Volunteer Lake Assessment Program Individual Lake Reports
TOM POND, WARNER, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	601	Max. Depth (m):	4.1	Flushing Rate (yr¹)	3.5		
Surface Area (Ac.):	32	Mean Depth (m):	2.5	P Retention Coef:	0.57		
Shore Length (m):	1,600	Volume (m³):	314,000	Elevation (ft):	383		

TROPHIC CLASSIFICATION

| Year	Trophic class
1998	MESOTROPHIC
2006	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 this parameter by a small margin.
	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	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	Chlorophyll-a	Slightly Bad	Data exceed water quality standards or thresholds for this parameter by a small margin.
Primary Contact Recreation	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Chlorophyll-a	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.

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.
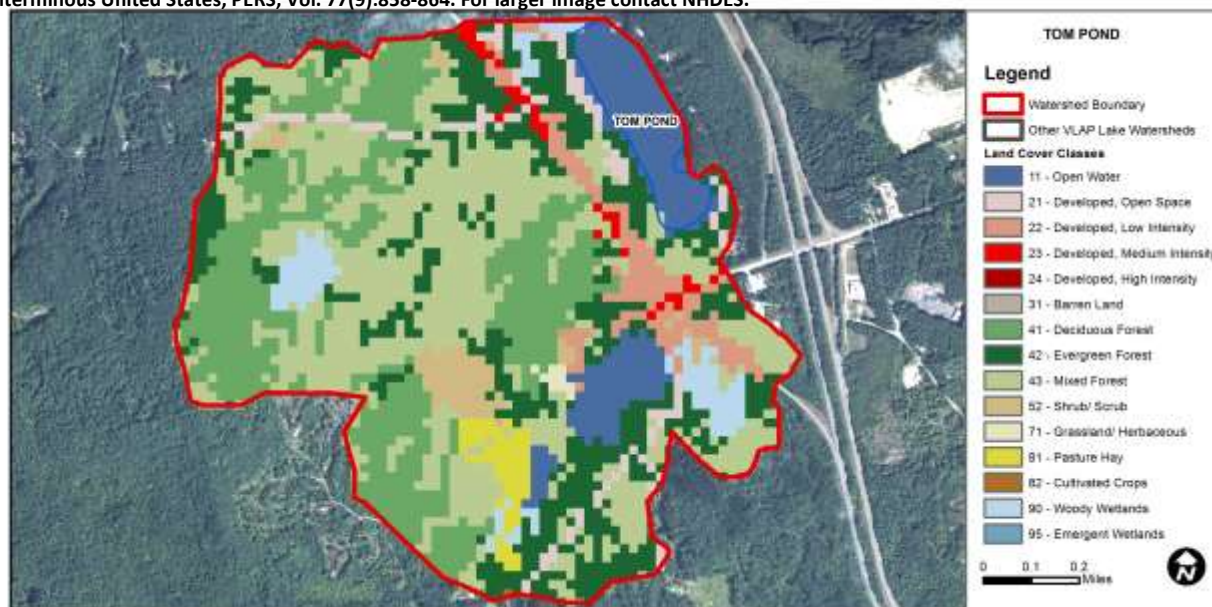
| Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.48	Barren Land	0	Grassland/Herbaceous	0.32
Developed-Open Space	3.66	Deciduous Forest	21.77	Pasture Hay	1.97
Developed-Low Intensity	4.56	Evergreen Forest	19.51	Cultivated Crops	0.03
Developed-Medium Intensity	1.2	Mixed Forest	32.06	Woody Wetlands	3.82
Developed-High Intensity	0	Shrub-Scrub	2.62	Emergent Wetlands	0

RECOMMENDED ACTIONS: Pond quality was good in 2019 with phosphorus levels less than the threshold for mesotrophic lakes, however chlorophyll levels remained greater than the threshold for mesotrophic lakes. Pond chlorophyll levels tend to be lowest during dry years when pond water levels are better regulated, the pond flushes, and nutrient inputs are lower. Managing shoreline erosion by stabilizing steep slopes and maintaining vegetated buffers can help to reduce nutrient loads when water levels are high. Install a staff gauge at the Outlet to better understand fluctuating water levels and recruit a pond resident to track weather conditions such as precipitation and temperature. The Warner River has been accepted as a Designated River into the NHDES River Management and Protection Program. A Local Advisory Committee (LAC) has been formed to identify areas within the watershed needing further studies and protection. Contact the Warner River LAC to discuss the potential of studying how the river interacts with Tom Pond during storm events. Pond pH levels, while decreasing over time, have remained within a higher (better) range since 2016 and we hope to see this continue. Keep up the great work!

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

- **CHLOROPHYLL-A:** Chlorophyll level was low in June and increased to a slightly elevated level by August. Average chlorophyll level decreased slightly from 2018 but was greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Hypolimnetic (lower water layer) and Outlet conductivity and/or chloride levels remained slightly elevated and greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Inlet conductivity and chloride levels were elevated and much greater than the state medians.
- **COLOR:** Apparent color measured in the epilimnion indicates the water was lightly to moderately tea colored, or light brown.
- **E. COLI:** Inlet E. coli levels fluctuated within a moderate range and were less than the state standard of 406 cts/100 mL for surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic and Hypolimnetic phosphorus levels were low in June, decreased in July, and then increased slightly in August but remained within a low range. Average epilimnetic phosphorus level decreased slightly from 2018 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Inlet phosphorus levels were greatly elevated on each sampling event and the turbidity of the samples was also elevated, however contained no sediment or organic matter. Outlet phosphorus levels were slightly elevated in June and then decreased to a low levels in July and August.
- **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was good and fluctuated within an average range for the pond. Average NVS transparency increased (improved) slightly from 2018 and historical trend analysis indicates relatively stable transparency since monitoring began. Viewscope transparency (VS) was slightly higher (better) than NVS transparency and likely a better measured of actual conditions.
- **TURBIDITY:** Epilimnetic, Hypolimnetic and Outlet turbidity levels fluctuated within a low range for those stations. Inlet turbidity levels were elevated on each sampling event and lab data noted cloudy water.
- **PH:** Epilimnetic, Hypolimnetic and Outlet pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH levels since monitoring began. Inlet pH levels fluctuated around the low end of the desirable range.

Dissolved Oxygen & Temperature Profile, July 2019

Tom Pond Annual Phytoplankton Population
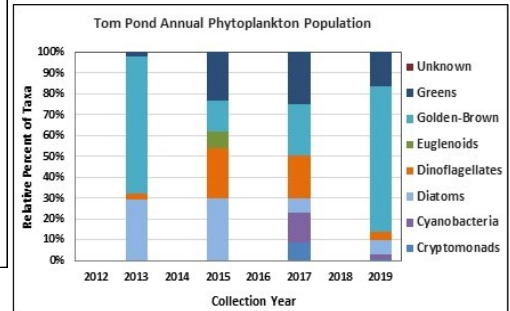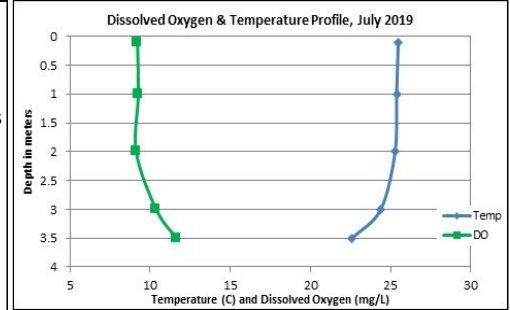
Station Name	Table 1. 2019 Average Water Quality Data for TOM POND - WARNER										
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	E. coli mpn/100ml	Total P mg/l	Trans. m NVS	Trans. m VS	Turb. ntu	pH
Epilimnion	14.0	6.12	33	43	147.7		9	2.93	3.30	1.00	6.97
Hypolimnion					145.7		10			1.09	6.78
Inlet			62		254.0	171	71			21.10	6.43
Outlet					149.4	5	11			1.33	6.88

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

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)

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)	Worsening	Data significantly decreasing.	Transparency	Stable	Trend not significant; data show low variability.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.

Historical Trend Epilimnetic Conductivty and pH

Historical Chlorophyll-a, Epilimnetic Phosphorus & Transparency Data

This report was generated by the NHDES Volunteer Lake Assessment Program (VLAP). For more information contact VLAP at (603) 271-2658 or sara.steiner@des.nh.gov