Volunteer Lake Assessment Program Individual Lake Reports

OTTERNICK POND, HUDSON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	2,752	**Max. Depth (m):**	3.7	**Flushing Rate (yr^{-1}):**	20.5
Surface Area (Ac.):	34	**Mean Depth (m):**	1.9	**P Retention Coef:**	0.4
Shore Length (m):	1,800	**Volume (m^3):**	261,500	**Elevation (ft):**	170

TROPHIC CLASSIFICATION

Year	Trophic class
1979	EUTROPHIC
1998	EUTROPHIC

KNOWN EXOTIC SPECIES

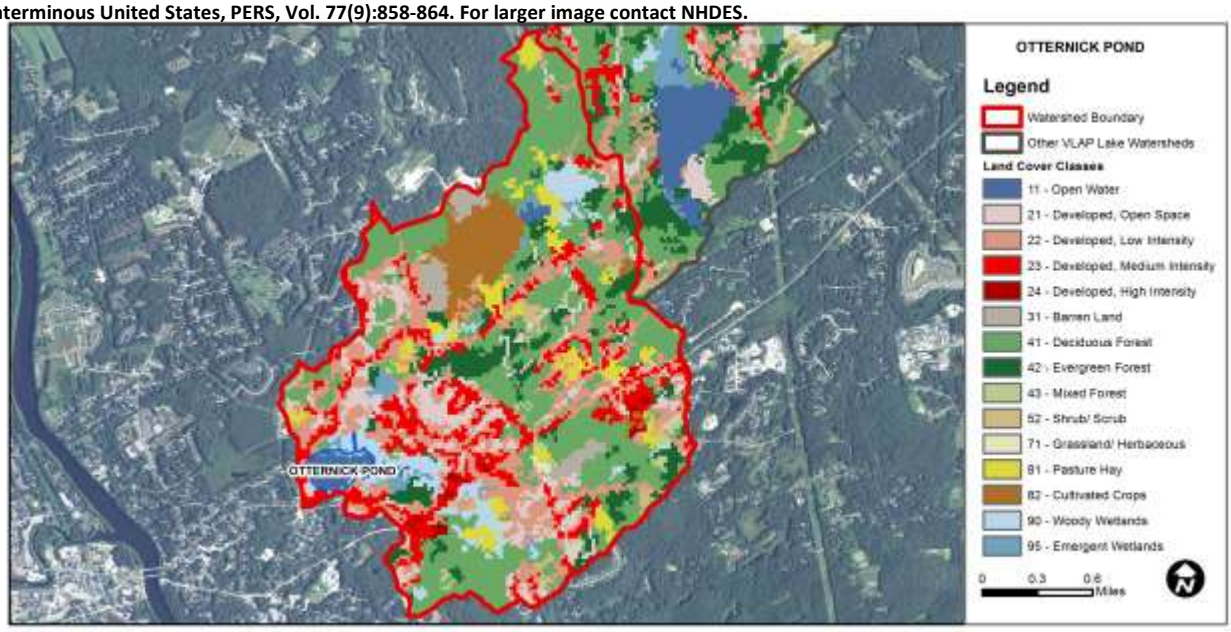
Variable Milfoil
Fanwort

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 a given parameter by a small margin.
	Oxygen, Dissolved	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
	Dissolved oxygen satura	Slightly Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a small margin.
	Chlorophyll-a	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a large 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	1.74	Barren Land	2.35	Grassland/Herbaceous	0.13
Developed-Open Space	8.68	Deciduous Forest	30.87	Pasture Hay	5.06
Developed-Low Intensity	19.2	Evergreen Forest	7.43	Cultivated Crops	4.99
Developed-Medium Intensity	11.1	Mixed Forest	0.71	Woody Wetlands	4.48
Developed-High Intensity	0.63	Shrub-Scrub	1.15	Emergent Wetlands	1.53

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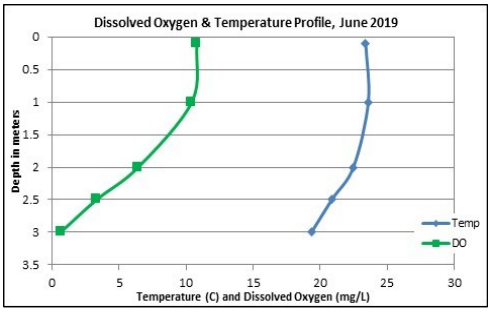
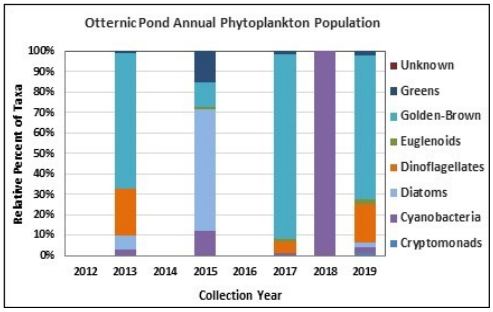
Otternic Pond, Hudson
2019 Data Summary

Recommended Actions: Pond quality improved in 2019 following a period of slow decline since 2013 which is encouraging. However, continue to evaluate pond management activities to identify any changes that may be negatively impacting water quality such as exotic plant and water level management. Chemical treatment of exotic plants results in rapid die off resulting in depleted dissolved oxygen levels and release of nutrients into the water column that can feed cyanobacteria growth. Notify DES of any potential cyanobacteria blooms or surface scums. Evaluate nutrient sources, stormwater runoff, watershed development, and the application of winter de-icing materials on nearby roads, parking lots, walkways and driveways. Encourage local winter maintenance companies to obtain NH Voluntary 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 moderate in May and July, elevated in June and August indicative of algae/ cyanobacteria blooms, and low in September. Average chlorophyll level decreased from 2018 but remained greater than the state median and the threshold for eutrophic lakes. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Epilimnetic (deep spot), Benson Inlet, Glover Inlet, and Outlet conductivity and chloride levels remained elevated and much greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began, and particularly since 2014.
- **Color:** Apparent color measured in the epilimnion indicates the water fluctuated between moderately to highly tea colored conditions.
- **Total Phosphorus:** Epilimnetic phosphorus levels fluctuated within a moderate range in May, June, August, and September, and were elevated in July following the herbicide treatment. Average epilimnetic phosphorus level decreased from 2018, was much greater than the state median, and was slightly less than the threshold for eutrophic lakes. Historical trend analysis indicates stable epilimnetic phosphorus levels since monitoring began. Benson Inlet phosphorus levels fluctuated within a low to moderate range and average phosphorus levels were the lowest measured since monitoring began. Glover Inlet phosphorus levels fluctuated within a moderate range. Outlet phosphorus levels were elevated in May and the turbidity of the sample was also elevated.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) in May and June, increased (improved) in July and August, and then decreased slightly in September. Average NVS transparency increased (improved) from 2018 and historical trend analysis indicates relatively stable transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity levels were slightly elevated in May and June and then decreased to a moderate range. Benson Inlet and Outlet turbidity levels were also elevated in May. Glover Inlet turbidity levels fluctuated within a low to moderate range. Overall, average turbidity levels decreased at all stations from that measured in 2018.
- **pH:** Epilimnetic, Benson Inlet, Glover Inlet, and Outlet pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began.





Station Name	Table 1. 2019 Average Water Quality Data for OTTERNIC POND - HUDSON									
	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	39.7	12.72	68	80	312.8	26	2.19	2.28	1.59	7.19
Benson Inlet			76		332.6	19			1.37	7.03
Glover Inlet			67		301.4	20			1.08	7.13
Outlet			71		314.8	21			1.12	7.35

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