

2019 Canandaigua Lake Sampling and Monitoring Program

Report to the Canandaigua Lake Watershed Council
February 5, 2020

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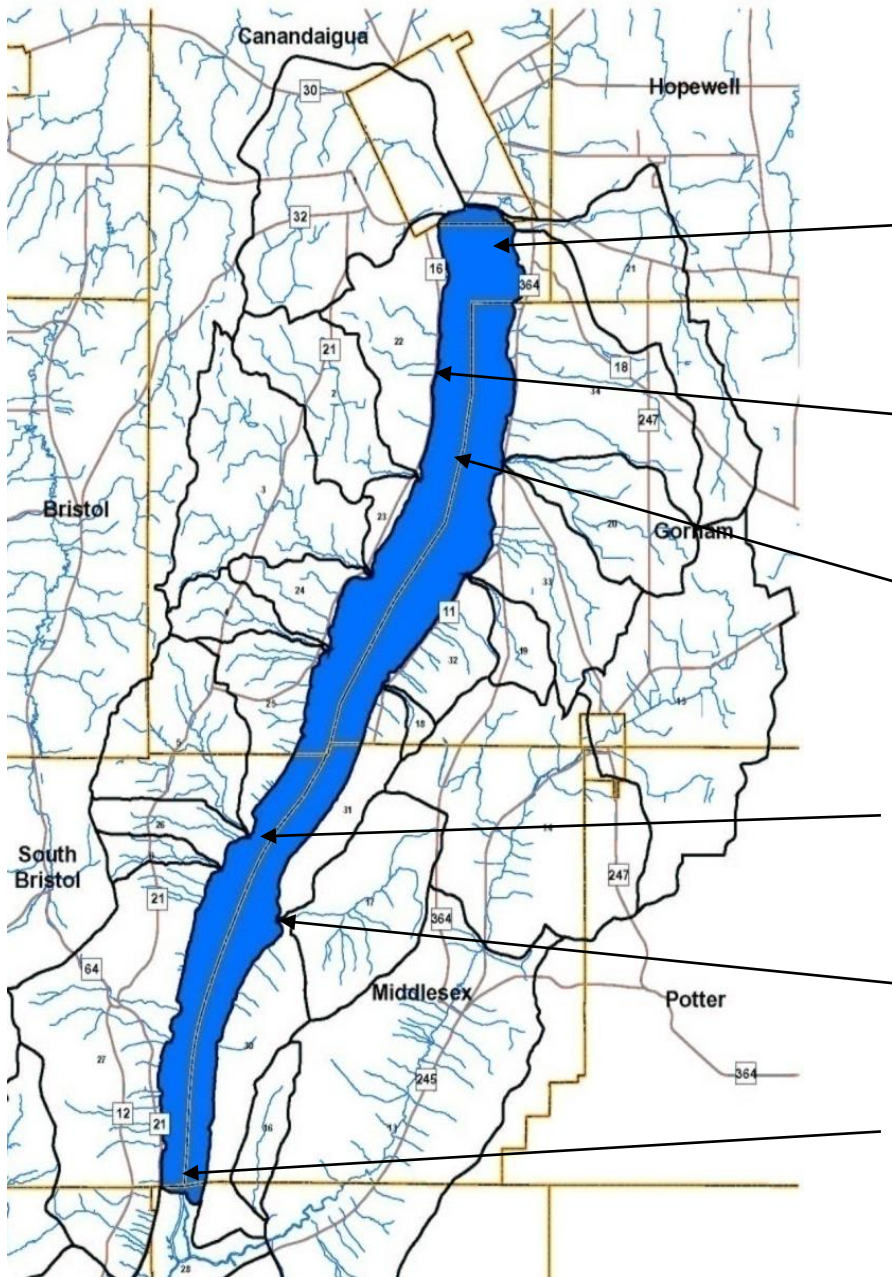
Program Background

- Program in it's 25th year (1996 – 2020)
- FLCC's role
- Lake attributes that are monitored each year since 1996:
 - Water clarity
 - Lake algal productivity
 - Lake nutrients
 - Water quality profiles: temperature, dissolved oxygen, pH, conductivity, blue-green algal cell counts

Recent Program Changes

- 2018:
 - New FLCC Researcher
 - Partnership with the Finger Lakes Hub
 - Additional nearshore phosphorous sampling
 - Reduced sampling period:
 - From April to November
 - To May to October
- 2019:
 - Increased FLCC student participation
 - Updated QAPP
 - Data archiving (beginning this spring)
 - Increased profile resolution sampling (2019)

Study Sites



Fallbrook (FB)

Hope Point (HP)

Deep Run (DR)

mid-lake locations

Seneca Point (SP)

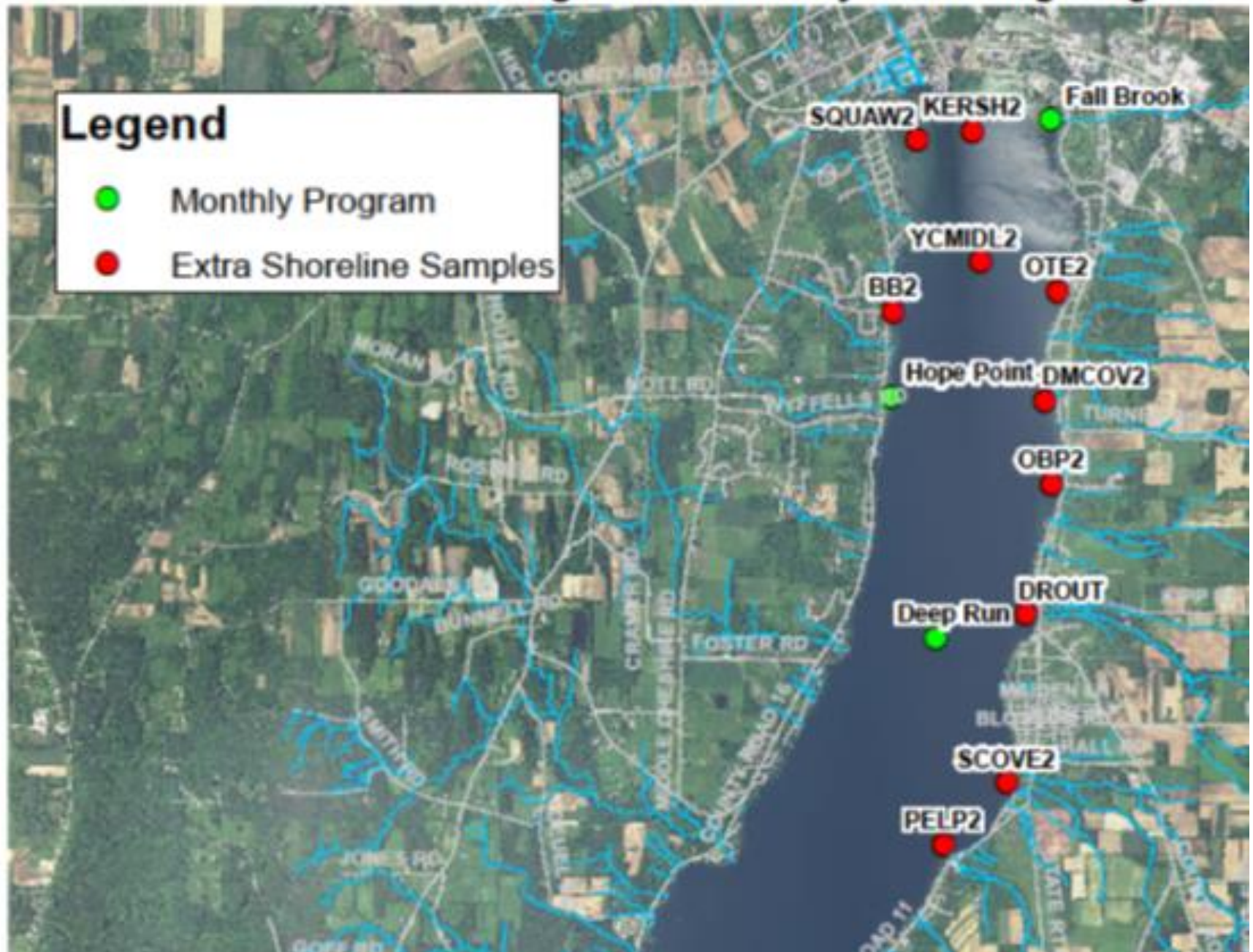
Vine Valley (VV)

West River (WR)

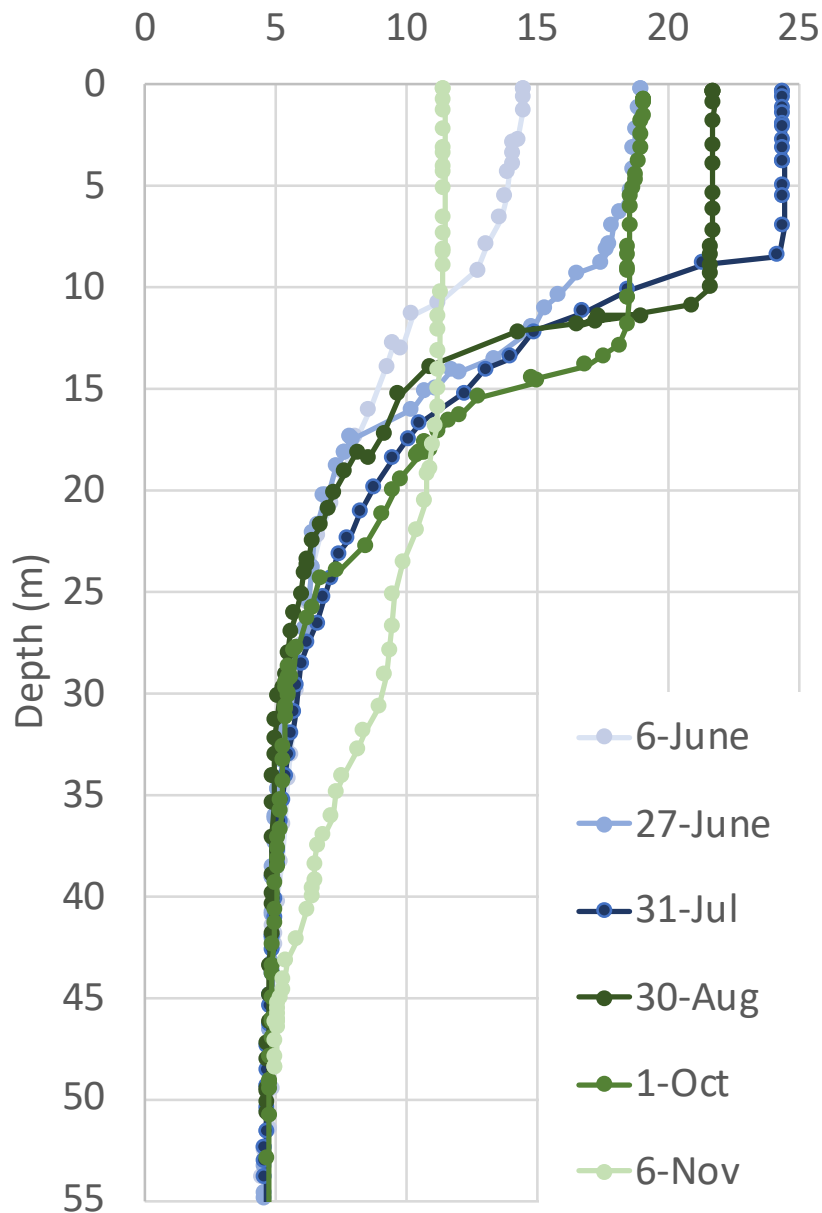
Canandaigua Lake Monthly Monitoring Program

Legend

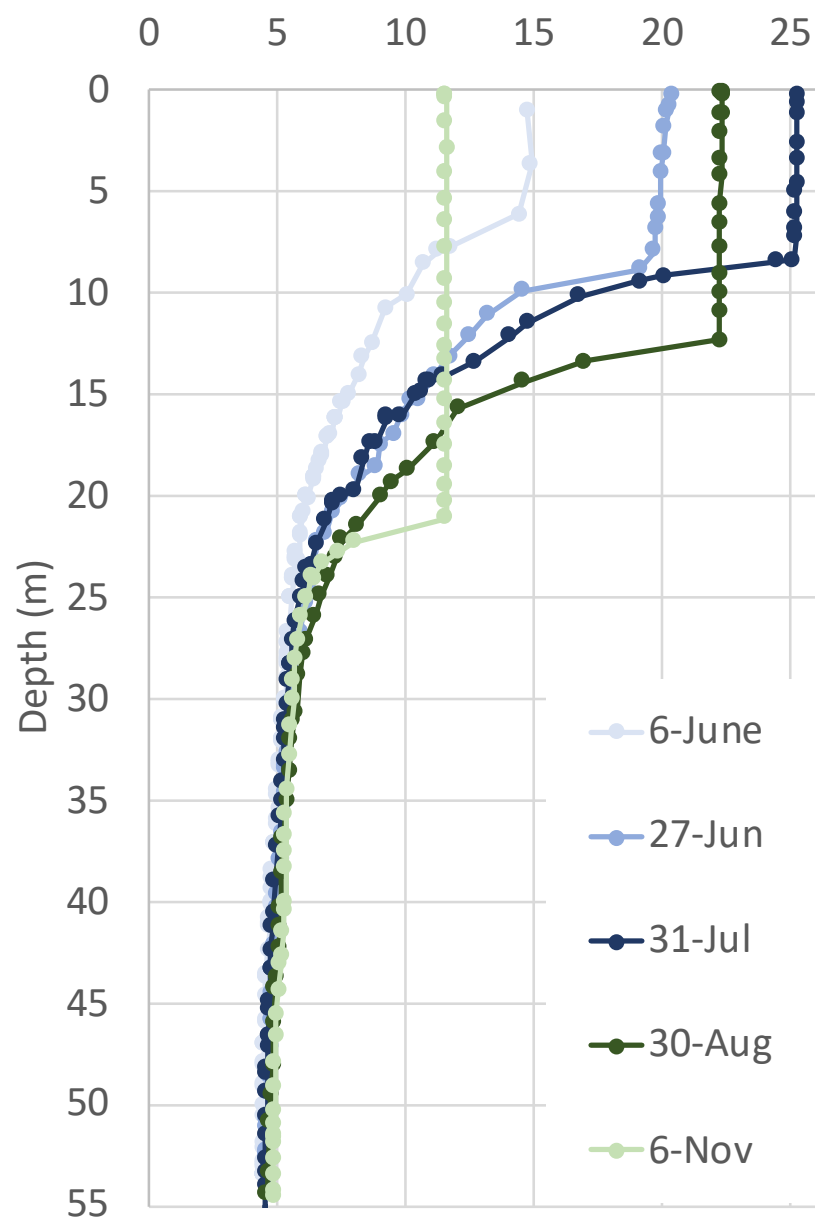
- Monthly Program
- Extra Shoreline Samples



Seneca Point Temp. (°C)

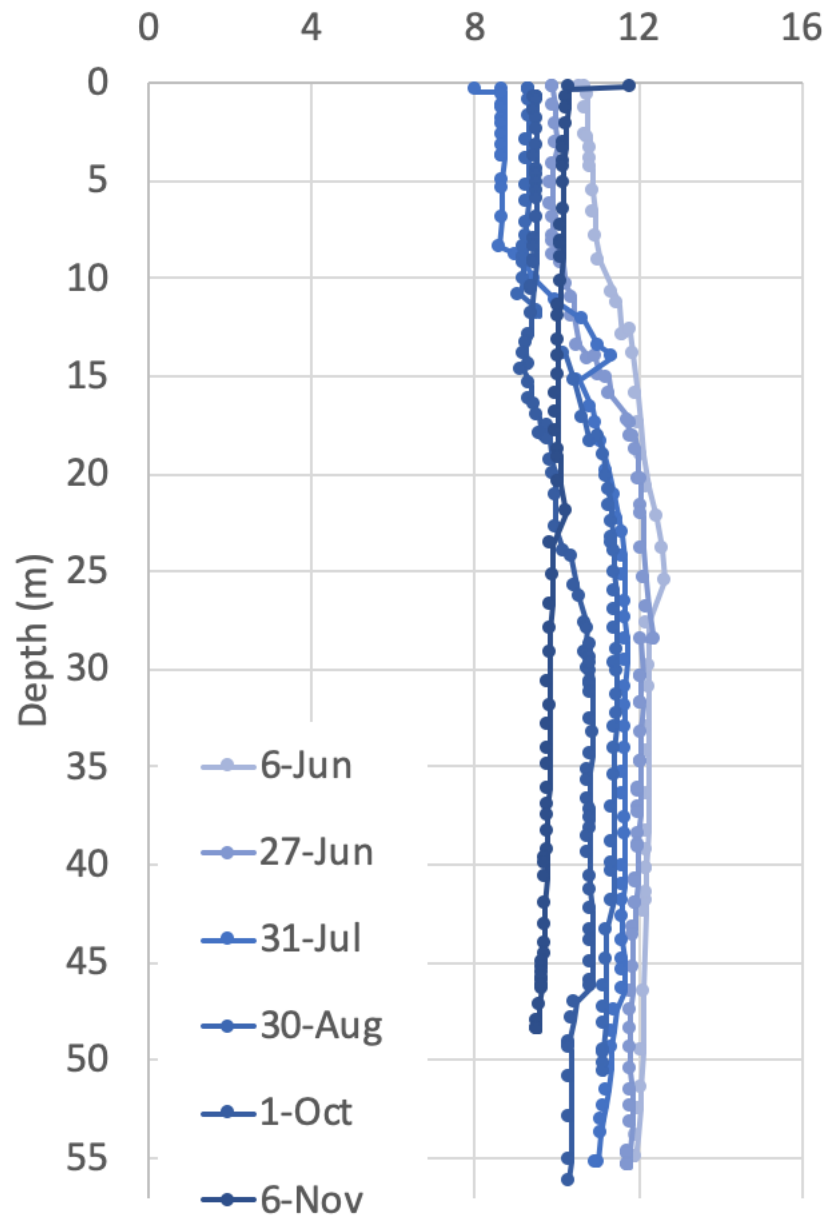


Deep Run Temp. (°C)



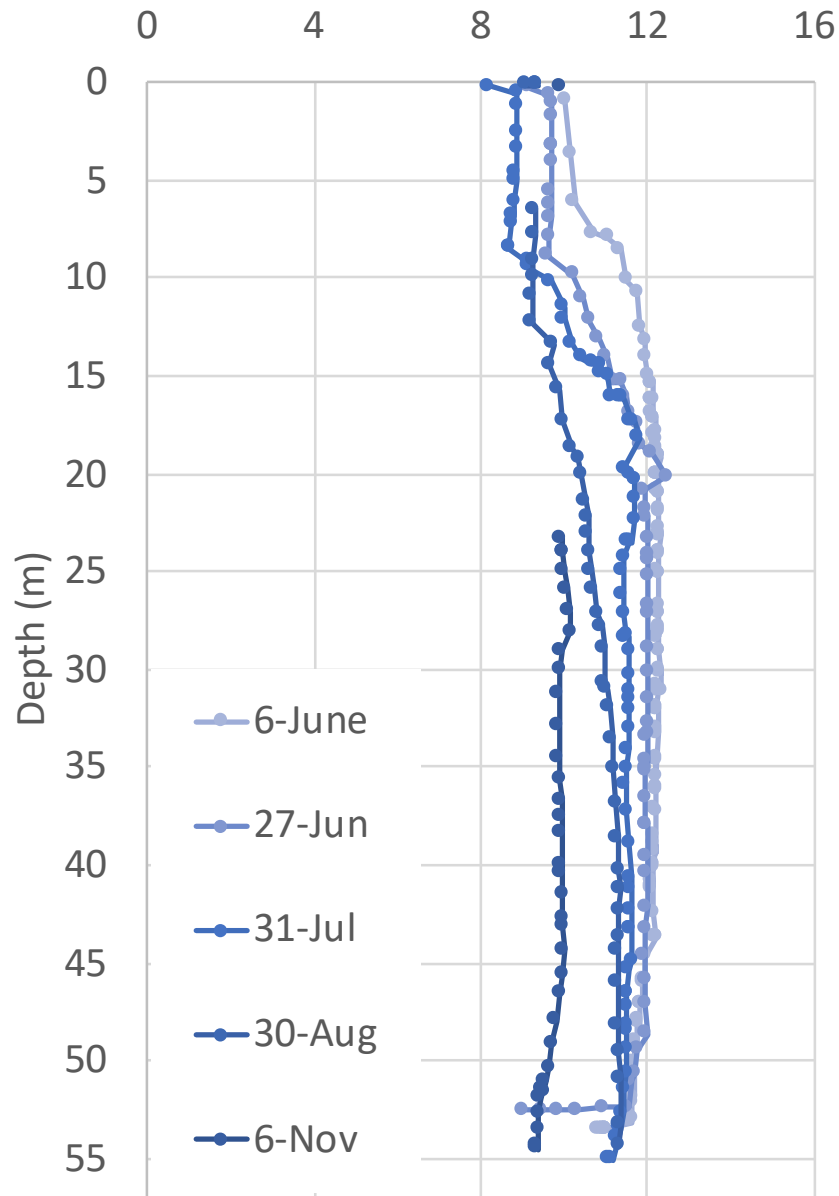
Note: October is missing due to probe failure

Seneca Point D.O. (mg/L)



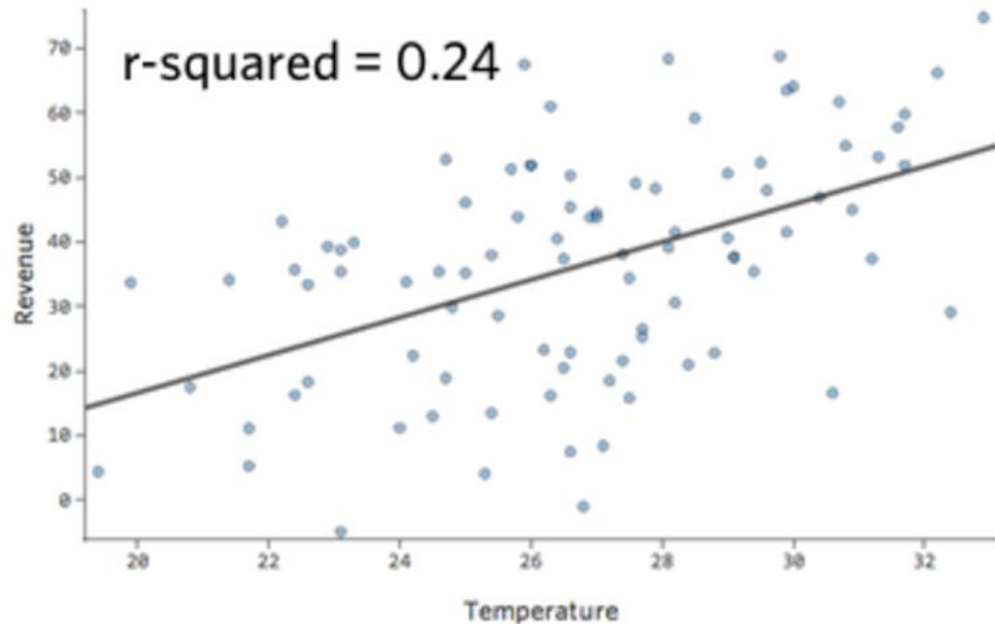
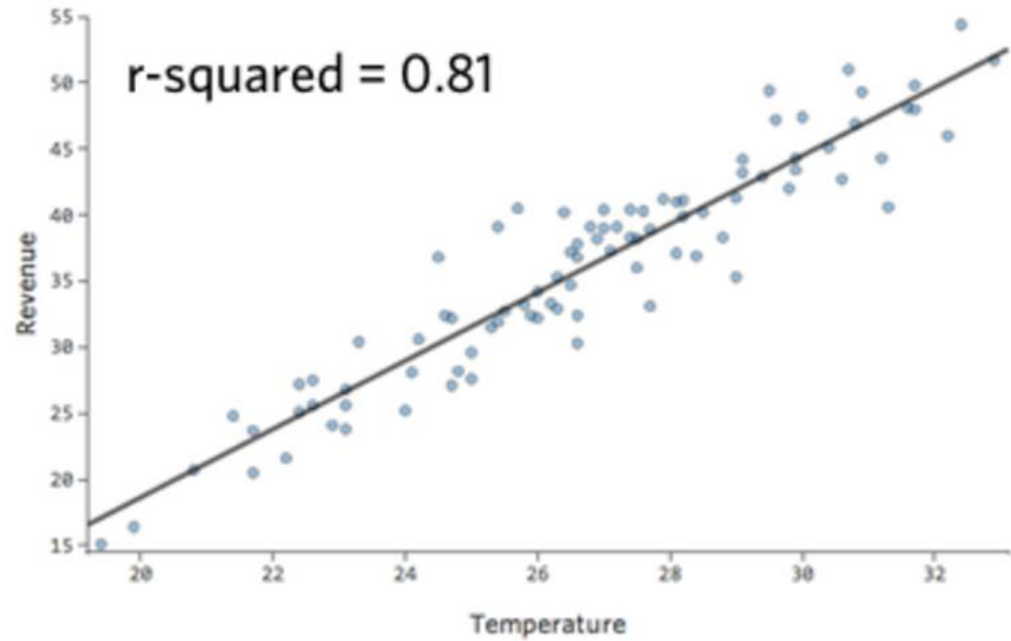
Meter failure on 8/30 at 11, 12 meters

Deep Run Dissolved Oxygen (mg/L)



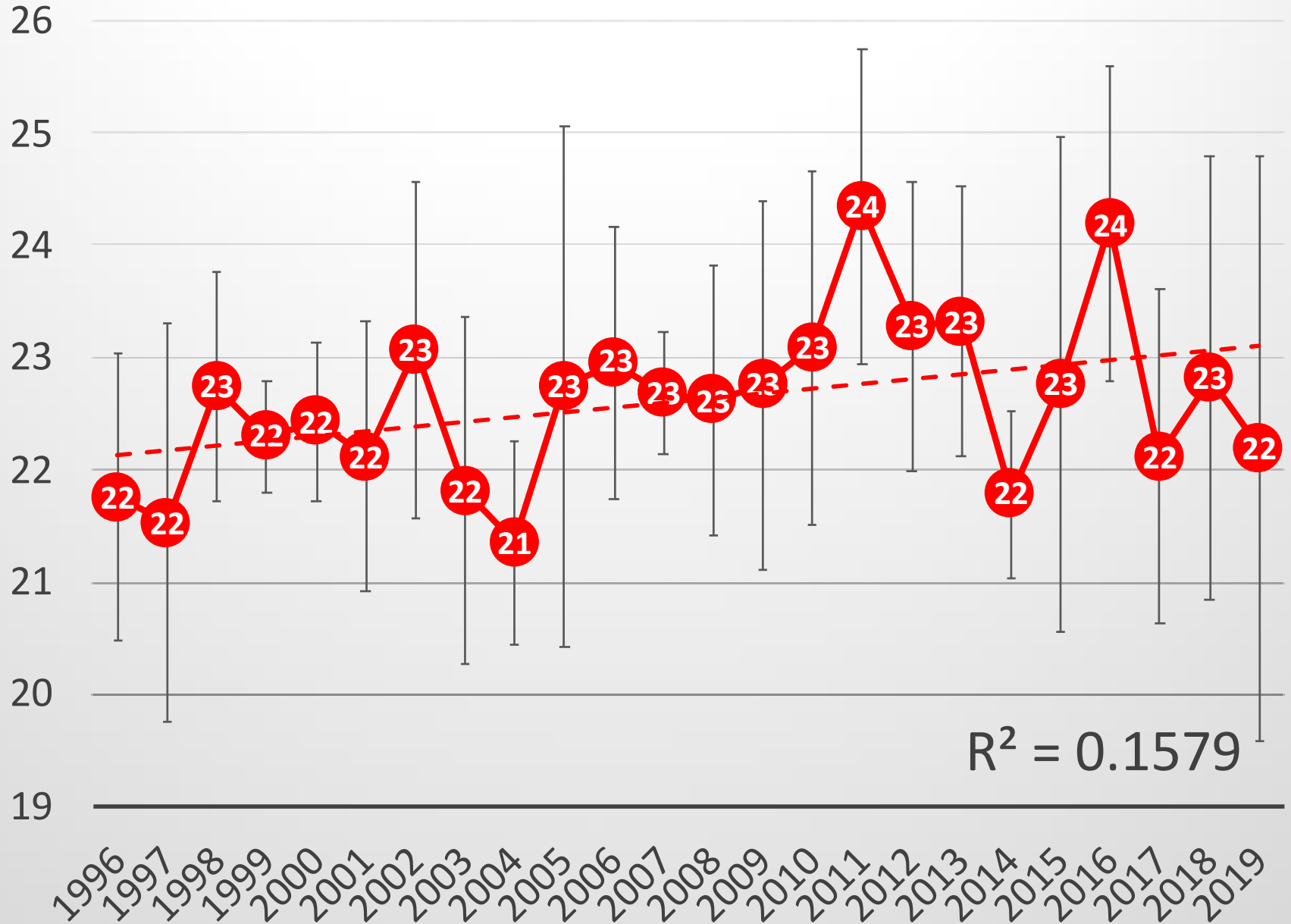
Meter failure on 8/30 at meters 1-6 and 11/6 for meters 0.23 to 22 for D.O.

A word
about
 R^2



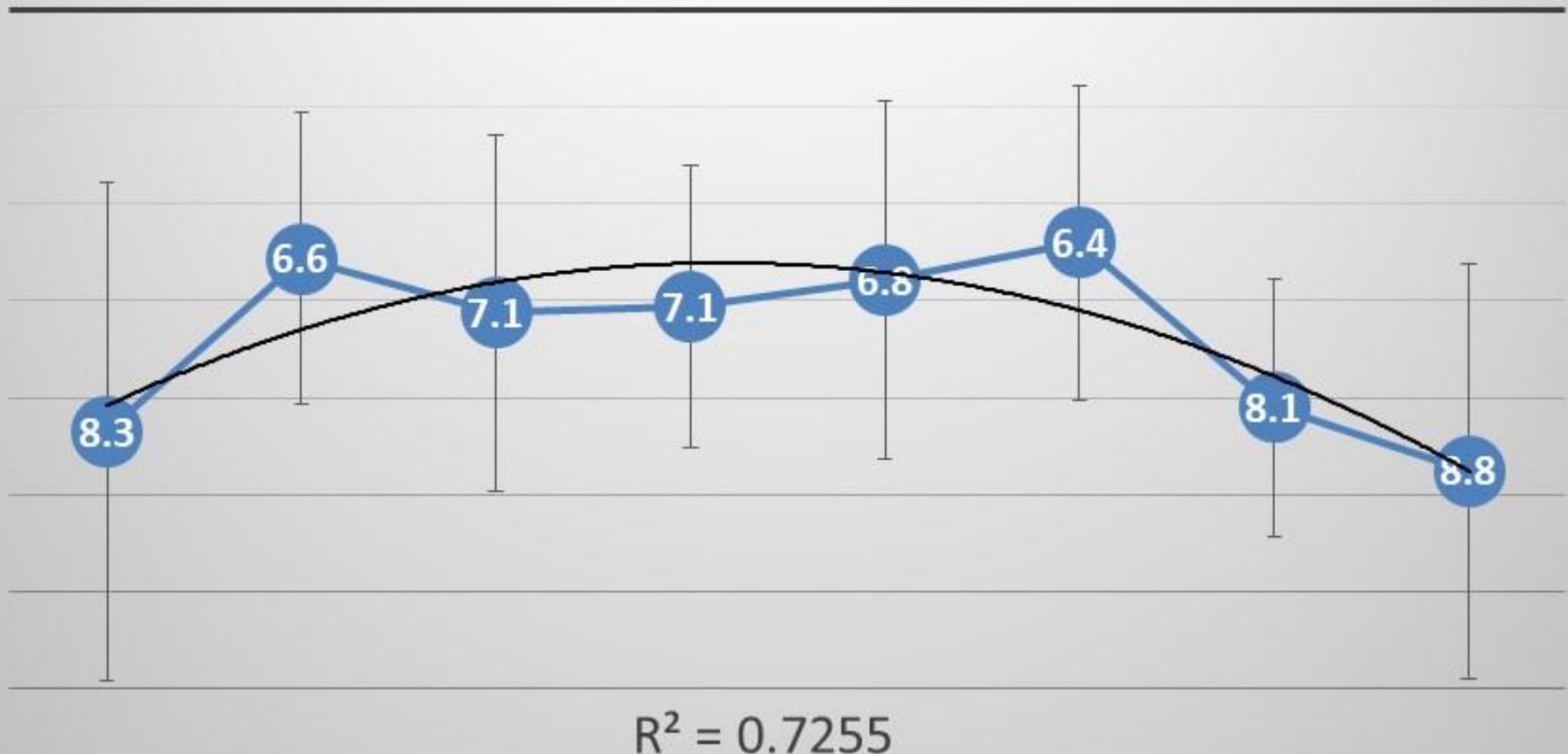
Summer Surface Temperatures (1996 - 2019)

June, July, August Temperature (C°)



Seasonal Mean Lake Clarity (1996-2019)

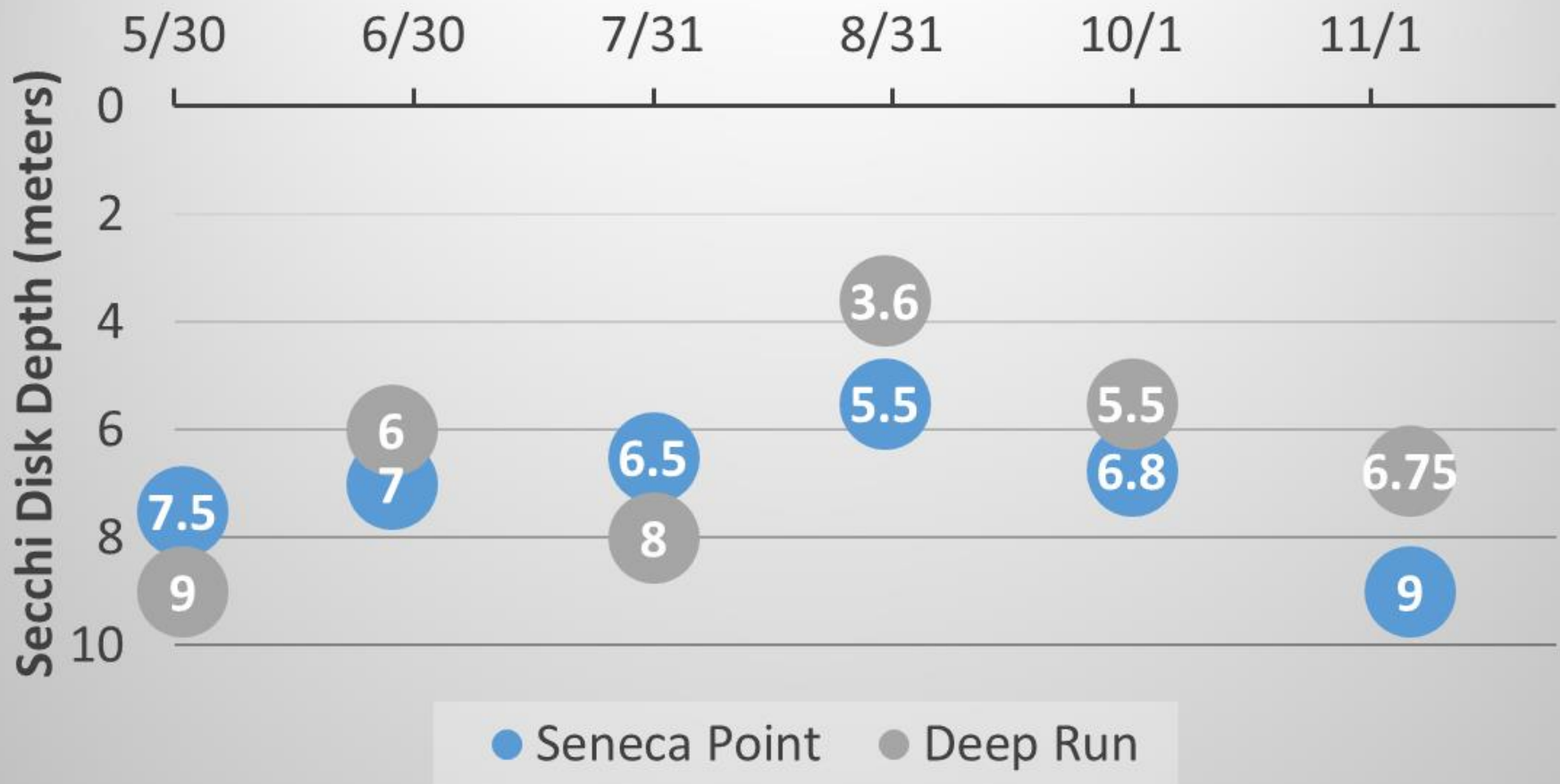
APR MAY JUN JUL AUG SEP OCT NOV



*Note, 2019 April and November data
has not yet been provided by NYS DEC*

Lake Clarity

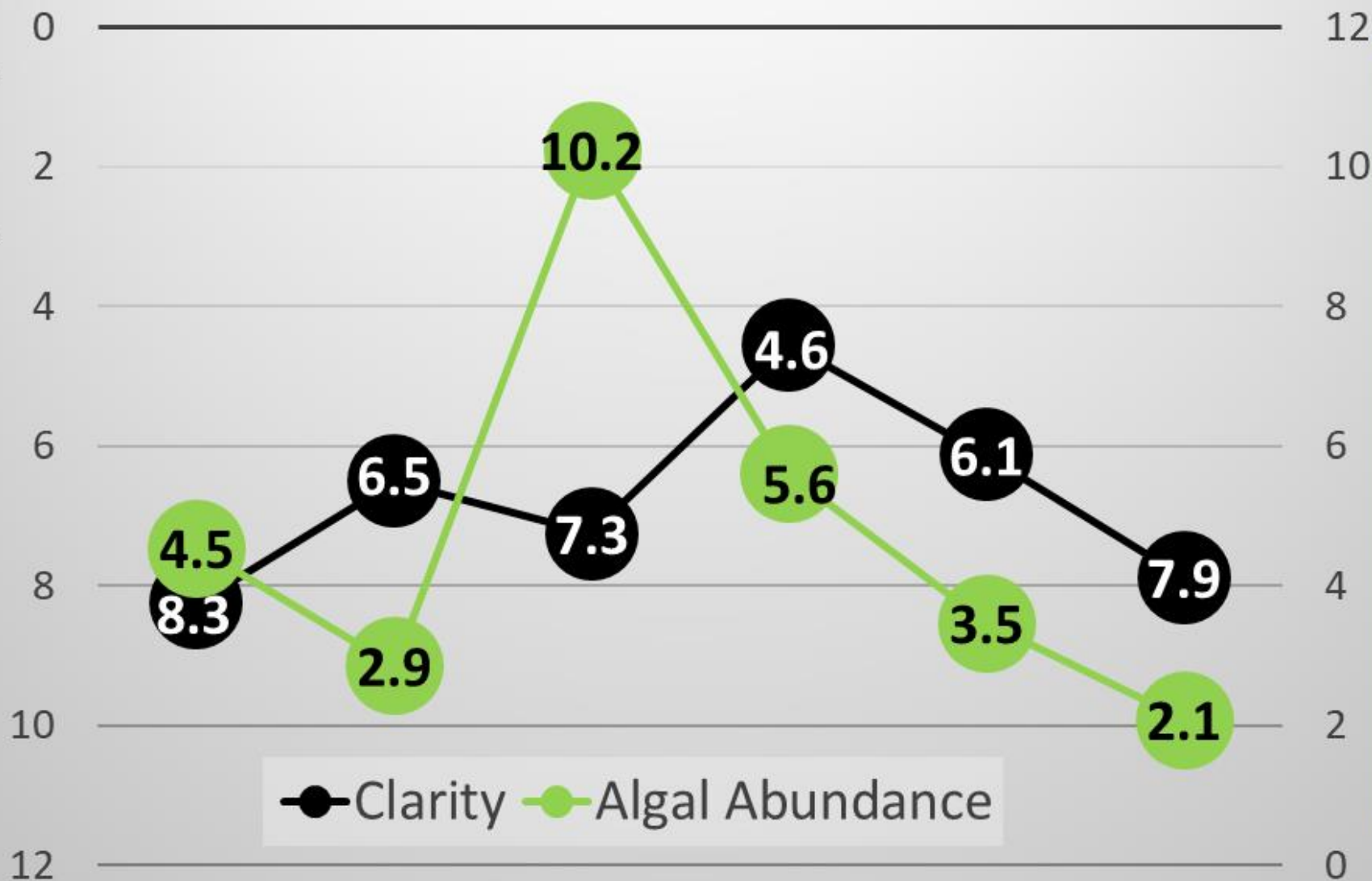
2019 Secchi Disk Measurements (meters)



Clarity versus Algal Abundance (2019)

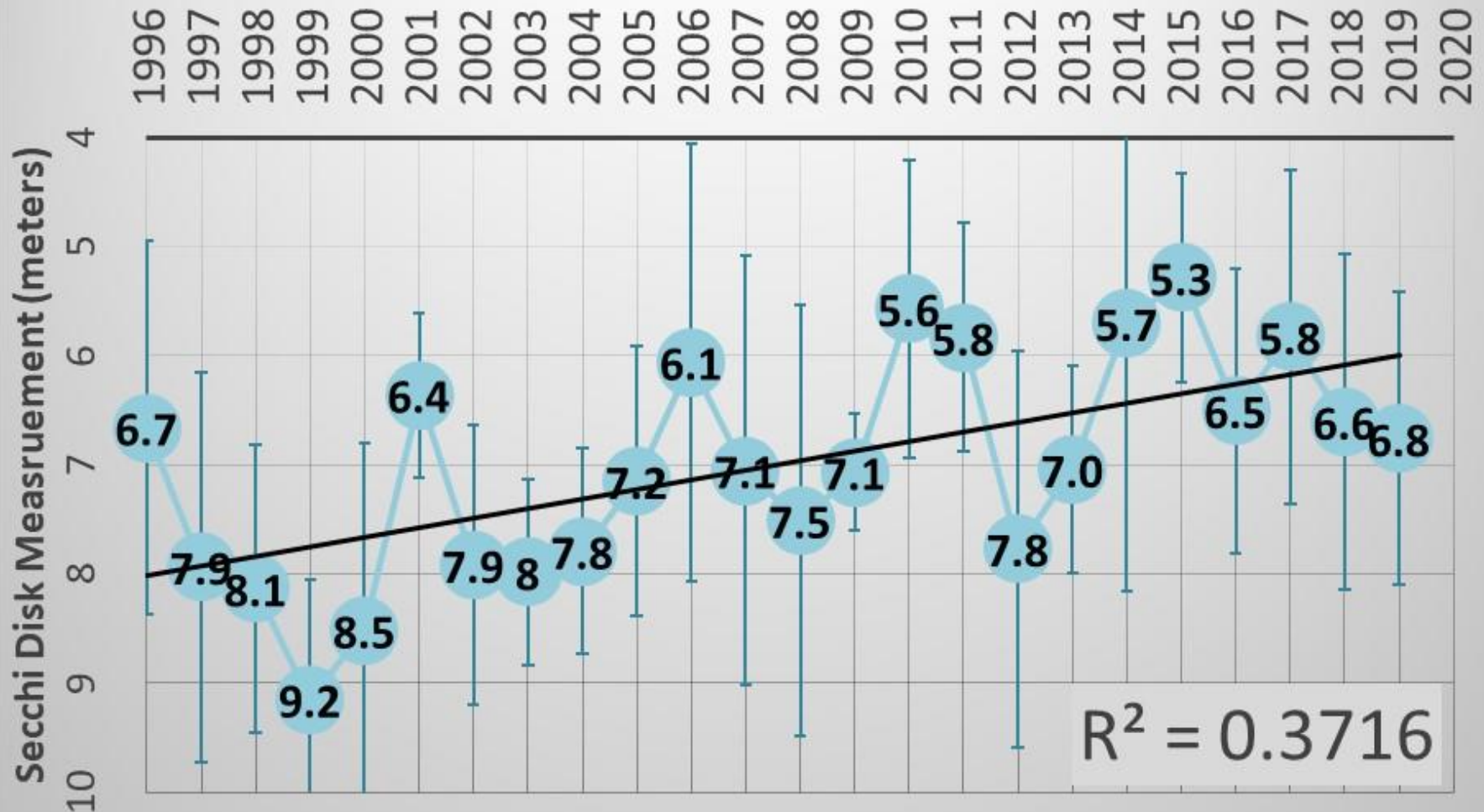
MAY JUN JUL AUG SEP OCT

Secchi Disk Measurement (meters)



Chlorophyll-a Measurements (ug/L)

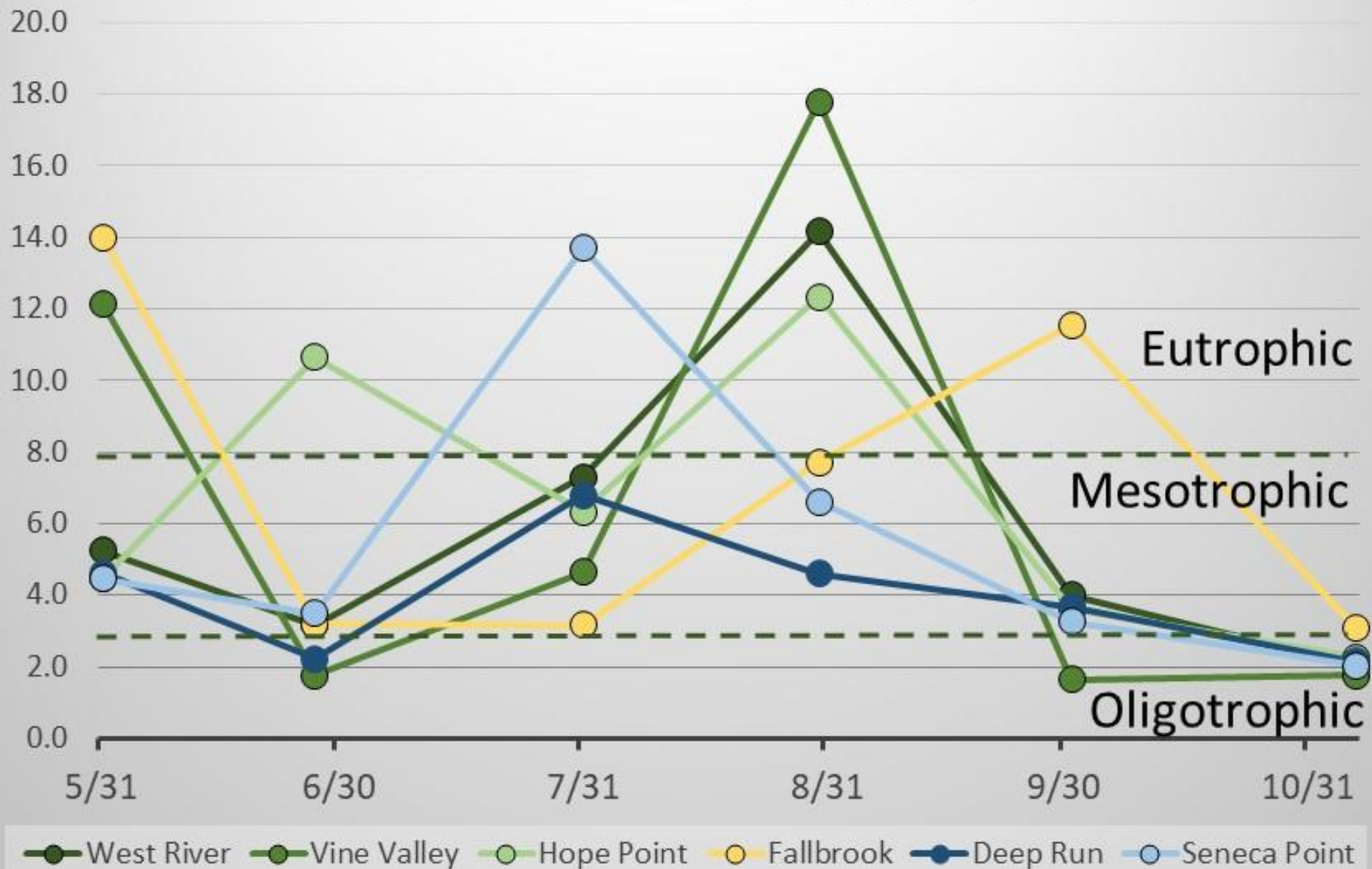
Summer Mean Lake Clarity (1996 - 2019)



Long-term summer average clarity
7.0 m (+/- 1.02)

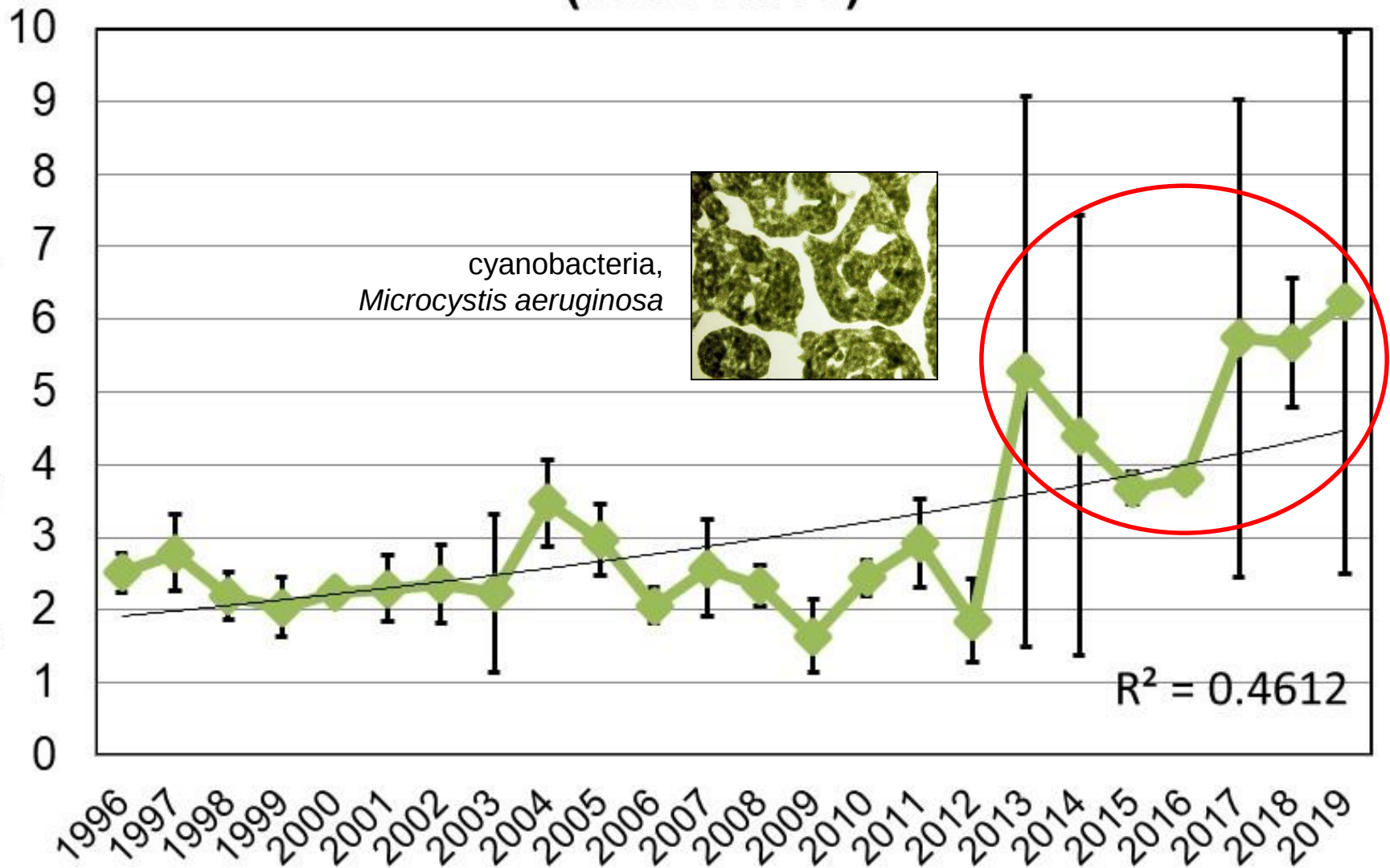
2019 Seasonal Algal Abundance

Chlorophyll-a (ug/L)



Long-term Summer Mean Algal Abundance (1996-2019)

June, July, August Mean Chlorophyll *a*
(micrograms/liter)



What affects algal abundance?

Nutrients – managing nutrients is complicated! It requires monitoring external loading of phosphorus and nitrogen, and total concentrations in the lake.

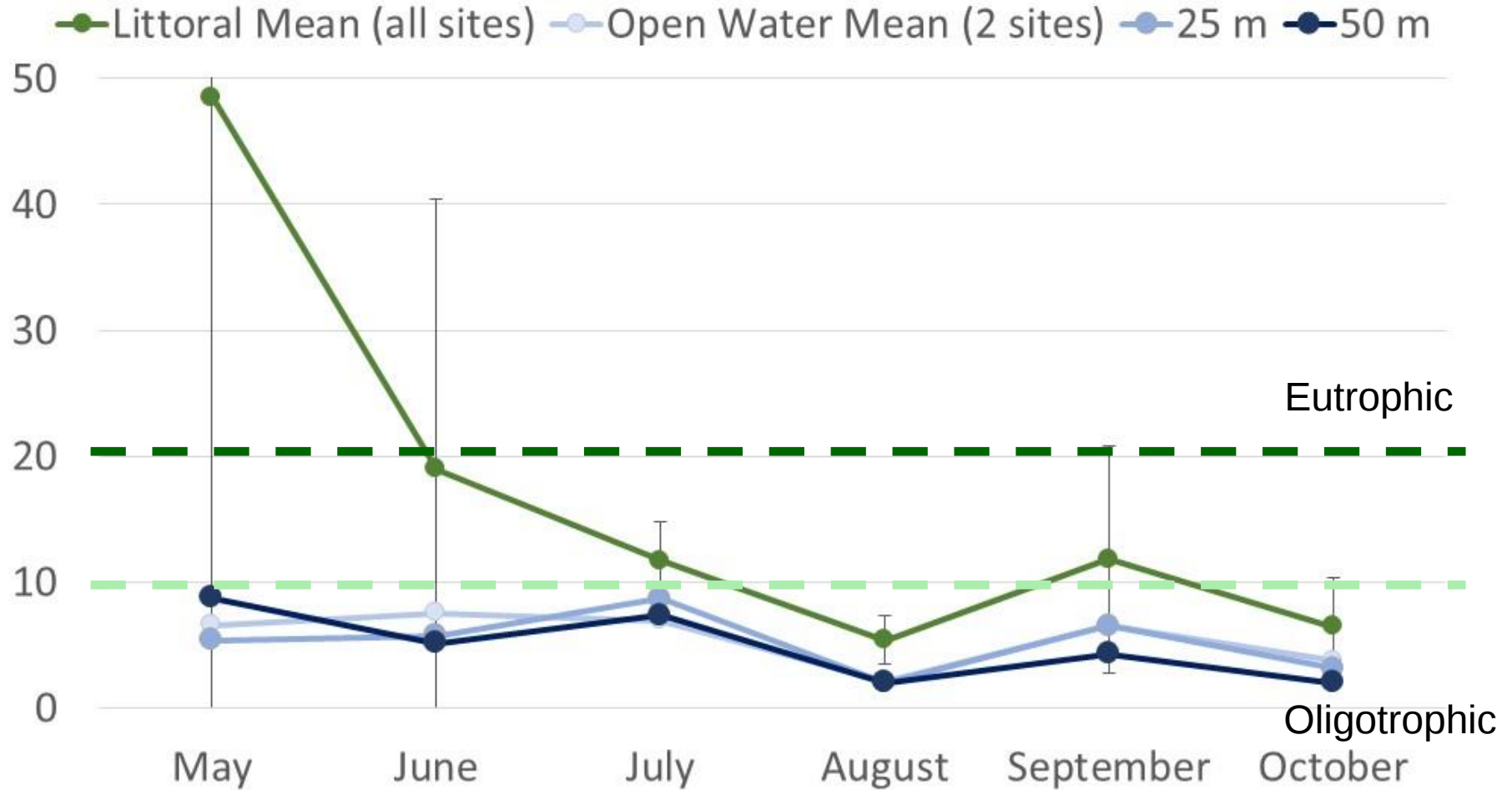
- Some sources of nutrients are “easily” managed
 - Effective watershed regulations may reduce external loading
- Other sources of nutrients “require higher levels of resource commitment and restoration/enhancement activities”
 - Intense storm events produce locally high nutrient runoff, leading to sub-watershed storm water management projects
- The impact of biologically-bound phosphorus affects the concentrations detected in the lake
 - Changing role of invasive quagga and zebra mussels living in the benthic zone of the lake



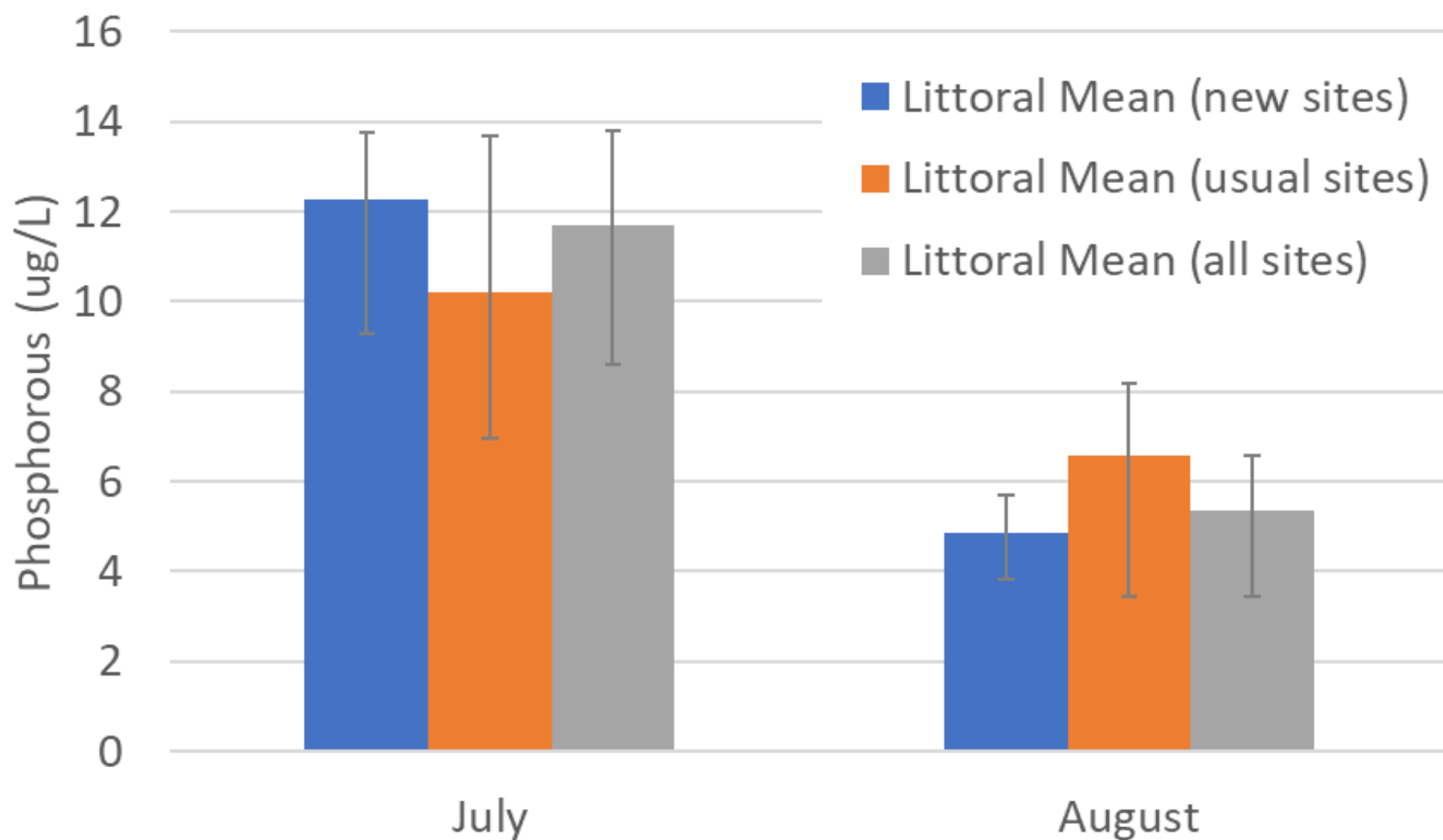
Total Phosphorous

- Includes ortho-phosphate and the phosphorus in suspended plant and animal fragments
- New York State's trophic assessments
 - Eutrophic: total phosphorus readings exceeded 20 ug/l
 - Mesotrophic: between the two categories
 - Oligotrophic: total phosphorus readings below 10 ug/l

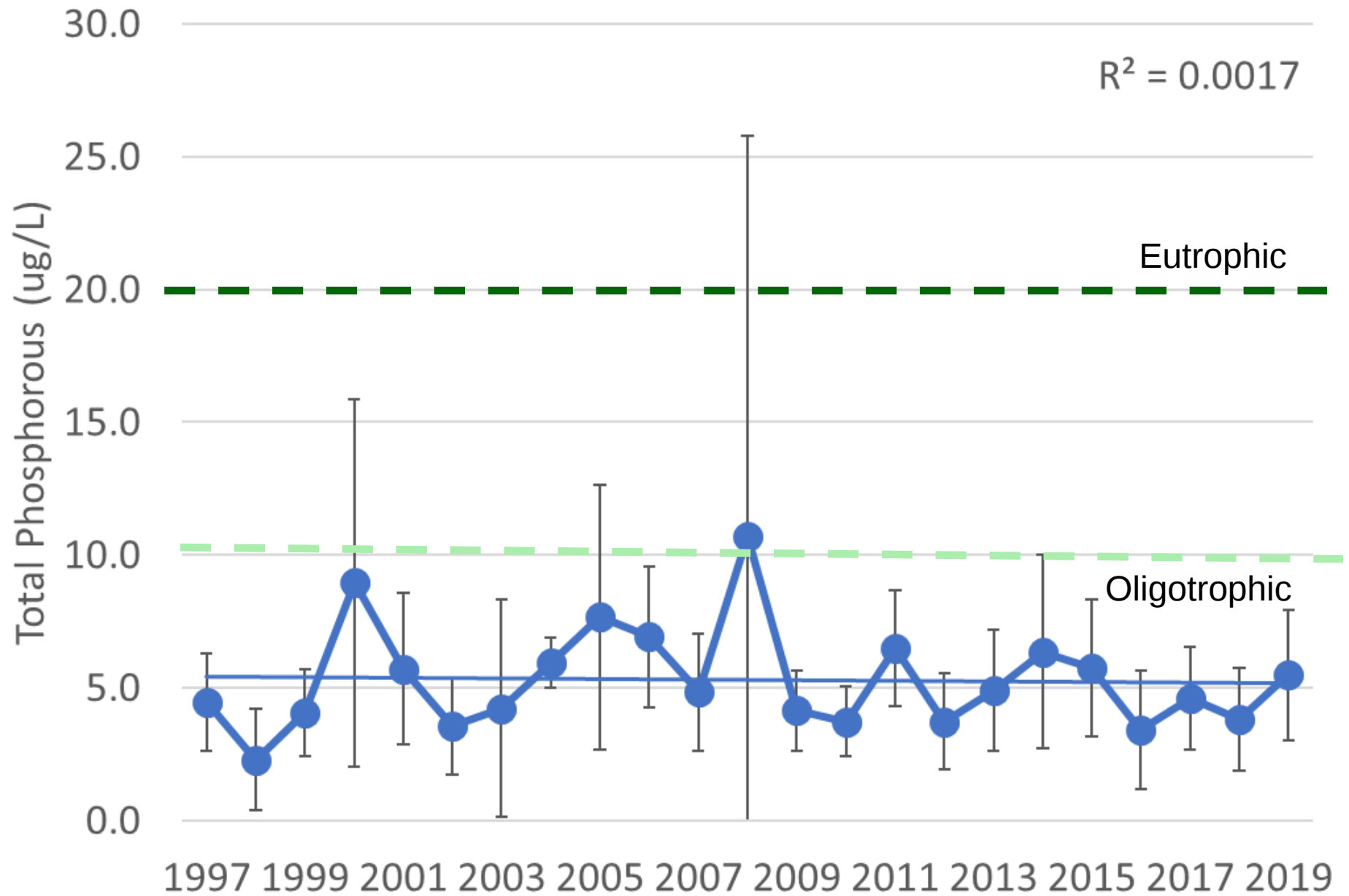
2019 Total Phosphorus (ug/L)



Comparison of "Usual" versus "Extra" Sites for Total Phosphorous (ug/L)

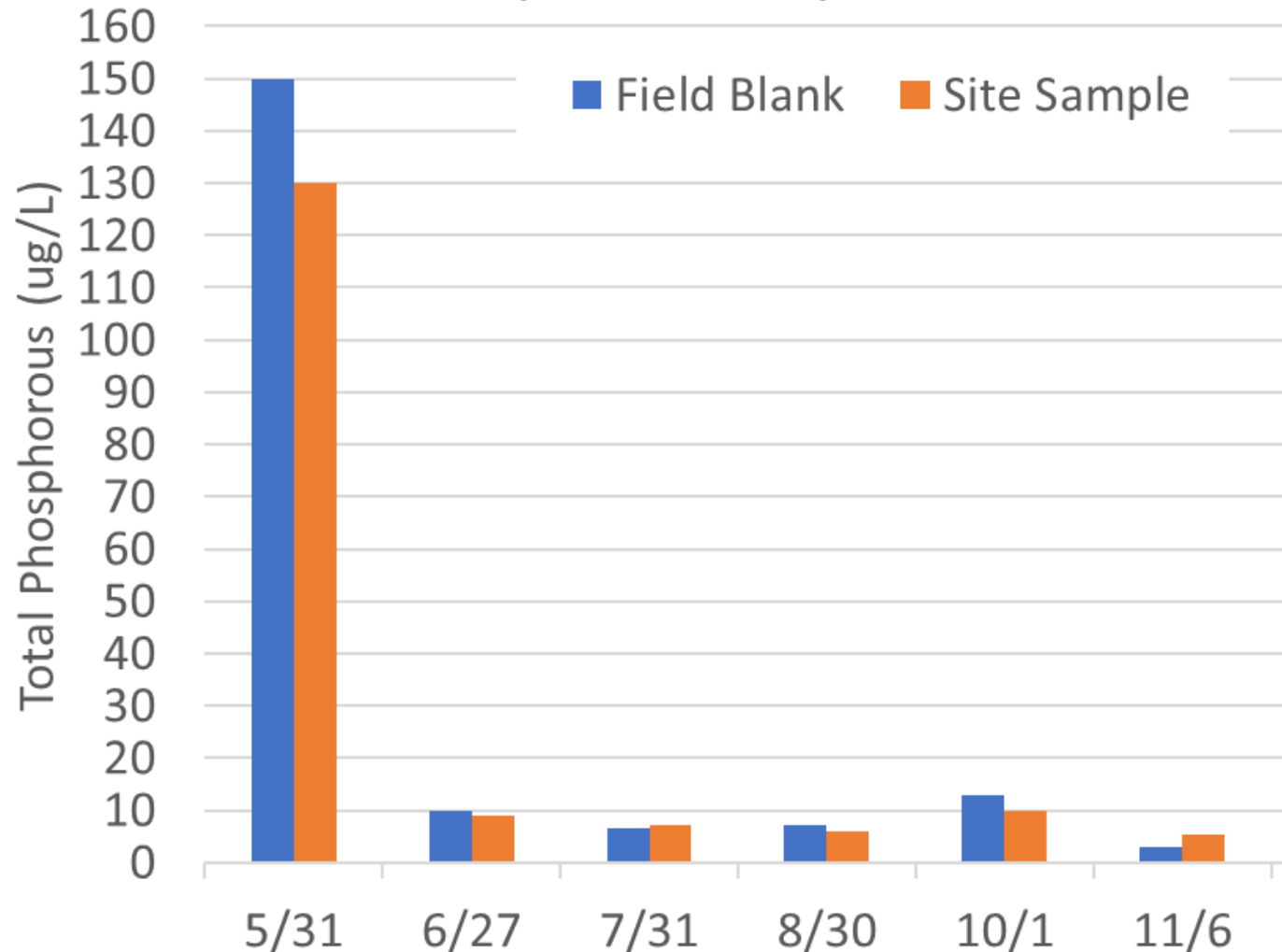


Mean TP (ug/L) May to October at Deep Run (2 m)



QAQC results

Field Duplicate Comparison 2019



Thank you! Questions?

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