



# Volunteer Lake Assessment Program Individual Lake Reports

## GREGG LAKE, ANTRIM, NH

### MORPHOMETRIC DATA

Watershed Area (Ac.):	2,944	Max. Depth (m):	11	Flushing Rate (yr <sup>1</sup> )	1.6
Surface Area (Ac.):	195	Mean Depth (m):	5.3	P Retention Coef:	0.57
Shore Length (m):	6,400	Volume (m <sup>3</sup> ):	4,199,000	Elevation (ft):	1053

### TROPHIC CLASSIFICATION

Year	Trophic class
1978	OLIGOTROPIC
1994	OLIGOTROPIC

### KNOWN EXOTIC SPECIES


The Waterbody Report Card tables are generated from the DRAFT 2018 305(b) report on the status of N.H. waters, and are based on data collected from 2008-2017. Detailed waterbody assessment and report card information can be found at [www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm](http://www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm)

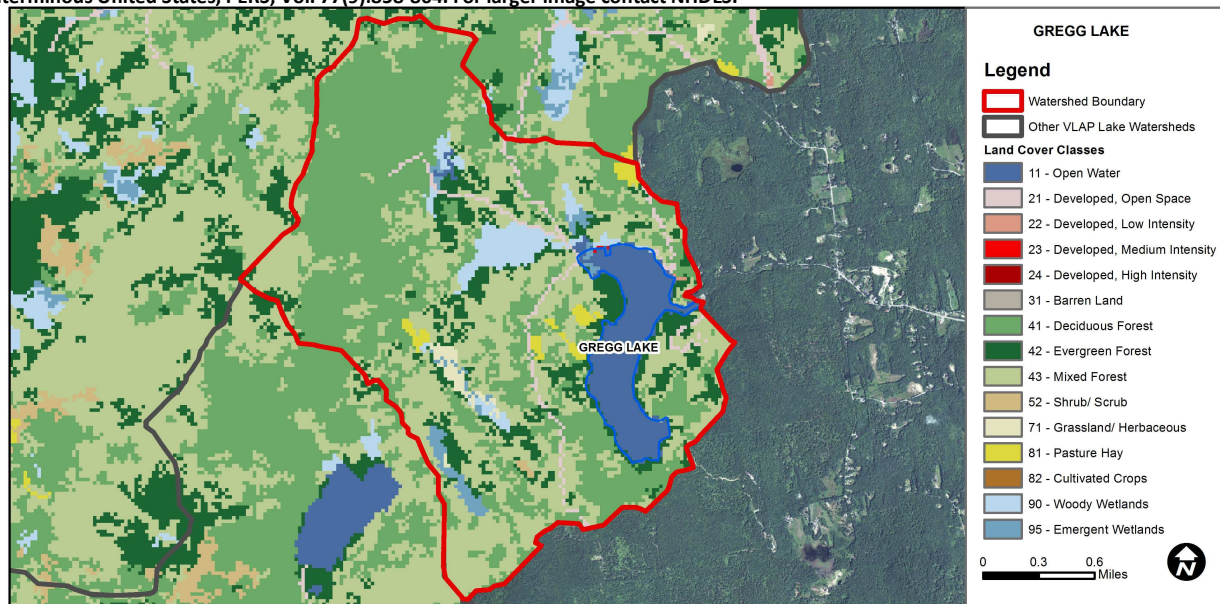
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	pH	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
	Oxygen, Dissolved	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
	Dissolved oxygen satura	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.
Primary Contact Recreation	Chlorophyll-a	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
Primary Contact Recreation	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

### BEACH PRIMARY CONTACT ASSESSMENT STATUS

GREGG LAKE - TOWN BEACH	Escherichia coli	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
GREGG LAKE - CAMP CHENOA BEACH	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds 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	7.36	Barren Land	0	Grassland/Herbaceous	0.72
Developed-Open Space	1.97	Deciduous Forest	40.56	Pasture Hay	1.17
Developed-Low Intensity	0.03	Evergreen Forest	10.39	Cultivated Crops	0
Developed-Medium Intensity	0.03	Mixed Forest	33.02	Woody Wetlands	3.25
Developed-High Intensity	0	Shrub-Scrub	0.1	Emergent Wetlands	1.41



# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

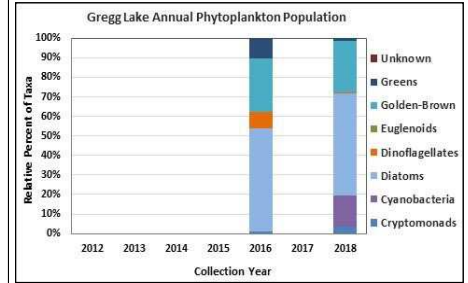
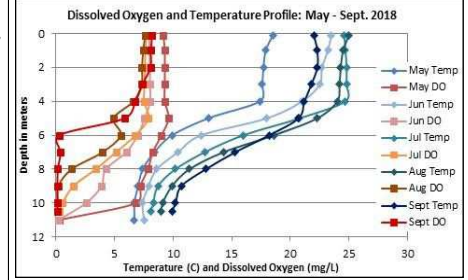
## GREGG LAKE, ANTRIM

### 2018 DATA SUMMARY

**RECOMMENDED ACTIONS:** The lake quality was good during the growing season (May–September) and generally representative of borderline oligotrophic/mesotrophic conditions. Phosphorus levels spiked following ice out and during fall turnover which can be a normal occurrence for NH lakes, and neither resulted in algal blooms. Epilimnetic and Outlet turbidity levels have significantly increased since 2005 and may be a result of the increased frequency and intensity of storm events. Stormwater runoff as well as flushing of wetlands rich in dissolved organic matter could be influencing turbidity levels in surface waters. The “tea” color of the water appears to also have increased since the mid 1990’s. Continued color measurements will help to assess how color may affect turbidity as well as water clarity. Continue the development of a watershed management plan to help quantify pollutant loading to the lake and make recommendations to maintain high quality waters. Keep up the great work!

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

- CHLOROPHYLL-A:** Chlorophyll levels were low in April, increased slightly in May and June, remained stable in July and August, and increased slightly to a moderate level in September and October. Average chlorophyll level remained stable with 2017, was less than the state median, and approximately equal to the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), and tributary conductivity and chloride levels were low and less than the state medians. Historical trend analysis indicates relatively stable epilimnetic conductivity levels since monitoring began.
- COLOR:** Apparent color was measured in the epilimnion and was stable from April through July, and increased in August and October. Color measurements indicate the lake water is tea colored, or brown, and is generally darker following significant storm events.
- E. COLI:** White Birch Point E. coli levels were very low and much less than the state standard for public beaches.
- TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were stable and low except in May when they spiked into a moderate range. Lab data noted algae in the sample which could have contributed to the higher phosphorus. Average epilimnetic phosphorus level increased slightly from 2017, was less than the state median, and was approximately equal to the threshold for oligotrophic lakes. Historical trend analysis indicates stable epilimnetic phosphorus levels with high variability between years. Metalimnetic phosphorus levels were elevated in April during ice-out. Hypolimnetic phosphorus levels were elevated in August and September under anoxic conditions. Inlet phosphorus levels fluctuated within a normal range for that station. Outlet phosphorus levels were low. Castor Lane, Craig Rd. Bridge, Hattie Brown Bk., and Hattie Brown Rd. phosphorus levels were higher in August and September during high flows following storm events.
- TRANSPARENCY:** Transparency measured without the viewscope (NVS) was within high (good) range from April through August and decreased (worsened) in September following storm events, and in October during turnover. Average NVS transparency remained stable with 2017 and was higher (better) than the state median. Historical trend analysis indicates stable transparency with high variability between years. Viewscope transparency (VS) was higher (better) than NVS transparency on each sampling event and likely a better measure of actual conditions.
- TURBIDITY:** Epilimnetic turbidity was elevated in October during fall turnover and lab data noted organic matter in the sample. Metalimnetic turbidity was elevated in April following ice-out. Hypolimnetic turbidity was slightly elevated in August and September due to the formation and accumulation of organic compounds under anoxic conditions. Tributary turbidity levels fluctuated within a low to moderate range.
- pH:** Epilimnetic pH levels were within the desirable range 6.5-8.0 units, however epilimnetic pH levels have historically fluctuated below the desirable range. Historical trend analysis indicates stable epilimnetic pH levels with high variability between years. Metalimnetic, Hypolimnetic and tributary pH levels were slightly acidic and potentially critical to aquatic life.



**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:** 4.5 mg/L
- Chlorophyll-a:** 4.39 mg/m<sup>3</sup>
- Conductivity:** 42.3 uS/cm
- Chloride:** 5 mg/L
- Total Phosphorus:** 11 ug/L
- Transparency:** 3.3 m
- pH:** 6.6

Station Name	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	3.1	3.57	3	60	23.1		8	4.24	4.65	0.89	6.54
Metalimnion					23.4		11			1.26	5.97
Hypolimnion					26.1		12			1.13	5.93
Castor Lane			3		16.4		16			0.95	5.72
Craig Rd. Bridge			3		14.9		12			0.53	5.67
Hattie Brown Brook			3		16.3		17			0.86	5.70
Hattie Brown Rd.			3		14.3		12			0.73	5.67
Inlet			3		19.3		14			0.85	5.82
Outlet			3		24.1		7			0.85	6.31
White Birch Point						18					

### HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Stable	Trend not significant; data highly variable.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.

