Lily Pond Questions and Answers, 2015 CSLAP

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

A1. Water quality conditions in Lily Pond were probably more favorable than normal in 2015. Nutrient and algae levels were lower, and although plant coverage was greater, no shoreline blue green algae blooms were reported.

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 biological impacts have been reported or measured.

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

A3. Lily Pond has slightly lower water clarity, but similar algae and nutrient levels, than a typical lake in the area. No shoreline blue green algae blooms have been reported (although high green algae levels are common), and no invasive plant species have been reported.

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

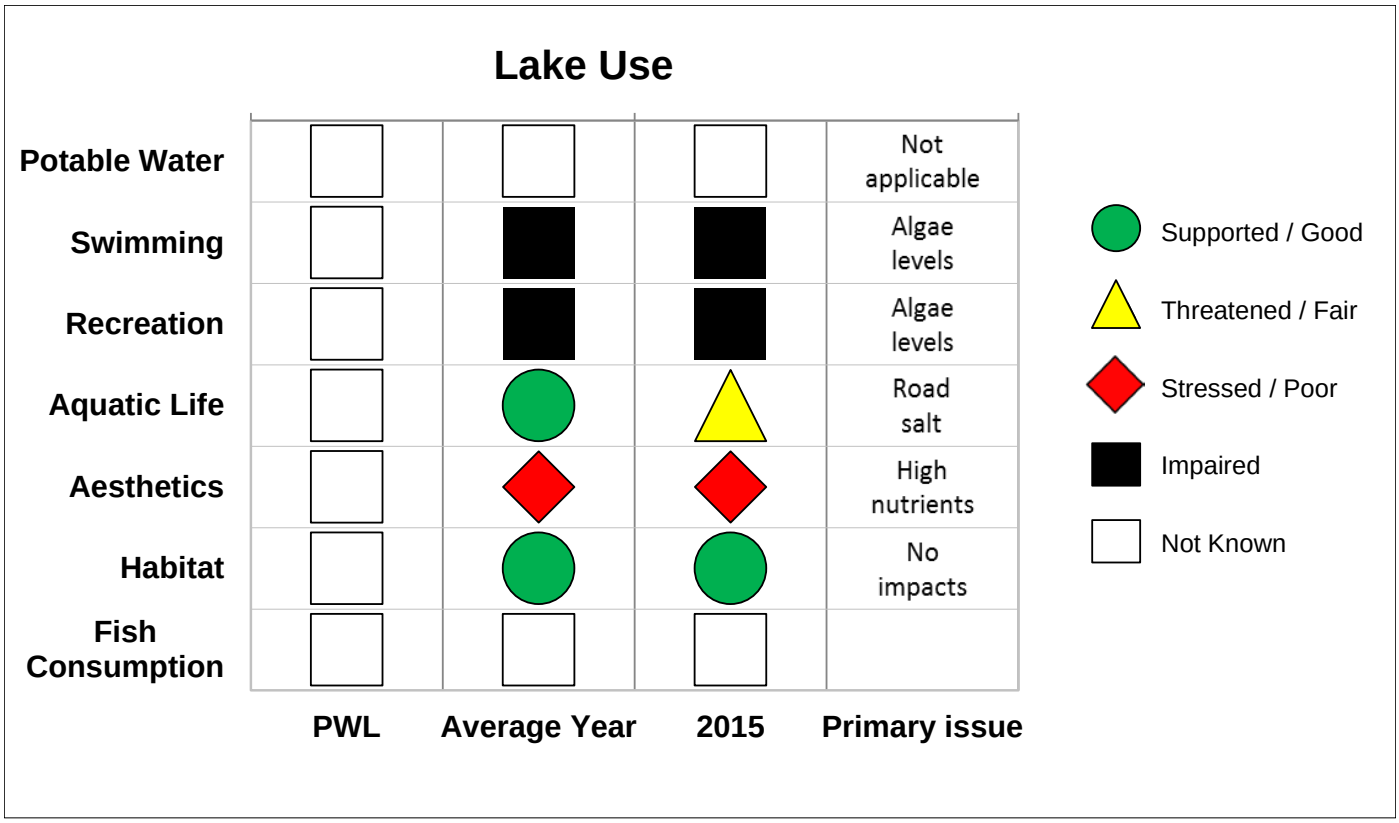
A4. Each of the trophic indicators- water clarity, chlorophyll *a*, and phosphorus- has decreased slightly over the last decade. The drop in the latter may have led to more favorable water quality assessments. Ammonia levels have decreased slightly over this period..

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

A5. Lily Pond does not appear to be susceptible to shoreline blue green algae blooms, although it is likely susceptible to invasive plants given the increasing frequency of *fanwort* and *hydrilla* reports in nearby lakes.

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 water quality conditions by reducing nutrient and sediment loading to the lake. Visiting boats (if any are used on the lake) should be inspected to reduce the risk of new invasive species, since nearby lakes harbor several invasive plants not found in the lake



CSLAP 2015 Lake Water Quality Summary:
Lily Pond

General Lake Information

Location	Town of Southampton
County	Suffolk
Basin	Long Island Sound/Atlantic Ocean
Size	2.9 hectares (7.2 acres)
Lake Origins	Natural
Watershed Area	38.5 hectares (95.1 acres)
Retention Time	0.3 years
Mean Depth	1.0 meters
Sounding Depth	2.1 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To…	no named outlet
WQ Classification	C (non-contact recreation = boating, angling)
Lake Outlet Latitude	40.980
Lake Outlet Longitude	-72.301
Sampling Years	2008-2013, 2015
2015 Samplers	Dai Dayton, Jean Dodds, Tom Hensler and Doreen Johnston
Main Contact	Dai Dayton

Lake Map

Background

Lily Pond is a 7 acre, class C lake found in the Town of Southampton in Suffolk County, in the Long Island region of New York State. It was first sampled as part of CSLAP in 2008.

It is one of six CSLAP lakes among the nearly 750 lakes and ponds found in Suffolk County, and one of seven CSLAP lakes among the more than 1150 lakes and ponds in the Long Island Sound / Atlantic Ocean drainage basin.

Lake Uses

Lily Pond is a Class C lake; this means that the best intended use for the lake is for non-contact recreation—boating and aesthetics, although the lake may also support contact recreation—swimming and bathing. The lake is not used for swimming or other recreational uses, and there is no public access to the lake.

It is not known whether Lily Pond has been stocked through any state fisheries stocking programs, or if any private stocking has occurred.

General statewide fishing regulations are applicable in Lily Pond. In addition, there is a year-round open season on bluegill, crappie, pumpkinseed sunfish, trout and yellow perch. There is a size limit of nine inches, and a daily take limit of 15 for all of these fish except trout, which has a daily take limit of three fish. Ice fishing of trout is permitted.

There are no lake-specific fish consumption advisories on Lily Pond.

Historical Water Quality Data

CSLAP sampling was conducted on Lily Pond from 2008 to 2013, and in 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 report and scorecard for Lily Pond can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77836.html.

Lily Pond has not been sampled through any previous NYSDEC monitoring program. It is not known if the lake has been sampled by any organizations associated with the Long Island Greenbelt.

There are no NYSDEC RIBS monitoring sites near Lily Pond, and there are no named tributaries to the lake.

Lake Association and Management History

Lily Pond is part of the Long Pond Greenbelt complex, along with (among other CSLAP lakes) Black Pond and Little Long Pond. The Long Pond Greenbelt is an approximately 11-kilometer (7-mile) north-south corridor of ponds, streams, and adjacent upland areas in the Outer Coastal Plain physiographic province. The preservation of land in the Long Pond Greenbelt has been a goal in the master plan for the town of Southampton since 1970. Long Pond Greenbelt is recognized by the New York State Department of State as a Significant Coastal Fish and Wildlife Habitat, and by the U.S. Fish and Wildlife Service as a priority wetland complex under the federal Emergency Wetlands Resources Act of 1986. The New York State Natural Heritage Program, in conjunction with The Nature Conservancy, recognizes several Priority Sites for

Biodiversity within the Long Pond Greenbelt complex. Other excellent examples of coastal plain pond shore communities occur at Black Pond and Little Long Pond.

Information about the Long Pond Greenbelt can be found at http://library.fws.gov/pubs5/web_link/text/lpg_form.htm.

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual and Monthly Results Relative to 2006-2013

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 –Lily Pond" section in Appendix C.

Evaluation of Eutrophication Indicators

Algae levels (as measured by chlorophyll *a*) were lower than normal in 2015, corresponding to lower than normal phosphorus readings. However, water clarity as close to normal, and none of these changes were statistically significant. None of these trophic indicators has exhibited any clear long-term trends, although each of these indicators has decreased slightly over the last decade.

Phosphorus readings decrease slightly over the typical summer, but this does not trigger similar seasonal changes in chlorophyll *a* or Secchi disk transparency. Phosphorus levels did decrease during the summer of 2013 and 2015, and water clarity increased slightly during the summer of 2015, but algae levels varied unpredictably.

The lake can be characterized as *mesoeutrophic,* or moderately to highly productive, based on chlorophyll *a* (typical of *mesotrophic* lakes), and water clarity and total phosphorus readings (typical of *eutrophic* lakes). The trophic state indices (TSI) evaluation suggests that water clarity readings are slightly lower than expected given the phosphorus and chlorophyll a readings. This suggests that water clarity is limited more by depth and water color than by algae. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are infrequently 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 use for drinking water. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Each of the nitrogen indicators (ammonia, NOx, and total nitrogen) was lower than normal in 2015, part of a longer term decrease over the last decade. Calcium and color readings were also slightly lower than usual in 2015, but these readings have not changed significantly over the same period. Conductivity readings were slightly higher than usual in 2015, and with pH have increased slightly over the last decade.

Chloride levels in the 2015 samples, collected for the first time through CSLAP and cited in Appendix A, ranged from 26 to 30 mg/l. These values fall within the range for "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 generally within the typical 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, zooplankton and macroinvertebrates have not been evaluated through CSLAP in Lily Pond, and the composition of the fish community is not known.

The fluoroprobe data from the last several years suggests a low susceptibility to blue green algae blooms, and both total and blue green algae levels have been low in nearly all samples. The green algae content of these samples increased over the course of the summer in 2015. No shoreline blooms have been reported or sampled.

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

Evaluation of Lake Perception

Recreational assessments were less favorable than normal in 2015 after improvements in 2012 and 2013, despite lower algae levels. Aquatic plant coverage was higher than normal in 2015, part of a slight longer term trend; it is not known if this was due to more extensive growth of native or exotic plants. Water quality assessments have improved slightly over the last several years, despite decreasing or stable water transparency over the same period, but consistent with decreasing algae levels.

These water quality assessments usually improve significantly during the summer, while plant coverage typically increases during the summer. These changes were not apparent, however, in 2015, although overall recreational assessments degraded slightly during the summer of 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 higher than normal in 2013 and 2015, and these readings have increased slightly over the last several years. It is not yet known if these measures can be used to evaluate local climate change.

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 data from 2013 and 2015 showed very low blue green algae levels. This is consistent with algal toxin levels that were not measureable in any samples. No shoreline blooms have been reported.

Lake Condition Summary

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.71	1.11	2.63	1.11	Eutrophic	Within Normal Range	No Change
	Chlorophyll *a*	0.40	6.41	46.20	3.17	Mesotrophic	Within Normal Range	No Change
	Total Phosphorus	0.007	0.028	0.103	0.019	Eutrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia							Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus							Not known
	Nitrate + Nitrite	0.00	0.32	4.69	0.01	Intermediate NOx	Within Normal Range	No Change
	Ammonia	0.00	0.08	0.43	0.04	Low Ammonia	Within Normal Range	Decreasing Slightly
	Total Nitrogen	0.34	0.81	1.47	0.64	Intermediate Total Nitrogen	Lower Than Normal	No Change
	pH	6.28	7.15	8.32	7.33	Circumneutral	Within Normal Range	No Change
	Specific Conductance	79	140	201	159	Intermediate Hardness	Within Normal Range	No Change
	True Color	18	47	99	30	Intermediate Color	Lower Than Normal	No Change
	Calcium	5.5	9.7	15.5	7.3	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.3	5	2.1	Not Quite Crystal Clear	Within Normal Range	Slightly Improving
	Aquatic Plant Coverage	3	3.6	5	4.9	Dense Plant Growth	Less Favorable than Normal	No Change
	Recreational Assessment	1	3.1	5	3.9	Slightly Impaired	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Not measured through CSLAP	Not known	Not known
	Zooplankton					Not measured through CSLAP	Not known	Not known
	Macroinvertebrates					Not measured through CSLAP	Not known	Not known
	Fish					Not known	Not known	Not known
	Invasive Species					None observed	Not known	Not known
Local Climate Change	Air Temperature	14	24.6	34	27.7		Higher Than Normal	No Change
	Water Temperature	16	25.3	35	26.3		Within Normal Range	No Change
Harmful Algal Blooms	Open Water Phycocyanin	1	8	35	5	No readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	2	6	18	10	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	0	0	0	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	<DL	<DL	<DL	Open water MC-LR consistently not detectable	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

Lily Pond is not presently listed on the Atlantic Ocean / Long Island Sound PWL, last updated in 2002.

Potable Water (Drinking Water)

The CSLAP dataset at Lily Pond, 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 algae levels in the lake suggest that the "unofficial" potable water use may be compromised.

Public Bathing

The CSLAP dataset at Lily Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public swimming beach, may be *impaired* by high algae levels and poor water clarity associated with elevated nutrient levels, although additional information about bacterial levels is needed to evaluate the safety of the water for swimming. There is no evidence of harmful algal blooms occurring at the lake, or that the lake supports this use.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Lily Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation may be *impaired* by excessive algae and *stressed* by nuisance weeds, although it is not known if this is due to native or exotic plants.

Aquatic Life

The CSLAP dataset on Lily Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life should be fully supported, although road salt runoff and slightly depressed pH may *threaten* this use. Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics and Habitat

The CSLAP dataset on Lily Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *poor* at times due to excessive algae levels associated with high nutrient levels. Habitat should be *good.*

Fish Consumption

There are no fish consumption advisories posted for Lily Pond.

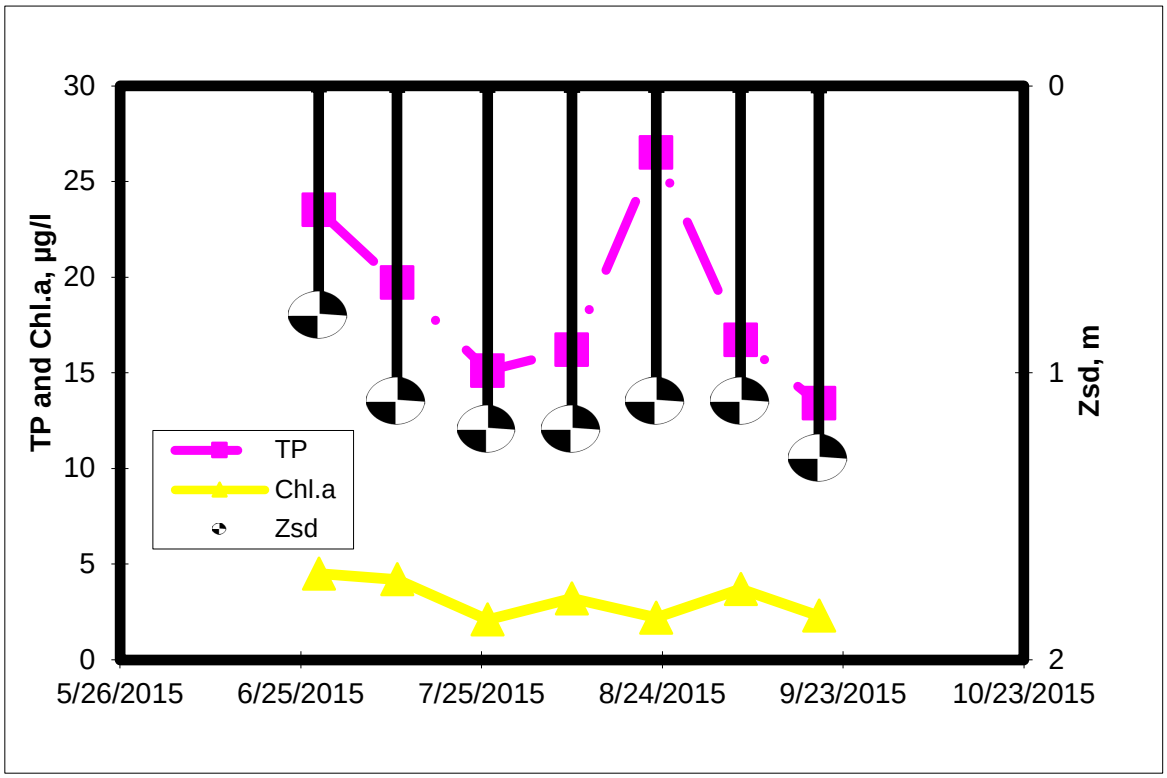
Additional Comments and Recommendations

Aquatic plant monitoring in Lily Pond may be useful in determining if the plant community is more strongly affected by native or invasive plants, particularly fanwort (*Cabomba caroliniana*) and variable watermilfoil (*Myriophyllum heterophyllum*), exotic plant species commonly found in lakes near the Long Pond Greenbelt.

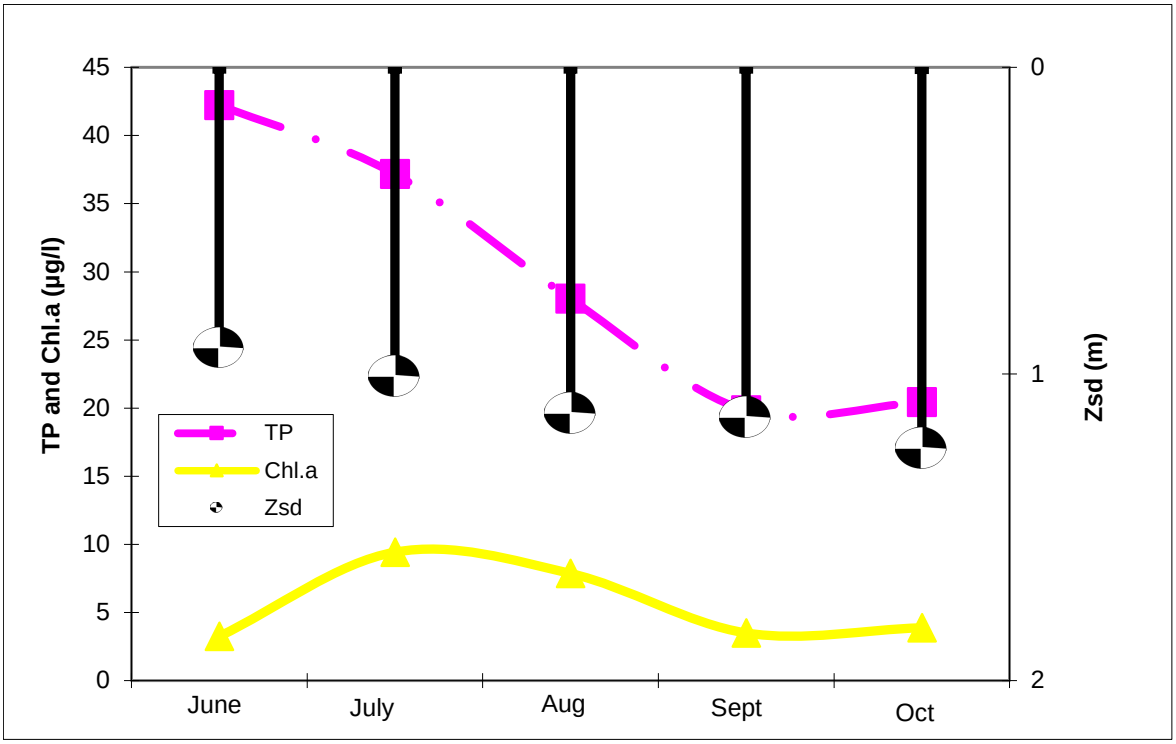
Aquatic Plant IDs-2015

None submitted for identification in 2015.

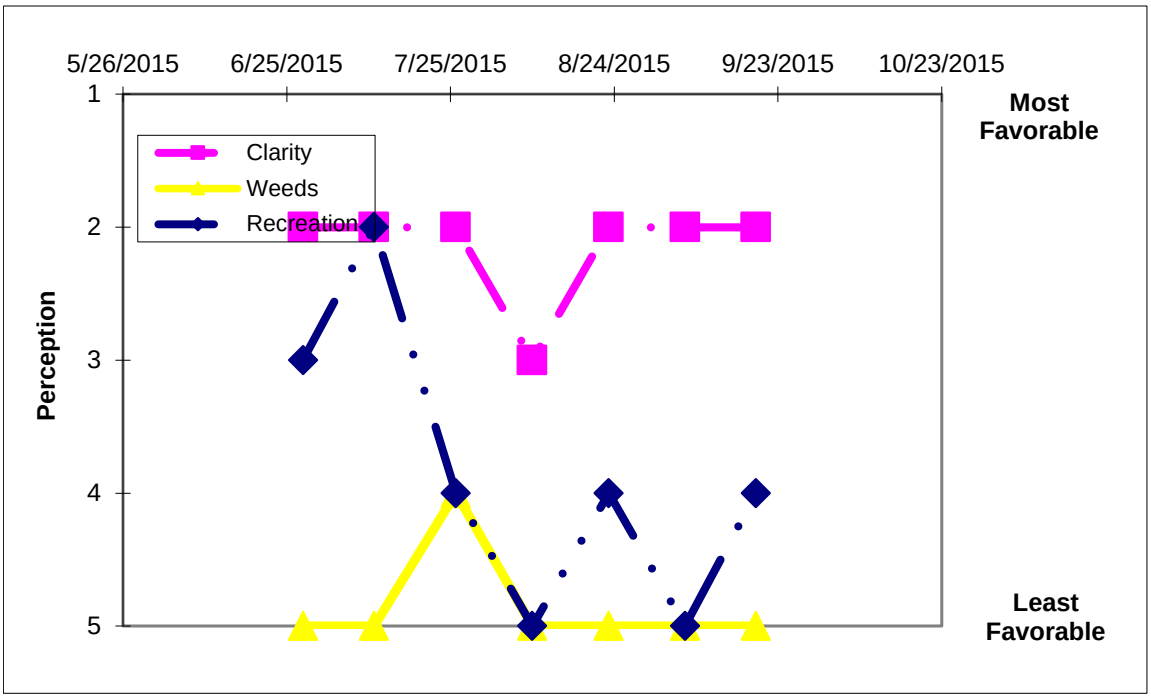
Time Series: Trophic Indicators, 2015



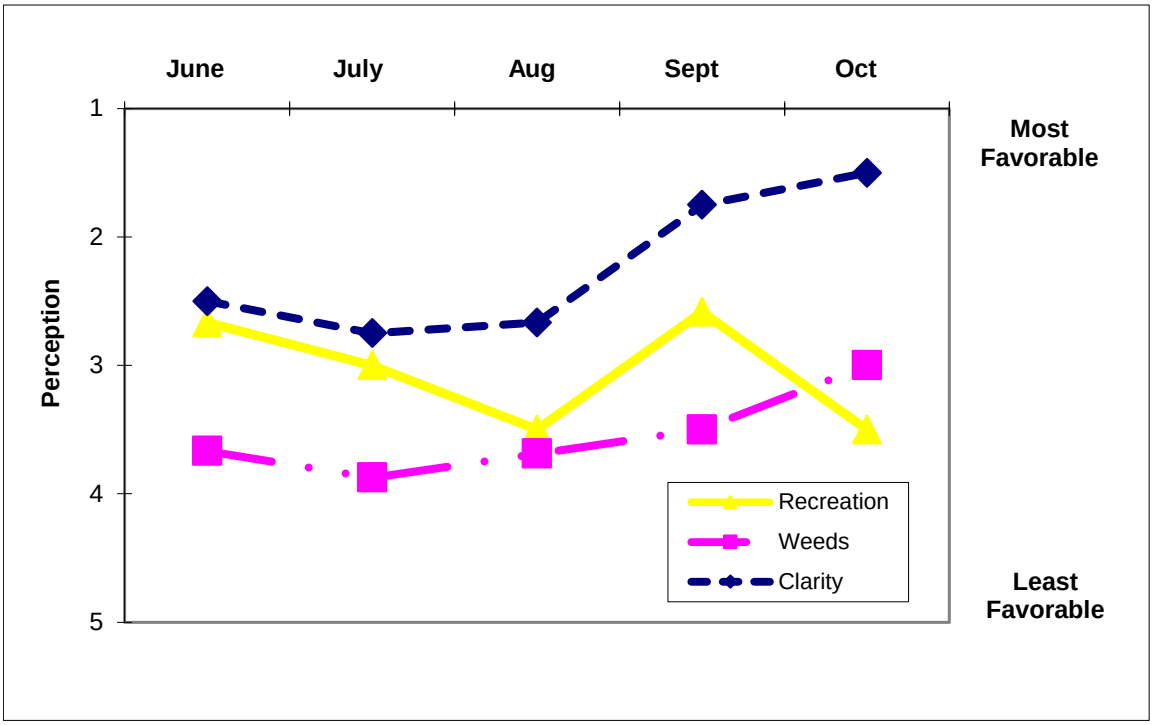
Time Series: Trophic Indicators, Typical Year (2008-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (2008-2015)



Appendix A- CSLAP Water Quality Sampling Results for Lily Pond

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
219	Lily Pond	7/13/2008	1.0	0.83	1.0	0.103	0.04	0.43	1.38	29.60		6.89	128	10.1	23.7	
219	Lily Pond	7/27/2008	2.1	1.23	1.8	0.024	0.04	0.04	0.71	65.40	31	6.97	95		25.3	
219	Lily Pond	8/10/2008		1.33	1.8	0.019	0.02	0.02	0.34	39.86	30	7.39	135		3.0	
219	Lily Pond	8/31/2008		2.63		0.016	0.01	0.00	0.56	78.24	35	7.22	114		14.4	
219	Lily Pond	10/13/2008		1.45		0.016	0.01	0.02			35	7.53	79	6.5	8.5	
219	Lily Pond	07/12/2009	1.5	1.18	1.3	0.049	0.86	0.02	1.47	66.82	70	6.86	111	8.1	5.38	
219	Lily Pond	07/26/2009		0.90	1.0	0.028	0.22	0.09	0.71	56.07	61	6.28	104		8.49	
219	Lily Pond	08/02/2009	1.0	1.25	1.2	0.033	0.17	0.08	0.66	43.87	69	6.49	103		2.64	
219	Lily Pond	08/09/2009	1.5	0.85	1.1	0.025	0.01	0.19	1.01	89.87	62	6.71	136		46.20	
219	Lily Pond	08/23/2009	1.3	1.10	1.1	0.027	0.64	0.06	1.19	97.28	99	7.66		10.4	4.80	
219	Lily Pond	08/30/2009	1.0	1.15	1.1	0.014	0.48	0.17	1.07	171.34	78	6.57	136		3.10	
219	Lily Pond	09/07/2009	1.1	1.20		0.014	0.35	0.11	0.71	114.89	57	6.93	109		3.00	
219	Lily Pond	09/13/2009	1.2	1.20	1.2	0.013	0.60	0.10	0.70	120.39	45	6.94	93		1.20	
219	Lily Pond	6/13/2010	1.5	1.10	1.5	0.068	4.69	0.06			53	6.86	201	13.6		
219	Lily Pond	8/14/2010	1.1	1.10	1.1	0.014	0.52	0.08	0.98	152.60	47	7.15	126		0.60	
219	Lily Pond	8/21/2010	1.0	1.10	1.3	0.007	0.91	0.06	0.87	273.74	46	7.45	193		0.40	
219	Lily Pond	9/19/2010	1.4	1.20	1.4	0.031	0.76	0.17	1.36	96.59	38	7.04	195		8.00	
219	Lily Pond	9/26/2010	1.5	1.55	1.5	0.019	0.73	0.18	1.30	147.62	39	7.08	187	11.5	4.90	
219	Lily Pond	8/5/2011	0.5	1.00	0.5	0.036	0.07	0.05	0.88	53.48	67	7.58	176.7	15.5	2.10	
219	Lily Pond	8/18/2011				0.057	0.03	0.02	0.66	25.41	84	7.43	152.3		10.50	
219	Lily Pond	8/25/2011		0.90	0.5	0.070	0.03	0.03	0.59	18.71	76	8.04	122.5		2.60	
219	Lily Pond	8/12/2012	1.3	0.80	0.5	0.034	0.02	0.03	1.34	85.69	37	7.09	148.1	9.5	9.60	
219	Lily Pond	8/23/2012	1.2	0.98	1.0	0.044	0.01	0.11	0.98	49.22	32	8.32	140.4		22.30	
219	Lily Pond	9/3/2012	1.3	1.04	1.0	0.034	0.05	0.05	0.99	63.93	38	7.75	142		9.60	
219	Lily Pond	9/13/2012	1.0	0.98	0.5	0.026	0.02	0.04	0.66	55.93	43	6.67	146.5		1.90	
219	Lily Pond	9/23/2012	1.2	1.07	0.5	0.019	0.02	0.07	0.50	57.74	34	7.21	137.5	6.6	3.30	
219	Lily Pond	10/7/2012	0.9	0.92	0.5	0.021	0.02	0.16	0.75	77.10	30	7.09	100.1		1.30	
219	Lily Pond	10/18/2012	1.1	1.10	0.5	0.024	0.06	0.24	0.96	88.65	32	7.25	129.8		1.90	
219	Lily Pond	10/28/2012	1.5	1.50	0.5											
219	Lily Pond	6/23/2013	1.7	0.85	1.0	0.035	0.04	0.05	1.22	76.72	85	6.75	127.2		2.00	
219	Lily Pond	7/6/2013	0.9	0.74	0.5	0.028			0.61	48.03	53	7.23	136.4		1.80	
219	Lily Pond	7/21/2013	1.2	0.90	0.5	0.032	0.05	0.03	0.54	37.41	46	6.99	153.7		4.50	
219	Lily Pond	8/5/2013	0.7	0.71	0.5	0.021			0.72	76.43	35	7.02	160.3		1.70	
219	Lily Pond	8/18/2013	0.9	0.89	0.5	0.018	0.04	0.03	0.58	69.63	48	7.4	157.9		4.40	
219	Lily Pond	9/1/2013	1.2	1.21	0.5	0.017			0.47	60.73	48	6.67	128.7		1.50	
219	Lily Pond	9/15/2013	1.0	0.95	0.5	0.018	0.02	0.05	0.54	67.54	51	6.69	129.2		0.80	
219	Lily Pond	9/30/2013	0.9	0.90		0.018			0.57	69.83	32	6.96	124.4		1.80	
219	Lily Pond	6/28/2015	0.8	0.80	0.7	0.024	0.02	0.03	0.58	24.85	18	7.5	165.1	5.53	4.50	
219	Lily Pond	7/11/2015	1.2	1.10	1.1	0.020			0.76	38.58	37	7.55	155.3		4.20	
219	Lily Pond	7/26/2015	1.9	1.20	1.5	0.015	0.01	0.04	0.62	41.06	31	7.12	180.1		2.10	29.6
219	Lily Pond	8/9/2015	1.4	1.20	1.0	0.016			0.72	44.14	34	7.62	183.4		3.20	
219	Lily Pond	8/23/2015	1.3	1.10	1.0	0.027	0.00	0.06	0.70	26.23		7.06	169.7	9.12	2.20	
219	Lily Pond	9/6/2015	1.3	1.10	1.0	0.017			0.55	33.05	30	7	135.8		3.70	
219	Lily Pond	9/19/2015	1.4	1.30	1.0	0.013	0.01	0.04	0.59	43.81	27	7.49	123.9		2.30	26.8

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
219	Lily Pond	7/13/2008	epi	31	27	5	4	4	1234											
219	Lily Pond	7/27/2008	epi	26	25	4	4	4	2348											
219	Lily Pond	8/10/2008	epi		25	2	4	4	238											
219	Lily Pond	8/31/2008	epi	27	26															
219	Lily Pond	10/13/2008	epi	21	18	2	3	4	2											
219	Lily Pond	07/12/2009	epi	26	23	2	4	4	2											
219	Lily Pond	07/26/2009	epi	28	27	4	4	4	23											
219	Lily Pond	08/02/2009	epi	26	26	3	4	4	2											
219	Lily Pond	08/09/2009	epi	23	25	3	4	4	23											
219	Lily Pond	08/23/2009	epi	26	28	3	3	4	23											
219	Lily Pond	08/30/2009	epi	21	24	2	3	4	23											
219	Lily Pond	09/07/2009	epi	20	23	3	3	4	2											
219	Lily Pond	09/13/2009	epi	22	23	2	3	3	2											
219	Lily Pond	6/13/2010	epi	22	32	3	3	4	23											
219	Lily Pond	8/14/2010	epi	29	22	3	4	4	23	0										
219	Lily Pond	8/21/2010	epi	27	22	3	4	4	2	0	0									
219	Lily Pond	9/19/2010	epi	24	26	2	3	4	2	8										
219	Lily Pond	9/26/2010	epi	21	25	2	3	4	2	0	0									
219	Lily Pond	8/5/2011	epi	27	27	4	3	4	2	4	4	16.2	10.0							
219	Lily Pond	8/18/2011	epi			3	3	4	28	4	4	4.30	5.90							
219	Lily Pond	8/25/2011	epi	29	25	3	3	4	8	4	4	7.60	8.40							
219	Lily Pond	8/12/2012	epi	27	31		4	3	1	0	0								I	
219	Lily Pond	8/23/2012	epi	25	28	1	4	1	0	0	0								I	
219	Lily Pond	9/3/2012	epi	22	26	1	3	1	0	0	0								I	
219	Lily Pond	9/13/2012	epi	22	27	1	3	1	0	0	0								I	
219	Lily Pond	9/23/2012	epi	21	23	1	3	1	0	0	0								I	
219	Lily Pond	10/7/2012	epi	14	18	1	3	4	0	7	7								I	
219	Lily Pond	10/18/2012	epi	18	16	1	3	3	0	0	0								I	
219	Lily Pond	10/28/2012	epi	16	17	2	3	3	3	7	7								I	
219	Lily Pond	6/23/2013	epi	28	31	2	3	1	0	0	0	2.90	4.60	<0.30	<0.410		5.10	0.00	I	I
219	Lily Pond	7/6/2013	epi	34	35	2	3	1	0	0	0	2.90	2.30	<0.30	<0.510		1.60	0.00	I	I
219	Lily Pond	7/21/2013	epi	31	33	1	3	1	0	0	0	2.30	5.60	<0.30	<0.910		6.00	0.00	I	I
219	Lily Pond	8/5/2013	epi	25	28	3	3	1	1	0	0	2.70	6.90	<0.30	<0.390		8.00	0.00	F	F
219	Lily Pond	8/18/2013	epi	23	27	2	3	2	0	0	0	1.50	2.10	<0.30	<0.510		1.50	0.00	F	F
219	Lily Pond	9/1/2013	epi	26	27	2	4	2	1	0	0	3.70	1.60	<0.30	<1.100		1.60	0.00	I	I
219	Lily Pond	9/15/2013	epi	19	22	1	4	1	0	0	0	3.20	2.70	<0.30	<0.100		2.00	0.00	I	I
219	Lily Pond	9/30/2013	epi	18	21	2	3	1	1	0	0	1.70	2.80	<0.30	<0.100		2.70	0.00	I	I
219	Lily Pond	6/28/2015	epi	22	24	2	5	3	2	0	0	1.00	1.80	<1.01	<0.007	<0.000	3.58	0.00	I	I
219	Lily Pond	7/11/2015	epi	32	30	2	5	2	0	0	0	6.90	1.20	<0.76	<0.003	<0.011	4.91	0.00	I	I
219	Lily Pond	7/26/2015	epi	27	28	2	4	4	25	0	0	7.80	1.50	<0.30	<0.002	<0.014	7.35	0.00	I	I
219	Lily Pond	8/9/2015	epi	28	27	3	5	5	2	0	0	3.30	2.10	<0.18	<0.002	<0.009	7.84	0.00	I	I
219	Lily Pond	8/23/2015	epi	25	27	2	5	4	2	0	0	8.10	0.70	<0.21	<0.003	<0.010			I	I
219	Lily Pond	9/6/2015	epi	30	23	2	5	5	2	0	0			<0.26	<0.023	<0.086	17.39	0.00	I	I
219	Lily Pond	9/19/2015	epi	30	25	2	5	4	2	0	0	3.70	3.60	<0.30	<0.007	<0.035	18.24	0.00	I	I

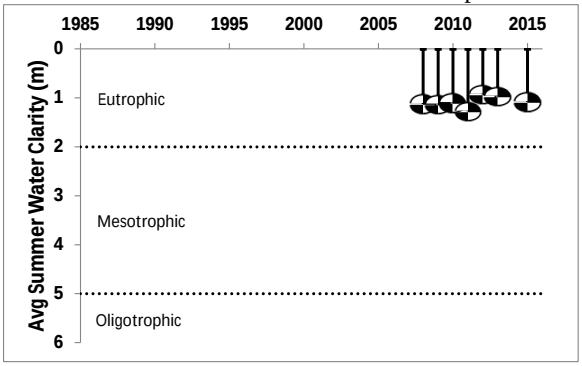
Legend Information

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 C- Long Term Trends: Lily Pond

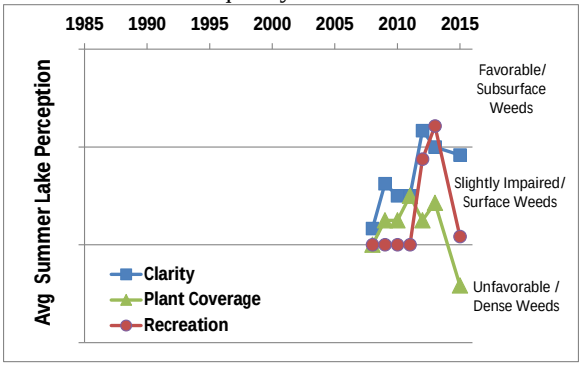
Long Term Trends: Water Clarity

- No trends apparent
- Most readings typical of *eutrophic* lakes, consistent with color and water depth



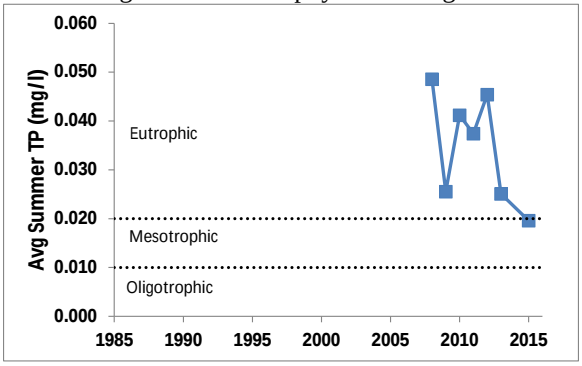
Long Term Trends: Lake Perception

- More plants/less favorable recreation 2015
- Recreational perception linked to changes in both water quality and weeds



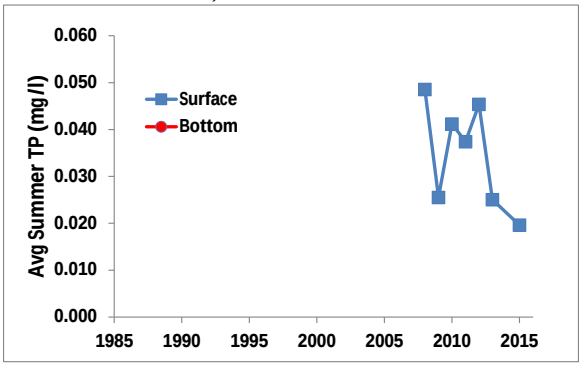
Long Term Trends: Phosphorus

- Recently decreasing; lowest on record 2015
- Most readings typical of *eutrophic* lakes, higher than chlorophyll *a* readings



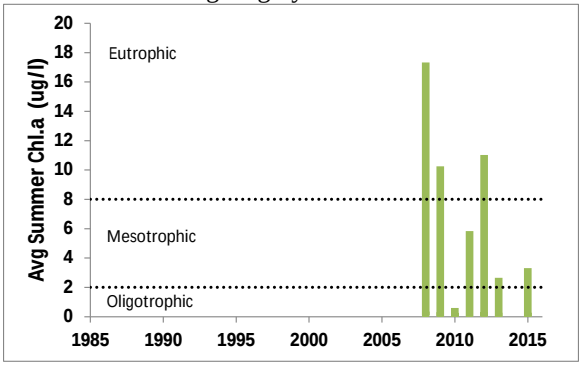
Long Term Trends: Bottom Phosphorus

- No deepwater TP readings
- Likely that surface and bottom TP readings are similar, as in most shallow lakes



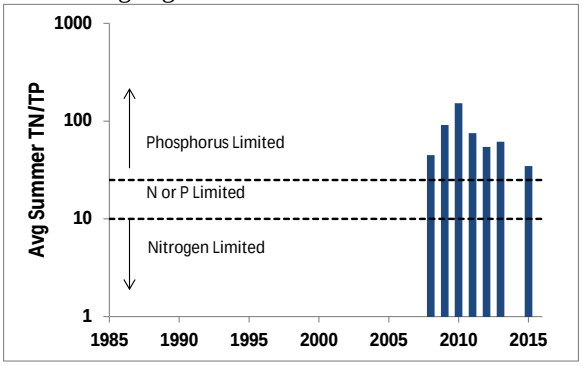
Long Term Trends: Chlorophyll a

- Decreasing algae levels since late 2000s
- Most readings typical of *mesotrophic* lakes, but readings highly variable



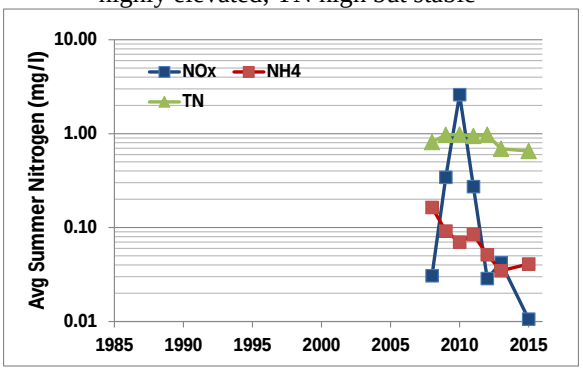
Long Term Trends: N:P Ratio

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



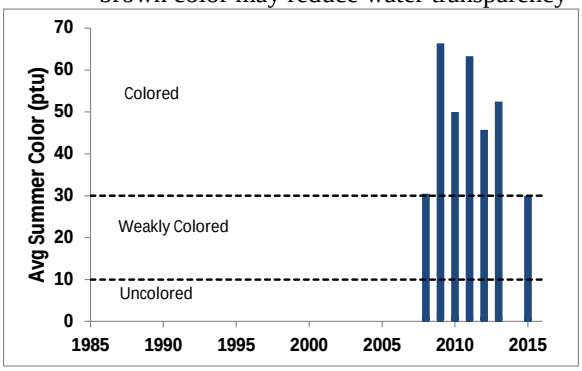
Long Term Trends: Nitrogen

- NH4, NOx decreasing
- NOx readings highly variable and at times highly elevated; TN high but stable



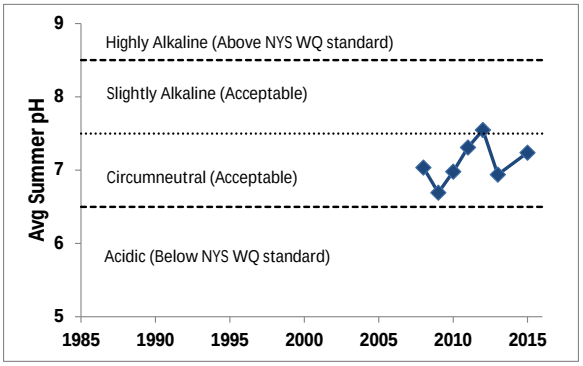
Long Term Trends: Color

- No trends apparent, but recent decrease
- Most readings typical of *colored* lakes and brown color may reduce water transparency



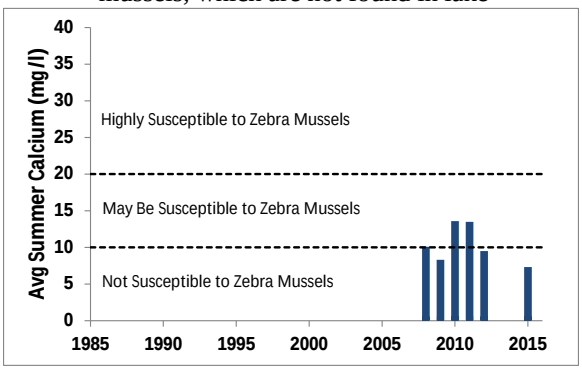
Long Term Trends: pH

- No trends apparent; perhaps recent increase
- Most readings typical of *circumneutral* lakes



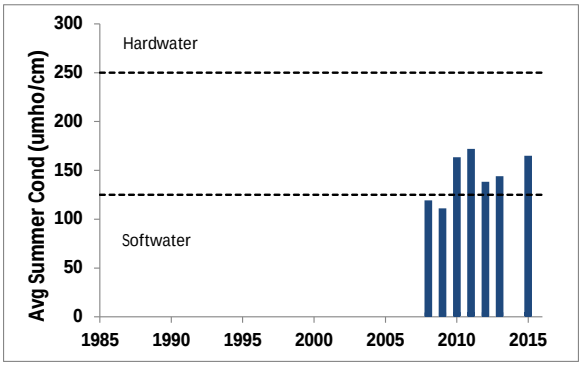
Long Term Trends: Calcium

- No trends apparent; decrease last few years
- Data indicates low susceptibility to zebra mussels, which are not found in lake



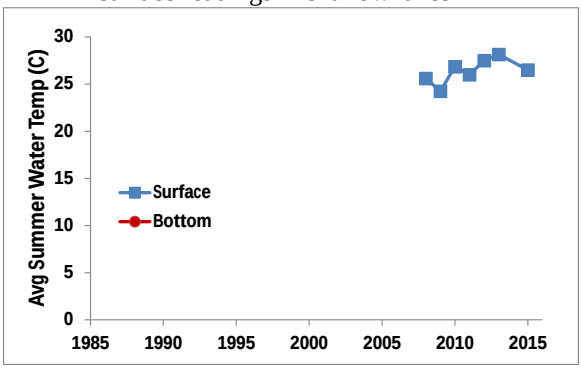
Long Term Trends: Conductivity

- Slight increase
- Most readings typical of *softwater* to *intermediate hardness* lakes



Long Term Trends: Water Temperature

- Slight increase not mirrored by air temps
- Bottom temperatures probably close to surface readings in shallow lakes



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.

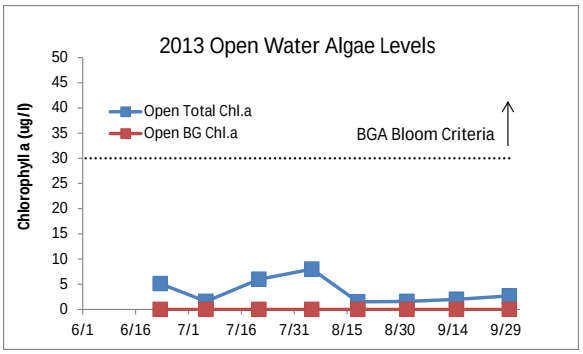


Figure D1:
2013 Open Water Total and BGA Chl.a

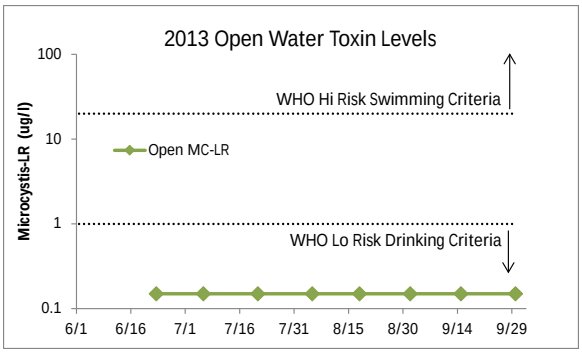


Figure D2:
2013 Open Water Microcystin-LR

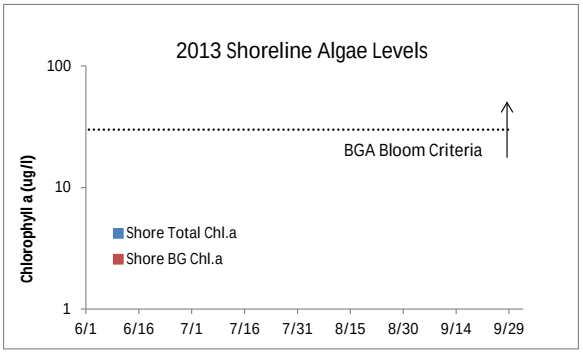


Figure D3:
2013 Shoreline Total and BGA Chl.a

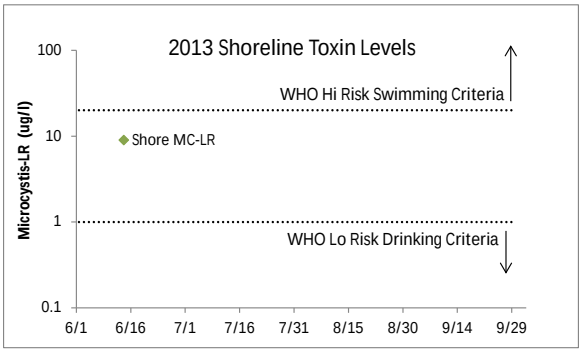


Figure D4:
2013 Shoreline Microcystin-LR

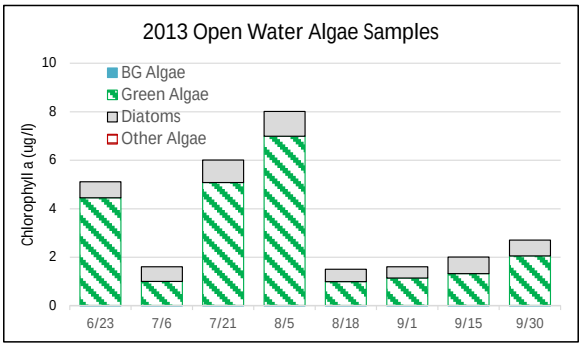


Figure D5:
2013 Open Water Algae Types

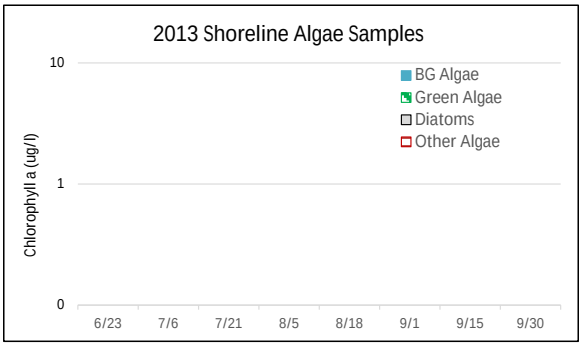


Figure D6:
2013 Shoreline Algae Types

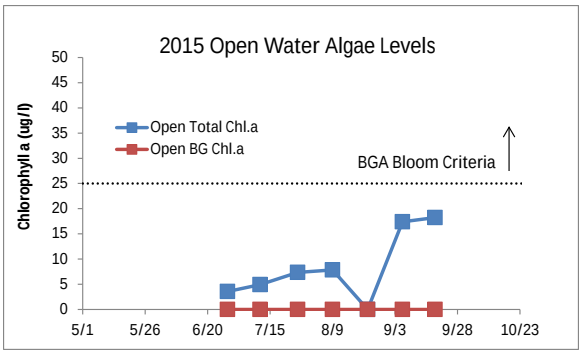


Figure D7:
2015 Open Water Total and BGA Chl.a

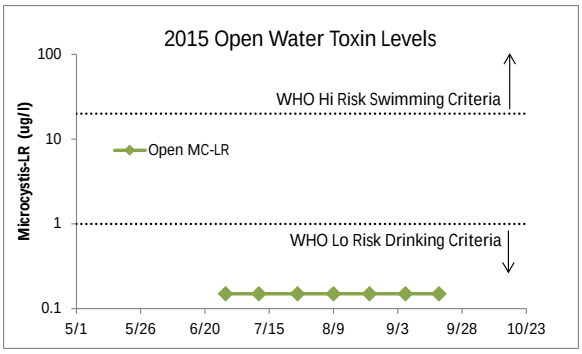


Figure D8:
2015 Open Water Microcystin-LR

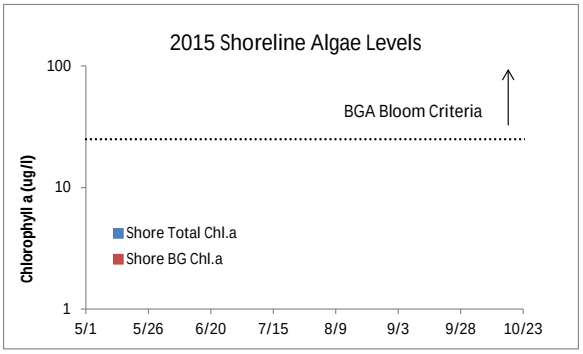


Figure D9:
2015 Shoreline Total and BGA Chl.a

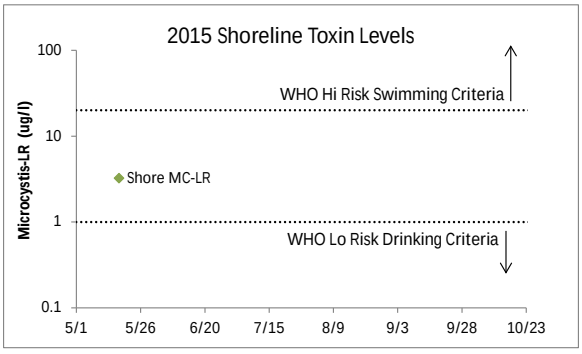


Figure D10:
2015 Shoreline Microcystin-LR

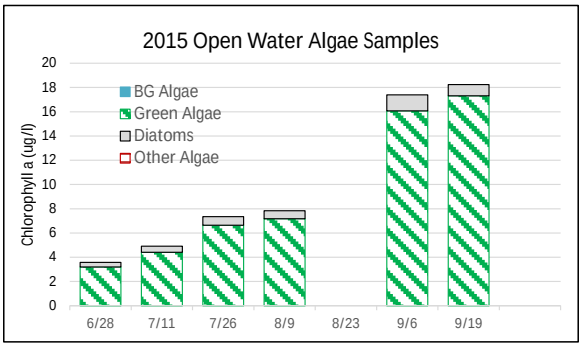


Figure D11:
2015 Open Water Algae Types

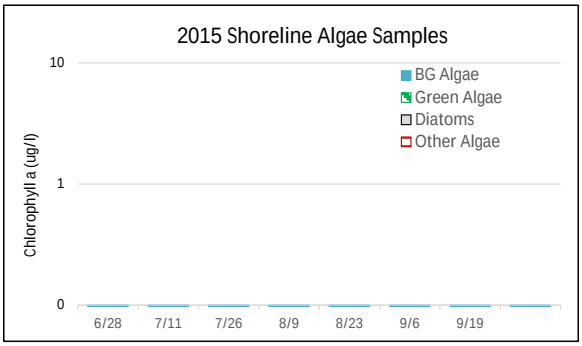


Figure D12:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Suffolk County

The table below shows the invasive aquatic plants and animals that have been documented in Suffolk 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.

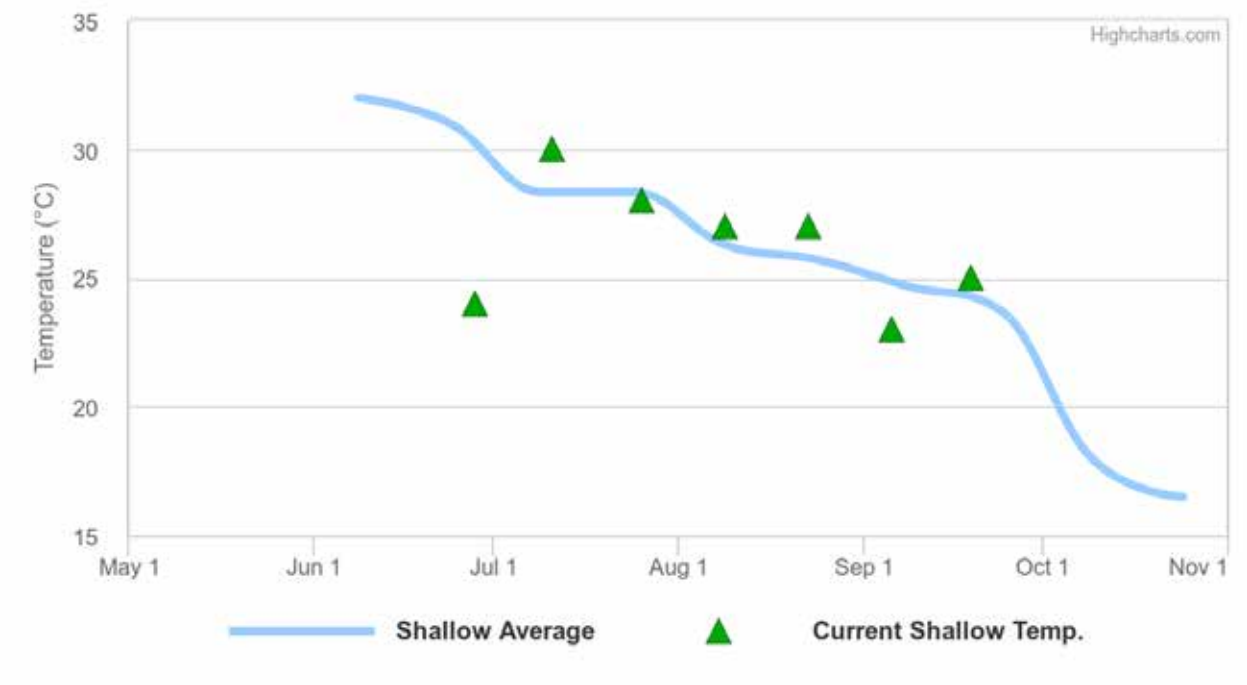
Aquatic Invasive Species – Suffolk County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Artist Lake	Plant	Fanwort	*Cabomba caroliniana*
Artist Lake	Animal	Goldfish	*Carassius auratus*
Avon Manor Lake	Plant	Parrot feather	*Myriophyllum aquaticum*
Belmont Lake	Plant	Fanwort	*Cabomba caroliniana*
Belmont Lake	Animal	Common carp	*Cyprinus carpio*
Blydenburgh Pond aka New Mill Pond	Plant	Hydrilla	*Hydrilla verticillata*
Blydenburgh Pond aka New Mill Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Canaan Lake	Plant	Fanwort	*Cabomba caroliniana*
Canaan Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Carlls River - Park Ave	Animal	Asian Clam	*Corbicula fluminea*
Donohue Pond	Plant	Fanwort	*Cabomba caroliniana*
Duck Pond	Plant	Fanwort	*Cabomba caroliniana*
Elda Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Fort Pond	Animal	Common carp	*Cyprinus carpio*
Great Patchogue Lake	Plant	Fanwort	*Cabomba caroliniana*
Great Patchogue Lake	Plant	Brazilian elodea	*Egeria densa*
Great Patchogue Lake	Plant	Hydrilla	*Hydrilla verticillata*
Great Patchogue Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Hards Pond	Plant	Fanwort	*Cabomba caroliniana*
Knapps Lake	Plant	Parrot feather	*Myriophyllum aquaticum*
Lake Ronkonkoma	Animal	Goldfish	*Carassius auratus*
Lake Ronkonkoma	Animal	Common carp	*Cyprinus carpio*
Lake Ronkonkoma	Plant	Hydrilla	*Hydrilla verticillata*

Waterbody	Kingdom	Common name	Scientific name
Lake Ronkonkoma	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lake Ronkonkoma	Plant	Brittle naiad	*Najas minor*
Little Fresh Pond	Plant	Fanwort	*Cabomba caroliniana*
Little Fresh Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Little Long Pond	Plant	Fanwort	*Cabomba caroliniana*
Little Peconic Reservoir	Plant	Fanwort	*Cabomba caroliniana*
Long Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Lotus Lake	Plant	Fanwort	*Cabomba caroliniana*
Lotus Lake	Plant	Hydrilla	*Hydrilla verticillata*
Lotus Lake	Plant	European four leaf clover	*Marsilea quadrifolia*
Lotus Lake	Plant	Parrot feather	*Myriophyllum aquaticum*
Lotus Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Lower Lake	Plant	Fanwort	*Cabomba caroliniana*
Lower Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Lower Vail Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Lower Yaphank Lake	Plant	Fanwort	*Cabomba caroliniana*
Lower Yaphank Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Massapequa Creek - North Soule	Animal	Asian Clam	*Corbicula fluminea*
Mill Pond - Islip	Plant	Curly leafed pondweed	*Potamogeton crispus*
Mill Pond - Oyster Bay	Plant	Water chestnut	*Trapa natans*
Millers Pond	Plant	Hydrilla	*Hydrilla verticillata*
New Millpond	Plant	Hydrilla	*Hydrilla verticillata*
New Millpond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Nissiquoge River - Smithtown	Animal	Asian Clam	*Corbicula fluminea*
Nissiquoge River - Caleb Smith SP	Animal	Asian Clam	*Corbicula fluminea*
Old Ice Pond	Plant	Brittle naiad	*Najas minor*
Peconic Lake	Plant	Fanwort	*Cabomba caroliniana*
Peconic Lake	Plant	Brazilian elodea	*Egeria densa*
Peconic Lake	Plant	European frogbit	*Hydrocharis morsus-ranae*
Peconic Lake	Plant	Floating primrose willow	*Ludwigia peploides ssp. glabrescens*
Peconic Lake	Plant	Parrot feather	*Myriophyllum aquaticum*
Peconic River	Plant	Floating primrose willow	*Ludwigia peploides ssp. glabrescens*
Phillips Mill Pond	Plant	Hydrilla	*Hydrilla verticillata*
Pine Lake	Plant	Brazilian elodea	*Egeria densa*
Pine Lake	Animal	Red-eared slider turtle	*Trachemys scripta elegans*
Randall Pond	Plant	Brazilian elodea	*Egeria densa*
Ross Pond	Plant	Parrot feather	*Myriophyllum aquaticum*
Sans Souci Lake	Plant	Hydrilla	*Hydrilla verticillata*
Sans Souci Lake	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Southards Pond	Plant	Fanwort	*Cabomba caroliniana*
Swan Pond	Plant	Fanwort	*Cabomba caroliniana*
Swan Pond	Plant	Water chestnut	*Trapa natans*

Waterbody	Kingdom	Common name	Scientific name
Swan Pond	**Plant**	**Hydrilla**	***Hydrilla verticillata***
Sweezy Pond	Plant	Fanwort	*Cabomba caroliniana*
Tarkill Pond	Animal	Chinese mystery snail	*Cipangopaludina chinensis*
Trout Pond	Plant	Fanwort	*Cabomba caroliniana*
Upper Lake	Plant	Fanwort	*Cabomba caroliniana*
Upper Vail Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Upper Yaphank Lake	Plant	Fanwort	*Cabomba caroliniana*
Vail Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Webster Pond	Plant	Fanwort	*Cabomba caroliniana*
Webster Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
West Brook Pond	Plant	Fanwort	*Cabomba caroliniana*
West Brook Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
West Lake	Plant	Fanwort	*Cabomba caroliniana*
Wildwood Lake	Plant	Fanwort	*Cabomba caroliniana*
Willow Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*

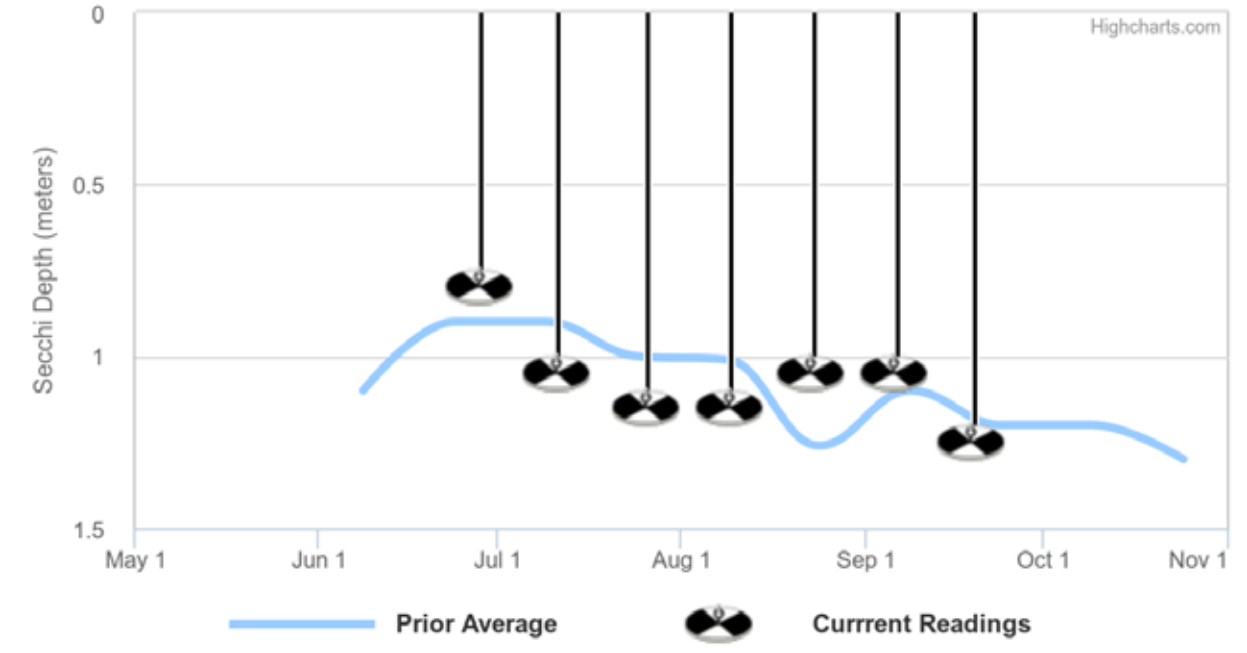
Appendix F: Current Year vs. Prior Averages for Lily Pond

Current Year Water Temperatures vs. Prior Average



This year's shallow water sample temperatures are about the same as the average of readings collected from 2008 to 2013.

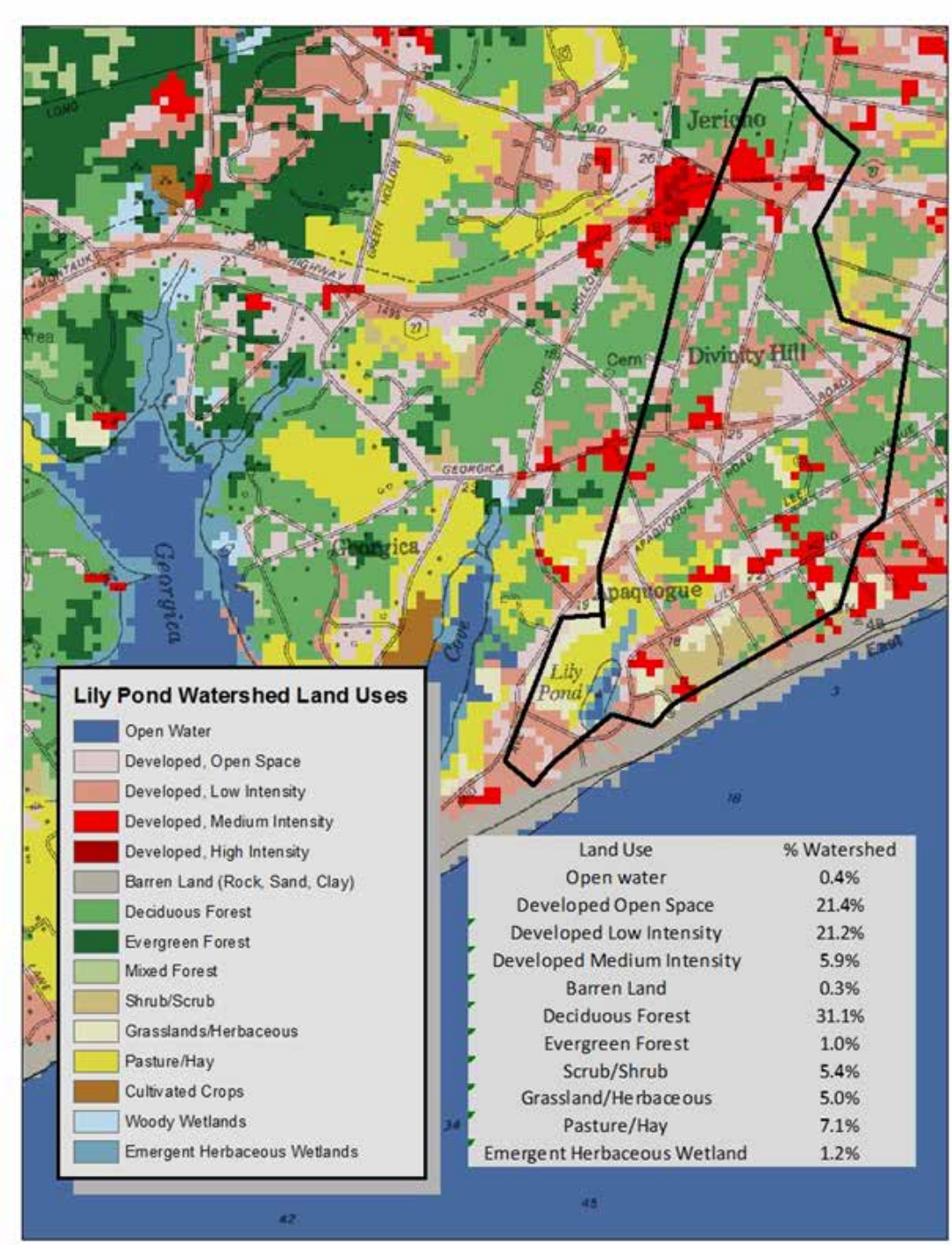
Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are about the same as the average of readings collected from 2008 to 2013

Appendix G: Watershed and Land Use Map for Lily Pond

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.



Land Use	% Watershed
Open water	0.4%
Developed Open Space	21.4%
Developed Low Intensity	21.2%
Developed Medium Intensity	5.9%
Barren Land	0.3%
Deciduous Forest	31.1%
Evergreen Forest	1.0%
Scrub/Shrub	5.4%
Grassland/Herbaceous	5.0%
Pasture/Hay	7.1%
Emergent Herbaceous Wetland	1.2%