



2022 Data Report for Loon Lake, Benzie County

Site ID: 100275

44.7083°N, 86.1298°W

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Michigan Clean
Water Corps

EGLE

MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

MICHIGAN STATE
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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

Loon Lake, Benzie County 2022 CLMP Results



Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2022	8	10.0	15.0	12.3	1.7	41
2022 All CLMP Lakes	2817	1.0	50.0	12.7	2.9	42

No graph: Not enough data

Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Median	Std. Dev	Carlson TSI
2022	5	1.8	2.4	2.0	0.2	37
2022 All CLMP Lakes	687	< 1.0	43.0	3.7	5.3	43

No graph: Not enough data

Spring Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev
2022	1	18.0	18.0	18.0	NA
2022 All CLMP Lakes	220	<5	220.0	20.7	21.3

No graph: Not enough data

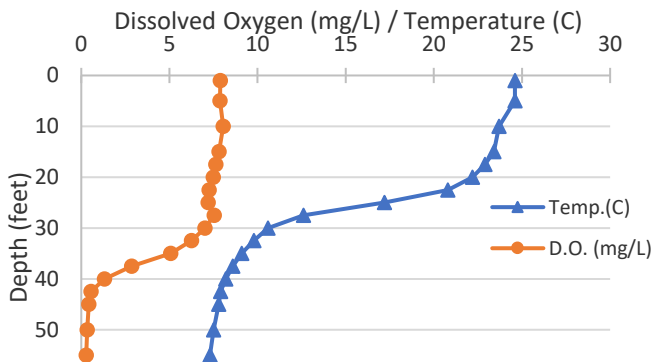
Summer Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2022	1	8.0	8.0	8.0	NA	34
2022 All CLMP Lakes	234	<= 3	150.0	17.4	15.3	45

No graph: Not enough data

Dissolved Oxygen and Temperature Profile

8/1/2022



Summary

Average TSI	2022
Loon Lake	37
All CLMP Lakes	44

With an average TSI score of 37 based on 2022 Secchi transparency, chlorophyll-a, and summer total phosphorus data, this lake is rated between the oligotrophic and mesotrophic lake classification. The lake leans slightly more oligotrophic than mesotrophic.

The lake keeps 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.

Welcome to the CLMP! The longer you stay in the program and the more parameters you monitor, the more interesting this report will become. Once you have eight years of data there will be enough history to analyze the long-term trend.

* = 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.

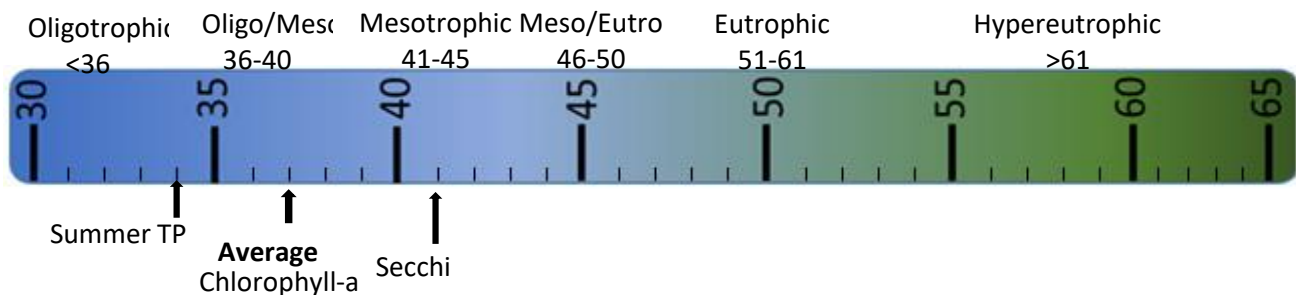
The tables below give the results-to-TSI conversions for the water quality data ranges normally seen in the CLMP. The formulas for this conversion can be found in the CLMP manual (link is on page 2 of this report).

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 Loon Lake in 2022	
Average	37
Secchi Disk	41
Summer TP	34
Chlorophyll-a	37



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 eutrophic lakes. These lakes exhibit extremely high productivity, such as nuisance algae and weed growth.

Loon Lake, Benzie County

2022 CLMP Aquatic Plant Results



The Aquatic Plant Mapping survey was conducted on Loon Lake in 2022.

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 33 locations (11 transects) in Loon Lake in 2022. Below is a list of species reported, in order of relative abundance. Survey conducted June 22-August 4.

Loon Lake, Benzie County		
2022 Aquatic Plant Mapping: Species Reported		
<u>Common Name</u>	<u>Latin Name</u>	<u>Average Density*</u>
Stonewort	<i>Chara</i> sp.	1.55
Eurasian milfoil [^]	<i>Myriophyllum spicatum</i>	1.00
Slender naiad	<i>Najas flexilis</i>	1.00
Variable pondweed	<i>Potamogeton gramineus</i>	0.51
Waterweed	<i>Elodea canadensis</i>	0.48
Longleaf pondweed	<i>Potamogeton nodosus</i>	0.36
Water celery	<i>Vallisneria americana</i>	0.33
White water lily	<i>Nymphaea odorata</i>	0.33
Bladderwort	<i>Utricularia</i> sp.	0.30
Sago pondweed	<i>Stuckenia pectinata</i>	0.30
Clasping-leaf pondweed	<i>Potamogeton richardsonii</i>	0.27
Alpine pondweed	<i>Potamogeton alpinus</i>	0.24
Illinois pondweed	<i>Potamogeton illinoensis</i>	0.24
Floating-leaf pondweed	<i>Potamogeton natans</i>	0.12
Large-leaf pondweed	<i>Potamogeton amplifolius</i>	0.12
Coontail	<i>Ceratophyllum demersum</i>	0.09
Flat-stemmed pondweed	<i>Potamogeton zosteriformis</i>	0.09
Native milfoil	<i>Myriophyllum</i> sp.	0.09
Perfoliate pondweed	<i>Potamogeton perfoliatus</i>	0.09
Fries pondweed	<i>Potamogeton friesii</i>	0.06
Curly-leaf pondweed [^]	<i>Potamogeton crispus</i>	0.03
Fern pondweed	<i>Potamogeton robbinsii</i>	0.03
Water star grass	<i>Heteranthera dubia</i>	0.03
Whitestem pondweed	<i>Potamogeton praelongus</i>	0.03
Freshwater sponge (not a plant)		0.03
[^] <i>invasive</i>	*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.

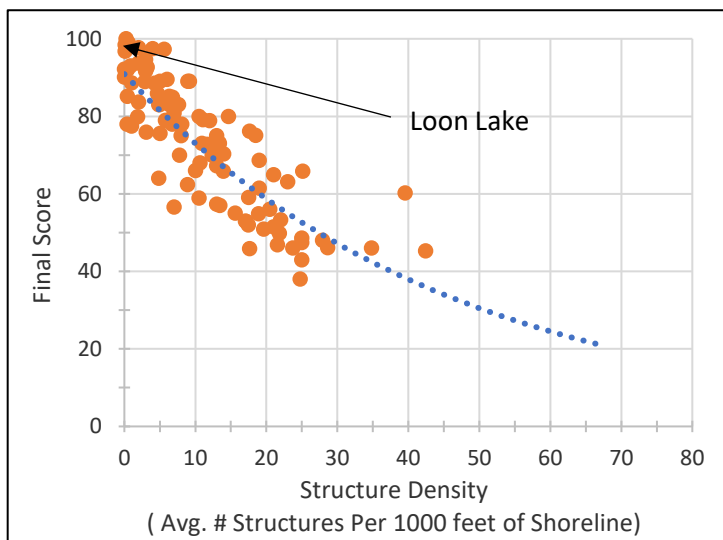
Loon Lake, Benzie County 2022 Score the Shore Results



The Score the Shore Habitat Assessment was conducted on Loon Lake in 2022.

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 nearly pristine.

How does your lake compare to others in the program?



Loon	
Number of Sections:	9
Number of Structures:	5
Structure Density:	0.6
Final Score:	98.9

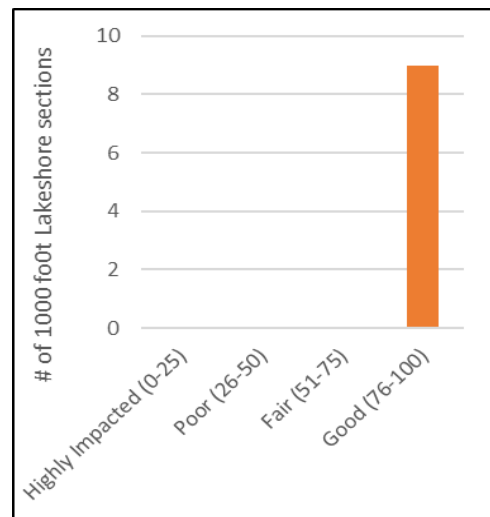
All 97 Participating Lakes from 2015-2022:	
Avg. Number of Sections:	16
Avg. Number of Structures:	228
Avg. Structure Density:	12
Avg. Final Score:	73

Note about graph to the left: The dotted line sets your 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 Loon Lake:

With an average score of 98.9 out of 100, Loon Lake is nearly pristine in its lakeshore habitat.

There is not much room for improvement on Loon Lake. Maintaining and preserving the habitat on the lake is the most important thing residents or managers can do.



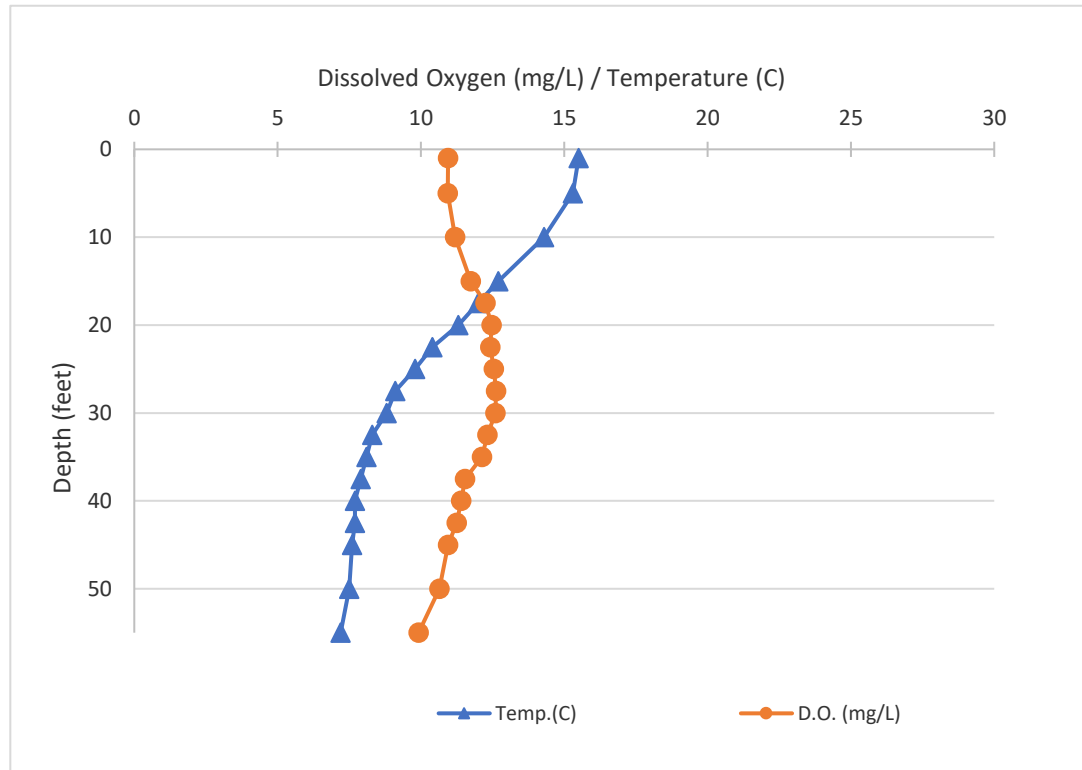
Name: Loon Lake
County: Benzie
Site ID: 100275
Date: 5/13/2022

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	15.5	10.95
5	15.3	10.94
10	14.3	11.19
15	12.7	11.74
17.5	12	12.25
20	11.3	12.47
22.5	10.4	12.42
25	9.8	12.54
27.5	9.1	12.62
30	8.8	12.6
32.5	8.3	12.32
35	8.1	12.13
37.5	7.9	11.54
40	7.7	11.41
42.5	7.7	11.25
45	7.6	10.95
50	7.5	10.65
55	7.2	9.92

Lake: Loon Lake (Benzie Co.)

5/13/2022



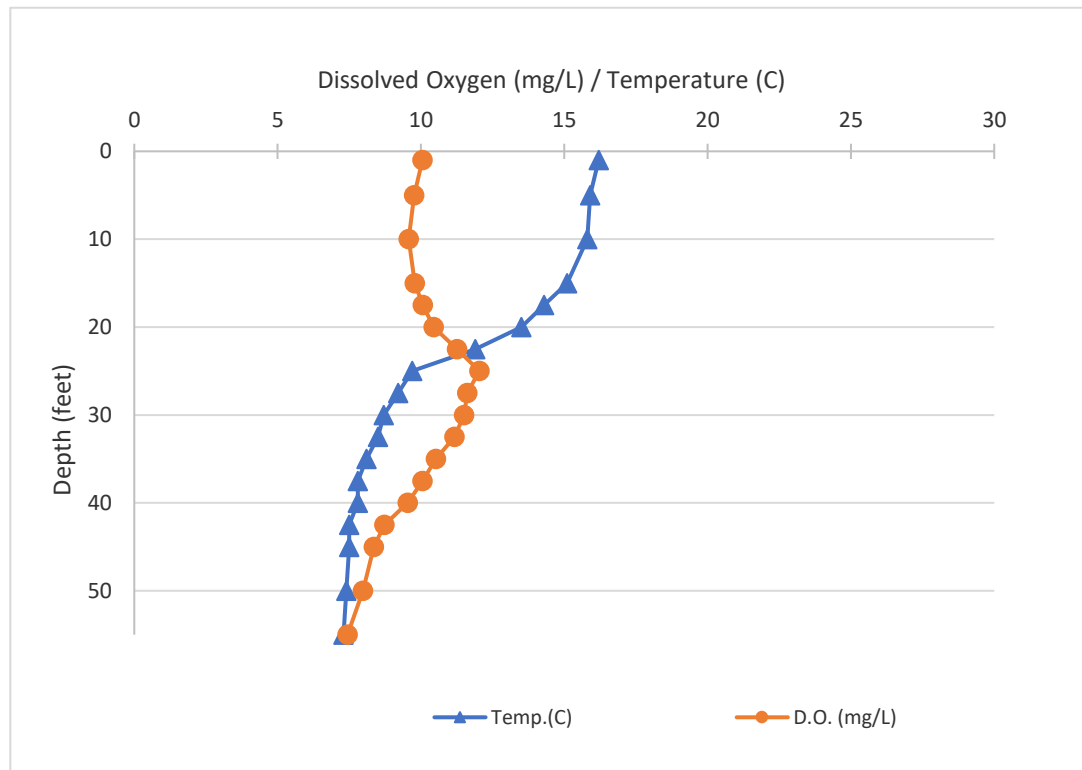
Name: Loon Lake
County: Benzie
Site ID: 100275
Date: 5/24/2022

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	16.2	10.05
5	15.9	9.76
10	15.8	9.57
15	15.1	9.79
17.5	14.3	10.07
20	13.5	10.44
22.5	11.9	11.26
25	9.7	12.04
27.5	9.2	11.62
30	8.7	11.51
32.5	8.5	11.17
35	8.1	10.52
37.5	7.8	10.05
40	7.8	9.54
42.5	7.5	8.72
45	7.5	8.36
50	7.4	7.98
55	7.3	7.44

Lake: Loon Lake (Benzie Co.)

5/24/2022



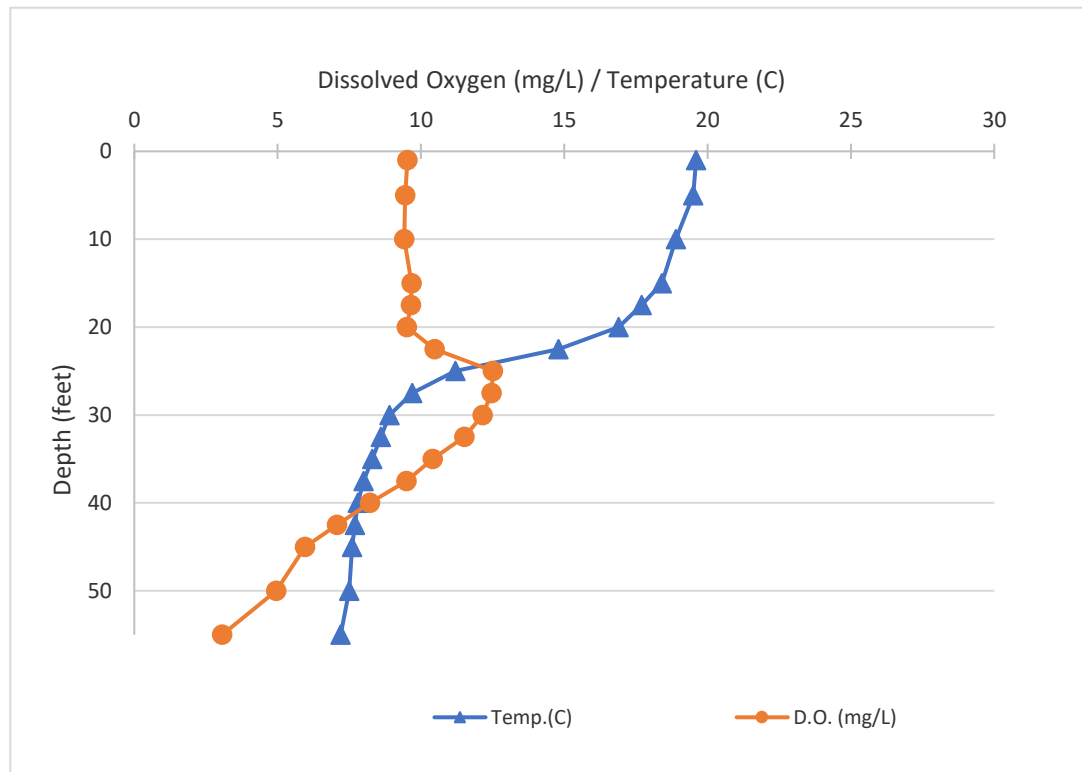
Name: Loon Lake
County: Benzie
Site ID: 100275
Date: 6/14/2022

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	19.6	9.53
5	19.5	9.45
10	18.9	9.42
15	18.4	9.67
17.5	17.7	9.65
20	16.9	9.51
22.5	14.8	10.48
25	11.2	12.51
27.5	9.7	12.46
30	8.9	12.15
32.5	8.6	11.52
35	8.3	10.41
37.5	8	9.5
40	7.8	8.22
42.5	7.7	7.07
45	7.6	5.96
50	7.5	4.95
55	7.2	3.07

Lake: Loon Lake (Benzie Co.)

6/14/2022



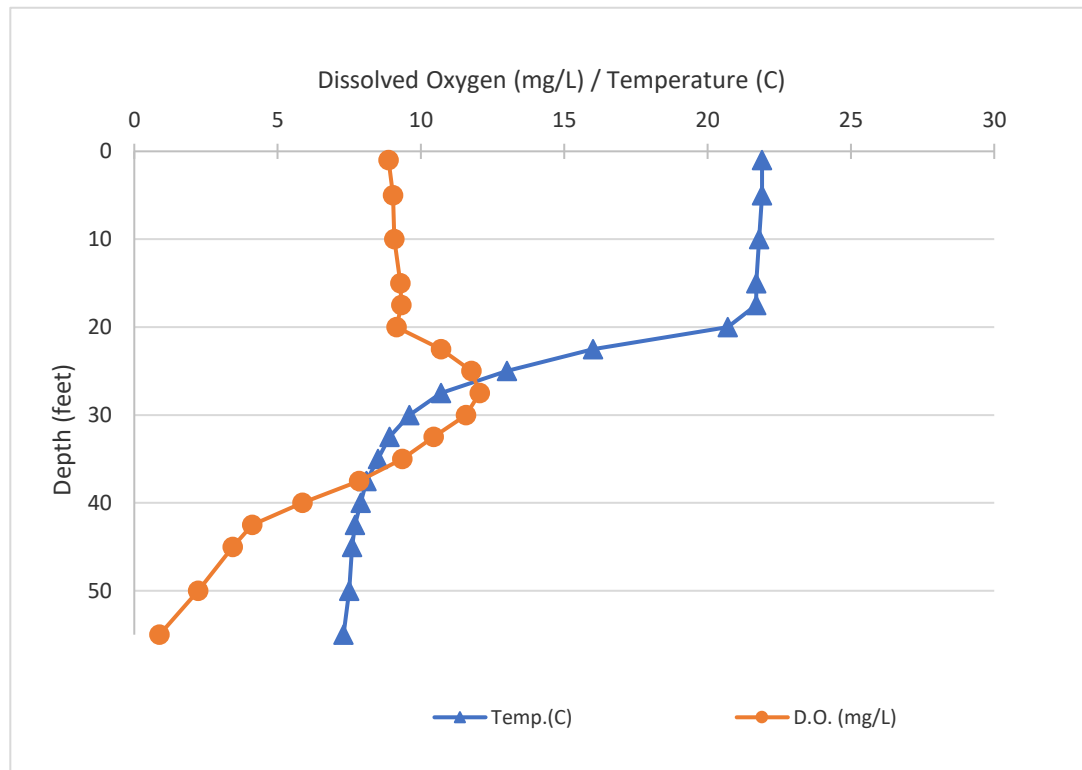
Name: Loon Lake
 County: Benzie
 Site ID: 100275
 Date: 7/1/2022

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	21.9	8.87
5	21.9	9.03
10	21.8	9.07
15	21.7	9.28
17.5	21.7	9.32
20	20.7	9.15
22.5	16	10.7
25	13	11.76
27.5	10.7	12.05
30	9.6	11.57
32.5	8.9	10.45
35	8.5	9.35
37.5	8.1	7.84
40	7.9	5.87
42.5	7.7	4.12
45	7.6	3.43
50	7.5	2.23
55	7.3	0.88

Lake: Loon Lake (Benzie Co.)

7/1/2022



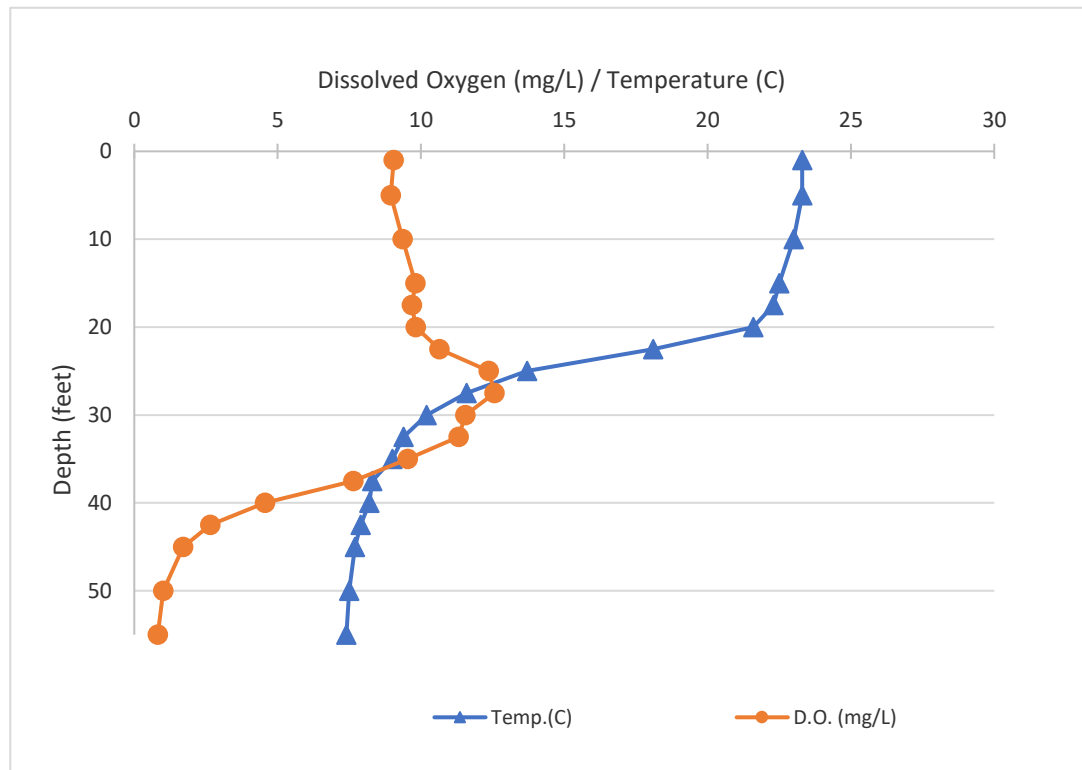
Name: Loon Lake
 County: Benzie
 Site ID: 100275
 Date: 7/15/2022

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.3	9.05
5	23.3	8.95
10	23	9.36
15	22.5	9.81
17.5	22.3	9.69
20	21.6	9.82
22.5	18.1	10.65
25	13.7	12.36
27.5	11.6	12.57
30	10.2	11.55
32.5	9.4	11.31
35	9	9.54
37.5	8.3	7.64
40	8.2	4.56
42.5	7.9	2.65
45	7.7	1.7
50	7.5	1.01
55	7.4	0.82

Lake: Loon Lake (Benzie Co.)

7/15/2022



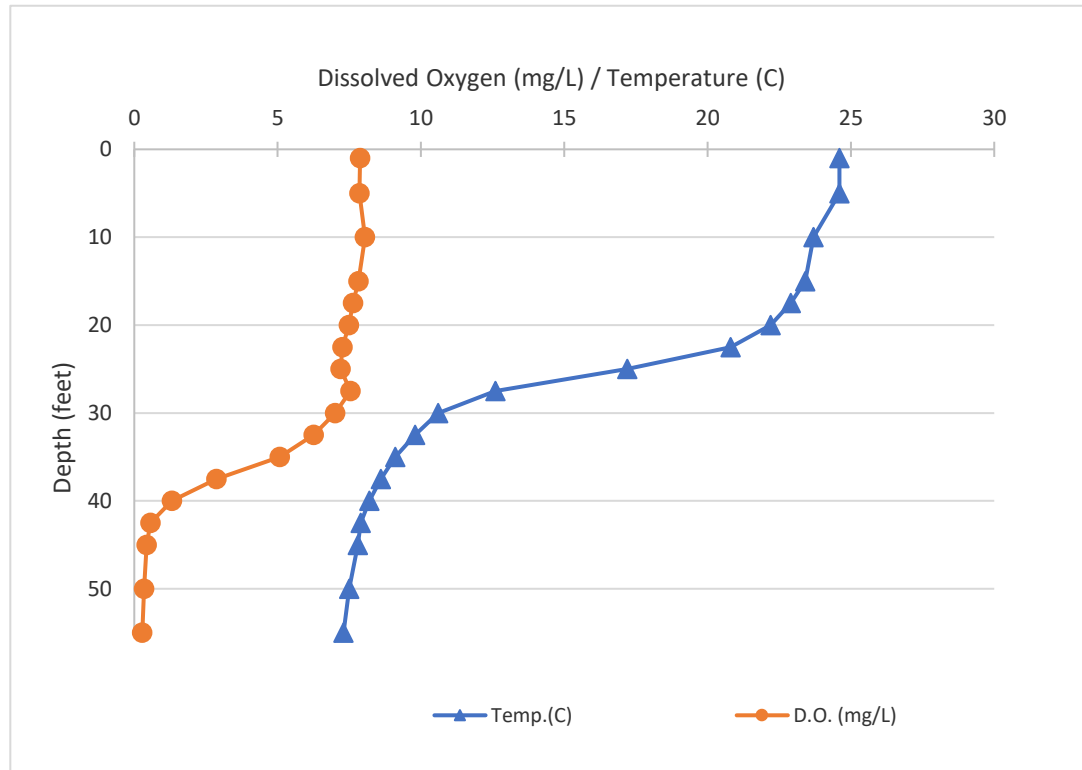
Name: Loon Lake
 County: Benzie
 Site ID: 100275
 Date: 8/1/2022

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	24.6	7.88
5	24.6	7.86
10	23.7	8.05
15	23.4	7.82
17.5	22.9	7.63
20	22.2	7.49
22.5	20.8	7.26
25	17.2	7.2
27.5	12.6	7.54
30	10.6	7.01
32.5	9.8	6.26
35	9.1	5.07
37.5	8.6	2.86
40	8.2	1.31
42.5	7.9	0.56
45	7.8	0.43
50	7.5	0.34
55	7.3	0.28

Lake: Loon Lake (Benzie Co.)

8/1/2022



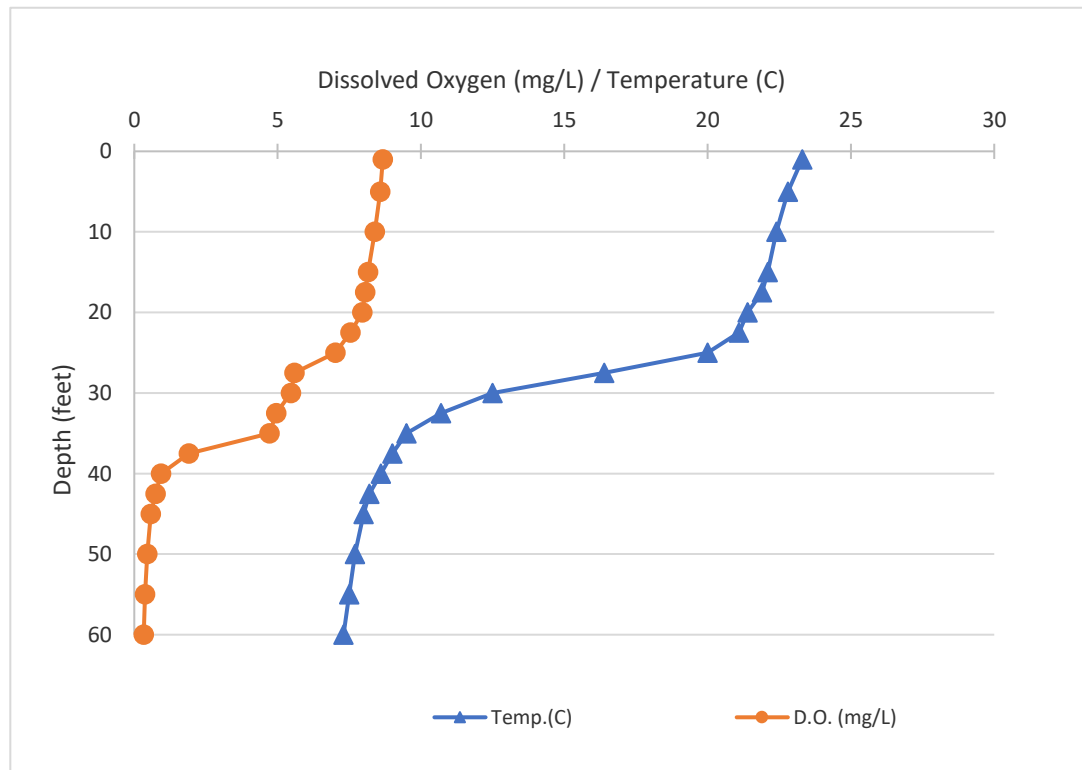
Name: Loon Lake
 County: Benzie
 Site ID: 100275
 Date: 8/16/2022

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.3	8.67
5	22.8	8.58
10	22.4	8.39
15	22.1	8.16
17.5	21.9	8.06
20	21.4	7.96
22.5	21.1	7.54
25	20	7.02
27.5	16.4	5.59
30	12.5	5.47
32.5	10.7	4.95
35	9.5	4.72
37.5	9	1.9
40	8.6	0.93
42.5	8.2	0.74
45	8	0.58
50	7.7	0.45
55	7.5	0.38
60	7.3	0.33

Lake: Loon Lake (Benzie Co.)

8/16/2022



Name: Loon Lake
County: Benzie
Site ID: 100275
Date: 9/10/2022

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	22.3	7.74
5	22.2	7.47
10	22.1	7.51
15	21.9	7.02
17.5	21.8	7.25
20	21.7	7.38
22.5	21.5	7.18
25	20.8	6.48
27.5	16.5	2.74
30	13.8	1.64
32.5	10.9	1.2
35	9.7	0.65
37.5	9	0.46
40	8.4	0.38
42.5	8.1	0.29
45	8	0.22
50	7.8	0.19
55	7.6	0.16
60	7.5	0.15

Lake: Loon Lake (Benzie Co.)

9/10/2022

