

2024 Long Lake Dissolved Oxygen (DO) and Temp Monitoring Results

The Hubbard County Soil and Water Conservation District (HCSWCD) has the toolset to monitor the Dissolved Oxygen (DO) / Temperature and other metrics throughout the water column at our deepest spot on the lake. LLAA volunteer, Sharon Natzel, provides the boat taxi to the deepest spot in our lake (site 202) where the measurement takes place. This provides a cost savings for the LLAAF, who pays for the DO/Temp monitoring by the HCSWCD. If you have questions, please reach out to stewardship@longlakeliving.org. See prior year history on the bottom of the Water Quality page on this LLAA website here: <https://www.longlakeliving.org/p/water-quality-data.html>

Understanding the monthly DO / Temp charts and why it is important to understand:

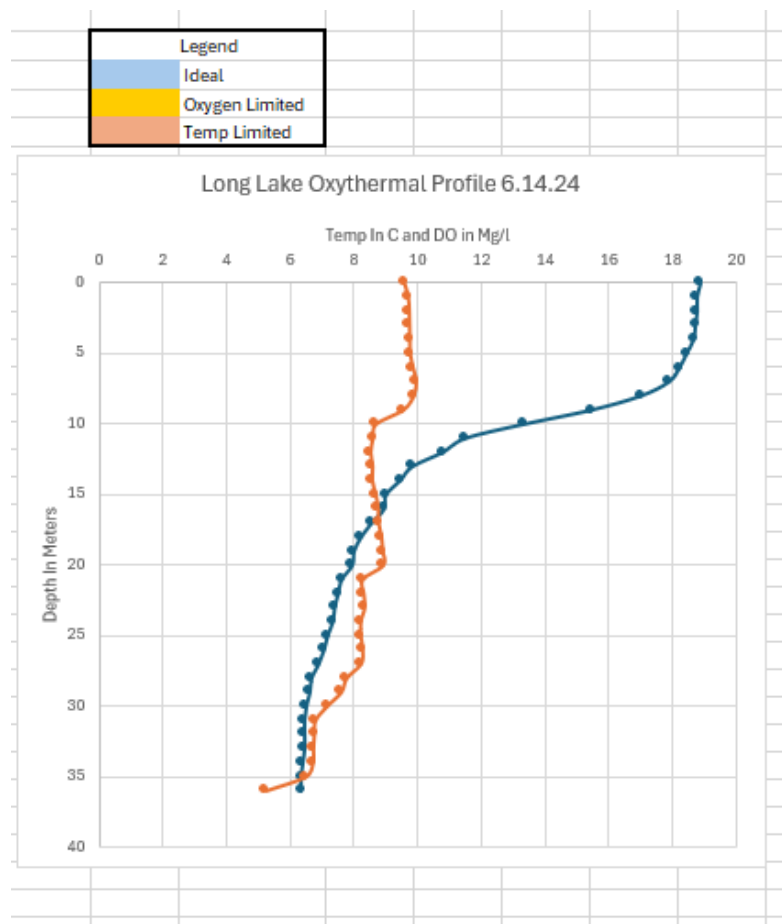
Cisco are the “canary in the gold mine” for DO and Temp requirements in a lake for cold-water fish. Cisco need DO at 3 ppm or greater. Cisco need Temp below 68 degrees F (20 degrees C). They do well in cold, deep lakes. Cisco are the preferred forage for our favored walleyes. Loons like them too. When cisco spawn in autumn, loons eat well before their long migration flight.

Our actions in the watershed and on our shorelines can help protect the lake water quality for the cisco by preventing runoff and erosion which can provide nutrients to wash into the lake and that cause excessive plant growth. Decaying plants in the lake where light is insufficient consume oxygen dissolved in the water.

This UMN article “Will lake warming in Minnesota drive cold-water fish to extinction?” Is very helpful in understanding the important variables. <https://cse.umn.edu/safl/news/will-lake-warming-minnesota-drive-cold-water-fish-extinction>

JUNE 2024

For the sampling on **6-14-2024**, the entire lake water column down to 36 meters was in the Ideal Status. There was no oxygen limitation or temperature limitation in the ranges that would affect fish. The **entire water column was Ideal Habitat** indicated by the Blue rows in the spreadsheet on the next page.

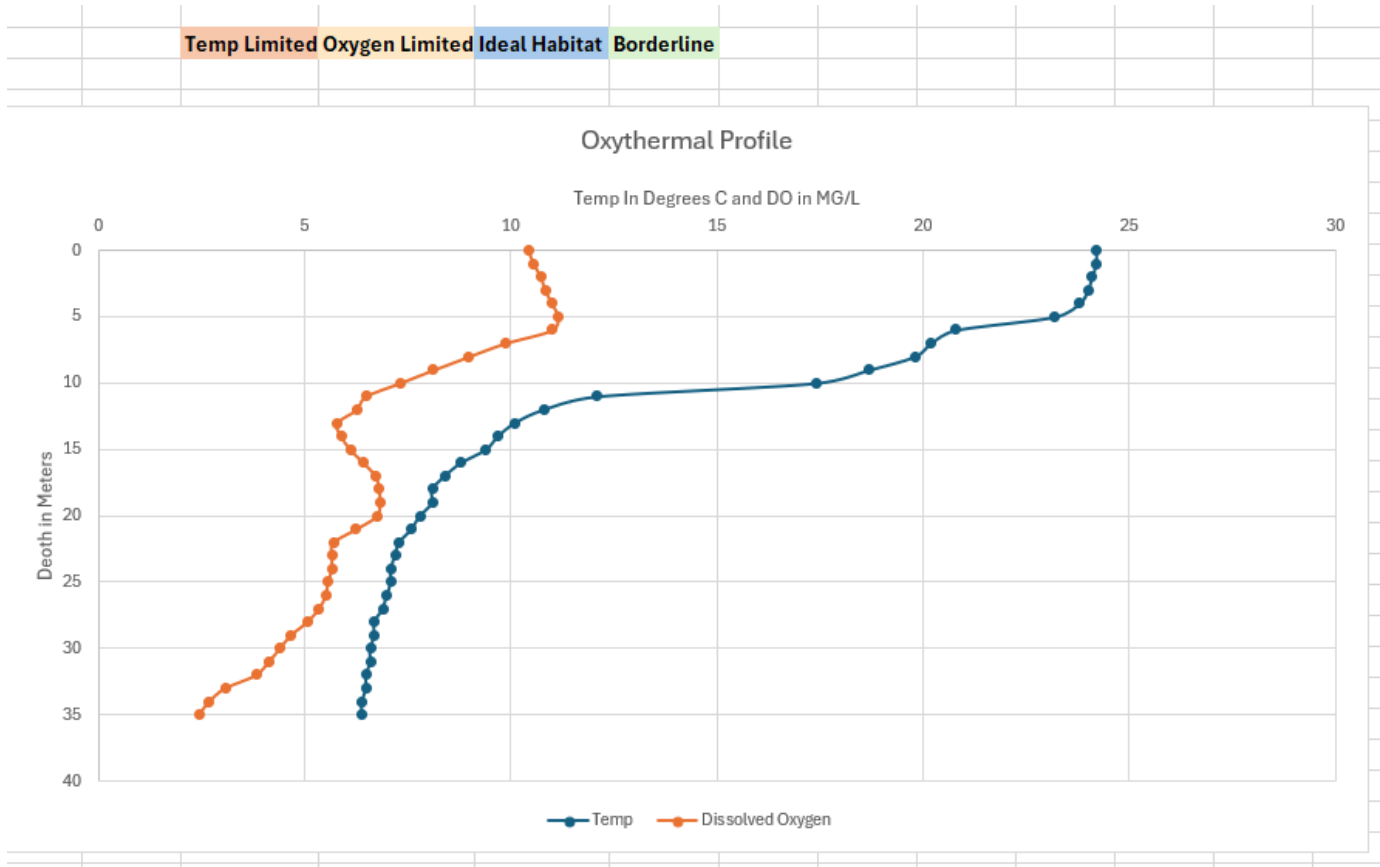


Temp Limited
 Ideal Habitat
 DO Limited

DATE	TIME	SITE	DATA ID	Barometer	Cond (µS)	Sp Cond (Sal (psu)	nLFCCond	TDS (mg/L)	Temp (°F)	temp C	Resistivity	Sigma-T (s	Sigma (s)	ODO (% S	ODO (mg/l	pH	pH (mV)	ORP (mV)	Pressure (l	Depth (m)	Depth In Meters
6/14/2024	9:18:19 AM	29*0161*00 Long	727.2	187.9	212.7	0.1	214.9	138	66	18.8889	5323.4	-1.5	-1.5	102.9	9.57	8.57	-107.8	116.4	0.519	0.366	0	
6/14/2024	9:18:47 AM	29*0161*00 Long	727.1	187.4	212.7	0.1	214.9	138	65.8	18.7778	5336.2	-1.5	-1.5	104	9.69	8.59	-108.5	111.7	1.539	1.083	1	
6/14/2024	9:19:00 AM	29*0161*00 Long	727.1	187.2	212.6	0.1	214.9	138	65.8	18.7778	5341	-1.5	-1.5	104.3	9.72	8.59	-108.9	110.2	3.014	2.122	2	
6/14/2024	9:19:06 AM	29*0161*00 Long	727.2	187.1	212.6	0.1	214.9	138	65.7	18.7222	5345.3	-1.5	-1.4	104.4	9.73	8.59	-109	109.6	4.313	3.037	3	
6/14/2024	9:19:15 AM	29*0161*00 Long	727.2	186.9	212.6	0.1	214.9	138	65.6	18.6667	5351.3	-1.4	-1.4	104.4	9.74	8.59	-109	108.9	5.668	3.991	4	
6/14/2024	9:19:35 AM	29*0161*00 Long	727.1	186.2	212.8	0.1	215.2	138	65.2	18.4444	5371.1	-1.4	-1.4	104.1	9.75	8.59	-108.7	107.8	7.015	4.939	5	
6/14/2024	9:19:57 AM	29*0161*00 Long	727.2	185.2	212.7	0.1	215.1	138	64.8	18.2222	5399	-1.4	-1.3	104.5	9.84	8.59	-108.3	107	8.433	5.937	6	
6/14/2024	9:20:17 AM	29*0161*00 Long	727.1	184	213	0.1	215.6	138	64.2	17.8889	5434.2	-1.3	-1.3	104.7	9.94	8.58	-107.9	106.8	10.139	7.138	7	
6/14/2024	9:20:47 AM	29*0161*00 Long	727.1	181	213.7	0.1	216.4	139	62.6	17	5525.8	-1.1	-1.1	102	9.86	8.49	-102.9	109.8	11.565	8.14	8	
6/14/2024	9:21:12 AM	29*0161*00 Long	727.1	177.6	217.2	0.1	220.4	141	59.8	15.4444	5632.2	-0.9	-0.8	95.5	9.53	8.4	-97.3	112.3	12.789	9	9	
6/14/2024	9:22:24 AM	29*0161*00 Long	727.1	171.6	220.8	0.11	224.4	143	56	13.3333	5828.2	-0.6	-0.5	83	8.68	8.18	-84.5	119.9	14.29	10.053	10	
6/14/2024	9:23:35 AM	29*0161*00 Long	727	165.7	223.1	0.11	227	145	52.7	11.5	6036.8	-0.4	-0.3	78.8	8.58	8.09	-79.4	122.4	15.665	11.018	11	
6/14/2024	9:23:58 AM	29*0161*00 Long	727	163.1	223.8	0.11	227.7	145	51.4	10.7778	6132.7	-0.3	-0.2	77	8.51	8.08	-78.6	122.7	17.101	12.027	12	
6/14/2024	9:24:20 AM	29*0161*00 Long	727.1	159.6	224.7	0.11	228.7	146	49.7	9.83333	6266.1	-0.2	-0.1	75.7	8.57	8.03	-75.5	124	18.506	13.014	13	
6/14/2024	9:24:38 AM	29*0161*00 Long	727	158.2	224.9	0.11	228.8	146	49	9.44444	6322.3	-0.2	-0.1	74.9	8.56	8.02	-74.3	124.4	20.045	14.096	14	
6/14/2024	9:25:04 AM	29*0161*00 Long	727	156.4	225.2	0.11	229.2	146	48.2	9	6392.6	-0.1	0	75	8.67	8.01	-74.3	124.8	21.433	15.071	15	
6/14/2024	9:25:44 AM	29*0161*00 Long	727.1	155.9	225	0.11	228.9	146	48.1	8.94444	6413.1	-0.1	0	75.6	8.67	8.02	-74.8	124.6	22.648	15.925	16	
6/14/2024	9:26:04 AM	29*0161*00 Long	727.1	154.3	225.2	0.11	229.1	146	47.4	8.55556	6480.5	-0.1	0	75	8.76	8.01	-74.5	124.8	24.222	17.031	17	
6/14/2024	9:26:25 AM	29*0161*00 Long	727.1	153	225.3	0.11	229.2	146	46.8	8.22222	6535.9	-0.1	0	75.2	8.85	8	-73.9	125.2	25.731	18.092	18	
6/14/2024	9:26:44 AM	29*0161*00 Long	727	151.9	225	0.11	228.9	146	46.4	8	6585.4	-0.1	0.1	75.1	8.89	8	-73.6	125.3	27.104	19.057	19	
6/14/2024	9:27:04 AM	29*0161*00 Long	727.1	151.6	224.9	0.11	228.8	146	46.3	7.94444	6598	-0.1	0.1	75.1	8.91	7.99	-73.3	125.5	28.494	20.034	20	
6/14/2024	9:28:25 AM	29*0161*00 Long	727.1	151	226	0.11	229.9	147	45.7	7.61111	6623.8	0	0.1	69.2	8.26	7.93	-69.6	127	30.017	21.105	21	
6/14/2024	9:28:55 AM	29*0161*00 Long	727.1	150.3	225.8	0.11	229.6	147	45.5	7.5	6653.8	0	0.1	69.2	8.29	7.93	-69.9	127.1	31.382	22.064	22	
6/14/2024	9:29:27 AM	29*0161*00 Long	727	149.8	225.9	0.11	229.7	147	45.3	7.38889	6675.6	0	0.1	69.2	8.32	7.93	-69.7	127.1	32.804	23.064	23	
6/14/2024	9:30:47 AM	29*0161*00 Long	727.1	149.6	226	0.11	229.8	147	45.2	7.33333	6684	0	0.1	68.1	8.2	7.93	-69.8	126.7	34.153	24.012	24	
6/14/2024	9:31:02 AM	29*0161*00 Long	727.1	149.2	226.1	0.11	229.9	147	44.9	7.16667	6704.2	0	0.2	67.9	8.2	7.93	-69.9	126.6	35.555	24.998	25	
6/14/2024	9:31:37 AM	29*0161*00 Long	727	148.5	226	0.11	229.8	147	44.7	7.05556	6734.9	0	0.2	68.2	8.26	7.93	-69.9	126.6	36.981	26	26	
6/14/2024	9:32:07 AM	29*0161*00 Long	727	148	226.2	0.11	230	147	44.4	6.88889	6754.5	0	0.2	67.6	8.21	7.92	-69.3	126.8	38.494	27.064	27	
6/14/2024	9:33:39 AM	29*0161*00 Long	727.1	147.2	226.4	0.11	230.1	147	44	6.66667	6795.8	0	0.2	63.5	7.76	7.88	-66.8	128.3	39.917	28.063	28	
6/14/2024	9:34:25 AM	29*0161*00 Long	727.1	146.9	226.5	0.11	230.2	147	43.9	6.61111	6807.8	0	0.2	62	7.59	7.86	-65.8	128.7	41.213	28.975	29	
6/14/2024	9:35:47 AM	29*0161*00 Long	727.1	146.6	226.7	0.11	230.4	147	43.7	6.5	6820.8	0	0.2	58.1	7.14	7.82	-63.7	129.7	42.653	29.987	30	
6/14/2024	9:37:00 AM	29*0161*00 Long	727	146.5	227	0.11	230.7	148	43.6	6.44444	6824.1	0	0.2	55.1	6.78	7.8	-62.4	130.6	44.045	30.965	31	
6/14/2024	9:37:34 AM	29*0161*00 Long	727.1	146.5	227	0.11	230.6	148	43.6	6.44444	6828.3	0	0.2	54.8	6.74	7.79	-62.4	130.6	45.465	31.964	32	
6/14/2024	9:38:13 AM	29*0161*00 Long	727.1	146.4	226.9	0.11	230.6	148	43.6	6.44444	6831.1	0	0.2	54.5	6.71	7.79	-62.2	130.7	46.893	32.968	33	
6/14/2024	9:38:28 AM	29*0161*00 Long	727	146.4	227	0.11	230.6	148	43.5	6.38889	6832.5	0	0.3	54.4	6.7	7.79	-62.2	130.8	48.365	34.002	34	
6/14/2024	9:39:47 AM	29*0161*00 Long	727	146.4	227.5	0.11	231.2	148	43.4	6.33333	6830.1	0	0.3	52.5	6.47	7.77	-61.2	131.2	49.814	35.021	35	
6/14/2024	9:42:07 AM	29*0161*00 Long	727	146.9	228.4	0.11	232.1	148	43.4	6.33333	6808.3	0	0.3	42.3	5.22	7.69	-57	-32.5	50.324	35.379	36	

JULY 2024

For the sampling on **7-12-2024**, the entire lake water column down to 35 meters was in the Ideal Status. There were oxygen limitations and temperature limitations in the ranges that could affect fish if they did not have the Ideal Habitat represented by the Blue Coloring. See the data below in the worksheet where Blue Rows show **Ideal Habitat from 9 thru 32 meters** - next pg.



Temp Limited

Ideal Habitat

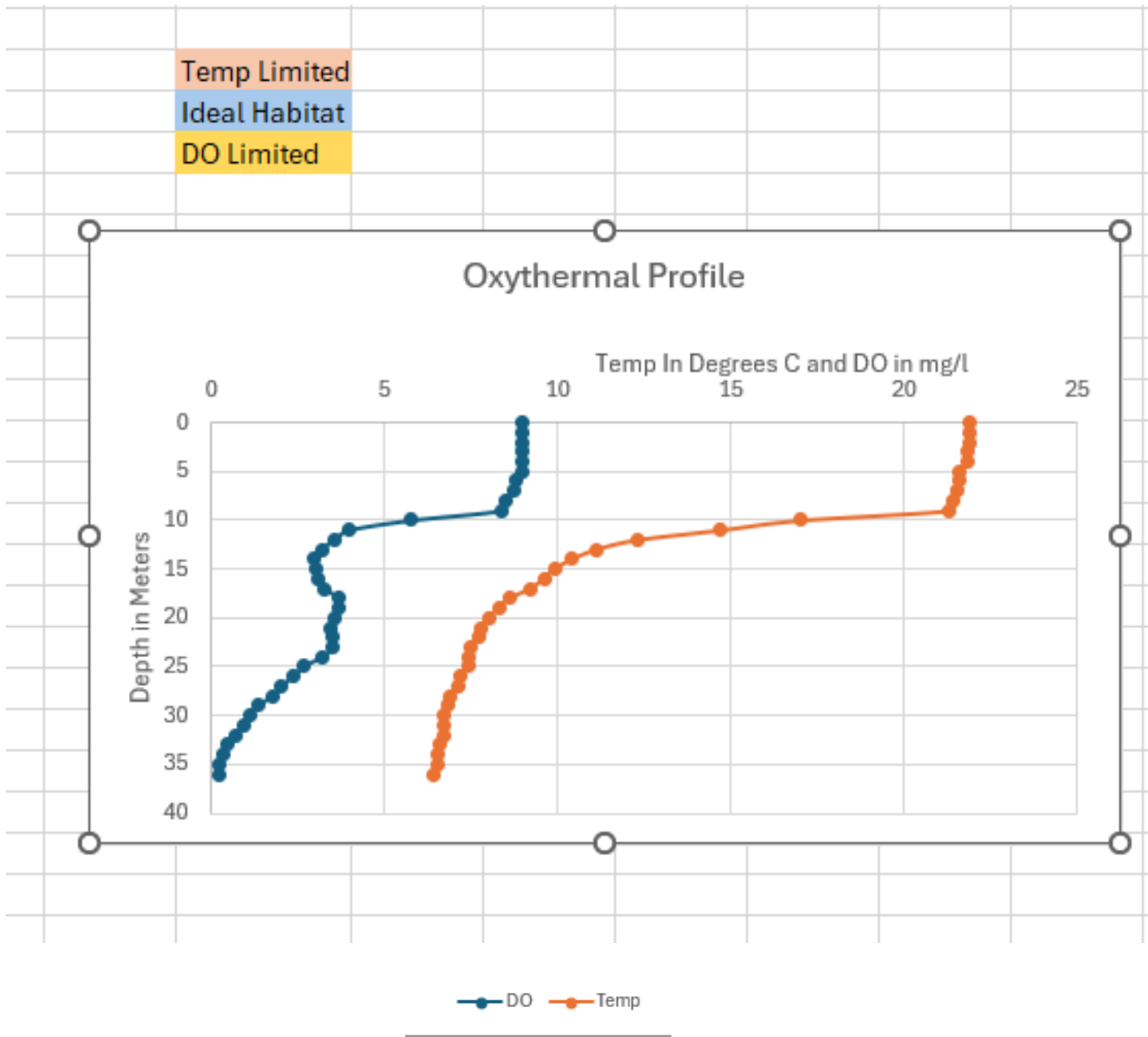
DO Limited

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Date	Time	Site	Unit ID	User ID	°C		mmHg	DO %	DO mg/L	SPC-uS/cn	pH	DEP m
2	7/12/2024	09:08:40	AI29*0161*00	Long		24.2		725.4	124.4	10.42	193.7	8.7	0
3	7/12/2024	09:08:51	AI29*0161*00	Long		24.2		725.4	125.8	10.55	193.7	8.71	1
4	7/12/2024	09:09:17	AI29*0161*00	Long		24.1		725.3	127.7	10.72	193.6	8.71	2
5	7/12/2024	09:09:32	AI29*0161*00	Long		24		725.3	128.6	10.83	193.4	8.72	3
6	7/12/2024	09:09:50	AI29*0161*00	Long		23.8		725.3	130.1	10.99	193.4	8.74	4
7	7/12/2024	09:10:05	AI29*0161*00	Long		23.2		725.4	130.5	11.14	193.5	8.74	5
8	7/12/2024	09:10:22	AI29*0161*00	Long		20.8		725.3	123	11	198.8	8.7	6
9	7/12/2024	09:10:40	AI29*0161*00	Long		20.2		725.4	109	9.86	202	8.53	7
10	7/12/2024	09:10:53	AI29*0161*00	Long		19.8		725.3	98.5	8.98	203.5	8.41	8
11	7/12/2024	09:11:07	AI29*0161*00	Long		18.7		725.3	87.1	8.13	207	8.35	9
12	7/12/2024	09:11:24	AI29*0161*00	Long		17.4		725.3	76.4	7.31	211.9	8.18	10
13	7/12/2024	09:11:54	AI29*0161*00	Long		12.1		725.4	60.4	6.49	227.5	7.99	11
14	7/12/2024	09:12:10	AI29*0161*00	Long		10.8		725.3	56.5	6.26	226.7	7.94	12
15	7/12/2024	09:12:30	AI29*0161*00	Long		10.1		725.4	51.5	5.79	226.8	7.87	13
16	7/12/2024	09:12:44	AI29*0161*00	Long		9.7		725.4	51.9	5.89	226.2	7.87	14
17	7/12/2024	09:12:56	AI29*0161*00	Long		9.4		725.4	53.4	6.11	226.4	7.88	15
18	7/12/2024	09:13:15	AI29*0161*00	Long		8.8		725.2	55.4	6.43	226.3	7.89	16
19	7/12/2024	09:13:36	AI29*0161*00	Long		8.4		725.4	57.3	6.72	226.3	7.89	17
20	7/12/2024	09:13:52	AI29*0161*00	Long		8.1		725.2	57.7	6.81	226.1	7.88	18
21	7/12/2024	09:14:03	AI29*0161*00	Long		8.1		725.2	57.7	6.82	226	7.88	19
22	7/12/2024	09:14:18	AI29*0161*00	Long		7.8		725.2	56.8	6.76	226.5	7.86	20
23	7/12/2024	09:14:38	AI29*0161*00	Long		7.6		725.2	52.3	6.25	226.9	7.8	21
24	7/12/2024	09:15:11	AI29*0161*00	Long		7.3		725.4	47.4	5.7	227.1	7.77	22
25	7/12/2024	09:15:30	AI29*0161*00	Long		7.2		725.3	46.8	5.66	226.9	7.77	23
26	7/12/2024	09:15:44	AI29*0161*00	Long		7.1		725.2	46.8	5.66	226.9	7.77	24
27	7/12/2024	09:15:55	AI29*0161*00	Long		7.1		725.3	46	5.57	227.1	7.76	25
28	7/12/2024	09:16:07	AI29*0161*00	Long		7		725.2	45.4	5.51	227.1	7.76	26
29	7/12/2024	09:16:20	AI29*0161*00	Long		6.9		725.2	44	5.35	227.3	7.74	27
30	7/12/2024	09:16:36	AI29*0161*00	Long		6.7		725.2	41.4	5.06	227.5	7.72	28
31	7/12/2024	09:16:54	AI29*0161*00	Long		6.7		725.4	38.2	4.67	227.6	7.69	29
32	7/12/2024	09:17:05	AI29*0161*00	Long		6.6		725.2	35.9	4.4	227.9	7.67	30
33	7/12/2024	09:17:13	AI29*0161*00	Long		6.6		725.3	33.7	4.13	228.1	7.66	31
34	7/12/2024	09:17:25	AI29*0161*00	Long		6.5		725.2	31.2	3.82	228.2	7.65	32
35	7/12/2024	09:17:54	AI29*0161*00	Long		6.5		725.3	25	3.07	228.9	7.62	33
36	7/12/2024	09:18:11	AI29*0161*00	Long		6.4		725.2	21.9	2.69	229.4	7.61	34
37	7/12/2024	09:18:23	AI29*0161*00	Long		6.4		725.2	19.8	2.44	230	7.6	35

AUGUST 2024

For the sampling on **8-12-2024**, the entire lake water column was sampled down to 36 meters at the deepest area.

There were oxygen limitations and temperature limitations in the ranges that could affect fish if they did not have the Ideal Habitat represented by the Blue Coloring. See the data below in the worksheet where Blue Rows show **Ideal habitat from 10 thru 13 meters** - next page.



Temp Limited

Ideal Habitat

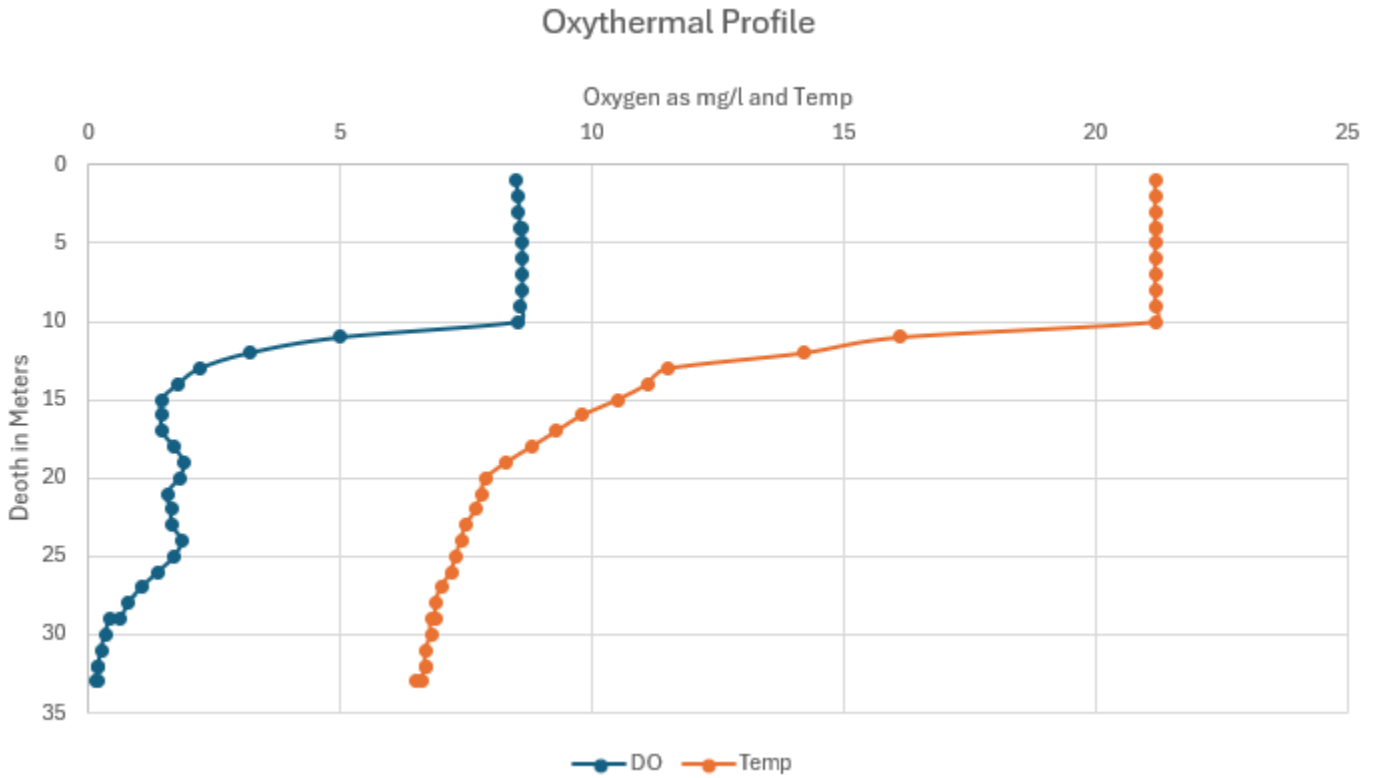
DO Limited

	A	B	C	D	E	F	G	H	I	J	K
	Date	Time	Site	°C	Temp In F	mmHg	DO %	DO mg/L	SPC-uS/cn	pH	Depth In M
	8/12/2024	09:09:52AM	29*0161*00 Long	21.9	71.42	728.7	102.2	8.96	187.6	8.54	0
	8/12/2024	09:10:04AM	29*0161*00 Long	21.9	71.42	728.7	102.4	8.97	187.6	8.53	1
	8/12/2024	09:10:15AM	29*0161*00 Long	21.9	71.42	728.7	102.5	8.98	187.6	8.53	2
	8/12/2024	09:10:26AM	29*0161*00 Long	21.8	71.24	728.6	102.5	8.98	187.6	8.53	3
	8/12/2024	09:10:38AM	29*0161*00 Long	21.8	71.24	728.7	102.4	8.99	187.5	8.53	4
	8/12/2024	09:10:47AM	29*0161*00 Long	21.6	70.88	728.7	102.1	8.98	187.4	8.53	5
	8/12/2024	09:11:12AM	29*0161*00 Long	21.6	70.88	728.7	99.9	8.8	187.6	8.52	6
	8/12/2024	09:11:22AM	29*0161*00 Long	21.5	70.7	728.6	98.8	8.72	187.9	8.5	7
	8/12/2024	09:11:40AM	29*0161*00 Long	21.4	70.52	728.7	96	8.48	188.8	8.47	8
	8/12/2024	09:11:51AM	29*0161*00 Long	21.3	70.34	728.7	94.5	8.37	189.3	8.45	9
	8/12/2024	09:12:10AM	29*0161*00 Long	17	62.6	728.7	59.5	5.74	211.9	7.85	10
	8/12/2024	09:12:33AM	29*0161*00 Long	14.7	58.46	728.7	39.3	3.98	219.3	7.69	11
	8/12/2024	09:12:50AM	29*0161*00 Long	12.3	54.14	728.6	33.1	3.54	223.8	7.66	12
	8/12/2024	09:13:22AM	29*0161*00 Long	11.1	51.98	728.6	28.8	3.17	223.1	7.57	13
	8/12/2024	09:13:44AM	29*0161*00 Long	10.4	50.72	728.6	26.7	2.98	223.6	7.53	14
	8/12/2024	09:14:07AM	29*0161*00 Long	9.9	49.82	728.7	26.7	3.03	222.8	7.52	15
	8/12/2024	09:14:30AM	29*0161*00 Long	9.6	49.28	728.6	27.1	3.09	222.8	7.52	16
	8/12/2024	09:14:43AM	29*0161*00 Long	9.2	48.56	728.6	28.4	3.27	222.7	7.52	17
	8/12/2024	09:15:12AM	29*0161*00 Long	8.6	47.48	728.6	31.7	3.69	222.8	7.53	18
	8/12/2024	09:15:34AM	29*0161*00 Long	8.3	46.94	728.7	31.2	3.67	223.1	7.52	19
	8/12/2024	09:15:47AM	29*0161*00 Long	8	46.4	728.7	30.2	3.57	223.4	7.51	20
	8/12/2024	09:16:04AM	29*0161*00 Long	7.8	46.04	728.6	29.1	3.46	223.4	7.5	21
	8/12/2024	09:16:26AM	29*0161*00 Long	7.7	45.86	728.7	29.4	3.51	223.3	7.5	22
	8/12/2024	09:17:01AM	29*0161*00 Long	7.5	45.5	728.6	29.1	3.49	223.6	7.5	23
	8/12/2024	09:17:18AM	29*0161*00 Long	7.4	45.32	728.7	26.7	3.21	223.9	7.48	24
	8/12/2024	09:17:44AM	29*0161*00 Long	7.4	45.32	728.6	22	2.65	224.2	7.45	25
	8/12/2024	09:17:58AM	29*0161*00 Long	7.2	44.96	728.6	19.7	2.38	224.4	7.44	26
	8/12/2024	09:18:31AM	29*0161*00 Long	7.1	44.78	728.6	16.6	2.01	224.7	7.43	27
	8/12/2024	09:18:44AM	29*0161*00 Long	6.9	44.42	728.6	14.7	1.79	225.2	7.42	28
	8/12/2024	09:19:07AM	29*0161*00 Long	6.8	44.24	728.6	10.9	1.33	225.4	7.41	29
	8/12/2024	09:19:32AM	29*0161*00 Long	6.7	44.06	728.6	9	1.1	225.5	7.4	30
	8/12/2024	09:19:55AM	29*0161*00 Long	6.7	44.06	728.7	7.5	0.92	225.6	7.4	31
	8/12/2024	09:20:19AM	29*0161*00 Long	6.7	44.06	728.6	5.6	0.69	225.8	7.39	32
	8/12/2024	09:20:39AM	29*0161*00 Long	6.6	43.88	728.5	3.7	0.46	226.5	7.38	33
	8/12/2024	09:20:58AM	29*0161*00 Long	6.5	43.7	728.6	2.6	0.32	226.8	7.38	34
	8/12/2024	09:21:21AM	29*0161*00 Long	6.5	43.7	728.7	1.9	0.23	227.3	7.39	35
	8/12/2024	09:21:43AM	29*0161*00 Long	6.4	43.52	728.5	1.5	0.19	228.1	7.39	36

SEPT 2024

For the sampling on **9-3-2024**, the entire lake water column was sampled down to 36 meters at the deepest area.

There were oxygen limitations and temperature limitations in the ranges that could affect fish if they did not have the Ideal Habitat represented by the Blue Coloring. See the data below in the worksheet where Blue Rows show Ideal habitat for 11 and 12 meters - next page. The weather turned colder in early Sept. There were no reported fish die-offs.



Temp Limited

Ideal Habitat

Oxygen Limited

A	B	C	D	E	F	G	H	I	J
Date	Time	Site	°C	mmHg	DO %	DO mg/L	SPC-uS/cm	pH	Depth M
9/3/2024	09:16:50AM	29*0161*00 Long	21.2	726	95.5	8.48	303.4	8.46	1
9/3/2024	09:17:04AM	29*0161*00 Long	21.2	726	96	8.52	303.4	8.46	2
9/3/2024	09:17:15AM	29*0161*00 Long	21.2	725.8	96.2	8.54	303.4	8.45	3
9/3/2024	09:17:31AM	29*0161*00 Long	21.2	726	96.4	8.56	303.5	8.45	4
9/3/2024	09:18:19AM	29*0161*00 Long	21.2	725.9	96.8	8.59	303.5	8.45	4
9/3/2024	09:18:31AM	29*0161*00 Long	21.2	725.9	96.8	8.6	303.5	8.46	5
9/3/2024	09:18:43AM	29*0161*00 Long	21.2	725.9	96.9	8.6	303.6	8.46	6
9/3/2024	09:19:01AM	29*0161*00 Long	21.2	725.9	96.9	8.6	303.6	8.47	7
9/3/2024	09:19:15AM	29*0161*00 Long	21.2	725.9	96.9	8.6	303.6	8.46	8
9/3/2024	09:19:31AM	29*0161*00 Long	21.2	725.9	96.6	8.58	303.8	8.46	9
9/3/2024	09:19:43AM	29*0161*00 Long	21.2	725.9	96.2	8.54	303.9	8.45	10
9/3/2024	09:19:55AM	29*0161*00 Long	16.1	725.8	50.8	5	347.7	7.76	11
9/3/2024	09:20:06AM	29*0161*00 Long	14.2	725.9	31.2	3.2	364.1	7.6	12
9/3/2024	09:20:21AM	29*0161*00 Long	11.5	725.9	20.3	2.21	367.3	7.57	13
9/3/2024	09:20:33AM	29*0161*00 Long	11.1	725.7	16.2	1.78	363.8	7.53	14
9/3/2024	09:20:45AM	29*0161*00 Long	10.5	725.8	13	1.45	363.7	7.49	15
9/3/2024	09:21:17AM	29*0161*00 Long	9.8	725.8	12.8	1.45	362.7	7.43	16
9/3/2024	09:21:33AM	29*0161*00 Long	9.3	725.9	12.8	1.47	362.1	7.42	17
9/3/2024	09:21:47AM	29*0161*00 Long	8.8	726	14.7	1.7	362	7.42	18
9/3/2024	09:22:03AM	29*0161*00 Long	8.3	725.9	16.2	1.9	362.2	7.42	19
9/3/2024	09:22:22AM	29*0161*00 Long	7.9	725.8	15.3	1.81	362.8	7.4	20
9/3/2024	09:23:02AM	29*0161*00 Long	7.8	725.9	13.1	1.56	362.7	7.38	21
9/3/2024	09:23:21AM	29*0161*00 Long	7.7	725.8	13.7	1.64	363.1	7.38	22
9/3/2024	09:23:39AM	29*0161*00 Long	7.5	725.8	13.8	1.66	362.5	7.38	23
9/3/2024	09:23:59AM	29*0161*00 Long	7.4	725.9	15.4	1.85	362.7	7.39	24
9/3/2024	09:24:14AM	29*0161*00 Long	7.3	725.8	14.2	1.71	363.4	7.38	25
9/3/2024	09:24:25AM	29*0161*00 Long	7.2	725.7	11.5	1.39	363.9	7.37	26
9/3/2024	09:24:38AM	29*0161*00 Long	7	725.7	8.7	1.05	364.3	7.35	27
9/3/2024	09:24:51AM	29*0161*00 Long	6.9	725.8	6.6	0.8	364.4	7.34	28
9/3/2024	09:25:06AM	29*0161*00 Long	6.9	725.8	5.1	0.63	364.5	7.34	29
9/3/2024	09:25:27AM	29*0161*00 Long	6.8	725.8	3.6	0.44	364.7	7.33	29
9/3/2024	09:25:41AM	29*0161*00 Long	6.8	725.8	2.7	0.33	365	7.33	30
9/3/2024	09:25:56AM	29*0161*00 Long	6.7	725.9	2.1	0.25	365.5	7.33	31
9/3/2024	09:26:13AM	29*0161*00 Long	6.7	725.8	1.7	0.2	366.1	7.32	32
9/3/2024	09:26:21AM	29*0161*00 Long	6.7	725.8	1.5	0.19	366.5	7.32	32
9/3/2024	09:26:33AM	29*0161*00 Long	6.6	725.8	1.4	0.17	368.2	7.32	33
9/3/2024	09:26:56AM	29*0161*00 Long	6.5	725.7	1.1	0.14	369.8	7.32	33