



# Cooperative Lakes Monitoring Program

Michigan Lakes— Ours to Protect

## 2015 Data Report for Stony Lake, Oceana County

Site ID: 640049

43.56060°N, 86.48610°W

The CLMP is brought to you by:



### **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. These numbers of measurements are required to ensure that the results are 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 Plant Watch or Full Plant Mapping, if you participated in that parameter. If you enrolled in the Score the Shore Parameter, a summary will be found after the plant page.

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.

Remember that some lakes see a lot of fluctuation in these parameters from year to year. Until you have eight years worth of data, consider all trends to be preliminary.

To learn more about the CLMP monitoring parameters or get definitions to unknown terms, check out the CLMP Manual, found at: <https://micorps.net/wp-content/uploads/CLMP-Manual.pdf>

### **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: Marcy Knoll Wilmes, Jean Roth, Jo Latimore, Paul Steen, Scott Brown, Laura Kaminski, and Katherine Hollins.

### **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**

# Stony Lake, Oceana County

## 2015 CLMP Results

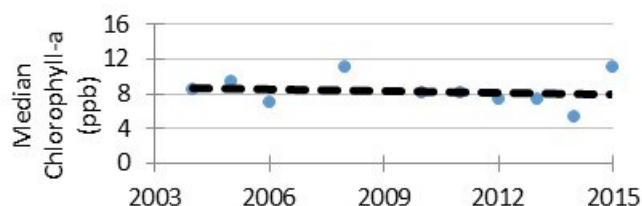
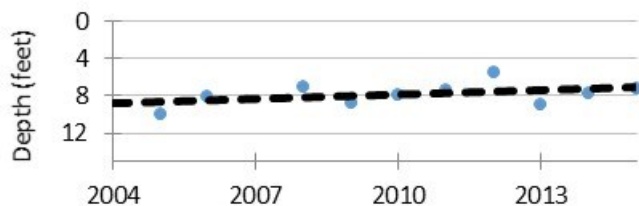


### Secchi Disk Transparency (feet)

Year	# Readings	Min	Max	Average	Std. Dev	Carlson TSI
2015	19	2.0	12.0	7.2	2.5	49
2010-2014	118	4.0	14.0	7.5	1.9	48
2004-2009	93	1.5	19.0	8.4	3.0	47
2015 All CLMP Lakes	3018	1.5	42.0	12.6	6.1	42

### Chlorophyll-a (parts per billion)

Year	# Samples	Min	Max	Median	Std. Dev	Carlson TSI
2015	5	5.0	35.0	11.0	11.6	54
2010-2014	26	2.7	17.0	7.4	3.7	50
2004-2009	18	3.3	23.0	7.4	4.4	52
2015 All CLMP Lakes	628	< 1.0	14.0	2.5	2.1	39

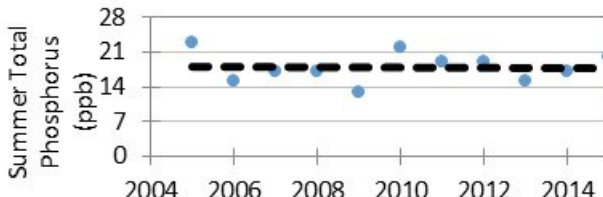
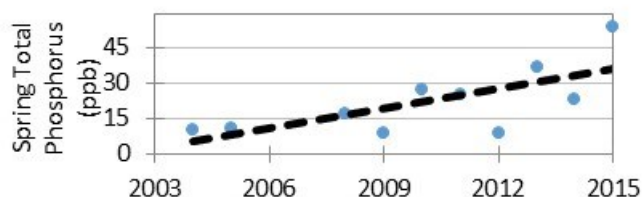


### Spring Total Phosphorus (parts per billion)

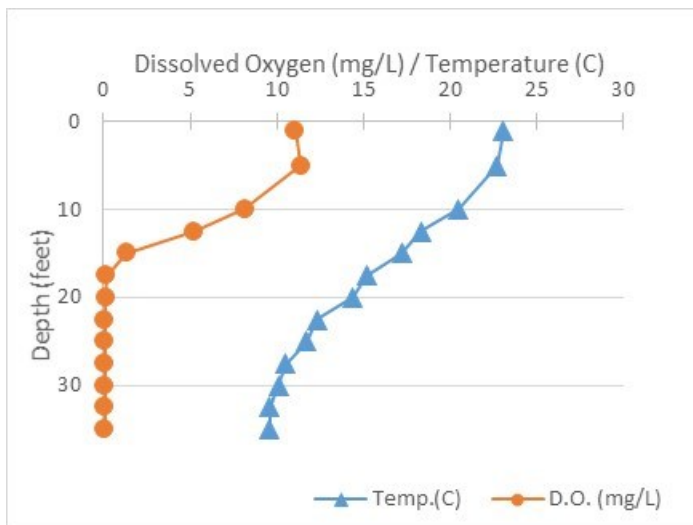
Year	# Samples	Min	Max	Average	Std. Dev
2015	1	54	54	54.0	NA
2010-2014	5	9	37	24.2	10.1
2004-2009	4	9	17	11.8	3.6
2015 All CLMP Lakes	131	<= 3	70	11.5	13.7

### Summer Total Phosphorus (parts per billion)

Year	# Samples	Min	Max	Average	Std. Dev	Carlson TSI
2015	1	20	20	20.0	NA	47
2010-2014	5	15	22	18.4	2.6	46
2005-2009	5	13	23	17.0	3.7	45
2015 All CLMP Lakes	173	<= 3	68	13.2	8.1	39



### Dissolved Oxygen and Water Temperature Profile



### Summary

Average TSI	2015	2010-2014	2004-2009
Stony Lake	50	48	48
All CLMP Lakes	40	NA	NA

With an average TSI score of 50 based on Secchi transparency, chlorophyll-a, and summer total phosphorus, this lake is rated between the mesotrophic and eutrophic lake classification. The lake leans slightly more eutro than meso. Due to the high nutrient level, the lake loses dissolved oxygen in the bottom waters in early summer. Spring phosphorus, which is indicative of overall lake phosphorus levels, is increasing in the lake and should continue to be monitored in the future. The other trophic status parameters have not changed beyond minor 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).

# Stony Lake, Oceana County

## 2015 CLMP Aquatic Plant Results



This lake does not have aquatic plant data available for 2015. 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.

# Stony Lake, Oakland County

## 2015 Score the Shore Results



The Score the Shore Habitat Assessment was conducted on Stony Lake in 2015.

This assessment involves rating 1,000 foot sections of shoreline for aquatic vegetation, shoreline vegetation, erosion, and erosion control practices (like sea walls). Each shoreline section is given three scores ranging from 0-100 for the categories of Littoral, Riparian, and Erosion Management. The three scores are averaged to produce an average section score. Then a total score is given to the entire lake by averaging all of the average section scores. A score of 0 indicates a shoreline that has been extremely disturbed by human impacts and no natural shoreline remains. A score of 100 indicates a shoreline that is nearly pristine.

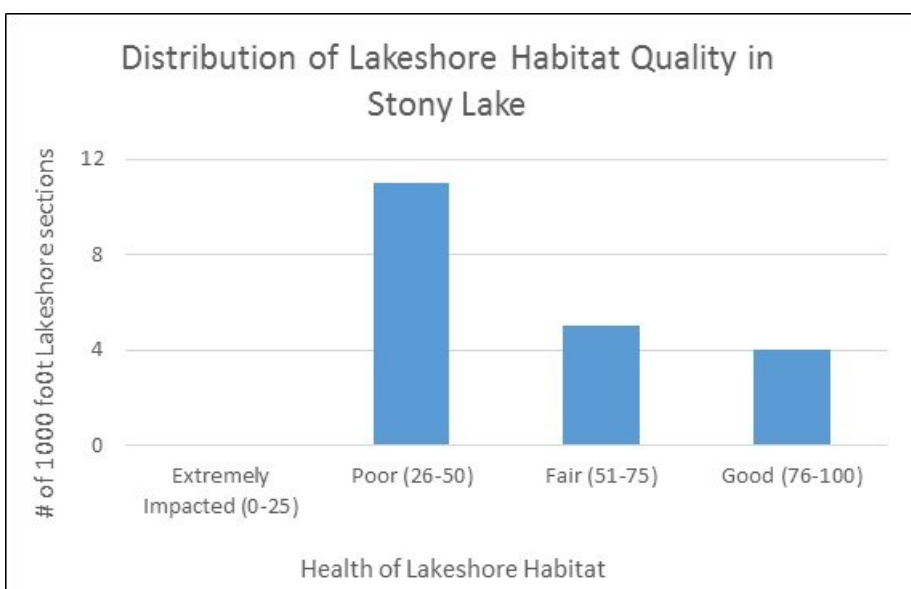
*\*Note for 2015 volunteers: CLMP staff scaled all of your observations to a 0-100 scale to make interpretation easier. In the future, this will be a standard practice that volunteers do themselves.*

In 2015, seven lakes participated in the Score the Shore parameter. The following table shows a comparison of all of the lakes (sorted by total score, highest to lowest).

Lake	# of Lakeshore Sections	Houses/Docks per 1000 ft	Averages			
			Total Score	Littoral	Riparian	Erosion
Duck	15	5.9	79	67	82	87
Deer	13	11.0	74	80	65	77
Independence	36	8.2	71	64	70	79
Pleasant	15	13.2	58	50	52	73
Stony	20	15.7	55	55	44	65
Klinger	25	28.0	48	39	50	56
Eagle	7	67.1	42	45	27	56

### Analysis specific to Stony Lake:

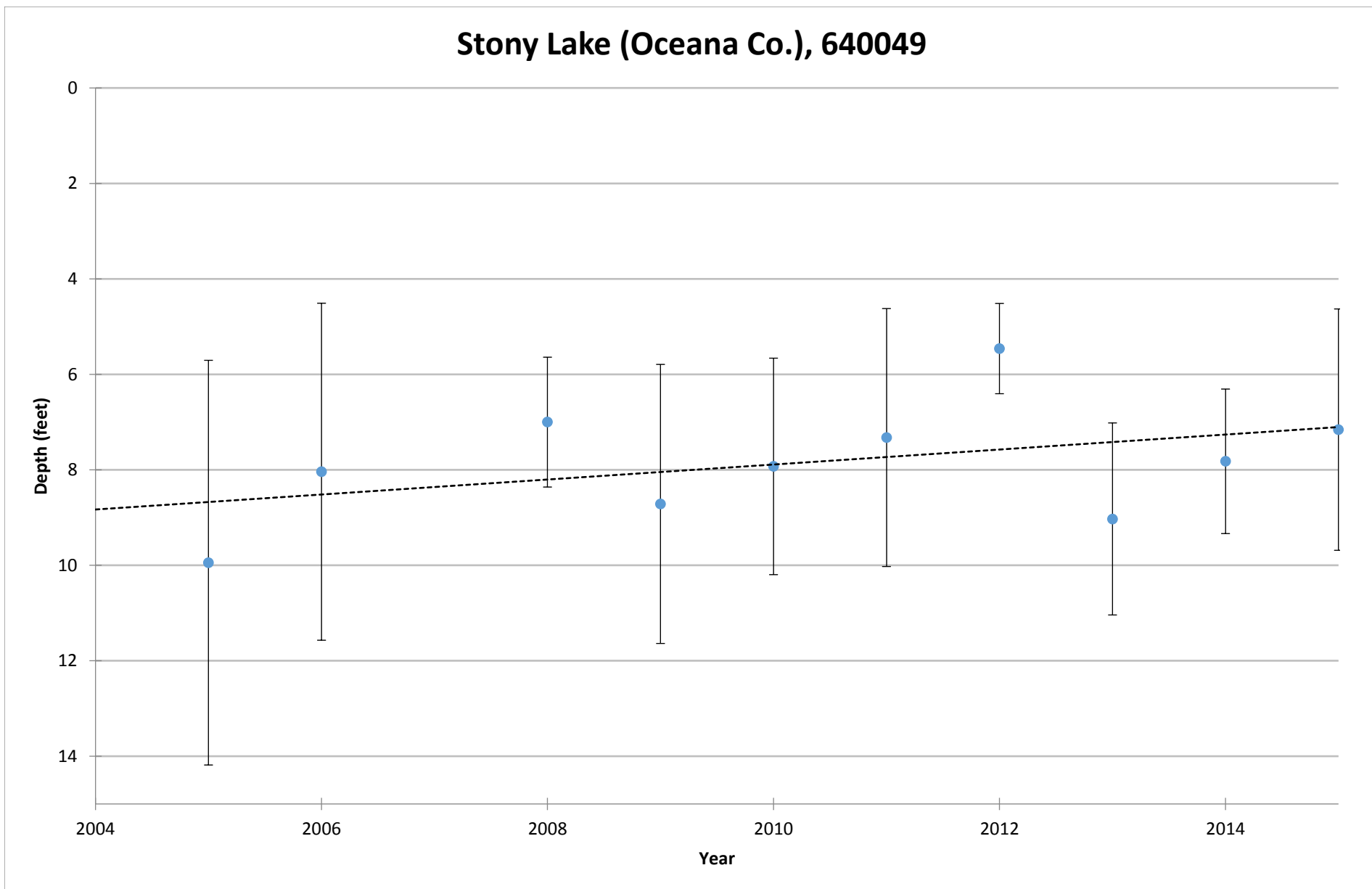
Stony Lake, overall, falls into the “Fair” range for lakeshore habitat. There is certainly degradation present, but there are some nice areas as well. Four sections are considered good, 5 are fair, but 11 are poor. The worst scoring section was section 2, which had a total score of 37 (littoral score of 31, riparian score of 36, and shoreline management score of 44). The full score breakdown for each section can be obtained by requesting it of Paul Steen (psteen@hrwc.org).



The weakest point of Stony Lake assessment was the riparian zone (land adjacent to the water). If residents are interested in increasing the habitat score, boosting the riparian score would be the first priority. Reducing the amount of mowed grass and increasing the amount of unmowed vegetation is the primary way to make these improvements.

COOPERATIVE LAKES MONITORING PROGRAM  
SUMMER MEAN TRANSPARENCY

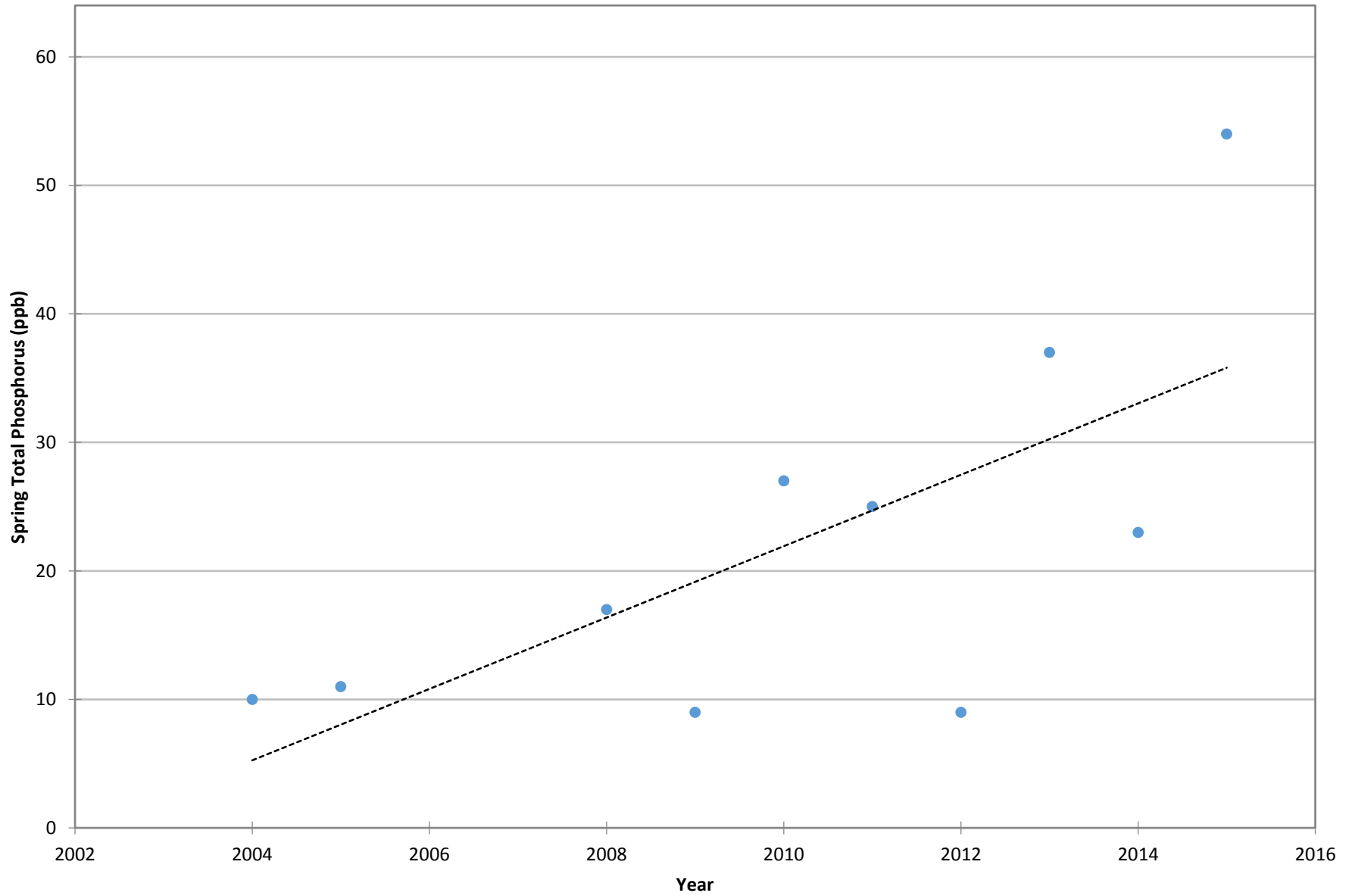
**Stony Lake (Oceana Co.), 640049**



Vertical bars indicate standard deviation

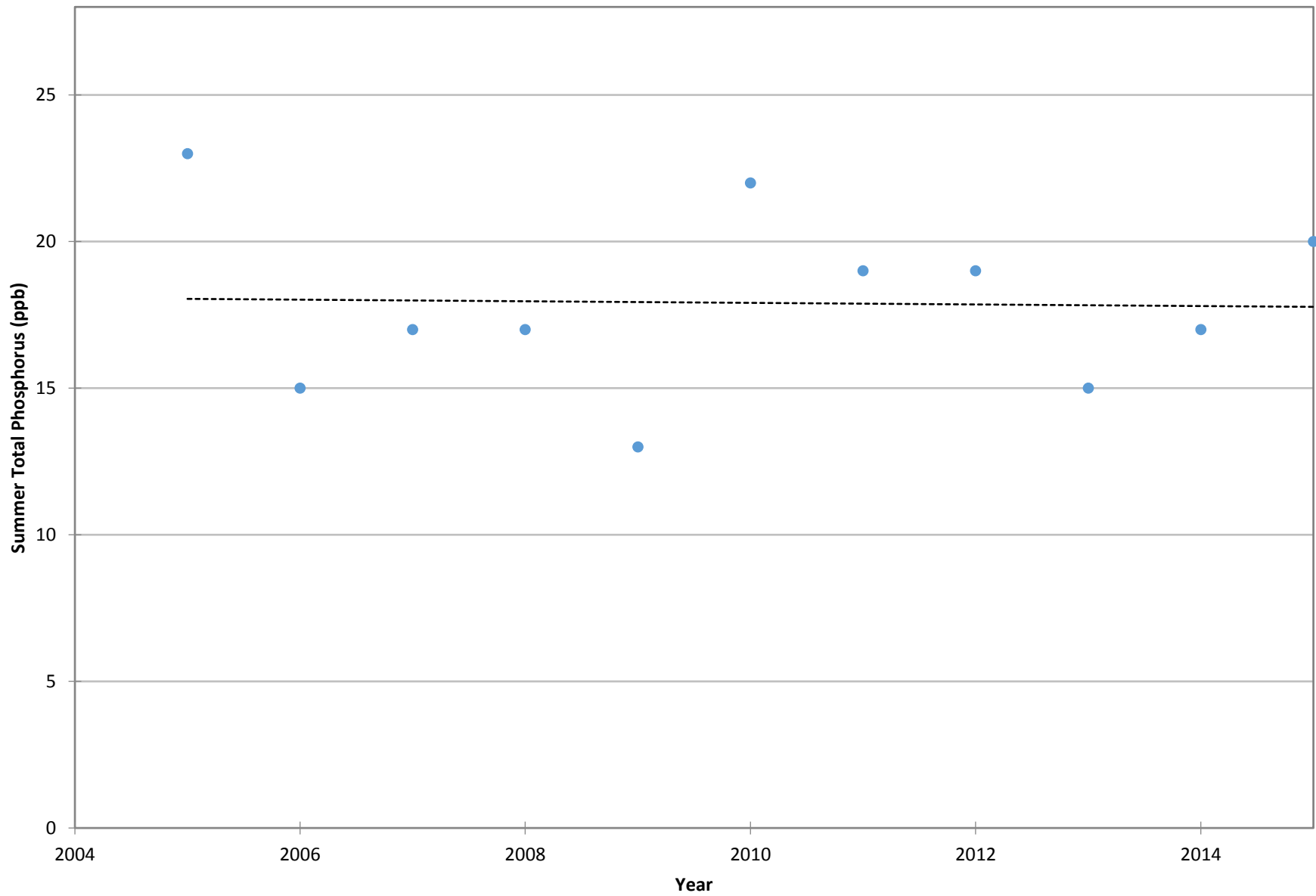
COOPERATIVE LAKES MONITORING PROGRAM  
SPRING TOTAL PHOSPHORUS

**Stony Lake (Oceana Co.), 640049**



COOPERATIVE LAKES MONITORING PROGRAM  
SUMMER TOTAL PHOSPHORUS

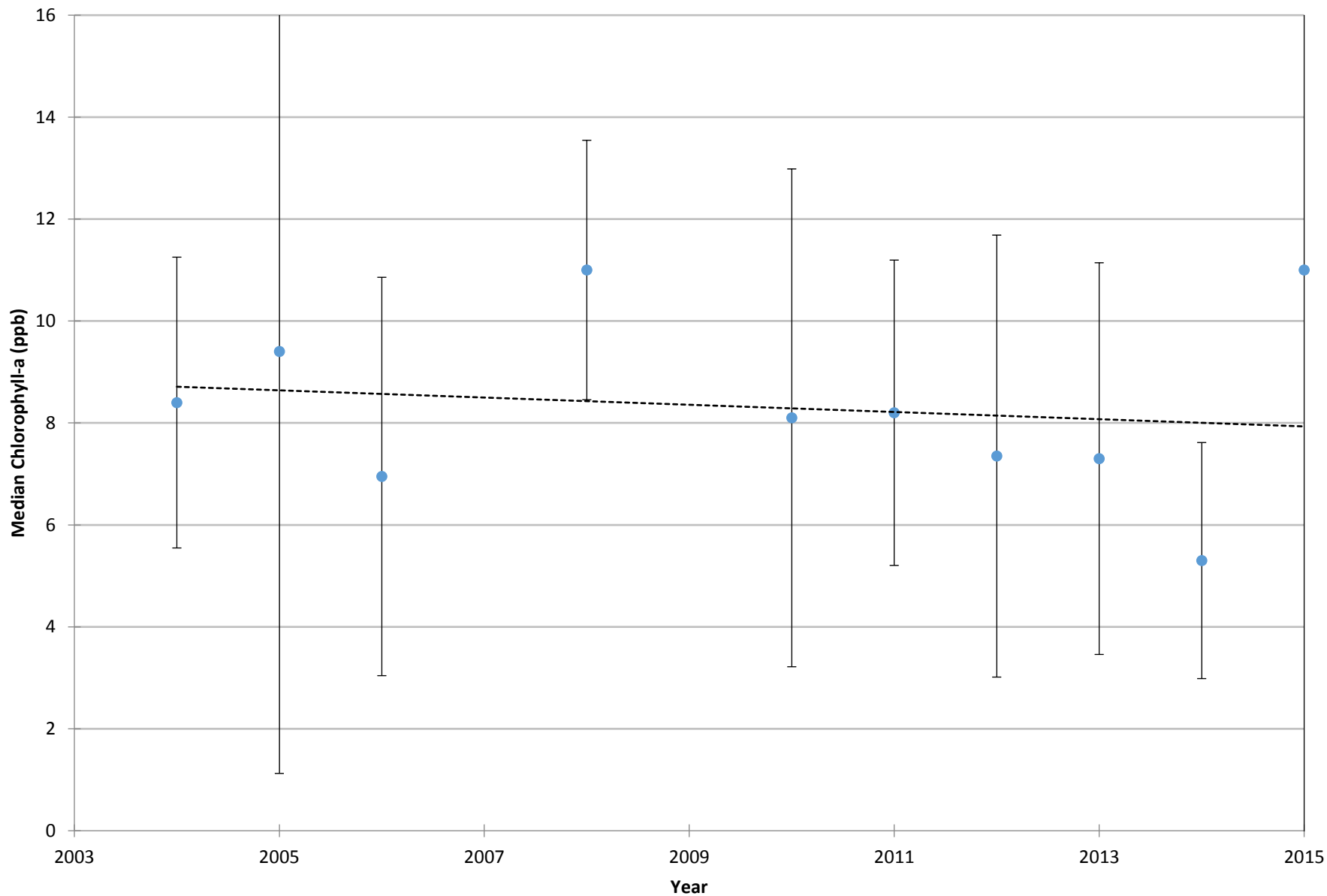
**Stony Lake (Oceana Co.), 640049**





COOPERATIVE LAKES MONITORING PROGRAM  
SUMMER MEDIAN CHLOROPHYLL-A

**Stony Lake (Oceana Co.), 640049**



Vertical bars indicate standard deviation

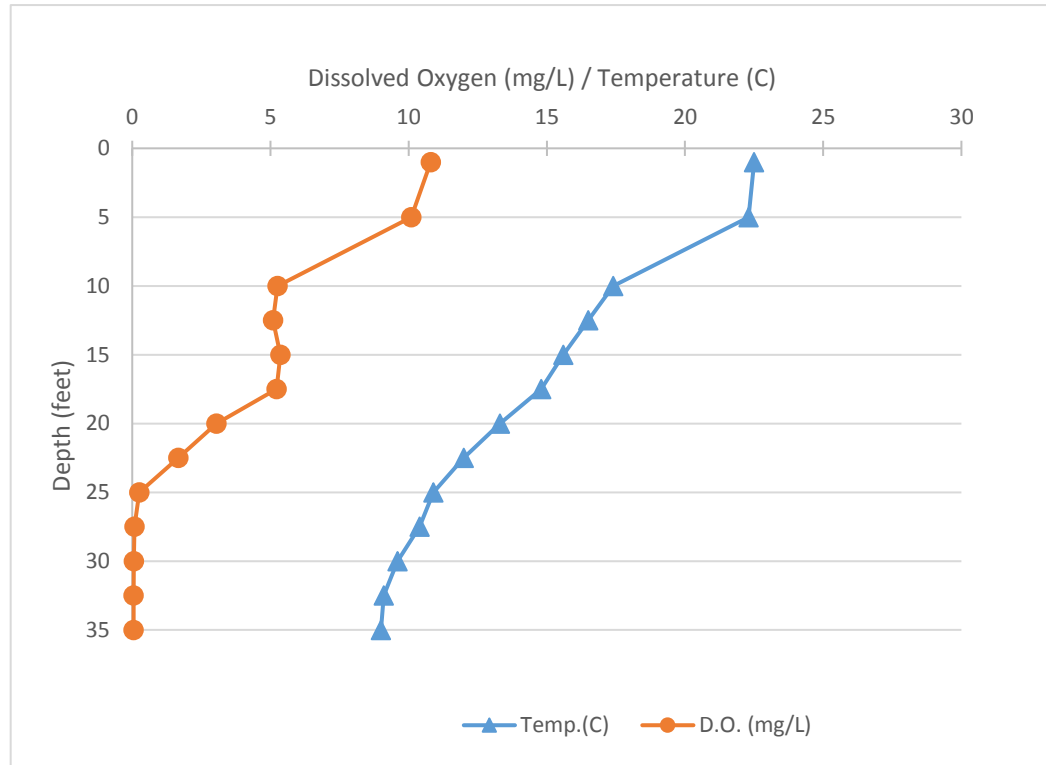
Name: Stony  
 County: Oceana  
 Site ID: 640049  
 Date: 6/22/2015

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	22.5	10.8
5	22.3	10.1
10	17.4	5.26
12.5	16.5	5.1
15	15.6	5.36
17.5	14.8	5.22
20	13.3	3.05
22.5	12	1.67
25	10.9	0.25
27.5	10.4	0.08
30	9.6	0.06
32.5	9.1	0.05
35	9	0.05

Lake: Stony (Oceana Co.)

6/22/2015



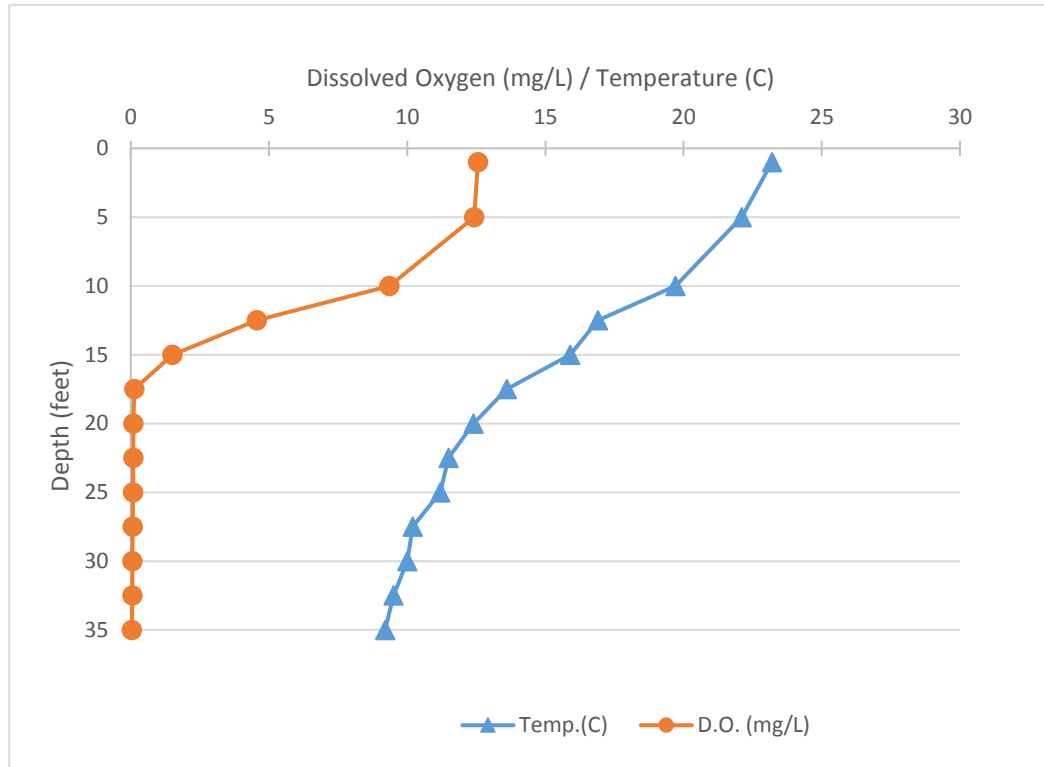
Name: Stony  
 County: Oceana  
 Site ID: 640049  
 Date: 7/15/2015

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.2	12.56
5	22.1	12.42
10	19.7	9.36
12.5	16.9	4.56
15	15.9	1.51
17.5	13.6	0.13
20	12.4	0.09
22.5	11.5	0.09
25	11.2	0.08
27.5	10.2	0.07
30	10	0.06
32.5	9.5	0.06
35	9.2	0.04

Lake: Stony (Oceana Co.)

7/15/2015



Name: Stony  
 County: Oceana  
 Site ID: 640049  
 Date: 8/10/2015

### Dissolved Oxygen and Temperature Profile

Depth (ft)	Temp.(C)	D.O. (mg/L)
1	23.1	11.09
5	22.7	11.38
10	20.5	8.15
12.5	18.3	5.23
15	17.2	1.35
17.5	15.2	0.18
20	14.4	0.11
22.5	12.3	0.1
25	11.7	0.09
27.5	10.5	0.09
30	10.1	0.08
32.5	9.6	0.07
35	9.6	0.07

Lake: Stony (Oceana Co.)

8/10/2015

