Cooperative Lakes Monitoring Program

Michigan Lakes– Ours to Protect

2024 Data Report for Fuller Lake, Benzie County

Site ID: 100285

44.7403°N, 85.8672°W

The CLMP is brought to you by:

Michigan Clean Water Corps

EGLE MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

MICHIGAN STATE UNIVERSITY

MICHIGAN LAKES AND STREAMS ASSOCIATION

Huron River Watershed Council

About this report:
This report is a summary of the data that have been collected through the Cooperative Lakes Monitoring Program. The contents have been customized for your lake. The first page is a summary of the Trophic Status Indicators of your lake (Secchi Disk Transparency, Chlorophyll-a, Spring Total Phosphorus, and Summer Total Phosphorus). Where data are available, they have been summarized for the most recent field season, five years prior to the most recent field season, and since the first year your lake has been enrolled in the program.

If you did not take 8 or more Secchi disk measurements or 4 or more chlorophyll measurements, there will not be summary data calculated for these parameters. These numbers of measurements are required to ensure that the results are indicative of overall summer conditions.

If you enrolled in Dissolved Oxygen/Temperature, the summary page will have a graph of one of the profiles taken during the late summer (typically August or September). If your lake stratifies, we will use a graph showing the earliest time of stratification, because identifying the timing of this condition and the depth at which it occurs is typically the most important use of dissolved oxygen measurements.

The back of the summary page will be an explanation of the Trophic Status Index and where your lake fits on that scale.

The rest of the report will be aquatic plant summaries, Score the Shore results, and larger graphs, including all Dissolved Oxygen/Temperature Profiles that you recorded. For Secchi Disk, Chlorophyll, and Phosphorus parameters, you need to have two years of data for a graph to make logical sense. Therefore if this is the first year you have enrolled in the CLMP, you will not receive a graph for these parameters.

Remember that some lakes see a lot of fluctuation in these parameters from year to year. Until you have eight years worth of data, consider all trends to be preliminary.

To learn more about the CLMP monitoring parameters or get definitions to unknown terms, check out the CLMP Manual, found at: **https://micorps.net/wp-content/uploads/2021/03/CLMP-Manual-2019update2_2021.pdf**

Thank you!
The CLMP leadership team would like to thank you for all of your efforts over the past year. The CLMP would not exist without dedicated and hardworking volunteers!

The CLMP Leadership Team is made of: Jo Latimore, Erick Elgin, Jean Roth, Tamara Lipsey, Mike Gallagher, Melissa DeSimone, and Paul Steen

Questions?
If you have questions on this report or believe that the tabulated data for your lake in this report are in error please contact:
Paul Steen (psteen@hrwc.org), CLMP Data Analyst

Site ID: 100285

Fuller Lake, Benzie County
2024 CLMP Results

Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2024	10	12.5	20.0	14.9	2.3	38
2024 All CLMP Lakes	3348	0.5	85.0	11.7	6.2	43

No graph: Not enough data

Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Median	Std. Dev	Carlson TSI
2024	5	<1.0	6.4	4.0	2.6	44
2024 All CLMP Lakes	708	< 1.0	63.0	2.8	7.3	41

No graph: Not enough data

Spring Phosphorus (parts per billion)

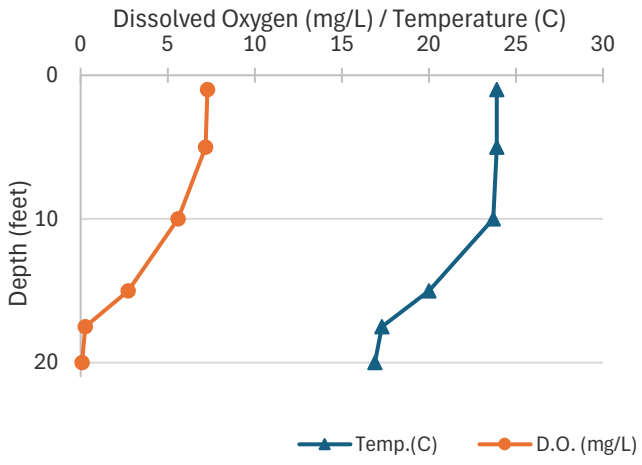
Fuller Lake does not have spring total phosphorus data available. Consider enrolling in this parameter next year. Phosphorus is one of several essential nutrients that algae need to grow and reproduce. An increase in phosphorus over time is a measure of nutrient enrichment in a lake. A surface water sample taken in the spring, shortly after spring turnover, will be a representative sample for estimating the total amount of phosphorus in the lake.

Summer Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2024	1	10.0	10.0	10.0	NA	37
2024 All CLMP Lakes	261	<= 5	140.0	14.6	11.9	43

No graph: Not enough data

Dissolved Oxygen and Temperature Profile



7/24/2024

Summary

Average TSI	2024
Fuller Lake	40
All CLMP Lakes	41

Welcome to the CLMP! The longer you stay in the program and the more parameters you monitor, the more interesting this report will become.

With an average TSI score of 40 based on 2024 Secchi transparency, chlorophyll-a, and summer total phosphorus data, this lake is rated between the oligotrophic and mesotrophic classification. The lake leans slightly more mesotrophic than oligotrophic.

This lake displays a normal stratification pattern. The lake maintains some dissolved oxygen in the bottom waters through early summer, but by mid-summer the lake has stratified and the bottom water is devoid of oxygen.

For now, there is too little data to assess long term trends. CLMP recommends eight years of consistent monitoring to develop a strong data baseline.

** = Minimum # samples not met for average/median/TSI value*

<1.0 = Chlorophyll-a: Sample value is less than limit of quantification (<1 ppb).

W= Value is less than the detection limit (<3 ppb) T = Value reported is less than the reporting limit (5 ppb)

Trophic Status Index Explained

In 1977, limnologist Dr. Robert Carlson developed a numerical scale (0-100) where the numbers indicate the level of nutrient enrichment. Using the proper equations, we can convert results from Summer Total Phosphorus, Secchi Depth, and Chlorophyll-a to this Trophic Status Index (TSI). The TSI numbers are furthermore grouped into general categories (oligotrophic, mesotrophic, eutrophic, and hypereutrophic), to quickly give us a way to understand the general nutrient level of any lake.

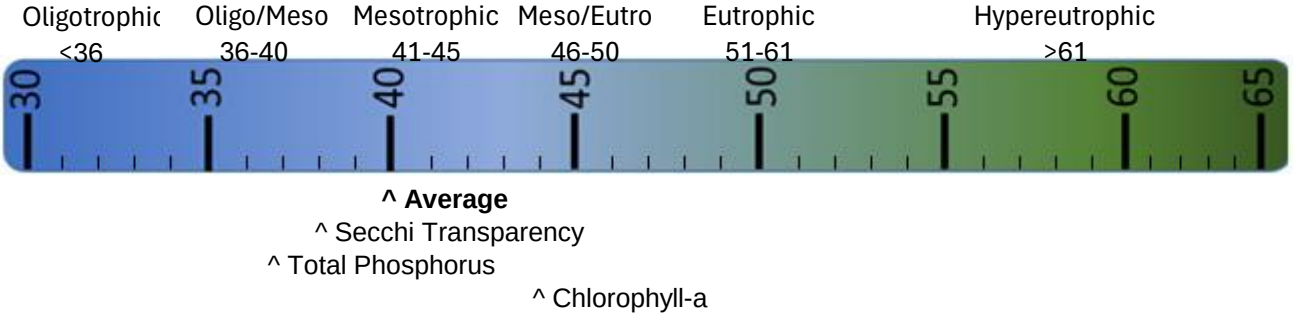
The tables below give the results-to-TSI conversions for the water quality data ranges normally seen in the CLMP. The formulas for this conversion can be found in the CLMP manual (link is on page 2 of this report).

Phosphorus (ppb)	TSI Value
<5	<27
6	30
8	34
10	37
12	40
15	43
18	46
21	48
24	50
32	54
36	56
42	58
48	60
>50	>61

Secchi Depth (ft)	TSI Value
>30	<28
25	31
20	34
15	38
12	42
10	44
7.5	48
6	52
4	57
<3	>61

Chlorophyll-a (ppb)	TSI Value
<1	<31
2	37
3	41
4	44
6	48
8	51
12	55
16	58
22	61
>22	>61

TSI for Fuller Lake in 2024	
Average	40
Secchi Disk	38
Summer TP	37
Chlorophyll-a	44



Oligotrophic: Generally deep and clear lakes with little aquatic plant or algae growth. These lakes maintain sufficient dissolved oxygen in the cool, deep-bottom waters during late summer to support cold water fish, such as trout and whitefish.

Mesotrophic: Lakes that fall between oligotrophic and eutrophic. Mid-ranged amounts of nutrients.

Eutrophic: Highly productive eutrophic lakes are generally shallow, turbid, and support abundant aquatic plant growth. In deep eutrophic lakes, the cool bottom waters usually contain little or no dissolved oxygen. Therefore, these lakes can only support warm water fish, such as bass and pike.

Hypereutrophic: A specialized category of euthrophic lakes. These lakes exhibit extremely high productivity, such as nuisance algae and weed growth.

Site ID: 100285

Fuller Lake, Benzie County
2024 CLMP Aquatic Plant Results

The Aquatic Plant Mapping survey was conducted on Fuller Lake in 2024.

This survey involves intensive sampling at multiple locations and depths around the lake produce a complete map of all aquatic plants present in a lake. A great deal of effort is involved both on the lake and back on shore to identify plants, compile data, and develop a detailed plant map, but the result is an extremely valuable record of the plant community of the lake.

Aquatic plants were sampled from a total of 18 locations (6 transects) in Fuller Lake in 2024. Below is a list of species reported, in order of relative abundance. Survey conducted August 7-13, 2024.

Fuller Lake, Benzie County
2024 Aquatic Plant Mapping: Species Reported

Common Name	Latin Name	Average Density*
Bladderwort	*Utricularia* sp.	3.22
Watershield	*Brasenia schreberi*	2.72
White waterlily	*Nymphaea odorata*	2.61
Variable pondweed	*Potamogeton gramineus*	1.89
Yellow waterlily	*Nuphar variegata*	1.89
Native milfoil	*Myriophyllum* sp.	1.72
Slender naiad	*Najas flexilis*	1.72
Eurasian milfoil^	*Myriophyllum spicatum*	1.67
Floating leaf pondweed	*Potamogeton natans*	0.78
Flat-stem pondweed	*Potamogeton zosteriformis*	0.67
Illinois pondweed	*Potamogeton illinoensis*	0.50
Waterweed	*Elodea canadensis*	0.44
Globular stonewort	*Chara globularis*	0.39
Needle spikerush	*Eleocharis acicularis*	0.33
Arum-leaved arrowhead	*Sagittaria cuneata*	0.28
Broad leaf cattail	*Typha latifolia*	0.11
Water marigold	*Bidens beckii*	0.11
Water stargrass	*Heteranthera dubia*	0.11
Coontail	*Ceratophyllum demersum*	0.06
Freshwater sponge	*Spongilla* sp.	0.06
Water celery	*Vallisneria americana*	0.06

^invasive **Lakewide. Scale: 0 (absent) - 5 (dense)*

Visit the MiCorps Data Exchange (www.micorps.net) or contact the lead volunteer on your lake for more details on the survey, including sampling locations, maps, and abundance information, and for information on past surveys.

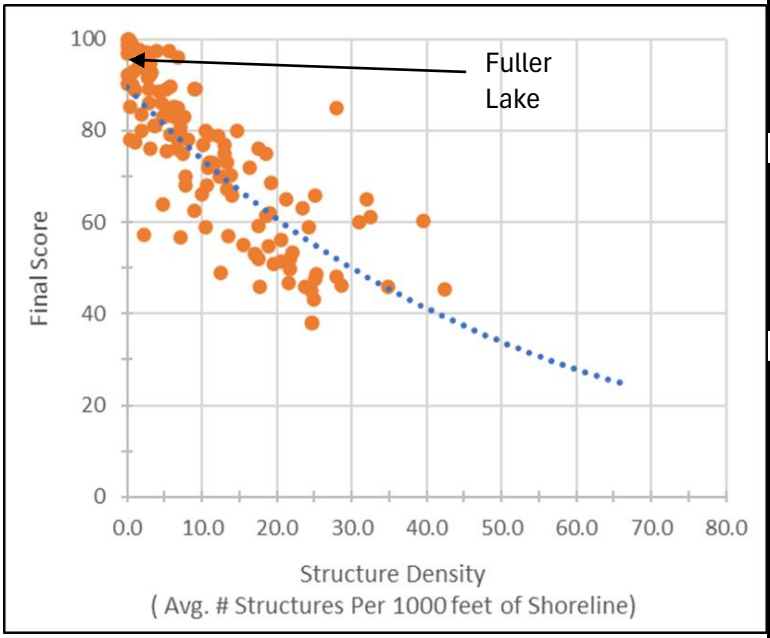
Site ID: 100285

Fuller Lake, Benzie County
2024 Score the Shore Results

The Score the Shore Habitat Assessment was conducted on Fuller Lake in 2024.

This assessment involves rating 1000 foot sections of shoreline for aquatic vegetation, shoreline vegetation, erosion, and erosion control practices (like sea walls). Each shoreline section is given three scores ranging from 0-100 for the categories of Littoral, Riparian, and Erosion Management. The three scores are averaged to produce a average section score. Then a total score is given to the entire lake by averaging all of the average section scores. A score of 0 indicates a shoreline that has been extremely disturbed by human impacts and no natural shoreline remains. A score of 100 indicates a shoreline that is pristine.

How does your lake compare to others in the program?



Fuller Lake	
Number of Sections:	3
Number of Structures:	8
Structure Density:	2.7
Final Score:	97

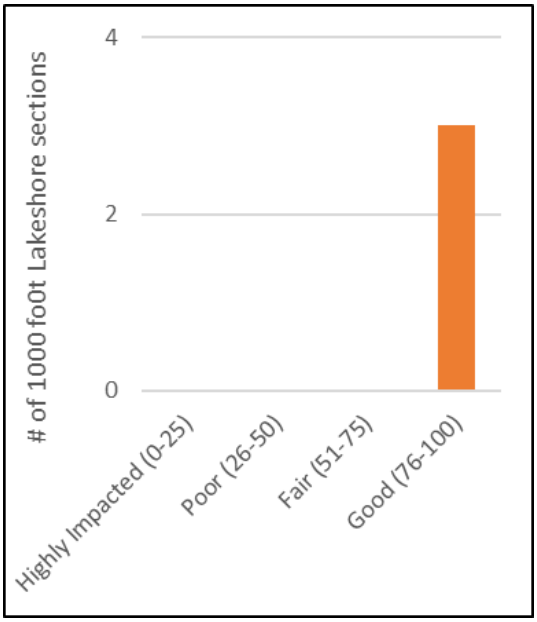
All 123 Participating Lakes from 2015-2024:	
Avg. Number of Sections:	16
Avg. Number of Structures:	230
Avg. Structure Density:	12.2
Avg. Final Score:	73.2

Note about graph to the left: The dotted line sets the average expectation of the score of your lake. If your lake is lower than the dotted line, then your shoreline health is lower than average compared to *lakes with similar amount of shoreline development*. And vice-versa in regards to a lake above the dotted line.

Analysis specific to Fuller Lake:

Overall, the lakeshore habitat of Fuller Lake is nearly pristine and scored higher than average when compared to other lakes in the program with similar amount of development. All 3 of the scored sections were rated as Good.

The lakeshore is nearly pristine. This survey can serve as a reference point for when upcoming changes may threaten the lakes integrity. Landowners could consider permanent protections on their land, such as conservation easements or protected status for shoreline properties, to help ensure these sensitive areas are preserved for future generations.

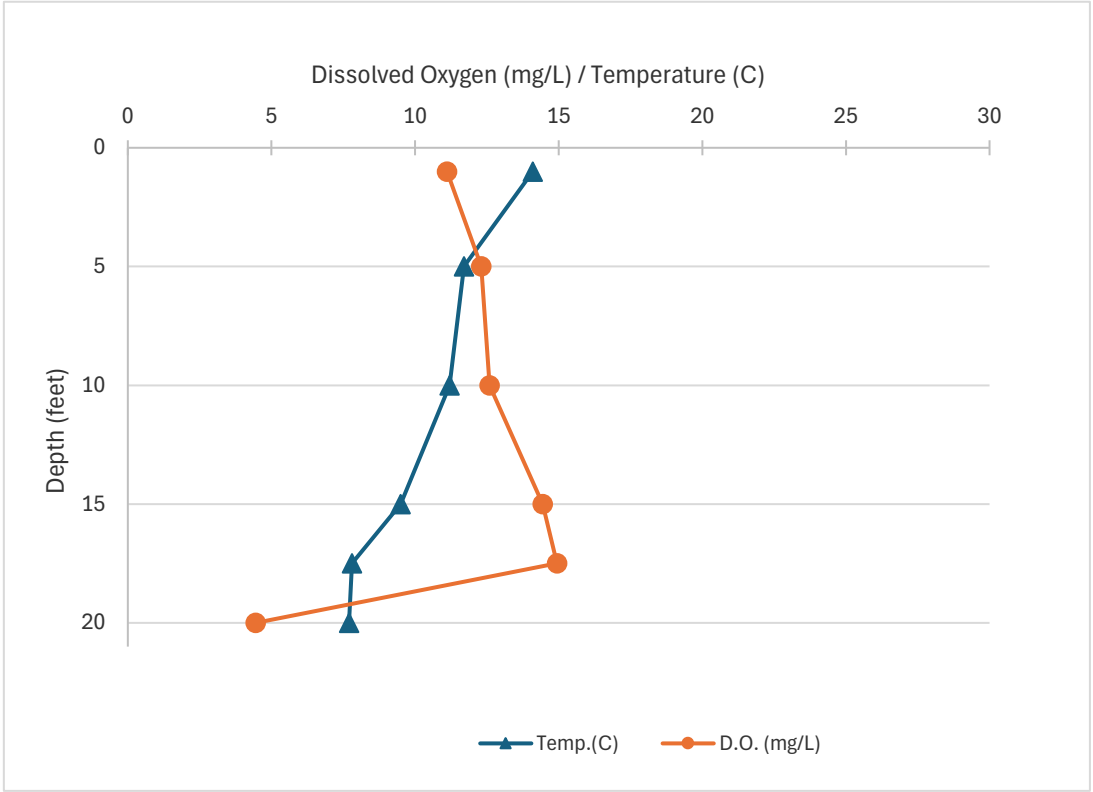


Name: Fuller Lake
County: Benzie
Site ID: 100285
Date: 4/25/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	14.1	11.11
5	11.7	12.31
10	11.2	12.6
15	9.5	14.44
17.5	7.8	14.94
20	7.7	4.45

Lake: Fuller Lake (Benzie Co.) **4/25/2024**

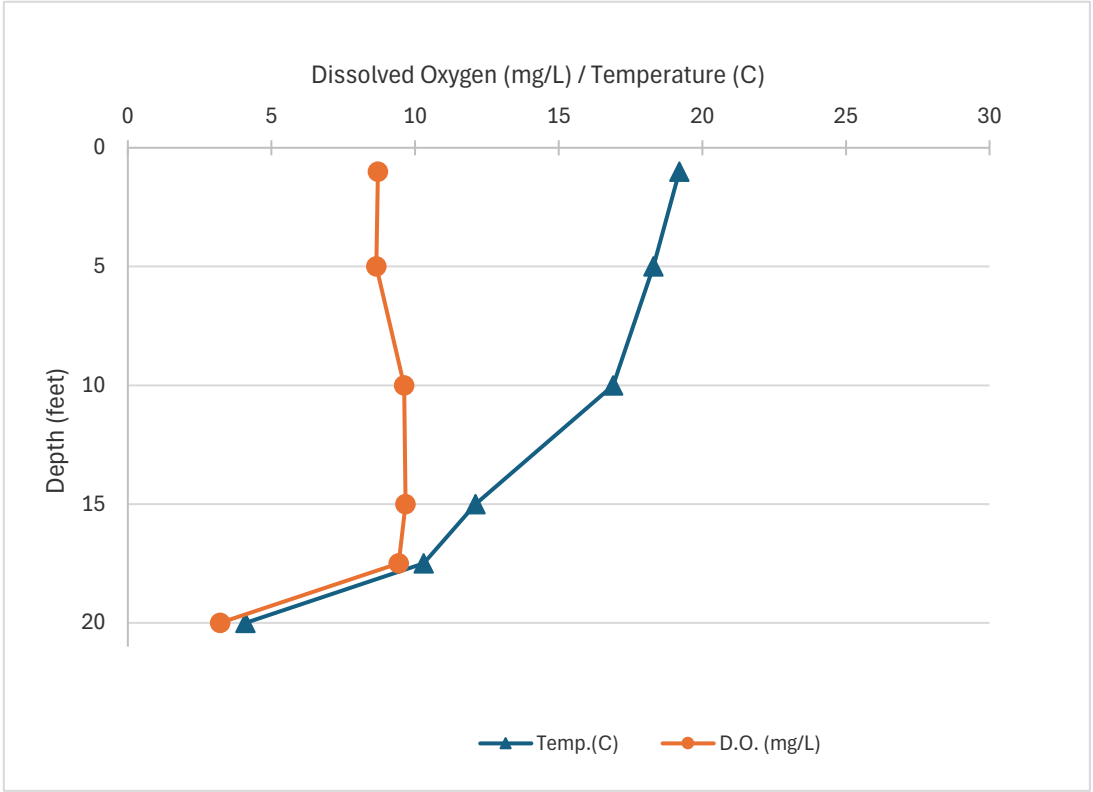


Name: Fuller Lake
County: Benzie
Site ID: 100285
Date: 5/14/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	19.2	8.71
5	18.3	8.65
10	16.9	9.62
15	12.1	9.67
17.5	10.3	9.43
20	4.1	3.21

Lake: Fuller Lake (Benzie Co.) **5/14/2024**

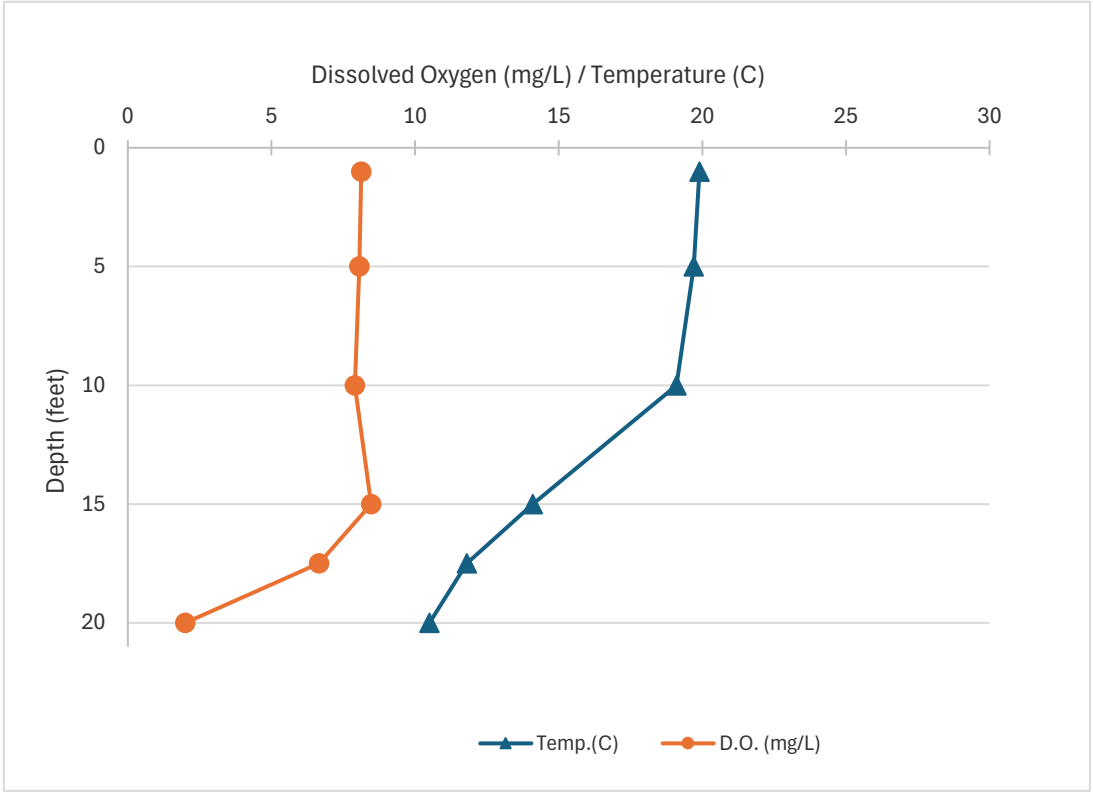


Name: Fuller Lake
County: Benzie
Site ID: 100285
Date: 5/31/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	19.9	8.13
5	19.7	8.06
10	19.1	7.91
15	14.1	8.47
17.5	11.8	6.662
20	10.5	2

Lake: Fuller Lake (Benzie Co.) **5/31/2024**

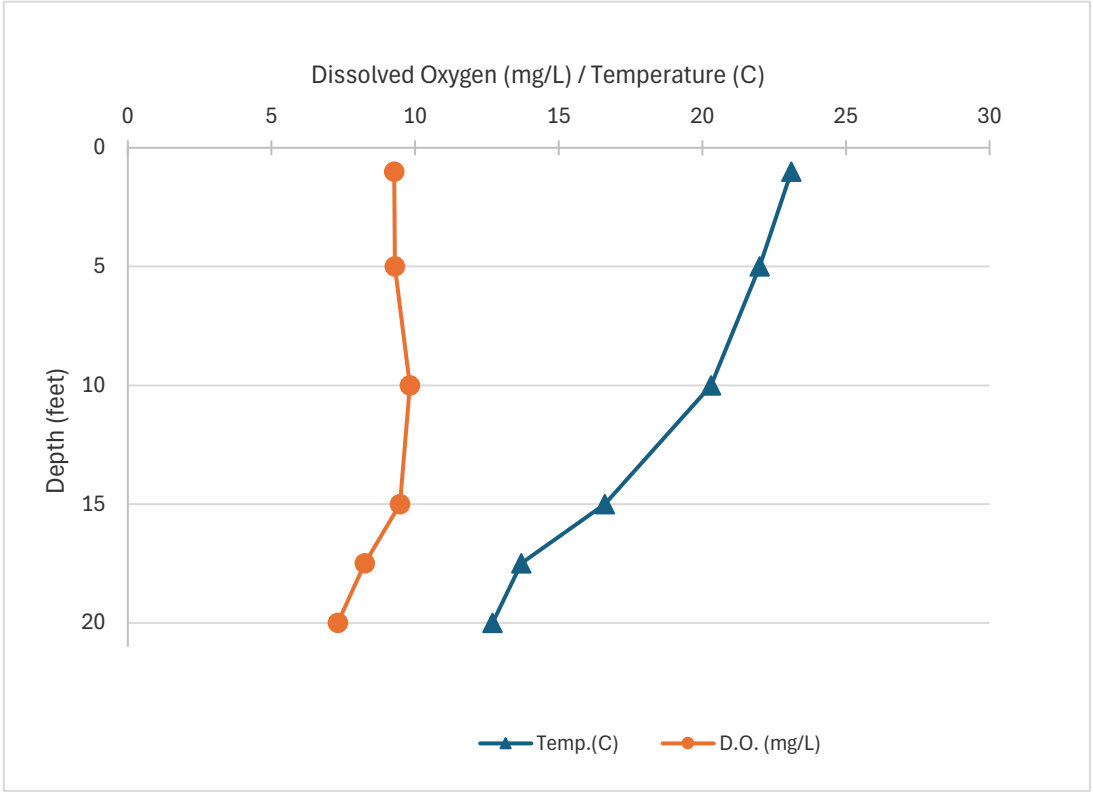


Name: Fuller Lake
County: Benzie
Site ID: 100285
Date: 6/14/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.1	9.27
5	22	9.3
10	20.3	9.82
15	16.6	9.48
17.5	13.7	8.25
20	12.7	7.31

Lake: Fuller Lake (Benzie Co.) **6/14/2024**

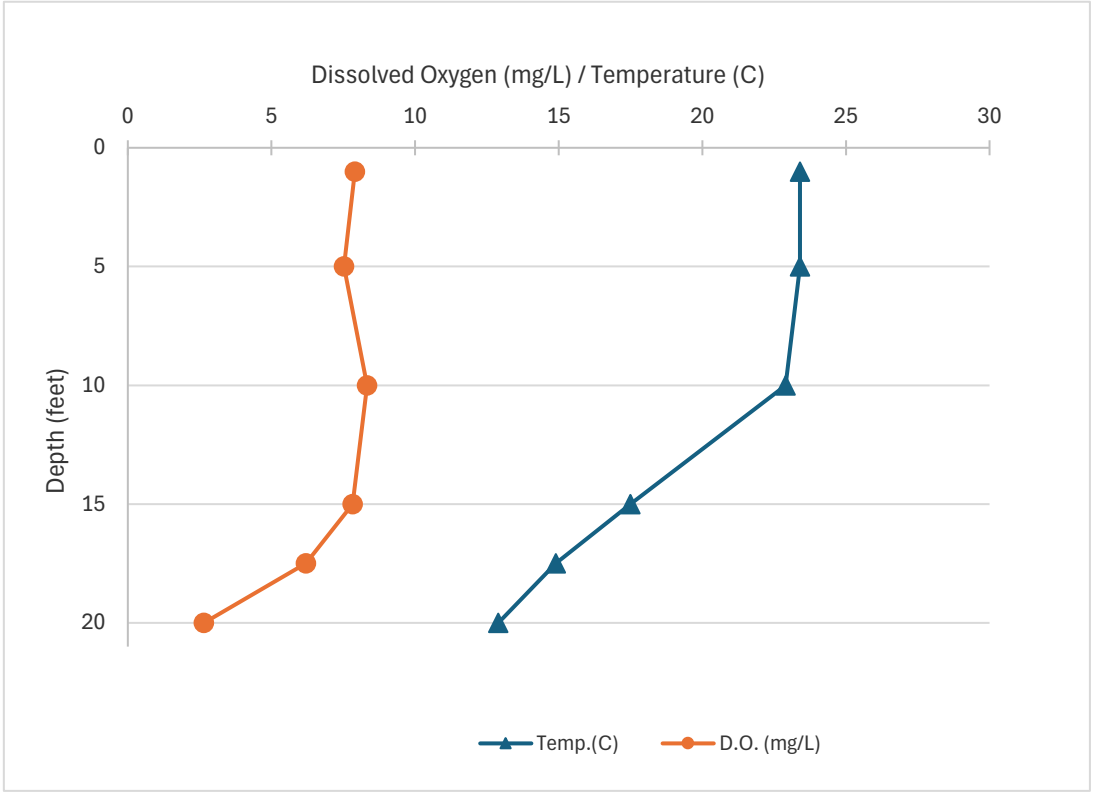


Name: Fuller Lake
County: Benzie
Site ID: 100285
Date: 6/28/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.4	7.91
5	23.4	7.53
10	22.9	8.33
15	17.5	7.83
17.5	14.9	6.2
20	12.9	2.65

Lake: Fuller Lake (Benzie Co.) **6/28/2024**

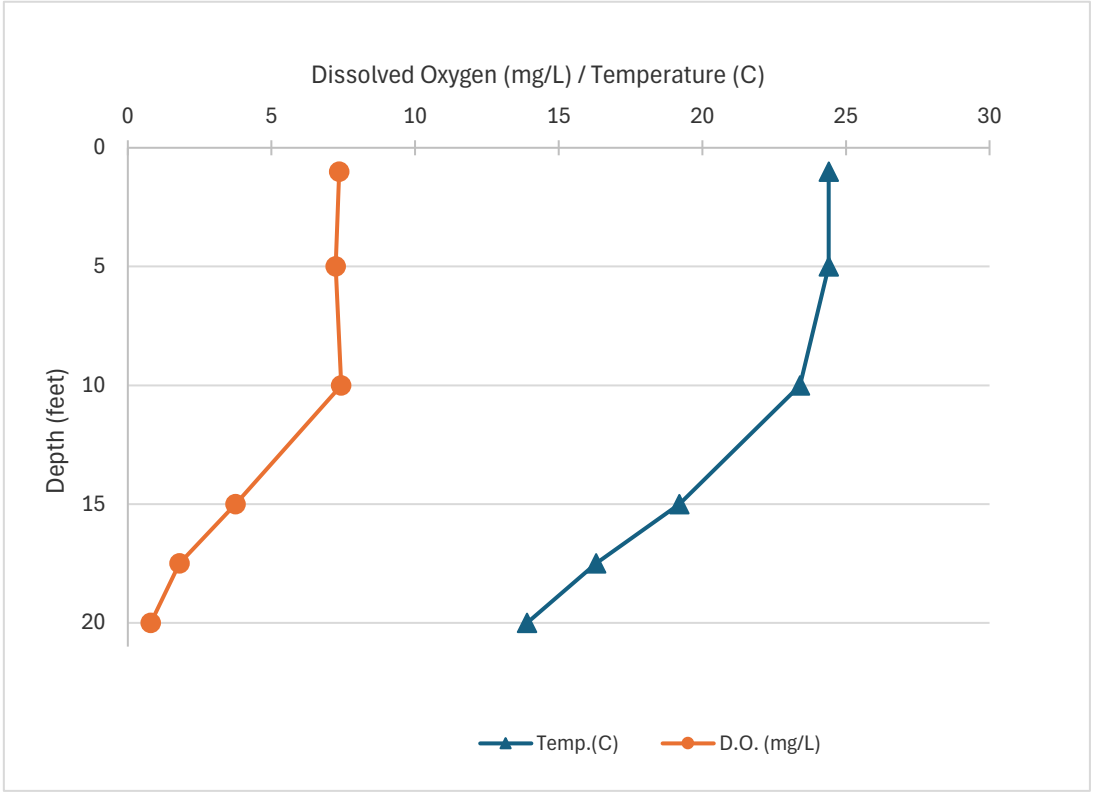


Name: Fuller Lake
County: Benzie
Site ID: 100285
Date: 7/7/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	24.4	7.36
5	24.4	7.24
10	23.4	7.43
15	19.2	3.75
17.5	16.3	1.8
20	13.9	0.8

Lake: Fuller Lake (Benzie Co.) **7/7/2024**

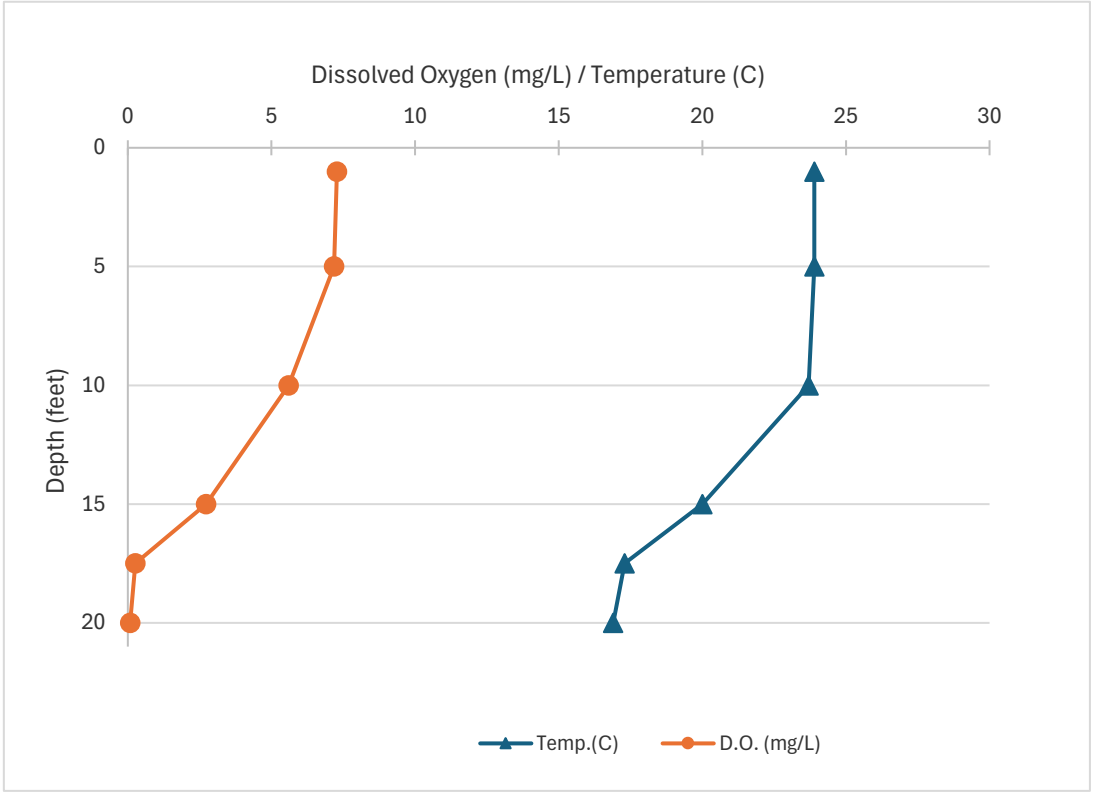


Name: Fuller Lake
County: Benzie
Site ID: 100285
Date: 7/24/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.9	7.28
5	23.9	7.18
10	23.7	5.6
15	20	2.72
17.5	17.3	0.26
20	16.9	0.08

Lake: Fuller Lake (Benzie Co.) **7/24/2024**

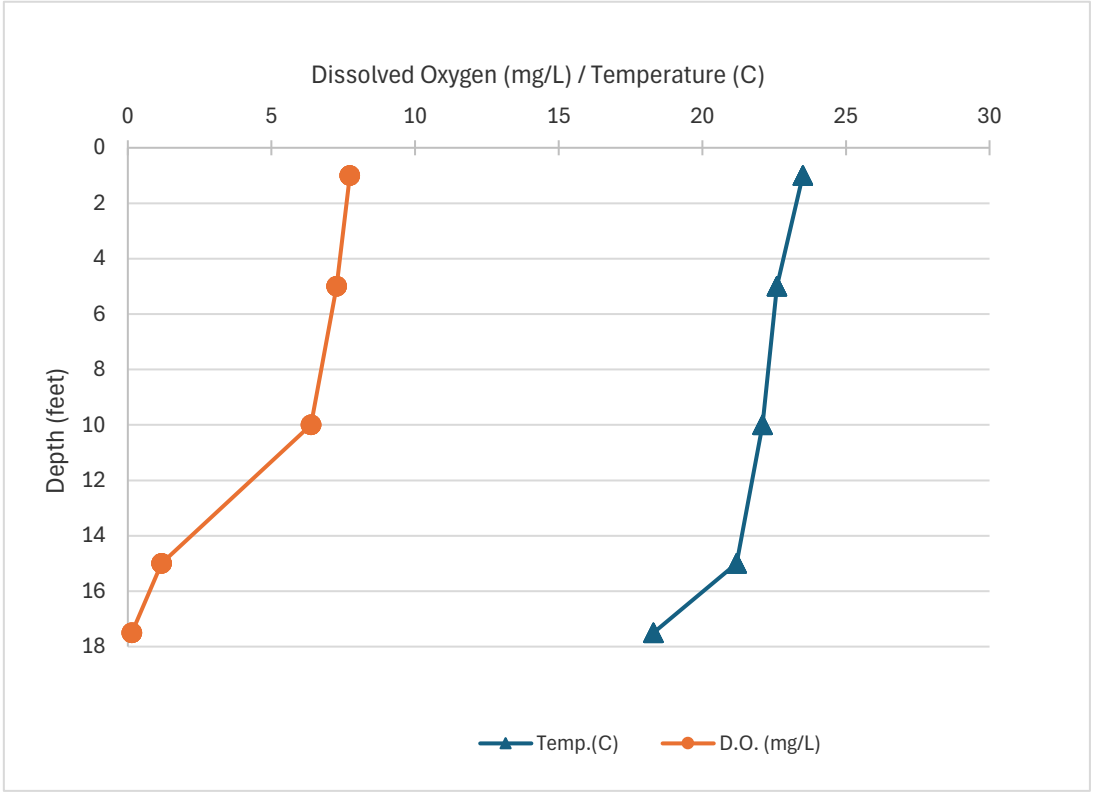


Name: Fuller Lake
County: Benzie
Site ID: 100285
Date: 8/13/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.5	7.73
1	23.5	7.73
1	23.5	7.73
1	23.5	7.73
5	22.6	7.27
5	22.6	7.27
5	22.6	7.27
5	22.6	7.27
10	22.1	6.38
10	22.1	6.38
10	22.1	6.38
10	22.1	6.38
15	21.2	1.18
15	21.2	1.18
15	21.2	1.18
15	21.2	1.18
17.5	18.3	0.14
17.5	18.3	0.14
17.5	18.3	0.14
17.5	18.3	0.14

Lake: Fuller Lake (Benzie Co.) **8/13/2024**



Name: Fuller Lake
County: Benzie
Site ID: 100285
Date: 9/5/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	21.5	7.75
1	21.5	7.75
1	21.5	7.75
1	21.5	7.75
5	21.3	7.73
5	21.3	7.73
5	21.3	7.73
5	21.3	7.73
10	21.2	7.33
10	21.2	7.33
10	21.2	7.33
10	21.2	7.33
15	20.8	5.72
15	20.8	5.72
15	20.8	5.72
15	20.8	5.72
17.5	19.1	0.75
17.5	19.1	0.75
17.5	19.1	0.75
17.5	19.1	0.75

Lake: Fuller Lake (Benzie Co.) **9/5/2024**