Cooperative Lakes Monitoring Program

2014 Data Report

for

Upper Hamlin Lake, Mason County

Michigan Lakes– Ours to Protect

The CLMP is brought to you by:

Michigan Clean Water Corps

DEQ

Great Lakes Commission des Grands Lacs

Michigan Lake and Stream Associations

Michigan State University

Huron River Watershed Council

About this report:

This report is a summary of the data that have been collected through the Cooperative Lakes Monitoring Program. The contents have been customized for your lake. The first page is a summary of the Trophic Status Indicators of your lake (Secchi Disk Transparency, Chlorophyll-a, Spring Total Phosphorus, and Summer Total Phosphorus). Where data are available, they have been summarized for the past field season, the past five years, and since the first year your lake has been enrolled in the program.

If you did not take 8 or more Secchi disk measurements or 4 or more chlorophyll measurements, there will not be summary data calculated for these parameters. This is because missing measurements result in the data not being indicative of overall summer conditions.

If you enrolled in Dissolved Oxygen/Temperature, the summary page will have a graph of one of the profiles taken during the late summer (typically August or September). A late summer graph is used because dissolved oxygen is often depleted in the late summer, and identifying this condition and the depth at which it occurs is typically the most important use of dissolved oxygen measurements.

The back of the summary page will be the results of the Exotic Aquatic Plant Watch or Plant Identification and Mapping, if you participated in that parameter.

The rest of the report will be larger graphs, including all Dissolved Oxygen/Temperature Profiles that you recorded. For Secchi Disk, Chlorophyll, and Phosphorus parameters, you need to have two years of data for a graph to make logical sense. Therefore if this is the first year you have enrolled in the CLMP, you will not receive a graph for these parameters.

To learn more about these parameters or get definitions to unknown terms, check out the CLMP Manual found at: http://www.micorps.net/documents/CLMP_Manual.pdf. [Please note: This is a new publication and a printed version will not be available until April 2015. The printed version will be available at the CLMP training held during the annual MLSA Conference in early May.]

Thank you!

The CLMP Leadership Team would like to thank you for all of your efforts over the past year. The CLMP would not exist without dedicated and hardworking volunteers!

The CLMP Leadership Team is made of: Bill Dimond, Marcy Knoll Wilmes, Jean Roth, Jo Latimore, Paul Steen, Scott Brown, Laura Kaminski, and Anne Sturm.

Questions?

If you have questions on this report or believe that the tabulated data for your lake in this report are in error please contact:

Paul Steen (psteen@hrwc.org), MiCorps Program Manager

Site Id: 530074

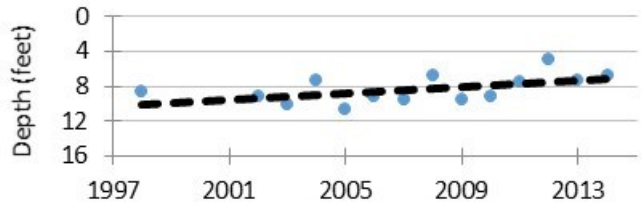
Upper Hamlin Lake, Mason County

2014 CLMP Results

Cooperative Lakes Monitoring Program

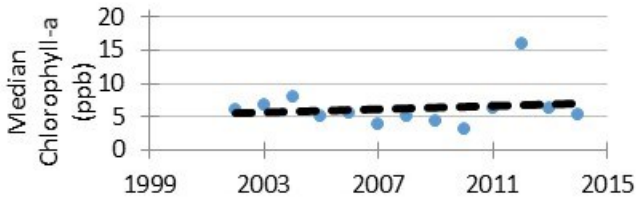
Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2014	20	3.5	9.0	6.8	1.6	50
2009-2013	91	2.0	13.5	7.7	2.0	48
1997-2008	142	3.0	15.5	8.9	2.2	46
2014 All CLMP Lakes	3050	2.0	50.0	13.1	2.1	41



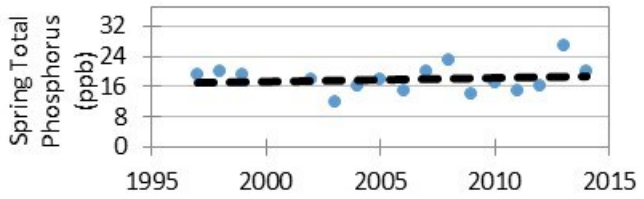
Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Median	Std. Dev	Carlson TSI
2014	5	4.7	11.0	5.4	3.0	47
2009-2013	25	1.3	29.0	6.2	6.1	48
2002-2008	35	2.0	20.0	6.2	4.5	47
2014 All CLMP Lakes	583	<1.0	23.5	2.0	2.9	37



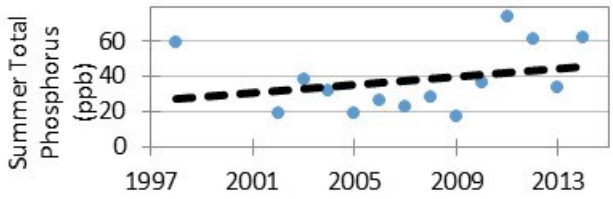
Spring Total Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev
2014	1	20	20	20.0	NA
2009-2013	5	14	27	17.8	5.3
1997-2008	10	12	23	18.0	3.1
2014 All CLMP Lakes	164	3 W	77	13.2	11.1

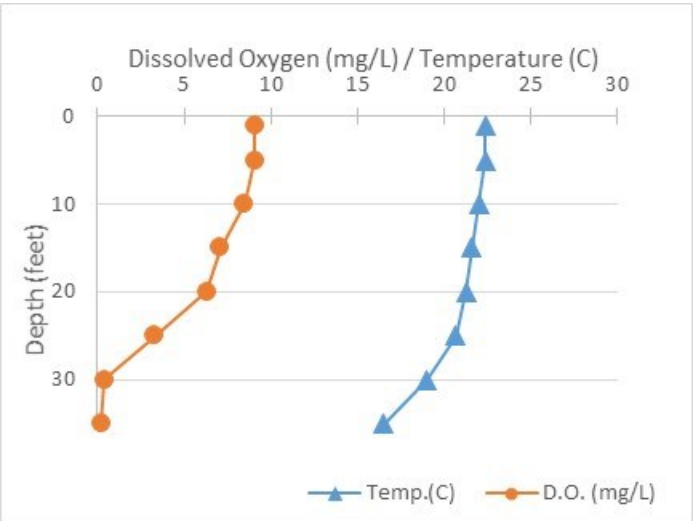


Summer Total Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2014	1	62	62	62.0	NA	64
2009-2013	5	17	74	44.4	22.8	57
1998-2008	8	19	59	30.5	13.2	52
2014 All CLMP Lakes	180	4 T	62	13.5	7.9	41



Aug Dissolved Oxygen and Water Temperature Profile



Summary

Average TSI	2014	2009-2013	1997-2008
Upper Hamlin	53	51	48
All CLMP Lakes	40	NA	NA

With an average TSI score of 53 based on Secchi transparency, Chlorophyll-a, and summer total phosphorus, this lake is rated as an eutrophic lake. The lake keeps some dissolved oxygen in the bottom waters through early summer, but by late summer the bottom water is completely devoid of oxygen.

Long term trends indicate that transparency and summer phosphorus have moved toward eutrophy since monitoring began (loss of transparency, increase of phosphorus). Chlorophyll and spring phosphorus have not changed beyond normal year-to-year variation.

*= No sample received W= Value is less than the detection limit (<3 ppb) T= Value reported is less than the reporting limit (5 ppb). Result is estimated.

<1 = Chlorophyll-a: Sample value is less than limit of quantification (<1 ppb).

Upper Hamlin Lake, Mason County

2014 CLMP Aquatic Plant Results

This lake does not have aquatic plant data available for 2014. Consider enrolling in an aquatic plant parameter next year.

Why is monitoring aquatic plants important?

A major component of the plant community in lakes is the large, leafy, rooted plants. Compared to the microscopic algae the rooted plants are large. Sometimes they are collectively called the "macrophytes" ("macro" meaning large and "phyte" meaning plant). These macrophytes are the plants that people sometimes complain about and refer to as lake weeds.

Far from being weeds, macrophytes or rooted aquatic plants are a natural and essential part of the lake, just as grasses, shrubs and trees are a natural part of the land. Their roots are a fabric for holding sediments in place, reducing erosion and maintaining bottom stability. They provide habitat for fish, including structure for food organisms, nursery areas, foraging and predator avoidance. Waterfowl, shore birds and aquatic mammals use plants to forage on and within, and as nesting materials and cover.

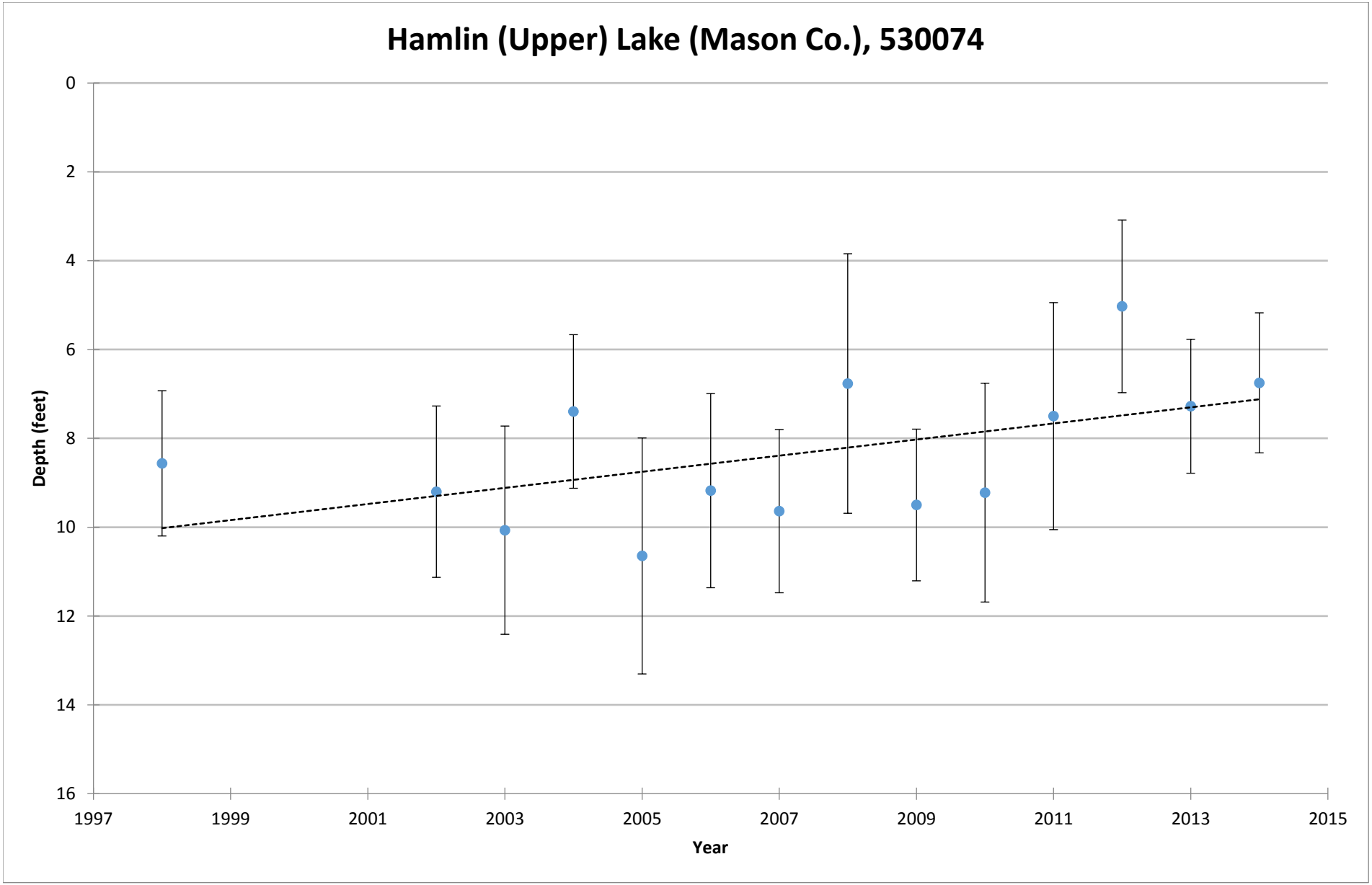
Though plants are important to the lake, overabundant plants can negatively affect fish populations, fishing and other recreational activities. Rooted plant populations increase in abundance as nutrient concentrations increase in the lake. As lakes become more eutrophic rooted plant populations increase. They are rarely a problem in oligotrophic lakes, only occasionally a problem in mesotrophic lakes, sometimes a problem in eutrophic lakes, and often a problem in hypereutrophic lakes.

However, sometimes a lake is invaded by an aquatic plant species that is not native to Michigan. In these cases, even nutrient poor oligotrophic lakes can be threatened. Some of these exotic plants, like Curly-leaf Pondweed, Eurasian Milfoil, Starry Stonewort, and Hydrilla can be extremely disruptive to the lake's ecosystem and recreational activities.

To avoid a takeover by exotic plants, it is necessary to use Integrated Pest Management (IPM) strategies: monitoring, early detection, rapid response, maintenance control, and preventive management. For more information on these strategies, check out Integrated Pest Management for Nuisance Exotics in Michigan Inland Lakes (MSU Extension Water Quality Publication WQ-56, available at http://www.micorps.net/CLMPdocuments.html.)

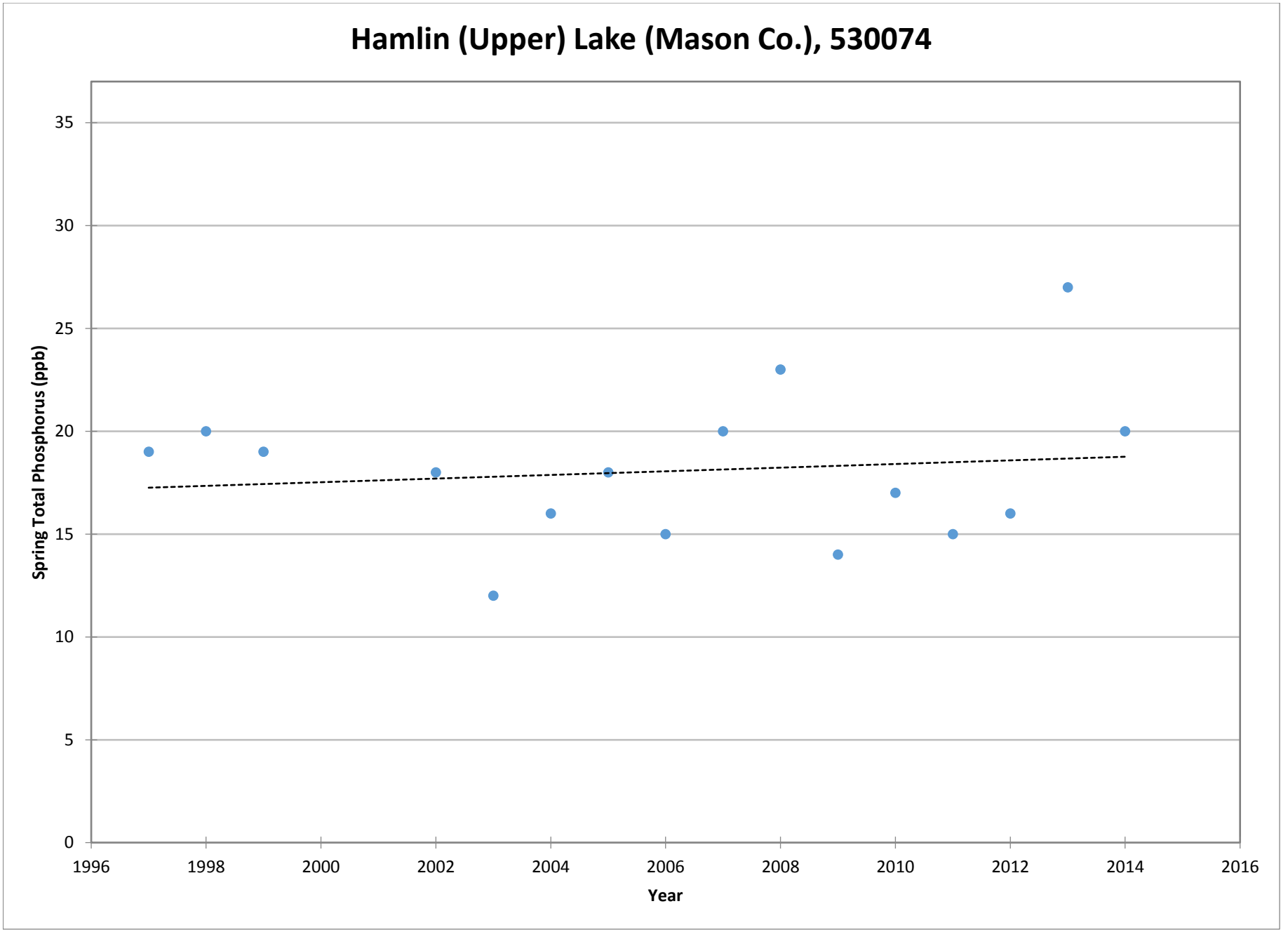
The CLMP offers two parameters on aquatic plants. In the Exotic Aquatic Plant Watch, volunteers concentrate on monitoring and early detection of exotic invasive plants only. In Aquatic Plant Identification and Mapping, volunteers identify all native and non-native plants. In both parameters, volunteers create lake maps or use digital tools to georeference where the plants are found.

COOPERATIVE LAKES MONITORING PROGRAM
SUMMER MEAN TRANSPARENCY

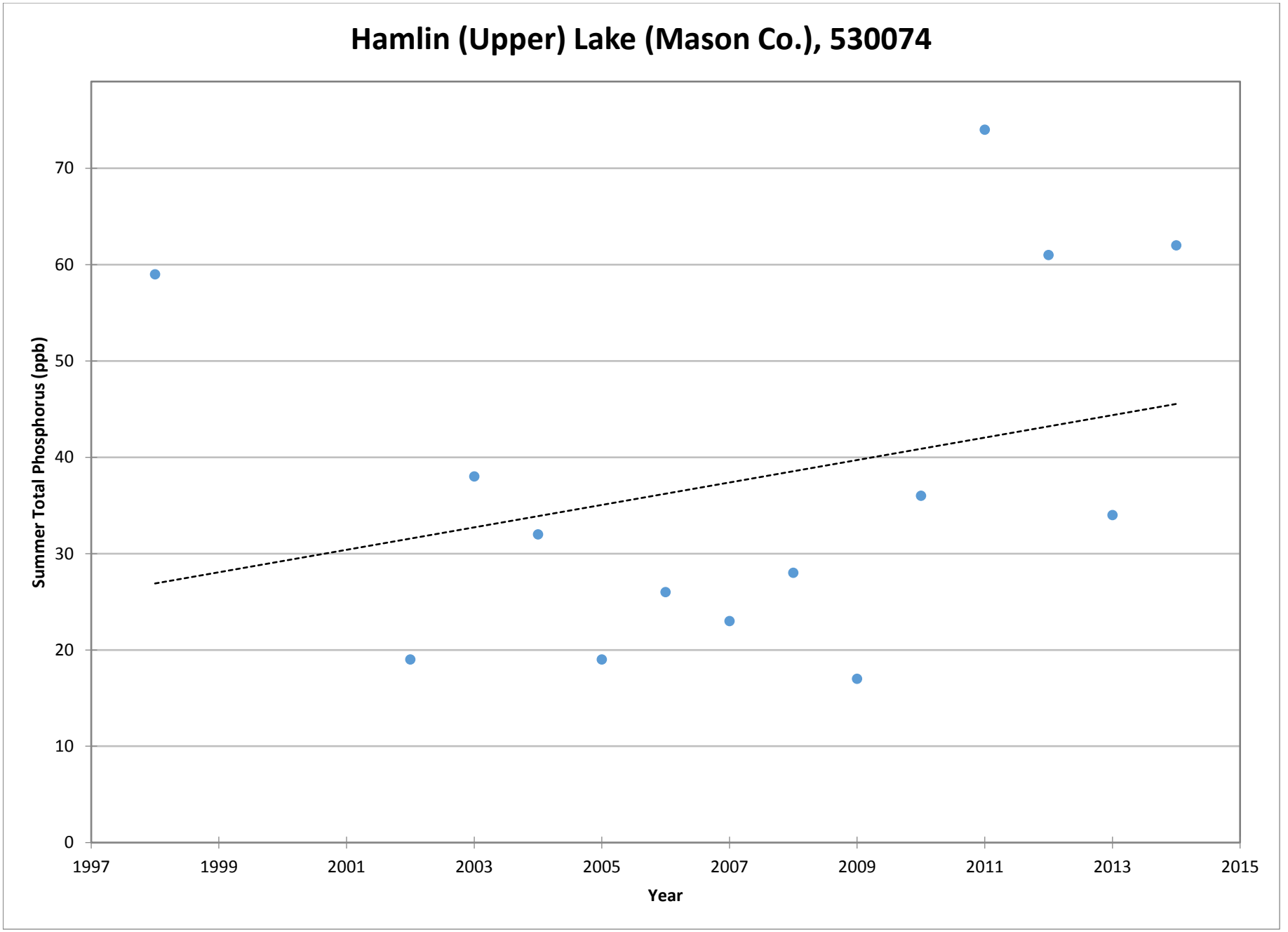


Vertical bars indicate standard deviation

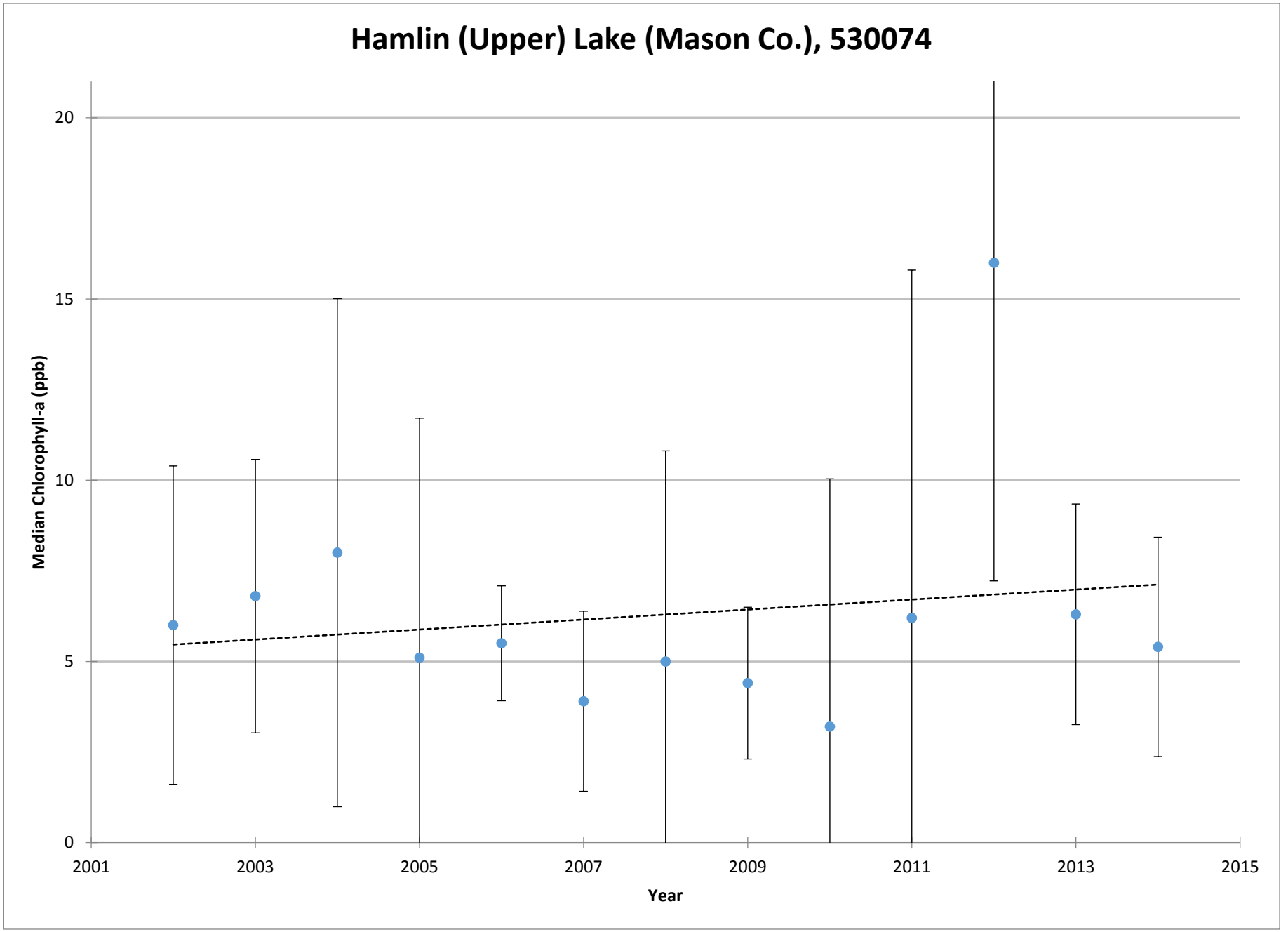
COOPERATIVE LAKES MONITORING PROGRAM
SPRING TOTAL PHOSPHORUS



COOPERATIVE LAKES MONITORING PROGRAM
SUMMER TOTAL PHOSPHORUS



COOPERATIVE LAKES MONITORING PROGRAM
SUMMER MEDIAN CHLOROPHYLL-A



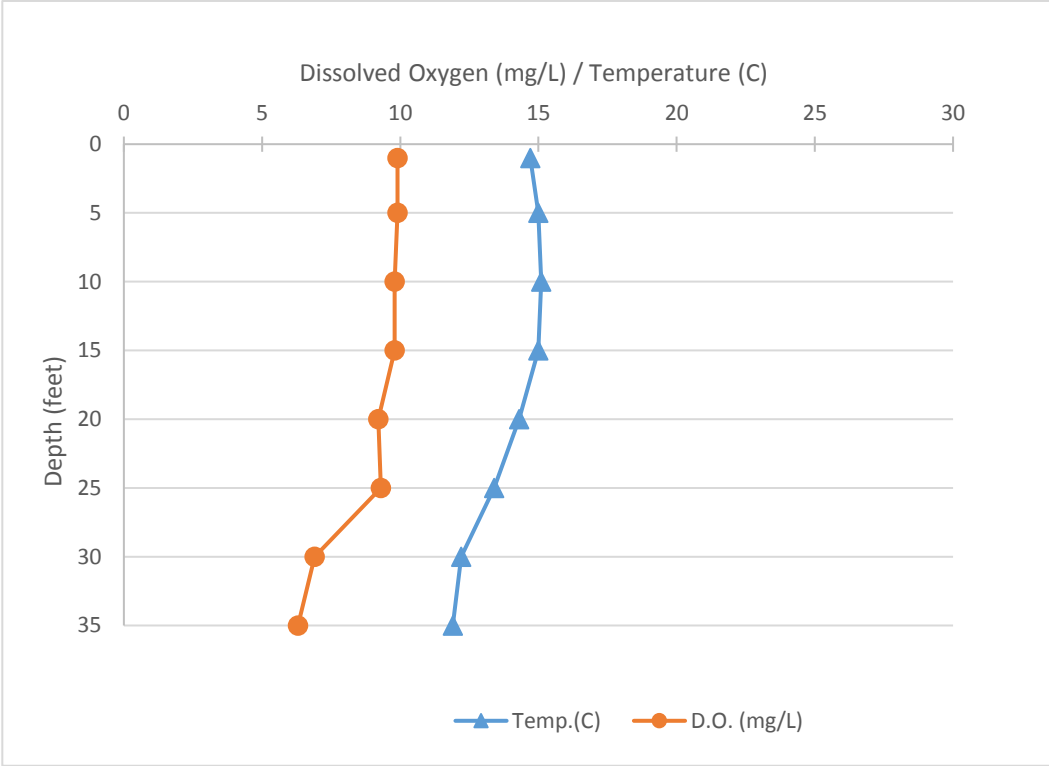
Vertical bars indicate standard deviation

Name: Hamlin (Upper)
County: Mason
Site ID: 530074
Date: 5/14/2014

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	14.7	9.9
5	15	9.9
10	15.1	9.8
15	15	9.8
20	14.3	9.2
25	13.4	9.3
30	12.2	6.9
35	11.9	6.3

Lake: Hamlin (Upper) (Mason Co.) **5/14/2014**

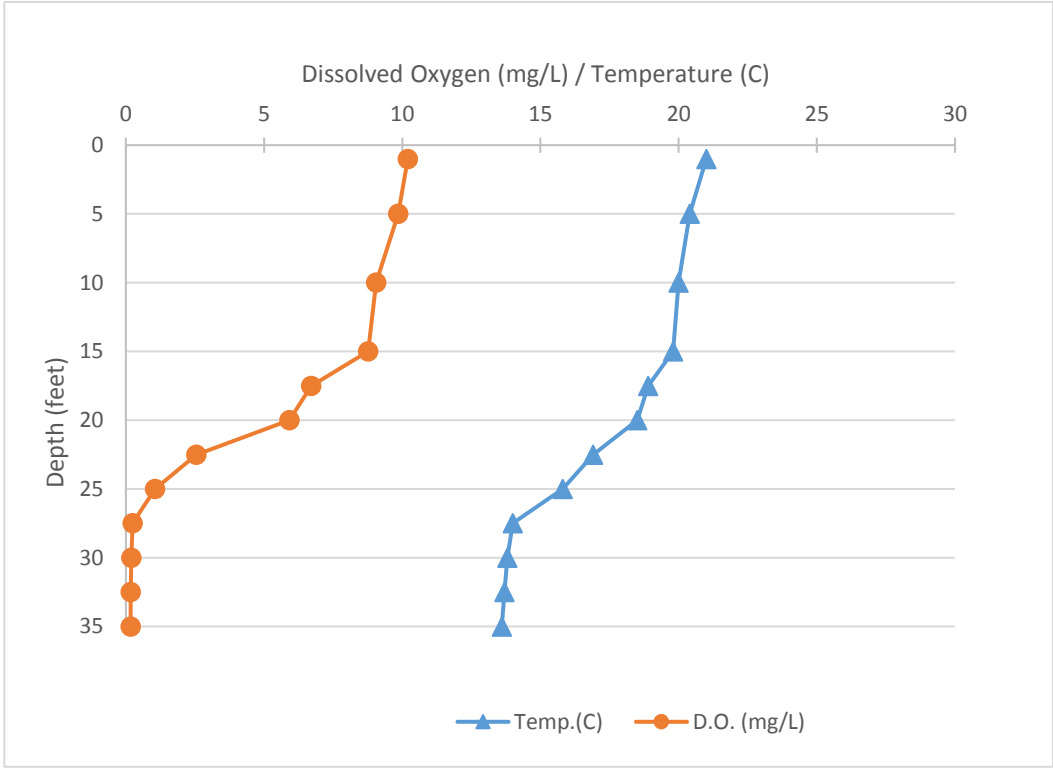


Name: Hamlin (Upper)
County: Mason
Site ID: 530074
Date: 6/16/2014

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	21	10.2
5	20.4	9.85
10	20	9.05
15	19.8	8.77
17.5	18.9	6.7
20	18.5	5.92
22.5	16.9	2.55
25	15.8	1.05
27.5	14	0.25
30	13.8	0.2
32.5	13.7	0.18
35	13.6	0.17

Lake: Hamlin (Upper) (Mason Co.) **6/16/2014**

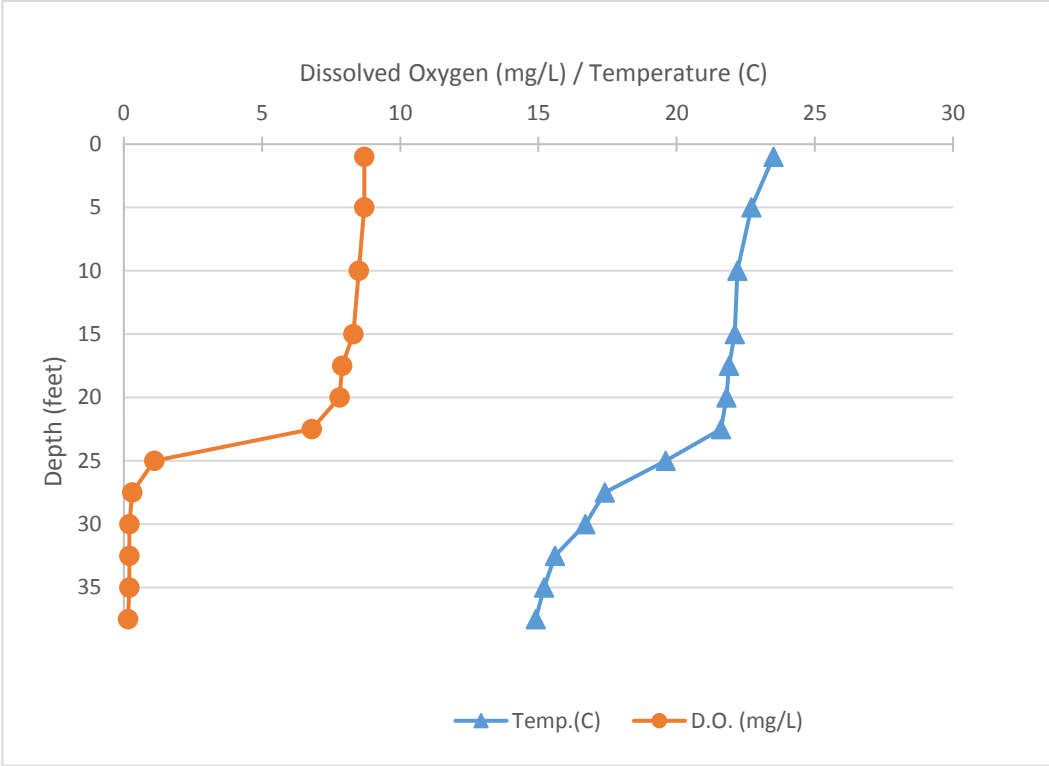


Name: Hamlin (Upper)
County: Mason
Site ID: 530074
Date: 7/18/2014

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.5	8.7
5	22.7	8.7
10	22.2	8.5
15	22.1	8.3
17.5	21.9	7.9
20	21.8	7.8
22.5	21.6	6.8
25	19.6	1.1
27.5	17.4	0.3
30	16.7	0.2
32.5	15.6	0.2
35	15.2	0.2
37.5	14.9	0.15

Lake: Hamlin (Upper) (Mason Co.) **7/18/2014**

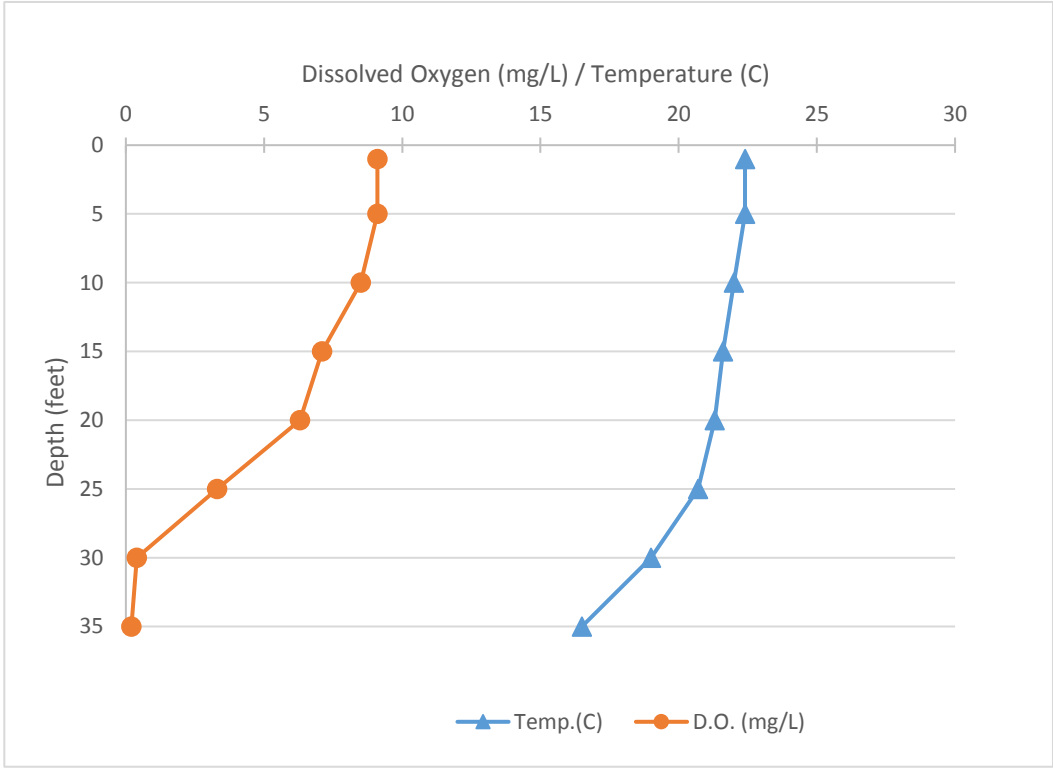


Name: Hamlin (Upper)
County: Mason
Site ID: 530074
Date: 8/20/2014

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	22.4	9.1
5	22.4	9.1
10	22	8.5
15	21.6	7.1
20	21.3	6.3
25	20.7	3.3
30	19	0.4
35	16.5	0.2

Lake: Hamlin (Upper) (Mason Co.) **8/20/2014**



Name: Hamlin (Upper)
County: Mason
Site ID: 530074
Date: 9/13/2014

Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	18.9	7.2
5	19	7.1
10	19.1	7
15	19.1	7
20	19.2	6.8
25	19	6.8
30	18.9	6.5
35	18.8	6.5

Lake: Hamlin (Upper) (Mason Co.) **9/13/2014**