

## Little Fresh Pond Questions and Answers, 2015 CSLAP

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

A1. Water quality conditions in Little Fresh Pond were probably slightly less favorable than usual in 2015. Water clarity was slightly lower and plant coverage was slightly higher, although algae levels (and most other water quality indicators) were close to normal. A small shoreline blue green algae bloom was apparent in September.

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

A2. Chloride sampling results were highly variable, ranging from lakes with little to high likely impacts from road salt runoff, although no actual impacts were apparent.

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

A3. Little Fresh Pond has slightly higher water clarity, and slightly lower algae and nutrient levels, with few instances of blooms- than other Long Island lakes. The lake also does not typically suffer from invasive weed problems, despite the presence of fanwort (an invasive plant species).

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

A4. Water quality conditions in the lake vary slightly from year to year, and except for a small decrease in conductivity and increase in pH over the last 10-15 years, no long term trends have been apparent. Water quality and recreational assessments have improved slightly over the same period.

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

A5. Little Fresh Pond has exhibited shoreline blue green algae blooms in the past and in 2015, and the lake has sufficiently high nutrient levels to support these blooms. Efforts should be undertaken to minimize additional nutrient loading to the lake.

**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.

<b>Lake Use</b>				
	PWL	Average Year	2015	Primary issue
<b>Potable Water</b>	□	□	□	Not applicable
<b>Swimming</b>	◆	◆	◆	Algae levels
<b>Recreation</b>	■	■	■	Algae levels
<b>Aquatic Life</b>	●	◆	▲	Low pH
<b>Aesthetics</b>	□	●	◆	Nuisance plants
<b>Habitat</b>	□	▲	●	Invasive plants
<b>Fish Consumption</b>	●	□	□	

<span style="color: green;">●</span> Supported / Good
<span style="color: yellow;">▲</span> Threatened / Fair
<span style="color: red;">◆</span> Stressed / Poor
■ Impaired
□ Not Known

# CSLAP 2015 Lake Water Quality Summary: Little Fresh Pond

## General Lake Information

<b>Location</b>	Town of Southampton
<b>County</b>	Suffolk
<b>Basin</b>	Long Island Sound/Atlantic Ocean
<b>Size</b>	7.8 hectares (19.3 acres)
<b>Lake Origins</b>	Natural
<b>Watershed Area</b>	224 hectares (553 acres)
<b>Retention Time</b>	0.4 years
<b>Mean Depth</b>	3 meters
<b>Sounding Depth</b>	6 meters
<b>Public Access?</b>	no
<b>Major Tributaries</b>	no named tribs
<b>Lake Tributary To...</b>	no named outlet
<b>WQ Classification</b>	B (contact recreation = swimming)
<b>Lake Outlet Latitude</b>	40.916
<b>Lake Outlet Longitude</b>	-72.408
<b>Sampling Years</b>	1989-1994, 1997, 2002-2015
<b>2015 Samplers</b>	Ann Barzola and Scott Frank
<b>Main Contact</b>	Ann Barzola

## Lake Map



## **Background**

Little Fresh Pond is a 19 acre, class B lake found in the Town of Southampton in Suffolk County on Long Island. It has been sampled as part of CSLAP since 1989.

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**

Little Fresh Pond 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, aquatic life, and aesthetics. The lake is used by lake residents and invited guests for non-power boating and swimming, via a lake association beach. There is no public access to the lake.

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

General statewide fishing regulations may be applicable in Little Fresh Pond (it is not known by the report authors if the Southampton charter precludes the applicability of statewide fishing regulations).

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

## **Historical Water Quality Data**

CSLAP sampling was conducted on Little Fresh Pond from 1989 to 1994, 1997, and 2002 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 report and scorecard for Little Fresh Pond can also be found on the NYSDEC web page at <http://www.dec.ny.gov/lands/77836.html>.

Little Fresh Pond was not sampled by the NYSDEC as part of any of the major regional or statewide monitoring programs, and it is unlikely that the lake was sampled as part of fisheries management efforts at the lake, due to the charter governing activities at the lake.

None of the unnamed ephemeral tributaries, 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 has not been sampled by DEC fisheries staff in support of fish stocking activities or any other statewide monitoring programs.

## **Lake Association and Management History**

Little Fresh Pond is served by the Little Fresh Pond Association. Lake management activities are governed by the association and the Southampton Trustees.

It is not known if the lake association maintains a web site.

## Summary of 2015 CSLAP Sampling Results

### Evaluation of 2015 Annual and Monthly Results Relative to 1989-2014

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 –Little Fresh Pond” section in Appendix C.

### Evaluation of Eutrophication Indicators

Phosphorus readings were much higher than usual in 2015. It is not known if these are non-representative results (due to bottle contamination at the factory, as may have occurred with some CSLAP lakes in 2015). However, the lake experiences periodic spikes in nutrients (1991, 2003 and 2010) and algae (1990, 2004) with both indicators dropping for several years afterwards. These spikes may be due to unusual weather, with the tailing off period associated with lake “recovery”. In 2015, water clarity readings were slightly lower than usual, but algae levels were close to normal.

Algae levels typically increase from early to late summer, due to a slight increase in nutrient levels, although water clarity levels do not change seasonally in a similar manner. Lake productivity increased during the summer of 2015, as seen in decreasing water clarity and increasing algae levels. .

The lake can be characterized as *eutrophic*, or highly productive, based on water clarity, total phosphorus readings, and chlorophyll *a* readings (typical of *eutrophic* lakes). An evaluation of trophic state indices (TSI) shows that water clarity is slightly lower than expected given the nutrient and (in some years) algae levels in the lake, suggesting that turbidity, “natural” color, or other eroding materials may be affecting water clarity. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

### Evaluation of Potable Water Indicators

Algae levels are at times high enough to render the lake susceptible to taste and odor compounds, algal toxins, or elevated DBP (disinfection by product) compounds that could affect the potability of the water, although the lake is not used for drinking water. Little Fresh Pond is weakly stratified, and deepwater phosphorus and ammonia readings are similar to those measured at the lake surface (and were close to normal in 2015). This suggests that elevated algae levels throughout most depths of the lake may affect this 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

Color readings were lower than normal in each of the last three years, and these readings have dropped since the early 2000s. pH has increased over the last 10-15 years, and these readings were slightly higher than usual in 2015. Total nitrogen and calcium levels were also slightly higher than normal, but neither of these indicators has changed significantly since the early 2000s. It is likely that the small changes in each of the other limnological indicators have been within the normal range of variability in the lake.

Chloride levels in the 2015 samples, collected for the first time through CSLAP and cited in Appendix A, ranged from 14 to 58 mg/l- additional data will help to determine if either number better represents normal conditions in the lake. These values fall within the range for “moderate” to “major” road salt runoff levels cited by the New Hampshire DES. These readings are well below the state potable water quality standard of 250 mg/l, but within the typical range of values found in most NYS lakes. These readings suggest a moderate to high likelihood of biological impacts from road salt. Additional data will help to determine if these represent normal readings for the lake

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

### **Evaluation of Biological Condition**

The fluoroprobe screening samples analyzed by SUNY ESF in the last three years indicated relatively low algae levels in most samples, but an increasing percentage of blue green algae when algae levels are higher later in the summer. The algae community appears to be comprised of a mix of algae species during most of the summer. A small shoreline blue green algae bloom was reported (and verified) in early fall of 2015, while a larger bloom earlier in the summer was not comprised of high levels of blue green algae.

Macrophyte surveys have been conducted through CSLAP and the 2009 biomonitoring study in Little Fresh Pond. At least 27 aquatic plant species have been found, including at least four protected plant species (*Elatine minima*, small waterwort; *Myriophyllum pinnatum*, cutleaf watermilfoil; *Stuckenia filiformis*, fineleafed pondweed; and *Utricularia radiata*, little floating bladderwort) and one exotic plant species (*Cabomba caroliniana*, fanwort). The modified floristic quality index (FQI) for the lake indicates that the quality of the aquatic plant community is “excellent”, although the extent of the aquatic plant coverage and perhaps the germination of individual plant species are highly variable from year to year.

The macroinvertebrate results from the 2009 biomonitoring survey of the lake are not yet available.

The composition of the fish community is comprised of at least four warmwater fish species, and at least one coolwater fish species. This suggests that the lake can most likely be characterized as a warmwater fishery, although the inventory of fish species in the lake is no doubt incomplete.

Zooplankton have not been evaluated through CSLAP in Little Fresh Pond.

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

### **Evaluation of Lake Perception**

Water quality assessments were more favorable than normal in 2014 but less favorable than usual in 2015; both are consistent with algae levels or water clarity at that time. This led to an improvement in recreational assessments in 2014. However, despite higher plant coverage in 2015, recreational assessments were close to normal. Water quality and recreational assessments improved from the mid-2000s until a few years ago. Lake perception degrades slightly in late

summer into the fall in most years, and similar patterns were apparent in 2015. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

### Evaluation of Local Climate Change

Air temperatures in the summer index period were slightly higher than normal in 2015, but this did not translate to higher water temperatures, and neither air nor water temperature readings has exhibited any long-term trends. It is not known if this is an indication of the lack 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 below the thresholds for harmful algal blooms (HABs) in the open water, although a shoreline bloom in September of 2015 showed high blue green algae levels. Toxin levels in all samples- open water and shoreline- have been below the safe swimming threshold, although at times these readings are detectable. An analysis of algae samples by Dr. Christopher Gobler in some previous years indicated toxin levels close to but below the levels needed to support safe swimming.

### Lake Condition Summary

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.50	1.82	5.00	1.41	Eutrophic	Within Normal Range	No Change
	Chlorophyll <i>a</i>	0.42	20.70	199.40	20.89	Eutrophic	Within Normal Range	No Change
	Total Phosphorus	0.005	0.026	0.069	0.048	Eutrophic	Higher than Normal	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.00	0.03	0.15	0.03	Close to Surface NH4 Readings	Within Normal Range	Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.013	0.036	0.194	0.081	Close to Surface TP Readings	Higher than Normal	Not known
	Nitrate + Nitrite	0.00	0.03	0.66	0.01	Low NOx	Within Normal Range	No Change
	Ammonia	0.00	0.04	0.53	0.03	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.18	0.52	1.24	0.67	Intermediate Total Nitrogen	Higher than Normal	No Change
	pH	5.20	7.02	9.09	7.43	Circumneutral	Within Normal Range	No Change
	Specific Conductance	14	56	111	56	Softwater	Within Normal Range	Decreasing Slightly
	True Color	11	52	203	31	Colored	Within Normal Range	No Change
Lake Perception	Calcium	1.0	1.9	5.8	2.7	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
	WQ Assessment	1	1.8	4	2.1	Not Quite Crystal Clear	Within Normal Range	No Change
	Aquatic Plant Coverage	1	2.4	4	3.0	Subsurface Plant Growth	Less Favorable than Normal	No Change
	Recreational Assessment	1	1.8	4	1.6	Excellent	Within Normal Range	No Change

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Biological Condition	Phytoplankton					Open water-low blue green algae biomass; Shoreline-high blue green algae in bloom	Not known	Not known
	Macrophytes					Excellent quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not evaluated through CSLAP	Not known	Not known
	Macroinvertebrates					2009 survey results not yet analyzed	Not known	Not known
	Fish					Warmwater fishery?	Not known	Not known
	Invasive Species					Fanwort	Not known	Not known
Local Climate Change	Air Temperature	11	24.7	34	27.6		Higher Than Normal	No Change
	Water Temperature	15	24.4	31	25.3		Within Normal Range	No Change
Harmful Algal Blooms	Open Water Phycocyanin	0	44	368	16	Most readings indicate low risk of BGA	Not known	Not known
	Open Water FP Chl.a	1	6	51	13	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	4	47	9	Few readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	<DL	0.9	<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	13	510	1008	510	Most readings indicate high algae levels	Not known	Not known
	Shoreline FP BG Chl.a	5	506	1008	506	Most readings indicate high BGA levels	Not known	Not known
	Shoreline Microcystis	<DL	<DL	<DL	<DL	Shoreline bloom MC-LR consistently not detectable	Not known	Not known
	Shoreline Anatoxin a	<DL	<DL	<DL	<DL	Shoreline bloom Anatoxin-a consistently not detectable	Not known	Not known

## Evaluation of Lake Condition Impacts to Lake Uses

Little Fresh Pond is presently among the lakes listed on the 2015 Long Island Sound Priority Waterbody List (PWL) as *impaired* for recreation and *stressed* for public bathing due to excessive algae and nutrients. The PWL listing for Little Fresh Pond is listed in Appendix B.

### Potable Water (Drinking Water)

The CSLAP dataset at Little Fresh 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 high algae levels suggest that "unofficial" surface potable water use may be impacted.

### Public Bathing

The CSLAP dataset at Little Fresh Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public bathing beach, may be *stressed* by excessive algae, algal toxins, (occasionally excessive) weeds, and poor water clarity. 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 Little Fresh Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation is *impaired* due to excessive algae and shoreline algae blooms, and this use may be *threatened* by excessive weeds and the presence of fanwort.

### **Aquatic Life**

The CSLAP dataset on Little Fresh Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life has at times been *stressed* by depressed pH and *threatened* by road salt runoff and invasive species, but no impacts have been apparent in recent years. Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

### **Aesthetics and Habitat**

The CSLAP dataset on Little Fresh Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *fair* due to nuisance plants, excessive algae and shoreline blue green algae blooms, although this was not apparent in the last several years. Habitat may be *fair* due to invasive plants, although it is not known if habitat was impacted in 2015.

### **Fish Consumption**

There are no fish consumption advisories posted for Little Fresh Pond.

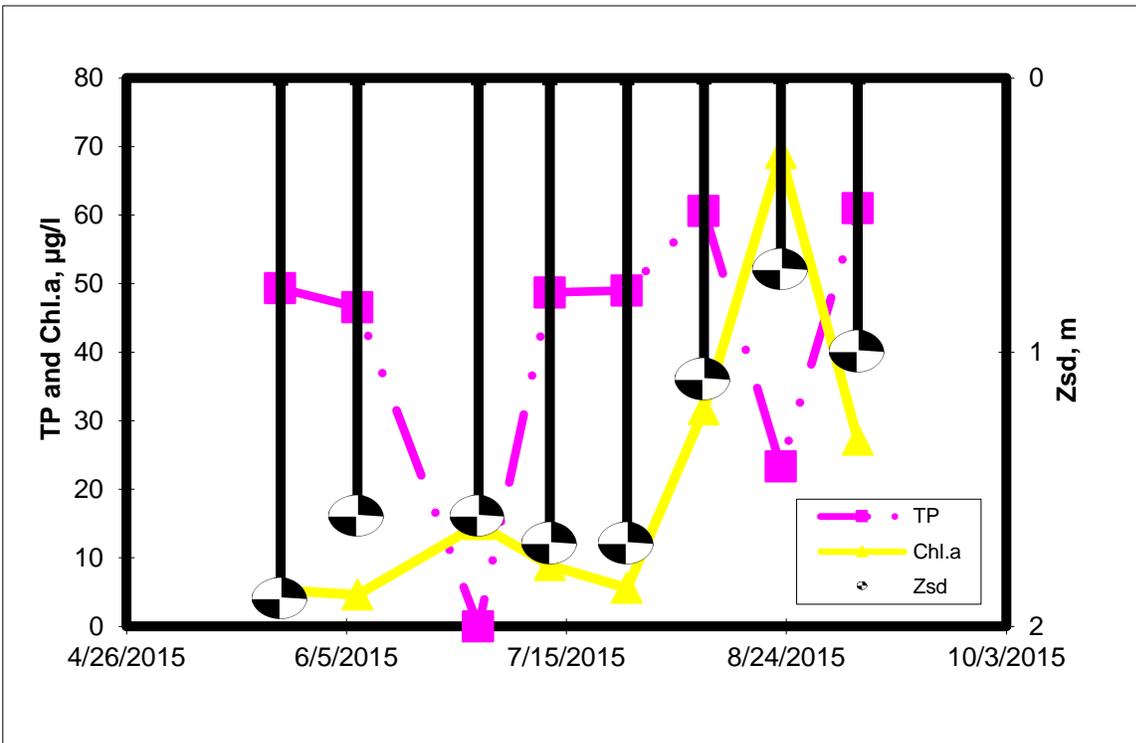
### **Additional Comments and Recommendations**

The continuing evaluation of the 2009 lake biomonitoring results will help to determine if any impacts to aquatic life can be detected in the nearshore sediments in the lake. Lake residents are advised to report (and avoid exposure to) any shoreline algae blooms. On-going nutrient control measures may have reduced algae levels in the lake in recent years; these actions and any other nutrient control measures should be continued.

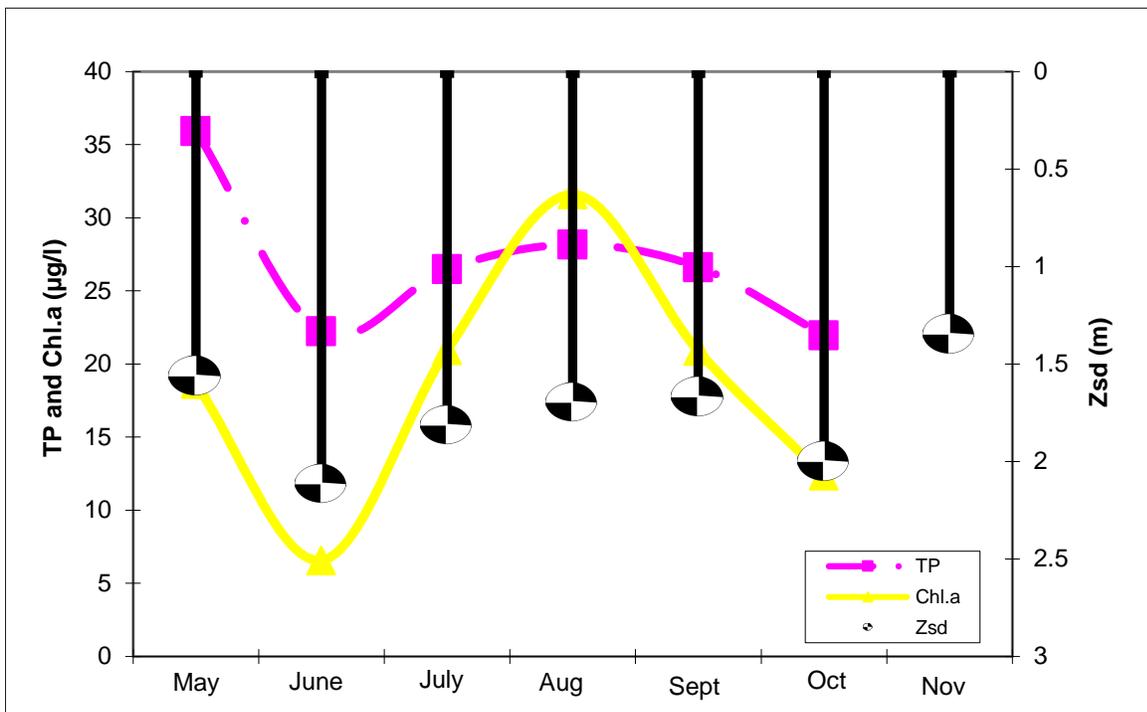
### **Aquatic Plant IDs-2015**

None submitted for identification in 2015.

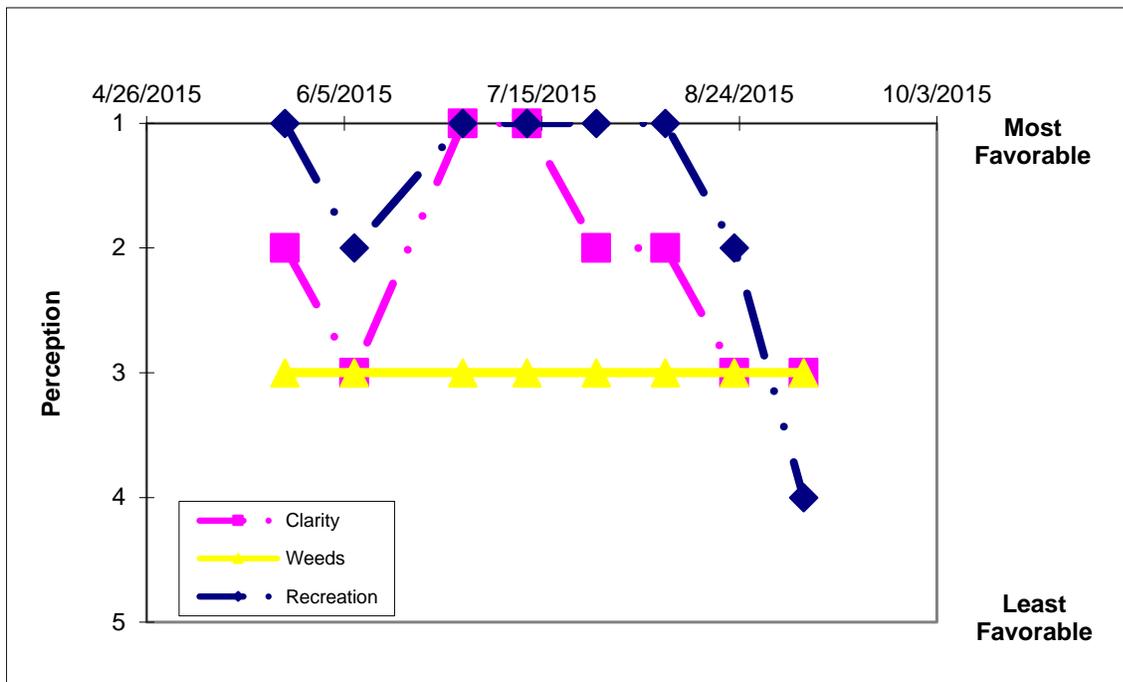
### Time Series: Trophic Indicators, 2015



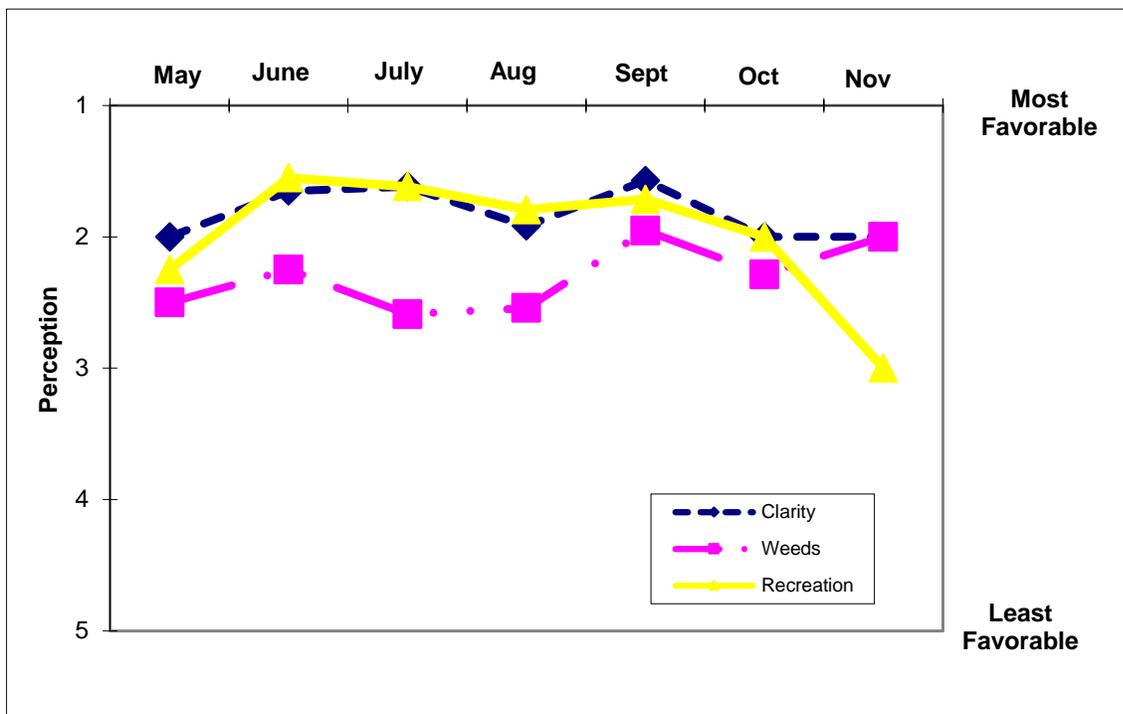
### Time Series: Trophic Indicators, Typical Year (1989-2015)



## Time Series: Lake Perception Indicators, 2015



## Time Series: Lake Perception Indicators, Typical Year (1989-2015)



## Appendix A- CSLAP Water Quality Sampling Results for Little Fresh Pond

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
58	Little Fresh P	7/7/1989	6.5	1.23	1.5	0.015	0.05				55	6.24	60		1.79	
58	Little Fresh P	7/22/1989	6.5	1.15	1.5	0.035	0.01				58	7.17	58		72.20	
58	Little Fresh P	8/5/1989	5.5	1.53	1.5	0.028	0.01				65	7.45	59		40.00	
58	Little Fresh P	8/19/1989	6.2	1.65	1.5	0.028	0.01				62	7.04	56		20.70	
58	Little Fresh P	9/1/1989	6.3	1.25	1.5	0.024	0.01				65	6.50	57		25.30	
58	Little Fresh P	9/16/1989	6.1	1.03	1.5	0.027	0.01				60	7.24	60		26.60	
58	Little Fresh P	9/30/1989	6.4	0.86	1.5	0.023	0.01				62	6.80	61		22.30	
58	Little Fresh P	10/13/1989	6.2	0.99	1.5	0.024	0.03				60	7.27	61		13.00	
58	Little Fresh P	7/7/1990	6.5	1.55	1.5	0.046					55	6.12	62		113.00	
58	Little Fresh P	7/21/1990	6.1	1.50	1.5	0.023	0.01				50				32.60	
58	Little Fresh P	8/4/1990	6.0	1.90	1.5	0.032					55	6.22	62		12.70	
58	Little Fresh P	8/18/1990	6.1	0.70	1.5	0.026	0.01				55	7.56	61		52.80	
58	Little Fresh P	9/1/1990	6.3	1.55	1.5	0.034	0.01				50	7.06	58		35.20	
58	Little Fresh P	9/15/1990	6.0	0.83	1.5	0.021					45	7.77	91		99.00	
58	Little Fresh P	9/30/1990	6.3	1.70	1.5	0.025	0.04				49	7.22	59		43.20	
58	Little Fresh P	6/30/1991		3.15	1.5	0.012	0.01				30	7.05	62		3.79	
58	Little Fresh P	7/13/1991	5.8	2.45	1.5						29				4.77	
58	Little Fresh P	7/27/1991	6.0	2.19	1.5	0.029	0.01				29	6.40	64		99.00	
58	Little Fresh P	8/10/1991	6.1	1.95	1.5	0.032					29	7.00	65		9.30	
58	Little Fresh P	8/24/1991	6.0	2.00	1.5	0.046	0.01				31	5.20	68		8.97	
58	Little Fresh P	9/7/1991	6.1	1.65	1.5	0.038					30	7.25	63		7.90	
58	Little Fresh P	9/21/1991	6.1	1.45	1.5	0.030	0.01				29	7.42	63		22.90	
58	Little Fresh P	10/5/1991	6.3	1.38	1.5	0.035					32	7.41	64		6.04	
58	Little Fresh P	6/6/1992	6.1	2.80	1.5	0.016	0.01				27	7.57	62		5.86	
58	Little Fresh P	6/21/1992	6.1	3.15	1.5	0.012					32	7.25	64		4.12	
58	Little Fresh P	6/30/1992	6.0	2.70	1.5	0.016	0.01				30	6.64	63		5.61	
58	Little Fresh P	7/18/1992	6.1	2.70	1.5	0.017	0.01				35	7.55	63		3.74	
58	Little Fresh P	8/1/1992	5.9	2.20	1.5	0.021					36	7.54	63		16.00	
58	Little Fresh P	8/15/1992	6.1	1.85	1.5	0.030					28	6.89	61		122.00	
58	Little Fresh P	8/29/1992	6.2	1.63	1.5	0.023	0.01				30	7.20	64		95.20	
58	Little Fresh P	9/12/1992	6.1	1.23	1.5	0.025					33	7.39	60		22.30	
58	Little Fresh P	6/19/1993	6.3	2.35	1.5	0.018	0.01				47	7.23	62		6.05	
58	Little Fresh P	7/1/1993	6.2	2.10	1.5	0.021	0.01				45	6.29	63		5.34	
58	Little Fresh P	7/17/1993	6.1	1.80	1.5	0.018	0.01				43	6.74	64		12.60	
58	Little Fresh P	8/1/1993	6.1	2.55	1.5	0.018					35	7.54	64		4.69	
58	Little Fresh P	8/16/1993	5.9	2.75	1.5	0.016	0.01				27	7.57	65		3.78	
58	Little Fresh P	8/30/1993	6.0	2.55	1.5	0.016					32	7.50	65		6.10	
58	Little Fresh P	9/13/1993	6.1	2.05	1.5	0.022	0.01				33	7.32	66		11.10	
58	Little Fresh P	10/6/1993	6.0	1.35	1.5											
58	Little Fresh P	7/2/1994	8.0	1.95	8.0											
58	Little Fresh P	7/9/1994	6.7	2.15	6.7											
58	Little Fresh P	7/22/1994	5.7	2.00	5.7											
58	Little Fresh P	06/14/02		1.70	1.5	0.014	0.00	0.02	0.42	29.98	23	6.25	56		6.31	
58	Little Fresh P	07/01/02	7.3	3.55	1.5	0.009	0.00	0.04	0.47	53.84	25	6.39	56			
58	Little Fresh P	07/14/02	8.0		1.5	0.015	0.01	0.07	0.73	47.80	24	6.20	60		14.01	
58	Little Fresh P	07/27/02	6.5	4.00	1.5	0.010	0.02	0.06	0.51	52.89	18	6.23	58		26.13	
58	Little Fresh P	08/10/02	6.0	4.23	1.5	0.011	0.01	0.06	0.49	45.14	27	6.28	58		8.06	
58	Little Fresh P	08/15/02	5.3	3.90	5.3	0.012	0.02	0.07	0.66	54.57	19	6.33	60		0.82	
58	Little Fresh P	09/12/02	6.0	2.25			0.00	0.02	0.50						0.42	
58	Little Fresh P	09/28/02				0.027	0.00	0.03	0.60	22.30	25	6.29	59		0.87	
58	Little Fresh P	10/17/02	6.0	5.00	1.5	0.015	0.00	0.07	0.48	31.63	26	6.32	60		12.16	
58	Little Fresh P	6/14/2003	8.0	1.95	8.0	0.018	0.010	0.028	0.45	25.2	71	6.1	56	1.8	2.35	
58	Little Fresh P	7/6/2003	6.7	1.50	6.7	0.036	0.005	0.020	0.40	11.4	86	5.9	57		30.90	
58	Little Fresh P	8/24/2003	6.1	0.90	1.5	0.052	0.006	0.014	0.55	10.5	185	6.0	56		10.53	
58	Little Fresh P	9/7/2003	6.5			0.035	0.056	0.100			131	6.2	59	1.9	5.14	
58	Little Fresh P	9/28/2003	8.5	4.00	1.5	0.039	0.003	0.003	0.35	9.0	110	6.6	59		11.69	
58	Little Fresh P	10/18/2003	6.0	1.00	7.0	0.031	0.012	0.066	0.43	13.9	96	6.4	62		6.29	
58	Little Fresh P	11/1/2003	6.6	1.35												
58	Little Fresh P	6/20/2004	6.0	1.30		0.023	0.01	0.01	0.34	14.9	89			2.0	4.8	
58	Little Fresh P	7/6/2004	6.0	1.10	2.0	0.027	0.05	0.01			115	7.05	66		9.8	
58	Little Fresh P	7/17/2004		1.00		0.047	0.01	0.01	0.37	7.9	83	6.59	63		2.9	
58	Little Fresh P	8/1/2004	6.0	0.50	5.0	0.046	0.17	0.04	0.97	21.1	11	6.97	87		43.3	
58	Little Fresh P	8/15/2004	6.2	2.00		0.028	0.12	0.05	0.61	21.9	71	7.47	64	2.3	199.4	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
58	Little Fresh P	8/28/2004	6.0	1.00		0.026	0.03	0.01	0.69	26.1	71	6.55	25		108.8	
58	Little Fresh P	9/11/2004		1.00	6.0	0.024	0.06	0.02	0.71	29.8	19	7.36	52		96.7	
58	Little Fresh P	10/2/2004	6.0	3.50	3.0	0.026	0.03	0.16			58	6.88	52			
58	Little Fresh P	6/13/2005	6.4	2.60		0.033	0.01	0.02	0.18	5.51	68	6.81	53	1.9	2.9	
58	Little Fresh P	7/4/2005	6.1	1.05	3.9	0.020	0.02	0.01	0.38	19.33	68	7.21	63		15.5	
58	Little Fresh P	7/16/2005		1.00	1.8	0.029	0.08	0.01	0.28	9.56	93	6.00	58		74.1	
58	Little Fresh P	7/31/2005	6.1	1.40		0.023	0.06	0.05	0.37	16.41	119	6.69	59		1.9	
58	Little Fresh P	8/15/2005	3.0	1.00	6.0	0.038	0.07	0.01	0.37	9.56	58	6.52	63	2.0	17.6	
58	Little Fresh P	8/27/2005	6.1	1.40	6.1	0.036	0.22	0.03	0.37	10.08	92	6.50	61		13.1	
58	Little Fresh P	9/10/2005	5.8	1.00	2.0	0.036	0.01	0.01	0.50	13.99	86	6.75	60		9.0	
58	Little Fresh P	9/23/2005	5.6	1.45	1.8	0.028	0.03	0.01	0.34	12.10	54	6.42	79			
58	Little Fresh P	6/13/2006	6.0	2.00	6.0	0.016	0.05	0.38	0.58	35.79	45	6.74	52	2.9	3.87	
58	Little Fresh P	7/3/2006	6.2	2.00	3.1	0.023	0.01	0.03	0.50	21.73	51	7.55	53		7.84	
58	Little Fresh P	7/14/2006	6.8	2.10		0.028	0.01	0.08	0.67	23.94	203	7.66	32		10.04	
58	Little Fresh P	7/29/2006		1.55	6.0	0.019	0.02	0.02	0.94	49.47	110	7.55	47		3.57	
58	Little Fresh P	8/12/2006		1.00	6.0	0.026	0.03	0.02	0.76	28.66	76	7.32	56	1.6	48.48	
58	Little Fresh P	9/3/2006		1.53	6.6	0.025	0.03	0.04	1.24	50.76	49	6.81	53		25.40	
58	Little Fresh P	9/17/2006		1.58	1.7	0.015	0.02	0.01	0.52	35.87	53	7.98	47		5.78	
58	Little Fresh P	10/3/2006	6.6	1.80	4.0	0.013	0.06	0.11	0.47	36.56	55	6.50	52		3.74	
58	Little Fresh P	7/8/2007	5.0	1.65	5.0	0.020	0.01	0.02	0.54	58.7	62	8.16	51	1.5	5.09	
58	Little Fresh P	7/22/2007	6.5	1.60	2.0	0.022	0.01	0.01	0.60	59.8	67	6.94	48		15.82	
58	Little Fresh P	8/12/2007	6.0	1.00	6.0	0.027	0.01	0.02	0.48	39.1	87	6.30	58		28.84	
58	Little Fresh P	8/25/2007	6.0	1.60	6.0	0.023	0.02	0.02	0.67	65.7	53	7.90	44		6.77	
58	Little Fresh P	9/9/2007		1.50	5.7	0.019	0.01	0.03	0.78	92.7	49	7.55	14	1.8	13.80	
58	Little Fresh P	9/23/2007	6.5	2.00	6.5	0.018	0.01	0.02	0.78	97.8	43	6.56	53		6.94	
58	Little Fresh P	10/7/2007	5.5	1.90	2.0	0.015	0.03	0.02	0.55	83.9	41	7.99	45		4.87	
58	Little Fresh P	10/21/2007		1.95	5.6	0.016	0.01	0.03	0.63	89.8	58	6.61	60		19.45	
58	Little Fresh P	6/15/2008	5.0	3.50	2.0	0.022	0.03	0.02	0.54	54.95	26	7.00	97		3.72	
58	Little Fresh P	6/22/2008	6.0	1.52	6.0	0.018	0.07	0.02	0.55	68.70	31	7.00	44		5.93	
58	Little Fresh P	7/5/2008	5.7	2.10	1.5	0.019	0.01	0.03	0.47	54.08	36	7.72	50	1.5	11.81	
58	Little Fresh P	7/19/2008	6.9	2.43	1.5	0.027	0.02	0.03	0.37	30.13	37	6.42	42			
58	Little Fresh P	8/3/2008	6.0	2.65	1.5	0.019	0.03	0.03	0.41	47.52	32	6.68	33	1.4	8.20	
58	Little Fresh P	8/16/2008	5.5	2.75	3.0	0.014	0.00	0.02	0.26	39.89	34	6.10	38		3.67	
58	Little Fresh P	9/1/2008				0.016	0.01	0.03	0.53	71.51	32	7.52	51		4.04	
58	Little Fresh P	9/21/2008	5.5	1.50		0.017	0.01	0.10	0.48	61.87	46	7.79	50		2.43	
58	Little Fresh P	6/14/2009				0.022	0.02	0.03	0.43	42.14	67	6.40	49	1.4	0.65	
58	Little Fresh P	6/29/2009	6.0	1.55		0.030	0.01	0.02	0.31	22.95	68	6.62	48		18.83	
58	Little Fresh P	7/12/2009	6.8	1.35		0.005	0.01	0.01	0.40	170.82	125	6.53	44		37.54	
58	Little Fresh P	7/27/2009		1.35	1.5	0.023	0.01	0.01	0.28	27.40	96	7.88	37		3.33	
58	Little Fresh P	8/9/2009	6.2	1.45	1.5	0.035	0.01	0.01	0.41	25.17	89	6.42	46	1.1	47.70	
58	Little Fresh P	8/22/2009	6.2	1.40		0.020	0.01	0.01	0.43	46.72	107	6.90	41		18.10	
58	Little Fresh P	9/13/2009	7.0	1.90		0.018	0.02	0.02	0.34	40.51	72	7.94	32		6.20	
58	Little Fresh P	10/1/2009	5.8	1.15	1.5	0.024	0.03	0.01	0.43	38.64	86	6.71	50		33.36	
58	Little Fresh P	5/17/2010	6.5	1.05	1.5	0.031	0.03	0.02			117	7.09	59	1.3	18.30	
58	Little Fresh P	5/31/2010	6.1	1.60	1.5	0.030	0.01	0.03	0.63	46.97	59	6.88	67		46.70	
58	Little Fresh P	6/12/2010	7.0	0.90	1.5	0.044	0.02	0.03			81	6.59	62		1.00	
58	Little Fresh P	6/27/2010	6.9	0.95	1.5	0.041	0.02	0.03	0.82	43.79	132	6.43	60		39.60	
58	Little Fresh P	7/11/2010	6.7	1.00	1.5	0.069	0.01	0.02	0.49	15.75	67	6.99	64	1.8	48.60	
58	Little Fresh P	7/24/2010	6.7	1.20	1.5	0.039	0.01	0.05	0.77	42.99	75	6.69	30		8.80	
58	Little Fresh P	8/8/2010	6.6	0.95	1.5	0.040	0.02	0.02			80	6.81	31		15.70	
58	Little Fresh P	8/21/2010		0.95		0.029	0.03	0.06	0.66	50.12	58	6.78	60		25.90	
58	Little Fresh P	5/22/2011	6.0	1.70	1.5	0.034	0.66	0.53	0.43	27.77	54	6.33	61	1.1	4.20	
58	Little Fresh P	6/5/2011	5.8	1.70	1.5	0.026	0.02	0.05	0.35	29.53	44	7.00	59		7.30	
58	Little Fresh P	6/15/2011	6.0	2.00	1.5	0.024	0.02	0.03	0.30	27.59	46	6.18	89		2.80	
58	Little Fresh P	7/4/2011	5.9	1.85	1.5	0.048	0.02	0.02	0.34	15.56	47	9.09	78		0.80	
58	Little Fresh P	7/19/2011	5.9	1.70	1.5	0.035	0.03	0.03	0.49	30.50	56	6.68	69	5.8	8.20	
58	Little Fresh P	7/31/2011	5.4	1.33	1.5	0.030	0.05	0.02	0.66	48.71	46	7.75	52		24.00	
58	Little Fresh P	8/13/2011	5.8	1.30	1.5	0.041	0.03	0.02	0.78	41.44	62	7.29	57		19.70	
58	Little Fresh P	9/11/2011	5.6	0.73	1.5	0.054	0.04	0.04	1.14	46.31	36	7.82	34		54.00	
58	Little Fresh P	fall 2011														
58	Little Fresh P	6/21/2012	5.1	1.90	1.5	0.024	0.01	0.04	0.52	47.39	26	7.50	25	1.0	2.10	
58	Little Fresh P	7/8/2012	5.1	2.02	1.5	0.020	0.01	0.03	0.30	33.90	31	7.98	41		6.50	
58	Little Fresh P	7/22/2012	5.7	2.30	1.5	0.024	0.02	0.03	0.41	37.34	33	7.44	39		15.20	
58	Little Fresh P	8/5/2012	5.7		1.5	0.018	0.01	0.02	0.41	49.08	21	8.66	34		6.60	
58	Little Fresh P	8/12/2012	5.6	1.70	1.5	0.024	0.01	0.33	0.39	35.44	22	7.31	54	1.2	17.10	
58	Little Fresh P	9/2/2012	5.7	2.15	1.5	0.021	0.01	0.04	0.47	49.06	25	7.10	47		12.30	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
58	Little Fresh P	9/17/2012	5.6	3.10	1.5	0.019	0.01	0.03	0.41	46.96	24	7.63	56		5.50	
58	Little Fresh P	9/30/2012	5.2	2.30	3.7	0.020	0.02	0.04	0.33	36.29	30	7.36	49		11.90	
58	Little Fresh P	6/16/2013	6.2	2.25	1.5	0.013	0.02	0.04	0.53	91.46		6.66	41		7.80	
58	Little Fresh P	7/1/2013	6.0	1.90	1.5	0.018			0.35	41.42	42	6.54	60		28.20	
58	Little Fresh P	7/15/2013	6.3	2.05	1.5	0.020	0.05	0.01	0.26	28.48	37	7.80	33		6.60	
58	Little Fresh P	7/29/2013	6.3	1.85	1.5	0.030			0.58	42.35	45	6.62	63			
58	Little Fresh P	8/11/2013	6.2	2.15	1.5	0.022	0.01	0.02	0.46	45.58	29	7.35	60		12.00	
58	Little Fresh P	8/25/2013	6.0	1.55	1.5	0.024					23	7.58	27		19.70	
58	Little Fresh P	9/8/2013	6.1	1.60	1.5	0.021	0.01	0.01	0.49	50.25	30	6.64	56		12.80	
58	Little Fresh P	9/22/2013		2.65	1.5	0.016			0.50	69.57	30	7.60	80		3.70	
58	Little Fresh P	6/1/2014	5.8	2.80	1.5	0.014	0.02	0.06	0.73	112.79	38	6.23	58	1.7	1.70	
58	Little Fresh P	6/15/2014	5.7	2.70	1.5	0.011			0.46	89.95	28	6.90	35		1.90	
58	Little Fresh P	6/29/2014	6	2.15	1.5	0.021	0.03	0.05	0.39	41.56	37	7.74	53		5.60	
58	Little Fresh P	7/13/2014	6	2.30	1.5	0.022			0.49	48.04	28	7.24	60		4.00	
58	Little Fresh P	7/27/2014	6.1	1.70	1.5	0.028	0.01	0.03	0.45	35.61	35	6.75	58	1.8	15.00	
58	Little Fresh P	8/11/2014	6	2.05	1.5	0.032			0.50	34.49	28	8.49	59		21.50	
58	Little Fresh P	8/24/2014	6	2.10	1.5	0.024	0.01	0.01	0.37	34.43	28	7.48	60		6.00	
58	Little Fresh P	9/7/2014	6	1.65	1.5	0.029			0.39	29.23	28	7.19	60		15.60	
58	Little Fresh P	5/24/2015	6.5	1.90	1.5	0.049	0.00	0.01	0.38	7.77	28	7.25	55	2.5	5.30	
58	Little Fresh P	6/7/2015	6	1.60	1.5	0.047			0.35	7.61	28	7.91	52		4.60	
58	Little Fresh P	6/29/2015	5.8	1.60	1.5		0.03	0.02	0.58		26	7.75	59		14.90	57.6
58	Little Fresh P	7/12/2015	6.2	1.70	1.5	0.049			0.53	10.92	22	7.30	111		8.90	
58	Little Fresh P	7/26/2015	6.5	1.70	1.5	0.049	0.02	0.04	0.53	10.84	44	7.20	28	2.8	5.60	
58	Little Fresh P	8/9/2015	6	1.10	1.5	0.061			0.89	14.60	43	7.33	52		31.60	
58	Little Fresh P	8/23/2015	6	0.70	1.5	0.023	0.00	0.06	1.14	48.93	29	7.35	49		69.00	14.7
58	Little Fresh P	6/7/2015			Bloom											
58	Little Fresh P	9/6/2015			bloom											
58	Little Fresh P	9/6/2015	5.6	1.00	1.5	0.061			0.98	16.11	26	7.37	45		27.20	
LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4							NO2	
58	Little Fresh P	6/13/2005				0.040										
58	Little Fresh P	7/4/2005				0.055										
58	Little Fresh P	7/16/2005				0.025										
58	Little Fresh P	7/31/2005				0.023										
58	Little Fresh P	8/15/2005				0.029										
58	Little Fresh P	8/27/2005				0.048										
58	Little Fresh P	9/10/2005				0.042										
58	Little Fresh P	9/23/2005				0.025										
58	Little Fresh P	06/14/2009				0.034		0.03								
58	Little Fresh P	06/29/2009				0.039		0.00								
58	Little Fresh P	07/12/2009			6.2	0.087		0.01								
58	Little Fresh P	07/27/2009				0.026		0.01								
58	Little Fresh P	08/09/2009			6.2	0.083		0.01								
58	Little Fresh P	09/13/2009			7.0	0.024		0.01								
58	Little Fresh P	10/01/2009			5.0	0.033		0.01								
58	Little Fresh P	5/17/2010	6.5			0.058		0.02								
58	Little Fresh P	5/31/2010	6.1			0.044		0.03								
58	Little Fresh P	6/12/2010	7.0			0.035		0.02								
58	Little Fresh P	6/27/2010	6.9		5.0	0.037		0.02								
58	Little Fresh P	7/11/2010	6.7		5.0	0.038		0.03								
58	Little Fresh P	7/24/2010	6.7		5.0	0.040		0.02								
58	Little Fresh P	8/8/2010	6.6			0.048		0.03								
58	Little Fresh P	8/21/2010			5.9	0.063		0.07								
58	Little Fresh P	5/22/2011	6.0		5.0	0.030		0.03							0.01	
58	Little Fresh P	6/5/2011	5.8			0.026		0.02							0.01	
58	Little Fresh P	6/15/2011	6.0			0.025		0.04							0.00	
58	Little Fresh P	7/4/2011	5.9			0.024		0.01							0.01	
58	Little Fresh P	7/19/2011	5.9			0.026		0.03							0.01	
58	Little Fresh P	7/31/2011	5.4			0.024		0.02							0.01	
58	Little Fresh P	8/13/2011	5.8			0.032		0.05							0.01	
58	Little Fresh P	9/11/2011	5.6			0.026		0.04							0.01	
58	Little Fresh P	6/24/2012				0.021		0.06							0.00	
58	Little Fresh P	7/8/2012			5.1	0.014		0.08							0.00	
58	Little Fresh P	7/21/2012			4.5	0.020		0.02							0.00	
58	Little Fresh P	8/5/2012			4.2	0.025		0.03							0.08	
58	Little Fresh P	8/21/2012			4.1	0.029		0.03							0.00	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4								NO2
58	Little Fresh P	9/2/2012			4.2	0.041		0.03								0.00
58	Little Fresh P	9/17/2012			4.2	0.021		0.03								0.00
58	Little Fresh P	9/30/2012			5.2	0.015		0.15								0.00
58	Little Fresh P	6/16/2013			5.3	0.018		0.03								
58	Little Fresh P	7/1/2013			5.0	0.022										
58	Little Fresh P	7/15/2013			5.0	0.020		0.01								
58	Little Fresh P	7/29/2013			5.0	0.021										
58	Little Fresh P	8/11/2013			5.0	0.021		0.03								
58	Little Fresh P	8/25/2013			5.0	0.034										
58	Little Fresh P	9/8/2013			5.0	0.015		0.01								
58	Little Fresh P	9/22/2013			5.0	0.016										
58	Little Fresh P	6/1/2014			4.5	0.014		0.04								
58	Little Fresh P	6/15/2014			4.5	0.013										
58	Little Fresh P	6/29/2014			4.5	0.017		0.03								
58	Little Fresh P	7/13/2014			4.5	0.030										
58	Little Fresh P	7/27/2014			5	0.027		0.03								
58	Little Fresh P	8/11/2014			4.5	0.024										
58	Little Fresh P	8/24/2014			4.5	0.023		0.01								
58	Little Fresh P	9/7/2014			4.5	0.020										
58	Little Fresh P	5/24/2015			5	0.047		0.02								
58	Little Fresh P	6/7/2015			5	0.047										
58	Little Fresh P	6/29/2015			4.3	0.194		0.03								
58	Little Fresh P	7/12/2015			5	0.052										
58	Little Fresh P	7/26/2015			5	0.061		0.04								
58	Little Fresh P	8/9/2015			4.5	0.125										
58	Little Fresh P	8/23/2015			4.5	0.065		0.06								
58	Little Fresh P	9/6/2015			4	0.055										

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB-form	Shore HAB
58	Little Fresh P	7/7/1989	epi	31	26															
58	Little Fresh P	7/22/1989	epi	23	24															
58	Little Fresh P	8/5/1989	epi	28	26															
58	Little Fresh P	8/19/1989	epi	23	24															
58	Little Fresh P	9/1/1989	epi	24	22															
58	Little Fresh P	9/16/1989	epi	19	22															
58	Little Fresh P	9/30/1989	epi	15	17															
58	Little Fresh P	10/13/1989	epi	16	15															
58	Little Fresh P	7/7/1990	epi	20	25															
58	Little Fresh P	7/21/1990	epi	25	26															
58	Little Fresh P	8/4/1990	epi	21	25															
58	Little Fresh P	8/18/1990	epi	27	25															
58	Little Fresh P	9/1/1990	epi	28	26															
58	Little Fresh P	9/15/1990	epi	24	24															
58	Little Fresh P	9/30/1990	epi	21	22															
58	Little Fresh P	6/30/1991	epi	21	21															
58	Little Fresh P	7/13/1991	epi	21	28															
58	Little Fresh P	7/27/1991	epi	22	28															
58	Little Fresh P	8/10/1991	epi	24	26															
58	Little Fresh P	8/24/1991	epi	22	24															
58	Little Fresh P	9/7/1991	epi	23	25															
58	Little Fresh P	9/21/1991	epi	19	20															
58	Little Fresh P	10/5/1991	epi	20	20															
58	Little Fresh P	6/6/1992	epi	20	21															
58	Little Fresh P	6/21/1992	epi	23	24															
58	Little Fresh P	6/30/1992	epi	26	26	2	3	2												
58	Little Fresh P	7/18/1992	epi	27	27															
58	Little Fresh P	8/1/1992	epi	24	24															
58	Little Fresh P	8/15/1992	epi	20	22															
58	Little Fresh P	8/29/1992	epi	26	27	2	2	2	0											
58	Little Fresh P	9/12/1992	epi	18	20	2	2	2												
58	Little Fresh P	6/19/1993	epi	30	28															
58	Little Fresh P	7/1/1993	epi	27	27															
58	Little Fresh P	7/17/1993	epi	24	26															

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB-form	Shore HAB
58	Little Fresh P	8/1/1993	epi	31	29															
58	Little Fresh P	8/16/1993	epi	26	27															
58	Little Fresh P	8/30/1993	epi	27	28															
58	Little Fresh P	9/13/1993	epi	26	24	1	3	1												
58	Little Fresh P	10/6/1993		14	18															
58	Little Fresh P	7/2/1994	epi	23	28	2	3	2	6											
58	Little Fresh P	7/9/1994	epi	33	31	1	3	1												
58	Little Fresh P	7/22/1994	epi	28	29	2	3	1												
58	Little Fresh P	06/14/02	epi	16	21	2	2	3	25											
58	Little Fresh P	07/01/02	epi	27		2	3	3	2											
58	Little Fresh P	07/14/02	epi	23	24	2	3	3	2											
58	Little Fresh P	07/27/02	epi	26	23	2	3	3	2											
58	Little Fresh P	08/10/02	epi	26	27															
58	Little Fresh P	08/15/02	epi	26	26															
58	Little Fresh P	09/12/02	epi	16	21	2	3	3	2											
58	Little Fresh P	10/17/02	epi	11	17	2	3	2	25											
58	Little Fresh P	6/14/2003	epi	23	20	2	1	1	8											
58	Little Fresh P	7/6/2003	epi	27		2	3	2	28											
58	Little Fresh P	8/24/2003	epi	22	23	3	3	3	2											
58	Little Fresh P	9/7/2003	epi	22	21															
58	Little Fresh P	9/28/2003	epi	26	24	2	3	4	2											
58	Little Fresh P	10/18/2003	epi	13	16	2	3	3	2											
58	Little Fresh P	11/1/2003	epi	18	16	2	2	3	126											
58	Little Fresh P	6/20/2004	epi	20	24	3	3	2	1											
58	Little Fresh P	7/6/2004	epi	21	26	2	3	3	12											
58	Little Fresh P	7/17/2004	epi	26	27	3	2	3	1											
58	Little Fresh P	8/1/2004	epi	27	18	4	2	4	3											
58	Little Fresh P	8/15/2004	epi	24	27	3	3	4	2347											
58	Little Fresh P	9/11/2004	epi	22	26	3	3	3	3											
58	Little Fresh P	10/2/2004	epi	21	20	3	3	3	13											
58	Little Fresh P	6/13/2005	epi	32	27	1	2	1	6											
58	Little Fresh P	7/4/2005	epi	29	21	2	3	2	2											
58	Little Fresh P	7/16/2005	epi	27	29	3	3	2	2											
58	Little Fresh P	7/31/2005	epi	24	25	2	2	2	2											
58	Little Fresh P	8/15/2005	epi	28	29	1	1	1	0											
58	Little Fresh P	8/27/2005	epi	27	25	2	2	2	0											
58	Little Fresh P	9/10/2005	epi	24	27	2	4	2	18											
58	Little Fresh P	9/23/2005	epi	29	26	2	1	2	2											
58	Little Fresh P	6/13/2006	epi	24	22	2	1	2	5											
58	Little Fresh P	7/3/2006	epi	33	28	1	3	2	2											
58	Little Fresh P	7/14/2006	epi	26	31	2	1	2												
58	Little Fresh P	7/29/2006	epi	33	28	2	1	2	8											
58	Little Fresh P	8/12/2006	epi	26	24	2	2	3	2											
58	Little Fresh P	9/3/2006	epi	22	22	2	1	2	5											
58	Little Fresh P	9/17/2006	epi	21	22	2	1	2	5											
58	Little Fresh P	10/3/2006	epi	21	19	1	3	1	0											
58	Little Fresh P	7/8/2007	epi	32	18	1	1	2	0											
58	Little Fresh P	7/22/2007	epi	23	26	2	3	2	8											
58	Little Fresh P	8/12/2007	epi	29	22	3	1	3	1											
58	Little Fresh P	8/25/2007	epi	25	25	3	4	3	2											
58	Little Fresh P	9/9/2007	epi	17	17	1	2	2	8											
58	Little Fresh P	9/23/2007	epi	21	21	1	3	1	8											
58	Little Fresh P	10/7/2007	epi	25	23	2	2	2	8											
58	Little Fresh P	10/21/2007	epi	22	18	1	1	1	8											
58	Little Fresh P	6/15/2008	epi	32	27	2	2	1	8											
58	Little Fresh P	6/22/2008	epi	26	26	2	3	2	0											
58	Little Fresh P	7/5/2008	epi	24	27	2	1	2	8											
58	Little Fresh P	7/19/2008	epi	33	30	2	3	1	2											
58	Little Fresh P	8/3/2008	epi	24	27	2	3	1	0											
58	Little Fresh P	8/16/2008	epi	29	26	1	3	1	8											
58	Little Fresh P	9/21/2008	epi	24	21	2	3	2	2											

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB-form	ShoreHAB
58	Little Fresh P	6/29/2009	epi	20	22	1	2	1	0											
58	Little Fresh P	7/12/2009	epi	23	23															
58	Little Fresh P	7/27/2009	epi	33	28	1	2	1	5											
58	Little Fresh P	8/9/2009	epi	23	24	2	3	2	5											
58	Little Fresh P	8/22/2009	epi	32	25	1	2	1	0											
58	Little Fresh P	9/13/2009	epi	29	27	1	2	1	0			80.5								
58	Little Fresh P	10/1/2009	epi	15	18	3	1	2	5			201.3								
58	Little Fresh P	5/17/2010	epi	24	21	3	2	3	58	0	0									
58	Little Fresh P	5/31/2010	epi	23	24	2	2	1	0	0	0									
58	Little Fresh P	6/12/2010	epi	21	22	2	3	2	5	0	0									
58	Little Fresh P	6/27/2010	epi	27	28	3	3	1	0	0	0									
58	Little Fresh P	7/11/2010	epi	32	29	2	3	1	0	0	0									
58	Little Fresh P	7/24/2010	epi		27	2	2	1	0	0	0									
58	Little Fresh P	8/8/2010	epi	31	28	2	3	1	0	0	0	189.2								
58	Little Fresh P	8/21/2010	epi	30	26	2	2	1	0			292.7								
58	Little Fresh P	5/22/2011	epi	18	20	1	3	4	0	0	0			4.4						
58	Little Fresh P	6/5/2011	epi	22	22	1	3	1	0	0	0		6.3							
58	Little Fresh P	6/15/2011	epi	29	25	1	3	3	0	0	0	10.0	3.7							
58	Little Fresh P	7/4/2011	epi	26	29	1	3	1	0	0	0	11.0	6.5							
58	Little Fresh P	7/19/2011	epi	30	27	1	3	1	0	0	0	21.6	9.8	0.15	<0.902	<0.1				
58	Little Fresh P	7/31/2011	epi	27	29	1	3	1	0	0	0	74.8	9.0							
58	Little Fresh P	8/13/2011	epi	28	26	1	3	1	0	0	0	191.9	8.2	0.35						
58	Little Fresh P	9/11/2011	epi	22	23	3	1	1	0	0	0	367.8	13.4	0.15	<0.4	<0.1			f	
58	Little Fresh P	fall 2011	bloom											0.30	<0.8	<0.1				
58	Little Fresh P	6/21/2012	epi	26	28	1	3	1	0	0	0	2.00	0.60				1.56	0.78	I	
58	Little Fresh P	7/8/2012	epi	32	30	1	3	1	0	0	0	4.60	0.70	0.37	<0.392		2.30	1.02	G	
58	Little Fresh P	7/22/2012	epi	26	26	1	3	1	0	0	0	7.50	0.90	0.40	<0.328		5.50	1.98	G	
58	Little Fresh P	8/5/2012	epi	30	28	1	3	1	0	0	0	10.70	0.60	<0.30	<0.659		5.49	3.33	G	
58	Little Fresh P	8/12/2012	epi	25	26	1	3	1	0	0	0	20.50	1.10	0.59	<0.552		6.04	4.00	G	
58	Little Fresh P	9/2/2012	epi	26	26							16.60	0.90	<0.30	<0.580		5.76	3.60	G	
58	Little Fresh P	9/17/2012	epi	19	22							3.00	0.50	0.84	<3.299		1.76	0.51	G	
58	Little Fresh P	9/30/2012	epi		20	1	3	1	0	0	0	6.80	0.80	0.47	<3.205		2.31	0.76	G	
58	Little Fresh P	6/16/2013	epi	24	23	1	2	2	0	0	0	0.60	1.40	<0.30	<0.440		1.10	0.00	I	I
58	Little Fresh P	7/1/2013	epi	25	26	1	3	1	0	0	0	0.10	0.90	<0.30	<0.510		0.70	0.00	G	G
58	Little Fresh P	7/15/2013	epi	32	27	1	1	1	0	0	0	6.50	1.60	<0.30	<0.910		1.60	0.30		
58	Little Fresh P	7/29/2013	epi	28	27	1	3	1	0	0	0	9.80	2.10	<0.30	<0.380		4.40	1.90	gi	G
58	Little Fresh P	8/11/2013	epi	26	26	1	3	1	0	0	0	32.60	3.90	<0.30	<0.380		10.30	8.00	gi	gi
58	Little Fresh P	8/25/2013	epi	25	26	2	1	2	0	0	0	43.60	2.50	0.38	<0.390		11.20	10.40	gi	gi
58	Little Fresh P	9/8/2013	epi	25	24	1	1	1	0	0	0	24.60	2.80	0.68	<1.240		6.30	3.00	gi	gi
58	Little Fresh P	9/22/2013	epi	22	22	1	1	1	0	0	0	4.20	1.60	0.92	<19.130		2.10	0.60	gi	gi
58	Little Fresh P	6/1/2014	epi	23	23	1	1	1	0	0	0	0.10	0.70	<0.37	<0.09	<0.001	0.80	0.00	I	
58	Little Fresh P	6/15/2014	epi	21	23	1	1	1	0	0	0	0.10	0.20	<0.61	<0.08	<0.002	1.07	0.00	I	
58	Little Fresh P	6/29/2014	epi	24	26	1	1	1	0	0	0	1.00	0.40	<0.48	<0.48	<0.002	0.99	0.00	I	
58	Little Fresh P	7/13/2014	epi	28	26	1	3	1	0	0	0	3.30	0.40	<0.40	<0.21	<0.003	1.28	0.00	G	
58	Little Fresh P	7/27/2014	epi	27	27	1	3	1	0	0	0	4.90	0.70	<0.63	<0.03	<0.001	4.83	0.32	gi	I
58	Little Fresh P	8/11/2014	epi	27	27	1	3	1	0	0	0	6.50	0.40	<0.26	<0.10	<0.002	2.67	0.67	gi	gi
58	Little Fresh P	8/24/2014	epi	22	25	1	3	1	0	0	0	7.00	0.60	<0.26	<0.10	<0.002	2.68	0.45	gi	gi
58	Little Fresh P	9/7/2014	epi	24	26	1	1	1	0	0	0	24.20	0.60	<0.64	<0.03	<0.001	9.19	6.20	gi	gi
58	Little Fresh P	5/24/2015	epi	26	22	2	3	1	0	0	0	5.50	0.70	<1.34	<0.032	<0.080	1.12	0.00	I	I
58	Little Fresh P	6/7/2015	epi	26	22	3	3	2	0	0	0	5.20	0.70	<0.77	<0.126	<1.739	1.76	0.00	D	D
58	Little Fresh P	6/29/2015	epi	24	23	1	3	1	0	0	0	4.80	0.90	<0.63	<0.007	<0.000	2.90	0.00	I	I
58	Little Fresh P	7/12/2015	epi	34	26	1	3	1	0	0	0	17.60	0.90	<1.01	<0.003	<0.011	3.80	0.65	G	I
58	Little Fresh P	7/26/2015	epi	28	27	2	3	1	0	0	0	17.80	1.00	<0.30	<0.002	<0.014	4.18	0.79	G	I
58	Little Fresh P	8/9/2015	epi	27	27	2	3	1	0	0	0	47.50	3.00	<0.18	<0.002	<0.009	21.24	10.09	G	I
58	Little Fresh P	8/23/2015	epi	27	28	3	3	2	1	0	0	12.80	1.00	<0.21	<0.003	<0.010	50.74	47.48	I	I
58	Little Fresh P	6/7/2015	epi											<1.32	<0.252	<3.477	12.97	5.40		
58	Little Fresh P	9/6/2015	epi											<0.43	<0.020	<0.058	1008	1008		
58	Little Fresh P	9/6/2015	epi	29	27	3	3	4	1	4	4			<0.30	<0.007	<0.035	16.83	14.96	C	C
58	Little Fresh P	06/29/2009	hypo		21															
58	Little Fresh P	07/27/2009	hypo		27															
58	Little Fresh P	08/09/2009	hypo		23															

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB-form	Shore HAB
58	Little Fresh P	10/01/2009	hypo		17															
58	Little Fresh P	6/27/2010	hypo		16															
58	Little Fresh P	7/11/2010	hypo		26															
58	Little Fresh P	7/24/2010	hypo		25															
58	Little Fresh P	6/16/2013	hypo		23															
58	Little Fresh P	7/1/2013	hypo		23															
58	Little Fresh P	7/15/2013	hypo		27															
58	Little Fresh P	7/29/2013	hypo		26															
58	Little Fresh P	8/11/2013	hypo		25															
58	Little Fresh P	8/25/2013	hypo		24															
58	Little Fresh P	9/8/2013	hypo		23															
58	Little Fresh P	9/22/2013	hypo		21															
58	Little Fresh P	6/1/2014	hypo		22															
58	Little Fresh P	6/15/2014	hypo		20															
58	Little Fresh P	6/29/2014	hypo		22															
58	Little Fresh P	7/13/2014	hypo		25															
58	Little Fresh P	7/27/2014	hypo		25															
58	Little Fresh P	8/11/2014	hypo		25															
58	Little Fresh P	8/24/2014	hypo		22															
58	Little Fresh P	9/7/2014	hypo		27															
58	Little Fresh P	5/24/2015	hypo		19															
58	Little Fresh P	6/7/2015	hypo		17															
58	Little Fresh P	6/29/2015	hypo		20															
58	Little Fresh P	7/12/2015	hypo		22															
58	Little Fresh P	7/26/2015	hypo		25															
58	Little Fresh P	8/9/2015	hypo		26															
58	Little Fresh P	8/23/2015	hypo		27															
58	Little Fresh P	9/6/2015	hypo		25															

## Legend Information

<i>Indicator</i>	<i>Description</i>	<i>Detection Limit</i>	<i>Standard (S) / Criteria (C)</i>
<b>General Information</b>			
Lnum	lake number (unique to CSLAP)		
Lname	name of lake (as it appears in the Gazetteer of NYS Lakes)		
Date	sampling date		
<b>Field Parameters</b>			
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
<b>Laboratory Parameters</b>			
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/l	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 (aquafior) (unitless)	1 unit	none
AQ-Chl	Chlorophyll a (aquafior) (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	Cylindrospermopsin (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
<b>Lake Assessment</b>			
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 Little Fresh Pond

### Big/Little Fresh Ponds (1701-0125)

Impaired

#### Waterbody Location Information

Revised: 10/30/2015

**Water Index No:** (MW6.3c) GB..LPB-123..P661,P662    **Drain Basin:** Atlantic-Long Island Sound  
**Unit Code:** 0203020205    **Class:** B    **Atlantic Ocean**  
**Water Type/Size:** Lake/Reservoir    101.2 Acres    **Reg/County:** 1/Suffolk (52)  
**Description:** total area of both lakes

#### Water Quality Problem/Issue Information

(CAPS indicate MAJOR Pollutants/Sources)

Uses Evaluated	Severity	Confidence
Public Bathing	Stressed	Suspected
Recreation	Impaired	Suspected
Aquatic Life	Fully Supported	Suspected
Fish Consumption	Fully Supported	Unconfirmed

**Conditions Evaluated**

Habitat/Hydrology	Unknown
Aesthetics	Unknown

#### Type of Pollutant(s)

Known: HARMFUL ALGAL BLOOMS  
Suspected: NUTRIENTS (phosphorus), Low D.O./Oxygen Demand  
Unconfirmed: - - -

#### Source(s) of Pollutant(s)

Known: - - -  
Suspected: URBAN/STORM RUNOFF  
Unconfirmed: - - -

#### Management Information

**Management Status:** Verification of Sources Needed  
**Lead Agency/Office:** ext/WQCC  
**IR/305(b) Code:** Water with Insufficient Data (IR Category 3)

#### Further Details

##### Overview

Big/Little Fresh Pond is assessed as having minor impacts – that may rise to the level of impairment – due to recreational uses that are thought to be impaired harmful algal blooms and elevated levels of nutrients. No specific sources have been identified, but nonpoint sources and wildlife/waterfowl sources are thought to contribute to the impacts.

##### Use Assessment

Big/Little Fresh Ponds is a Class B waterbody, suitable for public bathing, general recreation use and support of aquatic life, but not as a water supply.

Recreation use and public bathing are considered to be stressed/impaired due to periodic occurrence of shoreline

harmful algal blooms and somewhat elevated nutrient levels. Additional bacteriological sampling is needed to more fully evaluate the impact of pathogen levels on public bathing (swimming) use. This waterbody is thought to support a warmwater fishery, although no specific fishery or biological reports are included in this assessment. (DEC/DOW, BWAM/LMAS, July 2013)

There are no health advisories in place limiting the consumption of fish from this waterbody (beyond the general advice for all waters). Fish consumption is considered to be fully supported based on the absence of any waterbody-specific advisory, but is noted as unconfirmed since routine monitoring of contaminants in fish is limited. (NYS DOH Health Advisories and DEC/DOW, BWAM, January 2014)

#### Water Quality Information

Water quality sampling of Big Fresh and Little Fresh Ponds has been conducted through the NYSDEC Citizens Statewide Lake Assessment Program (CSLAP) from 2010 through 2014. Results of this sampling indicate the Little Fresh Pond is best characterized as mesoeutrophic, or moderately productive, while Big Fresh Pond is a mesotrophic lake. Chlorophyll/algal levels in Little Fresh Pond rarely exceed criteria corresponding to impaired recreational uses, while phosphorus concentrations are typically somewhat high. Occurrences of harmful algal blooms have been documented. Lake clarity measurements indicate water transparency that typically fails to meet the recommended minimum criteria for swimming beaches. In Big Fresh Pond, chlorophyll/algal and phosphorus levels are consistently below impaired water criteria, with clarity that typically meets bathing beach criteria. (DEC/DOW, BWAM/LMAS, May 2006)

#### Source Assessment

Based on surrounding land use and other knowledge of the waterbody, the most likely sources of pathogens to the waterbody are largely nonpoint runoff from developed urban and residential areas agricultural activity and open space/forest; direct waterfowl/wildlife inputs; and boats and marinas. Relative contributions from each type of source are very site-specific in nature, particularly in localized areas of study. (DEC/DOW, BWRM, September 2015)

#### Management Actions

This segment is included within the Peconic Estuary Program (PEP) study area, situated between the North and South Forks of eastern Long Island and consisting of more than 100 distinct bays, harbors, embayments, and tributaries, covering more than 128,000 acres of land and 121,000 acres of surface water. As part of the National Estuary Program (NEP), the Peconics were charged with developing and implementing a watershed-based comprehensive management plan. To accomplish this goal the PEP established an innovative partnership of local, state, and federal governments, citizen and environmental groups, businesses and industries, and academic institutions. The PEP Comprehensive Conservation and Management Plan (CCMP) was formally approved by USEPA in 2001. There are over 300 specific management tasks included in the CCMP, with priority topics focusing on Brown Tide, nutrients, habitat and living resources, pathogens, toxic pollutants, and critical lands protection. A vessel waste no discharge zone was established for the entire Peconic Estuary in 2002 to address impacts from boat pollution. (PEP, August 2010)

#### Section 303(d) Listing

Big/Little Fresh Ponds is included on the current (2014) NYS Section 303(d) List of Impaired/TMDL Waters. The waterbody is included on Part 3a of the List as an impaired waterbody requiring verification of an impairment for phosphorus. However this updated assessment suggests that the suspected impacts to water quality and uses may not be sufficient to warrant continued listing. This waterbody should be considered for delisting for phosphorus during the next update of the List. As an alternative, consideration should be given to separating the ponds into two waterbody segments, with Big Fresh Pond being removed from the list. (DEC/DOW, BWAM/WQAS, January 2015)

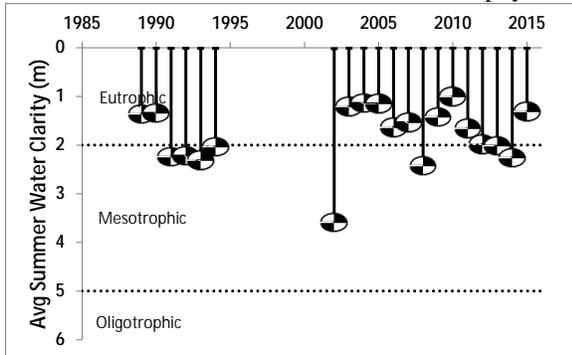
#### Segment Description

This segment includes the total area of both Big Fresh (P661) and Little Fresh (P662) Ponds.

# Appendix C- Long Term Trends: Little Fresh Pond

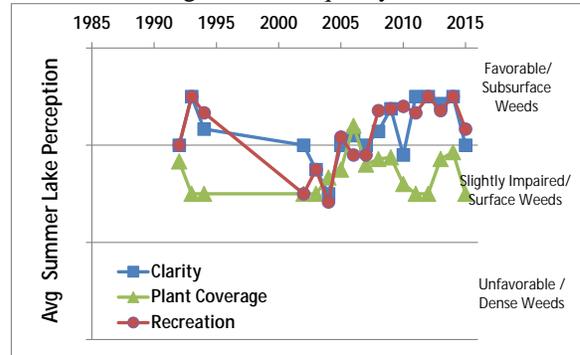
## Long Term Trends: Water Clarity

- Highly variable; lower in 2015
- Most readings typical of *mesoeutrophic* lakes, consistent with TP and chlorophyll *a*



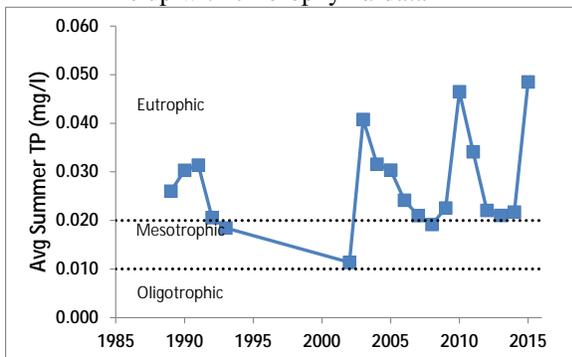
## Long Term Trends: Lake Perception

- Improved early 2000s to 2014 but variable
- Recreational perception only slightly linked to changes in water quality and weeds



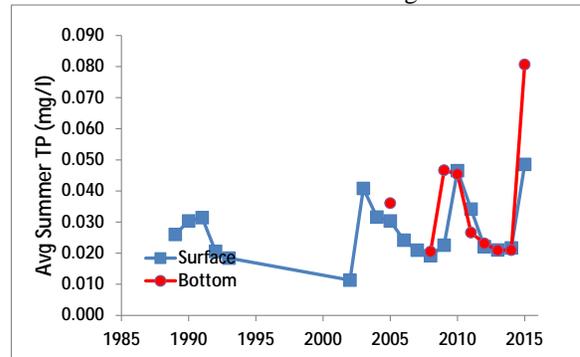
## Long Term Trends: Phosphorus

- Spikes in '03, '10 and '15, ↓ afterwards
- Most readings typical of *eutrophic* lakes, and line up with chlorophyll *a* data



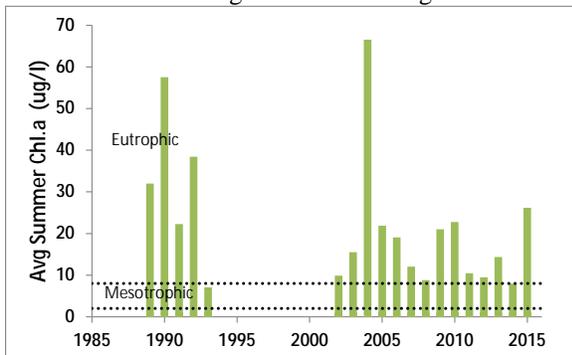
## Long Term Trends: Bottom Phosphorus

- Deep TP (trends) similar to surface TP
- Similarity indicates weak thermal layer and little internal nutrient loading



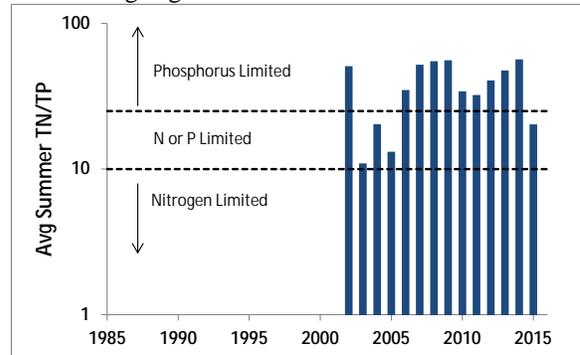
## Long Term Trends: Chlorophyll a

- Spikes in '90 and '05, dropping afterwards
- Most readings typical of *eutrophic* lakes, but some readings indicative of algal blooms



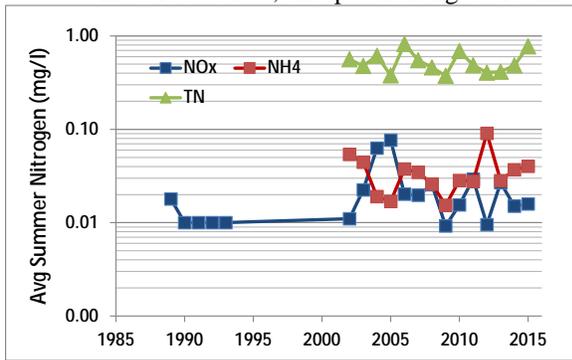
## Long Term Trends: N:P Ratio

- No trends apparent
- Most readings indicate phosphorus limits algae growth



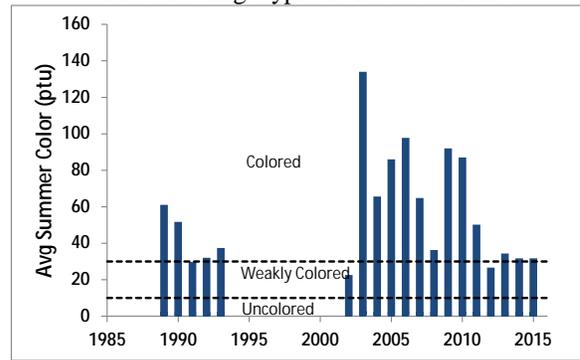
### Long Term Trends: Nitrogen

- No trends apparent; all N indicators variable
- Most NO<sub>x</sub>, ammonia, and TN readings moderate to low, except when algae blooms



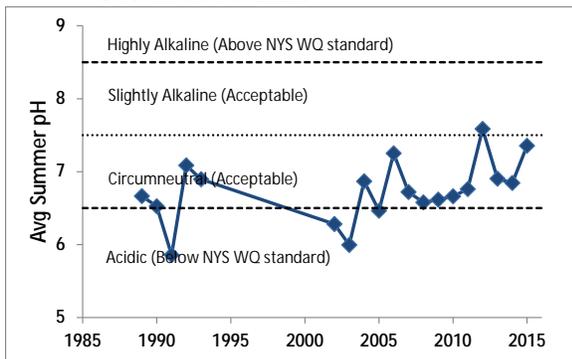
### Long Term Trends: Color

- Decreasing since mid-2000s; now in range where color doesn't affect clarity
- Most readings typical of *colored* lakes



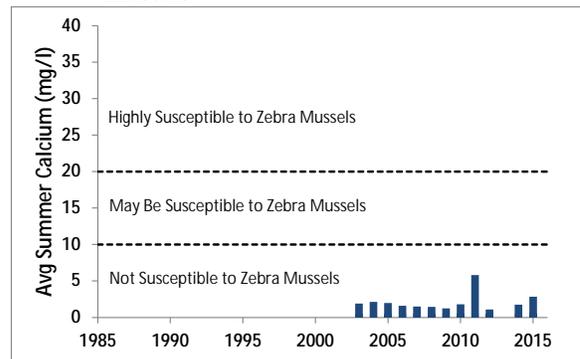
### Long Term Trends: pH

- Increase from early 2000s to present
- Most readings typical of *slightly acidic* to *circumneutral* lakes



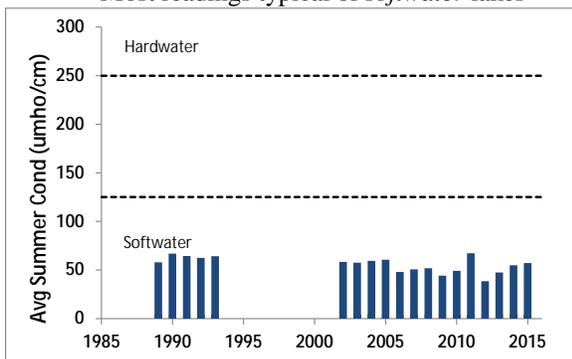
### Long Term Trends: Calcium

- No trends apparent
- Data indicates low susceptibility to zebra mussels



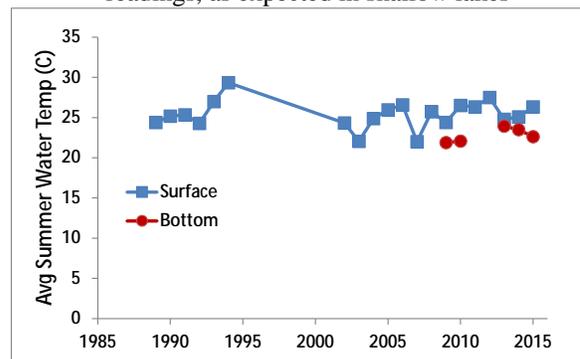
### Long Term Trends: Conductivity

- Conductivity fairly stable with slight long-term decrease
- Most readings typical of *softwater* lakes



### Long Term Trends: Water Temperature

- No trends apparent in surface readings
- Bottom temperatures close to surface readings, as expected in shallow lakes



## **Appendix D: Algae Testing Results from SUNY ESF Study**

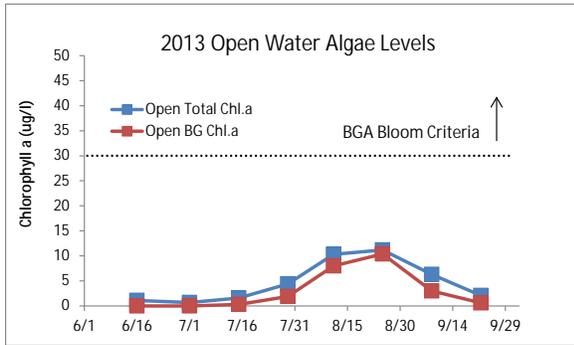
Most algae are harmless, naturally present, and an important part of the food web. However excessive algae growth can cause health, recreational, and aesthetic problems. Some algae can produce toxins that can be harmful to people and animals. High quantities of these algae are called harmful algal blooms (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

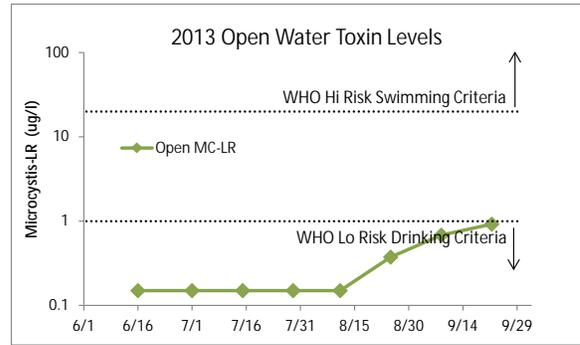
Some of these results are reported in other portions of these reports. This appendix the seasonal change in blue green algae, other algae types, and the primary algal toxin (microcystin-LR, a liver toxin). Analysis was completed on open water samples and, for some lakes, shoreline samples that were collected 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



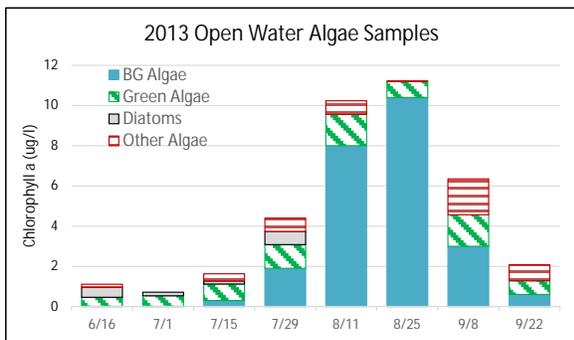
**Figure D2:**  
2013 Open Water Microcystin-LR



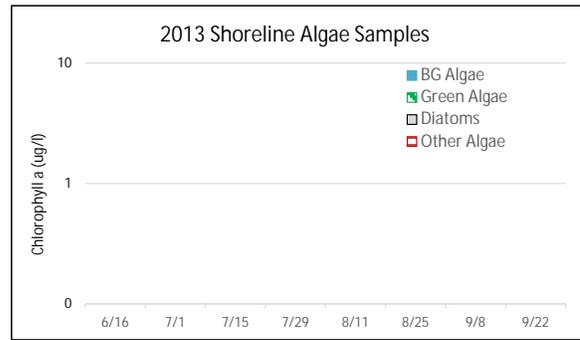
**Figure D3:**  
2013 Shoreline Total and BGA Chl.a



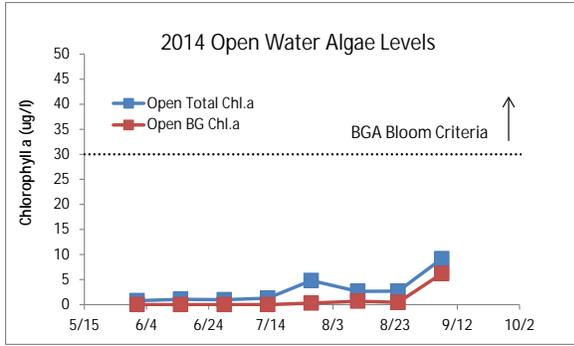
**Figure D4:**  
2013 Shoreline Microcystin-LR



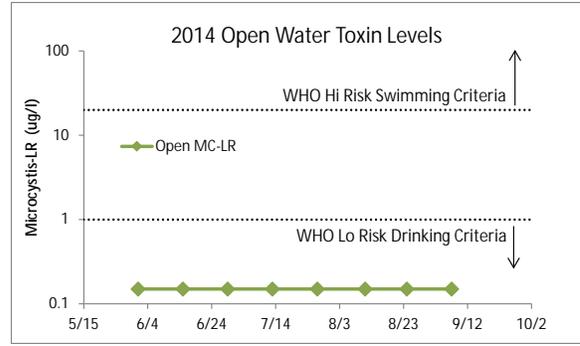
**Figure D5:**  
2013 Open Water Algae Types



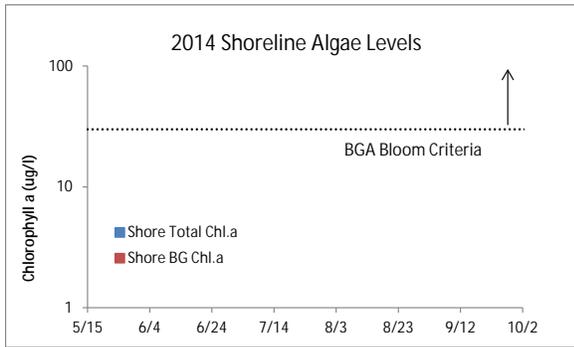
**Figure D6:**  
2013 Shoreline Algae Types



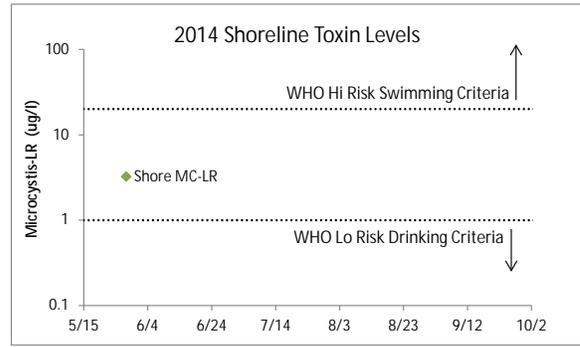
**Figure D7:**  
2014 Open Water Total and BGA Chl.a



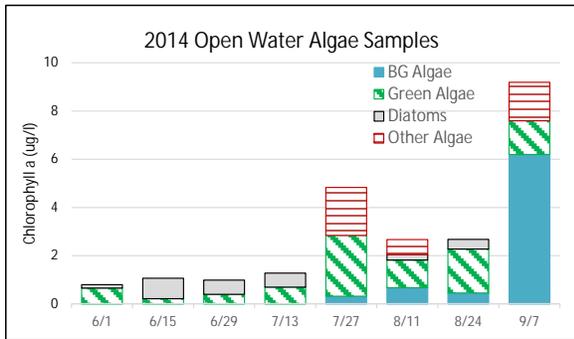
**Figure D8:**  
2014 Open Water Microcystin-LR



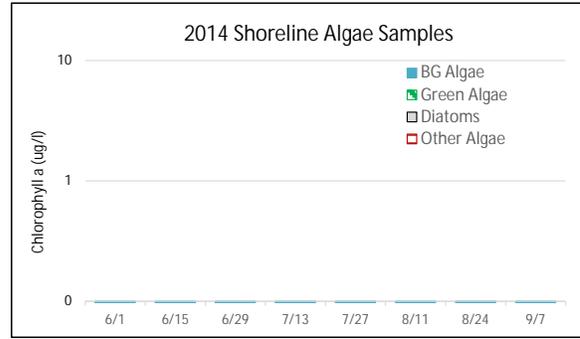
**Figure D9:**  
2014 Shoreline Total and BGA Chl.a



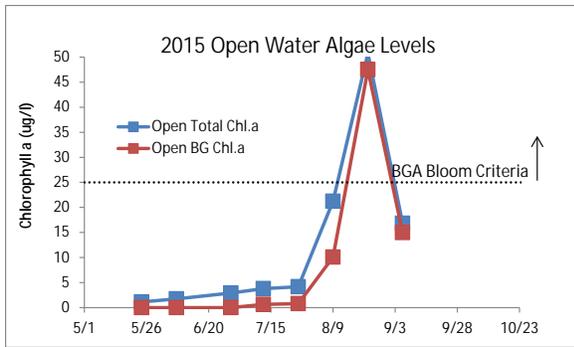
**Figure D10:**  
2014 Shoreline Microcystin-LR



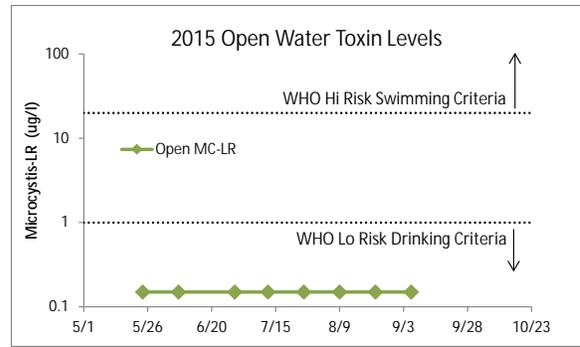
**Figure D11:**  
2014 Open Water Algae Types



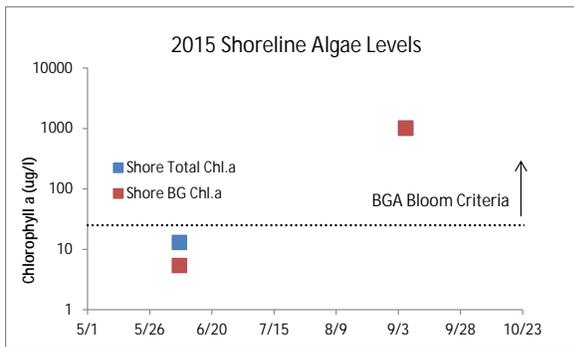
**Figure D12:**  
2014 Shoreline Algae Types



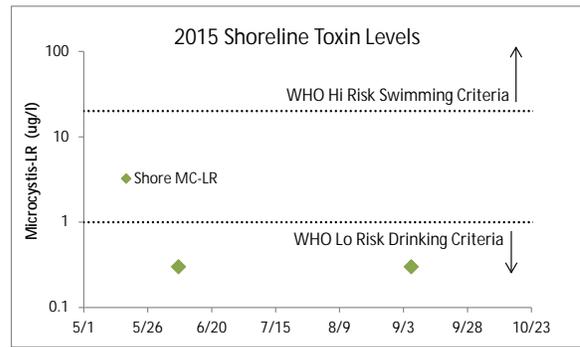
**Figure D13:**  
2015 Open Water Total and BGA Chl.a



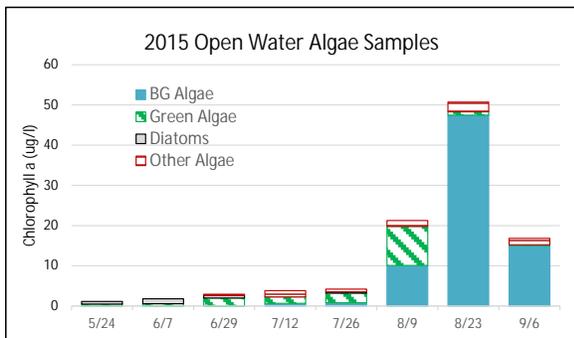
**Figure D14:**  
2015 Open Water Microcystin-LR



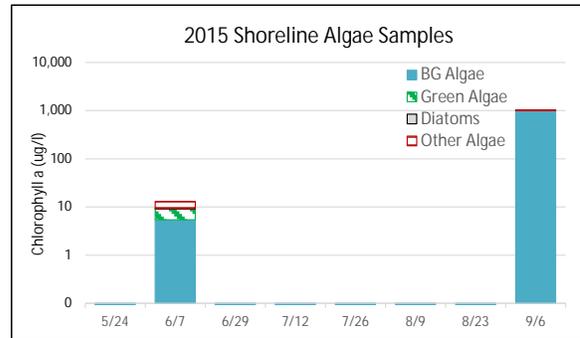
**Figure D15:**  
2015 Shoreline Total and BGA Chl.a



**Figure D16:**  
2015 Shoreline Microcystin-LR



**Figure D17:**  
2015 Open Water Algae Types



**Figure D18:**  
2015 Shoreline Algae Types

## Appendix E: AIS Species in 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](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](mailto:dowinfo@dec.ny.gov).

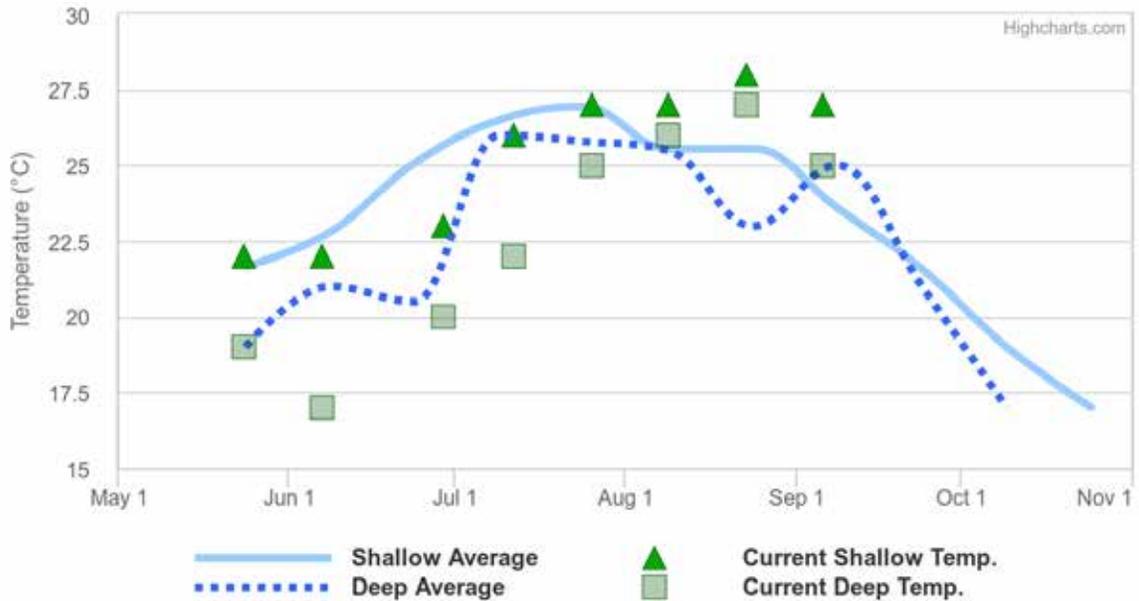
<b>Aquatic Invasive Species – Suffolk County</b>			
<b>Waterbody</b>	<b>Kingdom</b>	<b>Common name</b>	<b>Scientific name</b>
Artist Lake	Plant	Fanwort	<i>Cabomba caroliniana</i>
Artist Lake	Animal	Goldfish	<i>Carassius auratus</i>
Avon Manor Lake	Plant	Parrot feather	<i>Myriophyllum aquaticum</i>
Belmont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

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

<b>Waterbody</b>	<b>Kingdom</b>	<b>Common name</b>	<b>Scientific name</b>
Swan Pond	Plant	Water chestnut	<i>Trapa natans</i>
Swan Pond	Plant	Hydrilla	<i>Hydrilla verticillata</i>
Sweezy Pond	Plant	Fanwort	<i>Cabomba caroliniana</i>
Tarkill Pond	Animal	Chinese mystery snail	<i>Cipangopaludina chinensis</i>
Trout Pond	Plant	Fanwort	<i>Cabomba caroliniana</i>
Upper Lake	Plant	Fanwort	<i>Cabomba caroliniana</i>
Upper Vail Pond	Plant	Variable watermilfoil	<i>Myriophyllum heterophyllum</i>
Upper Yaphank Lake	Plant	Fanwort	<i>Cabomba caroliniana</i>
Vail Pond	Plant	Variable watermilfoil	<i>Myriophyllum heterophyllum</i>
Webster Pond	Plant	Fanwort	<i>Cabomba caroliniana</i>
Webster Pond	Plant	Variable watermilfoil	<i>Myriophyllum heterophyllum</i>
West Brook Pond	Plant	Fanwort	<i>Cabomba caroliniana</i>
West Brook Pond	Plant	Variable watermilfoil	<i>Myriophyllum heterophyllum</i>
West Lake	Plant	Fanwort	<i>Cabomba caroliniana</i>
Wildwood Lake	Plant	Fanwort	<i>Cabomba caroliniana</i>
Willow Pond	Plant	Variable watermilfoil	<i>Myriophyllum heterophyllum</i>

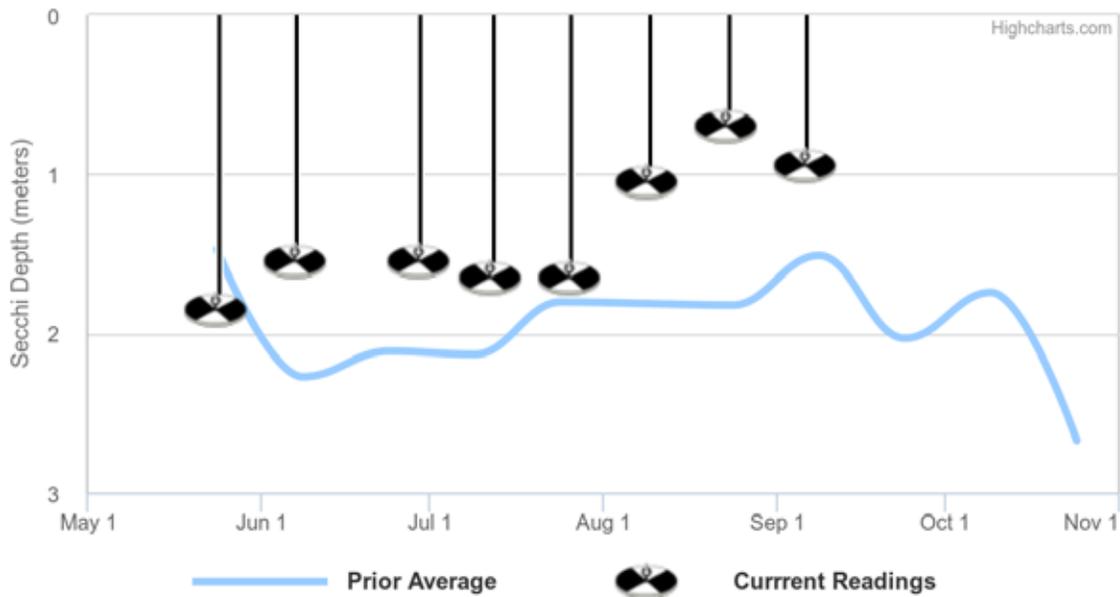
## Appendix F: Current Year vs. Prior Averages for Little Fresh Pond

### 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 1989 to 2014. There are not enough deep water sample temperatures to determine a trend for the current year when compared to the average of readings collected from 2009 to 2014.

### Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are tending to be lower than normal when compared to the average of readings collected from 1989 to 2014

## Appendix G: Watershed and Land Use Map for Little Fresh 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.

