

Overview of Michigan's Surface Water Monitoring Program – Integrating Volunteer Monitoring

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Monitoring Strategy

- Completed in January 1997, updated in 2005 per EPA requirements
- Identifies and describes the necessary monitoring activities for a comprehensive assessment of water quality in Michigan's surface waters, with cost estimates
- Funded by the CMI-Clean Water Fund at approx. \$3 million per year
- Implementation primarily through grants and contracts

A STRATEGIC ENVIRONMENTAL
QUALITY MONITORING
PROGRAM FOR MICHIGAN'S
SURFACE WATERS



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
JANUARY 1997
UPDATED APRIL 2005

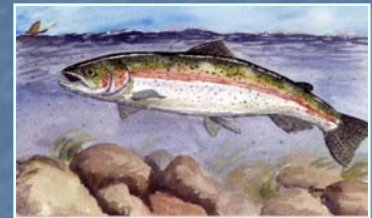
Four Monitoring Goals



- Assess the current status and condition of individual waterbodies and determine whether MI Water Quality Standards are being met
- Measure temporal and spatial water quality trends
- Provide data to support DEQ water quality protection programs and evaluate their effectiveness
- Detect new and emerging water quality problems

Water Quality Monitoring Program Elements

- Inland Lake Quality – Condition and Status (LWQA)
- NLA Survey – National/Regional/State-Specific (2007)
- **Volunteer Monitoring - Lakes and Streams (MICorps)**
- Lake Sediment Chemistry – Long-Term Trends
- Fish Contaminants
- Beach Monitoring
- Water Chemistry – Rivers and Streams
- Biological Integrity & Physical Habitat
- Stream Flow
- Wildlife Contaminants



MiCorps - Volunteer Stream Monitoring

- DEQ Volunteer Stream Monitoring Program – 1998
- Under MiCorps (Since 2005)
 - 17 Grants Awarded + 3 Start-Ups (~\$207,000)
 - 15 QAPPs approved
 - 273 sites monitored
 - 8 project reports completed
- DEQ uses data as a tool to identify sites for follow-up assessment



Cooperative Lakes Monitoring Program (The Self-Help Legacy)

- Program began in 1974 with water clarity (Secchi disk) monitoring – second oldest program in country
- Current focus on trophic state indicators
 - water clarity (215 lakes)
 - total phosphorus
 - spring overturn (158 lakes)
 - late-summer stratification (197 lakes)
 - chlorophyll *a* (131 lakes)
 - dissolved oxygen and temperature (46 lakes)
 - aquatic plant ID and mapping (2+5 lakes)
 - exotic aquatic plant watch - pilot (2 lakes)

CLMP Data - Applications

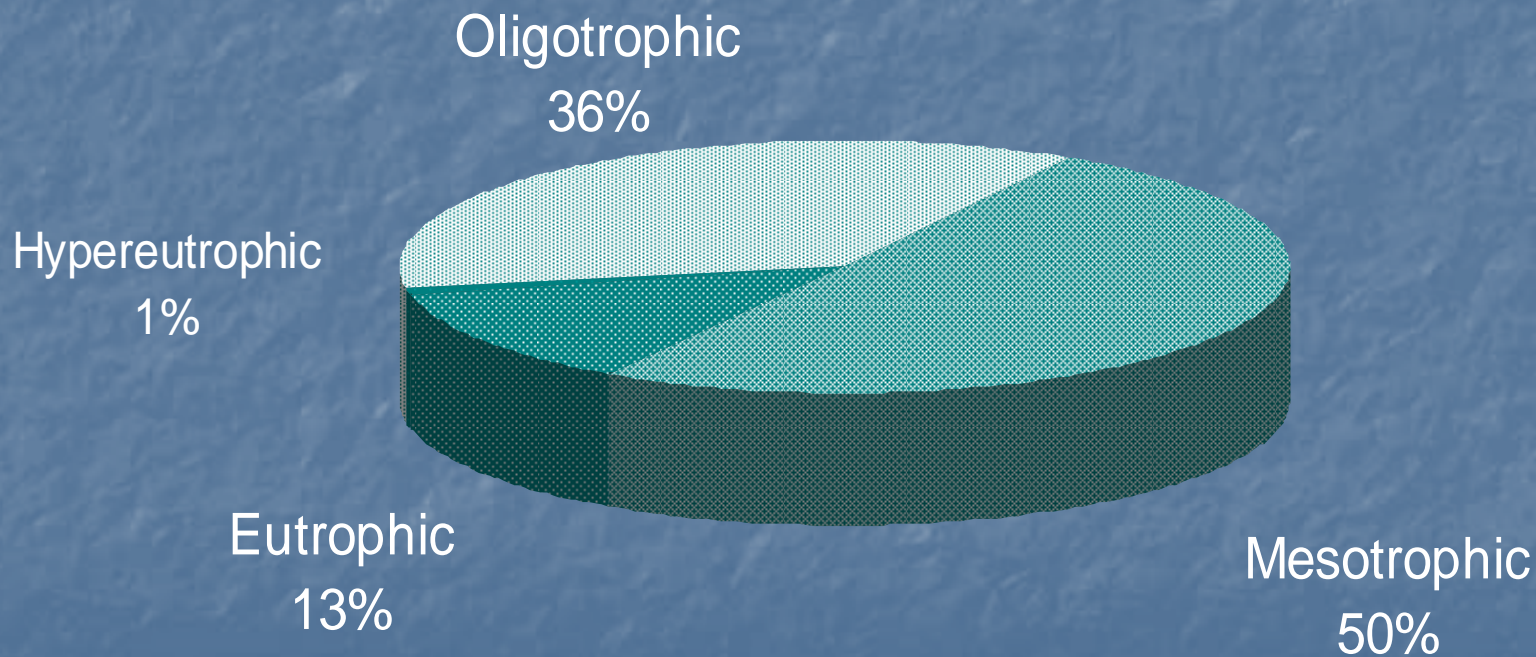
- Current baseline WQ data
- Assess status and condition – w/LWQA
- Trophic status classification update
- TMDL – lake nutrient goals
- Historical WQ changes



Michigan's Inland Lakes Trophic Status Classification Criteria

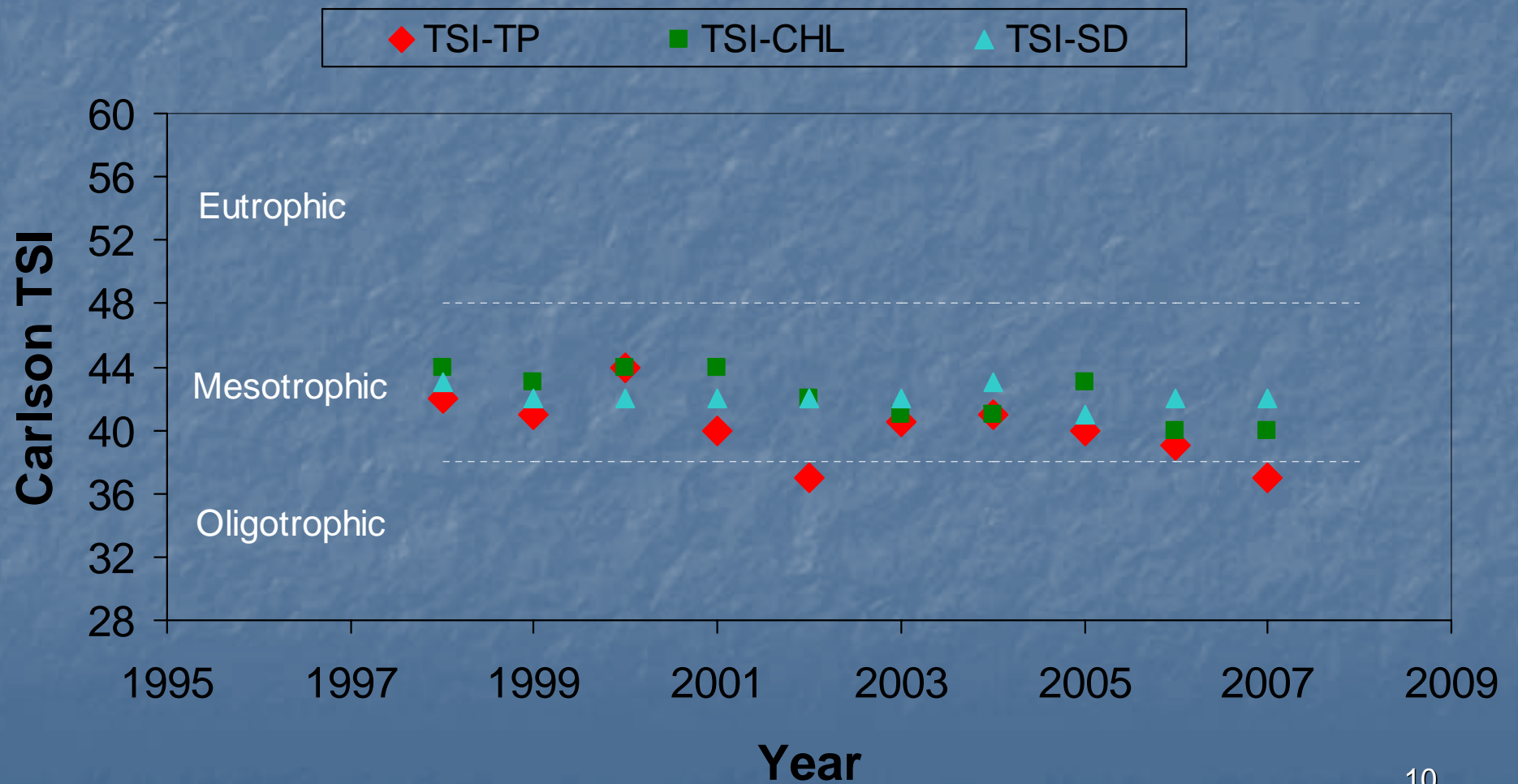
Lake Trophic State	Carlson TSI	TP (ug/l)	SD-Trans. (ft)	SD-Trans. (m)	Chl-a (ug/l)
Oligotrophic	<38	≤10	>15	>4.6	<2.2
Mesotrophic	38-48	10-20	7.5-15	2.3-4.6	2.2-6
Eutrophic	48-61	20-50	3-7.5	0.9-2.3	6-22
Hypereutrophic	>61	>50	<3	<0.9	>22

Classification of 119 Lakes Monitored through Michigan's CLMP during 2006-2007



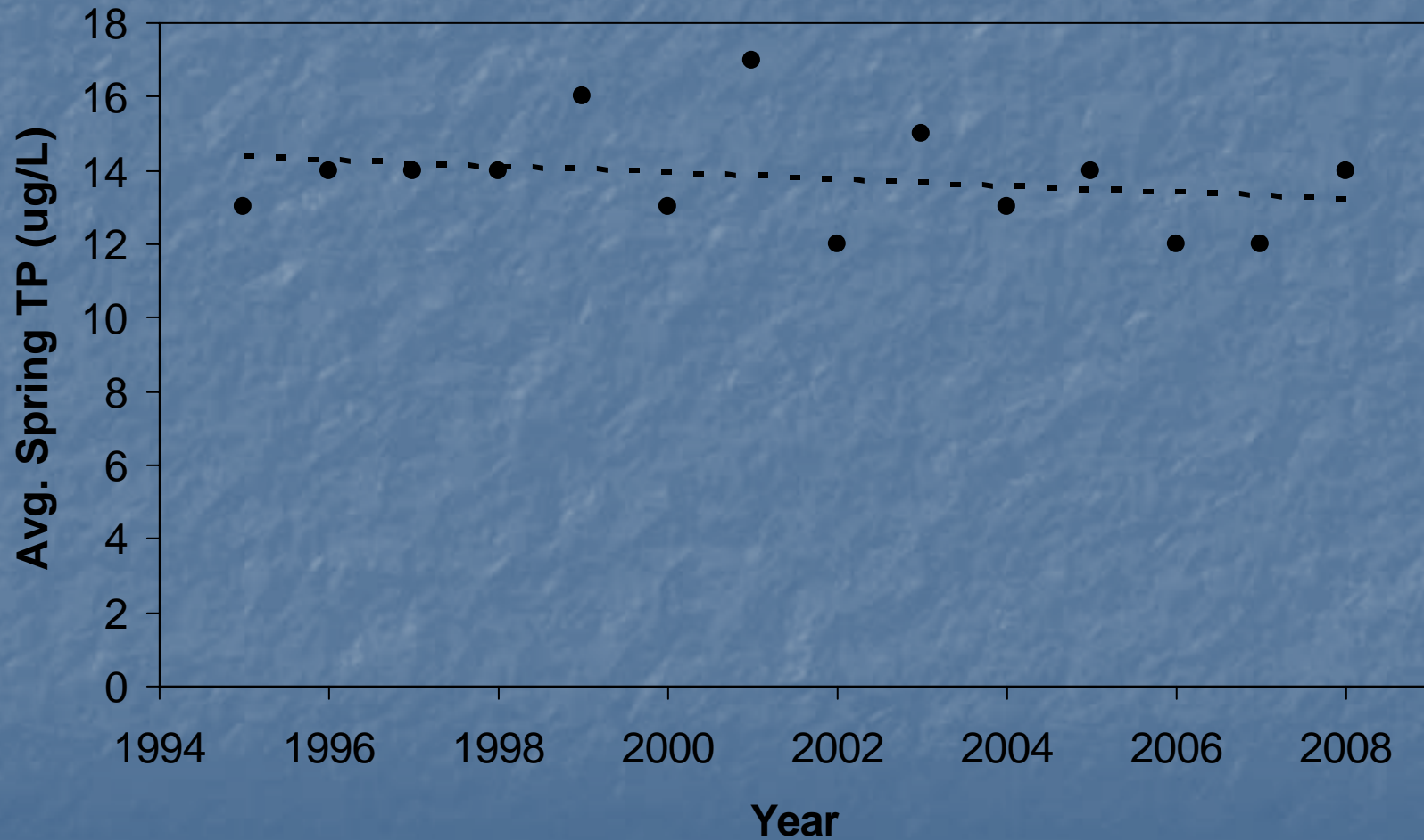
CLMP Annual Results

Mean Trophic State Indices

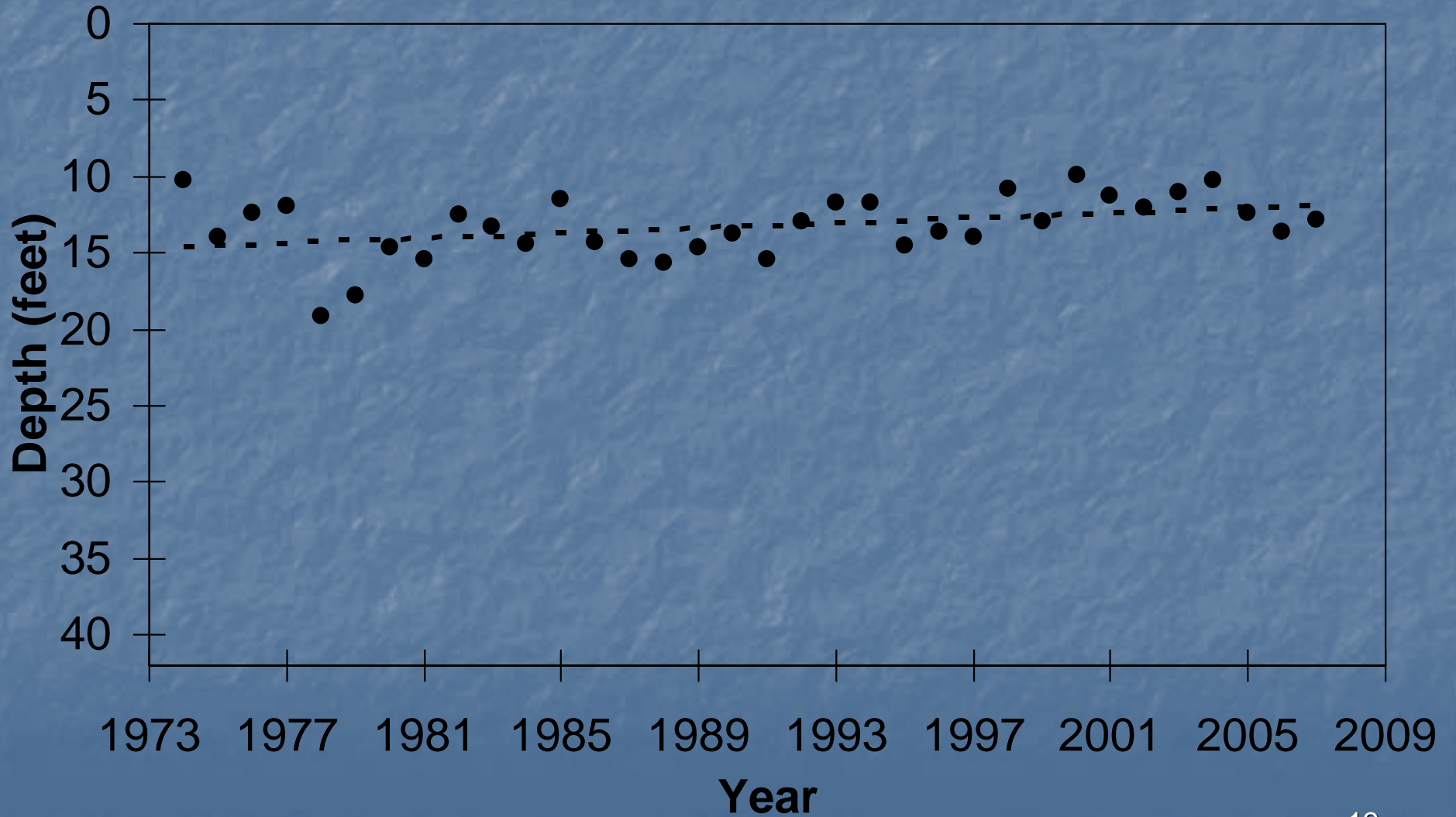


CLMP Annual Results

Mean Spring Total Phosphorus (ug/L)



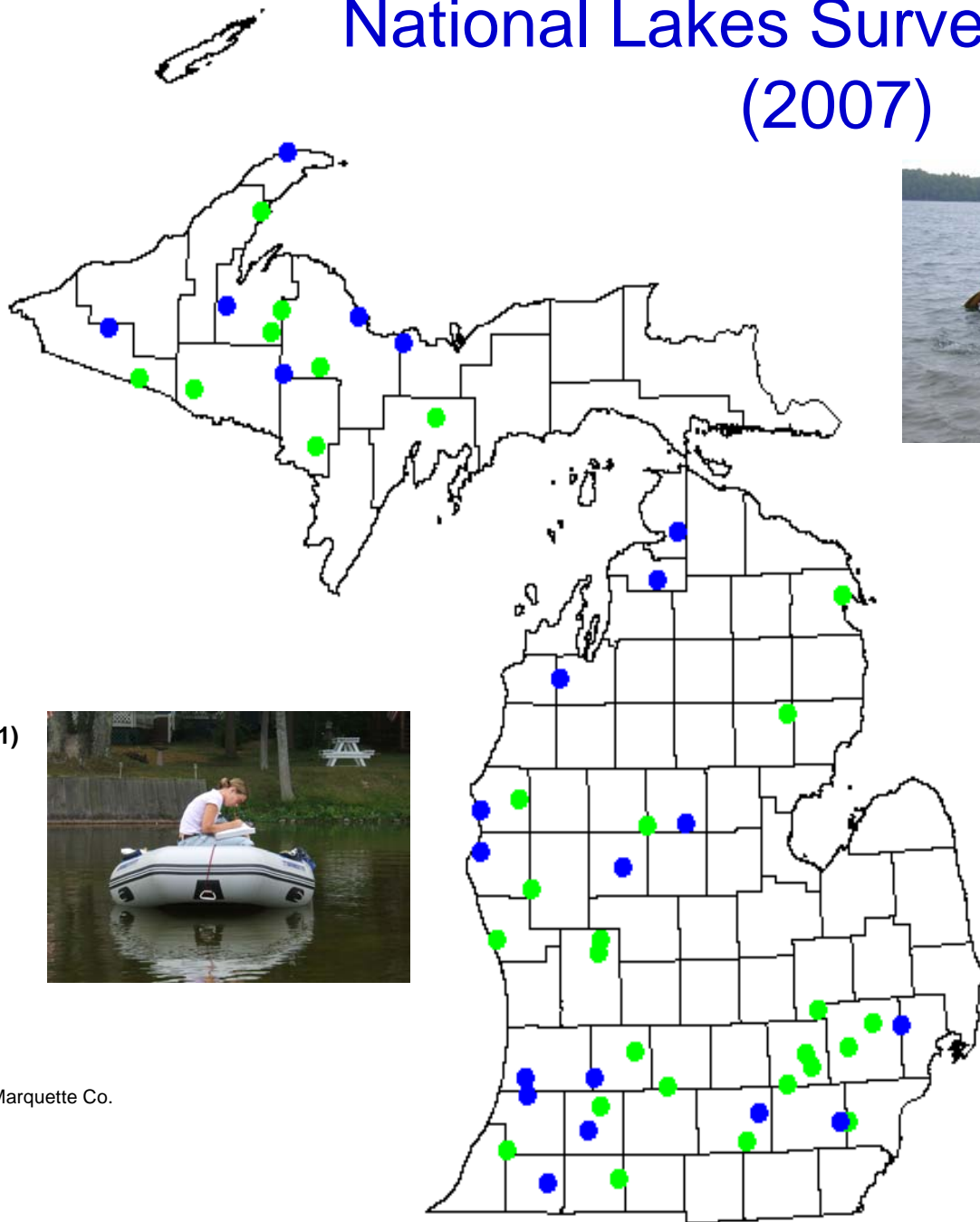
CLMP Summer Mean Transparency Corey Lake (St. Joseph Co.)



● **EPA Target Lakes (29)**

- Lake Besser, Alpena Co.
- Fence Lake, Baraga Co.
- Thornapple Lake, Barry Co.
- Eight Point Lake, Clare Co.
- McDonald Lake, Delta Co.
- Bloomgreen Marsh, Dickinson Co.
- Pine Lake, Eaton Co.
- Squaw Lake, Genesee Co.
- Loon Lake, Gogebic Co.
- Mud Lake, Houghton Co.
- Silver Lake, Iron Co.
- Clark Lake, Jackson Co.**
- Campbell Lake, Kalamazoo Co.
- Pine Lake, Kent Co.
- Stoner Lake, Kent Co.
- Brighton Lake, Livingston Co.
- Hi-Land Lake, Livingston Co.
- Lake Chemung, Livingston Co.**
- Dewey Lake, Marquette Co.
- Keewaydin Lake, Marquette Co.
- Tallman Lake, Mason Co.
- Muskegon Lake, Muskegon Co.
- Martin Lake, Newaygo Co.
- Bogie Lake, Oakland Co.
- Mill Lake, Oakland Co.
- Au Sable Lake, Ogemaw Co.
- Palmer Lake, St. Joseph Co.
- Round Lake, Van Buren Co.
- Belleville Lake, Wayne Co.

National Lakes Survey- Michigan (2007)



● **MI Enhancement Lakes (+21)**

- Howe Lake, Alger Co.
- Upper Scott Lake, Allegan Co.
- Big Lake, Baraga Co.
- Warner Lake, Barry Co.
- Donnell Lake, Cass Co.
- Deer Lake, Charlevoix Co.
- No Name Lake, Clare Co.
- Crooked Lake, Emmet Co.
- Lake Gogebic, Gogebic Co.
- Bridge Lake, Grand Traverse Co.
- Tims Lake, Jackson Co.
- West Lake, Kalamazoo Co.
- Lake Bailey, Keweenaw Co.
- Stony Creek Lake, Macomb Co.
- Forestville Impoundment, Dead River, Marquette Co.
- Lotto Lake, Marquette Co.
- Pere Marquette Lake, Mason Co.
- Blue Lake, Mecosta Co.
- Wyckoff Lake, Oceana Co.
- Lake Saddle, Van Buren Co.
- Ford Lake, Washtenaw Co.



For more information, visit:

www.epa.gov/owow/lakes/lakessurvey/



- Lakes Survey
- Lake Water Quality
- Clean Lakes Program
- Documents On-Line
- Documents To Order
- Lakes Mtg/Training
- Related Links
- Lakes Awareness Month
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Clean Lakes

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Survey of the Nation's Lakes

EPA is working with states, tribes and others to survey the quality of the nation's lakes, ponds and reservoirs.

EPA and its partners will soon be embarking on a Survey of the Nation's lakes. This Survey will be designed to help us to provide regional and national estimates of the condition of lakes. It will use a statistically-valid dataset that represents the condition of all lakes in similar regions sharing similar ecological characteristics. We will ask states and tribes to use consistent sampling and analytical procedures to ensure that the results can be compared across the country. This Survey of the Nation's Lakes will also help build state and tribal capacity for monitoring and assessment and promote collaboration across jurisdictional boundaries in the assessment of water quality.

- [Survey of the Nation's Lakes - Introductory Fact Sheet - Nov. 2005](#) (PDF, 106 KB, 2 pages, [about PDF](#))
- [Site Selection for the Survey of the Nation's Lakes - Technical Fact Sheet - April 2006](#) ([HTML](#) | [PDF](#), 197 KB, 2 pages, [about PDF](#))

Lakes,
Ponds, and

Lakes, Ponds and Reservoirs: Assessing Waters

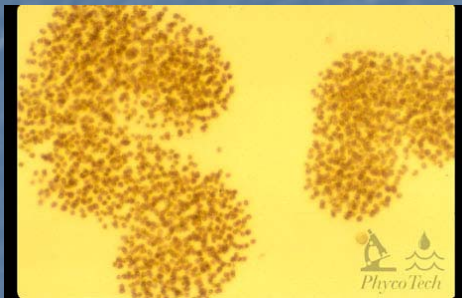
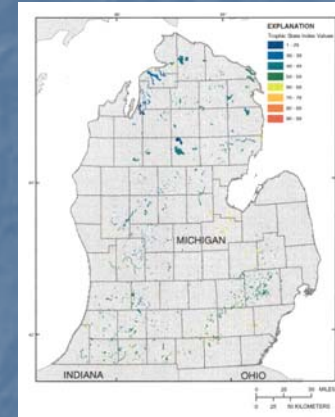


Features

Site Selection for the Survey of the Nation's Lakes - Technical Fact Sheet - April 2006

CLMP Data - Research

Satellite Remote Sensing
Project – Predicting TSI
(USGS –DEQ-CLMP)



Monitoring and predicting concentrations
of cyanobacterial toxins in Michigan lakes
(MSU – DEQ – CLMP)

Climate Change – Lake ice duration database
(UW – MSU – DEQ – CLMP)



Additional Information



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- www.michigan.gov/deq, click on “Water”, click on “Water Quality Monitoring”, click on “Inland Lakes Monitoring” or “Assessment of Michigan Waters”
- www.micorps.net

Questions ?

