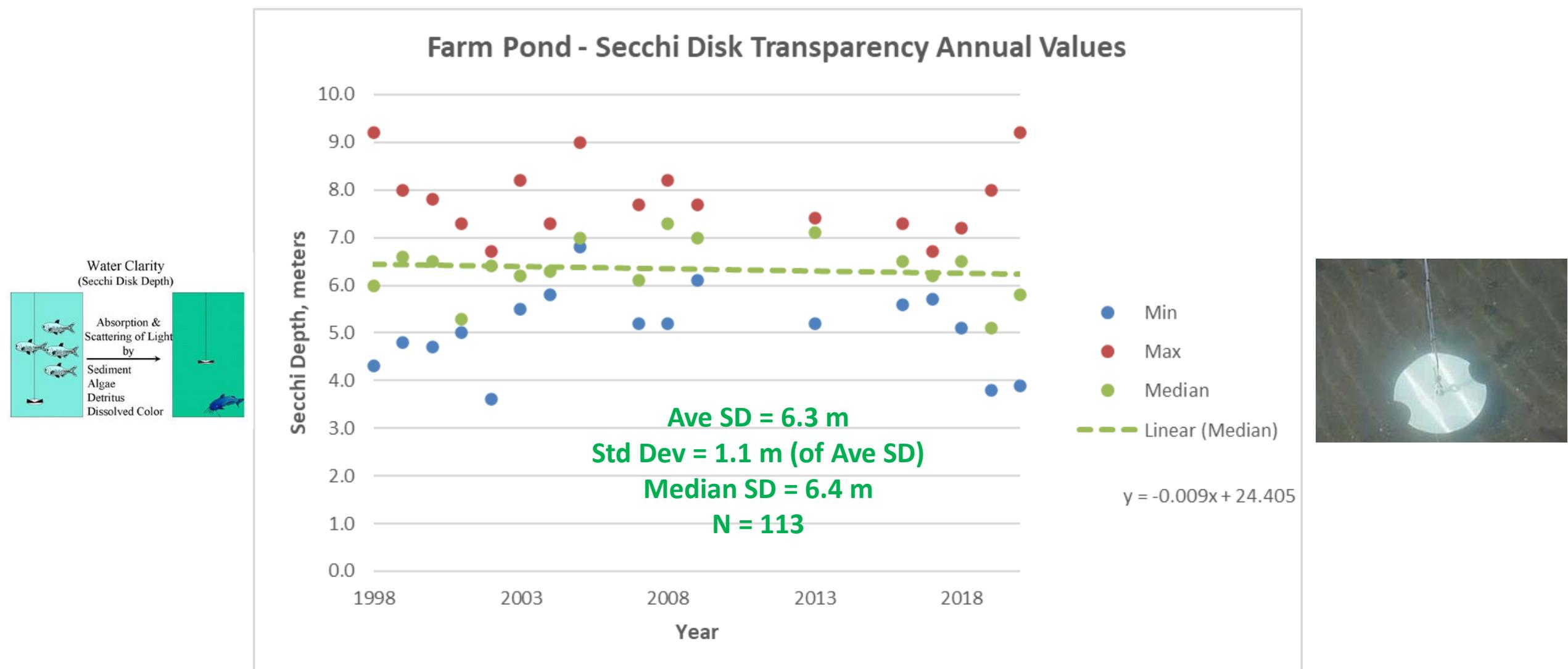


Farm Pond Volunteer Water Quality Monitoring Program, 1998 - 2020

Annual Data Report Summary

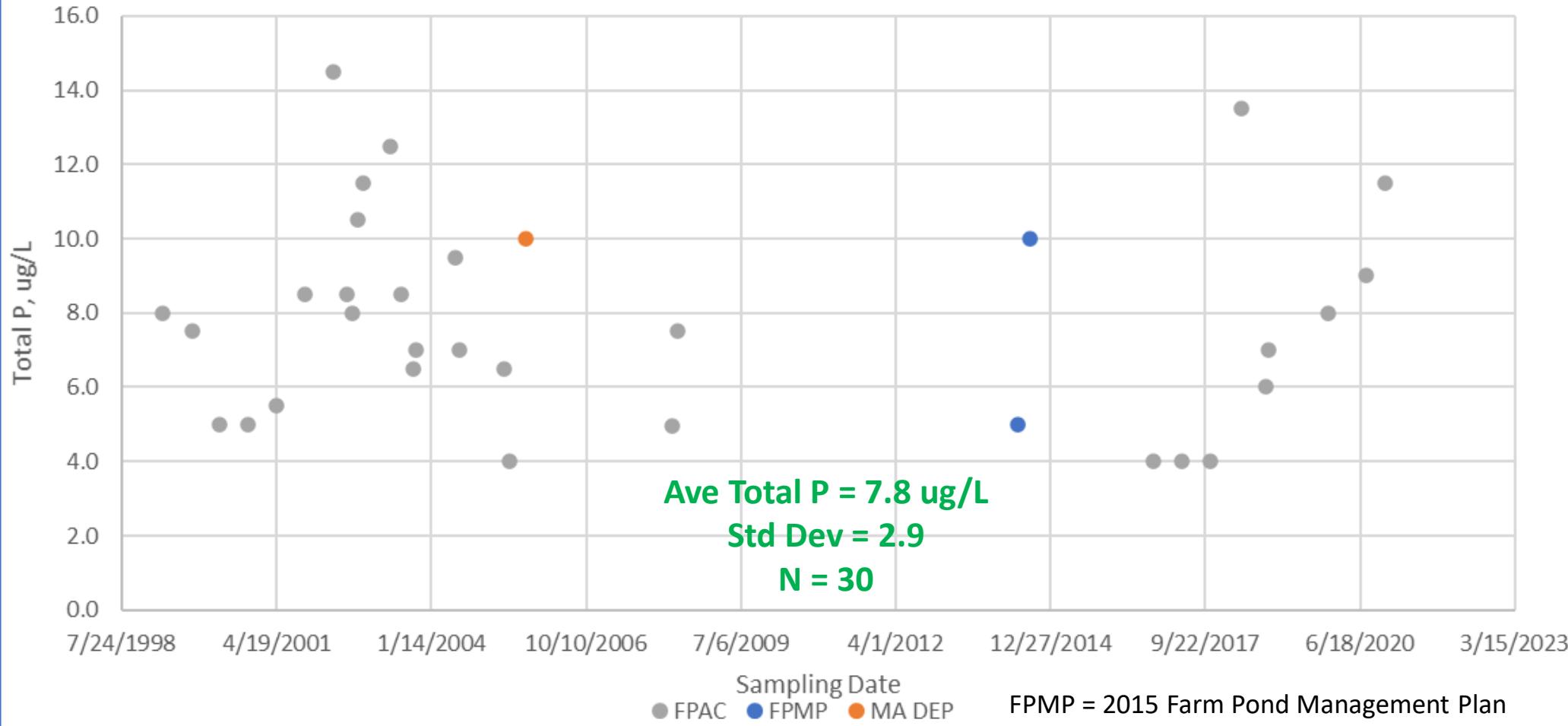
2/23/21

Plot of Farm Pond annual min, max, and median Secchi Disk (SD) values, 1998 to 2020



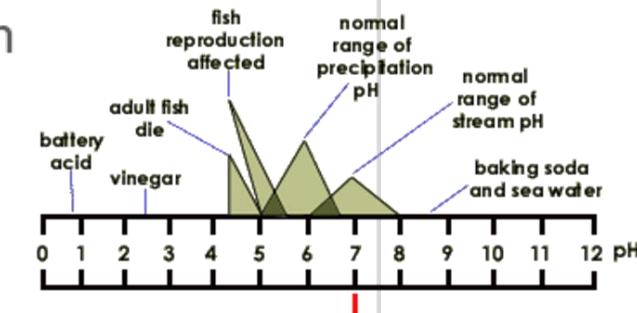
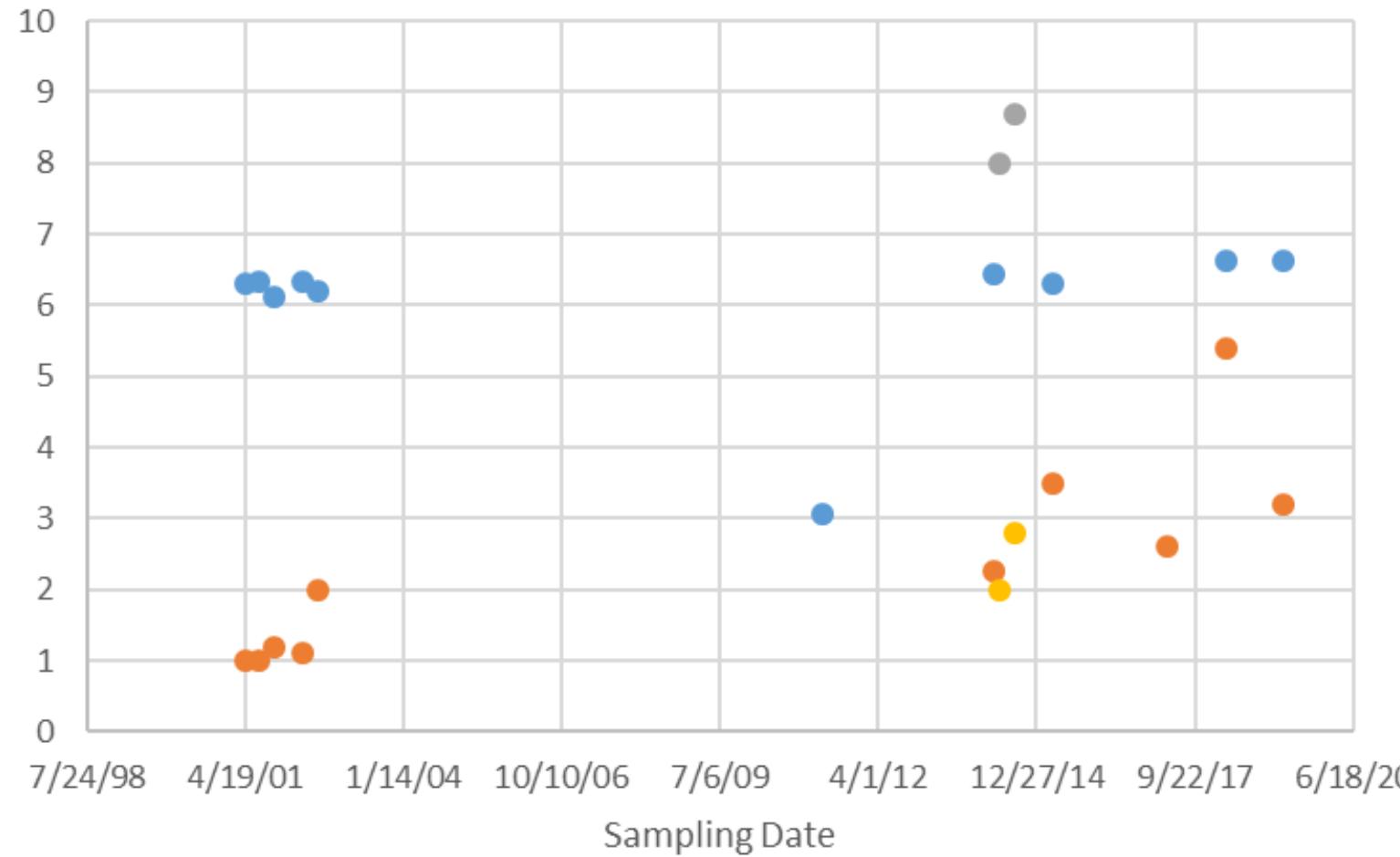
Note: Trend line of SD median values is now on a slight negative trend, but water clarity near constant over last 22 years).

Farm Pond - Total Phosphorus, ug/L - 1999 to 2020



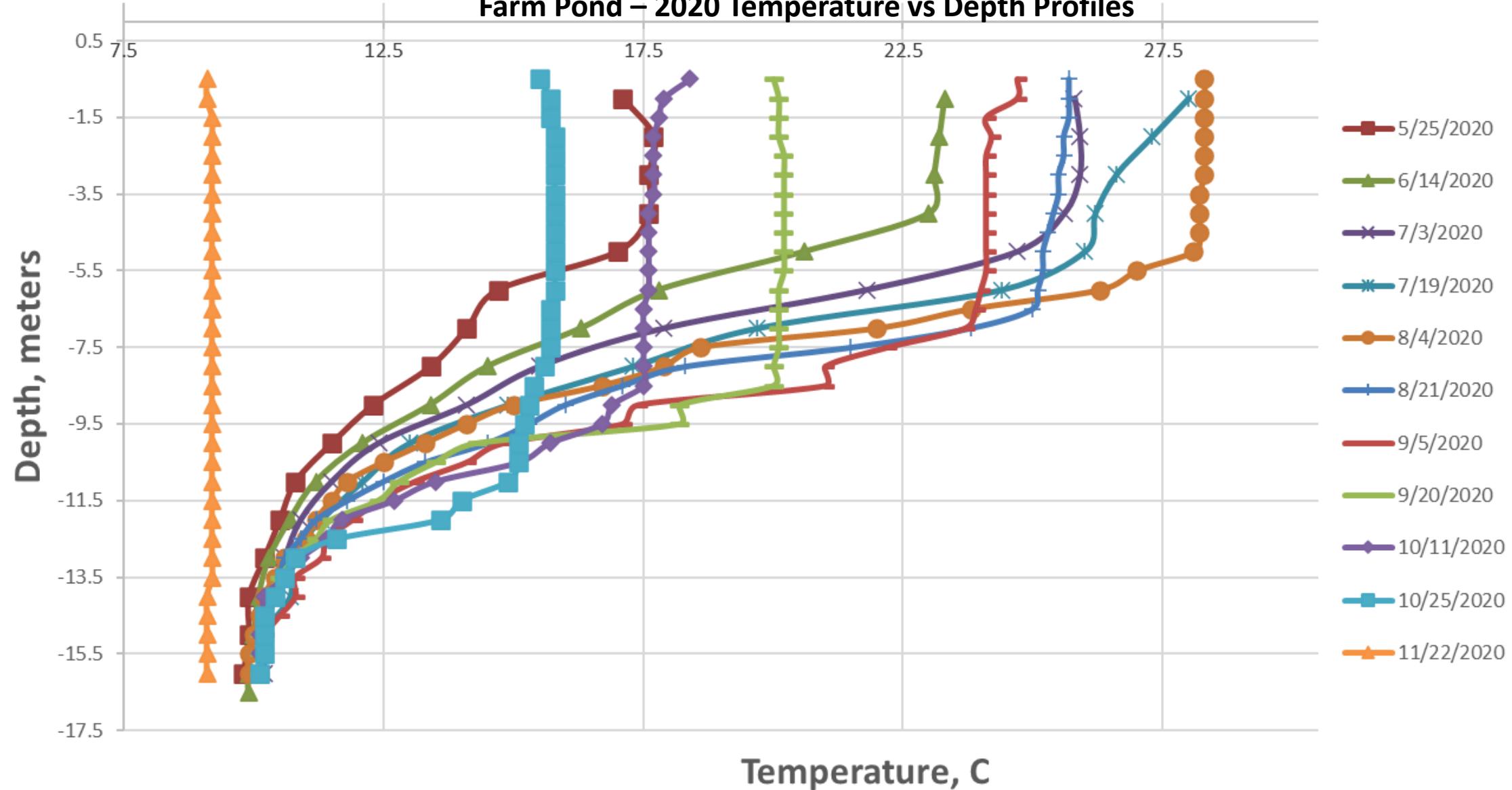
Samples taken at 0.5 M depth; FPAC samples analysed by UMASS WRRC; Ave Total P calculated for FPAC samples only. Note: for samples exhibiting results < method detection limits a value of $\frac{1}{2}$ the detection limit was substituted (not "zero") for graph and for calculations of average and std dev. For FPAC values method det limit (UMASS WRRC) was < 8.0 ug/L for most years.

Farm Pond - UMASS Acid Rain Monitoring Program



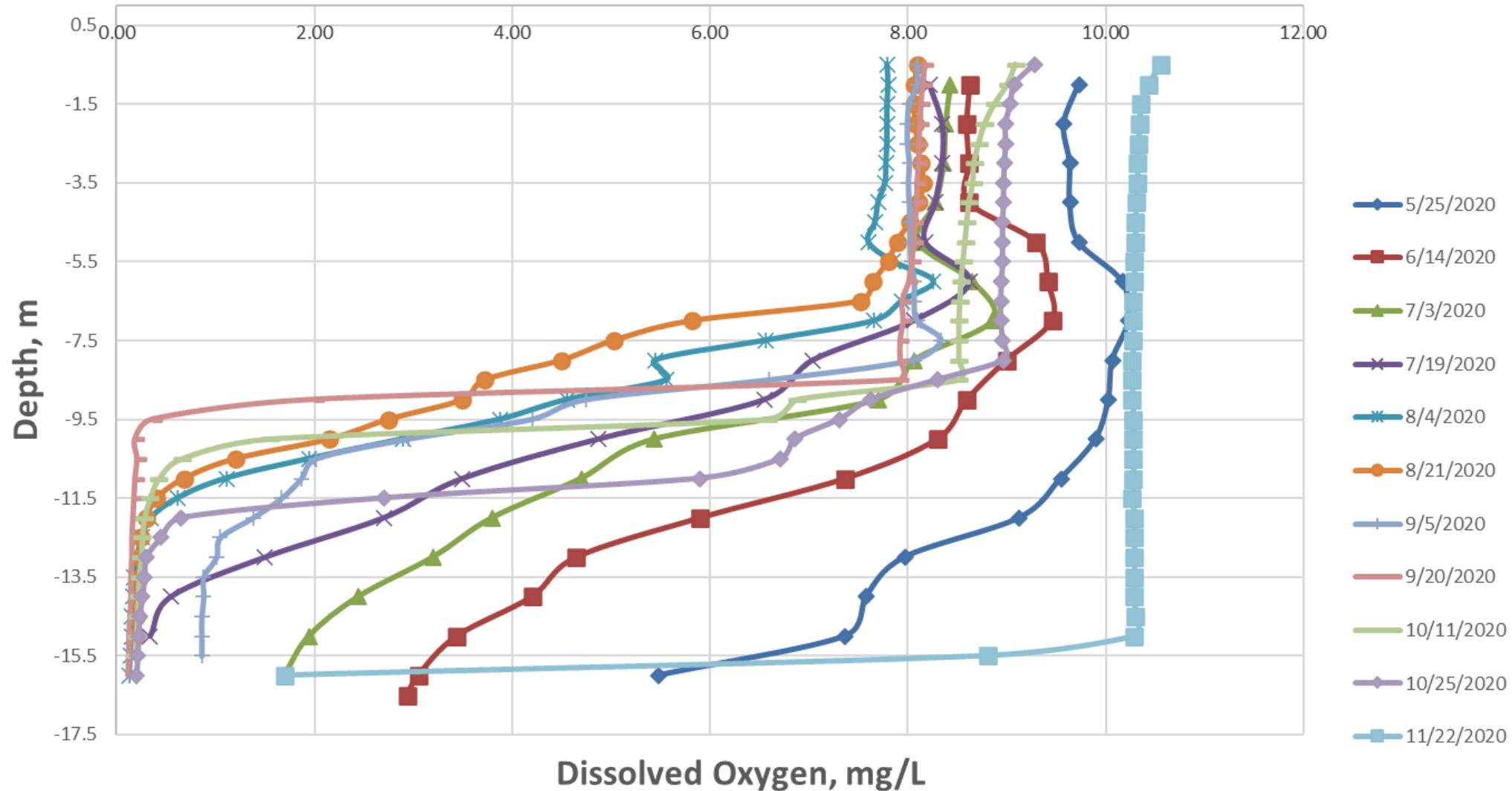
ARM – data from UMASS ARM project; FPMP – data from 2015 Farm Pond Management Plan. No ARM sampling in 2020 due to COVID-19.

Farm Pond – 2020 Temperature vs Depth Profiles



Note: Starting on 8/4/20 changed to 0.5 m data collection intervals from original 1.0 m intervals.

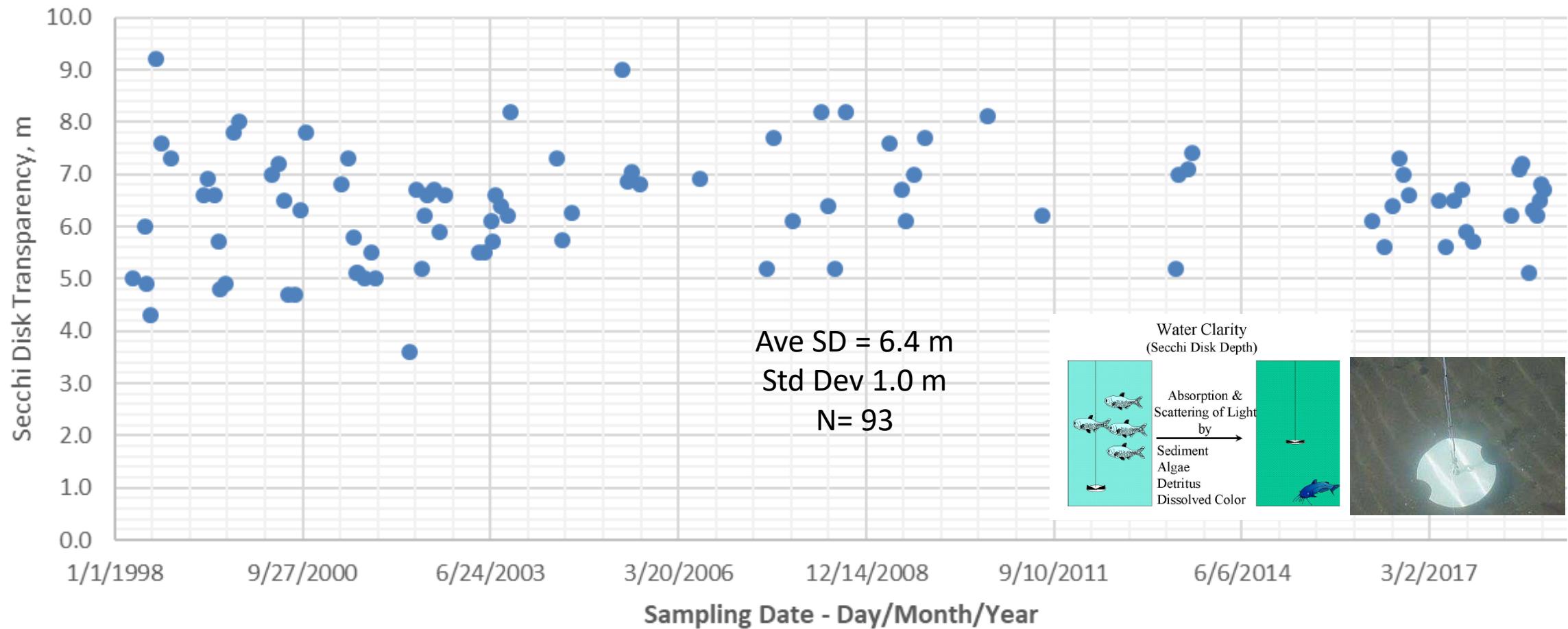
Farm Pond - 2020 Dissolved Oxygen vs Depth Profiles



Note: Starting on 8/4/20 changed to 0.5 m data collection intervals from original 1.0 m intervals.

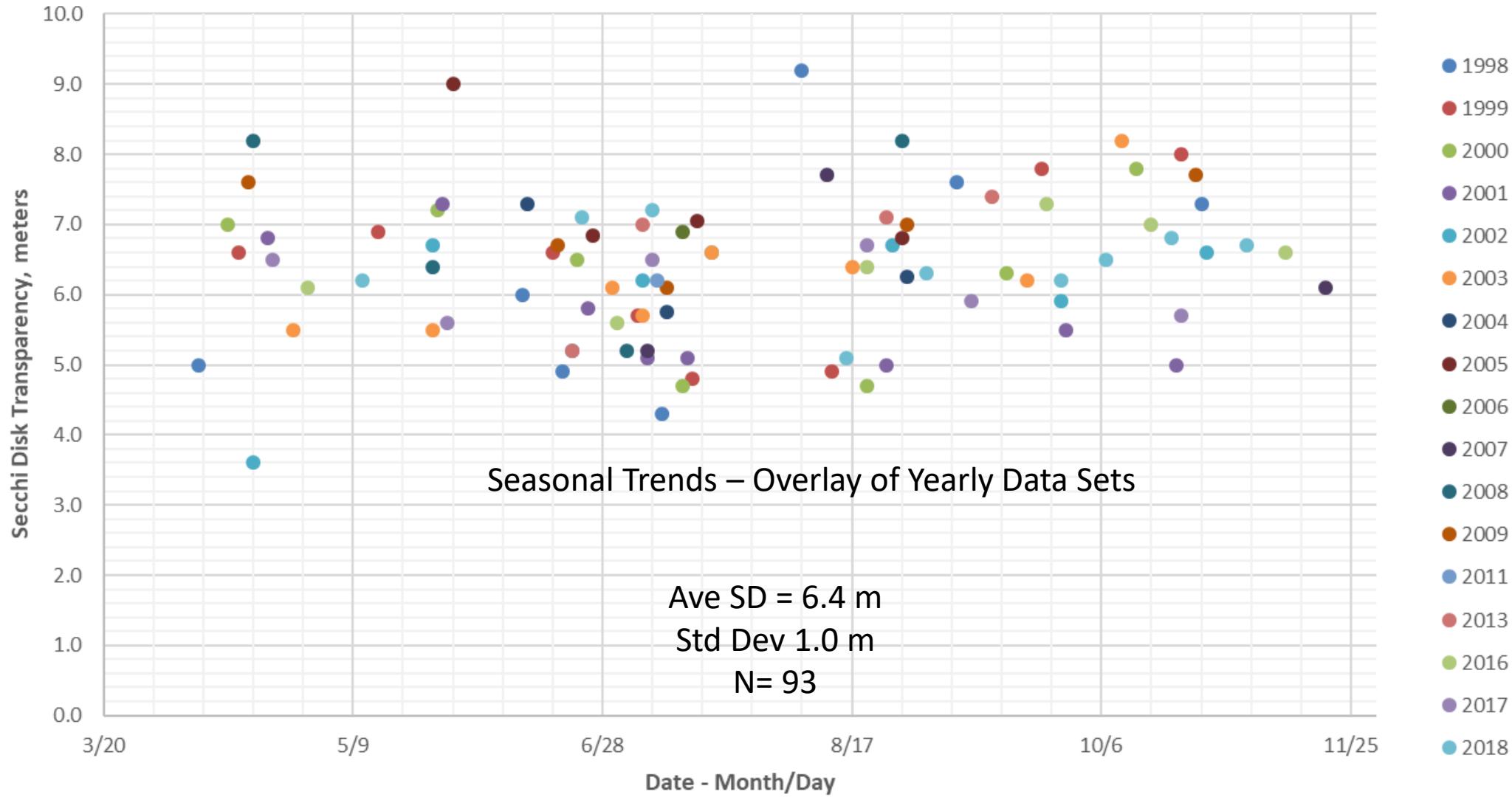
Recent Past Years Results:

Farm Pond 1998-2018 Secchi Disk Transparency



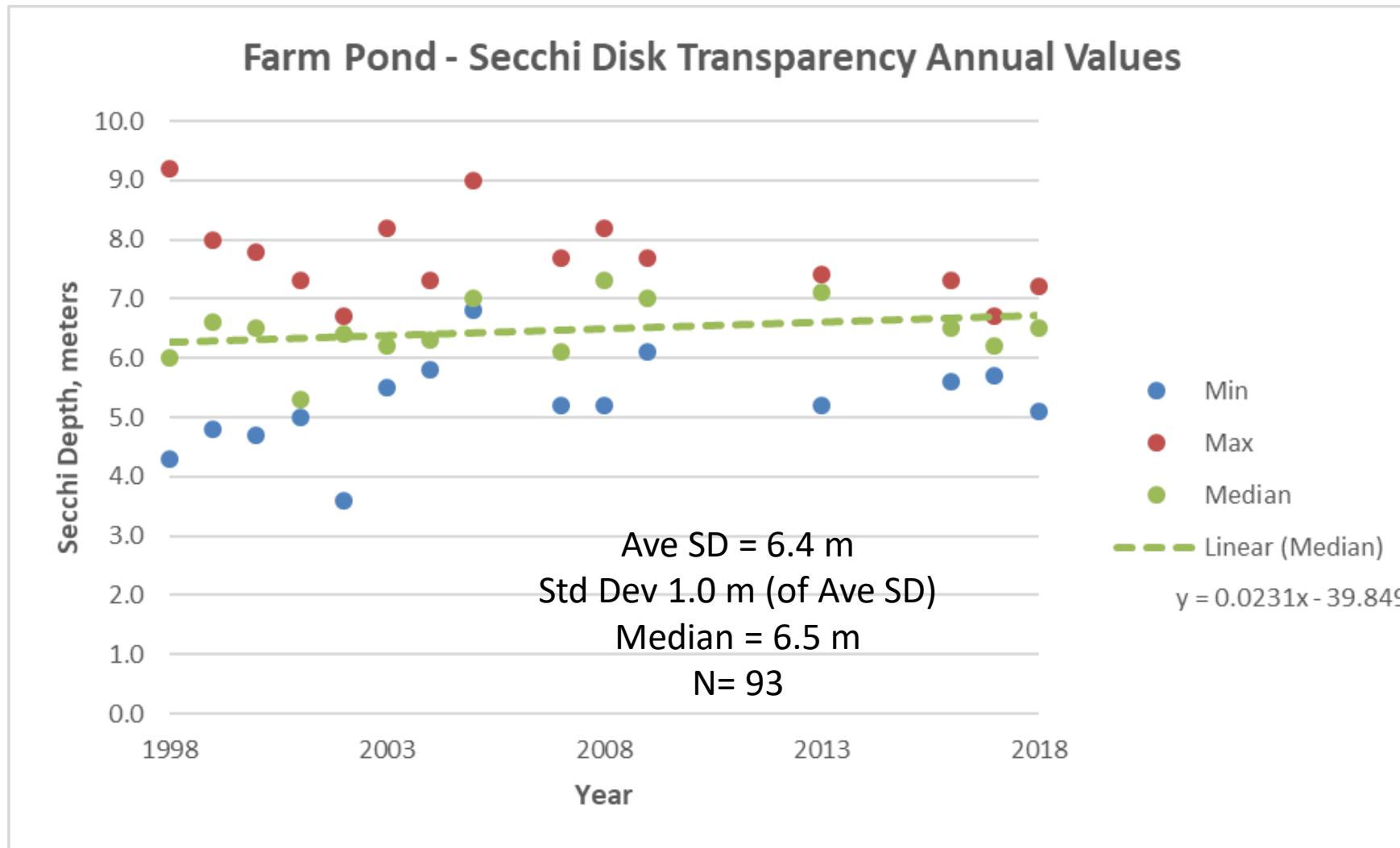
Note: Sampling 1998 to 2018 at mooring near center of Farm Pond, with no data from years 2012, 2014, and 2015

Farm Pond (Sherborn MA) - Secchi Disk Transparency - 1998 to 2018



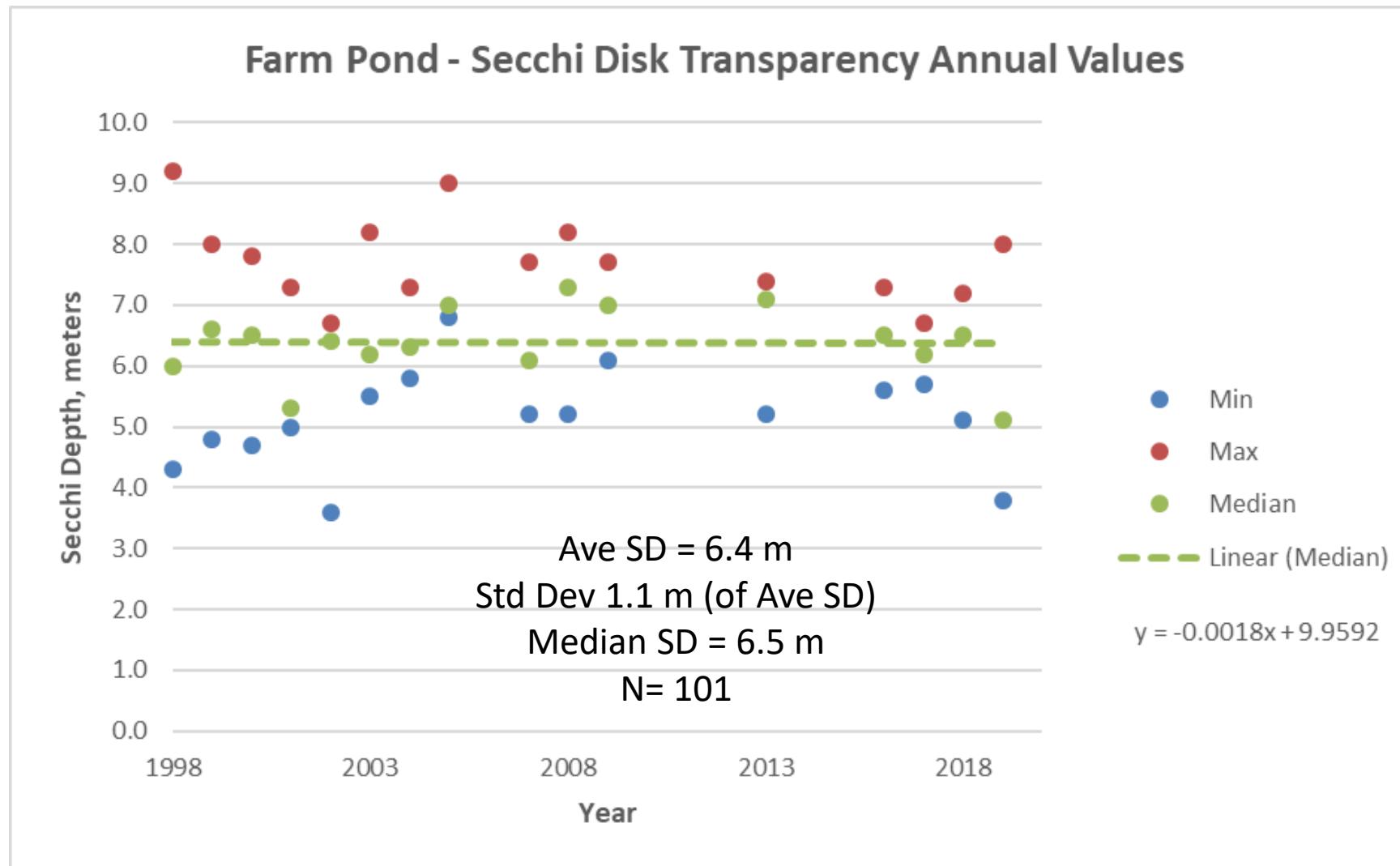
Note: Sampling 1998 to 2018 at mooring near center of Farm Pond, with no data from years 2012, 2014, and 2015

Plot of Farm Pond annual min, max, and median SD values, 98' to 2018



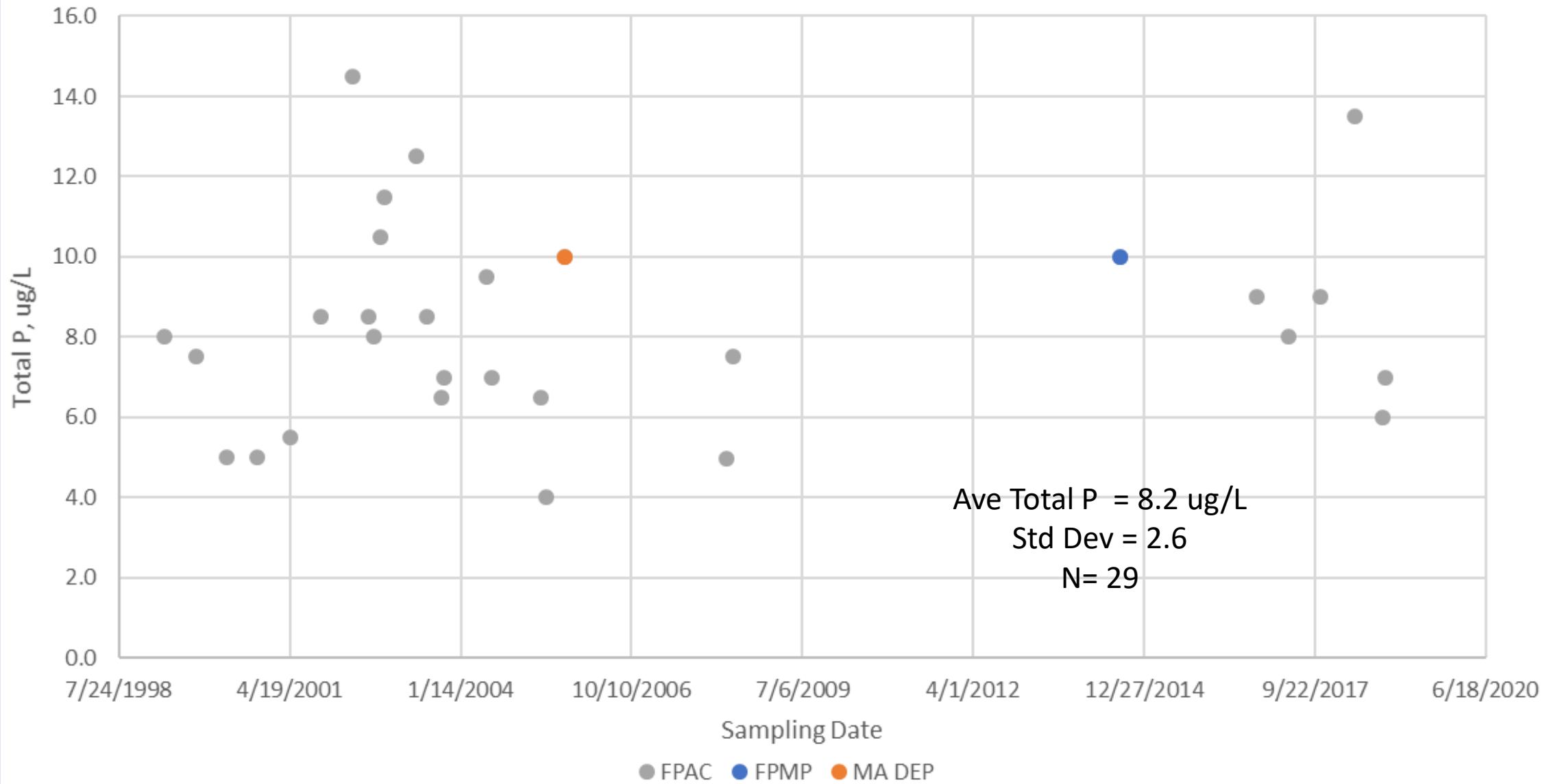
Note: Very encouraging that trend line of SD median values is slightly positive (water clarity improving over last 20 years).

Plot of Farm Pond annual min, max, and median SD values, 98' to 2019

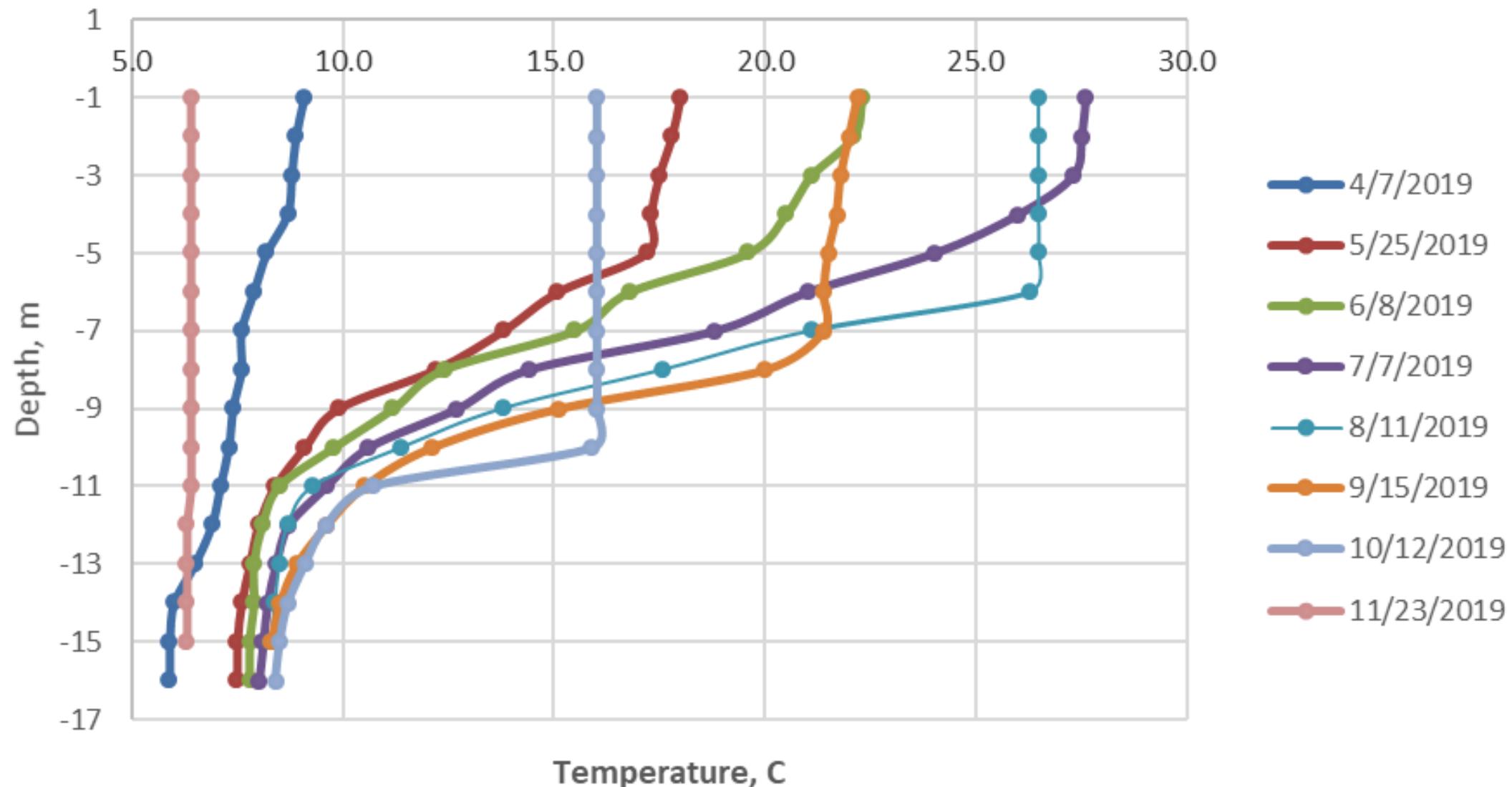


Note: Trend line of SD median values is now almost flat, slight negative trend (water clarity near constant over last 21 years).

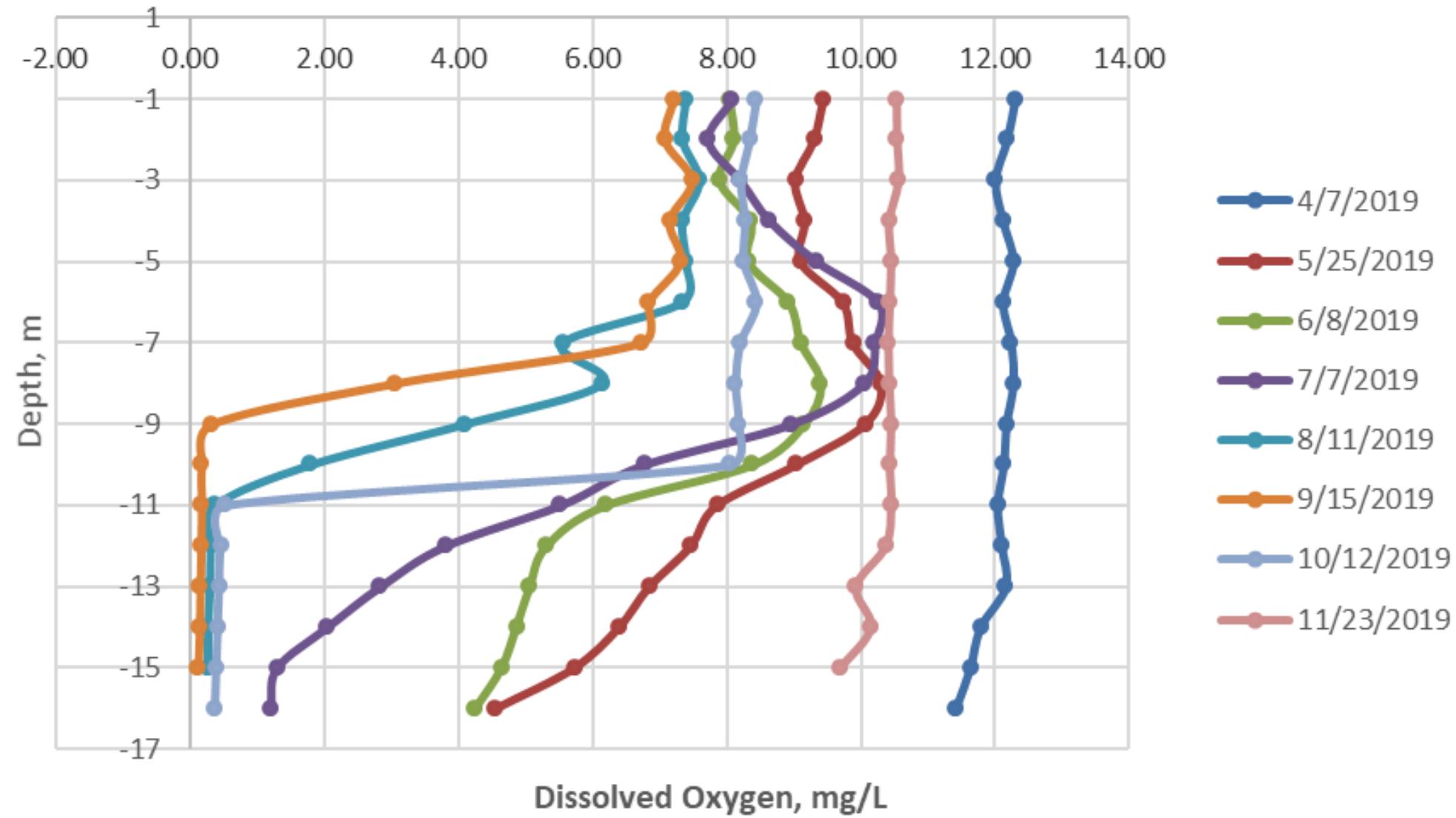
Farm Pond - Total Phosphorus, ug/L - 1999 to 2018



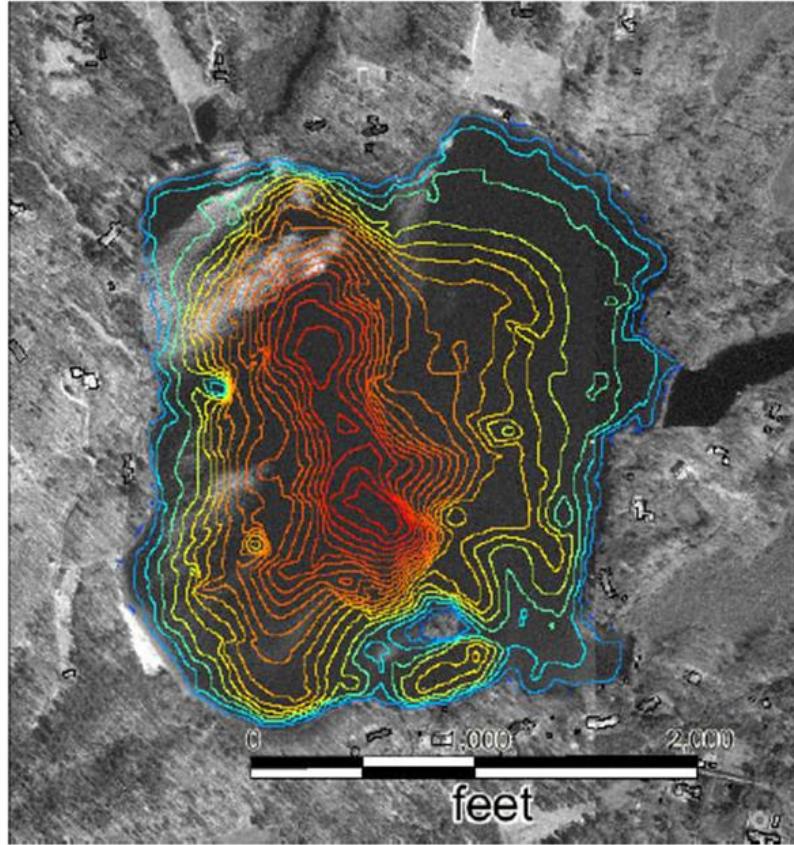
Farm Pond - 2019 Temperature vs Depth Profiles



Farm Pond - 2019 Dissolved Oxygen vs Depth Profiles



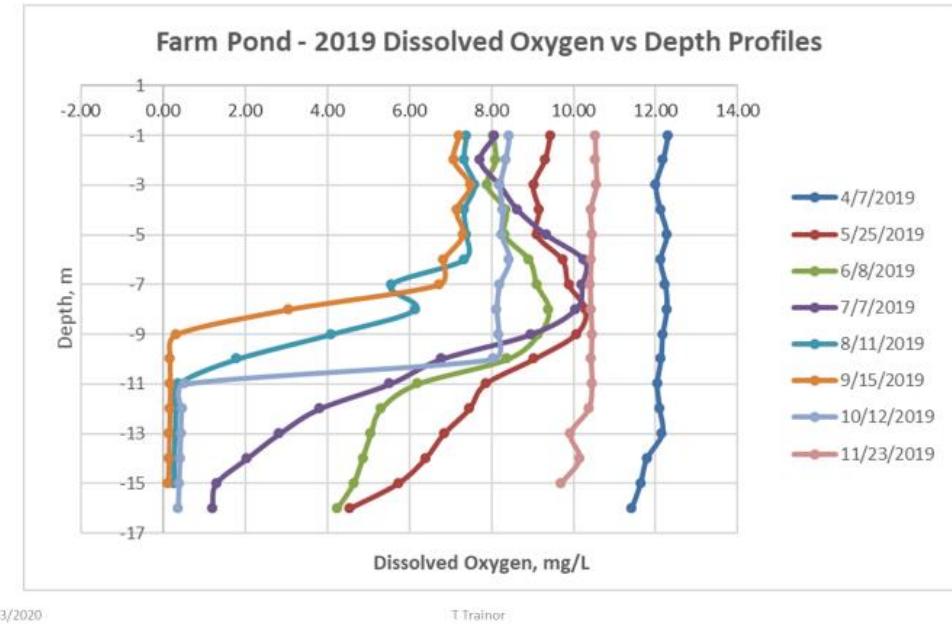
A need to calculate for Farm Pond: total water layer volumes by DO concentrations and time periods:



Farm Pond Management Plan, 2015



T Trainor



Bathymetry Range (Feet)	Area (Acres)
0-5	19.37
5-10	21.59
10-15	14.70
15-20	11.12
20-25	11.27
25-30	10.38
30-35	8.46
35-40	4.89
40-45	5.08
45-50	5.68
50-58	5.63

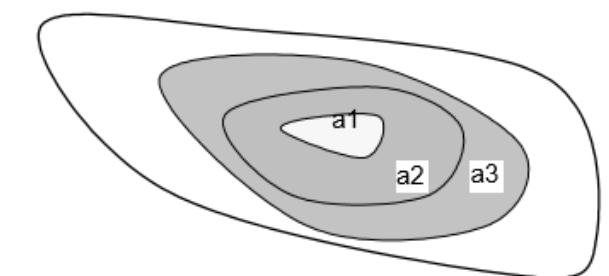
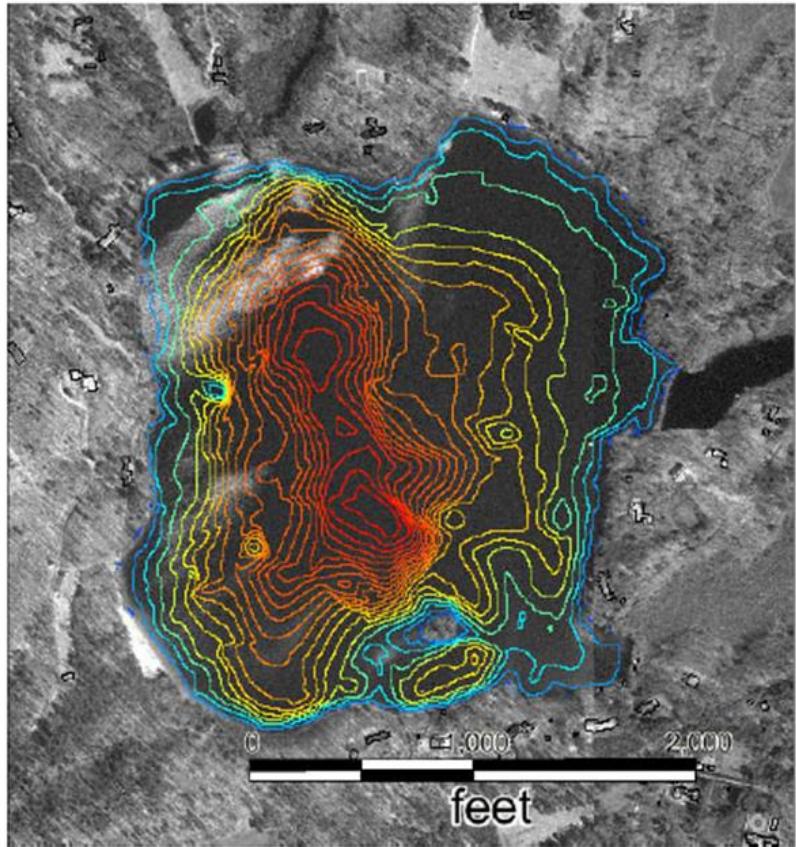
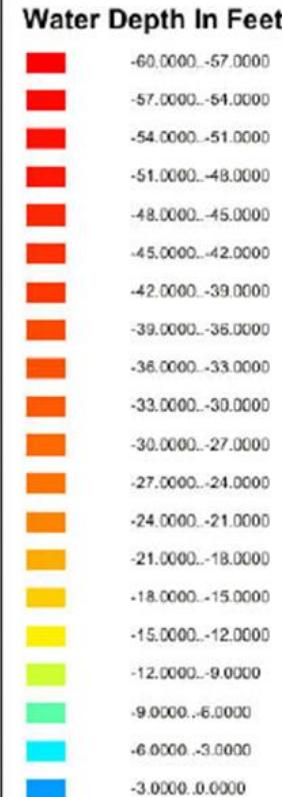


FIGURE 1. The sketch indicates different areas of a hypothetical lake that become anoxic sequentially with time, where a_1 becomes anoxic first, then a_2 , etc.

A need to calculate for Farm Pond: total water layer volumes by DO concentrations and time periods:



Note: most of the western half of Pond > 15 ft (4.6 m) depths, and eastern region much shallower.



Farm Pond Management Plan, 2015

→

Bathymetry Range (Feet)	Area (Acres)
0-5	19.37
5-10	21.59
10-15	14.70
15-20	11.12
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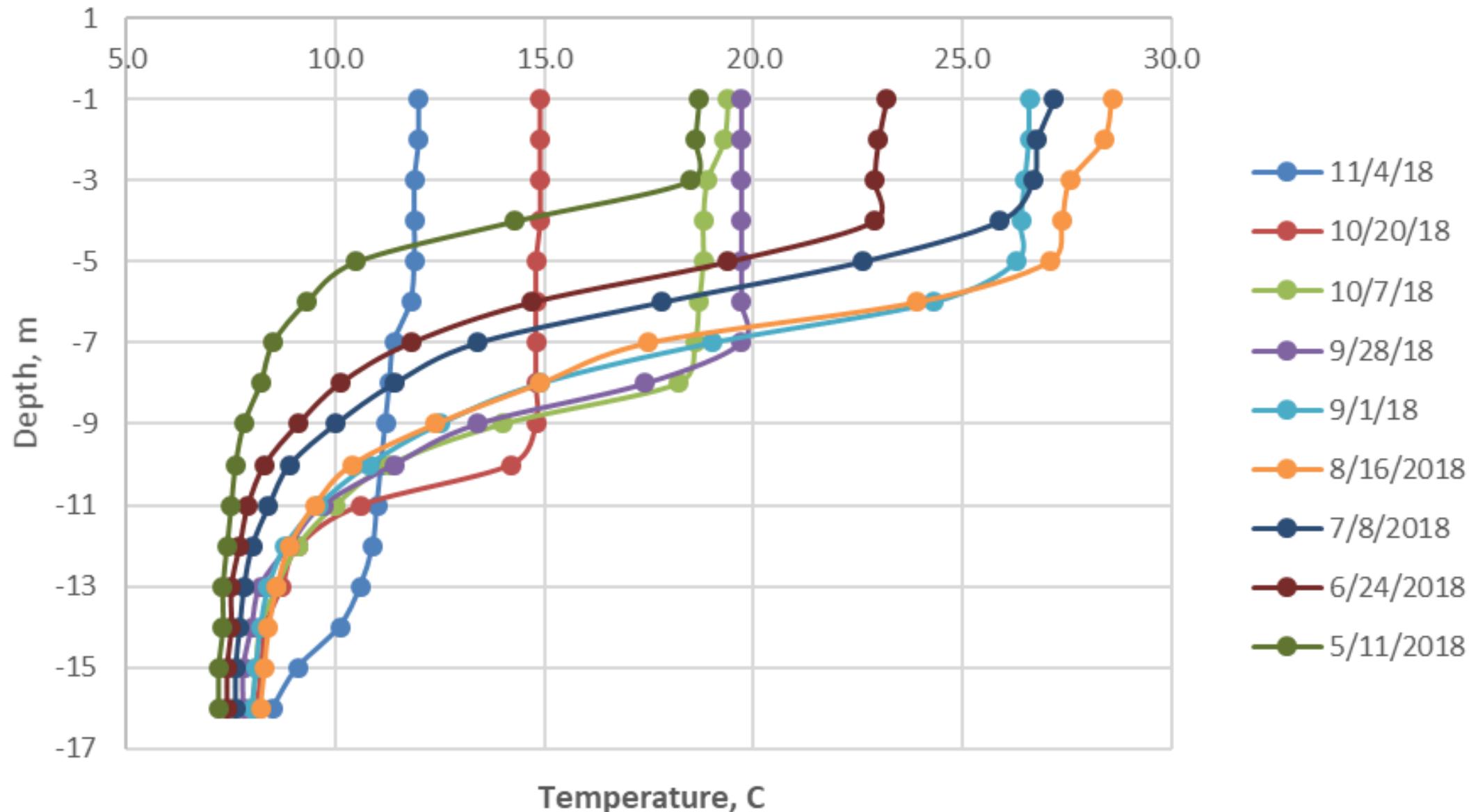
> 25 ft depths cover about 40 acres.

8.0 m = 26.25 ft

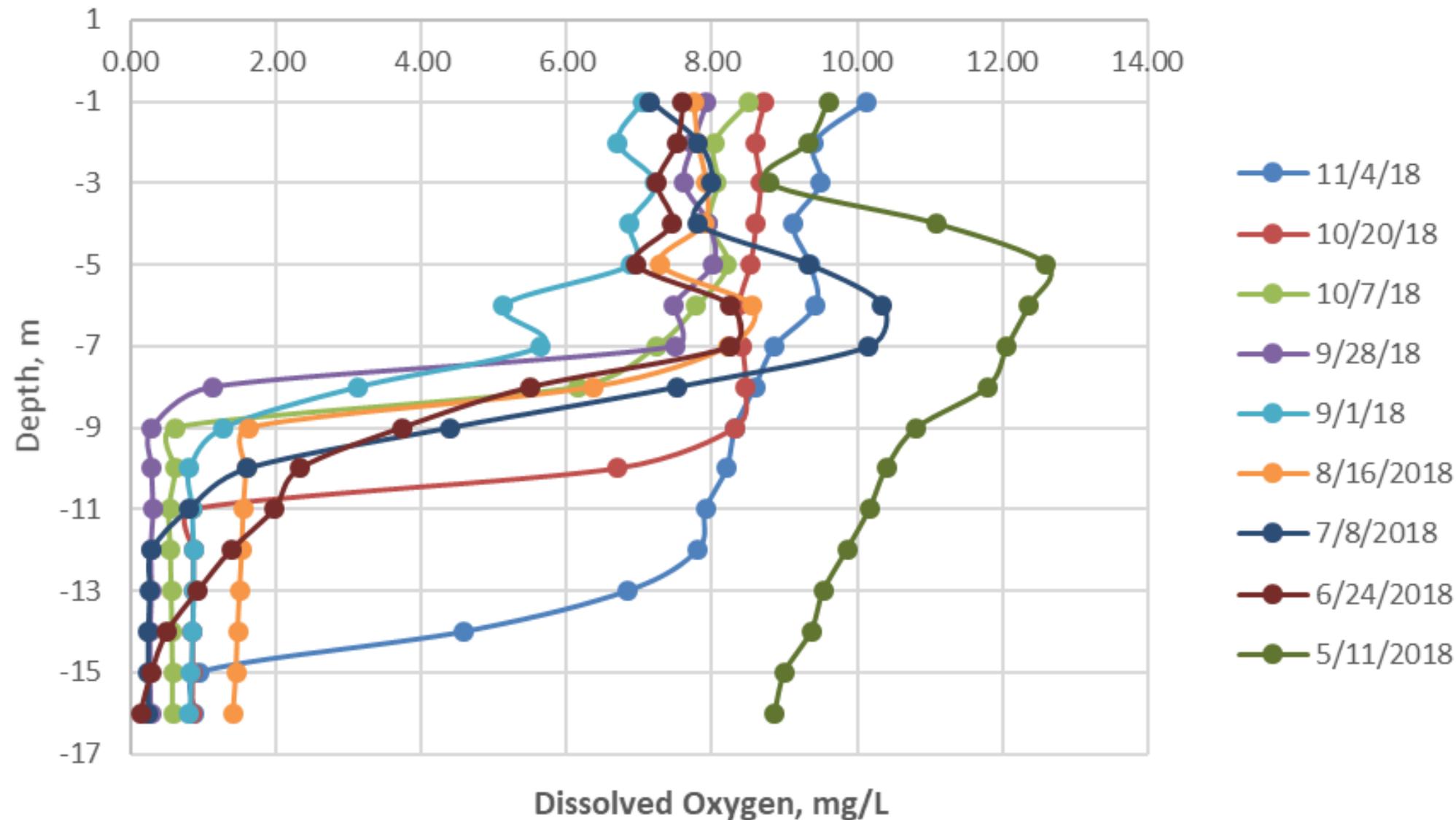
Volumes – depth estimates ?

Bathymetric mapping was done in feet, while DO/T in meters ...

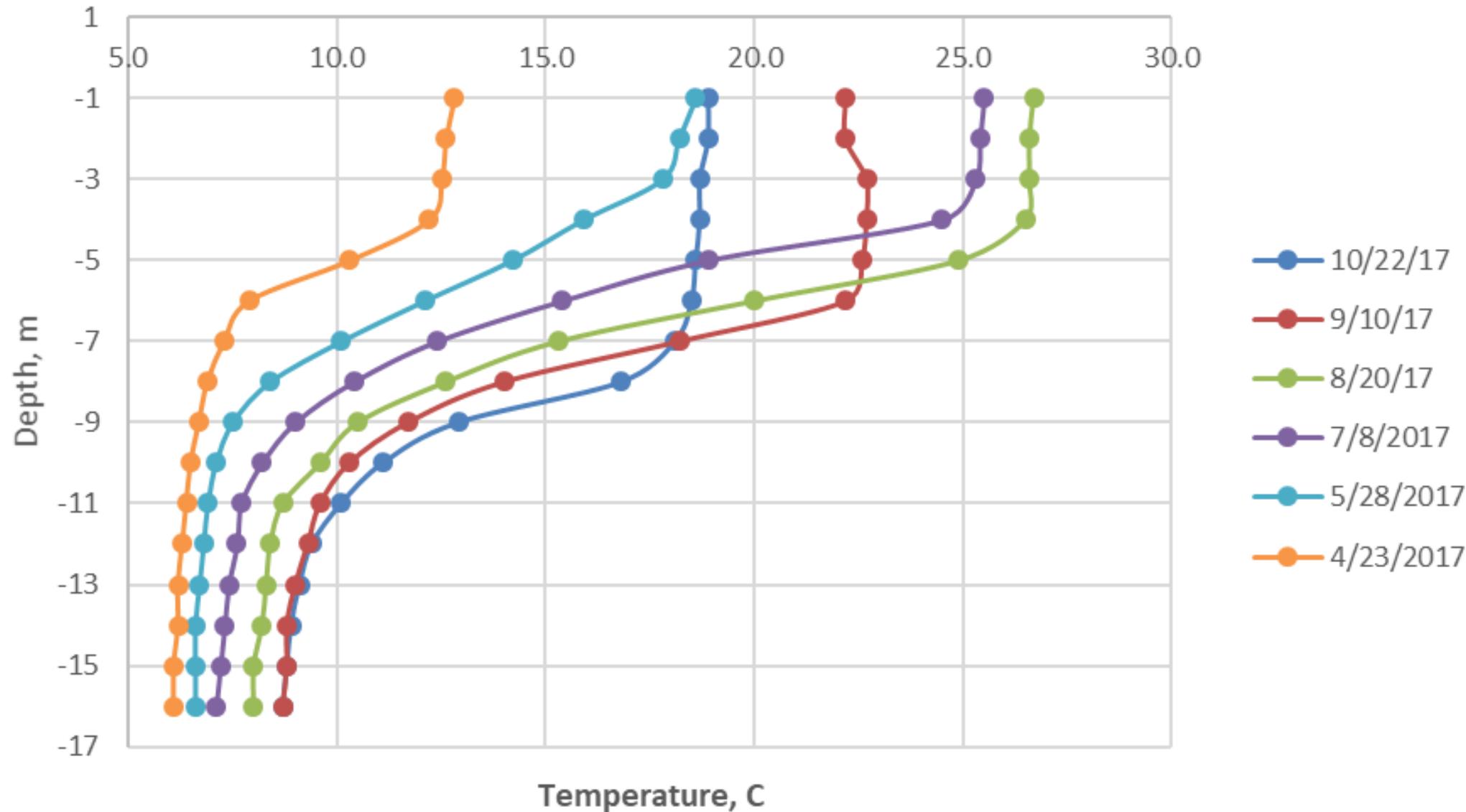
Farm Pond - 2018 Temperature vs Depth Profiles



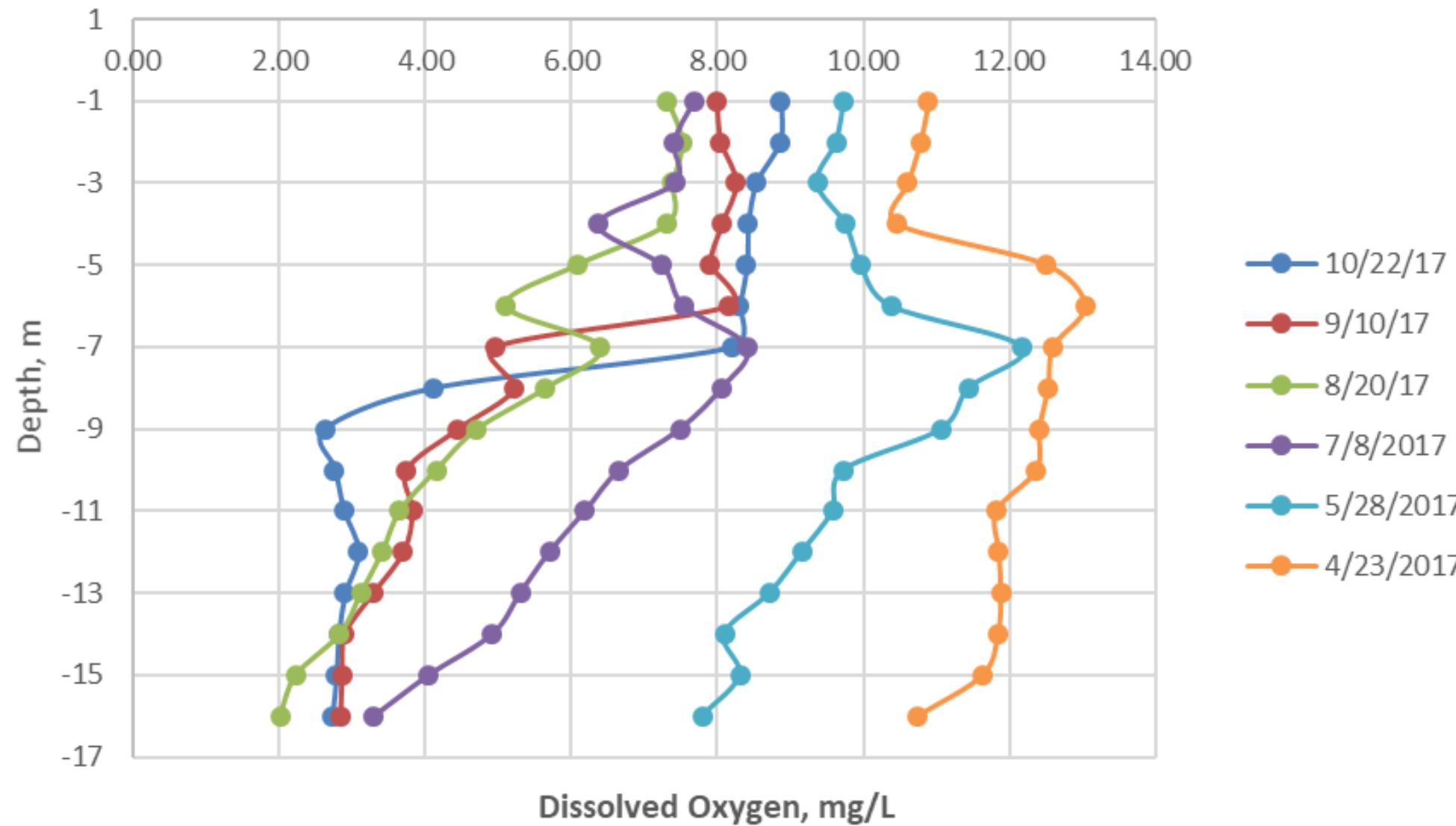
Farm Pond - 2018 Dissolved Oxygen vs Depth Profiles



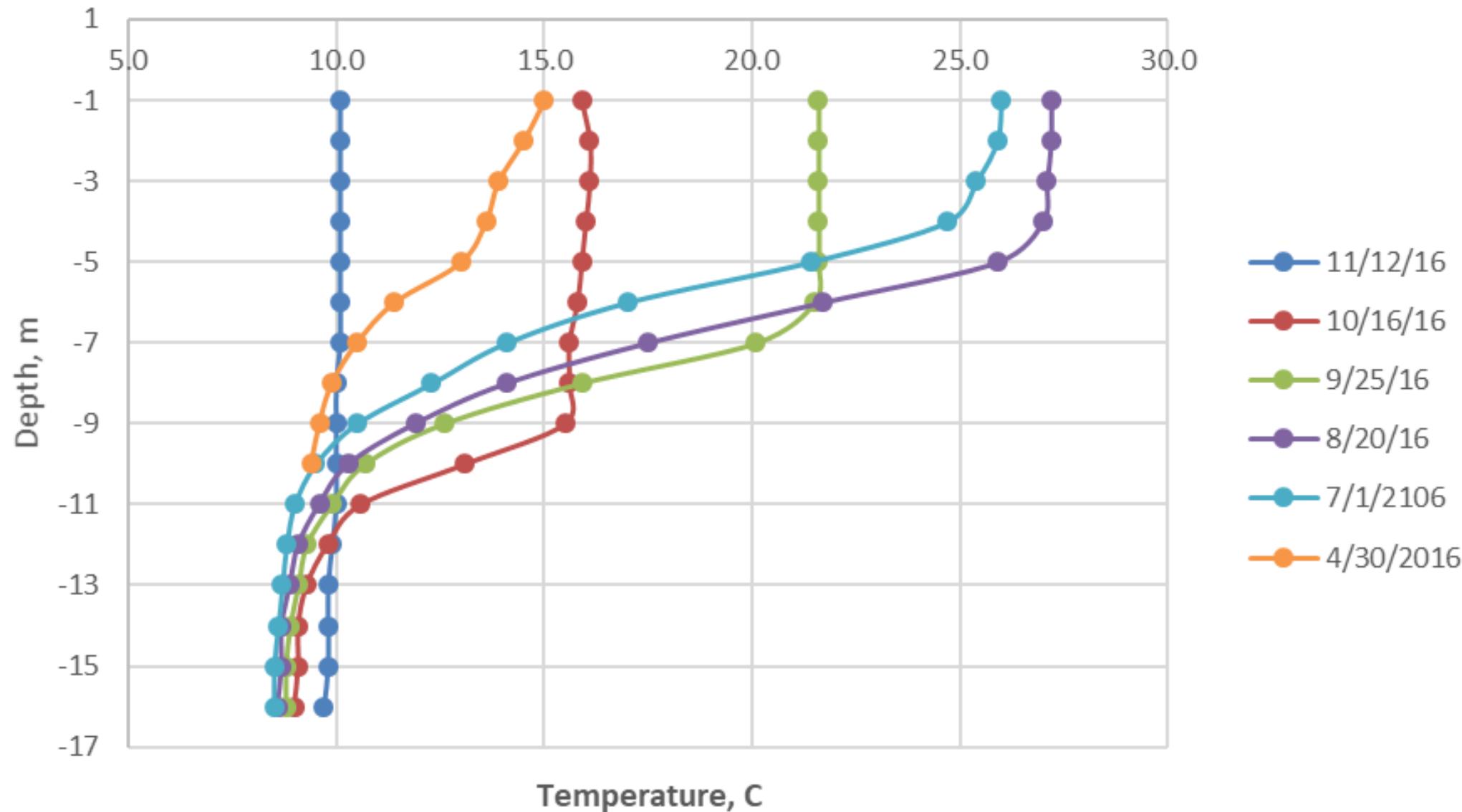
Farm Pond - 2017 Temperature vs Depth Profiles



Farm Pond - 2017 Dissolved Oxygen vs Depth Profiles



Farm Pond - 2016 Temperature vs Depth Profiles



Farm Pond - 2016 Dissolved Oxygen vs Depth Profiles

