

A

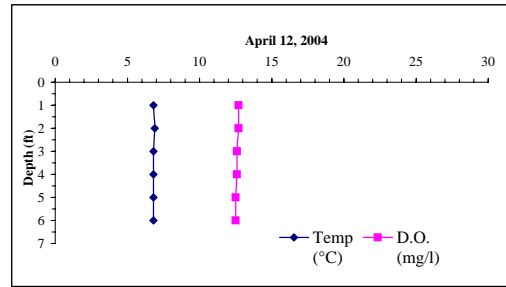
APPENDIX A

2004 & 2005 Water Quality Data Set

Buffalo Lake

Date: 04-12-04 Max Depth (ft): 6.7
 Time: 10:21 BUF S Depth (ft): 1.5
 Weather: 38F, Clear, Breezy BUF B Depth (ft): 5.0
 Ent: TSN Verf: Secchi Depth (ft): 2.8

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	6.8	12.7	na	395
2.0	6.9	12.7	na	394
3.0	6.8	12.6	na	395
4.0	6.8	12.6	na	393
5.0	6.8	12.5	na	394
6.0	6.8	12.5	na	393



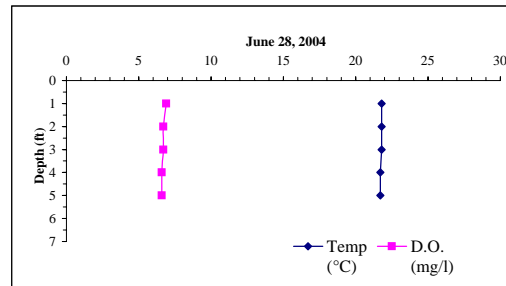
Parameter	BUFS	BUFB
Total P (µg/L)	63.000	64.000
Dissolved P (µg/L)	ND	ND
Chl a (µg/L)	35.30	
TKN (µg/L)	1020.00	1200.00
NO4+NO3-N (µg/L)	1130.000	1140.000
NH3-N (µg/L)	71.000	62.000
Total N (µg/L)	2150.00	2340.00
Lab Cond. (µS/cm)	412	408
Lab pH	8.76	8.77
Alkal (mg/l CaCO3)	181	181
Total Susp Sol (mg/l)	5	7
Calcium (mg/l)	44.0	

Notes:

Buffalo Lake

Date: 06-28-04 Max Depth (ft): 5.7
 Time: 15:27 BUF S Depth (ft): 1.5
 Weather: 63F, Windy, Mostly Cloudy BUF B Depth (ft): 4.5
 Ent: TSN Verf: Secchi Depth (ft): 3.2

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	21.8	6.9	na	349
2.0	21.8	6.7	na	348
3.0	21.8	6.7	na	348
4.0	21.7	6.6	na	349
5.0	21.7	6.6	na	347



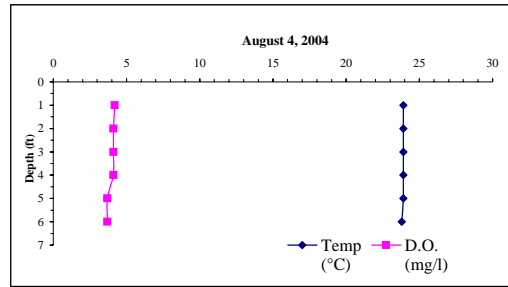
Parameter	BUFS	BUFB
Total P (µg/L)	119.000	114.000
Dissolved P (µg/L)		
Chl a (µg/L)	16.30	
TKN (µg/L)		
NO4+NO3-N (µg/L)		
NH3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkal (mg/l CaCO3)		
Total Susp Sol (mg/l)	5	7
Calcium (mg/l)		

Notes:

Buffalo Lake

Date: 08-04-04 Max Depth (ft): 6.4
 Time: 11:50 BUFS.S Depth (ft): 1.5
 Weather: 74F, Breezy, Partly Cloudy BUFB.B Depth (ft): 4.5
 Ent: TSN Verf: Secchi Depth (ft): 4.8

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	23.9	4.2	na	395
2.0	23.9	4.1	na	396
3.0	23.9	4.1	na	395
4.0	23.9	4.1	na	396
5.0	23.9	3.7	na	396
6.0	23.8	3.7	na	396



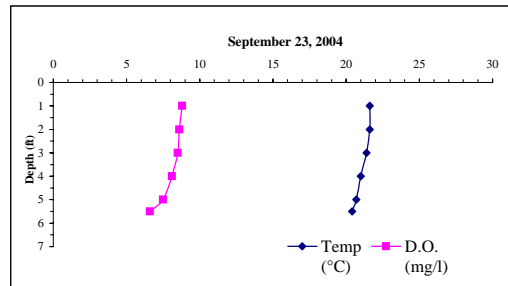
Parameter	BUFS	BUFB
Total P (µg/L)	127	118.000
Dissolved P (µg/L)		
Chl a (µg/L)	7.46	
TKN (µg/L)	960	1210
NO4+NO3-N (µg/L)	149	148
NH3-N (µg/L)	74	273
Total N (µg/L)	1109.00	1358.00
Lab Cond. (µS/cm)	392	390
Lab pH	8.09	8.09
Alkal (mg/l CaCO3)	182	182
Total Susp Sol (mg/l)	3	4
Calcium (mg/l)	42.3	

Notes: Chemistry Data was not sent to us, used DNR website Data.

Buffalo Lake

Date: 09-23-04 Max Depth (ft): 5.8
 Time: 13:17 BUFS.S Depth (ft): 1.5
 Weather: 82F, Breezy, Clear BUFB.B Depth (ft): 4.5
 Ent: TSN Verf: Secchi Depth (ft): 4.0

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	21.6	8.8	na	408
2.0	21.6	8.6	na	408
3.0	21.4	8.5	na	410
4.0	21.0	8.1	na	409
5.0	20.7	7.5	na	409
5.5	20.4	6.6	na	407



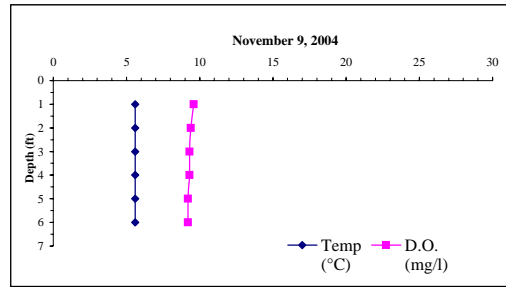
Parameter	BUFS	BUFB
Total P (µg/L)	92	64
Dissolved P (µg/L)		
Chl a (µg/L)	26	
TKN (µg/L)		
NO4+NO3-N (µg/L)		
NH3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkal (mg/l CaCO3)		
Total Susp Sol (mg/l)	6	6
Calcium (mg/l)		

Notes: Chemistry Data was not sent to us, used DNR website Data.

Buffalo Lake

Date: 11-09-04 Max Depth (ft): 7.0
 Time: 12:00 BUF.S Depth (ft): 1.5
 Weather: 40F, Windy, Clear BUF.B Depth (ft): 6.0
 Ent: TSN Verf: Secchi Depth (ft): 3.7

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	5.6	9.6	na	410
2.0	5.6	9.4	na	410
3.0	5.6	9.3	na	409
4.0	5.6	9.3	na	410
5.0	5.6	9.2	na	410
6.0	5.6	9.2	na	410



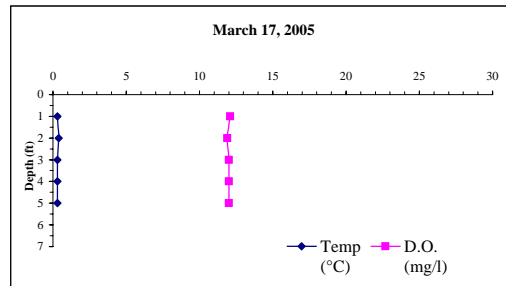
Parameter	BUFS	BUFB
Total P (µg/L)	42	45
Dissolved P (µg/L)		
Chl a (µg/L)	6.38	
TKN (µg/L)		
NO4+NO3-N (µg/L)		
NH3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkal (mg/l CaCO3)		
Total Susp Sol (mg/l)	4	
Calcium (mg/l)		

Notes: Chemistry Data was not sent to us, used DNR website Data.

Buffalo Lake

Date: 03-17-05 Max Depth (ft): 5.5
 Time: 11:21 BUF.S Depth (ft): 2.0
 Weather: 28°F, Ice depth - 0.5 feet, 75% Cloud BUF.B Depth (ft): 4.5
 Ent: TSN Verf: Secchi Depth (ft): 4.7

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	0.3	12.1	7.4	409
2.0	0.4	11.9	7.6	408
3.0	0.3	12.0	8.1	410
4.0	0.3	12.0	8.1	410
5.0	0.3	12.0	8.1	409



Parameter	BUFS	BUFB
Total P (µg/L)	65.000	62.000
Dissolved P (µg/L)		
Chl a (µg/L)		
TKN (µg/L)	650.00	710.00
NO4+NO3-N (µg/L)	1340.000	1350.000
NH3-N (µg/L)	93.000	69.000
Total N (µg/L)	1990.00	2060.00
Lab Cond. (µS/cm)		
Lab pH		
Alkal (mg/l CaCO3)		
Total Susp Sol (mg/l)	3	5
Calcium (mg/l)		

Notes: 223 paces south of County Hwy C Boatramp

Water Quality Data

2004-2005 Parameter	Surface		Bottom	
	Count	Mean	Count	Mean
Secchi Depth (feet)	6	3.87		
Total P (µg/L)	6	84.67	6	77.83
Dissolved P (µg/L)				
Chl a (µg/L)	5	18.29		
TKN (µg/L)	3	876.67	3	1040.00
NO4+NO3-N (µg/L)	3	873.00	3	879.33
NH3-N (µg/L)	3	79.33	3	134.67
Total N (µg/L)	3	1749.67	3	1919.33
Lab Cond. (µS/cm)	2	402.00	2	399.00
Lab pH	2	8.43	2	8.43
Alkal (mg/l CaCO3)	2	181.50	2	181.50
Total Susp Sol (mg/l)	6	4.33	5	5.80
Calcium (mg/l)	2	43.15		

Wisconsin Trophic State Index (WTSI)

Year	TP	Chla	SD
1973	71.27		
1974			
1980		58.28	67.14
1986	67.27		
1991	65.07	59.34	71.77
1993	67.48	46.66	57.51
1994	67.40	63.25	63.92
1997	64.73		
1998	67.95	58.12	62.11
1999	64.36	46.45	57.02
2000	65.23	54.19	59.07
2001	68.04	53.96	62.11
2004	65.60	53.32	57.14
All Years (weighted)	67.09	55.81	60.61
WI Impoundments	60.51	58.05	56.10
Central Region	51.45	49.88	47.33

Morphological / Geographical Data

Parameter	Value
Acreage	2210
Volume (acre-feet)	10180
Perimeter (miles)	24.9
Shoreland Development	3.78
Maximum Depth (feet)	8
County	Marquette County
WBIC	168000
Lillie Mason Region(1983)	Central Region
Nichols Ecoregion(1999)	NCSE

Watershed Data

WILMS Class	Acreage	kg/yr	lbs/yr
Row Crop Agriculture	60292	24400	53793
Pasture/Grass	75106	9119	20104
High Density Urban (1/8 Ac)	1358	824	1817
Medium Density Urban (1/4 Ac)	1068	216	476
Wetlands	49205	1991	4389
Forest	72908	2656	5855
Golf Course	58	106	234
Lake Surface	2210	268	591

Year	Secchi (feet)				Chlorophyll a (µg/L)				Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1973									4	220.00	2	255.00
1974									4	72.50		
1980	1	2.0	1	2.0	1	23.00	1	23.00				
1986									10	150.00	8	152.50
1991	2	1.5	2	1.5	2	26.50	2	26.50	2	115.00	2	115.00
1993	4	4.1	3	3.9	5	8.28	3	4.88	5	124.60	3	156.67
1994	4	2.8	2	2.5	5	35.26	2	44.65	5	116.80	2	155.00
1997									1	110.00	1	110.00
1998	4	2.8	3	2.8	4	27.55	3	22.53	4	143.25	3	166.33
1999	4	3.6	3	4.0	4	8.26	3	4.75	4	96.00	3	105.00
2000	4	3.1	3	3.5	4	14.00	3	13.33	4	104.75	3	117.33
2001	4	2.5	3	2.8	4	29.95	3	12.93	4	127.50	3	168.33
2004	4	3.7	2	4.0	4	21.27	2	11.88	4	100.25	2	123.00
All Years (weighted)		3.1		3.1		21.14		16.56		127.53		149.0
WI Impoundments				4.3				22.30				64
Central Region				7.9				7.50				20