Lake Rippowam Questions and Answers, 2015 CSLAP

Q1. What is the condition of our lake this year?

A1. Conditions in Lake Rippowam were again similar to those measured in previous years. Both water clarity and chlorophyll *a* levels were slightly lower than normal, but these differences were small.

Q2. Is there anything new that showed up in the testing this year?

A2. Chloride sampling results were typical of lakes with moderate to high impacts from road salt runoff, although actual impacts have not been measured.

Q3. How does the condition of our lake this year compare with other lakes in the area?

A3. Lake Rippowam had slightly lower water clarity, and slightly higher nutrient levels and algae levels, than other nearby lakes. Aquatic plant coverage is slightly higher than in most of these nearby lakes, and at times impact lake use. This may be due to the presence of Eurasian watermilfoil.

Q4. Are there any trends in our lake's condition?

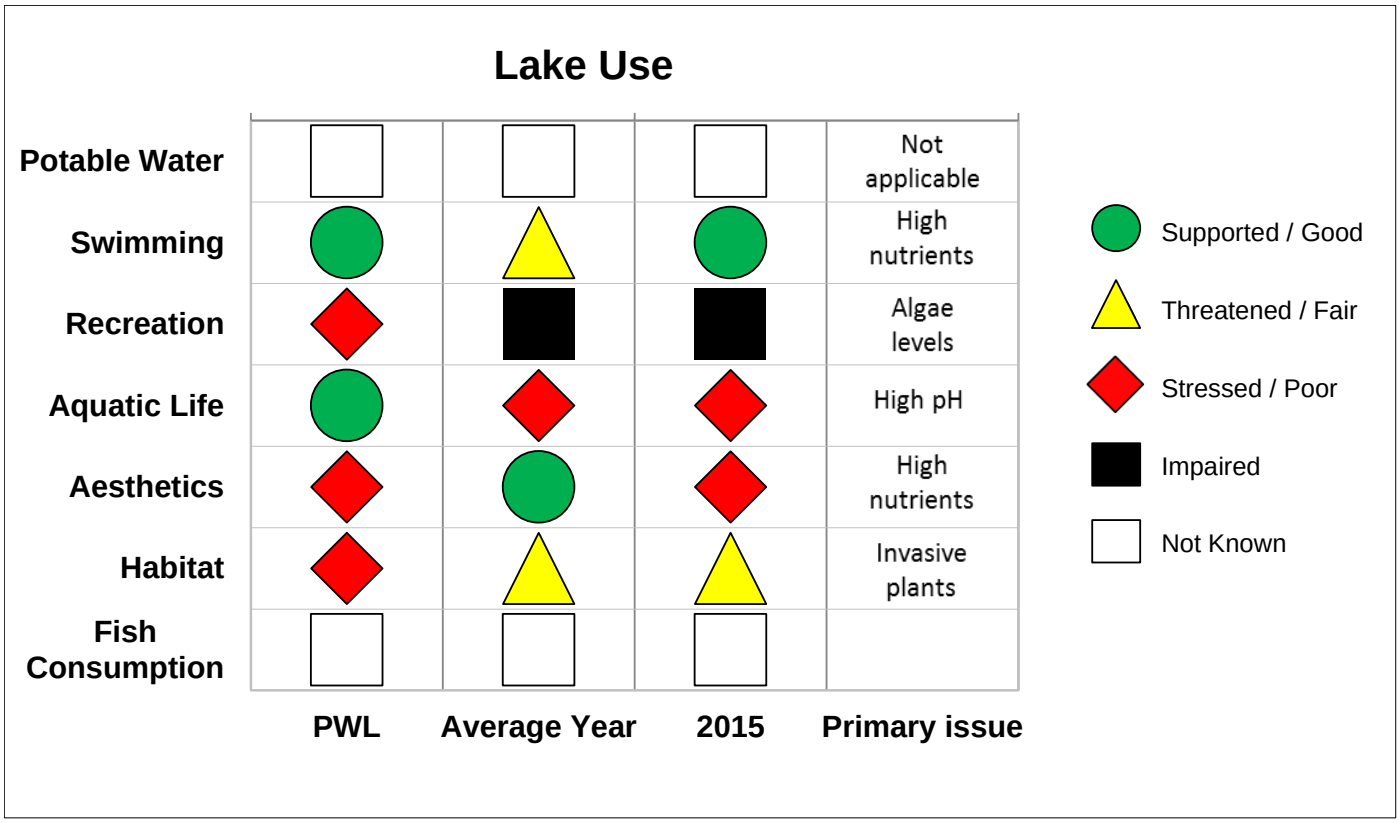
A4. Water clarity readings have decreased slightly (and water quality perception has degraded slightly) over the last decade, in response to a slight increase in algae levels. Although the change in deepwater phosphorus readings has been the most significant change, impacts to the surface nutrient levels or other water quality indicators have not been measured.

Q5. Should we be concerned about the condition of our lake? Are we close to a tipping point?

A5. The recent rise in phosphorus readings may indicate a longer-term trend; it is not known if the periodically elevated algae levels seen in some years (and in spring and fall most years) are part of a longer-term trend. The lake should continue to be evaluated for more frequent occurrences of water quality problems.

Q6. Are any actions indicated, based on the trends and this year's results?

A6. Individual stewardship activities such as pumping your septic system, growing a buffer of native plants next to the water bodies, and reducing erosion from shoreline properties and runoff into the lake will help to improve lake health by reducing nutrient and sediment loading to the lake. Visiting boats should be inspected to reduce the risk of new invasive species, since nearby lakes harbor several invasive plants not presently found in the lake.

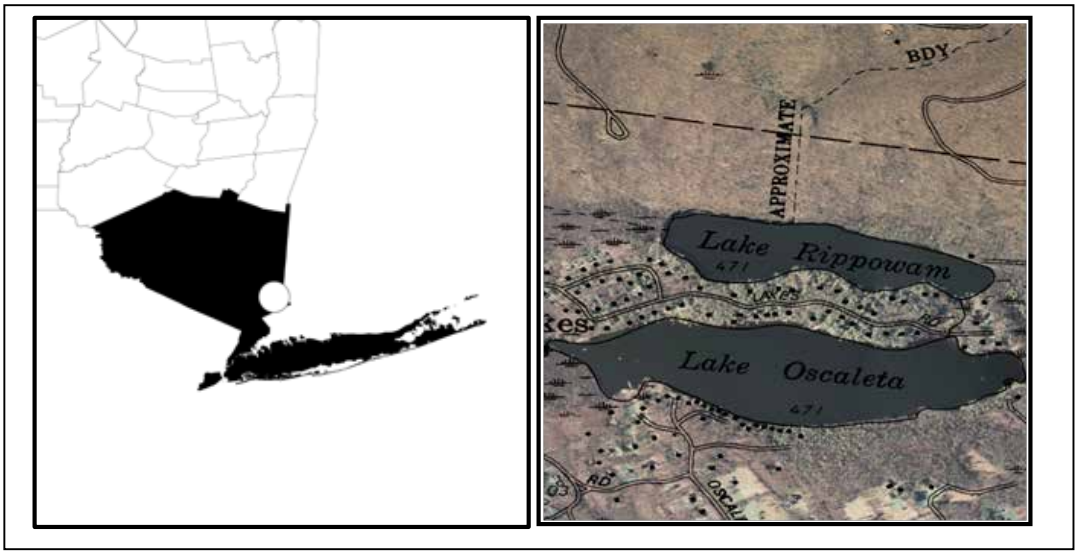


CSLAP 2015 Lake Water Quality Summary:
Lake Rippowam

General Lake Information

Location	Town of South Salem
County	Westchester
Basin	Lower Hudson River
Size	13 hectares (32.1 acres)
Lake Origins	Natural
Watershed Area	410 hectares (1,013 acres)
Retention Time	0.2 years
Mean Depth	2.7 meters
Sounding Depth	5.7 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To…	Lake Oscaleta to Lake Waccabuc to Waccabuc River to Cross River to Cross River Reservoir to….to Hudson River
WQ Classification	B (contact recreation = swimming)
Lake Outlet Latitude	41.299
Lake Outlet Longitude	-73.557
Sampling Years	2006-2011, 2013-2015
2015 Samplers	Lou Feeney and Jan Anderson
Main Contact	Janet Andersen

Lake Map



Background

Lake Rippowam is a 34 acre lake found in the town of Lewisboro in Westchester County, just north of the New York City region of New York State. The lake was first sampled as part of CSLAP in 2006.

It is one of 19 CSLAP lakes among the more than 630 lakes and ponds found in Westchester County, and one of 67 CSLAP lakes among the more than 1370 lakes and ponds in the Lower Hudson River drainage basin.

Lake Uses

Lake Rippowam is a Class B lake- this means that the best intended use for the lake is for contact recreation—bathing and swimming, non-contact recreation—boating and fishing, aquatic life, and aesthetics. The lake is used by lake residents and invited guests for a variety of recreational purposes, and there is no public access to the lake.

The following local stocking record is reported by the Three Lakes Council for Lake Waccabuc, Lake Rippowam, and Lake Oscaleta:

Year	Waccabuc	Rippowam	Oscaleta
1996	No stocking		
1998	none	250 smallmouth bass	250 smallmouth bass
1999	800 11” brown trout	none	200 11” brown trout
2000	500 trout (location not known)		
2001	300 11” brown trout	none	120 11” brown trout
2002	No stocking		
2003	350 10” brown trout	none	150 10” brown trout
2004	400 11” brown trout	none	250 11” brown trout
2006	425 11” brown trout	none	225 11” brown trout
2007	No stocking		
2008	none	none	350 brown trout
2009	200 11” brown trout	none	300 11” brown trout
2010	300 11” brown trout	none	200 11” brown trout
2011	No stocking		
2012	350 brown trout		150 brown trout
2013	250 brown trout	None	250 brown trout
2014	350 brown trout	None	150 brown trout
2015	350 brown trout		150 brown trout

The state record hybrid striped bass was caught in Lake Waccabuc in 2004, according to the state records: http://www.dec.ny.gov/outdoor/7935.html..

General statewide fishing regulations are applicable in Lake Rippowam. In addition, local regulations include a limit of five bass (small or large mouth) with a size limit of 12 inches from June 21st to November 30th, five trout of any size from April 1st to October 15th, five pickerel with a size limit of 15 inches between May 3rd and March 15th, 25 crappie with a size limit of nine inches, 50 perch or sunfish of any size, and no catch or size limit for carp or suckers.

Historical Water Quality Data

CSLAP sampling was conducted on Lake Rippowam each year from 2006-2011 and from 2013 to 2015. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at http://nysfola.mylaketown.com. The most recent CSLAP reports for Lake Rippowam can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77829.html..

Cornell University conducted an aquatic plant survey of the lakes in 1970. A summary of the survey can be found on the Three Lakes Council web page.

SUNY Purchase conducted some limited studies of the lakes from 1976 through 1983. The results from these studies can be found on the Three Lakes Council web page.

Unlike the other two lakes in the Three Lakes "chain", Lake Rippowam was not sampled in 1987 as part of the Adirondack Lake Survey Corporation (ALSC) study of more than 1500 lakes in the Adirondacks and southern New York.

The lake was sampled by Cedar Eden Environmental LLC in 2003 in anticipation of developing a Lake and Watershed Management Plan for the lake. These data indicate that Lake Rippowam was probably about as productive in the last three years than in 2003.

It is not known if local monitoring has been conducted as a fisheries management tool, or to evaluate swimming conditions in the lake.

None of the ephemeral inlets has been monitored through the NYSDEC Rotating Intensive Basins (RIBS) program or the state stream macroinvertebrate monitoring program. The lake has not been sampled by DEC fisheries staff in support of fish stocking activities.

Lake Association and Management History

Lake Rippowam (and its sister lakes Lake Oscaleta and Lake Waccabuc) is served by the Three Lakes Council, which was organized in 1970 and has been involved in a variety of lake and watershed management activities. These include:

- CSLAP sampling on all three lakes
- setting up a Google Group to support communication on lake stewardship and watershed topics
- providing education about yard care—lake water quality and phosphorus, yard waste, pet care, aquatic plants and invasives, town wetland permits re: docks, shoreline buffers,
- setting boat speed limits (25hp town law Waccabuc, 10hp town law Oscaleta/Rippowam, no 25hp motors allowed at Two Lake club beach)
- fish stocking and encouraging participating in creel census
- conducting residential surveys
- management of Brazilian elodea (*Egeria densa*)
- conducting egg addling to control nuisance waterfowl
- hiring a lake manager for counsel and aquatic plant surveys
- algae and zooplankton sampling to help understand the food web
- issuing boat stickers to help discourage transient boats that might carry invasive species

The Three Lakes Council maintains a website at http://www.threelakescouncil.org.

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual Results Relative to 2006-2014

The summer (mid-June through mid-September) average readings are compared to historical averages for all CSLAP sampling seasons in the "Lake Condition Summary" table, and are compared to individual historical CSLAP sampling seasons in the "Long Term Data Plots –Lake Rippowam" section in Appendix C.

Evaluation of Eutrophication Indicators

Water clarity readings were slightly higher than usual in 2015, but so were algae (chlorophyll *a*) levels, and phosphorus readings were close to normal. This suggests that the small variability in each of indicators is routine, although algae levels have increased slightly over the last decade. Deepwater phosphorus readings were slightly higher than normal, and deep ammonia readings were slightly lower than normal, although suggesting that deepwater oxygen levels (and deficits) may be variable.

Lake productivity typically is stable or decreases slightly from April through June, then increases from June through November. The latter occurs during lake destratification, a trend generally seen in the other Three Lakes Council lakes and in recent years, including 2014 and 2015. This further suggests that internal nutrient loading may play a role in seasonal changes in the lake, although much of the seasonal increase in deepwater nutrient levels in many years appears to occur in early summer.

The lake continues to be characterized as *mesoeutrophic*, based on water clarity (typical of *mesotrophic* lakes), total phosphorus and chlorophyll *a* (both typical of *eutrophic* lakes); Lake Oscaleta and Lake Waccabuc exhibit similar conditions. Trophic conditions in Lake Rippowam in 2015 were more typical of *eutrophic* lakes in 2015. This assessment was also apparent in 2014. The trophic state index (TSI) evaluation suggests that chlorophyll *a* levels may be slightly higher than expected given the water clarity and phosphorus readings. This suggests that algae may be growing patchy or in gradients. Overall trophic conditions are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are high enough to render the lake susceptible to taste and odor compounds or elevated DBP (disinfection by product) compounds that could affect the potability of the water, but the lake is not classified for this use. Deepwater ammonia and phosphorus readings are somewhat higher than those at the lake surface, as expected given the weak thermal stratification in the lake (although some anoxia was reported in 2015). Deep TP readings have increased significantly in recent years, although surface water impacts are not (yet) apparent. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

NOx readings were slightly lower than normal in 2015, and these readings have decreased slightly over the last decade. Conductivity readings were slightly higher than usual in 2015, and these readings have increased slightly in the last decade. Ammonia readings have decreased slightly and total nitrogen readings have increased slightly in recent years, and TN was slightly higher than usual in 2015.

Chloride levels in the 2015 samples, collected for the first time through CSLAP and cited in Appendix A, ranged from 36 to 39 mg/l. These values fall within the "major" road salt runoff levels cited by the New Hampshire DES. These readings are well below the state potable water quality standard of 250 mg/l and above the range of values found in most NYS lakes. These readings suggest a moderate to high likelihood of biological impacts from road salt. Additional data will help to determine if these represent normal readings for the lake.

Overall limnological conditions are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Biological Condition

Zooplankton and macroinvertebrate data have not been collected through CSLAP at Lake Rippowam. The fluoroprobe data from SUNY ESF showed decreasing overall algae levels and blue green algae levels from 2013 to 2015, although elevated readings were apparent later in the summer in all three years. No blooms were apparent in the open water. A microscopic analysis of these samples showed a mix of species, including several blue green algae species (*Anabaena, Lyngbya, Microcystis*, and *Oscillatoria*, all of which can produce algal toxins. A small shoreline bloom on the east side of the lake in early August of 2013 showed the same blue green algae species, although this also did not meet the criteria of a "bloom". Similar conditions were also apparent along the shoreline in mid-September of 2014. No shoreline blooms were reported in 2015.

The CSLAP macrophyte surveys conducted by Allied Biological identified at least 6 different aquatic plant species at the lake, including one exotic plant species (*Myriophyllum spicatum*, Eurasian watermilfoil). It is not known if a greater variety of plants is found in the lake. The modified floristic quality index (FQI) indicates that the quality of the aquatic plant community is "fair".

Fish information collected through the ALSC indicates a mix of coldwater (at least one species), coolwater (at least one species) and warmwater (at least six species) fish. This suggests that the lake is primarily a warmwater fishery.

Biological conditions in the lake are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Lake Perception

Aquatic plant coverage increases slightly in early to mid-summer, but stabilizes after that, in a typical year. The same seasonal patterns were apparent in 2015. Water quality assessments have degraded slightly in recent years, although both water quality and recreational assessments were

close to normal in 2015. No clear seasonal changes in lake perception are apparent. Overall lake perception is summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Water temperature readings were slightly higher than normal in 2014 and 2015, but no long-term changes have been apparent in either air or water temperature.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Fluoroprobe readings indicate little evidence of open water harmful algal blooms (HABs), although these readings at times approach the DEC blue green algae bloom criteria in late summer to early fall. Microcystin readings in these samples are below the levels needed to support safe swimming. Algal toxin levels in bloom samples are occasionally above recreational criteria, indicating a higher risk in areas where surface scums or heavily discolored water is apparent along the shoreline, but no shoreline blooms were reported in 2015.

Lake Condition Summary

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.53	2.14	3.90	1.96	Mesotrophic	Within Normal Range	No Change
	Chlorophyll *a*	0.30	17.28	202.8	15.2	Eutrophic	Within Normal Range	Increasing Slightly
	Total Phosphorus	0.009	0.026	0.061	0.027	Eutrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.01	0.05	0.56	0.04	Close to Surface NH4 Readings	Lower Than Normal	Not known
	Hypolimnetic Arsenic							
	Hypolimnetic Iron							
	Hypolimnetic Manganese							
Limnological Indicators	Hypolimnetic Phosphorus	0.010	0.045	0.155	0.072	Close to Surface TP Readings	Higher than Normal	Not known
	Nitrate + Nitrite	0.00	0.02	0.47	0.01	Low NOx	Lower Than Normal	No Change
	Ammonia	0.01	0.04	0.24	0.03	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.18	0.56	1.36	0.68	Intermediate Total Nitrogen	Within Normal Range	No Change
	pH	6.62	7.97	9.40	7.96	Alkaline	Within Normal Range	No Change
	Specific Conductance	103	177	243	210	Intermediate Hardness	Higher than Normal	No Change
	True Color	10	23	49	19	Intermediate Color	Within Normal Range	No Change
	Calcium	11.0	16.6	19.8	16.6	May be Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.4	4	2.6	Not Quite Crystal Clear	Within Normal Range	Slightly Degrading
	Aquatic Plant Coverage	1	2.5	4	2.5	Surface Plant Growth	Within Normal Range	No Change
	Recreational Assessment	1	2.2	4	2.1	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-moderate blue algae biomass; Shoreline-low blue green algae biomass	Not known	Not known
	Macrophytes					Fair quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not measured through CSLAP	Not known	Not known
	Macroinvertebrates					Not measured through CSLAP	Not known	Not known
	Fish					Warmwater fishery	Not known	Not known
	Invasive Species					Eurasian watermilfoil	Not known	Not known
Local Climate Change	Air Temperature	4	22.3	32	25.4		Higher Than Normal	No Change
	Water Temperature	6	21.4	30	24.3		Higher Than Normal	No Change

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Harmful Algal Blooms	Open Water Phycocyanin	1	67	461	23	Some readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	2	9	26	8	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	4	19	2	Few readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	0.4	3.4	<DL	Mostly undetectable open water MC-LR	Not known	Not known
	Open Water Anatoxin a	<DL	<DL	0.1	<DL	Open water Anatoxin-a at times detectable	Not known	Not known
	Shoreline Phycocyanin					No shoreline blooms sampled for PC	Not known	Not known
	Shoreline FP Chl.a	32.8	33.9	35.0		All readings indicate high algae levels	Not known	Not known
	Shoreline FP BG Chl.a	15.7	21.1	26.5		Most readings indicate high BGA levels	Not known	Not known
	Shoreline Microcystis	<DL	7.0	15.2		At times elevated shoreline bloom MC-LR	Not known	Not known
	Shoreline Anatoxin a	<DL	<DL	<DL		Shoreline bloom Anatoxin-a consistently not detectable	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

The 2007 NYSDEC Priority Waterbody Listings (PWL) for the Lower Hudson River drainage basin indicate that Lake Rippowam has "no known impacts." The PWL listing for Lake Rippowam can be found in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Lake Rippowam, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake is not used for this purpose.

Public Bathing

The CSLAP dataset at Lake Rippowam, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public swimming beach, would at times be *threatened* by excessive nutrients that can trigger excessive algae and reduced water clarity. Additional information about bacteria levels is needed to determine if pathogens impact swimming.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Lake Rippowam, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation may be *impaired* by excessive algae.

Aquatic Life

The CSLAP dataset on Lake Rippowam, including water chemistry data and physical measurements, suggest that aquatic life may be *stressed* by elevated pH associated with excessive algae growth. This use may also be *threatened* by road salt runoff, deepwater anoxia and invasive plants. Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

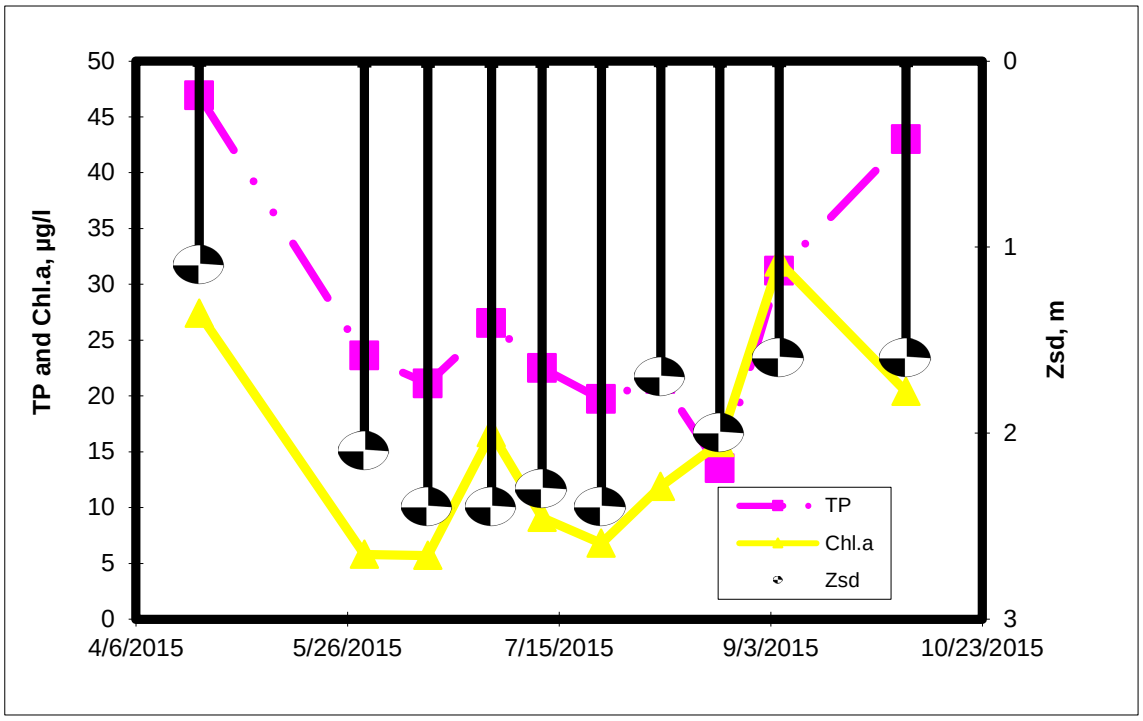
Aesthetics and Habitat
The CSLAP dataset on Lake Rippowam, including volunteer samplers' perception data, suggest that aesthetics may be *fair* due to excessive nutrients that can lead to shoreline blooms. Habitat may be *poor* due to invasive weeds.

Fish Consumption
There are no fish consumption advisories on Lake Rippowam.

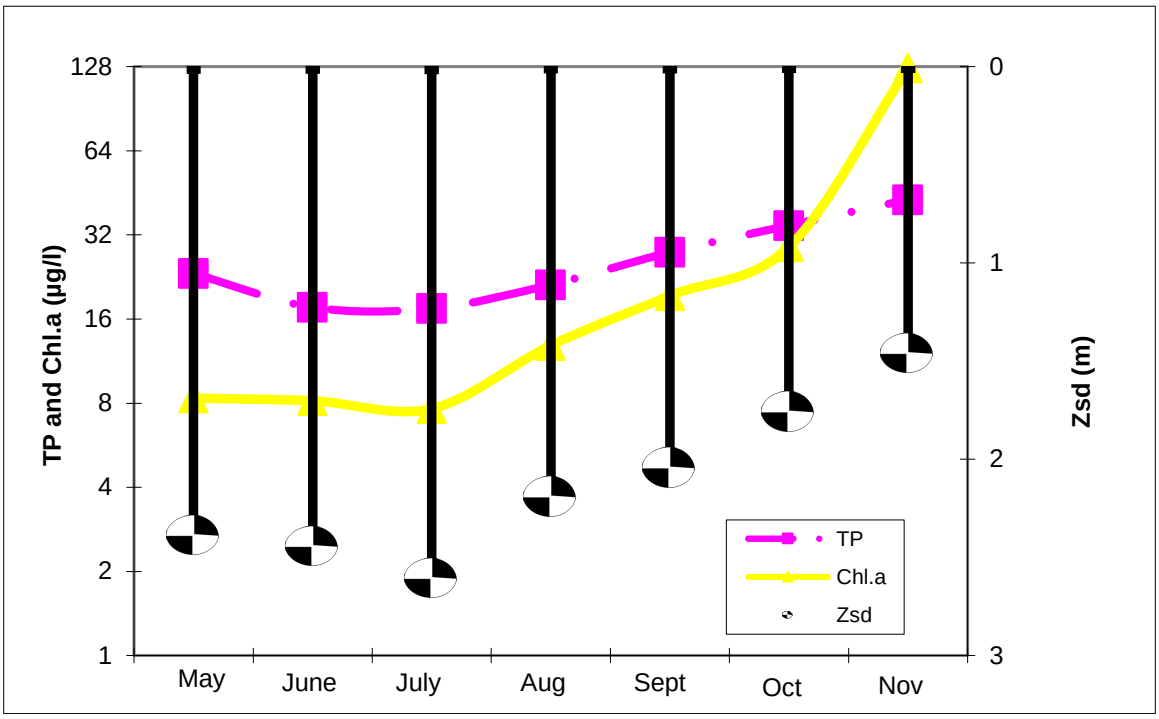
Additional Comments and Recommendations
Aquatic plant surveys should continue to be conducted at Lake Rippowam to determine if the plant community is comprised by other plants, or if the Brazilian elodea in Lake Waccabuc has migrated into this lake. Lake residents are advised to report any shoreline blooms. The rise in surface and bottom phosphorus may represent a new source of nutrients to the lake; all potential sources should be evaluated.

Aquatic Plant IDs-2015
None submitted for identification in 2015.

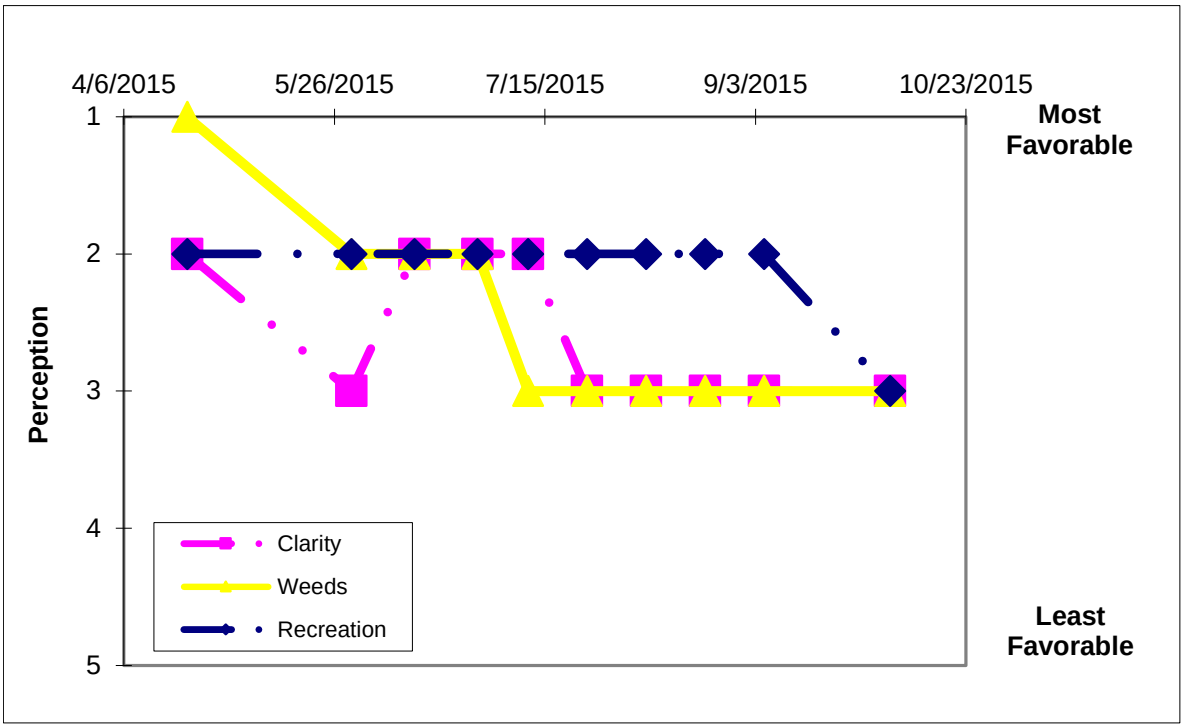
Time Series: Trophic Indicators, 2015



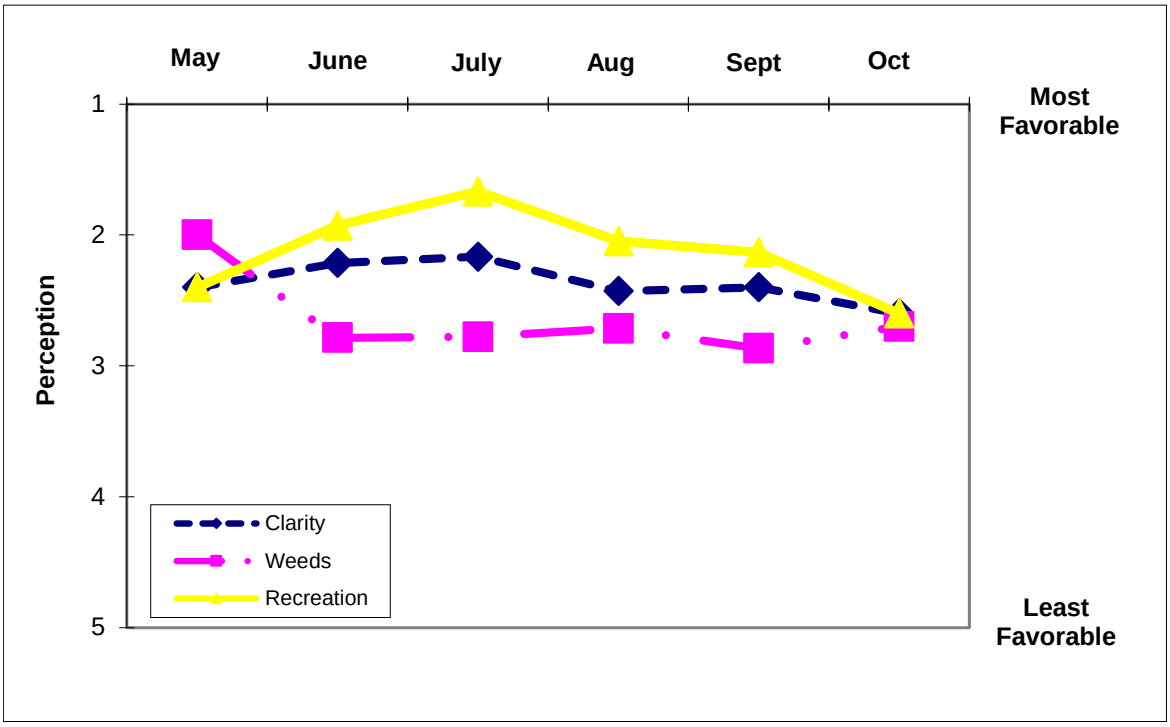
Time Series: Trophic Indicators, Typical Year (2006-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (2006-2015)



Appendix A- CSLAP Water Quality Sampling Results for Lake Rippowam

LNum	LName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
204	L Rippowam	6/10/2006	6.0	1.40	1.5	0.024	0.03	0.03			13	7.88	148	11.0	5.07	
204	L Rippowam	6/24/2006	5.7	1.95	1.5	0.019	0.03	0.02	0.44	50.85	14	8.15	180		6.15	
204	L Rippowam	7/8/2006	5.8	1.90	1.5	0.02	0.02	0.08	0.64	70.93	14	7.75	190		9.64	
204	L Rippowam	7/22/2006	5.8	1.80	1.5	0.015	0.01	0.01	0.45	65.36	29	8.15	168		7.83	
204	L Rippowam	8/5/2006	5.6	1.25	1.5	0.018	0.02	0.04	0.66	78.90	22	8.65	183	16.1	13.51	
204	L Rippowam	8/19/2006	5.5	0.53	1.5	0.034	0.01	0.03	1.04	66.53	37	9.40	162			
204	L Rippowam	9/11/2006	5.7	3.05	1.5	0.021	0.03	0.15	1.05	107.74	40	7.88	181		6.08	
204	L Rippowam	10/8/2006	5.8	1.60	1.5	0.028	0.04	0.23	0.67	52.66	31	7.38	203		19.53	
204	L Rippowam	7/8/2007	5.6	2.75	1.5	0.013	0.00	0.01	0.52	85.89	19	7.65	186	15.9	5.02	
204	L Rippowam	7/21/2007	5.6	2.50	1.5	0.017	0.01	0.02	0.52	69.19	17	8.21	176		8.11	
204	L Rippowam	8/4/2007	5.6	1.95	1.5	0.014	0.01	0.01	0.79	123.97	18	7.14	161		6.90	
204	L Rippowam	8/18/2007	5.6	1.60	1.5	0.020	0.00	0.01	0.57	62.57	17	8.00	158		14.94	
204	L Rippowam	9/3/2007	5.6	2.10	1.5	0.019	0.00	0.01	0.88	104.66	16	8.20	135	15.9	6.93	
204	L Rippowam	9/15/2007	5.7	2.15	1.5	0.017	0.00	0.01	0.77	97.94	17	7.61	180		12.73	
204	L Rippowam	9/30/2007	5.5	2.40	1.5	0.020	0.01	0.09	0.75	82.02	27	7.68	157		14.64	
204	L Rippowam	10/20/2007	5.6	2.15	1.5	0.026	0.01	0.02	0.87	74.35	17	7.35	148		21.52	
204	L Rippowam	5/11/2008	5.7	2.65	1.5	0.016	0.20	0.11			17	8.30	172		5.84	
204	L Rippowam	5/25/2008	5.7	2.15	1.5	0.019	0.01	0.03	0.45	52.64	20	8.63	196		11.12	
204	L Rippowam	6/7/2008	5.7	3.40	1.5	0.017	0.02	0.02	0.46	57.98	22	8.17	172		7.53	
204	L Rippowam	6/21/2008	5.7	2.00	1.5	0.015	0.00	0.01	0.64	91.79	31	8.51	154	17.5	9.51	
204	L Rippowam	7/7/2008	5.7	2.20	1.5	0.017	0.00	0.02	0.43	57.00	20	8.77	116		10.89	
204	L Rippowam	7/19/2008	5.6	3.12	1.5	0.013	0.02	0.04	0.31	53.99	17	8.49	114		3.20	
204	L Rippowam	8/2/2008	5.6	2.75	1.5	0.012	0.00	0.02	0.34	65.62	26	8.37	149		5.42	
204	L Rippowam	8/16/2008	5.7	2.70	1.5	0.014	0.00	0.05	0.35	56.74	15	8.54	170	16.7	7.26	
204	L Rippowam	8/30/2008	5.6	2.25	1.5	0.018	0.00	0.06	0.46	57.41	27	8.92	189		15.02	
204	L Rippowam	9/14/2008	5.7	2.50	1.5	0.019	0.00	0.02	0.43	51.12	24	7.65	190		18.86	
204	L Rippowam	9/28/2008	5.7	2.05	1.5	0.030	0.01	0.06	0.64	47.19	22	7.97	147		29.38	
204	L Rippowam	10/12/2008	5.7	1.85	1.5	0.031	0.02	0.06	0.61	42.95		7.40	202		20.10	
204	L Rippowam	10/26/2008	5.7	1.50	1.5	0.036	0.01	0.11	0.66	40.33		7.30	201		47.20	
204	L Rippowam	11/9/2008	5.8	1.35	1.5	0.049	0.01	0.02				7.30	207		107.22	
204	L Rippowam	11/29/2008	5.8	1.55	1.5	0.044	0.02	0.05	0.67	33.23		7.10	217		405.60	
204	L Rippowam	5/18/2009	5.7	2.4	1.5	0.022						7.82			12.6	
204	L Rippowam	06/21/2009	6.0	1.85	1.5	0.020	0.02	0.04	0.51	56.04	24	7.58	178	18.4	26.45	
204	L Rippowam	07/03/2009	5.8	2.25	1.5	0.015	0.01	0.02	0.42	62.97	30	6.62	181		9.17	
204	L Rippowam	07/18/2009	5.7	3.00	1.5	0.019	0.02	0.02	0.39	46.13	49	8.28	148		7.64	
204	L Rippowam	08/03/2009	5.7	2.80	1.5	0.033	0.01	0.02	0.41	27.02	37	7.40	159		8.04	
204	L Rippowam	08/15/2009	5.7	3.30	1.5	0.012	0.03	0.03	0.40	74.65	37	8.64	103	19.8	6.20	
204	L Rippowam	08/30/2009	5.7	2.75	1.5	0.015	0.01	0.01	0.41	59.53	31	7.95	186		11.30	
204	L Rippowam	09/13/2009	5.7	2.30	1.5	0.022	0.01	0.06	0.50	50.07	37	7.66	160		11.90	
204	L Rippowam	10/04/2009	5.6	1.80	1.5	0.028	0.01	0.06	0.64	50.51	31	7.55	198		19.60	
204	L Rippowam	10/30/2009	5.8	1.9	1.5	0.026						7.36			13.0	
204	L Rippowam	11/29/2009	5.8	1.8	1.5	0.035						7.10			22.3	
204	L Rippowam	4/11/2010				0.023									21.30	
204	L Rippowam	5/7/2010				0.018									5.90	
204	L Rippowam	6/4/2010				0.014									0.30	
204	L Rippowam	6/27/2010	5.7	2.20	1.5	0.014	0.01	0.02	0.37	57.42	15	8.64	171	18.0	9.30	
204	L Rippowam	7/11/2010	5.5	3.50	1.5	0.009	0.01	0.03	0.31	75.39	14	8.63	201		5.20	
204	L Rippowam	7/24/2010	5.6	3.90	1.5	0.012	0.01	0.02			16	8.45	172		5.30	
204	L Rippowam	8/7/2010	5.6	3.35	1.5	0.019	0.01	0.02	0.48	55.12	21	8.52	176		9.20	
204	L Rippowam	8/21/2010	5.5	2.50	1.5	0.027	0.03	0.04	0.46	37.73	21	8.07	205	18.7	11.20	
204	L Rippowam	9/4/2010	5.6	2.05	1.5	0.029	0.02	0.03	0.52	40.08	23	8.54	207		23.50	
204	L Rippowam	9/20/2010	5.6	2.20	1.5	0.027	0.47	0.02	0.57	45.69	26	7.58	218		14.20	
204	L Rippowam	10/3/2010	5.8	1.85	1.5	0.030	0.01	0.09	0.45	33.07	15	7.37	194		16.90	
204	L Rippowam	10/31/2010				0.054									17.10	
204	L Rippowam	11/28/2010				0.040									58.10	
204	L Rippowam	4/22/2011	5.9	1.75	1.5	0.032						7.51	181		12.80	
204	L Rippowam	5/14/2011	5.7	2.55	1.5	0.026						7.53	185		6.50	
204	L Rippowam	6/4/2011	5.7	2.40	1.5	0.013						7.84	186		5.30	
204	L Rippowam	6/25/2011	5.8	2.00	1.5	0.019	0.01	0.03	0.48	55.76	24	8.28	198	15.7	9.10	
204	L Rippowam	7/9/2011	5.7	2.70	1.5	0.017	0.01	0.02	0.47	62.55	23	7.97	189		6.70	
204	L Rippowam	7/23/2011	5.6	3.05	1.5	0.017	0.02	0.02	0.38	48.45	20	8.32	174		3.60	
204	L Rippowam		grab	HAB												
204	L Rippowam	8/6/2011	5.6	2.70	1.5	0.017	0.02	0.02	0.44	55.00	21	8.39	177		7.60	

LNum	LName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
204	L Rippowam	8/20/2011	5.7	2.35	1.5	0.018	0.01	0.01	0.46	55.97	24	8.34	183	17.7	11.70	
204	L Rippowam	9/4/2011	5.9	1.85	1.5	0.032	0.01	0.05	0.57	38.91	23	8.08	167		17.10	
204	L Rippowam	9/18/2011	5.8	1.25	1.5	0.057	0.03	0.04	0.64	24.96	38	7.50	149		26.30	
204	L Rippowam	10/9/2011	5.8	1.55	1.5	0.044	0.03	0.05	0.77	38.70	34	7.32	155		55.80	
204	L Rippowam	10/9/2011	grab	HAB												
204	L Rippowam	11/6/2011	5.8	1.45	1.5	0.042						7.62	162		26.50	
204	L Rippowam	11/26/2011	5.8	1.50	1.5	0.038						7.49	162		36.10	
204	L Rippowam	3/14/2012	5.7	2	1.5	0.032						8.03	165.6			
204	L Rippowam	5/18/2012	5.7	2.1	1.5	0.039						8.34	169.2		5.2	
204	L Rippowam	6/11/2012	5.7	1.8	1.5	0.016						8.51	173.5		7.7	
204	L Rippowam	6/23/2012	5.7	2.5	1.5	0.015	0.01	0.04	0.5	67.959	19	8.24	175	17.8	5.7	
204	L Rippowam	7/14/2012	5.6	2.6	1.5	0.013	0.01	<LOD	0.5	77.657	17	8.6	181.6		4.9	
204	L Rippowam	7/28/2012	5.6	1.7	1.5	0.02	0.01	0.02	0.4	49.035	17	9	176.9		14	
204	L Rippowam	8/12/2012	5.7	1.1	1.5	0.022	0.01	0.24	0.8	78.742	16	9.34	175.9		23.3	
204	L Rippowam	8/25/2012	5.6	1.4	1.5	0.019	0.01	0.15	0.7	82.762	17	9.18	175.3	17	14.9	
204	L Rippowam	9/9/2012	5.7	2.1	1.5	0.025	0.01	0.01	0.6	55.043	17	8.24	170.9		19.4	
204	L Rippowam	9/21/2012	5.7	2.4	1.5							7.31	176.6			
204	L Rippowam	10/8/2012	5.8	1.7	1.5	0.04	0.04	0.14	0.8	44.599	26	7.28	175.7		28	
204	L Rippowam	11/24/2012	5.6	1.9	1.5	0.05						8	180.2		7.6	
204	L Rippowam	4/8/2013	5.7	1.6	1.5	0.033						8.5	175.2		12.2	
204	L Rippowam	5/20/2013	5.6	3.2	1.5	0.024						7.94	182.4		7.3	
204	L Rippowam	6/16/2013	5.6	3.25	1.5	0.014	0.03	0.03	0.40	63.45	12	7.33	161		5.90	
204	L Rippowam	6/29/2013	5.7	3.10	1.5	0.015			0.39	55.42	27	8.42	153		5.00	
204	L Rippowam	7/13/2013	5.7	3.15	1.5	0.019		0.01	0.18	20.62	24	8.12	166		10.00	
204	L Rippowam	7/28/2013	5.6	1.90	1.5	0.024			0.59	53.62	25	8.09	167			
204	L Rippowam				bloom											
204	L Rippowam	8/10/2013	5.7	1.80	1.5	0.033	0.01	0.03	0.65	43.80	23	8.35	162		23.60	
204	L Rippowam	8/24/2013	5.6	1.90	1.5	0.026			0.60	50.90	23	8.30	166		15.20	
204	L Rippowam	9/7/2013	5.7	1.55	1.5	0.040	0.01	0.04	0.67	37.22	30	7.33	160		21.40	
204	L Rippowam	9/22/2013	5.7	1.35	1.5	0.033			0.61	40.82	25	7.38	166		31.40	
204	L Rippowam	10/28/2013	5.6	1.7	1.5	0.051						7.68	170.7		36.6	
204	L Rippowam	4/13/2014	5.8	1.10	1.5	0.061						8.28	181		26.40	
204	L Rippowam	5/11/2014	5.7	1.40	1.5	0.037						8.22	181		13.40	
204	L Rippowam	6/7/2014	5.7	2.65	1.5	0.020	0.01	0.01	0.39	42.14	22	7.70	188	14.8	5.40	
204	L Rippowam	6/21/2014	5.7	3.25	1.5	0.016			0.43	58.85	18	7.08	154		5.00	
204	L Rippowam	7/5/2014	5.7	2.55	1.5	0.021	0.01	0.01	0.46	48.61	19	8.20	183		10.60	
204	L Rippowam	7/20/2014	5.7	2.00	1.5	0.023			0.50	48.28	18	7.56	188		11.20	
204	L Rippowam	8/3/2014	5.6	2.55	1.5	0.035	0.03	0.04	0.51	32.52	14	7.70	188	15.0	17.80	
204	L Rippowam	8/18/2014	5.6	1.80	1.5	0.034			0.55	35.26	21	7.13	187		21.10	
204	L Rippowam	8/30/2014	5.6	1.50	1.5	0.028	0.01	0.01	0.74	58.38	24	8.26	188		23.80	
204	L Rippowam	9/12/2014														
204	L Rippowam	9/12/2014	5.6	2.30	1.5	0.030			0.60	44.59	23	7.18	161		24.50	
204	L Rippowam	10/12/2014	5.5	1.75	1.5	0.049						7.45	194		35.80	
204	L Rippowam	4/21/2015	5.7	1.10	1.5	0.047									27.40	
204	L Rippowam	5/30/2015	5.7	2.10	1.5	0.024	0.01	0.01	0.45	19.07	10	7.34	243	17.3	5.80	
204	L Rippowam	6/14/2015	5.7	2.40	1.5	0.021			0.45	21.18	16	7.13	181		5.70	
204	L Rippowam	6/29/2015	5.7	2.40	1.5	0.027	0.00	0.03	0.51	19.09	16	7.38	233		16.70	36.0
204	L Rippowam	7/11/2015	5.8	2.30	1.5	0.023			0.74	32.89	25	8.4	183		9.10	
204	L Rippowam	7/25/2015	5.6	2.40	1.5	0.020	0.00	0.03	0.53	27.11	26	8.16	165	15.8	6.80	
204	L Rippowam	8/8/2015	5.6	1.70	1.5	0.022			0.65	30.42	22	8.53	239		11.90	
204	L Rippowam	8/22/2015	5.6	2.00	1.5	0.014	0.01	0.04	0.72	53.19	19	8.17	218		15.80	39.0
204	L Rippowam	9/5/2015	5.6	1.60	1.5	0.031			1.36	43.62	19	8.56	221		32.00	
204	L Rippowam	10/5/2015	5.6	1.60	1.5	0.043									20.40	
204	L Rippowam	6/21/2008			4.2	0.035										
204	L Rippowam	7/7/2008			4.3	0.034										
204	L Rippowam	7/19/2008			4.0	0.010										
204	L Rippowam	8/2/2008			4.0	0.019										
204	L Rippowam	8/16/2008			4.2	0.017										
204	L Rippowam	8/30/2008			4.0	0.015										
204	L Rippowam	9/14/2008			4.2	0.013										
204	L Rippowam	9/28/2008			4.2	0.021										
204	L Rippowam	10/12/2008				0.030										
204	L Rippowam	10/26/2008				0.036										
204	L Rippowam	11/9/2008				0.046										
204	L Rippowam	11/29/2008			4.3	0.049										
204	L Rippowam	06/21/2009	6.0		4.5	0.028		0.03								

LNum	LName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
204	L Rippowam	07/03/2009	5.8		4.3	0.032		0.03								
204	L Rippowam	07/18/2009	5.7		4.2	0.034		0.03								
204	L Rippowam	08/03/2009	5.7		4.2	0.033		0.03								
204	L Rippowam	08/15/2009	5.7		4.2	0.032		0.02								
204	L Rippowam	08/30/2009	5.7		4.2	0.018		0.02								
204	L Rippowam	09/13/2009	5.7		4.2	0.018		0.02								
204	L Rippowam	10/04/2009	5.6		4.1	0.025		0.02								
204	L Rippowam	4/11/2010				0.026										
204	L Rippowam	5/7/2010				0.031										
204	L Rippowam	6/4/2010				0.029										
204	L Rippowam	6/27/2010	5.7		4.2	0.025		0.02								
204	L Rippowam	7/24/2010	5.6		4.1	0.021		0.02								
204	L Rippowam	8/21/2010	5.5		4.0	0.026		0.03								
204	L Rippowam	9/20/2010	5.6		4.1	0.030		0.04								
204	L Rippowam	4/22/2011	5.9		4.4	0.032										
204	L Rippowam	5/14/2011	5.7		4.2	0.023										
204	L Rippowam	6/4/2011	5.7		4.2	0.030										
204	L Rippowam	6/25/2011	5.8		4.3	0.036		0.04								
204	L Rippowam	7/23/2011	5.6		4.1	0.029		0.02								
204	L Rippowam	8/20/2011	5.7		4.2	0.028		0.02								
204	L Rippowam	9/18/2011				0.035		0.05								
204	L Rippowam	5/18/2012			4.2	0.155						7.38	167			
204	L Rippowam	6/11/2012			4.2	0.032						7.59	171			
204	L Rippowam	6/23/2012			4.2	0.039		0.03				7.27	162			
204	L Rippowam	7/28/2012			4.1	0.037		0.02				7.40	171			
204	L Rippowam	8/12/2012			4.2	0.055		0.56				7.36	167			
204	L Rippowam	8/25/2012			4.1	0.031		0.18				7.64	161			
204	L Rippowam	9/9/2012			4.2	0.049		0.01				7.14	168			
204	L Rippowam	9/21/2012			4.2							7.26	177			
204	L Rippowam	4/8/2013			4.2							8.50	173			
204	L Rippowam	5/20/2013			4.1	0.025						7.45	183			
204	L Rippowam	6/16/2013			4.4	0.020		0.03								
204	L Rippowam	7/13/2013			4.2	0.036										
204	L Rippowam	8/10/2013			4.2	0.117		0.03								
204	L Rippowam	9/7/2013			4.2	0.062		0.10								
204	L Rippowam	10/28/2013			4.1	0.048						7.61	171			
204	L Rippowam	4/13/2014				0.048										
204	L Rippowam	5/11/2014				0.050										
204	L Rippowam	6/7/2014			4.2	0.094		0.03								
204	L Rippowam	6/21/2014			4.2	0.078										
204	L Rippowam	7/5/2014			4.2	0.086		0.04								
204	L Rippowam	7/20/2014			4.2	0.095										
204	L Rippowam	8/3/2014			4.1	0.054		0.04								
204	L Rippowam	8/18/2014			4.1	0.035										
204	L Rippowam	8/30/2014			4.1	0.051		0.05								
204	L Rippowam	9/12/2014			4.1	0.036										
204	L Rippowam	10/12/2014			4	0.045										
204	L Rippowam	4/21/2015			4.2	0.056										
204	L Rippowam	5/30/2015			4.2	0.141		0.03								
204	L Rippowam	6/14/2015			4.2	0.082										
204	L Rippowam	6/29/2015			4.2	0.062		0.04								
204	L Rippowam	7/11/2015			4.3	0.046										
204	L Rippowam	7/25/2015			4.1	0.063		0.03								
204	L Rippowam	8/8/2015			4.1	0.119										
204	L Rippowam	8/22/2015			4.1	0.048		0.05								
204	L Rippowam	9/5/2015			4.1	0.074										
204	L Rippowam	10/5/2015			4.1	0.032										

LNum	LName	Date	Type	TAir	TH2O	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chl	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HABform	ShoreHAB
204	L Rippowam	6/10/2006	epi	18	19	2	3	2	25											
204	L Rippowam	6/24/2006	epi	23	25	1	4	3	25											
204	L Rippowam	7/8/2006	epi	27	25	2	3	1	0											
204	L Rippowam	7/22/2006	epi	26	28	2	3	2	25											
204	L Rippowam	8/5/2006	epi	27	30	2	1	1	0											
204	L Rippowam	8/19/2006	epi	31	26	4	3	4	134											

LNum	LName	Date	Type	TAir	TH2O	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chl	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB form	Shore HAB
204	L Rippowam	9/11/2006	epi	16	22	2	2	1	0											
204	L Rippowam	10/8/2006	epi	20	19	2	3	1	0											
204	L Rippowam	7/8/2007	epi	29	25	2	3	2	2											
204	L Rippowam	7/21/2007	epi	22	25	2	3	1	2											
204	L Rippowam	8/4/2007	epi	27	28	2	3	2	23											
204	L Rippowam	8/18/2007	epi	18	25	3	3	2	12											
204	L Rippowam	9/3/2007	epi	23	24	2	3	2	12											
204	L Rippowam	9/15/2007	epi	17	22	2	3	2	2											
204	L Rippowam	9/30/2007	epi	19	21	2	3	1	2											
204	L Rippowam	10/20/2007	epi	17	18	2	3	1	25											
204	L Rippowam	5/11/2008	epi	17	16	2	2	1												
204	L Rippowam	5/25/2008	epi	19	17	2	2	1	58											
204	L Rippowam	6/7/2008	epi	24	21	2	3	2	28											
204	L Rippowam	6/21/2008	epi	23	25	2	3	2	128											
204	L Rippowam	7/7/2008	epi	23	26	2	3	2	25											
204	L Rippowam	7/19/2008	epi	30	29	2	3	2	2											
204	L Rippowam	8/2/2008	epi	27	28	2	3	2	2											
204	L Rippowam	8/16/2008	epi	22	25	2	3	2	2											
204	L Rippowam	8/30/2008	epi	25	25	3	3	2	25											
204	L Rippowam	9/14/2008	epi	29	24	2	3	2	28											
204	L Rippowam	9/28/2008	epi	23	21	3	3	3	258											
204	L Rippowam	10/12/2008	epi	20	19	2	3	2	2											
204	L Rippowam	10/26/2008	epi	13	14	3	3	3	25											
204	L Rippowam	11/9/2008	epi	13	13	3	3	4	5											
204	L Rippowam	11/29/2008	epi	6	6	2	3	4	5											
204	L Rippowam	4/17/2009	epi	14	11															
204	L Rippowam	5/18/2009	epi	13	17															
204	L Rippowam	06/21/2009	epi	22	22	3	3	2	2											
204	L Rippowam	07/03/2009	epi	25	25	2	3	2	128											
204	L Rippowam	07/18/2009	epi	25	27	2	3	2	28											
204	L Rippowam	08/03/2009	epi	27	26	2	3	2	12											
204	L Rippowam	08/15/2009	epi	30	30	1	3	1	2					0.01						
204	L Rippowam	08/30/2009	epi	25	27	2	3	2	25											
204	L Rippowam	09/13/2009	epi	25	25	2	3	2	2			64.6		0.02						
204	L Rippowam	10/04/2009	epi	23	22	3	3	2	25			81.91		0.05						
204	L Rippowam	10/30/2009	epi	17	13	2	3	4	5					0.01						
204	L Rippowam	11/29/2009	epi	13	9															
204	L Rippowam	6/27/2010	epi	28	26	3	2	2	2	0	0									
204	L Rippowam	7/11/2010	epi	32	28	2	2	1	2	0	0									
204	L Rippowam	7/24/2010	epi	32	27	2	2	1	2	0	0									
204	L Rippowam	8/7/2010	epi	28	26	2	2	2	2	6	7	36.00		0.02						
204	L Rippowam	8/21/2010	epi	28	25	2	2	2	2	67	0	81.09								
204	L Rippowam	9/4/2010	epi	26	26	3	3	2	126	46	0	338.00		0.24						
204	L Rippowam	9/20/2010	epi	23	22	3	3	3	125	6	0	460.90								
204	L Rippowam	10/3/2010	epi	16	19	3	3	3	125	7	0	296.00		0.33						
204	L Rippowam	4/22/2011	epi	15	11	2	1	2	5	0	0									
204	L Rippowam	5/14/2011	epi	23	18	3	2	3	15	0	0									
204	L Rippowam	6/4/2011	epi	25	22	2	2	2	2	0	0									
204	L Rippowam	6/25/2011	epi	27	23	2	3	2	25	0	0	14.40	5.60							
204	L Rippowam	7/9/2011	epi	30	27	2	2	2	2	0	0	7.20	2.90							
204	L Rippowam	7/23/2011	epi	29	30	2	2	2	2	0	0	9.40	2.86							
204	L Rippowam		bloom											15.18	<0.4	<0.1				
204	L Rippowam	8/6/2011	epi	30	27	1	2	2	2	0	0	26.50	4.70	0.40						
204	L Rippowam	8/20/2011	epi	29	23	3	2	2	2	4	0	26.50	5.10							
204	L Rippowam	9/4/2011	epi	30	24	3	2	2	12		0	82.80	9.90							
204	L Rippowam	9/18/2011	epi	21	20	3	3	3	12	4	4	105.90	13.70							
204	L Rippowam	10/9/2011	epi	25	18	3	2	3	125	0	0	144.50	20.40							
204	L Rippowam	10/9/2011	epi											6.50						
204	L Rippowam	11/6/2011	epi	14	10	3	2	3	5	0	0									
204	L Rippowam	11/26/2011	epi	17	9	3	2	3	235	4	0									
204	L Rippowam	3/14/2012	epi	19	10	3	1	3	15											
204	L Rippowam	5/18/2012	epi	18	19	3	2	3	135											
204	L Rippowam	6/11/2012	epi	24	22	2	2	2	25											
204	L Rippowam	6/23/2012	epi	27	26	3	2	2	23											
204	L Rippowam	7/14/2012	epi	28	28	3	2	2	2											

LNum	LName	Date	Type	TAir	TH2O	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chl	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB form	Shore HAB
204	L Rippowam	7/28/2012	epi	26	27	3	2	3	125											
204	L Rippowam	8/12/2012	epi	27	28	4	2	4	123		37	42.83		<0.065						
204	L Rippowam	8/25/2012	epi	27	26	3	2	3	123	4										
204	L Rippowam	9/9/2012	epi	22	21	2	2	2	2			24.83		0.49						
204	L Rippowam	9/21/2012	epi	15	18	3	2	3	25											
204	L Rippowam	10/8/2012	epi	6	7	3	1	4	15			25.55		0.33						
204	L Rippowam	11/24/2012	epi	6	7	3	1	4	15											
204	L Rippowam	4/8/2013	epi	13	9	2	1	3	15											
204	L Rippowam	5/20/2013	epi	20	19	2	2	3	5											
204	L Rippowam	6/16/2013	epi	25	24	3	3	2	0	0	0	13.30	2.60	<0.30	<0.440		4.2	0.8		
204	L Rippowam	6/29/2013	epi	22	22	2	3	1	0	0	0	11.30	2.30	<0.30	<0.650		3.1	0.8		
204	L Rippowam	7/13/2013	epi	17	20	3	3	2	0	0	0	17.80	2.40	<0.30	<0.910		4.0	1.6		
204	L Rippowam	7/28/2013	epi	18	20	2	3	1	0	0	0	74.00	4.00	<0.30	<0.380		13.9	9.8		
204	L Rippowam		bloom														32.80	26.50		
204	L Rippowam	8/10/2013	epi	26	20	3	3	2	0	0	0	107.30	3.50	<0.30	<0.380		14.80	10.40		
204	L Rippowam	8/24/2013	epi	18	17	3	3	2	0	0	0	64.10	4.50	0.65	<0.570		8.20	5.30		
204	L Rippowam	9/7/2013	epi	13	14	1	3	1	0	0	0	152.20	6.10	3.43	<1.240		25.50	19.20		
204	L Rippowam	9/22/2013	epi	4	9	2	3	2	5	0	0	139.70	7.70	1.48			23.80	14.80		
204	L Rippowam	10/28/2013	epi	13	13	3	2	4	35											
204	L Rippowam	4/13/2014	epi	18	11	3	1	3	158	0	0									
204	L Rippowam	5/11/2014	epi	21	17	3	2	4	15	0	0									
204	L Rippowam	6/7/2014	epi	31	23	3	3	1	2	0	0	1.00	2.60	<1.83	<0.17	<0.001	2.90	0.64	i	i
204	L Rippowam	6/21/2014	epi	25	24	2	3	2	2	0	7	4.90	0.60	<0.58	<0.44	<0.002	2.37	0.00	i	i
204	L Rippowam	7/5/2014	epi	25	26	2	3	1	2	6	0	14.50	0.70	<0.62	<0.03	<0.002	4.48	1.60	f	f
204	L Rippowam	7/20/2014	epi	26	26	3	3	2	2	0	0	20.10	0.70	<0.39	<0.03	<0.001	5.25	3.54	f	f
204	L Rippowam	8/3/2014	epi	24	25	2	3	2	25	0	0	16.60	1.40	<0.33	<0.01	<0.002	7.34	1.00	f	f
204	L Rippowam	8/18/2014	epi	27	24	3	3	2	2	0	0	20.10	0.70	<0.39	0.11	<0.001	12.21	6.06	f	i
204	L Rippowam	8/30/2014	epi	26	25	3	3	3	123	46	0	30.80	1.10	<0.29	<0.14	<0.002	12.39	3.68	f	f
204	L Rippowam	9/12/2014	epi											<0.48	<0.25	<0.002	35.03	15.66		h
204	L Rippowam	9/12/2014	epi	22	23	3	3	4	128	0	0	50.70	1.90	<0.24	<0.03	<0.001	12.64	3.51	h	h
204	L Rippowam	10/12/2014	epi	17	17	3	2	3	23	4	0									
204	L Rippowam	4/21/2015	epi	28	27	2	1	2	158	0	0								i	i
204	L Rippowam	5/30/2015	epi	28	28	3	2	2	126	0	0	16.50	0.80	<0.66	<0.313	<1.561	4.40	2.10	H	I
204	L Rippowam	6/14/2015	epi	23	25	2	2	2	2	57	0	12.90	1.50	<0.86	<0.027	<0.318	4.70	0.00	I	I
204	L Rippowam	6/29/2015	epi	28	26	2	2	2	2	0	0	13.20	1.70	<0.63	<0.007	<0.040	7.00	1.20	I	I
204	L Rippowam	7/11/2015	epi	28	27	2	3	2	28	7	7	21.30	1.30	<1.01	<0.003	<0.011	7.80	1.80	F	I
204	L Rippowam	7/25/2015	epi	29	27	3	3	2	128	0	0	15.80	1.20	<0.30	<0.002	<0.014	6.00	0.70	I	I
204	L Rippowam	8/8/2015	epi	27	27	3	3	2	12	0	0	23.40	1.30	<0.44	<0.002	<0.014	8.40	1.50	F	I
204	L Rippowam	8/22/2015	epi	27	26	3	3	2	23	4	0	33.50	1.30	<0.28	<0.008	<0.021	10.50	6.00	F	I
204	L Rippowam	9/5/2015	epi	19	18	3	3	2	23	6	0	51.10	2.30	<0.39	<0.004	<0.012	13.40	5.50	F	I
204	L Rippowam	10/5/2015	epi	28	27	3	3	3	125	0	0								i	i
204	L Rippowam	6/21/2008			18															
204	L Rippowam	7/7/2008			19															
204	L Rippowam	7/19/2008			21															
204	L Rippowam	8/2/2008			25															
204	L Rippowam	8/16/2008			25															
204	L Rippowam	8/30/2008			24															
204	L Rippowam	9/14/2008			23															
204	L Rippowam	9/28/2008			20															
204	L Rippowam	11/29/2008			6															
204	L Rippowam	06/21/2009			17															
204	L Rippowam	07/03/2009			18															
204	L Rippowam	07/18/2009			20															
204	L Rippowam	08/03/2009			21															
204	L Rippowam	08/15/2009			25															
204	L Rippowam	08/30/2009			26															
204	L Rippowam	09/13/2009			20															
204	L Rippowam	10/04/2009			21															
204	L Rippowam	10/30/2009			13															
204	L Rippowam	6/27/2010			19															
204	L Rippowam	7/24/2010			23															
204	L Rippowam	8/21/2010			25															
204	L Rippowam	9/20/2010			21															
204	L Rippowam	4/22/2011			10															
204	L Rippowam	5/14/2011			12															

LNum	LName	Date	Type	TAir	TH2O	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chl	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HABform	ShoreHAB
204	L Rippowam	6/4/2011			14															
204	L Rippowam	6/25/2011			18															
204	L Rippowam	7/23/2011			20															
204	L Rippowam	8/20/2011			22															
204	L Rippowam	9/18/2011			10															
204	L Rippowam	5/18/2012			15															
204	L Rippowam	6/11/2012			18															
204	L Rippowam	6/23/2012			19															
204	L Rippowam	7/28/2012			23															
204	L Rippowam	8/12/2012			22															
204	L Rippowam	8/25/2012			24															
204	L Rippowam	9/9/2012			25															
204	L Rippowam	9/21/2012			21															
204	L Rippowam	4/8/2013			8															
204	L Rippowam	5/20/2013			17															
204	L Rippowam	6/16/2013			19															
204	L Rippowam	7/13/2013			18															
204	L Rippowam	8/10/2013			22															
204	L Rippowam	9/7/2013			23															
204	L Rippowam	10/28/2013			13															
204	L Rippowam	4/13/2014			8															
204	L Rippowam	5/11/2014			13															
204	L Rippowam	6/7/2014			16															
204	L Rippowam	6/21/2014			19															
204	L Rippowam	7/5/2014			20															
204	L Rippowam	7/20/2014			22															
204	L Rippowam	8/3/2014			24															
204	L Rippowam	8/18/2014			24															
204	L Rippowam	8/30/2014			24															
204	L Rippowam	9/12/2014			22															
204	L Rippowam	10/12/2014			17															
204	L Rippowam	4/13/2014			8															
204	L Rippowam	5/11/2014			13															
204	L Rippowam	6/7/2014			16															
204	L Rippowam	4/21/2015			9															
204	L Rippowam	5/30/2015			18															
204	L Rippowam	6/14/2015			20															
204	L Rippowam	6/29/2015			22															
204	L Rippowam	7/11/2015			20															
204	L Rippowam	7/25/2015			22															
204	L Rippowam	8/8/2015			22															
204	L Rippowam	8/22/2015			24															
204	L Rippowam	9/5/2015			24															
204	L Rippowam	10/5/2015			18															

Legend Information

Indicator	*Description*	*Detection Limit*	*Standard (S) / Criteria (C)*
General Information			
Lnum	lake number (unique to CSLAP)		
Lname	name of lake (as it appears in the Gazetteer of NYS Lakes)		
Date	sampling date		
Field Parameters			
Zbot	lake depth at sampling point, meters (m)		
Zsd	Secchi disk transparency or clarity	0.1m	1.2m (C)
Zsamp	water sample depth (m) (epi = epilimnion or surface; bot = bottom)	0.1m	none
Tair	air temperature (C)	-10C	none
TH20	water temperature (C)	-10C	none
Laboratory Parameters			
Tot.P	total phosphorus (mg/l)	0.003 mg/l	0.020 mg/l (C)
NOx	nitrate + nitrite (mg/l)	0.01 mg/l	10 mg/l NO3 (S), 2 mg/l NO2 (S)
NH4	total ammonia (mg/l)	0.01 mg/l	2 mg/l NH4 (S)
TN	total nitrogen (mg/l)	0.01 mg/l	none
TN/TP	nitrogen to phosphorus (molar) ratio, = (TKN + NOx)*2.2/TP		none
TCOLOR	true (filtered) color (ptu, platinum color units)	1 ptu	none
pH	powers of hydrogen (S.U., standard pH units)	0.1 S.U.	6.5, 8.5 S.U. (S)
Cond25	specific conductance, corrected to 25C (umho/cm)	1 umho/cm	none
Ca, Cl	calcium, chloride (mg/l)	1 mg/l	none
Chl.a	chlorophyll a (ug/l)	0.01 ug/l	none
Fe	iron (mg/l)	0.1 mg/1	1.0 mg/l (S)
Mn	manganese (mg/l)	0.01 mg/l	0.3 mg/l (S)
As	arsenic (ug/l)	1 ug/l	10 ug/l (S)
AQ-PC	Phycocyanin (aquaflor) (unitless)	1 unit	none
AQ-Chl	Chlorophyll *a* (aquaflor) (ug/l)	1 ug/l	none
MC-LR	Microcystis-LR (ug/l)	0.01 ug/l	1 ug/l potable (C) 20 ug/l swimming (C)
Ana	Anatoxin-a (ug/l)	variable	none
Cyl	Cylindrospermposin (ug/l)	0.1 ug/l	none
FP-Chl, FP-BG	Fluoroprobe total chlorophyll, fluoroprobe blue-green chlorophyll (ug/l)	0.1 ug/l	none
Lake Assessment			
QA	water quality assessment; 1 = crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels		
QB	aquatic plant assessment; 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = surface plant coverage		
QC	recreational assessment; 1 = could not be nicer, 2 = excellent, 3 = slightly impaired, 4 = substantially impaired, 5 = lake not usable		
QD	reasons for recreational assessment; 1 = poor water clarity, 2 = excessive weeds, 3 = too much algae, 4 = lake looks bad, 5 = poor weather, 6 = litter/surface debris, 7 = too many lake users, 8 = other		
QF, QG	Health and safety issues today (QF) and past week (QG); 0 = none, 1 = taste/odor, 2 = GI illness humans/animals, 3 = swimmers itch, 4 = algae blooms, 5 = dead fish, 6 = unusual animals, 7 = other		
HAB form, Shore HAB	HAB evaluation; A = spilled paint, B = pea soup, C = streaks, D = green dots, E = bubbling scum, F = green/brown tint, G = duckweed, H = other, I = no bloom		

Appendix B- Priority Waterbody Listing for Lake Rippowam

Lake Oscaleta, Lake Rippowam (1302-0141) MinorImpacts

Waterbody Location Information

Revised: 04/25/2008

Water Index No: H- 31-P44-35-P109- 6..P118,P119
Drain Basin: Lower Hudson River
Hydro Unit Code:
Str Class: B
Waterbody Type: Lake
Reg/County: 3/Westchester Co. (60)
Waterbody Size: 93.6 Acres
Quad Map: PEACH LAKE (P-26-3)
Seg Description: total area of both lakes

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
Recreation	Stressed	Suspected

Type of Pollutant(s)

Known: ALGAL/WEED GROWTH, NUTRIENTS (phosphorus)
Suspected: - - -
Possible: - - -

Source(s) of Pollutant(s)

Known: - - -
Suspected: OTHER SOURCE (nutrient recycling), URBAN/STORM RUNOFF
Possible: - - -

Resolution/Management Information

Issue Resolvability: 1 (Needs Verification/Study (see STATUS))
Verification Status: 4 (Source Identified, Strategy Needed)
Lead Agency/Office: ext/NYCW
Resolution Potential: Medium
TMDL/303d Status: n/a

Further Details

Overview

Recreational uses in Snyders Lake are thought to experience minor impacts due to aquatic weed growth and occasional algal blooms related to seasonal phosphorus releases from lake bottom sediments.

Water Quality Sampling

Lake Oscaleta and Lake Rippowam have been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 2006. An Interpretive Summary report of the findings of this sampling was published in 2007. These data indicate that the lake continues to be best characterized as eutrophic, or highly productive. Phosphorus levels in the lake regularly exceed the state guidance values indicating impacted/stressed recreational uses. However, corresponding transparency measurements rarely fail to meet what is the recommended minimum for swimming beaches. Measurements of pH typically fall within the state water quality range of 6.5 to 8.5; occasional high pH does not appear to result in ecological impacts. The lake water is moderately colored, likely reflecting natural conditions, but color does not limit water transparency. (DEC/DOW, BWAM/CSLAP, September 2007)

Recreational Assessment

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. This assessment indicates

recreational suitability of the lake to be generally favorable. The recreational suitability of Lake Rippowam is described most frequently as "excellent." The lake itself is most often described as "not quite crystal clear." Recreational suitability in Lake Oscaleta was described most frequently as "slightly" impacted with the lake typically described as having "definite algal greenness." Assessments have noted that aquatic plants and algal growth have occasional impact on uses. (DEC/DOW, BWAM/CSLAP, September 2007)

Lake Uses

This lake waterbody is designated class B, suitable for use as a public bathing beach, general recreation and aquatic life support, but not as a water supply. Water quality monitoring by NYSDEC focuses primarily on support of general recreation and aquatic life. Samples to evaluate the bacteriological condition and bathing use of the lake or to evaluate contamination from organic compounds, metals or other inorganic pollutants have not been collected as part of the CSLAP monitoring program. Monitoring to assess public bathing use is generally the responsibility of state and/or local health departments.

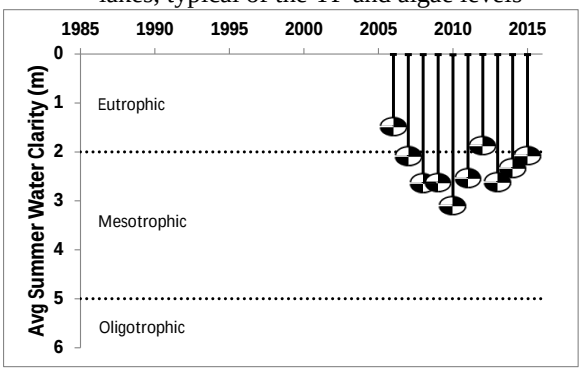
New York City Watershed

Lake Oscaleta and Lake Rippowam are tributary to the Croton System of New York City water supply reservoirs (see New Croton Reservoir, Segment 1302-0010). A Watershed Agreement is in place between NYCDEP and the Croton Watershed communities which sets forth programs and funding for watershed protection. In addition, NYCDEP has developed a phosphorus TMDL for the entire Croton System Watershed to aid in the management of nutrients. An Implementation Plan for this TMDL is being developed. (NYCDEP, July 2006)

Appendix C- Long Term Trends: Lake Rippowam

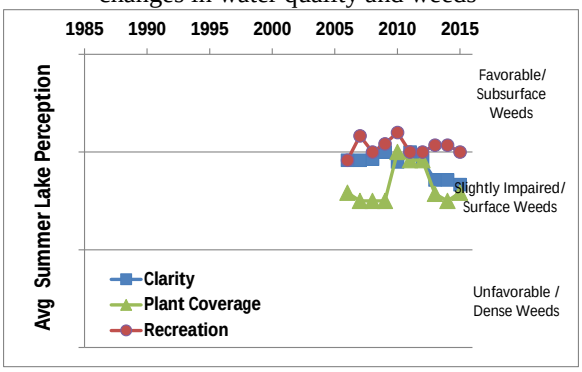
Long Term Trends: Water Clarity

- ↑ clarity 2006-10; ↓ clarity 2010-15
- Most readings typical of *mesoeutrophic* lakes, typical of the TP and algae levels



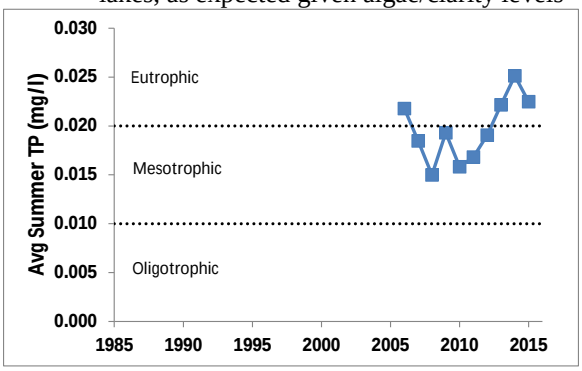
Long Term Trends: Lake Perception

- ↓ perceived clarity aligned with ↓ Secchi
- Recreational perception somewhat linked to changes in water quality and weeds



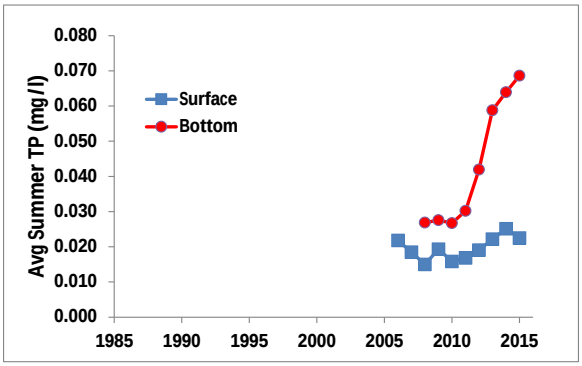
Long Term Trends: Phosphorus

- TP pattern mostly following clarity pattern
- Most readings typical of *mesoeutrophic* lakes, as expected given algae/clarity levels



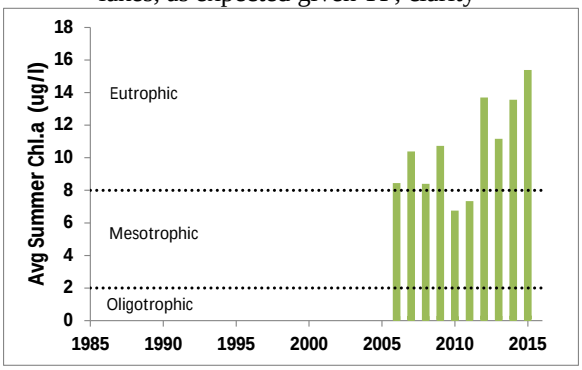
Long Term Trends: Bottom Phosphorus

- Bottom TP increasing faster than surface TP
- Suggests that bottom TP may trigger increase in surface TP in fall



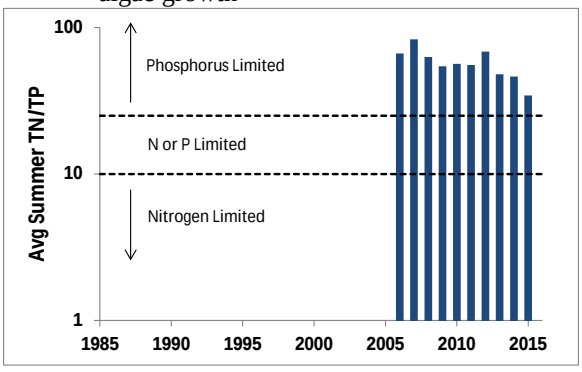
Long Term Trends: Chlorophyll a

- Chl pattern mostly following clarity, TP
- Most readings typical of *mesoeutrophic* lakes, as expected given TP, clarity



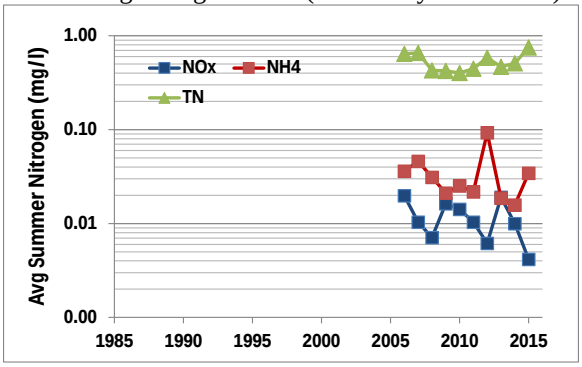
Long Term Trends: N:P Ratio

- Slight decrease in N:P ratio
- Most readings indicate phosphorus limits algae growth



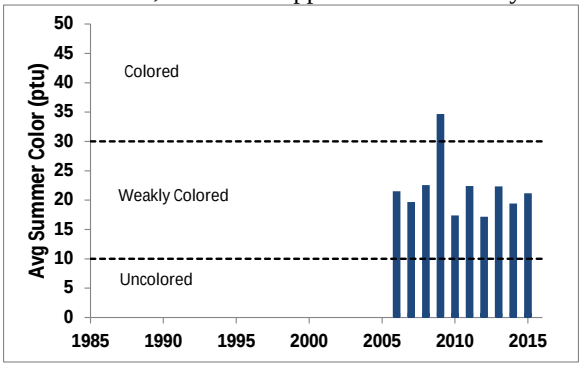
Long Term Trends: Nitrogen

- ↓ NOx and NH4; recent ↑ TN
- Higher total nitrogen not associated with higher algae levels (as in many other lakes)



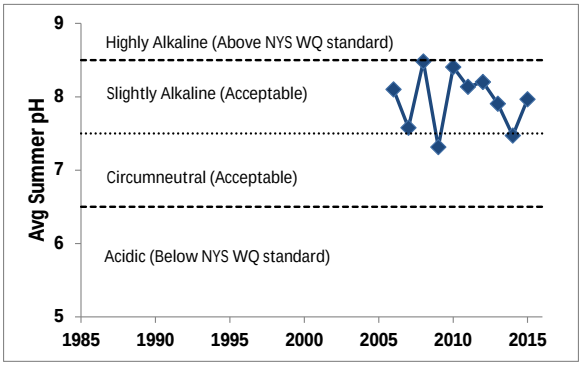
Long Term Trends: Color

- Color variable from year to year
- Most readings typical of *weakly colored* lakes, but do not appear to affect clarity



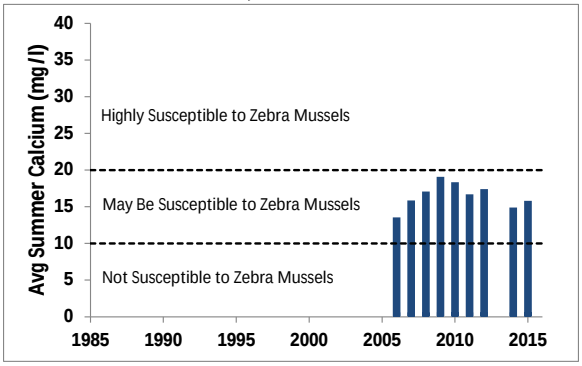
Long Term Trends: pH

- Mostly variable within a small range
- Most readings typical of *slightly alkaline* lakes



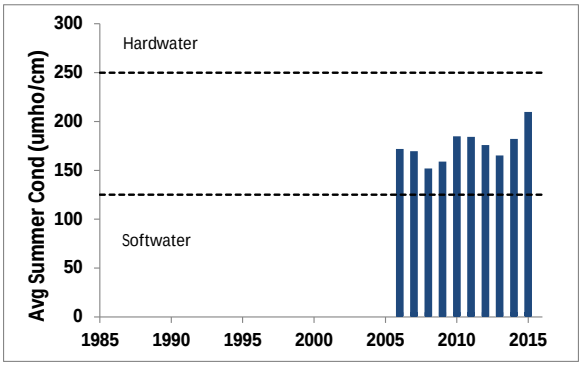
Long Term Trends: Calcium

- Slight decrease after 2009
- Most readings indicate some susceptibility to zebra mussels, but not found in lake



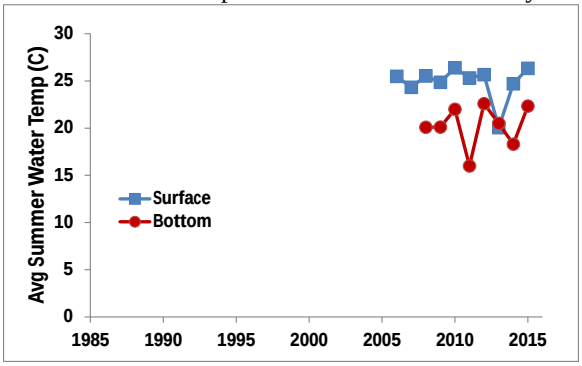
Long Term Trends: Conductivity

- Slight increase last few years
- Most readings typical of lakes with *intermediate hardness*



Long Term Trends: Water Temperature

- No clear trends; surface T changes differ from bottom T changes
- Similar deep T indicate weak thermal layers



Appendix D:
Algae Testing Results from SUNY ESF Study

Most algae are harmless, naturally present, and an important part of the food web. However excessive algae growth can cause health, recreational, and aesthetic problems. Some algae can produce toxins that can be harmful to people and animals. High quantities of these algae are called harmful algal blooms (HABs). CSLAP lakes have been sampled for a variety of HAB indicators since 2008. This was completed on selected lakes as part of a NYS DOH study from 2008-2010. In 2011, enhanced sampling on all CSLAP lakes was initiated through an EPA-funded project that has continued through the current sampling season. This study has evaluated a number of HAB indicators as follows:

- Algae types - blue green, green, diatoms, and "other"
- Algae densities
- Microscopic analysis of bloom samples
- Algal toxin analysis

Some of these results are reported in other portions of these reports. This appendix the seasonal change in blue green algae, other algae types, and the primary algal toxin (microcystin-LR, a liver toxin). Analysis was completed on open water samples and, for some lakes, shoreline samples that were collected when visual evidence of blooms were apparent. Results are compared to the DEC criteria of 25-30 ug/l blue green chlorophyll a and 20 ug/l microcystin-LR (based on the World Health Organization (WHO) threshold for unsafe swimming conditions) and the WHO provisional criteria for long-term protection of treated water supplies (= 1 ug/l microcystin-LR). The data for algae types are drawn from a high end fluorometer used by SUNY ESF. While these results are useful for timely approximation of lake conditions, they are not as accurate as the total chlorophyll results measured as a regular part of CSLAP since 1986 in all open water samples. Therefore these results are used judiciously in the assessment of sampled waterbodies.

Two separate samples are evaluated. A sample is taken at the CSLAP sample point at the deepest point of the lake at every sample session. In addition, shoreline samples can be taken when a bloom is visible. It should be noted that shoreline conditions can vary significantly over time and from one location to another. The shoreline bloom sampling results summarized below are not collected as routinely as open water samples, and therefore represent snapshots in time. It is assumed that sampling results showing high blue green algae and/or toxin levels indicate that algae blooms may be common and/or widespread on these lakes. However, the absence of elevated blue green algae and toxin levels does not assure the lack of shoreline blooms on these lakes. Elevated open water readings may indicate a higher likelihood of shoreline blooms, but in some lakes, these shoreline blooms have not been (well) documented.

The results from these samples are summarized within the CSLAP report for the lake.

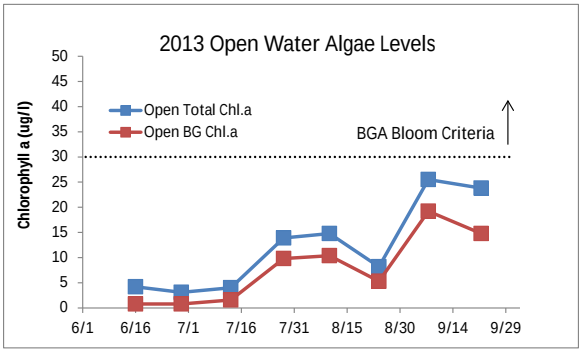


Figure D1:
2013 Open Water Total and BGA Chl.a

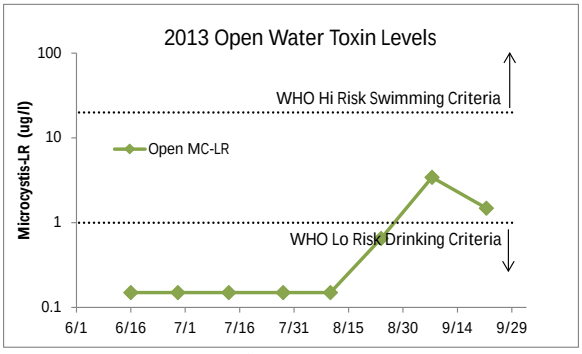


Figure D2:
2013 Open Water Microcystin-LR

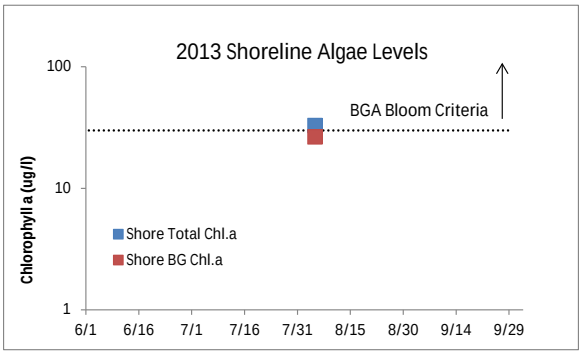


Figure D3:
2013 Shoreline Total and BGA Chl.a

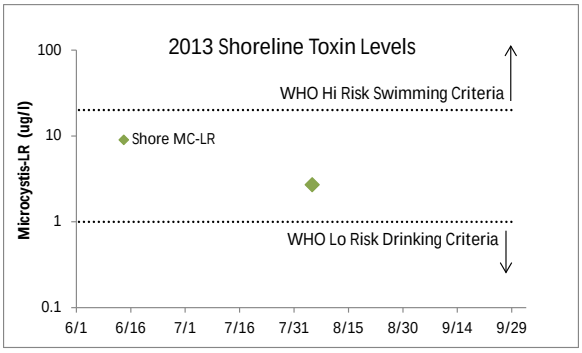


Figure D4:
2013 Shoreline Microcystin-LR

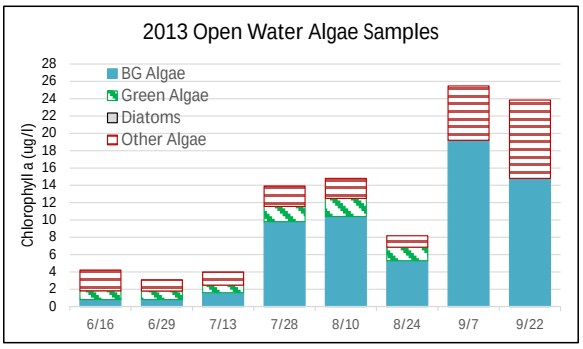


Figure D5:
2013 Open Water Algae Types

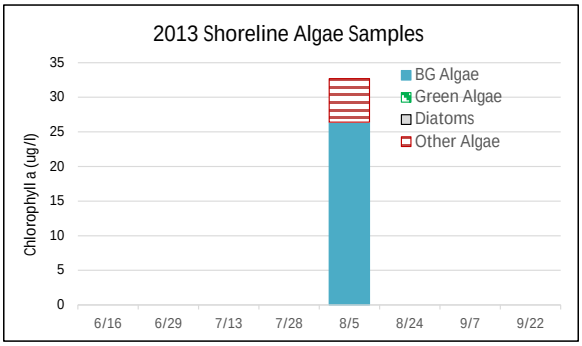


Figure D6:
2013 Shoreline Algae Types

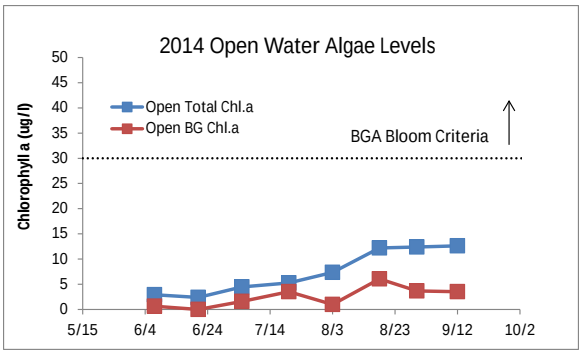


Figure D7:
2014 Open Water Total and BGA Chl.a

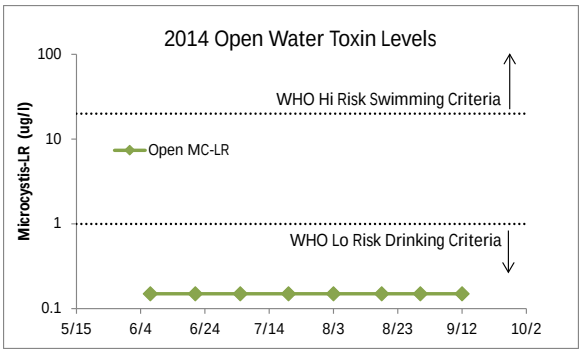


Figure D8:
2014 Open Water Microcystin-LR

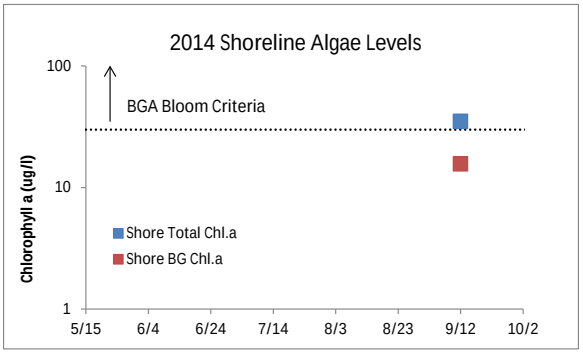


Figure D9:
2014 Shoreline Total and BGA Chl.a

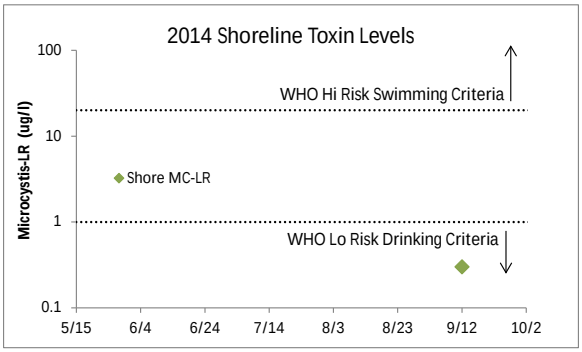


Figure D10:
2014 Shoreline Microcystin-LR

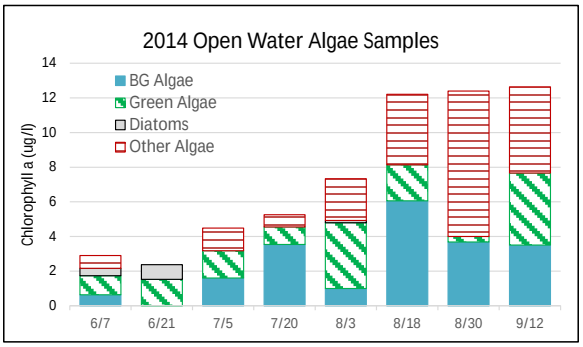


Figure D11:
2014 Open Water Algae Types

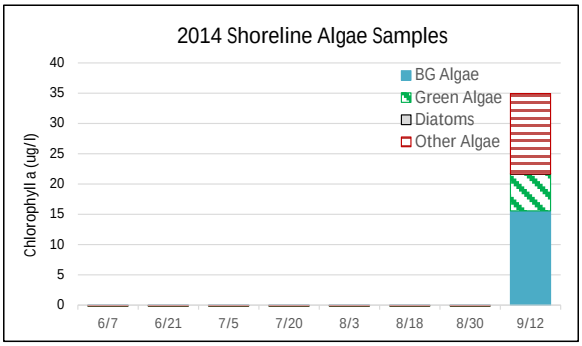


Figure D12:
2014 Shoreline Algae Types

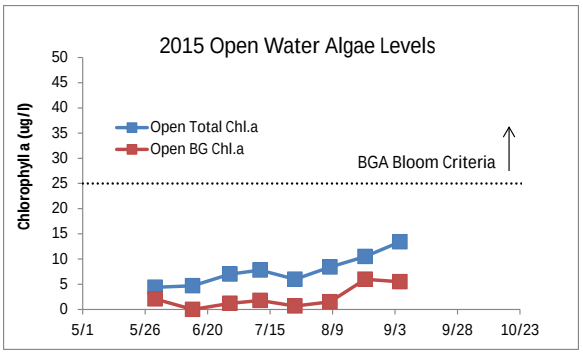


Figure D13:
2015 Open Water Total and BGA Chl.a

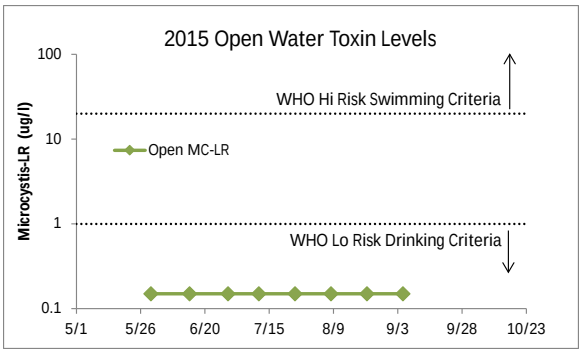


Figure D14:
2015 Open Water Microcystin-LR

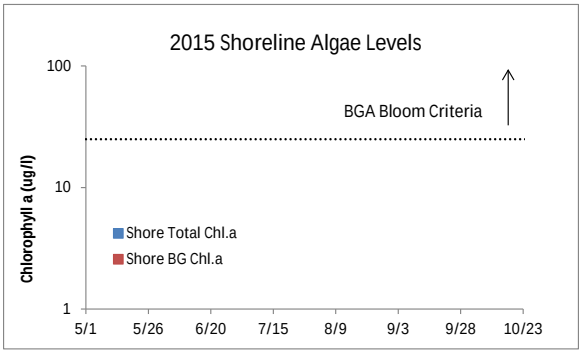


Figure D15:
2015 Shoreline Total and BGA Chl.a

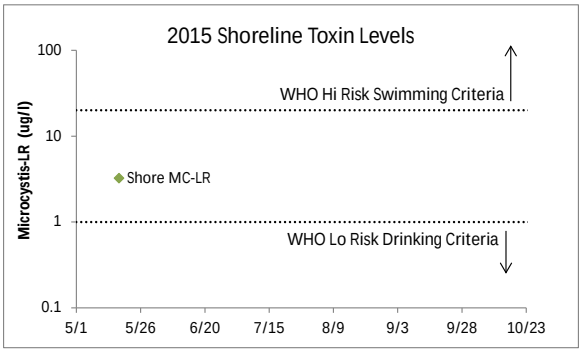


Figure D16:
2015 Shoreline Microcystin-LR

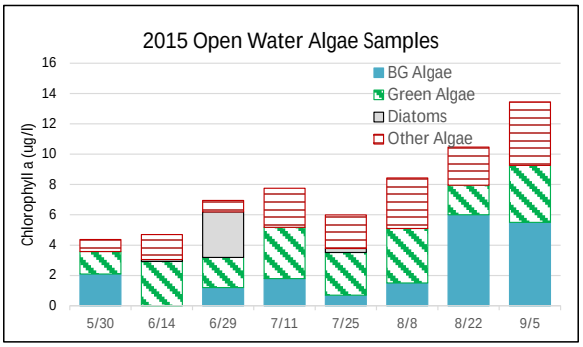


Figure D17:
2015 Open Water Algae Types

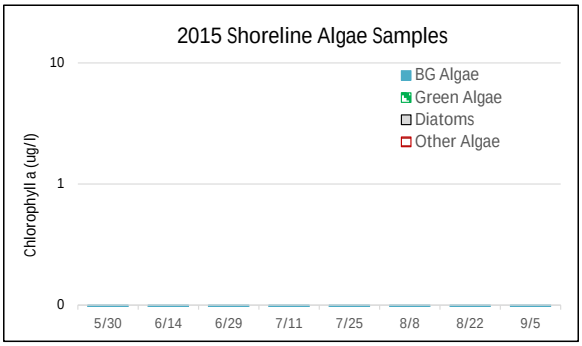


Figure D18:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Westchester County

The table below shows the invasive aquatic plants and animals that have been documented in Westchester County, as cited in either the iMapInvasives database (http://www.imapinvasives.org/) or in the NYSDEC Division of Water database. These databases may include some, but not all, non-native plants or animals that have not been identified as "Prohibited and Regulated Invasive Species" in New York state regulations (6 NYCRR Part 575; http://www.dec.ny.gov/docs/lands_forests_pdf/islist.pdf).

This list is not complete, but instead represents only those species that have been reported and verified within the county. If any additional aquatic invasive species (AIS) are known or suspected in these or other waterbodies in the county, this information should be reported through iMap invasives or by contacting NYSDEC at dowinfo@dec.ny.gov.

Aquatic Invasive Species - Westchester County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Cross River Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Cross River Reservoir	Animal	Virile crayfish	*Orconectes virilis*
Croton River	Plant	Hydrilla	*Hydrilla verticillata*
Croton River	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Croton River	Plant	Brittle naiad	*Najas minor*
Croton River	Plant	Curly leafed pondweed	*Potamogeton crispus*
Grassy Sprain Reservoir	Animal	American alligator	*Alligator mississippiensis*
Howlands Lake	Plant	Brittle naiad	*Najas minor*
Hudson River	Plant	Water chestnut	*Trapa natans*
Hudson River	Animal	Zebra mussel	*Dreissena polymorpha*
Huguenot Lake	Animal	American alligator	*Alligator mississippiensis*
Lake Katonah	Plant	Curly leafed pondweed	*Potamogeton crispus*
Lake Lincolndale	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lake Lincolndale	Plant	Brittle naiad	*Najas minor*
Lake Mohegan	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lake Oscaleta	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lake Oscaleta	Plant	Brittle naiad	*Najas minor*
Lake Oscaleta	Plant	Curly leafed pondweed	*Potamogeton crispus*
Lake Rippowam	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lake Waccabuc	Plant	Brazilian elodea	*Egeria densa*
Lake Waccabuc	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lake Waccabuc	Plant	Brittle naiad	*Najas minor*
Lake Waccabuc	Plant	Curly leafed pondweed	*Potamogeton crispus*
Lake Waccabuc	Plant	Water chestnut	*Trapa natans*
Lounsbury Pond	Plant	Water chestnut	*Trapa natans*
Mohansic Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Muscoot Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*

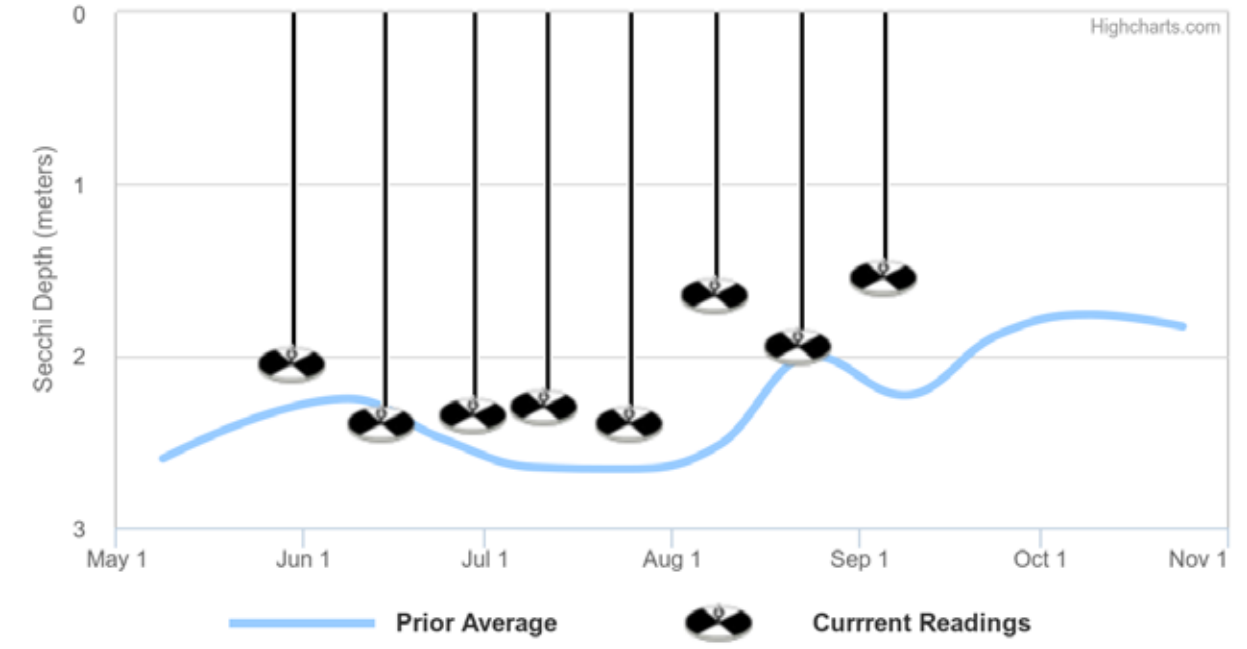
Waterbody	Kingdom	Common name	Scientific name
Muscoot Reservoir	Animal	Rusty crayfish	*Orconectes rusticus*
Muscoot Reservoir	Plant	Curly leafed pondweed	*Potamogeton crispus*
Muscoot Reservoir	Plant	Water chestnut	*Trapa natans*
New Croton Reservoir	Plant	Hydrilla	*Hydrilla verticillata*
New Croton Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Peach Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Pine Lake	Plant	Water chestnut	*Trapa natans*
Tarrytown Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Teatown Lake	Plant	European four leaf clover	*Marsilea quadrifolia*
Teatown Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Teatown Lake	Plant	Water chestnut	*Trapa natans*
Titicus Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Troublesome Brook n of Tuckahoe	Animal	Asian Clam	*Corbicula fluminea*
Truesdale Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Vernay Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Wallace Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Wampus Lake Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Wampus Lake Reservoir	Plant	Curly leafed pondweed	*Potamogeton crispus*

Appendix F: Current Year vs. Prior Averages for Lake Rippowam

Current Year Water Temperatures vs. Prior Average

This year's shallow water sample temperatures are tending to be higher than normal when compared to the average of readings collected from 2006 to 2014. This year's deep water sample temperatures are tending to be higher than normal when compared to the average of readings collected from 2008 to 2014.

Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are tending to be lower than normal when compared to the average of readings collected from 2006 to 2014

Appendix G: Watershed and Land Use Map for Lake Rippowam

This watershed and land use map was developed using USGS StreamStats and ESRI ArcGIS using the 2006 land use satellite imagery. The actual watershed map and present land uses within this watershed may be slightly different due to the age of the underlying data and some limits to the use of these tools in some geographic regions and under varying flow conditions. However, these maps are intended to show the approximate extent of the lake drainage basin and the major land uses found within the boundaries of the basin.