Craine Lake Questions and Answers, 2015 CSLAP

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

A1. Water quality conditions in Craine Lake were probably close to normal in 2015. Fewer and less intense shoreline algae blooms were reported, and overall algae levels lower than normal. However, water clarity was also lower than usual in 2015.

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. Craine Lake has slightly lower water clarity, but also lower algae and nutrient levels, than a typical lake in the area. The frequency and duration of shoreline blue green algae blooms is much greater.

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

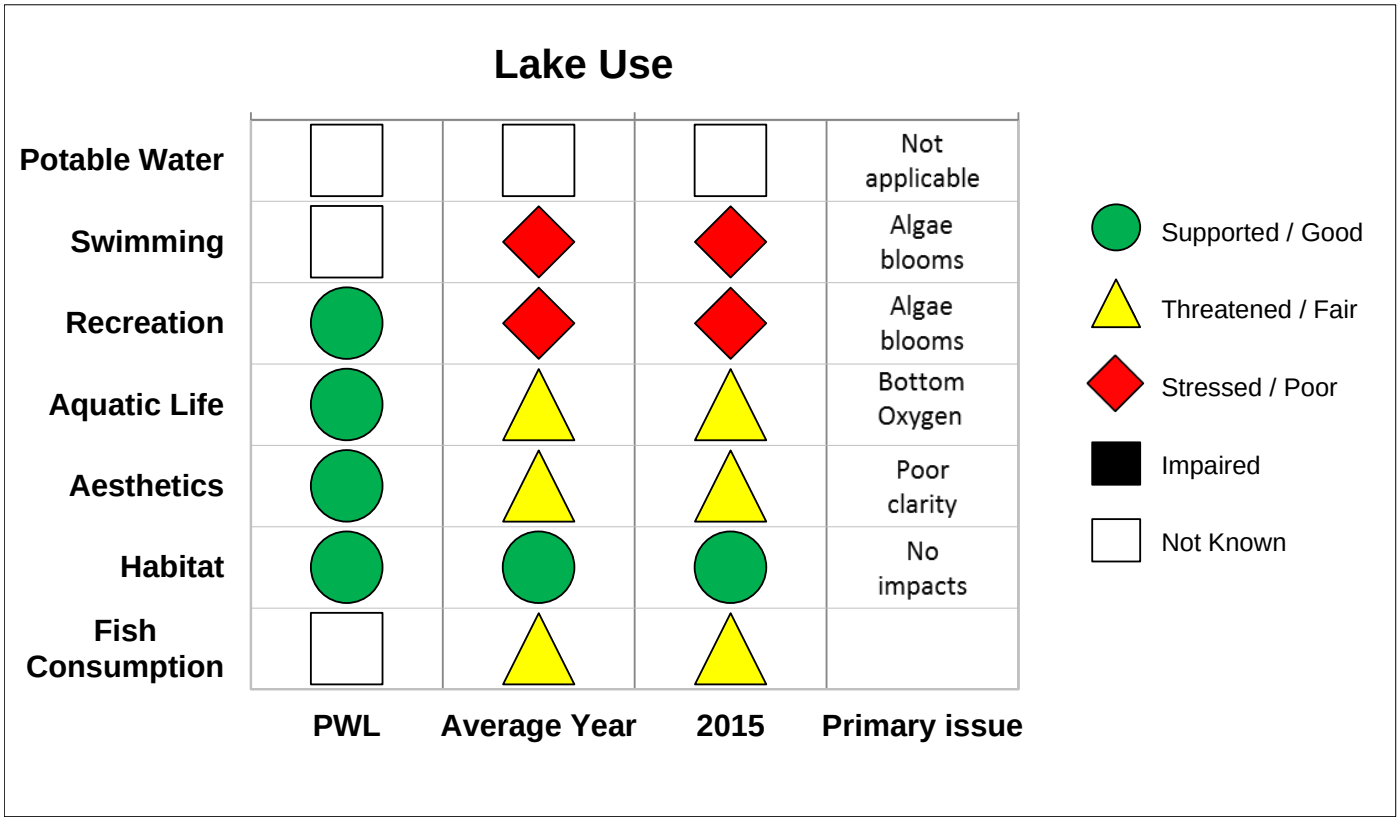
A4. Phosphorus readings have increased while (open water) algae levels have decreased over the last two decades. Conductivity and pH readings have also decreased over the same period. It is not known if the extent of shoreline algae blooms has changed in recent years (they have been better documented over the last five years).

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

A5. Craine Lake continues to be susceptible to widespread and shoreline blue green algae blooms. It is not known if a reduction in lake phosphorus levels would improve this situation, since open water nutrient levels in Craine Lake are not particularly high. Craine Lake and other CSLAP data continue to be evaluated to determine the cause of these blooms.

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:
Craine Lake

General Lake Information

Location	Town of Hamilton
County	Madison
Basin	Susquehanna River
Size	10.4 hectares (25.7 acres)
Lake Origins	Natural
Watershed Area	50.4 hectares (124.5 acres)
Retention Time	1.6 years
Mean Depth	3.7 meters
Sounding Depth	10 meters
Public Access?	local beach
Major Tributaries	no named tribs
Lake Tributary To…	unnamed outlet to Chenango Creek to Chenango River to Susquehanna River
WQ Classification	C (non-contact recreation = boating, angling)
Lake Outlet Latitude	42.759
Lake Outlet Longitude	-75.559
Sampling Years	1988-1994, 1996-1998, 2000-2001, 2009-2013, 2015
2015 Samplers	Bob Bond
Main Contact	Bob Bond

Lake Map

Background

Craine Lake is a 26 acre, class C lake found in the Town of Hamilton in Madison County, just east of the Finger Lakes region of New York state. It was first sampled as part of CSLAP in 1988.

It is one of 12 CSLAP lakes among the nearly 120 lakes and ponds found in Madison County, and one of 25 CSLAP lakes among the nearly 900 lakes and ponds in the Susquehanna River drainage basin.

Lake Uses

Craine Lake is a Class C lake; this means that the best intended use for the lake is for non-contact recreation—boating, aquatic life, and aesthetics. However, the lake is used by lake residents and invited guests for swimming and non-power boating, via a lake association beach. There is no public access to the lake.

It is not known if Craine Lake is stocked privately (beyond grass carp stocked previously to control nuisance plants); the state does not stock the lake.

General statewide fishing regulations are applicable in Craine Lake. In addition, open season for trout is April 1st through October 15th, with no size limits, but a daily take limit of five fish, with no more than two trout greater than 12 inches and no more than five brook trout under 8 inches.

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

Historical Water Quality Data

CSLAP sampling was conducted on Craine Lake from 1988 to 1994, 1996 to 1998, 2000 to 2001, 2009 to 2013, and 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 Craine Lake can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77861.html.

Craine Lake was sampled as part of DEC Lake Classification and Inventory (LCI) survey in 2008, the chemical results of which did not show any evidence of the algal blooms from 2007, despite some suspended algae forming a surface film and washed up on the leeward shoreline. None of the streams entering or departing the lake have been sampled through the state Rotating Intensive Basins (RIBS) program or macroinvertebrate sampling program.

Lake Association and Management History

Craine Lake is served by the Craine Lake Lot Owners Association. Management activities at the lake include:

- Aquatic plant control (bassweed, lilies) with herbicides in 1984, harvesting in 1994, seasonal drawdown on occasion, and grass carp stocking recently
- Individual septic pumpout and shoreline cleanups
- Boat management—no power boats allowed
- Fish management—trout, northern pike, channel catfish stocked years ago, but not recently

It is not known if the Craine Lake Lot Owners Association maintains a website.

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 – Craine Lake" section in Appendix C.

Evaluation of Eutrophication Indicators

Chlorophyll *a* readings were lower than normal in each of the last several years, perhaps in response to the barley straw applications. Although water clarity and total phosphorus readings were close to normal in most of these years, water clarity was lower than usual in 2015. Phosphorus levels have increased slightly over the last two decades, but (open water) algae levels have decreased over the same period, and water clarity readings have not exhibited any clear long-term trends.

Craine Lake continues to exhibit extensive shoreline toxic algae blooms, particularly along the north shore, at much higher levels than expected given the overall algae levels in the lake. There continues to be research to evaluate why these concentrated blooms are present in the lake. These trophic readings are not typical of lakes with algae blooms, although these (shoreline) bloom conditions may be variable or cyclical, due to sporadic changes in weather or nutrient loading to the lake or from the lake bottom. This is consistent with highly elevated phosphorus and ammonia readings in the hypolimnion, and may be related to periodic summer mixing of bottom to surface. Deepwater ammonia readings were slightly higher than usual in 2015.

This is also consistent with a slight seasonal increase in lake productivity during the typical summer, although both water clarity and phosphorus readings decreased slightly during at least part of the summer in 2015.

The lake can be characterized as *mesotrophic,* or moderately productive, based on water clarity, chlorophyll *a*, and total phosphorus readings (all typical of *mesotrophic* lakes). The trophic state indices (TSI) evaluation suggests that open water algae levels are lower than expected given the nutrient and clarity readings. This may indicate that algae growth is highly patchy, consistent with heavy shoreline blooms (when open water conditions indicate much lower algae levels). Lower-than-expected water clarity readings are measured in some years; this may be related to higher turbidity (from colloidal or other material) in some years. 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 or elevated DBP (disinfection by product) compounds that could affect the potability of the water, particularly along some the north shoreline, although the lake is not used for drinking water. Hypolimnetic phosphorus and ammonia readings are higher than those measured at the lake surface, and deepwater ammonia levels were higher than normal in 2015. This suggests that deepwater intakes may be compromised for any "unofficial" potable water use. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

NOx, pH, and calcium readings were slightly lower than usual in 2015, and pH and conductivity levels have decreased over the last 25 years. Color readings have decreased slightly over the last decade, although they were close to normal in 2015. 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 13 to 16 mg/l. These values fall within the "moderate" road salt runoff levels cited by the New Hampshire DES. These readings are well below the state potable water quality standard of 250 mg/l and below the range of values found in most NYS lakes. These readings suggest a low to moderate likelihood of biological impacts from road salt. Additional data will help to determine if these represent normal readings for the lake.

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

Evaluation of Biological Condition

Phytoplankton surveys have not been conducted through CSLAP in Craine Lake, although the algal bloom in 2007 was associated with *Microcystis aeruginosa*, a cyanobacteria that can release algal toxins. The fluoroprobe screening samples analyzed by SUNY ESF in the last several years found low overall algae and blue green algae levels in the open water (center of the lake) samples but very high blue green algae levels in the shoreline blooms samples. In most years, these blooms were dominated by *Microcystis* and *Anabaena*, two blue green algae species known to produce toxins. These shoreline blooms appear to be persistent in most years, although both the frequency and duration of the blooms along the northern shoreline and in the inlet were less apparent in 2015 (these blooms are not routinely sampled).

Macrophyte surveys have been conducted through CSLAP (as part of the 2009 biomonitoring survey) in Craine Lake. At least nine aquatic plant species have been found, including at least one exotic plant species (*Najas minor*, brittle naiad) and one protected plant species (*Potamogeton strictifolius*, blunt-leafed pondweed) has been found in the lake. The modified floristic quality index (FQI) for the lake indicates that the quality of the aquatic plant community is "excellent"; however, the low abundance of plants throughout the lake suggests that the modified FQI assessment of the lake weighted for plant abundance is better described as "fair" to "poor". It is likely that the poor plant diversity is a consequence of the grass carp stocking, which has selectively removed some plant species.

The samples from the macroinvertebrate survey conducted in 2009 have not been fully interpreted. Zooplankton surveys have not been conducted through CSLAP at Craine Lake.

The composition of the fish community has not been reported, although it is likely that the lake supports a warmwater fishery (including grass carp).

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

Evaluation of Lake Perception

Water quality assessments have improved slightly in the last few years, despite continuing problems with shoreline algae blooms. The coverage of aquatic plants has decreased in recent years, perhaps in response to the grass carp stocking. This has not translated into a clear change in recreational assessments. The highly variable lake conditions—toxic algal blooms and active management of aquatic plants—confound an evaluation of long-term trends—no clear trends have been apparent. Lake perception does not usually exhibit any clear seasonal trends, although water quality assessments degraded slightly in late summer in 2015. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Water temperature readings in the summer index period were higher than normal in each of the last several years, and these readings have increased slightly in recent years. This is consistent with a rise in air temperatures (during the summer index period), at least as measured through CSLAP. It is not known if this is an indication of local climate change or if these changes cannot be well evaluated through CSLAP.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Fluoroprobe screening readings in the open water have been below the criteria for harmful algal blooms (HABs), but are often highly elevated in shoreline blooms, borne out by microscopic analysis showing very high blue green algae levels. An analysis of algae samples have indicated microcystin levels well above the levels needed to support safe swimming within the blooms, and occasionally well above these levels in the open water (though not in the open water in at least the last few years). Swimmers and their pets are strongly encouraged to stay out of the water when blooms are present. These blooms continue to be closely studied to better understand the cause of blooms in a lake with relatively low nutrient and open water algae levels.

Lake Condition Summary

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.90	2.84	7.70	2.41	Mesotrophic	Within Normal Range	No Change
	Chlorophyll *a*	0.05	3.68	15.20	2.70	Mesotrophic	Within Normal Range	No Change
	Total Phosphorus	0.005	0.011	0.025	0.011	Mesotrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.03	1.22	5.83	2.42	Highly Elevated Deepwater NH4	Higher than Normal	Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.012	0.060	0.549	0.054	Elevated Deepwater TP	Within Normal Range	Not known
	Nitrate + Nitrite	0.01	0.54	2.30	0.27	High NOx	Within Normal Range	No Change
	Ammonia	0.01	0.06	0.20	0.06	Low Ammonia	Within Normal Range	Not yet known
	Total Nitrogen	0.35	0.82	2.02	0.81	Intermediate Total Nitrogen	Within Normal Range	Not yet known
	pH	5.72	8.10	8.53	7.66	Alkaline	Within Normal Range	No Change
	Specific Conductance	191	292	370	282	Hardwater	Within Normal Range	No Change
	True Color	1	10	69	8	Intermediate Color	Within Normal Range	Increasing Slightly
	Calcium	14.3	42.3	62.8	16.5	Highly Susceptible to Zebra Mussels	Lower Than Normal	Not yet known
Lake Perception	WQ Assessment	1	2.2	3	2.0	Not Quite Crystal Clear	Within Normal Range	No Change
	Aquatic Plant Coverage	1	2.8	3	3.0	Surface Plant Growth	Within Normal Range	No Change
	Recreational Assessment	1	2.0	4	2.0	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass; Shoreline-high blue green algae in bloom	Not known	Not known
	Macrophytes					Fair 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 available	Not known	Not known
	Fish					Not available	Not known	Not known
	Invasive Species					Zebra mussels, brittle naiad	Not known	Not known
Local Climate Change	Air Temperature	8	21.9	36	20.9		Within Normal Range	Increasing Slightly
	Water Temperature	10	22.2	28	24.0		Higher Than Normal	Increasing Slightly
Harmful Algal Blooms	Open Water Phycocyanin	0	14	90	7	No readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	2	5	3	No readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	1	3	1	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	1.2	31.5	<DL	Occasionally high open water MC-LR	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	42.7	1938.1	9994.		Most readings indicate high risk of BGA	Not known	Not known
	Shoreline FP Chl.a	4	1374	21738	70	Most readings indicate high algae levels	Not known	Not known
	Shoreline FP BG Chl.a	0	1337	21738	51	Most readings indicate high BGA levels	Not known	Not known
	Shoreline Microcystis	<DL	104.1	631.3	0.4	Very high shoreline bloom MC-LR	Not known	Not known
	Shoreline Anatoxin a	<DL	<DL	1.1	<DL	Shoreline bloom Anatoxin-a at times detectable	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Craine Lake is presently among the lakes cited on the 2009 Susquehanna River Basin PWL, with no use impairments. The PWL listing for Craine Lake is listed in Appendix C.

Potable Water (Drinking Water)

The CSLAP dataset at Craine Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake is not used for this purpose. The periodic toxic algal blooms would significantly impact any "unofficial" potable water use of the lake, particularly along the northern shoreline.

Public Bathing

The CSLAP dataset at Craine Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that bathing is *stressed* by periodic and intense toxic blooms. When and where these blooms occur, bathing is either *impaired* or *precluded.* 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 Craine Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation is *stressed* by these shoreline blue green algae blooms.

Aquatic Life

The CSLAP dataset on Craine Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *threatened* by deepwater anoxia, road salt runoff, and the presence of zebra mussels. Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake. It is not known if the substantially reduced aquatic plant coverage has affected the lake ecology.

Aesthetics and Habitat

The CSLAP dataset on Craine Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics are often (only) *fair* due to shoreline algal blooms. Habitat is probably *good*, although this condition may be affected by the lack of plant growth in some locations.

Fish Consumption

There are no fish consumption advisories posted for Craine Lake.

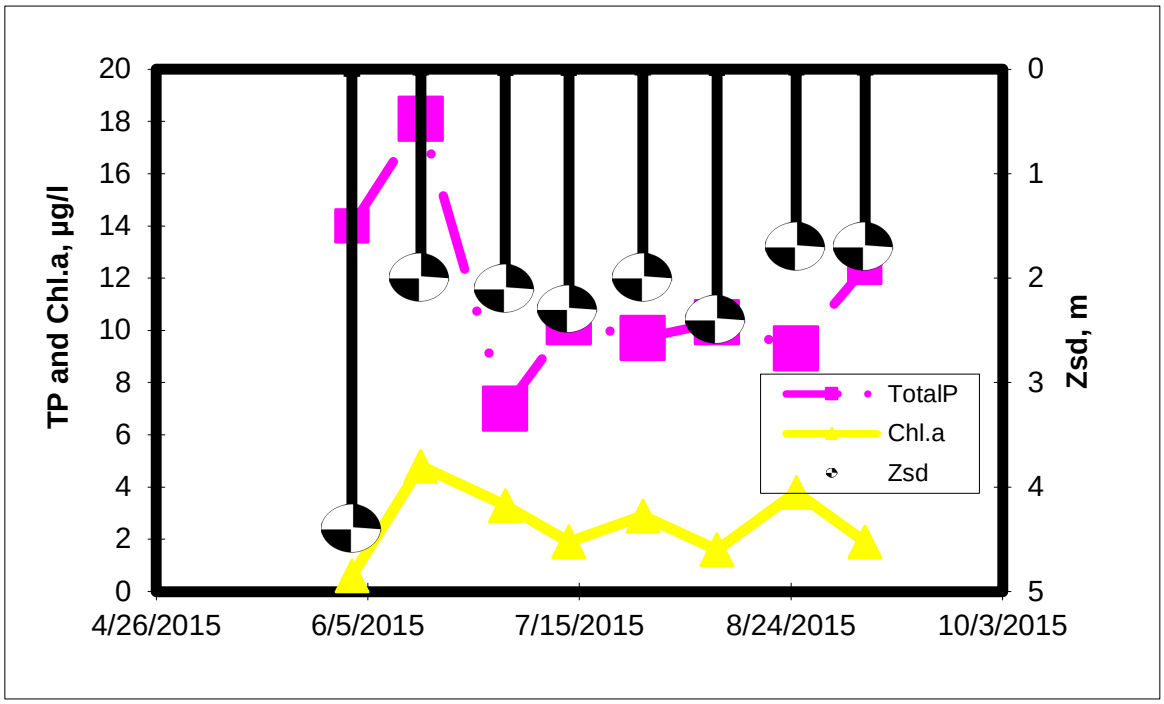
Additional Comments and Recommendations

The lake should continue to be studied to determine the trigger for these shoreline blue green algae blooms, and to determine the effectiveness of the barley straw treatments and other lake management actions. The lake association should not consider the use of grass carp or other aquatic plant management actions at this time, due to the potential connection between the reduction in plants and the onset of harmful algal blooms. Lake residents and their pets are strongly urged to avoid exposure to these surface scums or heavily discolored water.

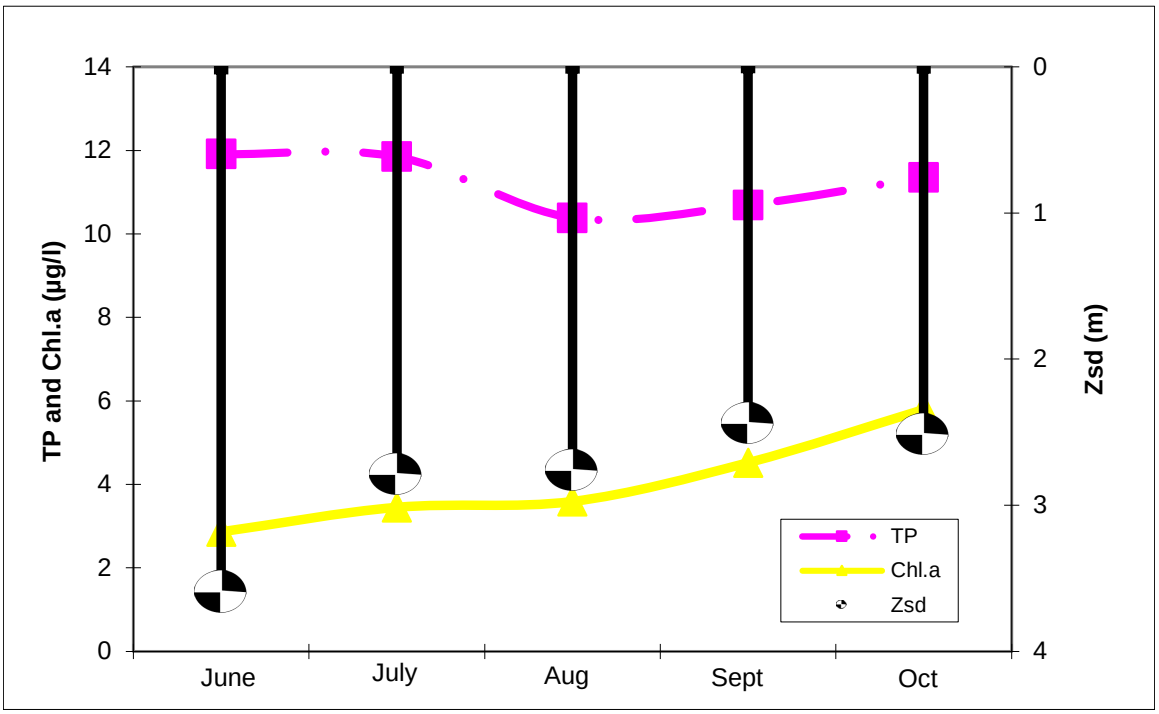
Aquatic Plant IDs-2015

None submitted for identification.

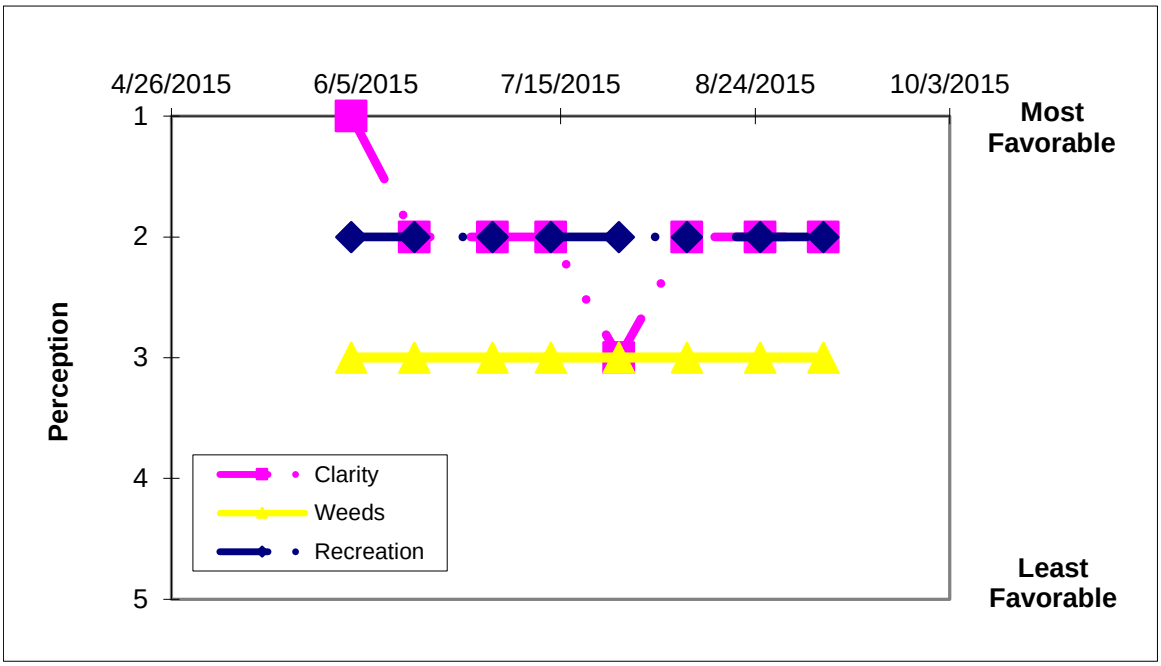
Time Series: Trophic Indicators, 2015



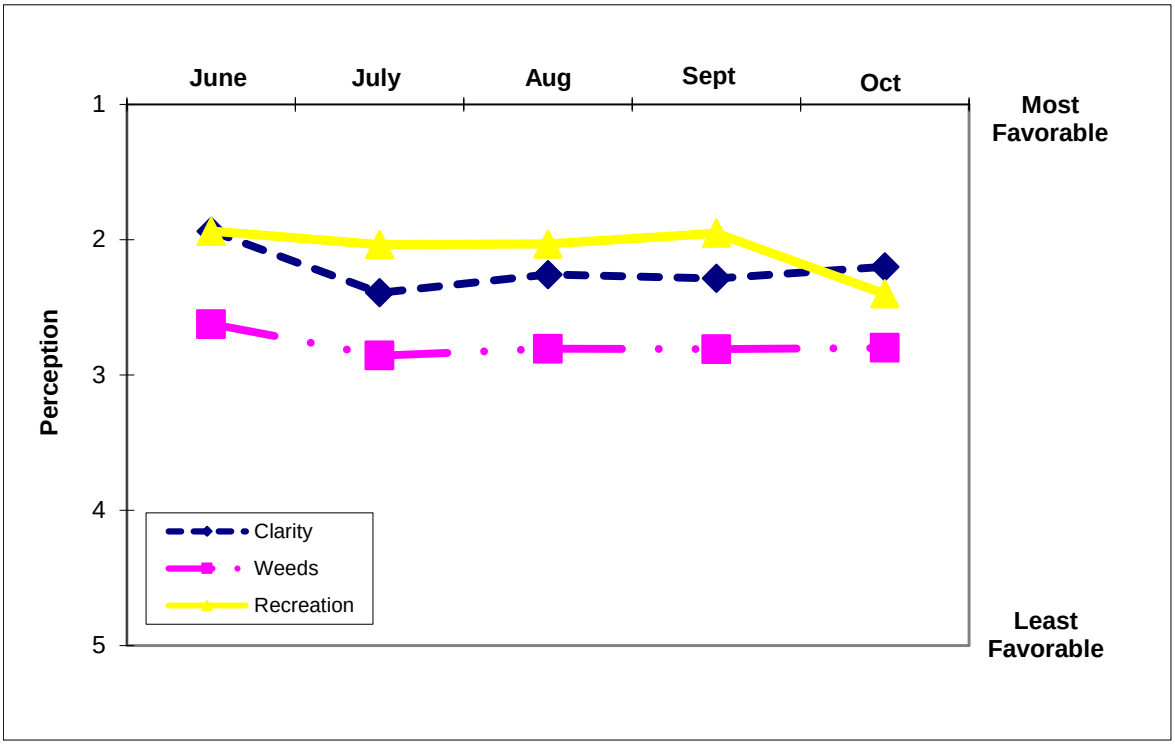
Time Series: Trophic Indicators, Typical Year (1988-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (1988-2015)



Appendix A- CSLAP Water Quality Sampling Results for Craine Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH3	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
37	Craine L	6/13/1988	8.2	2.65	1.5	0.012	1.10				5	8.51	357		6.22	
37	Craine L	6/22/1988	8.3	3.05	1.5	0.010	0.88				4	8.28	344		5.12	
37	Craine L	6/29/1988	8.3	3.32	1.5	0.009	0.71				7	8.17	251		2.44	
37	Craine L	7/7/1988	8.0	3.20	1.5	0.009	0.64				6	8.40	343		2.67	
37	Craine L	7/13/1988	7.9	3.67	1.5	0.017	0.56								2.29	
37	Craine L	7/20/1988	7.9	3.78	1.5	0.010	0.68				6	6.49	360		2.29	
37	Craine L	7/29/1988	8.0	3.09	1.5	0.025	0.62				4	8.31	330		5.03	
37	Craine L	8/4/1988	8.0	2.73	1.5	0.011	0.53				4	8.49	317		2.96	
37	Craine L	8/10/1988	8.1	2.35	1.5	0.012	0.32				5	8.30	300		4.66	
37	Craine L	8/17/1988	8.1	2.50	1.5	0.009	0.33				6	8.48	317		3.85	
37	Craine L	8/25/1988	8.0	2.39	1.5	0.012	0.25				6	8.38	312		4.07	
37	Craine L	9/7/1988	7.9	2.77	1.5	0.018	0.20				5	8.46	315		5.62	
37	Craine L	9/15/1988	8.0	2.99	1.5	0.009	0.01				5	8.52	316		2.44	
37	Craine L	9/22/1988	7.6	3.02	1.5	0.012	0.18				2	8.52	305		1.92	
37	Craine L	7/10/1989	7.7	2.68	1.5	0.015	1.10				3	8.37	351		2.29	
37	Craine L	7/17/1989	8.1	2.29	1.5	0.010	1.00				2	8.30	357		4.57	
37	Craine L	7/24/1989	8.2	2.21	1.5	0.012	0.90				7	8.48	332		2.90	
37	Craine L	7/31/1989	8.2	3.23	1.5	0.010	0.76				7	8.44	351		1.44	
37	Craine L	8/7/1989	7.6	2.97	1.5	0.008	0.72				3	8.45	344		3.03	
37	Craine L	9/4/1989	7.7	1.85	1.5	0.013	0.45				3	8.40	329		5.55	
37	Craine L	9/18/1989	7.8	3.08	1.5		0.38				5	8.28	322		2.35	
37	Craine L	9/25/1989	7.9	2.99	1.5	0.010	0.33				2	8.11	324		1.25	
37	Craine L	7/4/1990	8.0	2.47	1.5	0.011	1.40					8.33	329		2.43	
37	Craine L	8/8/1990	7.9	3.02	1.5	0.006	0.88				4	8.34	253		2.78	
37	Craine L	9/6/1990	8.0	2.96	1.5	0.006	0.56				5	8.34	273		3.27	
37	Craine L	9/27/1990	7.8	2.84	1.5	0.009	0.43				4	8.14	280		2.92	
37	Craine L	10/9/1990	7.5	3.17	1.5	0.009	0.41				7	8.35	273		3.19	
37	Craine L	7/3/1991	7.8	2.39	1.5	0.009	0.67				4	8.30	297		3.90	
37	Craine L	7/17/1991	7.3	2.61	1.5	0.010	0.54				6	8.25	230		4.73	
37	Craine L	8/1/1991	8.2	2.32	1.5	0.014	0.37				2	8.26	275		6.14	
37	Craine L	8/22/1991	7.3	2.82	1.5	0.007	0.25				8	8.49	261		5.58	
37	Craine L	8/29/1991	8.1	1.88	1.5	0.009	0.19				8	8.47	258		5.37	
37	Craine L	9/11/1991	8.5	1.68	1.5	0.010	0.10				7	8.43	252		7.29	
37	Craine L	9/25/1991	8.3	2.76	1.5	0.012	0.08				4	8.52	259		5.77	
37	Craine L	10/10/1991	8.3	2.88	1.5	0.011	0.08				6	8.49	271		4.39	
37	Craine L	7/15/1992	8.8	1.28	1.5	0.021	0.47					8.21	227			
37	Craine L	7/22/1992	8.3	1.25	1.5	0.017	0.42				5	8.33	220		13.90	
37	Craine L	8/5/1992	7.8	0.99	1.5	0.018	0.31				5	8.16	212		14.40	
37	Craine L	8/19/1992	8.0	1.78	1.5	0.014	0.36				7	8.34	214		6.09	
37	Craine L	9/1/1992	8.3	1.28	1.5	0.018	0.33				6	8.32	231		12.70	
37	Craine L	9/15/1992	8.2	1.52	1.5	0.014	0.33				9	8.37	237		5.92	
37	Craine L	9/30/1992	8.3	2.09	1.5	0.010	0.29				7	8.50	262		2.52	
37	Craine L	10/13/1992	7.4	1.98	1.5	0.009	0.27				6	8.47	268		5.10	
37	Craine L	6/28/1993	7.5	1.50	1.5	0.010	1.08				3	8.36	321		5.40	
37	Craine L	7/12/1993	8.2	2.16	1.5	0.008	0.83				2	8.46	305		4.01	
37	Craine L	7/26/1993	8.1	1.95	1.5	0.010	0.67				2	8.39			8.80	
37	Craine L	8/9/1993	7.9	2.64	1.5	0.009	0.51				4	8.47	292		6.97	
37	Craine L	8/23/1993	7.8	2.83	1.5	0.007	0.41				2	8.46	289		3.67	
37	Craine L	9/8/1993	7.8	2.67	1.5	0.007	0.30				4	8.42	288		5.65	
37	Craine L	9/20/1993	7.3	2.17	1.5	0.009	0.27				2	8.50	294		6.12	
37	Craine L	10/4/1993	7.8	1.77	1.5	0.010	0.21				3	8.38	304		10.70	
37	Craine L	6/3/1994	7.0	0.90	1.5	0.020	2.30				4	8.35	353		7.17	
37	Craine L	6/20/1994				0.011	2.30				2	8.38	324		2.67	
37	Craine L	7/8/1994	7.0	2.72		0.008	1.80				2	8.30	308		2.18	
37	Craine L	7/18/1994	7.0	2.72	1.5	0.006	1.70				3	8.35	308		3.96	
37	Craine L	8/4/1994	7.0	3.45	1.5	0.007	1.40				2	8.40	307		2.12	
37	Craine L	8/15/1994	6.8	2.97	1.5	0.005	1.20				2	8.40	306		3.65	
37	Craine L	9/19/1994	7.0	2.56	1.5	0.008	0.91				2	8.37	306		3.19	
37	Craine L	10/3/1994	8.1	1.80	1.5	0.011	0.80				5	8.38	315		6.46	
37	Craine L	7/1/1996	7.7	0.91	1.5	0.012	0.83				5	8.37	309		6.80	
37	Craine L	7/15/1996	8.1	2.10	1.5	0.010	0.99				1	5.72	296		6.90	
37	Craine L	7/29/1996	8.1	2.65	1.5	0.009	0.89				5	8.28	294		2.00	
37	Craine L	8/12/1996	8.0	3.15	1.5	0.011	0.76				5	7.12	310		3.90	
37	Craine L	8/26/1996	7.8	2.55	1.5	0.010	0.63				5	8.47	294		3.80	
37	Craine L	9/16/1996	9.2	1.85	1.5	0.008	0.48				5	8.35	289		12.50	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH3	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
37	Craine L	9/23/1996	9.2	1.71	1.5	0.012	0.43				5	8.43	286		12.90	
37	Craine L	10/9/1996	8.9	1.50	1.5	0.018	0.36				5	8.42	286		15.20	
37	Craine L	6/9/1997	9.2	4.70	1.5	0.011	1.48				5	8.34	349		0.64	
37	Craine L	6/30/1997	9.0	6.18	1.5	0.007	1.08				5	8.33	342		1.67	
37	Craine L	7/7/1997	8.8	5.80	1.5	0.008	0.91				5	8.26	341		1.26	
37	Craine L	7/22/1997	8.9	5.65	1.5	0.016	0.82				5	8.25	334		2.85	
37	Craine L	8/4/1997	8.8	2.80	1.5	0.008	0.65				5	8.43	325		3.48	
37	Craine L	8/18/1997	8.9	1.98	1.5	0.010	0.46				5	8.39	314		3.24	
37	Craine L	9/1/1997	8.8	2.27	1.5	0.009	0.34				4	8.35	312		3.06	
37	Craine L	9/15/1997	8.5	2.18	1.5	0.009	0.25				3	8.35	313		5.00	
37	Craine L	6/9/1998	8.8	2.73	1.5	0.010	1.12				4	8.44	344		8.44	
37	Craine L	6/23/1998	8.5	3.80	1.5		0.58				2	8.41	329		1.49	
37	Craine L	7/7/1998	9.3	2.38	1.5		0.72				2	8.34	320		4.00	
37	Craine L	7/20/1998	9.0	1.95	1.5		0.54				1	8.35	304		2.85	
37	Craine L	8/3/1998	8.7	1.74	1.5		0.40				2	8.36	304		2.25	
37	Craine L	8/18/1998	8.8	2.10	1.5						1	8.39	292		3.87	
37	Craine L	8/31/1998	9.2	2.68	1.5						5	8.32	293		3.45	
37	Craine L	9/15/1998	9.0	3.45	1.5	0.009					1	8.33	300		4.14	
37	Craine L	8/1/2000	8.7	2.35	1.5	0.014	0.8				1	8.11	314		3.05	
37	Craine L	8/14/2000	8.7	2.60	1.5	0.010	0.68				2	7.47	311		3.56	
37	Craine L	8/28/2000	9.5	2.45	1.5	0.011	0.63				5	8.46	301		3.17	
37	Craine L	9/10/2000	8.5	1.80	1.5	0.015	0.01				5	8.40	300		5.25	
37	Craine L	6/6/2001	9.0	1.79	1.5	0.016	0.92				5	8.31	335		2.08	
37	Craine L	6/18/2001	8.8	1.57	1.5		0.81				2	8.17	322		2.22	
37	Craine L	7/2/2001	8.7	1.17	1.5	0.013	0.64				1	7.98	308		4.75	
37	Craine L	7/19/2001	8.5	1.75	1.5	0.013	0.13				3	8.09	290		4.28	
37	Craine L	8/13/2001	8.3	3.28	1.5	0.009	0.25				1	8.46	277		2.62	
37	Craine L	8/27/2001	8.5	3.26	1.5	0.008	0.16				1	8.33	282		4.00	
37	Craine L	9/11/2001	8.2	1.81	1.5	0.010	0.11				6	8.53	276		5.80	
37	Craine L	9/21/2001	8.0	1.73	1.5	0.013	0.10				2	8.30	280		7.35	
37	Craine L	07/10/2009	8.5	7.70	1.2	0.009	0.44	0.06	0.64	155.47	69	7.71	213	54.3	0.73	
37	Craine L	07/19/2009	8.5	4.75	1.2	0.019	0.43	0.05	0.69	79.85	54	7.16	191		2.15	
37	Craine L	07/27/2009														
37	Craine L	08/03/2009	8.6	6.25	1.2	0.009	0.29	0.05	0.74	190.75	65	7.47	195			
37	Craine L	08/03/2009	grab	bloom												
37	Craine L	08/17/2009	9.5	5.55	1.5	0.015	0.14	0.02	0.48	70.13	9	8.49	215		2.40	
37	Craine L	08/17/2009	grab	bloom												
37	Craine L	08/31/2009	8.8	4.05		0.009	0.09	0.08	0.46	108.58	21	7.90	236	33.9	1.70	
37	Craine L	09/14/2009	8.9	3.96		0.015	0.17	0.10	0.50	74.53	19	7.93	332		0.10	
37	Craine L	09/27/2009				0.011	0.10	0.16	0.54	106.83	10	7.45	227		1.00	
37	Craine L	10/10/2009				0.013	0.11	0.20	0.60	105.95	12	7.76	228		0.30	
37	Craine L	5/26/2010	9.0	5.10	1.5	0.012	0.26	0.08			7	8.31	367	58.1	1.10	
37	Craine L	6/10/2010	8.8	4.35	1.5	0.014	0.18	0.05			1	8.34	370		0.30	
37	Craine L	7/1/2010	9.0	2.25	1.5	0.012	0.04	0.01	0.37	68.00	11	8.27	293		2.00	
37	Craine L	7/14/2010	8.7	1.75	1.5	0.013	0.01	0.01	0.41	69.38	5	8.40	266		2.00	
37	Craine L	7/28/2010	8.8	2.23	1.5	0.012	0.01	0.02	0.35	66.38	12	8.27	262	32.9	2.10	
37	Craine L	8/11/2010	9.0	2.83	1.5	0.012	0.02	0.02	0.37	69.60	7	8.39	272		1.70	
37	Craine L	8/11/2010	grab	bloom												
37	Craine L	8/11/2010	grab	bloom												
37	Craine L	8/26/2010	8.9	1.85	1.5	0.017	0.01	0.05	0.61	80.84	12	8.08	277		2.20	
37	Craine L	9/7/2010	8.7	2.23	1.5	0.012	0.01	0.02	0.39	73.65	17	8.20	290		0.80	
37	Craine L	9/7/2010	grab	bloom		0.013			0.87	144.50	25	7.69	299	62.8	1.90	
37	Craine L	6/21/2011	9.3	2.80	1.5	0.010	0.45	0.04	0.72	156.40	15	7.61	289		0.90	
37	Craine L	7/4/2011	9.4	2.65	1.5	0.010	0.19	0.04	0.69	155.57	6	7.51	296			
37	Craine L	7/20/2011	8.7	3.20	1.5											
37	Craine L	7/20/2011	grab	bloom		0.013	0.16	0.07	0.70	122.05	50	7.43	259			
37	Craine L	8/15/2011	9.2	1.40	1.5	0.010	0.03	0.10	0.50	110.44	18	7.38	217	39.4	0.40	
37	Craine L	8/30/2011	8.9	2.75	1.5											
37	Craine L	8/30/2011	grab	bloom		0.008	0.09	0.04	0.48	126.43	37	7.30	290			
37	Craine L	9/12/2011	9.4	1.70	1.8										4.20	
37	Craine L	9/20/2011	8.8	3.45	1.5	0.012	0.35	0.08	0.77	141.90	52	7.17	287		1.20	
37	Craine L	9/20/2011	grab	bloom												
37	Craine L	10/10/2011	grab	bloom		0.010	0.77	0.19	1.14	243.71	67	7.14	271		1.00	
37	Craine L	10/10/2011	8.9	4.50	1.5											
37	Craine L	6/5/2012	9.1	3.80	1.5	0.012	0.73	0.06	1.52	286.19	53	7.31	302	57.7	1.20	
37	Craine L	6/5/2012			bloom											
37	Craine L	6/17/2012	8.5	6.65	1.5	0.011	0.68	0.06	1.11	66.72	30	7.21	303		<LOD	
37	Craine L	7/2/2012	9.0	4.05	1.5	0.020	0.57	0.03	0.82	65.84	28	7.67	278		2.50	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH3	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
37	Craine L	7/2/2012			bloom											
37	Craine L	7/2/2012			bloom											
37	Craine L	7/16/2012	8.6	2.20	1.5	0.013	0.22	0.03	0.68	28.95	21	8.13	279		0.30	
37	Craine L	7/29/2012	9.4	2.55	1.5	0.012	0.16	0.04	0.68	120.82	42	7.75	270	35.3	1.30	
37	Craine L	7/29/2012			bloom											
37	Craine L	8/11/2012	8.6	3.05	1.5	0.010	0.09	0.06	0.56	121.54	29	7.81	279		2.00	
37	Craine L	8/26/2012	9.1	3.35	1.5	0.014	0.04	0.07	0.47	75.09	38	7.82	265		0.40	
37	Craine L	8/26/2012			bloom											
37	Craine L	9/9/2012	9.0	2.70	1.5	0.016	0.01	0.07	0.48	67.97	7	7.46	246		1.30	
37	Craine L	5/27/2013	9.5	4.28	1.5	0.009	1.50	0.05	2.00	468.79	31	7.58	295	57.8	0.40	
37	Craine L	6/10/2013	9.2	5.75	1.5	0.008			2.02	529.31	25	7.40	257		1.00	
37	Craine L	6/24/2013	8.6	6.35	1.5	0.007	1.34	0.05	1.65	517.00	12	7.55	274		0.10	
37	Craine L	7/8/2013	9.2	4.10	1.5	0.012			1.40	266.13	14	7.66	276		0.30	
37	Craine L	7/22/2013	9.2	2.55	1.5	0.011	1.04	0.02	1.28	268.61	20	7.48	299		0.70	
37	Craine L	8/5/2013	9.1	2.95	1.5	0.010			1.48	342.29	22	7.70	278		3.00	
37	Craine L	8/19/2013	8.9	3.90	1.5	0.012	0.82	0.04	1.18	218.34	16	7.72	282		1.50	
37	Craine L	5/28/2013			shore bloom											
37	Craine L	7/16/2013			shore bloom											
37	Craine L	7/16/2013			shore bloom											
37	Craine L	6/11/2013			shore bloom											
37	Craine L	8/19/2013			shore bloom											
37	Craine L	8/5/2013			shore bloom											
37	Craine L	6/25/2013			shore bloom											
37	Craine L	7/8/2013			shore bloom											
37	Craine L	7/22/2013			shore bloom											
37	Craine L	9/1/2013			shore bloom											
37	Craine L	9/1/2013	9.1	3.85	1.5	0.022			1.09	107.99	19	7.51	273		2.90	
37	Craine L	6/2/2015	9.3	4.40	1.5	0.014	0.54	0.10	1.12	80.00	9	7.46	311	14.3	0.60	
37	Craine L	6/15/2015	8.5	2.00	1.5	0.018			1.07	59.34	4	7.45	301		4.80	
37	Craine L	7/1/2015	8.5	2.10	1.5	0.007	0.36	0.06	0.90	129.00	11	7.55	334		3.30	15.1
37	Craine L	7/13/2015	8.0	2.30	1.5	0.010			0.68	66.12	7	7.58	263		1.90	
37	Craine L	7/27/2015	8.5	2.00	1.5	0.010	0.14	0.03	0.58	59.38	6	7.59	257	18.7	2.90	
37	Craine L	8/10/2015	7.7	2.40	1.5	0.010			0.66	64.08	9	7.98	278		1.60	
37	Craine L	8/25/2015	8.9	1.70	1.5	0.009	0.03	0.05	0.65	70.11	7	8.00	229		3.80	13.2
37	Craine L	7/29/2015														
37	Craine L	7/29/2015														
37	Craine L	8/25/2015														
37	Craine L	9/9/2015														
37	Craine L	9/7/2015	9.4	1.70	1.5	0.012			0.42	33.55	9	8.00	251		1.90	
37	Craine L	6/20/1994				0.048										
37	Craine L	7/18/1994	7.0			0.044										
37	Craine L	8/15/1994	6.8			0.018										
37	Craine L	10/3/1994	8.1		7.5	0.024										
37	Craine L	7/1/1996				0.015										
37	Craine L	7/29/1996	8.0	3.10		0.071										
37	Craine L	8/26/1996				0.042										
37	Craine L	9/23/1996				0.140										
37	Craine L	6/9/1997				0.062										
37	Craine L	7/7/1997				0.044										
37	Craine L	8/4/1997				0.035										
37	Craine L	9/15/1997				0.026										
37	Craine L	9/15/1998				0.012										
37	Craine L	7/7/1998				0.063										
37	Craine L	8/3/1998				0.045										
37	Craine L	8/31/1998				0.105										
37	Craine L	07/10/2009			6.7	0.025		0.31								
37	Craine L	07/19/2009			7.3	0.025		0.65								
37	Craine L	08/03/2009			7.4	0.038		0.84								
37	Craine L	08/17/2009				0.228		2.58								
37	Craine L	08/31/2009			7.0	0.027		0.55								
37	Craine L	09/14/2009				0.549		5.83								
37	Craine L	09/27/2009				0.013		0.17								
37	Craine L	10/10/2009				0.025		0.26								
37	Craine L	5/26/2010	9.0		8.0	0.050		0.47								
37	Craine L	6/10/2010	8.8		8.0	0.068		0.58								
37	Craine L	7/1/2010	9.0		9.0	0.057		0.45								
37	Craine L	7/14/2010	8.7		8.0	0.019		0.20								
37	Craine L	7/28/2010	8.8		8.0	0.030		0.34								

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH3				NO2				
37	Craine L	8/11/2010	9.0		8.5	0.030		0.37								
37	Craine L	8/26/2010	8.9		8.0	0.015		0.10								
37	Craine L	9/7/2010	8.7		8.0	0.068		0.96								
37	Craine L	6/21/2011				0.042		0.50				0.01				
37	Craine L	7/4/2011				0.014		0.07				0.01				
37	Craine L	7/20/2011				0.032		0.33				0.01				
37	Craine L	8/15/2011			9.0	0.035		0.81				0.01				
37	Craine L	8/30/2011				0.050		1.28				0.01				
37	Craine L	9/12/2011			9.0	0.012		0.07				0.01				
37	Craine L	9/20/2011			9.0	0.050		1.75				0.01				
37	Craine L	10/10/2011			9.0	0.098		4.07				0.01				
37	Craine L	6/5/2012			8.5	0.024		0.34				0.01				
37	Craine L	6/17/2012			6.7	0.037		0.06				0.01				
37	Craine L	7/2/2012			7.5	0.028		0.07				0.01				
37	Craine L	7/16/2012			8.0	0.052		0.03				0.01				
37	Craine L	7/29/2012			9.0	0.079		2.78				0.00				
37	Craine L	8/11/2012			8.6	0.095		1.05				0.00				
37	Craine L	8/26/2012			8.5	0.166		4.64				0.00				
37	Craine L	9/9/2012			8.5	0.143		3.73				0.00				
37	Craine L	5/27/2013			8.0	0.062										
37	Craine L	6/10/2013			8.0	0.020										
37	Craine L	6/24/2013			8.0	0.027		0.32								
37	Craine L	7/8/2013			8.5	0.037										
37	Craine L	7/22/2013			8.5	0.019		0.41								
37	Craine L	8/5/2013			8.5	0.037										
37	Craine L	8/19/2013			8.0	0.084		0.83								
37	Craine L	9/1/2013			8.5	0.087										
37	Craine L	6/2/2015			8.8	0.028		2.29								
37	Craine L	6/16/2015			7.5	0.035										
37	Craine L	7/1/2015			7.5	0.103		1.90								
37	Craine L	7/13/2015			7.5	0.061										
37	Craine L	7/27/2015			8.0	0.082		1.03								
37	Craine L	8/10/2015			7.0	0.039										
37	Craine L	8/25/2015			8.0	0.053		4.48								
37	Craine L	9/7/2015			8.5	0.034										

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
37	Craine L	6/13/1988	epi	29	23															
37	Craine L	6/22/1988	epi	30	25															
37	Craine L	6/29/1988	epi	18	21															
37	Craine L	7/7/1988	epi	27	25															
37	Craine L	7/13/1988	epi	27	26															
37	Craine L	7/20/1988	epi	24	25															
37	Craine L	7/29/1988	epi	27	26															
37	Craine L	8/4/1988	epi	29	28															
37	Craine L	8/10/1988	epi	29	27															
37	Craine L	8/17/1988	epi	24	25															
37	Craine L	8/25/1988	epi	25	21															
37	Craine L	9/7/1988	epi	15	18															
37	Craine L	9/15/1988	epi	9	16															
37	Craine L	9/22/1988	epi	15	17															
37	Craine L	7/10/1989	epi	28	24															
37	Craine L	7/17/1989	epi	26	23															
37	Craine L	7/24/1989	epi	25	25															
37	Craine L	7/31/1989	epi	23	24															
37	Craine L	8/7/1989	epi	14	21															
37	Craine L	9/4/1989	epi	16	20															
37	Craine L	9/18/1989	epi	16	18															
37	Craine L	9/25/1989	epi	12	15															
37	Craine L	7/4/1990	epi	24	23															
37	Craine L	8/8/1990	epi	21	23															
37	Craine L	9/6/1990	epi	25	24															
37	Craine L	9/27/1990	epi	15	15															
37	Craine L	10/9/1990	epi	22	17															
37	Craine L	7/3/1991	epi	20	22															
37	Craine L	7/17/1991	epi	19	22															
37	Craine L	8/1/1991	epi	27	24															
37	Craine L	8/22/1991	epi	25	23															
37	Craine L	8/29/1991	epi	19	23															
37	Craine L	9/11/1991	epi	16	21															
37	Craine L	9/25/1991	epi	12	15															
37	Craine L	10/10/1991	epi	21	16															
37	Craine L	7/15/1992	epi	22	24															
37	Craine L	7/22/1992	epi	23	22	3	3	4	12											
37	Craine L	8/5/1992	epi	28	22	3	3	2	15											
37	Craine L	8/19/1992	epi	16	19	2	3	2	5											
37	Craine L	9/1/1992	epi	15	18	3	3	2	5											
37	Craine L	9/15/1992	epi	25	21	3	3	2												
37	Craine L	9/30/1992	epi	8	13	3	3	3	5											
37	Craine L	10/13/1992	epi	13	18	2	3	3	5											
37	Craine L	6/28/1993	epi	21		3	3	2												
37	Craine L	7/12/1993	epi	23	27	3	3	2	2											
37	Craine L	7/26/1993	epi	26	23	3	3	3	25											
37	Craine L	8/9/1993	epi	18	23	2	3	2	2											
37	Craine L	8/23/1993	epi	20	22	2	3	2	2											
37	Craine L	9/8/1993	epi	13	22	2	3	2	5											
37	Craine L	9/20/1993	epi	8	12	3	3	2	5											
37	Craine L	10/4/1993	epi	10	10	3	3	3	5											
37	Craine L	6/3/1994	epi	13	18	3	1	2												
37	Craine L	6/20/1994	epi																	
37	Craine L	7/8/1994	epi	23	25	2	3	2												
37	Craine L	7/18/1994	epi	26	25	2	3	2	5											
37	Craine L	8/4/1994	epi	29	25	1	3	1	5											
37	Craine L	8/15/1994	epi	16	18	2	3	2	5											
37	Craine L	9/19/1994	epi	15	19	2	3	2												
37	Craine L	10/3/1994	epi	12	15	2	3	2												
37	Craine L	7/1/1996	epi	26	22															
37	Craine L	7/15/1996	epi	23	23	2	3	2	5											

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
37	Craine L	7/29/1996	epi	21	23	2	3	1												
37	Craine L	8/12/1996	epi	19	23	1	3	1												
37	Craine L	8/26/1996	epi	24	24	2	3	1												
37	Craine L	9/16/1996	epi	17	20	2	3	1												
37	Craine L	9/23/1996	epi	11	12	2	3	2	5											
37	Craine L	10/9/1996	epi	10	13	2	2	2	5											
37	Craine L	6/9/1997	epi	22	19	1	3	1	6											
37	Craine L	6/30/1997	epi	27	24	1	3	1												
37	Craine L	7/7/1997	epi	22	23	1	3	1												
37	Craine L	7/22/1997	epi	25	24	1	3	1												
37	Craine L	8/4/1997	epi	24	24	2	3	2												
37	Craine L	8/18/1997	epi	20	23	2	3	2												
37	Craine L	9/1/1997	epi	23	22	2	3	2												
37	Craine L	9/15/1997	epi	17	19	2	3	2												
37	Craine L	6/9/1998	epi	17	16	2	1	2												
37	Craine L	6/23/1998	epi	27	27	1	3	2	5											
37	Craine L	7/7/1998	epi	21	23	2	3	2	5											
37	Craine L	7/20/1998	epi	26	24	2	2	2												
37	Craine L	8/3/1998	epi	22	24	2	2	2												
37	Craine L	8/18/1998	epi	25	24	3	3	2												
37	Craine L	8/31/1998	epi	23	24	2	3	2												
37	Craine L	9/15/1998	epi	27	22	2	3	2												
37	Craine L	8/1/2000	epi	22	23	2	3	2												
37	Craine L	8/14/2000	epi	19	23	2	2	2												
37	Craine L	8/28/2000	epi	27	24	3	2	2												
37	Craine L	9/10/2000	epi	23	21	2	2	2												
37	Craine L	6/6/2001	epi	20	18	3	3	2	5											
37	Craine L	6/18/2001	epi	22	23	2	2	2												
37	Craine L	7/2/2001	epi	18	22	3	2	2	0											
37	Craine L	7/19/2001	epi	28	24	2	3	2	0											
37	Craine L	8/13/2001	epi	26	26	2	2	2												
37	Craine L	8/27/2001	epi	23	24	2	1	2												
37	Craine L	9/11/2001	epi	21	22	2	2	2												
37	Craine L	9/21/2001	epi	26	20	2	2	2												
37	Craine L	07/10/2009	epi	25	22	1	1	2	0											
37	Craine L	07/19/2009	epi	22	23	3	3	2	5											
37	Craine L	07/27/2009	epi											1.21						
37	Craine L	08/03/2009	epi	21	25	2	3	2	0					31.51						
37	Craine L	08/03/2009	bloom											518.40						
37	Craine L	08/17/2009	epi	30	27	3	3	2	0					1.82						
37	Craine L	08/17/2009	bloom											154.96						
37	Craine L	08/31/2009	epi	25	23	3	3	3	0											
37	Craine L	09/14/2009	epi	23	22	2	3	2	0			12.26		0.49						
37	Craine L	09/27/2009	epi									7.468								
37	Craine L	10/10/2009	epi									5.659		0.02						
37	Craine L	5/26/2010	epi	31	26	2	3	1	0	4	0									
37	Craine L	6/10/2010	epi	22	21	2	3	2	0	4	4									
37	Craine L	7/1/2010	epi	23	24	3	3	2	0	7	0									
37	Craine L	7/14/2010	epi	26	27	3	3	2	8	4	4									
37	Craine L	7/28/2010	epi	29	26	3	3	2	0	4	0									
37	Craine L	8/11/2010	epi	28	27	3	3	2	3	4	4	33.00		0.11						
37	Craine L	8/11/2010	bloom									9994.00		316.23						
37	Craine L	8/11/2010	bloom									2321.00		80.39						
37	Craine L	8/26/2010	epi	22	23	2	3	3	2	4	4	57.39								
37	Craine L	9/7/2010	epi	26	23	3	3	2	0	6	6	90.00		0.08						
37	Craine L	9/7/2010	bloom									42.70	3.10							
37	Craine L	6/21/2011	epi	30	26	3	3	2	0	0	0	28.10	2.50							
37	Craine L	7/4/2011	epi	30	26	2	3	2	8	4	4	22.50	2.00	0.75	<0.500	<0.1				
37	Craine L	7/20/2011	epi	28	27	3	3	2	8	4	4									
37	Craine L	7/20/2011	bloom									53.40	3.50	0.15	<0.500	<0.1				
37	Craine L	8/15/2011	epi	21	25	3	3	2	5	4	4	29.70	2.20							

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
37	Craine L	8/15/2011	epi											0.30						
37	Craine L	8/30/2011	epi	23	22	2	3	2	0	0	4	34.70	7.00	196.97	<0.900	<0.1				
37	Craine L	8/30/2011	bloom																	
37	Craine L	9/12/2011	epi	25	28	3	2	2	0	0	0									
37	Craine L	9/20/2011	epi	20	21	2	3	1	0	0	0	25.10	2.80							
37	Craine L	9/20/2011	bloom											184.25						
37	Craine L	9/26/2011	epi											0.16						
37	Craine L	9/26/2011	bloom											631.32						
37	Craine L	10/10/2011	bloom																	
37	Craine L	10/10/2011	epi	22	18	2	3	2	0	4		8.90	2.40							
37	Craine L	10/10/2011	epi											0.16						
37	Craine L	10/10/2011	bloom											131.36						
37	Craine L	10/10/2011	bloom											153.80						
37	Craine L	6/5/2012	epi	15	20	2	3	2	0	4		15.00	0.20	<0.30	<0.417		1.03	0.50	F	
37	Craine L	6/5/2012	bloom											3.02	<0.715		4.10	2.60	F	
37	Craine L	6/17/2012	epi	24	25	1	3	2	2	0	34	0.20	0.20	<0.30	<0.413		0.66	0.50	F	
37	Craine L	7/2/2012	epi	25		3	3	2	0	4	4	7.60	0.30	1.84	<0.392				C	
37	Craine L	7/2/2012	bloom											83.31	<0.820		131.77	80.65	A	
37	Craine L	7/2/2012	bloom											87.28	<0.846		161.86	114.83		
37	Craine L	7/16/2012	epi	26	25	3	3	2	0	4	4	9.10	0.40	1.84	<0.392		3.72	2.81	F	
37	Craine L	7/29/2012	epi	26	26	3	3	2	0	4	4	11.60	0.40	<0.30	<0.328		3.30	2.20	ABC	
37	Craine L	7/29/2012	bloom											51.64	<0.657		209.80	168.50		
37	Craine L	8/11/2012	epi	26	25	2	3	2	0	4	4			<0.30	<0.292		2.94	1.85	AB	
37	Craine L	8/26/2012	epi	27	24	3	3	2	8	4	4	5.50	0.50				1.98	1.00	ABC	
37	Craine L	8/26/2012	bloom											9.94	<1.038		21738.00	21738.00		
37	Craine L	9/9/2012	epi	19	24	2	3	2	0	4	4	10.80	0.80	<0.30	<0.642		3.49	1.00	I	
37	Craine L	9/9/2012	bloom											36.85	<1.101		207.27	193.83		
37	Craine L	5/27/2013	epi	19	18	2	2	1	0	4	4	1.70	0.50	<0.30	<0.440		0.30	0.00		I
37	Craine L	6/10/2013	epi	17	20	2	2	3	58	4	45	9.70	0.90	<0.30	<0.440		1.80	0.90	I	BC
37	Craine L	6/24/2013	epi	27	25	2	3	2	0	0	4	0.60	0.40	<0.30	<0.410		0.30	0.00	I	I
37	Craine L	7/8/2013	epi	22	27	2	3	2	8	4	4	1.80	0.80	0.43	<0.510		0.80	0.00	BC	BC
37	Craine L	7/22/2013	epi	25	28	3	3	3	3	4	4	7.20	2.90	<0.30	<0.370		3.80	0.00	BC	B
37	Craine L	8/5/2013	epi	20	24	3	3	3	8	4	4	6.10	1.60	<0.30	<0.390		2.50	0.20		BC
37	Craine L	8/19/2013	epi	22	10	3	3	3		4	4	3.60	1.90	<0.30	<0.510		3.90	0.10	I	BC
37	Craine L	5/28/2013	bloom											246.29	<3.570		128.70	56.00		
37	Craine L	7/16/2013	bloom											50.83	<0.750		261.20	170.40		be
37	Craine L	7/16/2013	bloom											10.33	<0.750		63.00	56.70		be
37	Craine L	6/11/2013	bloom											<0.60	<0.830		548.00	522.00		
37	Craine L	8/19/2013	bloom											177.88	<1.020		1348.00	1191.50		bc
37	Craine L	8/5/2013	bloom											11.93	<0.800		113.30	100.30		bc
37	Craine L	6/25/2013	bloom											8.25	<0.740		123.30	60.80		b
37	Craine L	7/8/2013	bloom											24.19	<1.010		1182.30	1182.30		ab
37	Craine L	7/22/2013	bloom											25.89	<0.750		163.30	140.50		
37	Craine L	9/1/2013	bloom											2.58	<1.150		826.80	753.80		bc
37	Craine L	9/1/2013	epi	36	26	2	3	2	0	4	4	5.10	1.80	<0.30	<0.570		2.50	0.30	I	
37	Craine L	6/2/2015	epi	13	21	1	3	2	0	0	34	3.60	0.05	<0.56	<0.119	<0.706	0.60	0.00	I	I
37	Craine L	6/15/2015	epi	23	24	2	3	2	5	0	0	9.60	1.00	<0.55	<0.018	<0.139	4.34	0.00	I	I
37	Craine L	7/1/2015	epi	19	22	2	3	2	0	0	0	11.30	0.30	<0.88	<0.010	<0.000	2.77	0.87	I	I
37	Craine L	7/13/2015	epi	20	25	2	3	2	5	4	0	9.80	0.30	<0.76	<0.005	<0.028	1.49	0.45	I	CE
37	Craine L	7/27/2015	epi	23	26	3	3	2	0	4	0	8.40	0.40	<0.19	<0.002	<0.014	1.90	0.82	F	I
37	Craine L	8/10/2015	epi	24	25	2	3	2	0	0	7	9.60	0.40	<0.44	<0.002	<0.014	2.04	0.42	I	I
37	Craine L	8/25/2015	epi	24	25	2	3	2	0	4	4	0.05	0.60	<0.21	<0.003	<0.010	4.78	2.46	CE	CH
37	Craine L	7/29/2015	bloom											30.63	<0.004	<0.028	172.25	126.33		c
37	Craine L	7/29/2015	bloom											<1.13	<0.008	<0.052	3.53	0.20		c
37	Craine L	8/25/2015	bloom											<0.57	1.07	<0.048	77.96	66.11		c
37	Craine L	9/9/2015	bloom											0.83	<0.008	<0.024	25.07	10.32		cg
37	Craine L	9/7/2015	epi	31	26	2	3	2	8	4	4			<0.37	<0.012	<0.031			I	BC
37	Craine L	6/20/1994	hypo		11															
37	Craine L	10/3/1994	hypo		13															
37	Craine L	07/10/2009	hypo		5															
37	Craine L	07/19/2009	hypo		6															

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
37	Craine L	08/03/2009	hypo		5															
37	Craine L	08/17/2009	hypo		5															
37	Craine L	08/31/2009	hypo		5															
37	Craine L	09/14/2009	hypo		5															
37	Craine L	09/27/2009	hypo		5															
37	Craine L	6/10/2013	hypo		13															
37	Craine L	6/24/2013	hypo		22															
37	Craine L	7/8/2013	hypo		23															
37	Craine L	7/22/2013	hypo		24															
37	Craine L	8/5/2013	hypo		19															
37	Craine L	8/19/2013	hypo		20															
37	Craine L	9/1/2013	hypo		24															
37	Craine L	6/16/2015	hypo		22															
37	Craine L	7/1/2015	hypo		14															
37	Craine L	7/13/2015	hypo		18															
37	Craine L	7/27/2015	hypo		20															
37	Craine L	8/10/2015	hypo		17															
37	Craine L	8/25/2015	hypo		17															
37	Craine L	9/7/2015	hypo		26															

Legend Information

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

Appendix B: Priority Waterbody Listing for Craine Lake

Earlville/Craine Lake (0602-0108) NoKnownImpct

Waterbody Location Information

Revised: 07/08/2009

Water Index No: SR- 44-76-P146
Hydro Unit Code: 02050102/020 **Str Class:** C
Waterbody Type: Lake (Unknown Trophic)
Waterbody Size: 27.4 Acres
Seg Description: entire lake

Drain Basin: Susquehanna River
Chenango River
Reg/County: 7/Madison Co. (27)
Quad Map: HAMILTON (J-18-3)

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
NO USE IMPAIRMNT		

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

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

Resolution/Management Information

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

Further Details

Water Quality Sampling
Earlville (aka Craine) Lake has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1988 and continuing through 2001. An Interpretive Summary report of the findings of this sampling was published in 2005. These data indicate that the lake continues to be best characterized as mesotrophic, or moderately productive. Phosphorus levels in the lake only rarely exceed the state guidance values indicating impacted/stressed recreational uses. Corresponding transparency measurements routinely exceed the recommended minimum for swimming beaches. Measurements of pH are occasionally high but typically fall within the state water quality range of 6.5 to 8.5. The lake water is weakly colored, and color does not appear to limit lake clarity. (DEC/DOW, BWAM/CSLAP, May 2002)

Recreational Assessment
Public perception of the lake and its uses is also evaluated as part of the CSLAP program. This assessment indicates recreational suitability of the lake to be very favorable. The recreational suitability of the lake is described most frequently as "excellent" to "slightly" impacted. The lake itself is most often described as "not quite crystal clear," an assessment that is consistent with measured water quality characteristics. Assessments have noted that rooted aquatic plants are visible but do not typically grow to the lake surface, and are not frequently cited as impacting recreational uses.

(DEC/DOW, BWAM/CSLAP, May 2002)

Lake Uses

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

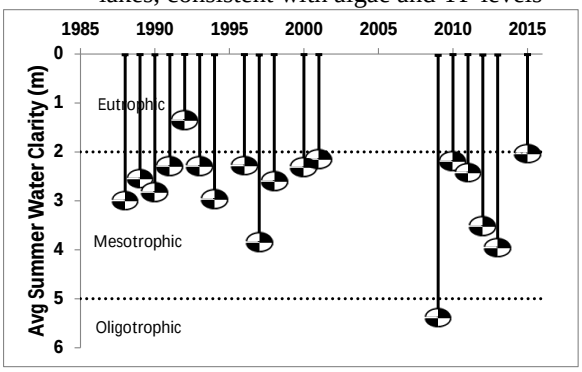
Segment Description

This segment includes the total area of the entire lake.

Appendix C- Long Term Trends: Craine Lake

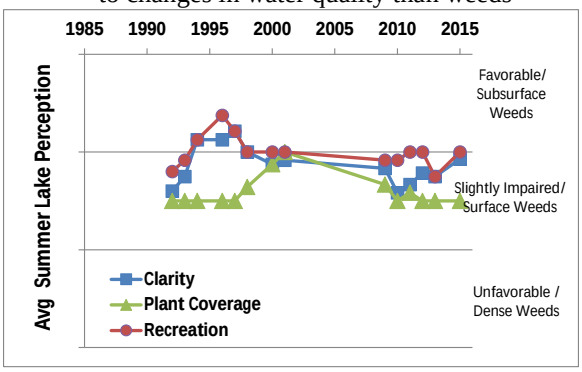
Long Term Trends: Water Clarity

- No trends apparent; clarity highly variable
- Most readings typical of *mesoeutrophic* lakes, consistent with algae and TP levels



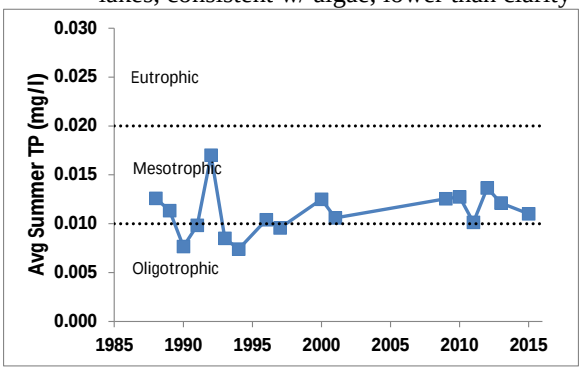
Long Term Trends: Lake Perception

- Recent years more weeds, improved clarity
- Recreational perception more closely linked to changes in water quality than weeds



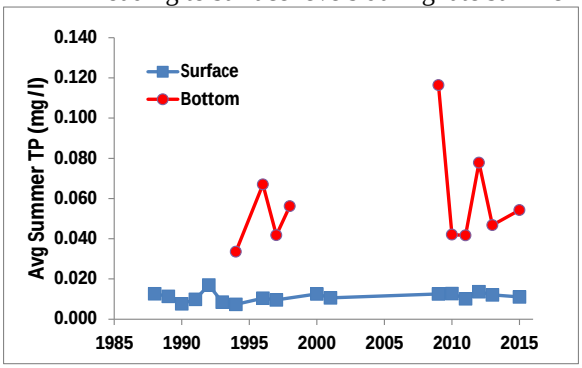
Long Term Trends: Phosphorus

- Increasing TP last two decades
- Most readings typical of *mesoligotrophic* lakes, consistent w/ algae, lower than clarity



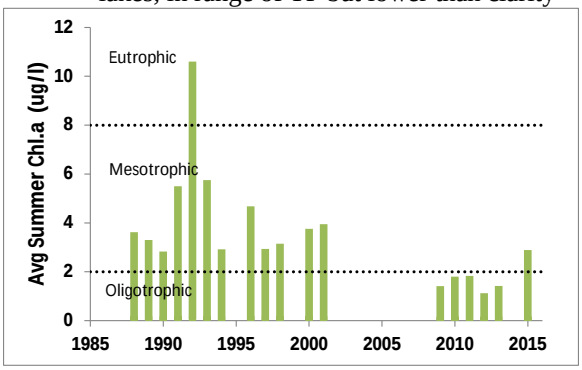
Long Term Trends: Bottom Phosphorus

- At times much higher bottom TP
- Bottom TP may indicate some to high TP loading to surface levels during late summer



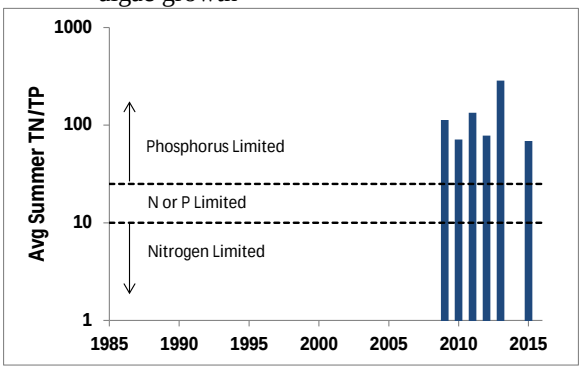
Long Term Trends: Chlorophyll a

- Drop since early 1990s, but no clear trend
- Most readings typical of *mesoligotrophic* lakes, in range of TP but lower than clarity



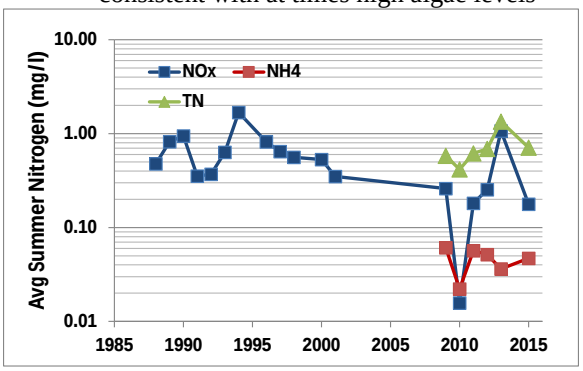
Long Term Trends: N:P Ratio

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



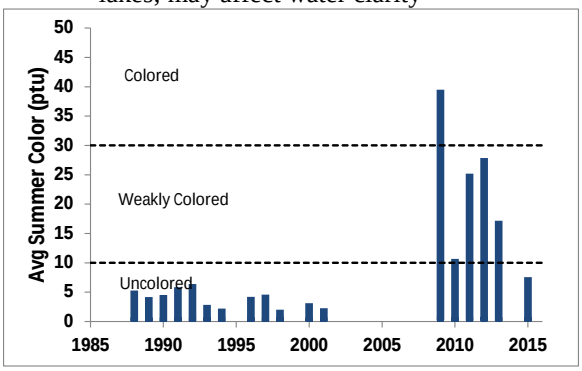
Long Term Trends: Nitrogen

- Highly variable TN and NOx
- Occasionally elevated NOx and TN readings consistent with at times high algae levels



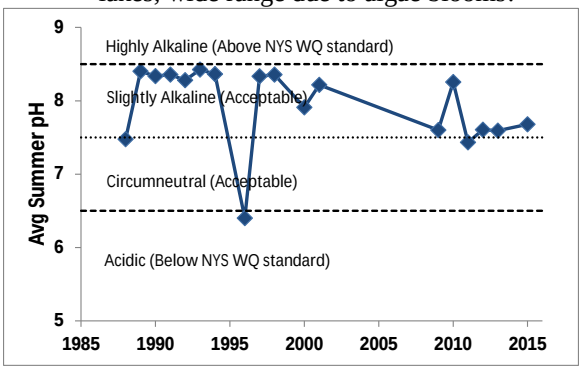
Long Term Trends: Color

- Higher color since 2000s due to lab change
- Most readings typical of *moderately colored* lakes; may affect water clarity



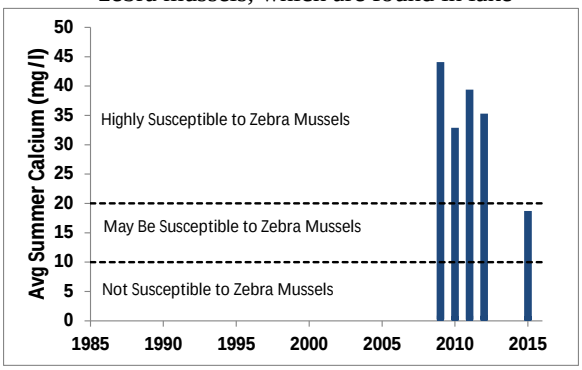
Long Term Trends: pH

- Highly variable but generally decreasing pH
- Most readings typical of *slightly alkaline* lakes; wide range due to algae blooms?



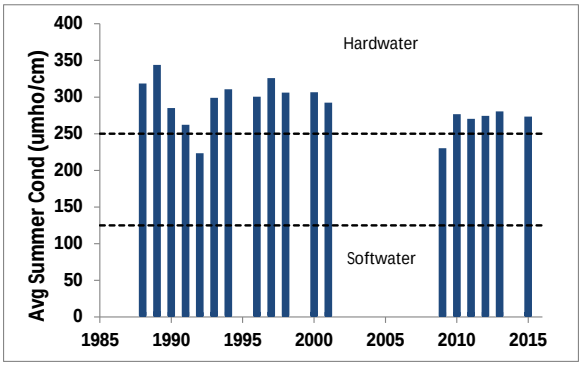
Long Term Trends: Calcium

- Slight decrease since late 2000s
- Most readings indicate high susceptibility to zebra mussels, which are found in lake



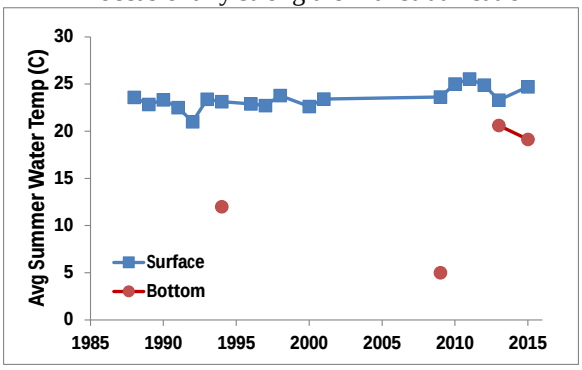
Long Term Trends: Conductivity

- No trends apparent but lower recently
- Most readings typical of lakes with *hardwater* lakes



Long Term Trends: Water Temperature

- Surface temperatures increasing slightly
- Much colder (at times) bottom T indicate occasionally strong thermal stratification



Appendix D:
Algae Testing Results from SUNY ESF Study

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

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

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

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

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

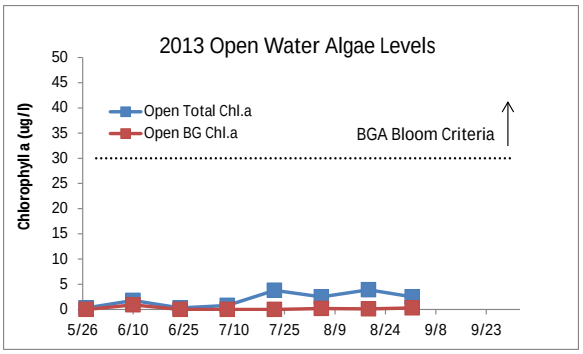


Figure D1:
2013 Open Water Total and BGA Chl.a

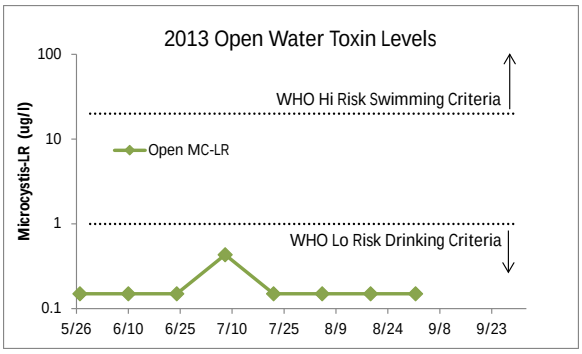


Figure D2:
2013 Open Water Microcystin-LR

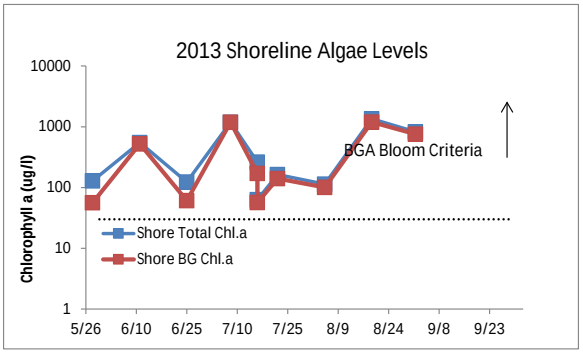


Figure D3:
2013 Shoreline Total and BGA Chl.a

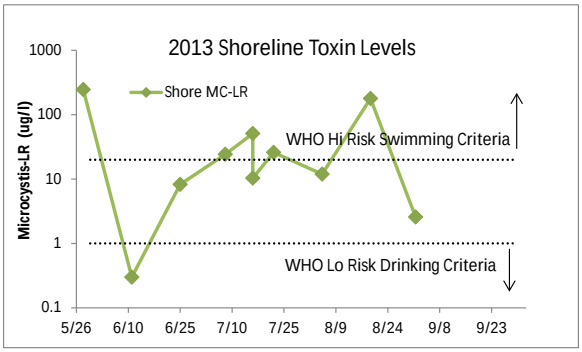


Figure D4:
2013 Shoreline Microcystin-LR

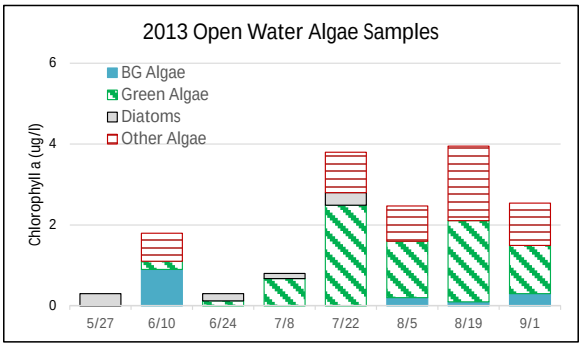


Figure D5:
2013 Open Water Algae Types

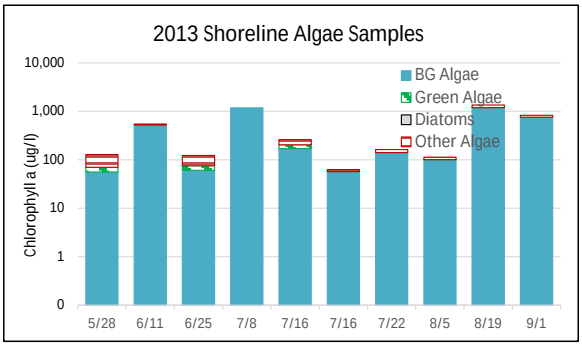


Figure D6:
2013 Shoreline Algae Types

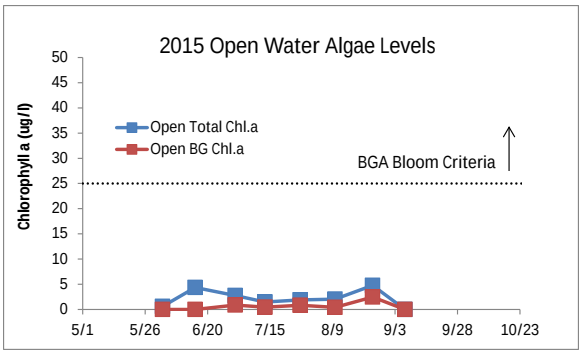


Figure D7:
2015 Open Water Total and BGA Chl.a

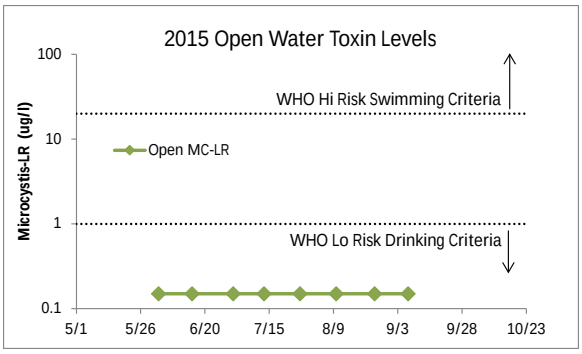


Figure D8:
2015 Open Water Microcystin-LR

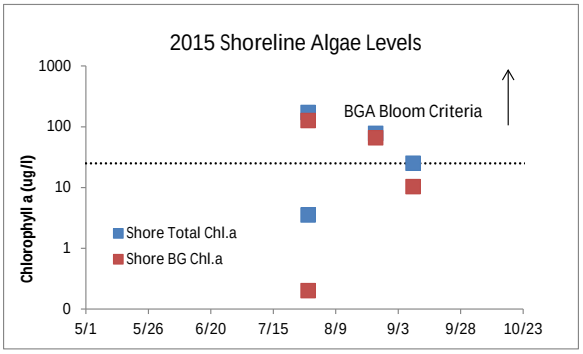


Figure D9:
2015 Shoreline Total and BGA Chl.a

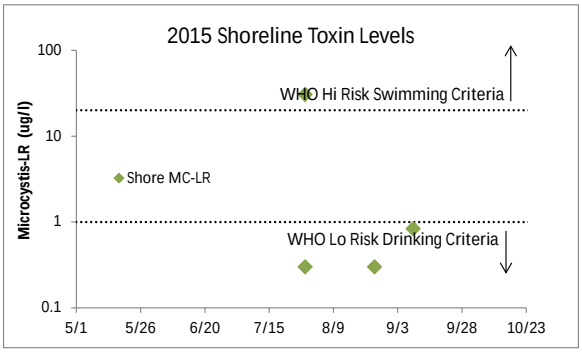


Figure D10:
2015 Shoreline Microcystin-LR

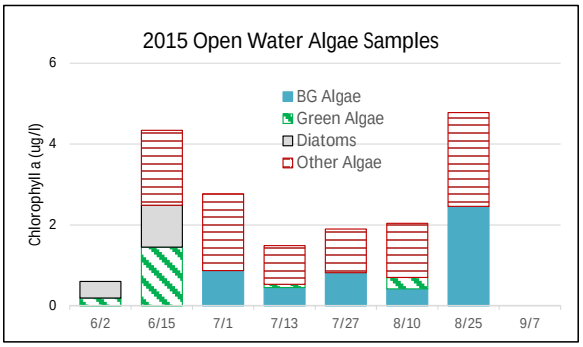


Figure D11:
2015 Open Water Algae Types

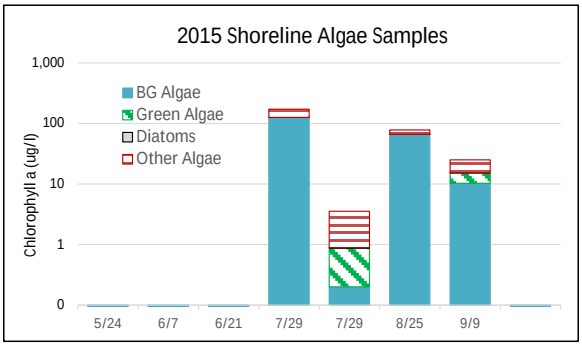


Figure D12:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Madison County

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

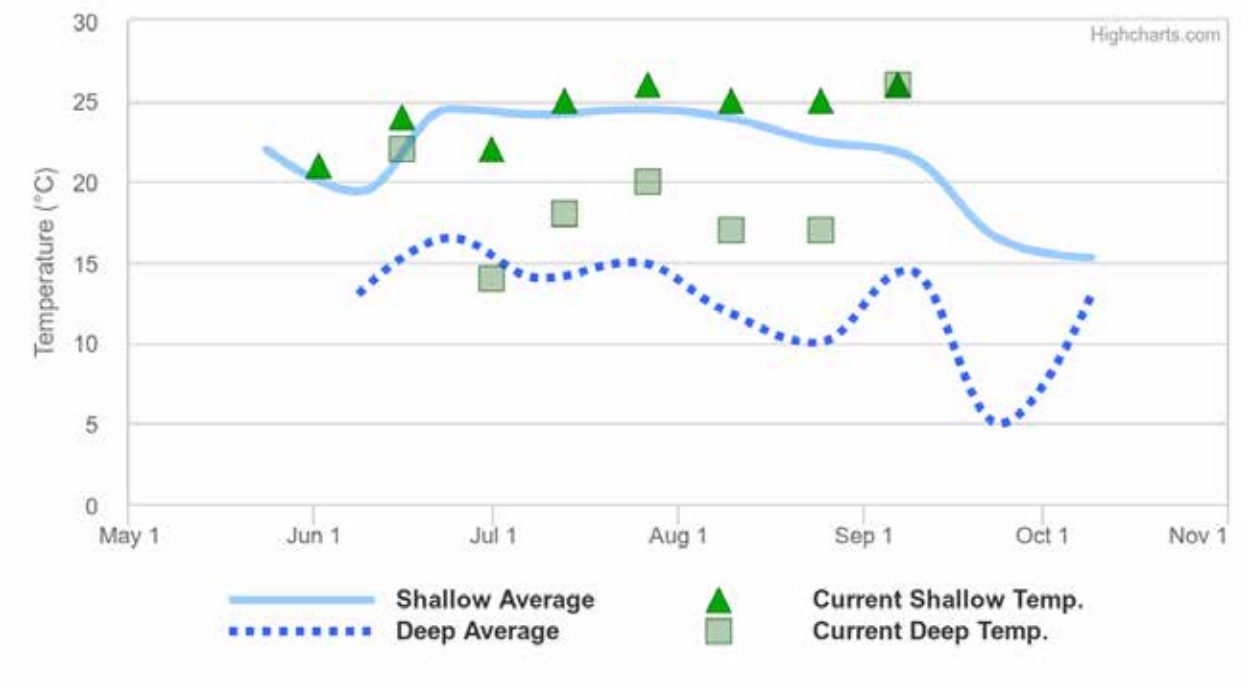
This list is not complete, but instead represents only those species that have been reported and verified within the county. If any additional aquatic invasive species (AIS) are known or suspected in these or other waterbodies in the county, this information should be reported through iMap invasives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

Aquatic Invasive Species – Madison County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Bradley Brook Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Bradley Brook Reservoir	Plant	Curly leafed pondweed	*Potamogeton crispus*
Cazenovia Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Cazenovia Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Cazenovia Lake	Plant	Starry stonewort	*Nitellopsis obtusa*
Cazenovia Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Craine Lake	Animal	Zebra mussel	*Dreissena polymorpha*
DeRuyter Reservoir	Animal	Zebra mussel	*Dreissena polymorpha*
DeRuyter Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
DeRuyter Reservoir	Plant	Banded mystery snail	*Viviparus georgianus*
Earlville Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Eaton Brook Reservoir	Animal	Zebra mussel	*Dreissena polymorpha*
Eaton Reservoir	Animal	Zebra mussel	*Dreissena polymorpha*
Eaton Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Eaton Reservoir	Plant	Curly leafed pondweed	*Potamogeton crispus*
Gorton Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Hatch Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Hatch Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Hatch Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Lake Moraine	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lake Moraine	Plant	Curly leafed pondweed	*Potamogeton crispus*
Lebanon Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lebanon Reservoir	Plant	Curly leafed pondweed	*Potamogeton crispus*
Leland Pond	Animal	Zebra mussel	*Dreissena polymorpha*

Waterbody	Kingdom	Common name	Scientific name
Leland Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Leland Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Lower Leland Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lower Leland Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Madison Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Mud Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Mud Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Oneida Lake	Plant	Water chestnut	*Trapa natans*
Stoney Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Tuscarora Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Tuscarora Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Tuscarora Lake	Plant	Brittle naiad	*Najas minor*
Tuscarora Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Unadilla River near Leonardsville	Animal	Asian Clam	*Corbicula fluminea*
Upper Leland Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Upper Leland Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*

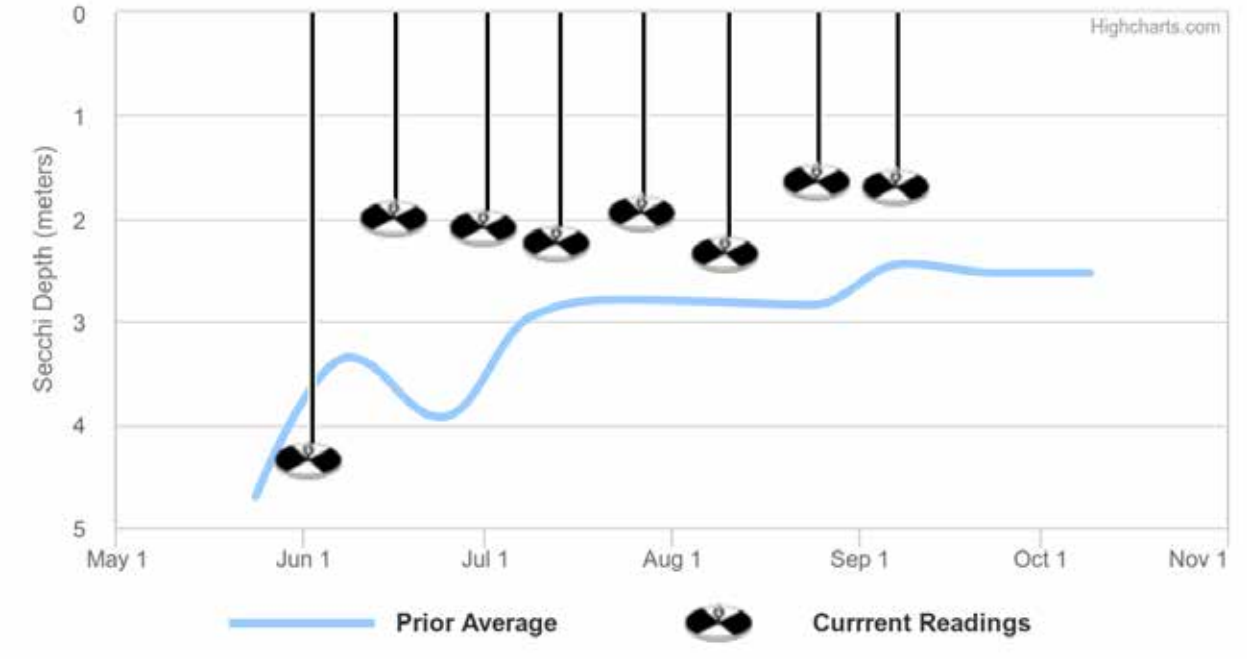
Appendix F: Current Year vs. Prior Averages for Craine Lake

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 1988 to 2013. 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 1994 to 2013.

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 1988 to 2013

Appendix G: Watershed and Land Use Map for Craine Lake

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