



Michigan's Citizen Volunteer Partnership for Lakes

2015 Annual Summary

Managed By:
Michigan Department of Environmental Quality
Michigan Lake & Stream Associations, Inc.
Michigan State University Department of Fisheries and Wildlife
Great Lakes Commission
Huron River Watershed Council



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I. Introduction

The Michigan Department of Environmental Quality (DEQ), Michigan Lake & Stream Associations (MLSA), the Great Lakes Commission, the Huron River Watershed Council, and Michigan State University have partnered to implement the Cooperative Lakes Monitoring Program (CLMP).

The goals of the CLMP are to:

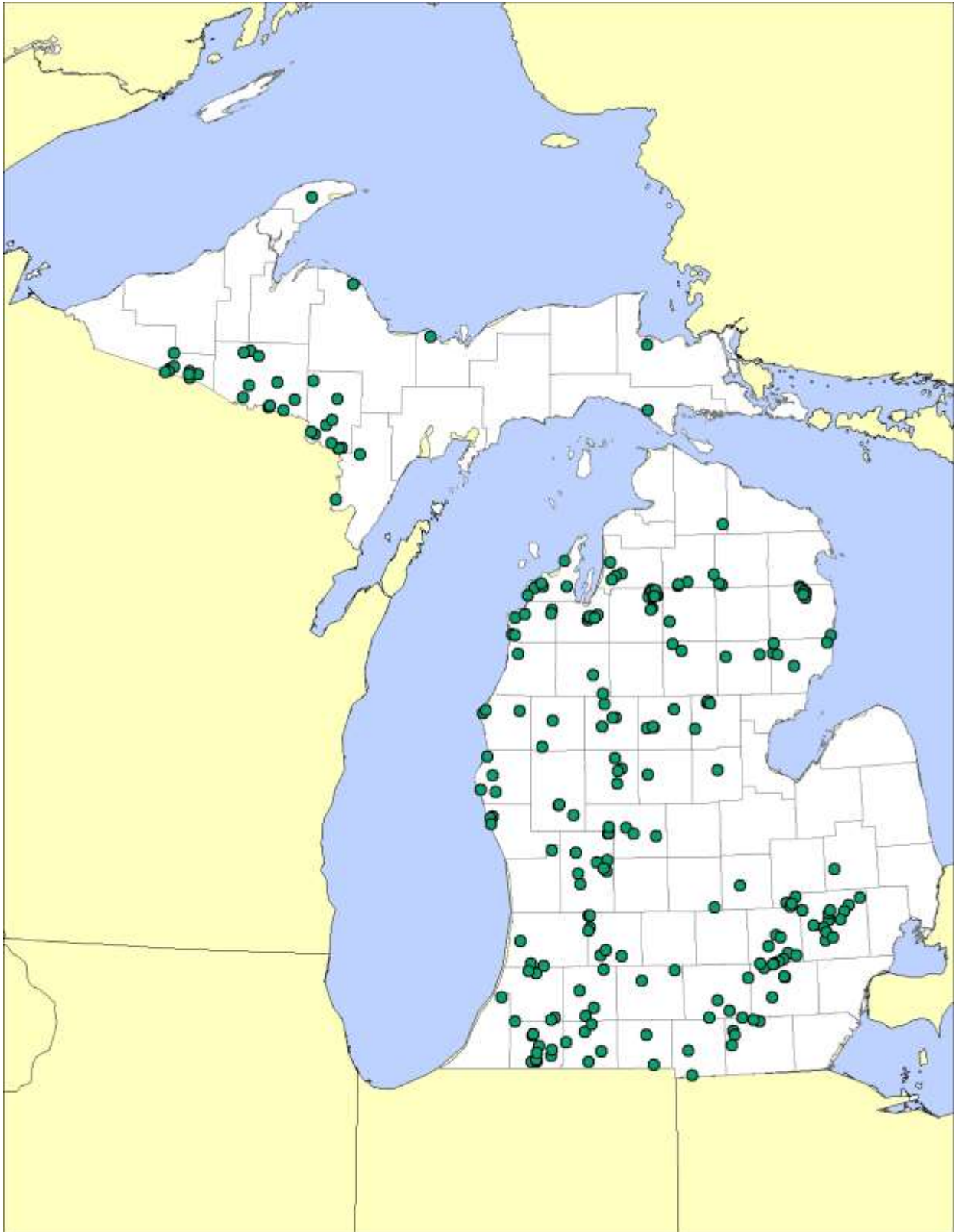
- Provide baseline information and document trends in water quality for individual lakes.
- Educate lake residents, users, and interested citizens in the collection of water quality data, lake ecology, and lake management practices.
- Build a constituency of citizens to practice sound lake management at the local level and to build public support for lake quality protection.
- Provide a cost-effective process for the DEQ to increase baseline data for lakes state-wide.

This report summarizes the 2015 CLMP field season.

To learn more about the CLMP program, there are many other resources available:

1. The Michigan Clean Water Corps website includes a variety of resources including the online database which contains all CLMP data. www.micorps.net
2. The CLMP Manual contains an overview of the program and all of the volunteer monitoring procedures: <https://micorps.net/wp-content/uploads/CLMP-Manual.pdf>
3. Starting in 2014, each lake enrolling in the program received an individual report summarizing their data. <https://micorps.net/individual-lake-reports/>
4. The CLMP Quality Assurance Project Plan (QAPP) is a detailed report on how the CLMP collects and maintains high quality scientific data: <https://micorps.net/wp-content/uploads/QAPP-CLMP.pdf>

II. Map of 2015 CLMP Participating Lakes



III. Summary Statistics of Monitored Parameters

A. Secchi Disk Transparency

CLMP volunteers measure water transparency using a Secchi disk from late spring to the end of the summer. Ideally, 18 weekly measurements are made from mid-May through mid-September. Minimum participation requires submitting at least one measurement.

2015 Secchi Disk Transparency	
No. of sites enrolled	230
No. of sites meeting minimum participation	220 (96%)
Total no. of measurements reported	1963
Minimum reported measurement	2.0' (multiple lakes)
Maximum reported measurement	42.0' (Hubbard Lake, Alcona County and Higgins Lake, Roscommon County)
Mean (average) measurement	13.4'

B. Total Phosphorus

CLMP volunteers collect water samples for total phosphorus during spring overturn, when the lake is generally well mixed from top to bottom, and during late summer, when the lake is at maximum temperature stratification from the surface to the bottom.

2015 Total Phosphorus Monitoring	
<u>Spring Overturn Sampling</u>	
No. of sites enrolled	162
No. of sites submitting samples	150 (93.0%)
Minimum reported value	< 3 µg/L (Crystal Lake, Benzie Co. and Little Glen Lake, Leelanau Co.)
Maximum reported value	70 µg/L (Duncan Lake, Barry Co.)
Mean (average) value	14.0 µg/L
<u>Summer Stratification Sampling</u>	
No. of sites enrolled	208
No. of sites submitting samples	191 (91.8%)
Minimum reported value	< 5 µg/L (multiple lakes)
Maximum reported value	68 µg/L (Manitou Lake, Shiawassee Co.)
Mean (average) value	13.2 µg/L

C. Chlorophyll-a

Volunteers collect water samples for chlorophyll-a, an estimator of the amount of algae in the water column, once per month from May through September. Minimum participation requires at least one sample be submitted; at least four samples must be submitted to be considered full participation in this parameter.

2015 Chlorophyll-a Monitoring	
No. of sites enrolled	143
No. of sites meeting minimum participation	127 (88.8%)
No. of sites meeting full participation	118 (82.5%)
Total no. of samples submitted	646
Minimum reported measurement	< 1 µg/L (multiple lakes)
Maximum reported measurement	190 µg/L (Painter Lake, Cass Co.)
Mean (average) measurement	4.3 µg/L
Median measurement	< 1.0 µg/L

D. Dissolved Oxygen and Temperature

CLMP volunteers measure dissolved oxygen and temperature profiles for their lakes, measured from the surface to within 3 feet of the bottom, at the deepest point in the lake. These profile measurements are made with an electronic meter, ideally every two weeks from mid-May through mid-September.

2015 Dissolved Oxygen and Temperature Monitoring	
No. of sites enrolled	47
No. of sites submitting at least one profile	45 (95.7%)
Total no. of profiles submitted	510
Total no. of measurements taken	4947

E. Exotic Aquatic Plant Watch

Volunteers in this monitoring program survey their lakes for invasive aquatic plants of special concern for Michigan lakes: curly-leaf pondweed, Eurasian watermilfoil, Hydrilla, and starry stonewort.

2015 Exotic Aquatic Plant Watch	
No. of sites enrolled	32
No. of sites submitting report	25 (79%)

F. Aquatic Plant Identification and Mapping

This program is the most labor-intensive volunteer activity within the CLMP. Typically, a team of volunteers from each enrolled lake is involved, with assistants from a MiCorps biologist. The end result is a plant distribution map and abundance report for all types of plants growing in the lake, including both native and, if found, invasive species.

2015 Aquatic Plant Identification and Mapping	
Lakes Conducting Surveys	
Diane	Hillsdale
Antoine	Dickinson
Bass	Dickinson
Carney	Dickinson
Hanbury	Dickinson
Hermansville	Menominee
Louise	Dickinson
Mary	Dickinson
Hamilton	Dickinson
Moon	Dickinson
Norway	Dickinson
Sawyer	Dickinson
Shakey	Menominee
Lakes Continuing Survey Efforts from Previous Years	
Earl	Livingston

G. Score the Shore

This was a pilot program this year. Volunteers motor around the lake, ranking 1000 foot sections of shoreline in regards to littoral habitat, riparian habitat, and erosion control.

2015 Score the Shore	
No. of sites enrolled	12
No. of sites submitting report	7 (58%%)

IV. DEQ Side-by-side Data Verification

DEQ staff monitor several lakes a year alongside the CLMP volunteer for phosphorus and chlorophyll. In the early years of the program, the DEQ used its standard operating procedures to collect the data, which differ slightly from the volunteers' monitoring procedures. The goal of the side-by-side visits was to ensure that the volunteer procedures produced accurate data. The correlation between DEQ samples and volunteers' samples has proven to be very high through many years of these side-by-side tests. CLMP and DEQ staff have concluded that the original goal of the side-by-sides has been met.

Starting in 2011, DEQ began to use the volunteer procedures to run the side-by-side data verifications. The new goal of the side-by-side visits are to build relationships with the volunteers and ensure that they correctly follow the volunteer procedures as a check on the training protocols.

A. 2015 Total Phosphorus Side-by-side samples

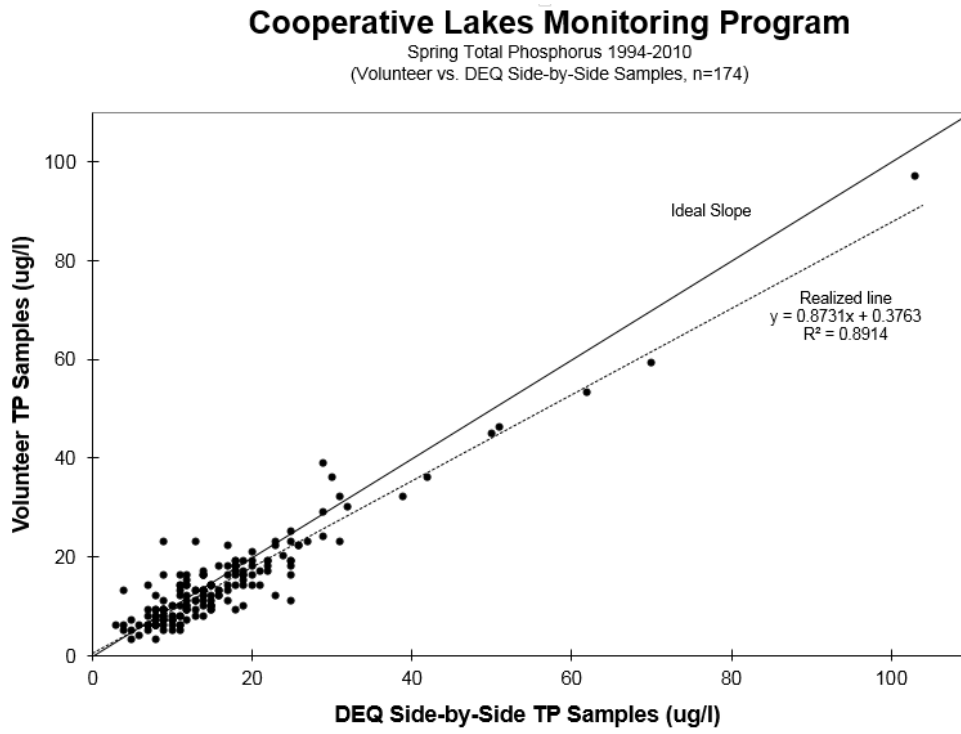
Date	Parameter	Lake	Lake ID	County	Vol	Phosphorus (µg/L)		
						Rep	DEQ	Rep
9/11/2015	Summer TP	Eagle	400130	Cass	10		9	7
9/14/2015	Summer TP	Indian	670227	Osceola	8		9	9
9/21/2015	Summer TP	Park	190099	Clinton	13		15	14

B. 2015 Chlorophyll Side-by-side samples

Date	Parameter	Lake	Lake ID	County	Vol	Chlorophyll (µg/L)		
						Rep	DEQ	Rep
6/10/2015	Chlorophyll-a	Cedar	010017	Alcona	2.0		<1.0	2.0
7/13/2015	Chlorophyll-a	Oxbow	630666	Oakland	4.0		3.3	3.3
7/15/2015	Chlorophyll-a	Margrethe	200157	Crawford	1.4		1.8	2.1
8/11/2015	Chlorophyll-a	Corey	750142	St. Joseph	<1.0		<1.0	
8/12/2015	Chlorophyll-a	Spider	280395	Grand Traverse	<1.0		3.2	
8/17/2015	Chlorophyll-a	Wall	080294	Barry	3.9		2.9	
9/14/2015	Chlorophyll-a	Indian	670227	Osceola	4.1		5.6	
9/21/2015	Chlorophyll-a	Park	190099	Clinton	2.5		2.5	2.5

C. Total Spring Phosphorus side by side data

1994-2010

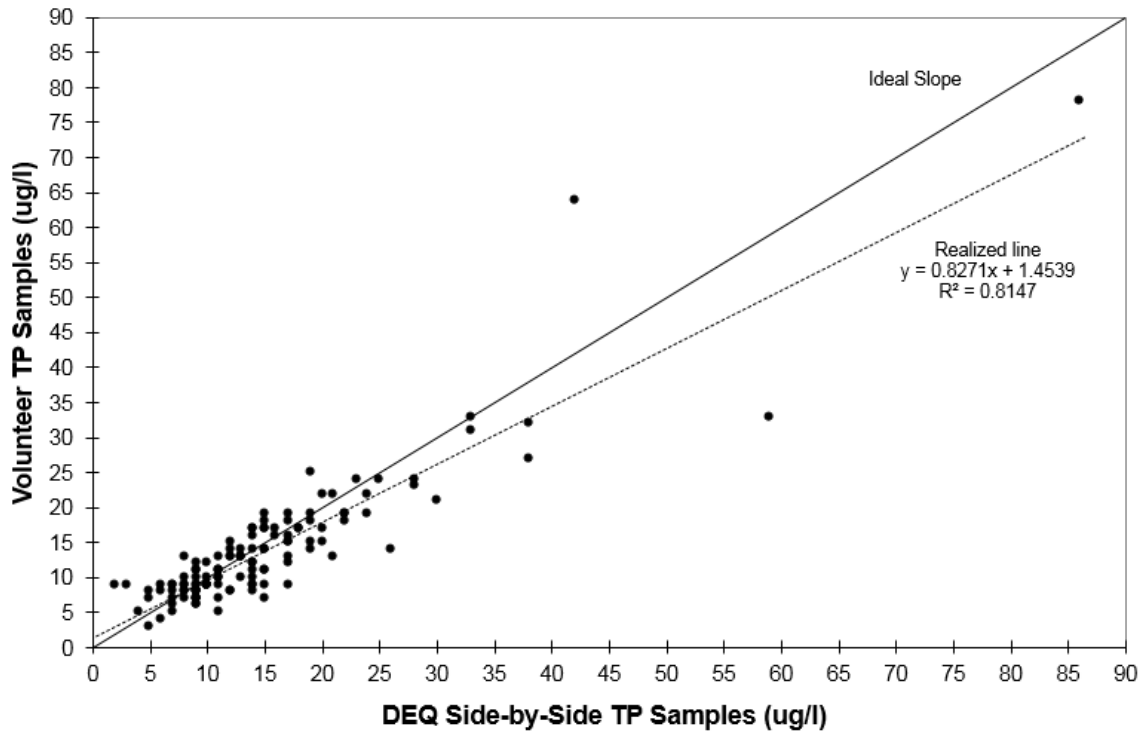


2011-2015: Graph not produced. Only 6 samples to date.

D. Total Summer Phosphorus side-by-side data

Cooperative Lakes Monitoring Program

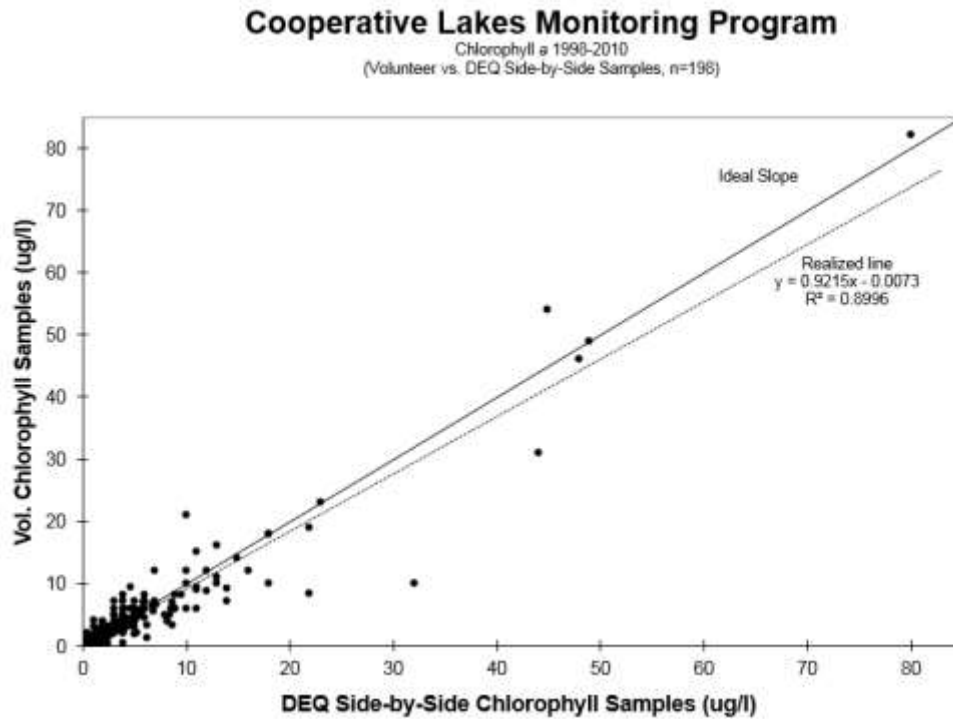
Summer Total Phosphorus 1998-2010
(Volunteer vs. DEQ Side-by-Side Samples; n = 126)



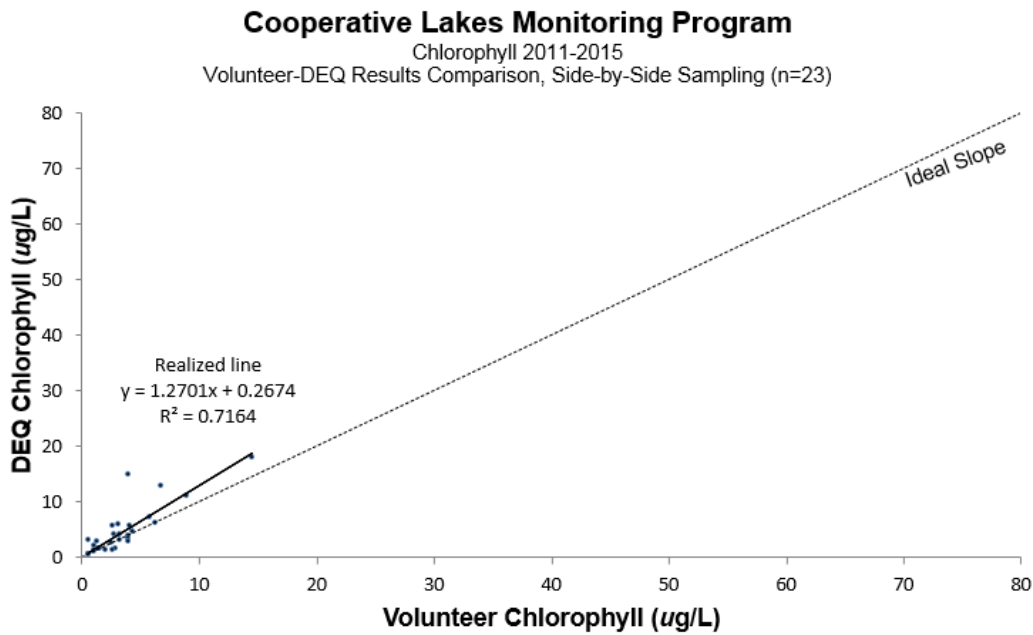
2011-2015: Graph not produced. Only 11 samples to date.

E. Chlorophyll, side-by-side data

1994-2010



2011-2015



V. Thank you, CLMP Volunteers!

In 2015, 396 volunteers participated in Michigan's Cooperative Lakes Monitoring Program.

Adam Freid	Carim Calkins	Dave Long
Al Schwennessen	Carl Seaver	Dave Pruess
Al Vichunas	Carolyn Grace	Dave Ridders
Allen Dyer	Carolyn LeJuste	Dave Whitehead
Andy DuPont	Carolyn Zader	David Allen
Angie Stine	Cary Hamann	David Ball
Ann Hruska	Char McDonnell	David Hayhow
Anne Conklin	Charles Miller	David Kindt
Arda Bucher	Charles Richards	David Maxson
Arnold Domanus Jr.	Charlie Jones	David VanPortFleet
Art Hoadley	Charlie Spoering	Dennis Arms
Arthur Bombrys	Charlie Taylor	Dennis Curtice
Arthur Hoadley	Cherly Dyer	Dennis LaFave
Ashley Harris	Cheryl Pytlarz	Dennis Paulin
Barb Smith	Cheryl Zuelke	Dennis Zimmerman
Barbara Cunningham	Chris Floyd	Diane Blanchard
Barbara Lund	Christie Budnick	Diane Tryon
Barbara VanDenEeden	Chuck Goll	Dick Morey
Bart Harris	Chuck Pilar	Don Hunkins
Becky Norris	Chuck Pugh	Don Klobucar
Bernard Woltjer	Chuck Wolverton	Donald Ferguson
Bethany Sheffer	Connie Selles	Donald Parkey
Bill Bainton	Craig Kivi	Donald Petree
Bill Henning	Dale French	Doris Loomans
Bill Miner	Dale Hartman	Dorothy Jamison
Bill Smith	Dale Peterson	Dottie Myers-Hill
Bill Tidey	Dale Sharpee	Doug Hanna
Bob Barr	Dan Bailey	Doug Hansen
Bob Forche	Dan Smith	Doug Jagen
Bob Haase	Daniel Hayes	Douglas Cooper
Bob Hutchings	Daniel Stock	Douglas Gembis
Bob Leon Lederman	Darlene Morey	Douglas Scott Miller
Bob Sacksteder	Darly Lang	Duane Drake
Bonnie Hay	Darrill Peltier	Ed Franks
Bonnie Isaacs	Darrin Wassom	Ed Hass
Bonnie Kanitz	Daryl Allison-Busch	Ed Novak
Brigid Forlenza	Daryl Brandt	Ed Waits
Bruce King	Dave Beeke	Elaine Pentilla
Bruce Lichliter	Dave Havercamp	Eldonna May
Bryan Roels	Dave hays	Ellen Whitehead
C. Richard Sierakowski	Dave Hedges	Emery Blanksma
Calvin Killen	Dave Lee	Emil Kezerle

Emmett Holmes
Eric Shafer
Ernest (Mike) Litch
Frank Hulme
Frank Siewiorek
Frank Wolf
Fred Daris
Fred Dean
Fred Farkas
Fred Jensen
Frederick Jensen
Gary Cross
Gary Gries
Gary Johnson
George Hanley
George King
George Purlee
Georgia Richardson
Gerald Cox
Gerald Gerou
Gerry Kraft
Gertrude Temple
Glenn Hayden
Gordon Buchanan
Gordon Fox
Greg Garrett
Greg Nichols
Greg Wenzel
Gregg Kabacinski
Gretchen Klobucar
Harris John Iler
Harry Dawson
Hope Bradley
Howard Wandell
Irene Petree
Jac Groppuso
Jack Burke
Jack Delee
Jack Walls
Jacob Calkins
Jacqueline Dauw
James Feudi
James Findley
James Gonzalez
James Novitski

Jan Omo
Jan Reid
Jane Patterson
Janet Durbin
Jason Broestra
Jean Roth
Jean Stuart
Jeff Adams
Jeff Banaszynski
Jeff Sanborn
Jennifer Parker
Jerry Hughes
Jim Cherfoli
Jim Collins
Jim Hamp
Jim Kelts
Jim McDowell
Jim McGurrin
Jim Meyer
Jim Mortimer
Jim Ross
Jim Roth
Jo Foley
Joan Uhley
Joanne Iler
Joe Czuk
Joe Evans
Joe Plunkey
Joe Porter
Joe Primozich
Joe Reynolds
Joel Blum
Joel Johnson
John (Red) Warner
John Collins
John DiGiovanni
John Hartsig
John Hause
John Hoek
John Kreag
John Lindahl
John Lund
John Mater
John Peterson
John Reed

John Sheppard
John Sick
John Stivers
John Waclawski
John Zuelke
Jon Waitz
Jon Wilford
Joshua Epperly
Judith Briggs
Judith Pugh
Judy Kukla
Judy Porman
Judy Shatney
Julie Lovelace
Julie Stivers
Karen Holmes
Karl Jacob
Katherine Haynor
Kathleen Anne Petersen
Kathleen Peterson
Kathryn Haughton
Kathy Gallagher
Kay Johnson
Kay Weber
Keith Carman
Keith Dennis
Kelly Dowd
Ken Gill
Kenneth Nelson
Kimberly Andrews
Kurt Richardson
Kyle Brown
Laurence Gavin
Lee Embrey Sr.
Linda Daniels
Linda Davis
Linda Hass
Lindsay Peterson
Lisa Sostecke
Lon Nordeen
Lonnie Loveland
Lori Mroczek
Lorraine Willison
Lynda Little
Lynn Beres

Lynn Hoepfinger
Mari Dallapiazza
Marilyn Merit
Maris Ziemelis
Marjorie Findley
Mark Bradburn
Mark Little
Mark Mitchell
Mark Smith
Martin Straka
Marty Foster
Marv Kingsley
Mary Shaw
Mary Sue Pollitt
Matthew Long
Maurine McCloud
Michael Borys
Michael Cunningham
Michael Dombrowski
Michael Mutschler
Michael Needham
Michael Scherba
Mike Boss
Mike Cherkoian
Mike Devarenne
Mike Gallagher
Mike Jones
Mike Litch
Mike Russell
Mike Sheehy
Mitchell LeClaire
Nancy Beckwith
Nanette Hibler
Neil Barr
Netty Kiecover
Nicolette Jenaras
Nola Parkey
Pat Wolters
Patricia Nelson
Patsy Mortimer
Paul Curell
Paul Dalpra
Paul Fallon
Paul Gluski
Paul Smith

Phil Sworden
Ralph Vogel
Ray Malcoun
Reno Nave
Rhonda Wassom
Ric Rentfro
Rich Meeuwenberg
Richard Brown
Richard Frendt
Richard Walklet
Richard Weber
Rick Bakka
Rick Kinas
Rick Meeks
Rick Rumstead
Rita Heady
Rob Namowicz
Robb Zoellmer
Robert Alvey
Robert Blauwkamp
Robert Clark
Robert Embrey
Robert Johnson
Robert Schirado
Robert Turnquist
Robert VanDenBrouck
Robert Willing
Roger Gaede
Roger Giallorati
Roger Hopkins
Roger Storm
Ron Henning
Ron Rausch
Ron Reid
Ronald Basso
Ronald Compton
Ronald Heady
Ronald Kreiger
Ronnie Hughes
Roy Pentilla
Ryan Kanitz
Sandra Michalik
Sara Basso
Sarah Litch
Scott Austin

Scott Scarpelli
Sheri Kurtyak
Stacy Daniels
Stan Grove
Stan Roland
Stephen Franklin
Steve Lindsay
Steve Ockaskis
Steve Roth
Steven Kosto
Sue Boss
Susan Donovan
Susan Houseman
Susan LaRose-Grover
Susan Wedzel
Susan White
Sven Anderson
Ted Gatto
Terry Dugan
Terry Mohler
Thomas Clement
Thomas Madden
Thomas Tisue
Tim Murphy
Tim Stegeman
Tom Donaldson
Tom Donovan
Tom Leister
Tom Ollila
Tom Page
Tom Rush
Tom Thering
Traceford A. LaRose
Ursula Charaf
Ursula Froehlich
Virginia Himich
Wayne Kiefer
Wayne Swallow
Wayne Wunderlich
Wellington Jones
Wendy Shrake
Wes Durbin
Wesley Nolde
William Meserve
William Fronk

VI. Thank you, DEQ and DNR Employees!

These individuals help with the logistics of collecting samples, mailing them to Lansing, and distributing and collecting Dissolved Oxygen meters.

Beth Anderson
James Caron
Kristina Coffey
Debra Frazier
Greg Goudy
Martin Hedges
Sonya Hudson
Deana Mercs
Deana North
Lucy Robinson
Crystal Smith

VIII. CLMP Contacts

Questions about enrollment or monitoring equipment:

Jean Roth
Michigan Lake and Stream Associations, Inc.
989-257-3715, jroth@mlswa.org

Questions about aquatic plants or sample turn-in for any parameter:

Dr. Jo Latimore
Michigan State University
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Questions about Dissolved Oxygen/Temperature meters or side-by-side sampling:

Marcy Knoll Wilmes
Michigan DEQ
517-284-5544, knollM@michigan.gov

Questions about data entry or getting a login/password for the MiCorps Data Exchange:

Laura Kaminski
Great Lakes Commission
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Questions about anything else:

Dr. Paul Steen
Huron River Watershed Council
734-769-5123 x601, psteen@hrwc.org