Spring Lake Questions and Answers, 2015 CSLAP

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

A1. Water quality conditions in Spring Lake appeared to be close to normal in 2015—phosphorus levels were higher (early in the summer), but algae levels were lower than usual and water clarity was close to normal.

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

A2. Chloride sampling results were typical of lakes with low to moderate impacts from road salt runoff, and no impacts have been measured or reported.

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

A3. Spring Lake had lower water clarity, but much lower nutrient and algae levels, than the typical lake in the area. Aquatic plant coverage continues to be slightly higher than in these other lakes.

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

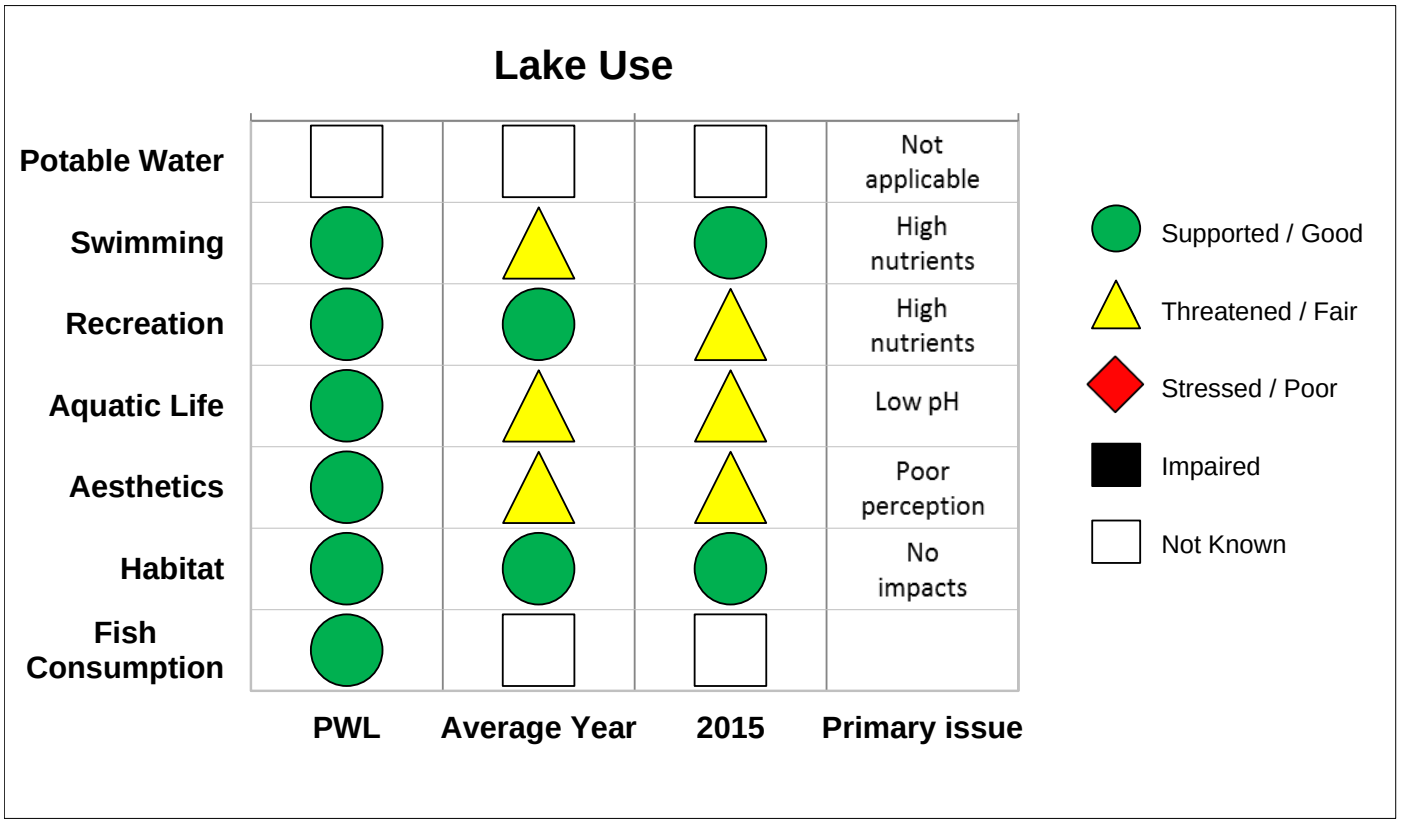
A4. Water clarity has been slightly lower in most recent years (although slightly higher in 2015), and ammonia readings have increased slightly. Most of the CSLAP indicators have not shown any clear long-term trends.

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

A5. Spring Lake does not appear to be susceptible to shoreline algae blooms, due to relatively low nutrient and open water algae levels. However, the drop in water clarity may be significant and any sources of turbidity from nearshore activities (contributing to the decrease in clarity) should be evaluated. It is not known if the change in water clarity and apparent change in thermal stratification are related.

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 maintain 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.

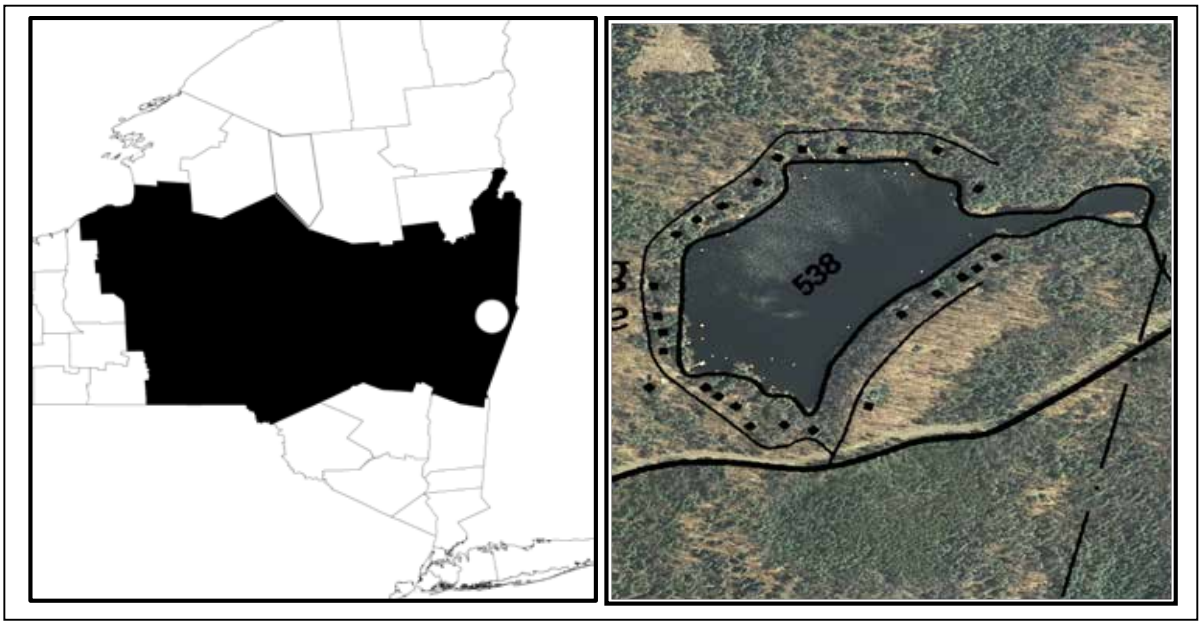


CSLAP 2015 Lake Water Quality Summary:
Spring Lake

General Lake Information

Location	Town of Sand Lake
County	Rensselaer
Basin	Lower Hudson River
Size	10.4 hectares (25.7 acres)
Lake Origins	Natural
Watershed Area	39.9 hectares (98.6 acres)
Retention Time	1.7 years
Mean Depth	4 meters
Sounding Depth	10.7 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To…	Black River to Kinderhook Creek to Hudson River
WQ Classification	B (contact recreation = swimming)
Lake Outlet Latitude	42.654
Lake Outlet Longitude	-73.417
Sampling Years	1998-2001, 2007-2011, 2014-2015
2015 Samplers	Liz Mastrianni and Steve Frank
Main Contact	Liz Mastrianni

Lake Map



Background
Spring Lake is a 26 acre, class B lake found in the Town of Berlin in Rensselaer County, near the eastern portion of Capital District region of New York State. It was first sampled as part of CSLAP in 1998.

It is one of 11 CSLAP lakes among the more than 370 lakes and ponds found in Rensselaer County, and one of 67 CSLAP lakes among the more than 3680 lakes and ponds in the Lower Hudson River drainage basin.

Lake Uses
Spring Lake is a Class B lake; this means that the best intended use for the lake is for contact recreation—swimming and bathing, non-contact recreation—boating and fishing, aesthetics, and aquatic life. The lake is used by lake residents and invited guests for non-power boating and swimming, through residential shoreline access to the lake. There is no public access to the lake.

The state does not stock Spring Lake; it is not known if any private stocking occurs.

General statewide fishing regulations are applicable in Spring Lake.

There are no lake-specific fish consumption advisories on Spring Lake.

Historical Water Quality Data
CSLAP sampling was conducted on Spring Lake from 1998 to 2001, 2007 to 2011, and 2014 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 Spring Lake will also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77848.html.

Spring Lake was not sampled by the NYSDEC as part of any of its statewide water quality monitoring programs (prior to CSLAP). It is not known if the lake has been sampled by the regional fisheries staff as part of any fisheries management activities on the lake.

None of the unnamed ephemeral tributaries to the lake, nor the outlet of the lake have been monitored through the NYSDEC Rotating Intensive Basins (RIBS) program or the state stream macroinvertebrate monitoring program. The lake was not sampled by DEC fisheries staff in support of fish stocking activities or resource management.

Lake Association and Management History
Spring Lake is served by the Spring Lake Association (aka SPLAKE). The lake association is involved in a variety of lake management and social activities, including aquatic plant management. It is not known if the lake association maintains a website.

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual and Monthly Results Relative to 1998-2014
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 – Spring Lake” section in Appendix C.

Evaluation of Eutrophication Indicators

Chlorophyll *a* readings were lower than normal, but total phosphorus readings were much higher than normal in the early summer of 2015. It is not known if the higher TP readings are representative of normal conditions in the lake at that time. Water clarity was very close to normal. The variation in each of these indicators suggests that water quality conditions "normally" vary from sample to sample and year to year.

Water clarity typically decreases from June through August, and then increases in the fall. This does not align with a decrease in phosphorus from June through October, or higher algae levels in the fall (only). This suggests that the seasonal changes in each of these indicators are not interrelated (or represent normal variability). In 2015, nutrient levels decreased and water clarity increased through mid- to late-summer, although algae levels did not exhibit any clear seasonal trends.

The lake can usually be characterized as *mesoligotrophic*, or moderately unproductive, based on Secchi disk transparency, chlorophyll *a* (both typical of *mesotrophic* lakes), and total phosphorus readings (typical of *oligotrophic* lakes). However, algae levels in 2014 and 2015 were more typical of unproductive (*oligotrophic*) lakes, and phosphorus readings in 2015 were more typical of *mesotrophic* lakes. The trophic state indices (TSI) evaluation suggests that each of the trophic indicators may vary in an unpredictable way (i.e. not predictable from the other trophic indicators) in any given year . Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are usually not 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, and the lake is not classified for use for drinking water. Deepwater phosphorus and ammonia readings are not elevated, but deepwater oxygen levels were very low in previous DEC evaluations, so deepwater intakes may not support "unofficial" potable water use. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Conductivity and pH readings have increased slightly over the last decade, and these readings were higher than normal in 2015. Ammonia readings have also increased slightly over this period, but were close to usual in 2015. Total nitrogen readings were slightly lower than normal in 2015, but these readings have not exhibited any clear long-term trends.

Chloride levels in the 2015 samples, collected for the first time through CSLAP and cited in Appendix A, ranged from 12 to 15 mg/l. These values fall within the range of "minor" to "moderate" 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 below the range of values found in most NYS lakes. These readings suggest a low to moderate 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

Macrophyte surveys have been conducted through CSLAP and the ALSC survey. At least 15 aquatic plant species have been found, and it is likely that all of these are native plants (although the bladderwort and water lilies have been sufficiently abundant to prompt a local push for plant management). The modified floristic quality index (FQI) for the lake indicates that the quality of the aquatic plant community is "excellent". It is not known if these plant communities have changed in response to the aquatic plant management actions taken at the lake.

The fish community is comprised of at least five warmwater fish species and at least one coolwater fish species. It is assumed that this is not a complete inventory. This limited data suggests that the lake can most likely be characterized as a warmwater fishery. An evaluation of the health of the fish community using the Minnesota index for biotic integrity (IBI) indicates that the quality of the fish community is "good".

Phytoplankton, zooplankton, and macroinvertebrates have not been evaluated through CSLAP in Spring Lake. The fluoroprobe samples analyzed by SUNY ESF found low total algae and low blue green algae levels in the open water, with samples comprised primarily of green algae or diatoms. No shoreline blooms have been reported or sampled, at least in recent years. Similar results were reported in 2015.

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

Evaluation of Lake Perception

Water quality and recreational assessments were close to normal in 2015, consistent with water clarity readings that were close to normal, and consistent with plant coverage that was also close to normal. These assessments often vary slightly and normally from year to year, and none of these indicators of lake perception has exhibited a clear long-term trend. Recreational and water quality assessments usually improve slightly during the summer, but no clear seasonal changes were apparent in 2015. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Water temperature readings in the summer index period were slightly higher than usual in 2014 and 2015, but these readings have increased slightly since about 2000. Deepwater temperatures have also increased slightly over this period. However, it is not known if the changes in water temperature were an indication of local climate change or if these changes cannot be well evaluated through CSLAP.

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 have consistently been well below the thresholds for harmful algal blooms (HABs), and low blue green algae levels were found in all open water samples in 2015. As expected, algal toxins were not detected in any of these samples. No shoreline blooms have been reported or sampled over at least the last few years.

Lake Condition Summary

Category	Indicator	Min	CSLAP Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	1.78	3.18	10.60	3.18	Mesotrophic	Within Normal Range	Decreasing Slightly
	Chlorophyll *a*	0.05	2.58	8.75	1.09	Mesotrophic	Lower Than Normal	No Change
	Total Phosphorus	0.003	0.009	0.043	0.019	Oligotrophic	Higher than Normal	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.01	0.07	0.36	0.03	Close to Surface NH4 Readings	Lower Than Normal	Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.000	0.015	0.147	0.020	Close to Surface TP Readings	Higher than Normal	Not known
	Nitrate + Nitrite	0.00	0.02	0.12	0.01	Low NOx	Within Normal Range	No Change
	Ammonia	0.00	0.02	0.09	0.03	Low Ammonia	Within Normal Range	Increasing Slightly
	Total Nitrogen	0.19	0.34	0.60	0.29	Low Total Nitrogen	Within Normal Range	No Change
	pH	4.91	7.24	8.60	7.63	Circumneutral	Within Normal Range	No Change
	Specific Conductance	20	46	73	54	Softwater	Higher than Normal	No Change
	True Color	6	21	60	20	Intermediate Color	Within Normal Range	No Change
	Calcium	1.6	2.8	3.3	3.2	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	1.7	3	1.6	Not Quite Crystal Clear	Within Normal Range	No Change
	Aquatic Plant Coverage	1	2.8	4	2.9	Surface Plant Growth	Within Normal Range	No Change
	Recreational Assessment	1	1.8	4	1.9	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Excellent quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not measured through CSLAP	Not known	Not known
	Macroinvertebrates					2009 results not yet available	Not known	Not known
	Fish					Coldwater fishery?	Not known	Not known
	Invasive Species					None observed	Not known	Not known
Local Climate Change	Air Temperature	11	23.0	37	26.4		Higher Than Normal	Increasing Significantly
	Water Temperature	12	21.6	27	24.1		Higher Than Normal	No Change
Harmful Algal Blooms	Open Water Phycocyanin	0	5	32	4	No readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	1	4	1	No readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	0	1	0	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	<DL	0.8	<DL	Low to undetectable open water microcystins	Not known	Not known
	Open Water Anatoxin a	<DL	<DL	<DL	<DL	Open water Anatoxin-a consistently not detectable	Not known	Not known
	Shoreline Phycocyanin					No shoreline blooms sampled for PC	Not known	Not known
	Shoreline FP Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline FP BG Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline Microcystis					No shoreline bloom MC-LR data	Not known	Not known
	Shoreline Anatoxin a					No shoreline bloom anatoxin data	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Spring Lake is presently among the lakes listed on the 2008 Lower Hudson River drainage basin Priority Waterbody List (PWL); the lake is listed as having "no known impacts". The PWL listing for the lake is in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Spring Lake, 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. The low algae levels may indicate support for any "unofficial" potable water use from the surface waters of the lake, although deepwater intakes may not be supported.

Public Bathing

The CSLAP dataset at Spring Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public swimming beach, would be fully supported, although this may be *threatened* by decreasing water clarity associated with high nutrients and algae. Additional information about bacterial levels is needed to evaluate the safety of the water for swimming.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Spring Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation should be fully supported, although this use may occasionally be *threatened* by excessive nutrients and occasionally excessive growth of purple bladderwort and lily pads, both associated with native plants.

Aquatic Life

The CSLAP dataset on Spring Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *stressed* by depressed pH and deepwater hypoxia (reduced oxygen levels). Road salt runoff may *threaten* this use. However, additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics and Habitat

The CSLAP dataset on Spring Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may at times be *fair* due to poor lake perception as a result of poor clarity. Habitat should be *good.*

Fish Consumption

There are no fish consumption advisories posted for Spring Lake.

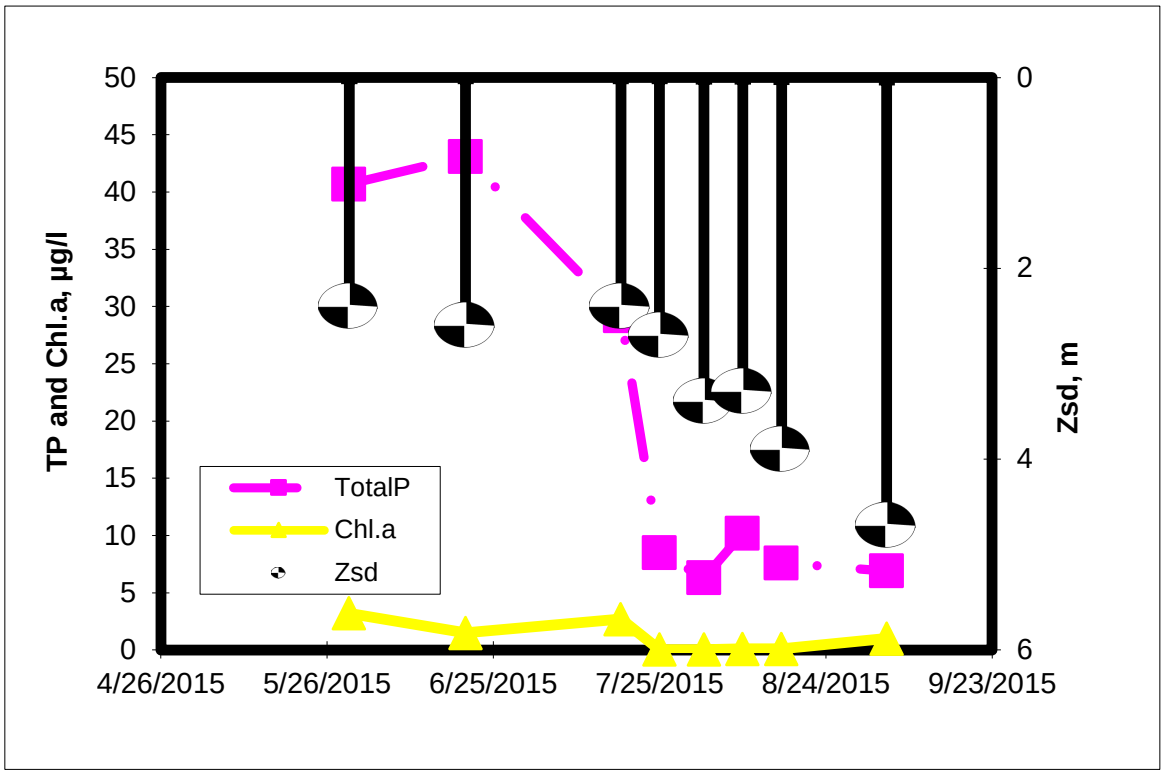
Additional Comments and Recommendations

Continued aquatic plant monitoring in Spring Lake may be useful in determining if the management of bladderwort and/or lilies has affected the aquatic plant community structure and recreational use of the lake. Any sources of turbidity that might have contributed to the recent drop in water clarity should continue to be evaluated. Lake residents should report and avoid exposure to any surface scums or heavily discolored water from blue green algae blooms.

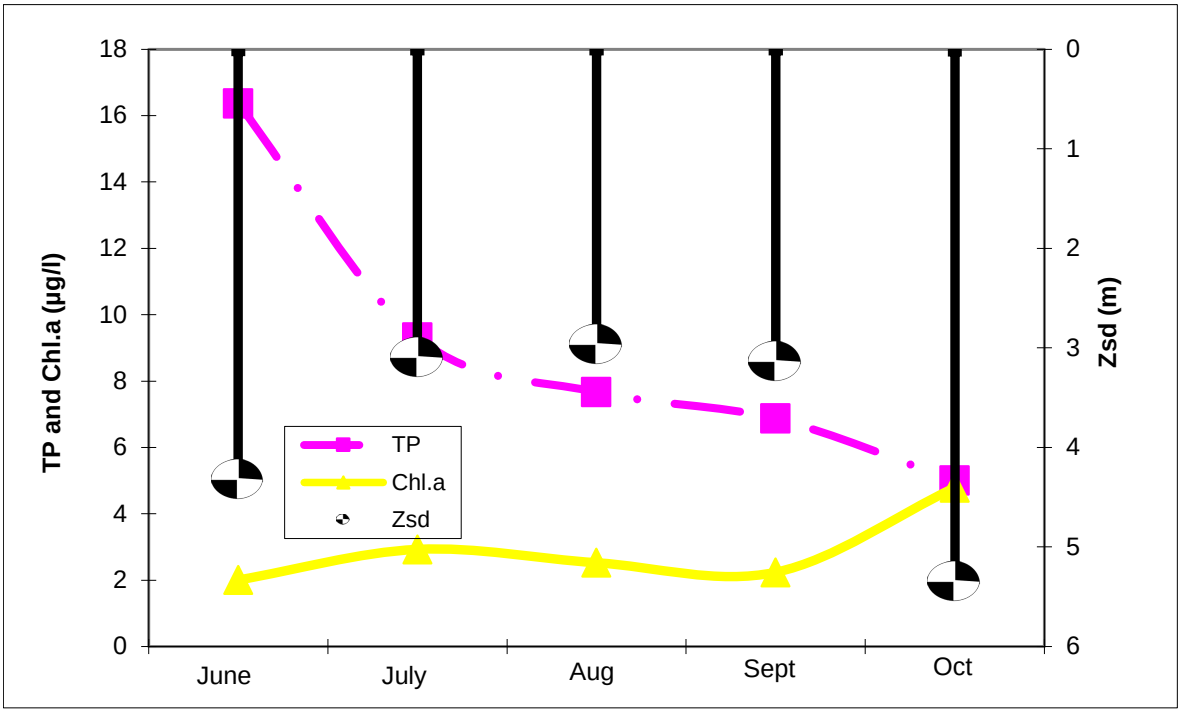
Aquatic Plant IDs-2015

None submitted for identification.

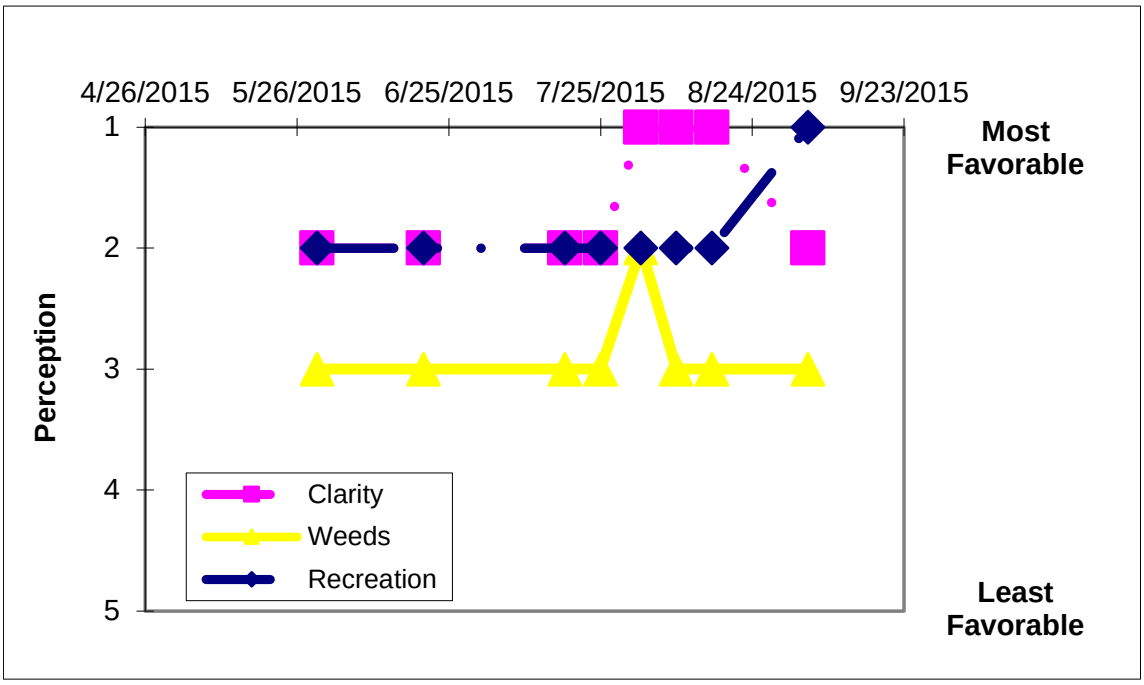
Time Series: Trophic Indicators, 2015



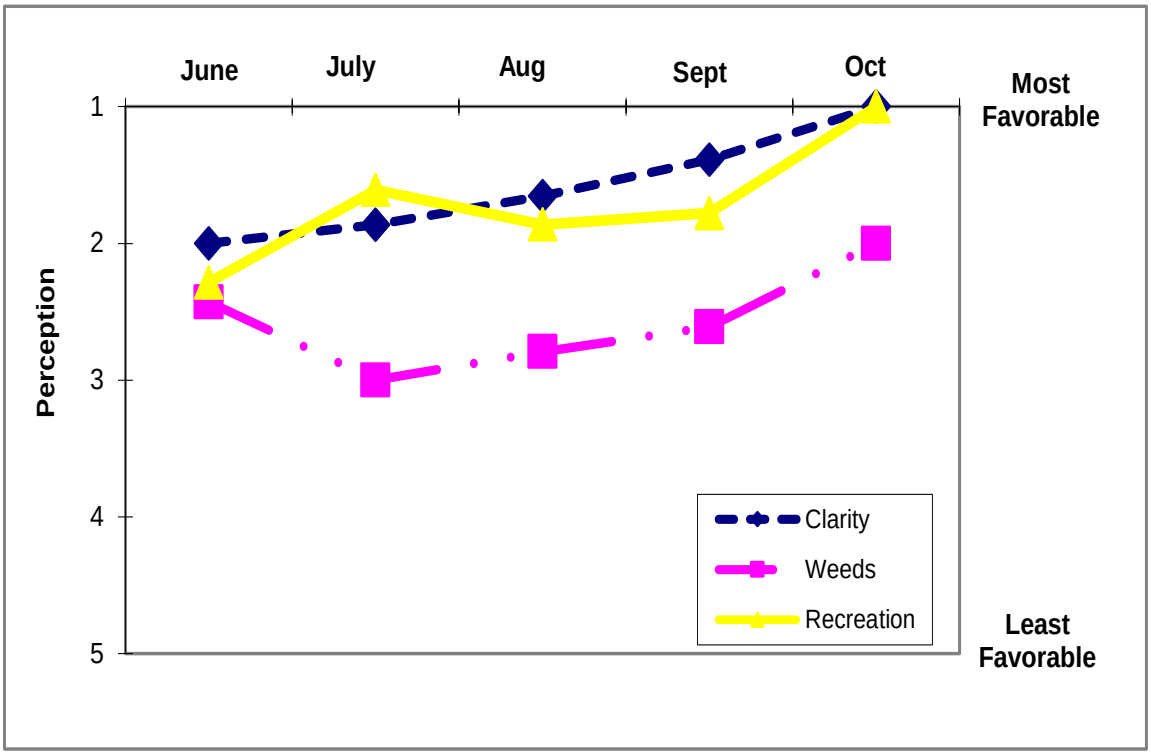
Time Series: Trophic Indicators, Typical Year (1998-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (1998-2015)



Appendix A- CSLAP Water Quality Sampling Results for Spring Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
154	Spring L	6/7/1998		4.50	1.5		0.01				6	6.68	44		3.74	
154	Spring L	6/29/1998	7.0	3.58	1.5		0.01				13	6.85	42		3.92	
154	Spring L	7/12/1998	9.0	4.15	1.5		0.01				11	6.28	42		1.51	
154	Spring L	7/29/1998	6.5	5.15	1.5		0.01				11	7.12	43		3.07	
154	Spring L	8/28/1998	7.9	6.50	1.5						9	7.24	45		2.38	
154	Spring L	9/28/1998	6.0	4.00	1.5	0.004					9	7.29	46		1.90	
154	Spring L	10/5/1998	6.6	5.35	1.5	0.005					10	7.49	46		4.79	
154	Spring L	7/21/1999	9.0	3.25		0.009	0.01				11	7.71	47		4.80	
154	Spring L	7/27/1999	10.4	2.55		0.010	0.01				7	7.48	46		8.75	
154	Spring L	8/9/1999	9.1	2.75		0.007	0.02				15	7.24	55		1.54	
154	Spring L	8/30/1999	10.3	3.25	1.5	0.008	0.01				15	7.28	48		1.98	
154	Spring L	7/17/2000	10.1	2.25	1.5	0.011	0.01				14	7.11	45		3.08	
154	Spring L	7/24/2000	9.6	2.90	1.5		0.01				14	6.43	46		3.79	
154	Spring L	8/7/2000	10.6	3.25	1.5		0.01				14	6.86	46		4.32	
154	Spring L	8/14/2000	10.0	2.05	1.5	0.009	0.01									
154	Spring L	8/28/2000	10.3	3.25	1.5		0.01				20	7.61	45		2.50	
154	Spring L	9/4/2000	10.2	3.25	1.5	0.010	0.01				20	7.43	45		2.92	
154	Spring L	9/10/2000	10.0	4.00	1.5	0.009	0.01				18	7.12	45		2.36	
154	Spring L	6/25/2001	10.6	**10.6**	1.5		0.01				10	4.91	49		2.48	
154	Spring L	7/10/2001	10.2	4.35	1.5	0.010	0.01				10	5.72	50		2.41	
154	Spring L	7/14/2001	10.0	4.25	1.5	0.011	0.01				9	6.68	47		3.12	
154	Spring L	7/31/2001	9.0	4.40	1.5	0.007	0.01				8	6.02	46		1.42	
154	Spring L	8/5/2001	9.8	3.90		0.005	0.01				7	8.03	47		1.02	
154	Spring L	8/19/2001	8.9	4.55		0.006	0.01				7	6.76	48		2.17	
154	Spring L	8/27/2001	10.6	4.15		0.013					6	6.82	53		0.91	
154	Spring L	8/16/2007	10.5	2.85	1.5	0.007	0.00	0.01	0.40	132.5	15	7.57	31	3.1	3.16	
154	Spring L	8/24/2007		2.00	1.5	0.008	0.01	0.01	0.60	174.0	15	8.12	31		2.54	
154	Spring L	8/25/2007	10.0	3.00	1.5	0.007	0.00	0.01	0.47	151.3	16	7.70	32		1.07	
154	Spring L	9/2/2007		3.00	1.5	0.011	0.00	0.01	0.52	101.3	12	6.96	45		2.34	
154	Spring L	9/8/2007	9.5	3.50	1.5	0.007	0.00	0.01	0.48	154.8	12	7.65		2.8	3.67	
154	Spring L	9/15/2007	11.9	3.10	1.5	0.005	0.01	0.01	0.50	219.5	9	6.51	48		2.18	
154	Spring L	9/22/2007	10.5	3.55	1.5	0.006	0.01	0.04	0.54	214.4	12	7.91	38		1.59	
154	Spring L	9/29/2007		3.50	1.5	0.008	0.01	0.03	0.60	163.4	11	7.58	56		1.58	
154	Spring L	7/19/2008	8.6	3.50	1.5	0.006	0.01	0.02	0.24	89.96	16	7.09	48	1.6	1.09	
154	Spring L	7/27/2008	6.9	2.63	1.5	0.009	0.02	0.05	0.20	50.44	29	6.82	34		4.04	
154	Spring L	8/17/2008	10.5	2.45	1.5	0.008	0.00	0.04	0.24	63.99	18	6.27	41		2.36	
154	Spring L	8/23/2008	10.7	2.70	1.5	0.009	0.00	0.01	0.27	68.92	19	7.92	41	2.7	2.11	
154	Spring L	8/31/2008	10.0	2.35	1.5	0.005	0.01	0.00	0.27	114.14	18	8.03	48		3.82	
154	Spring L	9/6/2008	8.3	2.58		0.003	0.00	0.02	0.24	182.09	18	7.57	30		5.55	
154	Spring L	9/13/2008	10.3	2.45	1.5	0.006	0.00	0.02	0.27	102.13	25	6.51	46		1.15	
154	Spring L	9/21/2008	10.5	2.35	1.5	0.007	0.01	0.02	0.23	69.18	17	7.06	46		2.74	
154	Spring L	07/06/2009	10.1	3.36	1.5	0.008	0.00	0.01	0.29	84.00	17	7.58	61	2.6	4.78	
154	Spring L	07/20/2009	10.2	2.85	1.5	0.006	0.03	0.02	0.29	111.96	33	7.51	40		4.33	
154	Spring L	08/03/2009	10.3	2.70	4.5	0.006	0.02	0.02	0.27	99.37	45	6.23	34		1.00	
154	Spring L	08/08/2009		2.60	1.5	0.007	0.02	0.03	0.26	84.06	39	6.06	32		1.40	
154	Spring L	08/16/2009		2.80	1.5	0.007	0.02	0.03	0.35	105.48	60	7.63	35	3.0	2.80	
154	Spring L	08/22/2009	6.3	2.55	1.5	0.007	0.08	0.05	0.50	155.89	56	7.26	34		4.20	
154	Spring L	08/30/2009	4.5	3.20	1.5	0.006	0.01	0.01	0.29	100.72	59	8.00	43		1.70	
154	Spring L	09/05/2009	4.3	2.40	1.5	0.009	0.09	0.03	0.30	73.58	52	7.75	20		1.50	
154	Spring L	6/26/2010	4.4	3.88	1.5	0.009	0.02	0.03	0.49	118.80	39	6.69	52	2.8	1.10	
154	Spring L	7/5/2010	6.4	3.81	1.5	0.006	0.05	0.03	0.22	77.90	60	7.30	50		1.00	
154	Spring L	7/11/2010	11.0	2.40	1.5	0.006	0.02	0.03	0.24	91.03	23	7.48	49		3.20	
154	Spring L	7/18/2010	10.4	2.45	1.5	0.010	0.03	0.03	0.43	89.90	20	7.32	54		0.30	
154	Spring L	8/28/2010	10.3	3.05	1.5	0.006	0.01	0.03	0.35	132.00	23	7.46	53	2.9	0.50	
154	Spring L	9/6/2010	10.4	3.30	1.5	0.003	0.02	0.02	0.28	215.45	27	7.16	55		0.80	
154	Spring L	9/11/2010	10.3	3.40	1.5	0.007	0.01	0.02	0.33	103.71	7	7.04	61		0.70	
154	Spring L	9/18/2010	10.6	2.85	1.5	0.007	0.12	0.09	0.59	177.21	18	6.80	56		1.80	
154	Spring L	7/19/2011	10.0	2.30	1.5	0.007	0.03	0.01	0.27	86.71		8.08	58	3.3	5.50	
154	Spring L	7/25/2011	9.8	2.15	1.5	0.006	0.01	0.01	0.26	104.40	34	7.48	55		0.20	
154	Spring L	7/31/2011	10.3	2.45	1.5	0.008	0.02	0.02	0.31	86.59	19	7.09	45		6.20	
154	Spring L	8/6/2011	7.0	2.13	1.5	0.007	0.01	0.03	0.37	121.00	13	7.78	49		6.70	
154	Spring L	8/12/2011		2.15	1.5	0.008	0.01	0.02	0.57	166.91	23	8.10	33	3.0	4.20	
154	Spring L	8/21/2011	9.0	2.03	1.5	0.008	0.01	0.04	0.20	59.25	29	7.44	33		7.10	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	
154	Spring L	8/26/2011	10.0	1.80	1.5	0.008	0.02	0.03	0.29	84.00	15	7.44	55		7.80	
154	Spring L	9/3/2011	10.9	1.78	1.5	0.009	0.01	0.01	0.47	114.94	32	7.06	49		5.30	
154	Spring L	5/30/2014	10.6	2.58	1.5	0.008	0.02	0.03	0.33	95.33	27	7.51	20	1.8	3.90	
154	Spring L	6/15/2014	10.2	2.12	1.5	0.012			0.38	70.25	35	7.46	50		0.20	
154	Spring L	6/29/2014	7.7	3.05	1.5	0.013	0.01	0.03	0.26	43.66	21	7.45	73		1.10	
154	Spring L	7/6/2014	10.0	2.73	1.5	0.009			0.36	90.78	20	7.55	51		1.10	
154	Spring L	7/19/2014	9.4	2.30	1.5		0.01	0.04	0.34	23.66	28	6.45	51	2.8	0.90	
154	Spring L	8/10/2014	7.4	2.25	1.5	0.011			0.37	72.74	10	7.60	53		1.80	
154	Spring L	8/24/2014	10.0	2.30	1.5	0.008	0.02	0.02	0.29	84.82	22	7.13	50		1.90	
154	Spring L	9/7/2014	10.0	2.80	1.5	0.006			0.31	121.19	20	7.77	52		1.20	
154	Spring L	5/30/2015	7.0	2.40	1.5	0.041	0.01	0.02	0.30	7.37	16	7.62	35	3.1	3.20	
154	Spring L	6/20/2015	4.7	2.60	1.5	0.043			0.20	4.55	10	7.06	50		1.50	
154	Spring L	7/18/2015	8.9	2.40	1.5	0.029	0.00	0.03	0.30	10.41	24	7.25	52		2.70	15.1
154	Spring L	7/25/2015	8.9	2.70	1.5	0.009			0.29	33.53	24	8.15	56		0.05	
154	Spring L	8/2/2015	8.7	3.40	1.5	0.006	0.01	0.03	0.29	46.35	24	7.49	57	3.3	0.05	
154	Spring L	8/9/2015	9.3	3.30	1.5	0.010			0.42	41.27	27	7.21	59		0.10	
154	Spring L	8/16/2015	8.8	3.90	1.5	0.008	0.01	0.04	0.36	46.97	20	7.62	60		0.10	12.3
154	Spring L	9/4/2015	8.7	4.70	1.5	0.007			0.19	27.68	16	8.60	63		1.00	
154	Spring L	8/16/2007	10.5		9.0	0.000										
154	Spring L	8/24/2007			9.0	0.001										
154	Spring L	8/25/2007	10.0		9.0	0.147										
154	Spring L	9/2/2007			9.0	0.003										
154	Spring L	9/8/2007	9.5			0.004										
154	Spring L	9/15/2007	11.9		10.5	0.005										
154	Spring L	9/22/2007	10.5		10.5	0.006										
154	Spring L	9/29/2007			9.0	0.006										
154	Spring L	7/19/2008			6.0	0.009										
154	Spring L	7/27/2008			5.0	0.011										
154	Spring L	8/17/2008			3.0	0.010										
154	Spring L	8/23/2008			10.0	0.007										
154	Spring L	8/31/2008			9.0	0.008										
154	Spring L	9/6/2008			8.0	0.007										
154	Spring L	9/13/2008			3.5	0.005										
154	Spring L	9/21/2008			10.0	0.052										
154	Spring L	07/06/2009	10.1		9.0	0.010										
154	Spring L	07/20/2009	10.2		9.0	0.011										
154	Spring L	08/03/2009	10.3		8.7	0.009		0.03								
154	Spring L	08/08/2009			4.0	0.007										
154	Spring L	08/16/2009			6.0	0.030		0.06								
154	Spring L	08/22/2009	6.3		4.0	0.016										
154	Spring L	08/30/2009	4.5		4.0	0.006		0.03								
154	Spring L	09/05/2009	4.3		4.0	0.005										
154	Spring L	6/26/2010	4.4		4.0	0.010		0.17								
154	Spring L	7/11/2010	11.0		5.0	0.010		0.08								
154	Spring L	8/28/2010	10.3		9.0	0.023		0.10								
154	Spring L	9/11/2010	10.3		9.0	0.011		0.13								
154	Spring L	7/19/2011	10.0		9.0	0.036		0.08								
154	Spring L	7/31/2011	10.3		9.0	0.003		0.36								
154	Spring L	8/12/2011			8.0	0.009		0.01								
154	Spring L	8/26/2011	10.0		10.0	0.017		0.01								
154	Spring L	5/30/2014			10.0	0.025		0.05								
154	Spring L	6/15/2014			6.0	0.016										
154	Spring L	6/29/2014			5.1	0.014		0.04								
154	Spring L	7/6/2014			5.0	0.008										
154	Spring L	7/19/2014			5.0	0.008		0.04								
154	Spring L	8/10/2014			6.0	0.009										
154	Spring L	8/24/2014			5.0	0.005		0.01								
154	Spring L	9/7/2014			5.0	0.006										
154	Spring L	5/30/2015			5.0	0.020		0.02								
154	Spring L	6/20/2015			4.0	0.028										
154	Spring L	7/18/2015			6.0	0.062		0.03								
154	Spring L	7/25/2015			8.2	0.009										
154	Spring L	8/2/2015			8.0	0.014		0.03								
154	Spring L	8/9/2015			8.5	0.009										
154	Spring L	8/16/2015			8.2	0.008		0.03								
154	Spring L	9/4/2015			6.0	0.013										

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB form	Shore HAB
154	Spring L	6/7/1998	epi	11	14	2	1	2												
154	Spring L	6/29/1998	epi	18	22	2	1	4	5											
154	Spring L	7/12/1998	epi	21	25	2	2	1												
154	Spring L	7/29/1998	epi	24	22	2	3	1												
154	Spring L	8/28/1998	epi	21	20	2	3	3	5											
154	Spring L	9/28/1998	epi	18	16	1	3	2												
154	Spring L	10/5/1998	epi	14	12	1	2	1												
154	Spring L	7/21/1999	epi	21	23	1	3	1	6											
154	Spring L	7/27/1999	epi	20	24	2	3	1												
154	Spring L	8/9/1999	epi	21	22	3	3	1	5											
154	Spring L	8/30/1999	epi	19	19	2	2	2												
154	Spring L	7/17/2000	epi	20	20	2	3	3	5											
154	Spring L	7/24/2000	epi	20	19	2	3	2												
154	Spring L	8/7/2000	epi	23	20	2	3	2	25											
154	Spring L	8/14/2000	epi	18	18	2	3	3	5											
154	Spring L	8/28/2000	epi		19	2	3	2	2											
154	Spring L	9/4/2000	epi	12	19	2	3	3	5											
154	Spring L	9/10/2000	epi	17	18	2	2	1	2											
154	Spring L	6/25/2001	epi	23	21	1	3	1												
154	Spring L	7/10/2001	epi		20	2	3	1												
154	Spring L	7/14/2001	epi	19	20	2	3	2	5											
154	Spring L	7/31/2001	epi	24	23	2	3	1												
154	Spring L	8/5/2001	epi	24	23	2	3	1												
154	Spring L	8/19/2001	epi	26	21	2	3	2	2											
154	Spring L	8/27/2001	epi	21	20	2	3	3	5											
154	Spring L	8/16/2007	epi	23	23	1	3	2	2											
154	Spring L	8/24/2007	epi	22	20	1	3	2	0											
154	Spring L	8/25/2007	epi	21	21															
154	Spring L	9/2/2007	epi	25	22	1	3	2	2											
154	Spring L	9/8/2007	epi	30		1	2	1	0											
154	Spring L	9/15/2007	epi	14	18		3	2	58											
154	Spring L	9/22/2007	epi	21	19	1	3	2	5											
154	Spring L	9/29/2007	epi	14	20	1	3	2	25											
154	Spring L	7/19/2008	epi	33	27	2	3	1	2											
154	Spring L	7/27/2008	epi	20	23	2	3	2	5											
154	Spring L	8/17/2008	epi	22	22	3	3	1	2											
154	Spring L	8/23/2008	epi	23	22	1	3	3	2											
154	Spring L	8/31/2008	epi	24	23	1	4	3	2											
154	Spring L	9/6/2008	epi	22	23	2	3	2	25											
154	Spring L	9/13/2008	epi	19	18	1	4	2	2											
154	Spring L	9/21/2008	epi	20	19	2	3	2	2											
154	Spring L	07/06/2009	epi	23	22	1	3	1	2											
154	Spring L	07/20/2009	epi	23	22	1	4	3	28											
154	Spring L	08/03/2009	epi	27	23	1	3	2	28											
154	Spring L	08/08/2009	epi	16	23	3	3	3	2											
154	Spring L	08/16/2009	epi	32	26	2	3	2	2											
154	Spring L	08/22/2009	epi		24	2	3	2	2											
154	Spring L	08/30/2009	epi	19	22															
154	Spring L	09/05/2009	epi	21	22	2	3	3	2			13.96								
154	Spring L	6/26/2010	epi	24	23	3	3	3	2	47	0									
154	Spring L	7/5/2010	epi	30	25	2	3	2	0	47	0									
154	Spring L	7/11/2010	epi	35	27	3	3	2	2	0	0									
154	Spring L	7/18/2010	epi	34	27	3	3	2	2	0	0									
154	Spring L	8/28/2010	epi	28	22	1	1	1	0	0	0									
154	Spring L	9/6/2010	epi	20	21	1	1	1	0	0	0	16.09								
154	Spring L	9/11/2010	epi	21	18	1	1	1	0	0	0									
154	Spring L	9/18/2010	epi	17	16	1	2	1	0	0	0									
154	Spring L	7/19/2011	epi	27	24	1	3	1	0	6	6	3.70	3.00							
154	Spring L	7/25/2011	epi	23	26	1	3	1	5	0	0	3.50	3.34							
154	Spring L	7/31/2011	epi	29	24	1	3	1	0	0	0	4.50	4.20							
154	Spring L	8/6/2011	epi	22	24	1	3	1	0	0	0	5.70	4.90							

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB form	Shore HAB
154	Spring L	8/12/2011	epi	21	24	1	3	1	0	0	0	7.10	4.30							
154	Spring L	8/21/2011	epi	22	24	1	3	1	0	0	0	6.70	4.40							
154	Spring L	8/26/2011	epi	28	22	1	3	1	0	0	0	5.70	6.70							
154	Spring L	9/3/2011	epi	29	21	1	3	2		0	0	4.90	6.00							
154	Spring L	5/30/2014	epi	19	18	1	2	1	5	0	0	0.30	0.80	<0.37	<0.17	<0.001	1.69	0.00		
154	Spring L	6/15/2014	epi	27	20	1	3	2	0	0	0	0.30	3.90	<0.61	<0.08	<0.002	3.78	0.00	i	i
154	Spring L	6/29/2014	epi	29	26	3	3	2	2	0	0	1.00	0.50	<1.60	<0.48	<0.002	1.73	0.00	i	i
154	Spring L	7/6/2014	epi	32	23		3	2	2	0	0	1.40	0.50	<0.62	<0.03	<0.002	1.19	0.00	i	i
154	Spring L	7/19/2014	epi	25	24	3	3	2	25	0	0	1.10	0.50	<0.39	<0.21	<0.003	1.39	0.00	i	i
154	Spring L	8/10/2014	epi	25	25	3	3	2	2	0	0	1.80	0.30	<0.35	<0.03	<0.001	0.94	0.00	fi	f
154	Spring L	8/24/2014	epi	30	23	3	3	2	2	0	0	31.90	0.60	<0.26	<0.10	<0.002	0.04	0.00	i	i
154	Spring L	9/7/2014	epi	21	22	3	2	2	2	0	0	2.10	0.30	<0.29	<0.14	<0.002	1.35	0.00	i	i
154	Spring L	5/30/2015	epi	28	24	2	3	2	0	0	0	7.60	0.70	<0.45	<0.089	<0.199	1.65	0.71		
154	Spring L	6/20/2015	epi	22	22	2	3	2	0	0	0	5.10	0.60	<0.55	<0.004	<0.024	1.44	0.00		
154	Spring L	7/18/2015	epi	37		2	3	2	0	0	0	3.00	0.90	<0.30	<0.009	<0.049	2.50	0.00		
154	Spring L	7/25/2015	epi	25	24	2	3	2	0	0	0	2.80	0.30	<0.19	<0.005	<0.020	0.44	0.00		
154	Spring L	8/2/2015	epi	24	25	1	2	2	0	0	0	3.39	0.39	<0.23	<0.004	<0.015	0.79	0.06		
154	Spring L	8/9/2015	epi	23	24	1	3	2	0	0	0	0.05	0.60	<0.44	<0.002	<0.009	1.26	0.00		
154	Spring L	8/16/2015	epi	25	25	1	3	2	0	0	0	3.80	0.60	<0.44	<0.002	<0.014	1.47	0.00		
154	Spring L	9/4/2015	epi	27	25	2	3	1	0	0	0			<0.39	<0.004	<0.012	0.72	0.00		
154	Spring L	8/16/2007	hypo		8															
154	Spring L	8/25/2007	hypo		6															
154	Spring L	9/2/2007	hypo		7															
154	Spring L	9/15/2007	hypo		17															
154	Spring L	9/22/2007	hypo		18															
154	Spring L	9/29/2007	hypo		19															
154	Spring L	7/19/2008	hypo		11															
154	Spring L	7/27/2008	hypo		22															
154	Spring L	8/17/2008	hypo		18															
154	Spring L	8/23/2008	hypo		19															
154	Spring L	8/31/2008	hypo		20															
154	Spring L	9/13/2008	hypo		17															
154	Spring L	9/21/2008	hypo		18															
154	Spring L	07/06/2009	hypo		8															
154	Spring L	07/20/2009	hypo		8															
154	Spring L	08/03/2009	hypo		20															
154	Spring L	08/08/2009	hypo		22															
154	Spring L	08/22/2009	hypo		24															
154	Spring L	08/30/2009	hypo		22															
154	Spring L	09/05/2009	hypo		22															
154	Spring L	6/26/2010	hypo		22															
154	Spring L	7/11/2010	hypo		20															
154	Spring L	8/28/2010	hypo		17															
154	Spring L	9/11/2010	hypo		15															
154	Spring L	7/19/2011	hypo		7															
154	Spring L	7/31/2011	hypo		7															
154	Spring L	8/12/2011	hypo		24															
154	Spring L	8/26/2011	hypo		22															
154	Spring L	5/30/2014	hypo		18															
154	Spring L	6/15/2014	hypo		20															
154	Spring L	6/29/2014	hypo		25															
154	Spring L	7/6/2014	hypo		24															
154	Spring L	7/19/2014	hypo		24															
154	Spring L	8/10/2014	hypo		13															
154	Spring L	8/24/2014	hypo		22															
154	Spring L	9/7/2014	hypo		23															
154	Spring L	5/30/2015	hypo		23															
154	Spring L	6/20/2015	hypo		22															
154	Spring L	7/18/2015	hypo		23															
154	Spring L	7/25/2015	hypo		23															
154	Spring L	8/2/2015	hypo		24															

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB form	Shore HAB
154	Spring L	8/9/2015	hypo		22															
154	Spring L	8/16/2015	hypo		22															
154	Spring L	9/4/2015	hypo		16															

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 Spring Lake

Spring Lake (1310-0045) NoKnownImpct

Waterbody Location Information

Revised: 04/14/2008

Water Index No: H-204- 2-36- 4-P81
Drain Basin: Lower Hudson River
Hydro Unit Code:
Str Class: B
Waterbody Type: Lake
Reg/County: 4/Rensselaer Co. (42)
Waterbody Size: 25.8 Acres
Quad Map: TABORTON (K-27-1)
Seg Description: entire lake

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
NO USE IMPAIRMNT		

Type of Pollutant(s)
Known: - - -
Suspected: - - -
Possible: - - -

Source(s) of Pollutant(s)
Known: - - -
Suspected: - - -
Possible: - - -

Resolution/Management Information

Issue Resolvability: 8 (No Known Use Impairment)
Verification Status: (Not Applicable for Selected RESOLVABILITY)
Lead Agency/Office: n/a
Resolution Potential: n/a
TMDL/303d Status: n/a

Further Details

Water Quality Sampling
Spring Lake has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1998 and continuing through 2002. An Interpretive Summary report of the findings of this sampling was published in 2002. These data indicate that the lake continues to be best characterized as mesoligotrophic, or moderately to highly unproductive. Low algal level and high clarity are typical of the lake. Phosphorus levels in the lake are consistently below the state guidance values indicating impacted/stressed recreational uses. Corresponding transparency measurements meet what is recommended for swimming beaches. Measurements of pH are somewhat low but typically fall within the state water quality range of 6.5 to 8.5. The lake water is slightly colored, but this is considered to be natural and does not appear to influence lake clarity. (DEC/DOW, BWAM/CSLAP, November 2002)

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 very favorable. The recreational suitability of the lake is described most frequently as "could not be nicer" or "excellent." The lake itself is most often described as either "crystal clear" or "not quite crystal clear." Assessments have noted that rooted aquatic plants densities have increased slightly over the sampling period, conditions that have at times been cited as impacting recreational uses. (DEC/DOW, BWAM/CSLAP, November

2002)

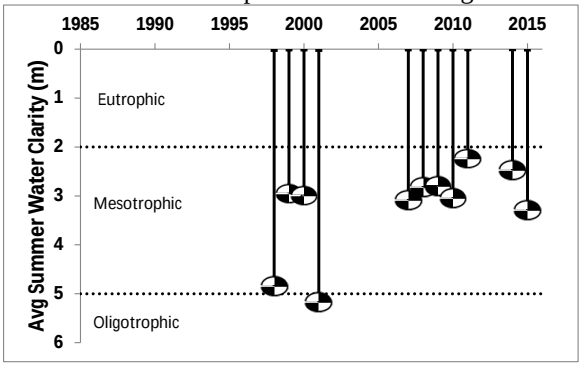
Lake Uses

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.

Appendix C- Long Term Trends: Spring Lake

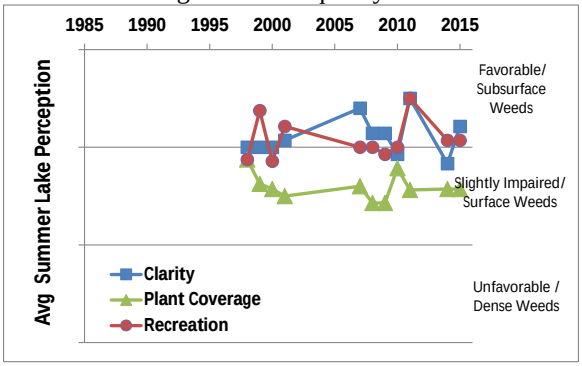
Long Term Trends: Water Clarity

- No change in clarity most years
- Most readings typical of *mesotrophic* lakes, lower than expected for TP and algae levels



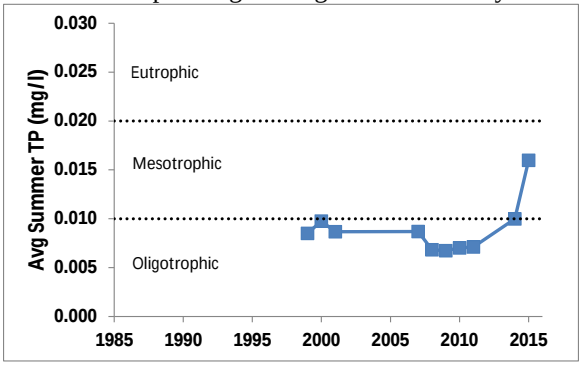
Long Term Trends: Lake Perception

- No clear trends
- Recreational perception more closely linked to changes in water quality than weeds



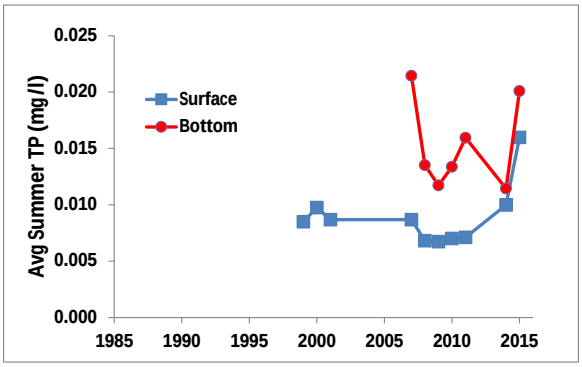
Long Term Trends: Phosphorus

- Phosphorus ↑ in 2014 and 2015
- Most readings typical of *oligotrophic* lakes, as expected given algae but not clarity levels



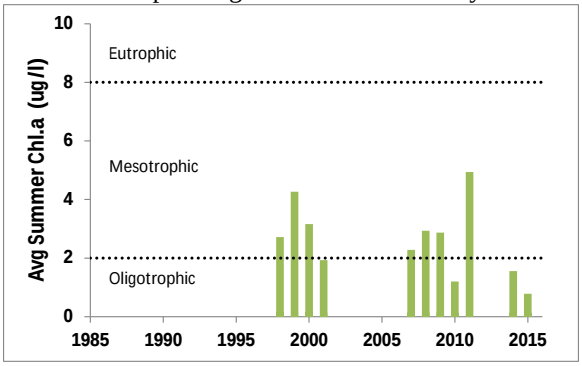
Long Term Trends: Bottom Phosphorus

- Bottom TP variable
- Occasionally elevated bottom TP indicates moderate thermal stratification



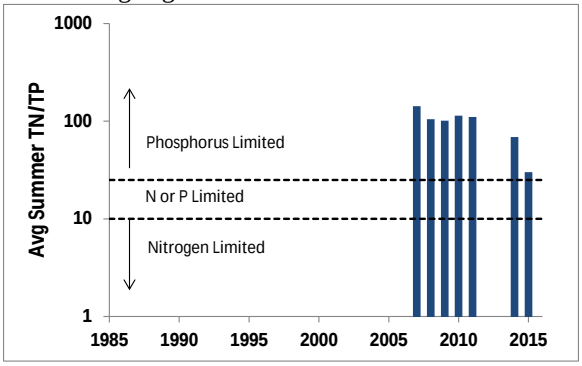
Long Term Trends: Chlorophyll a

- Recent decrease in algae levels
- Most readings typical of *mesotrophic* lakes, as expected given TP but not clarity



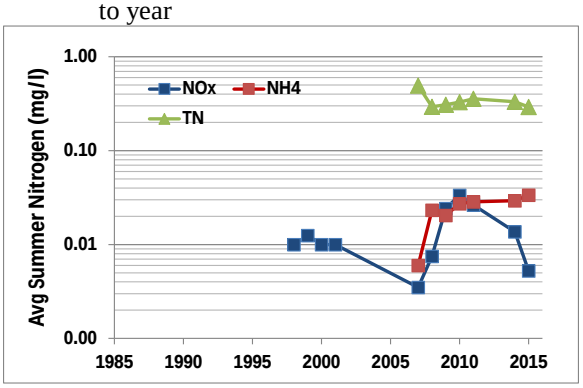
Long Term Trends: N:P Ratio

- Recent decrease in ratios
- Most readings indicate phosphorus limits algae growth



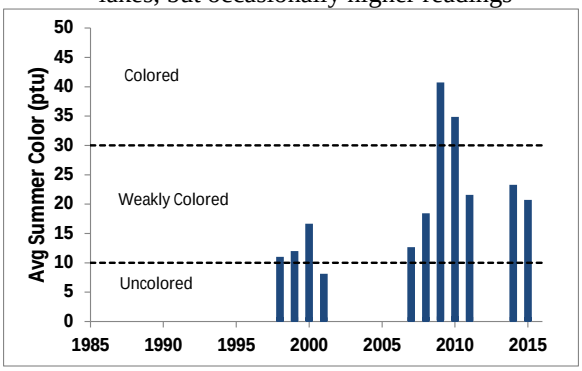
Long Term Trends: Nitrogen

- NH4 higher since late 2000s
- Some variability in nitrogen levels from year to year



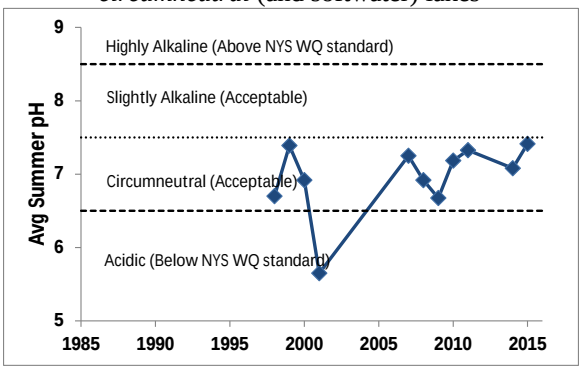
Long Term Trends: Color

- Much higher color after lab change in 2002
- Most readings typical of *weakly colored* lakes, but occasionally higher readings



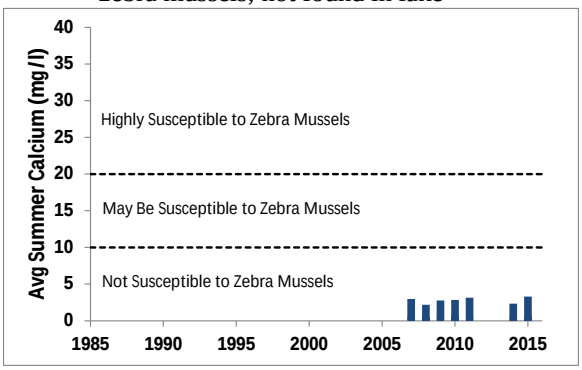
Long Term Trends: pH

- pH variable- higher pH since early 2000s
- Readings typical of *slightly alkaline* to *circumneutral* (and softwater) lakes



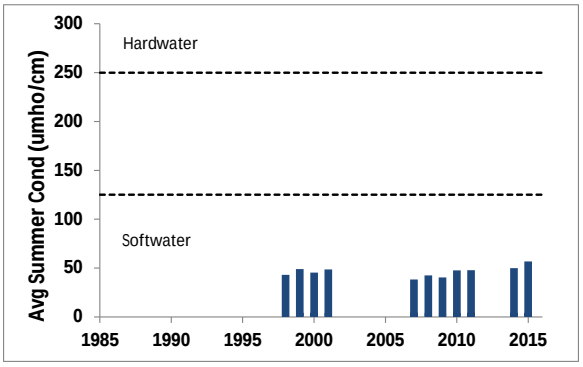
Long Term Trends: Calcium

- Stable and very low calcium levels
- Most readings indicate low susceptibility to zebra mussels; not found in lake



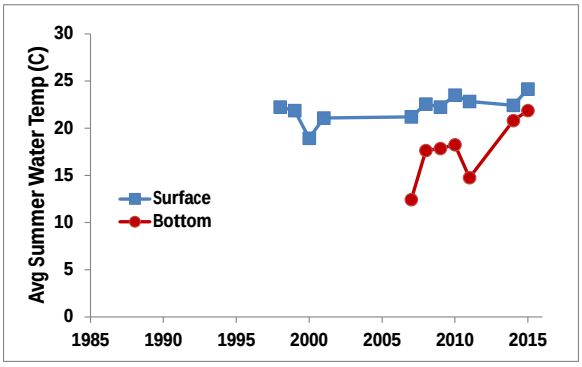
Long Term Trends: Conductivity

- Recent rise in conductivity
- Nearly all readings typical of lakes with *soft water*



Long Term Trends: Water Temperature

- Slight increase in surface and bottom T's
- Surface temperatures indicate weak to moderate thermal stratification



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.

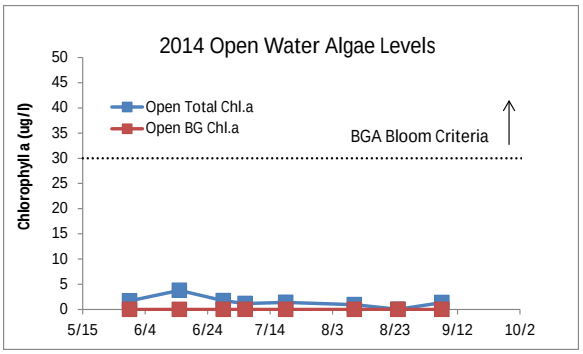


Figure D1:
2014 Open Water Total and BGA Chl.a

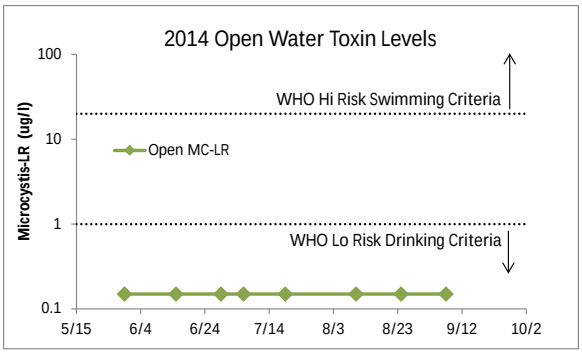


Figure D2:
2014 Open Water Microcystin-LR

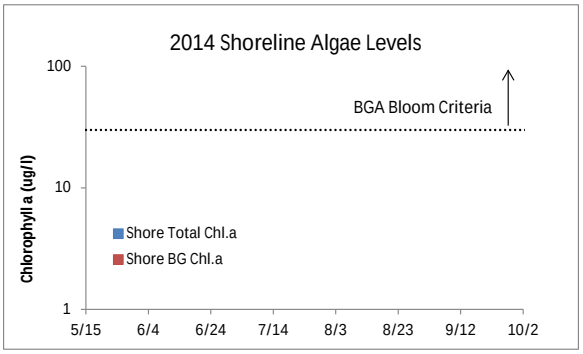


Figure D3:
2014 Shoreline Total and BGA Chl.a

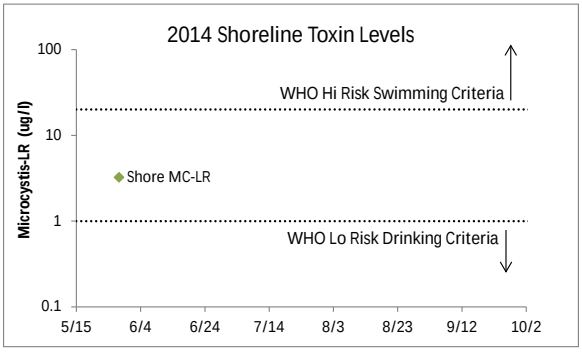


Figure D4:
2014 Shoreline Microcystin-LR

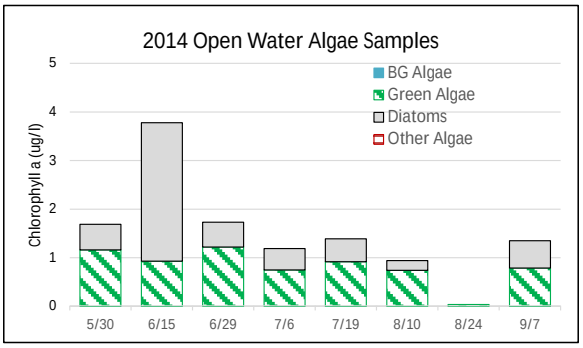


Figure D5:
2014 Open Water Algae Types

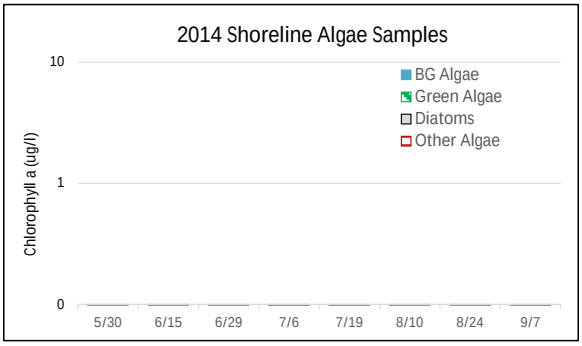


Figure D6:
2014 Shoreline Algae Types

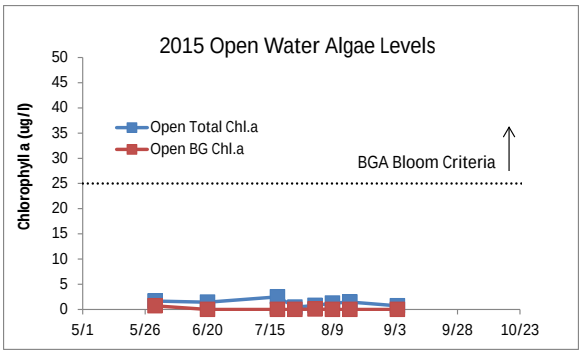


Figure D7:
2015 Open Water Total and BGA Chl.a

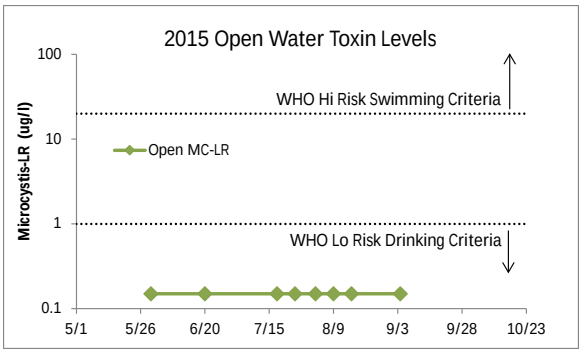


Figure D8:
2015 Open Water Microcystin-LR

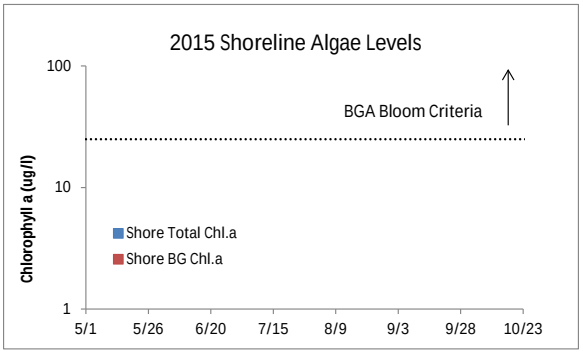


Figure D9:
2015 Shoreline Total and BGA Chl.a

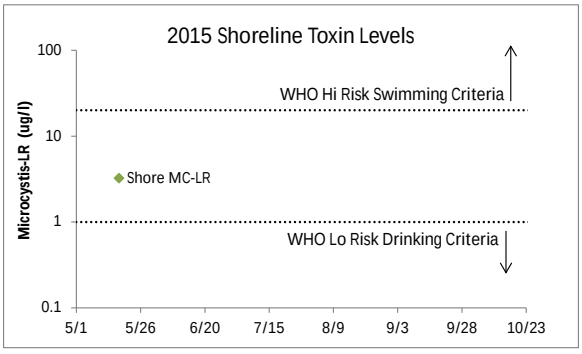


Figure D10:
2015 Shoreline Microcystin-LR

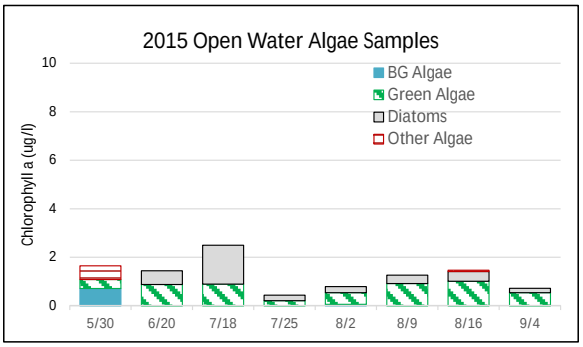


Figure D11:
2015 Open Water Algae Types

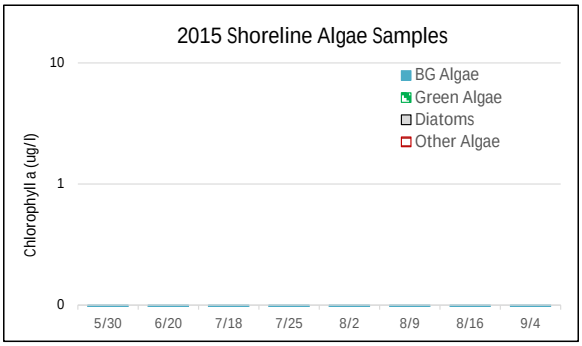


Figure D12:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Rensselaer County

The table below shows the invasive aquatic plants and animals that have been documented in Rensselaer 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 - Rensselaer County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Burden Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Burden Lake	Animal	Virile crayfish	*Orconectes virilis*
Burden Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Burden Lake	Plant	Water chestnut	*Trapa natans*
Burden First Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Burden First Lake	Plant	Water chestnut	*Trapa natans*
Burden Second Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Burden Second Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Burden Third Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Burden Third Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Castleton Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Coopers Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Crooked Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Crystal Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Crystal Lake	Animal	Virile crayfish	*Orconectes virilis*
Glass Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Glass Lake	Animal	Virile crayfish	*Orconectes virilis*
Golden Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Golden Pond	Plant	Water chestnut	*Trapa natans*
Hampton Manor Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Hampton Manor Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Hampton Manor Lake	Plant	Water chestnut	*Trapa natans*
Hudson River	Animal	Zebra mussel	*Dreissena polymorpha*
Hudson River	Plant	Water chestnut	*Trapa natans*
Hudson River (Schodack Island Park)	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Johnsonville Reservoir	Plant	Water chestnut	*Trapa natans*

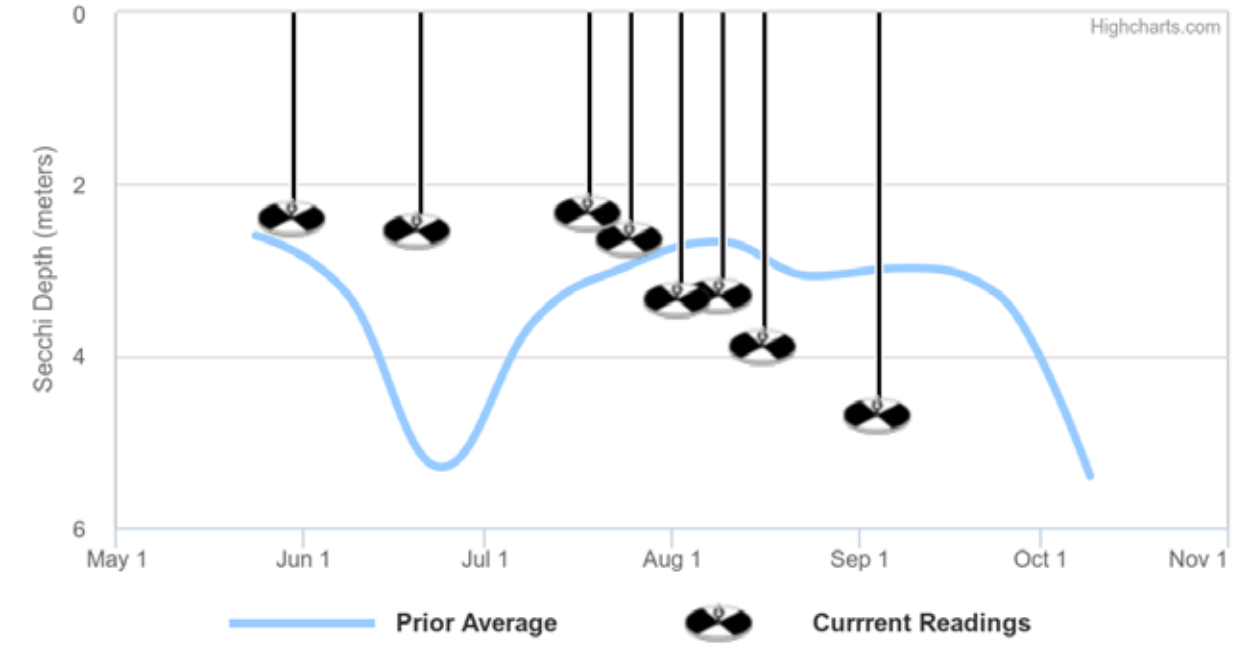
Waterbody	Kingdom	Common name	Scientific name
Johnsonville Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Links Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Links Pond	Plant	Water chestnut	*Trapa natans*
Long Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Mill Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Nassau Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Nassau Lake	Plant	Water chestnut	*Trapa natans*
Pine Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Pine Lake	**Plant**	**Water chestnut**	***Trapa natans***
Racquet Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Red Pond	Animal	Virile crayfish	*Orconectes virilis*
Reichards Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Second Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Shaver Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Snyders Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Snyders Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Snyders Lake	Plant	Brittle naiad	*Najas minor*
Snyders Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Tamarack Pond	Plant	Water chestnut	*Trapa natans*
Tomhannock Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Troy Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Vanderhyden Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*

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

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 1998 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 2007 to 2014.

Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are tending to be higher than normal when compared to the average of readings collected from 1998 to 2014

Appendix G: Watershed and Land Use Map for Spring Lake

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.