Cooperative Lakes Monitoring Program

Michigan Lakes– Ours to Protect

2019 Data Report for Little Long Lake, Barry County

Site ID: 080279

42.6525°N, 85.5376°W

The CLMP is brought to you by:

Michigan Clean Water Corps

EGLE Michigan Department of Environment, Great Lakes, and Energy

Michigan State University

Huron River Watershed Council

Great Lakes Commission des Grands Lacs

Michigan Lakes and Streams Association

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/sites/63/2019/06/CLMP-Manual-2019update.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: Marcy Knoll Wilmes, Jean Roth, Jo Latimore, Paul Steen, Mike Gallagher, Laura Kaminski, and Erick Elgin

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), MiCorps Program Manager

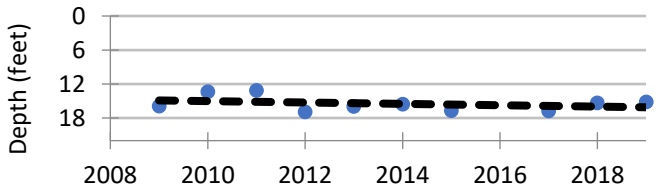
Site ID: 080279

Little Long Lake, Barry County
2019 CLMP Results

Cooperative Lakes Monitoring Program

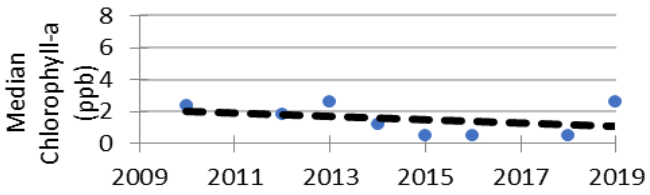
Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2019	14	9.0	27.5	15.1	6.2	38
2014-2018	54	9.5	30.5	15.1	5.6	37
2009-2013	61	6.5	27.5	15.1	3.7	38
2019 All CLMP Lakes	3392	1.5	50.0	12.8	5.8	42



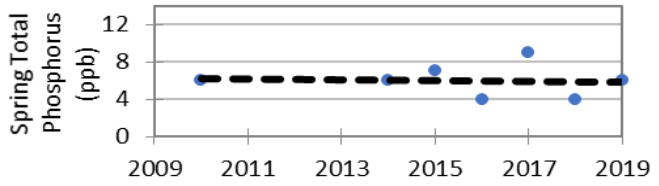
Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Median	Std. Dev	Carlson TSI
2019	5	<1.0	3.4	2.6	1.2	40
2014-2018	22	<1.0	4.5	<1.0	1.2	<31
2010-2013	15	<1.0	3.7	<1.0	1.0	39
2019 All CLMP Lakes	635	< 1.0	42.0	2.2	3.4	39



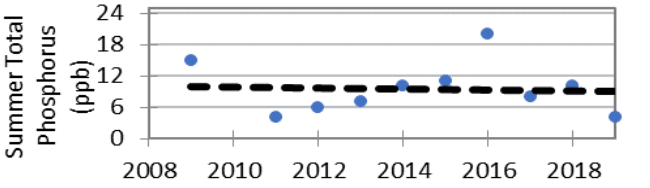
Spring Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev
2019	1	6.0	6.0	6.0	NA
2014-2018	5	<5 T	9.0	6.0	2.1
2010	1	6.0	6.0	6.0	NA
2019 All CLMP Lakes	220	<= 3	100.0	14.9	11.0



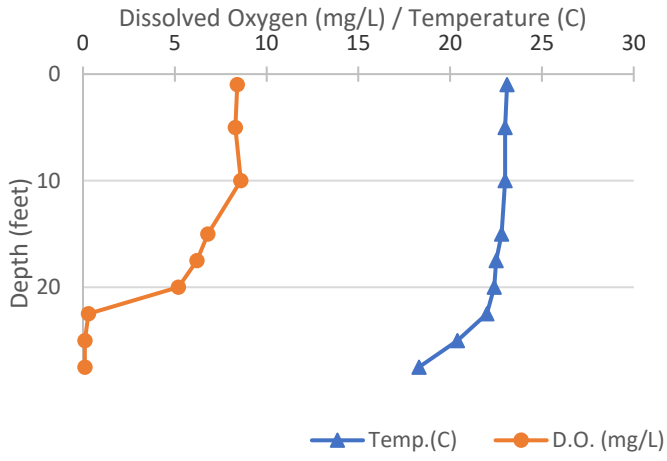
Summer Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2019	1	<5 T	<5 T	<5 T	NA	<27
2014-2018	5	8.0	20.0	11.8	4.7	39
2009-2013	4	<5 T	15.0	8.0	4.8	32
2019 All CLMP Lakes	281	<= 3	65.0	12.8	9.3	38



Dissolved Oxygen and Temperature Profile

8/30/2019



Summary

Average TSI	2019	2014-2018	2009-2013
Little Long Lake	35	36	37
All CLMP Lakes	40	40	41

With an average TSI score of 35 based on 2019 Secchi transparency, chlorophyll-a, and summer total phosphorus data, this lake is rated as an oligotrophic lake.

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.

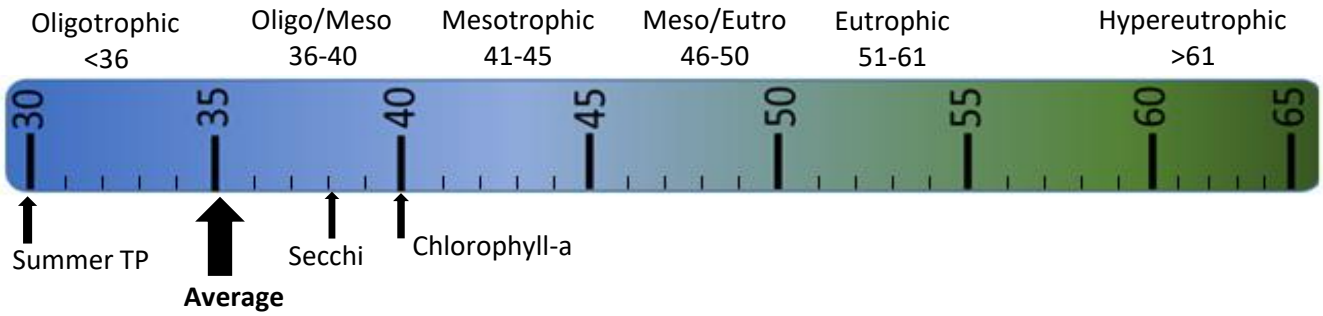
The tables below give the results-to-TSI conversions for the water quality data ranges normally seen in the CLMP. The formulas for this conversion can be found in the CLMP manual: **https://micorps.net/wp-content/uploads/sites/63/2019/06/CLMP-Manual-2019update.pdf**

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 Little Long Lake in 2019	
Average	35
Secchi Disk	38
Summer TP	<27
Chlorophyll-a	40



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: 080279

Little Long Lake, Barry County
2018 CLMP Aquatic Plant Results

The Aquatic Plant Identification and Mapping survey was conducted on Little Long Lake in 2018.

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 11 transects (33 locations) in Little Long Lake in 2018. Below is a list of species reported in order of relative abundance. Survey conducted July 23 - August 26, 2018.

Little Long Lake, Barry County
2018 Aquatic Plant Identification and Mapping: Species Reported

Common Name	Latin name	Average Density*
Sago pondweed	*Stuckenia pectinata*	3.36
Stonewort/muskgrass	*Chara* sp.	3.03
Spiny naiad	*Najas marina*	2.12
Wild celery	*Vallisneria americana*	0.70
Illinois pondweed	*Potamogeton illinoensis*	0.55
Common bladderwort	*Utricularia vulgaris*	0.39
Whitestem pondweed	*Potamogeton praelongus*	0.39
Flat-leaved bladderwort	*Utricularia intermedia*	0.36
Bushy pondweed	*Najas flexilis*	0.24
Native milfoil	*Myriophyllum* sp.	0.12
Fine-leaf pondweed	*Stuckenia filiformis*	0.12
Variable pondweed	*Potamogeton gramineus*	0.09
Floating-leaf pondweed	*Potamogeton natans*	0.09
Large purple bladderwort	*Utricularia purpurea*	0.09
White water lily	*Nymphaea odorata*	Observed
Bulrushes	(various)	Observed
Jointed spikesedge	*Eleocharis equisetoides*	Observed
Duckweeds	(various)	Observed
Yellow water lily	*Nuphar* sp.	Observed

**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.

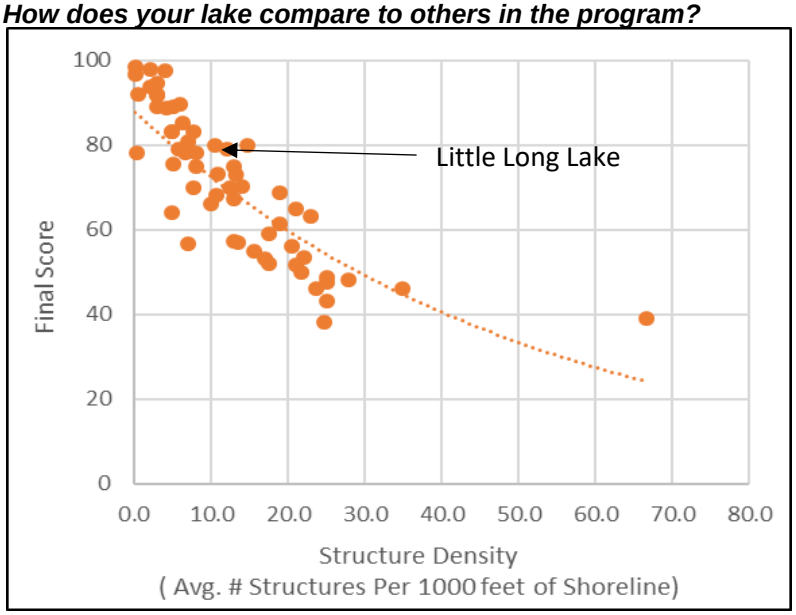
Site ID: 080279

Little Long Lake, Barry County
2019 Score the Shore Results

The Score the Shore Habitat Assessment was conducted on Little Long Lake in 2019.

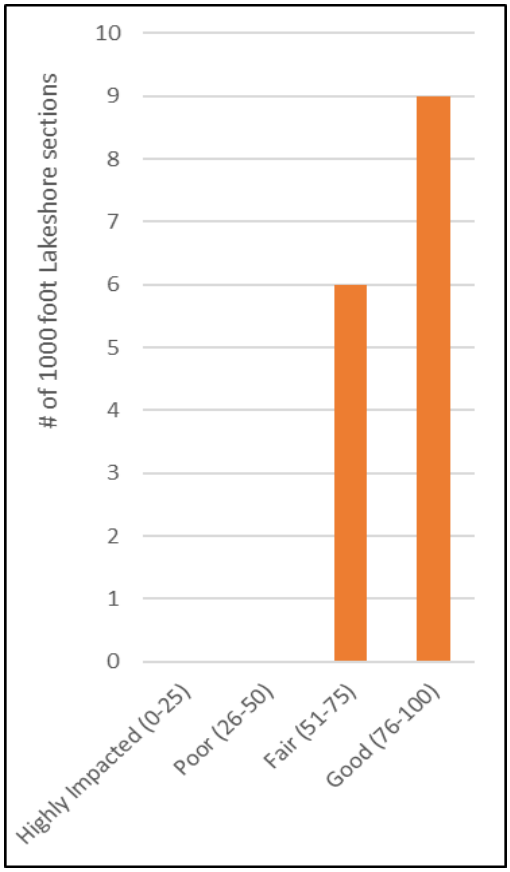
This assessment involves rating 1000 foot sections of shoreline for aquatic vegetation, shoreline vegetation, erosion, and erosion control practices (like sea walls). Each shoreline section is given three scores ranging from 0-100 for the categories of Littoral, Riparian, and Erosion Management. The 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?



Little Long Lake:	
Number of Sections:	15
Number of Structures:	182
Structure Density:	12
Final Score:	79

All 62 Participating Lakes from 2015-2019:	
Avg. Number of Sections:	16
Avg. Number of Structures:	228
Avg. Structure Density:	12.6
Avg. Final Score:	71



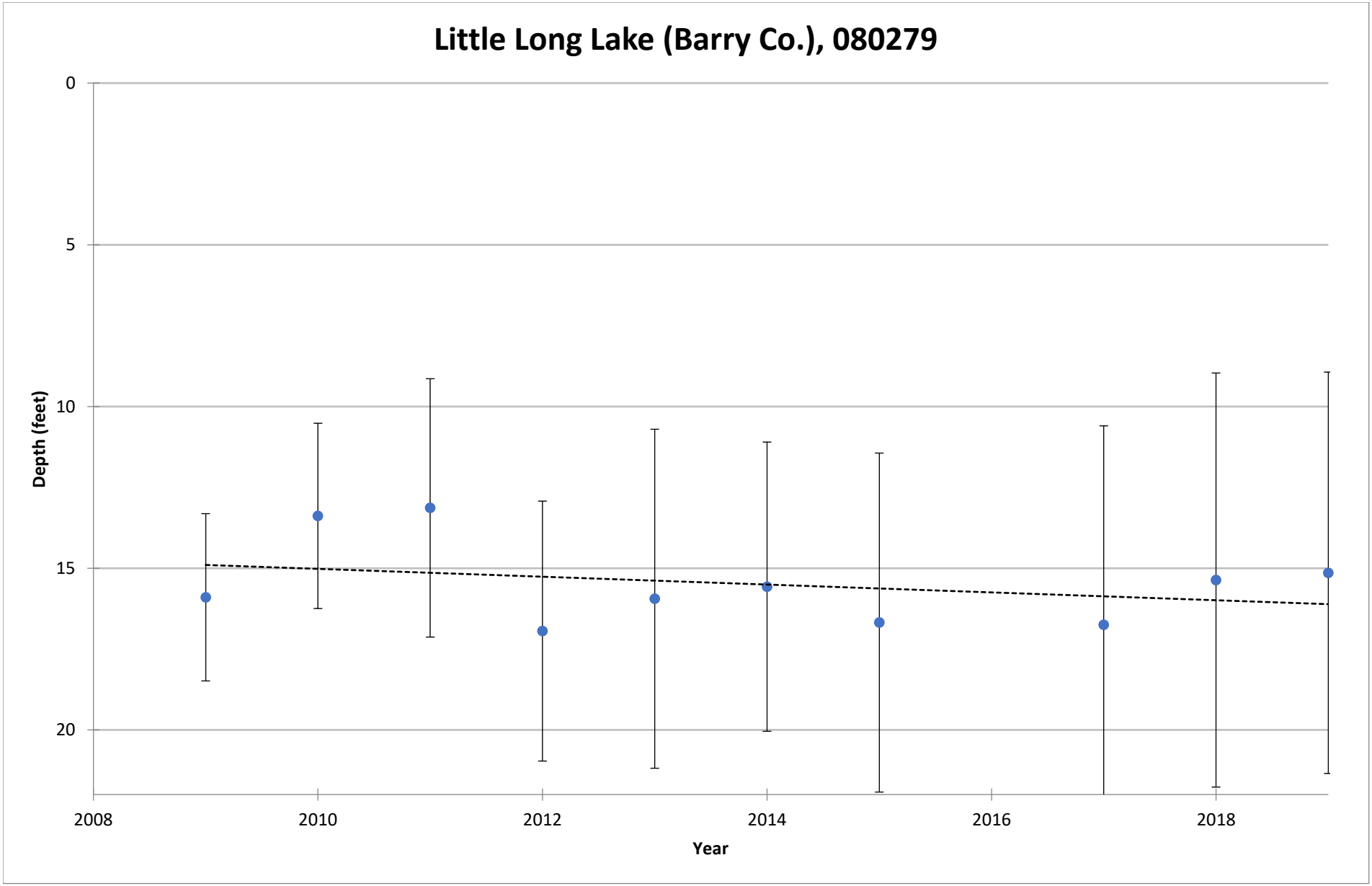
Analysis specific to Little Long Lake:

Overall, the lakeshore habitat of Little Long Lake is doing well and scored higher than average when compared to other lakes in the program. All of the 1000 foot sections scored either Fair or Good: 6 fair, and 9 good.

The lake sections scored highest for erosion control, with an average of 94, meaning that there are a low amount of sea walls, rock rip-rap, and other shoreline erosion structures.

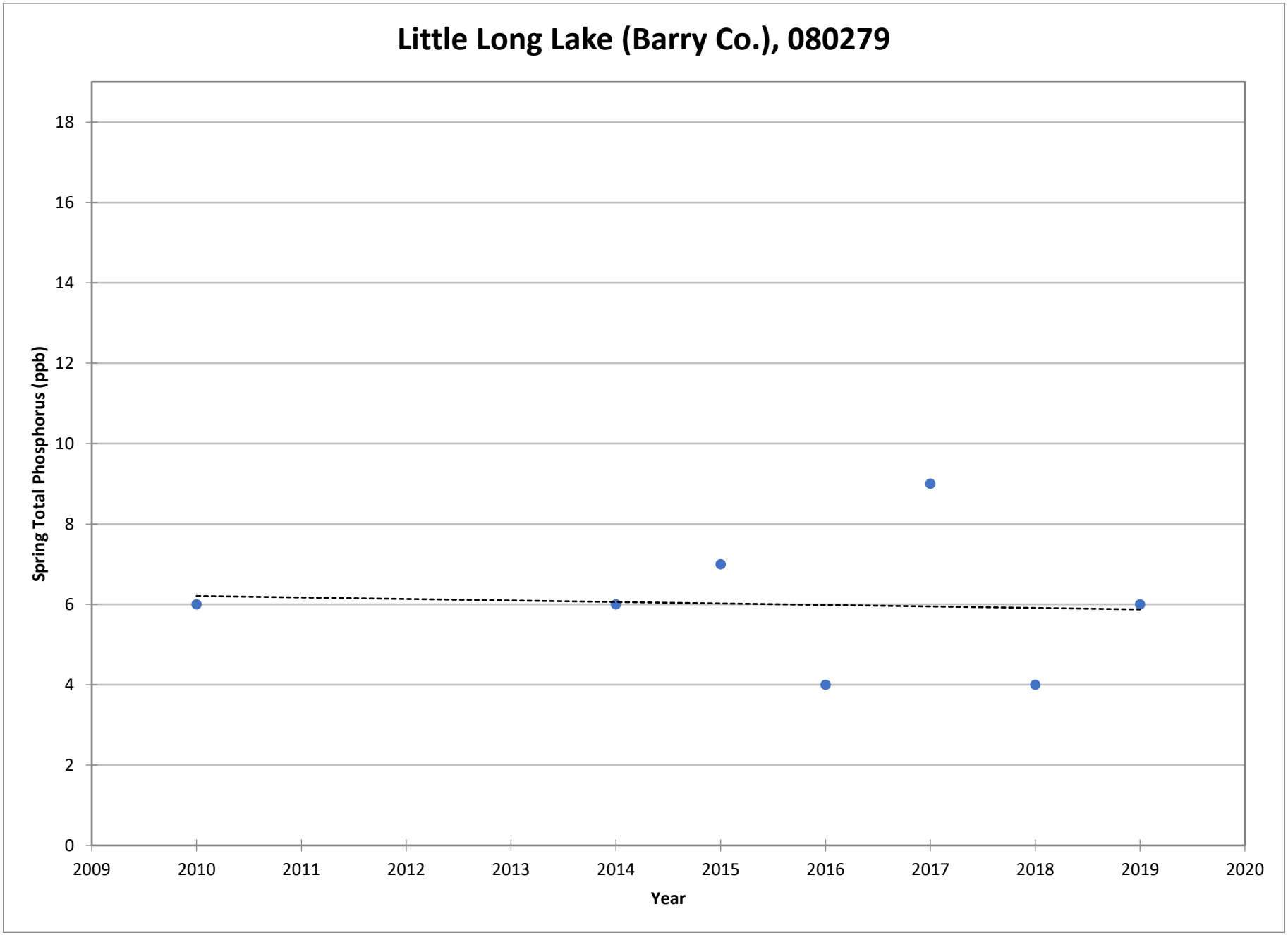
The riparian zone was the weak point in Little Long's score (scoring an average of 63). Reduce the amount of mowed grass and increase the amount of unmowed native vegetation along the lakeshore to boost this aspect of the shoreline habitat.

COOPERATIVE LAKES MONITORING PROGRAM
SUMMER MEAN TRANSPARENCY

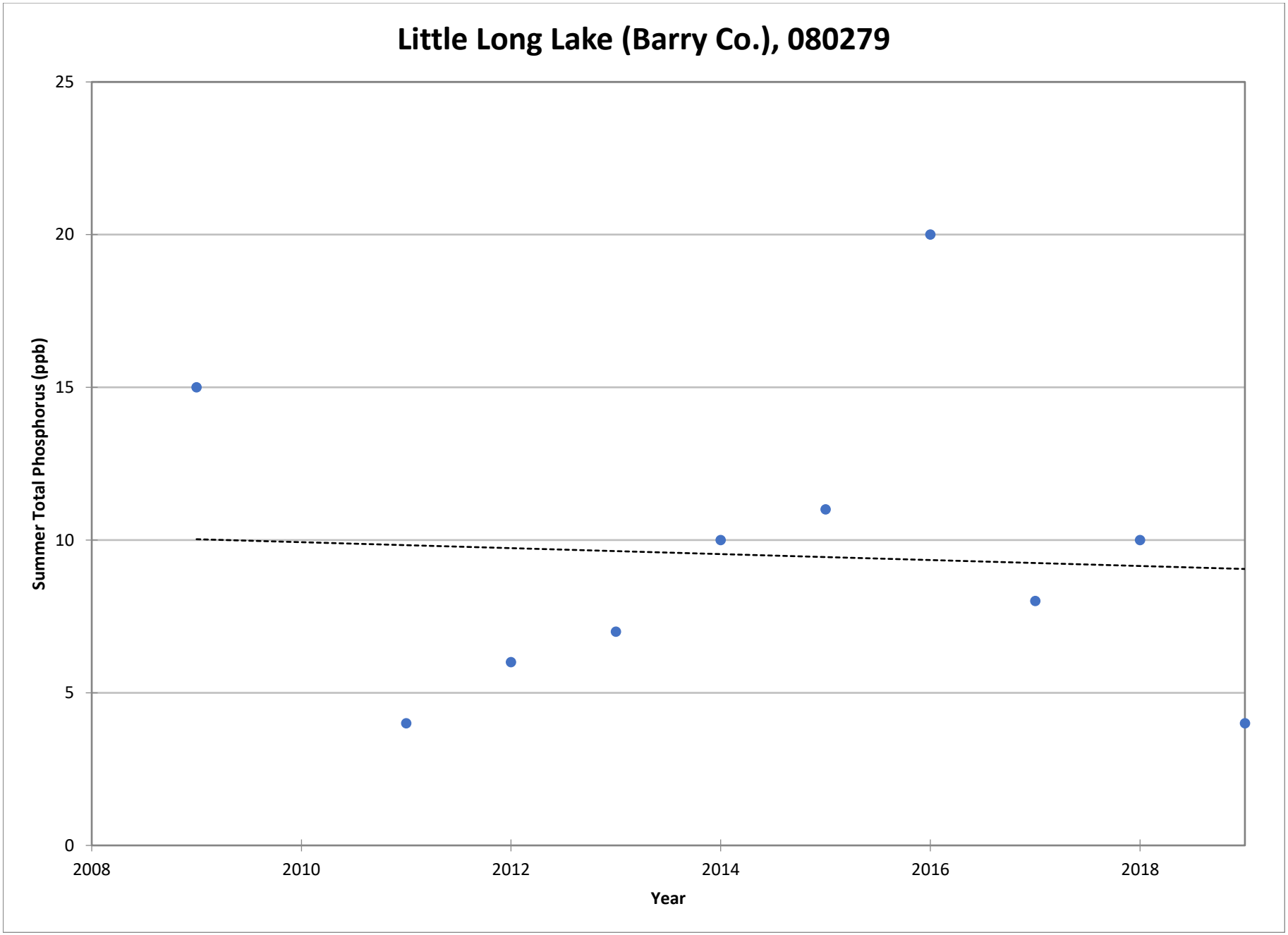


Vertical bars indicate standard deviation

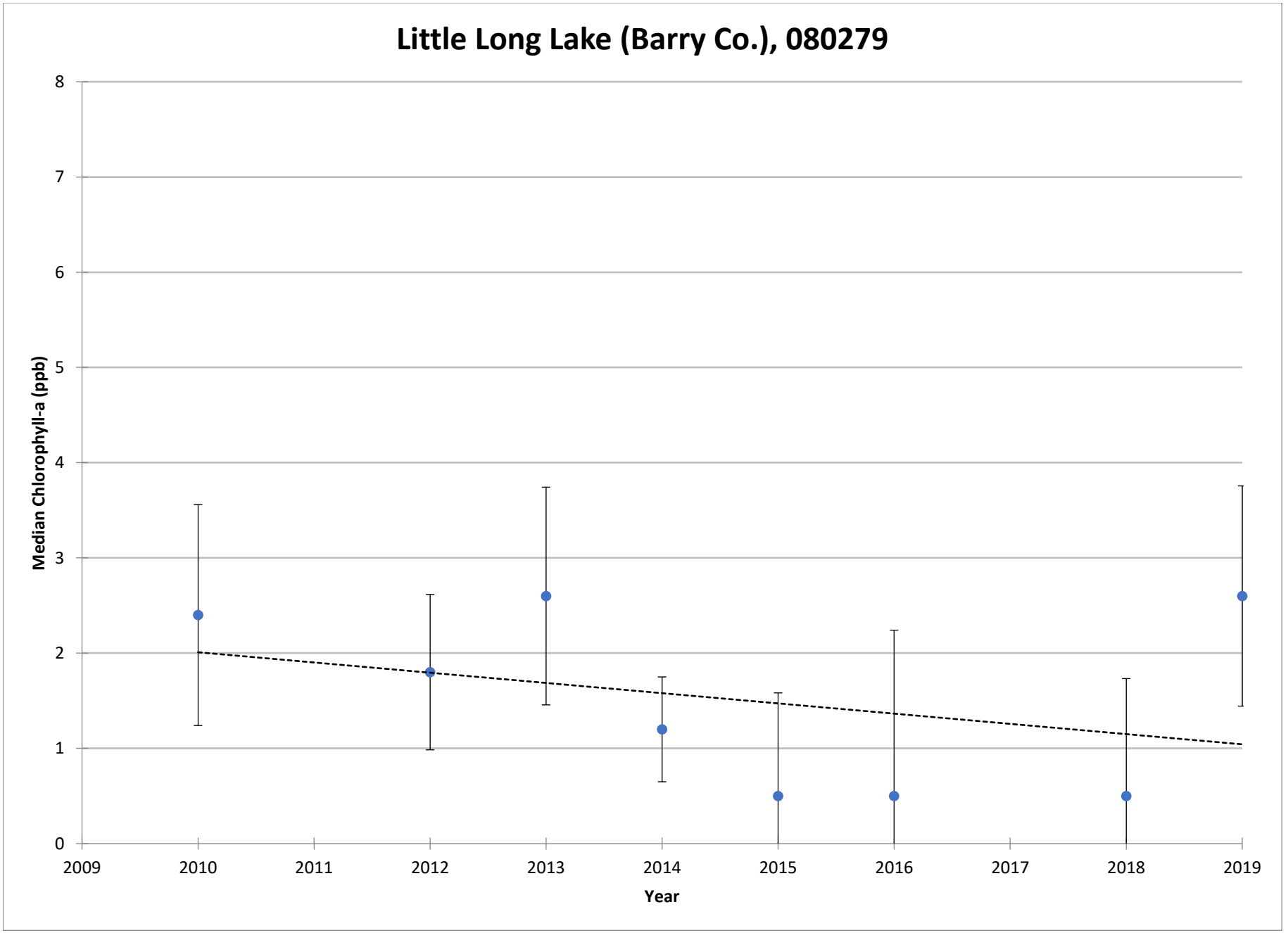
COOPERATIVE LAKES MONITORING PROGRAM
SPRING TOTAL PHOSPHORUS



COOPERATIVE LAKES MONITORING PROGRAM
SUMMER TOTAL PHOSPHORUS



COOPERATIVE LAKES MONITORING PROGRAM
SUMMER MEDIAN CHLOROPHYLL-A



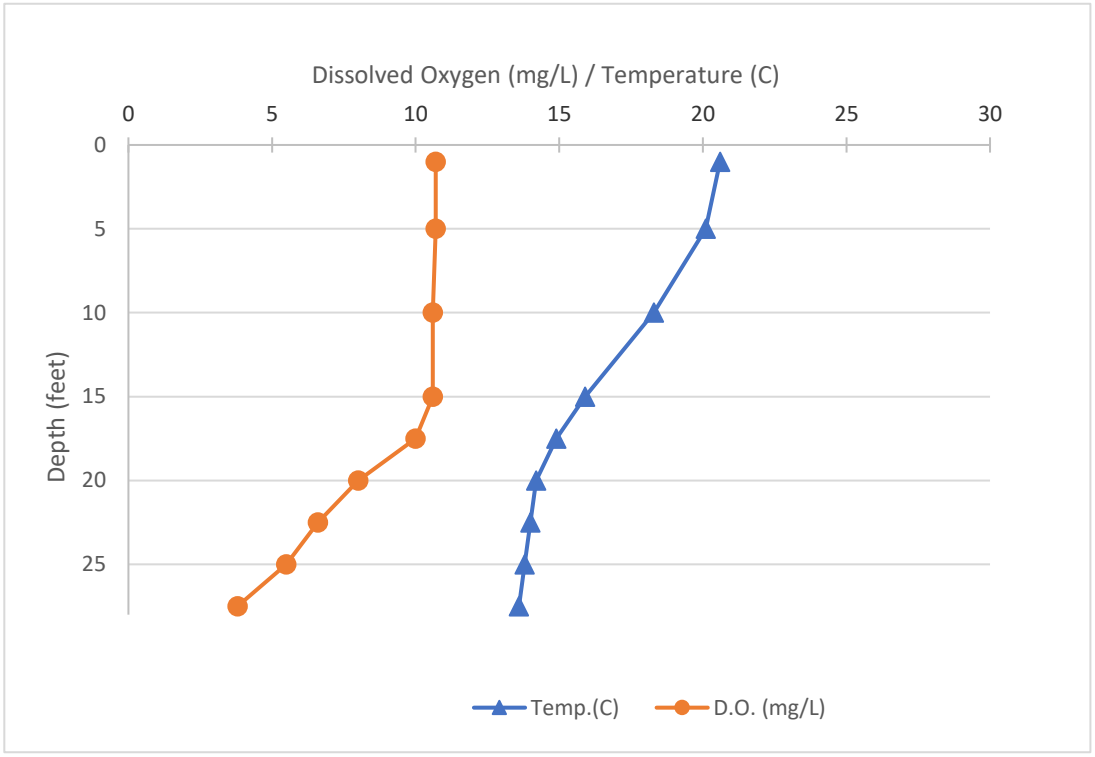
Vertical bars indicate standard deviation

Name: Little Long Lake
County: Barry
Site ID: 80279
Date: 5/26/2019

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	20.6	10.7
5	20.1	10.7
10	18.3	10.6
15	15.9	10.6
17.5	14.9	10
20	14.2	8
22.5	14	6.6
25	13.8	5.5
27.5	13.6	3.8

Lake: Little Long Lake (Barry Co.) **5/26/2019**

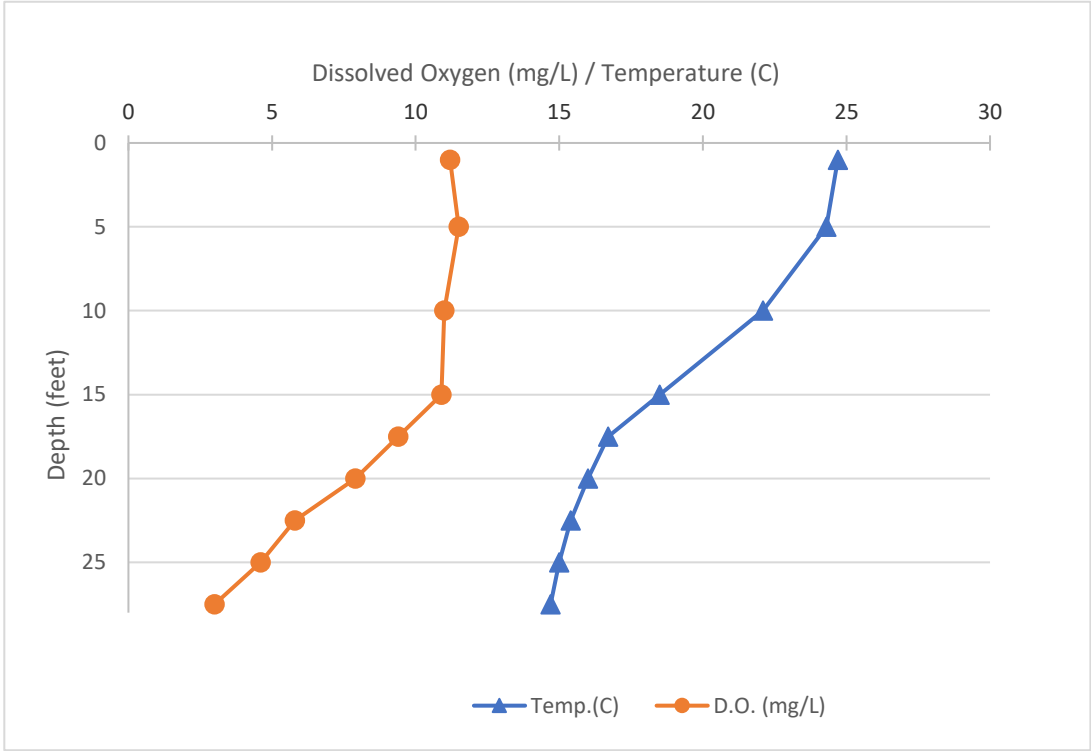


Name: Little Long Lake
County: Barry
Site ID: 80279
Date: 6/7/2019

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	24.7	11.2
5	24.3	11.5
10	22.1	11
15	18.5	10.9
17.5	16.7	9.4
20	16	7.9
22.5	15.4	5.8
25	15	4.6
27.5	14.7	3

Lake: Little Long Lake (Barry Co.) **6/7/2019**

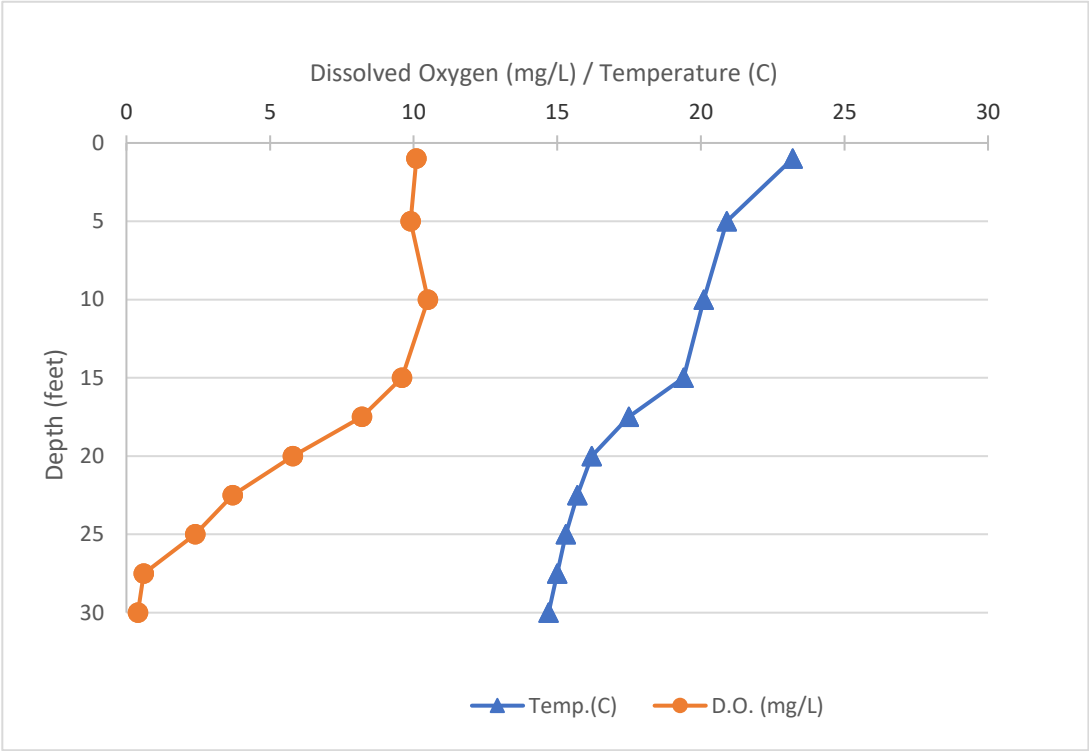


Name: Little Long Lake
County: Barry
Site ID: 80279
Date: 6/18/2019

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.2	10.1
1	23.2	10.1
5	20.9	9.9
5	20.9	9.9
10	20.1	10.5
10	20.1	10.5
15	19.4	9.6
15	19.4	9.6
17.5	17.5	8.2
17.5	17.5	8.2
20	16.2	5.8
20	16.2	5.8
22.5	15.7	3.7
22.5	15.7	3.7
25	15.3	2.4
25	15.3	2.4
27.5	15	0.6
27.5	15	0.6
30	14.7	0.4
30	14.7	0.4

Lake: Little Long Lake (Barry Co.) **6/18/2019**

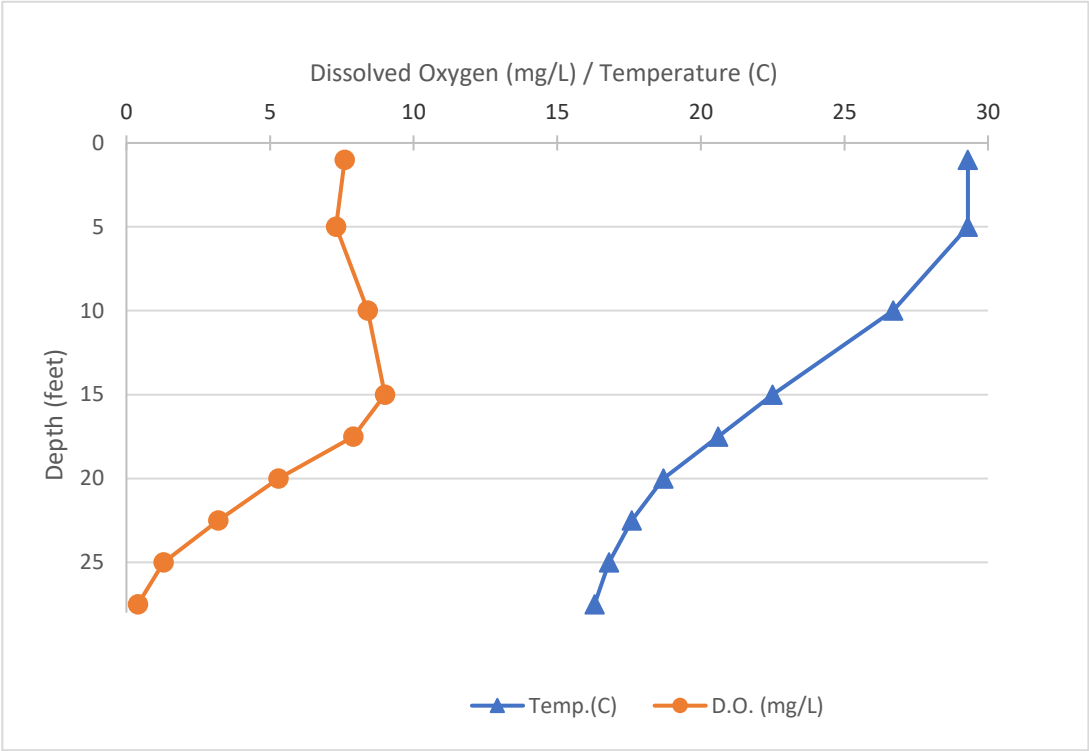


Name: Little Long Lake
County: Barry
Site ID: 80279
Date: 7/6/2019

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	29.3	7.6
5	29.3	7.3
10	26.7	8.4
15	22.5	9
17.5	20.6	7.9
20	18.7	5.3
22.5	17.6	3.2
25	16.8	1.3
27.5	16.3	0.4

Lake: Little Long Lake (Barry Co.) **7/6/2019**

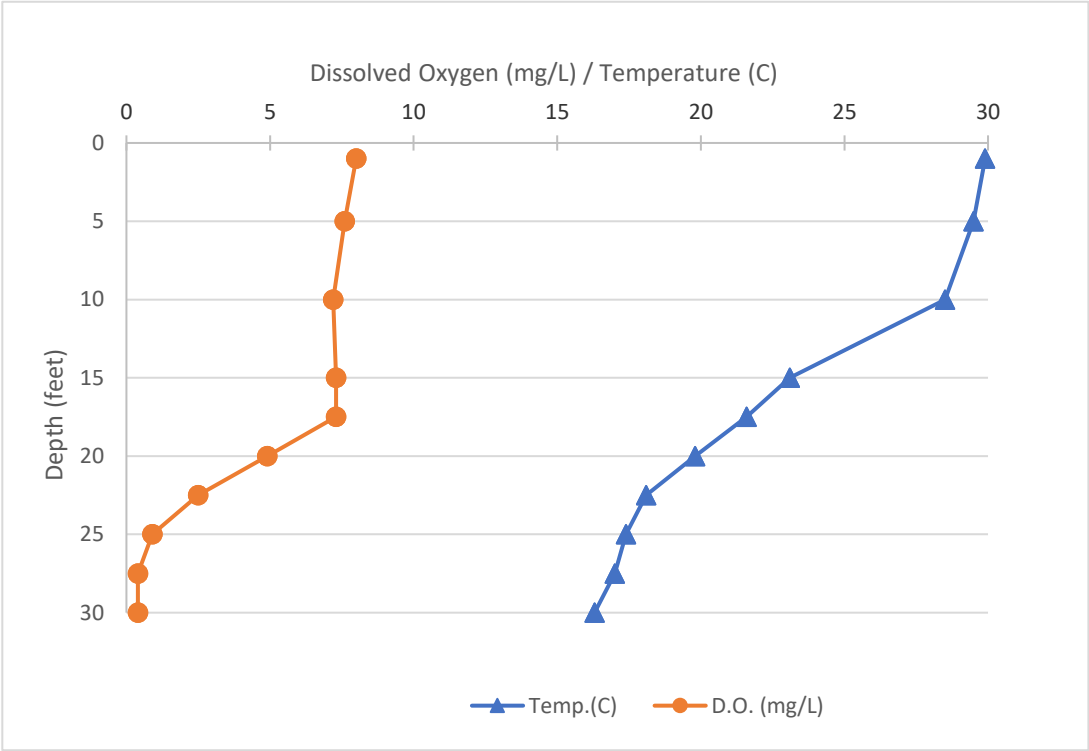


Name: Little Long Lake
County: Barry
Site ID: 80279
Date: 7/17/2019

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	29.9	8
1	29.9	8
5	29.5	7.6
5	29.5	7.6
10	28.5	7.2
10	28.5	7.2
15	23.1	7.3
15	23.1	7.3
17.5	21.6	7.3
17.5	21.6	7.3
20	19.8	4.9
20	19.8	4.9
22.5	18.1	2.5
22.5	18.1	2.5
25	17.4	0.9
25	17.4	0.9
27.5	17	0.4
27.5	17	0.4
30	16.3	0.4
30	16.3	0.4

Lake: Little Long Lake (Barry Co.) **7/17/2019**

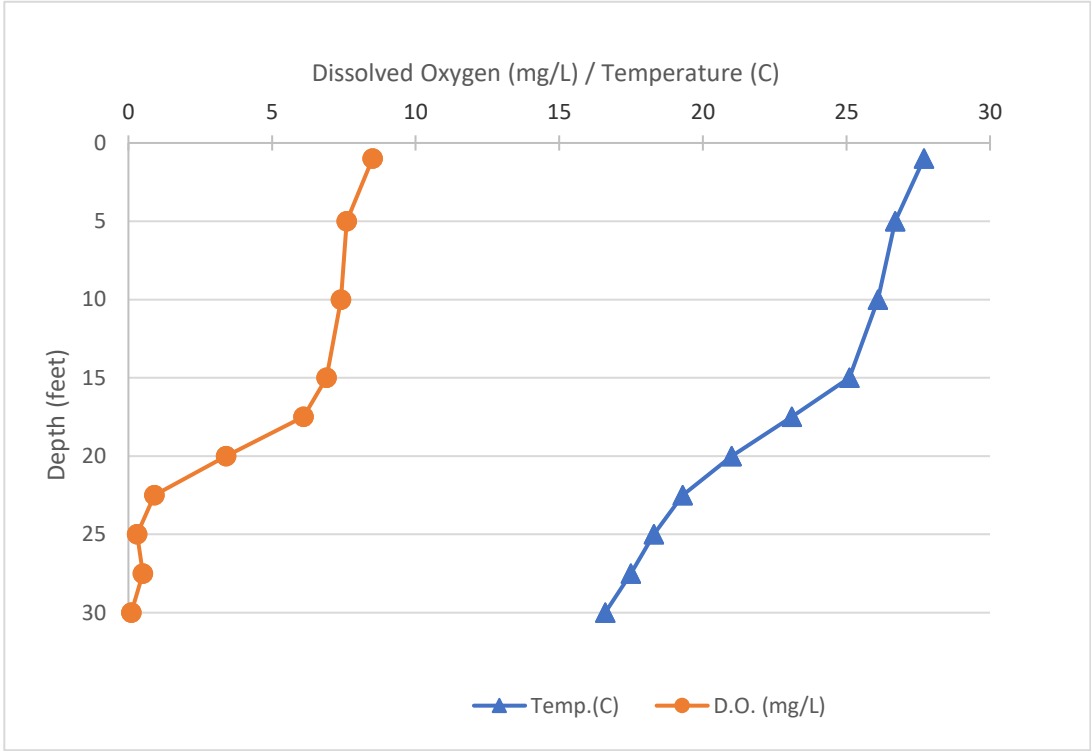


Name: Little Long Lake
County: Barry
Site ID: 80279
Date: 8/1/2019

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	27.7	8.5
1	27.7	8.5
5	26.7	7.6
5	26.7	7.6
10	26.1	7.4
10	26.1	7.4
15	25.1	6.9
15	25.1	6.9
17.5	23.1	6.1
17.5	23.1	6.1
20	21	3.4
20	21	3.4
22.5	19.3	0.9
22.5	19.3	0.9
25	18.3	0.3
25	18.3	0.3
27.5	17.5	0.5
27.5	17.5	0.5
30	16.6	0.1
30	16.6	0.1

Lake: Little Long Lake (Barry Co.) **8/1/2019**

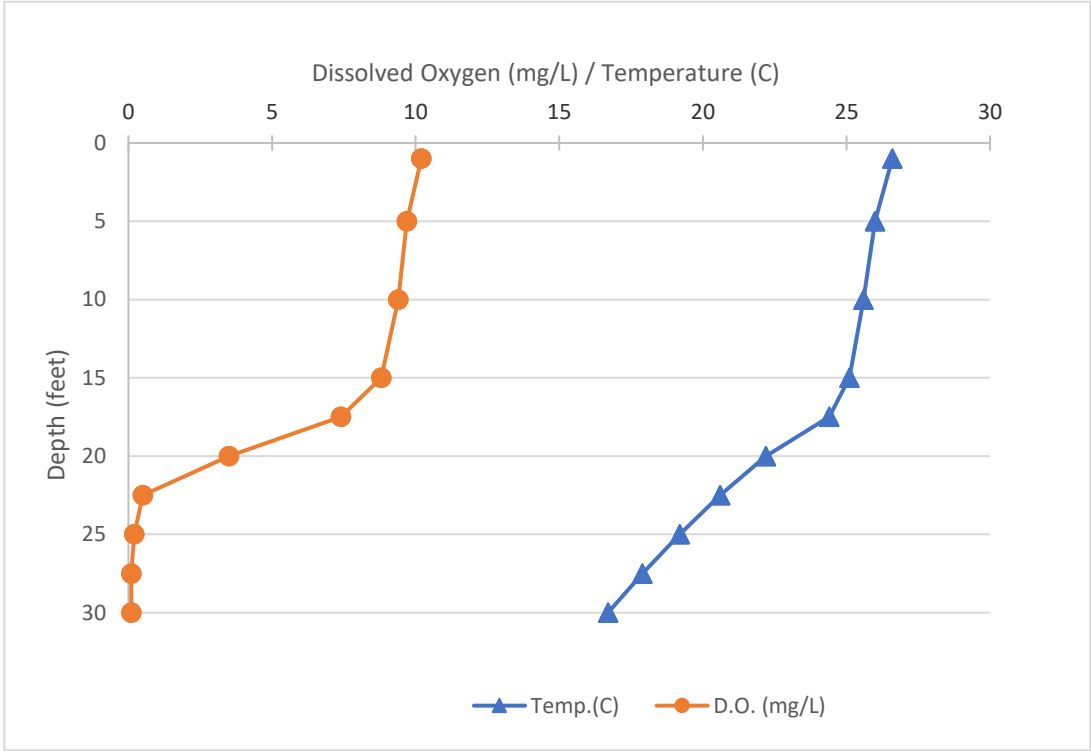


Name: Little Long Lake
County: Barry
Site ID: 80279
Date: 8/16/2019

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	26.6	10.2
1	26.6	10.2
5	26	9.7
5	26	9.7
10	25.6	9.4
10	25.6	9.4
15	25.1	8.8
15	25.1	8.8
17.5	24.4	7.4
17.5	24.4	7.4
20	22.2	3.5
20	22.2	3.5
22.5	20.6	0.5
22.5	20.6	0.5
25	19.2	0.2
25	19.2	0.2
27.5	17.9	0.1
27.5	17.9	0.1
30	16.7	0.1
30	16.7	0.1

Lake: Little Long Lake (Barry Co.) **8/16/2019**

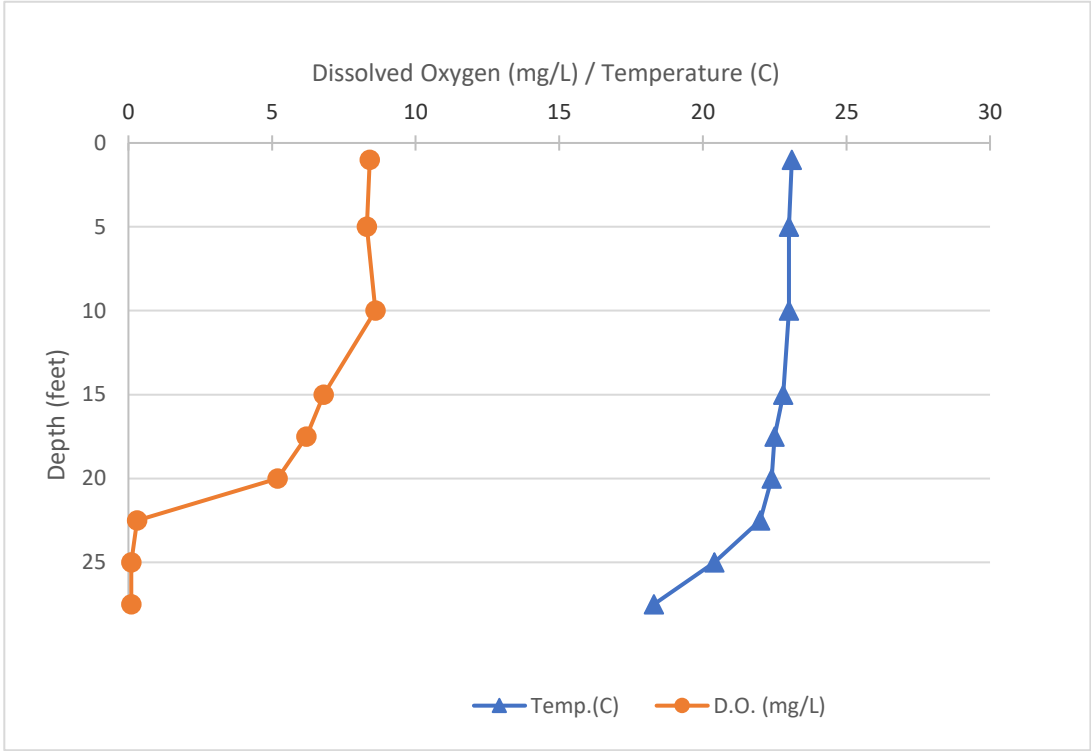


Name: Little Long Lake
County: Barry
Site ID: 80279
Date: 8/30/2019

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.1	8.4
5	23	8.3
10	23	8.6
15	22.8	6.8
17.5	22.5	6.2
20	22.4	5.2
22.5	22	0.3
25	20.4	0.1
27.5	18.3	0.1

Lake: Little Long Lake (Barry Co.) **8/30/2019**



Name: Little Long Lake
County: Barry
Site ID: 80279
Date: 9/14/2019

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.1	8.3
5	23	8.1
10	22.8	8
15	22.5	7.5
17.5	21.8	5.9
20	21.6	3.8
22.5	21.3	1.9
25	20.8	0.1
27.5	19.1	0.1

Lake: Little Long Lake (Barry Co.) **9/14/2019**