



**2016 Data Report  
for  
Big Kelsey Lake, Cass County**

Site ID: 140195

41.975812°N, 86.023507°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 the results of the Exotic Plant Watch or Full Plant Mapping, if you participated in that parameter. If you enrolled in the Score the Shore Parameter, a summary will be found after the plant page.

The rest of the report will be 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:

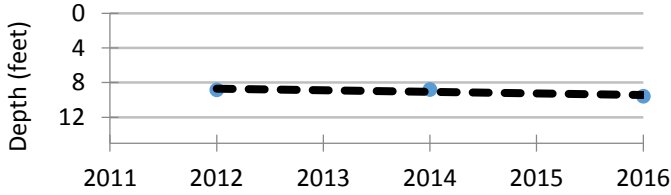
**Paul Steen (psteen@hrwc.org), MiCorps Program Manager**

# Big Kelsey Lake, Cass County 2016 CLMP Results



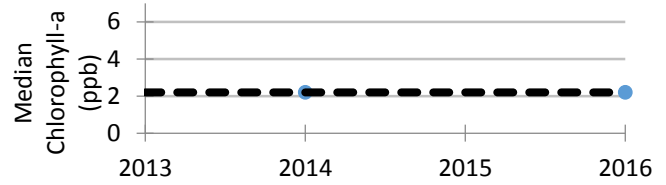
## Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2016	8	6.0	13.0	9.6	2.5	< 45
2012-2015	28	6.5	12.0	8.8	1.5	46
2016 All CLMP Lakes	3116	1.0	56.0	12.9	2.8	41



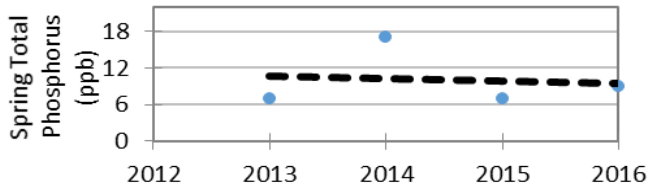
## Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Median	Std. Dev	Carlson TSI
2016	5	1.4	4.0	2.2	1.2	38
2013-2015	7	<1.0	5.2	2.2	1.5	38
2016 All CLMP Lakes	628	< 1.0	28.0	1.8	4.3	36



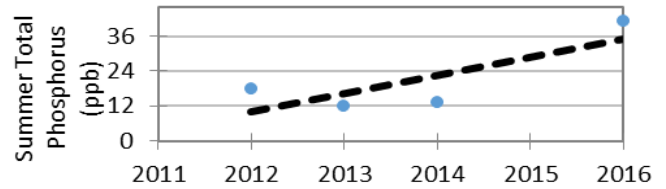
## Spring Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev
2016	1	9.0	9.0	9.0	NA
2013-2015	3	7.0	17.0	10.3	5.8
2016 All CLMP Lakes	168	<= 3	74.0	9.5	7.8



## Summer Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2016	1	41.0	41.0	41.0	NA	58
2012-2015	3	12.0	18.0	14.3	3.2	42
2016 All CLMP Lakes	173	<= 3	250.0	15.1	21.7	43



## 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	2016	2011-2015
Big Kelsey Lake	47	42
All CLMP Lakes	40	40

With an average TSI score of 47 based on Secchi transparency, chlorophyll-a, and summer total phosphorus, this lake is rated between the mesotrophic and eutrophic lake classification. The lake leans slightly more meso than eutro. There is too little data to assess long term trends. However, the trend from recent years shows a lake that is stable, though this year's summer phosphorus is quite high. It is possible the sample was taken during a late summer algae bloom. In any case, this parameter should be watched closely in the future.

\* = 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).

# Big Kelsey Lake, Cass County 2016 Exotic Aquatic Plant Watch Results



The Exotic Aquatic Plant Watch was conducted on Big Kelsey Lake in 2016.

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 2016 Exotic Aquatic Plant Watch on Big Kelsey Lake.

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**Big Kelsey Lake, Cass County**  
**2016 Exotic Aquatic Plant Watch Results**  
**Survey Date(s): No specific dates recorded**

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<u>Species</u>	<u>Status</u>	<u>Comments</u>
Eurasian watermilfoil	not found	
Starry stonewort	not found	
Curly-leaf pondweed	FOUND	Low density
Hydrilla	not found	

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Visit the MiCorps Data Exchange ([www.micorps.net](http://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.

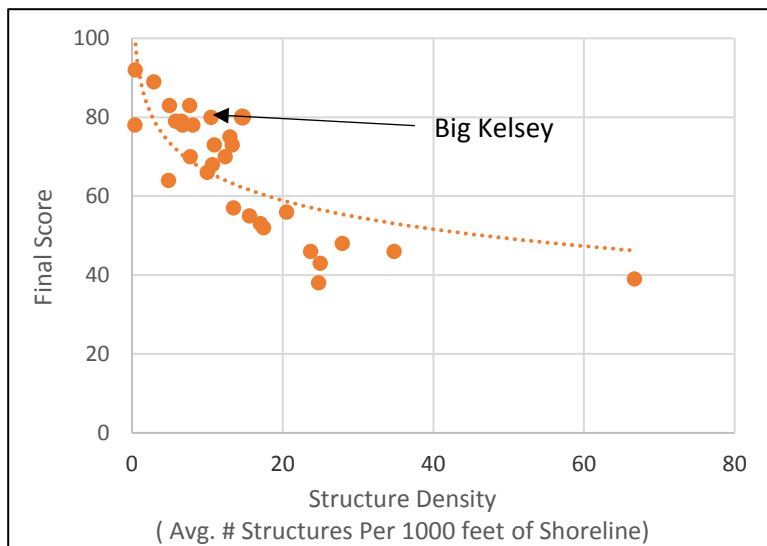
# Big Kelsey Lake, Cass County 2016 Score the Shore Results



The Score the Shore Habitat Assessment was conducted on Big Kelsey 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?



Big Kelsey Lake:	
Number of Sections:	10
Number of Structures:	105
Structure Density:	10.5
Final Score:	80

All 31 Participating Lakes in 2015 and 2016:	
Avg. Number of Sections:	16
Avg. Number of Structures:	233
Avg. Structure Density:	14.6
Avg. Final Score:	66

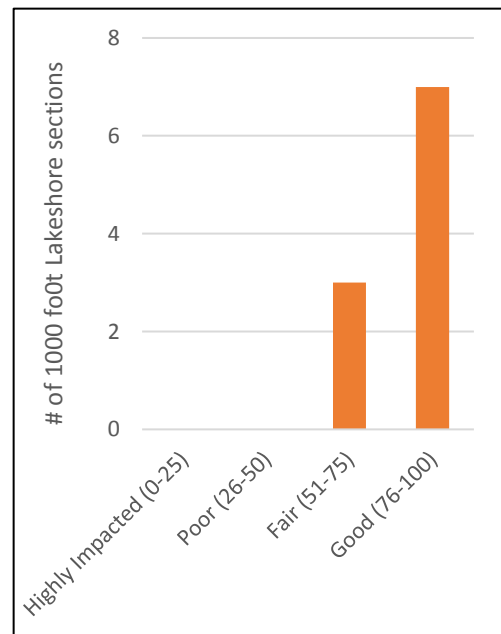
There is a very tight relationship between Final Score and Structure Density. It will be interesting to see if and how this changes as more lakes go through this scoring process.

### Analysis specific to Big Kelsey Lake:

Overall, the lakeshore habitat of Big Kelsey 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: 3 fair, and 7 good.

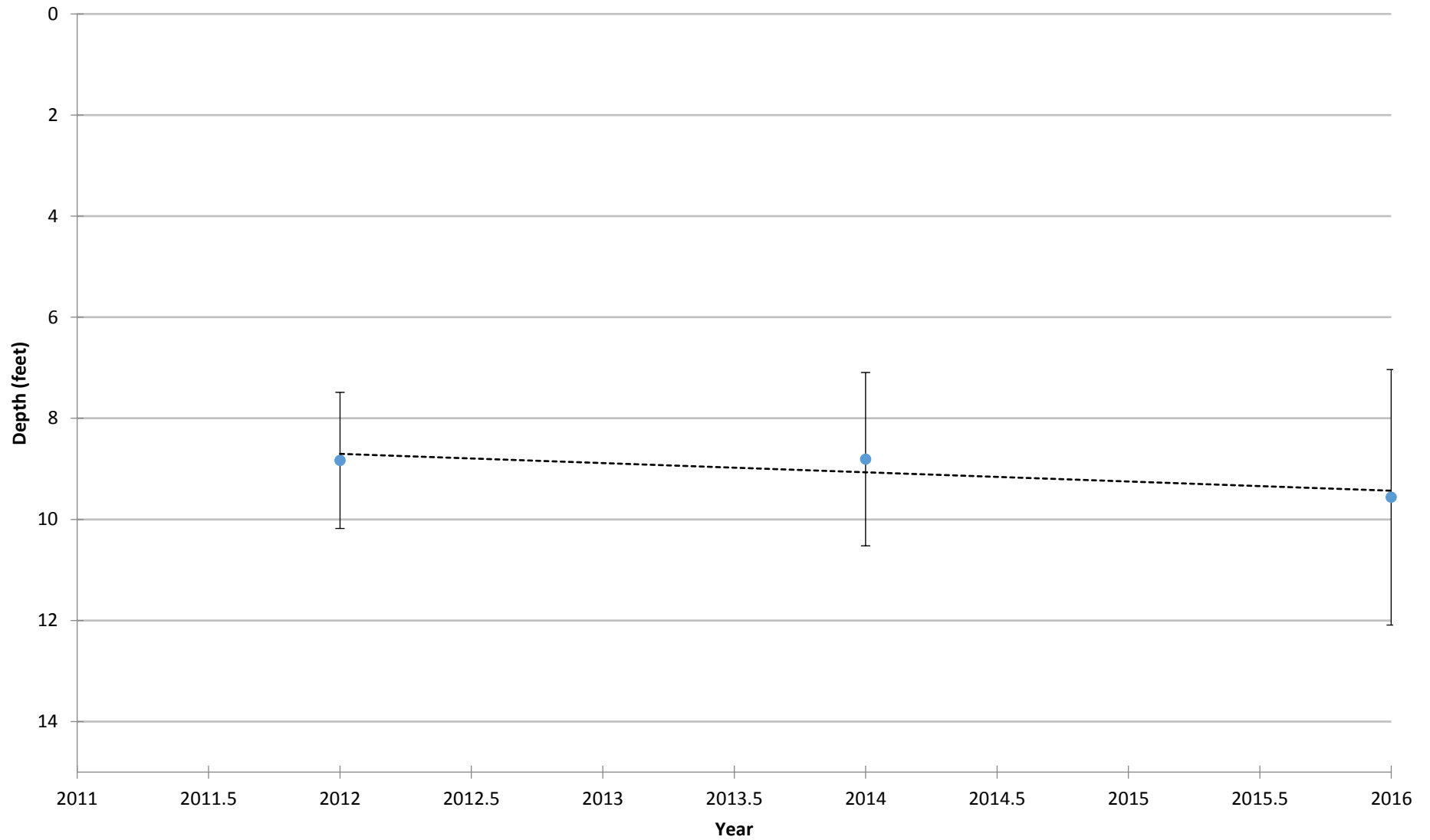
The sections scored highest for erosion control, with an average of 96.7, meaning that there are virtually no sea walls, rock rip-rap, or other shoreline erosion structures.

The riparian zone was the weak point in Big Kelsey score (scoring an average of 68). While 68 is not bad, there is room for improvement. Reduce the amount of mowed grass and increase the amount of unmowed vegetation along the lakeshore to boost this aspect of the shoreline habitat.



COOPERATIVE LAKES MONITORING PROGRAM  
SUMMER MEAN TRANSPARENCY

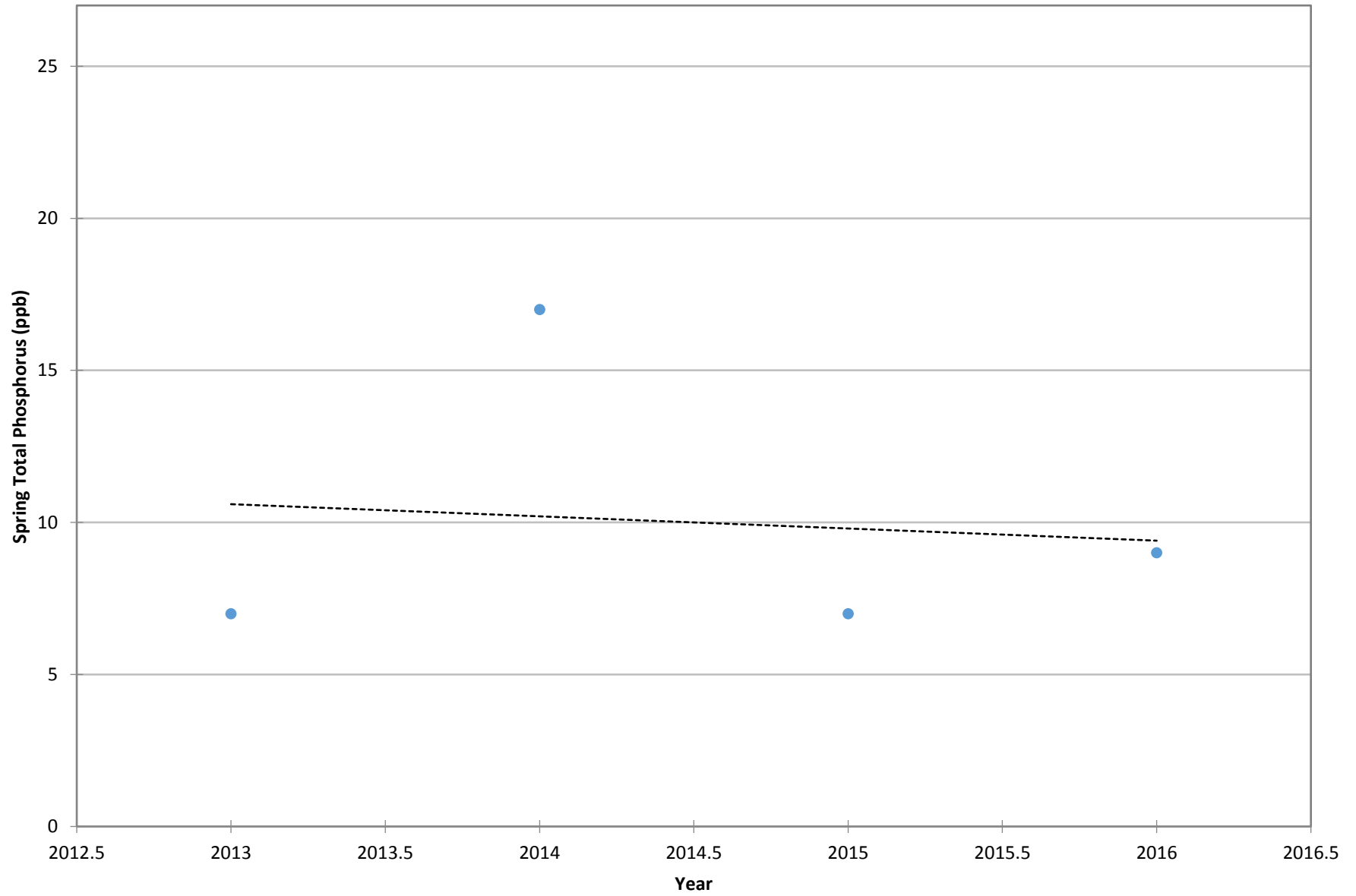
**Big Kelsey Lake (Cass Co.), 140195**



Vertical bars indicate standard deviation

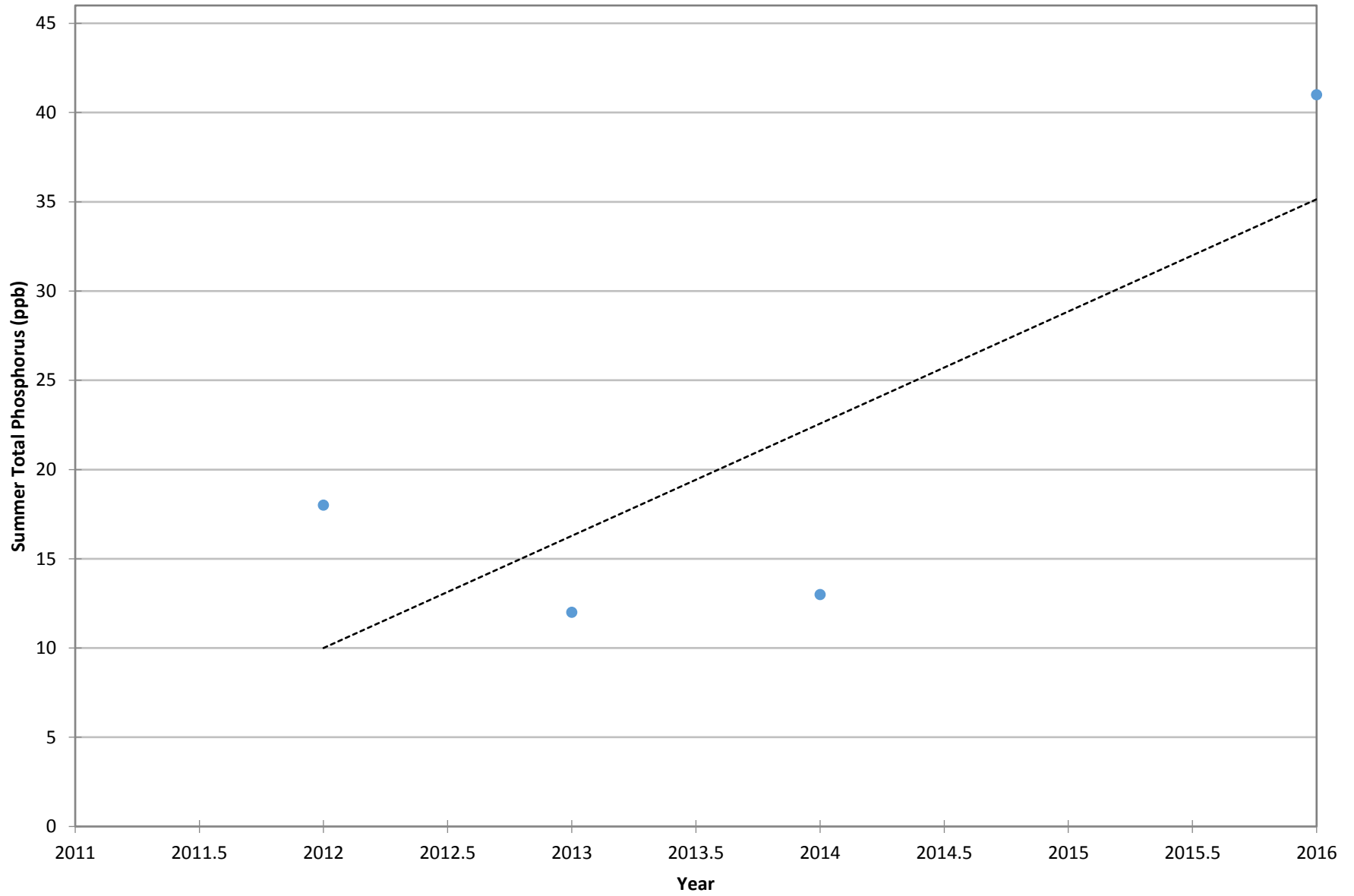
COOPERATIVE LAKES MONITORING PROGRAM  
SPRING TOTAL PHOSPHORUS

**Big Kelsey Lake (Cass Co.), 140195**



COOPERATIVE LAKES MONITORING PROGRAM  
SUMMER TOTAL PHOSPHORUS

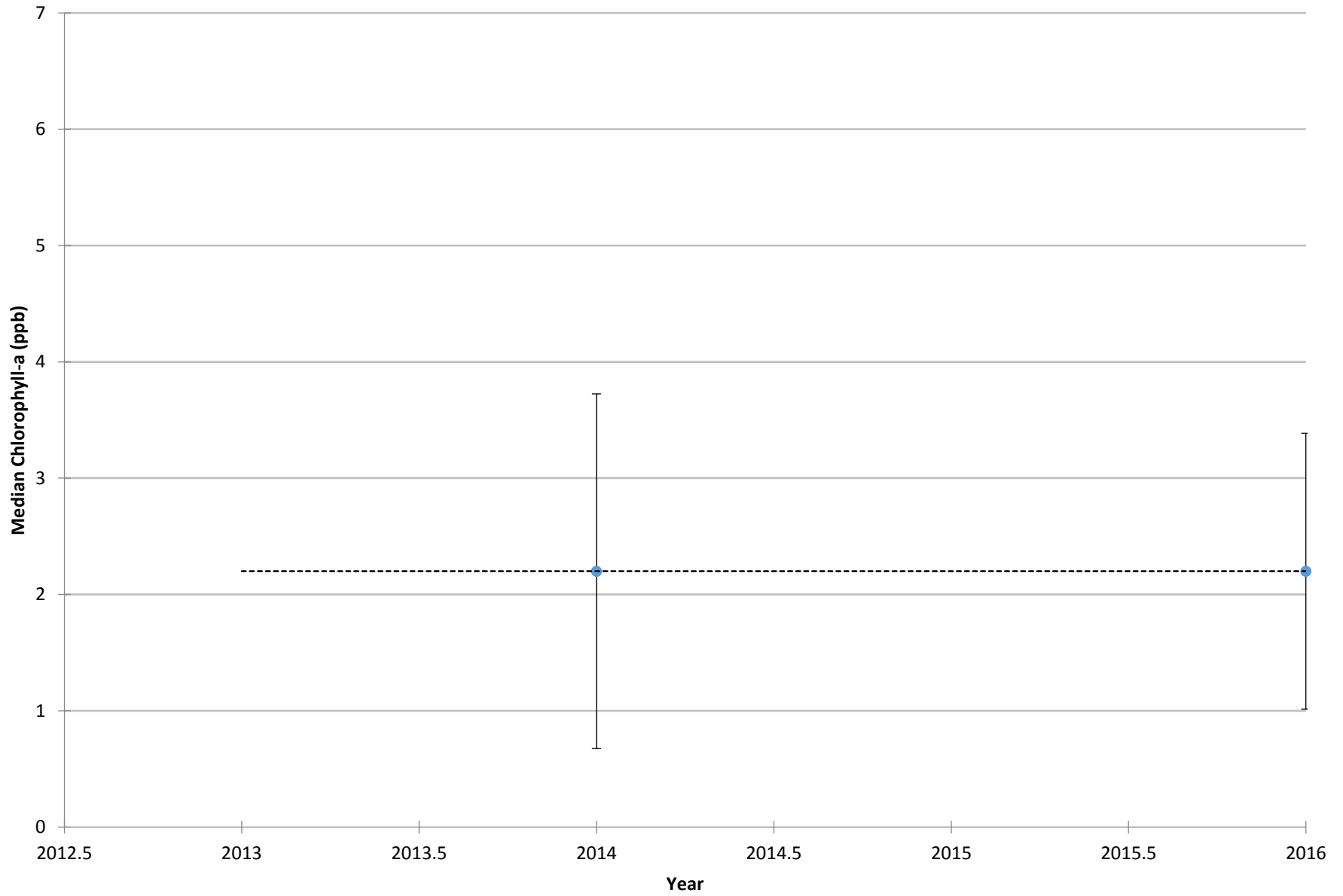
**Big Kelsey Lake (Cass Co.), 140195**





COOPERATIVE LAKES MONITORING PROGRAM  
SUMMER MEDIAN CHLOROPHYLL-A

**Big Kelsey Lake (Cass Co.), 140195**



Vertical bars indicate standard deviation