Volunteer Lake Assessment Program Individual Lake Reports

ISLAND POND, DERRY, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	10,880	**Max. Depth (m):**	24.3	**Flushing Rate (yr^{1})**	2.4
Surface Area (Ac.):	498	**Mean Depth (m):**	4.5	**P Retention Coef:**	0.54
Shore Length (m):	14,600	**Volume (m^3):**	9,558,500	**Elevation (ft):**	205

TROPHIC CLASSIFICATION

Year	Trophic class
1985	MESOTROPHIC
2002	EUTROPHIC

KNOWN EXOTIC SPECIES

Fanwort
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

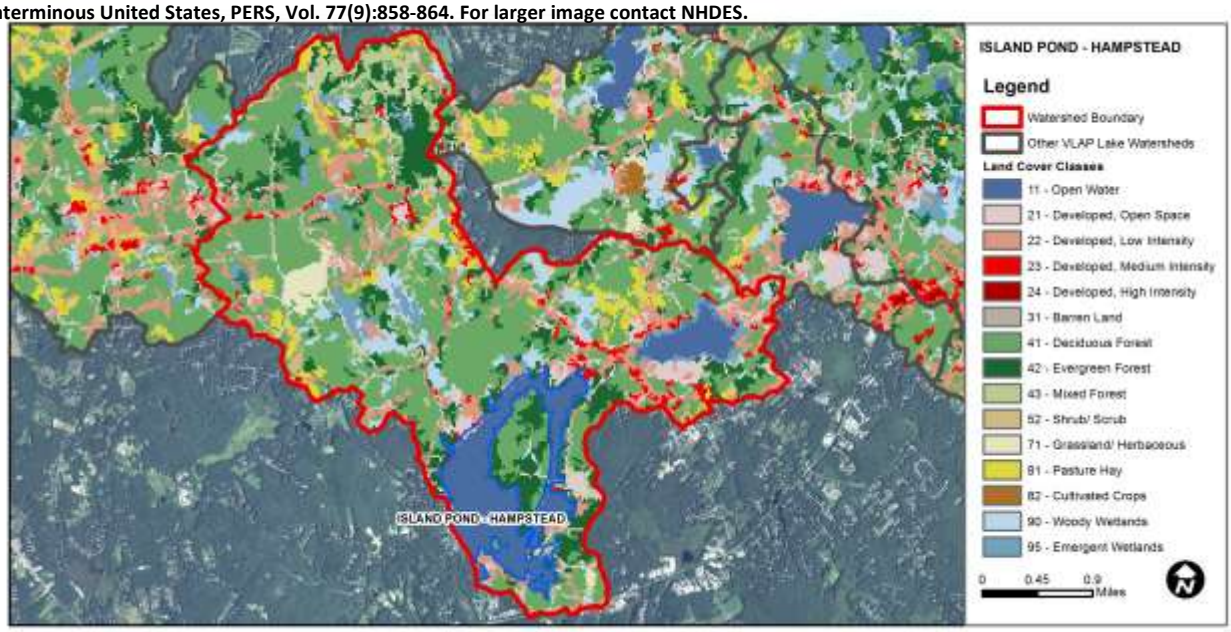
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
	pH	Slightly Bad	Data periodically exceed water quality standards or thresholds for this parameter by a small margin.
	Oxygen, Dissolved	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	Dissolved oxygen satura	Cautionary	Limited data for this parameter predicts exceedance of water quality standards or thresholds; however more data are necessary to fully assess the parameter.
	Chlorophyll-a	Slightly Bad	Data exceed water quality standards or thresholds for a given parameter by a small margin.
Primary Contact Recreation	Escherichia coli	Very Good	All sampling data meet water quality standards or thresholds for this parameter.
	Cyanobacteria hepatoto	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Very Good	All sampling data meet water quality standards or thresholds for this parameter.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

ISLAND POND - SANBORN SHORE ACRES	Escherichia coli	Good	Sampling data commonly meet water quality standards or thresholds for this parameter.
ISLAND POND - CHASE'S GROVE	Escherichia coli	Bad	Data periodically exceed water quality standards or thresholds for this parameter by a large margin.

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	10.8	Barren Land	0	Grassland/Herbaceous	1.33
Developed-Open Space	7.27	Deciduous Forest	38.67	Pasture Hay	3.98
Developed-Low Intensity	10.4	Evergreen Forest	12.87	Cultivated Crops	0.25
Developed-Medium Intensity	2.02	Mixed Forest	3.73	Woody Wetlands	4.52
Developed-High Intensity	0	Shrub-Scrub	1	Emergent Wetlands	3.08

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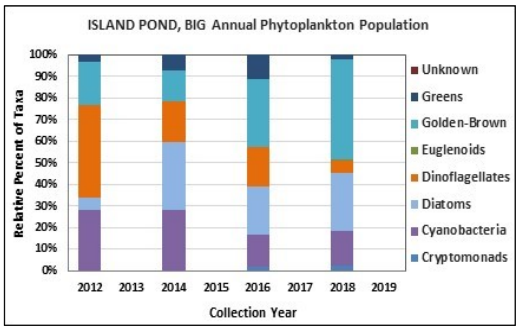
Big Island Pond, Derry
2019 Data Summary

Recommended Actions: Epilimnetic phosphorus levels have become increasingly variable since 2004, and generally spike every two to three years. This may coincide with other events happening in the watershed or lake that may be cyclical in nature, such as climate and precipitation patterns, water level management and drawdown, and exotic plant management activities. Try to better understand what might be driving these cyclical spikes in phosphorus levels. A storm event in June resulted in elevated phosphorus and turbidity levels indicating impacts from stormwater runoff. Consider partnering with Soak Up the Rain NH to implement best practices to reduce stormwater runoff in the watershed. For more information visit www.soaknh.com. Continue efforts to develop a watershed management plan to better identify, quantify and remediate nutrient sources. Keep up the great work!

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

- **Chlorophyll-a:** Chlorophyll levels were slightly elevated in June and July and then decreased to a low level in August. Average chlorophyll level increased slightly from 2018 and was greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot and tributary conductivity and chloride levels remained elevated and much greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity levels since monitoring began.
- **Color:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown, and was darkest in June.
- **E. coli:** Campground Inlet, Drew Inlet and Taylor Brook E. coli levels were less than the state standard for surface waters on each sampling event.
- **Total Phosphorus:** Epilimnetic phosphorus levels were within a low range and decreased as the summer progressed. Average epilimnetic phosphorus level increased slightly from 2018 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable, yet variable, epilimnetic phosphorus levels since monitoring began. Metalimnetic (middle water layer) phosphorus levels were stable and low. Hypolimnetic (lower water layer) phosphorus levels were low in June and July and slightly elevated in August when the turbidity of the sample was also elevated. Campground Inlet, Drew Inlet and Taylor Brook phosphorus levels were slightly elevated following a storm event in June and lab data noted colored water at Drew Inlet and Taylor Brook and light sediment at Campground Inlet.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) in June following a significant storm event, during high water levels, and when the water was darkest. Transparency increased (improved) in July and remained stable in August. Average NVS transparency decreased slightly from 2018 but was higher (better) than the state median. Historical trend analysis indicates stable, yet variable, transparency since monitoring began.
- **Turbidity:** Epilimnetic and Campground Inlet turbidity levels were slightly elevated in June following a storm event. Drew Inlet and Taylor Brook turbidity levels were also higher in June but within a normal range for those stations. Metalimnetic turbidity levels fluctuated within a normal range. Hypolimnetic turbidity level was elevated in August potentially due to the formation and accumulation of organic compounds under anoxic conditions.
- **pH:** Epilimnetic, Campground Inlet, Drew Inlet, and Taylor Brook pH levels were within 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.



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)

Table 1. 2019 Average Water Quality Data for BIG ISLAND POND - DERRY

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Color pcu	Cond. us/cm	E. coli mpn/100ml	Total P mg/l	Trans. m		Turb. ntu	pH
								NVS	VS		
Epilimnion	15.9	6.28	44	50	185.9		10	4.10	4.52	0.76	6.71
Metalimnion					183.2		11			0.72	6.45
Hypolimnion					181.2		13			3.85	6.41
Campground Inlet			55		244.0	139	21			1.54	7.10
Drew Inlet			39		188.3	44	21			1.20	6.73
Taylor Brook			41		187.6	40	23			0.84	6.91

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

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 highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.