



Michigan's Citizen Volunteer Partnership for Lakes

2014 Annual Summary

Managed By:

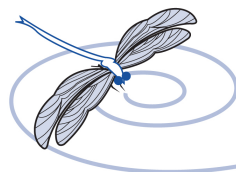
Michigan Department of Environmental Quality

Michigan Lake & Stream Associations, Inc.

Michigan State University Department of Fisheries and Wildlife

Great Lakes Commission

Huron River Watershed Council



Michigan Clean
Water Corps

www.micorps.net

TABLE OF CONTENTS



I. Introduction to the CLMP	2
II. Map of Participating Lakes	3
III. Summary Statistics of Monitored Parameters	4
IV. DEQ Side-by-side Data Verification	6
V. Thank you, CLMP Volunteers!.....	9
VI. Thank you, DEQ and DNR Employees!.....	13
VIII. CLMP Contacts	13

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:

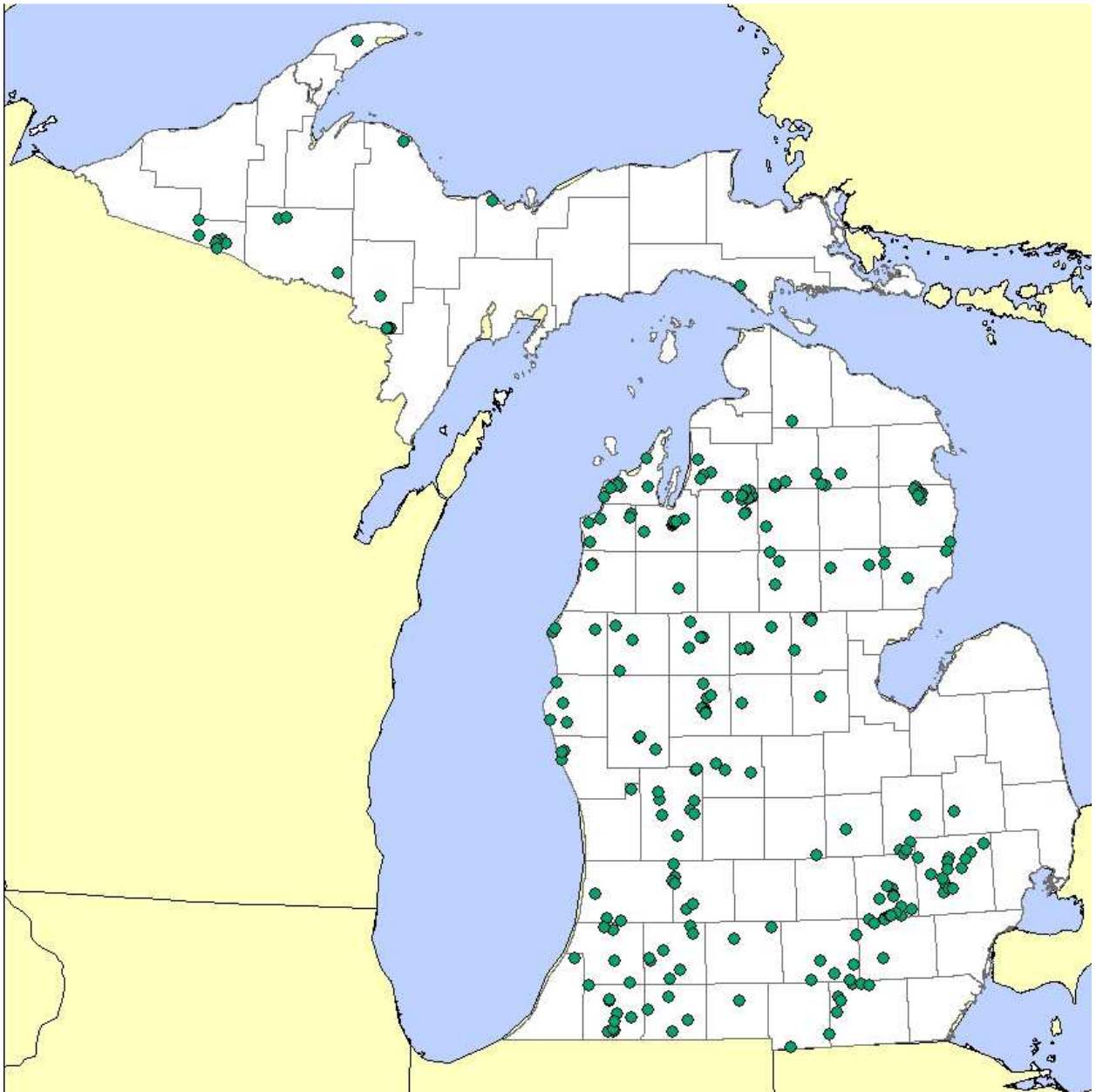
- Provide baseline information and document trends in water quality for individual lakes.
- Educate lake residents, users, and interested citizens in the collection of water quality data, lake ecology, and lake management practices.
- Build a constituency of citizens to practice sound lake management 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 2014 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 large 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: www.micorps.net/documents/CLMP_Manual.pdf
3. Starting in 2014, each lake enrolling in the program received a report summarizing their data. <http://www.micorps.net/lakereports.html>
4. The CLMP Quality Assurance Project Plan (QAPP) is a detailed report on how the CLMP collects and maintains high quality scientific data: www.micorps.net/documents/QAPP_CLMP.pdf

II. Map of 2014 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.

2014 Secchi Disk Transparency	
No. of sites enrolled	218
No. of sites meeting minimum participation	196 (89.9%)
Total no. of measurements reported	3070
Minimum reported measurement	2.0' (multiple lakes)
Maximum reported measurement	50.0' (Birch Lake, Cass County)
Mean (average) measurement	12.9'

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.

2014 Total Phosphorus Monitoring	
<u>Spring Overturn Sampling</u>	
No. of sites enrolled	178
No. of sites submitting samples	160 (89.9%)
Minimum reported value	< 3 µg/L (multiple lakes)
Maximum reported value	77 µg/L (Duncan Lake, Barry Co.)
Mean (average) value	13.3 µg/L
<u>Summer Stratification Sampling</u>	
No. of sites enrolled	197
No. of sites submitting samples	176 (89.3%)
Minimum reported value	< 3 µg/L (multiple lakes)
Maximum reported value	62 µg/L (Upper Hamlin L., Mason Co.)
Mean (average) value	13.4 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.

2014 Chlorophyll-a Monitoring	
No. of sites enrolled	141
No. of sites meeting minimum participation	132 (93.6%)
No. of sites meeting full participation	122 (86.5%)
Total no. of samples submitted	608
Minimum reported measurement	< 1 µg/L (multiple lakes)
Maximum reported measurement	47 µg/L (multiple lakes)
Mean (average) measurement	3.1 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.

2014 Dissolved Oxygen and Temperature Monitoring	
No. of sites enrolled	59
No. of sites submitting at least one profile	52 (88.1%)
Total no. of profiles submitted	318
Total no. of measurements taken	5083

E. Exotic Aquatic Plant Watch

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

2014 Exotic Aquatic Plant Watch	
No. of sites enrolled	32
No. of sites submitting report	20 (62.5%)

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 assistance 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.

2014 Aquatic Plant Identification and Mapping	
Lakes Conducting Surveys	
Crystal Lake	Montcalm County
South Bar Lake	Leelanau County
Lakes Continuing Survey Efforts from Previous Years	
Earl Lake	Livingston County
Park Lake	Clinton County
Pleasant Lake	Washtenaw County
White Lake	Muskegon County

IV. DEQ Side-by-Side Data Verification

DEQ staff monitor several lakes a year alongside the CLMP volunteers for phosphorus and chlorophyll. The DEQ uses its standard operating procedures to collect the data, which differ slightly from the volunteers’ monitoring procedures. However, the correlation between DEQ samples and volunteers’ samples has proven to be very high through many years of these side-by-side tests.

A. 2014 Total Phosphorus Side-by-side samples

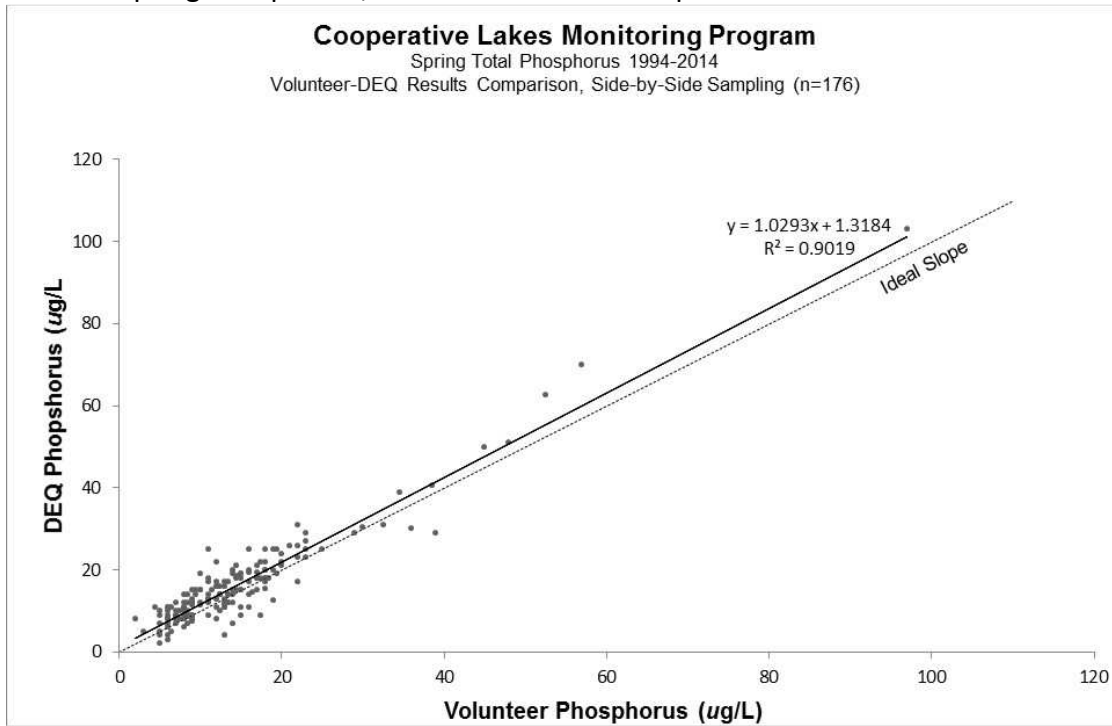
Date	Parameter	Lake	Lake ID	County	Phosphorus (µg/L)		
					Vol	Rep	DEQ
4/28/2014	Spring TP	Big Kelsey	140195	Cass	6		26*
9/19/2014	Summer TP	Fenton	250241	Genesee	12		10
9/25/2014	Summer TP	Barlow	80176	Barry	7		11

*Sampled during high winds; water quite disturbed; suspended solids visible in water; small lake, sampled not far from shore; recent heavy inundating rains prompted algae bloom last seen day prior to sampling. In general, high variability in the collection of the samples means that this sample comparison will be considered to be an outlier.

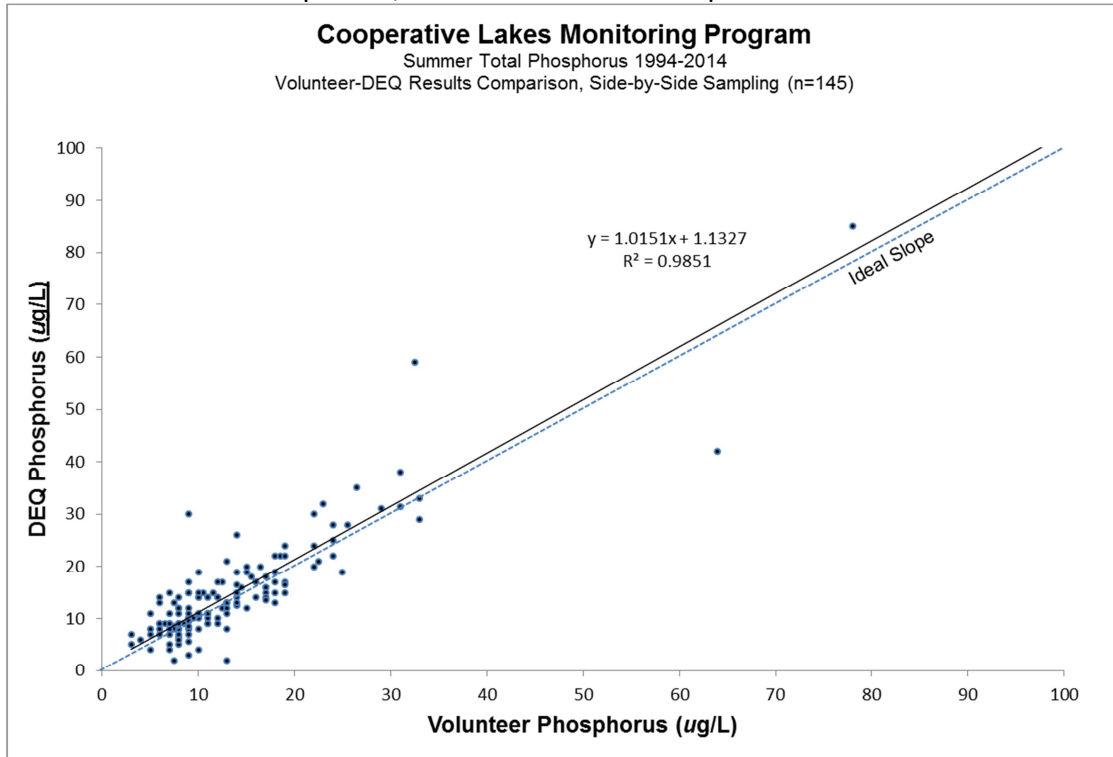
B. 2014 Chlorophyll Side-by-side samples

Date	Parameter	Lake	Lake ID	County	Chlorophyll ($\mu\text{g/L}$)		
					Vol	Rep	DEQ
6/16/2014	Chlorophyll-a	Hubbard	010106	Alcona	1.0		2.0
7/10/2014	Chlorophyll-a	Big Pine Island	410437	Kent	6.6	4.9	7.3
7/17/2014	Chlorophyll-a	Strawberry	470213	Livingston	3.9		3.8
7/17/2014	Chlorophyll-a	Pleasant	810266	Washtenaw	2.6		5.6
8/13/2014	Chlorophyll-a	Higgins (North)	720026	Roscommon	<1		<1
8/13/2014	Chlorophyll-a	Higgins (South)	720028	Roscommon	<1		<1
8/13/2014	Chlorophyll-a	Island	280164	Grand Traverse	2.7		4.2
8/20/2014	Chlorophyll-a	Hicks	670062	Osceola	13	16	18
9/25/2014	Chlorophyll-a	Barlow	080176	Barry	3.2		3.1

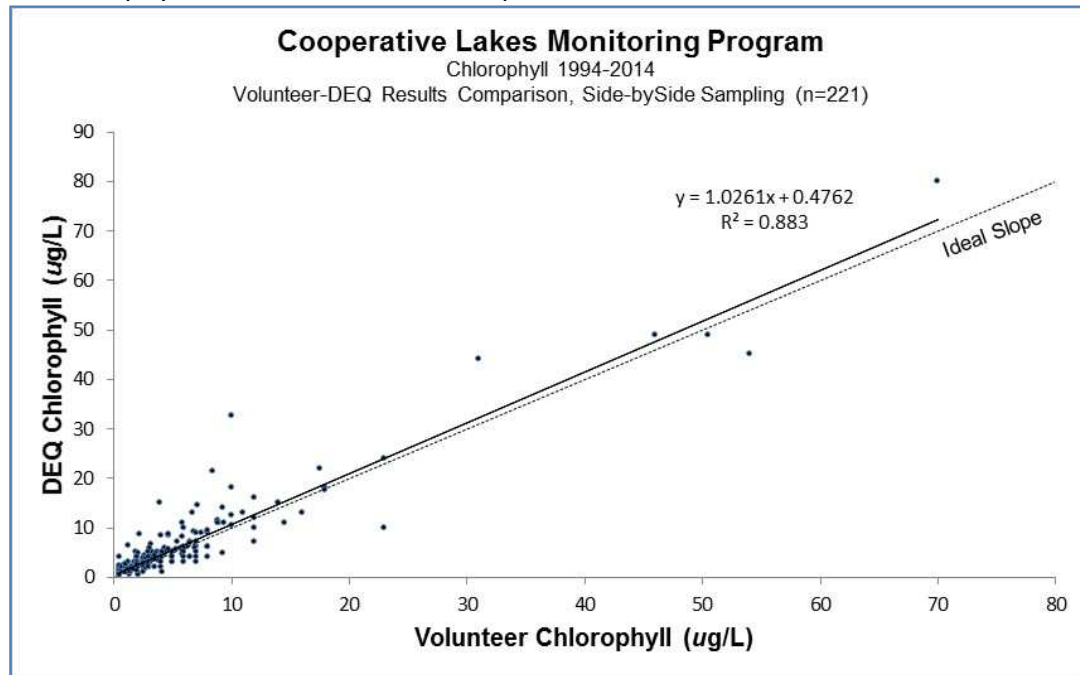
C. Total Spring Phosphorus, DEQ vs. Volunteer Samples 1994-2014



D. Total Summer Phosphorus, DEQ vs. Volunteer Samples 1994-2014



E. Chlorophyll, DEQ vs. Volunteer Samples 1994-2014



V. Thank you, CLMP Volunteers!

In 2014, over 419 volunteers participated in Michigan's Cooperative Lakes Monitoring Program.

Dave Adams	Daryl Brandt	Jacqueline Dauw
David Allen	Dave Breough	Linda Davis
Daryl Allison-Busch	Kyle Brown	Harry Dawson
Robert Alvey	Richard Brown	Keith Dennis
Wayne Andersen	Gordon Buchanan	Mike Devarenne
Emily Anderson	Charles Bushill	John DiGiovanni
Kimberly Andrews	Ken Butterfield	Wayne Diseqna
Julie Austin	Carim Calkins	Dave Dohring
Richard Bachelor	Keith Carman	Arnold Domanus Jr.
Dan Bailey	Ursula Charaf	Michael Dombrowski
William Bainton	Jim Cherfoli	Xavier Donajkowski
Rick Bakka	Karen Christensen	Tom Donaldson
David Ball	Robert Clark	Susan Donovan
Jeff Banaszynski	Terry Clarke	Tom Donovan
Susan Barnes	Thomas Clement	Patricia Doran
Neil Barr	Steve Clouse	Michael Dorys
Ronald Basso	Jim Collins	Kelly Dowd
Sara Basso	Ronald Compton	Duane Drake
Kelly Beauchamp	Douglas Cooper	Terry Dugan
Jim Beaver	Chris Cortez	Andy DuPont
Dennis Becker	Mark Coscarelli	Janet Durbin
Nancy Beckwith	Craig Cotterman	Wes Durbin
Lynn Beres	Gerald Cox	Allen Dyer
Diane Blanchard	Ruth Crompton	Cherly Dyer
Emery Blanksma	Gary Cross	Andrew Dyke
Joel Blum	Michael Cunningham	Gary Dyke
Mark Boley	Paul Curell	Lorraine Eastham
Arthur Bombrys	Dennis Curtice	Roy Eastham
David Boprie	Dave Czuk	Tom Engle
Mike Boss	Paul Dalpra	Daniel Evert
Sue Boss	Stacy Daniels	Paul Fallon
Mark Bradburn	Linda Daniels	Fred Farkas
Dennis Bradley	Fred Daris	Donald Ferguson
Hope Bradley	Emma Darling	James Feudi
Jim Bradley	Fred Darling	Dale Flaherty

Daniel Fleck
Shannon Fleck
Chris Floyd
Jo Foley
Bob Forche
Starr Foster
Stephen Franklin
Ed Franks
Adam Freid
Dale French
Richard Frendt
Russ Friess
Ursula Froehlich
William Fronk
Roger Gaede
Kathy Gallagher
Mike Gallagher
Greg Garrett
Ted Gatto
Laurence Gavin
Douglas Gembis
Terry Gerber
Gerald Gerou
Roger Giallorati
Michael Gildea
Charles Gill
Ken Gill
Paul Gluski
Chuck Goll
Jim Gonzalez
Gary Gries
Joe Groppuso
Stan Grove
Bob Haase
Jim Hagon
Connie Hales
Dave Hales
Cary Hamann
Thomas Hamilton

George Hanley
Doug Hanna
Jane Hanna
Doug Hansen
Bart Harris
John Hartsig
Ed Hass
Linda Hass
Kathryn Haughton
John Hause
Dave Havercamp
Lynn Hawley
Rick Hawley
Bonnie Hay
Jim Hay
Glenn Hayden
Daniel Hayes
David Hayhow
Rita Heady
Ronald Heady
Dave Hedges
Bill Henning
Ron Henning
Nanette Hibler
Bradley Hill
Virginia Himich
Art Hoadley
Arthur Hoadley
John Hoek
Lynn Hoepfinger
John Hoffman
Emmett Holmes
Karen Holmes
Roger Hopkins
Susan Houseman
Ann Hruska
Sheryl Hugger
Jerry Hughes
Ronnie Hughes

Don Hunkins
Sharon Hurlbert
Bob Hutchings
Harris John Iler
Joanne Iler
Bill Ingle
Bonnie Isaacs
Karl Jacob
Doug Jagen
Dorothy Jamison
Fred Jensen
Frederick Jensen
Gary Johnson
Joel Johnson
Kay Johnson
Robert Johnson
Mike Jones
Gregg Kabacinski
Bonnie Kanitz
Ryan Kanitz
Jim Kelts
Martha Kern-Boprie
Emil Kezerle
Wayne Kiefer
Netty Kiekover
Calvin Killen
Bruce King
Marv Kingsley
Don Klobucar
Gretchen Klobucar
Steven Kosto
Tom Kowalski
Gerry Kraft
Kristofer Kraft
John Kreag
Ronald Kreiger
Sheri Kurtyak
Carol LaGrasso
Paul LaGrasso

Paul Lammons
Jim Langerveld
Mitchell Le Claire
Tom Leister
Cardyn Lejuste
Bruce Lichliter
John Lindahl
Mike Litch
Lynda Little
Mark Little
Frank Loedeman
Michelle Loedeman
Dave Long
Matthew Long
Doris Loomans
Lonnie Loveland
John Lund
Fred Mahler
Ruth Mahler
Ray Malcoun
John Mater
David Maxson
Eldonna May
Char McDonnell
Jim McDowell
Jim McGurrin
Jody McManus
Rick Meeks
Rich Meeuwenberg
Peggy Merrill
Sandra Michalik
Douglas Scott Miller
Bill Miner
Terry Mohler
Stephen Molle
Darlene Morey
Dick Morey
Pam Moseley
Lori Mroczek

Thomas Murphy
Tim Murphy
Michael Mutschler
Joe Muzzo
Dottie Myers-Hill
Rob Namowicz
Reno Nave
Michael Needham
Kenneth Nelson
Patricia Nelson
Bob Nester
Greg Nichols
Lon Nordeen
Becky Norris
Ed Novak
James Novitski
Steve Ockaskis
Collin O'Dea
Conor O'Dowd
Dave Ollila
Jan Omo
Melinda Otto
Ray Parker
Donald Parkey
Nola Parkey
Jane Patterson
Elaine Pentilla
Roy Pentilla
Kathleen Anne Petersen
John Peterson
Kathleen Peterson
Donald Petree
Irene Petree
Chuck Pilar
Joe Plunkey
Mary Sue Pollitt
Bill Pontius
Valerie Pontius
Joe Porter

Jerry Powley
June Powley
Joe Primozich
David Pruess
Chuck Pugh
Judith Pugh
George Purlee
Cheryl Pytlarz
Ron Rausch
Bill Rehling
Charles Richards
Jerry Richards
Kurt Richardson
George Richey
Valorie Rissi
Robert Robertson
Gene Robinson
Bryan Roels
Stan Roland
Jim Ross
Jean Roth
Jim Roth
Steve Roth
Nick Roupas
Rick Rumstead
Tom Rush
Mike Russell
Bob Sacksteder
Jeff Sanborn
Scott Scarpelli
Carol Scheff
Ronald Scheff
Michael Scherba
Jeff Schimp
Robert Schirado
David Schmidt
Roger Schweitzer
Al Schwennessen
Carl Seaver

Robert Seger	Lesa VanderMeer
Connie Selles	David VanPortFleet
Gordon Seyfarth	Albert Vichunas
Eric Shafer	Ralph Vogel
Harry Shaffer	Ed Waits
Dale Sharpee	Jon Waitz
Judy Shatney	Richard Walklet
Mary Shaw	Jack Walls
Gabriel Sheppard	Hugh Walton
John Sheppard	Howard Wandell
John Sick	John (Red) Warner
Rich Sierakowski	Darrin Wassom
Barb Smith	Rhonda Wassom
Dan Smith	Richard Weber
Paul Smith	Susan Wedzel
David Stafford	Susan White
Linda Stafford	Dave Whitehead
Tim Stegeman	Ellen Whitehead
Carol Stephenson	Blair Wickman
John Stivers	Jon Wilford
Julie Stivers	Christopher Wilkinson
Daniel Stock	John Wilks
Roger Storm	Dave Wilutis
Martin Straka	Frank Wolf
Darlene Strasser	Gary Wolter
Mike Strasser	Rita Wolter
Wayne Swallow	Pat Wolters
Charles Taylor	Bernard Woltjer
Mark Teicher	Chuck Wolverton
Gertrude Temple	Wayne Wunderlich
Robert Temple	Alissa Yanochko
Bill Tidey	David Yanochko
Thomas Tissue	Carolyn Zader
Rusty Trapp	Maris Ziemelis
Robert Turnquist	Dennis Zimmerman
Joan Uhley	Robb Zoellmer
James Van Herweg	Cheryl Zuelke
Robert VanDenBrouck	John Zuelke
John VanderMeer	

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
Jennifer Draper
Debra Frazier
Martin Hedges
Deana Mercks
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
517-432-1491, latimor1@msu.edu

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:

Katherine Hollins or Laura Kaminski
Great Lakes Commission
734-971-9135, midata@glc.org

Questions about anything else:

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