Volunteer Lake Assessment Program Individual Lake Reports

SPECTACLE POND, GROTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	345	**Max. Depth (m):**	11.8	**Flushing Rate (yr^{-1})**	1.3
Surface Area (Ac.):	46	**Mean Depth (m):**	3.6	**P Retention Coef:**	0.67
Shore Length (m):	2,600	**Volume (m^3):**	659,500	**Elevation (ft):**	820

TROPHIC CLASSIFICATION

Year	Trophic class
1983	OLIGOTROPHIC
1996	MESOTROPHIC

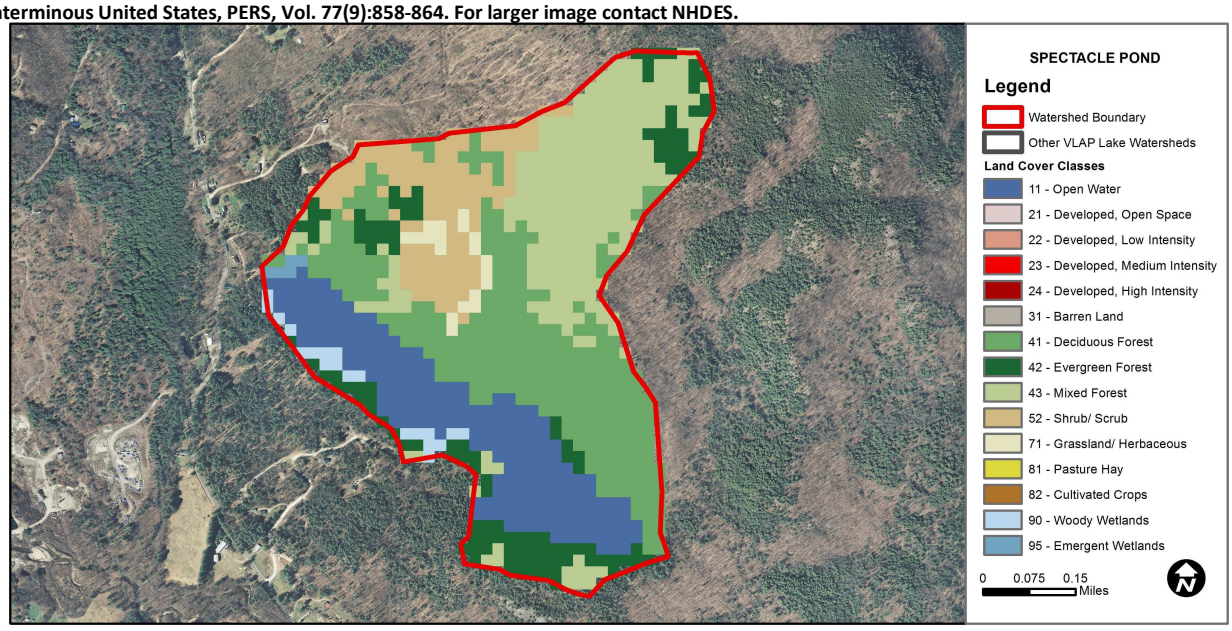
KNOWN EXOTIC SPECIES

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

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the 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 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.
	Chlorophyll-a	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
Primary Contact Recreation	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Chlorophyll-a	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.

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.

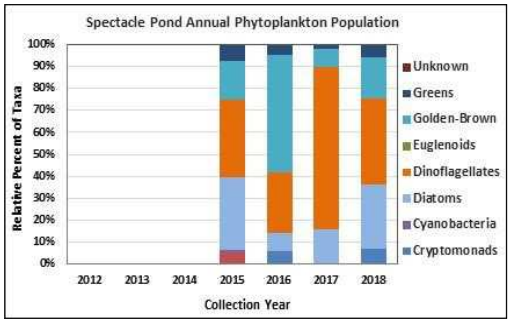


Volunteer Lake Assessment Program Individual Lake Reports
Spectacle Pond, Groton
2018 Data Summary

Recommended Actions: Average epilimnetic phosphorus levels were representative of mesotrophic conditions; however, average chlorophyll levels were elevated and exceeded the threshold for eutrophic conditions. The increased algal growth since monitoring began is a concern suggesting excess nutrient inputs from the watershed. Watershed management efforts should focus on ways to reduce nutrient loading and stormwater runoff to the pond such as preventing agricultural run-off, pumping and maintaining septic systems, and maintaining vegetative buffers along the shoreline and inlets. DES' "NH Homeowner's Guide to Stormwater Management" and UNH's Cooperative Extension's "Landscaping at the Water's Edge" are great resources. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll levels were low in June and increased to elevated levels in July and September that were indicative of an algal bloom. Average chlorophyll level increased from 2017 and was much greater than the state median and the threshold for mesotrophic lakes.
- **Conductivity/Chloride:** Epilimnetic (upper water layer) and Metalimnetic (middle water layer) conductivity levels remained low throughout the summer. Hypolimnetic (bottom water layer) conductivity levels were low in June and July and doubled in September, but remained below the state median. Average epilimnetic conductivity level remained stable with 2017 and epilimnetic chloride levels were very low indicating no influences from road salting.
- **Color:** Apparent color was measured in the epilimnion and indicates the pond water was lightly tea colored or light brown.
- **E. coli:** Boat Launch and Circle Camp E. coli levels were low and below the state standard for public beaches throughout the summer.
- **Total Phosphorus:** Epilimnetic phosphorus levels were slightly elevated in June, which may have contributed to later algal growth, and decreased to low levels by July and September. Metalimnetic phosphorus levels were slightly elevated and stable from June through September. Hypolimnetic phosphorus levels were slightly elevated in June and July and then increased to an elevated level in September when turbidity and conductivity levels also spiked. Average epilimnetic phosphorus level remained stable with 2017 and was less than the state median and the threshold for mesotrophic lakes.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was good in June, decreased to below average in July likely due to algal growth, and increased (improved) slightly in September. Average NVS transparency remained stable with 2017 and was slightly higher (better) than the state median.
- **Turbidity:** Epilimnetic turbidity level was low in June, increased to a slightly elevated level in July due to algal growth, and decreased to a low level in September. Metalimnetic turbidity levels were low in June and increased to an elevated level by September likely due to algal growth. Hypolimnetic turbidity levels were average in June and July and elevated by September suggesting the accumulation of organic compounds formed under anoxic (low dissolved oxygen) conditions.
- **pH:** Epilimnetic pH levels were within the desirable range of 6.5—8.0 units throughout the summer. Metalimnetic pH levels were approximately equal to the low end of the desirable range. Hypolimnetic pH levels were slightly acidic and less than desirable.



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^3
Conductivity: 42.3 uS/cm
Chloride: 5 mg/L
Total Phosphorus: 11 ug/L
Transparency: 3.3 m
pH: 6.6

Station Name	Table 1. 2018 Average Water Quality Data for SPECTACLE POND - GROTON										
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	E. Coli mpn/100ml	Total P mg/l	Trans. m		Turb. ntu	pH
								NVS	VS		
Epilimnion	2.3	12.92	3	27	14.5		10	3.95	4.10	1.17	6.66
Metalimnion					14.8		13			2.11	6.45
Hypolimnion					22		18			5.48	6.14
Boat Launch						14					
Circle Camp						12					

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 show low variability.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.