Cooperative Lakes Monitoring Program

Michigan Lakes– Ours to Protect

2017 Trophic & 2016 Score the Shore 2022 Plant Report

Sawyer Lake, Dickinson County

Site ID: 220036

46.1839°N, 88.0614°W

The CLMP is brought to you by:

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/CLMP-Manual.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, Scott Brown, Laura Kaminski, and Michele Leduc-Lapierre

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:
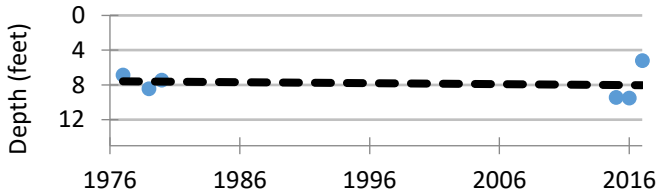**Paul Steen (psteen@hrwc.org), MiCorps Program Manager**

Sawyer Lake, Dickinson County
2017 CLMP Results

Cooperative Lakes
Monitoring Program

Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2017	16	4.0	7.5	5.2	1.1	53
2012-2016	36	6.0	14.0	9.5	2.3	45
1977-2011	48	5.0	10.5	7.6	1.1	48
2017 All CLMP Lakes	2949	1.0	52.0	12.3	2.7	43

Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Median	Std. Dev	Carlson TSI
2016	5	1.6	3.7	2.9	0.8	41
2011-2015	4	2.8	8.1	3.9	2.4	44
2017 All CLMP Lakes	628	< 1.0	28.0	1.8	4.3	36
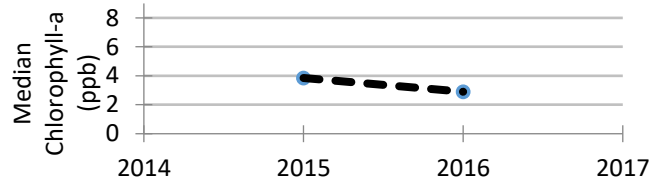
Spring Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev
2016	1	10.0	10.0	10.0	NA
2017 All CLMP Lakes	188	<= 3	120	11.6	12.7

No graph: Not enough data

Summer Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2017	1	15.0	15.0	15.0	NA	43
2012-2016	2	8.0	13.0	10.5	3.5	38
2017 All CLMP Lakes	208	<= 3	52.0	11.1	8.4	39
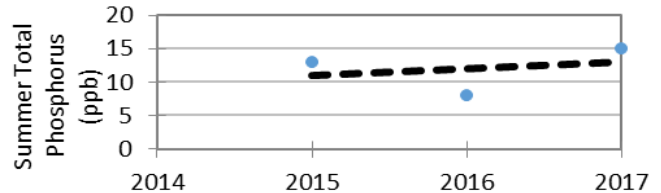
Dissolved Oxygen and Temperature Profile

This lake does not have recent (within 5 years) dissolved oxygen/water temperature data available. Consider enrolling in this parameter next year. Fish, insects, mollusks, and crustaceans need dissolved oxygen to live in water. By late summer, many lakes stratify, with cold anoxic water on the bottom and warm, oxygen rich water on the surface. Anoxic (oxygen-depleted) water occurring too close to the surface is a sign of nutrient enrichment. Understanding the pattern of dissolved oxygen and water temperature in a lake is important for assessing nutrient problems as well as the health of the biological community.

Summary

Average TSI	2017	2012-2016	1977-2011
Sawyer Lake	48	42	48
All CLMP Lakes	40	40	43

With an average TSI score of 48 based on 2017 Secchi transparency and summer total phosphorus data, this lake is rated between the mesotrophic and eutrophic lake classification.

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). Result is estimated.

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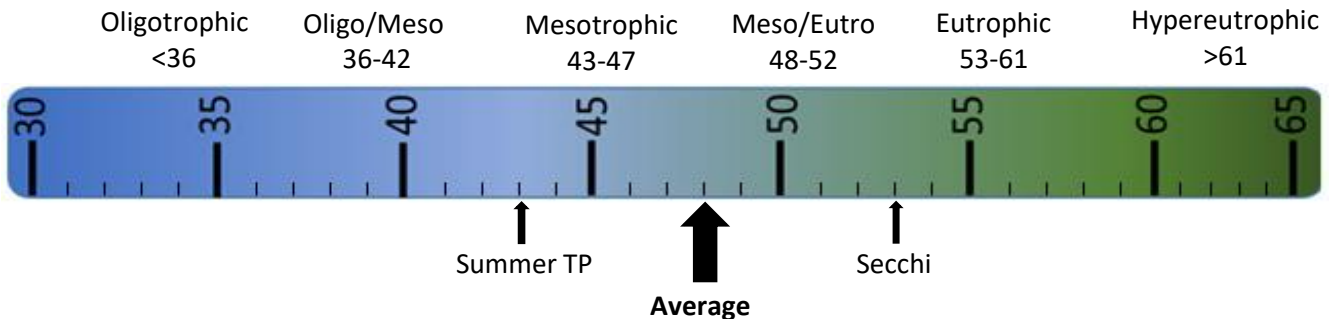
The tables below give the results-to-TSI conversions for the water quality data ranges normally seen in the CLMP. The formulas for this conversion can be found in the CLMP manual (https://micorps.net/wp-content/uploads/CLMP-Manual.pdf).

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 Sawyer Lake in 2017	
Average	48
Secchi Disk	53
Summer TP	43
Chlorophyll-a	

Oligotrophic <36	Oligo/Meso 36-42	Mesotrophic 43-47	Meso/Eutro 48-52	Eutrophic 53-61	Hypereutrophic >61

Summer TP   Average   Secchi

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.

Sawyer Lake, Dickinson County
2016 Score the Shore Results

Cooperative Lakes
Monitoring Program

The Score the Shore Habitat Assessment was conducted on Sawyer Lake in 2016.

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?

Final Score

Sawyer

Structure Density
(Avg. # Structures Per 1000 feet of Shoreline)
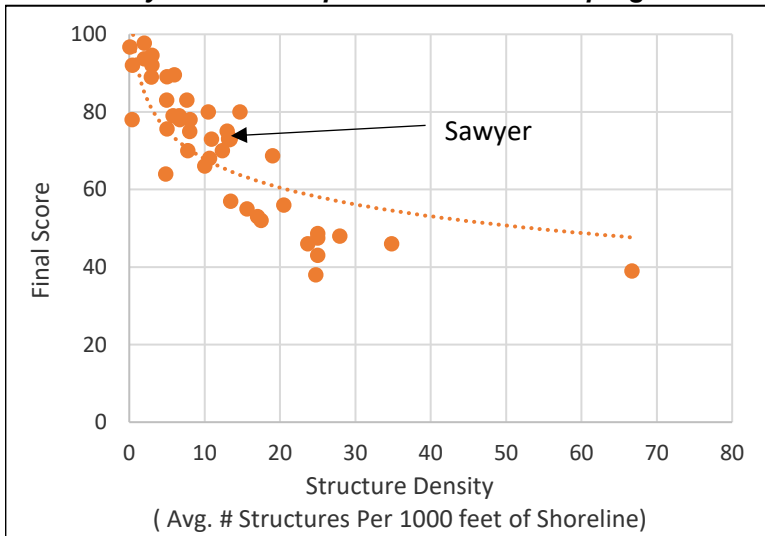
Sawyer Lake:	
Number of Sections:	14
Number of Structures:	186
Structure Density:	13.3
Final Score:	73

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 Sawyer Lake:

Overall, the lakeshore habitat of Sawyer 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: 7 fair, and 7 good.

All three of the scoring categories came out approximately the same on Sawyer Lake (Average scores: Littoral 73, Riparian 77, Erosion Control 74) This means that there is no particular weakness to the habitat on Sawyer Lake.

The lowest scoring sections were 1 and 12, which both had a total score of 56. To improve the overall lakeshore habitat, residents should look at these sections more closely (along with the other sections rated as fair) and keep native plants in the shallows, allow unvegetated areas to grow on the shoreline, and remove sea wall whenever possible.

# of 1000 foot Lakeshore sections

Highly Impacted (0-25)   Poor (26-50)   Fair (51-75)   Good (76-100)

Sawyer Lake, Dickinson County
2022 Exotic Aquatic Plant Watch Results

Cooperative Lakes
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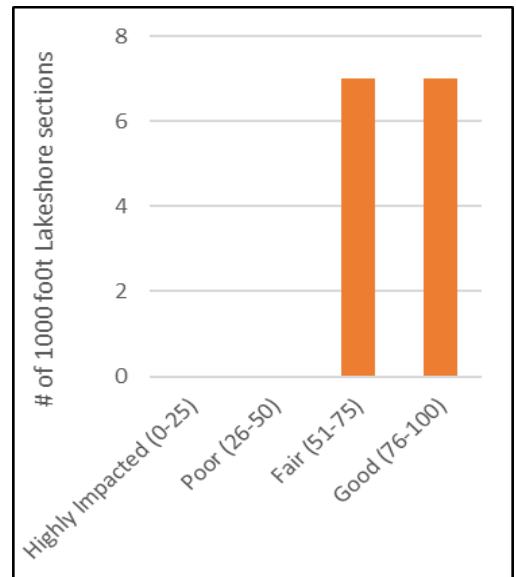
The Exotic Aquatic Plant Watch was conducted on Sawyer Lake in 2022.

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 five highly invasive species: Eurasian watermilfoil (*Myriophyllum spicatum*), starry stonewort (*Nitellopsis obtusa*), curly-leaf pondweed (*Potamogeton crispus*), European Frogbit (*Hydrocharis morsus-ranae*), and Hydrilla (*Hydrilla verticillata*).
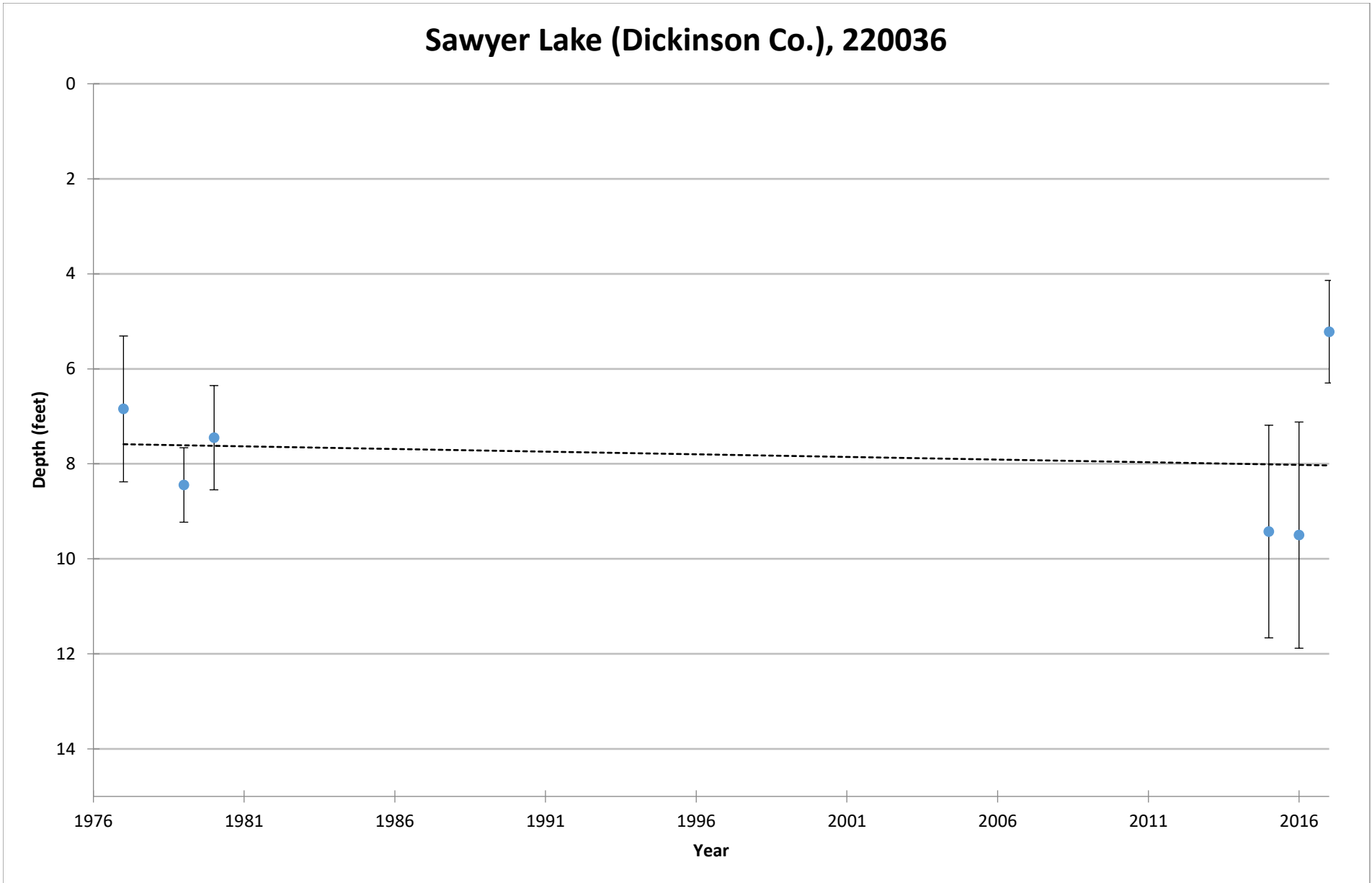
The table below summarizes the results of the 2022 Exotic Aquatic Plant Watch on Sawyer Lake.

Sawyer Lake, Dickinson County

2022 Exotic Aquatic Plant Watch Results

Survey Date(s): August 31

Species	Status	Comments
Eurasian watermilfoil	FOUND	Reported in 2 of 11 sites surveyed. No photos submitted for confirmation.
Starry stonewort	not found	
Curly-leaf pondweed	not found	
European Frogbit	not found	
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.

Sawyer Lake (Dickinson Co.), 220036

Vertical bars indicate standard deviation

Sawyer Lake (Dickinson Co.), 220036

COOPERATIVE LAKES MONITORING PROGRAM
SUMMER MEDIAN CHLOROPHYLL-A

Sawyer Lake (Dickinson Co.), 220036
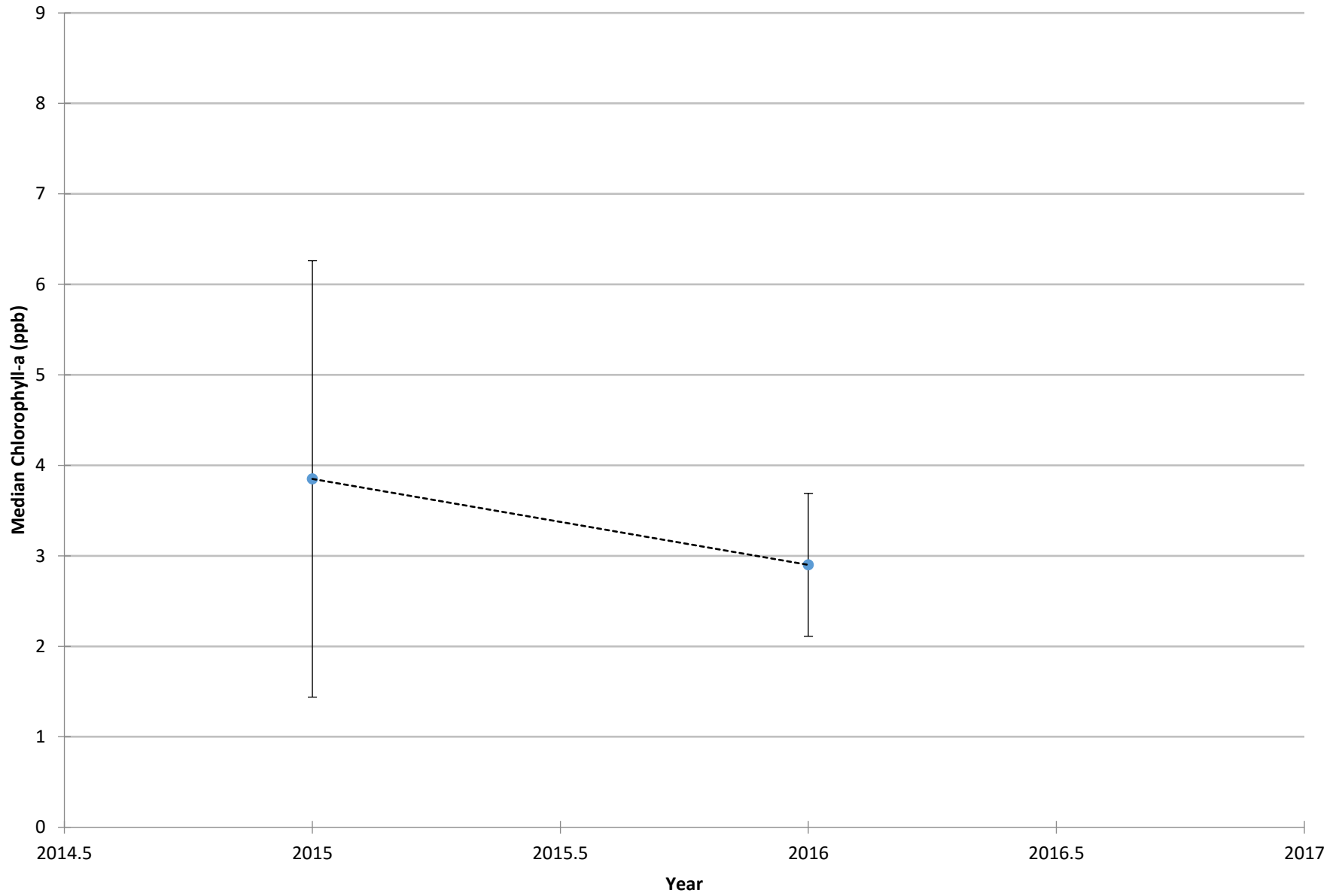
Vertical bars indicate standard deviation