Cooperative Lakes Monitoring Program

Michigan Lakes– Ours to Protect

2024 Data Report for Stony Lake, Oceana County

Site ID: 640049

43.5606°N, 86.4861°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

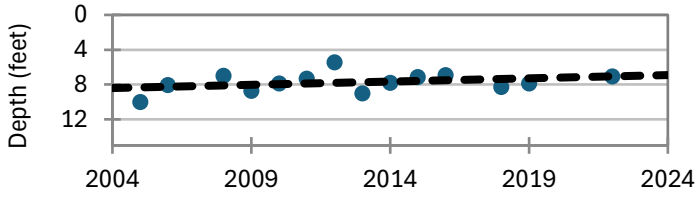
Site ID: 640049

Stony Lake, Oceana County
2024 CLMP Results

Cooperative Lakes Monitoring Program

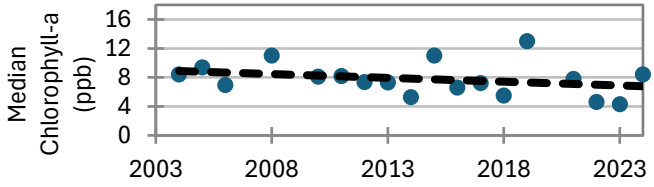
Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2024	5*	5.0	10.5			
2019-2023	29	3.0	13.0	7.5	2.2	48
2004-2018	271	1.5	19.0	7.8	2.3	48
2024 All CLMP Lakes	3348	0.5	85.0	11.7	6.2	43



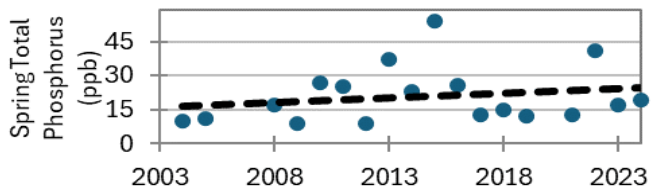
Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Median	Std. Dev	Carlson TSI
2024	4	1.5	11.0	8.4	4.2	51
2019-2023	19	1.5	16.0	6.2	4.1	48
2004-2018	62	2.5	35.0	6.2	4.4	50
2024 All CLMP Lakes	708	< 1.0	63.0	2.8	7.3	41



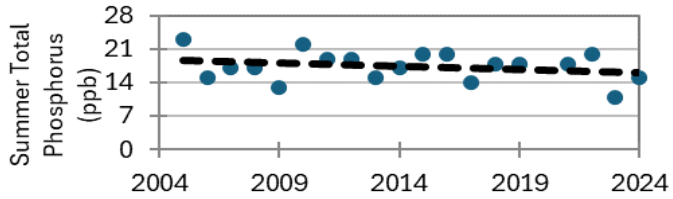
Spring Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev
2024	1	19.0	19.0	19.0	NA
2019-2023	4	12.0	41.0	20.8	13.7
2004-2018	13	9.0	54.0	21.2	13.1
2024 All CLMP Lakes	259	<= 5	140.0	14.3	39.7

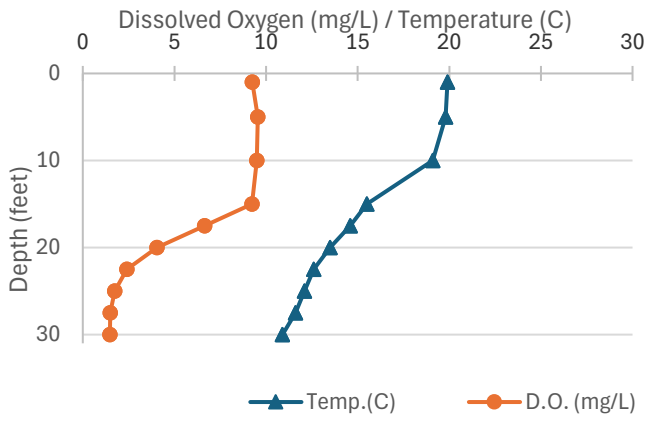


Summer Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2024	1	15.0	15.0	15.0	NA	43
2019-2023	4	11.0	20.0	16.8	3.9	44
2005-2018	14	13.0	23.0	17.8	2.9	45
2024 All CLMP Lakes	200	<= 5	4.0	190.0	14.9	18



Dissolved Oxygen and Temperature Profile



6/11/2024

Summary

Average TSI	2024	2019-2023	2004-2018
Stony Lake	47	47	48
All CLMP Lakes	41	42	40

With an average TSI score of 47 based on 2024 chlorophyll-a and summer total phosphorus data, this lake is rated between the mesotrophic and eutrophic classification. The lake leans slightly more mesotrophic than eutrophic.

Monitoring data indicates that this lake is stratified, and the bottom waters are nearly anoxic by early summer. Spring monitoring data is required to establish the point at which stratification begins.

While the trends for individual parameters are mixed, monitoring data indicates that overall nutrient levels remain largely unchanged since data collection began.

** = 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.

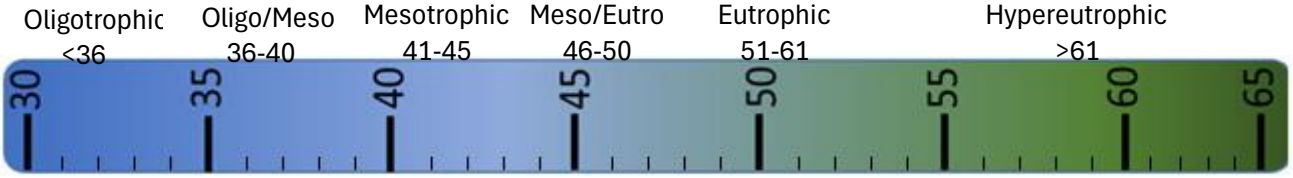
The tables below give the results-to-TSI conversions for the water quality data ranges normally seen in the CLMP. The formulas for this conversion can be found in the CLMP manual (link is on page 2 of this report).

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 Stony Lake in 2024	
Average	47
Secchi Disk	
Summer TP	43
Chlorophyll-a	51



^ Average

^ Total Phosphorus

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

Site ID: 640049

Stony Lake, Oceana County
2014 Exotic Aquatic Plant Watch Results

The Exotic Aquatic Plant Watch was conducted on Stony Lake in 2014.

This survey involves sampling at multiple locations around the lake to detect new invaders, and document the extent of known invaders. While notes on other plant species may be recorded during the survey, the effort focuses on four highly invasive species: Eurasian watermilfoil (*Myriophyllum spicatum*), starry stonewort (*Nitellopsis obtusa*), curly-leaf pondweed (*Potamogeton crispus*), and Hydrilla (*Hydrilla verticillata*).

The table below summarizes the results of the 2014 Exotic Aquatic Plant Watch on Stony Lake.

Stony Lake, Oceana County

2014 Exotic Aquatic Plant Watch Results

Survey Date(s): Multiple, Summer 2014

Species	Status	Comments
Eurasian watermilfoil	FOUND	A single plant; active management in progress
Starry stonewort	Not found	
Curly-leaf pondweed	FOUND	Sparse to common across several locations
Hydrilla	Not found	

Visit the MiCorps Data Exchange (https://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.

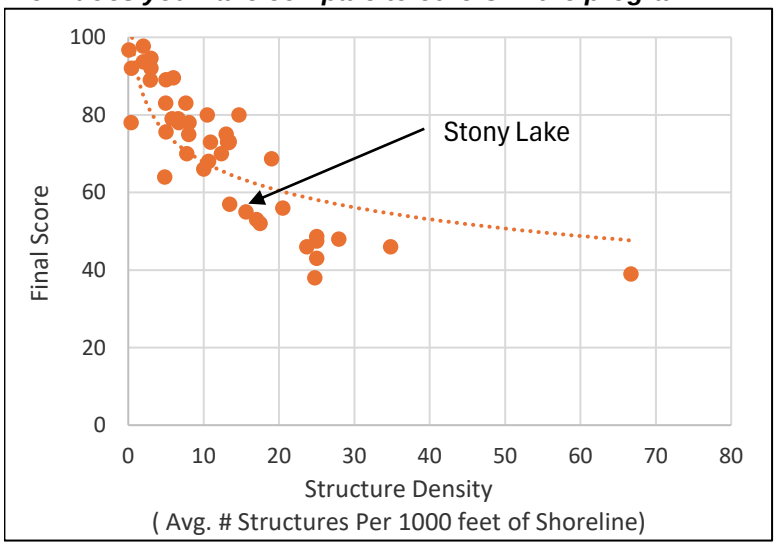
Site ID: 640049

Stony Lake, Oceana County
2016 Score the Shore Results

The Score the Shore Habitat Assessment was conducted on Stony Lake in 2015.

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?



Stony Lake:	
Number of Sections:	40
Number of Structures:	312
Structure Density:	15.6
Final Score:	55

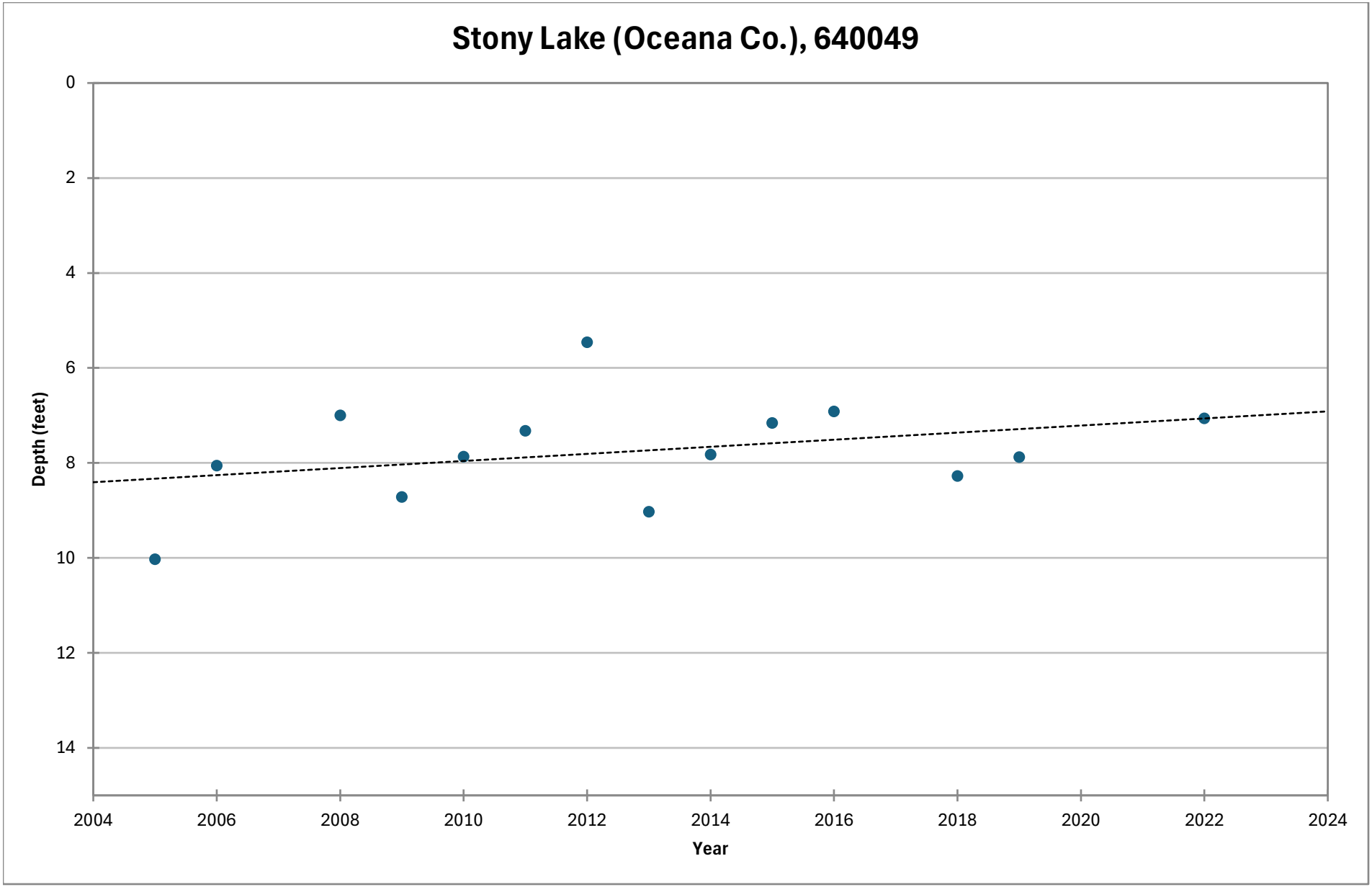
All 42 Participating Lakes from 2015-2018:	
Avg. Number of Sections:	16.3
Avg. Number of Structures:	248.5
Avg. Structure Density:	15.2
Avg. Final Score:	70.5

Analysis specific to Stony Lake:

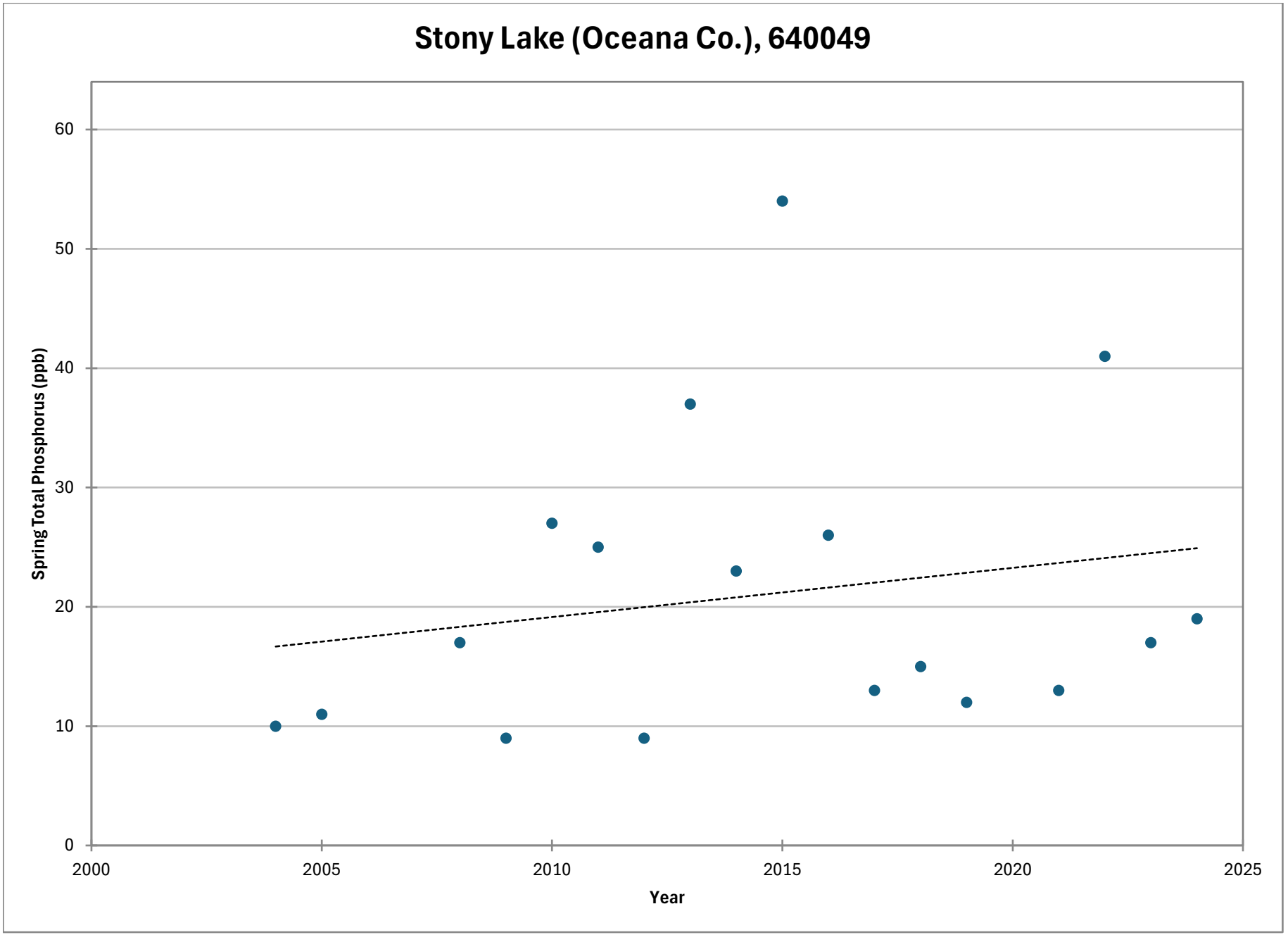
Stony Lake, overall, falls into the “Fair” range for lakeshore habitat. There is certainly degradation present, but there are some nice areas as well. Three sections are considered good, 7 are fair, but 10 are poor. The worst scoring section was section 2, which had a total score of 37 (littoral score of 31, riparian score of 36, and shoreline management score of 45).

The weakest point of Stony Lake assessment was the riparian zone (land adjacent to the water). If residents are interested in increasing the habitat score, boosting the riparian score would be the first priority. Reducing the amount of mowed grass and increasing the amount of unmowed native vegetation is the primary way to make these improvements.

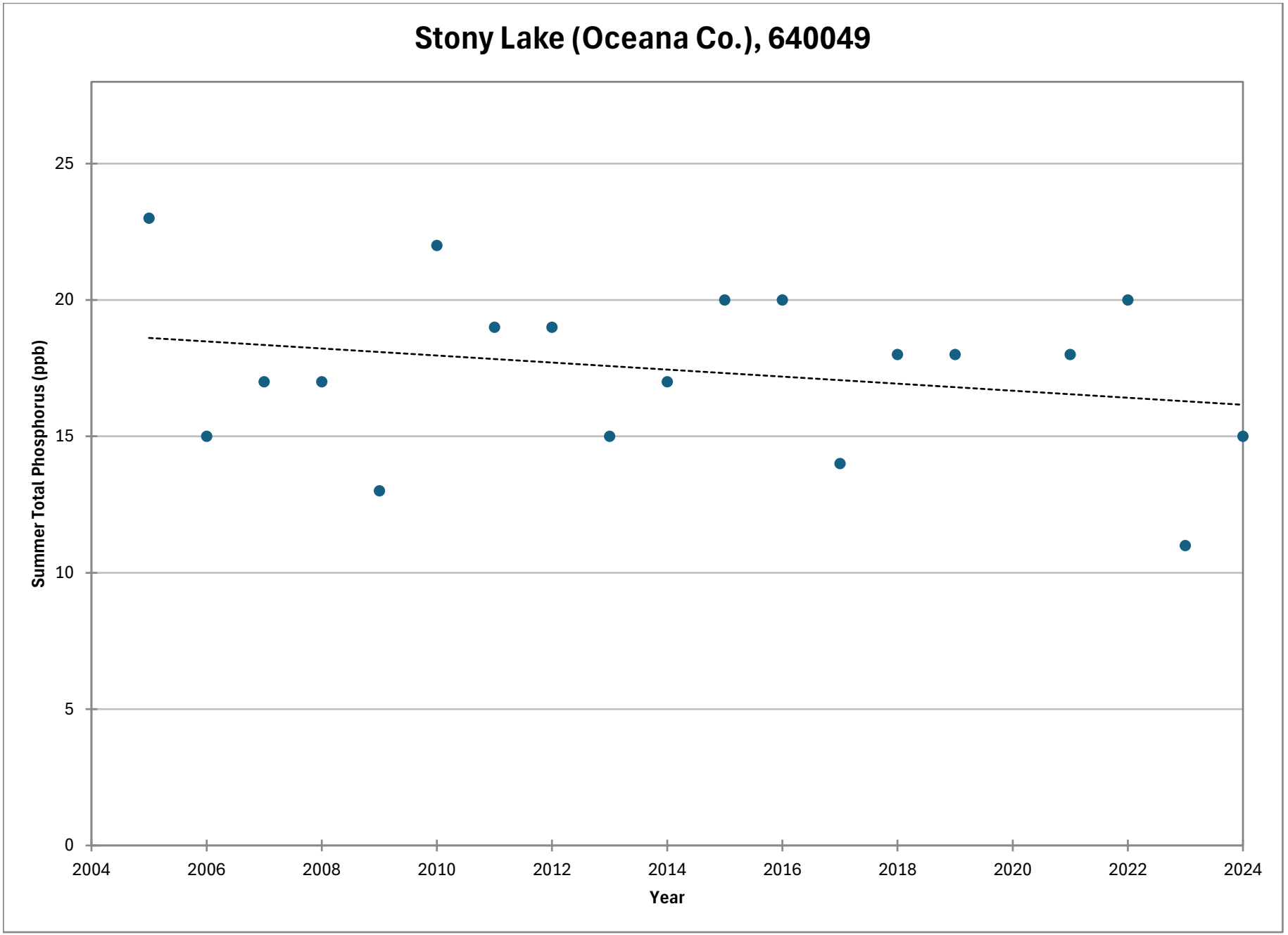
COOPERATIVE LAKES MONITORING PROGRAM
SUMMER MEAN TRANSPARENCY



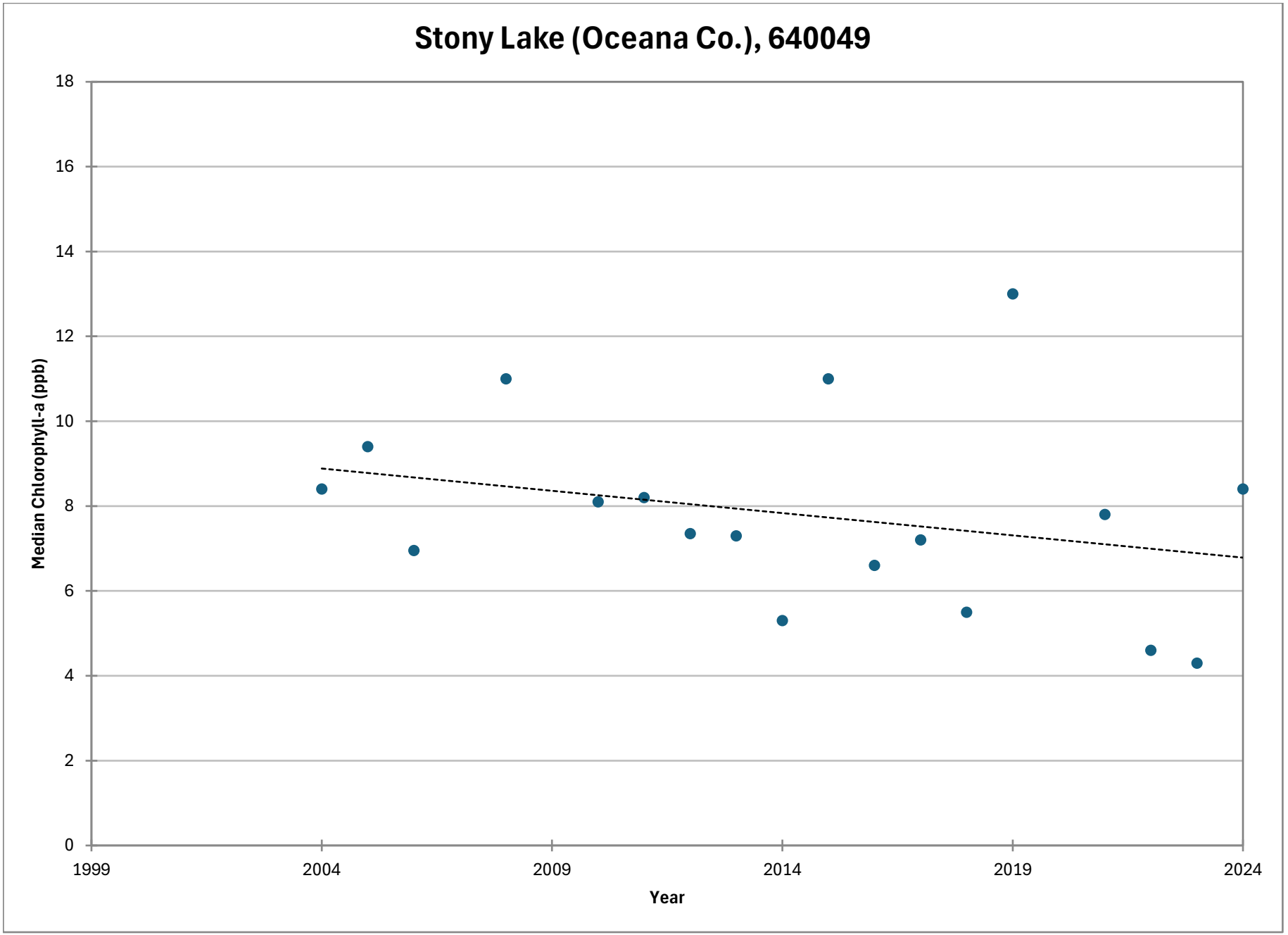
COOPERATIVE LAKES MONITORING PROGRAM
SPRING TOTAL PHOSPHORUS



COOPERATIVE LAKES MONITORING PROGRAM
SUMMER TOTAL PHOSPHORUS



COOPERATIVE LAKES MONITORING PROGRAM
SUMMER MEDIAN CHLOROPHYLL-A

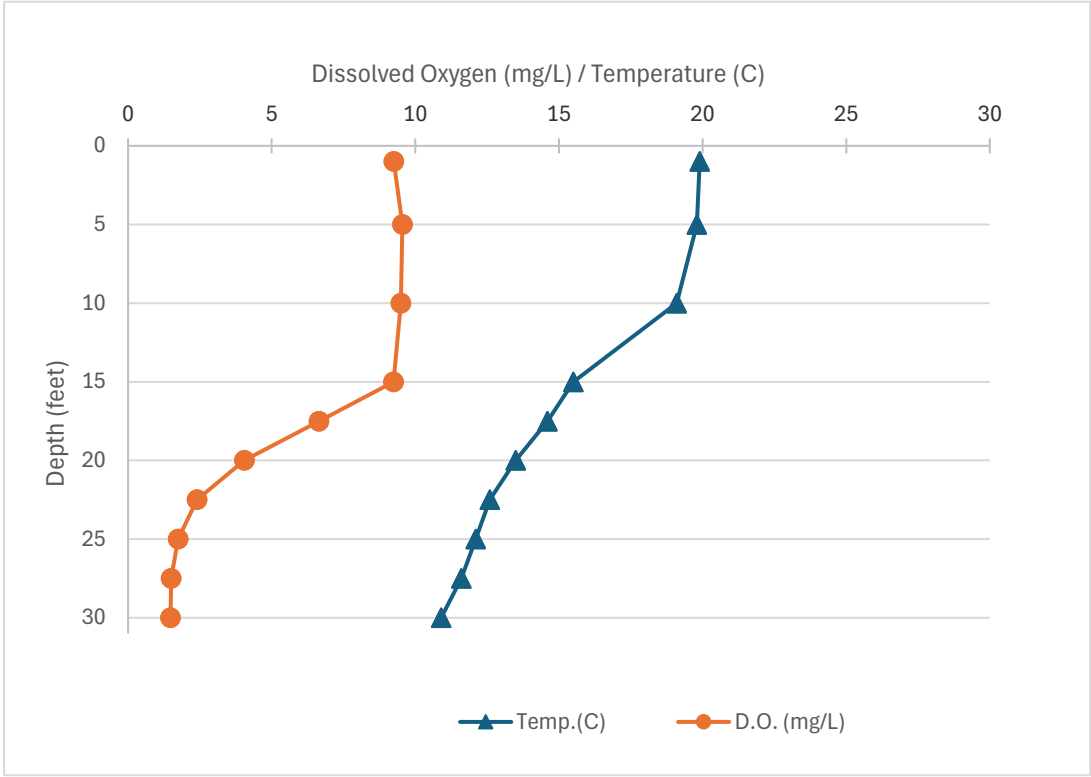


Name: Stony Lake
County: Oceana
Site ID: 640049
Date: 6/11/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	19.9	9.25
1	19.9	9.25
5	19.8	9.55
5	19.8	9.55
10	19.1	9.5
10	19.1	9.5
15	15.5	9.24
15	15.5	9.24
17.5	14.6	6.65
17.5	14.6	6.65
20	13.5	4.05
20	13.5	4.05
22.5	12.6	2.4
22.5	12.6	2.4
25	12.1	1.74
25	12.1	1.74
27.5	11.6	1.5
27.5	11.6	1.5
30	10.9	1.48
30	10.9	1.48

Lake: Stony Lake (Oceana Co.) **6/11/2024**

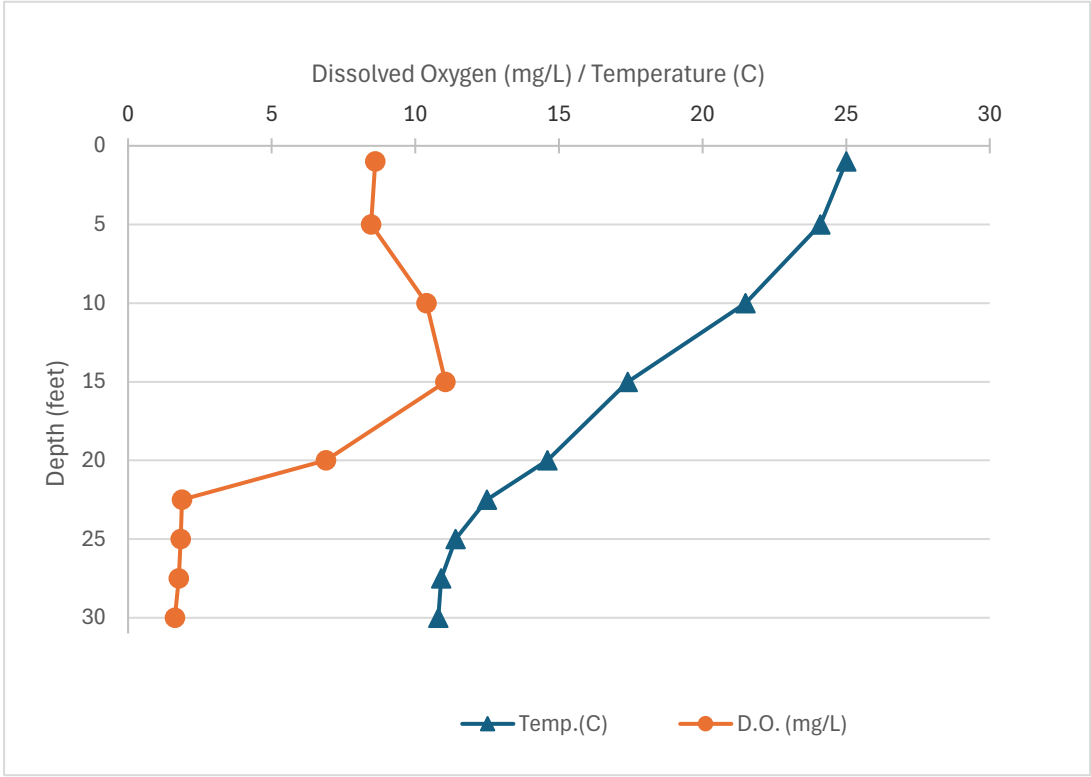


Name: Stony Lake
County: Oceana
Site ID: 640049
Date: 6/24/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	25	8.61
5	24.1	8.46
10	21.5	10.39
15	17.4	11.05
20	14.6	6.89
22.5	12.5	1.88
25	11.4	1.83
27.5	10.9	1.77
30	10.8	1.63

Lake: Stony Lake (Oceana Co.) **6/24/2024**

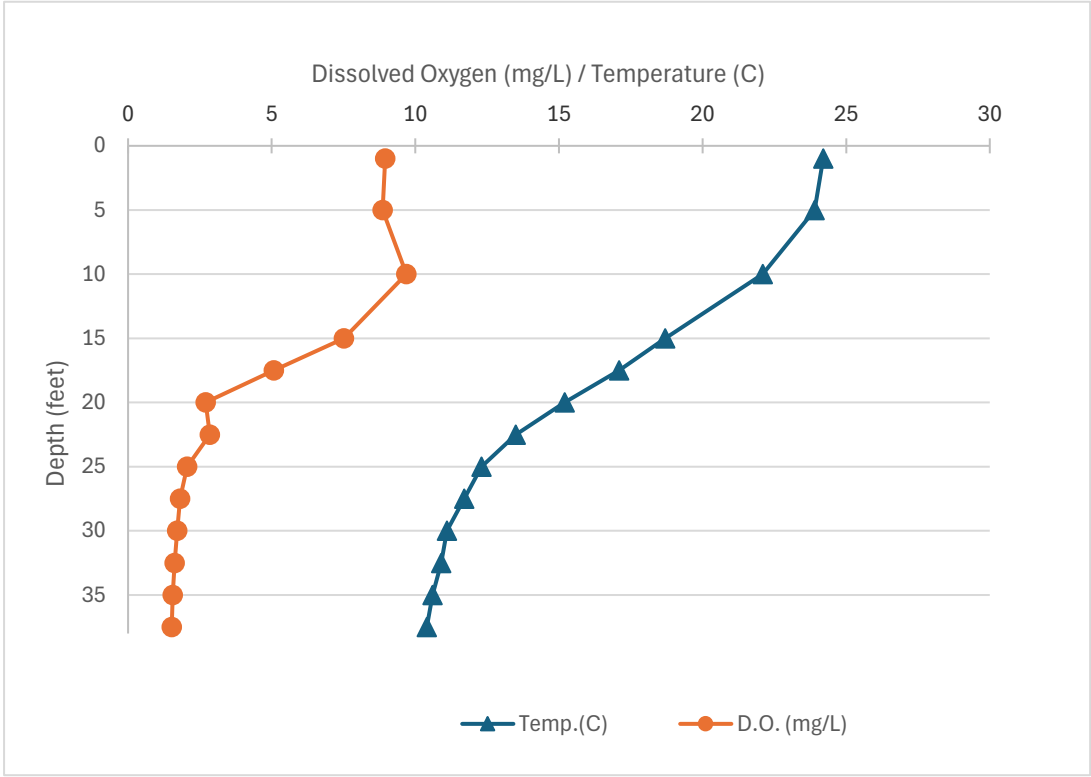


Name: Stony Lake
County: Oceana
Site ID: 640049
Date: 7/25/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	24.2	8.95
5	23.9	8.86
10	22.1	9.69
15	18.7	7.52
17.5	17.1	5.07
20	15.2	2.7
22.5	13.5	2.85
25	12.3	2.06
27.5	11.7	1.81
30	11.1	1.71
32.5	10.9	1.62
35	10.6	1.55
37.5	10.4	1.52

Lake: Stony Lake (Oceana Co.) **7/25/2024**

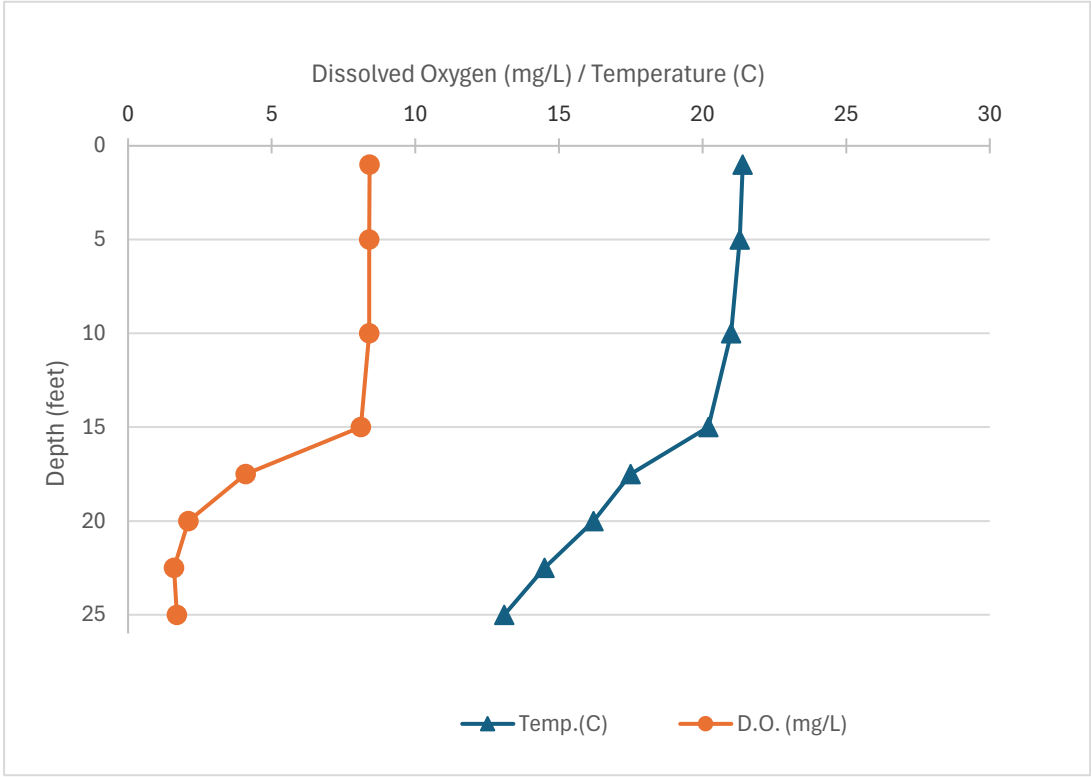


Name: Stony Lake
County: Oceana
Site ID: 640049
Date: 8/11/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	21.4	8.41
5	21.3	8.4
10	21	8.4
15	20.2	8.1
17.5	17.5	4.1
20	16.2	2.1
22.5	14.5	1.6
25	13.1	1.7

Lake: Stony Lake (Oceana Co.) **8/11/2024**



Name: Stony Lake
County: Oceana
Site ID: 640049
Date: 9/15/2024

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	22	10.48
5	21.5	9.86
10	21.1	9.87
15	17.7	5.61
17.5	16.7	2.75
20	16	1.76
22.5	15.3	1.39
25	14.2	1.49
27.5	12.9	1.58
30	12.5	1.49
32.5	11.6	1.56
35	11.2	1.5

Lake: Stony Lake (Oceana Co.) **9/15/2024**