Volunteer Lake Assessment Program Individual Lake Reports
AYERS POND, BARRINGTON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,987	Max. Depth (m):	9.1	Flushing Rate (yr[1])	1	
Surface Area (Ac.):	228	Mean Depth (m):	4.4	P Retention Coef:	0.69	
Shore Length (m):	7,400	Volume (m³):	4,030,500	Elevation (ft):	233	

TROPHIC CLASSIFICATION

Year	Trophic class
1979	OLIGOTROPHIC
1995	OLIGOTROPHIC

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)	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	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	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.
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

AYERS POND - CAMP FIRESIDE BEACH	Escherichia coli	Good	Sampling data commonly 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.
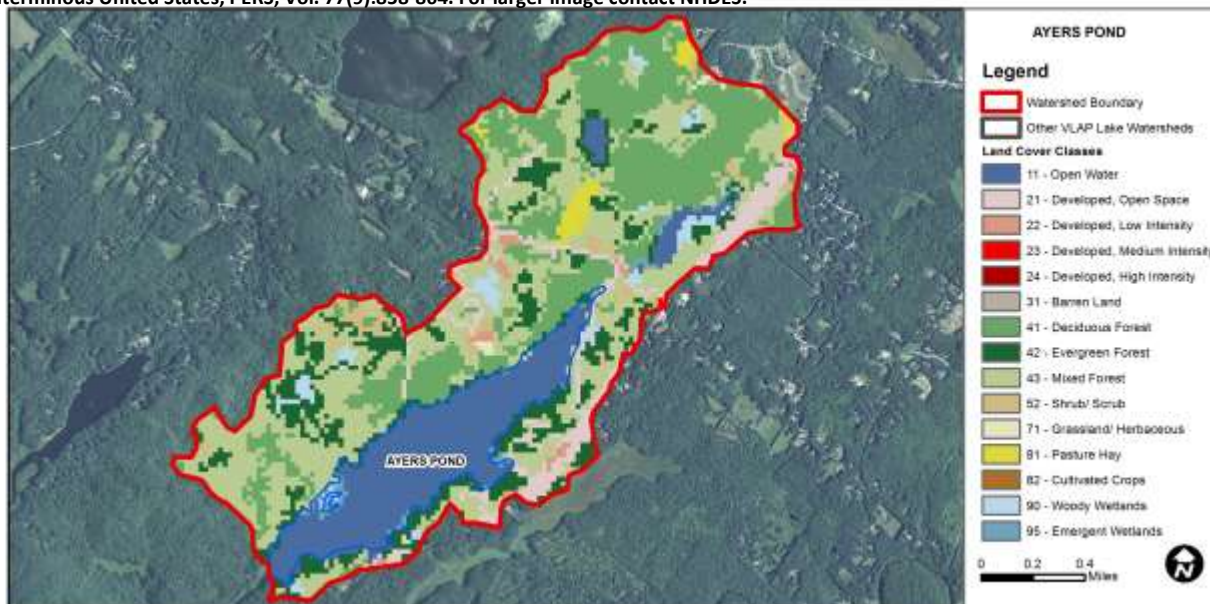
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	16.6	Barren Land	0.06	Grassland/Herbaceous	0.24
Developed-Open Space	6.28	Deciduous Forest	24.86	Pasture Hay	1.49
Developed-Low Intensity	0.78	Evergreen Forest	12.82	Cultivated Crops	0
Developed-Medium Intensity	0.03	Mixed Forest	31.53	Woody Wetlands	2.19
Developed-High Intensity	0	Shrub-Scrub	2.26	Emergent Wetlands	0.84

RECOMMENDED ACTIONS: Pond nutrient levels, algal growth and clarity continue to be representative of oligotrophic, or high quality, conditions and the improving water quality trends are a positive sign. However, pond conductivity levels have doubled in the past seven years and Inlet conductivity levels have doubled in the past four years. This accelerated rate of change is a concern. Phosphorus levels and algal growth were higher in June following spring rainfall, runoff and lake turnover. This highlights the importance of managing stormwater runoff directly adjacent to the pond. Evaluate any changes in the watershed and Inlet sub-watershed with regards to the application of road salt, dust suppressant usage on dirt roads, water softener usage and discharge to dry wells and septic systems, directional flow of stormwater runoff from roadways, and anything that could be related to the sudden increase in conductivity levels and contribute to nutrient loading. Conduct sampling at a small tributary located at the northwestern corner of the pond to evaluate how it impacts water quality. Encourage local road agents and private winter maintenance companies to obtain Voluntary NH Salt Applicator licenses through UNH Technology Transfer Center's Green SnowPro Certification program. Keep up the great work!

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

♦ **CHLOROPHYLL-A:** Chlorophyll levels were slightly elevated in June and decreased to low levels in July and August. Average chlorophyll level increased slightly from 2018, was less than the state median, and was slightly greater than the threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began. We hope to see this continue!

♦ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), and Outlet conductivity levels remained slightly elevated and greater than the state median. Epilimnetic chloride levels were also greater than the state median, yet much less than the state chronic chloride standard. However, historical trend analysis indicates significantly increasing epilimnetic conductivity levels since monitoring began. Inlet conductivity and chloride levels remained slightly elevated and greater than the deep spot and Outlet stations.

♦ **COLOR:** Apparent color was measured in the epilimnion and indicates the water was borderline clear to lightly tea colored.

♦ **TOTAL PHOSPHORUS:** Epilimnetic and Metalimnetic phosphorus levels were slightly above average in June following rainfall and spring turnover, and then decreased to low levels as the summer progressed. The higher phosphorus levels in June likely contributed to the elevated algal growth. Average epilimnetic phosphorus level decreased slightly from 2018 and was less than the state median and threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus levels were within an average range and remained stable from June through August. Inlet phosphorus levels were within a moderate range and remained stable from June through August. Outlet phosphorus levels were slightly elevated in June and July.

♦ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) in June when algal growth was elevated and following a significant storm event. Transparency increased (improved) in July and remained stable in August. Average NVS transparency remained stable with 2018 and was higher (better) than the state median. Historical trend analysis indicates stable transparency since monitoring began.

♦ **TURBIDITY:** Epilimnetic turbidity levels were slightly elevated in June potentially due to algal growth and stormwater runoff from a recent storm event. Metalimnetic, Hypolimnetic and Outlet turbidity levels fluctuated within a low range. Inlet turbidity levels were slightly elevated in August following a significant storm event.

♦ **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 since monitoring began. Metalimnetic, Hypolimnetic and Inlet pH levels were less than desirable and slightly acidic. Outlet pH levels were slightly less than desirable.

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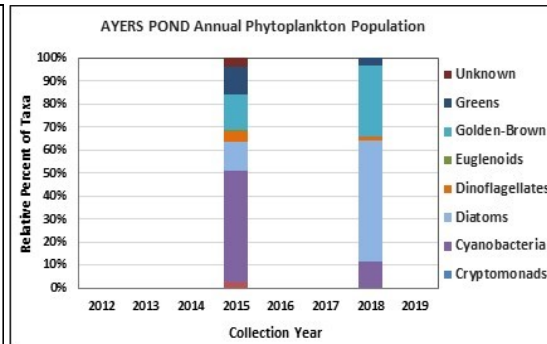
NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

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)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.5 mg/L

Chlorophyll-a: 4.39 ug/L

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. 2019 Average Water Quality Data for AYERS POND - BARRINGTON									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	Total P mg/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	3.3	3.63	30	30	124.8	7	4.75	5.00	0.80	6.52
Metalimnion					122.9	10			0.64	6.17
Hypolimnion					122.1	12			0.68	5.90
Inlet			41		156.0	19			0.94	6.14
Outlet					121.5	13			0.59	6.38

HISTORICAL WATER QUALITY TREND ANALYSIS

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

Historical Trend Epilimnetic Conductivty and pH

Historical Chlorophyll-a, Epilimnetic Phosphorus & Transparency Data