

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

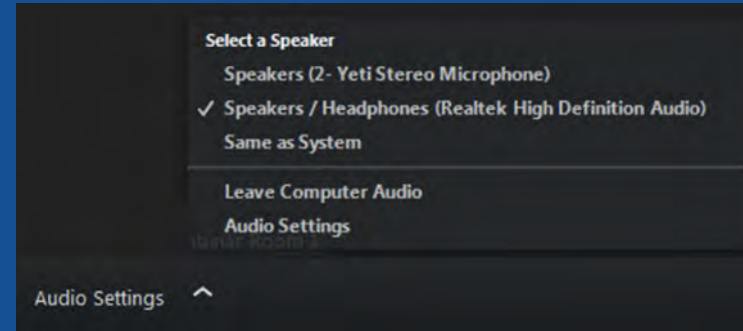
- For CLMP procedures and data forms please visit: [micorps.net/lake-monitoring/clmp-documents/](http://micorps.net/lake-monitoring/clmp-documents/) and then click on the name of the parameter.

### Today's Agenda:

<b>9:00 AM – 9:15 AM</b>	Welcome and CLMP Review
<b>9:15 – 10:15 AM</b>	Secchi Disk & Phosphorus
<b>10:15 - 10:30 AM</b>	BREAK
<b>10:30 – 11:30 AM</b>	Dissolved Oxygen & Temperature
<b>11:30 AM – 1:00 PM</b>	LUNCH BREAK
<b>1:00 – 2:00 PM</b>	Chlorophyll-a
<b>2:00 – 3:00 PM</b>	Score the Shore
<b>3:00 – 3:15 PM</b>	BREAK
<b>3:15 PM – 4:30 PM</b>	Exotic Aquatic Plant Watch

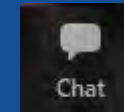
## Getting Started

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



# Score the Shore

Jo Latimore

# Training Agenda

9:00 AM – 9:15 AM	Welcome to CLMP
9:15 AM – 10:15 AM	Secchi Disk & Phosphorus
10:15 AM – 10:30 AM	BREAK
10:30 AM – 11:30 AM	Dissolved Oxygen & Temperature
11:30 AM – 1:00 PM	Lunch
1:00 PM – 2:00 PM	Chlorophyll-a
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



**MICHIGAN STATE**  

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**UNIVERSITY**

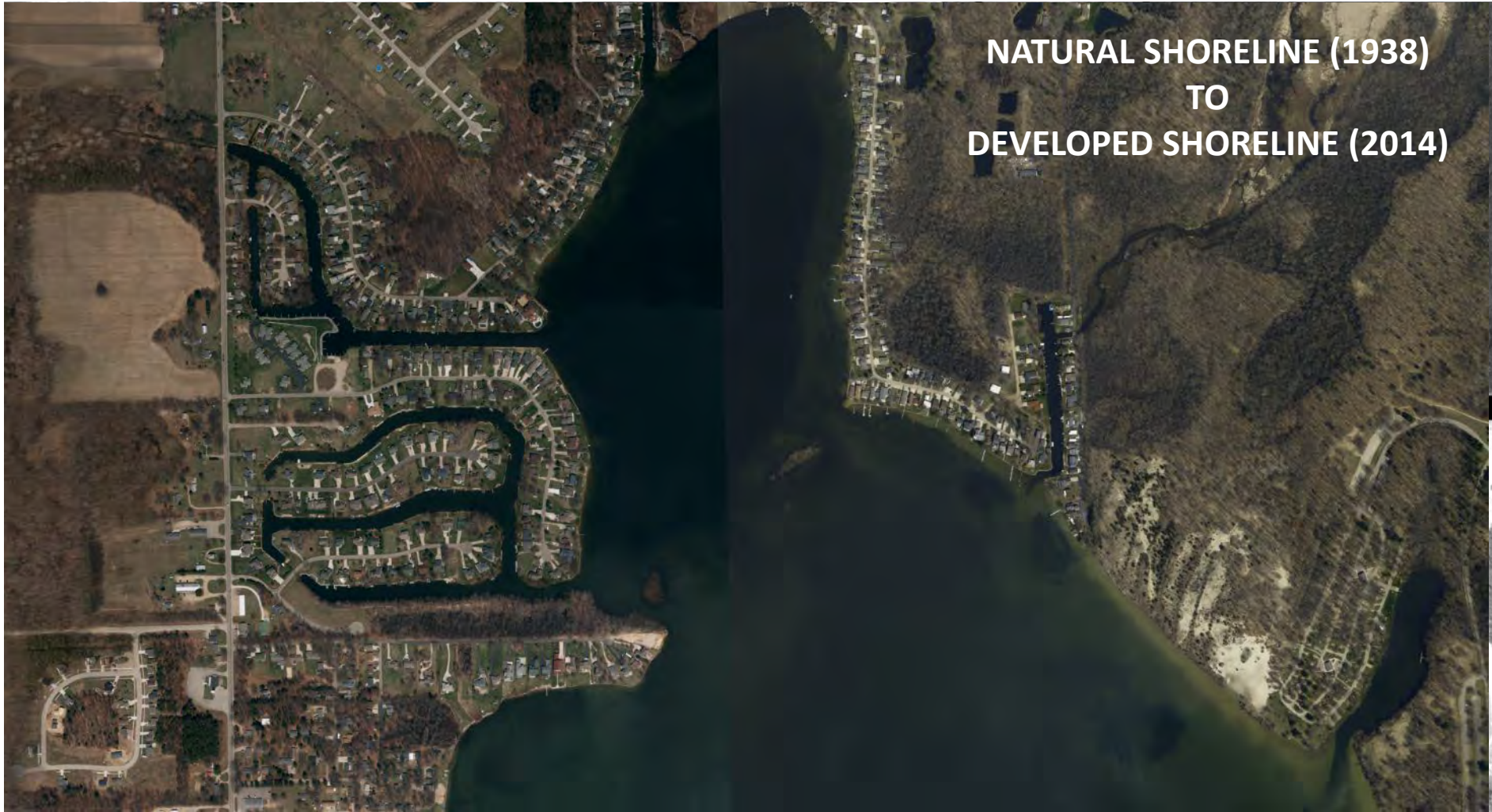
**Jo Latimore, Ph.D.**  
MiCorps Director  
517-432-1491  
latimor1@msu.edu

# Healthy Shorelines



# (Un)healthy Shorelines





NATURAL SHORELINE (1938)  
TO  
DEVELOPED SHORELINE (2014)

**NATURAL SHORELINE (1938)  
TO  
DEVELOPED SHORELINE (2014)**







**HISTORIC SHORELINE DEVELOPMENT (1938)**

# Score the Shore

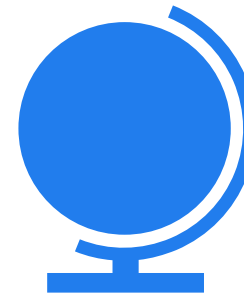


# What good is this information?



## Local – lake associations

Support educational efforts  
Inform lake management planning



## Region/state

Assess health of Michigan's lakeshores  
Research  
Reporting

# Shoreline Resources

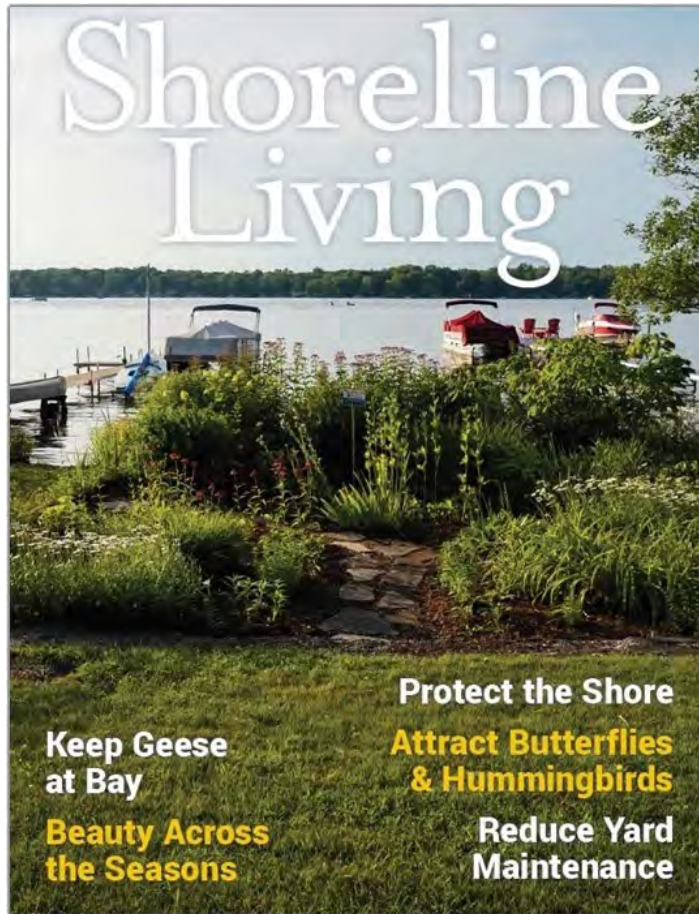


[MiShorelinePartnership.org](http://MiShorelinePartnership.org)



[MiShorelandStewards.org](http://MiShorelandStewards.org)

# Shoreline Resources



# The process in a nutshell



# How to talk about the results

- The survey is a valuable educational tool
- The results are not regulatory



# Prepare to Score the Shore!



# Score the Shore Paperwork

- Score the Shore procedures
- Data Forms
  - Survey Cover Sheet (only 1 needed)
  - Section data form
    - You will need to print/copy many of these
    - The digital version is be available at [micorps.net/lake-monitoring/clmp-documents/](http://micorps.net/lake-monitoring/clmp-documents/)

# Equipment Checklist

- Boat
- Boating safety equipment
- Copies of Data Forms
- Copy of Procedure
- Pencils or waterproof pens
- Clipboard(s)
- GPS unit\*
- Camera\* (digital if possible)
- Binoculars\*
- 2 Tally Counters\*

\*optional



# Timing and effort

- No earlier than mid-June (need full leaf out, vegetative growth)
  - Northern lakes can begin later
- Length of time depends on the size of your lake (2 hours on a small lake; more on a big lake).
- 30-45 minutes per 1000-foot section while you are learning.
- 15-30 minutes per 1000-foot section once you get good at it.
- Repeat the survey every 3-5 years

# Set up your shoreline sections ahead of time

- Use Google Maps to create approximate 1000-foot sections
- Google Maps can measure distance (right click on map, “measure distance”)



# Set up your shoreline sections ahead of time

- Ride around the lake to associate your map with GPS coordinates and/or shoreline landmarks.
- **DON'T USE PEOPLE'S NAMES FOR LANDMARKS.**



# Set up your shoreline sections ahead of time

- Other methods are fine if you have different technology or different ideas...
- The important thing?
  - Do it ahead of time!



# The Scoring Process

# General Process

- Your team: One driver, at least two others
- At least three passes of a 1000 foot section
  - ~100 yards from shore
  - ~20-30 yards from shore
  - ~100 yards from shore
- Team answers questions on every pass
  - Every member gets data sheets
- Driver idles boat while team discusses questions and reaches consensus.
- One person records the final answers.
- Back at home, do the math to get your final scores.



# SCORE THE SHORE

## Data Form



Lake Name: \_\_\_\_\_ County: \_\_\_\_\_

Township: \_\_\_\_\_ Lake Sampling Site (Field ID) Number: \_\_\_\_\_

Volunteer Monitor Name(s): \_\_\_\_\_

Date(s) of Survey : \_\_\_\_\_

Lake Level during survey was: \_\_\_\_\_ Average/Normal \_\_\_\_\_ Low \_\_\_\_\_ High

Does the lake have a legal lake level? \_\_\_\_\_ Yes \_\_\_\_\_ No

If yes, indicate level gage reading at time of survey, if possible: \_\_\_\_\_

Did the lake level impact survey results? If so, how?

\_\_\_\_\_

Total number of 1000' sections surveyed: \_\_\_\_\_

(If the final section was substantially shorter than 1000', note its approximate length here: \_\_\_\_\_)

Were photographs taken as part of this survey?  Yes  No

<u>Development Density</u>		<u>Overall Shore Score</u>	
A. Total no. of all buildings/docks		A. Add all of the overall section scores:	
B. Total no. of sections:		B. Total no. of sections:	
Divide A by B for the avg. number of structures per 1000 feet		Divide A by B for the Shore Score for your lake: <i>(It is a 0-100 scale)</i>	

CLMP Score the Shore Data Form    Survey Cover Sheet

Section #: \_\_\_\_\_ Lake/County: \_\_\_\_\_ Date: \_\_\_\_\_

GPS/Landmark at Start of Section: \_\_\_\_\_

**PASS 1 (Boat is 100 yards from shore):**

Number of: Homes/Major Buildings: \_\_\_\_\_

Docks/Boatlifts: \_\_\_\_\_



**PASS 2 (Boat is 20-30 yards from shore):**

**Littoral (Aquatic) Zone Characteristics and Shoreline Erosion:**

**Littoral Zone Raw Score:**

% Emergent/Floating Vegetation \_\_\_ None (0) \_\_\_ <10% (1) \_\_\_ 10-25% (2) \_\_\_ 25-75% (3) \_\_\_ >75% (4)

% Submerged Vegetation \_\_\_ None (0) \_\_\_ <10% (1) \_\_\_ 10-25% (2) \_\_\_ 25-75% (3) \_\_\_ >75% (4)

\_\_\_ Unable to see

Is aquatic plant management evident/known? \_\_\_ No (0) \_\_\_ Minor (at docks, swim areas; -1) \_\_\_ Major (-2)

Amount of Downed Trees/Woody Debris: \_\_\_ None (0) \_\_\_ Few: 1-5 (1) \_\_\_ Several: 6-15 (2) \_\_\_ Many: 16+ (3)

Erosion along shoreline (check one): \_\_\_ None observed (0) \_\_\_ Minor (-1) \_\_\_ Moderate (-2) \_\_\_ Severe (-3)

**PASS 3 (Boat back out to 100 yards from shore):**

**Riparian (Land Near Shore) Zone Characteristics:**

**Riparian Zone Raw Score:**

% Maintained Lawn, Maintained/Artificial Beach, or Impervious (% of total section length):

\_\_\_\_\_ None (0) \_\_\_\_\_ <10% (-1) \_\_\_\_\_ 10-25% (-2) \_\_\_\_\_ 25-75% (-3) \_\_\_\_\_ >75% (-4)

% Unmowed Vegetation Belt (any vegetation other than lawn; % of total section length):

\_\_\_\_\_ None (0) \_\_\_\_\_ <10% (1) \_\_\_\_\_ 10-25% (2) \_\_\_\_\_ 25-75% (3) \_\_\_\_\_ >75% (4)

Average Unmowed Vegetation Belt Depth:

\_\_\_\_\_ None (0) \_\_\_\_\_ < 10 ft. (1) \_\_\_\_\_ 10-40 ft. (2) \_\_\_\_\_ > 40 ft. (3)

**Shoreline Erosion Control Practices:**

**Erosion Control Raw Score:**

Vertical Artificial: \_\_\_\_\_ None (0) \_\_\_\_\_ <10% (-1) \_\_\_\_\_ 10-25% (-2) \_\_\_\_\_ 25-75% (-3) \_\_\_\_\_ >75% (-4)

Types of Vertical Structure (check all that apply) \_\_\_\_\_ Seawall \_\_\_\_\_ Boulders /Rock Walls

\_\_\_\_\_ Other - describe:

Sloped Artificial: \_\_\_\_\_ None (0) \_\_\_\_\_ <10% (-1) \_\_\_\_\_ 10-25% (-2) \_\_\_\_\_ 25-75% (-3) \_\_\_\_\_ >75% (-4)

Types of Sloped Artificial (check all that apply) \_\_\_\_\_ Concrete \_\_\_\_\_ Rock/Riprap

\_\_\_\_\_ Other - describe:

Bioengineering (e.g. coir logs, branch bundles):

\_\_\_\_\_ None (0) \_\_\_\_\_ <10% (-0.5) \_\_\_\_\_ 10-25% (-1) \_\_\_\_\_ 25-75%(-1.5) \_\_\_\_\_ >75% (-2)

GPS/Landmark at End of Section: \_\_\_\_\_

### **Final Scoring**

These equations transform your raw scores into a 0-100 scale. You should round to the nearest whole number. Remember to multiply before you add.

Littoral Zone Raw Score (from other side): \_\_\_\_\_ x 6.2 + 31.3 =  **Littoral Zone Final Score**

If "Unable to see" submerged vegetation use this: x 8.3 + 41.5 =

Riparian Zone Raw Score (from other side): \_\_\_\_\_ x 9.1 + 36.4 =  **Riparian Zone Final Score**

Erosion Control Raw Score (from other side): \_\_\_\_\_ x 11.1 + 100 =  **Erosion Control Final Score**

Add the Scores Above =

Divide the Score Above by 3 =

**OVERALL SECTION SCORE**

**Comments or Concerns for this Section:**

# Docks



# Emergent/Floating Vegetation



# Emergent/Floating Vegetation





# Emergent/Floating Vegetation? - YES



% Submerged Vegetation

\_\_\_ None (0) \_\_\_ <10% (1) \_\_\_ 10-25% (2) \_\_\_ 25-75% (3) \_\_\_ >75% (4)

\_\_\_ Unable to see

# Submerged Vegetation



% Submerged Vegetation

\_\_\_ None (0) \_\_\_ <10% (1) \_\_\_ 10-25% (2) \_\_\_ 25-75% (3) \_\_\_ >75% (4)

\_\_\_ Unable to see

# Submerged Vegetation



Is aquatic plant management evident/known? \_\_\_ No (0) \_\_\_ Minor (at docks, swim areas; -1) \_\_\_ Major (-2)

# Aquatic plant management



Is aquatic plant management evident/known? \_\_\_ No (0) \_\_\_ Minor (at docks, swim areas; -1) \_\_\_ Major (-2)

# Aquatic plant management



Is aquatic plant management evident/known? \_\_\_ No (0) \_\_\_ Minor (at docks, swim areas; -1) \_\_\_ Major (-2)

# Aquatic plant management



Amount of Downed Trees/Woody Debris:  None (0)  Few: 1-5 (1)  Several: 6-15 (2)  Many: 16+ (3)

# Woody Debris



Amount of Downed Trees/Woody Debris:  None (0)  Few: 1-5 (1)  Several: 6-15 (2)  Many: 16+ (3)

# Woody Debris





Amount of Downed Trees/Woody Debris: \_\_\_ None (0) \_\_\_ Few: 1-5 (1) \_\_\_ Several: 6-15 (2) \_\_\_ Many: 16+ (3)

# Woody Debris



Amount of Downed Trees/Woody Debris: \_\_\_ None (0) \_\_\_ Few: 1-5 (1) \_\_\_ Several: 6-15 (2) \_\_\_ Many: 16+ (3)

# Woody Debris



Erosion along shoreline (check one):  None observed (0)  Minor (-1)  Moderate (-2)  Severe (-3)

# Erosion



Erosion along shoreline (check one):  None observed (0)  Minor (-1)  Moderate (-2)  Severe (-3)

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Erosion along shoreline (check one):  None observed (0)  Minor (-1)  Moderate (-2)  Severe (-3)

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Erosion along shoreline (check one):  None observed (0)  Minor (-1)  Moderate (-2)  Severe (-3)

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Erosion along shoreline (check one):  None observed (0)  Minor (-1)  Moderate (-2)  Severe (-3)

# Erosion



Erosion along shoreline (check one):  None observed (0)  Minor (-1)  Moderate (-2)  Severe (-3)

# Erosion





# Does a beach count as “Erosion”?



% Maintained Lawn, Maintained/Artificial Beach, or Impervious (% of total section length):

\_\_\_ None (0) \_\_\_ <10% (-1) \_\_\_ 10-25% (-2) \_\_\_ 25-75% (-3) \_\_\_ >75% (-4)

# Maintained Lawn



% Maintained Lawn, Maintained/Artificial Beach, or Impervious (% of total section length):

\_\_\_ None (0) \_\_\_ <10% (-1) \_\_\_ 10-25% (-2) \_\_\_ 25-75% (-3) \_\_\_ >75% (-4)

# Impervious/Maintained Lawn



% Maintained Lawn, Maintained/Artificial Beach, or Impervious (% of total section length):

\_\_\_ None (0) \_\_\_ <10% (-1) \_\_\_ 10-25% (-2) \_\_\_ 25-75% (-3) \_\_\_ >75% (-4)

# Impervious/Maintained Lawn



% Maintained Lawn, Maintained/Artificial Beach, or Impervious (% of total section length):

\_\_\_\_ None (0) \_\_\_\_ <10% (-1) \_\_\_\_ 10-25% (-2) \_\_\_\_ 25-75% (-3) \_\_\_\_ >75% (-4)

# Impervious



% Maintained Lawn, Maintained/Artificial Beach, or Impervious (% of total section length):

\_\_\_\_ None (0) \_\_\_\_ <10% (-1) \_\_\_\_ 10-25% (-2) \_\_\_\_ 25-75% (-3) \_\_\_\_ >75% (-4)

# Impervious



# Maintained Lawn/Beach



% Maintained Lawn, Maintained/Artificial Beach, or Impervious (% of total section length):

\_\_\_ None (0) \_\_\_ <10% (-1) \_\_\_ 10-25% (-2) \_\_\_ 25-75% (-3) \_\_\_ >75% (-4)

# Maintained Lawn/Beach





% Unmowed Vegetation Belt (any vegetation other than lawn; % of total section length):  
\_\_\_\_\_ None (0) \_\_\_\_\_ <10% (1) \_\_\_\_\_ 10-25% (2) \_\_\_\_\_ 25-75% (3) \_\_\_\_\_ >75% (4)

Average Unmowed Vegetation Belt Depth:  
\_\_\_\_\_ None (0) \_\_\_\_\_ < 10 ft. (1) \_\_\_\_\_ 10-40 ft. (2) \_\_\_\_\_ > 40 ft. (3)

# Unmowed Vegetation Belt



% Unmowed Vegetation Belt (any vegetation other than lawn; % of total section length):

\_\_\_\_ None (0) \_\_\_\_ <10% (1) \_\_\_\_ 10-25% (2) \_\_\_\_ 25-75% (3) \_\_\_\_ >75% (4)

Average Unmowed Vegetation Belt Depth:

\_\_\_\_ None (0) \_\_\_\_ < 10 ft. (1) \_\_\_\_ 10-40 ft. (2) \_\_\_\_ > 40 ft. (3)

# Unmowed Vegetation Belt



% Unmowed Vegetation Belt (any vegetation other than lawn; % of total section length):

\_\_\_ None (0) \_\_\_ <10% (1) \_\_\_ 10-25% (2) \_\_\_ 25-75% (3) \_\_\_ >75% (4)

Average Unmowed Vegetation Belt Depth:

\_\_\_ None (0) \_\_\_ < 10 ft. (1) \_\_\_ 10-40 ft. (2) \_\_\_ > 40 ft. (3)

# Unmowed Vegetation



% Unmowed Vegetation Belt (any vegetation other than lawn; % of total section length):

\_\_\_\_ None (0) \_\_\_\_ <10% (1) \_\_\_\_ 10-25% (2) \_\_\_\_ 25-75% (3) \_\_\_\_ >75% (4)

Average Unmowed Vegetation Belt Depth:

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# Unmowed Vegetation Belt



% Unmowed Vegetation Belt (any vegetation other than lawn; % of total section length):

\_\_\_ None (0) \_\_\_ <10% (1) \_\_\_ 10-25% (2) \_\_\_ 25-75% (3) \_\_\_ >75% (4)

Average Unmowed Vegetation Belt Depth:

\_\_\_ None (0) \_\_\_ < 10 ft. (1) \_\_\_ 10-40 ft. (2) \_\_\_ > 40 ft. (3)

# Unmowed vegetation belt



Vertical Artificial: \_\_\_\_\_ None (0) \_\_\_\_\_ <10% (-1) \_\_\_\_\_ 10-25% (-2) \_\_\_\_\_ 25-75% (-3) \_\_\_\_\_ >75% (-4) \_\_\_\_\_

Types of Vertical Structure (check all that apply) \_\_\_\_\_ Seawall \_\_\_\_\_ Boulders /Rock Walls

# Seawall



# Seawall

Vertical Artificial: None (0) <10% (-1) 10-25% (-2) 25-75% (-3) >75% (-4)  
Types of Vertical Structure (check all that apply)  Seawall  Boulders /Rock Walls



# Seawall

Vertical Artificial: ..... None (0) ..... <10% (-1) ..... 10-25% (-2) ..... 25-75% (-3) ..... >75% (-4) .....  
Types of Vertical Structure (check all that apply)  Seawall  Boulders /Rock Walls





# Boulders

Vertical Artificial: ..... None (0) ..... <10% (-1) ..... 10-25% (-2) ..... 25-75% (-3) ..... >75% (-4) .....  
Types of Vertical Structure (check all that apply)  Seawall  Boulders /Rock Walls



# Boulders

Vertical Artificial: ..... None (0) ..... <10% (-1) ..... 10-25% (-2) ..... 25-75% (-3) ..... >75% (-4) .....  
Types of Vertical Structure (check all that apply)  Seawall  Boulders /Rock Walls



# Boulders

Vertical Artificial: None (0) <10% (-1) 10-25% (-2) 25-75% (-3) >75% (-4)  
Types of Vertical Structure (check all that apply)  Seawall  Boulders /Rock Walls



# Riprap

Sloped Artificial:  None (0)  <10% (-1)  10-25% (-2)  25-75% (-3)  >75% (-4)

Types of Sloped Artificial (check all that apply)  Concrete  Rock/Riprap

Other - describe:



Sloped Artificial:  None (0)  <10% (-1)  10-25% (-2)  25-75% (-3)  >75% (-4)

Types of Sloped Artificial (check all that apply)  Concrete  Rock/Riprap

Other - describe:

# Sloped Artificial - Concrete



# Riprap

Sloped Artificial:  None (0)  <10% (-1)  10-25% (-2)  25-75% (-3)  >75% (-4)

Types of Sloped Artificial (check all that apply)  Concrete  Rock/Riprap

Other - describe:



# Rock/Riprap

Sloped Artificial:  None (0)  <10% (-1)  10-25% (-2)  25-75% (-3)  >75% (-4)

Types of Sloped Artificial (check all that apply)  Concrete  Rock/Riprap

Other - describe:



# Rock/Riprap

Sloped Artificial:  None (0)  <10% (-1)  10-25% (-2)  25-75% (-3)  >75% (-4)

Types of Sloped Artificial (check all that apply)  Concrete  Rock/Riprap

Other - describe:





# Rock/Riprap



# Sloped or vertical?

Sloped Artificial:  None (0)  <10% (-1)  10-25% (-2)  25-75% (-3)  >75% (-4)

Types of Sloped Artificial (check all that apply)  Concrete  Rock/Riprap

Other - describe: \_\_\_\_\_



# Seawall or riprap?



# Seawall or Riprap?



# Bioengineering - Coir Logs



Bioengineering (e.g. coir logs, branch bundles):

\_\_\_ None (0) \_\_\_ <10% (-0.5) \_\_\_ 10-25% (-1) \_\_\_ 25-75% (-1.5) \_\_\_ >75% (-2)

# Bioengineering – Coir Logs



# Bioengineering – Coir Logs



# Placed Stumps and Branch Bundles





# What about stuff like this?



# What about stuff like this?



# Take useful photos

- TAKE lots of pictures
  - Be aware you can only upload 3 per section to the MDE
- Delete blurry photos
- Location is essential
  - Label with section number

# Submit Your Data

- Enter your data into the MDE
  - Follow the instructions for data submission on our website, [www.micorps.net](http://www.micorps.net)
  - Because of programming limitations– you need to enter all your lake sections at once. DO NOT close your browser until it is done.
  - You can upload 3 photographs from each section– each one no bigger than 5 MB.

# Submitting Your Data

Whether you enter data into MDE or not, be sure to:

Send complete report to MiCorps, either through mail (copies) or email (pdf). Addresses are on data form.

- Survey Cover Sheet
- All Data Forms
- Survey Map
- No Photographs- if you want these included in the long-term record, you need to enter them yourself into the MDE

# Questions?

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

[MiCorps.net](http://MiCorps.net)



MICHIGAN DEPARTMENT OF  
ENVIRONMENT, GREAT LAKES, AND ENERGY

MICHIGAN STATE UNIVERSITY | Extension



Huron  
River  
Watershed  
Council



Working Together to Protect Lakes



# Training Agenda

9:00 AM – 9:15 AM	Welcome to CLMP
9:15 AM – 10:15 AM	Secchi Disk & Phosphorus
10:15 AM – 10:30 AM	BREAK
10:30 AM – 11:30 AM	Dissolved Oxygen & Temperature
11:30 AM – 1:00 PM	Lunch
1:00 PM – 2:00 PM	Chlorophyll-a
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