Epilimnion	7.0	5.67	7	35	51.2		11	3.31	4.28	0.94	7.15
Metalimnion					51.4		19			1.40	6.83
Hypolimnion					55.3		21			3.46	6.66
Gagnes Brook			3		27.2	48	24			1.63	6.18
Lake Ave Trib.			7		45.2	241	37			3.15	6.16
Rte. 11 Inlet			3		19.0	98	7			0.46	6.49
Sucker Brook			7		61.4	92	13			0.85	6.93

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	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.

Historical Trend Epilimnetic Conductivty and pH

Historical Chlorophyll-a, Epilimnetic Phosphorus & Transparency Data

This report was generated by the NH DES Volunteer Lake Assessment Program (VLAP). For more information contact VLAP at (603) 271-2658 or sara.steiner@des.nh.gov