



## Volunteer Lake Assessment Program Individual Lake Reports

### DANFORTH POND, LOWER, FREEDOM, NH

#### MORPHOMETRIC DATA

Watershed Area (Ac.):	11,776	Max. Depth (m):	16.8	Flushing Rate (yr <sup>1</sup> )	31.6
Surface Area (Ac.):	32	Mean Depth (m):	7.1	P Retention Coef:	0.07
Shore Length (m):	1,400	Volume (m <sup>3</sup> ):	918,500	Elevation (ft):	408

#### TROPHIC CLASSIFICATION

Year	Trophic class
1983	MESOTROPHIC
2001	MESOTROPHIC

#### KNOWN EXOTIC SPECIES

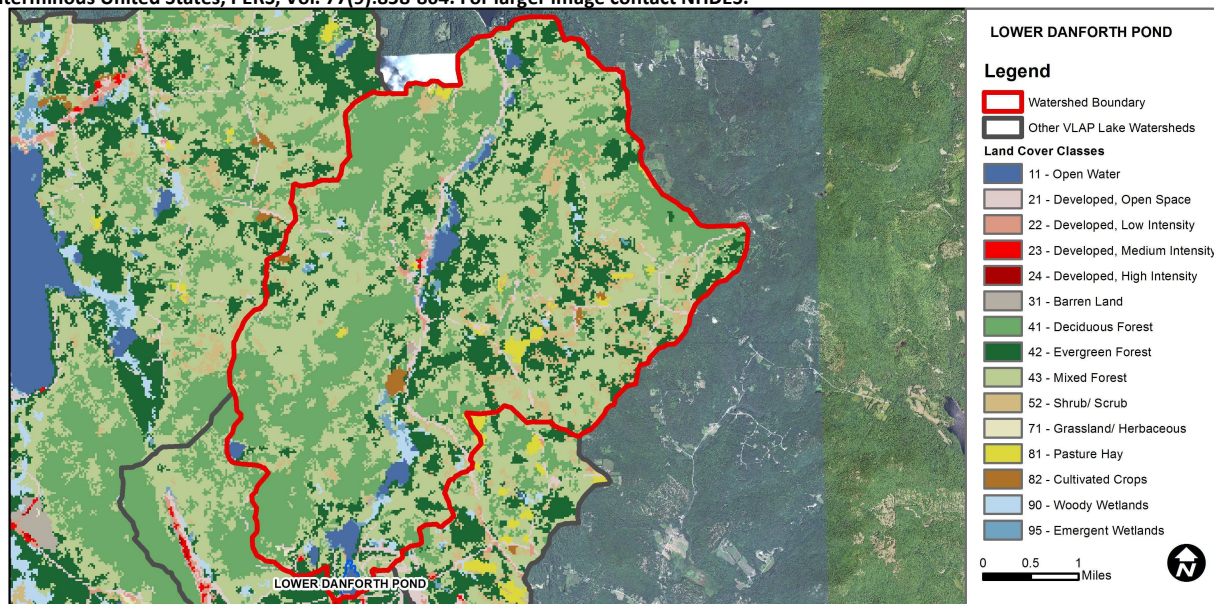
Variable Milfoil

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at [www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm](http://www.des.nh.gov/organizations/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	Good	Sampling data commonly 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	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	2.09	Barren Land	0.1	Grassland/Herbaceous	0.08
Developed-Open Space	2.61	Deciduous Forest	29.82	Pasture Hay	0.85
Developed-Low Intensity	0.26	Evergreen Forest	16.21	Cultivated Crops	0.41
Developed-Medium Intensity	0.03	Mixed Forest	40.01	Woody Wetlands	1.18
Developed-High Intensity	0	Shrub-Scrub	5.62	Emergent Wetlands	0.74



# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

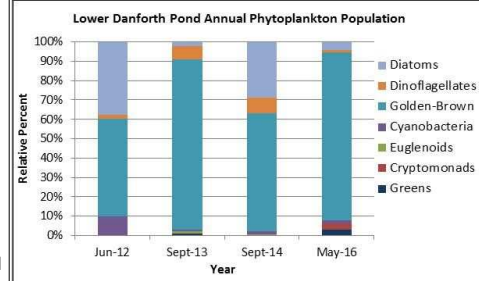
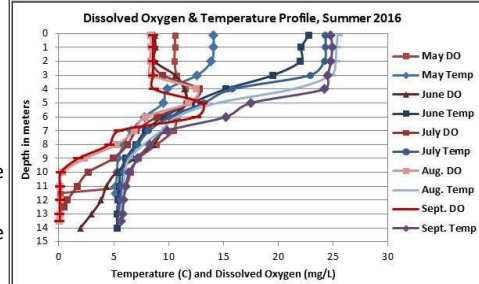
## LOWER DANFORTH POND, FREEDOM

### 2016 DATA SUMMARY

**RECOMMENDED ACTIONS:** Pond water quality generally remained within good to average ranges in 2016. Water clarity improved in 2016 potentially due to drought conditions and the lack of stormwater runoff. Clarity measurements in June and historical data indicate that significant storm events prior to sampling cause a decrease in water clarity. This indicates stormwater runoff is negatively impacting water quality. Educate and work with lake and watershed residents to identify areas impacted by stormwater runoff and implement best practices to reduce stormwater impacts. Encourage residents to stabilize steep slopes by planting and maintaining vegetative buffers. DES' "NH Homeowner's Guide to Stormwater Management" and UNH Cooperative Extension's "Landscaping at the Water's Edge" are great resources. Keep up the great work!

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

- CHLOROPHYLL-A:** Chlorophyll levels were low in May, increased to average levels in June and July, and then increased to levels approaching an algal bloom in August before decreasing to low levels in September. Average chlorophyll levels increased slightly from 2015 and were approximately equal to the state median. Historical trend analysis indicates stable chlorophyll levels with moderate variability between years.
- CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer) and Metalimnetic (middle water layer) conductivity levels were slightly above average for the pond and increased from May to September. Historical trend analysis indicates stable epilimnetic conductivity with moderate variability between years. Hypolimnetic (lower water layer) conductivity was within an average range for the pond and remained slightly greater than the state median. Epilimnetic chloride levels were also slightly above average yet remained much lower than the state acute and chronic chloride standards.
- TOTAL PHOSPHORUS:** Epilimnetic phosphorus was average in May and June, decreased to low levels in July and remained stable through September. Average epilimnetic phosphorus was increased slightly from 2015 and was slightly less than the state median. Historical trend analysis indicates stable epilimnetic phosphorus with moderate variability between years. Metalimnetic phosphorus was low in May and June, then increased to average levels in July as chlorophyll levels increased, and decreased to low levels in August and September. Hypolimnetic phosphorus levels were low in June and increased gradually to slightly elevated levels as the summer progressed and dissolved oxygen levels were depleted.
- TRANSPARENCY:** Transparency measured without the viewscope (NVS) was lower in June likely due to significant storm event prior to sampling, but remained slightly above average for the remaining months. Average NVS transparency increased (improved) slightly from 2015 and was better than the state median. Historical trend analysis indicates stable NVS transparency with moderate variability between years. Transparency measured with the viewscope (VS) was high (good) in May and September when algal growth was lowest, and was generally better than NVS transparency and likely a better measure of actual conditions.
- TURBIDITY:** Epilimnetic turbidity remained low from May through September. Metalimnetic turbidity was within a low to average range and slightly above average in July as algal growth increased. Hypolimnetic turbidity was average in May, June and September and elevated in July and August due to the formation and accumulation of organic compounds as the summer progressed and dissolved oxygen levels were depleted. The September hypolimnion sample was collected at a shallower depth and may be the reason why September turbidity decreased to an average range.
- pH:** Epilimnetic pH was within the desirable range 6.5-8.0 units and historical trend analysis indicates stable epilimnetic pH since monitoring began. Metalimnetic pH fluctuated below the desirable range as the summer progressed. Hypolimnetic pH was less than desirable.



Station Name	Table 1. 2016 Average Water Quality Data for LOWER DANFORTH POND, FREEDOM								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	10.1	4.59	10	68.5	9	4.19	4.98	0.60	6.72
Metalimnion				71.0	9			1.09	6.58
Hypolimnion				87.3	14			4.13	6.20

**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	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
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.

