



The Borough of Mountain Lakes

2023 Year-End Report

By Bob Schindler

Operations Director

Aquatic Biologist



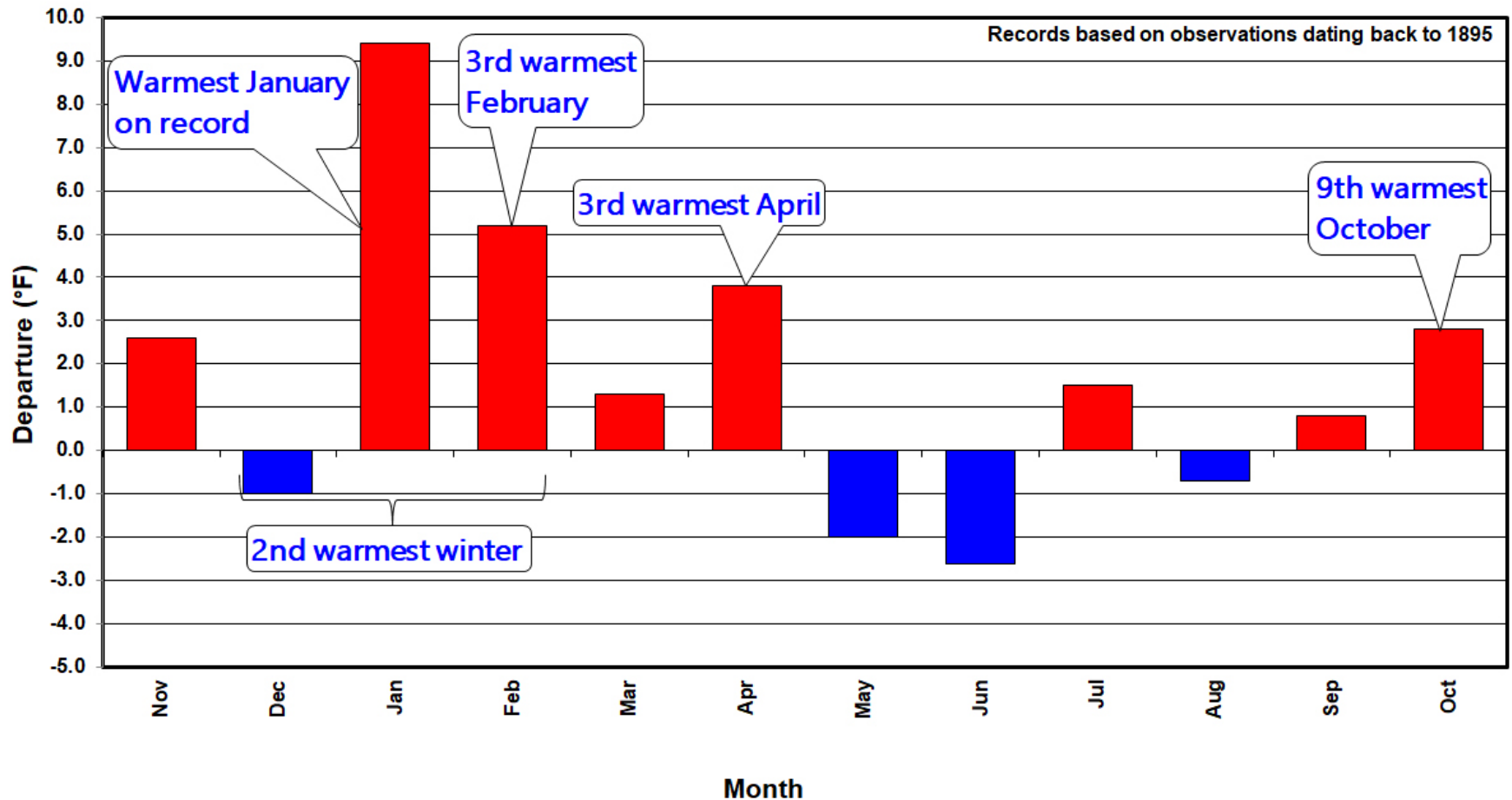
2023 Year End Summary

- 2023 Lake Treatment Review
- 2023 Water Quality Data
- 2023 Algae Sampling Results



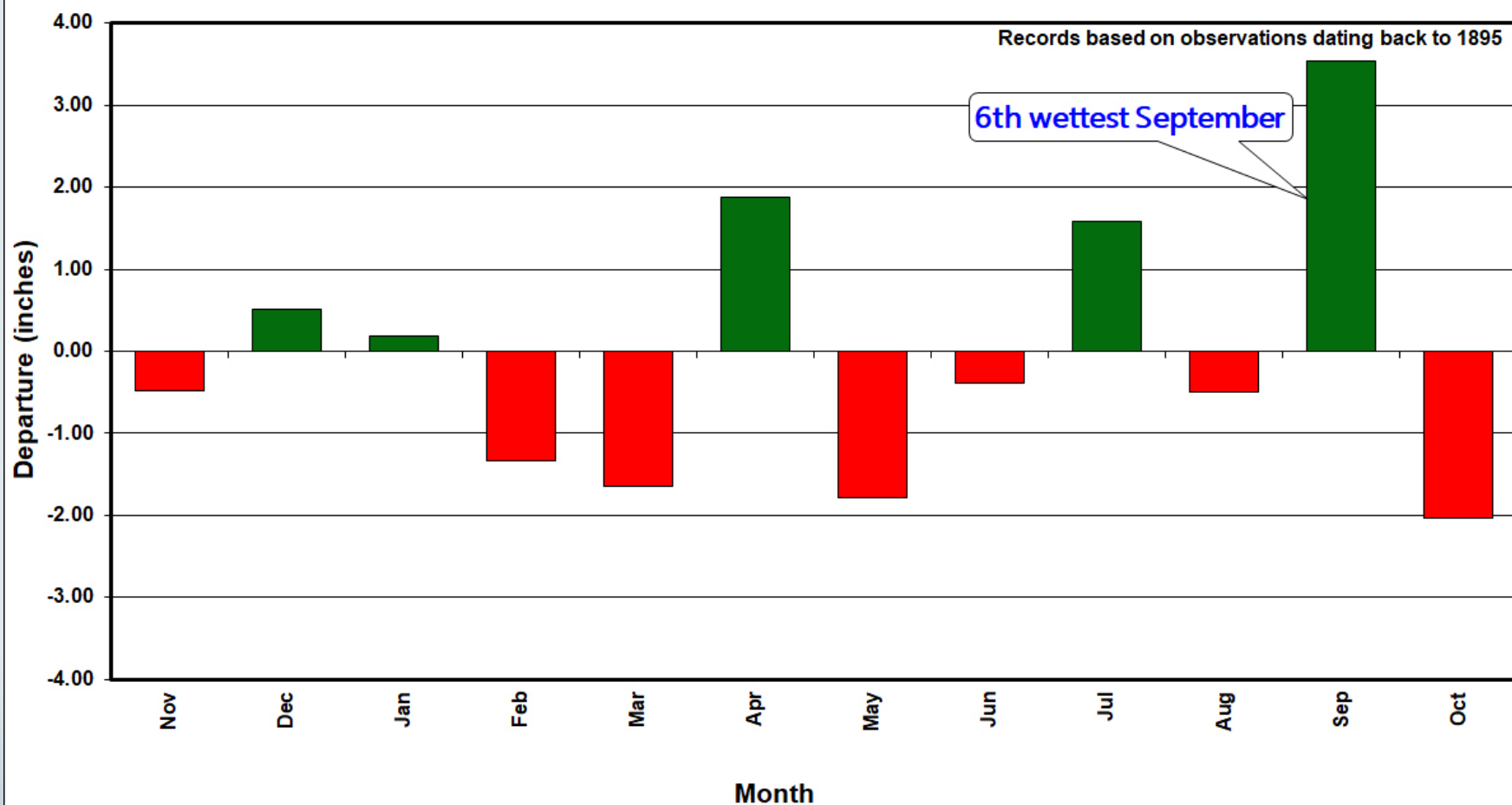
NJ Monthly Temperature Departures (November 2022 – October 2023)

Departures calculated from differences between observed monthly temperatures and 1991–2020 monthly averages



NJ Monthly Precipitation Departures (November 2022 – October 2023)

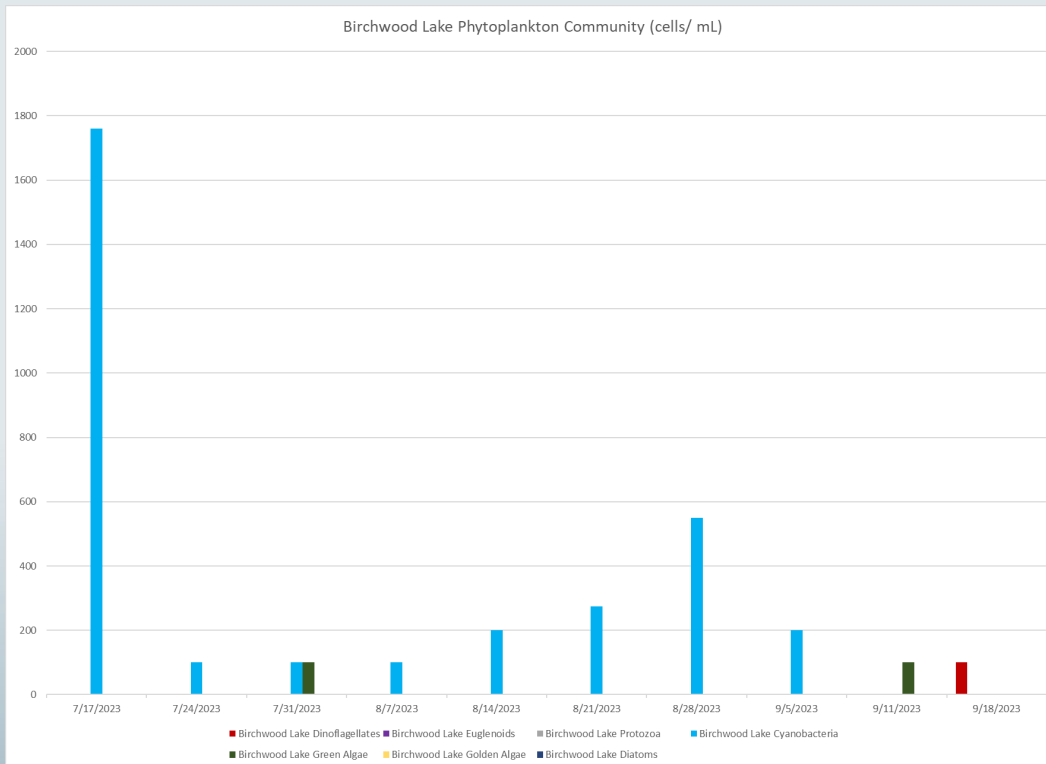
Departures calculated from differences between observed monthly precipitation and 1991–2020 monthly averages



Birchwood Lake	Oxygen (mg/L)	pH	Temp (F)	Clarity (FT)
7/17/2023	7.4	8.1	72	3.5
7/24/2023	3.1	8.96	77.5	4.5
7/31/2023	6.68	9.41	73.6	4
8/8/2023	7.12	9.2	74.6	3
8/14/2023	7.45	9.1	77.75	3
8/21/2023	7.21	9.5	75.6	3.5
8/28/2023	5.48	10.12	74.6	3.5
9/5/2023	5.33	10.7	76.12	4
9/11/2023	4.7	10.27	75.26	2.5
9/18/2023	4.75	10.11	10.7	2.5

Turbidity (NTU)	3.2
Total Phosphorous(mg/L)	0.0175
Nitrate/Nitrite (mg/L)	0.03

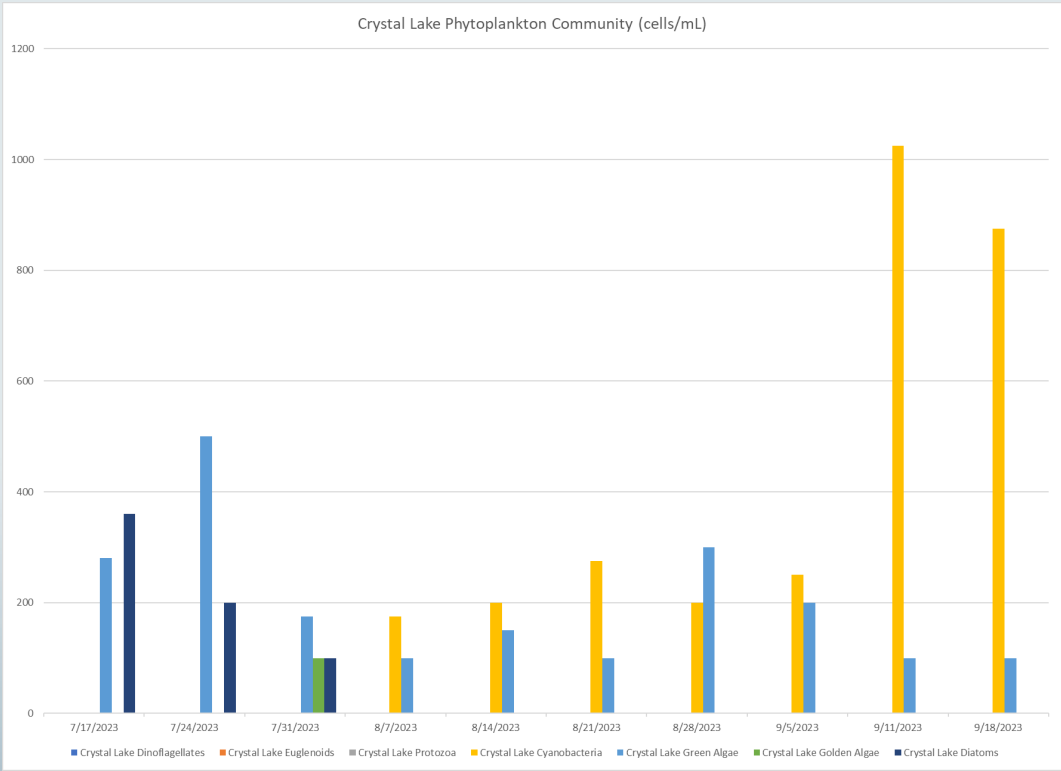
- Lily densities increasing
- No algaecide Treatments
- Two herbicide treatments in beach and swim area



Crystal Lake	Oxygen (mg/L)	pH	Temp (F)	Clarity (FT)
7/17/2023	6.4	7.77	66	4.5
7/24/2023	6.11	9	77.74	4
7/31/2023	7.04	9.14	75.69	4.5
8/8/2023	7.13	8.62	76.7	3
8/14/2023	7.12	8.6	77.5	3
8/21/2023	7	9.1	76.69	4.5
8/28/2023	7	10.1	74.72	4.5
9/5/2023	7.12	10.2	75.24	3
9/11/2023	5.09	9.48	74.26	2.5
9/18/2023	5	9.48	74.26	2.5

Turbidity (NTU)	5.2
Total Phosphorous(mg/L)	0.0241
Nitrate/Nitrite (mg/L)	<0.02

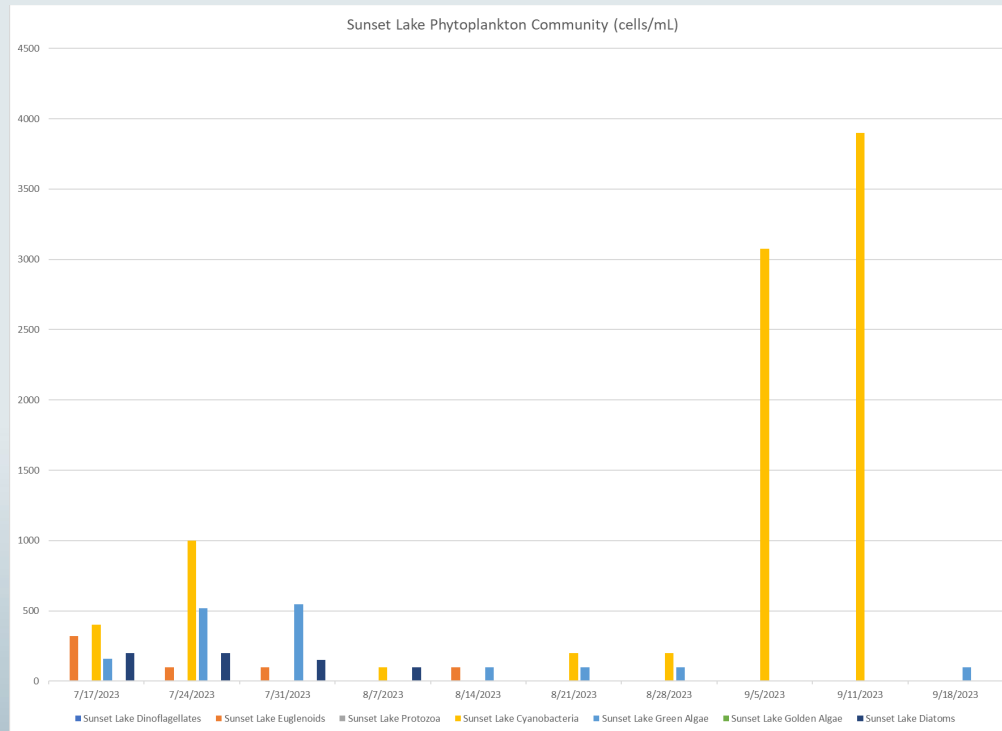
- No treatments performed in 2023
- Late season increase in cyanobacteria



Sunset Lake	Oxygen (mg/L)	pH	Temp (F)	Clarity (FT)
7/17/2023	6.68	7.14	67	3
7/24/2023	4.4	9.04	78.1	0.8
7/31/2023	6.72	8.78	74.5	3
8/8/2023	6.53	8.01	77.2	3
8/14/2023	6.4	8	77.4	3
8/21/2023	6	8.7	76.5	3
8/28/2023	6	9.12	74.7	3
9/5/2023	5.31	10.7	76.11	2
9/11/2023	4.11	9.4	75	2
9/18/2023	4.1	9.2	70	2

Turbidity (NTU)	3.1
Total Phosphorous(mg/L)	0.033
Nitrate/Nitrite (mg/L)	0.03

- Lily and bassweed densities increased through season
- Two algaecide treatments performed for filamentous algae growth
- Late season Cyanobacteria bloom

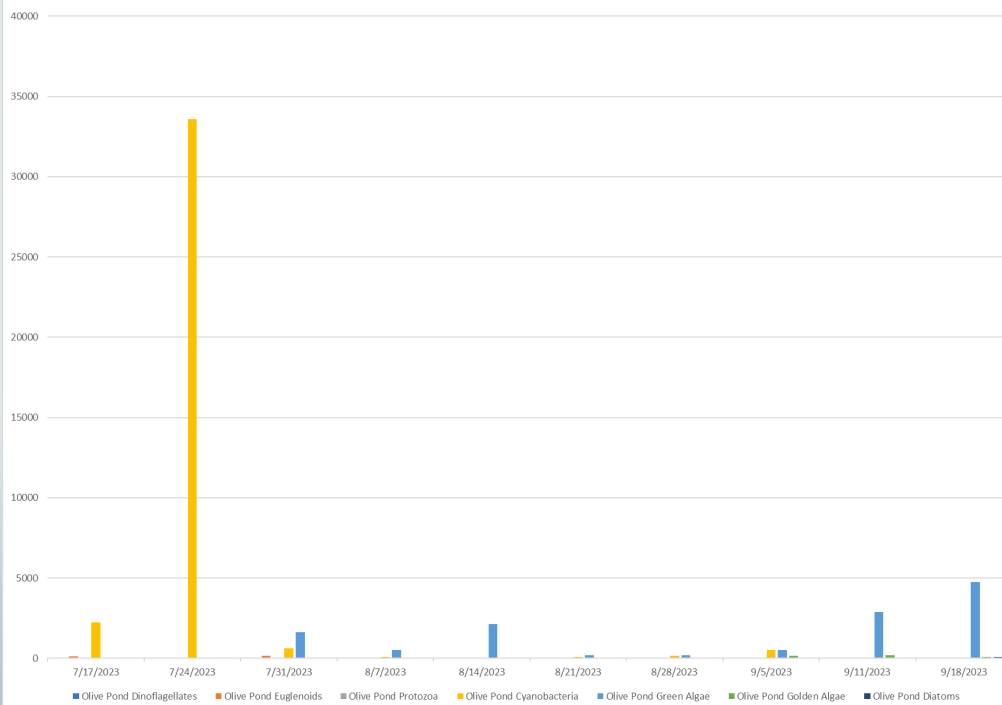


Olive Pond	Oxygen (mg/L)	pH	Temp (F)	Clarity (FT)
7/17/2023	2.3	7.5	69	2.5
7/24/2023	6.4	9	76.82	0.8
7/31/2023	6.62	9.56	75.8	3
8/8/2023	5.2	8.77	77.6	3
8/14/2023	4.9	8.8	77.2	2
8/21/2023	5.5	9.5	76.71	3
8/28/2023	5.5	9.46	75.21	3
9/5/2023	6.15	9.58	77	2
9/11/2023	6.15	9.3	75	2
9/18/2023	6.15	9.1	70	2

Turbidity (NTU)	3.7
Total Phosphorous(mg/L)	0.0407
Nitrate/Nitrite (mg/L)	<0.02

- Low oxygen levels most of summer
- High density cyanobacteria bloom in July
- Algaecide treatment able to be performed on 8/21

Olive Pond Phytoplankton Community (cells/mL)

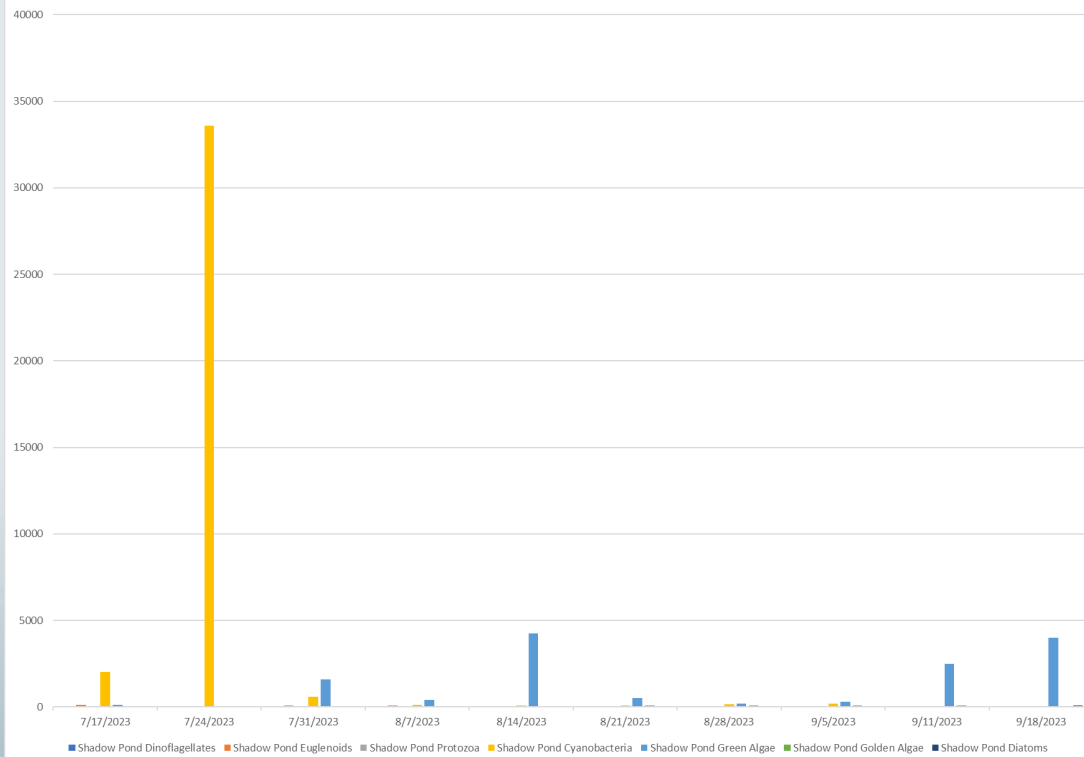


Shadow Pond	Oxygen (mg/L)	pH	Temp (F)	Clarity (FT)
7/17/2023	3.4	7.7	69	2.5
7/24/2023	6.4	9	76.9	0.8
7/31/2023	6.59	9.6	75.63	3
8/8/2023	6.02	8.81	77.63	3
8/14/2023	4.43	8.75	77.2	2
8/21/2023	5.59	9.52	78.63	3
8/28/2023	5.59	9.5	75.22	3
9/5/2023	6	9.5	77	2
9/11/2023	6	9.3	75	2
9/18/2023	6	9.1	70	2

Turbidity (NTU)	3.7
Total Phosphorous(mg/L)	0.0405
Nitrate/Nitrite (mg/L)	<0.02

- Low oxygen levels periodically
- Algaecide treatments performed on 7/31 and 8/21.

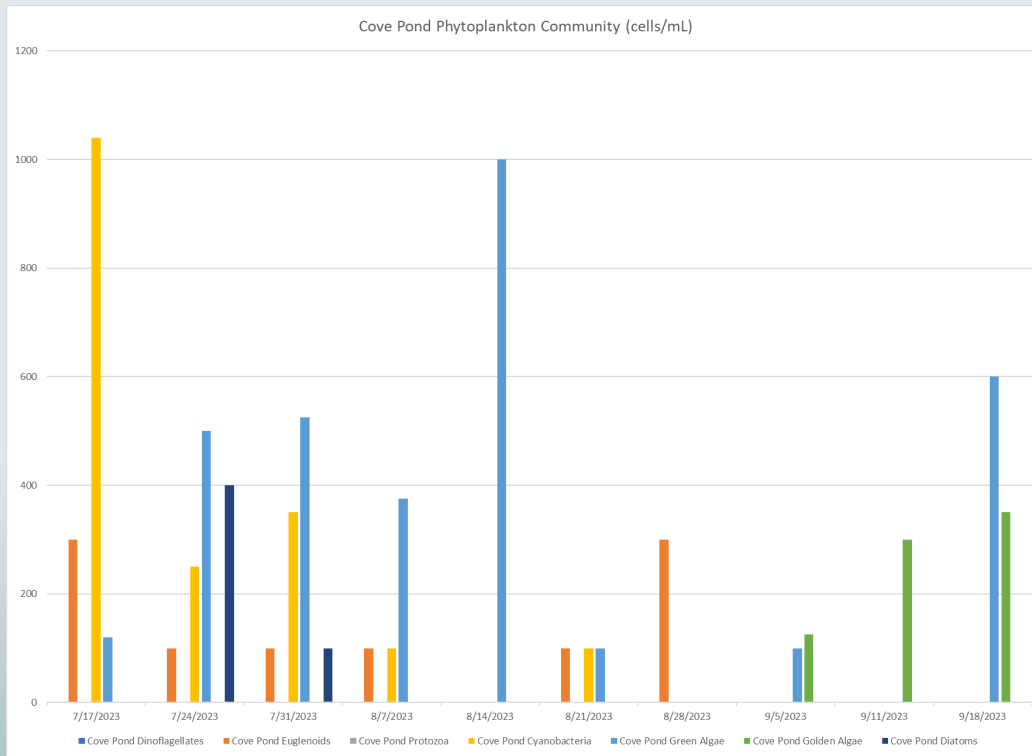
Shadow Pond Phytoplankton Community (cells/mL)



Cove Pond	Oxygen (mg/L)	pH	Temp (F)	Clarity (FT)
7/17/2023	2.8	7.3	67	3
7/24/2023	5.01	9.24	74.5	3
7/31/2023	5.4	9.72	74.42	3
8/8/2023	4.7	9.2	77.37	2
8/14/2023	6.87	8.6	77.4	2.5
8/21/2023	5.4	9.7	76.82	3
8/28/2023	5.4	10.1	74.6	3
9/5/2023	5.5	9.98	77.42	2
9/11/2023	5.5	6.56	75.4	2
9/18/2023	5.5	6.4	70	2

Turbidity (NTU)	3.9
Total Phosphorous(mg/L)	0.039
Nitrate/Nitrite (mg/L)	<0.02

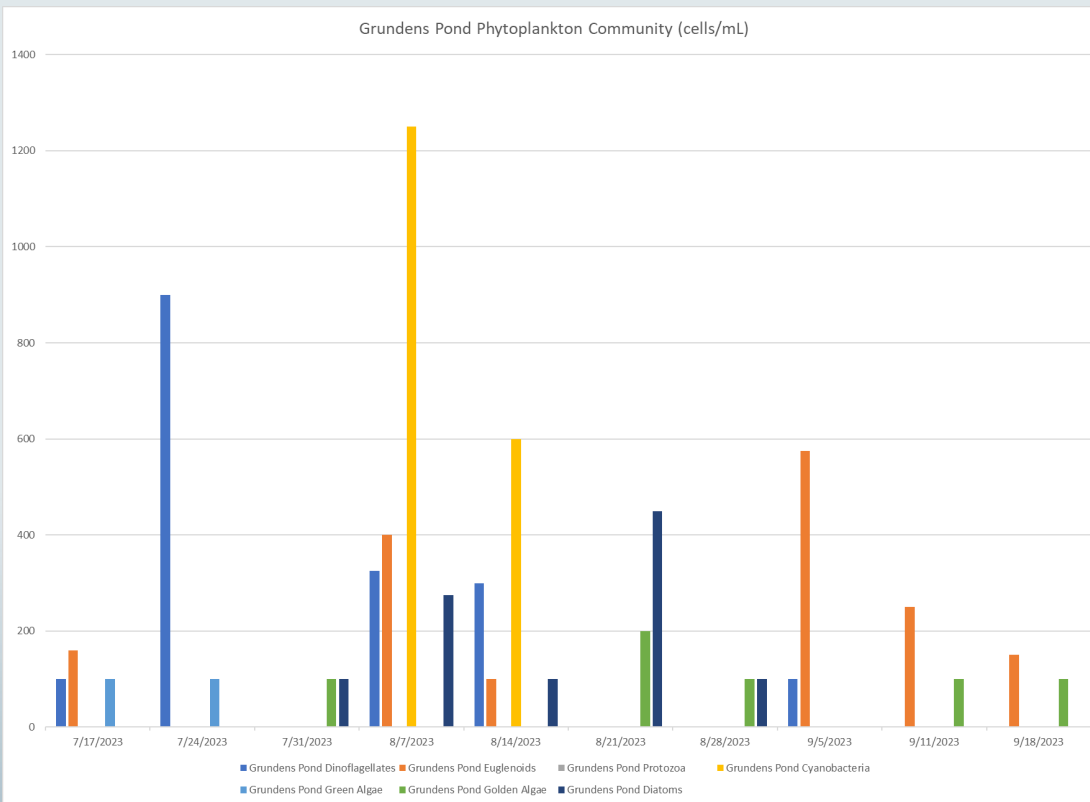
- One herbicide treatment on 8/14 for bladderwort



Grundens Pond	Oxygen (mg/L)	pH	Temp (F)	Clarity (FT)
7/17/2023	4.4	7.4	66	2.5
7/24/2023	2.5	8	75.5	0.8
7/31/2023	6.68	9.07	74.89	3
8/8/2023	5.48	8.4	76.12	2
8/14/2023	6.5	8.3	76.85	2
8/21/2023	6.37	9	75.8	2.5
8/28/2023	5.4	9	74.6	2.5
9/5/2023	5.4	9.23	76.4	2.5
9/11/2023	4.37	9.1	76.4	2.5
9/18/2023	4.2	9.1	70	2.5

Turbidity (NTU)	3.3
Total Phosphorous(mg/L)	0.0589
Nitrate/Nitrite (mg/L)	0.03

- Three herbicide treatments for duckweed and watermeal
- Overall, low densities of phytoplankton for this pond



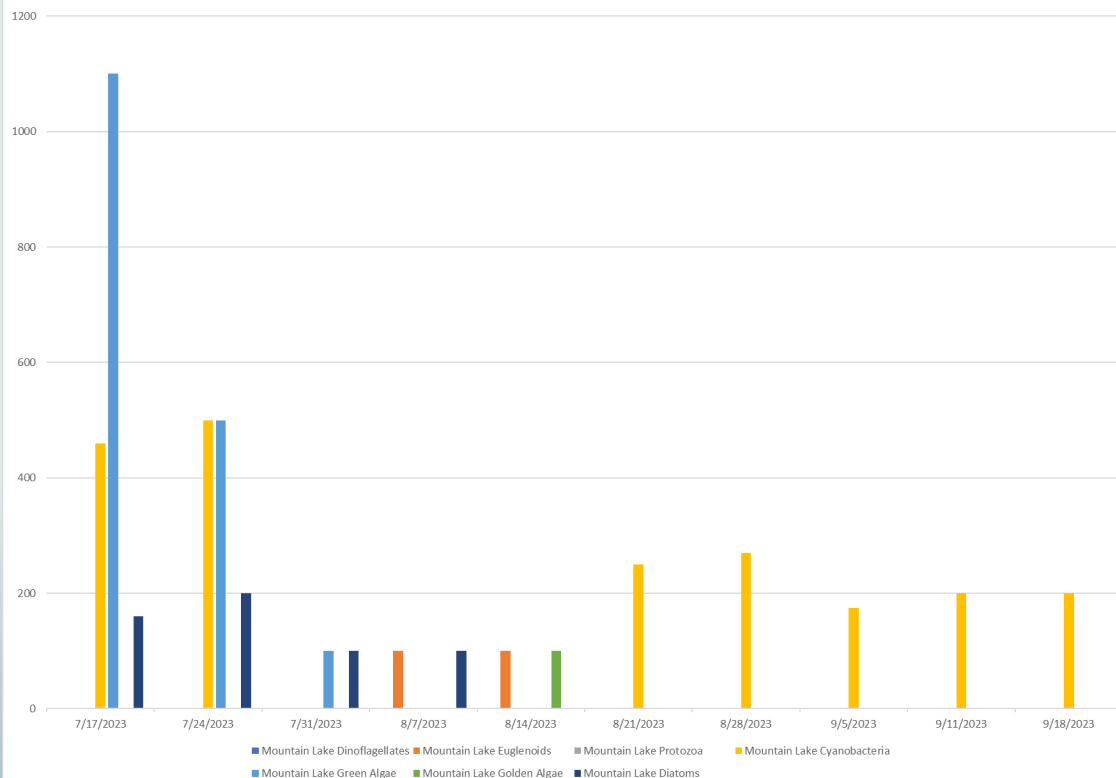
Mountain Lake	Oxygen (mg/L)	pH	Temp (F)	Clarity (FT)
7/17/2023	6.7	8	67	3.5
7/24/2023	7.5	9.5	80	3
7/31/2023	7.12	9.08	73.41	3
8/8/2023	6.55	9.02	75.63	3
8/14/2023	6.3	9.02	77.41	3
8/21/2023	6.92	9	76.78	3
8/28/2023	7	10.12	74.8	3
9/5/2023	8.26	9.63	77.32	3
9/11/2023	6.7	9.41	76.51	2
9/18/2023	6.5	9.2	70.2	2

Turbidity (NTU)	5.2
Total Phosphorous(mg/L)	0.0276
Nitrate/Nitrite (mg/L)	0.02

- April Sonar application for Eurasian water milfoil
- August treatment for bassweed and primrose
- Alum application on 11/2
- Low density phytoplankton



Mountain Lake Phytoplankton Community (cells/mL)

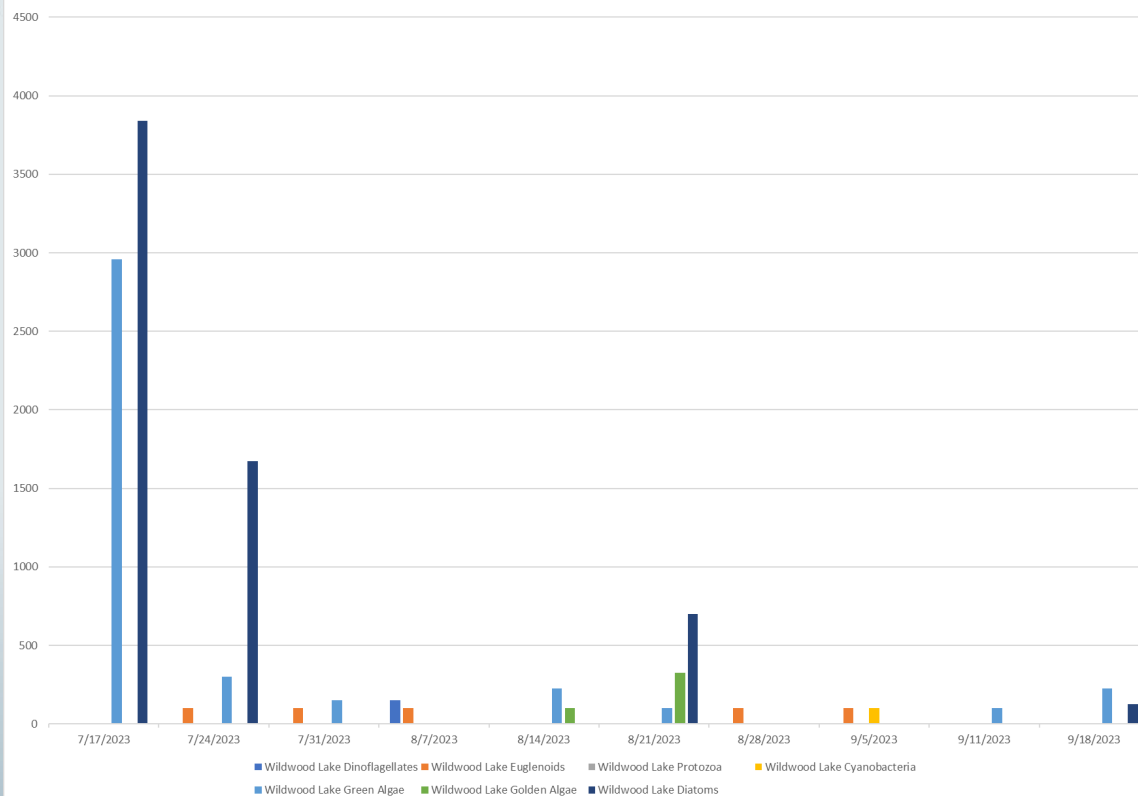


Wildwood Lake	Oxygen (mg/L)	pH	Temp (F)	Clarity (FT)
7/17/2023	6.4	7.8	67	3
7/24/2023	7.98	9.46	78.03	2
7/31/2023	6.4	8.8	75.6	3
8/8/2023	7.1	8.3	76.5	2
8/14/2023	6.43	7.79	77.3	3
8/21/2023	6.4	8.7	76.8	3
8/28/2023	6.2	9.78	74.8	3
9/5/2023	8.28	9.67	77.48	3
9/11/2023	8.28	7.2	75.21	2.5
9/18/2023	8.28	7.3	70	2.5

Turbidity (NTU)	4.3
Total Phosphorous(mg/L)	0.0217
Nitrate/Nitrite (mg/L)	0.03

- 8/2 – treatment for brittle naiad, primrose and filamentous algae
- Consistent degraded water clarity most of latter half of summer
- Overall, low phytoplankton densities

Wildwood Lake Phytoplankton Community (cells/mL)



2024 Recommendations

- Aggressive lily treatment in Birchwood and Crystal Lakes
- Alum application in Crystal Lake in spring
- Olive Pond – revisit aeration installation
 - Nutrient inactivation
 - Bacterial enhancement
- Shadow Pond – maintenance of aeration system
 - Nutrient inactivation
 - Bacterial enhancement
- Grundens Pond – Nutrient inactivation and bacteria
- Mountain Lake – aggressive bassweed and primrose treatment
 - Fall alum treatment
- Wildwood Lake – aggressive primrose treatment
 - Fall alum treatment

