Cooperative Lakes Monitoring Program

Michigan Lakes– Ours to Protect

2022 Data Report for James Lake, Roscommon County

Site ID: 720171

44.2989°N, 84.6337°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

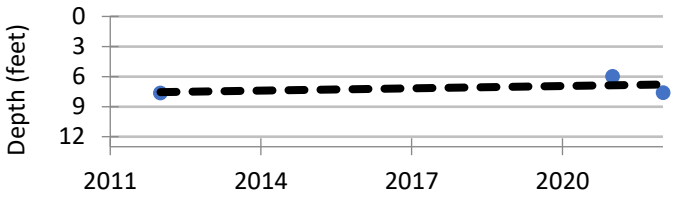
Questions?
If you have questions on this report or believe that the tabulated data for your lake in this report are in error please contact:
Paul Steen (psteen@hrwc.org), CLMP Data Analyst

Site ID: 720171

James Lake, Roscommon County
2022 CLMP Results

Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2022	14	5.0	10.5	7.6	1.8	48
2017-2021	14	4.5	7.5	7.6	0.9	51
2012-2016	14	5.0	11.5	7.6	2.0	48
2022 All CLMP Lakes	3178	1.0	63.0	11.6	2.5	43

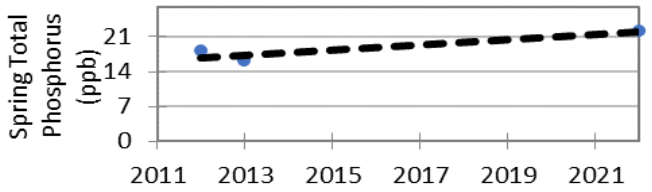


Chlorophyll-a (parts per billion)

James Lake 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.

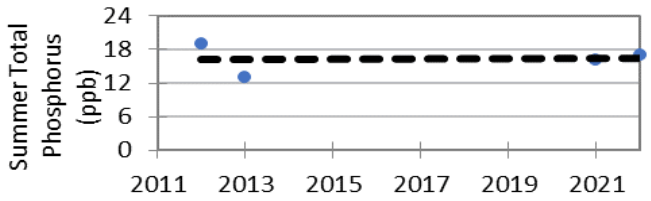
Spring Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev
2022	1	22.0	22.0	22.0	NA
2012-2013	2	16.0	18.0	17.0	1.4
2022 All CLMP Lakes	220	<5	220.0	20.7	21.3



Summer Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2022	1	17.0	17.0	17.0	NA	45
2021	1	16.0	16.0	16.0	NA	44
2012-2016	2	13.0	19.0	16.0	4.2	44
2022 All CLMP Lakes	234	<= 3	150.0	17.4	15.3	45



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	2022	2017-2021	2012-2016
James Lake	46	48	46
All CLMP Lakes	44	40	40

With an average TSI score of 46 based on 2022 Secchi transparency and summer total phosphorus data, this lake is rated between the mesotrophic and eutrophic lake classification. The lake leans slightly more mesotrophic than eutrotrophic.

There is too little data to assess long term trends. CLMP recommends eight years of consistent monitoring in order to develop a strong data baseline. It appears that the trend will be of an unchanging lake; more data is still needed however.

** = 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.

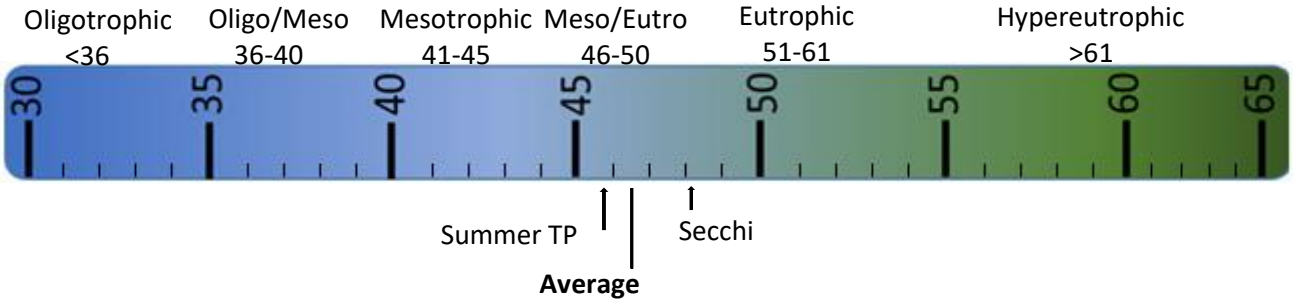
The tables below give the results-to-TSI conversions for the water quality data ranges normally seen in the CLMP. The formulas for this conversion can be found in the CLMP manual (link is on page 2 of this report).

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 James Lake in 2022	
Average	46
Secchi Disk	48
Summer TP	45
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.

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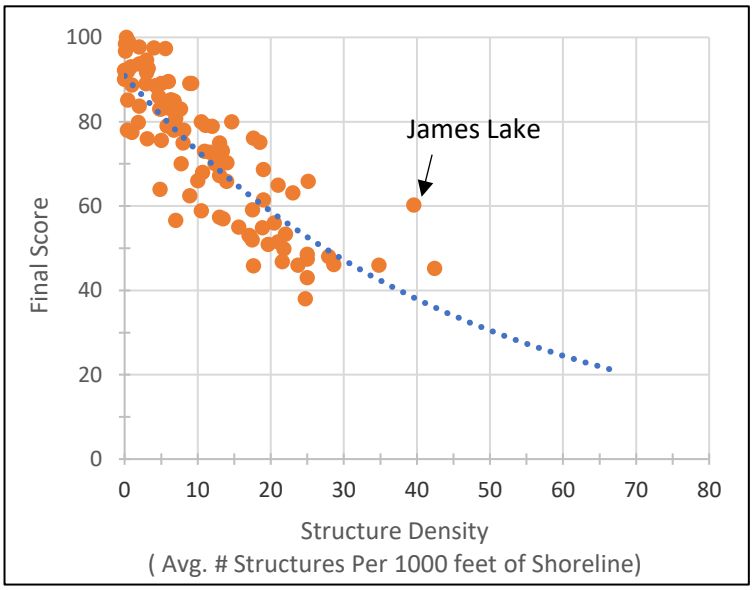
James Lake, Roscommon County
2022 Score the Shore Results

The Score the Shore Habitat Assessment was conducted on James Lake in 2022.

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 an 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?



James Lake	
Number of Sections:	27
Number of Structures:	1068
Structure Density:	39.5
Final Score:	60.2

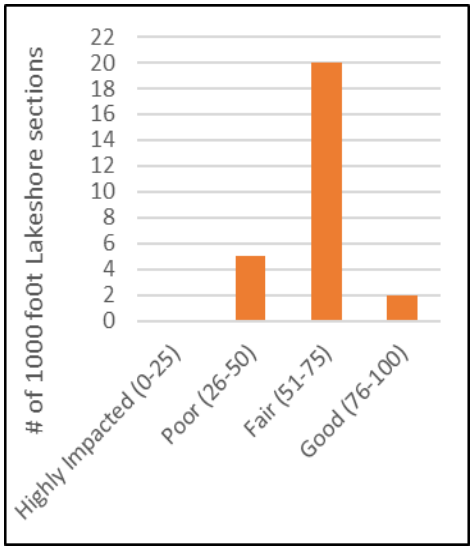
All 95 Participating Lakes from 2015-2022:	
Avg. Number of Sections:	16
Avg. Number of Structures:	228
Avg. Structure Density:	12
Avg. Final Score:	73

Note about graph to the left: The dotted line sets your average expectation of the score of your lake. If your lake is lower than the dotted line, then your shoreline health is lower than average compared to *lakes with similar amount of shoreline development*. And vice-versa in regards to a lake above the dotted line.

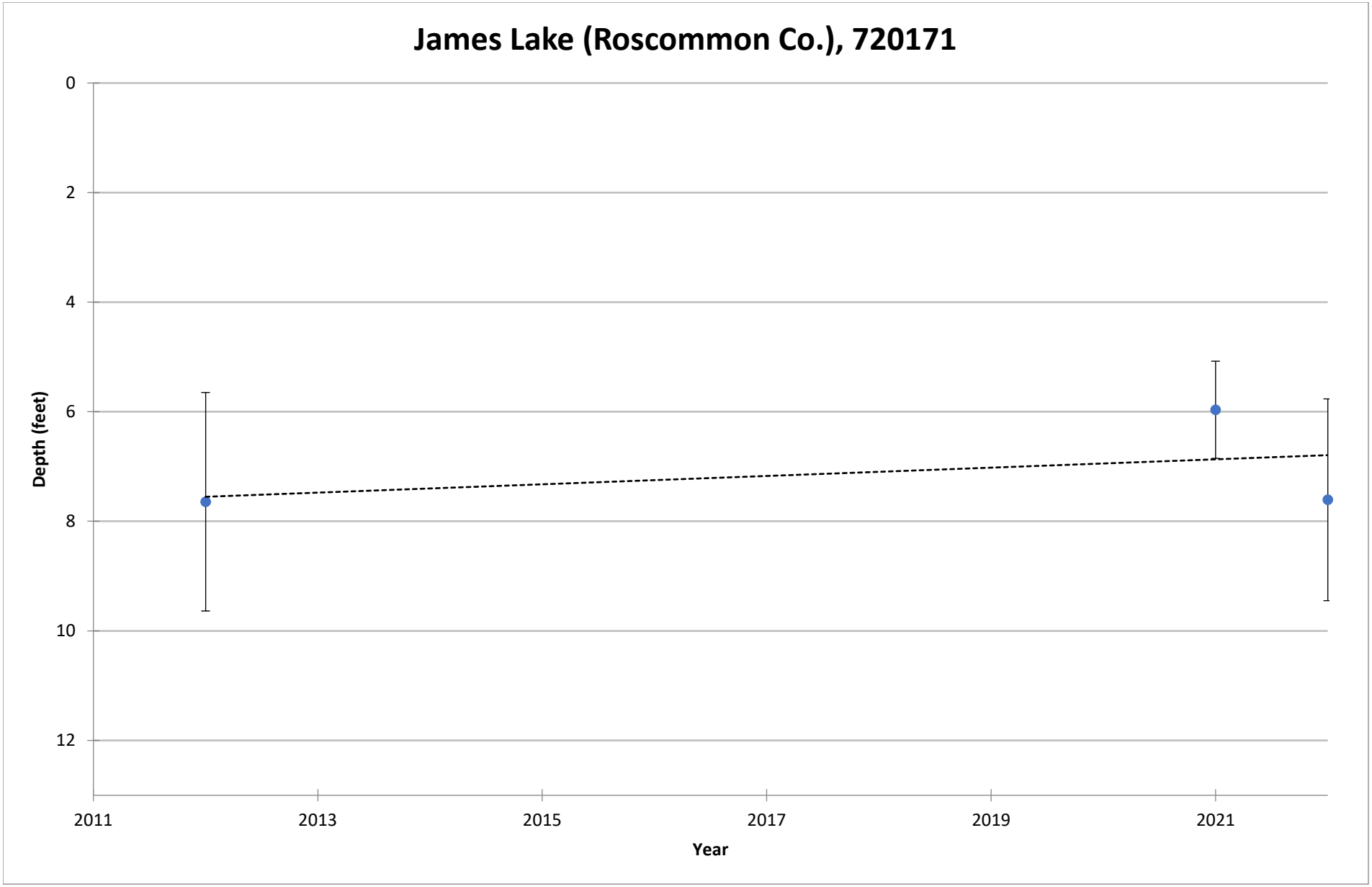
Analysis specific to James Lake:

With a structure density of 39.5 buildings and docks for every 1000 feet, James has the the second highest amount of development for any lake in this study. Because we have few lakes in the program with this level of development, it makes it difficult to compare James Lakes to others. That being said, it is interesting that James Lake has the same score as lakes that are half as developed, meaning that it must be doing something right in keeping lake habitat as healthy as possible.

Of the three main habitat categories, James Lake does the worst in Riparian habitat with an average section score of 46, which is in the Poor category. Residents should be encouraged to 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. You can get plenty of ideas for improving shoreline health from the Michigan Natural Shoreline Partnership (https://www.shorelinepartnership.org/

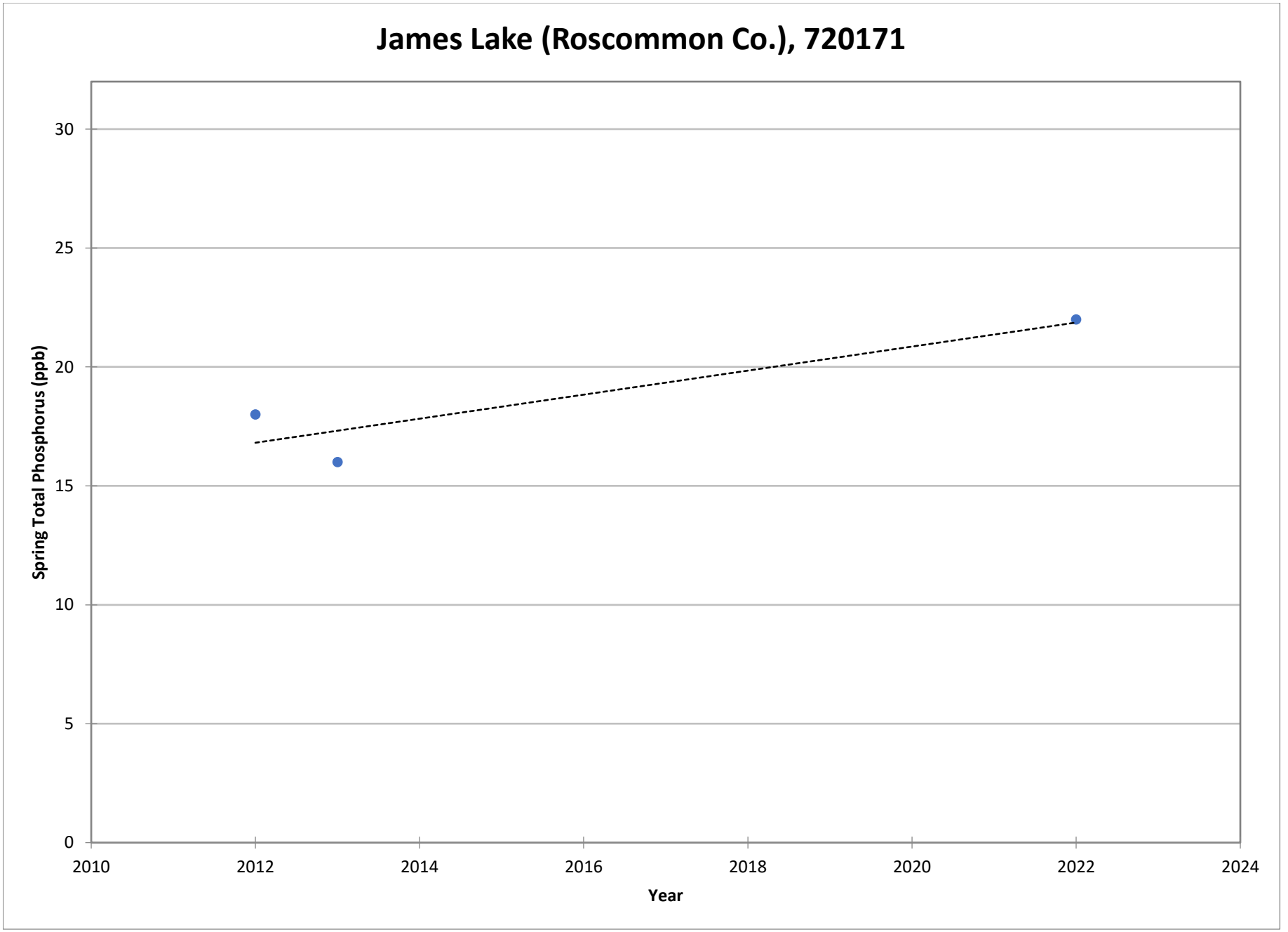


COOPERATIVE LAKES MONITORING PROGRAM
SUMMER MEAN TRANSPARENCY

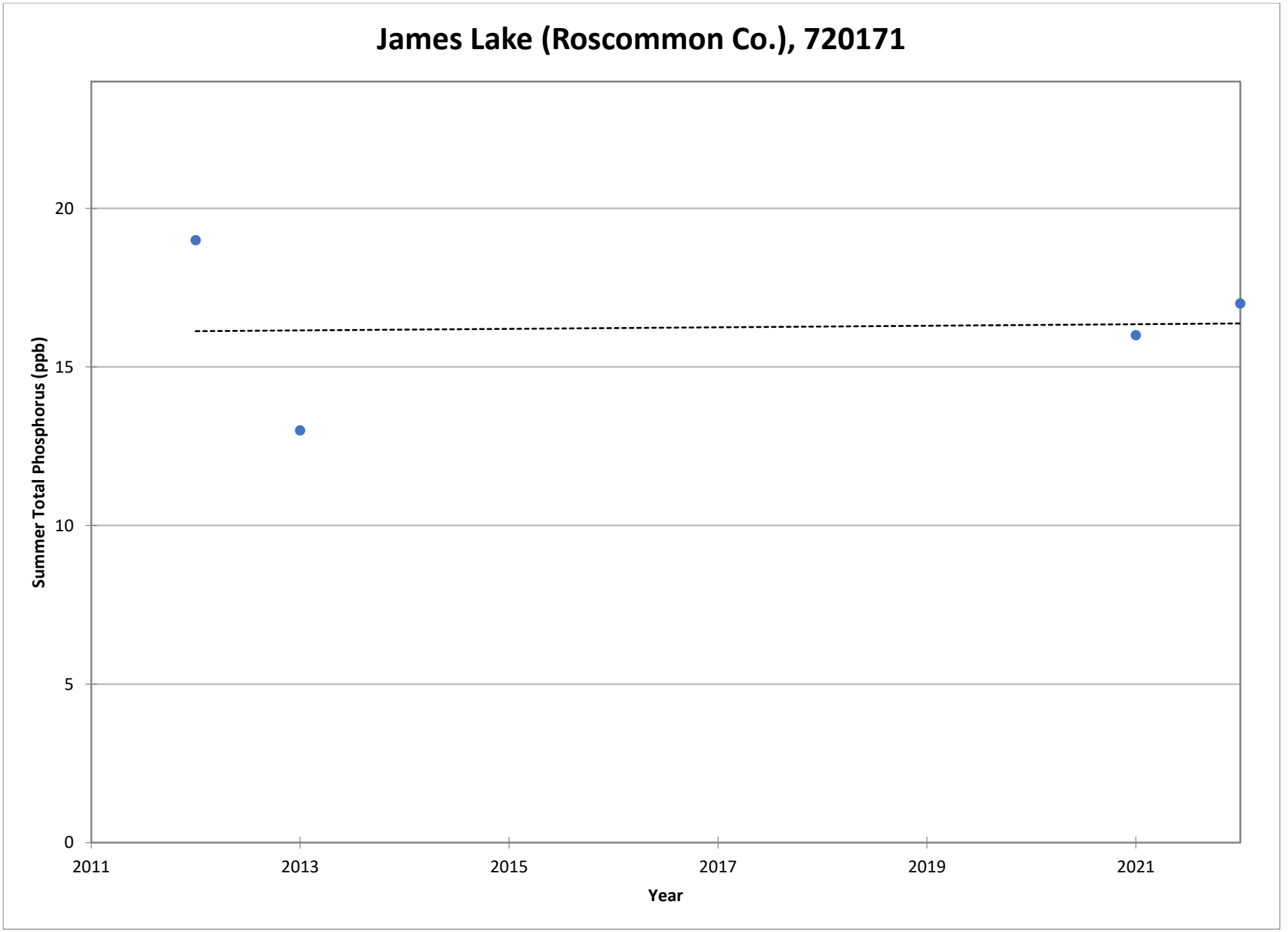


Vertical bars indicate standard deviation

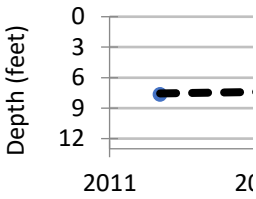
COOPERATIVE LAKES MONITORING PROGRAM
SPRING TOTAL PHOSPHORUS

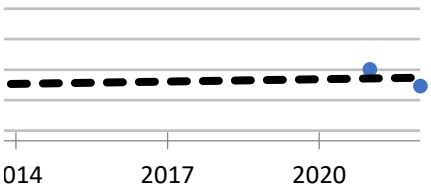


COOPERATIVE LAKES MONITORING PROGRAM
SUMMER TOTAL PHOSPHORUS



2012	7.642857	1.994498	14	5	11.5	47.79953
2021	5.964286	0.88718	14	4.5	7.5	51.37716
2022	7.607143	1.841598	14	5	10.5	47.8671





Year	# Readings	Min	Max	Average
2022	14	5.0	10.5	7.6
2017-2021	14	4.5	7.5	7.6
2012-2016	14	5.0	11.5	7.6
2022 All CLMP	3178	1.0	63.0	11.6

Std. Dev	Carlson TSI	James	Roscommc	720171
1.8	48			
0.9	51		# of bottom measurements	
2.0	48		0	
2.5	43			

	1	2012	2012-06-14	James	Roscommon	1	720171
.		2012	2012-06-21	James	Roscommon		720171
.		2012	2012-06-28	James	Roscommon		720171
.		2012	2012-07-06	James	Roscommon		720171
.		2012	2012-07-13	James	Roscommon		720171
.		2012	2012-07-19	James	Roscommon		720171
.		2012	2012-07-26	James	Roscommon		720171
.		2012	2012-08-02	James	Roscommon		720171
.		2012	2012-08-09	James	Roscommon		720171
.		2012	2012-08-16	James	Roscommon		720171
.		2012	2012-08-23	James	Roscommon		720171
.		2012	2012-08-29	James	Roscommon		720171
.		2012	2012-09-06	James	Roscommon		720171
	14	2012	2012-09-12	James	Roscommon		720171
	16	2021	2021-05-09	James	Roscommon		720171
.		2021	2021-05-17	James	Roscommon		720171
.		2021	2021-05-31	James	Roscommon		720171
.		2021	2021-06-08	James	Roscommon		720171
.		2021	2021-06-16	James	Roscommon		720171
.		2021	2021-06-28	James	Roscommon		720171
.		2021	2021-07-07	James	Roscommon		720171
.		2021	2021-07-14	James	Roscommon		720171
.		2021	2021-07-26	James	Roscommon		720171
.		2021	2021-08-04	James	Roscommon		720171
.		2021	2021-08-18	James	Roscommon		720171
.		2021	2021-08-24	James	Roscommon		720171
.		2021	2021-09-01	James	Roscommon		720171
	29	2021	2021-09-09	James	Roscommon		720171
	31	2022	2022-05-28	James	Roscommon		720171
.		2022	2022-05-31	James	Roscommon		720171
.		2022	2022-06-15	James	Roscommon		720171
.		2022	2022-06-29	James	Roscommon		720171
.		2022	2022-07-06	James	Roscommon		720171
.		2022	2022-07-13	James	Roscommon		720171
.		2022	2022-07-20	James	Roscommon		720171
.		2022	2022-07-25	James	Roscommon		720171
.		2022	2022-08-05	James	Roscommon		720171
.		2022	2022-08-18	James	Roscommon		720171
.		2022	2022-08-25	James	Roscommon		720171
.		2022	2022-09-01	James	Roscommon		720171
.		2022	2022-09-07	James	Roscommon		720171
	44	2022	2022-09-29	James	Roscommon		720171

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44.29893	-84.633727	NAD83/WGS84	2012-06-14
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44.29893	-84.633727	NAD83/WGS84	2012-07-26
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44.29893	-84.633727	NAD83/WGS84	2022-08-18
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44.29893	-84.633727	NAD83/WGS84	2022-09-01
44.29893	-84.633727	NAD83/WGS84	2022-09-07
44.29893	-84.633727	NAD83/WGS84	2022-09-29

5	Sunny			2012	6
6.5	Sunny			2012	6
5.5	Cloudy			2012	6
6.5	Sunny			2012	7
9	Sunny			2012	7
6.5	Sunny			2012	7
7	Cloudy			2012	7
6.5	Sunny			2012	8
6.5	Cloudy			2012	8
7.5	Sunny			2012	8
8				2012	8
11.5	Sunny			2012	8
10.5	Sunny,Windy			2012	9
10.5	Sunny,Windy			2012	9
5.5	Sunny		N	2021	5
5	Sunny		N	2021	5
4.5	Sunny		N	2021	5
6.5	Sunny		N	2021	6
7.5	Sunny		N	2021	6
7.5	Cloudy	After a week of rain	N	2021	6
6	Sunny	Large amount of boat traffic	N	2021	7
5.5	Sunny	Erosion control company stir	N	2021	7
6	Sunny		N	2021	7
6.5	Windy	Really Hot weather	N	2021	8
6.5	Sunny		N	2021	8
6	Cloudy	Lake was treated for weeds	N	2021	8
5.5	Sunny	Recent heavy rains	N	2021	9
5	Sunny	Recent Heavy Rains	N	2021	9
6.5	Sunny		N	2022	5
5	Sunny	windy after a busy holiday w	N	2022	5
5	Sunny		N	2022	6
8	Sunny	after a heavy rain	N	2022	6
7	Sunny	after a busy holiday weekend		2022	7
7.5	Sunny		N	2022	7
6	Cloudy,Windy		N	2022	7
6	Cloudy,Windy		N	2022	7
7	Sunny		N	2022	8
9.5	Sunny		N	2022	8
9.5	Sunny	after a heavy rain	N	2022	8
9	Windy		N	2022	9
10	Sunny		N	2022	9
10.5	Sunny		N	2022	9

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2012	18	45.84963	1	2012-04-13	Spring Ove	James	Roscommon
2013	16	44.15037	1	2013-04-27	Spring Ove	James	Roscommon
2022	22	48.74469	1	2022-04-17	Spring Ove	James	Roscommon

720171	44.29893	-84.6337	NAD83/WGS84	2012-04-13
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720171	44.29893	-84.6337	NAD83/WGS84	2022-04-17

14:30:00	2012-03-17	Sunny,Win	2012-04-17	1	17
09:00:00	2013-04-23	Sunny,Win	2013-04-30	1	
09:00:00	2022-04-15	Sunny	2022-06-21	1	

1
1
1

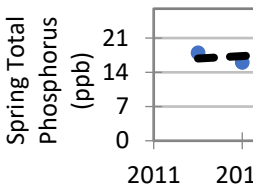
2012	19	46.62965	1	2012-09-06	Late Summ	James	Roscommon
2013	13	41.15477	1	2013-09-05	Late Summ	James	Roscommon
2021	16	44.15037	1	2021-09-05	Late Summ	James	Roscommon
2022	17	45.025	1	2022-09-05	Late Summ	James	Roscommon

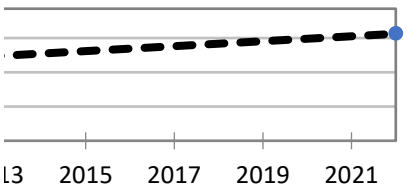
720171	44.29893	-84.633727	NAD83/WGS8
720171	44.29893	-84.633727	NAD83/WGS8
720171	44.29893	-84.633727	NAD83/WGS8
720171	44.29893	-84.633727	NAD83/WGS8

2012-09-06	12:00:00	0000-00-00	Sunny	2012-09-07	
2013-09-09	19:00:00	0000-00-00	Rainy	2013-09-10	
2021-09-09	11:00:00		Partly Cloudy	2021-09-14	Two days afte
2022-09-09	11:00:00		Sunny	2022-09-13	

1	1
1	1
1	1
1	1

2012	18	45.84963	1	FALSE
2013	16	44.15037	1	
2022	22	48.74469	1	





Year	# Samples	Min	Max	Average
2022	1	22	22	22.0
2017-2021				
2012-2016	2	16	18	17.0
2022 All CLMP	220	<5	220	20.7

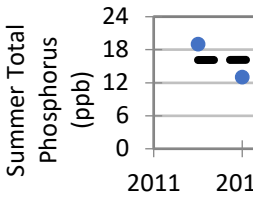
Std. Dev

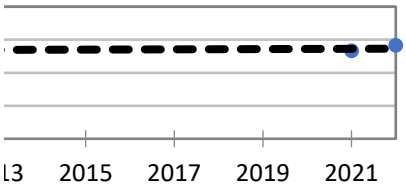
NA

1.4

21.3

2012	19	46.62965	1	FALSE
2013	13	41.15477	1	
2021	16	44.15037	1	
2022	17	45.025	1	





Year	# Samples	Min	Max	Average
2022	1	17	17	17.0
2017-2021	1	16	16	16.0
2012-2016	2	13	19	16.0
2022 All CLMP	234	<= 3	150	17.4

Std. Dev	Carlson TSI
NA	45
#DIV/0!	44
4.2	44
15.3	45

Lake Name	County	Township	Section	Site ID	STORETID	Latitude	Longitude

Watershed	Surface Area	Datum	GPS Source	Collecting Org	Date Sampled	Time Sampled	Event #

Secchi Depth	Composite De	Weather Con	Unusual Conc	Comments	Chlorophyll (u	REP (ug P/L)	DUP (ug P/L)

DUP REP (ug Lab Commen Tier

Lake Name	County	Township	Section	Site ID	STORETID	Latitude	Longitude

Watershed	Surface Area	Datum	GPS Source	Collecting Org	Date Sampled	Time Sampled	Weather Cond

Sampling Dep	Meter Type	Meter ID	Calibration DO	Calibration Te	Lake Altitude '	Unusual Conc	Comments

Depth (feet)	Temp (°C)	DO Level (mg	Tier

Secchi	2022	47.8671	46.44605	current year	
	2017-2021	51.37716			
	2012-2016	47.79953			
					2022
Summer Tl	2022	45.025	47.76377	5 year history	46
	2017-2021	44.15037			44
	2012-2016	43.89221			
					2017
			45.84587	full history	2012

720171
James Lake
Roscommon
44.29893
-84.6337

		3
Spring TP	2022	1
	2017-2021	
	2012-2016	2

	# Years do	0	0	1998		1998
			0	1999		1999
			0	2000		2000
2017-2021	2012-2016		0	2001		2001
48	46		0	2002		2002
40	40		0	2003		2003
			0	2004		2004
2021			0	2005		2005
2016			0	2006		2006
			0	2007		2007
			0	2008		2008
			0	2009		2009
			0	2010		2010
			0	2011		2011
			2	2012	1	2012
			1	2013		2013
			0	2014		2014
			0	2015		2015
			0	2016		2016
			0	2017		2017
			0	2018		2018
			0	2019		2019
			0	2020		2020
			2	2021	1	2021
			2	2022	1	2022
			0	2023		2023
			0	2024		2024
			0	2025		2025
			0	2026		2026
			0	2027		2027
			0	2028		2028
			0	2029		2029
			0	2030		2030

1
1

1
1