Volunteer Lake Assessment Program Individual Lake Reports

CONTOOCOOK LAKE, JAFFREY, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	5,888	**Max. Depth (m):**	6.4	**Flushing Rate (yr^{1})**	6.8
Surface Area (Ac.):	380	**Mean Depth (m):**	2.2	**P Retention Coef:**	0.5
Shore Length (m):	11,700	**Volume (m^{3}):**	1,944,000	**Elevation (ft):**	1009

TROPHIC CLASSIFICATION

Year	Trophic class
1988	MESOTROPHIC
2006	MESOTROPHIC

KNOWN EXOTIC SPECIES

Variable Milfoil

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

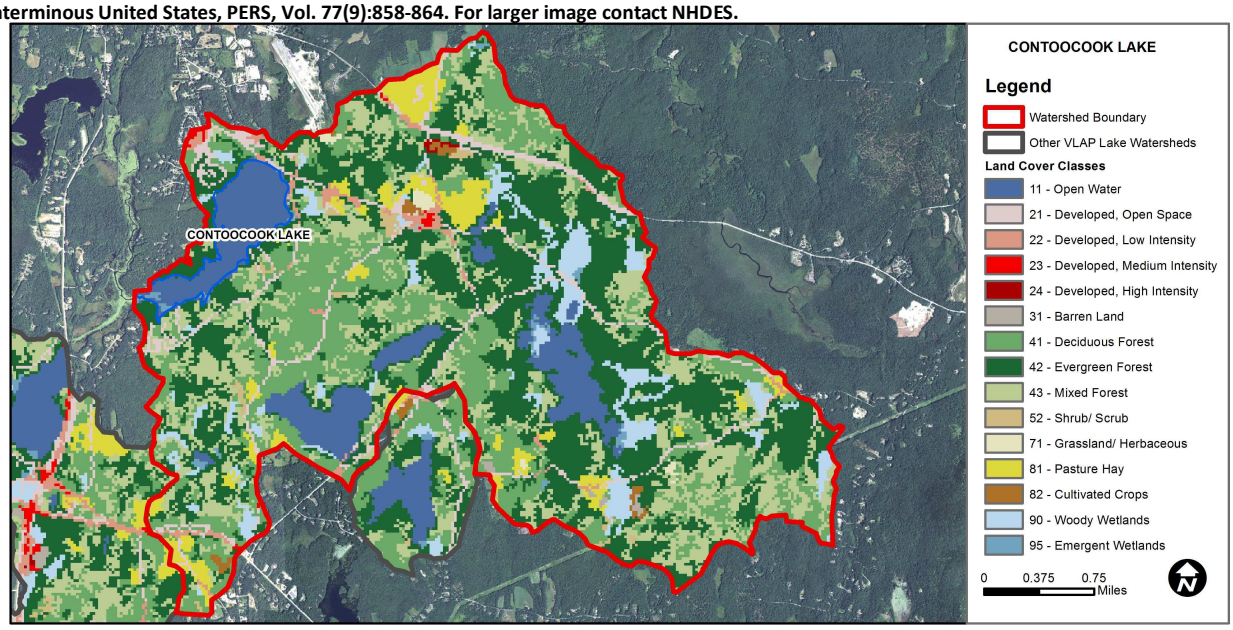
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for a given parameter by a small margin.
	Oxygen, Dissolved	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

CONTOOCOOK LAKE - TOWN 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	9.12	Barren Land	0.18	Grassland/Herbaceous	0.34
Developed-Open Space	4.21	Deciduous Forest	21.28	Pasture Hay	4.42
Developed-Low Intensity	1.33	Evergreen Forest	32.86	Cultivated Crops	0.41
Developed-Medium Intensity	0.16	Mixed Forest	19.15	Woody Wetlands	5.37
Developed-High Intensity	0.08	Shrub-Scrub	0.65	Emergent Wetlands	0.48

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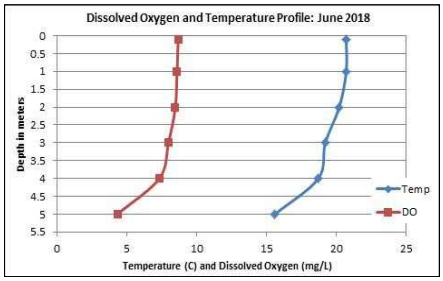
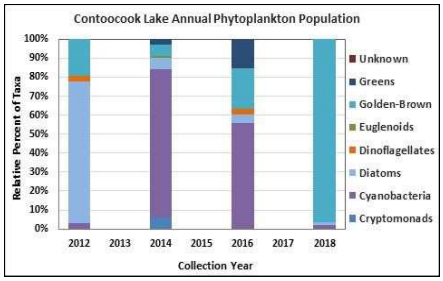
2018 Data Summary

Recommended Actions: Pond quality is representative of mesotrophic, or average, conditions and the improving chlorophyll levels are encouraging. However, conductivity levels have remained higher since 2015 and efforts should be focused towards practicing best management practices when applying road salt to roads, parking lots and driveways, particularly in the Taft, Townline and Woodbound Inlet sub-watersheds. Encourage local road agents and private winter maintenance companies to obtain Voluntary Salt Applicator license through UNH Technology Transfer Center's Green SnowPro Certification program. A significant storm event prior to sampling resulted in elevated phosphorus and turbidity levels in Cochrane Inlet W and Woodbound Inlet. Identify potential areas of erosion and nutrient pollution in the sub-watersheds and work to reduce the impacts of stormwater runoff here. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll levels were low in June, decreased slightly in July, and then increased to moderate level in September. Average chlorophyll level decreased slightly from 2017, and was slightly less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Hypolimentic (lower water layer), Cochrane Inlet E and W, Outlet, Jowder Cove Inlet, and Townline Inlet conductivity levels were slightly elevated and chloride levels were greater than the state median. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Squantum, Taft and Woodbound Inlet conductivity and chloride levels were elevated yet chloride levels were less than the state chronic chloride standard. Walsh Inlet conductivity and chloride levels were very low and less than the state medians.
- **Color:** Apparent color was measured in the epilimnion and indicates the lake is moderately to highly tea colored, or brown.
- **E. coli:** Squantum and Townline Inlet E. coli levels were lower in June and then increased greatly in July following a significant storm event, however levels remained less than the state standard of 406 cts/100 mL for surface waters. Jowder Cove Inlet E. coli levels were also slightly elevated in July but remained less than the state standard.
- **Total Phosphorus:** Epilimnetic, Hypolimnetic, Jowder Cove, Cochrane Inlet E, Townline Inlet, and Outlet phosphorus levels fluctuated within a moderate range from June through September. Average epilimnetic phosphorus level decreased slightly from 2017, was approximately equal to the state median, and was slightly less than the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Cochrane Inlet W, Squantum Inlet, Walsh Inlet, and Woodbound Inlet phosphorus levels were elevated in July following the significant storm event, and turbidity levels were also elevated at Cochrane W and Woodbound Inlet. Taft Inlet phosphorus levels were greatly elevated in June likely due to beaver activity that flooded a large, swampy area rich in nutrients. Subsequent sampling revealed phosphorus levels decreased to a normal range.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was below average in June, increased (improved) slightly in July, and then decreased in September. Average NVS transparency remained stable with 2017 and was less than the state median. Historical trend analysis indicates relatively stable transparency levels since monitoring began.
- **Turbidity:** Epilimnetic, Hypolimnetic, Squantum Inlet, and Outlet turbidity levels were within a low range. Cochrane Inlet E, Jowder Cove and Townline Inlet turbidity levels were elevated in September during low flows. Cochrane Inlet W and Woodbound Inlet had elevated turbidity levels in July following a significant storm event. Taft Inlet turbidity levels were elevated in June during low flows.
- **pH:** Epilimnetic and Woodbound Inlet pH levels were within the desirable range 6.5-8.0 units, however epilimnetic pH has historically fluctuated below the desirable range. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. All other stations experienced slightly acidic pH levels, particularly at Cochrane Inlet W where pH levels were critical to aquatic life.





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 CONTOOCOOK LAKE - JAFFREY										
	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	3.9	3.68	20	83	92.3		11	2.22	2.68	0.95	6.66
Hypolimnion					92.4		12			1.23	6.30
Cochrane Inlet E			21		114.0		15			3.39	6.22
Cochrane Inlet W			28		128.6		42			5.53	4.90
Dam Outlet					110.2		15			0.85	5.98
Jowder Cove Inlet			29		108.4	308	18			1.40	6.16
Squantum Inlet			46		150.3	147	69			0.86	6.16
Taft Inlet			89		298.0		69			5.01	6.08
Townline Inlet			25		100.0	234	21			2.79	6.18
Walsh Inlet			3		31.6		19			1.78	6.32
Woodbound Inlet			42		170.8		31			4.79	6.80

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 moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.