



## Volunteer Lake Assessment Program Individual Lake Reports

### SUNAPEE LAKE, SUNAPEE, NH

#### MORPHOMETRIC DATA

Watershed Area (Ac.):	28,863	Max. Depth (m):	31.9	Flushing Rate (yr <sup>-1</sup> )	0.3
Surface Area (Ac.):	4090	Mean Depth (m):	11.4	P Retention Coef:	0.7
Shore Length (m):	47,600	Volume (m <sup>3</sup> ):	188,150,000	Elevation (ft):	1092

#### TROPHIC CLASSIFICATION

Year	Trophic class
1995	OLIGOTROPHIC
2006	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](http://www.des.nh.gov/organization/divisions/water/wmb/swqa/index.htm)

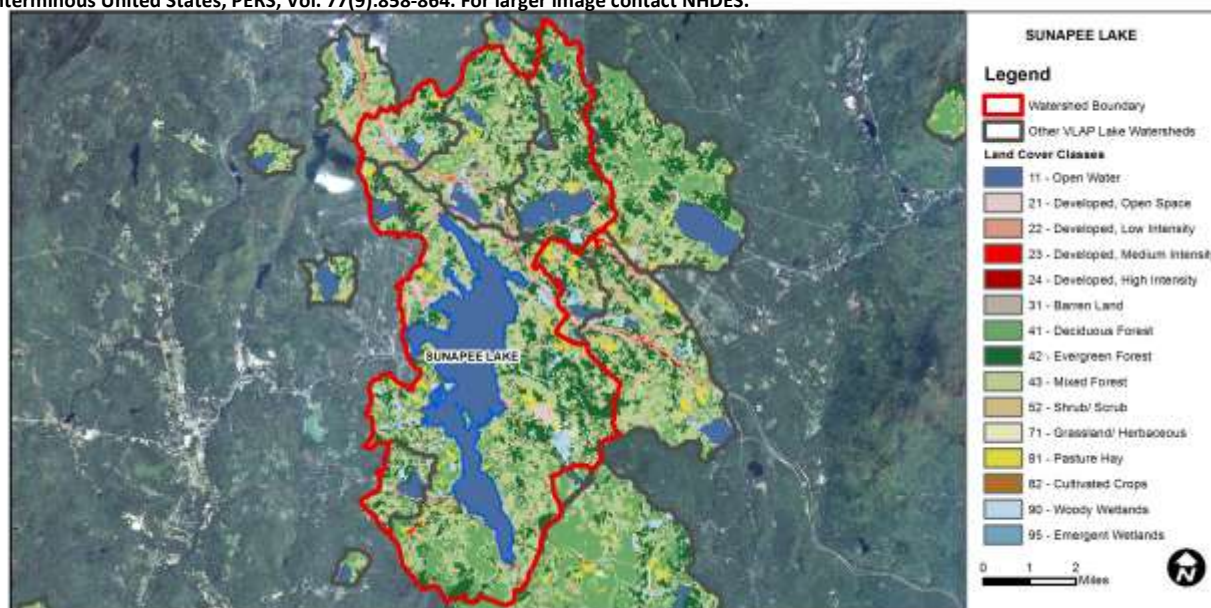
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	Sampling data is better than the water quality standards or thresholds for this parameter.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	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	Very Good	Sampling data is 50 percent 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

SUNAPEE LAKE - SUNAPEE STATE PARK BEACH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
SUNAPEE LAKE - BLODGETT'S LANDING BEACH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
SUNAPEE LAKE - DEWEY (TOWN) BEACH	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.
SUNAPEE LAKE - DEPOT BEACH	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
SUNAPEE LAKE - GEORGES MILL TOWN 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	17.9	Barren Land	0.18	Grassland/Herbaceous	0.44
Developed-Open Space	4.66	Deciduous Forest	12.49	Pasture Hay	2.59
Developed-Low Intensity	2.83	Evergreen Forest	21.94	Cultivated Crops	0.15
Developed-Medium Intensity	0.24	Mixed Forest	31.84	Woody Wetlands	3.2
Developed-High Intensity	0.01	Shrub-Scrub	1.14	Emergent Wetlands	0.3



# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

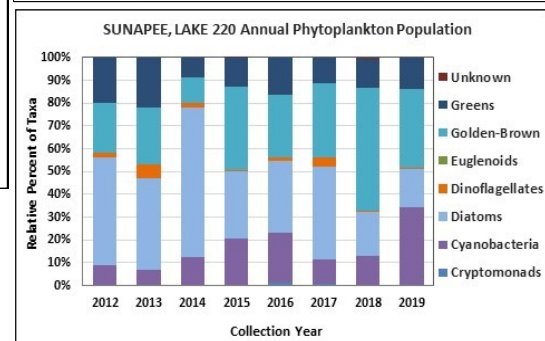
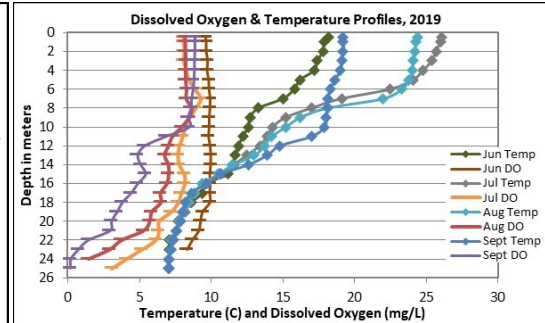
## LAKE SUNAPEE, STN. 220, SUNAPEE

### 2019 DATA SUMMARY

**RECOMMENDED ACTIONS:** Great job measuring chloride in 2019! Lake conductivity levels have significantly increased (worsened) indicating the use of de-icing materials in the winter is likely impacting lake quality. Continue to encourage local winter maintenance companies to obtain NH Voluntary Salt Applicator licenses through UNH Technology Transfer Center's Green SnowPro Certification. Inventory and prioritize areas susceptible to stormwater runoff and implement best management practices in these areas. Encourage lake residents to maintain vegetative buffers to infiltrate stormwater runoff and prevent shoreline erosion. Refer to DES' "New Hampshire Homeowner's Guide to Stormwater Management" for assistance. Keep up the great work!

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

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels were fluctuated within a low range and were highest in June. Average chlorophyll level decreased from 2018 and was slightly less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity levels remained slightly elevated and greater than the state median. Epilimnetic, Metalimnetic and Hypolimnetic 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) conductivity levels since monitoring began.
- ◆ **COLOR:** Apparent color was measured in the epilimnion and indicated the lake water was clear with little to no tea or brown coloring, and fluctuated slightly from June through September.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic and Hypolimnetic phosphorus levels were within a low range, were higher in June, decreased in July and remained stable through September. Average epilimnetic phosphorus level decreased slightly from 2018 and was much less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus levels were stable and low.
- ◆ **TRANSPARENCY:** Transparency was below average (worse) in June and the increased (improved) as the summer progressed. Average transparency remained stable with 2018 and was much higher (better) than the state median. Historical trend analysis indicates stable transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic, Metalimnetic and Hypolimnetic turbidity levels fluctuated within a low range for those stations.
- ◆ **pH:** Epilimnetic and Metalimnetic pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Hypolimnetic pH levels were slightly less than desirable from July through September.



Station Name	Table 1. 2019 Average Water Quality Data for SUNAPEE LAKE, STN. 220								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	Total P mg/l	Trans. m	Turb. ntu	pH
							VS		
Epilimnion	6.25	1.38	24	15	98.6	3	8.41	0.48	7.00
Metalimnion			26		96.2	4		0.59	6.66
Hypolimnion			26		95.8	4		0.67	6.38

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

