Welcome to MiCorps Cooperative Lakes Monitoring Program's Annual Training.

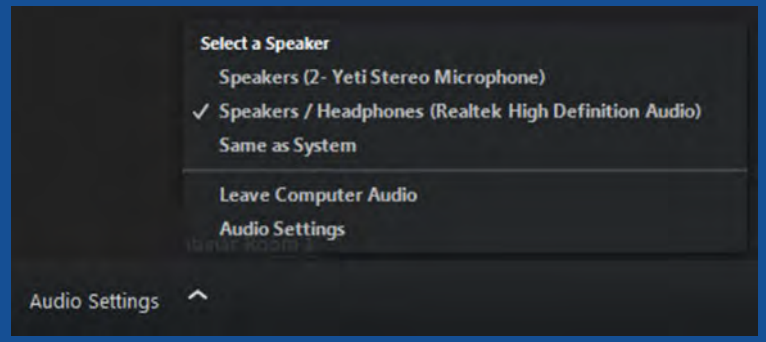
- For CLMP procedures and data forms please visit: micorps.net/lake-monitoring/clmp-documents/ and then click on the name of the parameter.

Today's Agenda:

9:00 AM – 9:30 AM	Welcome and Introduction to CLMP
9:30 – 10:00 AM	Secchi Disk
10:00 - 10:15 AM	BREAK
10:15 – 10:45 AM	Spring and Summer Phosphorus
10:45 AM – Noon	Dissolved Oxygen & Temperature
Noon – 1:00 PM	Lunch Break
1:00 – 2:00 PM	Score the Shore
2:00 – 3:00 PM	Chlorophyll-a
3:00 – 3:15 PM	BREAK
3:15 PM – 4:30 PM	Exotic Aquatic Plant Watch

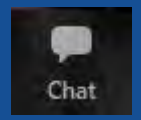
Getting Started

- Audio is through your computer speakers or headset: **You may not hear sound until training begins.**
- Use the **Audio Settings** option to do a sound check.
- During the webinar if you do not hear audio, make sure your sound is turned on then contact the **Help Desk.**



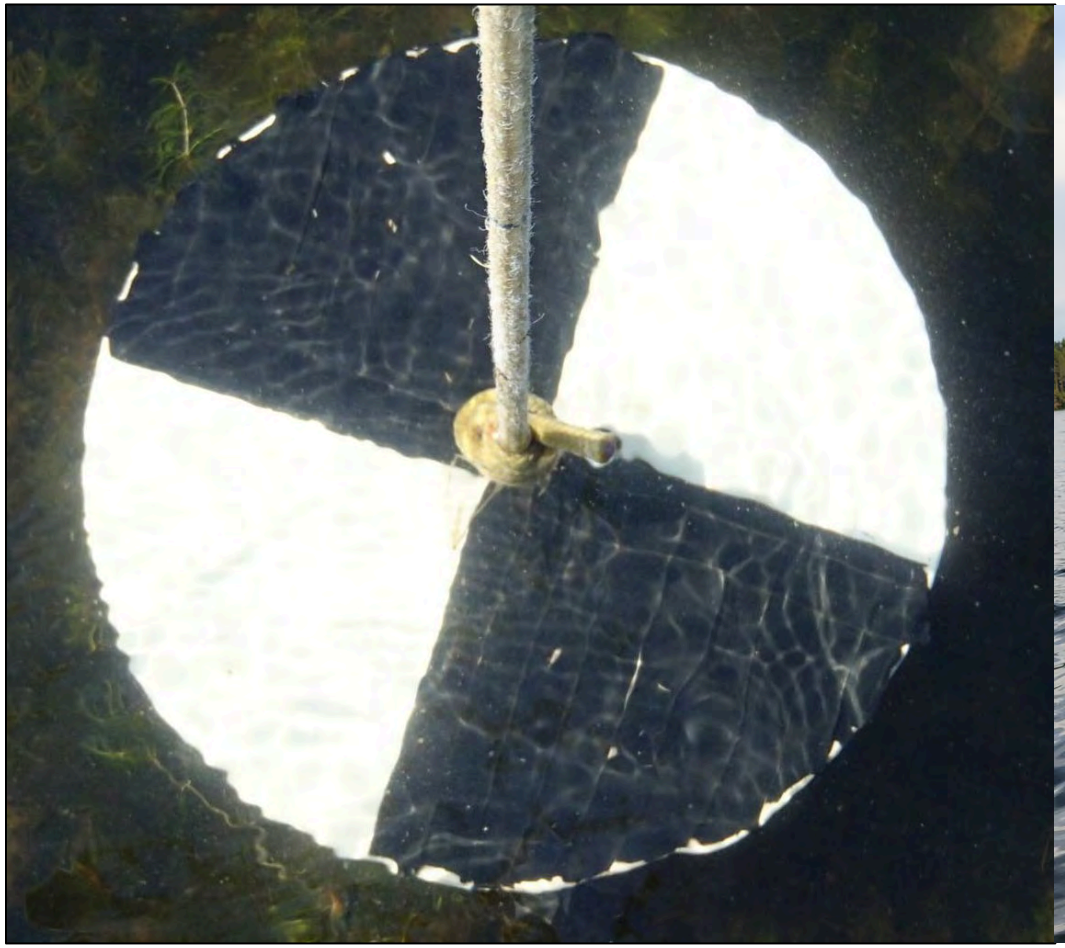
How to Ask Questions

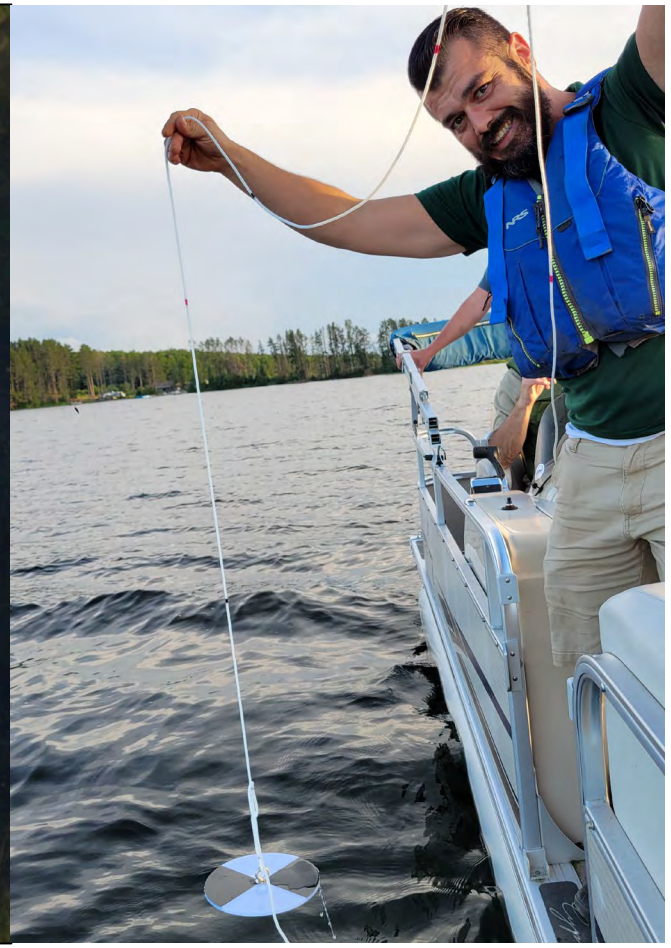
1. Click on the Chat Icon to submit a question to the presenters.



Help Desk

Call the MSU Distance Learning Help Desk 844-678-6200 for technical support.





Secchi Disk Water Transparency

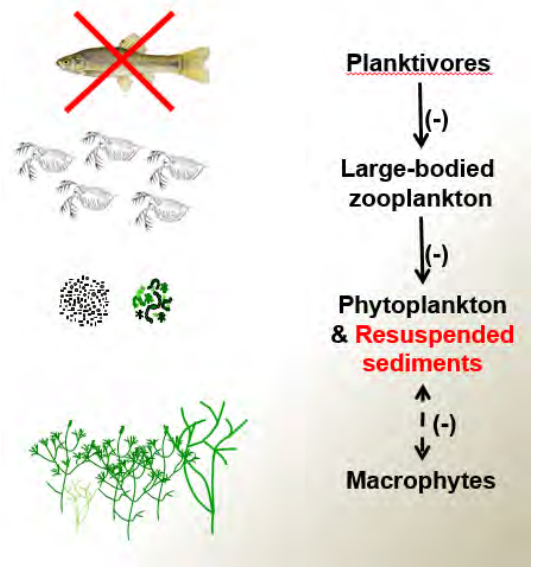
Erick Elgin

Erick Elgin,

CLMP Lake Program Manager

Michigan State University Extension

Contact:
218-340-5731
elgineri@msu.edu

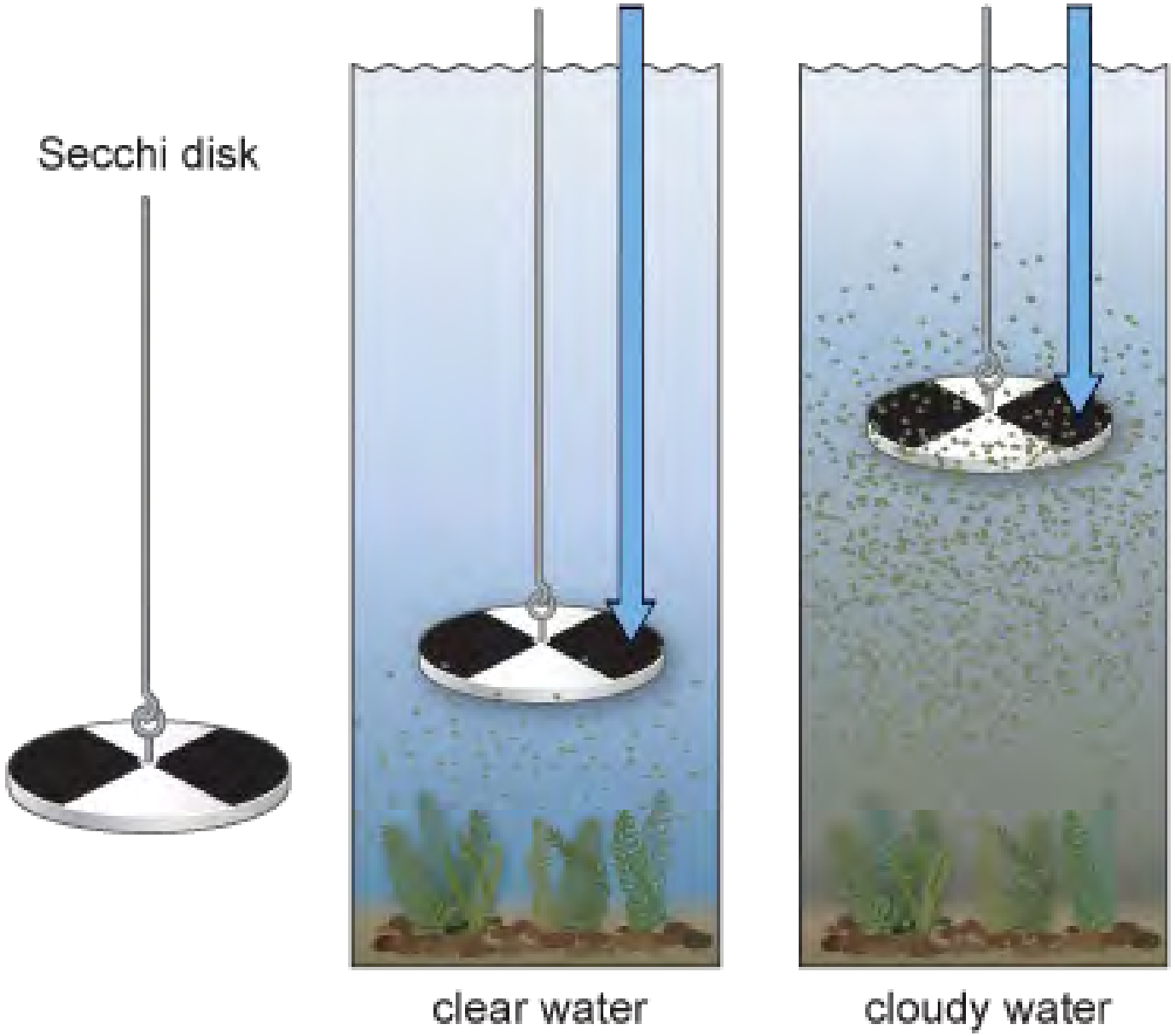

Planktivores
(-)
Large-bodied zooplankton
(-)
Phytoplankton & Resuspended sediments
(-)
Macrophytes

Secchi disk water transparency

What is a Secchi Disk?

Michigan Clean Water Corps

Cooperative Lakes Monitoring Program



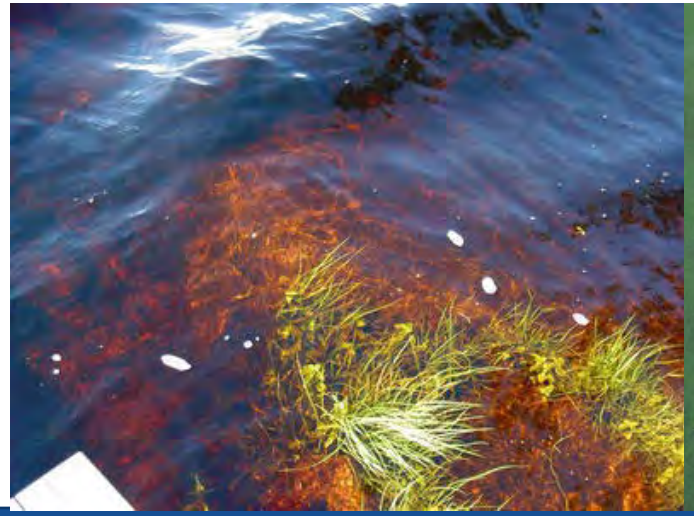
How does it work?

Water clarity is affected by

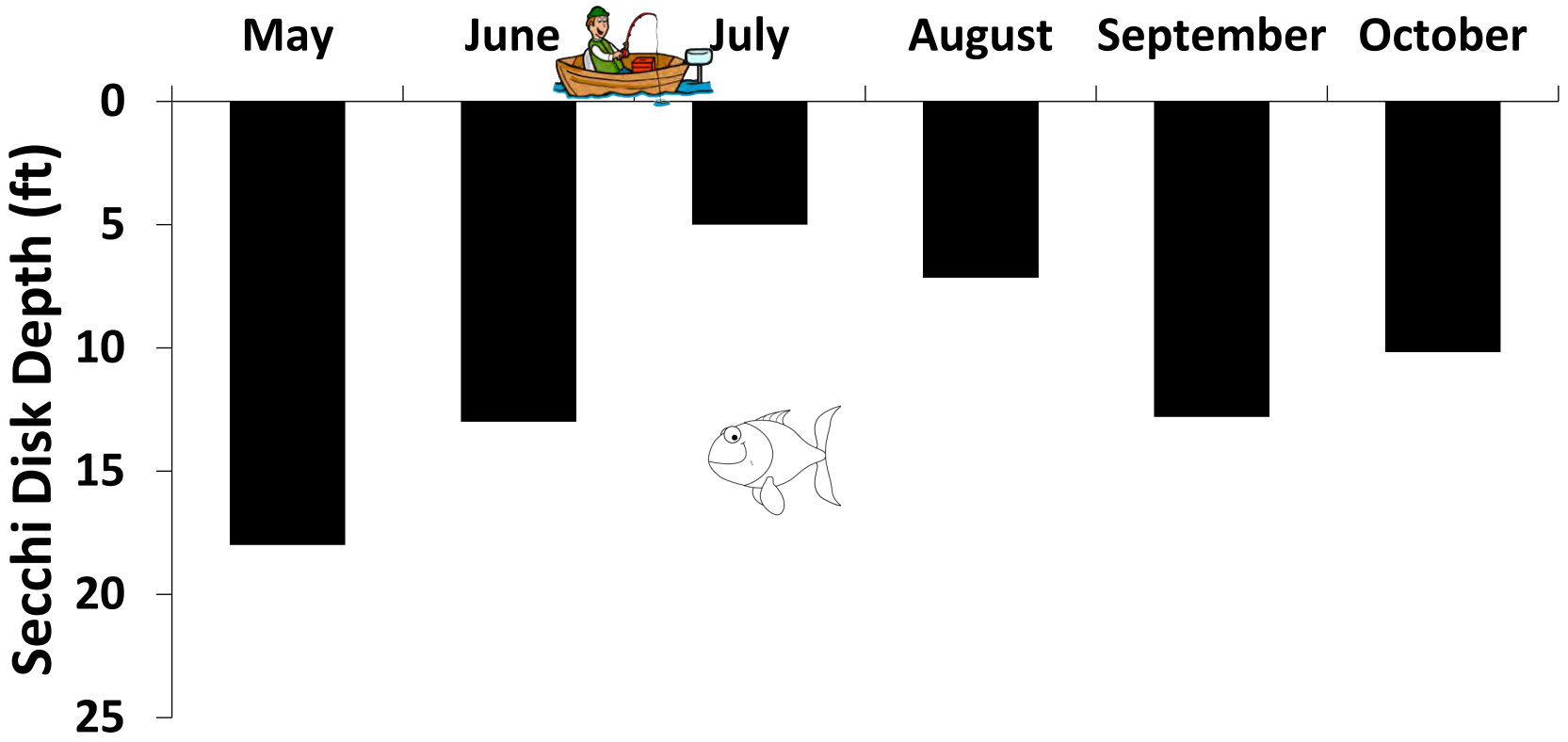
- Water color
- Algae
- Suspended solids (organic, sediment, etc…)

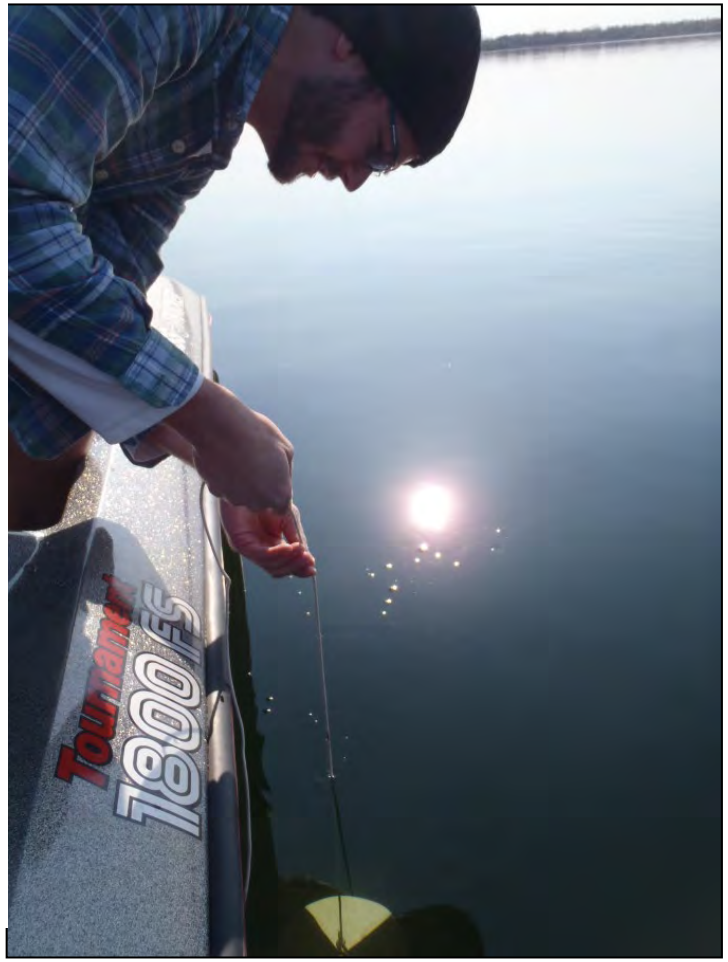
What does Secchi transparency tell us?

- Indicator of natural processes and human changes
  - Spring clear water state
  - Eutrophication, Oligotrophication, and Browning

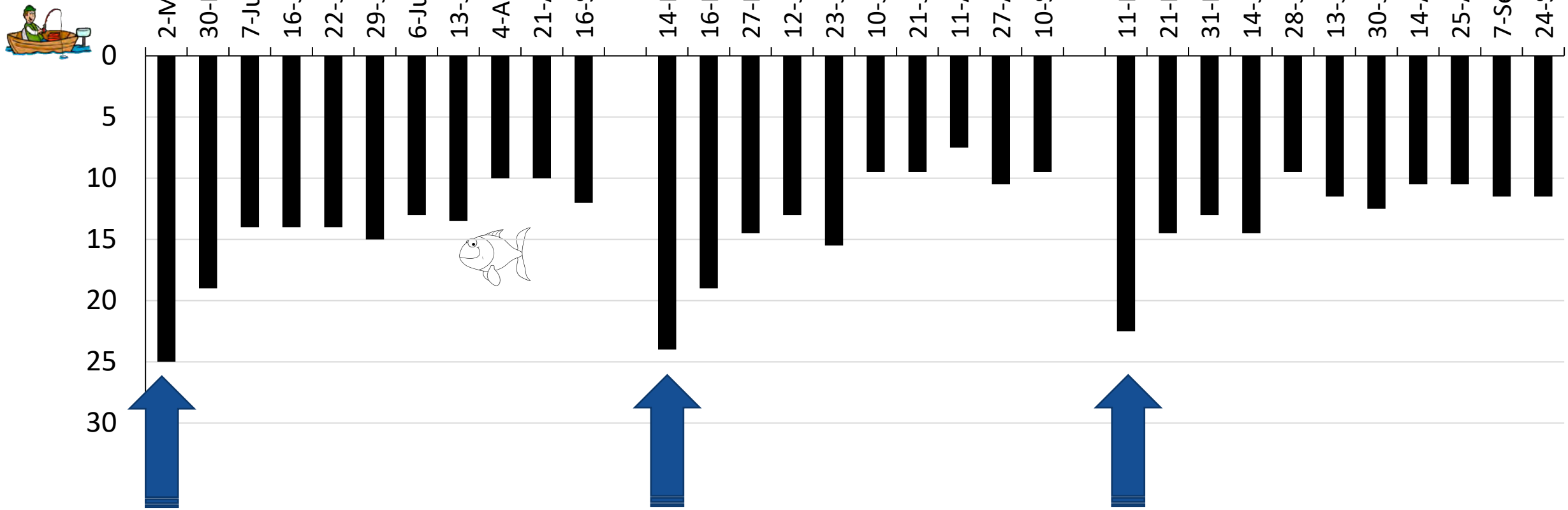


Monitoring water clarity through a season



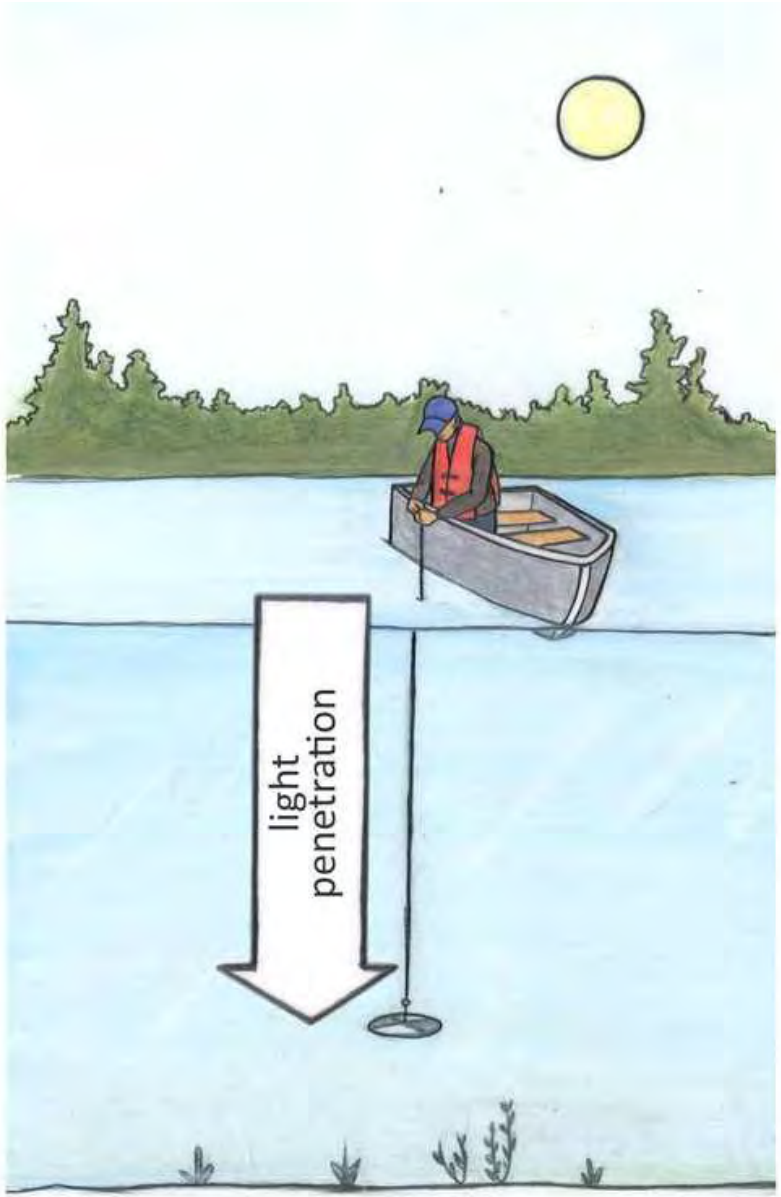


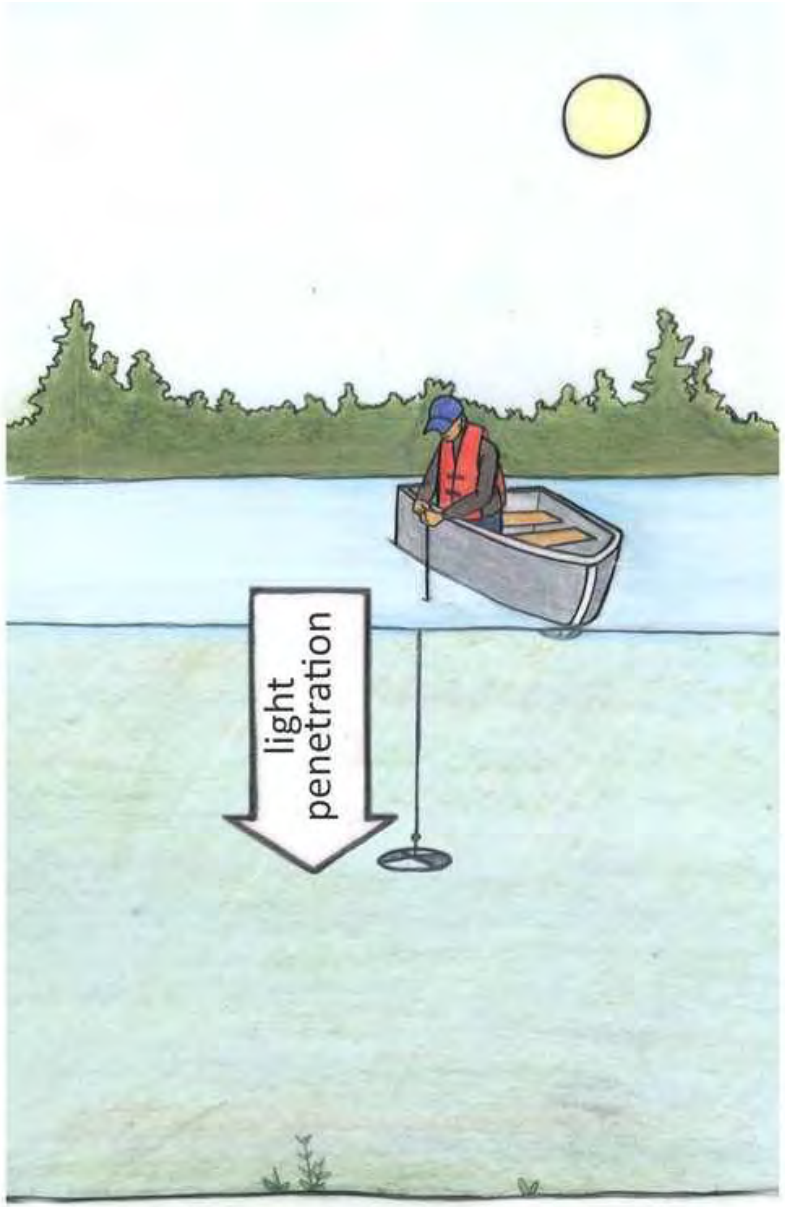
Monitoring water clarity through the seasons



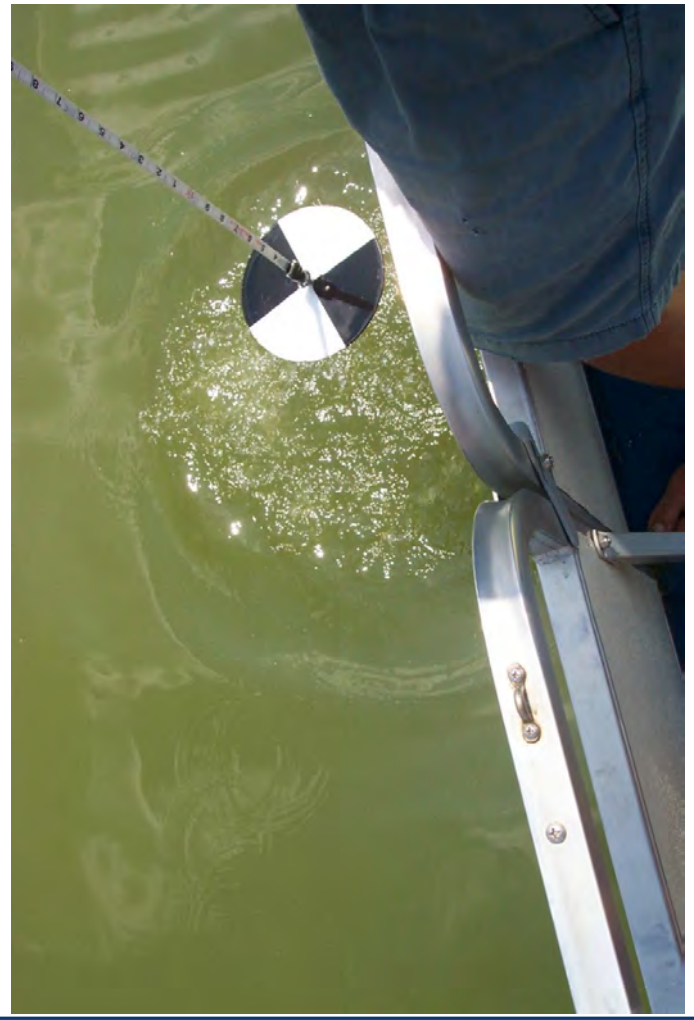
Monitoring Water Clarity: Summarized Historical Trends

Protocol





CLMP Secchi Sampling Requirements

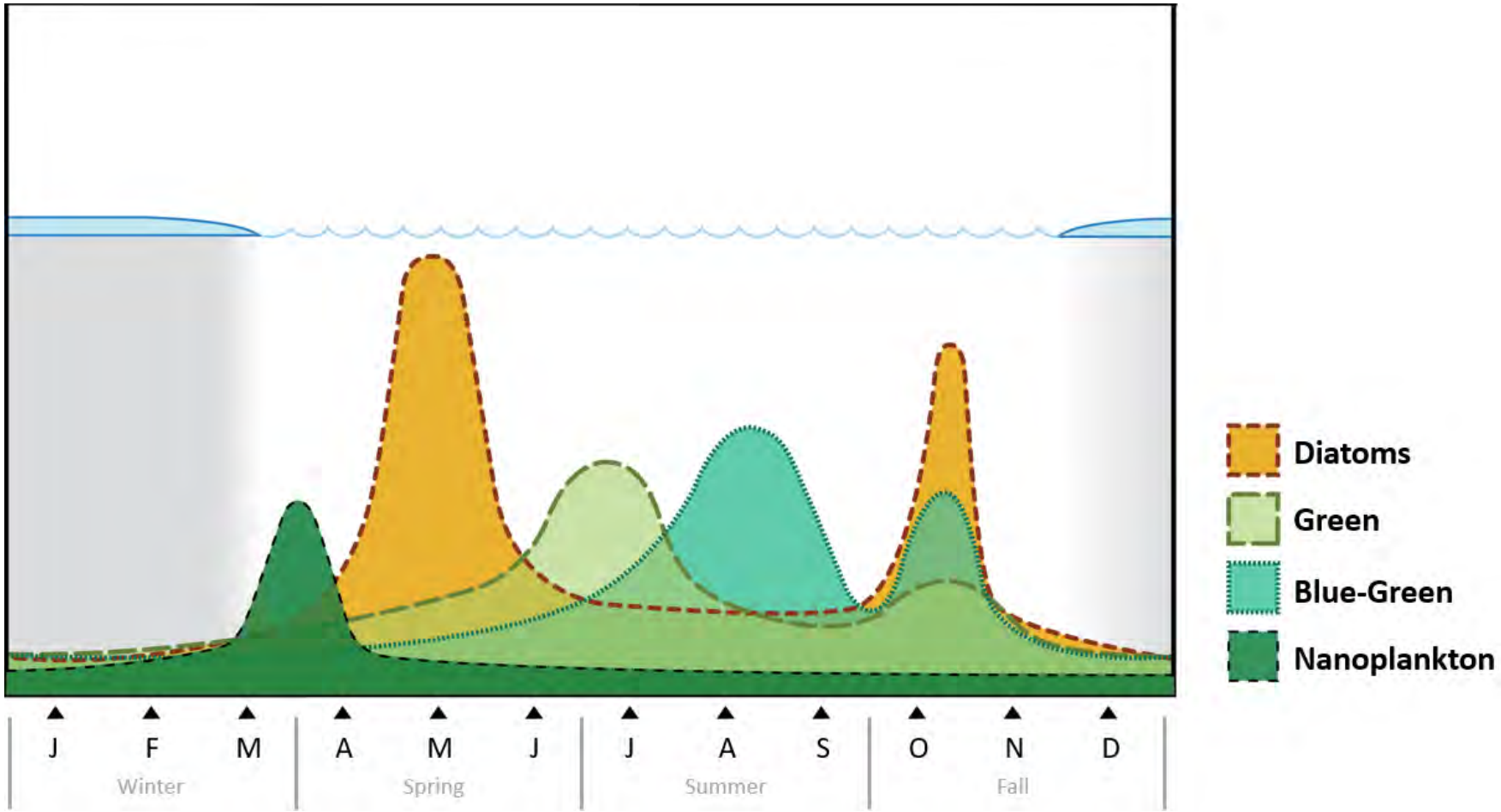


Evenly spaced monitoring through middle of May to middle of September

At least 8 measurements

One a week or every other week

Why 8 measurements spaced evenly through summer? Lakes Change Through Time!

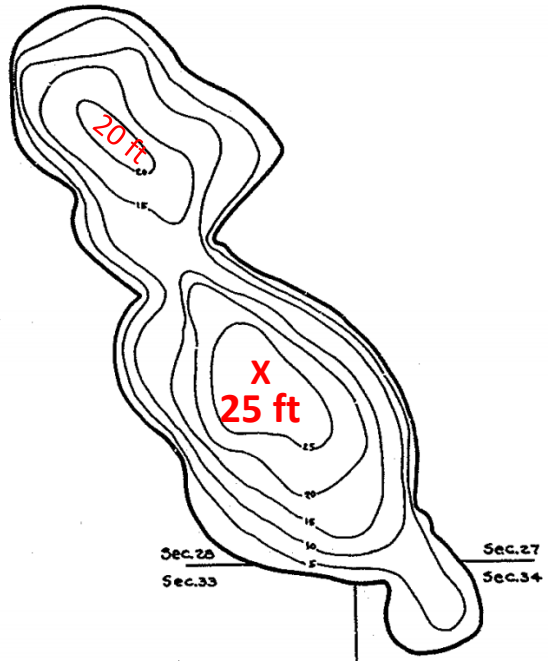


Step 1. Drift your boat approximately over the deepest part of the lake

Michigan Clean Water Corps

Cooperative Lakes Monitoring Program

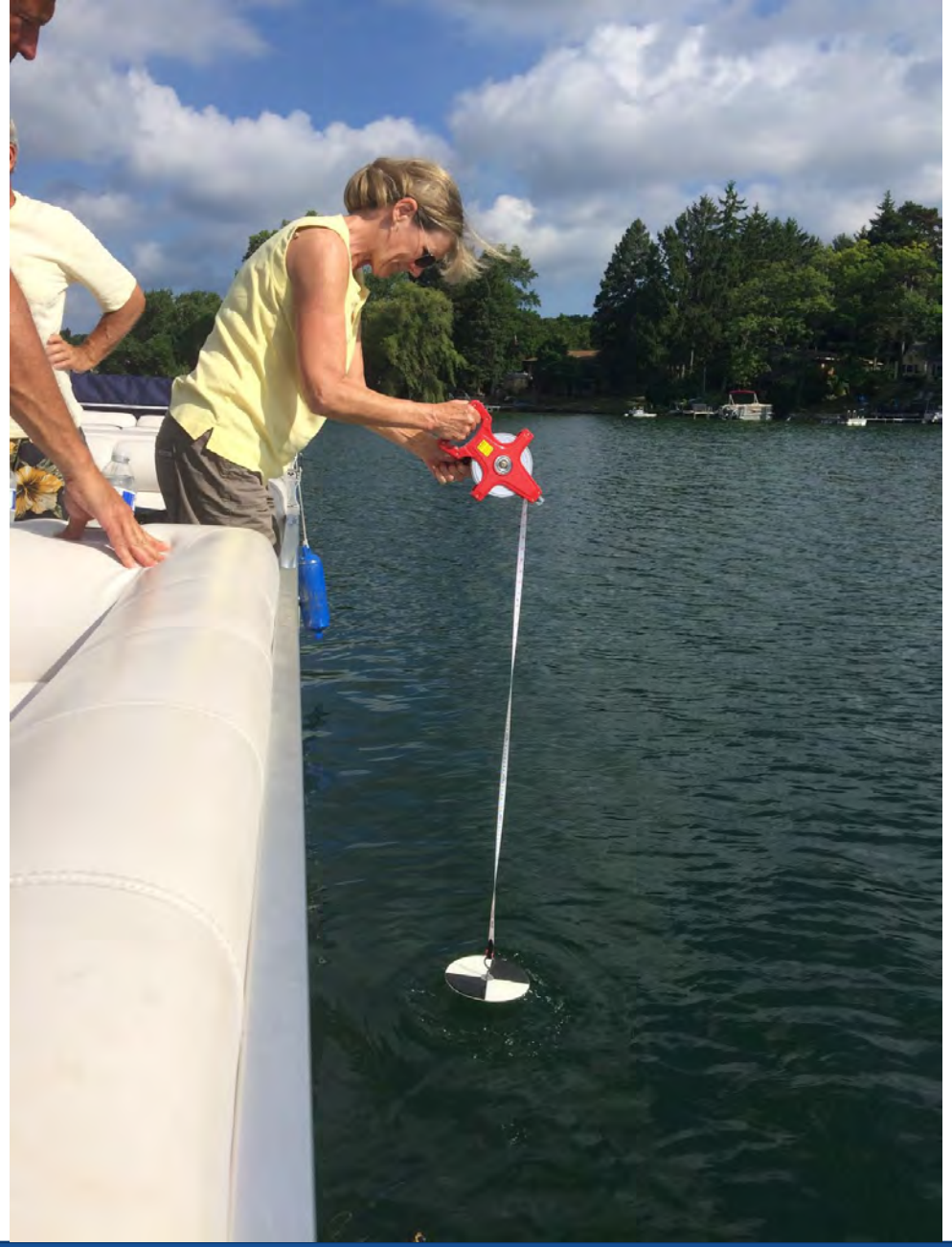
Where to monitor – Find the deepest basin



Mi DNR Lake Maps

010017	Cedar	Alcona	44.52751	-83.33195
010101	Hubbard (1)	Alcona	44.77224	-83.55287
010102	Hubbard (2)	Alcona	44.80941	-83.5468
010103	Hubbard (3)	Alcona	44.83379	-83.58163
010104	Hubbard (4)	Alcona	44.8483	-83.59922
010105	Hubbard (5)	Alcona	44.83168	-83.60152
010106	Hubbard (6)	Alcona	44.81146	-83.56633
010107	Hubbard (7)	Alcona	44.7943	-83.57416
020127	Deer	Alger	46.48016	-86.98277
030203	Hutchins	Allegan	42.58316	-86.13441
030259	Eagle	Allegan	42.425559	-85.930559
030263	Osterhout	Allegan	42.439448	-86.038892
050052	Bellaire	Antrim	44.95333	-85.21889
050055	Torch (North)	Antrim	45.027781	-85.31556
050101	Clam	Antrim	44.93612	-85.27334
050240	Torch (South)	Antrim	44.9159	-85.3028
080071	Crooked (Upper)	Barry	42.490281	-85.431392
080092	Bristol	Barry	42.484449	-85.248892
080096	Duncan	Barry	42.749448	-85.534448
080103	Payne	Barry	42.749448	-85.521115
080176	Barlow	Barry	42.670559	-85.52042
080259	Cobb	Barry	42.6525	-85.537626
080279	Long (Little)	Barry	42.6525	-85.537626
080294	Wall	Barry	42.5215	-85.3862
100066	Crystal	Benzie	44.668615	-86.186115

Micorps.net → Lake Monitoring → CLMP Documents



Step 2. On the shady side of the boat, slowly lower disk until it disappears from view.

- Note the depth of the water at which the disk disappears.

Step 3. Slowly raise disk until it reappears

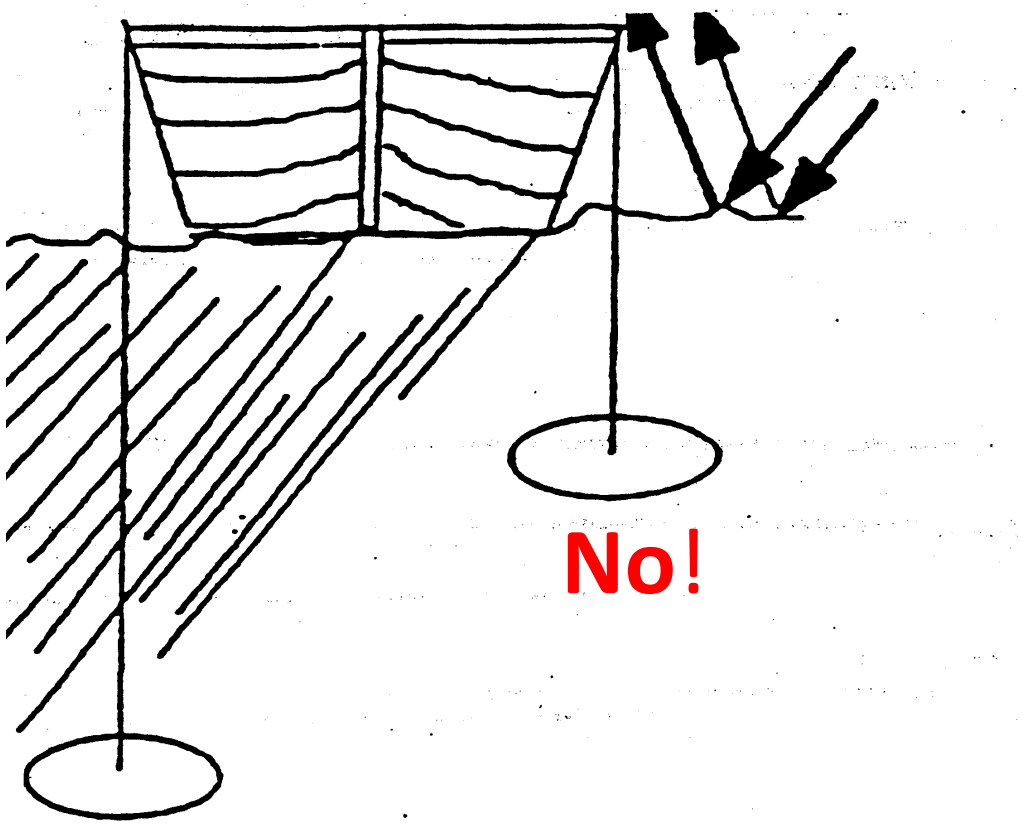
- Note this depth also.

Step 4. The official measurement is the average of the 2 depths.

- Record that number on our datasheet.
- Round to the nearest half-foot

A couple things to remember:
1. Don't wear sunglasses!

2. Pick the shady side



No!

Yes!

3. Be consistent in weather and timing!

- Measure between 10 am – 4 pm (try and be consistent)
- Sunny calm days are best
- Do not measure during heavy boating

4. For clear shallow lakes: Note if Secchi is on bottom of lake

Michigan Clean Water Corps

SECCHI DISK TRANSPARENCY

2023 Data Form

Cooperative Lakes Monitoring Program

Lake Name: _____ County: _____ Township: _____

Lake Sampling Site (Field ID) Number: _____ (see reverse and mark location on map)

Latitude: _____ Longitude: _____

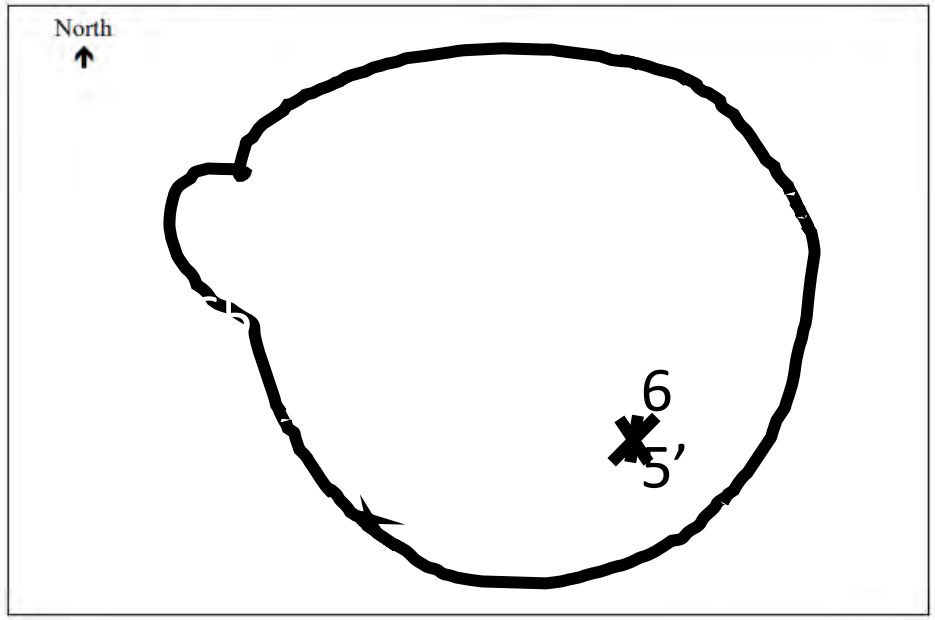
Volunteer Monitor Name(s): _____

WEEKLY SAMPLING INTERVAL	DATE SAMPLED	TIME OF DAY	SECCHI DEPTH (to nearest ½ foot)	WEATHER CONDITIONS (sunny, cloudy, windy)	UNUSUAL CONDITIONS (Secchi disk on bottom of lake, heavy rain, boating, etc.)
May 14-20					
May 21-27					
May 28-June 3					
June 4-10					
June 11-17					
June 18-24					
June 25-July 1					
July 2-8					
July 9-15					

Dates

Note if secchi is on bottom of lake

- In the box below draw an outline of your lake (i.e. lake map). Or attach a copy of a lake map.
- On the lake map, mark your Secchi disk sampling location (this should be at the deepest location in your lake) and write the LAKE DEPTH at this location (not Secchi depth).
- Surface Area of Lake (if known): _____(acres)



DATA ENTRY

If you can, please enter your data into the MiCorps Data Exchange by October 31st.

DATA SHEET TURN IN Protocol

Please do the following:

(1) Make a copy of your field data sheets to keep for your records,

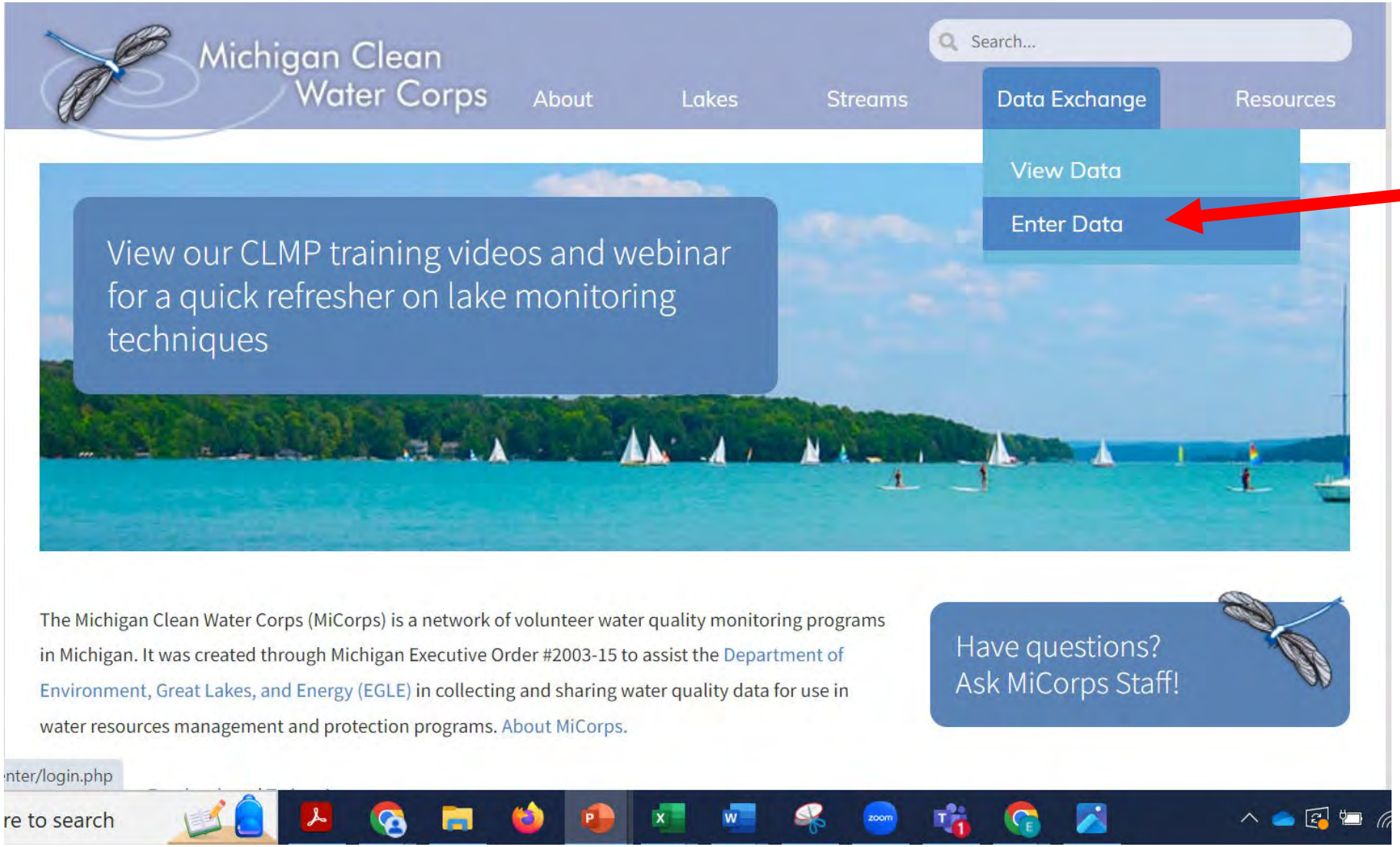
(2) Mail one copy by October 31st to: **MLSA, P.O. Box 303, Long Lake, MI 48743**

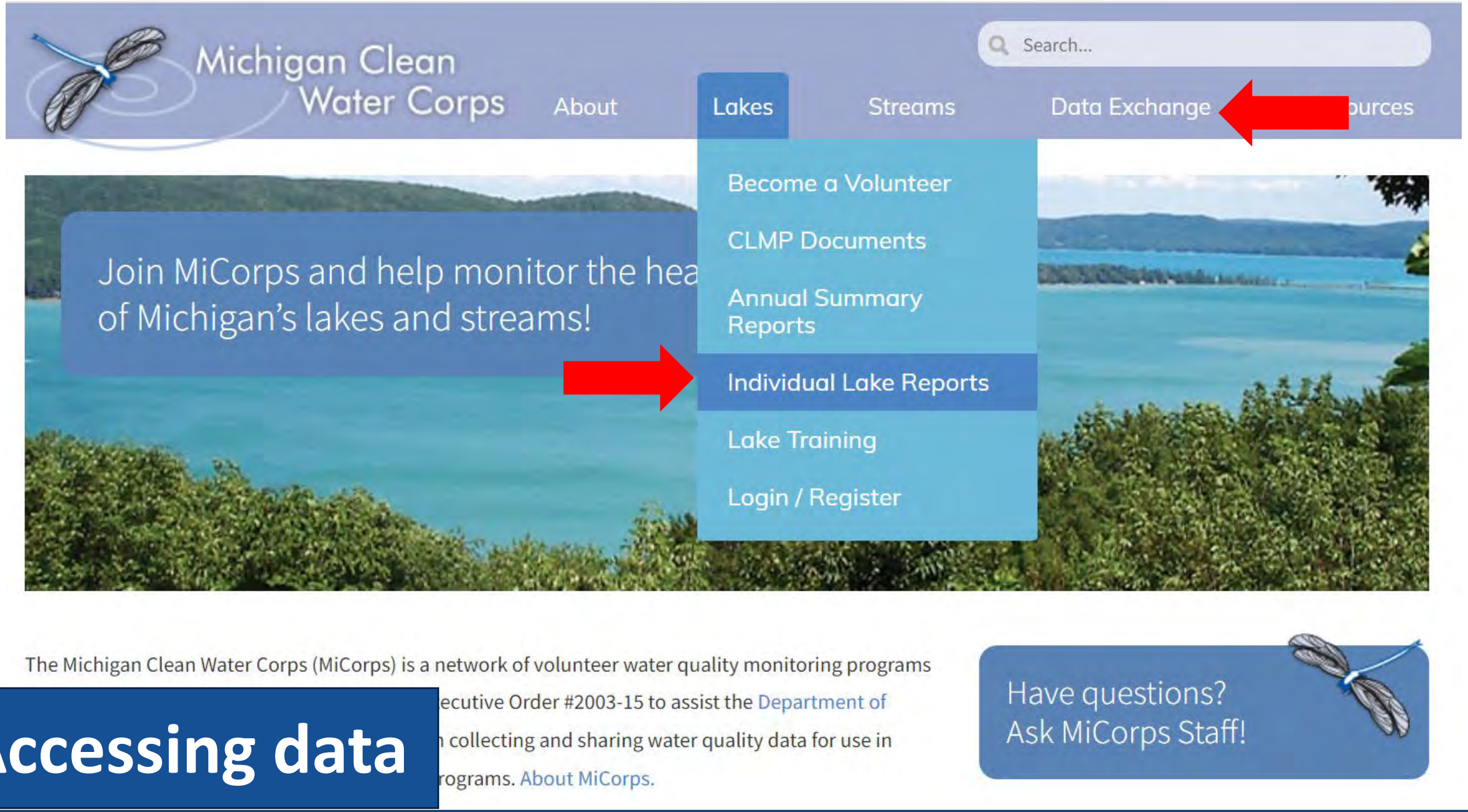
a. For electronic submission, send to: MiCorps@msu.edu

Data Entry

- All volunteers are encouraged to use the online data entry system
- Follow the instructions for data submission on our website, www.micorps.net.

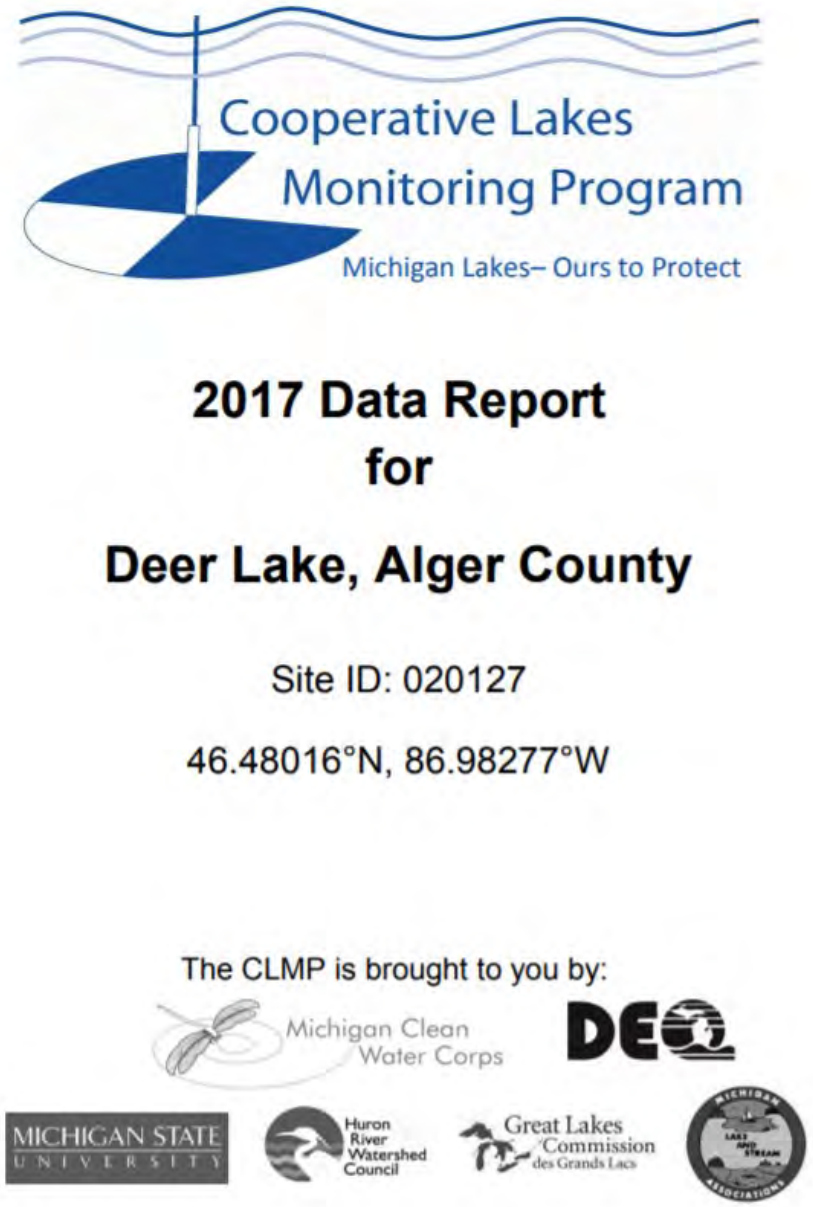
MiCorps Data Exchange Entry Point





Accessing data

Receive a data report in early 2025



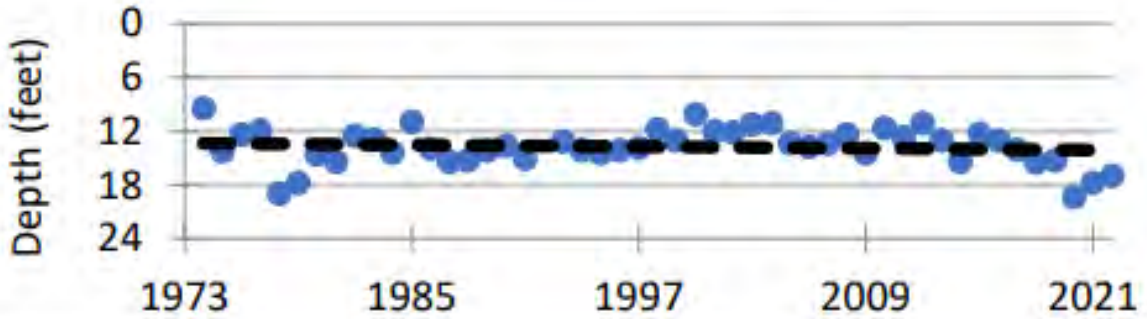
Site ID: 750142

Corey Lake, St. Joseph County
2022 CLMP Results

Cooperative Lakes Monitoring Program

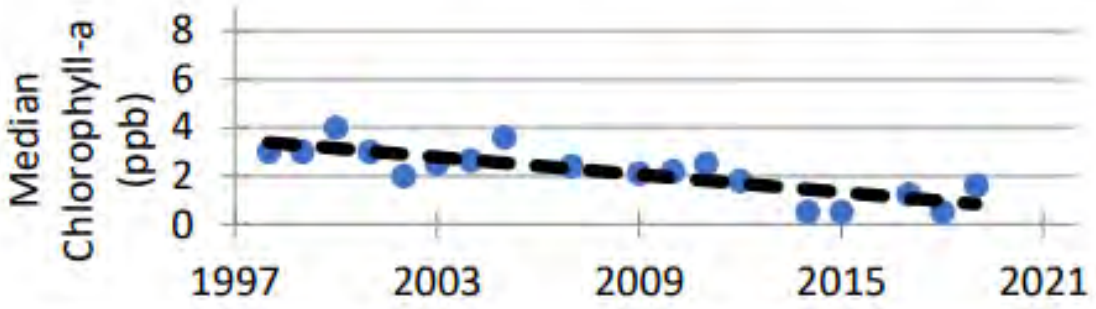
Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Avg	Std. Dev	Carlson TSI
2022	17	13.0	26.0	17.0	3.6	36
2017-2021	97	8.0	27.0	16.4	4.2	37
1974-2016	742	5.5	39.0	13.4	5.5	40
2022 All CLMP Lakes	3178	1.0	63.0	11.6	2.5	43



Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Med	Std. Dev	Carlson TSI
2019	5	<1.0	3.9	1.6	1.4	35
2014-2018	20	<1.0	2.7	<1.0	0.5	<31
1998-2013	71	<1.0	4.2	<1.0	0.8	40
2022 All CLMP Lakes	687	< 1.0	43.0	3.7	5.3	43



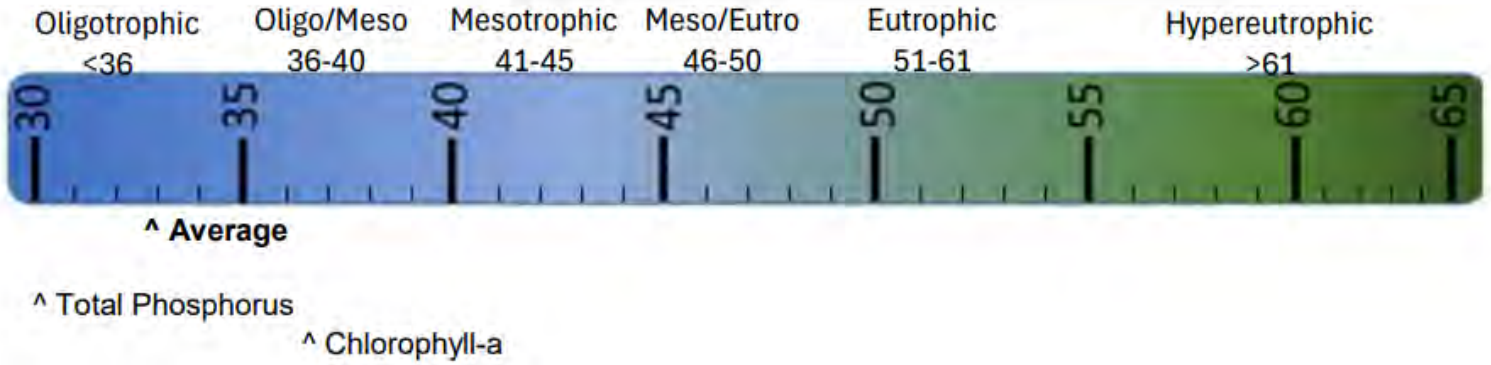
The tables below give the results-to-TSI conversions for the water quality data ranges normally seen in the CLMP. The formulas for this conversion can be found in the CLMP manual (link is on page 2 of this report).

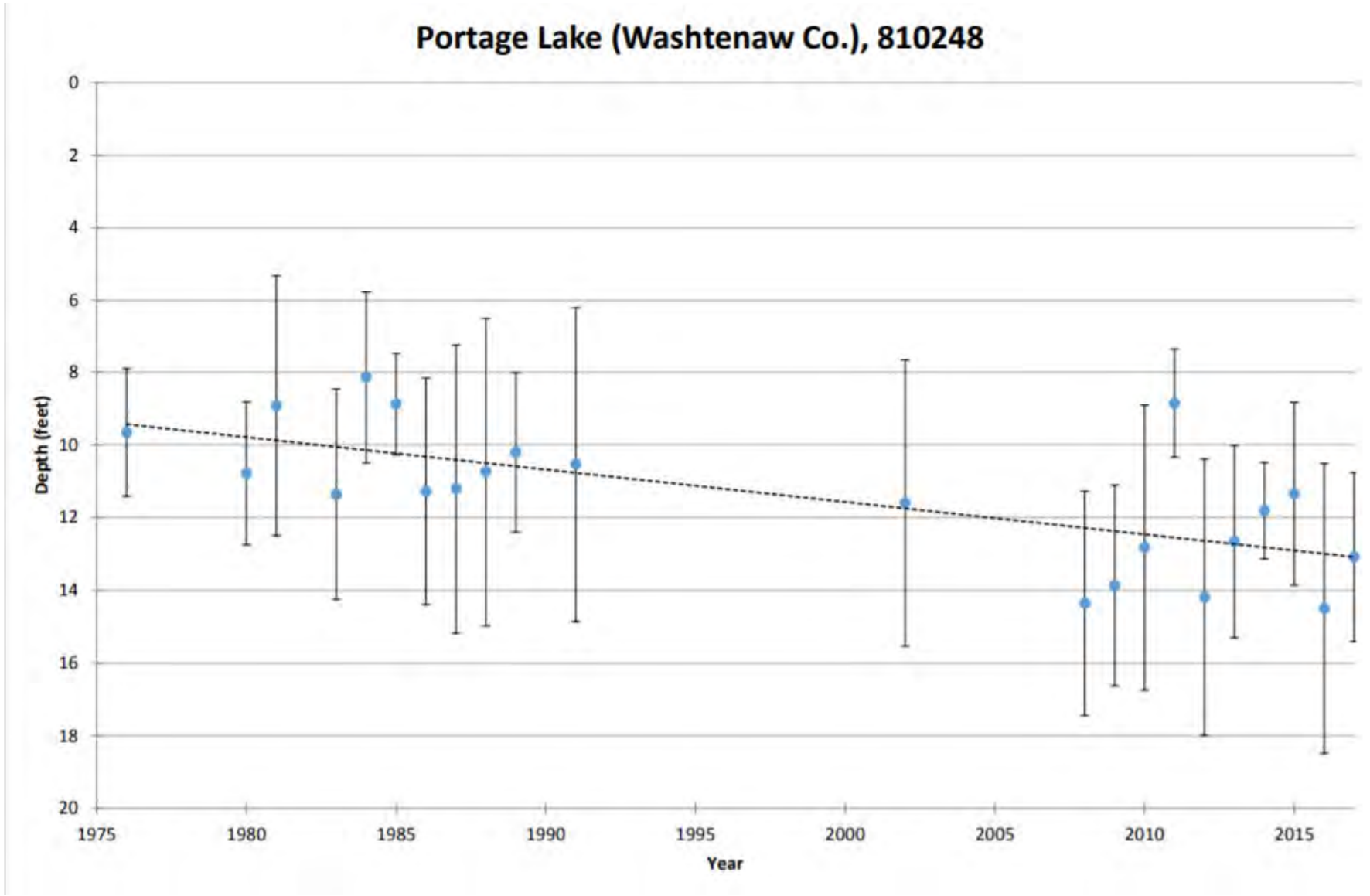
Phosphorus (ppb)	TSI Value
<5	<27
6	30
8	34
10	37
12	40
15	43
18	46
21	48
24	50
32	54
36	56
42	58
48	60
>50	>61

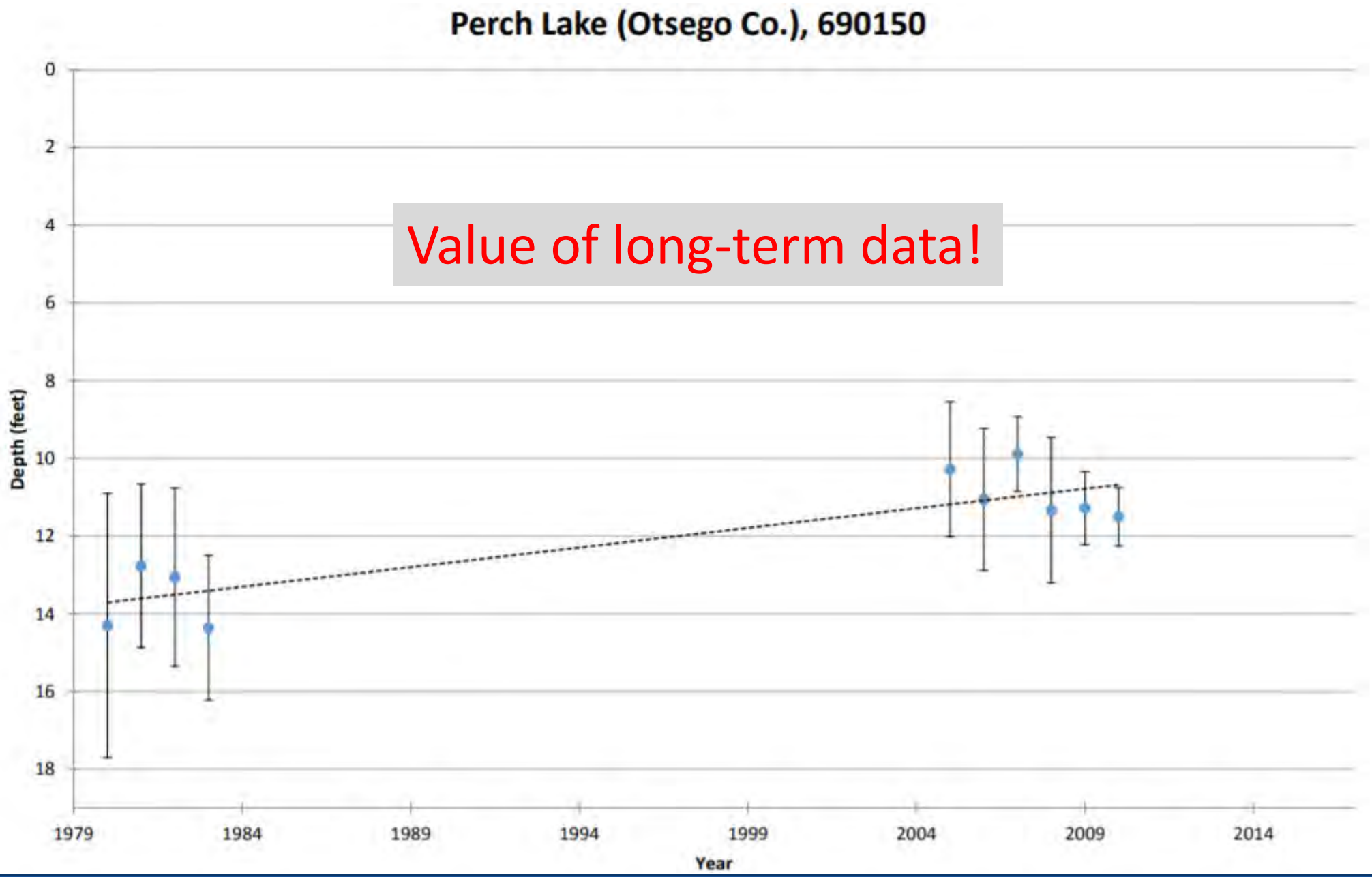
Secchi Depth (ft)	TSI Value
>30	<28
25	31
20	34
15	38
12	42
10	44
7.5	48
6	52
4	57
<3	>61

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 Cedar Lake in 2023	
Average	33
Secchi Disk	
Summer TP	30
Chlorophyll-a	37




Portage Lake (Washtenaw Co.), 810248
Depth (feet)
0
2
4
6
8
10
12
14
16
18
20
1975
1980
1985
1990
1995
2000
2005
2010
2015
Year


Perch Lake (Otsego Co.), 690150
Value of long-term data!
Depth (feet)
0
2
4
6
8
10
12
14
16
18
1979
1984
1989
1994
1999
2004
2009
2014
Year

Questions?

To learn more about the Cooperative Lakes Monitoring Program, visit:

MiCorps.net

EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

MICHIGAN STATE UNIVERSITY | Extension

Huron River Watershed Council

MICHIGAN LAKES AND STREAMS ASSOCIATION

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3:15 PM – 4:30 PM	Exotic Aquatic Plant Watch