



Volunteer Lake Assessment Program Individual Lake Reports

GRANITE LAKE, STODDARD, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	2,432	Max. Depth (m):	28.9	Flushing Rate (yr ⁻¹)	0.7
Surface Area (Ac.):	228	Mean Depth (m):	9.8	P Retention Coef:	0.61
Shore Length (m):	4,500	Volume (m ³):	9,027,000	Elevation (ft):	1278

TROPHIC CLASSIFICATION

Year	Trophic class
1996	OLIGOTROPHIC
2006	OLIGOTROPHIC

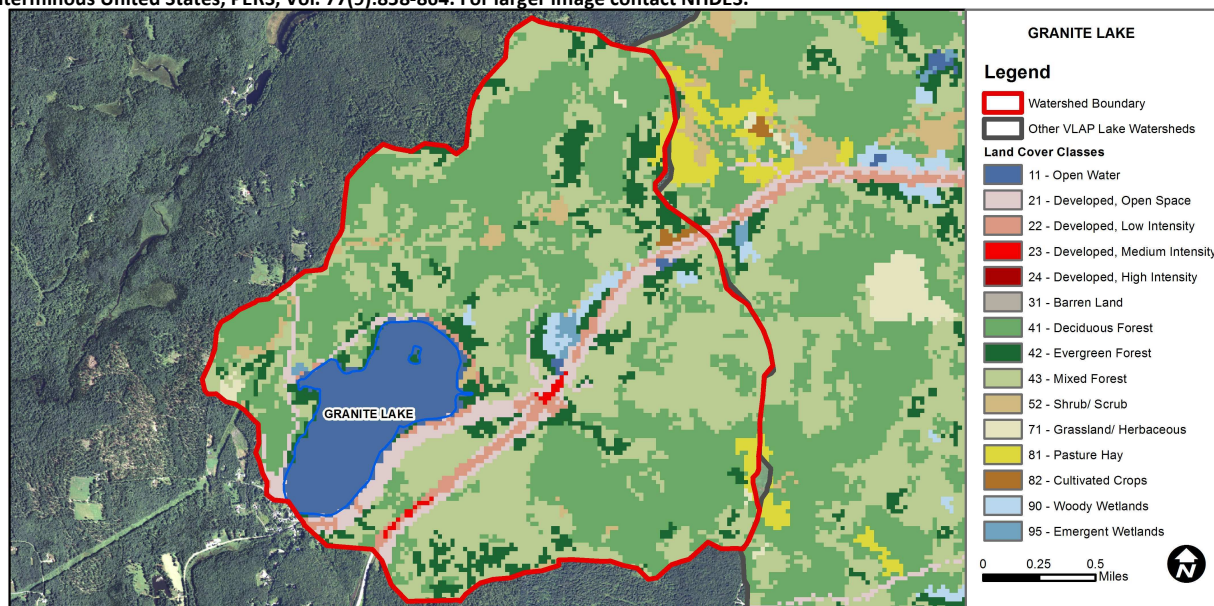
KNOWN EXOTIC SPECIES

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)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
	Oxygen, Dissolved	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.
	Dissolved oxygen saturation	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.
	Chlorophyll-a	Very Good	Sampling data is 50 percent better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Chlorophyll-a	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	9.46	Barren Land	0	Grassland/Herbaceous	0.3
Developed-Open Space	5	Deciduous Forest	36.11	Pasture Hay	0.67
Developed-Low Intensity	2.11	Evergreen Forest	8.75	Cultivated Crops	0.19
Developed-Medium Intensity	0.27	Mixed Forest	34.65	Woody Wetlands	0.87
Developed-High Intensity	0	Shrub-Scrub	1.22	Emergent Wetlands	0.36



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

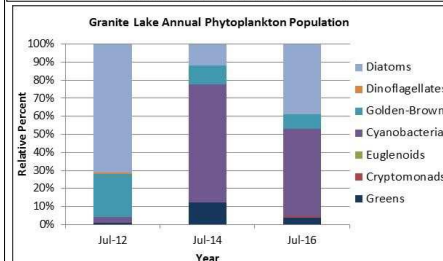
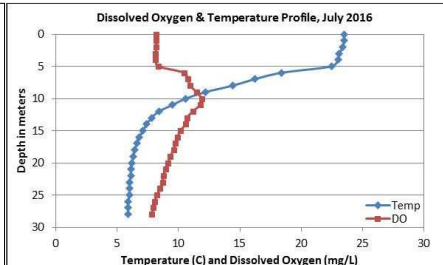
GRANITE LAKE, STODDARD

2016 DATA SUMMARY

RECOMMENDED ACTIONS: Lake quality is generally representative of Oligotrophic, or high quality water, conditions. The lack of stormwater runoff due to drought conditions in 2016 likely helped to keep lake nutrient levels and algal growth low. However, wet years and sampling following significant storm events indicates elevated phosphorus and nutrient levels particularly in the Inlet sub-watershed which includes Nye Meadow Outlet and Little Granite Lake Outlet. Volunteers noted the installation of a Beaver Deceiver in the Nye Meadow Outlet to allow water to flow through the beaver dam instead of the dam being destroyed repeatedly allowing sediments and debris to flow downstream. We hope to see this improve turbidity and sedimentation in the Inlet and lake. This system also flushes water rich in dissolved organic matter which imparts a "tea" color to the water. The increased frequency and intensity of storm events flushes this highly colored water to the lake which may, over time, decrease water clarity. Add Apparent Color analyses to measure any changes in water color in relation to water clarity (transparency). DES can perform this analysis free of charge. Continue efforts to minimize stormwater runoff in the watershed and keep up the great work!

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

- **CHLOROPHYLL-A:** Chlorophyll levels were very low in July, increased slightly in August, and decreased back to low levels in September. The 2016 average chlorophyll level remained stable with 2015 and was much less than the state median. Historical trend analysis indicates stable chlorophyll levels with moderate variability between years.
- **CONDUCTIVITY/CHLORIDE:** Deep spot, Little Granite Lake Outlet, Nye Meadow Outlet, and Outlet in Stream conductivity and chloride levels were slightly greater than the state medians yet remained below levels of concern. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity levels since monitoring began. 305 and 395 North Shore Rd. and North Shore End conductivity and chloride levels were very low. Inlet conductivity levels were slightly elevated and Townline Inlet conductivity and chloride levels were elevated.
- **TOTAL PHOSPHORUS:** Epilimnetic, Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) phosphorus levels remained very low and stable from July to September. Average epilimnetic phosphorus decreased from 2015 and was the lowest measured since 2011. Historical trend analysis indicates highly variable epilimnetic phosphorus levels since monitoring began. 305 and 395 North Shore Rd., North Shore End, Outlet in Stream, and Townline Inlet phosphorus levels remained within a low range. Inlet phosphorus levels were low in July and September and elevated in August and the turbidity was also elevated. Field data note colored water and high flows following a storm event which likely flushed nutrients following a period of dry weather as Little Granite Lake Outlet and Nye Meadow Outlet phosphorus levels were also elevated in August and are located upstream of the Inlet site. Nye Meadow Outlet phosphorus levels continued to be slightly elevated in September due to low flows.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was within an average range for the lake in July, decreased (worsened) in August following a significant storm event, and then increased (improved) to high (good) levels in September. VS transparency was generally higher (better) than NVS transparency and likely a better measure of actual conditions. Average NVS transparency remained stable with 2015 and was much higher (better) than the state median. Historical trend analysis indicates stable transparency with moderate variability between years.
- **TURBIDITY:** Deep spot, 305 and 395 North Shore Rd., North Shore End, Outlet in Stream, and Townline Inlet turbidities were within a low range on each sampling event. Inlet and Nye Meadow turbidities were elevated in August following a significant storm event after a dry period. Beaver activity at Nye Meadow Outlet and water high is dissolved organic matter likely impacted turbidities in August. Little Granite Lake Outlet turbidity was elevated in July during low flows and field data notes iron precipitate in the stream.
- **pH:** Epilimnetic and Outlet In Stream 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 highly variable epilimnetic pH levels since monitoring began. All other stations had pH levels that fluctuated below 6.5 or remained below 6.5 on each sampling event, particularly Nye Meadow Outlet and Townline Inlet.



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

Station Name	Table 1. 2016 Average Water Quality Data for GRANITE LAKE-STODDARD							
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m	Turb. ntu	pH
						NVS	VS	
Epilimnion	2.7	0.93	13	77.3	3	8.30	9.00	6.62
Metalimnion				74.0	3			6.49
Hypolimnion				74.5	3			6.10
305 North Shore Rd.			3	22.9	7			6.27
395 North Shore Rd.			3	27.2	8			6.37
Inlet			33	150.0	16			6.10
Little Granite Lake Outlet			17	90.5	27			6.06
North Shore End			3	21.1	11			6.34
Nye Meadow Outlet			11	64.6	24			5.86
Outlet In Stream			16	76.9	3			6.59
Townline Inlet			89	408.0	8			5.05

HISTORICAL WATER QUALITY TREND ANALYSIS

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

