



# 2021 Data Report for Lake of the Woods, Branch County

Site ID: 120111

41.855004°N, 85.041392°W

The CLMP is brought to you by:



**EGLE** MICHIGAN DEPARTMENT OF  
ENVIRONMENT, GREAT LAKES, AND ENERGY

MICHIGAN STATE  
UNIVERSITY



**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](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:

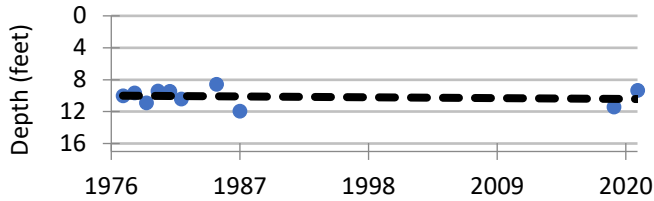
**Paul Steen (psteen@hrwc.org), CLMP Data Analyst**

# Lake of the Woods, Branch County 2021 CLMP Results



## Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2021	15	7.0	12.0	9.3	1.4	45
2019	18	7.0	15.5	9.3	2.1	42
1977-1987	123	5.0	16.5	10.1	2.8	44
2021 All CLMP Lakes	2817	1.0	50.0	12.7	2.9	42



## Chlorophyll-a (parts per billion)

Lake of the Woods does not have Chlorophyll-a data available. Consider enrolling in this parameter next year. Chlorophyll-a is the green photosynthetic pigment in the cells of plants. The amount of algae in a lake can be estimated by measuring the chlorophyll-a concentration in the water. As an algal productivity indicator, chlorophyll-a is used to determine the trophic status of a lake.

## Spring Phosphorus (parts per billion)

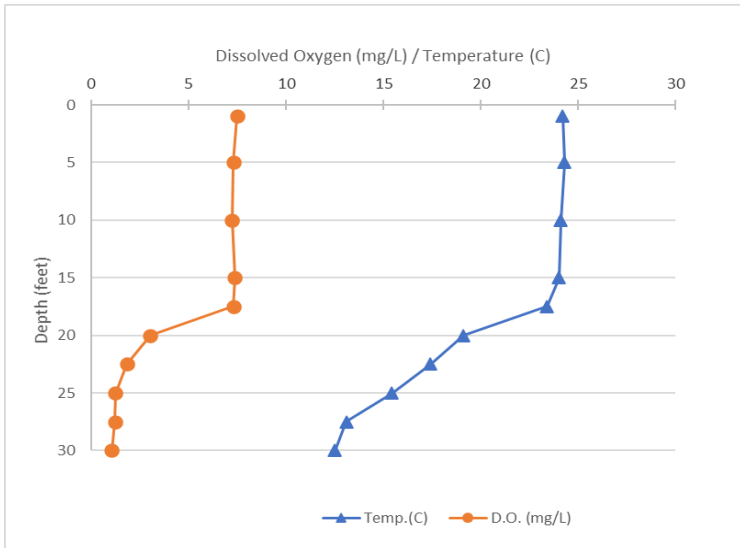
Lake of the Woods does not have spring total phosphorus data available. Consider enrolling in this parameter next year. Phosphorus is one of several essential nutrients that algae need to grow and reproduce. An increase in phosphorus over time is a measure of nutrient enrichment in a lake. A surface 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)

Lake of the Woods does not have summer 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 summer (when many lakes are stratified) will be a representative sample for the upper layer of the lake, where most summer algal productivity occurs.

## Dissolved Oxygen and Temperature Profile

8/19/2021



## Summary

Average TSI	2021	2019	1977-1987
Lake of the Woods	45	42	44
All CLMP Lakes	42	40	45

With a TSI score of 45 based on 2021 Secchi transparency, this lake is rated as a mesotrophic lake.

The lake keeps some dissolved oxygen in the bottom waters through mid-summer, but by late summer the lake has stratified and the bottom water is devoid of oxygen.

Long term trends indicate that the trophic status parameters have not changed beyond minor year-to-year variation since monitoring began.

\* = No sample received W= Value is less than the detection limit (<3 ppb) T= Value reported is less than the reporting limit (5 ppb).  
<1.0 = Chlorophyll-a: Sample value is less than limit of quantification (<1 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.

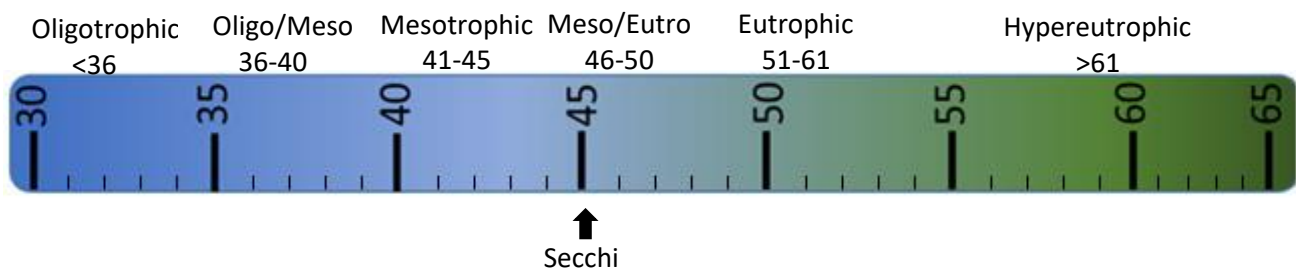
The tables below give the results-to-TSI conversions for the water quality data ranges normally seen in the CLMP. The formulas for this conversion can be found in the CLMP manual (link is on page 2 of this report).

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 Lake of the Woods in 2021	
Average	
Secchi Disk	45
Summer TP	
Chlorophyll-a	



**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.

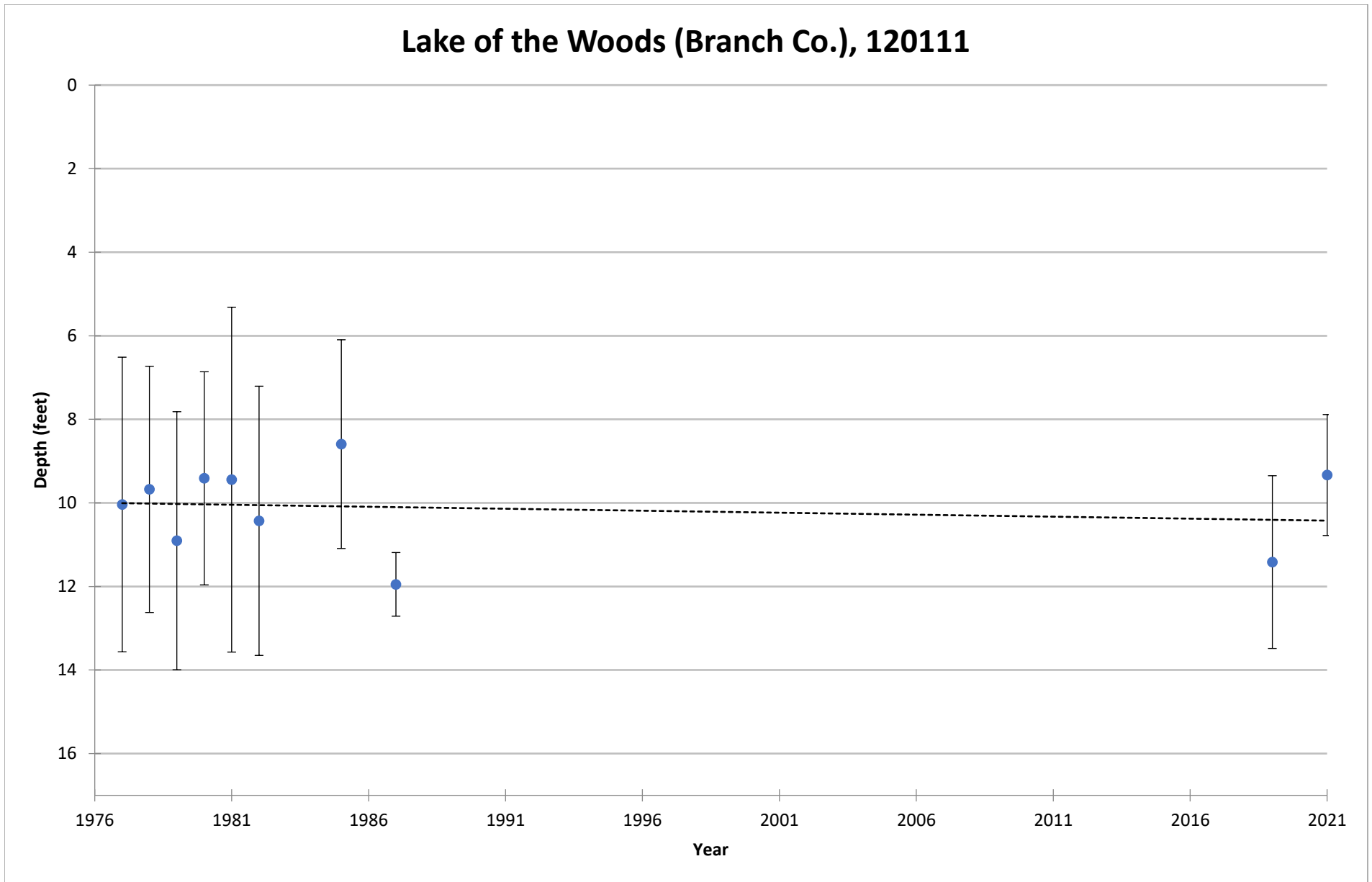
**Mesotrophic:** Lakes that fall between oligotrophic and eutrophic. Mid-ranged amounts of nutrients.

**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.

COOPERATIVE LAKES MONITORING PROGRAM  
SUMMER MEAN TRANSPARENCY

**Lake of the Woods (Branch Co.), 120111**



Vertical bars indicate standard deviation

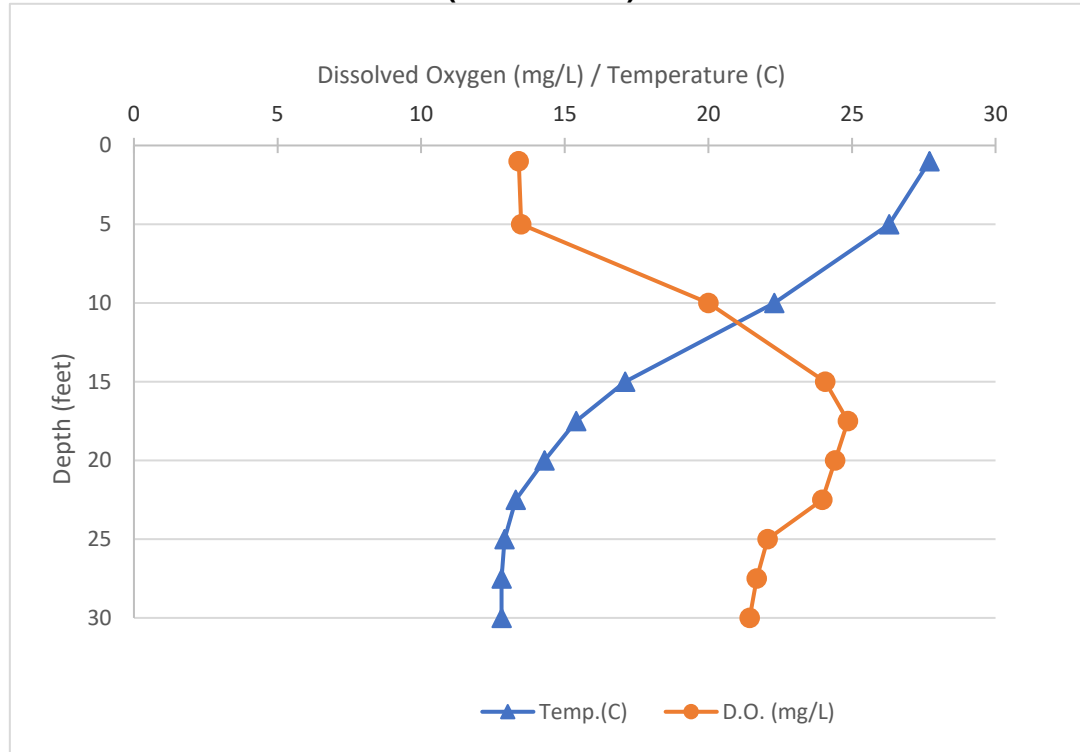
Name: Lake of the Woods  
County: Branch  
Site ID: 120111  
Date: 6/11/2021

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	27.7	13.4
5	26.3	13.48
10	22.3	20
15	17.1	24.07
17.5	15.4	24.86
20	14.3	24.41
22.5	13.3	23.97
25	12.9	22.06
27.5	12.8	21.68
30	12.8	21.44

Lake: Lake of the Woods (Branch Co.)

6/11/2021



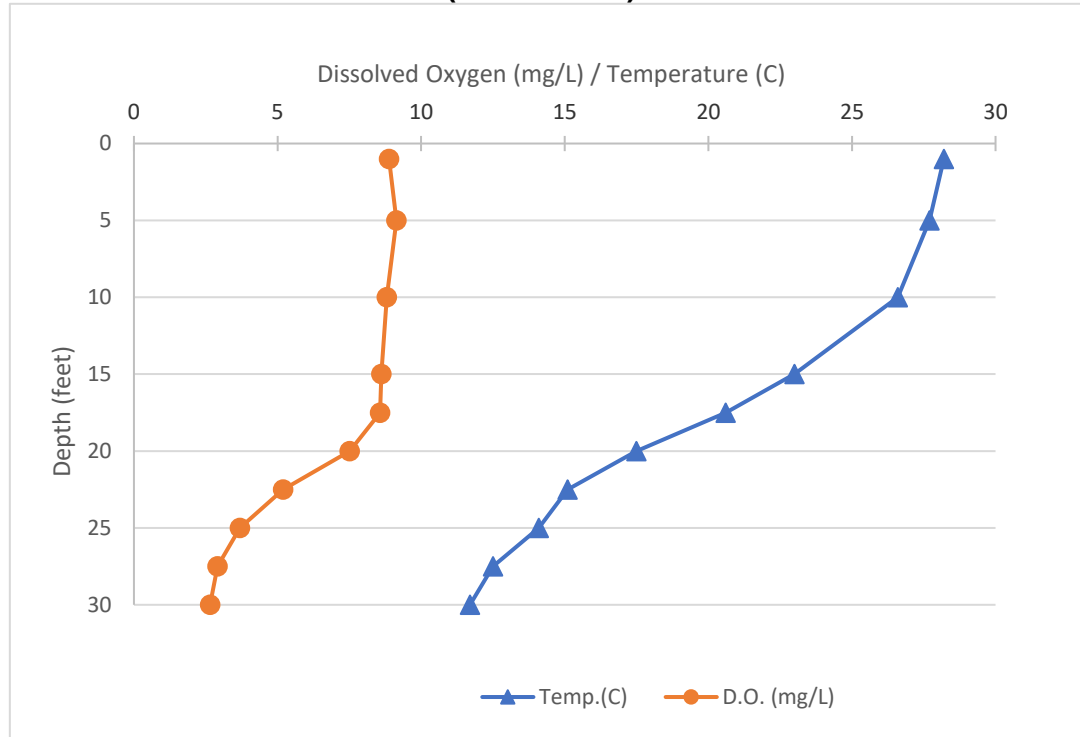
Name: Lake of the Woods  
County: Branch  
Site ID: 120111  
Date: 6/24/2021

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	28.2	8.88
5	27.7	9.14
10	26.6	8.8
15	23	8.61
17.5	20.6	8.57
20	17.5	7.51
22.5	15.1	5.2
25	14.1	3.69
27.5	12.5	2.91
30	11.7	2.65

Lake: Lake of the Woods (Branch Co.)

6/24/2021



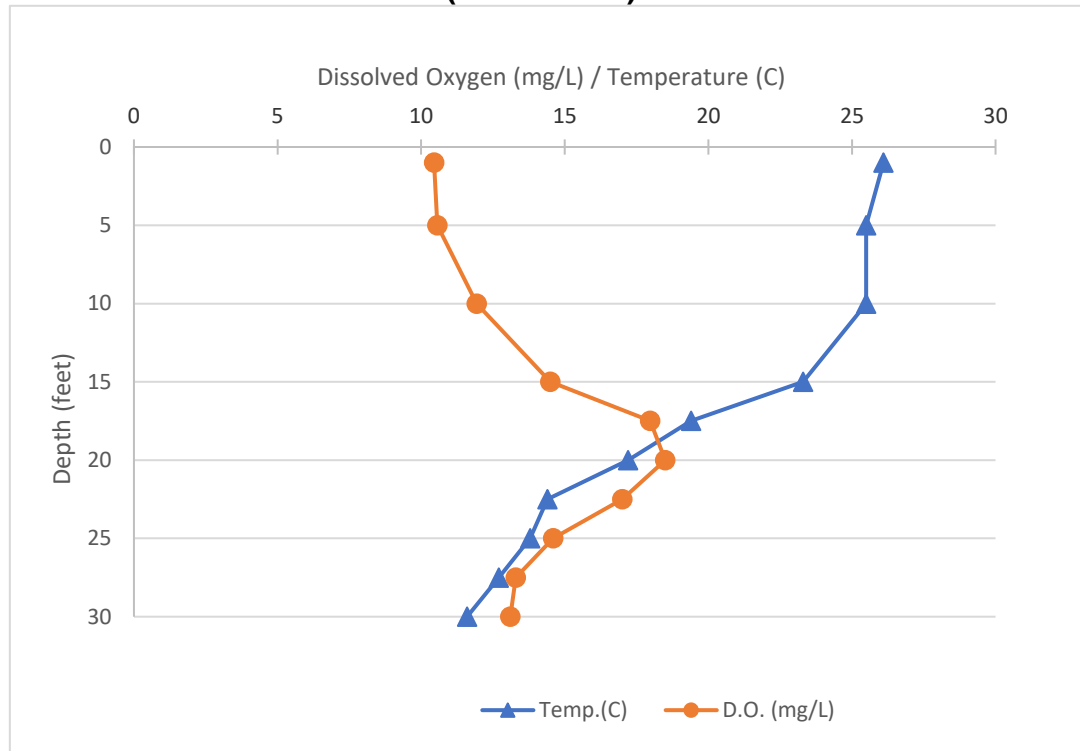
Name: Lake of the Woods  
County: Branch  
Site ID: 120111  
Date: 7/6/2021

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	26.1	10.45
5	25.5	10.57
10	25.5	11.94
15	23.3	14.5
17.5	19.4	17.97
20	17.2	18.5
22.5	14.4	17
25	13.8	14.6
27.5	12.7	13.3
30	11.6	13.1

Lake: Lake of the Woods (Branch Co.)

7/6/2021





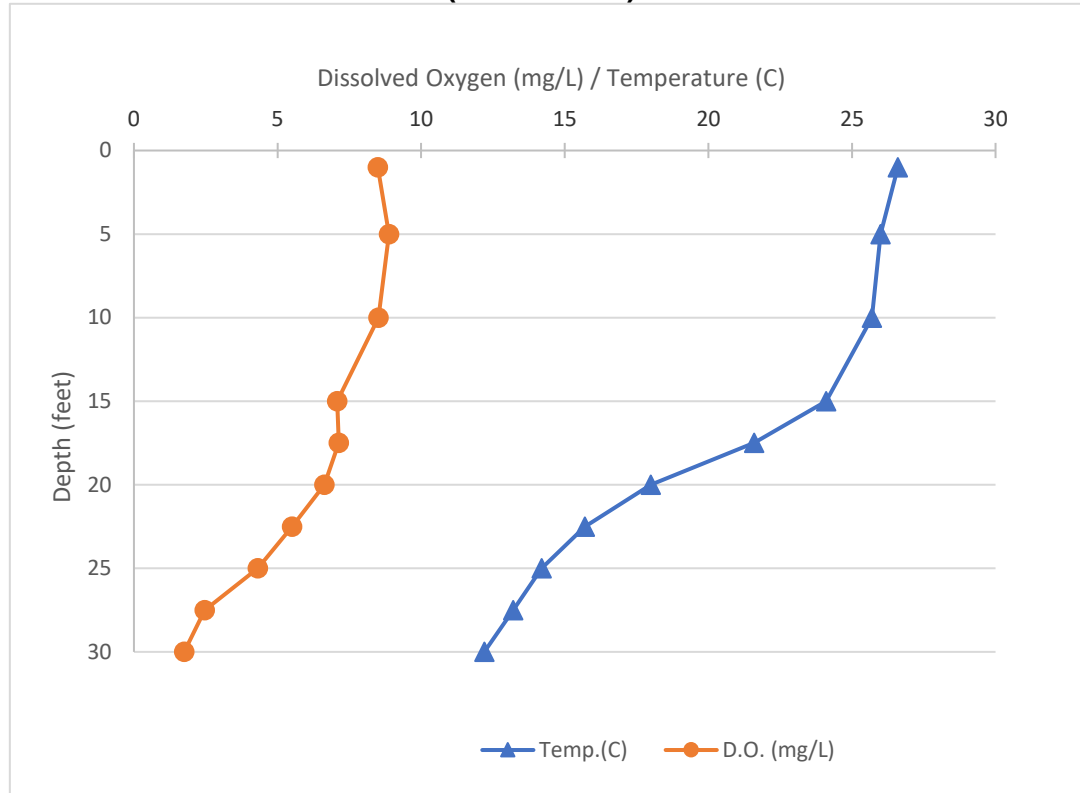
Name: Lake of the Woods  
County: Branch  
Site ID: 120111  
Date: 7/23/2021

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	26.6	8.49
5	26	8.88
10	25.7	8.51
15	24.1	7.08
17.5	21.6	7.13
20	18	6.63
22.5	15.7	5.51
25	14.2	4.31
27.5	13.2	2.47
30	12.2	1.75

Lake: Lake of the Woods (Branch Co.)

7/23/2021



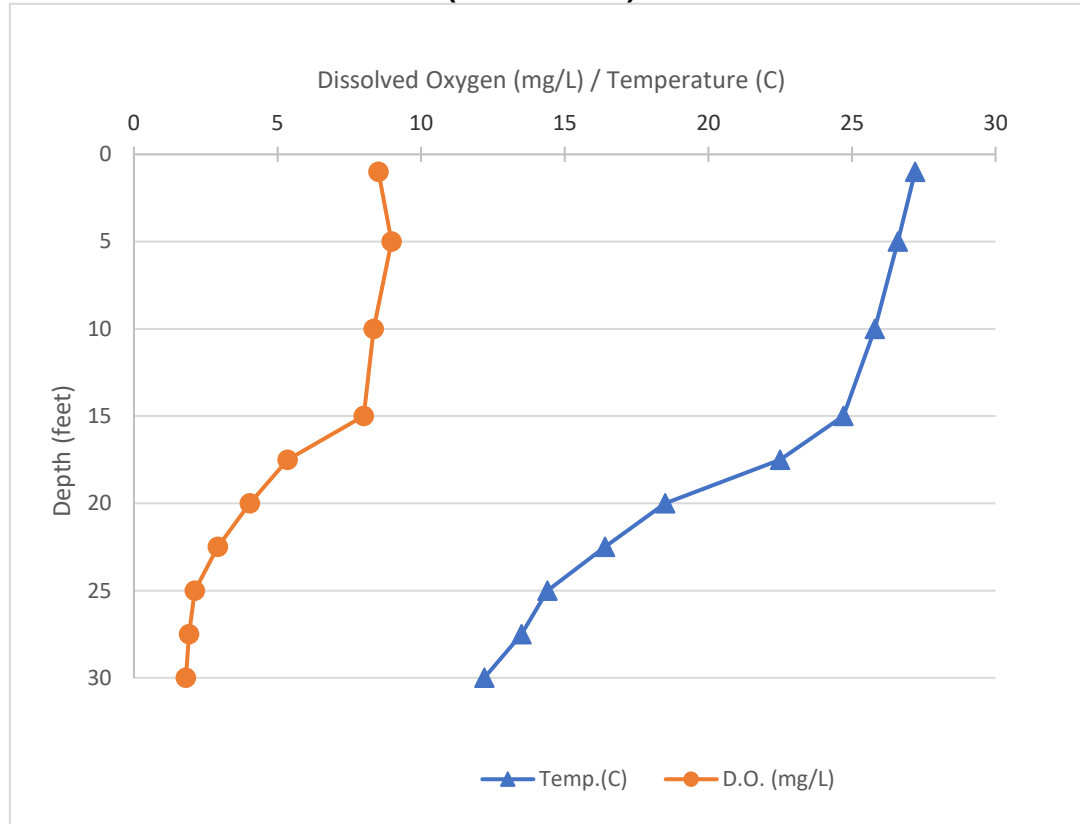
Name: Lake of the Woods  
County: Branch  
Site ID: 120111  
Date: 8/5/2021

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	27.2	8.52
5	26.6	8.97
10	25.8	8.35
15	24.7	8
17.5	22.5	5.35
20	18.5	4.04
22.5	16.4	2.92
25	14.4	2.12
27.5	13.5	1.92
30	12.2	1.81

Lake: Lake of the Woods (Branch Co.)

8/5/2021



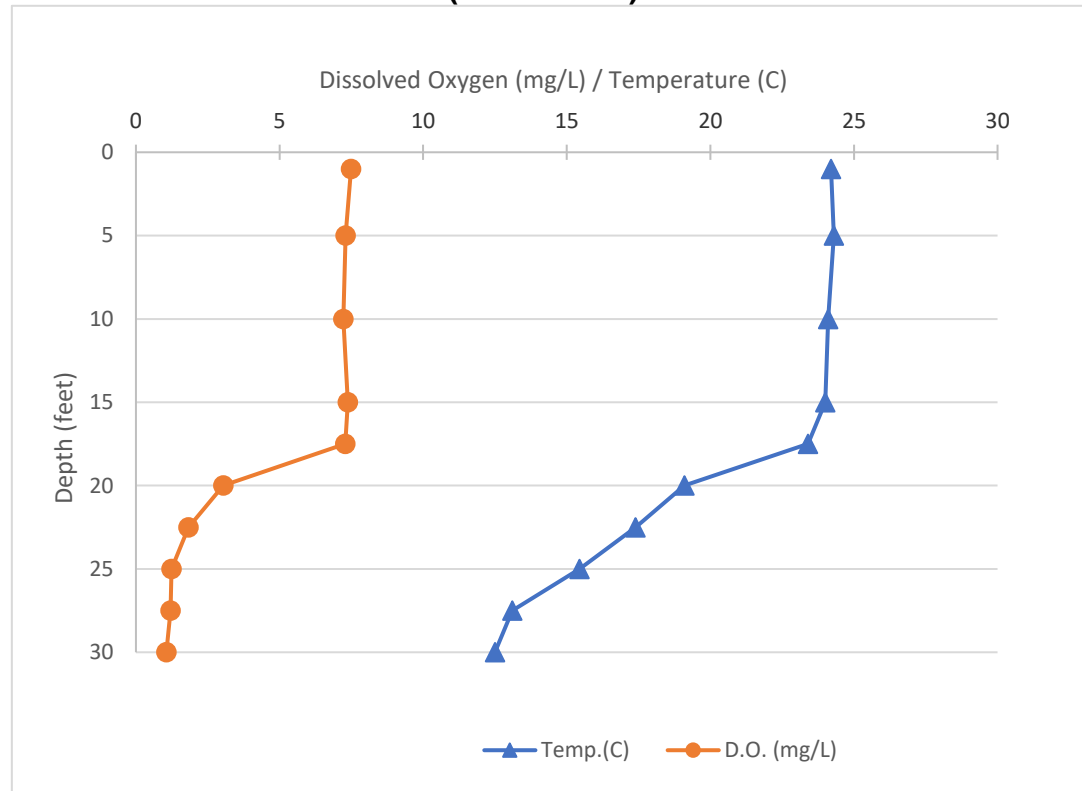
Name: Lake of the Woods  
 County: Branch  
 Site ID: 120111  
 Date: 8/19/2021

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	24.2	7.49
5	24.3	7.3
10	24.1	7.22
15	24	7.38
17.5	23.4	7.29
20	19.1	3.04
22.5	17.4	1.83
25	15.44	1.24
27.5	13.1	1.21
30	12.5	1.06

Lake: Lake of the Woods (Branch Co.)

8/19/2021



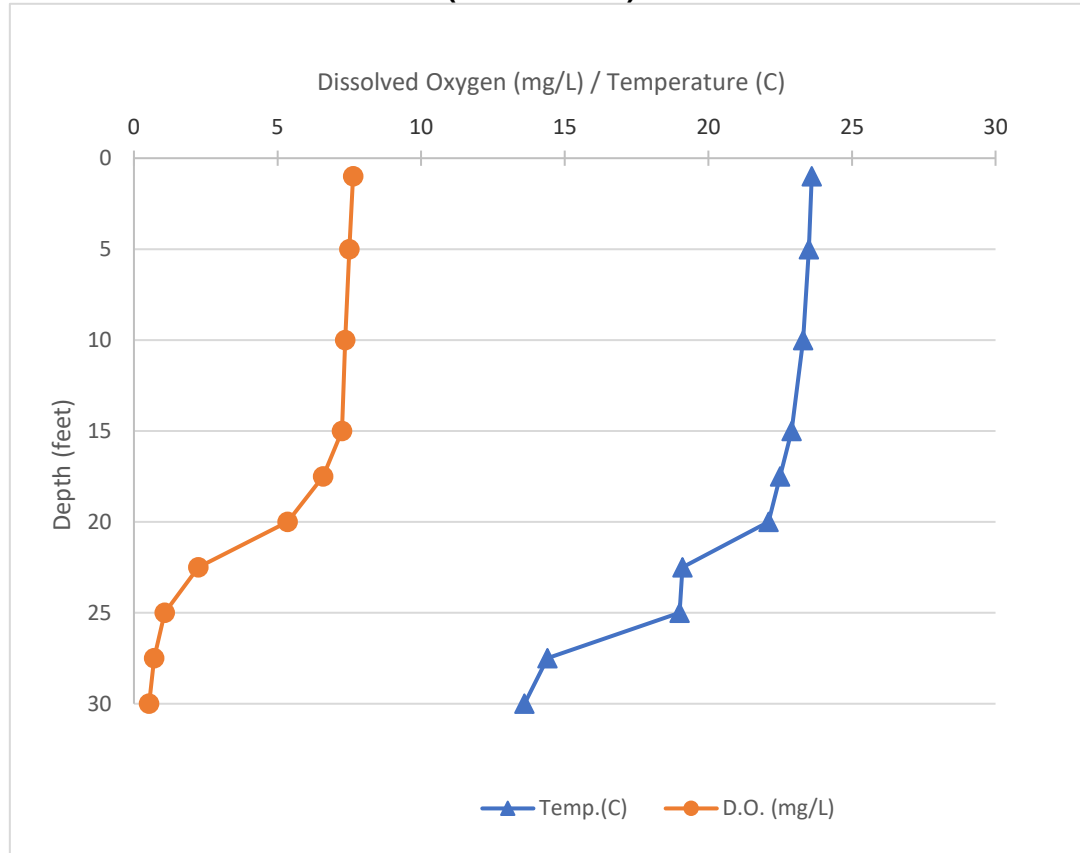
Name: Lake of the Woods  
 County: Branch  
 Site ID: 120111  
 Date: 9/2/2021

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.6	7.63
5	23.5	7.5
10	23.3	7.36
15	22.9	7.25
17.5	22.5	6.59
20	22.1	5.35
22.5	19.1	2.24
25	19	1.07
27.5	14.4	0.7
30	13.6	0.53

Lake: Lake of the Woods (Branch Co.)

9/2/2021



Name: Lake of the Woods  
County: Branch  
Site ID: 120111  
Date: 9/17/2021

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.6	7.6
5	23.5	7.73
10	23.3	7.54
15	23	7.33
17.5	22.8	7.14
20	22.5	6.96
22.5	22.3	6.29
25	22	5.04
27.5	16.83	1.54
30	15.6	0.73

Lake: Lake of the Woods (Branch Co.)

9/17/2021

