Volunteer Lake Assessment Program Individual Lake Reports
ANGLE POND, SANDOWN, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,511	Max. Depth (m):	11.6	Flushing Rate (yr[1])	1.6
Surface Area (Ac.):	150	Mean Depth (m):	3	P Retention Coef:	
Shore Length (m):	4,000	Volume (m³):	1,849,000	Elevation (ft):	220

TROPHIC CLASSIFICATION

Year	Trophic class
1984	EUTROPHIC
2002	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)	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for a given 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	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
Primary Contact Recreation	Escherichia coli	No Data	No data for this 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

ANGLE POND - ANGLE POND GROVE 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.
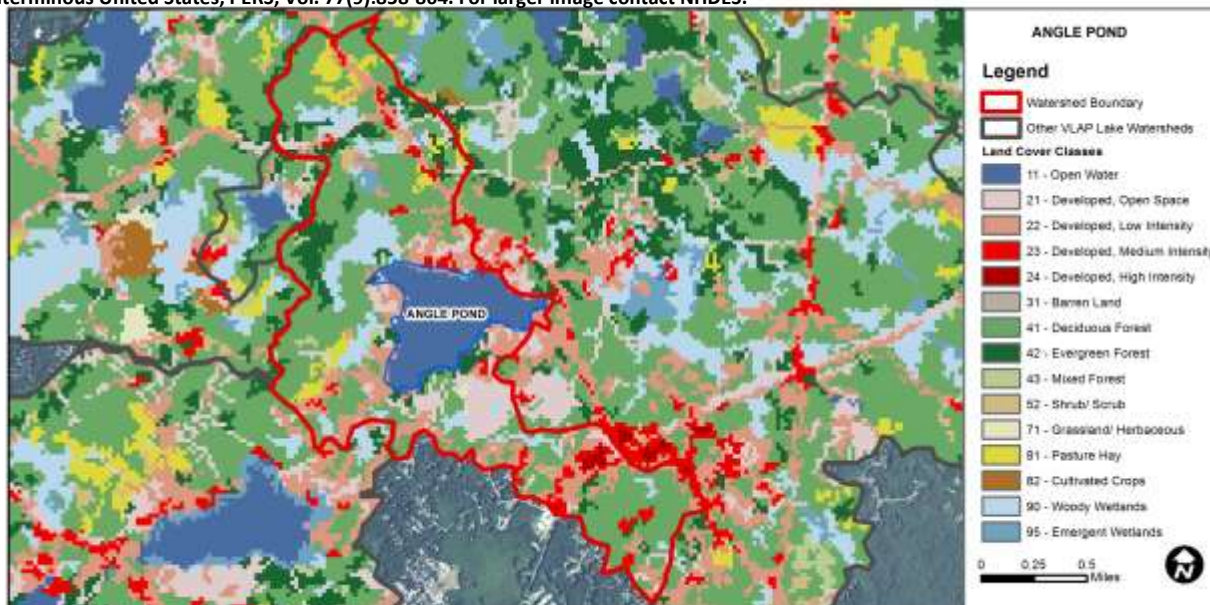
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	11.9	Barren Land	0	Grassland/Herbaceous	0.17
Developed-Open Space	8.55	Deciduous Forest	38.36	Pasture Hay	3.27
Developed-Low Intensity	15.6	Evergreen Forest	7.11	Cultivated Crops	0
Developed-Medium Intensity	4.03	Mixed Forest	0.64	Woody Wetlands	7.93
Developed-High Intensity	0.45	Shrub-Scrub	0.75	Emergent Wetlands	0.86

# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
ANGLE POND, SANDOWN
2019 DATA SUMMARY

RECOMMENDED ACTIONS: Pond quality is generally representative of mesotrophic, or average conditions, however phosphorus and chlorophyll levels occasionally spike above the thresholds for mesotrophic lakes and hypolimnetic phosphorus levels are indicative of an internal load of phosphorus caused by the release of phosphorus from bottom sediments when dissolved oxygen levels are depleted. This internal load can fuel algal and cyanobacteria growth. This highlights the importance of minimizing external nutrient (phosphorus) loads through stormwater management. Consider joining NHDES' Soak up the Rain NH program to help implement stormwater management in the watershed. For more information visit www.soaknh.org. Consider development of a watershed management plan to help identify and quantify nutrient loading to the pond and drive remediation activities. For more information contact the Watershed Assistance Section at 603-559-0032. Keep up the great work!

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

- **CHLOROPHYLL-A:** Chlorophyll level was low in June, increased to slightly elevated level in July, and then decreased to a low level in August. Average chlorophyll level increased slightly from 2018 and was slightly greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Sayre Inlet, and West Inlet conductivity and/or chloride levels remained elevated and much greater than the state medians. Chloride levels at all stations, while greater than the state median, did not exceed the state chronic chloride standard. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown.
- **E. COLI:** Sayre Inlet and Smith Inlet E. coli levels were less than the state standard of 406 cts/100 mL for surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was slightly elevated in June, decreased to a low level in July and remained stable in August. Average epilimnetic phosphorus level decreased slightly from 2018, was slightly greater than the state median, and was approximately equal to the threshold for mesotrophic lakes. Historical trend analysis indicates stable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus levels increased from low to elevated as the summer progressed and the turbidity also increased indicating a layer of algae at that depth. Hypolimnetic phosphorus level increased from moderate to elevated and the turbidity also increased likely due to the release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. Outlet phosphorus levels were within a moderate range for that station. West Inlet phosphorus levels were elevated in June during low flows and were within an average range for that station. Sayre Inlet phosphorus levels were greatly elevated during low flows and also within a normal range for that station.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) in June, decreased in July when algal growth was elevated, and then increased (improved) in August. Average NVS transparency decreased slightly from 2018 and was less (worse) than the state median. Historical trend analysis indicates highly variable transparency since monitoring began.
- **TURBIDITY:** Epilimnetic turbidity levels fluctuated within a low to moderate range and were highest in July when algal growth was elevated. Metalimnetic turbidity levels were elevated in August due to a layer of algae. Hypolimnetic turbidity levels were slightly elevated in July and August likely due to the formation and accumulation of organic compounds under anoxic conditions. Outlet and West Inlet turbidity levels were within a low range for those stations. Sayre Inlet turbidity levels were elevated on each sampling event and lab data noted colored water and organic matter in the sample.
- **PH:** Epilimnetic, Metalimnetic, Hypolimnetic, Outlet, and Sayre Inlet pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. West Inlet pH levels were slightly less than desirable.

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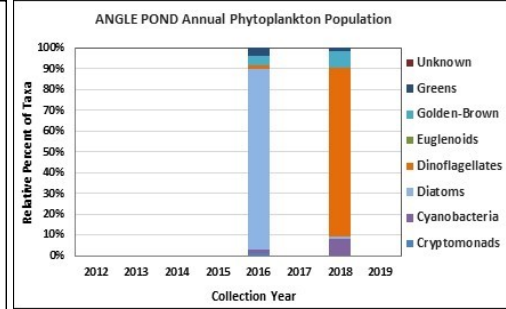
NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

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 ANGLE POND - SANDOWN										
	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 NVS	Trans. m VS	Turb. ntu	pH
Epilimnion	19.7	6.04	41	67	236.7		12	2.46	3.08	0.82	7.16
Metalimnion					235.7		19			2.85	6.61
Hypolimnion					235.7		22			2.74	6.63
Outlet					241.3		17			0.74	6.98
Sayre Inlet			70		287.0	138	166			9.64	6.81
Smith Inlet						146					
West Inlet			49		197.8		35			1.39	6.32

HISTORICAL WATER QUALITY TREND ANALYSIS

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

Historical Trend Epilimnetic Conductivty and pH

Historical Chlorophyll-a, Epilimnetic Phosphorus & Transparency Data