



Volunteer Lake Assessment Program Individual Lake Reports

BROAD BAY, OSSIPEE, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	224,432	Max. Depth (m):	22.3	Flushing Rate (yr ⁻¹):	34.1
Surface Area (Ac.):	464	Mean Depth (m):	8.3	P Retention Coef:	0.04
Shore Length (m):	10,600	Volume (m ³):	15,573,500	Elevation (ft):	406

TROPHIC CLASSIFICATION

Year	Trophic class
1987	OLIGOTROPHIC
2003	OLIGOTROPHIC

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

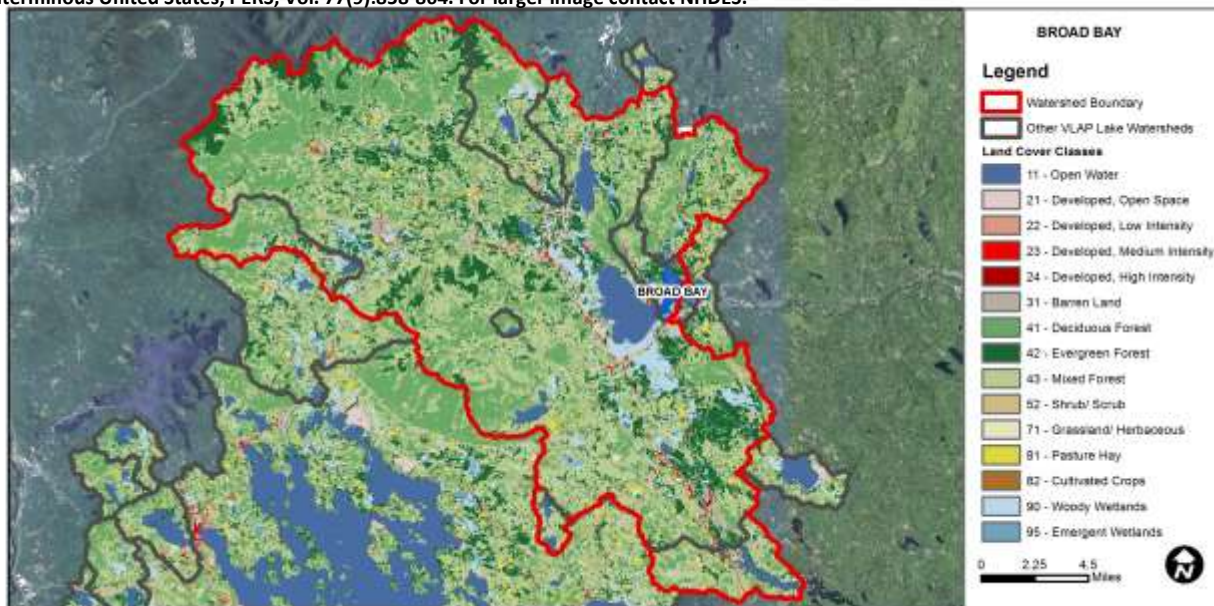
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Dissolved oxygen saturation	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	No Data	No data for this parameter.
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

BROAD BAY - CAMP HUCKINS BEACH	Escherichia coli	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
BROAD BAY - CAMP ROBIN HOOD BEACH	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
LEAVITT BAY - CAMP MARIST BEACH	Escherichia coli	Very Good	All sampling data 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	3.56	Barren Land	0.64	Grassland/Herbaceous	0.36
Developed-Open Space	2.91	Deciduous Forest	23.33	Pasture Hay	0.85
Developed-Low Intensity	0.74	Evergreen Forest	20.37	Cultivated Crops	0.5
Developed-Medium Intensity	0.24	Mixed Forest	38.49	Woody Wetlands	4.63
Developed-High Intensity	0.04	Shrub-Scrub	2.67	Emergent Wetlands	0.6



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

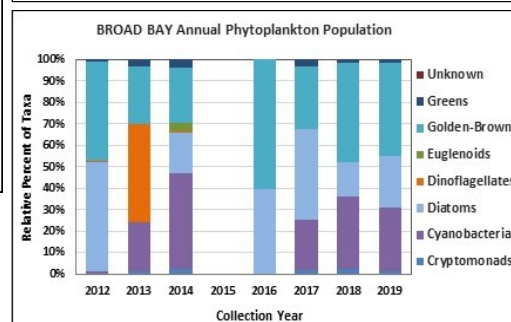
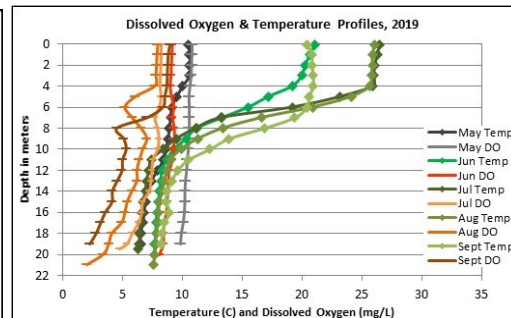
BROAD BAY, OSSISPEE

2019 DATA SUMMARY

RECOMMENDED ACTIONS: Broad Bay phosphorus and chlorophyll levels were representative of oligotrophic or high quality conditions and the improving chlorophyll levels are encouraging. However, water clarity (transparency) continues to experience years of decline potentially due to periods of darker water color. Continue to measure the relationship between water color and clarity as the increased frequency and intensity of storm events flushes waters rich in dissolved organic matter that imparts a tea color to the water. Conductivity levels, while low, have significantly increased (worsened) since monitoring began. This likely reflects road salt impacts from Rt.25 and residential development in sub-watersheds. Educating watershed residents on proper application of sodium chloride products in winter months and managing stormwater runoff can help reduce the pollutant load. UNH Technology Transfer Center's Road Salt Reduction and NHDES's Watershed Assistance websites are an excellent resource for information on road salt reduction and stormwater management. Keep up the great work!

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

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels fluctuated within a low range and were highest in July. Average chlorophyll level decreased slightly from 2018 and was much less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity levels remained within an average range for NH lakes and approximately equal to the state median. Epilimnetic chloride levels were slightly greater than the state median, yet much less than 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 indicated the water fluctuated within a moderately tea colored range and was darkest in May and July.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic, Metalimnetic and Hypolimnetic phosphorus levels fluctuated within a low range. Average epilimnetic phosphorus level increased from 2018 but remained much less than the state median, and slightly less than the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average from May through August and was lowest (worst) in May and July. Transparency then increased (improved) to within a good range in September. Average NVS transparency decreased from 2018 and was approximately equal to the state median. Historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic and Metalimnetic turbidity levels fluctuated within a low range. Hypolimnetic turbidity level was slightly elevated in September.
- ◆ **PH:** Epilimnetic pH levels fluctuated around the low end of the desirable range 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Metalimnetic and Hypolimnetic pH levels were slightly less than desirable.



Station Name	Table 1. 2019 Average Water Quality Data for BROAD BAY - FREEDOM									
	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	5.4	1.61	9	52	49.4	6	3.32	3.76	0.41	6.49
Metalimnion					46.9	6			0.39	6.24
Hypolimnion					45.4	6			0.99	6.05

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

