



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

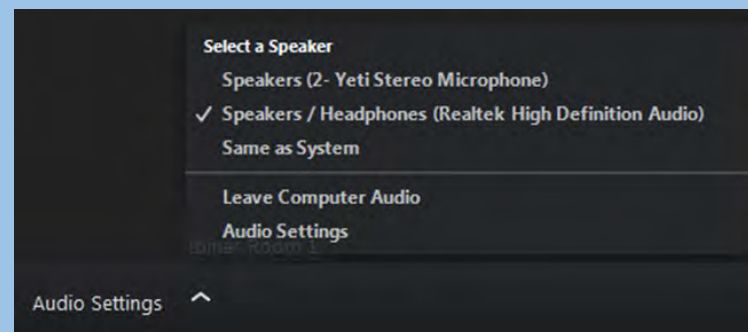
- For CLMP procedures and data forms please visit: micorps.net/lake-monitoring/clmp-documents/ and then click on the name of the parameter.

Today's Agenda:

9:00 AM – 9:15 AM	Welcome and CLMP Review
9:15 AM – 10:15 AM	Secchi Disk & Phosphorus
10:15 AM-10:30 AM	BREAK
10:30 AM – 11:45 AM	Chlorophyll-a (algae indicator)
11:45 AM – 12:30 PM	BREAK
12:30 PM – 1 PM	OPTIONAL: Online Registration Tutorial
1:00 PM – 2:00 PM	Dissolved Oxygen and Temperature
2:00 PM – 3:00 PM	Score the Shore
3:00 PM – 3:15 PM	BREAK
3:15 PM – 4:30 PM	Exotic Aquatic Plant Watch

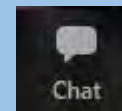
Getting Started

- 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

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



Help Desk

Call the Distance Learning Help Desk (800) 500-1554 for technical support.

Cooperative Lakes Monitoring Program



Secchi Disk Transparency and Total Phosphorus

Erick Elgin

CLMP Coordinator

Michigan State University
Extension

218-340-5731

elgineri@msu.edu

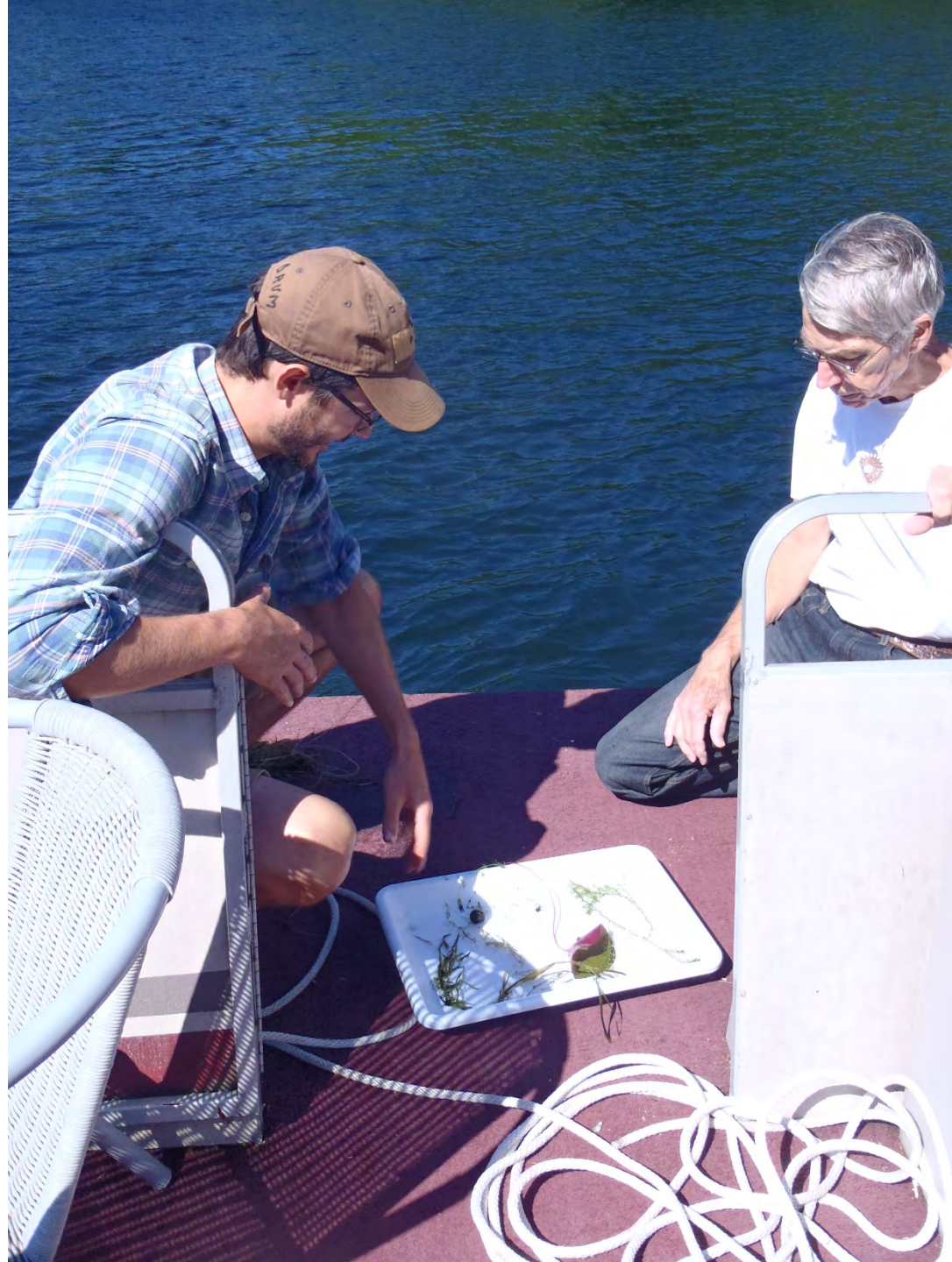


The Self-Help Legacy

- **1974:** Secchi disk - second oldest program in country
- **1993-1998:** added spring and summer total phosphorus and summer chlorophyll
- **2000:** added dissolved oxygen/temperature
- **2001:** added aquatic plant surveys
- **2011:** added Exotic Aquatic Plant Watch
- **2016:** added Score the Shore

CLMP Goals

- A cost effective volunteer framework for: **reliable, long-term, baseline data** collection
- Helps improve the understanding and management of your lake
- Online database that stores your lake data
- Training opportunities



Resources

Resources on MiCorps.net

- Fact sheets for each CLMP parameter
- **Protocol manual**
- Historical CLMP Reports
- All data forms, schedules, and **quick protocols**
- Training videos

micorps.net → Lake Monitoring →
CLMP Documents



Michigan Clean
Water Corps



MiCorps Factsheet



Cooperative Lakes
Monitoring Program

CLMP – Monitoring First



- The CLMP deals with baseline lake monitoring.
- This doesn't mean we aren't interested in management, but this is a larger, more complicated discussion.
- Today we are talking about monitoring.

Monitoring Parameters

- Water Clarity
- Total Phosphorus
- Chlorophyll a
- Dissolved Oxygen
- Temperature
- Aquatic Plants
- Aquatic invasive plants
- Shoreline surveys

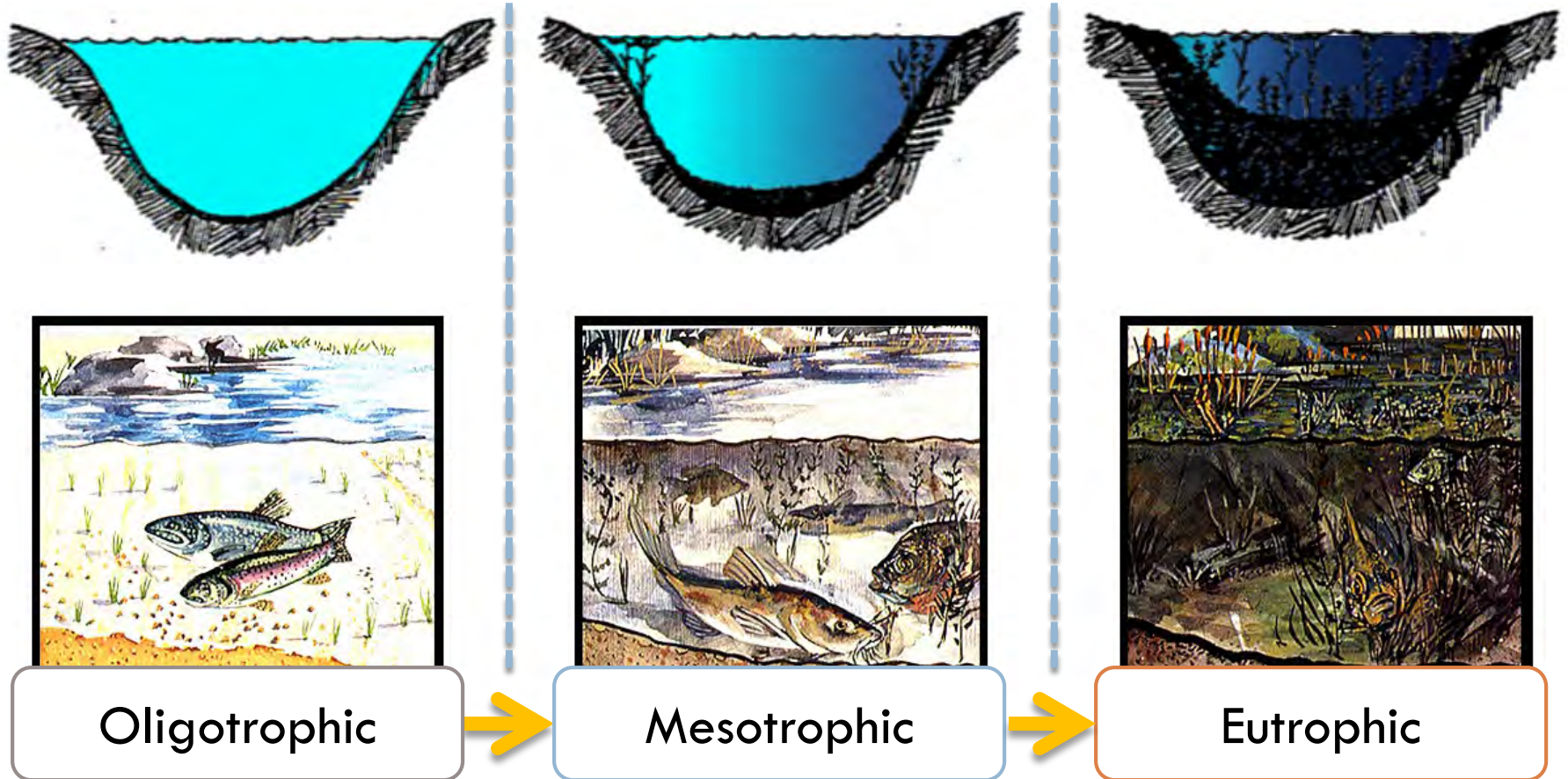


TROPHIC STATUS

- **Trophic Status**: description of how productive a lake is.
- **Productivity**: the amount of plant or animal life that a lake can support



TROPHIC STATUS



Trophic State Indicators

- Transparency
- Total Phosphorus
- Chlorophyll *a*
- Dissolved Oxygen and Temperature



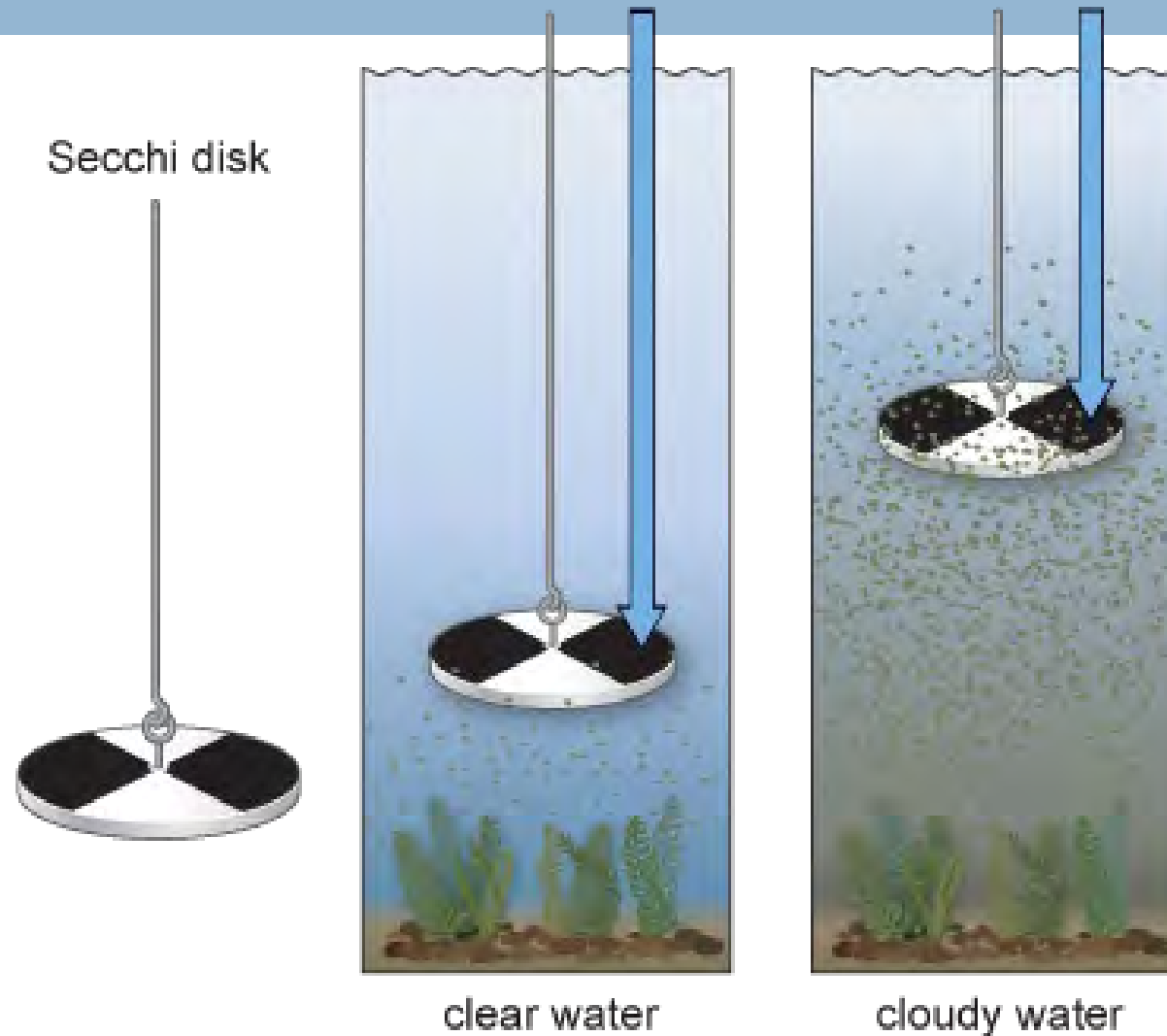
Water Transparency



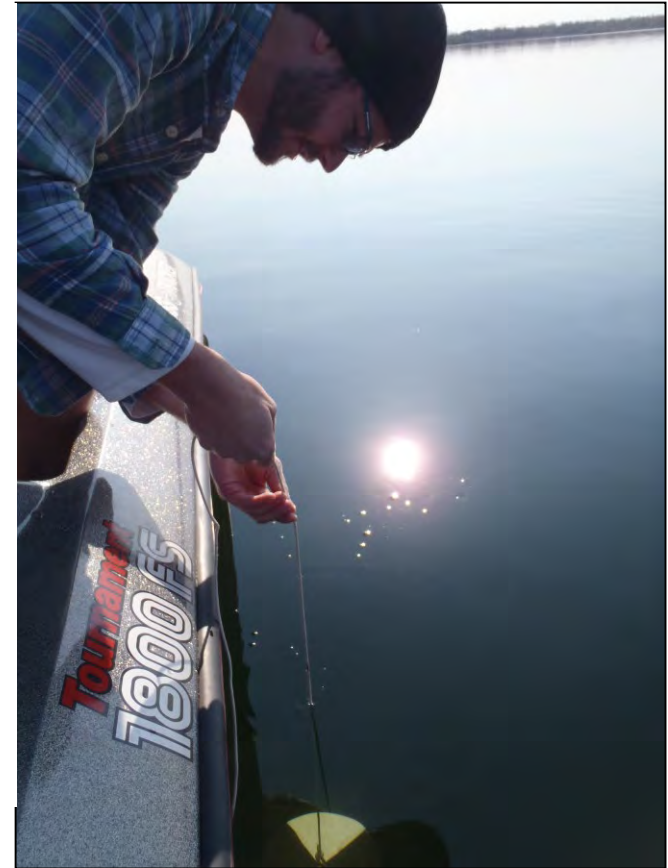
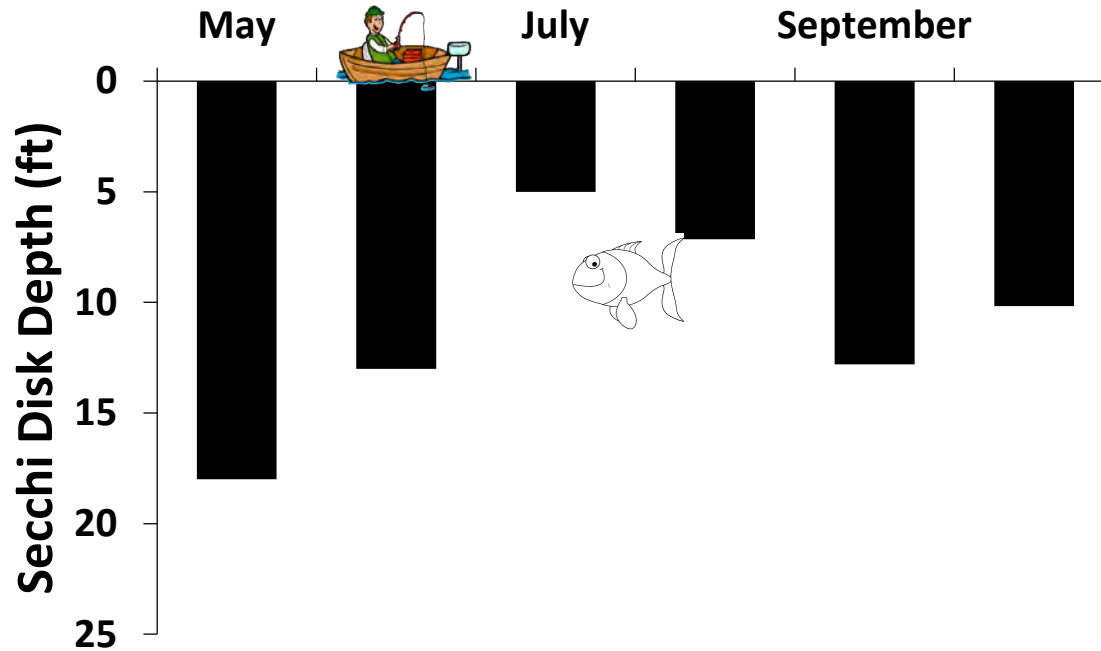
What is a Secchi Disk?



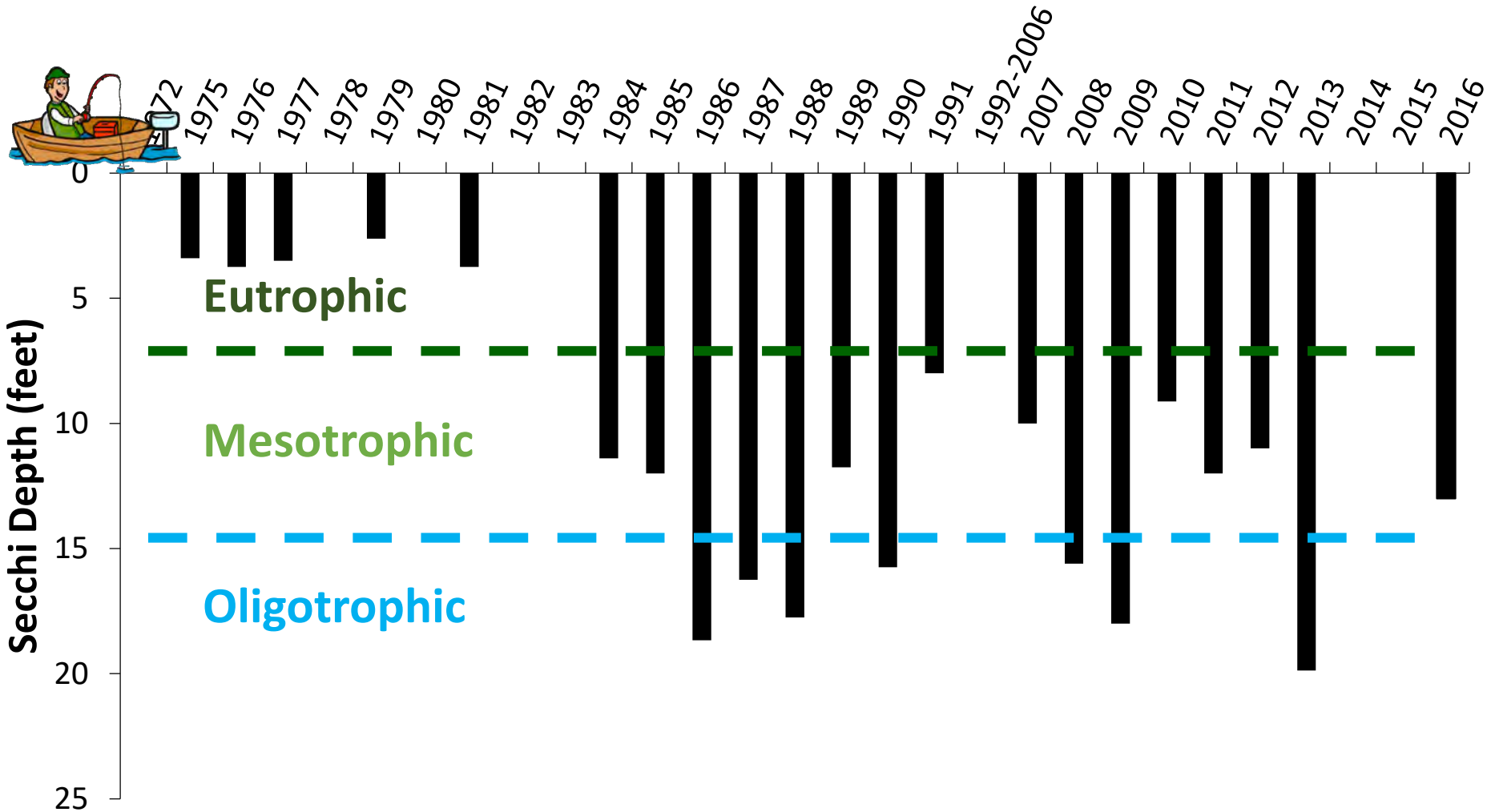
Secchi Disk Measurement



Monitoring Water Clarity through a Season



Monitoring Water Clarity: Historical Trends



CLMP Secchi Disk Transparency



- Evenly spaced monitoring through middle of May to middle of September
- ***At least 8 measurements***
- One a week or every other week
- Seasonal variability

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

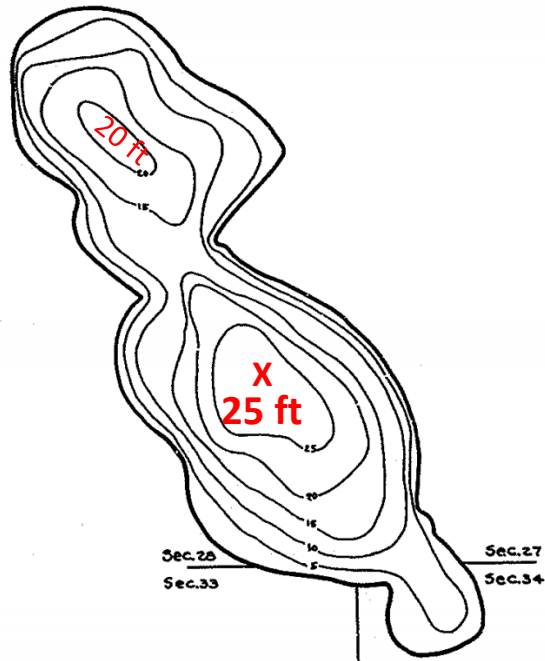


Where to monitor – the deepest basin

Lake Sampling Site (Field ID) Number

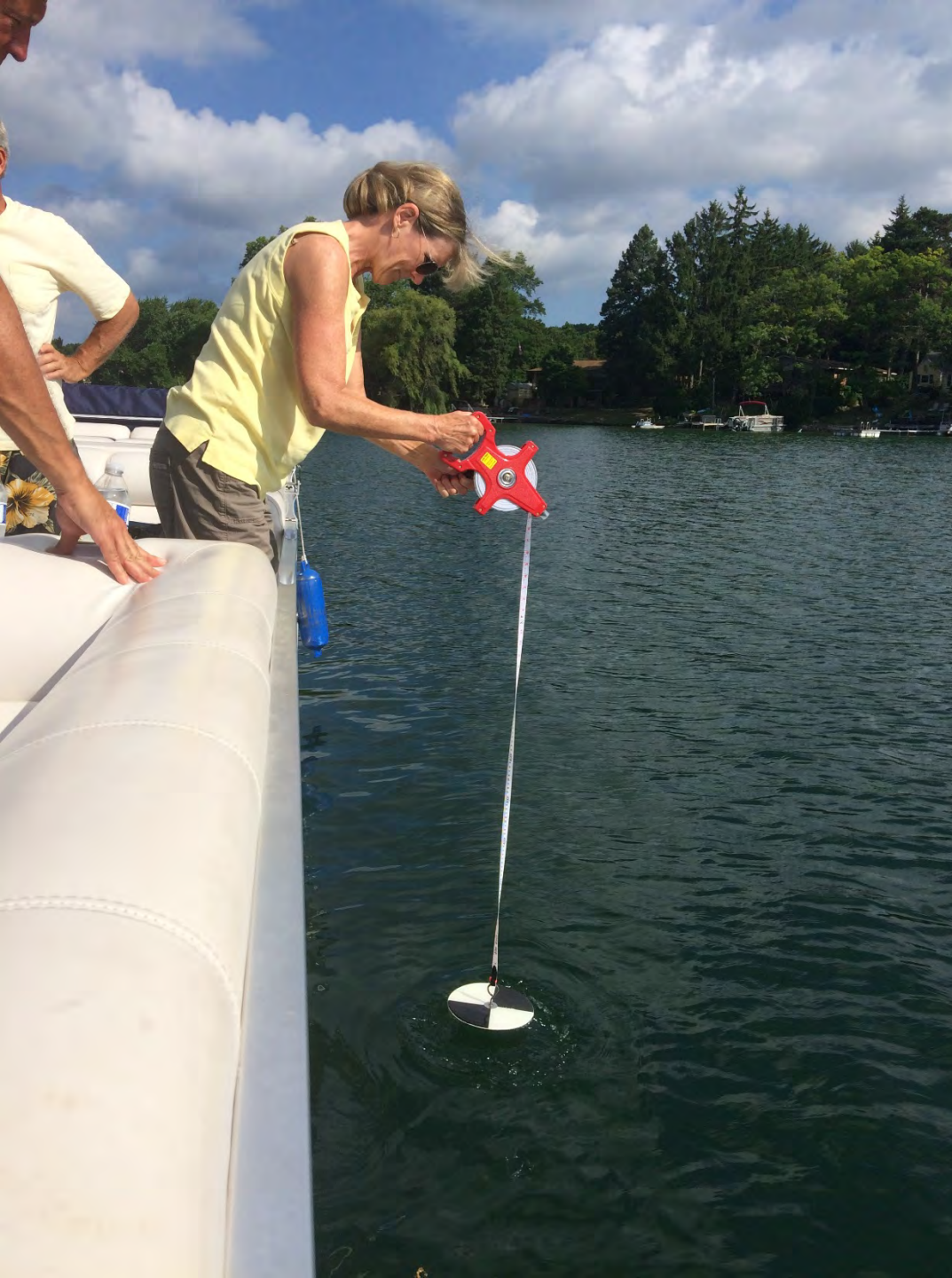
Listing at

micorps.net → Lake
Monitoring → CLMP
Documents



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
100082 Ann	Benzie	44.721	-85.8512
100085 Herring (Lower)	Benzie	44.56226	-86.21056
100086 Platte (Big)	Benzie	44.69228	-86.09589



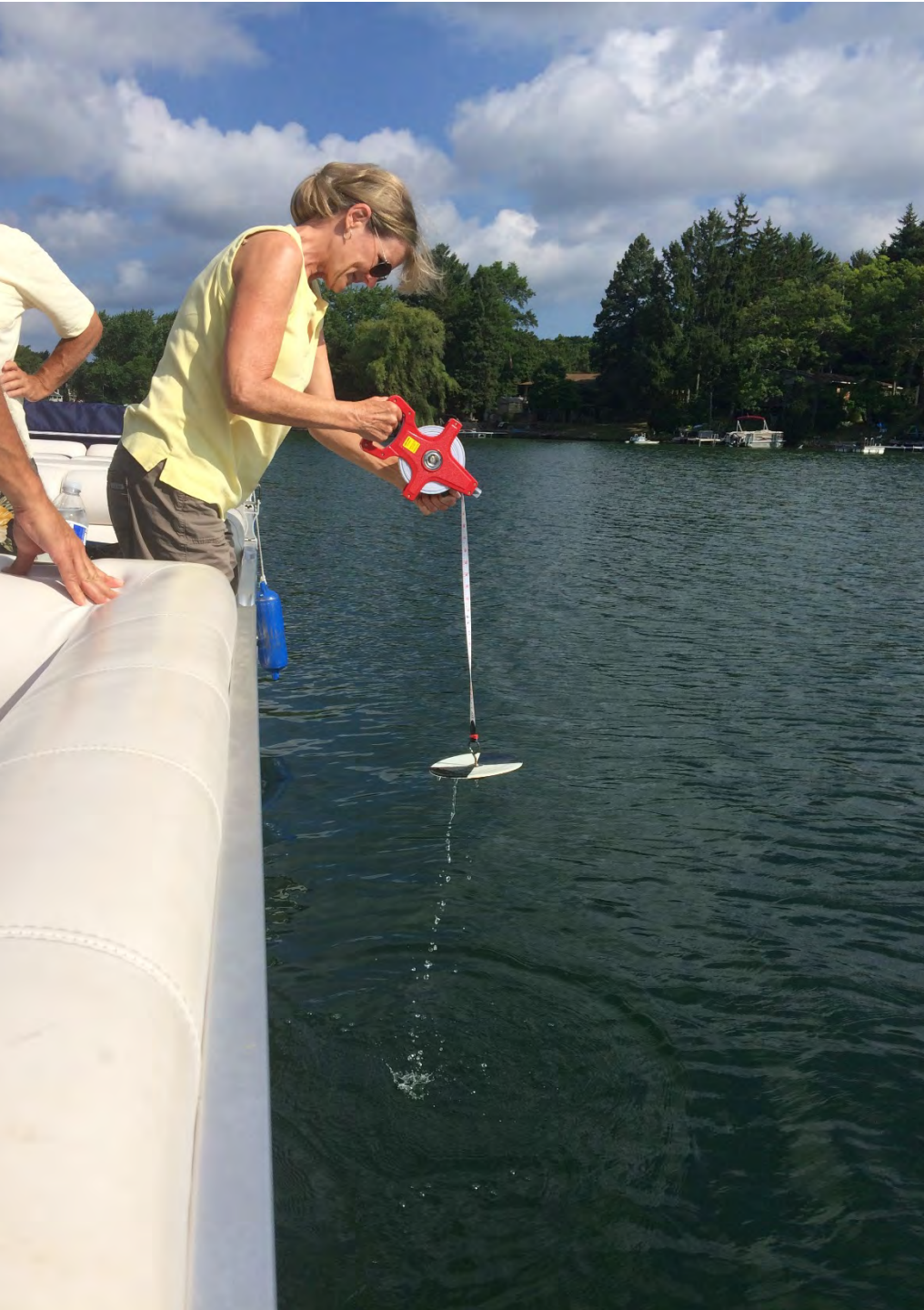
Step 2. Slowly lower disk until it disappears from view.

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



Step 3. Slowly raise disk until it reappears

- Note this depth also.



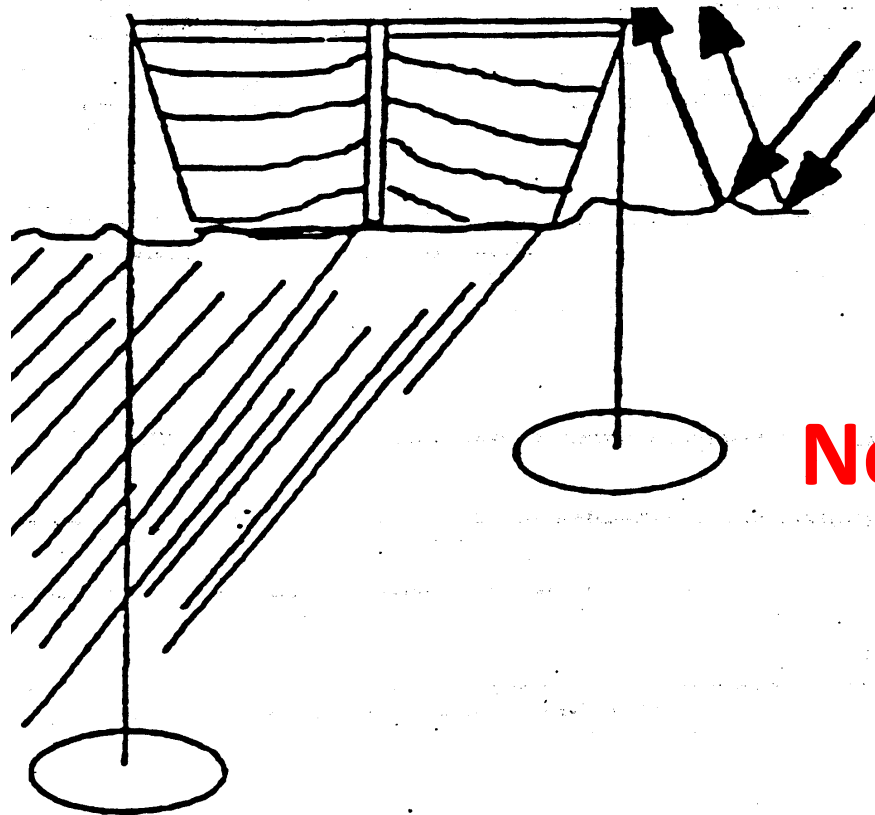
Step 4. The official measurement is the average of the 2 depths.

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

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



2. Pick the Shadow!



Yes!

No!

3. Be consistent in weather and timing!

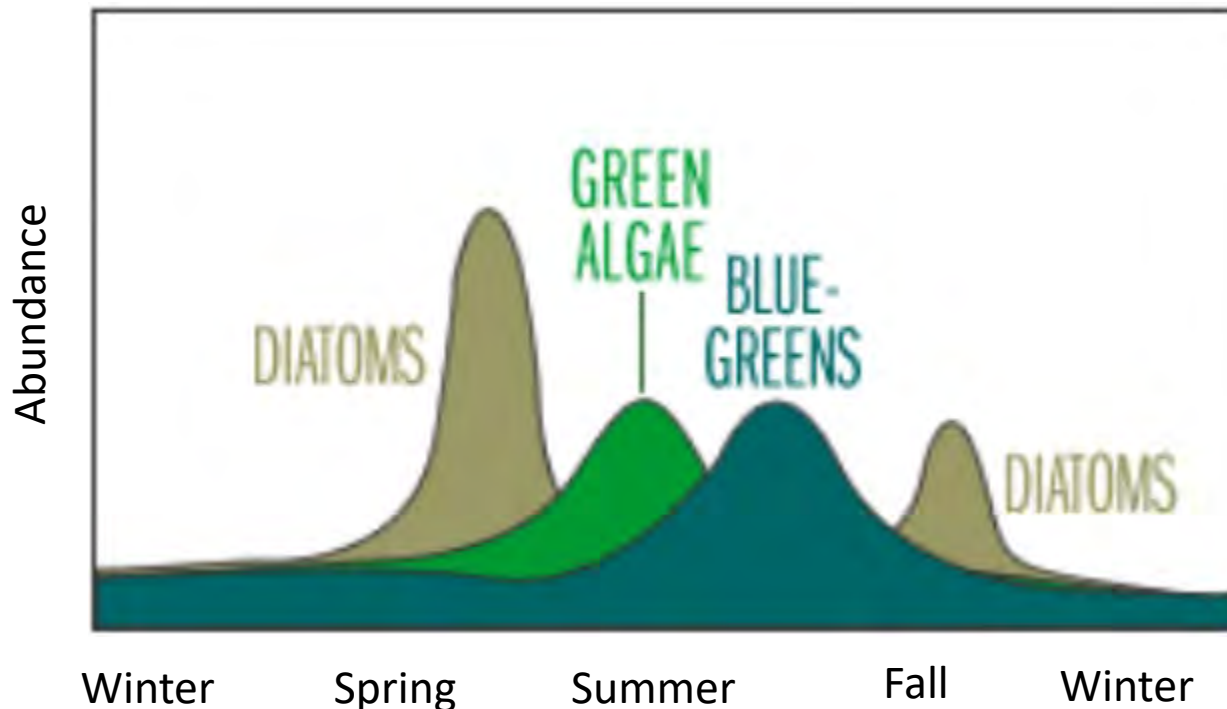
- Measure between 10 am – 4 pm (try and be consistent)
- Sunny calm days are best
- Do not measure during heavy boating



A minimum of 8 measurements required across whole summer Lakes Change Through Time!

Evenly space monitoring through May - Sept

Seasonal Succession of Lake Algae in a Mesotrophic Lake





SECCHI DISK TRANSPARENCY 2021 Data Form



Lake Name: _____ County: _____ Township: _____

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

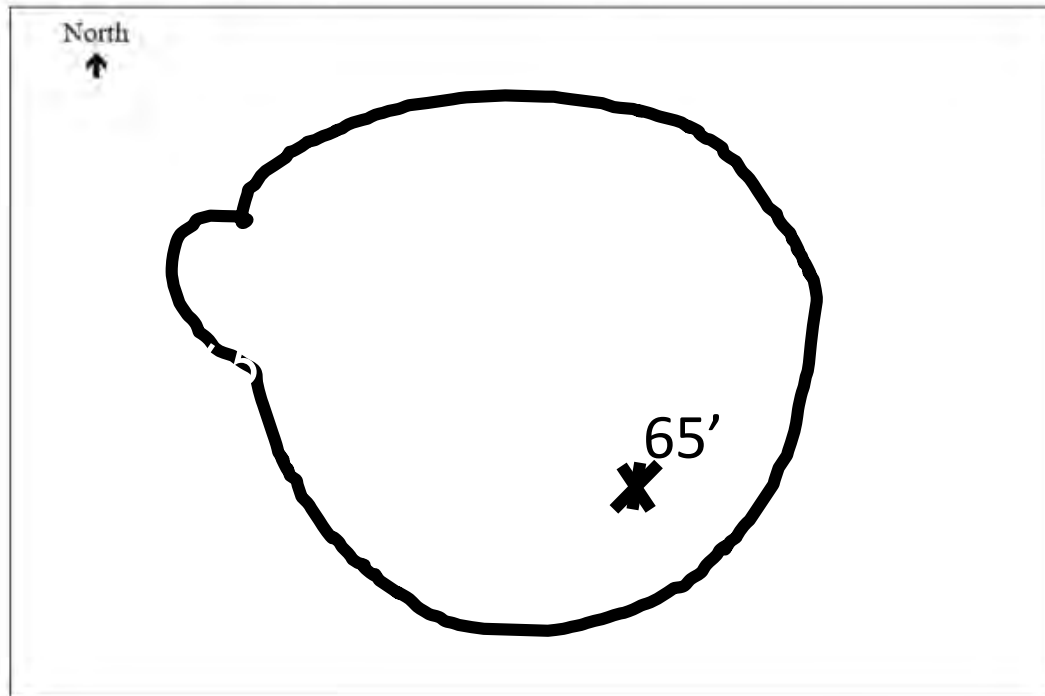
Latitude: _____ Longitude: _____

Volunteer Monitor Name(s): _____

Note if secchi is
on bottom of lake

WEEKLY SAMPLING INTERVAL	DATE SAMPLED	TIME OF DAY	SECCHI DEPTH (to nearest 1/2 foot)	WEATHER CONDITIONS (sunny, cloudy, windy)	UNUSUAL CONDITIONS (<u>Secchi</u> disk on bottom of lake, heavy rain, boating, etc.)
May 9-15					
May 16-22					
May 23-May 29					
May 30-June 5					
June 6-12					
June 13-19					
June 20-26					
June 27-July 3					
July 4-10					
July 11-17					
July 18-24					

- ❖ 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**

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

<https://micorps.net>



MiCorps Data Exchange

One of the key components of the MiCorps program is the MiCorps Data Exchange (MDE) platform, which provides online access to volunteer monitoring data through a searchable database. This system fulfills a critical role by allowing volunteers to gather and exchange reliable and meaningful water quality data for water resources management and protection programs at the state and local level.

Prior to 2015, the MDE was comprised of monitoring data collected by MiCorps member organizations and others who have completed the necessary trainings with MiCorps staff. To submit data to the MDE, monitors must demonstrate their capacity and willingness to adhere to specific MiCorps quality assurance and operating procedure criteria.

Now in its second decade, the MDE has been expanded to accept data based on a three-tiered data classification system:

- **Tier 1:** Data generated under the MiCorps (or equivalent) Quality Assurance Project Plan (QAPP)
(Includes current and former VSMP grant recipients with a MiCorps-approved QAPP and current CLMP participants collecting data under the approved CLMP monitoring procedures)
- **Tier 2:** Data generated under another acceptable QAPP
- **Tier 3:** Data generated with acceptable Standard Operating Procedures (SOPs), but no QAPP
(May include school programs)

Due to resource limitations under the program, monitoring data will only be accepted from entities willing to comply with the MiCorps data entry protocols, which may require entities to reformat their datasets. The MDE will also only accept data for the monitoring parameters currently supported under the MiCorps program for lake and

Inside this section:

[View data](#)
[Enter data](#)

Upcoming events

[Spring 2016 Stream Macroinvertebrate Monitoring](#)
04/09/2016 - 05/31/2016

[2016 Michigan Inland Lakes Convention](#)
04/28/2016 - 04/30/2016
Boyne Falls, MI

[2016 Cooperative Lakes Monitoring Program \(CLMP\) Training](#)
04/28/2016
Boyne Falls, MI

[Protecting Your Shoreline Workshop \(Clare County\)](#)
04/28/2016
Harrison, MI



Get a data report in early 2021

2017 Data Report for Deer Lake, Alger County

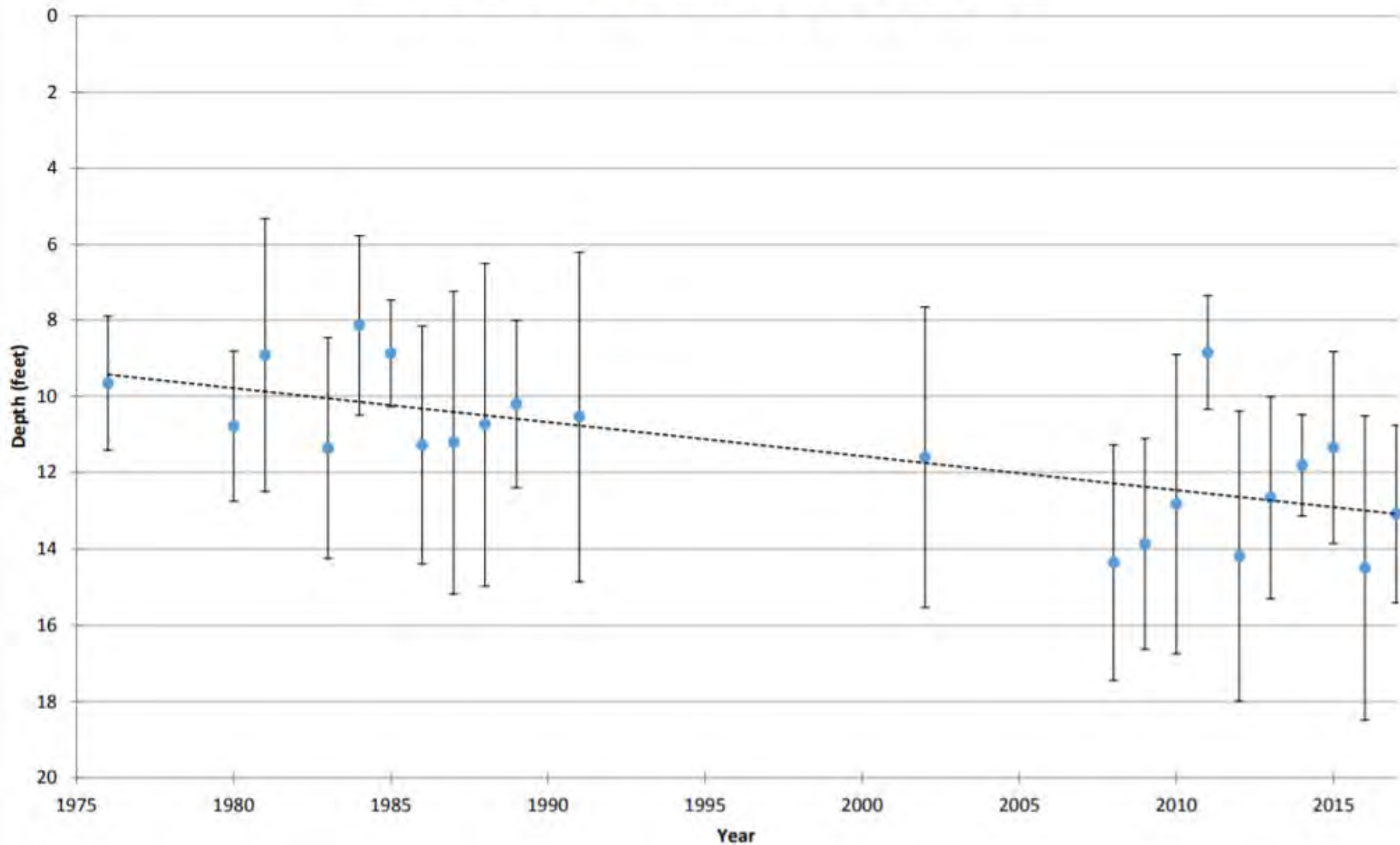
Site ID: 020127

46.48016°N, 86.98277°W

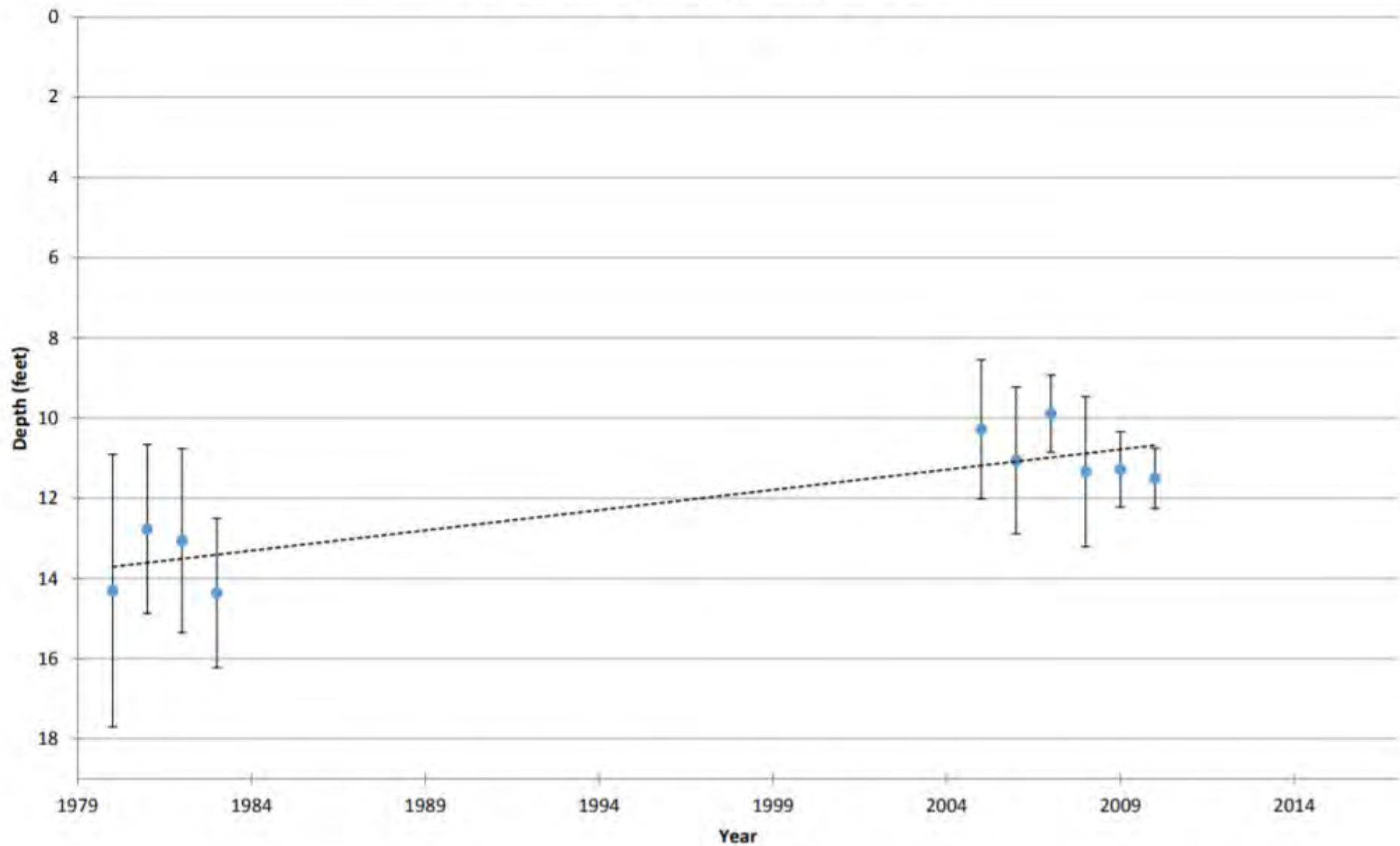
The CLMP is brought to you by:



Portage Lake (Washtenaw Co.), 810248



Perch Lake (Otsego Co.), 690150



Questions?



COOPERATIVE LAKES MONITORING PROGRAM

Spring and Summer Total Phosphorus



Nutrients and Eutrophication

- **Phosphorus** is typically the limiting nutrient in lakes
- **Natural Eutrophication**
 - ▣ Slow natural process
- **Cultural Eutrophication**
 - ▣ The aging of a lake that is accelerated by human activity in the watershed





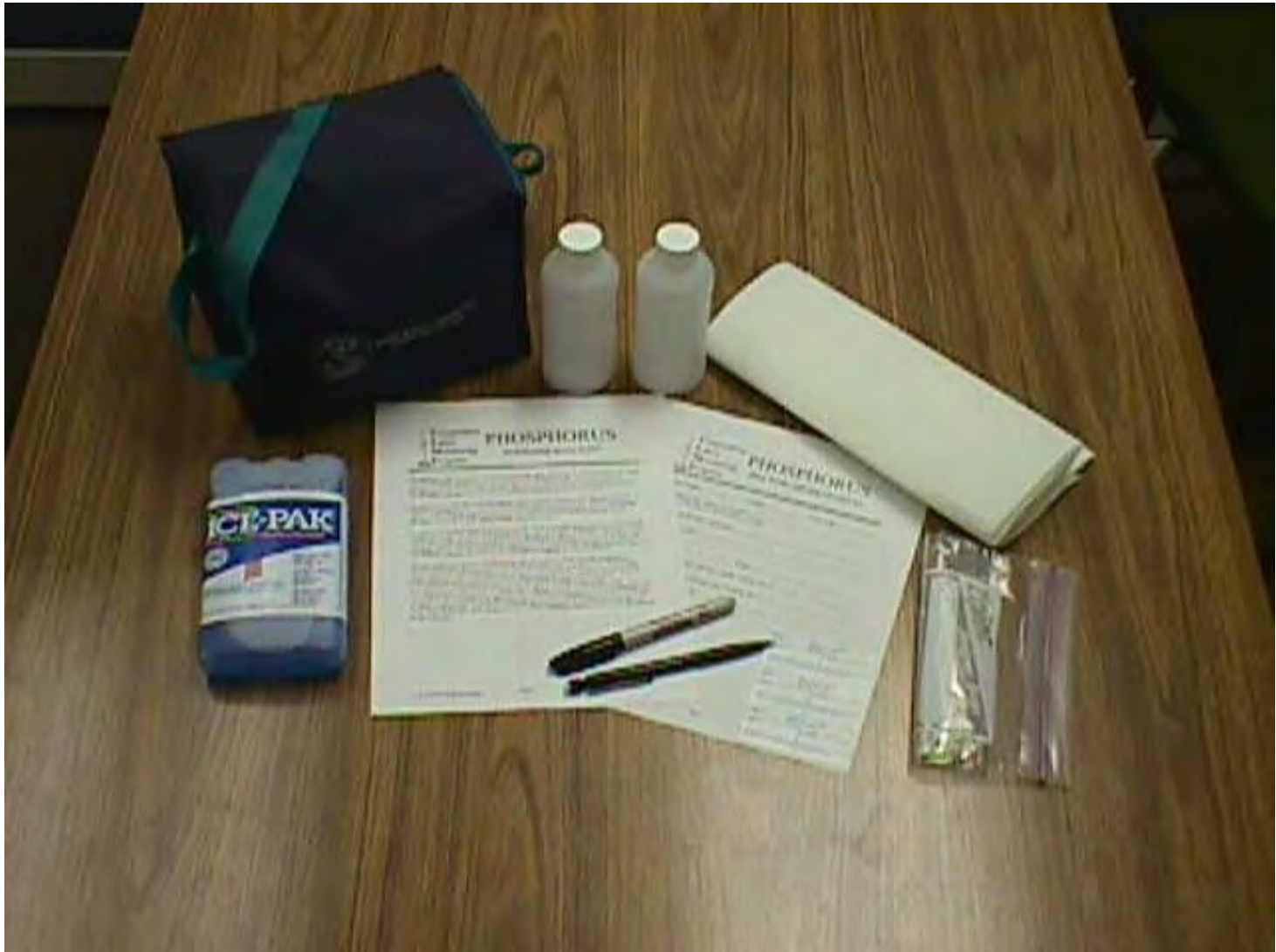
Harmful and Nuisance Algal Blooms

- Can Produce Toxins
- Potential Health Risk to People and Animals

What you get in the mail

- ❑ Monitoring instructions
- ❑ Sampling and sample turn-in schedule and locations
- ❑ Data form
- ❑ Bottle labels (3)
- ❑ Two 250ml sampling bottles with caps on
 - ▣ One is the actual sample and the other is a replicate

Other materials needed: Cooler bag, ice pack, zip lock baggies of different sizes, a pencil/Sharpee



When: Spring Overturn



- Within 14 days after ice-out (March/April/May)
- Volunteer determines ice-out
- Surface grab sample
- Representative of whole lake
- Shows nutrient enrichment trends

When: Summer Stratification



- ❑ Late summer - early fall (Aug. - Sept.)
- ❑ Surface grab sample
- ❑ Indicates the phosphorus available to plants/algae in the growing season.
- ❑ Used to calculate trophic state

When: Phosphorus Schedule

Spring P: Turn in TBD – will be near June 22nd

Summer P: Depends on your location in the State



SUMMER PHOSPHORUS 2021 Sample Collection and Turn-in Schedule



Due to complications with COVID-19, we are still finalizing the turn-in locations. Please keep your samples frozen and we will notify you when the locations and dates have been determined.

COUNTY	TURN-IN ADDRESS (EGLÉ unless noted otherwise)	SAMPLING DATES	TURN-IN DATES
Allegan, Kalamazoo, Barry, Van Buren, Berrien, Cass, St. Joseph	To Be Determined	Sept 23-27	8 am-Noon September 28
Calhoun, Jackson, Washtenaw, Branch, Hillsdale, Lenawee	To Be Determined	Sept 23-27	8 am-Noon September 28
St. Clair, Macomb, Oakland, Wayne, Monroe	To Be Determined	Sept 23-27	8 am-Noon September 28
Ottawa, Kent, Montcalm, Ionia, Muskegon, Oceana, Newaygo, Mecosta	To Be Determined	Sept 16-20	8 am-Noon September 21
Eaton, Ingham, Livingston, Clinton, Gratiot, Genesee, Shiawassee	To Be Determined	Sept 16-20	8 am-Noon September 21

Phosphorus Labels.. Pencil or sharpee

Step 1: Fill out labels

Collector's Initials TP	DEQ	Date 4-20-2013
Field ID 555432	Location DEAD SPIDER LAKE	
Analysis or Parameter Code GA	Chemicals Added	

Collector's Initials TP	DEQ	Date 4-20-2013
Field ID 555432	Location REP DEAD SPIDER LAKE	
Analysis or Parameter Code GA	Chemicals Added	

NOTE: On second label for replicate sample, include all above plus "REP" in the Location box along with the Lake Name.

Step 2. Drift your boat over the deepest part of the lake

- Remove cap and rinse the bottle twice

NOTE

- only use the bottle we provided
- Make sure not to contaminate bottle or cap





Step 3. Surface grab sample

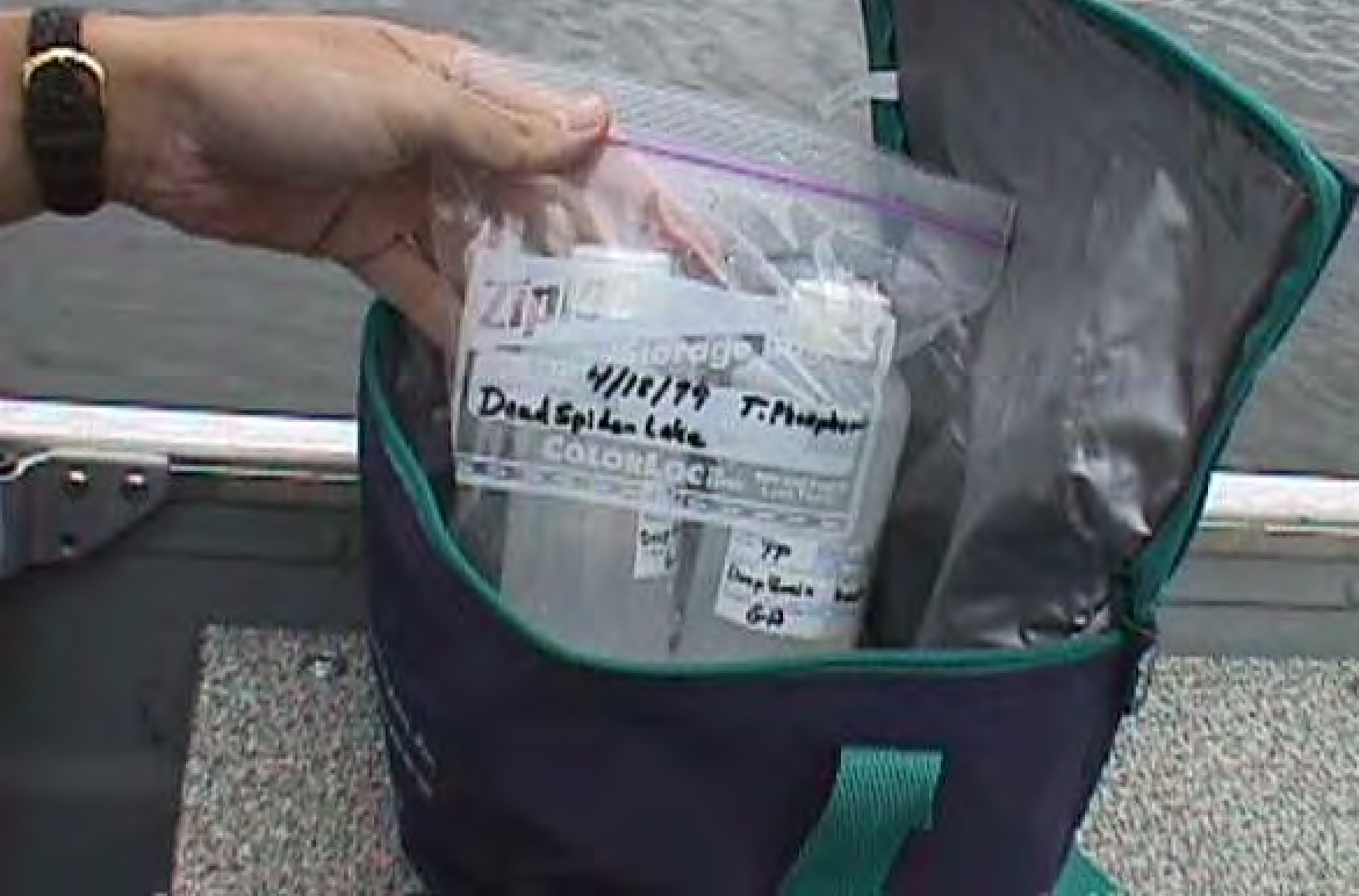
Fill bottle by lowering it upside down below surface to 1-2 foot depth and then tilt upward

- Repeat with second bottle



Step 4. Pour water out until bottle is filled to here to avoid cracking the bottle when frozen.

Step 5. Place in labeled baggie and place in cooler.



Step 6: Fill out datasheets

NOTE: Datasheet goes into its own baggie and then into the baggie with the samples.

[illegible]



SPRING OVERTURN PHOSPHORUS



Lake Name: _____ County: _____ Township: _____

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

Latitude: _____ Longitude: _____ GPS / Map
Circle

Volunteer Monitor Name(s): _____

Date of Ice-Out: _____

Date Sampled: _____ Time: _____

Weather Conditions (sunny, cloudy, windy, etc.): _____

Unusual Conditions (heavy rain, boating, etc.): _____

Date of Sample Turn-In: _____

Comments:

- ❖ In the box below draw an outline of your lake (i.e. lake map)
- ❖ On the lake map outline, mark your total phosphorus sampling location (this should be at the deepest basin in the lake) and write in the total LAKE DEPTH at this location. (**Note:** If you sample at more than one location in the lake, use a separate data form for each location.)
- ❖ Surface Area of Lake (if known): _____ (acres)



DATA ENTRY

Check **ONE** box:

- ☐ The field notes **have** been entered into the MiCorps Data Exchange (before October 30!)
Date entered _____.
- ☐ The field notes **have not** been entered into the MiCorps Data Exchange.

DATA SHEET TURN IN

No matter what box you check above, please do the following:

Make a copy for your records, put the data sheet in a baggie, and turn in the frozen sample and data sheet as directed by your procedures sheet.

Step 7: Store in freezer until Turn-in Date





Step 8. Turn in:

Turn in your **frozen bottles** with your data forms to the designated location.

We will give you your date and location soon!

Common Reasons for Sample Rejection

- Sample collected at the wrong time
 - ▣ Spring P— samples collected >2 weeks after ice-out will be flagged for error, >4 weeks will be rejected.
 - ▣ Summer P – samples collected more than a week outside the assigned interval will be rejected
- Incorrect delivery
 - ▣ If you forget or can't turn your samples to the drop-off location on the assigned date, that can cause problems. CONTACT US for instructions on safe shipping. Unexpected shipments will thaw and be rejected.
- Cracked bottles/caps
 - ▣ Be sure to leave headroom in the bottle for expansion

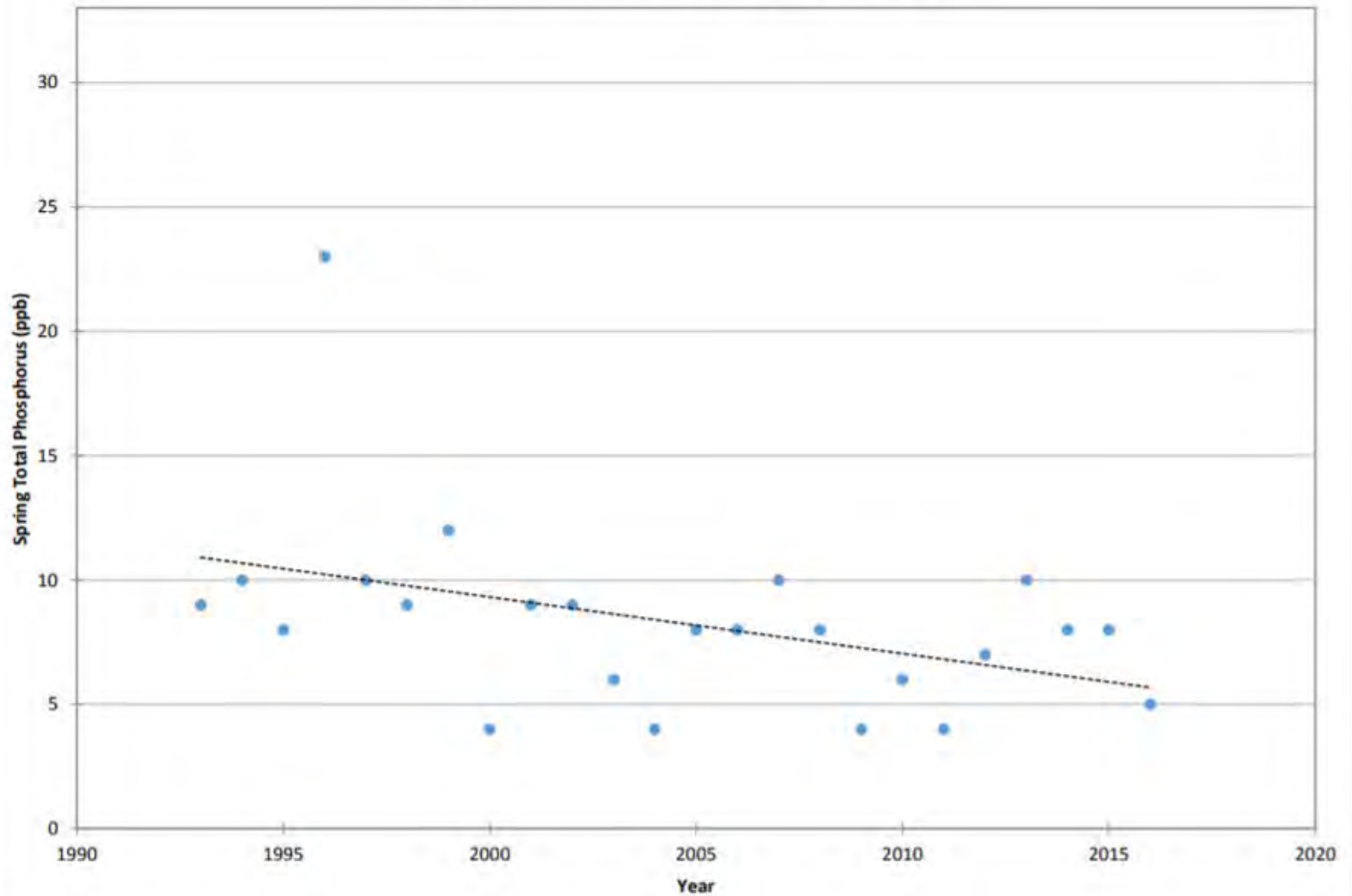
Common Reasons for Sample Rejection

- ❑ Wrong bottles used
 - ▣ We ONLY accept samples in the sterile bottles we send you



COOPERATIVE LAKES MONITORING PROGRAM
SPRING TOTAL PHOSPHORUS

Corey Lake (St. Joseph Co.), 750142



Aquatic Invasive Species- Decontaminate!



- Following any removal of your watercraft from a water body:
 - Clean
 - Drain
 - Dry
- Clean Boats, Clean Waters
- Let's not contribute to the very problem we are trying to stop!

Working together to protect lakes!



Questions?