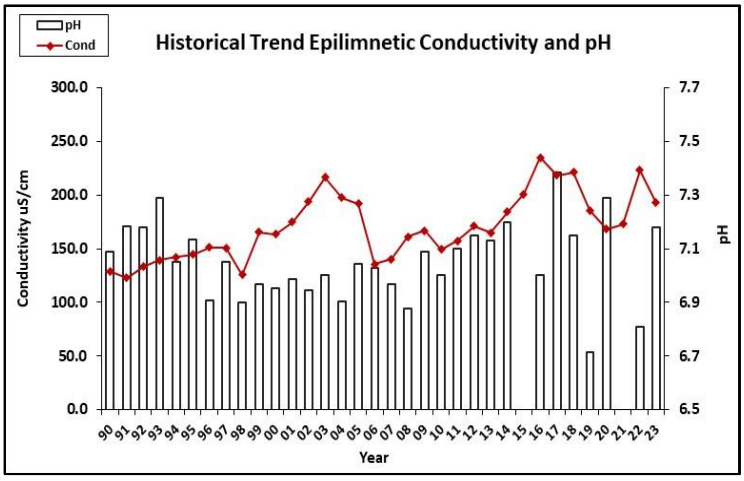
2023 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
BIG ISLAND POND, DERRY

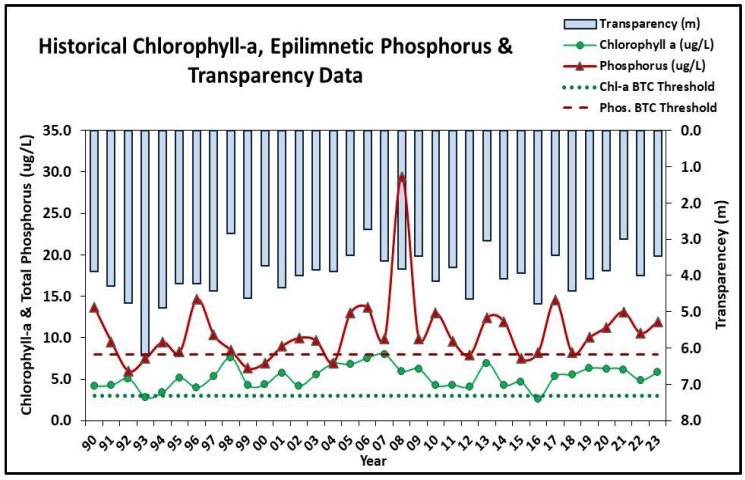
Recommended Actions: Great job sampling in 2023! Pond nutrient (phosphorus) levels and algal growth (chlorophyll) are higher than desirable and generally remain above the thresholds for oligotrophic lakes. Excessive summer rainfall and high water levels likely contributed to higher phosphorus levels measured in the lake and highlights the importance of managing stormwater runoff within the watershed and along the shoreline. Consider hiring a stormwater consultant to evaluate watershed properties and make recommendations on ways to manage stormwater runoff. Continue efforts to develop a watershed management plan to identify, quantify and remediate nutrient loads to the lake. Epilimnetic conductivity and chloride levels have significantly increased and indicate the negative impacts of winter road salting practices within the watershed. Encourage road agents and winter maintenance companies to obtain Green SnowPro certification. Green Mountain Conservation Group's Salt Responsibly initiative is a great example of education and outreach to reduce impacts of road salt. Keep up the great work!

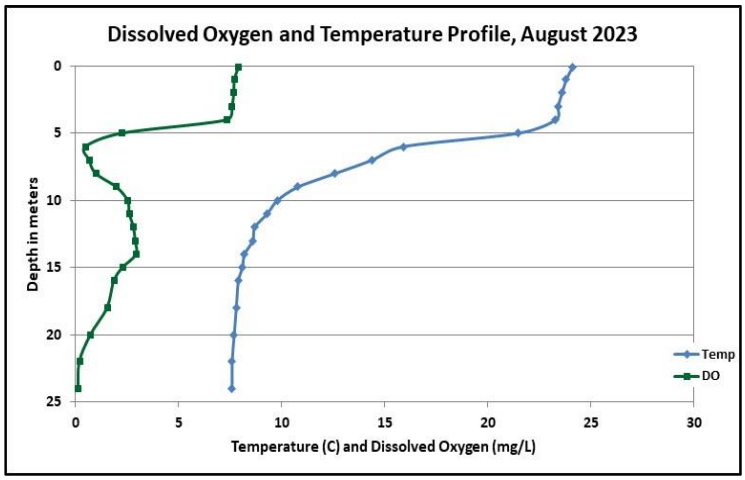
HISTORICAL WATER QUALITY TREND ANALYSIS

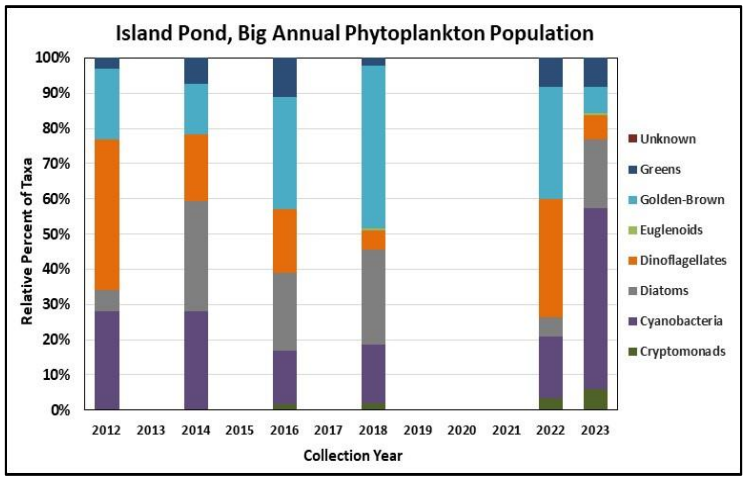
PARAMETER	TREND	PARAMETER	TREND
Conductivity	Worsening	**Chlorophyll-a**	Stable
pH (epilimnion)	Stable	**Transparency**	Worsening
Phosphorus (hypolimnion)	Stable	**Phosphorus (epilimnion)**	Stable

HISTORICAL WATER QUALITY GRAPHICS









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

- **CHLOROPHYLL-A:** Chlorophyll level was elevated in June, increased slightly in July, and decreased to a low level in August. Average chlorophyll level increased slightly from 2022 and was greater than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Campground Inlet, Drew Inlet, and Taylor Brook conductivity and chloride levels remained elevated and greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately tea colored from June through August.
- **E. COLI:** Campground Inlet, Drew Inlet and Taylor Brook E. coli levels fluctuated within a low range from June through August and were much less than the state standard for surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels fluctuated within a slightly elevated range from June through August and were slightly greater than the state median and the threshold for oligotrophic lakes. Metalimnetic phosphorus level was slightly elevated in July following periods of excessive rainfall. Hypolimnetic phosphorus level fluctuated within a low to moderate range for that station. Historical trend analysis indicates relatively stable epilimnetic and hypolimnetic phosphorus levels since monitoring began. Campround Inlet, Drew Inlet and Taylor Brook phosphorus levels fluctuated within low to moderate ranges for those stations and were lowest in August.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was within an average range in June, decreased slightly in July, and increased slightly in August. Average NVS transparency decreased slightly from 2022 but remained higher (better) than the state median. Historical trend analysis indicates significantly decreasing (worsening) NVS transparency since monitoring began.
- **TURBIDITY:** Epilimnetic and Metalimnetic turbidity levels fluctuated within a low range. Hypolimnetic turbidity levels were slightly elevated in July and August. Campground Inlet and Taylor Brook turbidity levels were slightly higher in July but within a normal range for those stations. Drew Inlet turbidity levels were slightly higher in June and August and lab data noted colored water conditions.
- **PH:** Epilinnetic and tributary pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates stable, yet variable, epilimnetic pH levels since monitoring began. Metalimnetic and Hypolimnetic pH levels decreased below the desirable range as the summer progressed.

Table 1. 2023 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 (ug/L)	Trans. (m)		Turb. (ntu)	pH
								NVS	VS		
Epilimnion	15.7	5.80	39	56	192.9	-	12	3.46	3.99	0.67	7.18
Metalimnion	-	-	-	-	205.6	-	10	-	-	0.67	6.55
Hypolimnion	-	-	-	-	210.8	-	11	-	-	2.89	6.49
Campground Inlet	-	-	57	-	260.7	24	21	-	-	1.08	7.17
Drew Inlet	-	-	41	-	201.1	28	25	-	-	1.35	6.64
Taylor Brook	-	-	35	-	187.2	55	22	-	-	1.06	6.86

NH Median Values

Median values 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. Water quality violation if thresholds exceeded.

Chloride: > 230 mg/L (chronic)
Turbidity: > 10 NTU above natural
E. coli: > 88 cts/100 mL (beach)
E. coli: > 406 cts/100 mL (surface waters)
pH: between 6.5-8.0 (unless naturally occurring)