



Northeast Aquatic Research, LLC

74 Higgins Highway
Mansfield Center, CT 06250
September 20, 2022



TO: Residents of East Hampton, CT
ATTN: Jeremy Hall, Parks and Recreation Director
Town of East Hampton Conservation Lake Commission
FROM: Hillary Kenyon, M.S., Limnologist & Certified Lake Manager

RE: Updated Pocotopaug Nutrients (8/2/22) and Profiles Data Results (8/26/22 and 9/12/22)

The Lake Advisory Committee jointly decided to proceed with a copper sulfate treatment to target cyanobacteria present in the northwestern half of the lake, on July 29, 2022. Follow-up monitoring by NEAR staff took place on August 2, 2022. Profile data from this date were reported in the previous summary report, dated August 3rd. This summary report includes laboratory nutrient data results from August 2nd, as well as the profile field data results from the August 26th and September 12th monitoring visits. Nutrient sample results from 8/26/22 and 9/12/22 are not yet available, but samples were brought to the UCONN CESE lab for analysis and nutrient results are expected within 6 weeks of sample delivery.

To reiterate a statement from the last monitoring summary, 8/2/22 clarity and profile data revealed that the lake experienced an apparent improvement in water clarity lake-wide as a result of the copper treatment. The lake did have a measurable reduction in dissolved oxygen saturation at that time, but open water monitoring stations all maintained roughly 80% dissolved oxygen saturation or higher on 8/2/22. By the time of the 8/26/22 monitoring visit water clarity (as collected with an 8" black and white Secchi disk and view scope) had declined to an average of 1.2 meters lake-wide. A slightly brownish water coloring was observed.

The 8/26/22 profile data indicated that dissolved oxygen concentrations had increased since the temporary decline after the copper sulfate algacide treatment, as expected. Dissolved oxygen was supersaturated (>100%) in the surface waters at several locations and depths on 8/26/22, indicating that algae production in the water column was once again elevated, though no cyanobacteria surface accumulations or scums were observed.

EverBlue Lakes performed a BioBlast microbial additive treatment over 8/29 to 9/1/22. NEAR received anecdotal reports of brown foamy lake water on 9/2/22, which is consistent with past BioBlast treatment observations and was not considered unusual. No resident cyanobacteria observations were received in August, or thus far in September. Chatham Health Department reported 0.95m Secchi clarity from the shoreline area near Sears Park on 9/2/22, but no cyanobacteria films, scums, or mats were observed. The beach remained open for swimming. Chatham Health Department monitoring typically ends after Labor Day weekend.

After a prolonged summer drought in eastern CT, heavy rains hit over 9/5-9/6. Many southeastern CT areas received up to 5+ inches of rainfall. The exact precipitation to fall near Lake Pocotopaug is unknown at this time but may be reported by residents with personal weather stations. NEAR performed the September water quality monitoring on 9/12/22. On this date, open water average Secchi clarity (with view scope) was 1.9m across the four sampling stations, slightly improved since the previous sampling date. Remaining late-August and September laboratory nutrient results will be shared as soon as they are reported from the lab.

If you have any questions, please contact me at hillary.kenyon@gmail.com.

Thank you.

Laboratory Nutrient Concentrations 2022 Results from 8/02/22

Nutrient results displayed below from 8/2/22 indicate that Total Phosphorus (TP) was evenly distributed throughout the water column at the Markham station. The bottom TP concentrations were slightly elevated at Oakwood stations. The South station had the highest surface nutrient concentrations for both TP and Total Nitrogen (TN). Chlorophyll-a was highest at the Markham station, but it does not appear directly correlated with nutrient TP or TN. Ammonia nitrogen was present at moderate levels throughout the water column at both the Oakwood and Markham stations.

Total Phosphorus and Total Nitrogen concentrations were overall considerably lower in early August 2022 than they were in 2021. Average 2021 August TP concentrations at Oakwood and Markham stations were 34 µg/L, compared to an average of just 22 µg/L TP on 8/2/22. The average August 2021 surface TN concentration at these two primary stations was 827 µg/L, compared to a much lower 606 µg/L TN on 8/2/22. The reduced nutrients on this 2022 sampling date are likely a combination of the success of the copper sulfate treatment, which allows for some level of organic nutrient reduction when dead algae/cyanobacteria cells fall out of the water column, and also from reduced watershed loading given low rainfall in July 2022. All nutrient results from 2022 will be compared graphically to previous years in the final water quality report of 2022.

Nutrient concentrations from 8/26/22 and 9/12/22 have not yet been reported by UCONN CESE lab. In 2023, the Town of East Hampton is considering opting for the rapid turn-around-time option with 7-14 day options (25-50% sample surcharge) on a select number of samples, to provide a more continuous summer nutrient conditions report without 6+ weeks laboratory lag times. Lake nutrient sampling must be done in a qualifying laboratory capable of test for very low limits of detection, as specified in the tables and EPA lab analysis methods.

Units	µg/L	µg/L	µg/L	µg/L	µg/L
EPA Method #	350.1	353.2	353.2	445	365.4
Practical Quantitation Limit (PQL)	10	10	50	0.3	10
Method Detection Limit (MDL)	3	3	8	0.1	1
Collection date	8/2/2022	8/2/2022	8/2/2022	8/2/2022	8/2/2022
	Ammonia Nitrogen	Nitrate+Nitrite Nitrogen	Total Nitrogen	Chlorophyll-a	Total Phosphorus
	NH3	NOX	TN	Chla	TP
Pocotopaug Markham 1 m	64	11	595	21.1	21
Pocotopaug Markham 5 m	NSS	NSS	585	NSS	23
Pocotopaug Markham 7.5 m	79	7	606	NSS	23
Pocotopaug Oakwood 1 m	104	6	616	15	22
Pocotopaug Oakwood 5 m	NSS	NSS	624	NSS	23
Pocotopaug Oakwood 9 m	98	5	631	NSS	28
Pocotopaug Island 1 m	NSS	NSS	627	13.6	23
Pocotopaug South 1 m (duplicate averaged)	NSS	NSS	630	14.5	29

ND = Not Detected

NSS = No Sample Sent (not part of the scope of services)

(Note: * in tables below denote dissolved oxygen values that had a hard time stabilizing, which is typical when very close to the sediment surface.)

8/26/22 Field Data Results

Water clarity was slightly worse on 8/26/22 than it was on 8/2/22. Dissolved oxygen conditions had improved.

Markham Station (41.59949, -72.49493)

Sampling Date: 08/26/2022

Water clarity: 1.3 meters

Water depth: 7.5 meters

Weather: Sunny/bright, breezy

Depth (m)	Temp (°C)	Oxygen (mg/L)	Oxygen Saturation %	Conductivity µS/cm
0	27.5	8.0	104	164
1	26.8	8.2	104	164
2	26.6	8.2	105	164
3	26.5	8.3	106	165
4	26.4	8.1	103	165
5	26.3	7.9	100	165
6	26.2	7.4	94	165
7	26.2	7.2	91	166
7.5	26.1	5-7*	N/A	166

Island Station (41.59668722, -72.50117)

Sampling Date: 08/26/2022

Water clarity: 1.1 meters

Water depth: 6.0 meters

Weather: Sunny/bright, breezy

Depth (m)	Temp (°C)	Oxygen (mg/L)	Oxygen Saturation %	Conductivity µS/cm
0	26.8	8.8	112	163
1	26.7	8.8	112	163
2	26.2	8.3	106	162
3	26.1	8.0	100	163
4	25.9	7.4	94	163
5	25.8	7.0	88	166
6	25.6	3.0*	74*	177

Oakwood Station (41.59758, -72.50849)

Sampling Date: 08/26/2022

Water clarity: 1.2 meters

Water depth: 10.4 meters

Weather: Sunny/bright, windy

Depth (m)	Temp (°C)	Oxygen (mg/L)	Oxygen Saturation %	Conductivity µS/cm
0	26.6	8.7	111	177
1	26.1	7.9	100	175
2	26.0	8.0	101	175
3	26.0	7.9	99	175
4	26.0	7.9	97	175
5	25.9	7.7	93	172
6	25.8	7.5	93	173
7	25.6	6.2	78	175
8	25.5	5.4	68	174
9	25.4	4.8	60	174
10	25.3	3.2	39	175
10.4	25.2	3.0	4	174

South/Outlet Station (41.587383, -72.501875)

Sampling Date: 08/26/2022

Water clarity: 1.15 meters

Water depth: 3.6 meters

Weather: Sunny/bright, light breeze

Depth (m)	Temp (°C)	Oxygen (mg/L)	Oxygen Saturation %	Conductivity µS/cm
0	27.3	8.9	115	176
1	26.9	8.8	113	174
2	26.1	7.6	96	173
3	25.9	6.7	85	174
3.6	25.6	4.8	60	174

9/12/22 Field Data Results

Open water Secchi clarity, measured with an 8-inch Secchi disk and view scope, had improved since the 8/26/22 NEAR monitoring visit. The water column has begun to cool. Oxygen conditions were good at all stations, with only slightly reduced dissolved oxygen at the bottom of each site (last probe readings are recorded roughly 2-inches above the sediment surface).

Markham Station (41.59949, -72.49493)

Sampling Date: 09/12/2022

Water clarity: 1.75 meters

Water depth: 7.8 meters

Weather: Overcast, very calm, no wind

Depth (m)	Temp (°C)	Oxygen (mg/L)	Oxygen Saturation %
0	23.3	7.6	91
1	23.5	7.4	89
2	23.5	7.4	89
3	23.5	7.5	90
4	23.5	7.5	90
5	23.5	7.4	89
6	23.5	7.3	88
7	23.5	7.2	87
7.8	23.5	7.0	84

Island Station (41.59668722, -72.50117)

Sampling Date: 09/12/2022

Water clarity: 1.8 meters

Water depth: 5.5 meters

Weather: Overcast/very calm

Depth (m)	Temp (°C)	Oxygen (mg/L)	Oxygen Saturation %
0	23.3	7.9	94
1	23.4	7.8	93
2	23.4	7.6	91
3	23.5	7.5	90
4	23.5	7.5	91
5	23.4	7.6	91
5.5	23.4	6.5	78

Oakwood Station (41.59758, -72.50849)

Sampling Date: 09/12/2022

Water clarity: 2.0 meters

Water depth: 10.5 meters

Weather: Sunny/bright, windy

Depth (m)	Temp (°C)	Oxygen (mg/L)	Oxygen Saturation %
0	23.2	7.5	90
1	23.3	7.4	89
2	23.4	7.3	88
3	23.4	7.3	88
4	23.4	7.4	89
5	23.4	7.5	89
6	23.4	7.4	89
7	23.4	7.4	89
8	23.4	7.5	90
9	23.4	7.5	90
10	23.4	7.4	89
10.5	23.4	5.9	71

South/Outlet Station (41.587383, -72.501875)

Sampling Date: 09/12/2022

Water clarity: 2.1 meters

Water depth: 3.3 meters

Weather: Cloudy/bright, very calm, no wind

Depth (m)	Temp (°C)	Oxygen (mg/L)	Oxygen Saturation %
0	23.9	8.5	103
1	23.8	8.5	102
2	23.7	8.5	102
3	23.7	8.4	101
3.3	23.5	4.3	54