



## 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 <sup>-1</sup> )	34.1
Surface Area (Ac.):	464	Mean Depth (m):	8.3	P Retention Coef:	0.04
Shore Length (m):	10,600	Volume (m <sup>3</sup> ):	15,573,500	Elevation (ft):	406

#### TROPHIC CLASSIFICATION

Year	Trophic class
1987	OLIGOTROPIC
2003	OLIGOTROPIC

#### KNOWN EXOTIC SPECIES

Variable Milfoil

The Waterbody Report Card tables are generated from the DRAFT 2016 305(b) report on the status of N.H. waters, and are based on data collected from 2006-2015. Detailed waterbody assessment and report card information can be found at [www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm](http://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	Very Good	All sampling data meet water quality standards or thresholds for this 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

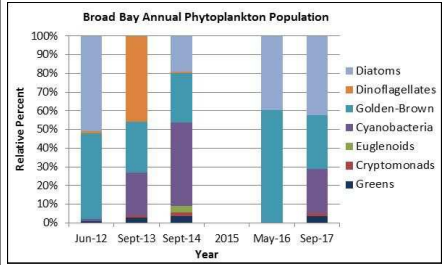
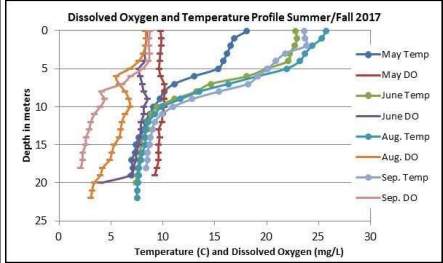
## BROAD BAY, OSSIPEE

### 2017 DATA SUMMARY

**RECOMMENDED ACTIONS:** Broad Bay water quality was again representative of oligotrophic, or high quality, conditions. However, water clarity (transparency) was below average for the majority of the summer season. Above average spring and early summer rainfall and resulting stormwater runoff and flushing of waters rich in dissolved organic matter may influence water clarity as well as boating activities. Educate boaters about responsible lake stewardship and the importance of following boating regulations. The DES fact sheet WD-WMB-25 "Impacts of Motorized Craft on New Hampshire's Waterbodies" is a good resource. Continue measuring apparent color to evaluate relationships between water color and water clarity. Color data collected this year indicated that the water was almost three times darker than when measured in 2003. Conductivity has significantly increased (worsened) in Leavitt and Broad Bays. This likely reflects the proximity of Rt. 25 and residential development in the sub-watersheds. Educate watershed residents on ways to reduce the application of de-icing products containing sodium chloride on their walkways and driveways. Continue watershed management activities and the development and implementation of a watershed management plan. 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 higher in May and September. Average chlorophyll level increased slightly from 2016, was much less than the state median, and was slightly less than 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 and/or chloride levels increased slightly as the summer progressed and were slightly greater than the state medians yet remained less than a level of concern. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- ◆ **COLOR:** Apparent color was measured in the epilimnion and indicates the lake water is moderately tea colored, or brown.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels remained stable and low from May through August and then increased to slightly elevated levels in September. Average epilimnetic phosphorus increased from 2016, was less than the state median, and was approximately equal to the threshold for oligotrophic lakes. Metalimnetic phosphorus levels were slightly elevated in May and then decreased to stable and low levels from June through September. Hypolimnetic phosphorus levels were stable and low from May through September.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) from May through August and then increased (improved) greatly in September. Average NVS transparency decreased from 2016 and was approximately equal to the state median. Historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic turbidity levels remained stable and low from May through September. Metalimnetic turbidity levels were low from May through August and then increased in September when algal growth was slightly higher. Hypolimnetic turbidity levels were low from May through August and slightly elevated in September.
- ◆ **pH:** Epilimnetic pH levels were within the desirable range 6.5-8.0 units, however, have historically fluctuated below the desirable range. Historical trend analysis indicates significantly decreasing (worsening) epilimnetic pH levels since monitoring began. Metalimnetic pH levels were slightly less than desirable and hypolimnetic pH levels were slightly acidic and less than desirable.



Station Name	Table 1. 2017 Average Water Quality Data for BROAD BAY-OSSIPEE									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color PCU	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	5.2	2.16	8	50	48.6	8	3.26	3.74	0.68	6.88
Metalimnion					46.0	8			0.63	6.32
Hypolimnion					46.1	7			1.27	6.16

**NH Median Values:** Median values for specific parameters generated from historic lake monitoring data.

- Alkalinity:** 4.9 mg/L
- Chlorophyll-a:** 4.58 mg/m<sup>3</sup>
- Conductivity:** 40.0 uS/cm
- Chloride:** 4 mg/L
- Total Phosphorus:** 12 ug/L
- Transparency:** 3.2 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)	Worsening	Data significantly decreasing.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.

