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

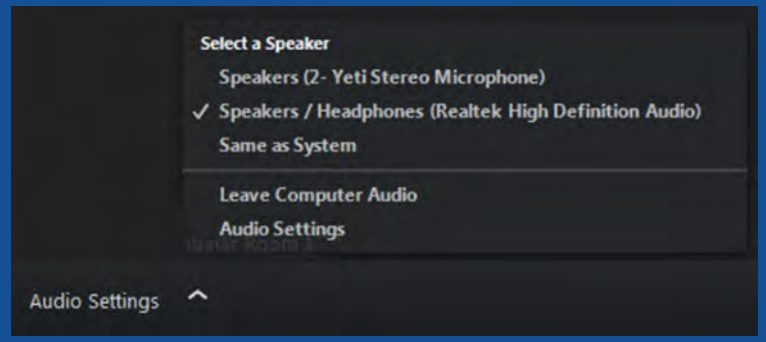
- For CLMP procedures and data forms please visit: micorps.net/lake-monitoring/clmp-documents/ and then click on the name of the parameter.

## 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 |

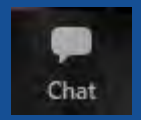
## Getting Started

- 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

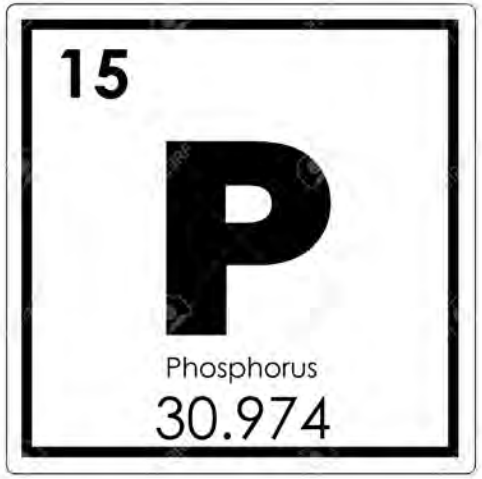
Call the MSU Distance Learning Help Desk 844-678-6200 for technical support.

# Spring and Summer Phosphorus

Erick Elgin

# Phosphorus is an important nutrient

- Key to primary productivity (algae and plants)
- Often the limiting nutrient
- Can cause problems when in excess




# Cultural Eutrophication

- Higher algal biomass and possible HABS
- Reduced aesthetics
- Increased anoxia
- Reduced economic value

# Harmful and Nuisance Algal Blooms

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

Credit: MERIS/NASA; processed by NOAA/NOS/NCCOS

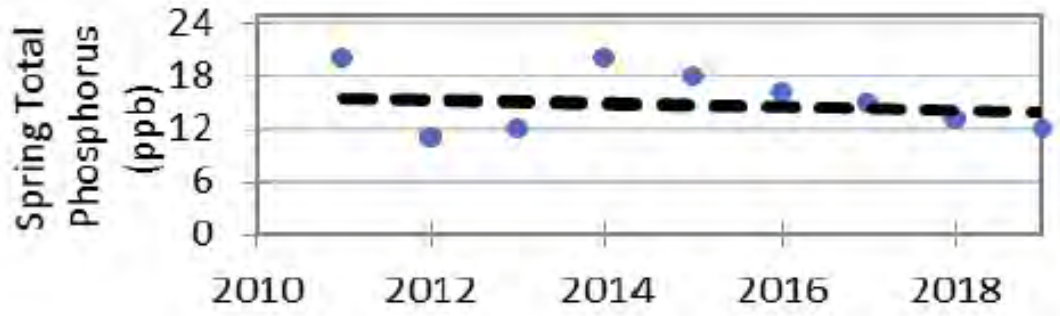
# Phosphorus is used to calculate trophic status

| Trophic Status | Carlson's TSI | TP (ppb or ug/L) | Description |
|---|---|---|---|
| Oligotrophic | < 38 | < 10 | Clear water, oxygen throughout the year in the hypolimnion. |
| Mesotrophic | 38 - 48 | 10 - 20 | Water moderately clear; increasing probability of hypolimnetic anoxia during summer. |
| Eutrophic | 48 - 61 | 21 - 50 | Anoxic hypolimnia, macrophyte problems possible. |
| Hypereutrophic | > 61 | > 50 | Blue-green algae dominate, algal scums and macrophyte problems. |

# Spring and Summer Phosphorus

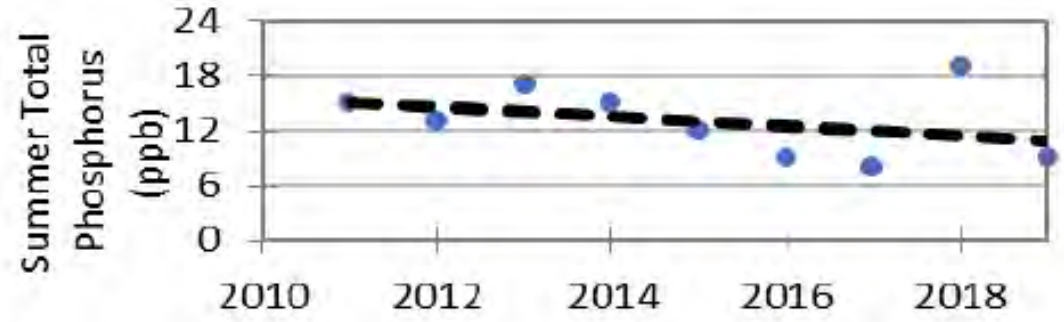
## Spring Phosphorus (parts per billion)

| Year | # Samples | Min | Max | Average | Std. Dev |
|---|---|---|---|---|---|
| 2019 | 1 | 12.0 | 12.0 | 12.0 | NA |
| 2014-2018 | 5 | 13.0 | 20.0 | 16.4 | 2.7 |
| 2011-2013 | 4 | 11.0 | 20.0 | 13.5 | 4.4 |
| 2019 All CLMP Lakes | 220 | <= 3 | 100.0 | 14.9 | 11.0 |

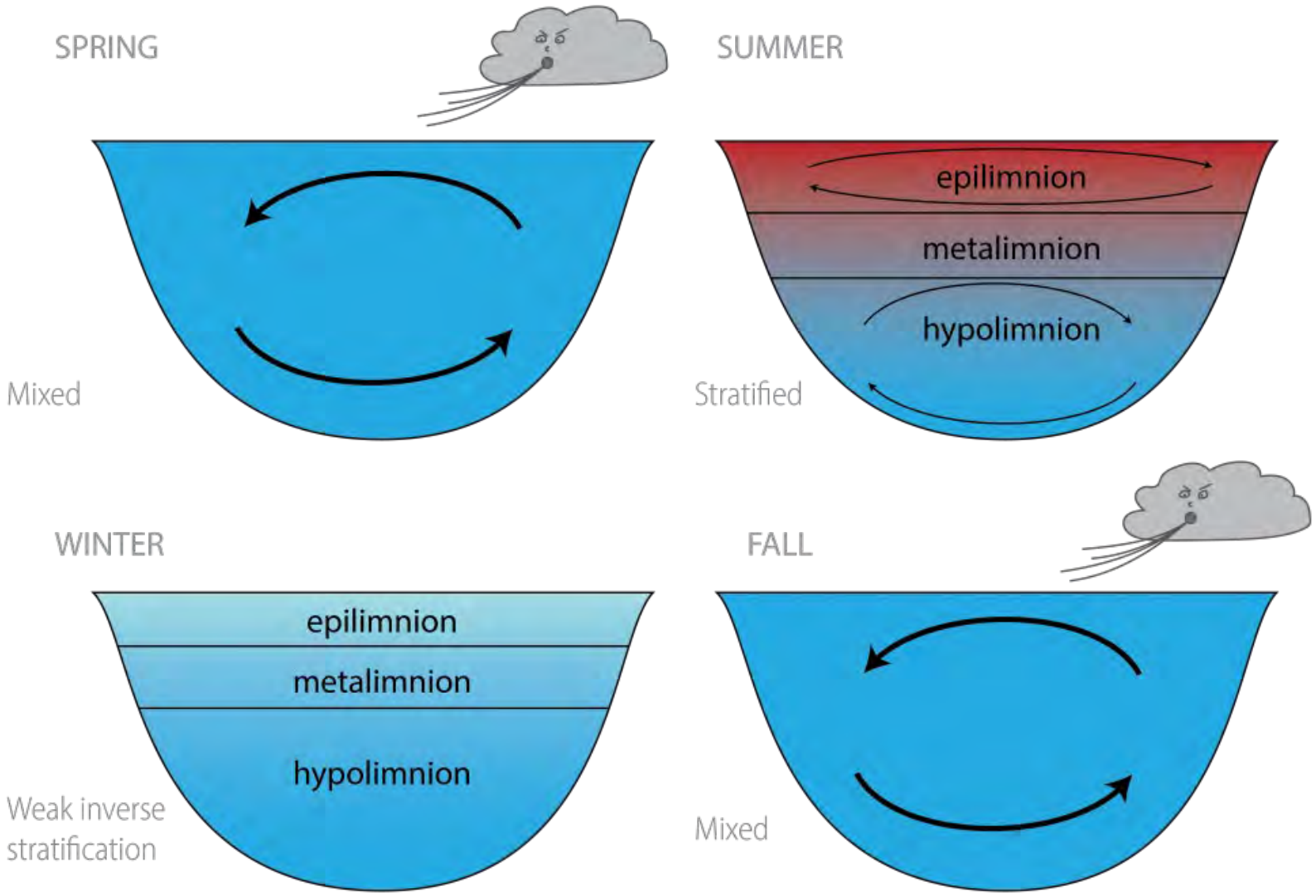



## Summer Phosphorus (parts per billion)

| Year | # Samples | Min | Max | Average | Std. Dev | Carlson TSI |
|---|---|---|---|---|---|---|
| 2019 | 1 | 9.0 | 9.0 | 9.0 | NA | 36 |
| 2014-2018 | 5 | 8.0 | 19.0 | 12.6 | 4.5 | 40 |
| 2011-2013 | 3 | 13.0 | 17.0 | 15.0 | 2.0 | 43 |
| 2019 All CLMP Lakes | 281 | <= 3 | 65.0 | 12.8 | 9.3 | 38 |



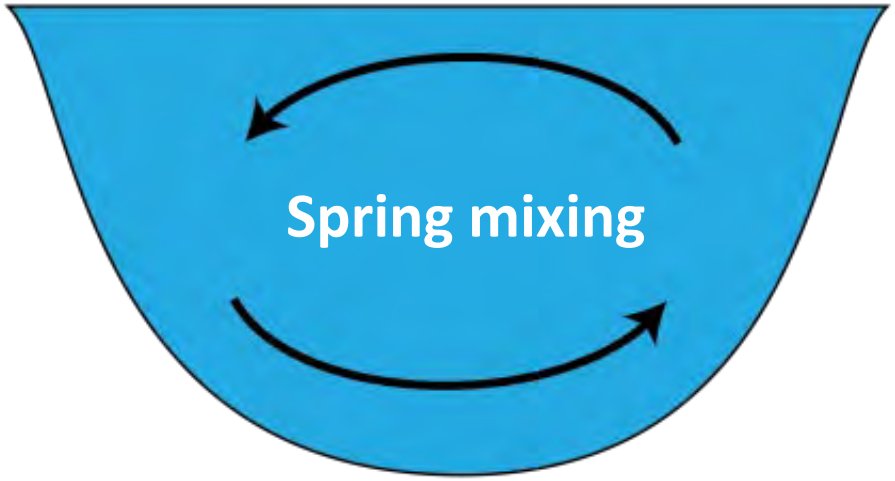
# So why do we collect phosphorus in Spring and Summer?



# Spring Samples

- Lake is well mixed, including P
- Is representative of the whole water column
- Helps us understand long term buildup in the system
- Can be influenced by snow melt

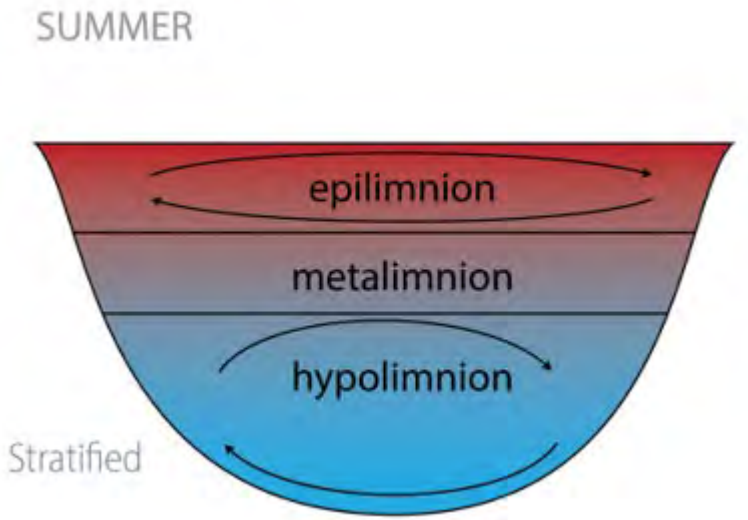
Phosphorus distributed throughout water column



# Summer Samples

- Lake is stratified, and so can P
  - Summer P is representative of the epilimnion and not the whole lake
- Helps us understand summer algae
- Used to calculate Trophic Status
- High values can indicate external loading issues

In deep lakes, phosphorus can become stratified in summer

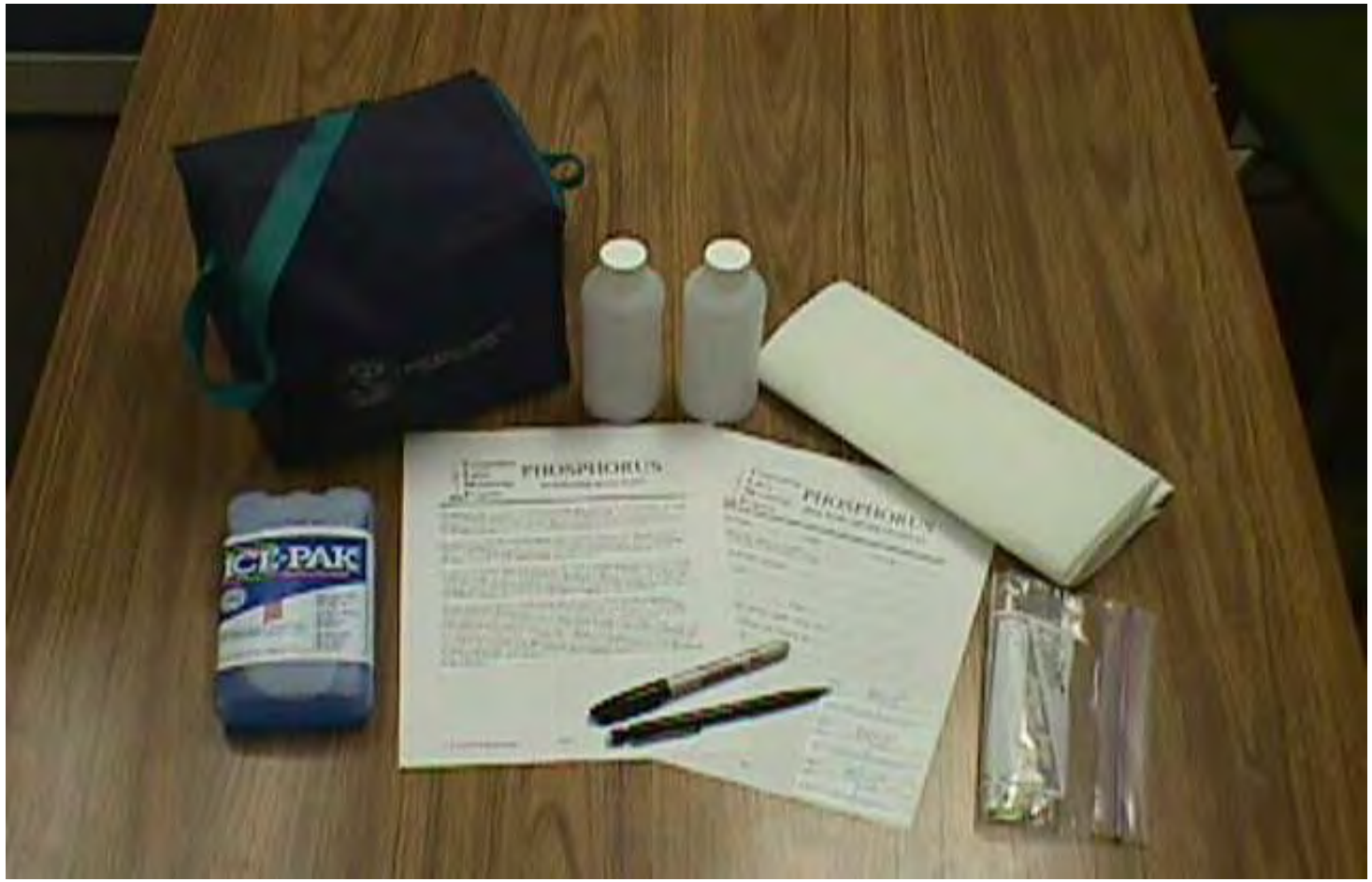


# Phosphorus Protocol

# 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



# Spring phosphorus is measured during spring mixing

- Within 14 days after ice-out (March/April/May)
- Volunteer determines ice-out
  - ***Important to write down on data sheet***
- Surface grab sample
- Representative of whole lake
- Shows nutrient enrichment trends

# Summer phosphorus is measured during summer stratification

- Late summer - early fall (Aug. - Sept.)
  - Depends on latitude
- 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 June 25th

**Summer P**: Sampling and drop off dates depend on your location

- UP lakes sample in August; southern counties: end of September

Michigan Clean Water Corps

## SUMMER PHOSPHORUS
2024 Sample
Collection and Turn-in Schedule

Cooperative Lakes Monitoring Program

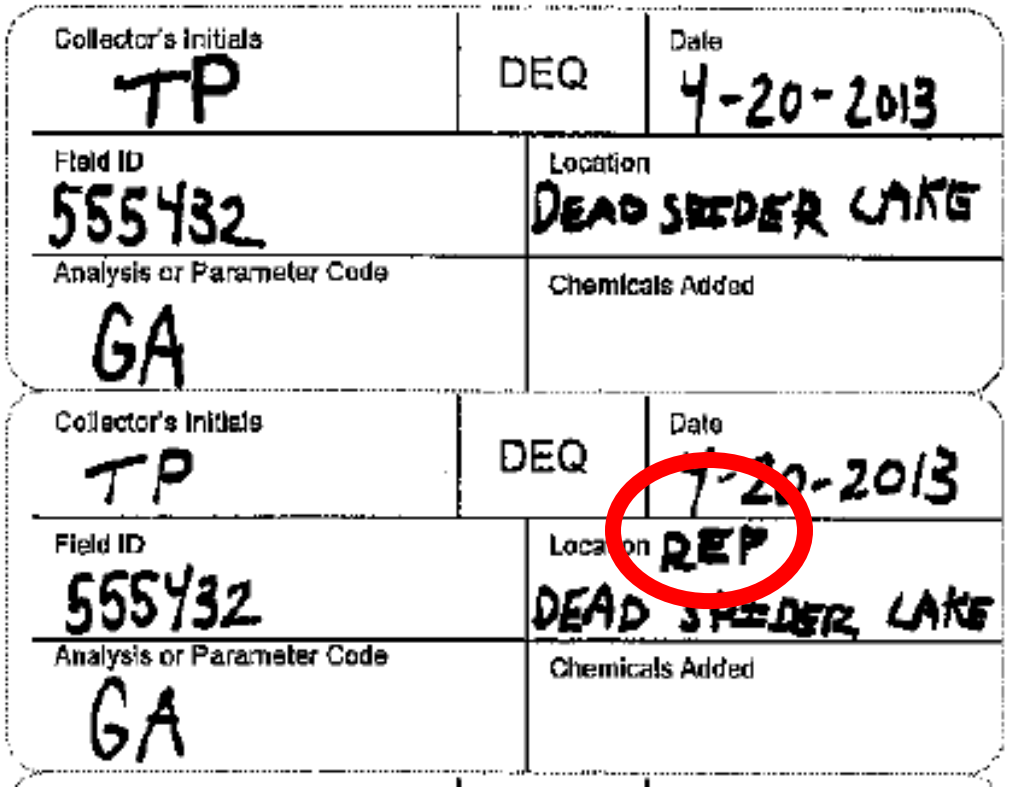
Summer Phosphorus samples must be collected within your 5-day sampling window and turned in (frozen) between **8 am – Noon** on the date and location listed for your county in the table below. Call the appropriate phone number below if other arrangements must be made.

| 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 | Sept 19-23 | 8 am-Noon September 24 |
| 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 | Sept 19-23 | 8 am-Noon September 24 |
| St. Clair, Macomb, Oakland, Wayne, Monroe | EGLE Warren District Office<br>27700 Donald Court<br>Warren, MI 48092<br>Jack Cotrone: 248-763-1994 | Sept 19-23 | 8 am-Noon September 24 |

# **Step 1:** Fill out labels

- Fill out and stick to bottle before you sample
- Use pencil or permanent marker

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

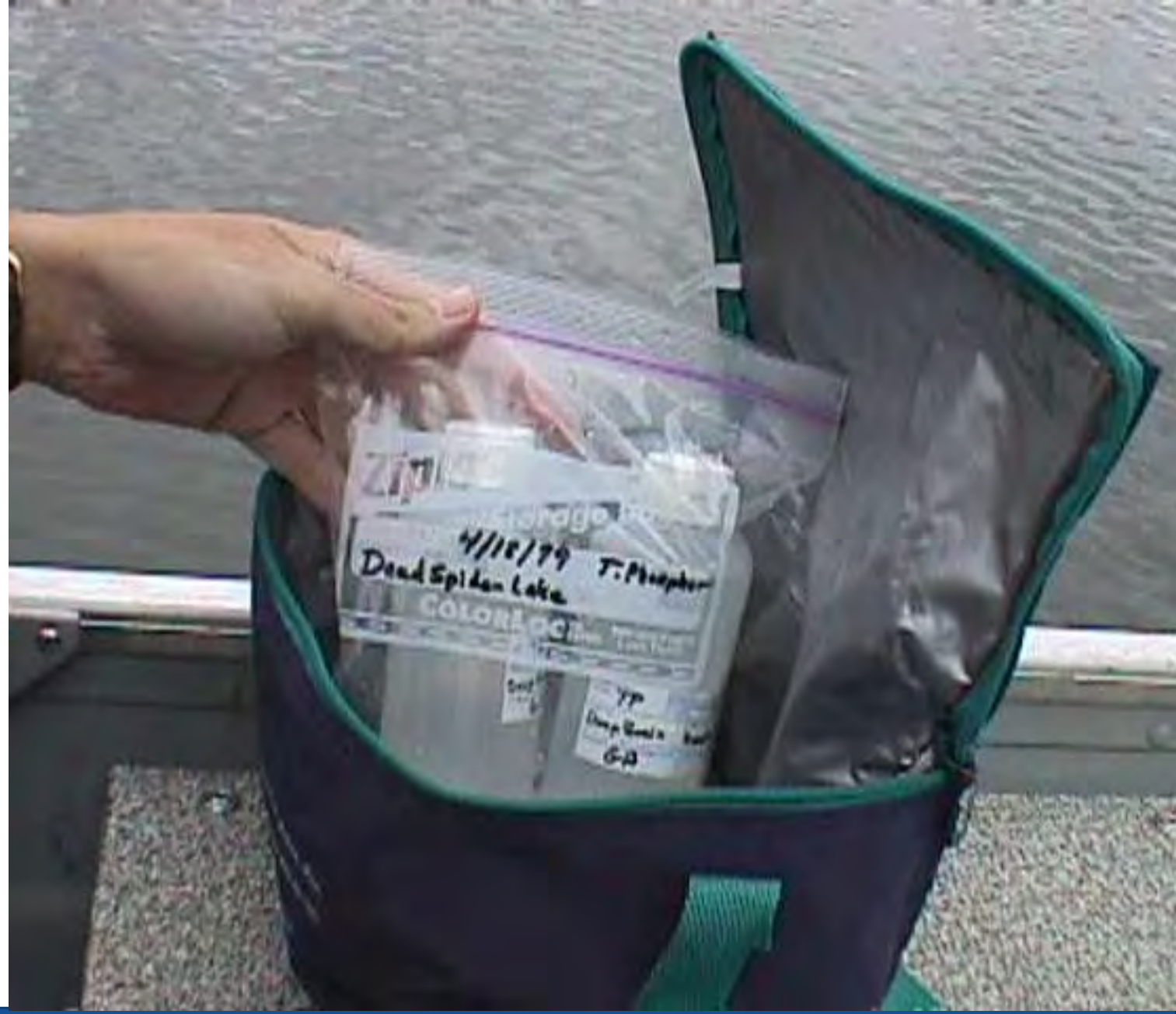
## **Step 3.** Collect sample

Holding the bottle upside down, lower the bottle below the surface to 1-2 foot depth and then tilt upward. Hold until bottle is full.

- Repeat with second bottle

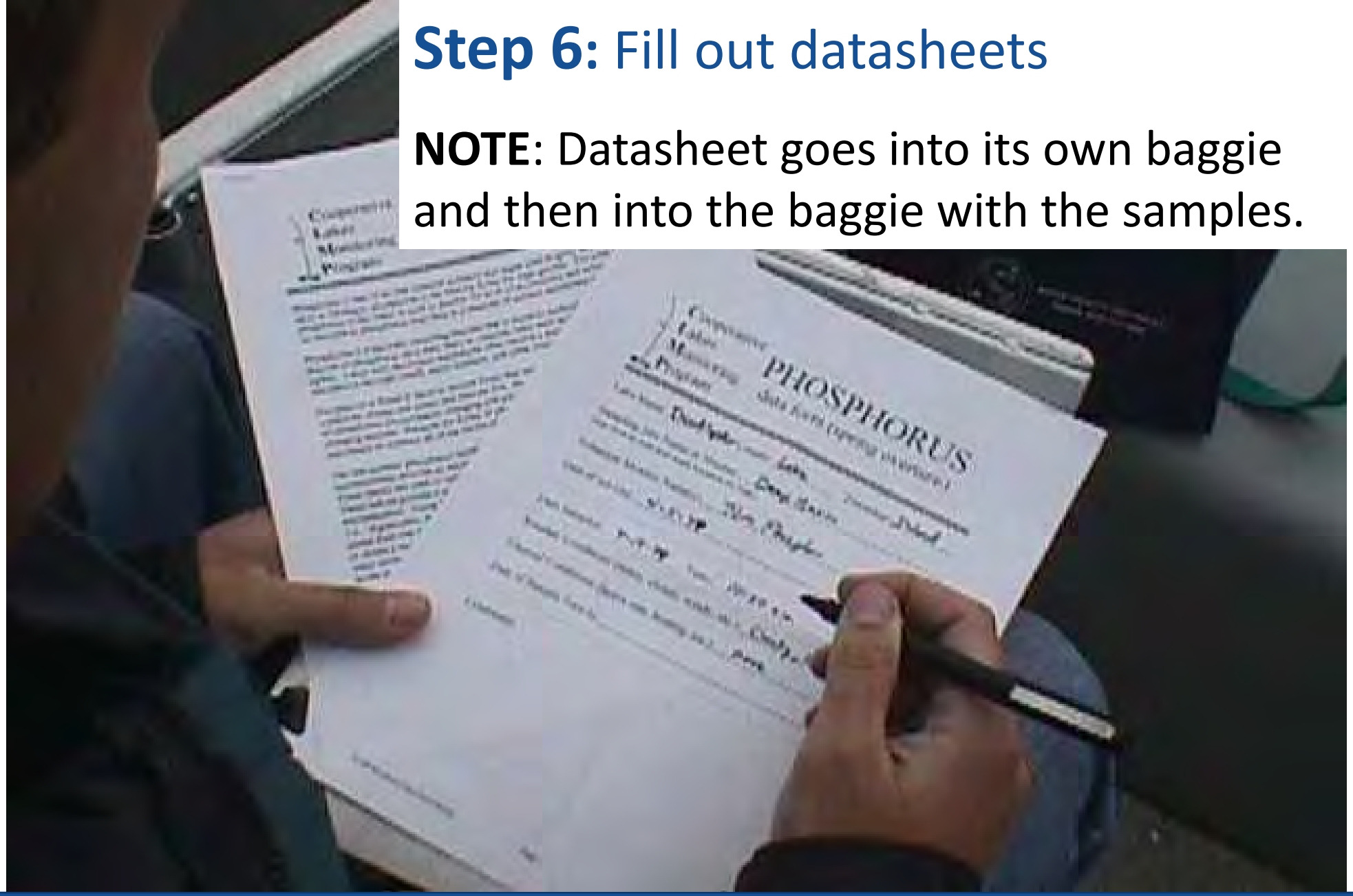
**Step 4**. Pour water out until bottle is filled to ¾ full to avoid cracking the bottle when frozen.

**Step 5.** Place bottles 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.



Michigan Clean Water Corps

# SPRING TOTAL PHOSPHORUS

## 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: _____ Circle GPS / Map

Volunteer Monitor Name(s):_____

Date of Ice-Out:_____

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Date Sampled: _____ Time: _____

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

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

Date of Sample Turn-In: _____

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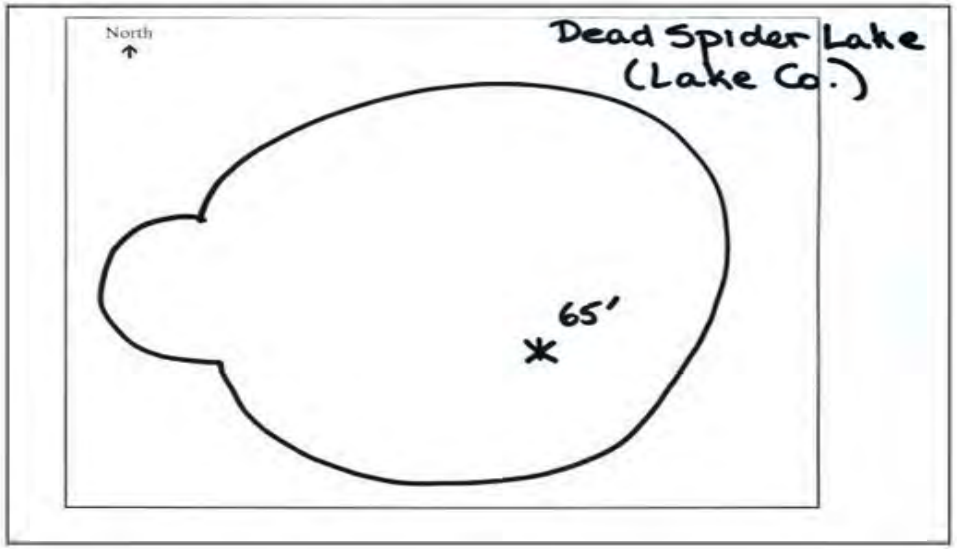
Comments:

- 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 total phosphorus sampling location (this should be at the deepest location in your lake) and write the 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

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)** Put **one copy** in a baggie to keep it dry and
**(3)** Deliver the frozen total phosphorus samples together with the data sheet copy to the designated drop-off location on the designated turn-in date (according to the Spring Phosphorus Sampling Schedule).

# **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.

**Drop off location and time in Phosphorus Schedule**

# Common Reasons for Sample Rejection

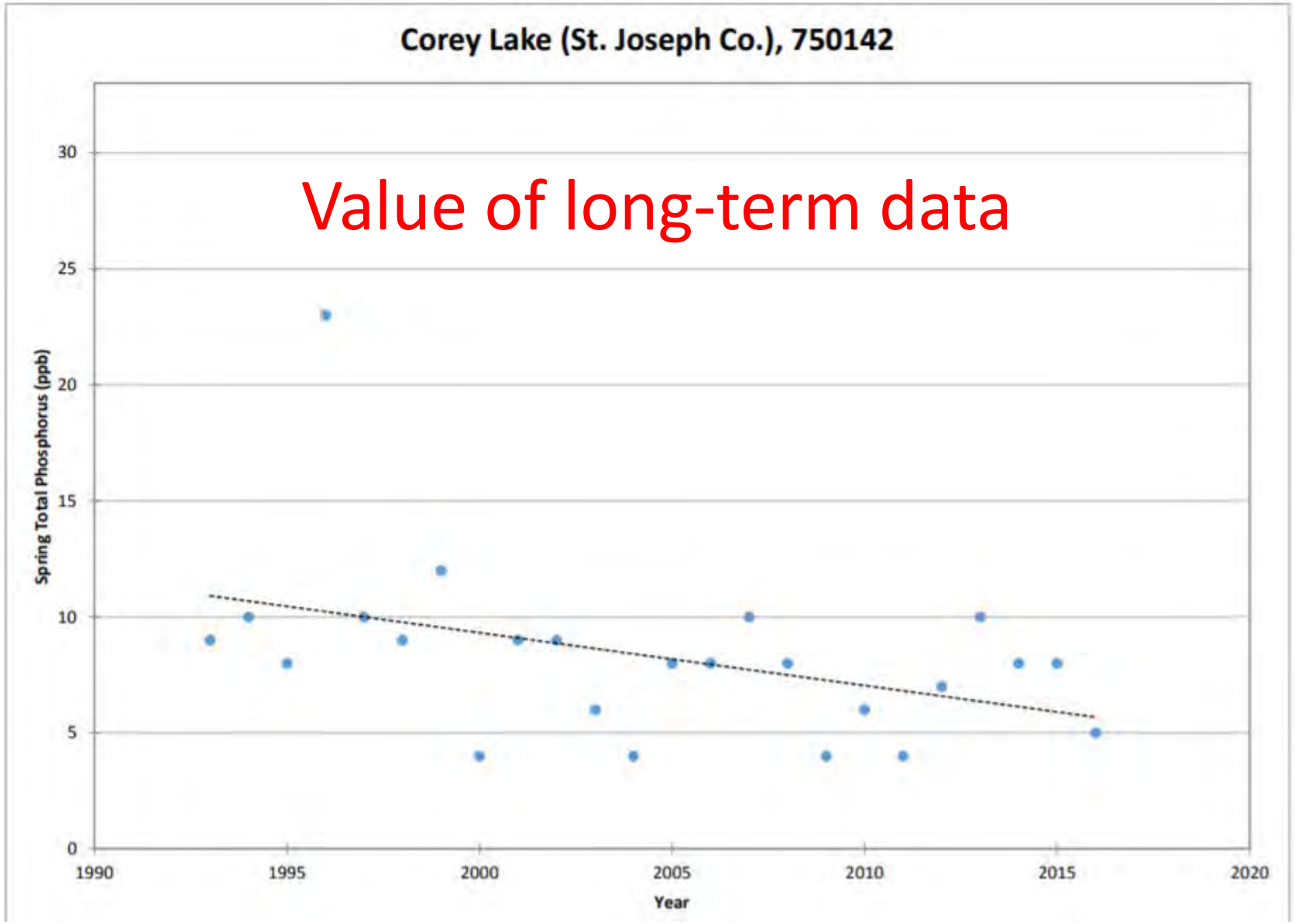
- **Sample collected at the wrong time**
  - Spring P– samples collected >2 weeks after ice-out will be flagged for error, >4 weeks will be rejected.
  - Summer P – samples collected more than a week outside the assigned interval will be rejected
- **Incorrect delivery**
  - If you forget or can't turn 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




# Value of long-term data

# 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