Volunteer Lake Assessment Program Individual Lake Reports
LEAVITT BAY, OSSIPEE, NH

MORPHOMETRIC DATA

							TROPHIC CLASSIFICATION		KNOWN EXOTIC SPECIES
Watershed Area (Ac.):	227,357	Max. Depth (m):	12.8	Flushing Rate (yr¹)	221	Year	Trophic class		Variable Milfoil
Surface Area (Ac.):	176	Mean Depth (m):	3.4	P Retention Coef:	0	1987	MESOTROPHIC		
Shore Length (m):	4,800	Volume (m³):	2,429,000	Elevation (ft):	406	2003	OLIGOTROPHIC		

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

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 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	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.
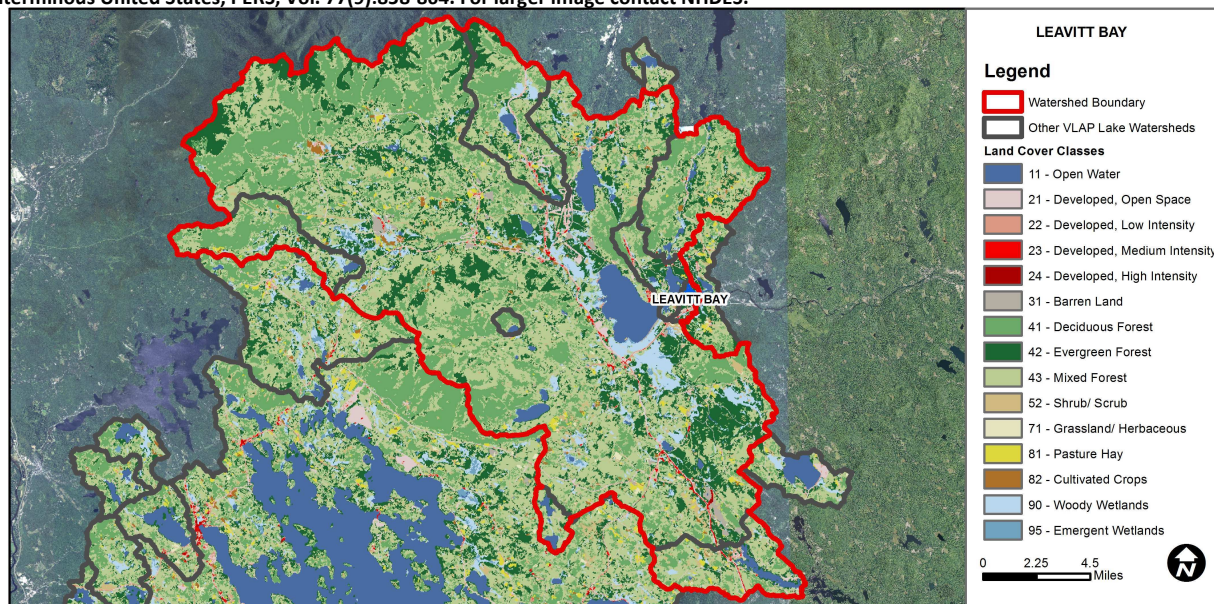
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	3.64	Barren Land	0.64	Grassland/Herbaceous	0.36
Developed-Open Space	2.95	Deciduous Forest	23.25	Pasture Hay	0.85
Developed-Low Intensity	0.77	Evergreen Forest	20.38	Cultivated Crops	0.5
Developed-Medium Intensity	0.25	Mixed Forest	38.4	Woody Wetlands	4.65
Developed-High Intensity	0.04	Shrub-Scrub	2.67	Emergent Wetlands	0.6

RECOMMENDED ACTIONS: Leavitt 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 twice as dark than when measured in 2003. Conductivity has significantly increased 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 were within a low range but were higher in May and June, decreased to very low levels in August, and then increased slightly in September. Average chlorophyll level remained stable with 2016 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years.

◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity and/or chloride levels were approximately equal to the state medians and increased from May through September. 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 and Metalimnetic phosphorus levels were slightly elevated in May following spring snowmelt and rainfall. Phosphorus levels then decreased to low levels and continued to decrease as the summer progressed. Average epilimnetic phosphorus level increased from 2016, was less than the state median, and was approximately equal to the threshold for oligotrophic lakes. Historical trend analysis indicates highly variable epilimnetic phosphorus levels since monitoring began.

◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) from May through August and then increased (improved) in September. Average NVS transparency decreased from 2016 and was approximately equal to the state median. Historical trend analysis indicates significantly decreasing (worsening) transparency levels since monitoring began.

◆ **TURBIDITY:** Epilimnetic turbidity levels were slightly elevated in May following spring snowmelt and rainfall, and then decreased to low levels in June through September. Metalimnetic turbidity levels remained stable and low. Hypolimnetic turbidity levels were slightly elevated in September during high wind and wave conditions.

◆ **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 and hypolimnetic pH levels were generally slightly less than the desirable range.

Dissolved Oxygen and Temperature Profile Summer/Fall 2017

Leavitt Bay Annual Phytoplankton Population
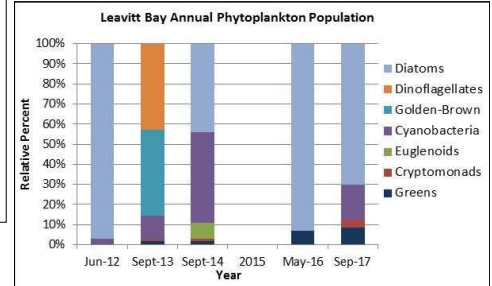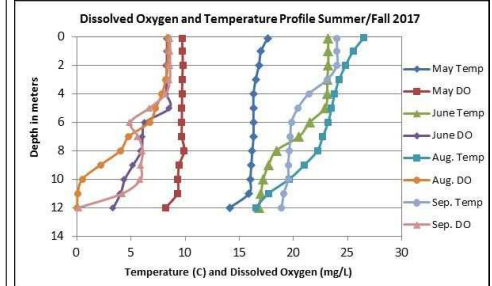
Station Name	Table 1. 2017 Average Water Quality Data for LEAVITT BAY-OSSIPEE									
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color PCU	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
							NVS	VS		
Epilimnion	5.3	2.05	8	55	49.1	8	3.25	3.65	0.76	6.78
Metalimnion					49.5	7			0.77	6.41
Hypolimnion					51.5	9			1.60	6.33

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^3
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	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Worsening	Data significantly decreasing.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.

Historical Trend Epilimnetic Conductivty and pH

Historical Chlorophyll-a, Epilimnetic Phosphorus & Transparency Data