# Chlorophyll a

Dr. Paul Steen

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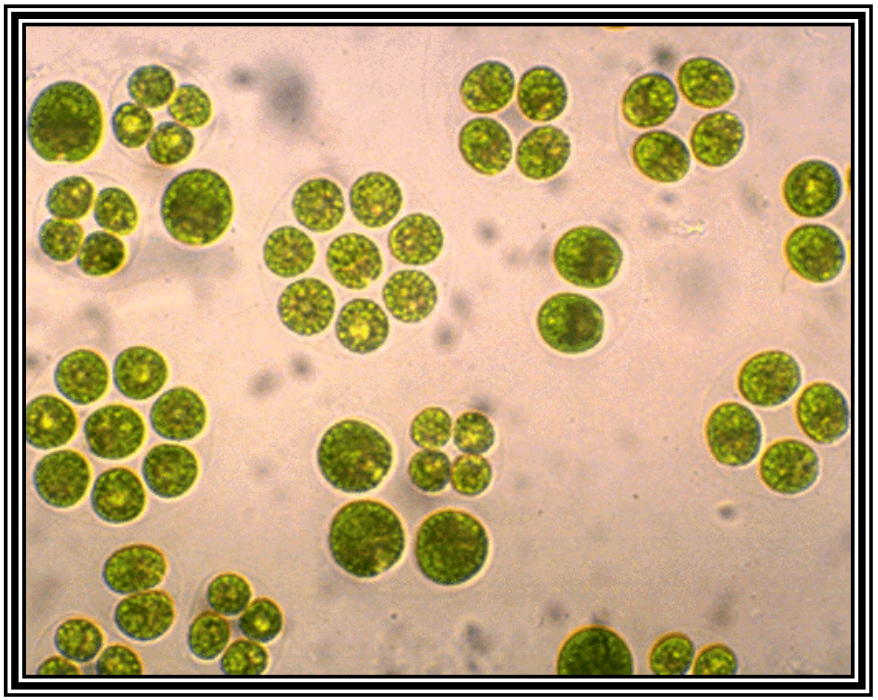
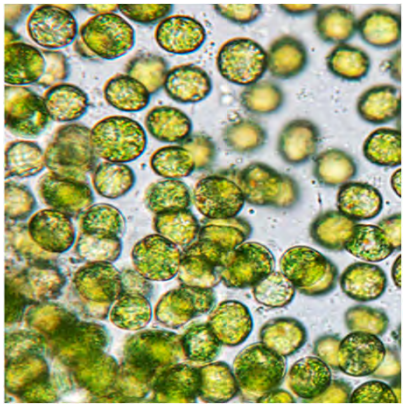
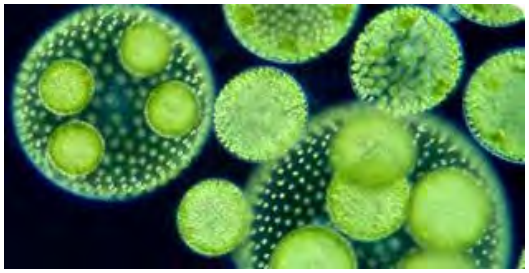
# Chlorophyll *a* Training Outline

- What is chlorophyll?
- When to sample
- How to sample:
  - Water Collection
  - Sample filtering and turn in
- When sampling goes wrong



# What is Chlorophyll-a?





Chlorophyll *a* best predicts the Trophic Status Index of the parameters we measure

# Sampling Schedule

micorps.net → Lakes→ CLMP documents

Michigan Clean Water Corps

# CHLOROPHYLL
## 2025 Sample Collection and Turn-in Schedule

Cooperative Lakes Monitoring Program

| COUNTY | TURN-IN ADDRESS (EGLE unless noted otherwise) | SAMPLING DATES | TURN-IN DATES |
|---|---|---|---|
| Allegan, Kalamazoo, Barry, Van Buren, Berrien, Cass, St. Joseph | EGLE Kalamazoo District Office<br>7953 Adobe Road<br>Kalamazoo, MI 48909<br>Deana Mercs: 269-330-8571 | Sample #1 May 10-20<br>Sample #2 June 10-20<br>.....<br>Sample #3 July 10-20<br>Sample #4 Aug 10-20<br>Sample #5 Sept 18-22 | 8 am-Noon<br>June 24<br>.....<br>8 am-Noon<br>September 23 |
| Calhoun, Jackson, Washtenaw, Branch, Hillsdale, Lenawee | EGLE Jackson District Office<br>301 E. Louis B. Glick Hwy.<br>Jackson, MI 49201<br>Brittany Santure 517-740-6504 | Sample #1 May 10-20<br>Sample #2 June 10-20<br>.....<br>Sample #3 July 10-20<br>Sample #4 Aug 10-20<br>Sample #5 Sept 18-22 | 8 am-Noon<br>June 24<br>.....<br>8 am-Noon<br>September 23 |
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Michigan Clean Water Corps

Cooperative Lakes Monitoring Program

micorps.net → Lakes→ CLMP documents

Michigan Clean Water Corps

## CHLOROPHYLL
### 2025 Data Form 1

Cooperative Lakes Monitoring Program

Lake Name: _____ County: _____ Township: _____

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

Circle GPS / Map

Latitude: _____ Longitude: _____

Volunteer Monitor Name(s):_____

**Sampling Event #1 (May)** Date Sampled: _____ Time: _____

Secchi Depth :_____(feet) Composite Sample Depth:_____(feet)

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

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

Filtering Sample (if 50 cc could not be filtered for this sample, indicate amount filtered):

Sample 1: _____ (cc) Sample 2: _____ (cc)

Michigan Clean Water Corps

## CHLOROPHYLL
### 2025 Data Form 2

Lake Name: _____ County: _____ Townsh

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

Latitude: _____ Longitude: _____

Volunteer Monitor Name(s):_____

**Sampling Event #3 (July)** Date Sampled: _____

Secchi Depth :_____(feet) Composite Sample Depth:_____

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

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

Filtering Sample (if 50 cc could not be filtered for this sample, indicate amount filtered):

Sample 1: _____ (cc) Sample 2: _____ (cc)

**Sampling Event #4 (August)** Date Sampled: _____

Secchi Depth :_____(feet) Composite Sample Depth:_____

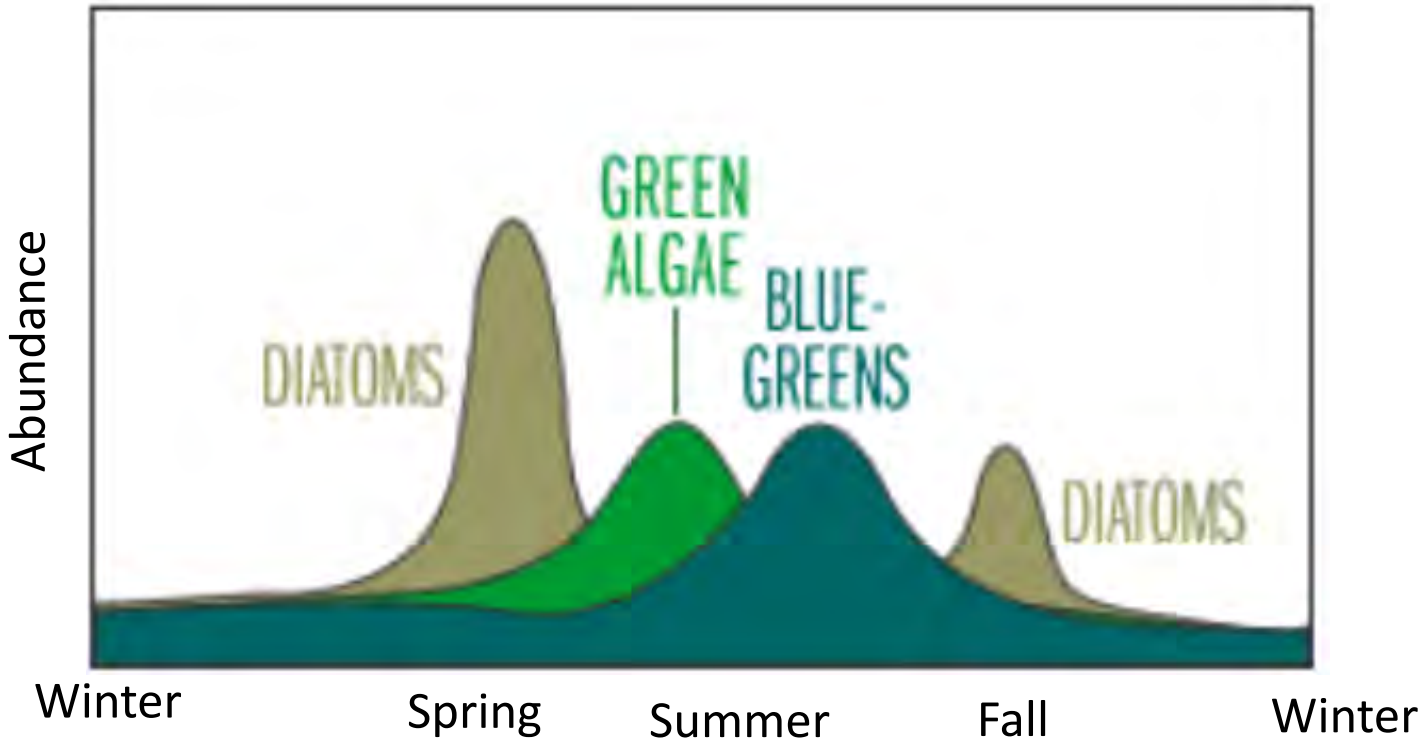
Weather Conditions (sunny, cloudy, windy, etc.):_____

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

Filtering Sample (if 50 cc could not be filtered for this sample, indicate amount filtered):

Sample 1: _____ (cc) Sample 2: _____ (cc)

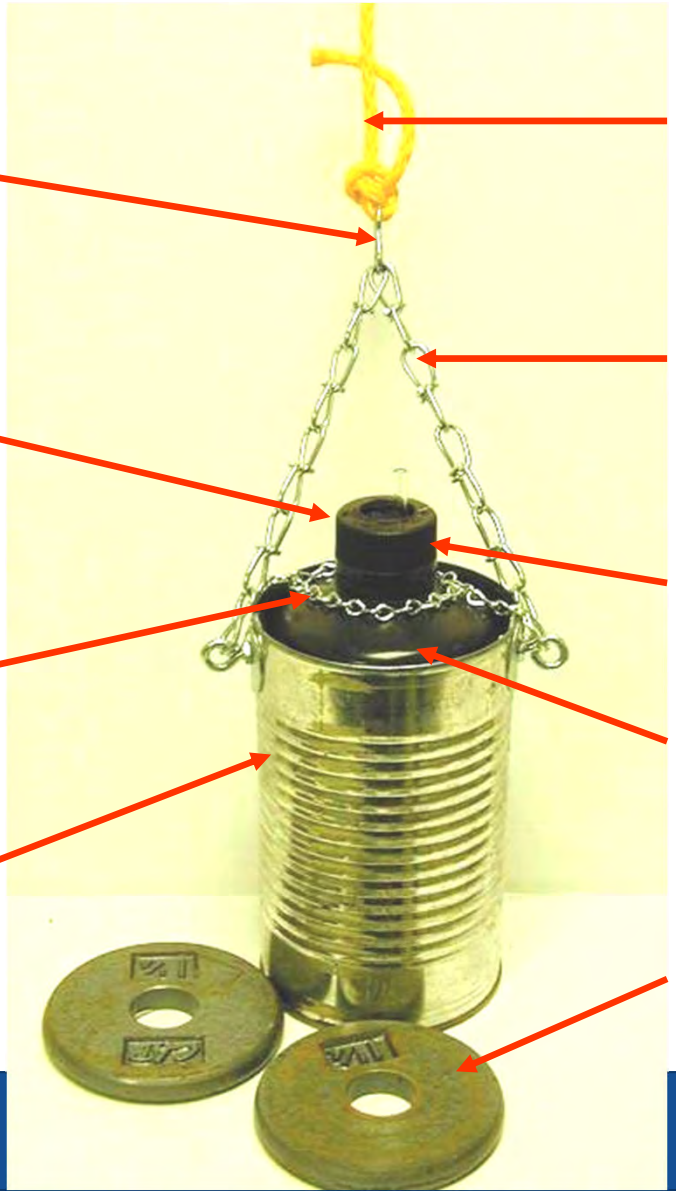
# Data Requirement:  4 or 5 samples.
# Lakes change over the course of the season!




Credit: Water on the Web

# Chlorophyll Equipment for a First time Monitor

- Bag of equipment contains
  - -60 cc (ml) syringe
  - -filter holder
  - -filters (12-13) (in a baggy)
  - -tygon tube
  - -vials with caps (11)
  - -tweezers
  - -amber bottles (2)
  - -dropper bottle with $MgCO_3$ (labeled)
  - -zip-lock bags
  - -labels (11)
  - -clothes pin
- Weighted composite sampler  (you provide the marked rope)


Connecting ring
Measured line
Rubber stopper with 2 glass tubes
Suspension chain
Bottle cap
Retaining chain
One liter amber bottle
Juice can
2 dumbbell weights

# What is a resupply kit?
# It only comes with the consumables.

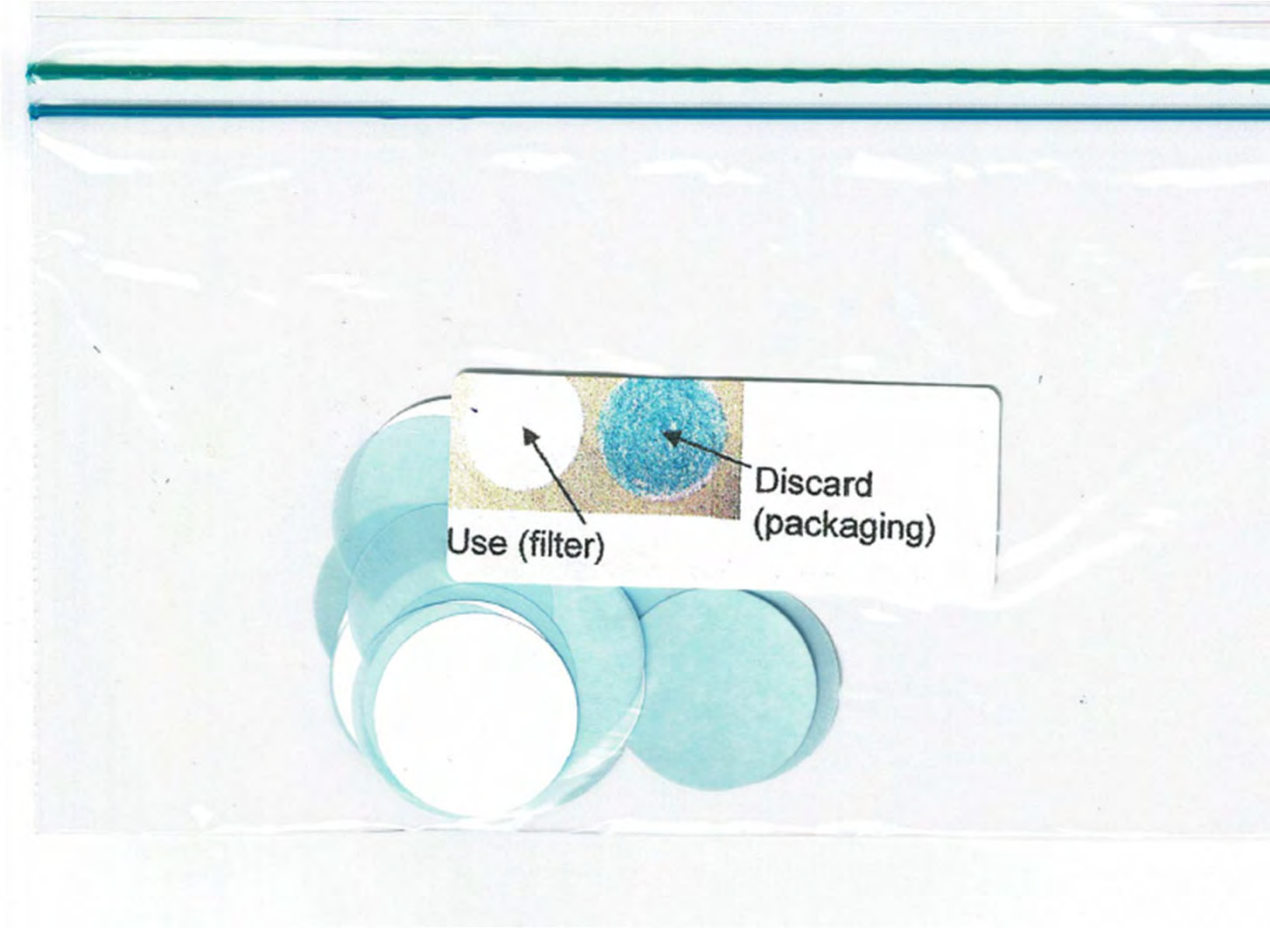
- Filters (11- 12) with warning label (in envelope).
- Vials with caps (11)
- Dropper bottle with $MgCO_3$ (labeled)
- Zip-lock bags
- Labels (11)

# Returning volunteers- don't use old filters.

Blue = BAD

Separator sheets look like tissue paper.

The good filters are opaque, white, often plastic looking



# Chlorophyll Sampling Equipment

## Provided by volunteer:

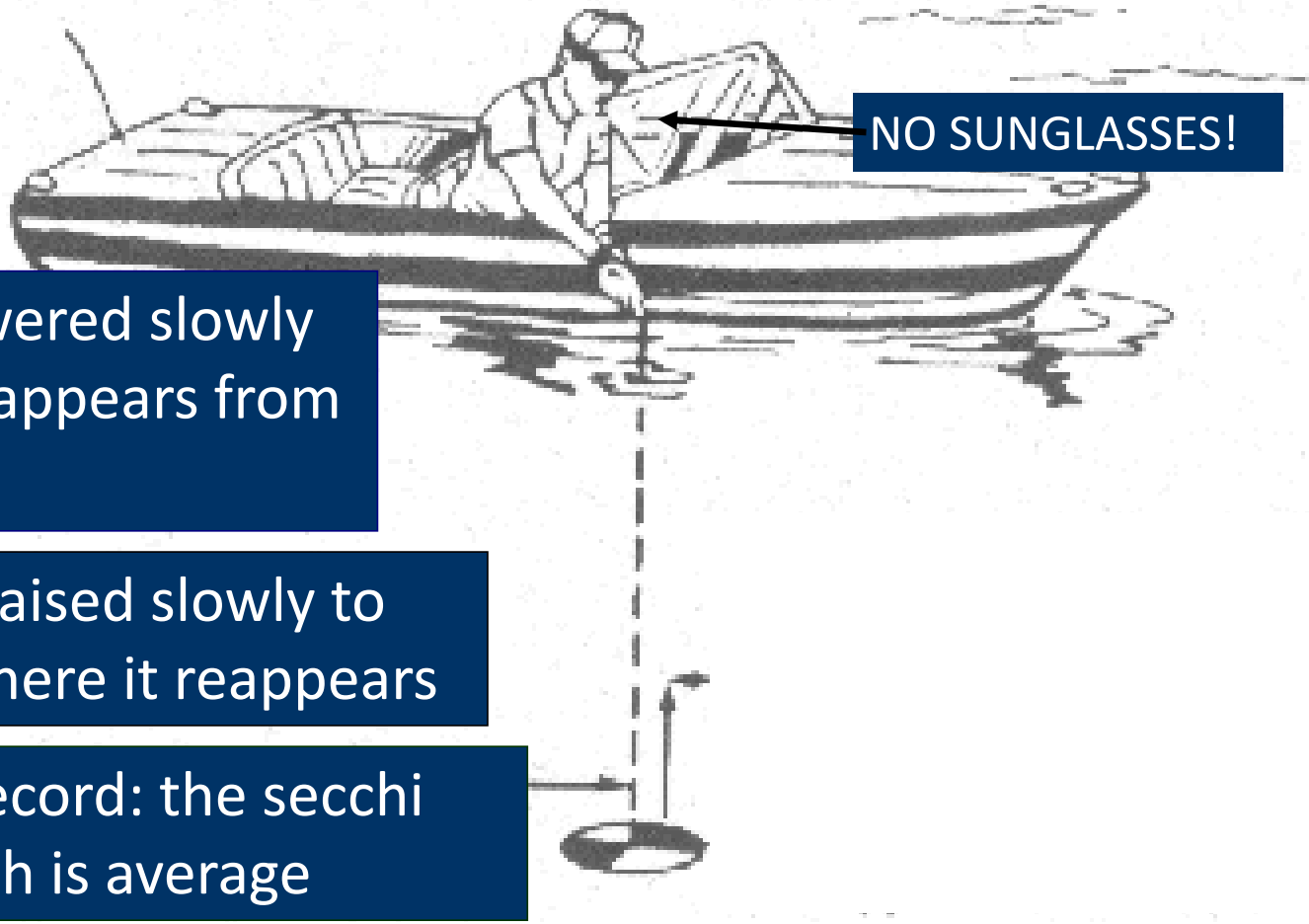
- boating safety equipment
- anchor
- pencil or indelible ink pen
- measured line for sampler
- freezer pack/ ice
- small amount of aluminum foil

# Sampling Step 1
# Getting a depth integrated water sample


Head out onto the water; anchor upwind;
drift your boat over the sample point

Start to fill out the data sheet on the trip out!

# Secchi Disk Measurement

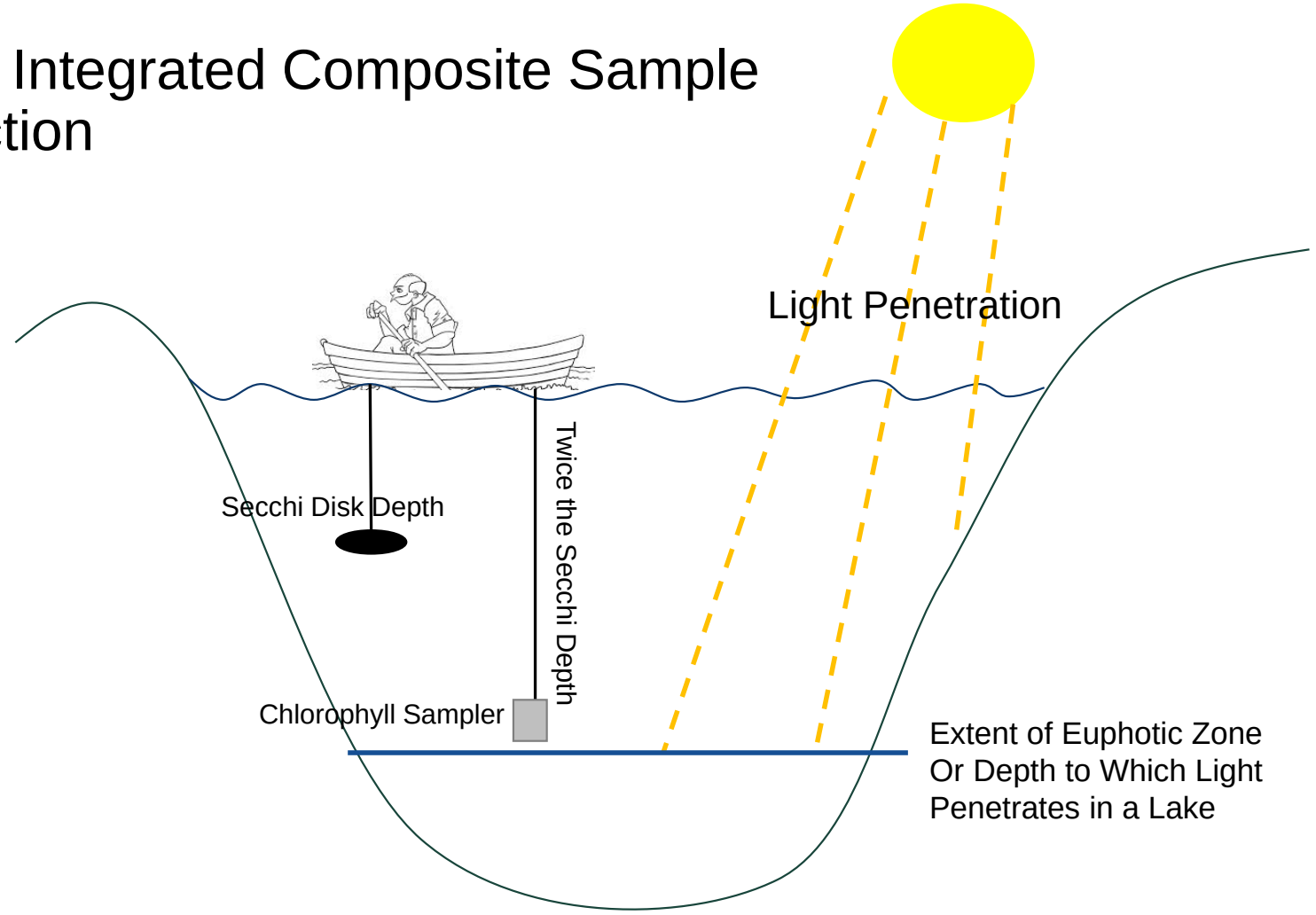



1. Disk lowered slowly until it disappears from view

2. Disk raised slowly to point where it reappears

3. Record: the secchi depth is average

# Depth Integrated Composite Sample Collection



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# CHLOROPHYLL
## 2022 Data Form 1

Cooperative Lakes Monitoring Program

Lake Name: _____ County: _____ Township: _____

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

Circle

Latitude: _____ Longitude: _____ GPS / Map

Volunteer Monitor Name(s):_____

---

~~Sampling Event #1 (May)~~ Date Sampled: _____ Time: _____

Secchi Depth :_____(feet)

Composite Sample Depth:_____(feet)

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

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

Filtering Sample (if 50 cc could not be filtered for this sample, indicate amount filtered):

Sample 1: _____ (cc) Sample 2: _____ (cc)

.....

# What if…

- …my lake is too shallow to go 2x the Secchi depth?

  - Measure the depth to bottom
  - Record the depth minus 1 foot as your "composite sample depth"
  - Don't hit the bottom when you drop your sampler

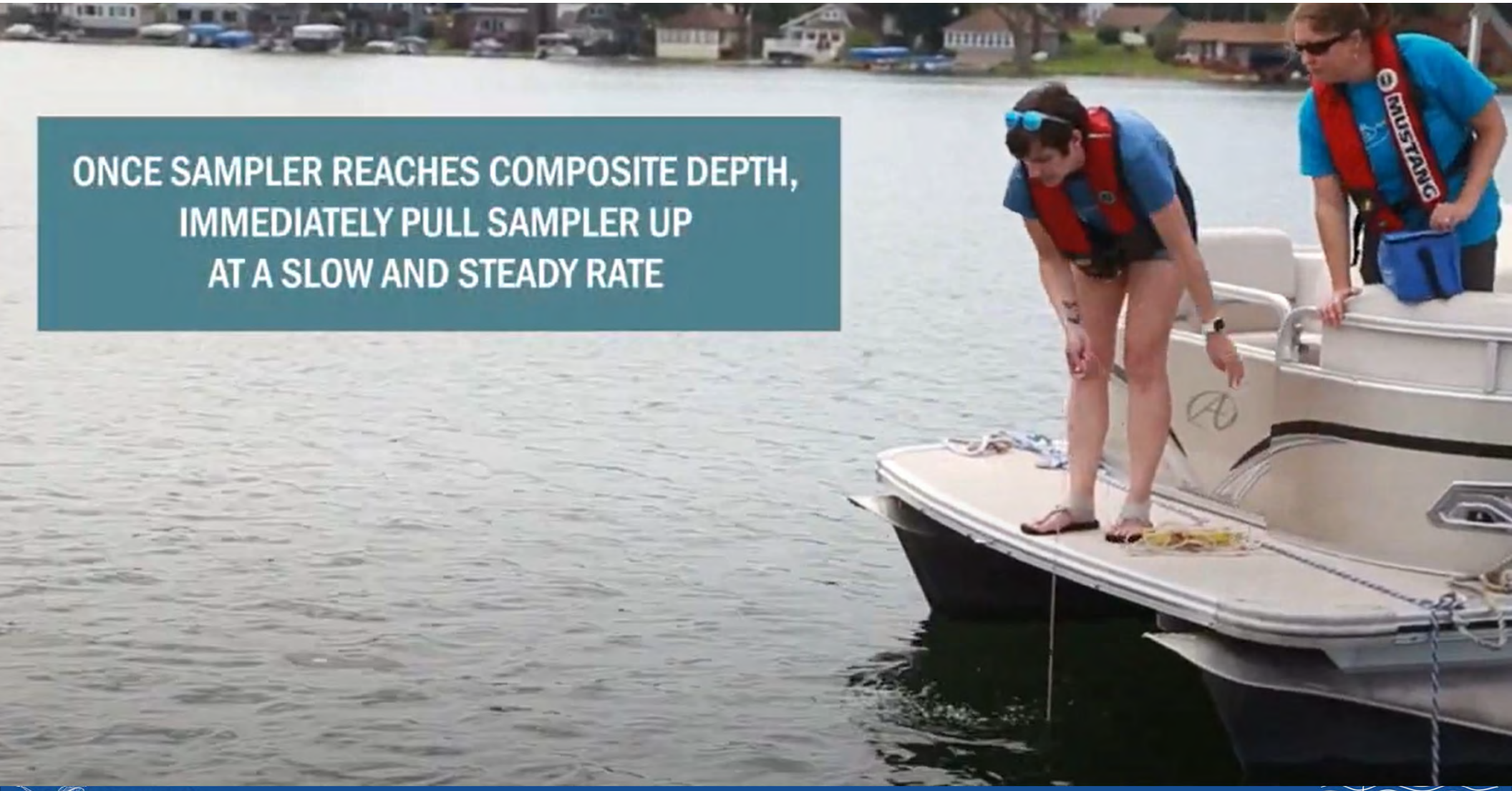
- …my Secchi disk is at the very bottom of the lake?

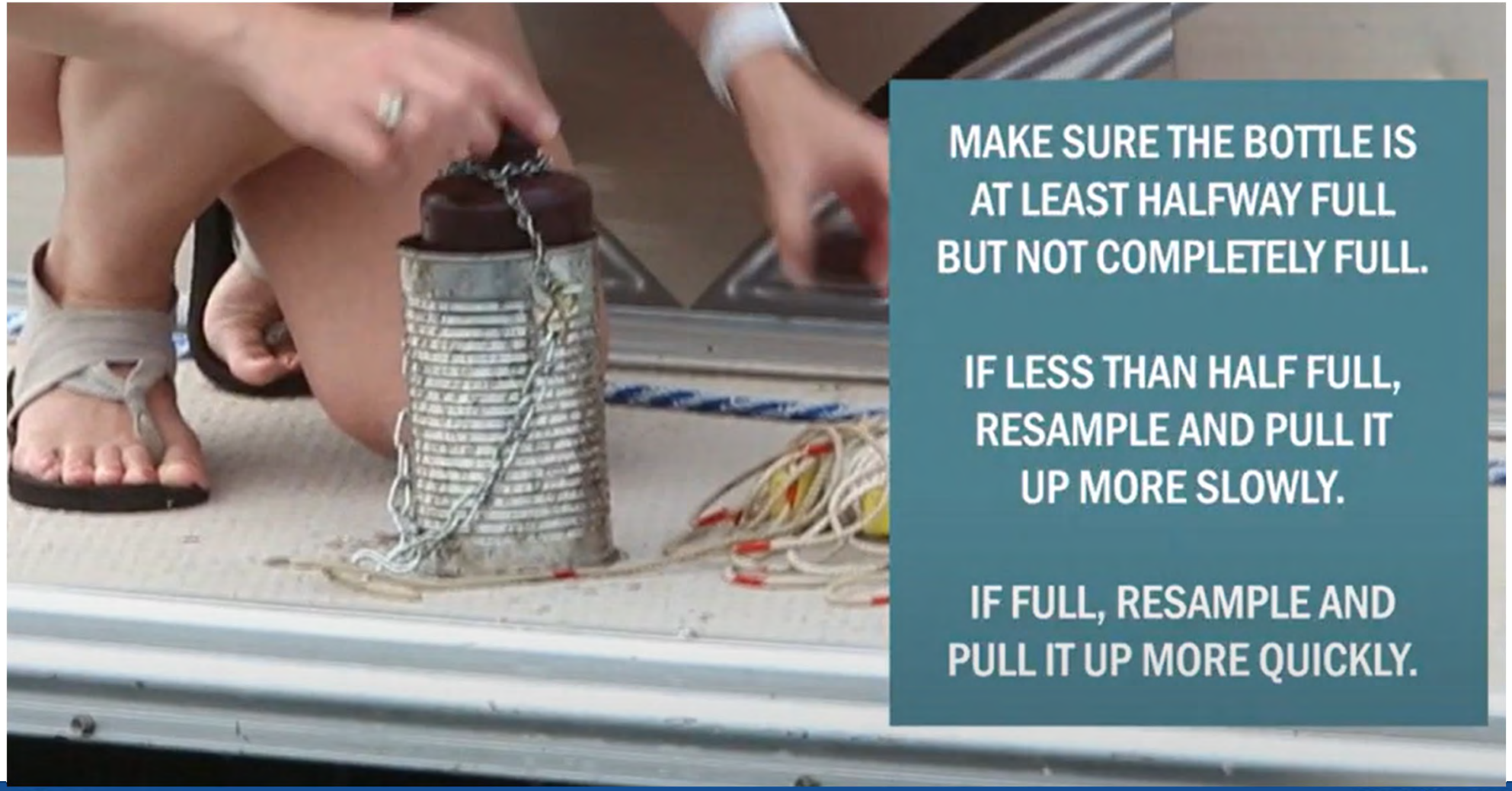
  - Record the depth minus 1 foot as your "composite sample depth"
  - Don't hit the bottom when you drop your sampler

Take sampler apart. Rinse 1 liter bottle with lake water, and then reassemble

Use a clothes pin to mark the composite sample depth on the rope;

Release the sampler and let it free fall sink until the clothes pin is at the water surface.

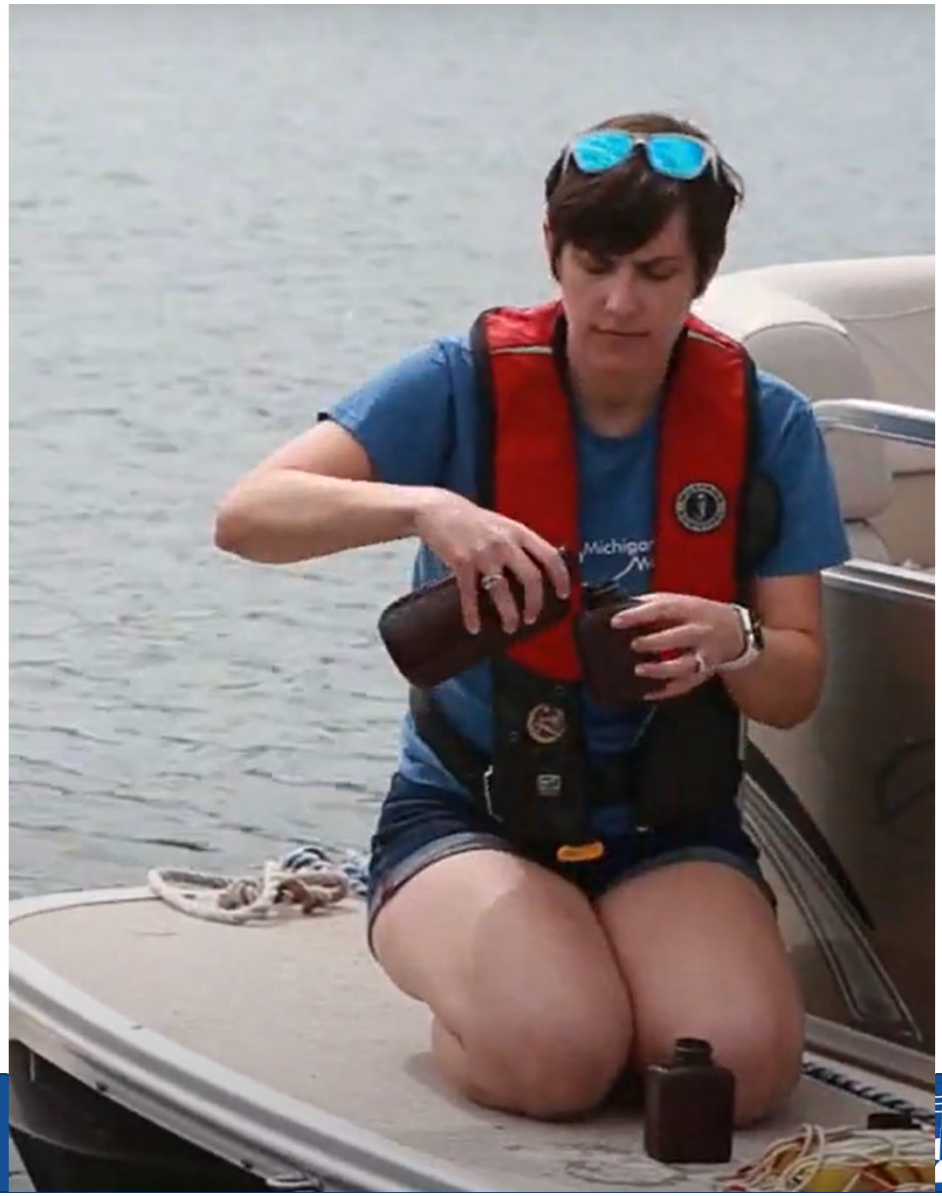

ONCE SAMPLER REACHES COMPOSITE DEPTH,
IMMEDIATELY PULL SAMPLER UP
AT A SLOW AND STEADY RATE
MUSTANG


MAKE SURE THE BOTTLE IS
AT LEAST HALFWAY FULL
BUT NOT COMPLETELY FULL.
IF LESS THAN HALF FULL,
RESAMPLE AND PULL IT
UP MORE SLOWLY.
IF FULL, RESAMPLE AND
PULL IT UP MORE QUICKLY.

Rinse and dump the 2 rectangular amber bottles with a small amount of the sample

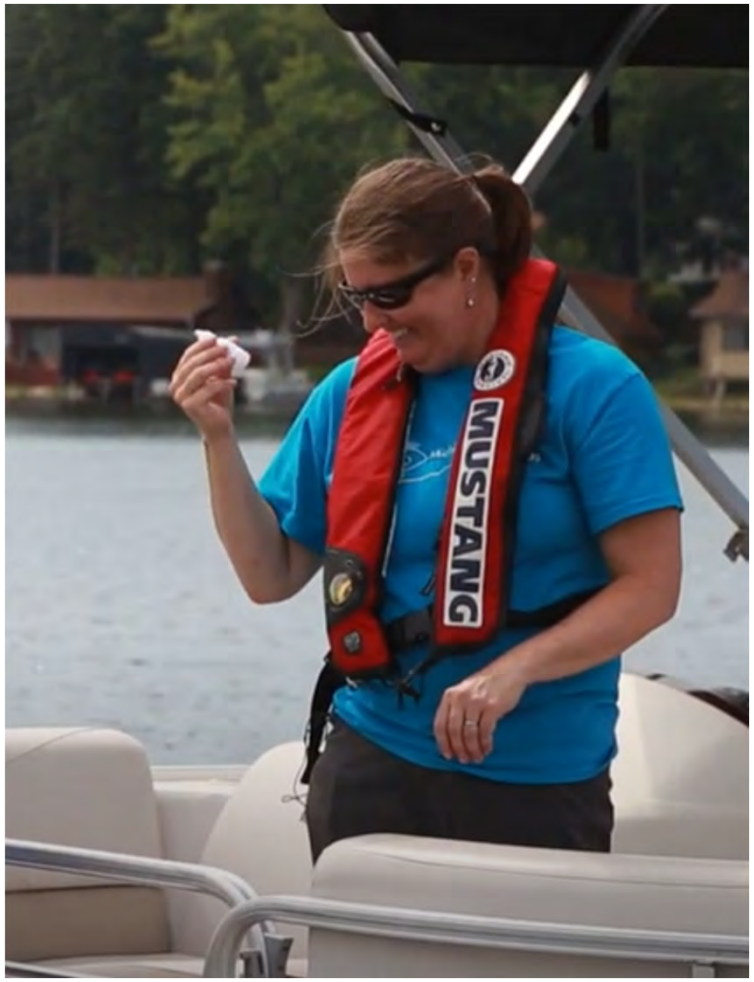
Then swirl your larger bottle to gently mix it…

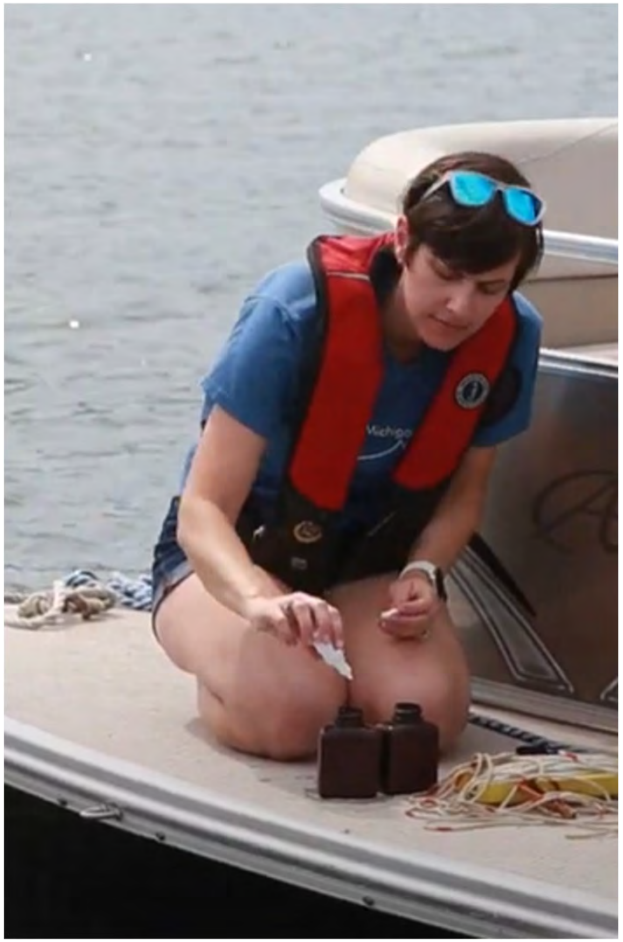
… and then fill the 2 rectangular amber bottles.



Shake $MgCO_3$ vigorously…

…add 5 drops to each bottle; swirl to mix



Cold storage until returning to shore

# Sampling Step 2
# Filtering the water sample

Let's go to the video tape!

https://www.youtube.com/watch?v=0IjBe3bUZHQ

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Filtering Sample (if 50 cc could not be filtered for this sample, indicate amount filtered):

Sample 1: _____ (cc) Sample 2: _____ (cc)

.....

# Sample turn-in and submitting your data

1. Make copies of your data forms for your records. (Take a picture of it).
2. Keep everything frozen!  Sample turn-in are the same days as Spring and Summer Phosphorus turn-ins.
3. Your field notes need to be added to the database by October 31.
   https://micorps.net → Data Exchange → Enter Data

micorps.net → Lakes→ CLMP documents

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Cooperative Lakes Monitoring Program

# Common Reasons for Sample Rejection

- Sample collected at the wrong time
  - Samples collected outside the assigned interval will be rejected
- Samples collected on the separator sheet. BLUE = BAD
- Samples not wrapped in foil
- Incorrect delivery
  - If you forget or can't turn your samples in to the drop-off location on the assigned date – CONTACT US for instructions on safe shipping. Unexpected shipments will thaw and be rejected.

# Questions about procedures?

# 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