

# C

## APPENDIX C

---

Water Quality Data

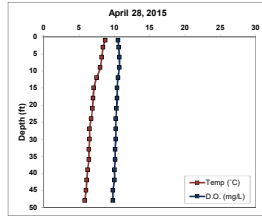


Harris Lake

Date: 4/28/2015  
Time: 14:50  
Weather: 0% clouds, 65F, light wind  
Entry: EEH

Max Depth: 49.2  
LS Depth (ft): 3.0  
LB Depth (ft): 45.0  
Secchi Depth (ft): 6.2

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	8.2	10.3		
3	8.2	10.0	7.1	
5	8.2	10.7		
9	8.0	10.7		
12	7.7	10.8		
15	7.3	10.4		
18	7.0	10.4		
21	6.9	10.3		
24	6.7	10.2		
27	6.6	10.2		
30	6.5	10.2		
33	6.4	10.1		
36	6.2	10.0		
39	6.2	10.0		
42	6.1	10.0		
45	6.0	9.8	7.0	
49	5.3	9.8		



Parameter	HALS	HALB
Total P (µg/L)	2.00	2.10
Dissolved P (µg/L)	2.00	2.10
Chla (µg/L)	6.42	NA
TPN (µg/L)	202.00	476.00
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	30.80	88.40
NH <sub>4</sub> -N (µg/L)	ND	ND
Total N (µg/L)	30.80	88.40
Lab Cond. (µS/cm)	39.30	38.40
Lab pH	7.63	7.48
Alkalinity (mg/L CaCO <sub>3</sub> )	38.50	38.50
Total Susp. Solids (mg/L)	NA	ND
Calcium (mg/L)	12.20	NA
Magnesium (mg/L)	2.78	NA
Hardness (mg/L)	14.98	NA
Color (SU)	30.00	NA
Turbidity (NTU)	NA	NA

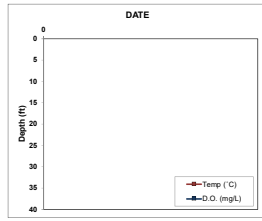
Data collected by BTB (Ontario)

Harris Lake

Date: 6/21/2015  
Time: 13:30  
Weather: 21.1 C, 5% clouds  
Entry: EEH

Max Depth:  
LS Depth (ft):  
LB Depth (ft): 14.0  
Secchi Depth (ft): 14.0

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)



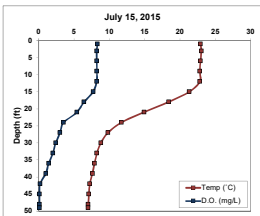
Parameter	HALS	HALB
Total P (µg/L)	NA	NA
Dissolved P (µg/L)	NA	NA
Chla (µg/L)	NA	NA
TPN (µg/L)	392.00	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	ND	ND
NH <sub>4</sub> -N (µg/L)	ND	NA
Total N (µg/L)	392.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

### Harris Lake

Date: 7/15/2015  
Time: 11:20  
Weather: Clear, light breeze, 68F  
Entry: EEH

Max Depth: 49.5  
LS Depth (ft): 3.0  
LB Depth (ft): 47.0  
Secchi Depth (ft): 12.4

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	22.0	8.3		
3	22.0	8.2		
6	22.0	8.2		
9	22.0	8.2		
12	22.0	8.2		
15	21.5	7.7		
18	18.4	6.4		
21	14.0	5.4		
24	11.7	5.2		
27	9.8	5.0		
30	8.8	2.4		
33	8.2	2.0		
36	7.8	1.8		
39	7.3	1.6		
42	7.2	0.9		
45	7.1	0.5		
48	7.0	0.1		
49	7.0	0.1		



Parameter	HALS	HALB
Total P (µg/L)	14.50	53.80
Dissolved P (µg/L)	NA	80.20
Chl a (µg/L)	2.95	NA
TNN (µg/L)	405.00	541.00
NH <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	363.00
NH <sub>4</sub> -N (µg/L)	NA	89.50
Total N (µg/L)	405.00	597.50
Lab Cond. (µS/cm)	87.00	NA
Lab pH	8.10	NA
Alkalinity (mg/L, CaCO <sub>3</sub> )	18.50	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	30.00	NA
Turbidity (NTU)	NA	NA

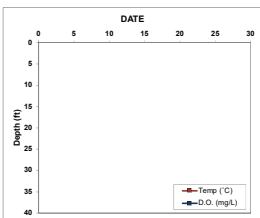
Data collected by TAH (Criteria)

### Harris Lake

Date: 8/29/2015  
Time: 12:00  
Weather: Entry: EEH

Max Depth:  
LS Depth (ft):  
LB Depth (ft):  
Secchi Depth (ft):

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)



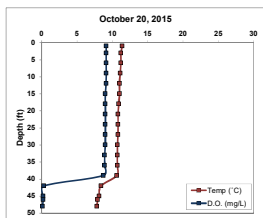
Parameter	HALS	HALB
Total P (µg/L)	NA	NA
Dissolved P (µg/L)	NA	NA
Chl a (µg/L)	NA	NA
TNN (µg/L)	678.00	NA
NH <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	120.00	NA
NH <sub>4</sub> -N (µg/L)	25.00	NA
Total N (µg/L)	1098.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L, CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Harris Lake

Date: 10/20/2015  
 Time: 15:00  
 Weather: 50F, 50% clouds  
 Entry: ESH

Max Depth: 49.0  
 LS Depth (ft): 3.0  
 LB Depth (ft): 46.0  
 Secchi Depth (ft): 10.0

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	11.4	9.1		
3	11.2	9.1		
6	11.2	9.1		
9	11.2	9.1		
12	11.0	9.1		
15	11.0	9.0		
18	10.9	9.0		
21	10.8	9.0		
24	10.8	9.0		
27	10.8	9.0		
30	10.7	8.9		
33	10.7	8.9		
36	10.6	8.9		
39	10.6	8.9		
42	8.4	0.3		
45	8.3	0.2		
46	7.8	0.2		
48	7.3	0.1		



Parameter	HALS	HALB
Total P (ppb/L)	24.10	347.00
Dissolved P (ppb/L)	NA	NA
Chl-a (ppb/L)	1.31	NA
TN (ppb/L)	NA	NA
NO <sub>2</sub> + NO <sub>3</sub> -N (ppb/L)	NA	NA
NH <sub>4</sub> -N (ppb/L)	NA	NA
Total N (ppb/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	ND	45.00
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

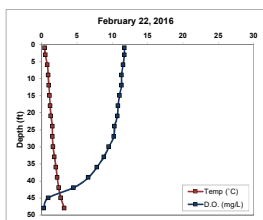
Data collected by TWH (Oniera)

Harris Lake

Date: 2/22/2016  
 Time: 13:00  
 Weather: Misty sunny, 28F, calm  
 Entry: JLW

Max Depth: 48.3  
 LS Depth (ft): 3.0  
 LB Depth (ft): 46.0  
 Secchi Depth (ft): 10.9

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	0.2	11.2		
3	0.5	11.7		
6	0.8	11.4		
9	0.9	11.3		
12	1.0	11.0		
15	1.0	11.0		
18	1.2	10.9		
21	1.3	10.7		
24	1.3	10.3		
27	1.3	10.2		
30	1.4	9.9		
33	1.4	9.8		
36	2.0	7.4		
39	2.2	6.0		
42	2.4	4.4		
45	2.7	0.9		
48	3.2	0.9		



Parameter	HALS	HALB
Total P (ppb/L)	30.10	50.00
Dissolved P (ppb/L)	4.60	17.00
Chl-a (ppb/L)	NA	NA
TN (ppb/L)	281.00	443.00
NO <sub>2</sub> + NO <sub>3</sub> -N (ppb/L)	69.50	176.00
NH <sub>4</sub> -N (ppb/L)	ND	176.00
Total N (ppb/L)	ND	619.00
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by BTB & TWH (Oniera), ice thickness 1.3 feet.

Water Quality Data

Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	5	10.7	NA	NA
Total P (µg/L)	4	22.7	4	128.0
Dissolved P (µg/L)	3	4.3	3	26.7
Chl a (µg/L)	3	3.6	0	NA
TKN (µg/L)	5	526.4	5	486.7
NO <sub>3</sub> +NO <sub>2</sub> -N (µg/L)	5	75.2	3	110.4
NH <sub>3</sub> -N (µg/L)	5	56.6	3	132.8
Total N (µg/L)	5	571.5	3	597.1
Lab Cond. (µS/cm)	2	89.2	1	85.4
Alkal (mg/l CaCO <sub>3</sub> )	2	38.7	1	38.5
Total Susp. Solids (mg/l)	2	ND	2	45.0
Calcium (mg/L)	1	12.2	0	NA
Magnesium (mg/L)	1	2.8	0	NA
Hardness (mg/L)	1	41.9	0	NA
Color (SU)	2	30.0	0	NA
Turbidity (NTU)	0	NA	0	NA

Trophic State Index (TSI)

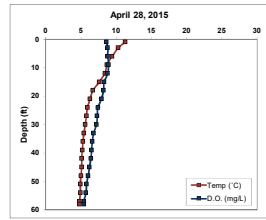
Year	TP	Chl-a	Secchi
1979			37.2
1991			35.5
1992	38.7		33.2
1993	43.7	39.2	35.2
1994	35.6	39.8	35.9
1995	36.1	24.9	36.5
1996	36.4	39.0	40.0
1997			
1998			
1999			37.9
2000	40.8	39.2	36.2
2001			
2002	38.7	37.6	35.9
2003	41.9	39.6	38.2
2004	42.9	41.3	41.3
2005	40.8	37.3	
2006	40.8	34.2	37.2
2007	38.3	36.1	35.9
2008	38.1	38.0	34.9
2009	41.1	40.7	38.1
2010	41.1	39.3	36.0
2011	41.1	42.1	38.8
2012	40.0	35.6	36.3
2013	32.7	42.4	40.7
2014	41.6	41.1	39.4
2015	44.3	38.4	39.3
2016	41.7	38.5	39.9
All Years (Weighted)	40.3	39.2	37.1
DHDL Median	45.0	46.4	42.8
NLF Ecoregion Median	48.1	47.5	45.7

Year	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1979	1	16.0	1	16.0	1	7.5	1	7.5	1	10.0	1.0	10.0
1991	5	18.0	5	18.0								
1992	4	19.3	3	21.0					2	14.5	1.0	11.0
1993	4	18.0	3	18.3	4	2.7	3	2.4	3	18.0	2.0	15.5
1994	4	17.2	2	17.5	4	2.7	2	2.6	4	11.5	2.0	9.5
1995	10	16.2	7	16.8	3	1.1	2	0.6	4	7.5	3.0	9.2
1996	9	13.5	8	13.2	3	2.3	3	2.3	3	9.3	3.0	9.3
1997	0	0	0	0					0	0.0		
1998	0	0	0	0					0	0.0		
1999	2	13.9	1	15.3	1	1.8	0	0	1	11.0	0.0	0.0
2000	4	17.9	3	17.1	3	2.4	3	2.4	3	12.7	3.0	12.7
2001	0	0	0	0					0	0.0		
2002	5	16.8	2	17.5	2	2.8	1	2.0	2	17.0	1.0	11.0
2003	9	14.3	5	14.9	5	2.7	4	2.5	7	16.7	4.0	13.8
2004	1	12.5	0	0	3	2.8	2	3.0	5	14.4	3.0	14.7
2005	0	0	0	0	4	2.0	3	2.0	5	13.4	3.0	12.7
2006	3	17.3	1	16.0	3	1.4	3	1.4	4	16.5	3.0	12.7
2007	3	16.7	2	17.5	3	1.8	3	1.8	4	11.3	3.0	10.7
2008	4	18.5	3	18.7	3	2.0	2	2.1	4	10.3	2.0	10.5
2009	2	15.0	2	15.0	2	2.8	2	2.8	2	13.0	2.0	13.0
2010	3	17.3	3	17.3	3	2.4	3	2.4	3	13.0	3.0	13.0
2011	3	14.3	3	14.3	3	3.2	3	3.2	3	13.0	3.0	13.0
2012	3	17.3	2	17.0	3	1.6	2	1.7	3	11.7	2.0	12.0
2013	2	12.5	2	12.5	2	3.3	2	3.3	2	7.3	2.0	7.3
2014	4	12.6	3	13.7	3	2.9	3	2.9	4	14.5	3.0	13.5
2015	5	11.5	3	13.8	5	3.0	3	2.2	5	16.9	3.0	16.1
2016	1	13.3	1	13.3	2	2.2	2	2.2	2	13.5	2.0	13.5
All Years (Weighted)	1	15.7		16.1		2.5		2.4		13.5		12.3
DHDL Median				10.8				5.0				17.0
NLF Ecoregion Median				8.9				6.6				21.0

Hiawatha Lake

Date: 4/28/2015  
Time: 13:06  
Weather: 9% clouds, 64F, light wind  
Entry: EEH  
Max Depth: 56.6  
LS Depth (ft): 3.0  
LB Depth (ft): 55.0  
Secchi Depth (ft): 4.1

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	17.1	10.6		
3	10.3	8.1	7.3	
6	9.4	8.1		
9	8.7	8.0		
12	8.0	8.0		
15	7.8	8.3		
18	6.7	8.2		
21	6.2	7.9		
24	5.8	7.4		
27	5.8	7.3		
30	5.8	7.2	8.2	
33	5.4	6.8		
36	5.4	6.8		
39	5.4	6.5		
42	5.3	6.4		
45	5.3	6.2		
48	5.2	6.0		
51	4.9	5.8		
54	4.3	5.7		
57	4.3	5.4		
59	4.8	5.4		



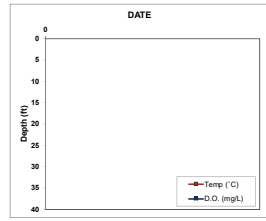
Parameter	HLS	HLB
Total P (µg/L)	15.00	17.00
Dissolved P (µg/L)	1.95	ND
Chla (µg/L)	1.86	NA
TPN (µg/L)	215.00	226.00
NO <sub>3</sub> -N (µg/L)	88.40	92.80
NH <sub>4</sub> -N (µg/L)	ND	ND
Total N (µg/L)	88.40	92.80
Lab Cond. (µS/cm)	23.20	46.20
Lab pH	6.80	6.60
Alkalinity (mg/L CaCO <sub>3</sub> )	15.00	16.80
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	6.00	NA
Magnesium (mg/L)	1.72	NA
Hardness (mg/L)	22.20	NA
Color (SU)	200.00	NA
Turbidity (NTU)	NA	NA

Data collected by BTD (Ontario).

Hiawatha Lake

Date: 6/28/2015  
Time: 12:00  
Weather: EEH  
Max Depth:  
LS Depth (ft):  
LB Depth (ft):  
Secchi Depth (ft):

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)



Parameter	HLS	HLB
Total P (µg/L)	NA	NA
Dissolved P (µg/L)	NA	NA
Chla (µg/L)	NA	NA
TPN (µg/L)	651.00	NA
NO <sub>3</sub> -N (µg/L)	59.00	NA
NH <sub>4</sub> -N (µg/L)	ND	NA
Total N (µg/L)	760.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by BTD (Ontario).

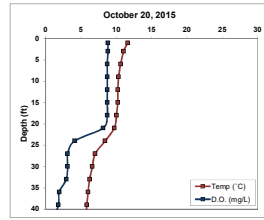




Hawatha Lake

Date: 10/20/2015  
Time: 12:00  
Weather: 10% clouds, 52F  
Entry: ESH  
Max Depth: 50.1  
LS Depth (ft): 3.0  
LB Depth (ft): 35.0  
Secchi Depth (ft): 4.0

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	11.0	8.8		
3	11.0	8.8		
6	10.0	8.7		
9	10.3	8.7		
12	10.2	8.7		
15	10.2	8.7		
18	10.0	8.7		
21	9.7	8.1		
24	8.9	4.1		
27	7.8	3.1		
30	6.8	3.1		
33	6.2	2.9		
36	6.0	1.8		
39	5.9	1.8		
42	5.3	1.1		
45	5.0	0.3		
48	5.3	0.1		
51	5.2	0.1		
54	5.0	0.1		
57	5.4	0.1		
59	5.4	0.0		



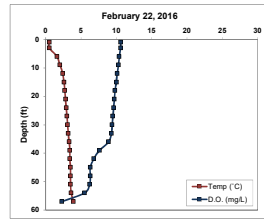
Parameter	HLS	HLB
Total P (µg/L)	13.50	35.20
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	2.51	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	ND	3.67
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH (Ortma).

Hawatha Lake

Date: 2/22/2016  
Time: 11:30  
Weather: 10% cloud cover, 29F, calm  
Entry: JLW  
Max Depth: 56.4  
LS Depth (ft): 3.0  
LB Depth (ft): 56.0  
Secchi Depth (ft): 2.6

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	0.5	10.6		
3	0.5	10.6		
6	1.0	10.4		
9	2.0	10.3		
12	2.4	10.1		
15	2.5	10.1		
18	2.7	9.9		
21	2.8	9.7		
24	2.9	9.6		
27	3.0	9.5		
30	3.1	9.4		
33	3.2	9.3		
36	3.2	9.1		
39	3.4	7.0		
42	3.4	6.8		
45	3.3	6.3		
48	3.3	6.2		
51	3.3	6.2		
54	3.6	9.5		
57	3.9	2.3		



Parameter	HLS	HLB
Total P (µg/L)	28.00	35.80
Dissolved P (µg/L)	3.90	9.20
Chl-a (µg/L)	NA	NA
TKN (µg/L)	197.00	723.00
NO <sub>3</sub> -N (µg/L)	106.00	131.00
NH <sub>4</sub> -N (µg/L)	18.00	22.00
Total N (µg/L)	803.00	874.00
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Collected by BTB TWH (Ortma), ice thickness 1.1 feet.

Water Quality Data

Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	4	3.6	NA	NA
Total P (µg/L)	4	17.9	4	28.0
Dissolved P (µg/L)	3	2.5	3	6.1
Chl a (µg/L)	3	3.3	0	NA
TKN (µg/L)	5	688.0	2	688.0
NO <sub>3</sub> +NO <sub>2</sub> -N (µg/L)	5	97.8	2	111.9
NH <sub>3</sub> -N (µg/L)	5	32.8	2	22.5
Total N (µg/L)	5	746.7	2	780.9
Tap Cond. (µS/cm)	2	41.3	1	46.2
Alkal (mg/l CaCO <sub>3</sub> )	2	14.6	1	16.8
Total Susp. Solids (mg/l)	2	ND	2	3.7
Calcium (mg/L)	1	6.1	0	NA
Magnesium (mg/L)	1	1.7	0	NA
Hardness (mg/L)	1	22.2	0	NA
Color (SU)	2	175.0	0	NA
Turbidity (NTU)	0	NA	0	NA

Trophic State Index (TSI)

Year	TP	Chl-a	Secchi
1979	51.7	51.7	52.6
1998			47.2
1999			52.6
2000	43.5	48.4	51.5
2001	45.0	46.8	50.1
2002	40.0	41.0	52.2
2003	40.6	40.6	53.2
2004	39.6	47.2	53.2
2005	41.1	45.1	49.8
2006	42.2	42.0	50.9
2007	38.4	38.3	50.0
2008	45.0	37.4	51.3
2009	45.2	38.7	49.1
2010	48.7	46.0	53.0
2011	48.5	44.4	53.9
2012	48.1	51.3	
2013	51.1	54.3	55.4
2014	49.5	42.9	54.7
2015	49.3	40.4	56.6
2016	48.4	31.1	
All Years (Weighted)	45.4	45.0	52.0
DHDL Median	45.0	46.4	42.8
NLF Ecoregion Median	48.1	47.5	45.7

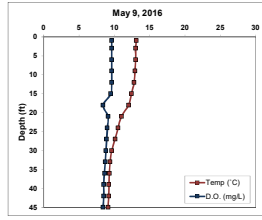
Year	Secchi (feet)				Chlorophyll- <i>a</i> (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1979	1	5.5		5.5	1	8.6		8.6	1	27.0		27.0
1998	4	8.1	1	8.0								
1999	6	6.3	2	5.5								
2000	7	5.7	4	5.9								
2001	6	6.5	2	6.5	4	5.0	3	6.2	5	14.0	3.0	15.3
2002	5	6.0	2	5.6	4	2.9	2	2.9	5	12.4	2.0	12.0
2003	4	5.5	2	5.3	3	3.7	2	2.8	4	16.3	2.0	12.5
2004	5	5.7	3	5.3	4	4.7	3	5.5	5	12.2	3.0	11.7
2005	4	6.8	3	6.7	4	3.9	3	4.4	5	12.6	3.0	13.0
2006	5	6.0	3	6.2	4	2.8	3	3.2	5	17.0	3.0	14.0
2007	4	6.4	3	6.6	3	2.2	3	2.2	4	10.8	3.0	9.3
2008	4	6.0	4	6.0	3	2.0	3	2.0	4	17.0	4.0	17.0
2009	4	7.0	4	7.0	3	2.5	3	2.5	4	17.3	4.0	17.3
2010	4	5.5	3	5.3	3	4.8	3	4.8	4	21.3	3.0	22.0
2011	4	4.8	3	5.0	3	4.1	3	4.1	4	21.0	3.0	21.7
2012	0		0		3	8.2	3	8.2	4	18.8	3.0	18.3
2013	4	4.5	3	4.5	3	11.2	3	11.2	4	30.1	3.0	25.9
2014	4	4.8	4	4.8	3	3.5	3	3.5	4	23.2	4.0	23.2
2015	6	4.3	3	4.2	6	2.5	4	2.7	7	17.4	4.0	18.6
2016	0		0		3	1.0	3	1.0	4	19.0	3.0	18.7
All Years (Weighted)		5.8		5.7		4.1		4.3		17.2		17.4
DHDL Median				10.8				5.0				17.0
NLF Ecoregion Median				8.9				5.6				21.0

Birch Lake

Date: 5/9/2016  
Time: 15:00  
Weather: 80% sun, 68F, slightly breezy  
Entry: EEH

Max Depth: 45.1  
LS Depth (ft): 3.0  
LB Depth (ft): 42.0  
Secchi Depth (ft): 4.6

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	13.3	9.0		
3	13.0	9.0		
6	13.0	9.0		
9	12.9	9.0		
12	12.8	9.0		
15	12.8	9.0		
18	12.0	8.4		
21	11.0	8.1		
24	10.8	8.0		
27	10.3	8.4		
30	9.8	8.8		
33	9.5	8.6		
36	9.5	8.6		
39	9.2	8.5		
42	9.2	8.5		
45	9.1	8.4		



Parameter	BLB	BLB
Total P (µg/L)	25.00	26.00
Dissolved P (µg/L)	2.50	2.70
Chl-a (µg/L)	1.85	NA
TPN (µg/L)	478.00	483.00
NO <sub>3</sub> -N (µg/L)	103.00	112.00
NH <sub>4</sub> -N (µg/L)	NA	24.00
Total N (µg/L)	581.00	595.00
Lab Cond. (µS/cm)	86.00	87.00
Lab pH	7.50	7.50
Alkalinity (mg/L CaCO <sub>3</sub> )	37.30	37.50
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	11.30	NA
Magnesium (mg/L)	3.00	NA
Hardness (mg/L)	40.70	NA
Color (SU)	60.00	NA
Turbidity (NTU)	NA	NA

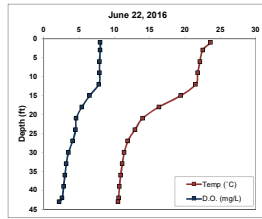
Data collected by TWH and TAH (Ontario)

Birch Lake

Date: 6/22/2016  
Time: 12:29  
Weather: 25% clouds, calm, 75F  
Entry: ALW

Max Depth: 44.0  
LS Depth (ft): 3.0  
LB Depth (ft): 42.0  
Secchi Depth (ft): 5.1

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	23.0	8.0		
3	22.0	8.0		
6	22.1	7.8		
9	21.5	7.8		
12	21.5	7.8		
15	19.4	6.5		
18	16.3	5.4		
21	14.0	4.8		
24	12.0	4.8		
27	11.8	4.1		
30	11.4	3.0		
33	11.1	2.2		
36	10.9	3.0		
39	10.7	2.8		
42	10.8	2.8		
45	10.8	2.2		



Parameter	LS	LB
Total P (µg/L)	18.10	46.90
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	1.10	NA
TPN (µg/L)	NA	NA
NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

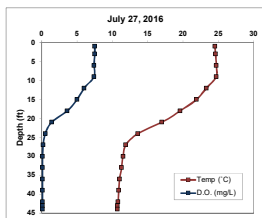
Data collected by TAH (Ontario)

Birch Lake

Date: 7/27/2016  
Time: 11:00  
Weather: 65F, overcast, no wind  
Entry: JMB

Max Depth: 45.4  
LS Depth (ft): 3.0  
LB Depth (ft): 43.0  
Secchi Depth (ft): 5.7

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (uS/cm)
1	24.3	7.0		
3	24.3	7.4		
6	24.3	7.4		
9	24.3	7.4		
12	23.3	6.0		
15	21.3	5.0		
18	19.3	3.0		
21	17.3	1.0		
24	15.3	0.5		
27	13.3	0.2		
30	11.3	0.1		
33	11.3	0.1		
36	11.3	0.1		
39	10.3	0.1		
42	10.3	0.1		
45	10.3	0.1		
48	10.3	0.1		
51				
54				
57				
60				



Parameter	LS	LB
Total P (ug/L)	24.50	22.80
Dissolved P (ug/L)	NA	6.70
Chl.a (ug/L)	3.95	NA
TNN (ug/L)	755.00	499.00
NO <sub>3</sub> + NO <sub>2</sub> -N (ug/L)	NA	181.00
NH <sub>4</sub> -N (ug/L)	NA	54.10
Total N (ug/L)	755.00	650.00
Lab Cond. (uS/cm)	82.50	84.50
Lab pH	7.60	7.50
Alkalinity (mg/L CaCO <sub>3</sub> )	39.20	42.80
Total Susp. Solids (mg/L)	2.20	NA
Calcium (mg/L)	11.50	NA
Magnesium (mg/L)	3.25	NA
Hardness (mg/L)	42.50	NA
Color (SU)	60.00	NA
Turbidity (NTU)	NA	NA

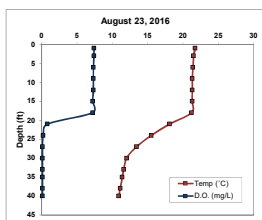
Data collected by TAH (Ontario)

Birch Lake

Date: 8/23/2016  
Time:  
Weather: Clear 65F, Breezy  
Entry: JMB

Max Depth: 41.2  
LS Depth (ft): 3.0  
LB Depth (ft): 38.0  
Secchi Depth (ft): 5.2

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (uS/cm)
1	21	7.4		
3	21.5	7.4		
6	21.0	7.3		
9	21.3	7.3		
12	21.3	7.3		
15	21.3	7.3		
18	21.2	7.2		
21	18.3	0.8		
24	15.3	0.2		
27	13.2	0.1		
30	12.0	0.1		
33	11.0	0.1		
36	11.4	0.1		
39	11.3	0.1		
42	10.3	0.1		
45	10.3	0.1		
48				
51				
54				
57				
60				



Parameter	LS	LB
Total P (ug/L)	14.20	33.80
Dissolved P (ug/L)	NA	NA
Chl.a (ug/L)	2.03	NA
TNN (ug/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (ug/L)	NA	NA
NH <sub>4</sub> -N (ug/L)	NA	NA
Total N (ug/L)	NA	NA
Lab Cond. (uS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

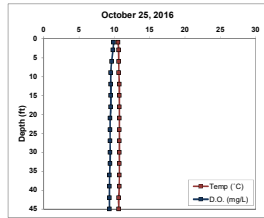
Data collected by TAH (Ontario)

Birch Lake

Date: 10/25/2016  
Time: 12:30  
Weather: 100% clouds, 7C  
Entry: JMB

Max Depth: 45.4  
LS Depth (ft): 3.0  
LB Depth (ft): 42.0  
Secchi Depth (ft): 5.1

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	10.9	9.9		
3	10.9	9.9		
6	10.6	9.9		
9	10.6	9.4		
12	10.7	9.3		
15	10.2	9.3		
18	10.2	9.3		
21	10.7	9.4		
24	10.7	9.4		
27	10.7	9.4		
30	10.7	9.4		
33	10.7	9.4		
36	10.3	9.3		
39	10.3	9.3		
42	10.6	9.3		
45	10.6	9.3		



Parameter	LS	LB
Total P (µg/L)	27.40	25.70
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	7.05	NA
TN (µg/L)	NA	NA
NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	2.40	ND
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

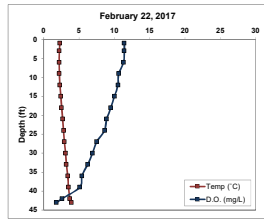
Data collected by TWH & JMB (Ontario)

Birch Lake

Date: 2/22/2017  
Time: 9:30  
Weather: 100% clouds, 40F, 0mph wind  
Entry: JMB

Max Depth: 44.8  
LS Depth (ft): 3.0  
LB Depth (ft): 42.0  
Secchi Depth (ft): 9.1

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	2.2	11.4		
3	2.2	11.4		
6	2.2	11.3		
9	2.2	10.8		
12	2.2	10.9		
15	2.2	10.9		
18	2.8	9.5		
21	2.7	8.9		
24	2.8	8.9		
27	2.2	7.8		
30	3.1	6.9		
33	3.2	6.2		
36	3.4	5.4		
39	3.3	5.1		
42	3.2	2.6		
43	3.9	1.8		



Parameter	LS	LB
Total P (µg/L)	19.80	49.00
Dissolved P (µg/L)	5.90	23.00
Chl-a (µg/L)	NA	NA
TN (µg/L)	404.00	492.00
NO <sub>3</sub> -N (µg/L)	77.10	106.00
NH <sub>4</sub> -N (µg/L)	15.00	91.10
Total N (µg/L)	491.10	698.00
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH & JMB (Ontario); ice depth: 1.3.

**Water Quality Data**

Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	6	5.8	NA	NA
Total P (µg/L)	6	21.4	6	34.6
Dissolved P (µg/L)	3	3.9	3	11.9
Chl a (µg/L)	5	3.2	0	NA
TKN (µg/L)	3	545.7	3	491.3
NO <sub>3</sub> +NO <sub>2</sub> -N (µg/L)	3	90.1	3	123.0
NH <sub>3</sub> -N (µg/L)	3	16.0	3	56.6
Total N (µg/L)	3	605.7	3	614.3
Lab Cond. (µS/cm)	2	84.5	2	90.9
Alkal (mg/l CaCO <sub>3</sub> )	2	36.8	2	40.2
Total Susp. Solids (mg/l)	3	2.3	3	ND
Calcium (mg/L)	2	11.4	0	NA
Magnesium (mg/L)	2	3.1	0	NA
Hardness (mg/L)	2	41.4	0	NA
Color (SU)	2	60.0	0	NA
Turbidity (NTU)	0	NA	0	NA

**Trophic State Index (TSI)**

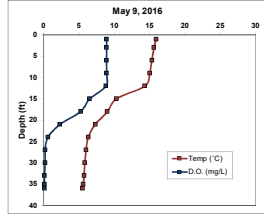
Year	TP	Chl-a	Secchi
1979			44.7
1997			49.2
1998			47.0
1999			45.3
2000	48.1	51.0	50.7
2001	47.7	44.2	46.7
2002	47.3	48.5	
2003	44.7	45.4	45.5
2004	45.4	48.2	44.7
2005	41.5	42.8	43.4
2006	51.3	45.8	
2007	47.3	47.3	45.3
2008	46.1	46.8	46.3
2009	46.6	45.6	42.0
2010	42.5	46.2	45.4
2011	47.5	51.0	53.6
2012	42.2	44.2	
2013	38.1	48.0	48.5
2014	46.1	49.7	50.0
2015	48.0	51.0	48.9
2016	47.9	43.7	52.0
All Years (Weighted)	45.3	47.1	47.5
DLDL Median	49.4	49.7	46.2
NLF Ecoregion Median	48.1	47.5	45.7

Year	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1979	1	9.5	1	9.5	1	7.7	1	7.7	1	31.0	1.0	31.0
1997	9	7.0	6	7.0								
1998	7	7.8	5	8.1								
1999	4	8.1	2	9.1								
2000	2	11.8	1	6.3	1	8.0	1	8.0	1	21.0	1.0	21.0
2001	3	8.8	2	6.3	2	4.0	2	4.0	3	21.3	2.0	20.5
2002	0		0		2	6.2	2	6.2	2	20.0	2.0	20.0
2003	2	9.5	1	9.0	4	6.4	3	4.5	6	18.3	3.0	16.7
2004	3	9.1	1	9.5	3	6.0	2	6.0	4	18.3	2.0	17.5
2005	4	9.9	3	10.4	4	4.3	3	3.5	4	14.5	3.0	13.3
2006	0		0		3	4.7	3	4.7	4	20.8	3.0	26.3
2007	3	9.1	3	9.1	3	5.5	3	5.5	4	19.3	3.0	20.0
2008	4	8.3	3	8.5	3	5.2	3	5.2	4	16.6	3.0	16.3
2009	4	10.9	3	11.4	3	4.6	3	4.6	4	19.5	3.0	19.0
2010	4	11.2	3	9.1	4	4.0	3	4.9	4	13.8	3.0	14.3
2011	6	5.2	4	5.1	3	8.0	3	8.0	4	20.3	4.0	20.3
2012	0		0		3	4.0	3	4.0	3	14.0	3.0	14.0
2013	4	7.3	4	7.3	3	5.9	3	5.9	3	10.6	3.0	10.6
2014	3	6.6	3	6.6	2	7.0	2	7.0	3	18.3	3.0	18.3
2015	3	7.1	3	7.1	3	8.0	3	8.0	3	20.9	3.0	20.9
2016	8	5.5	6	5.7	7	4.0	5	3.8	7	22.1	5.0	20.7
All Years (Weighted)		8.0		7.8		5.4		5.4		18.6		18.6
DLDL Median				8.5				7.0				23.0
NLF Ecoregion Median				8.9				5.6				21.0

**Rainbow Lake**

Date: 6/9/2016  
Time: 12:45  
Weather: 50% sun, light wind  
Entry: EEH  
Max Depth: 37.2  
LS Depth (ft): 3.0  
LB Depth (ft): 35.0  
Secchi Depth (ft): 5.1

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (uS/cm)
1	15.3	7.9		
3	15.6	8.0		
6	15.3	8.4		
9	15.0	8.9		
12	14.2	8.8		
15	10.3	6.9		
18	9.0	5.3		
21	7.5	2.3		
24	6.3	0.6		
27	6.0	0.2		
30	5.8	0.2		
33	6.4	0.1		
36	5.4	0.1		
39	5.8	0.1		



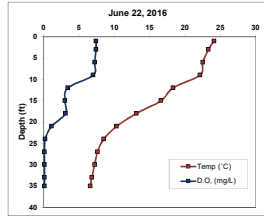
Parameter	RLS	RLB
Total P (ug/L)	2.60	2.60
Dissolved P (ug/L)	2.60	2.60
Chla (ug/L)	5.85	NA
TPN (ug/L)	722.00	722.00
NO <sub>3</sub> -N (ug/L)	ND	ND
NH <sub>4</sub> -N (ug/L)	ND	128.00
Total N (ug/L)	722.00	722.00
Lab Cond. (uS/cm)	68.10	85.90
Lab pH	7.61	8.27
Alkalinity (mg/L CaCO <sub>3</sub> )	29.20	42.80
Total Susp. Solids (mg/L)	2.20	16.00
Calcium (mg/L)	0.20	NA
Magnesium (mg/L)	2.40	NA
Hardness (mg/L)	33.10	NA
Color (SU)	70.00	NA
Turbidity (NTU)	NA	NA

Data collected by TWH and TAH (Ontera)

**Rainbow Lake**

Date: 6/22/2016  
Time: 11:15  
Weather: clear, 75F  
Entry: JLW  
Max Depth: 35.7  
LS Depth (ft): 3.0  
LB Depth (ft): 33.0  
Secchi Depth (ft): 4.4

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (uS/cm)
1	24.1	7.4		
3	23.3	7.4		
6	22.6	7.2		
9	18.3	7.0		
12	16.8	3.0		
15	13.1	1.4		
18	10.3	1.1		
21	6.3	0.2		
24	6.3	0.1		
27	7.0	0.1		
30	7.2	0.1		
33	6.9	0.1		
35	6.6	0.1		



Parameter	RLS	RLB
Total P (ug/L)	20.20	80.70
Dissolved P (ug/L)	NA	NA
Chla (ug/L)	11.70	NA
TPN (ug/L)	NA	NA
NO <sub>3</sub> -N (ug/L)	NA	NA
NH <sub>4</sub> -N (ug/L)	NA	NA
Total N (ug/L)	NA	NA
Lab Cond. (uS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

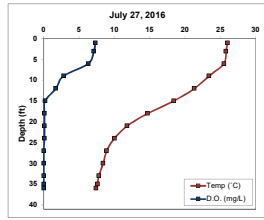
Data collected by TAH (Ontera)

Rainbow Lake

Date: 7/27/2016  
Time: 13:00  
Weather: 72F, overcast, no wind, light rain  
Entry: JMB

Max Depth: 37.0  
LS Depth (ft): 3.0  
LB Depth (ft): 35.0  
Secchi Depth (ft): 3.8

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (uS/cm)
1	25.0	7.0		
3	22.0	7.0		
6	20.0	6.3		
9	21.8	7.4		
12	21.3	1.7		
15	18.2	0.2		
18	14.7	0.1		
21	11.9	0.1		
24	10.5	0.1		
27	8.8	0.0		
30	8.9	0.4		
33	7.5	0.0		
36	7.5	0.0		



Parameter	RLS	RLB
Total P (ug/L)	27.50	152.00
Dissolved P (ug/L)	2.40	102.00
Chl.a (ug/L)	16.50	NA
TN (ug/L)	802.00	1100.00
NO <sub>3</sub> -N (ug/L)	NA	NA
NH <sub>4</sub> -N (ug/L)	18.50	478.00
Total N (ug/L)	802.00	1100.00
Lab Cond. (uS/cm)	68.00	95.00
Lab pH	7.40	8.10
Alkalinity (mg/L CaCO <sub>3</sub> )	30.00	45.00
Total Susp. Solids (mg/L)	ND	6.50
Calcium (mg/L)	8.80	NA
Magnesium (mg/L)	2.70	NA
Hardness (mg/L)	36.20	NA
Color (SU)	10.00	NA
Turbidity (NTU)	NA	NA

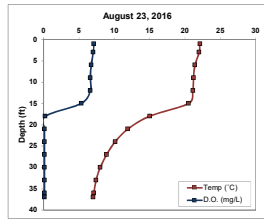
Data collected by TAH (Ontario).

Rainbow Lake

Date: 8/23/2016  
Time: 12:15AM  
Weather: Clear, 73F, Breezy  
Entry: JMB

Max Depth: 37.0  
LS Depth (ft): 3.0  
LB Depth (ft): 36.0  
Secchi Depth (ft): 7.7

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (uS/cm)
1	22.1	7.1		
3	22.0	7.0		
6	21.0	6.3		
9	21.2	6.8		
12	21.3	6.8		
15	20.3	5.3		
18	15.0	0.2		
21	11.9	0.1		
24	10.1	0.1		
27	8.3	0.1		
30	8.0	0.1		
33	7.4	0.1		
36	7.1	0.1		
37	7.0	0.1		



Parameter	RLS	RLB
Total P (ug/L)	15.00	226.00
Dissolved P (ug/L)	NA	NA
Chl.a (ug/L)	4.53	NA
TN (ug/L)	NA	NA
NO <sub>3</sub> -N (ug/L)	NA	NA
NH <sub>4</sub> -N (ug/L)	NA	NA
Total N (ug/L)	NA	NA
Lab Cond. (uS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TAH (Ontario).

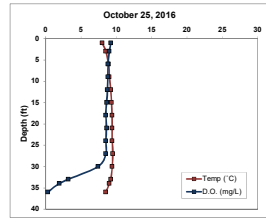


Rainbow Lake

Date: 10/25/2016  
Time: 8:40  
Weather: 5% clouds, 35F  
Entry: JMB

Max Depth: 36.9  
LS Depth (ft): 3.0  
LB Depth (ft): 34.0  
Secchi Depth (ft): 3.5

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	8.0	9.0		
3	8.0	8.8		
6	8.0	8.8		
9	8.0	8.8		
12	8.2	8.7		
15	8.2	8.8		
18	8.4	8.9		
21	8.4	8.9		
24	8.4	8.9		
27	8.3	8.9		
30	8.4	8.4		
33	8.2	8.2		
36	8.0	8.0		



Parameter	RLS	RLB
Total P (µg/L)	30.00	64.70
Dissolved P (µg/L)	NA	NA
Chl.a (µg/L)	0.55	NA
TN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	ND	4.00
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

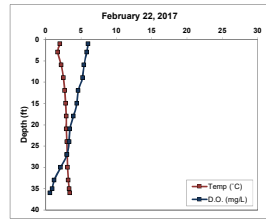
Data collected by JMB (Criteria)

Rainbow Lake

Date: 2/22/2017  
Time: 10:45  
Weather: 100% clouds, 0mph wind, 45F  
Entry: JMB

Max Depth: 37.5  
LS Depth (ft): 3.0  
LB Depth (ft): 35.0  
Secchi Depth (ft): 3.9

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	2.2	6.0		
3	1.7	5.8		
6	2.2	5.4		
9	2.2	5.2		
12	2.3	4.8		
15	2.3	4.4		
18	2.0	3.9		
21	2.0	3.4		
24	3.0	3.3		
27	3.0	3.0		
30	3.1	2.1		
33	3.2	1.0		
35	3.3	0.9		
36	3.4	0.6		



Parameter	RLS	RLB
Total P (µg/L)	19.00	47.00
Dissolved P (µg/L)	4.50	10.00
Chl.a (µg/L)	NA	NA
TN (µg/L)	500.00	778.00
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	7.3 TO	83.00
NH <sub>4</sub> -N (µg/L)	2.8 TO	207.00
Total N (µg/L)	578 TO	891.00
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH & JMB (Criteria); ice depth: 1.0ft.

**Water Quality Data**

2016-2017 Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	6	4.7	NA	NA
Total P (µg/L)	6	24.4	6	103.8
Dissolved P (µg/L)	3	3.2	3	40.8
Chl a (µg/L)	5	8.4	0	NA
TKN (µg/L)	3	721.0	3	883.3
NO <sub>3</sub> +NO <sub>2</sub> -N (µg/L)	3	73.1	3	63.5
NH <sub>4</sub> -N (µg/L)	3	22.5	3	281.3
Total N (µg/L)	3	745.4	3	911.2
Lab Cond. (µS/cm)	2	88.5	2	95.7
Alkal (mg/l CaCO <sub>3</sub> )	2	30.1	2	44.1
Total Susp. Solids (mg/l)	3	2.2	3	8.8
Calcium (mg/L)	2	9.6	0	NA
Magnesium (mg/L)	2	2.6	0	NA
Hardness (mg/L)	2	34.7	0	NA
Color (SU)	2	70.0	0	NA
Turbidity (NTU)	0	NA	0	NA

**Trophic State Index (TSI)**

Year	TP	Chl-a	Secchi
1984		48.2	
2005			50.3
2006			47.2
2007			47.1
2008			
2009			47.2
2010			50.8
2011			50.8
2012			46.7
2013			53.9
2014			52.7
2015			49.4
2016	50.2	54.8	52.6
All Years (Weighted)	50.2	53.5	50.0
DLDL Median	49.4	49.7	46.2
NLF Ecoregion Median	48.1	47.5	45.7

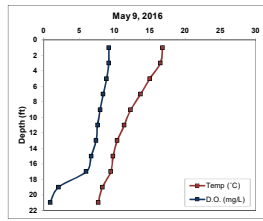
Year	Secchi (feet)				Chlorophyll- <i>a</i> (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1984					1	0.0	1	0.0				
2005	14	6.4	14	6.4								
2006	9	8.0	9	8.0								
2007	6	8.0	6	8.0								
2008	0											
2009	9	8.0	9	8.0								
2010	11	6.2	11	6.2								
2011	14	6.3	12	6.2								
2012	14	8.2	12	8.2								
2013	14	5.1	12	5.0								
2014	14	5.5	12	5.5								
2015	16	7.0	13	6.9								
2016	22	5.4	13	5.5	5	8.4	3	11.8	5	25.5	3.0	24.4
All Years (Weighted)		6.5		6.8		8.0		10.3		25.5		24.4
DLDL Median				6.5				7.0				23.0
NLF Ecoregion Median				6.9				5.6				21.0

Tamarack Lake

Date: 5/9/2016  
Time: 13:45  
Weather: 80% sun  
Entry: EBH

Max Depth: 21.9  
LS Depth (ft): 3.0  
LB Depth (ft): 19.0  
Secchi Depth (ft): 4.4

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	16.3	7.1		
3	15.0	9.2		
5	13.0	8.8		
7	13.7	8.4		
9	12.2	8.0		
11	11.4	7.8		
13	10.4	7.4		
15	9.5	6.7		
17	9.5	6.0		
19	8.3	2.4		
21	7.7	0.9		



Parameter	TAMLS	TAMLB
Total P (µg/L)	23.00	31.00
Dissolved P (µg/L)	2.95	3.20
Chloro (µg/L)	4.85	NA
TPH (µg/L)	805.00	803.00
NO <sub>3</sub> -N (µg/L)	ND	21.00
NH <sub>3</sub> -N (µg/L)	ND	73.00
Total N (µg/L)	805.00	704.00
Lab Cond. (µS/cm)	73.49	78.00
Lab pH	7.59	6.86
Alkalinity (mg/L CaCO <sub>3</sub> )	31.60	34.70
Total Susp. Solids (mg/L)	ND	2.20
Calcium (mg/L)	9.94	NA
Magnesium (mg/L)	2.06	NA
Hardness (mg/L)	15.70	NA
Color (SU)	60.00	NA
Turbidity (NTU)	NA	NA

Data collected by TWH and TAH (Onsite)

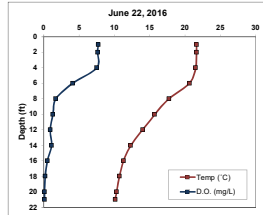
Parameter	Value
Total P (µg/L)	23.00
Dissolved P (µg/L)	2.95
Chloro (µg/L)	4.85
TPH (µg/L)	805.00
NO <sub>3</sub> -N (µg/L)	ND
NH <sub>3</sub> -N (µg/L)	ND
Total N (µg/L)	805.00
Lab Cond. (µS/cm)	73.49
Lab pH	7.59
Alkalinity (mg/L CaCO <sub>3</sub> )	31.60
Total Susp. Solids (mg/L)	ND
Calcium (mg/L)	9.94
Magnesium (mg/L)	2.06
Hardness (mg/L)	15.70
Color (SU)	60.00
Turbidity (NTU)	NA

Tamarack Lake

Date: 6/22/2016  
Time: 9:30  
Weather: 20% clouds, light breeze, 65F  
Entry: JLW

Max Depth: 21.7  
LS Depth (ft): 3.0  
LB Depth (ft): 19.0  
Secchi Depth (ft): 4.7

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	21.0	7.7		
3	21.0	7.8		
4	21.0	7.8		
5	20.9	4.1		
6	17.7	4.1		
10	15.7	1.3		
12	14.0	0.9		
14	12.3	1.1		
16	11.7	0.8		
18	10.7	0.2		
20	10.3	0.1		
21	10.1	0.1		



Parameter	TAMLS	TAMLB
Total P (µg/L)	27.00	29.00
Dissolved P (µg/L)	NA	NA
Chloro (µg/L)	11.00	NA
TPH (µg/L)	NA	NA
NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>3</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TAH (Onsite)

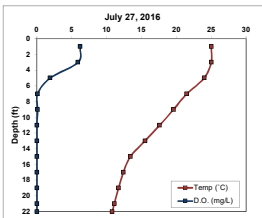
Parameter	Value
Total P (µg/L)	27.00
Dissolved P (µg/L)	NA
Chloro (µg/L)	11.00
TPH (µg/L)	NA
NO <sub>3</sub> -N (µg/L)	NA
NH <sub>3</sub> -N (µg/L)	NA
Total N (µg/L)	NA
Lab Cond. (µS/cm)	NA
Lab pH	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA
Total Susp. Solids (mg/L)	NA
Calcium (mg/L)	NA
Magnesium (mg/L)	NA
Hardness (mg/L)	NA
Color (SU)	NA
Turbidity (NTU)	NA

Tamarack Lake

Date: 7/27/2016  
Time: 11:50  
Weather: 7F, calm  
Entry: JMB

Max Depth: 22.7  
LS Depth (ft): 3.0  
LB Depth (ft): 21.0  
Secchi Depth (ft): 5.0

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	25.0	0.0		
3	25.0	0.0		
5	24.0	1.0		
7	21.0	0.1		
9	19.0	0.1		
11	17.0	0.0		
13	15.0	0.0		
15	13.0	0.0		
17	12.0	0.0		
19	11.7	0.0		
21	10.7	0.0		
22	10.8	0.0		



Parameter	TAMLS	TAML8
Total P (µg/L)	29.50	53.20
Dissolved P (µg/L)	4.16	16.70
Chl.a (µg/L)	4.16	NA
TKN (µg/L)	839.00	886.00
NO <sub>2</sub> + NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	20.50	189.00
Total N (µg/L)	839.00	886.00
Lab Cond. (µS/cm)	72.40	85.30
Lab pH	7.30	6.86
Alkalinity (mg/L CaCO <sub>3</sub> )	37.50	39.80
Total Susp. Solids (mg/L)	ND	4.29
Calcium (mg/L)	15.20	NA
Magnesium (mg/L)	3.05	NA
Hardness (mg/L)	38.20	NA
Color (SU)	70.00	NA
Turbidity (NTU)	NA	NA

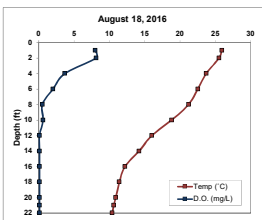
Data collected by TAH (Onetra)

Tamarack Lake

Date: 8/18/2016  
Time: 12:25  
Weather: 50% clouds, light breeze, 78F  
Entry: JMB

Max Depth: 22.8  
LS Depth (ft): 2.0  
LB Depth (ft): 21.0  
Secchi Depth (ft): 5.0

Depth (ft)	Temp (C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	25.3	8.1		
2	25.3	8.1		
4	23.7	3.1		
6	22.6	2.0		
8	21.4	0.9		
10	19.9	0.0		
12	18.0	0.1		
14	16.2	0.1		
16	15.2	0.1		
18	14.2	0.1		
20	10.9	0.1		
21	10.6	0.1		
22	10.4	0.1		



Parameter	TAMLS	TAML8
Total P (µg/L)	29.20	31.00
Dissolved P (µg/L)	NA	NA
Chl.a (µg/L)	1.53	NA
TKN (µg/L)	NA	NA
NO <sub>2</sub> + NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

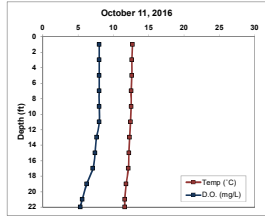
Data collected by TAH and AAH (Onetra)

Tamarack Lake

Date: 10/11/2016  
Time: 12:15 PM  
Weather: 100% clouds, 57F  
Entry: AMB

Max Depth: 24.2  
LS Depth (ft): 3.0  
LB Depth (ft): 22.0  
Secchi Depth (ft): 5.0

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	12.0	8.0		
3	12.0	8.0		
5	12.0	8.0		
7	12.0	8.0		
9	12.0	8.0		
11	12.0	8.0		
13	12.0	7.9		
15	12.0	7.4		
17	12.1	7.1		
19	11.8	6.2		
21	11.6	5.4		
22	11.8	5.3		
24	11.5	5.1		



Parameter	TAMLS	TAMLR
Total P (µg/L)	23.80	23.30
Dissolved P (µg/L)	5.0	4.30
Chl-a (µg/L)	4.05	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

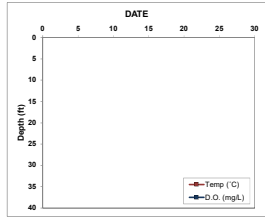
Data collected by TWH (Ontera)

Tamarack Lake

Date:  
Time:  
Weather:  
Entry:

Max Depth:  
LS Depth (ft):  
LB Depth (ft):  
Secchi Depth (ft):

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)



Parameter	TAMLS	TAMLR
Total P (µg/L)	NA	NA
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	NA	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Unable to sample water quality due to ice conditions

Water Quality Data

		Surface		Bottom	
Parameter	Count	Mean	Count	Mean	
Secchi Depth (feet)	5	4.8	5	NA	NA
Total P (µg/L)	5	28.8	5	33.8	
Dissolved P (µg/L)	3	4.1	3	9.1	
Chl-a (µg/L)	5	5.2	0	NA	
TKN (µg/L)	2	822.0	2	769.5	
NO <sub>3</sub> -N (µg/L)	2	ND	2	21.0	
NH <sub>4</sub> -N (µg/L)	2	20.3	2	131.2	
Total N (µg/L)	2	822.0	2	780.0	
Lab Cond. (µS/cm)	2	72.9	2	82.6	
Alkal (mg/L CaCO <sub>3</sub> )	2	32.1	2	37.3	
Total Susp. Solids (mg/L)	3	ND	3	3.2	
Calcium (mg/L)	2	10.3	0	NA	
Magnesium (mg/L)	2	2.9	0	NA	
Hardness (mg/L)	2	37.5	0	NA	
Color (SU)	2	65.0	0	NA	
Turbidity (NTU)	0	NA	0	NA	

Trophic State Index (TSI)

Year	TP	Chl-a	Secchi
2016	54.2	47.5	51.6
All Years (Weighted)	54.2	47.5	51.5
DLDL Median	49.4	49.7	46.2
NLF Ecoregion Median	48.1	47.5	45.7

Year	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
2016	5	5.4	3	5.9	5	5.2	3	5.6	5	28.8	3.0	32.2
All Years (Weighted)												
DLDL Median				8.5				7.0				23.0
NLF Ecoregion Median				8.9				5.8				21.0

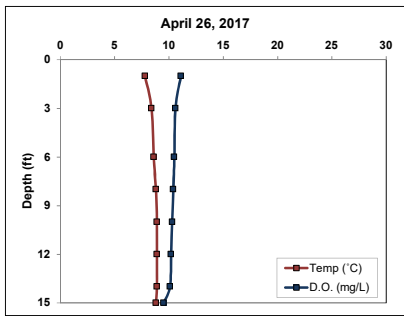


Rock Lake

Date: 4/26/2017  
Time: 10:30  
Weather: 100% clouds, 56F, 12 mph wind  
Entry: EEH

Max Depth: 16.5  
ROKS Depth (ft): 3.0  
ROKB Depth (ft): 14.0  
Secchi Depth (ft): 4.3

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	7.8	11.1		
3	8.4	10.6		
6	8.6	10.5		
8	8.8	10.4		
10	8.9	10.3		
12	8.9	10.2		
14	8.9	10.1		
15	8.8	9.5		



Parameter	ROKS	ROKB
Total P (µg/L)	28.30	29.30
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	0.61	NA
TKN (µg/L)	NA	NA
NO <sub>2</sub> + NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	531.00	543.00
Lab Cond. (µS/cm)	66.30	65.20
Lab pH	7.27	7.24
Alkalinity (mg/L CaCO <sub>3</sub> )	28.90	28.20
Total Susp. Solids (mg/L)	2.50	2.00
Calcium (mg/L)	8.79	NA
Magnesium (mg/L)	2.51	NA
Hardness (mg/L)	32.30	NA
Color (SU)	60.00	NA
Turbidity (NTU)	NA	NA

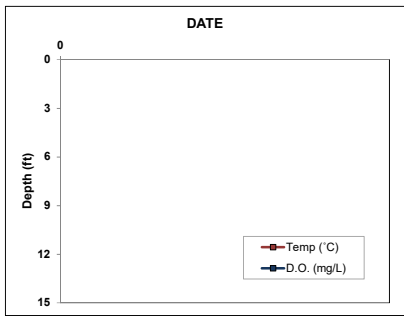
Data collected by JMB (Onterra).

Rock Lake

Date: 6/26/2017  
Time:  
Weather:  
Entry:

Max Depth:  
ROKS Depth (ft):  
ROKB Depth (ft):  
Secchi Depth (ft):

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)



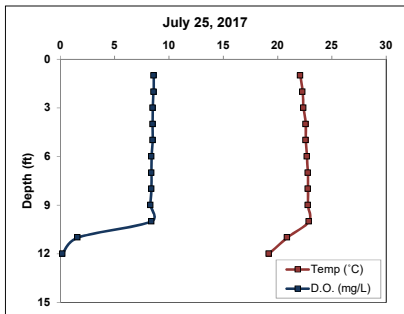
Parameter	ROKS	ROKB
Total P (µg/L)	30.30	NA
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	9.97	NA
TKN (µg/L)	NA	NA
NO <sub>2</sub> + NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	588.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Rock Lake

Date: 7/25/2017  
Time: 10:30  
Weather: 95% clouds  
Entry: EEH

Max Depth: 12.0  
ROKS Depth (ft): 3.0  
ROKB Depth (ft): 10.0  
Secchi Depth (ft): 3.7

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	22.1	8.6		
2	22.3	8.6		
3	22.4	8.5		
4	22.6	8.5		
5	22.6	8.5		
6	22.7	8.4		
7	22.8	8.4		
8	22.8	8.4		
9	22.8	8.3		
10	22.9	8.4		
11	20.9	1.6		
12	19.2	0.2		



Parameter	ROKS	ROKB
Total P (µg/L)	28.50	30.50
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	13.40	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	686.00	NA
Lab Cond. (µS/cm)	72.00	71.50
Lab pH	7.62	7.59
Alkalinity (mg/L CaCO <sub>3</sub> )	32.50	32.50
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	70.00	NA
Turbidity (NTU)	NA	NA

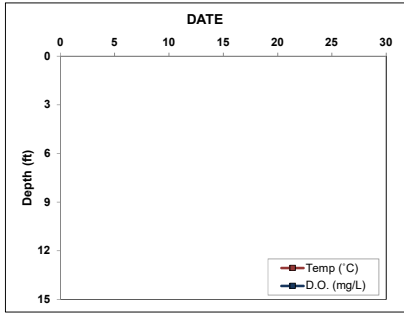
Data collected by JMB & AMS (Onterra).

Rock Lake

Date: 8/21/2017  
Time:  
Weather:  
Entry: EEH

Max Depth:  
ROKS Depth (ft):  
ROKB Depth (ft):  
Secchi Depth (ft):

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)



Parameter	ROKS	ROKB
Total P (µg/L)	30.50	NA
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	13.50	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	634.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

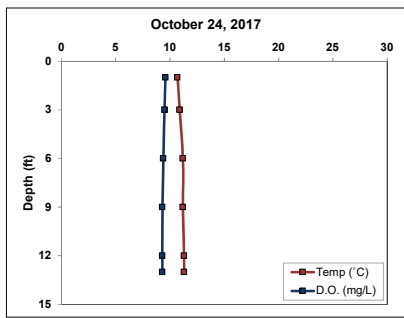


Rock Lake

Date: 10/24/2017  
Time: 11:00  
Weather: 37F, windy, rain, 100% clouds  
Entry: EEH

Max Depth: 14.7  
ROKS Depth (ft): 3.0  
ROKB Depth (ft): 12.0  
Secchi Depth (ft): 4.7

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	10.7	9.6		
3	10.9	9.5		
6	11.2	9.4		
9	11.2	9.3		
12	11.3	9.3		
13	11.3	9.3		



Parameter	ROKS	ROKB
Total P (µg/L)	34.30	31.20
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	12.80	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	3.00	2.75
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

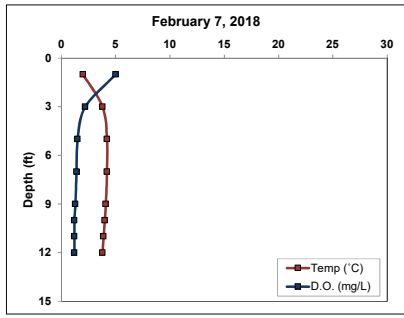
Data collected by TAH & PJG (Onterra).

Rock Lake

Date: 2/7/2018  
Time: 12:15  
Weather: 5F, no wind, 30% clouds  
Entry: EEH

Max Depth: 12.8  
ROKS Depth (ft): 3.0  
ROKB Depth (ft): 10.0  
Secchi Depth (ft): 3.9

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	2.0	5.0		
3	3.8	2.2		
5	4.2	1.5		
7	4.2	1.4		
9	4.1	1.3		
10	4.0	1.2		
11	3.9	1.2		
12	3.8	1.2		



Parameter	ROKS	ROKB
Total P (µg/L)	16.00	23.80
Dissolved P (µg/L)	2.70	4.70
Chl-a (µg/L)	NA	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	700.00	693.00
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH and JMB (Onterra). Ice thickness = 1.5 feet

**Water Quality Data**

2017-2018 Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	4	4.2	NA	NA
Total P (µg/L)	6	28.0	4	28.7
Dissolved P (µg/L)	1	2.7	1	4.7
Chl a (µg/L)	5	10.1	0	NA
TKN (µg/L)	0	NA	0	NA
NO <sub>2</sub> +NO <sub>3</sub> -N (µg/L)	0	NA	0	NA
NH <sub>3</sub> -N (µg/L)	0	NA	0	NA
Total N (µg/L)	5	627.8	2	618.0
Lab Cond. (µS/cm)	2	69.2	2	68.4
Alkal (mg/l CaCO <sub>3</sub> )	2	30.7	2	30.4
Total Susp. Solids (mg/l)	2	2.8	2	2.4
Calcium (mg/L)	1	8.8	0	NA
Magnesium (mg/L)	1	2.5	0	NA
Hardness (mg/L)	1	32.3	0	NA
Color (SU)	2	65.0	0	NA
Turbidity (NTU)	0	NA	0	NA

**Trophic State Index (TSI)**

Year	TP	Chl-a	Secchi
1984		59.5	54.2
1985			
1991			56.3
1992			51.9
1993			49.9
1994			51.3
1995			48.6
1996			55.7
1997			50.1
1998			
1999			53.9
2000			54.9
2001			55.1
2002			53.9
2003			
2004			
2005	49.8	54.3	49.1
2006	50.0	54.9	
2007	52.7	54.7	52.1
2008	49.6	55.1	53.5
2009	49.7	52.1	53.0
2010			54.5
2011			
2012			
2013			52.5
2014			52.8
2015			50.8
2016			
2017	53.1	55.2	51.4
<b>All Years (Weighted)</b>	51.0	54.3	51.8
<b>SLDL Median</b>	54.6	52.6	52.4
<b>NLF Ecoregion Median</b>	48.1	47.5	45.7

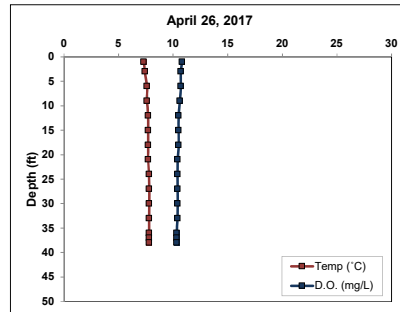
Year	Secchi (feet)				Chlorophyll-a (µg/L)						Total Phosphorus (µg/L)					
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1984	1	4.9	1	4.9	1	19.0	1	19.0								
1985	1	6.2	0						1	31.0					0.0	
1991	4	4.5	2	4.3												
1992	5	6.3	2	5.8												
1993	3	6.6	3	6.6												
1994	3	7.9	1	6.0												
1995	4	7.1	3	7.3												
1996	5	5.0	3	4.4												
1997	3	7.0	2	6.5												
1998	1	5.0	0													
1999	4	6.0	2	5.0												
2000	4	5.6	3	4.7												
2001	2	4.6	2	4.6												
2002	3	5.0	2	5.0												
2003	0		0													
2004	0		0													
2005	9	6.9	6	7.0	4	13.3	3	11.2	5	25.4			3.0	23.7		
2006	0		0		4	11.1	3	12.0	4	23.3			3.0	24.0		
2007	5	6.0	3	5.7	3	11.6	3	11.6	4	27.3			3.0	29.0		
2008	5	5.6	3	5.2	3	12.2	3	12.2	4	23.5			3.0	23.3		
2009	5	6.0	3	5.3	3	8.9	3	8.9	4	22.2			3.0	23.5		
2010	4	4.8	4	4.8	0		0		0				0.0			
2011	0		0		0		0		0				0.0			
2012	1	6.0	0		0		0		0				0.0			
2013	13	5.5	9	5.5	0		0		0				0.0			
2014	11	5.4	6	5.4	0		0		0				0.0			
2015	10	6.2	6	6.2	0		0		0				0.0			
2016	0		0		0		0		0				0.0			
2017	9	5.6	7	6.0	5	10.1	3	12.3	5	30.4			3.0	29.8		
<b>All Years (Weighted)</b>		5.9		5.7		11.5		11.8		25.7				25.6		
<b>SLDL Median</b>				5.6				9.4						33.0		
<b>NLF Ecoregion Median</b>				8.9				5.6						21.0		

North Turtle Lake

Date: 4/26/2017  
Time: 9:25  
Weather: 100% clouds, 8mph winds, 53F, rainy  
Entry: EEH

Max Depth: 38.9  
NTLS Depth (ft): 3.0  
NTLB Depth (ft): 36.0  
Secchi Depth (ft): 5.9

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	7.3	10.8		
3	7.4	10.7		
6	7.6	10.7		
9	7.6	10.6		
12	7.7	10.5		
15	7.7	10.5		
18	7.7	10.5		
21	7.7	10.4		
24	7.8	10.4		
27	7.8	10.4		
30	7.8	10.4		
33	7.8	10.4		
36	7.8	10.3		
37	7.8	10.3		
38	7.8	10.3		



Parameter	NTLS	NTLB
Total P (µg/L)	29.90	21.50
Dissolved P (µg/L)	2.40	2.30
Chl-a (µg/L)	ND	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	624.00	568.00
Lab Cond. (µS/cm)	71.20	58.30
Lab pH	7.27	7.08
Alkalinity (mg/L CaCO <sub>3</sub> )	29.70	21.20
Total Susp. Solids (mg/L)	ND	3.40
Calcium (mg/L)	10.70	NA
Magnesium (mg/L)	2.74	NA
Hardness (mg/L)	36.40	NA
Color (SU)	60.00	NA
Turbidity (NTU)	NA	NA

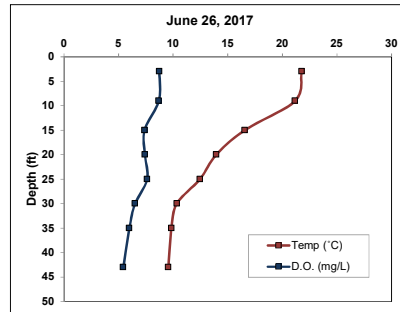
Data collected by JMB (Onterra).  
Max depth is listed as 58 ft. WQ point needs to be moved - EEH

North Turtle Lake

Date: 6/26/2017  
Time:  
Weather:  
Entry: EEH

Max Depth:  
NTLS Depth (ft):  
NTLB Depth (ft):  
Secchi Depth (ft):

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
3	21.8	8.7		
9	21.2	8.7		
15	16.6	7.4		
20	13.9	7.4		
25	12.4	7.6		
30	10.3	6.5		
35	9.8	6.0		
43	9.6	5.4		



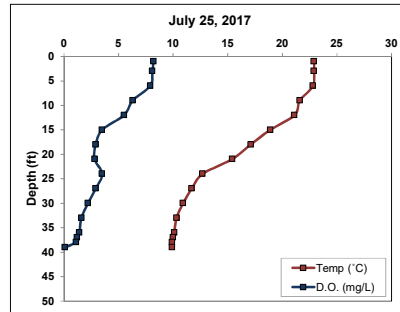
Parameter	NTLS	NTLB
Total P (µg/L)	17.20	NA
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	4.84	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	499.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

North Turtle Lake

Date: 7/25/2017  
Time: 9:50  
Weather: 90% clouds, 75F, 12 mph wind  
Entry: EEH

Max Depth: 39.2  
NTLS Depth (ft): 3.0  
NTLB Depth (ft): 36.0  
Secchi Depth (ft): 4.4

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	22.9	8.2		
3	22.9	8.1		
6	22.8	7.9		
9	21.6	6.3		
12	21.1	5.5		
15	18.9	3.5		
18	17.1	2.9		
21	15.4	2.8		
24	12.7	3.5		
27	11.7	2.9		
30	10.9	2.2		
33	10.3	1.6		
36	10.1	1.4		
37	10.0	1.2		
38	9.9	1.1		
39	9.9	0.1		



Parameter	NTLS	NTLB
Total P (µg/L)	18.90	35.70
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	4.78	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	452.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	7.60	7.00
Alkalinity (mg/L CaCO <sub>3</sub> )	30.40	31.70
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	60.00	NA
Turbidity (NTU)	NA	NA

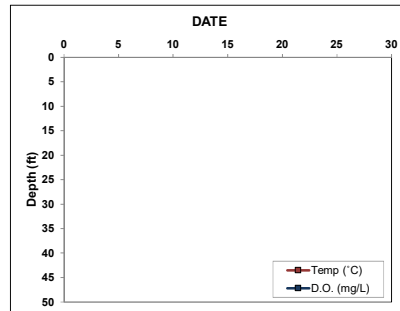
Data collected by JMB & AMS (Onterra).

North Turtle Lake

Date: 8/21/2017  
Time:  
Weather:  
Entry: EEH

Max Depth:  
NTLS Depth (ft):  
NTLB Depth (ft):  
Secchi Depth (ft):

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)



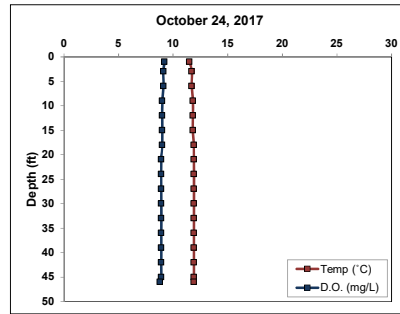
Parameter	NTLS	NTLB
Total P (µg/L)	13.80	NA
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	6.45	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	431.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

North Turtle Lake

Date: 10/24/2017  
Time: 11:00  
Weather: 37F, windy, rain, 100% clouds  
Entry: EEH

Max Depth: 46.5  
NTLS Depth (ft): 3.0  
NTLB Depth (ft): 44.0  
Secchi Depth (ft): 4.8

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	11.5	9.2		
3	11.7	9.1		
6	11.7	9.1		
9	11.8	9.0		
12	11.8	9.0		
15	11.8	9.0		
18	11.9	9.0		
21	11.9	8.9		
24	11.9	8.9		
27	11.9	8.9		
30	11.9	8.9		
33	11.9	8.9		
36	11.9	8.9		
39	11.9	8.9		
42	11.9	8.9		
45	11.9	8.9		
46	11.9	8.8		



Parameter	NTLS	NTLB
Total P (µg/L)	20.20	21.20
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	5.96	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

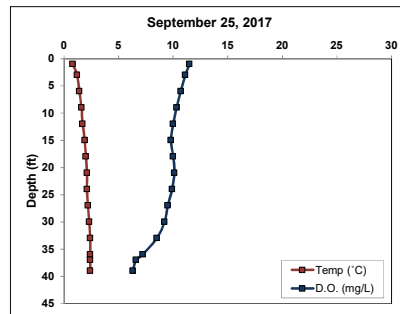
Data collected by TAH & PJG (Onterra).

North Turtle Lake

Date: 2/7/2018  
Time: 10:30  
Weather: 10% clouds, SF  
Entry: EEH

Max Depth: 39.9  
NTLS Depth (ft): 3.0  
NTLB Depth (ft): 37.0  
Secchi Depth (ft): 4.8

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	0.8	11.5		
3	1.2	11.1		
6	1.4	10.7		
9	1.6	10.3		
12	1.7	10.0		
15	1.9	9.8		
18	2.0	10.0		
21	2.1	10.1		
24	2.1	9.9		
27	2.2	9.5		
30	2.3	9.2		
33	2.4	8.5		
36	2.4	7.2		
37	2.4	6.6		
39	2.4	6.3		



Parameter	NTLS	NTLB
Total P (µg/L)	14.00	19.60
Dissolved P (µg/L)	4.30	6.20
Chl-a (µg/L)	NA	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	474.00	499.00
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH and JMB (Onterra). Ice thickness = 1.4 feet

**Water Quality Data**

2017-2018 Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	4	5.0	NA	NA
Total P (µg/L)	6	18.7	4	24.5
Dissolved P (µg/L)	2	3.4	2	4.3
Chl a (µg/L)	5	5.5	0	NA
TKN (µg/L)	0	NA	0	NA
NO <sub>2</sub> +NO <sub>3</sub> -N (µg/L)	0	NA	0	NA
NH <sub>3</sub> -N (µg/L)	0	NA	0	NA
Total N (µg/L)	5	496.0	2	533.5
Lab Cond. (µS/cm)	1	71.2	1	58.3
Alkal (mg/l CaCO <sub>3</sub> )	2	30.1	2	26.5
Total Susp. Solids (mg/l)	2	ND	2	3.4
Calcium (mg/L)	1	10.1	0	NA
Magnesium (mg/L)	1	2.7	0	NA
Hardness (mg/L)	1	36.4	0	NA
Color (SU)	2	60.0	0	NA
Turbidity (NTU)	0	NA	0	NA

**Trophic State Index (TSI)**

Year	TP	Chl-a	Secchi
1984		51.0	49.3
1985			
1991			50.7
1992			54.2
1993	42.9	49.1	47.2
1994	40.4	45.1	43.6
1995	38.7	34.4	43.6
1996	39.4	44.5	45.1
1997	49.6	44.5	45.6
1998	40.8	46.1	45.5
1999	42.2	44.1	46.6
2000	42.9	43.3	46.2
2001	47.3	48.2	46.8
2002	42.2	47.8	47.2
2003	44.8	46.0	45.5
2004	42.5	48.1	46.9
2005	42.2	45.9	45.1
2006	47.1	47.8	46.4
2007	44.7	50.5	48.1
2008	44.1	45.5	44.8
2009	42.2	43.6	44.4
2010			44.9
2011			46.8
2012	38.7	43.7	46.2
2013	41.4	50.6	46.9
2014	43.9	53.9	46.2
2015	47.9	48.5	46.4
2016	45.3	49.2	
2017	45.4	46.5	50.6
All Years (Weighted)	43.2	46.3	46.1
DLDL Median	49.4	49.7	46.2
NLF Ecoregion Median	48.1	47.5	45.7

Year	Secchi (feet)				Chlorophyll-a (µg/L)						Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer			
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean		
1984	1	6.9	1	6.9	1	8.0	1	8.0	1	22.0		0.0		
1985	1	6.9	0											
1991	11	6.5	8	6.3										
1992	5	5.9	3	4.9										
1993	7	8.0	6	8.0	2	6.6	2	6.6	3	14.7	3.0	14.7		
1994	6	9.6	5	10.3	3	4.4	3	4.4	3	12.3	3.0	12.3		
1995	6	10.0	5	10.3	4	2.4	3	1.5	4	12.8	3.0	11.0		
1996	4	8.2	2	9.3	4	5.5	2	4.1	4	14.8	2.0	11.5		
1997	5	8.3	3	8.9	4	5.4	3	4.1	5	25.0	3.0	23.3		
1998	5	8.1	3	9.0	3	4.8	3	4.8	4	15.3	3.0	12.7		
1999	5	9.1	3	8.3	4	3.8	3	3.9	5	15.0	3.0	14.0		
2000	8	8.8	5	8.6	4	4.2	3	3.6	5	15.8	3.0	14.7		
2001	9	8.3	6	8.2	4	6.5	3	6.0	5	21.0	3.0	20.0		
2002	7	7.8	5	8.0	3	5.8	2	5.8	5	18.2	3.0	14.0		
2003	10	9.0	7	9.0	5	5.3	4	4.8	7	16.7	4.0	16.8		
2004	6	8.2	4	8.1	4	7.1	3	6.0	5	17.8	3.0	14.3		
2005	7	9.4	5	9.3	4	5.2	3	4.8	5	15.2	3.0	14.0		
2006	5	7.9	3	8.4	4	6.8	3	5.8	5	20.6	3.0	19.7		
2007	5	9.2	3	7.5	3	7.6	3	7.6	4	16.5	3.0	16.7		
2008	4	8.9	3	9.4	3	4.5	3	4.5	4	16.5	3.0	16.0		
2009	4	9.3	3	9.7	3	3.8	3	3.8	4	16.0	3.0	14.0		
2010	13	8.9	8	9.4	0		0		0		0.0			
2011	13	8.1	8	8.2	0		0		0		0.0			
2012	15	9.0	9	8.6	1	3.8	1	3.8	1	11.0	1.0	11.0		
2013	7	8.1	6	8.2	3	7.7	3	7.7	4	15.1	3.0	13.2		
2014	11	8.4	6	8.5	3	10.7	3	10.7	4	18.7	3.0	15.8		
2015	10	8.4	6	8.4	3	6.2	3	6.2	4	20.9	3.0	20.8		
2016	0		0		3	6.7	3	6.7	4	18.6	3.0	17.4		
2017	7	6.3	4	6.3	5	5.2	4	5.1	7	19.2	4.0	17.5		
All Years (Weighted)		8.3		8.4		5.6		5.4		17.3		15.7		
DLDL Median				8.5				7.0				23.0		
NLF Ecoregion Median				8.9				5.6				21.0		

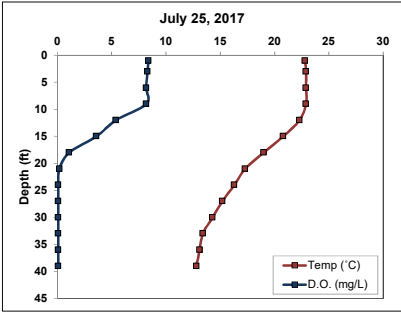


**South Turtle Lake**

Date: 7/25/2017  
Time: 8:50  
Weather: 60% Clouds, 75F, 12mph  
Entry: JMB

Max Depth: 40.9  
STLS Depth (ft): 3.0  
STLB Depth (ft): 36.0  
Secchi Depth (ft): 6.1

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	22.8	8.4		
3	22.9	8.3		
6	22.9	8.2		
9	22.9	8.2		
12	22.3	5.4		
15	20.8	3.6		
18	19.0	1.1		
21	17.3	0.2		
24	16.3	0.1		
27	15.2	0.1		
30	14.3	0.1		
33	13.4	0.1		
36	13.1	0.1		
39	12.8	0.1		



Parameter	STLS	STLB
Total P (µg/L)	19.90	52.20
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	4.98	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	466.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	7.73	6.96
Alkalinity (mg/L CaCO <sub>3</sub> )	36.90	46.30
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	40.00	NA
Turbidity (NTU)	NA	NA

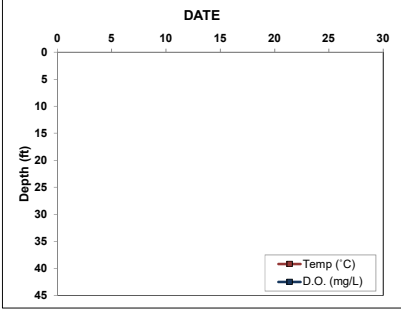
Data collected by JMB (Onterra).

**South Turtle Lake**

Date: 8/21/2017  
Time:  
Weather:  
Entry: EEH

Max Depth:  
STLS Depth (ft):  
STLB Depth (ft):  
Secchi Depth (ft):

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)



Parameter	STLS	STLB
Total P (µg/L)	27.70	NA
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	14.50	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	523.00	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

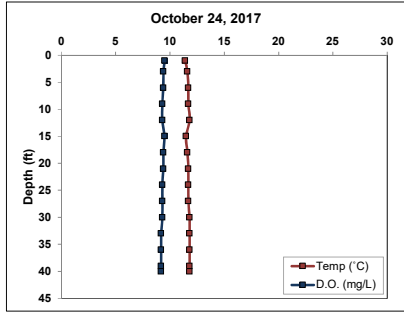


South Turtle Lake

Date: 10/24/2017  
Time: 9:15  
Weather: Rain, windy, 39F, 100% clouds  
Entry: EEH

Max Depth: 41.2  
STLS Depth (ft): 3.0  
STLB Depth (ft): 38.0  
Secchi Depth (ft): 6.7

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	11.4	9.5		
3	11.6	9.4		
6	11.7	9.4		
9	11.7	9.3		
12	11.8	9.3		
15	11.5	9.5		
18	11.6	9.4		
21	11.7	9.4		
24	11.7	9.3		
27	11.7	9.3		
30	11.8	9.3		
33	11.6	9.2		
36	11.8	9.2		
39	11.8	9.2		
40	11.8	9.2		



Parameter	STLS	STLB
Total P (µg/L)	24.40	25.20
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	8.58	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

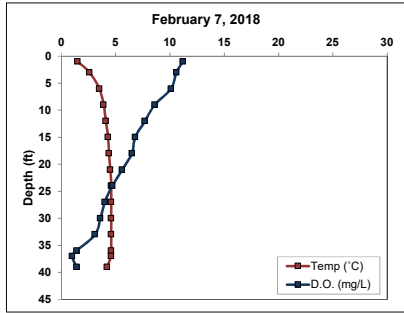
Data collected by TAH & PJG (Onterra).

South Turtle Lake

Date: 2/7/2018  
Time: 10:00  
Weather: 10% clouds, -1 F  
Entry: EEH

Max Depth: 39.7  
STLS Depth (ft): 3.0  
STLB Depth (ft): 37.0  
Secchi Depth (ft): 5.0

Depth (ft)	Temp (°C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	1.5	11.2		
3	2.6	10.6		
6	3.5	10.1		
9	3.9	9.9		
12	4.1	7.7		
15	4.3	6.8		
18	4.4	6.5		
21	4.5	5.6		
24	4.6	4.7		
27	4.6	4.0		
30	4.6	3.6		
33	4.6	3.1		
36	4.6	1.4		
37	4.6	1.0		
39	4.2	1.4		



Parameter	STLS	STLB
Total P (µg/L)	13.40	22.00
Dissolved P (µg/L)	4.70	9.20
Chl-a (µg/L)	NA	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	552.00	613.00
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH and JMB (Onterra).

**Water Quality Data**

2017-2018 Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	4	6.1	NA	NA
Total P (µg/L)	5	20.8	4	29.7
Dissolved P (µg/L)	2	3.4	2	9.2
Chl a (µg/L)	5	7.2	0	NA
TKN (µg/L)	0	NA	0	NA
NO <sub>3</sub> +NO <sub>2</sub> -N (µg/L)	0	NA	0	NA
NH <sub>3</sub> -N (µg/L)	0	NA	0	NA
Total N (µg/L)	5	495.0	2	571.5
Lab Cond. (µS/cm)	1	83.5	1	84.7
Alkal (mg/l CaCO <sub>3</sub> )	2	36.4	2	41.0
Total Susp. Solids (mg/l)	2	ND	2	ND
Calcium (mg/L)	1	11.7	0	NA
Magnesium (mg/L)	1	3.2	0	NA
Hardness (mg/L)	1	42.4	0	NA
Color (SU)	2	40.0	0	NA
Turbidity (NTU)	0	NA	0	NA

**Trophic State Index (TSI)**

Year	TP	Chl-a	Secchi
1984		57.8	54.2
1985			
1991			49.4
1992	44.1		49.9
1993	43.2	48.7	46.6
1994	46.2	47.5	48.4
1995	46.2	44.5	46.7
1996	46.6	51.3	50.1
1997	50.6	46.6	49.8
1998	45.0	52.0	50.4
1999	47.3	43.3	51.3
2000			
2001			53.9
2002			50.2
2003	50.0	49.4	48.7
2004	46.8	46.0	45.3
2005	47.1	51.1	45.9
2006	47.3	51.7	47.8
2007	48.6	55.5	48.4
2008	49.2	47.3	48.1
2009	49.2	47.0	43.2
2010	49.6	50.2	49.1
2011	50.4	54.2	
2012	48.9	54.0	49.1
2013	50.8	54.1	49.1
2014	46.9	51.0	
2015	51.0	54.4	47.8
2016	52.2	55.9	
2017	51.2	52.6	51.1
All Years (Weighted)	48.1	49.9	48.3
DHDL Median	45.0	46.4	42.8
NLF Ecoregion Median	48.1	47.5	45.7

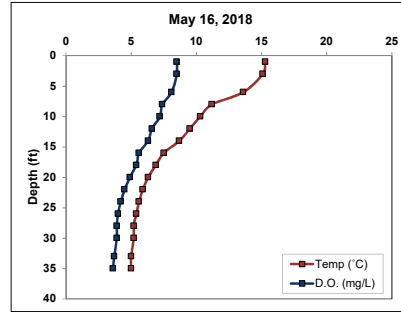
Year	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1984	1	4.9	1	4.9	1	16.0	1	16.0				
1985	1	7.5	0						1	24.0		
1991	8	6.5	6	6.8							0.0	16.0
1992	8	6.4	5	6.6					3	19.3	1.0	16.0
1993	5	7.7	4	8.3	3	6.3	3	6.3	3	15.0	3.0	15.0
1994	6	7.3	3	7.3	4	5.1	2	5.6	4	17.8	2.0	18.5
1995	4	7.4	3	8.3	4	9.9	2	4.1	4	19.0	2.0	18.5
1996	4	5.8	2	6.5	4	8.3	2	8.2	4	20.8	2.0	19.0
1997	5	6.6	3	6.7	4	6.8	3	5.1	5	33.4	3.0	25.0
1998	7	5.8	5	6.4	3	8.9	3	8.9	4	28.3	3.0	17.0
1999	2	6.5	1	6.0	2	3.6	2	3.6	3	18.0	2.0	20.0
2000	0		0		0		0		0		0.0	
2001	6	4.8	1	5.0	0		0		0		0.0	
2002	12	6.5	7	6.5	0		0		0		0.0	
2003	12	7.3	9	7.2	1	6.8	1	6.8	2	20.0	1.0	24.0
2004	12	9.1	7	9.1	4	5.7	3	4.8	5	20.2	4.0	19.3
2005	12	8.1	6	8.8	4	9.0	3	8.1	5	22.8	3.0	19.7
2006	8	7.0	6	7.7	5	8.7	4	8.6	5	22.6	4.0	20.0
2007	8	7.9	6	7.3	4	12.7	4	12.7	5	22.0	4.0	21.8
2008	2	7.3	1	7.5	3	5.5	3	5.5	3	22.7	3.0	22.7
2009	7	10.1	4	10.5	3	5.3	3	5.3	4	22.3	3.0	22.7
2010	4	9.0	3	7.0	3	7.4	3	7.4	4	21.8	3.0	23.3
2011	1	6.5	0		2	11.0	2	11.0	3	24.7	3.0	24.7
2012	4	6.8	3	7.0	3	10.9	3	10.9	4	22.8	3.0	22.3
2013	8	6.8	7	7.0	3	11.0	3	11.0	4	25.4	4.0	25.4
2014	0		0		4	8.0	4	8.0	3	19.4	3.0	19.4
2015	7	7.6	6	7.7	3	11.3	3	11.3	4	23.3	3.0	25.8
2016	0		0		3	13.2	3	13.2	3	28.0	3.0	28.0
2017	3	6.5	1	6.1	7	8.1	5	9.4	7	24.3	4.0	26.1
All Years (Weighted)		7.2		7.4		8.5		8.4		22.7		21.8
DHDL Median				10.8				5.0				17.0
NLF Ecoregion Median				8.9				5.6				21.0

Circle Lily Lake

Date: 5/16/2018  
Time: 10:30  
Weather: 10% clouds, 8 mph wind, 68°F  
Entry: JLW

Max Depth: 36.6  
LS Depth (ft): 3.0  
LB Depth (ft): 33.0  
Secchi Depth (ft): 5.0

Depth (ft)	Temp (°C)	D.O. (mg/L)	% Saturation	pH	Sp. Cond. (µS/cm)
1	15.3	8.5	85%		
3	15.1	8.5	84%	7.1	
6	13.6	8.1	78%		
8	11.2	7.4	67%		
10	10.3	7.2	64%		
12	9.5	6.6	58%	6.9	
14	8.7	6.3	54%		
16	7.5	5.6	47%		
18	6.9	5.4	44%		
20	6.3	4.9	40%		
22	5.9	4.5	36%	6.7	
24	5.6	4.2	33%		
26	5.4	4.0	32%		
28	5.2	3.9	31%		
30	5.2	3.9	31%		
33	5.0	3.7	29%	6.8	
35	5.0	3.6	28%		



Parameter	LS	LB
Total P (µg/L)	13.90	19.70
Dissolved P (µg/L)	2.10	4.80
Chl-a (µg/L)	1.91	NA
TKN (µg/L)	NA	NA
NO <sub>2</sub> + NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	539.00	666.00
Lab Cond. (µS/cm)	73.30	92.20
Lab pH	7.34	7.14
Alkalinity (mg/L CaCO <sub>3</sub> )	32.00	41.50
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	9.42	NA
Magnesium (mg/L)	2.53	NA
Hardness (mg/L)	33.90	NA
Color (SU)	70.00	NA
Turbidity (NTU)	NA	NA

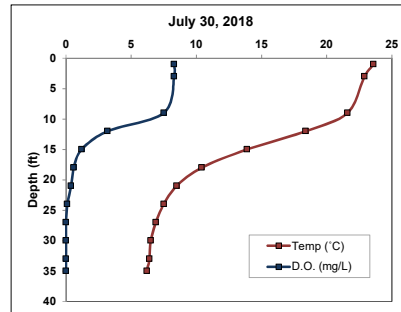
Data collected by JMB (Onterra). Moved water quality point south of the existing one.

Circle Lily Lake

Date: 7/30/2018  
Time: 14:00  
Weather: 50% clouds, no wind, 73°F  
Entry: HAL

Max Depth: 35.9  
LS Depth (ft): 3.0  
LB Depth (ft): 33.0  
Secchi Depth (ft): 4.3

Depth (ft)	Temp (°C)	D.O. (mg/L)	% Saturation	pH	Sp. Cond. (µS/cm)
1	23.6	8.3	98%		
3	22.9	8.3	97%		
9	21.6	7.5	85%		
12	18.4	3.2	34%		
15	13.9	1.2	12%		
18	10.4	0.6	5%		
21	8.5	0.4	3%		
24	7.5	0.1	1%		
27	6.9	0.0	0%		
30	6.5	0.0	0%		
33	6.4	0.0	0%		
35	6.2	0.0	0%		



Parameter	LS	LB
Total P (µg/L)	12.70	22.50
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	14.60	NA
TKN (µg/L)	NA	NA
NO <sub>2</sub> + NO <sub>3</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	669.00	NA
Lab Cond. (µS/cm)	76.50	53.40
Lab pH	7.73	7.24
Alkalinity (mg/L CaCO <sub>3</sub> )	31.50	18.90
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	120.00	NA
Turbidity (NTU)	NA	NA

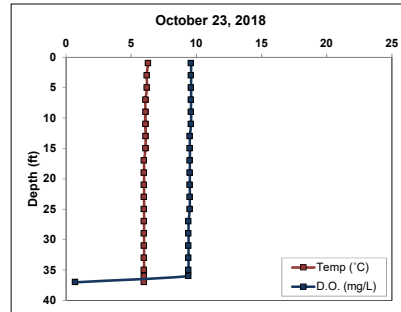
Data collected by Onterra (TAH & PJG)

Circle Lily Lake

Date: 10/23/2018  
Time: 14:45  
Weather: 80% clouds, no wind, 40°F  
Entry: HAL

Max Depth: 37.7  
LS Depth (ft): 3.0  
LB Depth (ft): 35.0  
Secchi Depth (ft): 3.7

Depth (ft)	Temp (°C)	D.O. (mg/L)	% Saturation	pH	Sp. Cond. (µS/cm)
1	6.3	9.6	77%		
3	6.2	9.6	77%		
5	6.2	9.6	77%		
7	6.1	9.6	77%		
9	6.1	9.6	77%		
11	6.1	9.6	77%		
13	6.1	9.5	77%		
15	6.1	9.5	77%		
17	6.0	9.5	77%		
19	6.0	9.5	77%		
21	6.0	9.5	77%		
23	6.0	9.5	77%		
25	6.0	9.5	77%		
27	6.0	9.4	76%		
29	6.0	9.4	76%		
31	6.0	9.4	76%		
33	6.0	9.4	76%		
35	6.0	9.4	76%		
36	6.0	9.4	76%		
37	6.0	0.7	6%		



Parameter	LS	LB
Total P (µg/L)	15.40	15.40
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	0.65	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

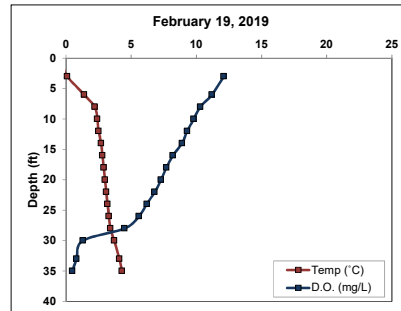
Data collected by Onterra (JMB & AMS).

Circle Lily Lake

Date: 2/19/2019  
Time: 11:00  
Weather: 0% clouds, 0F, 5mph winds, 1.6' ice  
Entry: HAL

Max Depth: 36.0  
LS Depth (ft): 3.0  
LB Depth (ft): 33.0  
Secchi Depth (ft): 3.7

Depth (ft)	Temp (°C)	D.O. (mg/L)	% Saturation	pH	Sp. Cond. (µS/cm)
1	-0.3		#N/A		
3	0.1	12.1	83%		
6	1.4	11.2	79%		
8	2.2	10.3	75%		
10	2.4	9.8	72%		
12	2.5	9.3	68%		
14	2.7	8.9	65%		
16	2.8	8.2	61%		
18	2.9	7.7	57%		
20	3.0	7.3	54%		
22	3.1	6.8	51%		
24	3.2	6.2	46%		
26	3.3	5.6	42%		
28	3.4	4.5	34%		
30	3.7	1.3	10%		
33	4.1	0.8	6%		
35	4.3	0.5	4%		



Parameter	LS	LB
Total P (µg/L)	NA	NA
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	NA	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by Onterra (JMB, AMS)

**Water Quality Data**

2018-2019 Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	4	4.2	NA	NA
Total P (µg/L)	3	14.0	3	19.2
Dissolved P (µg/L)	1	2.1	1	4.8
Chl a (µg/L)	3	5.7	0	NA
TKN (µg/L)	0	NA	0	NA
NO <sub>3</sub> +NO <sub>2</sub> -N (µg/L)	0	NA	0	NA
NH <sub>3</sub> -N (µg/L)	0	NA	0	NA
Total N (µg/L)	2	604.0	1	666.0
Lab Cond. (µS/cm)	2	74.9	2	72.8
Alkal (mg/l CaCO <sub>3</sub> )	2	31.8	2	29.2
Total Susp. Solids (mg/l)	2	ND	2	ND
Calcium (mg/L)	1	9.4	0	NA
Magnesium (mg/L)	1	2.5	0	NA
Hardness (mg/L)	1	33.9	0	NA
Color (SU)	2	95.0	0	NA
Turbidity (NTU)	0	NA	0	NA

**Trophic State Index (TSI)**

Year	TP	Chl-a	Secchi
1996			55.9
1997			52.6
1998			46.6
1999			53.1
2000			50.5
2001			50.2
2002			53.9
2003	42.2	46.0	51.9
2004			
2005			
2006			
2007	43.2	47.3	48.3
2008	45.3	47.5	53.6
2009	44.7	43.4	48.5
2010	51.1	53.7	51.9
2011	48.4	39.2	54.7
2012	48.7	48.3	53.0
2013	50.2	60.4	58.9
2014	43.9	44.0	57.0
2015	51.0	51.1	55.4
2016	48.8	47.0	58.1
2017	45.9	41.1	54.4
2018	44.6	49.0	54.3
<b>All Years (Weighted)</b>	46.8	47.5	53.8
<b>DLDL Median</b>	49.4	49.7	46.2
<b>NLF Ecoregion Median</b>	48.1	47.5	45.7

Year	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1996	10	4.1	5	4.4								
1997	5	6.1	3	5.5								
1998	7	7.2	3	8.3								
1999	9	5.6	5	5.3								
2000	12	5.5	6	6.3								
2001	10	5.9	6	6.5								
2002	9	4.8	6	5.0								
2003	9	5.8	7	5.8	1	4.8	1	4.8	2	17.0	1.0	14.0
2004	0		0		0		0		0		0.0	
2005	0		0		0		0		0		0.0	
2006	0		0		0		0		0		0.0	
2007	8	6.9	4	7.4	2	5.5	2	5.5	2	15.0	2.0	15.0
2008	7	5.2	4	5.1	3	5.6	3	5.6	4	17.8	3.0	17.3
2009	12	6.6	5	7.3	3	3.7	3	3.7	4	17.3	3.0	16.7
2010	3	5.5	2	5.8	3	10.5	3	10.5	4	25.3	3.0	26.0
2011	3	4.7	2	4.8	3	2.5	2	2.4	3	22.0	2.0	21.5
2012	3	5.1	1	5.3	2	6.1	2	6.1	3	22.7	2.0	22.0
2013	3	3.8	2	3.6	3	20.8	3	20.8	3	24.3	2.0	24.5
2014	5	4.1	5	4.1	3	3.9	3	3.9	3	15.7	3.0	15.7
2015	5	4.7	3	4.5	3	8.0	3	8.0	3	25.7	3.0	25.7
2016	3	4.2	1	3.8	3	5.3	3	5.3	3	22.1	3.0	22.1
2017	4	5.1	3	4.8	3	2.9	3	2.9	3	18.1	3.0	18.1
2018	8	4.8	5	4.9	6	4.8	4	6.5	6	15.9	4.0	16.6
<b>All Years (Weighted)</b>		5.4		5.6		6.5		6.9		19.8		19.7
<b>DLDL Median</b>				8.5				7.0				23.0
<b>NLF Ecoregion Median</b>				8.9				5.6				21.0

1996-2010 Average 6.0  
2011-2018 Average 4.5

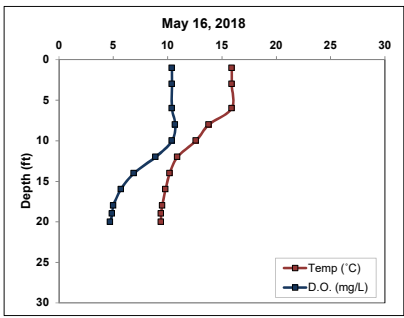


Pardee Lake

Date: 5/16/2018  
Time: 8:45  
Weather: 5% clouds, 63°F, 5 mph wind  
Entry: JLW

Max Depth: 21.9  
LS Depth (ft): 3.0  
LB Depth (ft): 18.0  
Secchi Depth (ft): 8.2

Depth (ft)	Temp (°C)	D.O. (mg/L)	% Saturation	pH	Sp. Cond. (µS/cm)
1	15.9	10.4	105%		
3	15.9	10.4	105%	8.1	
6	15.9	10.4	105%		
8	13.8	10.7	103%		
10	12.6	10.4	98%	7.7	
12	10.9	8.9	80%		
14	10.2	6.9	62%		
16	9.8	5.7	50%		
18	9.5	5.0	44%	7.3	
19	9.4	4.9	43%		
20	9.4	4.7	41%		



Parameter	LS	LB
Total P (µg/L)	13.20	32.70
Dissolved P (µg/L)	ND	2.30
Chl-a (µg/L)	1.73	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	300.00	368.00
Lab Cond. (µS/cm)	98.90	100.00
Lab pH	7.91	7.26
Alkalinity (mg/L CaCO <sub>3</sub> )	47.30	47.80
Total Susp. Solids (mg/L)	ND	2.50
Calcium (mg/L)	12.10	NA
Magnesium (mg/L)	3.36	NA
Hardness (mg/L)	44.00	NA
Color (SU)	30.00	NA
Turbidity (NTU)	NA	NA

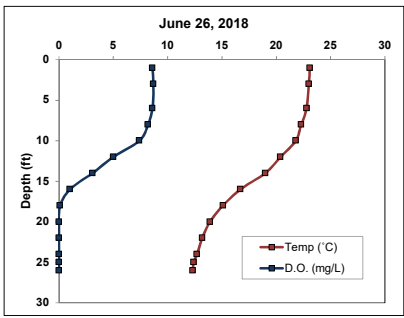
Data collected by JMB (Onterra). Moved water quality point as the old point was in 18 feet of water.

Pardee Lake

Date: 6/26/2018  
Time: 10:00  
Weather: 40% clouds, 70°F, 8 mph winds  
Entry: JLW

Max Depth: 27.0  
LS Depth (ft): 3.0  
LB Depth (ft): 24.0  
Secchi Depth (ft): 7.1

Depth (ft)	Temp (°C)	D.O. (mg/L)	% Saturation	pH	Sp. Cond. (µS/cm)
1	23.1	8.6	100%		
3	23.0	8.7	101%		
6	22.8	8.6	100%		
8	22.3	8.2	94%		
10	21.8	7.4	84%		
12	20.4	5.0	56%		
14	19.0	3.1	33%		
16	16.7	1.0	10%		
18	15.1	0.1	1%		
20	13.9	0.0	0%		
22	13.2	0.0	0%		
24	12.7	0.0	0%		
25	12.4	0.0	0%		
26	12.3	0.0	0%		



Parameter	LS	LB
Total P (µg/L)	19.10	34.20
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	1.93	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

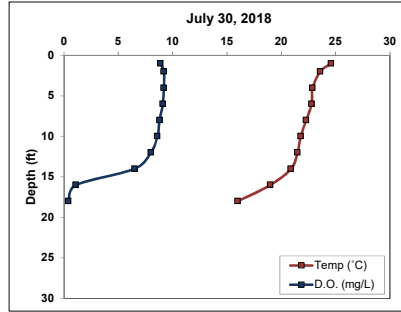
Collected by JMB & DOT (Onterra).

Pardee Lake

Date: 7/30/2018  
Time: 15:15  
Weather: 50% clouds, no wind, 73°F  
Entry: HAL

Max Depth: 18.6  
LS Depth (ft): 3.0  
LB Depth (ft): 16.0  
Secchi Depth (ft): 7.1

Depth (ft)	Temp (°C)	D.O. (mg/L)	% Saturation	pH	Sp. Cond. (µS/cm)
1	24.6	8.9	107%		
2	23.6	9.2	108%		
4	22.9	9.2	107%		
6	22.8	9.1	106%		
8	22.3	8.8	101%		
10	21.8	8.6	98%		
12	21.5	8.0	91%		
14	20.9	6.5	73%		
16	19.0	1.1	12%		
18	16.0	0.4	4%		



Parameter	LS	LB
Total P (µg/L)	13.20	15.80
Dissolved P (µg/L)	ND	ND
Chl-a (µg/L)	6.85	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	421.00	385.00
Lab Cond. (µS/cm)	96.10	104.00
Lab pH	8.43	7.74
Alkalinity (mg/L CaCO <sub>3</sub> )	44.00	46.70
Total Susp. Solids (mg/L)	2.20	2.20
Calcium (mg/L)	12.40	NA
Magnesium (mg/L)	3.45	NA
Hardness (mg/L)	45.30	NA
Color (SU)	30.00	NA
Turbidity (NTU)	NA	NA

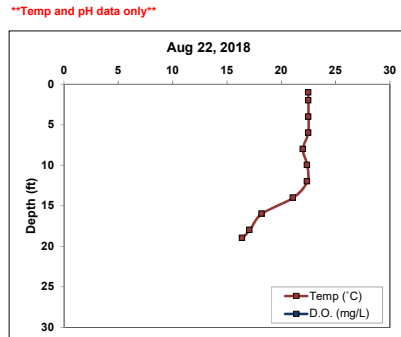
Data collected by Onterra (TAH & PJG)

Pardee Lake

Date: 8/22/2018  
Time: 14:45  
Weather: 50% clouds, breezy, 72°F  
Entry: HAL

Max Depth: 20.2  
LS Depth (ft): 3.0  
LB Depth (ft): 17.0  
Secchi Depth (ft): 5.0

Depth (ft)	Temp (°C)	D.O. (mg/L)	% Saturation	pH	Sp. Cond. (µS/cm)
1	22.5		0%	9.0	
2	22.5		0%	9.0	
4	22.5		0%	9.0	
6	22.5		0%	9.0	
8	22.0		0%	9.0	
10	22.4		0%	9.0	
12	22.4		0%	8.9	
14	21.1		0%	7.8	
16	18.2		0%	7.3	
18	17.1		0%	7.2	
19	16.4		0%	7.2	



Parameter	LS	LB
Total P (µg/L)	18.20	44.70
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	3.95	NA
TKN (µg/L)	NA	NA
NO <sub>3</sub> + NO <sub>2</sub> -N (µg/L)	NA	NA
NH <sub>4</sub> -N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L CaCO <sub>3</sub> )	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by Onterra (TAH). TAH accidentally grabbed the pH probe instead of the DO probe, so no DO data.





**Water Quality Data**

2018-2019 Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	6	7.3	NA	NA
Total P (µg/L)	5	16.4	5	28.3
Dissolved P (µg/L)	2	ND	2	2.3
Chl a (µg/L)	5	3.5	0	NA
TKN (µg/L)	0	NA	0	NA
NO <sub>2</sub> +NO <sub>3</sub> -N (µg/L)	0	NA	0	NA
NH <sub>3</sub> -N (µg/L)	0	NA	0	NA
Total N (µg/L)	2	360.5	2	376.5
Lab Cond. (µS/cm)	2	97.5	2	102.0
Alkal (mg/l CaCO <sub>3</sub> )	2	45.7	2	47.0
Total Susp. Solids (mg/l)	3	2.2	3	2.4
Calcium (mg/L)	2	12.3	0	NA
Magnesium (mg/L)	2	3.4	0	NA
Hardness (mg/L)	2	44.7	0	NA
Color (SU)	2	30.0	0	NA
Turbidity (NTU)	0	NA	0	NA

**Trophic State Index (TSI)**

Year	TP	Chl-a	Secchi
1998			46.9
1999			46.3
2000			45.6
2001	45.0	52.0	45.9
2002	48.5	60.9	46.3
2003	45.3	46.4	43.9
2004	49.4	55.6	48.7
2005	45.3	52.4	45.6
2006	49.4	56.7	51.3
2007	45.0	57.2	51.3
2008	51.5	55.4	53.5
2009	48.9	45.1	43.5
2010	45.8	53.7	50.4
2011			50.1
2012			59.1
2013			
2014			
2015			45.9
2016			49.1
2017			
2018	44.9	44.8	50.4
<b>All Years (Weighted)</b>	47.2	52.8	48.3
<b>DHDL Median</b>	45.0	46.4	42.8
<b>NLF Ecoregion Median</b>	48.1	47.5	45.7

Year	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1998	9	7.6	7	8.1					1	16.0		0.0
1999	8	7.6	6	8.5					0			0.0
2000	8	8.6	5	8.9	1	10.0	0		1	23.0		0.0
2001	5	8.8	4	8.8	4	7.7	3	8.9	4	18.0	3.0	17.0
2002	6	8.8	3	8.5	3	18.6	2	22.0	5	22.0	3.0	21.7
2003	4	9.4	3	10.0	4	6.9	3	5.0	4	20.3	3.0	17.3
2004	5	7.7	3	7.2	4	12.2	3	12.9	5	23.4	3.0	23.0
2005	5	9.9	3	8.9	4	9.8	3	9.3	5	19.0	3.0	17.3
2006	4	5.9	3	6.0	4	15.1	3	14.2	4	26.5	3.0	23.0
2007	4	5.8	3	6.0	4	17.4	3	15.0	4	20.5	3.0	17.0
2008	3	5.2	3	5.2	3	12.6	3	12.6	3	26.7	3.0	26.7
2009	7	9.8	6	10.3	3	4.4	3	4.4	3	22.3	3.0	22.3
2010	3	8.3	2	6.4	3	10.5	3	10.5	3	18.0	3.0	18.0
2011	3	6.5	3	6.5	0		0		0			0.0
2012	3	6.2	1	3.5	0		0		0			0.0
2013	0		0		0		0		0			0.0
2014	0		0		0		0		0			0.0
2015	3	7.8	2	8.8	0		0		0			0.0
2016	3	7.2	2	7.0	0		0		0			0.0
2017	0		0		0		0		0			0.0
2018	5	7.3	3	6.4	5	3.5	3	4.2	5	16.4	3.0	16.8
<b>All Years (Weighted)</b>		7.9		7.9		10.5		10.5		21.0		20.0
<b>DHDL Median</b>				10.8				5.0				17.0
<b>NLF Ecoregion Median</b>				8.9				5.6				21.0