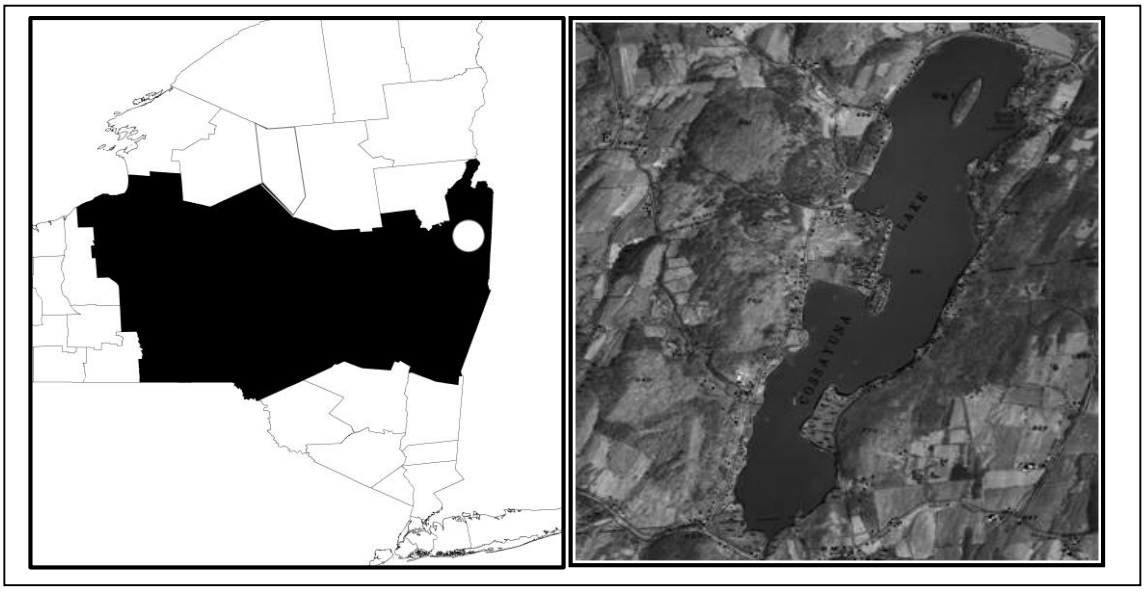
CSLAP 2015 Lake Water Quality Summary: Cossayuna Lake

General Lake Information

Location	Town of Argyle
County	Washington
Basin	Upper Hudson River
Size	266.8 hectares (659.0 acres)
Lake Origins	Natural
Watershed Area	3,060 hectares (7,558 acres)
Retention Time	0.8 years
Mean Depth	3.7 meters
Sounding Depth	7.5 meters
Public Access?	DEC launch
Major Tributaries	no named tribs
Lake Tributary To…	Whittaker Brook to Batten Kill to Hudson River
WQ Classification	A (potable water)
Lake Outlet Latitude	43.183
Lake Outlet Longitude	-73.433
Sampling Years	1992-1996, 1998-1999, 2001-2010, 2012-2015
2015 Samplers	Bill Sowinski and Patricia McAuliff
Main Contact	Patricia McAuliff

Lake Map



Background

Cossayuna Lake is a 659 acre, class A lake found in the Town of Argyle in Washington County, northeast of the Capital District region of New York State. It was first sampled as part of CSLAP in 1992.

It is one of five CSLAP lakes among the nearly 200 lakes found in Washington County, and one of 32 CSLAP lakes among the more than 1370 lakes and ponds in the Upper Hudson River drainage basin.

Lake Uses

Cossayuna Lake is a Class A lake; this means that the best intended use for the lake is for potable water—drinking, contact recreation—swimming and bathing, non-contact recreation—boating and fishing, aquatic life, and aesthetics. The lake is used by lake residents and visitors for swimming, power boating and other recreation via shoreline properties and a DEC boat ramp.

Cossayuna Lake is regularly stocked with approximately 2600 nine inch tiger muskellunge. It is not known by the report authors if Cossayuna Lake has been stocked by lake residents or municipal officials. Other fish species in the lake include black crappie, brown bullhead, largemouth bass, northern pike, pumpkinseed sunfish, rock bass, smallmouth bass, walleye, white sucker, and yellow perch.

General statewide fishing regulations are applicable in Cossayuna Lake. In addition, open season for pickerel runs from 1st Saturday in May to March 15th, with no size limit and a daily take limit of five fish. The open season on trout runs from April 1st to October 15th, with no size limit but a daily take limit of five fish with no more than five brook trout less than eight inches.

Historical Water Quality Data

CSLAP sampling was conducted on Cossayuna Lake from 1992 to 1996, 1998 to 1999, and 2001 to 2010, and 2012 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 Cossayuna Lake can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77830.html.

Cossayuna Lake has been sampled by the NYSDEC as part of several major NYS monitoring programs, including the NYSDEC Division of Water's Lake Classification and Inventory (LCI) survey in 1982 and 1987, and through a similar NYSDEC Division of Water program in 1976. These data suggest that conductivity was slightly lower and pH slightly higher in this previous studies, but water clarity and phosphorus readings were within the same range as the contemporary data. Algae levels (measured by chlorophyll *a*) were higher in the 1970s and 1980s- it is not known if this reflects more active algae management in the present day, since the "source" of the algae growth (phosphorus) appears to have been similar over this period.

The lake was also sampled as part of the Conservation Department (predecessor to the NYSDEC) Biological Survey of the Upper Hudson River basin in 1932. This monitoring program focused primarily on the relationship between water quality and fisheries management, although some of the water quality indicators evaluated through CSLAP were also monitored in 1932. Cossayuna Lake was described as follows:

"There is considerable agitation among sportsmen and cottage owners to raise the water level by the construction of a three-foot dam at the foot of the lake. It is hoped by this method to increase the area of water which would be too deep to support the rank growth of vegetation which makes fishing difficult. It is safe to predict that an increase of three feet in the depth of Cossayuna would not materially affect the extent of the weed areas... It would improve the appearance of the lake by preventing the lower end from becoming practically dry in late summer."

These data showed that water transparency was much higher in 1932, although the same seasonal drop seen in present clarity measurements in Cossayuna Lake was also found in this earlier study. pH readings were comparable to present day readings. Although not measured through CSLAP, data collected in other monitoring programs have indicated that Cossayuna Lake exhibits deepwater oxygen depletion during the summer; this was not apparent in the 1932 study of the lake.

None of the unnamed ephemeral tributaries, nor the outlet of the lake (Whittaker Brook) has been monitored through the NYSDEC Rotating Intensive Basins (RIBS) program or the state stream macroinvertebrate monitoring program. The lake has been sampled occasionally by DEC fisheries staff in support of fish stocking activities or any other statewide monitoring programs. Water clarity readings were much lower in CSLAP, but the other parameters showed comparable results.

Lake Association and Management History

Cossayuna Lake is served by the Cossayuna Lake Improvement Association. The management of the lake is summarized in the Cossayuna Lake Watershed Management Plan developed by the Washington County Soil and Water Conservation District and other partners as part of the NYSFOLA small lake management program. Management of the lake and watershed has focused on controlling nonpoint source pollution from agricultural land and shoreline development. Nuisance weeds have been controlled with the aquatic herbicide 2,4-D and by mechanical weed harvesting.

The goals of the lake association are to:

- maintain and improve the waters of Cossayuna Lake
- provide education to the community related to lake ecology
- promote sports, social activities, and good fellowship among the members of the community
- serve as a voice of the membership in matters under consideration by federal, state, and local governments which have a direct impact on the lake
- seek enforcement of laws which affect the lake and its watershed
- maintain a place to meet

A plan to control nutrient loading to the lake has been developed as part of the TMDL (total maximum daily load) and impaired waters listing process for the lake. The TMDL calculation can be found at http://www.dec.ny.gov/docs/water_pdf/cossayuna.pdf.

The lake association maintains a website at http://www.cossayunalake.com/.

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual Results Relative to 1992-2014

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 – Cossayuna Lake" section in Appendix C.

Evaluation of Eutrophication Indicators

Lake productivity has decreased substantially over the last two decades, and particularly since about 2000, as seen from higher water clarity and lower algae levels. These trends appear to be statistically significant. Water clarity was also higher than usual in 2015, consistent with lower than usual algae levels (as measured by chlorophyll *a*). Phosphorus readings have also decreased since the mid-1990s, although this trend is not statistically significant. This might be due to more active management of nutrient sources or other factors, including more favorable weather. However, deepwater phosphorus levels have dropped slightly over this period, including 2015, suggesting that internal nutrient loading may be lower. Shoreline algae blooms were still apparent in 2015, although the frequency and duration (and toxicity) of the blooms decreased.

Lake productivity increases substantially during the typical summer—water clarity drops as algae and nutrient levels increase—although there is a slight decrease in productivity in the fall. Despite a decrease in lake productivity in recent years, the same seasonal trends were also apparent in the last several years, including 2015.

The lake can be characterized as *eutrophic*, or highly productive, based on total phosphorus, water clarity, and chlorophyll *a* readings (all typical of *eutrophic* lakes). However, water clarity readings in 2015 were more typical of *mesotrophic*, or moderately productive, lakes. The trophic state indices (TSI) evaluation suggests that algae levels are higher than expected given the phosphorus and especially water clarity readings in the lake. This suggests that algae growth may be patchy (bloom conditions in some locations, relatively clear water in other locations), and that the lake may be susceptible to small increases in phosphorus loading. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are frequently 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, even with the apparent decrease in algae levels, but it is not known if these impacts occur. Hypolimnetic phosphorus, ammonia, iron and manganese readings in Cossayuna Lake are (now) similar to those measured at the lake surface. This suggests that deepwater intakes may be more supportive of potable water use, and that thermal stratification is weak. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

pH readings have decreased since the early-to-mid 1990s, and were lower than normal in 2015. This is probably due to the lower algae levels, and the pH is well within the acceptable range for most aquatic organisms. Conductivity has decreased slightly since the early 2000s, perhaps in response to the same factors that lead to the decrease in algae levels. Calcium levels have also

dropped over the last decade. It is likely that the small long-term changes in the other 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 19 to 20 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 within than the range of values found in many NYS lakes. These readings suggest a moderate likelihood of biological impact from road salt, although these impacts have not been measured or reported. 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 several years showed moderate overall algae levels and low levels of blue green algae in the open water, although samples are often comprised of blue green algae more than other algae species, especially later in the summer. Shoreline bloom samples have indicated high levels of blue green algae, especially in 2013, and at times these blooms are widespread. This is consistent with the trophic data indicating patchy algae growth. However, bloom frequency and intensity may have been lower in 2015.

Only limited macrophyte surveys have been conducted through CSLAP at Cossayuna Lake. These surveys identified at least six aquatic plant species, and at least two exotic plant species (*Myriophyllum spicatum,* Eurasian watermilfoil, and *Potamogeton crispus,* curly-leafed pondweed) have been found in the lake. The modified floristic quality index (FQI) data indicate that the quality of the aquatic plant community is "poor," although this assessment may change with additional macrophyte survey data.

The composition of the fish community includes a mix of coolwater (at least five species) and warmwater (at least six species) fish species. The lake fishery can likely be described as coolwater. Fish collection data indicate that largemouth bass are smaller than expected.
Two separate zooplankton surveys from 1992 showed a high percentage of rotifers, but higher lake productivity than seen in other CSLAP lakes dominated by rotifers. It is not known if this is representative of normal conditions in the lake.

Macroinvertebrate surveys have not been conducted through CSLAP in Cossayuna Lake.

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

Evaluation of Lake Perception

Aquatic plant coverage was reported by the CSLAP volunteers to be lower than usual in each of the last several years, resulting in more favorable recreational assessments in most recent years. Water quality assessments were close to normal in 2015, despite higher water clarity. Water quality assessments have improved slightly in the last decade, consistent with a long-term increase in water transparency. The extent of aquatic plant (weed) growth is likely controlled as

much by active management (harvesting and/or herbicides) than natural changes, and overall plant coverage may have also decreased over the last decade.

Lake perception degrades over the course of the typical summer, consistent with seasonal trends in lake productivity. These seasonal trends were apparent in 2015, although these changes were less significant than in the typical years. These changes are also consistent with a seasonal increase in productivity. Plant coverage does not change in a clear seasonal pattern, perhaps due to summer long management. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Air and water temperature readings in the summer index period were close to normal in 2014. Water temperatures have risen slightly since the mid-1990s, perhaps an indication of local climate change.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Phycocyanin readings in the early 2010s at times exceed the levels indicating susceptibility for harmful algal blooms (HABs), although this was not apparent from the fluoroprobe screening results from the open water in the last several years.

An analysis of algae samples has indicated microcystin levels that are usually below the levels needed to support safe swimming in the open water, but above safe levels within some of the sampled blooms. Shoreline blooms in 2013 indicated elevated blue green algae and toxin levels, but neither were apparent in open water. High blue green algae levels were also apparent in the single bloom sample submitted in 2014, and visual reports indicated bloom conditions in some other locations, but toxin levels were low in all open water and shoreline samples in 2014. 2015 found a lower frequency, intensity and toxicity of blooms. However, despite these apparent improvements, lake residents and their pets should avoid contact with shoreline blooms or discolored water, although the risk appears to be lower away from these shoreline blooms.

Lake Condition Summary

Category	Indicator	Min	Overall Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.52	1.95	5.40	3.39	Eutrophic	Higher Than Normal	Increasing Significantly
	Chlorophyll *a*	0.30	19.26	81.60	11.30	Eutrophic	Within Normal Range	Decreasing Significantly
	Total Phosphorus	0.003	0.028	0.066	0.025	Eutrophic	Within Normal Range	Decreasing Slightly
Potable Water Indicators	Hypolimnetic Ammonia	0.00	0.06	0.30	0.07	Close to Surface NH4 Readings	Within Normal Range	Not known
	Hypolimnetic Arsenic	0.34	1.05	2.50		Low Deepwater Arsenic Levels		Not known
	Hypolimnetic Iron	0.03	0.23	1.17		Low Iron Levels		Not known
	Hypolimnetic Manganese	0.02	0.21	0.70		Low Manganese Levels		Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.010	0.042	0.265	0.020	Close to Surface TP Readings	Lower Than Normal	Not known
	Nitrate + Nitrite	0.00	0.02	0.22	0.01	Low NOx	Within Normal Range	No Change
	Ammonia	0.00	0.06	0.78	0.04	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.09	0.53	2.45	0.61	Intermediate Total Nitrogen	Within Normal Range	No Change
	pH	6.09	8.03	9.13	7.76	Alkaline	Within Normal Range	Decreasing Significantly
	Specific Conductance	106	185	227	185	Intermediate Hardness	Within Normal Range	Decreasing Slightly
	True Color	1	15	82	6	Intermediate Color	Within Normal Range	No Change
	Calcium	10.8	22.7	29.9	17.7	Highly Susceptible to Zebra Mussels	Within Normal Range	Decreasing Slightly
Lake Perception	WQ Assessment	1	2.7	5	2.7	Definite Algal Greenness	Within Normal Range	No Change
	Aquatic Plant Coverage	1	2.5	5	1.3	Surface Plant Growth	More Favorable Than Normal	No Change
	Recreational Assessment	1	2.9	4	2.2	Slightly Impaired	More Favorable Than Normal	No Change
Biological Condition	Phytoplankton					Open water-moderate blue algae biomass; Shoreline-high blue green algae in bloom	Not known	Not known
	Macrophytes					Poor quality of the aquatic plant community	Not known	Not known
	Zooplankton					Dominated by rotifers	Not known	Not known
	Macroinvertebrates					Not evaluated through CSLAP	Not known	Not known
	Fish					Coolwater fishery	Not known	Not known
	Invasive Species					Zebra mussels, Eurasian watermilfoil, curly-leafed pondweed	Not known	Not known
Local Climate Change	Air Temperature	7	22.7	32	26.0		Higher Than Normal	No Change
	Water Temperature	12	22.7	28	23.7		Within Normal Range	No Change

Category	Indicator	Min	Overall Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Harmful Algal Blooms	Open Water Phycocyanin	0	128	1166	46	Most readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	8	31	7	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	5	26	4	Few readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	0.3	1.5	<DL	Mostly undetectable 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	225	908	1890		All readings indicate high risk of BGA	Not known	Not known
	Shoreline FP Chl.a	2455	21747	65831	2455	All readings indicate very high algae levels	Not known	Not known
	Shoreline FP BG Chl.a	2198	21635	65831	2198	All readings indicate very high BGA levels	Not known	Not known
	Shoreline Microcystis	<DL	13.1	74.8	8.3	Occasionally very high shoreline bloom MC-LR	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

The 2007 NYSDEC Priority Waterbody Listings (PWL) for the Upper Hudson River drainage basin indicate that *recreation* and *habitat* are *impaired* and *aquatic life* is *stressed* due to excessive nutrients, algae and weeds. The PWL listing for Cossayuna Lake is listed in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Cossayuna Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water. Algae levels are high enough in the surface waters to *impair* any surface use of the lake for potable water, although this impact may be reduced in deeper water.

Public Bathing

The CSLAP dataset at Cossayuna Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if at a public swimming beach, would be *impaired* by excessive algae and nutrients, periodic shoreline algae blooms, and by poor water clarity. These conditions are improving, although impacts likely still existing. 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 Cossayuna Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation is *impaired* by excessive algae a shoreline blooms, and excessive weed growth associated with Eurasian watermilfoil and curly leafed pondweed. Improved conditions were reported in recent years, although this impacts are still apparent.

Aquatic Life

The CSLAP dataset on Cossayuna Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *stressed* by high pH associated with excessive algae and shoreline blooms, and *threatened* by road salt runoff and by

invasive species (zebra mussels and invasive plants). Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics and Habitat

The CSLAP dataset on Cossayuna Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *threatened* by excessive algae and shoreline blooms, consistent with occasional reports that the lake "looks bad" by CSLAP volunteers. Habitat is *stressed* by excessive invasive plants.

Fish Consumption

There are no fish consumption advisories posted for Cossayuna Lake.

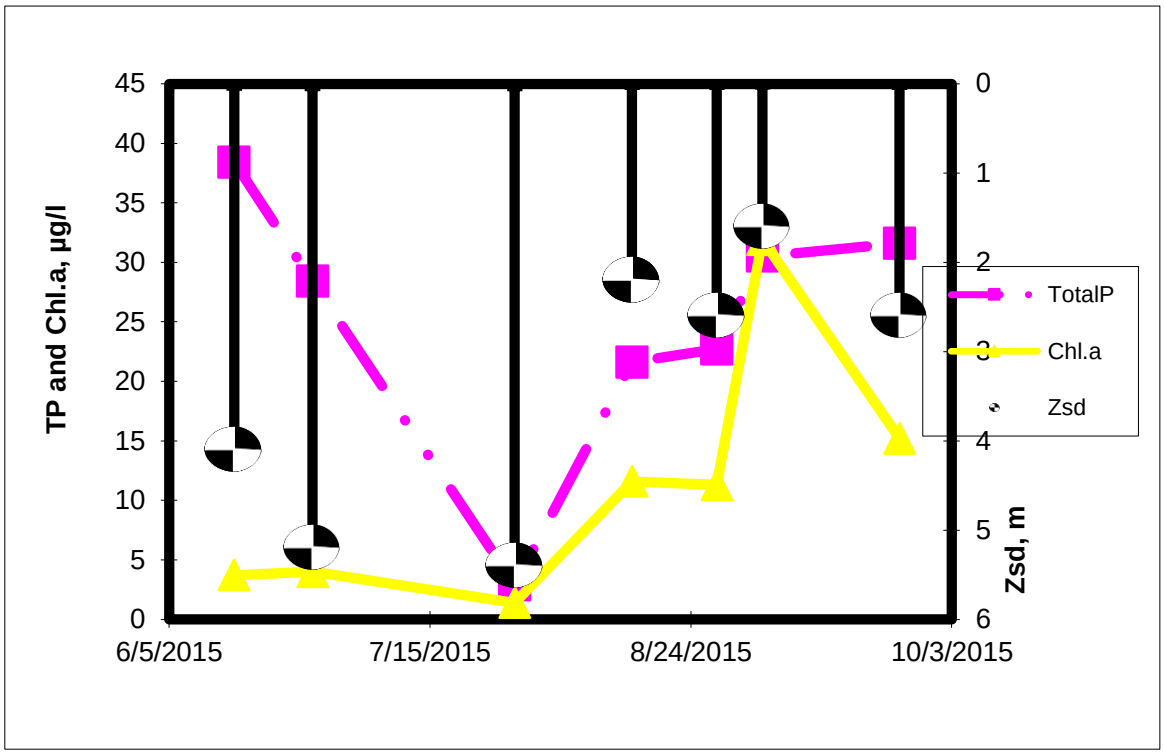
Additional Comments and Recommendations

Any activities presently conducted by the lake community or individuals to reduce nutrient loading to the lake should be continued, since these actions may have contributed to the long-term increase in water clarity and decrease in algae levels. Aquatic plant communities in Cossayuna Lake should be evaluated to determine if the lake perception results can be reconciled with the plans to manage these plant communities. Lake residents are advised to report any shoreline algae blooms, and lake residents and pets should avoid exposure to shoreline scums or heavily discolored water.

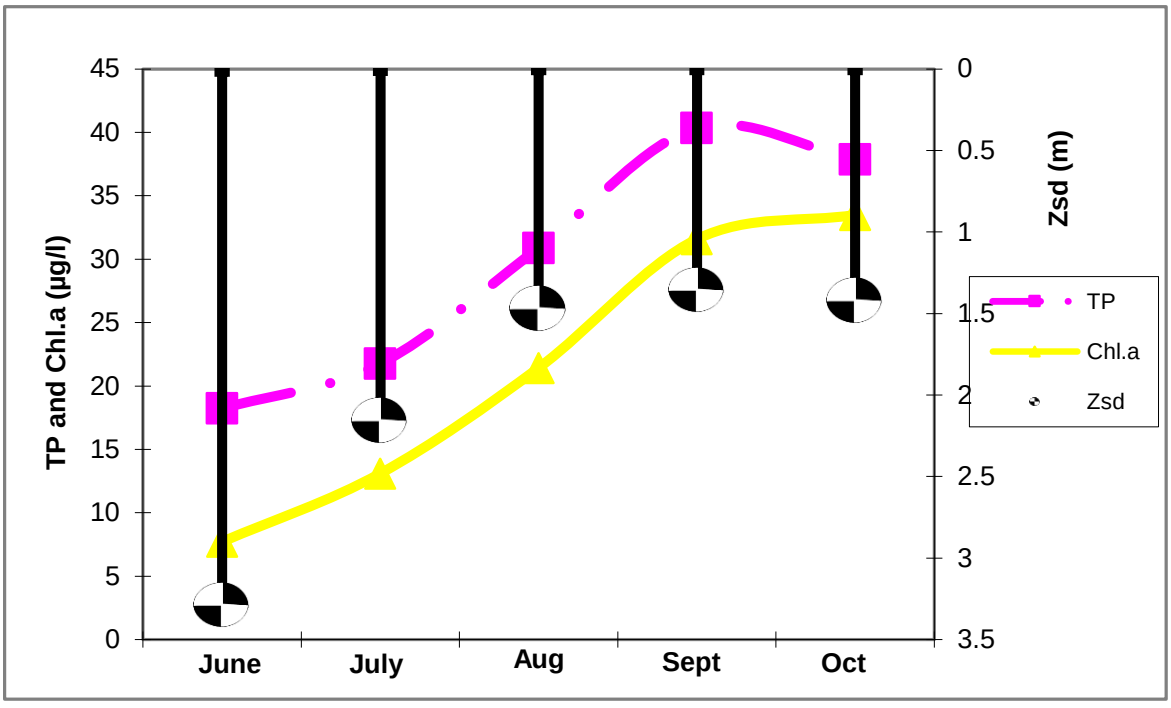
Aquatic Plant IDs-2015

None submitted for identification in 2015.

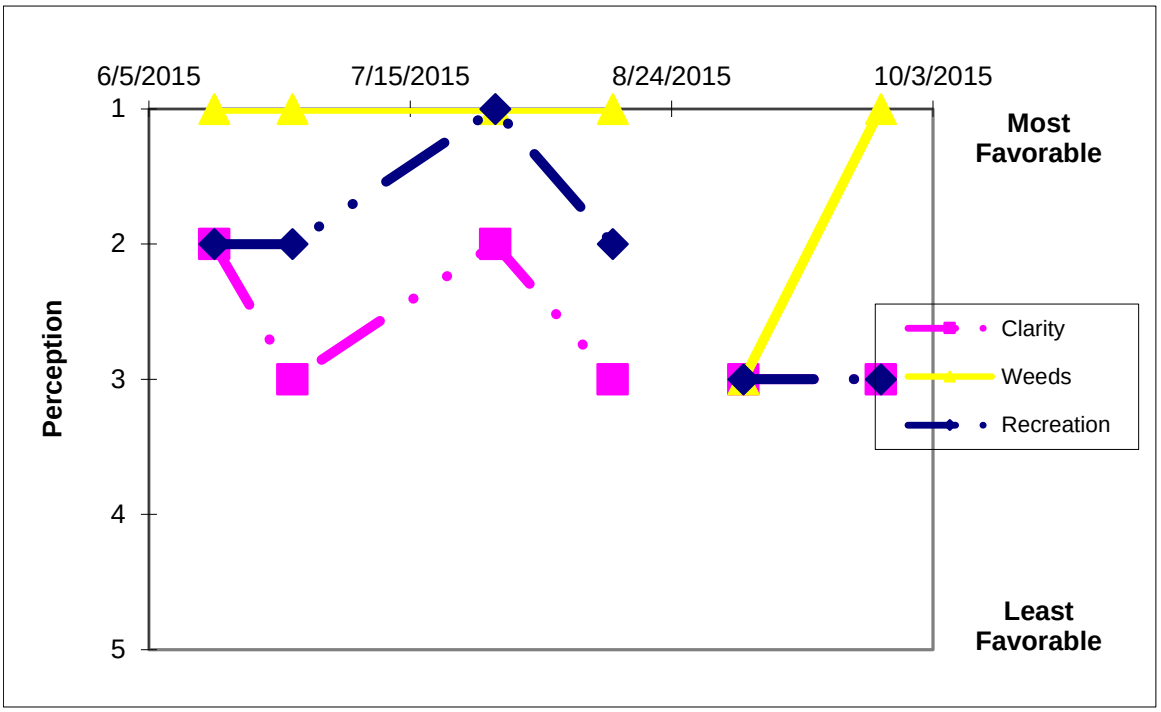
Time Series: Trophic Indicators, 2015



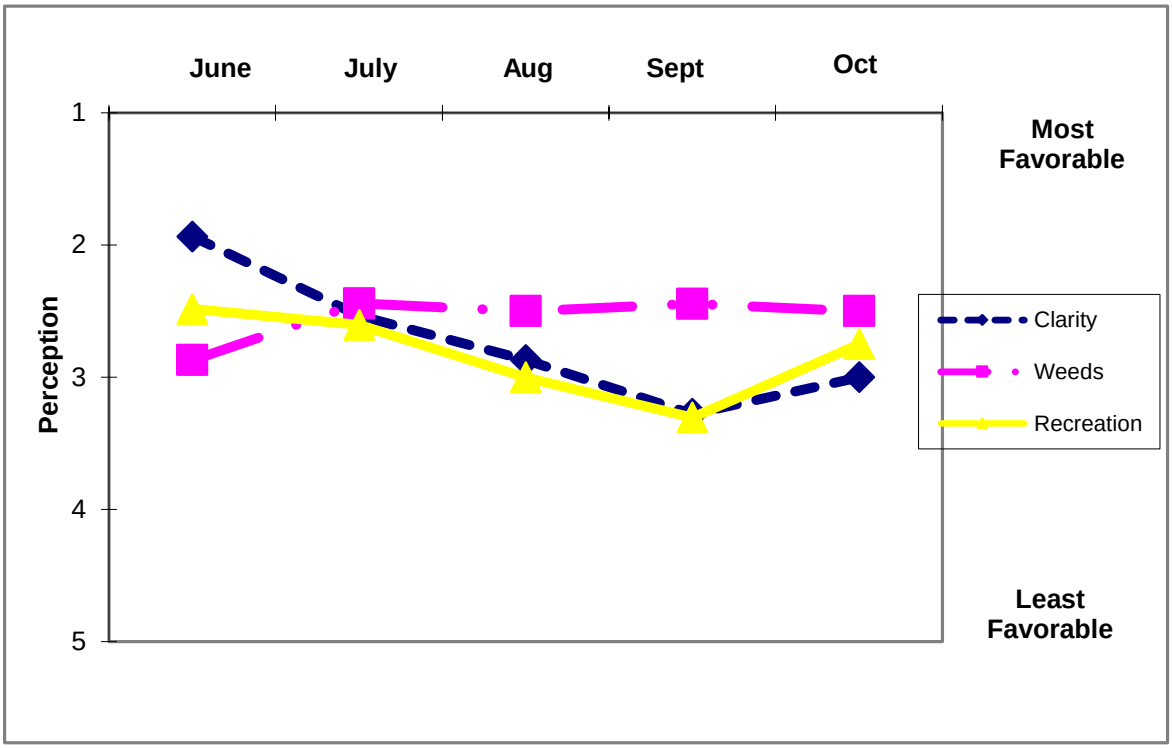
Time Series: Trophic Indicators, Typical Year (1992-2013)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (1992-2015)



Appendix A- CSLAP Water Quality Sampling Results for Cossayuna Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
96	Cossayuna L	6/28/1992	6.2	2.24	1.5	0.023	0.01				7	8.10	192		13.50	
96	Cossayuna L	7/11/1992	6.1	1.57	1.5	0.018	0.01				10	8.32	196		12.90	
96	Cossayuna L	7/28/1992	8.3	1.37	1.5	0.026						8.40	199			
96	Cossayuna L	8/9/1992	6.3	1.66	1.5	0.031	0.01				9	8.30	198		22.70	
96	Cossayuna L	8/22/1992	5.9	1.25	1.5	0.053	0.01				6	8.09	200		53.00	
96	Cossayuna L	9/7/1992	5.7	2.00	1.5	0.028	0.01				13	8.04	195		27.50	
96	Cossayuna L	9/20/1992	6.1	1.16	1.5	0.062	0.01				12	7.91	197		80.80	
96	Cossayuna L	10/4/1992	5.9	1.69	1.5	0.046	0.01				8	8.19	198		81.60	
96	Cossayuna L	6/7/1993	5.9	2.09	1.5	0.030					7	8.21	186		21.70	
96	Cossayuna L	6/22/1993			1.5	0.028	0.01				6	8.21	191		13.50	
96	Cossayuna L	7/5/1993	6.1	1.71	1.5	0.016					4	8.33	195		15.40	
96	Cossayuna L	7/18/1993	6.0	1.28	1.5	0.031	0.01				3	8.24	194		25.20	
96	Cossayuna L	8/1/1993	5.9	0.90	1.5	0.031					3	8.88	190		48.00	
96	Cossayuna L	8/17/1993	5.9	1.22	1.5	0.029	0.01				4	8.11	192		22.00	
96	Cossayuna L	8/29/1993	5.8	1.16	1.5	0.036					6	8.27	189		30.60	
96	Cossayuna L	9/12/1993	6.1	1.25	1.5	0.041	0.01				8	8.18	197		26.80	
96	Cossayuna L	6/5/1994	5.8	2.53	1.5	0.010	0.01				6	7.36	191		16.00	
96	Cossayuna L	6/19/1994	5.8	1.80	1.5	0.021					3	8.66	189		10.80	
96	Cossayuna L	7/4/1994	5.8	1.19	1.5	0.038	0.01				4	8.76	190		44.10	
96	Cossayuna L	7/17/1994	5.8	1.00	1.5	0.040					4	9.13	181		44.10	
96	Cossayuna L	8/2/1994	5.8	0.85	1.5	0.052	0.01				4	8.63	187		28.50	
96	Cossayuna L	8/21/1994	5.8	1.30	1.5	0.033					10	7.95	198		2.76	
96	Cossayuna L	8/30/1994	5.8	0.69	1.5	0.041	0.01				10	8.21	202		32.00	
96	Cossayuna L	9/12/1994	5.8	0.52	1.5	0.065	0.01				7	8.37	205		33.60	
96	Cossayuna L	7/4/1995	5.5	1.53	1.5	0.015	0.01				5	8.22	198		16.20	
96	Cossayuna L	7/16/1995	5.6	1.31	1.5	0.034	0.01				10	8.73	204		30.50	
96	Cossayuna L	7/30/1995	6.1	1.26	1.5	0.028	0.01				10	8.52	203		12.50	
96	Cossayuna L	8/30/1995	5.7	0.81	1.5	0.041	0.01				5	7.97	204		58.60	
96	Cossayuna L	9/12/1995	5.7	0.87	1.5	0.037					5	7.91	206		40.30	
96	Cossayuna L	7/14/1996	5.9	1.94	1.5	0.034	0.01				5	8.29	190		27.00	
96	Cossayuna L	7/30/1996	6.1	1.25	1.5	0.032	0.01				5	8.81	188		28.00	
96	Cossayuna L	8/13/1996	6.2	1.08	1.5	0.030	0.01				5	8.80	187		22.00	
96	Cossayuna L	9/3/1996	6.2	1.02	1.5	0.036	0.01				5	9.04	185		39.00	
96	Cossayuna L	7/15/1998	7.6	1.25	1.5	0.022	0.01				2	8.77	192		24.80	
96	Cossayuna L	7/27/1998	7.6	1.15	1.5	0.025	0.01				4	8.15	190		17.30	
96	Cossayuna L	8/10/1998	7.6	0.87	1.5	0.025	0.01				6	8.42	183		5.36	
96	Cossayuna L	8/24/1998	7.6	0.95	1.5	0.036	0.01				10	8.45	189		39.30	
96	Cossayuna L	9/8/1998	7.6	0.93	1.0	0.043					24	8.21	194		35.60	
96	Cossayuna L	9/21/1998	7.6	0.76	1.0	0.049					7	8.54	196		77.60	
96	Cossayuna L	10/4/1998	7.6	0.88	1.0	0.032					7	7.91	200		69.20	
96	Cossayuna L	10/25/1998	7.6	1.44	1.0	0.045					9	7.36	205		32.80	
96	Cossayuna L	6/26/1999	7.5	1.97	1.5	0.018	0.01				2	8.17	203		1.45	
96	Cossayuna L	7/26/1999	7.6	1.16	1.5	0.032	0.01				12	8.14	184		32.70	
96	Cossayuna L	7/11/1999	7.9	1.74	1.5	0.028	0.01				10	7.99	203		15.20	
96	Cossayuna L	8/9/1999	7.6	1.44	1.5	0.030	0.01				8	7.92	192		19.50	
96	Cossayuna L	8/23/1999	7.5	1.52	1.5	0.029	0.01				3	7.57	194		15.40	
96	Cossayuna L	9/7/1999	7.5	1.52	1.5	0.035	0.01				7	8.50	194		34.60	
96	Cossayuna L	9/20/1999	7.5	1.07	1.5	0.045	0.01				6	8.06	197		34.20	
96	Cossayuna L	10/5/1999	7.6	1.37	1.5	0.037	0.01				10	7.75	201		8.90	
96	Cossayuna L	6/25/2000	7.6	2.06	1.5	0.016	0.01				11	7.86	192		7.40	
96	Cossayuna L	7/9/2000	7.6	1.55	1.5	0.018	0.01				12	8.37	196		9.45	
96	Cossayuna L	7/24/2000	7.6	1.32	1.5	0.029	0.01				16	8.73	195		27.20	
96	Cossayuna L	8/6/2000	7.6	1.03	1.5	0.036	0.01				9	8.76	189		10.50	
96	Cossayuna L	8/20/2000	7.6	1.14	1.5	0.027	0.01				6	7.99	195		11.80	
96	Cossayuna L	9/4/2000	7.6	0.90	1.5	0.042	0.01				12	8.03	195		50.00	
96	Cossayuna L	9/17/2000		0.78	1.5	0.066	0.01				19	8.07	204		49.40	
96	Cossayuna L	10/1/2000	7.6	1.03	1.5	0.053	0.01				8	7.99	208		8.85	
96	Cossayuna L	6/12/2001	7.6	2.87	1.5	0.011	0.01				8	8.20	207		2.24	
96	Cossayuna L	6/25/2001	7.6	4.03	1.5	0.009	0.01				5	8.06	204		4.18	
96	Cossayuna L	7/9/2001	7.6	2.26	1.5	0.016	0.01				5	8.31	211		12.50	
96	Cossayuna L	7/23/2001	7.6	2.83	1.5	0.025	0.01				2	8.61	212		1.68	
96	Cossayuna L	8/6/2001	7.6	1.99	1.5	0.009	0.01				6	8.88	206		4.92	
96	Cossayuna L	8/20/2001	7.6	1.36	1.5	0.028	0.01				5	8.78	204		35.10	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	
96	Cossayuna L	9/3/2001	7.6	0.99	1.5	0.037					21	7.40	206		47.20	
96	Cossayuna L	9/19/2001	7.6	0.94	1.5	0.035	0.01				17	7.63	207		13.40	
96	Cossayuna L	06/03/02	7.6	3.85		0.029	0.01	0.05	0.53	18.49	1	8.18	184		3.68	
96	Cossayuna L	06/24/02	7.6	2.85		0.026	0.01	0.07	0.47	17.97		8.06	193		5.09	
96	Cossayuna L	07/08/02	7.6	2.55	1.5	0.015	0.00	0.07	2.45	161.42	17	8.30	197		1.06	
96	Cossayuna L	07/22/02	7.6	1.65	1.5	0.017	0.02	0.08	0.52	29.88	9	6.09	210		0.87	
96	Cossayuna L	08/06/02	7.6	2.00	1.5	0.021	0.00	0.01	0.59	27.68	15	8.57	206	10.8	2.77	
96	Cossayuna L	08/19/02	7.6	1.25	1.5	0.024	0.00	0.07	0.68	28.96	6	9.10	191		19.83	
96	Cossayuna L	09/03/02	7.6	0.56	1.5	0.049	0.00	0.01	0.65	13.24	10	8.85	192			
96	Cossayuna L	09/23/02	7.6	1.35	1.5	0.035	0.00	0.01	0.51	14.55	8	8.10	203		31.03	
96	Cossayuna L	6/9/2003	7.5	2.50	1.5	0.012	0.01	0.01	0.17	14.46	6	8.28	203	25.0	4.72	
96	Cossayuna L	6/23/2003	7.5	3.65	1.5	0.013	0.01	0.03	0.19	14.50	5	8.41	206		4.27	
96	Cossayuna L	7/7/2003	7.5	3.70	1.5	0.024	0.01	0.04	0.30	12.43	20	7.99	202		15.48	
96	Cossayuna L	7/22/2003	7.5	2.20		0.013	0.00	0.21	0.32	25.06	19	7.65	204		1.19	
96	Cossayuna L	8/4/2003	7.5	1.50	1.5	0.024	0.14	0.00	0.12	4.90	22	8.96	193	26.0	10.32	
96	Cossayuna L	8/18/2003	7.5	2.00	1.5	0.028	0.00	0.15	0.38	13.65	24	8.28	186		17.21	
96	Cossayuna L	9/1/2003	7.5	2.00	1.5	0.031	0.00	0.78	0.72	23.35	22	7.94	202		8.49	
96	Cossayuna L	9/16/2003	7.5	1.50	1.5	0.029	0.00	0.38	0.33	11.19	11	8.63	201		19.36	
96	Cossayuna L	6/6/2004	7.5	3.00	1.5	0.024	0.01	0.01			25	6.51	203	25.7	77.11	
96	Cossayuna L	6/21/2004	7.5	3.65	1.5	0.020	0.01	0.01	0.38	18.78	23	6.75	194		2.02	
96	Cossayuna L	7/5/2004	7.5	2.50	1.5	0.013	0.22	0.01	1.27	95.02	24	6.95	221		4.50	
96	Cossayuna L	7/19/2004	7.5	2.00	1.5	0.015	0.02	0.03	0.31	20.38	23	7.14	191		0.30	
96	Cossayuna L	8/2/2004	7.5	1.50	1.5	0.022	0.01	0.02	0.09	3.84	31	8.1	192	29.9	34.30	
96	Cossayuna L	8/17/2004	7.5	1.50	1.5	0.034	0.01	0.01	0.47	13.86	9	8.56	214		28.70	
96	Cossayuna L	8/30/2004	7.5	1.50	1.5	0.030	0.01	0.03	0.61	19.93	25	8.53	171		35.20	
96	Cossayuna L	9/13/2004	7.5	1.50	1.5	0.046	0.02	0.01	0.16	3.48	48	7.66	173		36.80	
96	Cossayuna L	6/6/2005	7.50	4.05	1.5	0.013	0.01	0.01	0.09	6.73	28	7.94	202	23.2	2.72	
96	Cossayuna L	6/20/2005	7.50	3.50	1.5	0.015	0.04	0.01	0.31	20.18	3	8.04	186		6.71	
96	Cossayuna L	7/5/2005	7.50	2.65	1.5	0.016	0.01	0.04	0.16	9.91	15	7.94	205		5.16	
96	Cossayuna L	7/18/2005	7.50	1.80	1.5	0.018	0.01	0.02	0.17	9.75	13	8.22	176		17.37	
96	Cossayuna L	8/1/2005	7.50	1.20	1.5	0.024	0.01	0.01	0.49	20.12	45	8.71	193	24.8	22.72	
96	Cossayuna L	8/15/2005	7.50	1.14	1.5	0.033	0.06	0.01	0.47	14.44	29	8.32	178		17.39	
96	Cossayuna L	8/29/2005	7.50	1.61	1.5	0.029	0.01	0.01	0.36	12.30	2	8.03	170		18.88	
96	Cossayuna L	9/13/2005	7.50	1.33	1.5	0.041	0.05	0.01	0.28	6.94	11	8.14	200		14.50	
96	Cossayuna L	6/5/2006	7.5	4.00	1.5	0.010	0.03	0.03					119	23.9	3.71	
96	Cossayuna L	6/19/2006	7.5	3.00	1.5	0.018	0.03	0.03			20	8.13	161		4.02	
96	Cossayuna L	7/4/2006	7.5	3.00	1.5	0.013	0.01	0.02			21	7.06	172		3.52	
96	Cossayuna L	7/17/2006	7.5	3.30	1.5	0.010	0.02	0.06			13	7.96	187		2.18	
96	Cossayuna L	7/31/2006	7.5	2.02	1.5	0.018	0.02	0.04			19	8.07	182	25.3	0.85	
96	Cossayuna L	8/14/2006	7.5	1.20	1.5	0.023	0.02	0.03			25	8.09	180		26.68	
96	Cossayuna L	8/28/2006	7.5	1.32	1.5	0.036	0.01	0.18			21	7.55	175		10.36	
96	Cossayuna L	9/11/2006	7.5	1.20	1.5	0.054	0.02	0.10			17	7.96	167		35.46	
96	Cossayuna L	6/25/2007	7.5	3.00	1.5	0.017	0.00	0.01	0.35	47.57	22	8.20	177	23.3	3.37	
96	Cossayuna L	7/9/2007	7.5	2.50	1.5	0.057	0.01	0.08	0.46	17.73	60	7.43	186		7.08	
96	Cossayuna L	7/23/2007	7.5	1.32	1.5	0.029	0.01	0.01	0.51	39.69	23	8.09	171		11.31	
96	Cossayuna L	8/6/2007	7.5	1.87	1.5	0.029	0.01	0.01	0.73	56.76	34	8.43	141		15.03	
96	Cossayuna L	8/20/2007	7.5	1.28	1.5	0.049	0.00	0.02	0.68	30.64	9	7.96	172	24.2	20.56	
96	Cossayuna L	9/4/2007	7.5	1.40	1.5	0.043	0.00	0.01	0.68	35.35	33	8.44	149		19.88	
96	Cossayuna L	9/18/2007	7.5	1.58	1.5	0.037	0.01	0.01	0.81	48.15	8	7.96	200		27.20	
96	Cossayuna L	10/1/2007	7.5	1.69	1.5	0.027	0.01	0.05	0.64	52.93	10	8.49	193		16.76	
96	Cossayuna L	6/9/2008	7.5	3.45	1.5	0.015	0.01	0.06	0.35	52.41		7.47	186	19.6	2.46	
96	Cossayuna L	6/23/2008	7.5	2.90	1.5	0.018	0.00	0.02	0.30	36.64	17	8.12	181		6.04	
96	Cossayuna L	7/7/2008	7.5	3.75		0.005	0.05	0.06	0.19	86.02	19	7.50	159		3.80	
96	Cossayuna L	7/21/2008	7.5	2.45	1.5	0.018	0.02	0.02	0.43	52.87	20	8.47	119		15.56	
96	Cossayuna L	8/4/2008	7.5	1.93	1.5	0.024	0.01	0.24	1.32	121.20	21	8.22	160	16.6	12.34	
96	Cossayuna L	8/18/2008	7.5	1.35	1.5	0.037	0.01	0.10	0.53	31.19	17	8.30	135		27.08	
96	Cossayuna L	9/1/2008	7.5	1.35	1.5	0.036	0.01	0.25	0.77	46.98	39	8.04	168		15.65	
96	Cossayuna L	9/16/2008	7.5	1.10	1.5	0.044	0.02	0.09	0.59	29.89	5	7.80	161		21.60	
96	Cossayuna L	06/08/2009	7.5	2.30	1.5	0.014	0.03	0.01	0.37	59.11	20	7.79	178		4.65	
96	Cossayuna L	06/20/2009	7.5	3.15	1.5	0.015	0.00	0.01	0.33	48.09	19	7.34	160		2.74	
96	Cossayuna L	07/05/2009	7.5	1.95	1.5	0.022	0.00	0.02	0.35	34.53	19	6.75	149		2.19	
96	Cossayuna L	07/20/2009	7.5	1.45	1.5	0.032	0.03	0.02	0.50	34.42	30	7.69	112		4.32	
96	Cossayuna L	08/01/2009	7.5	1.30	1.5	0.026	0.04	0.03	0.62	52.65	42	7.99	125		3.65	
96	Cossayuna L	08/15/2009	7.5	1.20	1.5	0.033	0.01	0.04	0.66	43.93	82	8.40	128		1.80	
96	Cossayuna L	08/28/2009	7.5	1.01	1.5	0.035	0.02	0.11	0.61	38.77	74	8.11	160		5.00	
96	Cossayuna L	09/15/2009	7.5	1.51	1.5	0.038	0.01	0.02	0.67	39.23	33	7.45	136		4.90	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
96	Cossayuna L	6/16/2010	7.7	3.45		0.017	0.12	0.03			13	7.40	197	28.2	1.40	
96	Cossayuna L	6/27/2010	7.5	4.70	1.5	0.012	0.01	0.02			15	7.52	201		3.90	
96	Cossayuna L	7/12/2010	7.5	3.50	1.5	0.017	0.02	0.02	0.39	50.81	15	7.80	193		3.00	
96	Cossayuna L	7/27/2010	7.6	1.92	1.5	0.022	0.01	0.02	0.41	41.76	31	7.71	205		16.80	
96	Cossayuna L	8/7/2010	7.5	1.13	1.5	0.027	0.04	0.08	0.94	75.15	32	8.62	148	24.1	45.60	
96	Cossayuna L	8/25/2010	7.6	1.53	1.5	0.037	0.02	0.15	0.20	11.50	25	8.17	185		17.40	
96	Cossayuna L	9/3/2010	7.4	1.48	1.5	0.025	0.02	0.02	0.51	45.97	70	8.50	165		22.80	
96	Cossayuna L	9/18/2010	7.3	1.50	1.5	0.046	0.06	0.03	0.76	36.33	25	7.53	200		22.90	
96	Cossayuna L	6/17/2012	7.5	4.76	1.5	0.015	0.01	0.05	0.45	67.97	16	7.16	162	23.8	3.00	
96	Cossayuna L	6/30/2012	7.7	3.50	1.5	0.016	0.01	0.04	0.41	56.38	26	7.08	148		3.40	
96	Cossayuna L	7/19/2012	7.6	2.95	1.5	0.024	0.01	0.02	0.56	51.76	27	8.08	125		8.30	
96	Cossayuna L	7/28/2012	7.4	1.45	1.5	0.035	0.05	0.03	0.60	37.38	19	8.33	114		23.60	
96	Cossayuna L	8/13/2012	7.4	1.40	1.5	0.046	0.01	0.02	0.63	30.01	5	7.50	125	20.8	22.20	
96	Cossayuna L	8/27/2012	7.4	1.60	1.5	0.027	0.01	0.03	0.70	56.57	9	7.66	154		20.60	
96	Cossayuna L	9/17/2012	7.3	1.30	1.5	0.035	0.01	0.06	0.76	48.07	12	8.41	191		26.50	
96	Cossayuna L	9/27/2012	7.3	1.89	1.5	0.036	0.04	0.09	0.67	41.01	8	6.96	162		24.00	
96	Cossayuna L	6/9/2013	7.6	3.61	1.5	0.015	0.01	0.01	0.36	55.08	19	8.38	106		2.30	
96	Cossayuna L	6/28/2013	8.0	2.93	1.5	0.019			0.36	40.95	28	7.82	185		6.80	
96	Cossayuna L	7/21/2013	7.5	3.29	1.5	0.018	0.01	0.01	0.22	26.57	25	7.78	186		8.10	
96	Cossayuna L	8/3/2013	7.6	1.77	1.5	0.027			0.67	55.58	31	8.04	197		32.80	
96	Cossayuna L	8/17/2013	7.5	1.97	1.5	0.034	0.01	0.02	0.48	31.44	23	7.71	167		19.80	
96	Cossayuna L	8/28/2013			bloom											
96	Cossayuna L	9/3/2013	7.6	1.07	1.5	0.030			0.56	41.35	23	7.91	171		25.00	
96	Cossayuna L	9/19/2013	7.4	1.24	1.5	0.050	0.01	0.31	0.79	35.16	29	7.52	209		55.50	
96	Cossayuna L	9/19/2013			bloom											
96	Cossayuna L	10/15/2013	7.6	1.71	1.5	0.032			0.68	46.86	17	7.32	216		27.50	
96	Cossayuna L	6/3/2014	7.5	4.55	1.5	0.014	0.01	0.04	0.26	38.96	5	7.41	188	22.6	1.70	
96	Cossayuna L	7/1/2014	7.7	4.15	1.5	0.012			0.32	59.79	7	7.52	196		2.70	
96	Cossayuna L	7/25/2014	7.7	2.70	1.5	0.017	0.02	0.04	0.50	66.40	7	7.84	180		5.90	
96	Cossayuna L	8/2/2014	7.6	2.95	1.5	0.017			0.44	58.67	2	7.87	183		14.60	
96	Cossayuna L	8/17/2014	7.4	1.15	1.5	0.030	0.01	0.03	0.65	47.65	8	7.02	151	22.7	19.20	
96	Cossayuna L	9/1/2014														
96	Cossayuna L	9/10/2014	7.5	1.35	1.5	0.030			0.61	44.22	11	7.87	164		25.40	
96	Cossayuna L	9/26/2014	7.5	1.60	1.5	0.030	0.01	0.02	0.43	31.11	7	7.92	185		31.00	
96	Cossayuna L	10/8/2014	7.5	1.55	1.5	0.031			0.58	40.56	8	8.03	198		22.30	
96	Cossayuna L	6/15/2015	8.6	4.10	1.5	0.038	0.01	0.03	0.39	10.10	4	7.25	212	15.6	3.70	
96	Cossayuna L	6/27/2015	7.5	5.20	1.5	0.028			0.33	11.76	4	7.57	227		4.00	
96	Cossayuna L	7/28/2015	7.8	5.40	1.5	0.003	0.01	0.03	0.73	252.76	10	8.11	196		1.40	19.3
96	Cossayuna L	8/15/2015	7.7	2.20	1.5	0.022			0.64	29.81	6	7.54	132		11.60	
96	Cossayuna L	8/28/2015	7.5	2.60	1.5	0.023	0.02	0.04	0.80	35.11	6	7.83	153	19.8	11.30	
96	Cossayuna L	9/4/2015	7.4	1.60	1.5	0.031			0.70	23.02	7	8.57	189		31.90	
96	Cossayuna L	9/15/2015			bloom											
96	Cossayuna L	9/25/2015		2.60	1.5	0.032	0.02	0.05	0.70	22.12	5	7.48	183		15.20	19.5
96	Cossayuna L	06/03/02	7.6			0.019	0.01	0.08	0.54	28.25						
96	Cossayuna L	06/24/02	7.6			0.025	0.02	0.07	0.40	16.13						
96	Cossayuna L	07/08/02	7.6		7.3	0.075	0.00	0.19	1.08	14.49						
96	Cossayuna L	07/22/02	7.6			0.129	0.00		0.94	7.27						
96	Cossayuna L	08/06/02	7.6			0.137	0.00		0.78	5.64						
96	Cossayuna L	08/19/02	7.6			0.088	0.00	0.30	0.71	8.07						
96	Cossayuna L	09/03/02	7.6			0.028	0.01	0.18	0.54	19.58						
96	Cossayuna L	09/23/02	7.6			0.025	0.00	0.03	0.41	16.19						
96	Cossayuna L	6/9/2003				0.018	0.01	0.02	0.28	15.35						
96	Cossayuna L	6/23/2003				0.024	0.00	0.00	0.35	14.30						
96	Cossayuna L	7/7/2003				0.127	0.00	0.03	0.27	2.13						
96	Cossayuna L	7/22/2003				0.032	0.00	0.04	0.06	1.82						
96	Cossayuna L	8/4/2003				0.071	0.02	0.01	0.29	4.07						
96	Cossayuna L	8/18/2003				0.265	0.00	0.02	0.47	1.77						
96	Cossayuna L	9/1/2003				0.080	0.01	0.05	0.38	4.75						
96	Cossayuna L	9/16/2003				0.053	0.00	0.01	0.30	5.71						
96	Cossayuna L	6/6/2004	7.5			0.024	0.01	0.01								
96	Cossayuna L	6/21/2004	7.5			0.011	0.04	0.01	0.24	21.38						
96	Cossayuna L	7/5/2004	7.5			0.010	0.02	0.01	1.14	113.62						
96	Cossayuna L	7/19/2004	7.5			0.070	0.01	0.24	0.32	4.56						
96	Cossayuna L	8/2/2004	7.5			0.037	0.01	0.11	0.57	15.65						
96	Cossayuna L	8/17/2004	7.5			0.019	0.02	0.02	0.31	16.48						
96	Cossayuna L	8/30/2004	7.5			0.031	0.01	0.07	0.42	13.42						

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
96	Cossayuna L	9/13/2004	7.5			0.041	0.01	0.03	0.26	6.36						
96	Cossayuna L	6/6/2005	7.5			0.022										
96	Cossayuna L	6/20/2005	7.5			0.024										
96	Cossayuna L	7/5/2005	7.5			0.026										
96	Cossayuna L	7/18/2005	7.5			0.118										
96	Cossayuna L	8/1/2005	7.5			0.035										
96	Cossayuna L	8/15/2005	7.5			0.073										
96	Cossayuna L	8/29/2005	7.5			0.049										
96	Cossayuna L	9/13/2005	7.5			0.043										
96	Cossayuna L	6/5/2006	7.5		0.0	0.017					119					
96	Cossayuna L	6/19/2006	7.5		0.0	0.020										
96	Cossayuna L	7/4/2006	7.5		0.0	0.027										
96	Cossayuna L	7/17/2006	7.5		0.0	0.050										
96	Cossayuna L	7/31/2006	7.5		0.0	0.051										
96	Cossayuna L	8/14/2006	7.5		0.0	0.040										
96	Cossayuna L	8/28/2006	7.5		0.0	0.031										
96	Cossayuna L	9/11/2006	7.5		0.0	0.032										
96	Cossayuna L	6/25/2007	7.5			0.030										
96	Cossayuna L	7/9/2007	7.5			0.023										
96	Cossayuna L	7/23/2007	7.5			0.103										
96	Cossayuna L	8/6/2007	7.5			0.120										
96	Cossayuna L	8/20/2007	7.5			0.046										
96	Cossayuna L	9/4/2007	7.5			0.040										
96	Cossayuna L	9/18/2007	7.5			0.025										
96	Cossayuna L	10/1/2007	7.5			0.028										
96	Cossayuna L	6/9/2008	7.5			0.017										
96	Cossayuna L	6/23/2008	7.5			0.025										
96	Cossayuna L	7/7/2008	7.5			0.019										
96	Cossayuna L	7/21/2008	7.5			0.049										
96	Cossayuna L	8/4/2008	7.5			0.090										
96	Cossayuna L	8/18/2008	7.5			0.074										
96	Cossayuna L	9/1/2008	7.5			0.042										
96	Cossayuna L	9/16/2008	7.5			0.035										
96	Cossayuna L	06/08/2009				0.025		0.03								
96	Cossayuna L	06/20/2009				0.021		0.01								
96	Cossayuna L	07/05/2009				0.034		0.04								
96	Cossayuna L	07/20/2009				0.030		0.04								
96	Cossayuna L	08/01/2009				0.027		0.02					1.17	0.28	0.34	
96	Cossayuna L	08/15/2009				0.040		0.02								
96	Cossayuna L	08/28/2009				0.076		0.19					0.36	0.70	2.50	
96	Cossayuna L	09/15/2009				0.051		0.01					0.10	0.10		
96	Cossayuna L	6/16/2010	7.7			0.016		0.02								
96	Cossayuna L	7/12/2010	7.5		3.8	0.015		0.02								
96	Cossayuna L	8/7/2010	7.5		7.5	0.024		0.03					0.03		0.34	
96	Cossayuna L	9/3/2010	7.4		3.5	0.028		0.02					0.08		1.10	
96	Cossayuna L	6/17/2012			6.0	0.025		0.03					1.17	0.28	0.34	
96	Cossayuna L	6/30/2012			6.0								0.03	0.02		
96	Cossayuna L	7/19/2012			6.0	0.019		0.02								
96	Cossayuna L	7/28/2012			6.0								0.03	0.02		
96	Cossayuna L	8/13/2012			6.0	0.035		0.05								
96	Cossayuna L	8/27/2012			6.0								0.19	0.28	1.00	
96	Cossayuna L	9/17/2012			6.0	0.041		0.04								
96	Cossayuna L	9/27/2012			6.5								0.07	0.08	1.00	
96	Cossayuna L	6/9/2013			6.0	0.014		0.06								
96	Cossayuna L	6/28/2013			6.0	0.023										
96	Cossayuna L	7/21/2013			6.5	0.017										
96	Cossayuna L	8/3/2013			6.5	0.031										
96	Cossayuna L	8/17/2013			6.5	0.037		0.05								
96	Cossayuna L	9/3/2013			6.5	0.040										
96	Cossayuna L	9/19/2013			6.5	0.044		0.24								
96	Cossayuna L	10/15/2013			6.5	0.032										
96	Cossayuna L	6/3/2014			6.0	0.013		0.04								
96	Cossayuna L	7/1/2014			6.5	0.021										
96	Cossayuna L	7/25/2014			6.5	0.027		0.04								
96	Cossayuna L	8/2/2014			6.5	0.027										
96	Cossayuna L	8/17/2014			6.5	0.030		0.07								

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
96	Cossayuna L	9/10/2014			6.5	0.062										
96	Cossayuna L	9/26/2014			6.5	0.012		0.03								
96	Cossayuna L	10/8/2014			6.5	0.031										
96	Cossayuna L	6/15/2015			6.5	0.012		0.04								
96	Cossayuna L	6/27/2015			6.5	0.017										
96	Cossayuna L	7/28/2015			6.5	0.015		0.04								
96	Cossayuna L	8/15/2015			6.5	0.023										
96	Cossayuna L	8/28/2015			6.5	0.015		0.13								
96	Cossayuna L	9/4/2015			6.5	0.032										
96	Cossayuna L	9/25/2015			6.5	0.026		0.06								

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
96	Cossayuna L	6/28/1992	epi	21	20	2	2	2												
96	Cossayuna L	7/11/1992	epi	20	20	2	2	2												
96	Cossayuna L	7/28/1992	epi	23	22	3	3	3	1											
96	Cossayuna L	8/9/1992	epi	19	21	2	2	2												
96	Cossayuna L	8/22/1992	epi	30	22	2	2	2	1											
96	Cossayuna L	9/7/1992	epi	24	20	2	1	1	5											
96	Cossayuna L	9/20/1992	epi	20	20	3	2	2	1											
96	Cossayuna L	10/4/1992	epi	13	12	2	1	1	5											
96	Cossayuna L	6/7/1993	epi	19	16															
96	Cossayuna L	6/22/1993	epi																	
96	Cossayuna L	7/5/1993	epi	27	25	2	2	2												
96	Cossayuna L	7/18/1993	epi	28	23	3	3	2	1											
96	Cossayuna L	8/1/1993	epi	29	23	4	3	4	13											
96	Cossayuna L	8/17/1993	epi	20	22	3	3	3	5											
96	Cossayuna L	8/29/1993	epi	21	23	2	1	2												
96	Cossayuna L	9/12/1993	epi	14	18	2	3	2	5											
96	Cossayuna L	6/5/1994	epi	24	18	2	1	1												
96	Cossayuna L	6/19/1994	epi	29	25	2	2	2												
96	Cossayuna L	7/4/1994	epi	23	23	3	2	2												
96	Cossayuna L	7/17/1994	epi	26	25	3	1	2												
96	Cossayuna L	8/2/1994	epi	22	24	3	2	3	1											
96	Cossayuna L	8/21/1994	epi	22	21	3	2	2												
96	Cossayuna L	8/30/1994	epi	20	20	3	2	3												
96	Cossayuna L	9/12/1994	epi	20	18	3	2	3	1											
96	Cossayuna L	7/4/1995	epi	24	26	2	2	2	1											
96	Cossayuna L	7/16/1995	epi	30	25	3	2	2												
96	Cossayuna L	7/30/1995	epi	21	26	2	2	2												
96	Cossayuna L	8/30/1995	epi	18	20	3	2	3	1											
96	Cossayuna L	9/12/1995	epi	22	18	2	2	2												
96	Cossayuna L	7/14/1996	epi	28	24	2	2	2	1											
96	Cossayuna L	7/30/1996	epi	18	22	3	3	3	12											
96	Cossayuna L	8/13/1996	epi	24	24	3	3	3	12											
96	Cossayuna L	9/3/1996	epi	22	23	4	3	4	123											
96	Cossayuna L	7/15/1998	epi	30	26	2	3	3	6											
96	Cossayuna L	7/27/1998	epi	28	26	2	3	4	2											
96	Cossayuna L	8/10/1998	epi	27	26	3	3	3												
96	Cossayuna L	8/24/1998	epi	24	23	3	3	3	1236											
96	Cossayuna L	9/8/1998	epi	15	21	3	3	3	26											
96	Cossayuna L	9/21/1998	epi	22	22	5	3	4	1234											
96	Cossayuna L	10/4/1998	epi	15	17	4	3	4	3											
96	Cossayuna L	10/25/1998	epi	20	14	4	4	4	4											
96	Cossayuna L	6/26/1999	epi	27	25	2	3	3	26											
96	Cossayuna L	7/26/1999	epi	25	27	3	3	4	123											
96	Cossayuna L	7/11/1999	epi	20	25	2	3	3	6											
96	Cossayuna L	8/9/1999	epi	19	25	2	3	2												
96	Cossayuna L	8/23/1999	epi	23	23	2	3	2	2											
96	Cossayuna L	9/7/1999	epi	24	24	5	3	4	12346											
96	Cossayuna L	9/20/1999	epi	19	20	4	3	4	123											
96	Cossayuna L	10/5/1999	epi	7	15	3	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
96	Cossayuna L	6/25/2000	epi	29	23	1	3	2	6											
96	Cossayuna L	7/9/2000	epi	24	23	2	3	3	2											
96	Cossayuna L	7/24/2000	epi	20	23	4	3	3	126											
96	Cossayuna L	8/6/2000	epi	23	24	3	3	3	1235											
96	Cossayuna L	8/20/2000	epi	16	22	2	3	3	26											
96	Cossayuna L	9/4/2000	epi	18	22	3	3	4	12345											
96	Cossayuna L	9/17/2000	epi	14	20	3	2	3	15											
96	Cossayuna L	10/1/2000	epi	16	16	3	3	3	123											
96	Cossayuna L	6/12/2001	epi	30	21	2	4	2	2											
96	Cossayuna L	6/25/2001	epi	23	22	2	2	3	5											
96	Cossayuna L	7/9/2001	epi	23	23	2	2	2	0											
96	Cossayuna L	7/23/2001	epi	24	23	2	2	2												
96	Cossayuna L	8/6/2001	epi	32	28	2	3	3												
96	Cossayuna L	8/20/2001	epi	22	25	3	3	4	134											
96	Cossayuna L	9/3/2001	epi	23	23	3	2	3	1											
96	Cossayuna L	9/19/2001	epi	19	21	3	2	4	1											
96	Cossayuna L	06/03/02	epi	16	18	1	5	3	2											
96	Cossayuna L	06/24/02	epi	20	23	2	3	3	2											
96	Cossayuna L	07/08/02	epi	26	25	2	2	2	5											
96	Cossayuna L	07/22/02	epi	27	26	2	2	3												
96	Cossayuna L	08/06/02	epi	26	26	3	2	3	5											
96	Cossayuna L	08/19/02	epi	23	26	3	3	3	123458											
96	Cossayuna L	09/03/02	epi	20	22	4	2	4	134											
96	Cossayuna L	09/23/02	epi	17	21	3	3	4	13											
96	Cossayuna L	6/9/2003	epi	19	19	2	5	3	256											
96	Cossayuna L	6/23/2003	epi	22	17	2	3	3	25											
96	Cossayuna L	7/7/2003	epi	27	27	2	3	3	2											
96	Cossayuna L	7/22/2003	epi	21	24	3	3	3	135											
96	Cossayuna L	8/4/2003	epi	27	26	3	4	3	125											
96	Cossayuna L	8/18/2003	epi	28	26	3	3	4	135											
96	Cossayuna L	9/1/2003	epi	20	20	3	3	3	8											
96	Cossayuna L	9/16/2003	epi	20	22	3	3	4	135											
96	Cossayuna L	6/6/2004	epi	22	20	2	5	3	256											
96	Cossayuna L	6/21/2004	epi	20	22	1	4	2	2											
96	Cossayuna L	7/5/2004	epi	22	23	3	4	4	1											
96	Cossayuna L	7/19/2004	epi	22	24	3	2	3	125											
96	Cossayuna L	8/2/2004	epi	19	24	4	3	4	1345											
96	Cossayuna L	8/17/2004	epi	20	22	4	3	4	1345											
96	Cossayuna L	8/30/2004	epi	25	24	3	3	4	1235											
96	Cossayuna L	9/13/2004	epi	18	22	3	2	4	12											
96	Cossayuna L	6/6/2005	epi	29.0	24.0	2	4	3	2											
96	Cossayuna L	6/20/2005	epi	16.0	21.0	2	3	3	2											
96	Cossayuna L	7/5/2005	epi	24.0	25.0	3	3	3	125											
96	Cossayuna L	7/18/2005	epi	26.0	27.0	4	3	4	1234											
96	Cossayuna L	8/1/2005	epi	30.0	26.0	3	3	4	145											
96	Cossayuna L	8/15/2005	epi	25.0	26.0	3	3	4	12											
96	Cossayuna L	8/29/2005	epi	22.0	23.0	3	3	3	1235											
96	Cossayuna L	9/13/2005	epi	22.0	24.0	4	4	4	1345											
96	Cossayuna L	6/5/2006	epi	20	19	2	3	3	25											
96	Cossayuna L	6/19/2006	epi	22	23	3	3	3	1											
96	Cossayuna L	7/4/2006	epi	27	25	3	2	3	125											
96	Cossayuna L	7/17/2006	epi	28	27	2	2	2	0											
96	Cossayuna L	7/31/2006	epi	24	26	3	3	3	12											
96	Cossayuna L	8/14/2006	epi	16	23	3	3	4	13											
96	Cossayuna L	8/28/2006	epi	20	22	3	2	4	13											
96	Cossayuna L	9/11/2006	epi	18	20	3	2	4	1											
96	Cossayuna L	6/25/2007	epi	25	23	2	2	3	2											
96	Cossayuna L	7/9/2007	epi	24	23	3	2	3	25											
96	Cossayuna L	7/23/2007	epi	22	24	3	3	3	125											
96	Cossayuna L	8/6/2007	epi	20	22	3	3	4	123											
96	Cossayuna L	8/20/2007	epi	21	22	3	2	4	15											

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
96	Cossayuna L	9/4/2007	epi	22	22	3	3	3	158											
96	Cossayuna L	9/18/2007	epi	12	18	3	3	3	2											
96	Cossayuna L	10/1/2007	epi	17	20	2	3	3	25											
96	Cossayuna L	6/9/2008	epi	24	19	2	3	3	256											
96	Cossayuna L	6/23/2008	epi	23	19	2	3	3	158											
96	Cossayuna L	7/7/2008	epi	26	22	1	3	2	238											
96	Cossayuna L	7/21/2008	epi	25	22	3	3	3	2											
96	Cossayuna L	8/4/2008	epi	25	22	3	3	4	1235											
96	Cossayuna L	8/18/2008	epi	24	23	3	3	4	1237											
96	Cossayuna L	9/1/2008	epi	23	22	3	3	4	1235											
96	Cossayuna L	9/16/2008	epi	21	21	4	3	4	12345											
96	Cossayuna L	06/08/2009	epi	24	20	2	4	3	25											
96	Cossayuna L	06/20/2009	epi	26	23	2	3	3	258											
96	Cossayuna L	07/05/2009	epi	24	23	2	3	3	0											
96	Cossayuna L	07/20/2009	epi	29	24	3	3	3	1											
96	Cossayuna L	08/01/2009	epi	24	25	3	3	3	58											
96	Cossayuna L	08/15/2009	epi	27	26	3	3	2	2											
96	Cossayuna L	08/15/2009	bloom											0.11						
96	Cossayuna L	08/15/2009	bloom											5.70						
96	Cossayuna L	08/15/2009	bloom											0.92						
96	Cossayuna L	08/28/2009	epi	17	24	4	3	3	1											
96	Cossayuna L	09/15/2009	epi	21	21	3	3	3	1			799.00								
96	Cossayuna L	09/15/2009	bloom											0.95						
96	Cossayuna L	09/15/2009	bloom											12.34						
96	Cossayuna L	09/15/2009	bloom											45.53						
96	Cossayuna L	10/04/2009	bloom											0.55						
96	Cossayuna L	10/04/2009	bloom											2.57						
96	Cossayuna L	10/04/2009	bloom											2.68						
96	Cossayuna L	6/16/2010	epi	20	21	1	2	1	5	0	0									
96	Cossayuna L	6/27/2010	epi	24	26	2	2	2	2	0	0									
96	Cossayuna L	7/12/2010	epi	31	28	3	2	3	8	46	47									
96	Cossayuna L	7/27/2010	epi	25	26	2	3	2	0	0	0									
96	Cossayuna L	8/7/2010	epi	21	25	3	3	2	0	0	0	1166								
96	Cossayuna L	8/7/2010	bloom									535		0.02						
96	Cossayuna L	8/25/2010	epi	23	22	2	1	2	0	0	0									
96	Cossayuna L	9/3/2010	epi	27	27	3	3	3	12	4	4	560								
96	Cossayuna L	9/3/2010	bloom									225		0.35						
96	Cossayuna L	9/3/2010	bloom									980		2.21						
96	Cossayuna L	9/3/2010	bloom									1890		8.95						
96	Cossayuna L	9/18/2010	epi	21	20	4	3	4	134	4	4									
96	Cossayuna L	6/17/2012	epi	25	24	2	3	2	2	0	0	9.60	0.30	<0.30	<0.413		1.48	0.71	I	
96	Cossayuna L	6/30/2012	epi	29	26	2	3	3	23	0	0	8.70	0.60	<0.30	<0.423		3.49	0.88	I	
96	Cossayuna L	7/19/2012	epi	27	26	3	3	2	0	0	0	24.10	0.80	<0.30	<0.585		4.49	2.45	F	
96	Cossayuna L	7/28/2012	epi	26	26	3	1	2	0	0	0	108	2.50	<0.30	<0.292		13.55	7.49	F	
96	Cossayuna L	8/13/2012	epi	26	27	3	2	3	1	0	4	72.90	1.70	0.33	<0.552		3.49	1.87		
96	Cossayuna L	8/27/2012	epi	22	25	3	1	2	1	0	0	87.60	0.90	0.75	<0.551		1.42	1.08	F	
96	Cossayuna L	9/17/2012	epi	27	22	3	1	2	1	4	4	136	0.80	0.80	<3.299		6.48	4.84	F	
96	Cossayuna L	9/27/2012	epi	18	19	2	2	2	1	0	0	54.30	0.80	1.50	<3.205		11.25	7.08	F	
96	Cossayuna L	6/9/2013	epi	17	20	2	3	2	5	0	0	6.60	1.60	<0.30	<0.440		1.70	0.00	I	I
96	Cossayuna L	6/28/2013	epi	25	25	2	3	3	25	0	0	5.50	7.40	<0.30	<0.650		5.20	0.00	G	G
96	Cossayuna L	7/21/2013	epi	22	27	2	2	2	0	0	0	26.00	1.80	<0.30	<0.370		5.00	2.50	I	G
96	Cossayuna L	8/3/2013	epi	19	24	3	3	3	2	0	0	73.40	2.90	<0.30	<0.390		13.60	11.10	I	I
96	Cossayuna L	8/17/2013	epi	28	24	2	1	2	0	0	0	50.90	5.40	0.32	<0.510		8.50	3.20	I	G
96	Cossayuna L	8/28/2013	bloom											74.83	<1.290		4572	4380		
96	Cossayuna L	9/3/2013	epi	20	24	4	2	4	136	4	4	172.10	5.10	<0.30	<0.570		30.50	26.00	F	F
96	Cossayuna L	9/19/2013	epi	22	20	5	2	4	134	4	4	157.70	6.30	0.65	<0.050		22.30	15.80	C	
96	Cossayuna L	9/19/2013	bloom											55.71	<2.200		14130	14130		
96	Cossayuna L	10/15/2013	epi	19	17	3	1	3	5	4	4	73.60	3.20	<0.30	<0.090		13.00	8.10	F	abfg
96	Cossayuna L	6/3/2014	epi	29	24	2	1	1	0	4	0	0.4	0.7	<1.83	<0.17	<0.001	0.0	0.0	f	i
96	Cossayuna L	7/1/2014	epi	29	26									<0.62	<0.03	<0.002			i	i
96	Cossayuna L	7/25/2014	epi	23	25	2	1	2	0	0	0	13.2	0.5	<0.63	<0.03	<0.001	4.6	2.0	f	i

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
96	Cossayuna L	8/2/2014	epi	23	25	2	1	2	0	0	0	28.9	0.9	<0.33	<0.01	<0.002	8.8	2.8	i	i
96	Cossayuna L	8/17/2014	epi	19	22	3	1	2	5	4	4	70.4	0.7	<0.35	<0.03	<0.001	15.5	10.9	f	i
96	Cossayuna L	9/1/2014	epi											<1.27	<0.32	<0.004	65831.0	65831.0		a
96	Cossayuna L	9/10/2014	epi	25	24	3	1	3	1	4	4	50.4	0.5	<0.24	<0.03	<0.001	6.4	4.3	f	
96	Cossayuna L	9/26/2014	epi	22	20	4	2	4	13	4	4	34.4	0.7	<0.19	<0.12	<0.001	10.3	4.0	f	f
96	Cossayuna L	10/8/2014	epi	19	17	3	2	2	5	4	4	36.4	0.4	<0.73	<0.06	<0.001	12.2	10.5	f	i
96	Cossayuna L	6/15/2015	epi	19	20	2	1	2	0	0	0	8.1	0.3	<0.55	<0.018	<0.139	1.9	0.9	I	
96	Cossayuna L	6/27/2015	epi	25	24	3	1	2	1	0	0	4.2	0.2	<0.86	<0.007	<0.040	0.9	0.3	F	I
96	Cossayuna L	7/28/2015	epi	25	26	2	1	1	0	0	0	5.1	0.2	<0.25	<0.002	<0.014	1.3	0.5	I	I
96	Cossayuna L	8/15/2015	epi	28	25	3	1	2	0	0	0	44	2.1	<0.44	<0.002	<0.014	10.3	2.9	I	I
96	Cossayuna L	8/28/2015	epi	27	25					0	0			<0.49	<0.003	<0.014	6.2	4.7	I	I
96	Cossayuna L	9/4/2015	epi	28	25	3	3	3	123	0	0	147.9	1.2	<0.26	<0.023	<0.086	19.0	14.3	F	I
96	Cossayuna L	9/15/2015	bloom											8.27	<0.019	<0.044	2455.0	2198.0		
96	Cossayuna L	9/25/2015	epi	30	21	3	1	3	13	0	0	68	1.3	<0.58	<0.082	<0.016	8.5	2.6	F	I
96	Cossayuna L	06/03/02	hypo	19	20	2	1	2	0	0	0	8.1	0.3	<0.55	<0.018	<0.139	1.9	0.9	I	
96	Cossayuna L	06/24/02	hypo	25	24	3	1	2	1	0	0	4.2	0.2	<0.86	<0.007	<0.040	0.9	0.3	F	I
96	Cossayuna L	07/08/02	hypo	26	19	2	2	2	5											
96	Cossayuna L	07/22/02	hypo	27	20	2	2	3												
96	Cossayuna L	08/06/02	hypo	26	22	3	2	3	5											
96	Cossayuna L	08/19/02	hypo	23	23	3	3	3	123458											
96	Cossayuna L	09/03/02	hypo	20	22	4	2	4	134											
96	Cossayuna L	09/23/02	hypo	17	21	3	3	4	13											
96	Cossayuna L	6/6/2004	hypo		22															
96	Cossayuna L	6/21/2004	hypo		20															
96	Cossayuna L	7/5/2004	hypo		22															
96	Cossayuna L	7/19/2004	hypo		22															
96	Cossayuna L	8/2/2004	hypo		19															
96	Cossayuna L	8/17/2004	hypo		20															
96	Cossayuna L	8/30/2004	hypo		25															
96	Cossayuna L	9/13/2004	hypo		18															
96	Cossayuna L	6/6/2005	hypo		24															
96	Cossayuna L	6/20/2005	hypo		21															
96	Cossayuna L	7/5/2005	hypo		25															
96	Cossayuna L	7/18/2005	hypo		27															
96	Cossayuna L	8/1/2005	hypo		26															
96	Cossayuna L	8/15/2005	hypo		26															
96	Cossayuna L	8/29/2005	hypo		23															
96	Cossayuna L	9/13/2005	hypo		24															
96	Cossayuna L	6/5/2006	hypo		16															
96	Cossayuna L	6/19/2006	hypo		18															
96	Cossayuna L	7/4/2006	hypo		18															
96	Cossayuna L	7/17/2006	hypo		20															
96	Cossayuna L	7/31/2006	hypo		23															
96	Cossayuna L	8/14/2006	hypo		22															
96	Cossayuna L	8/28/2006	hypo		22															
96	Cossayuna L	9/11/2006	hypo		20															
96	Cossayuna L	6/25/2007	hypo		18															
96	Cossayuna L	7/9/2007	hypo		19															
96	Cossayuna L	7/23/2007	hypo		20															
96	Cossayuna L	8/6/2007	hypo		21															
96	Cossayuna L	8/20/2007	hypo		22															
96	Cossayuna L	9/4/2007	hypo		21															
96	Cossayuna L	9/18/2007	hypo		18															
96	Cossayuna L	10/1/2007	hypo		19															
96	Cossayuna L	6/9/2008	hypo		19															
96	Cossayuna L	6/23/2008	hypo		19															
96	Cossayuna L	7/7/2008	hypo		22															
96	Cossayuna L	7/21/2008	hypo		22															
96	Cossayuna L	8/4/2008	hypo		22															
96	Cossayuna L	8/18/2008	hypo		23															
96	Cossayuna L	9/1/2008	hypo		22															

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
96	Cossayuna L	9/16/2008	hypo		21															
96	Cossayuna L	06/08/2009	hypo		18															
96	Cossayuna L	06/20/2009	hypo		22															
96	Cossayuna L	07/05/2009	hypo		20															
96	Cossayuna L	07/20/2009	hypo		24															
96	Cossayuna L	08/01/2009	hypo		25															
96	Cossayuna L	08/28/2009	hypo		23															
96	Cossayuna L	09/15/2009	hypo		20															
96	Cossayuna L	6/16/2010	hypo		21															
96	Cossayuna L	7/12/2010	hypo		26															
96	Cossayuna L	8/7/2010	hypo		25															
96	Cossayuna L	9/3/2010	hypo		24															
96	Cossayuna L	6/17/2012	hypo		22															
96	Cossayuna L	6/30/2012	hypo		25															
96	Cossayuna L	7/19/2012	hypo		27															
96	Cossayuna L	7/28/2012	hypo		26															
96	Cossayuna L	8/13/2012	hypo		26															
96	Cossayuna L	8/27/2012	hypo		25															
96	Cossayuna L	9/17/2012	hypo		22															
96	Cossayuna L	9/27/2012	hypo		20															
96	Cossayuna L	6/9/2013	hypo		19															
96	Cossayuna L	6/28/2013	hypo		25															
96	Cossayuna L	7/21/2013	hypo		26															
96	Cossayuna L	8/3/2013	hypo		24															
96	Cossayuna L	8/17/2013	hypo		23															
96	Cossayuna L	9/3/2013	hypo		23															
96	Cossayuna L	9/19/2013	hypo		20															
96	Cossayuna L	10/15/2013	hypo		17															
96	Cossayuna L	6/3/2014	hypo		22															
96	Cossayuna L	7/1/2014	hypo		24															
96	Cossayuna L	7/25/2014	hypo		25															
96	Cossayuna L	8/2/2014	hypo		24															
96	Cossayuna L	8/17/2014	hypo		22															
96	Cossayuna L	9/10/2014	hypo		23															
96	Cossayuna L	9/26/2014	hypo		18															
96	Cossayuna L	10/8/2014	hypo		17															
96	Cossayuna L	6/15/2015	hypo		22															
96	Cossayuna L	6/27/2015	hypo		26															
96	Cossayuna L	7/28/2015	hypo		26															
96	Cossayuna L	8/15/2015	hypo		25															
96	Cossayuna L	8/28/2015	hypo		24															
96	Cossayuna L	9/4/2015	hypo		25															
96	Cossayuna L	9/25/2015	hypo		20															

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 Cossayuna Lake

Cossayuna Lake (1103-0002) — Impaired Seg

Waterbody Location Information — Revised: 12/06/2006

Water Index No:	H-301-17-P79			**Drain Basin:**	Upper Hudson River
Hydro Unit Code:	02020003/080	**Str Class:**	A		Upper Hudson-Hoosic
Waterbody Type:	Lake			**Reg/County:**	5/Washington Co. (58)
Waterbody Size:	659.3 Acres			**Quad Map:**	COSSAYUNA (I-27-1)
Seg Description:	entire lake				

Water Quality Problem/Issue Information (CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
Aquatic Life	Stressed	Possible
RECREATION	Impaired	Known
HABITAT/HYDROLGY	Impaired	Known

Type of Pollutant(s)

Known:	ALGAL/WEED GROWTH, NUTRIENTS (phosphorus), PROBLEM SPECIES, Silt/Sediment
Suspected:	- - -
Possible:	Pathogens

Source(s) of Pollutant(s)

Known:	HABITAT MODIFICATION
Suspected:	FAILING ON-SITE SYST, Agriculture, Construction
Possible:	- - -

Resolution/Management Information

Issue Resolvability: 1 (Needs Verification/Study (see STATUS))
Verification Status: 4 (Source Identified, Strategy Needed)
Lead Agency/Office: DOW/Reg5 **Resolution Potential:** Medium
TMDL/303d Status: 3a->1 ())

Further Details

Recreational uses (swimming, fishing, boating) in Cossayuna Lake are considered to be impaired due to nutrient (phosphorus) enrichment, and aquatic weed growth (including invasives) in this eutrophic lake. The primary source of these impacts are failing and/or inadequate on-site septic systems serving lakeshore residences, nonpoint runoff of nutrients and sediment from the lake watershed and habitat modification (related to the invasive species).

Cossayuna Lake has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1992 and continuing through 2005. An Interpretive Summary report of the findings of this sampling was published in 2006. These data indicate that the lake continues to be best characterized as eutropic, or highly productive, although productivity has been somewhat lower over the most recent five years. Phosphorus levels in the lake regularly exceed the state guidance criteria for impacted recreational uses, resulting in transparency measurements that at times fail to meet what is recommended for swimming beaches. However water clarity readings have improved in the most recent years of sampling. (DEC/DOW, BWAM/CSLAP, May 2006)

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. These assessment also indicate recreational suitability of the lake to be mostly unfavorable since that lake was first evaluated and continuing through the most recent assessment. The lake is described most frequently as "slightly" to "substantially" impaired for most uses. Assessments have noted that aqautic plants regularly grow to the lake surface and are frequently quite dense. Aquatic plant communities appear to be dominated by a mix of native and non-native species. The lake association has been actively engaged in an aquatic plant control effort for many years. These efforts include use of aquatic herbicides in selective areas, targeted mechanical weed harvesting, and lake drawdown. (DEC/DOW, BWAM/CSLAP, May 2006)

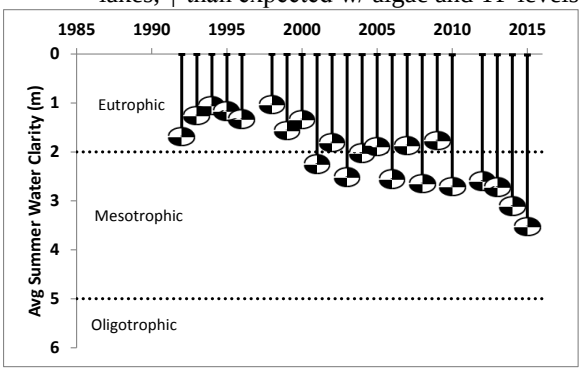
A two-year water quality study was conducted in 2000-01 by the Washington County WQCC and Adirondack Community College. The study found elevated nutrient concentrations in tribs to the lake. Elevated levels of pathogens - perhaps related to waterfowl populations - were also noted. The lake is surrounded by camps with on-site septic systems as well as a trailer park. There are some agricultural activity along the tribs to the lake, but overall agriculture is declining. (Washington County WQCC/SWCD, 2005)

The lake is included on the NYS 2006 Section 303(d) List of Impaired Waters. The lake is included on Part 3a of the List as a a Water Requiring Verification of Impairment, however this updated assessment suggests that the suspected impairments are confirmed and the lake be moved to Part 1 of the List as Waterbody Requiring TMDL Development (or other strategy to attain water quality standards).

Appendix C- Long Term Trends: Cossayuna Lake

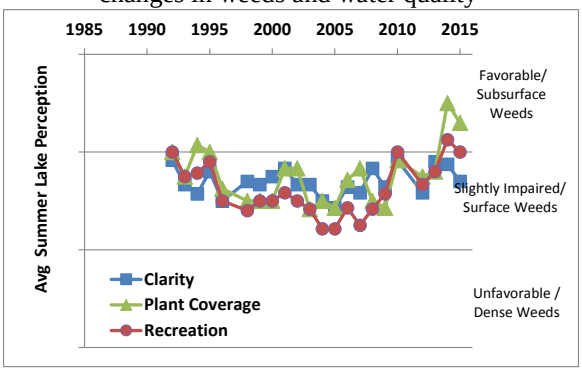
Long Term Trends: Water Clarity

- Increasing significantly since early 2000s
- Most readings now typical of *mesotrophic* lakes, ↑ than expected w/ algae and TP levels



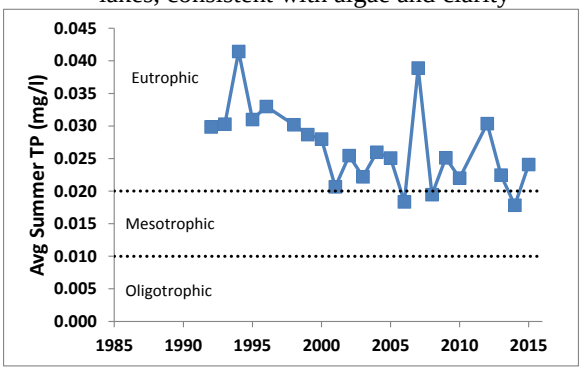
Long Term Trends: Lake Perception

- No clear trends, but recent improvement?
- Recreational perception closely linked to changes in weeds and water quality



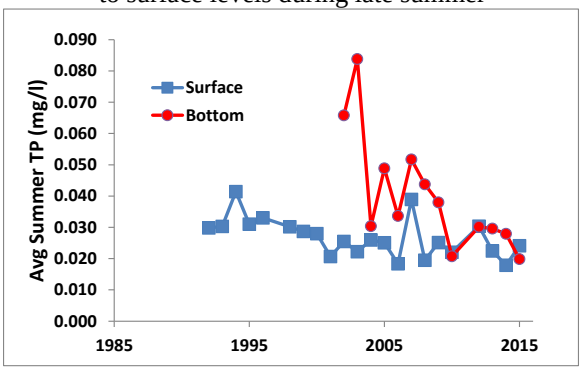
Long Term Trends: Phosphorus

- Decrease may not be statistically significant
- Most readings typical of *mesoeutrophic* lakes, consistent with algae and clarity



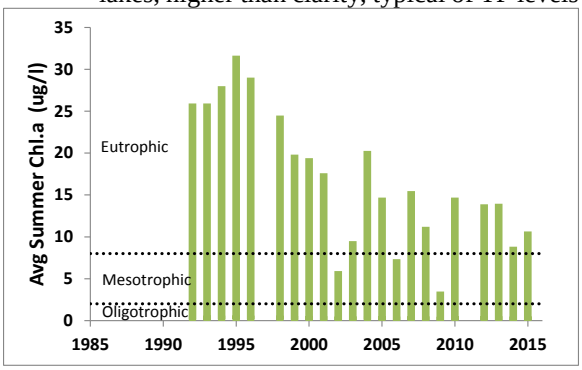
Long Term Trends: Bottom Phosphorus

- Surface and bottom TP now similar
- Bottom TP may indicate past nutrient loading to surface levels during late summer



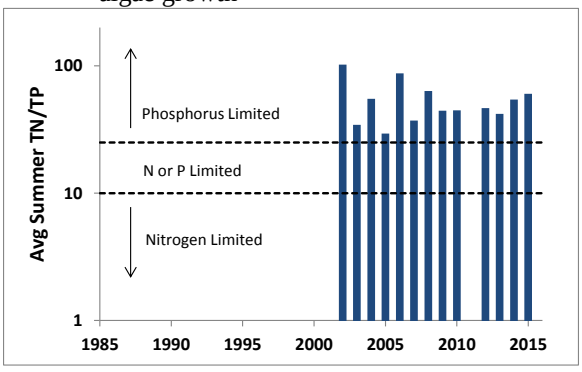
Long Term Trends: Chlorophyll a

- Decreasing since mid-1990s
- Most readings typical of *mesoeutrophic* lakes, higher than clarity, typical of TP levels



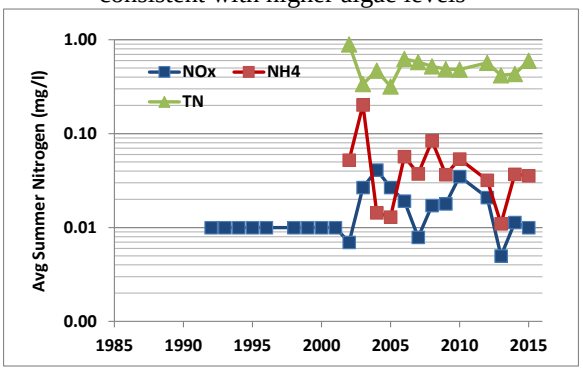
Long Term Trends: N:P Ratio

- Ratio may be decreasing slightly
- Most readings indicate phosphorus limits algae growth



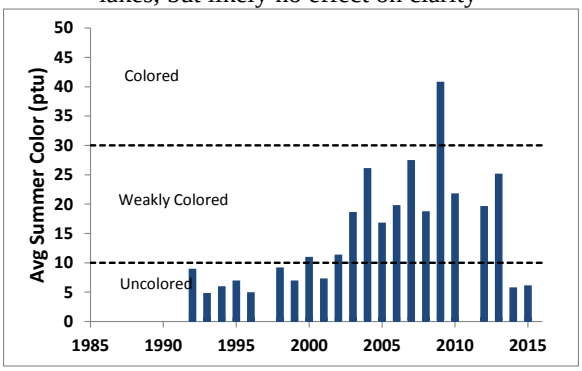
Long Term Trends: Nitrogen

- No clear trends; slight drop NH4?
- Occasionally elevated total nitrogen readings consistent with higher algae levels



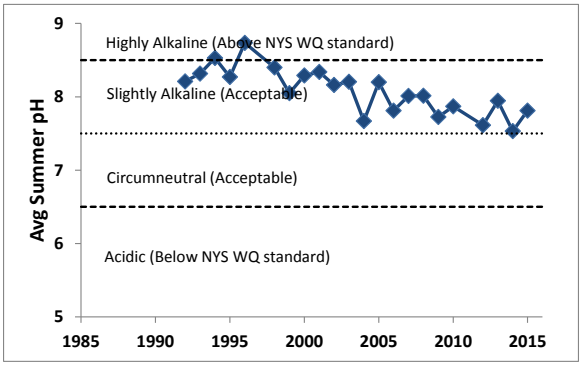
Long Term Trends: Color

- Higher color late 00s, but recent drop
- Most readings typical of *moderately colored* lakes, but likely no effect on clarity



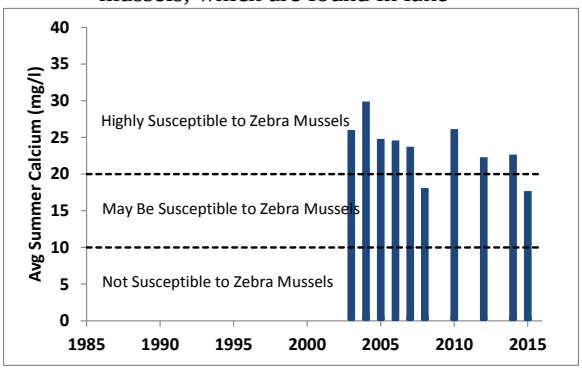
Long Term Trends: pH

- Decreasing pH and algae since early 2000s
- Most readings typical of *slightly alkaline* lakes



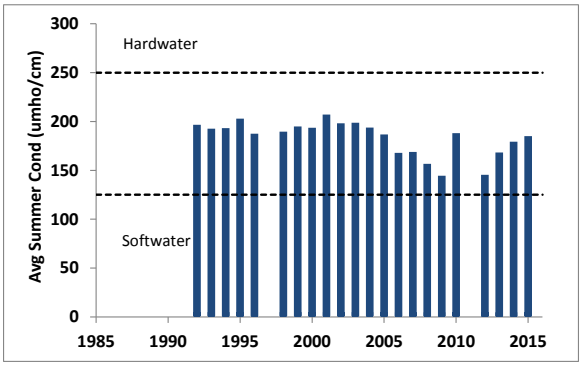
Long Term Trends: Calcium

- Slight decrease apparent
- Most readings indicate susceptibility to zebra mussels, which are found in lake



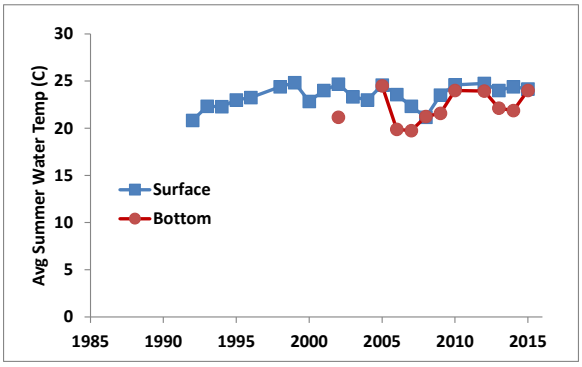
Long Term Trends: Conductivity

- ↓ levels since early 2000s, but recent ↑
- Most readings typical of lakes with *intermediate hardness*



Long Term Trends: Water Temperature

- No clear trends, but slight increase
- Similar surface and bottom temperatures indicate weak 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.

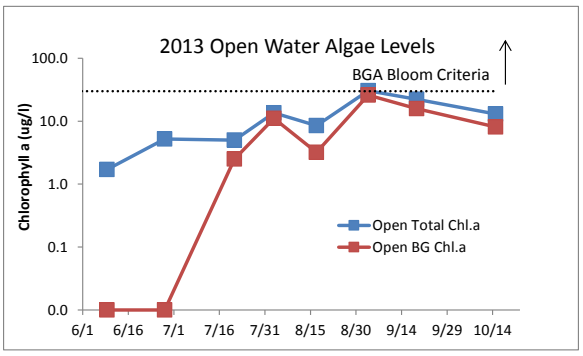


Figure D1:
2013 Open Water Total and BGA Chl.a

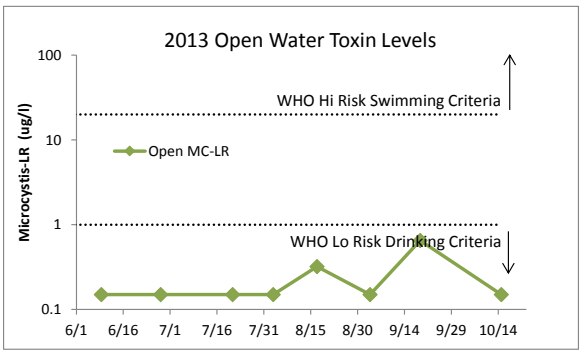


Figure D2:
2013 Open Water Microcystin-LR

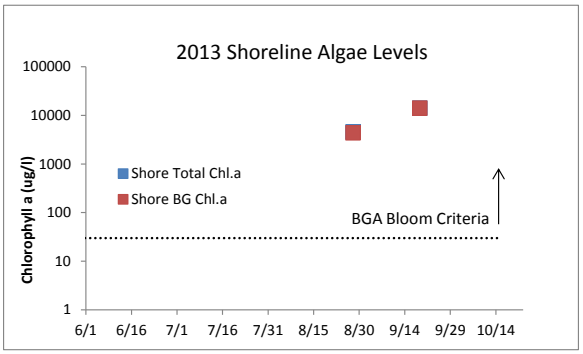


Figure D3:
2013 Shoreline Total and BGA Chl.a

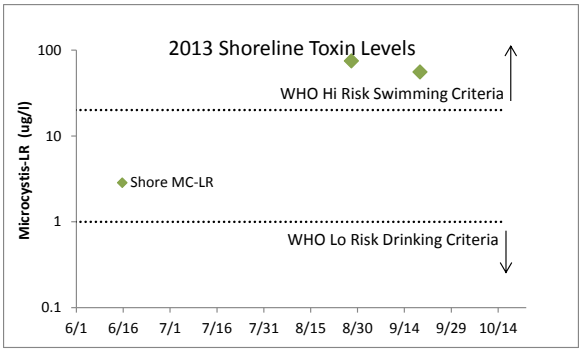


Figure D4:
2013 Shoreline Microcystin-LR

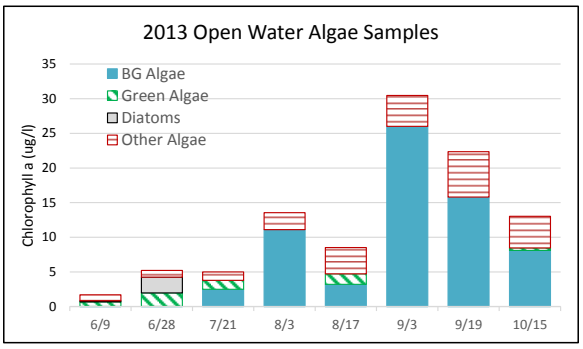


Figure D5:
2013 Open Water Algae Types

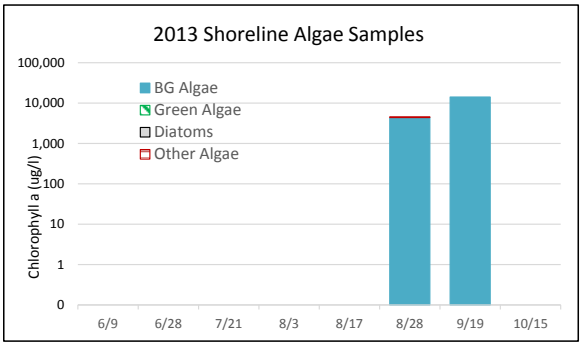


Figure D6:
2013 Shoreline Algae Types

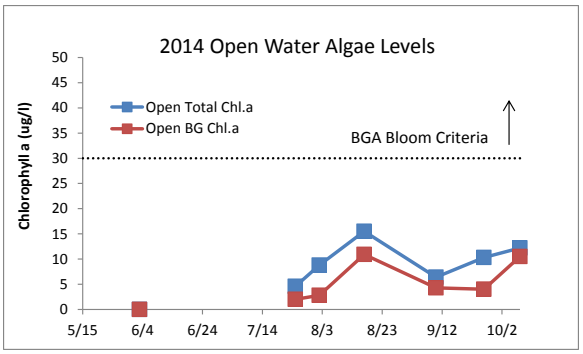


Figure D7:
2014 Open Water Total and BGA Chl.a

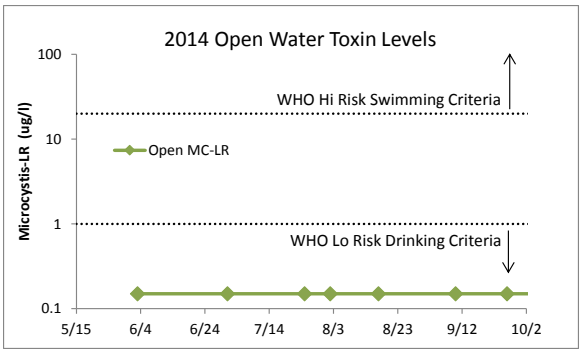


Figure D8:
2014 Open Water Microcystin-LR

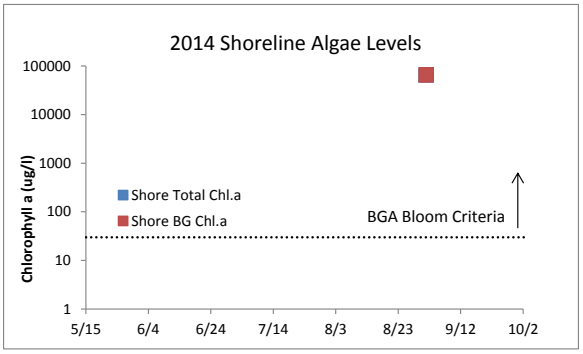


Figure D9:
2014 Shoreline Total and BGA Chl.a

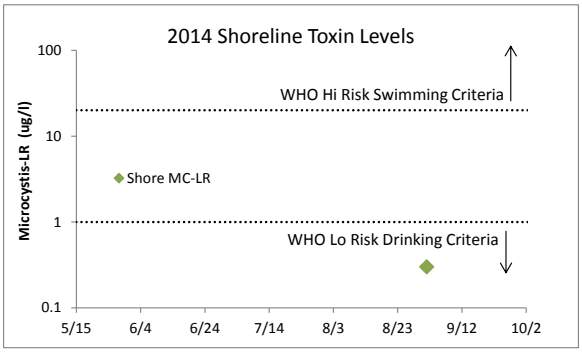


Figure D10:
2014 Shoreline Microcystin-LR

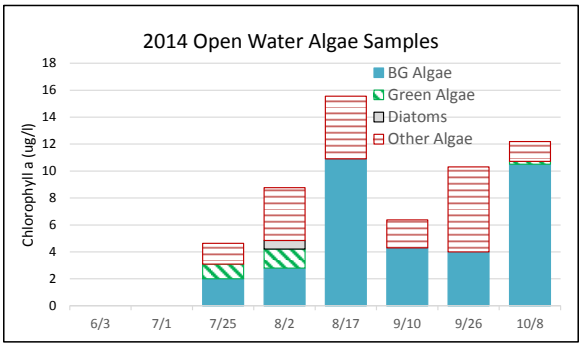


Figure D11:
2014 Open Water Algae Types

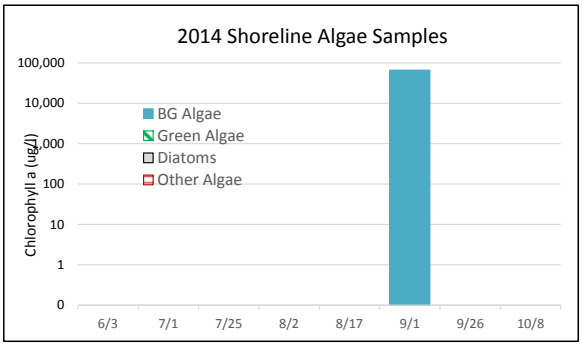


Figure D12:
2014 Shoreline Algae Types

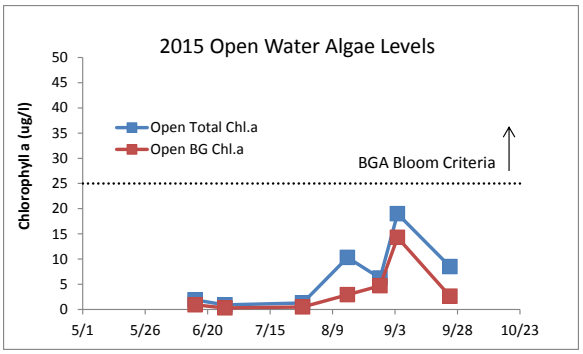


Figure D13:
2015 Open Water Total and BGA Chl.a

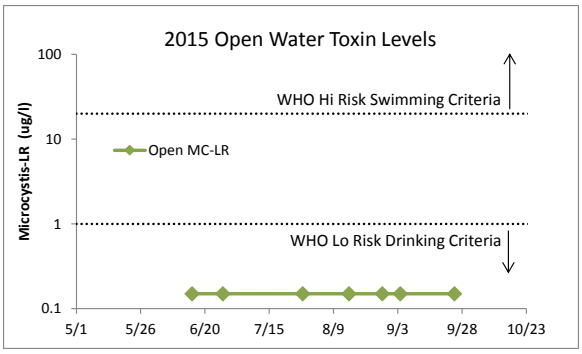


Figure D14:
2015 Open Water Microcystin-LR

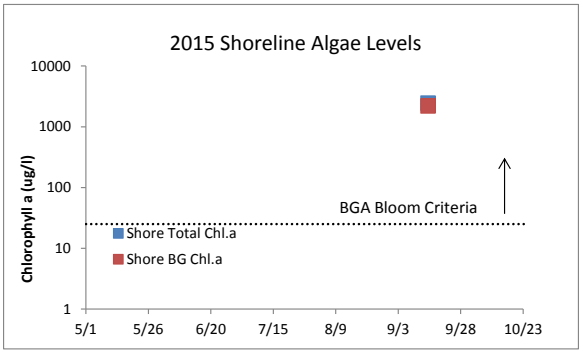


Figure D15:
2015 Shoreline Total and BGA Chl.a

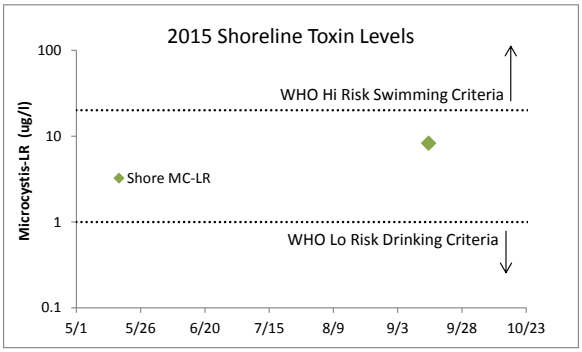


Figure D16:
2015 Shoreline Microcystin-LR

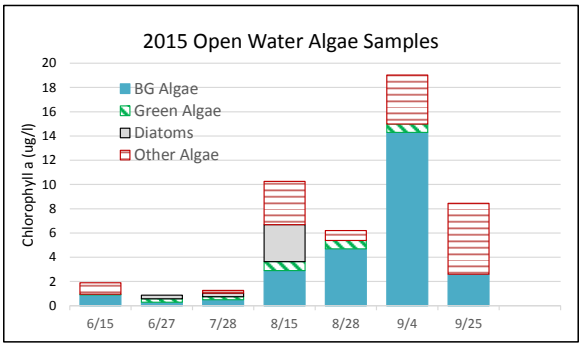


Figure D17:
2015 Open Water Algae Types

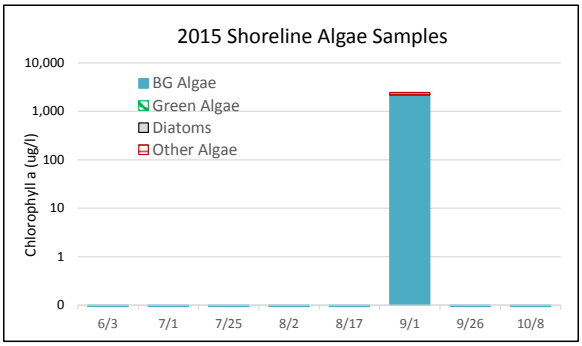


Figure D18:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Washington County

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

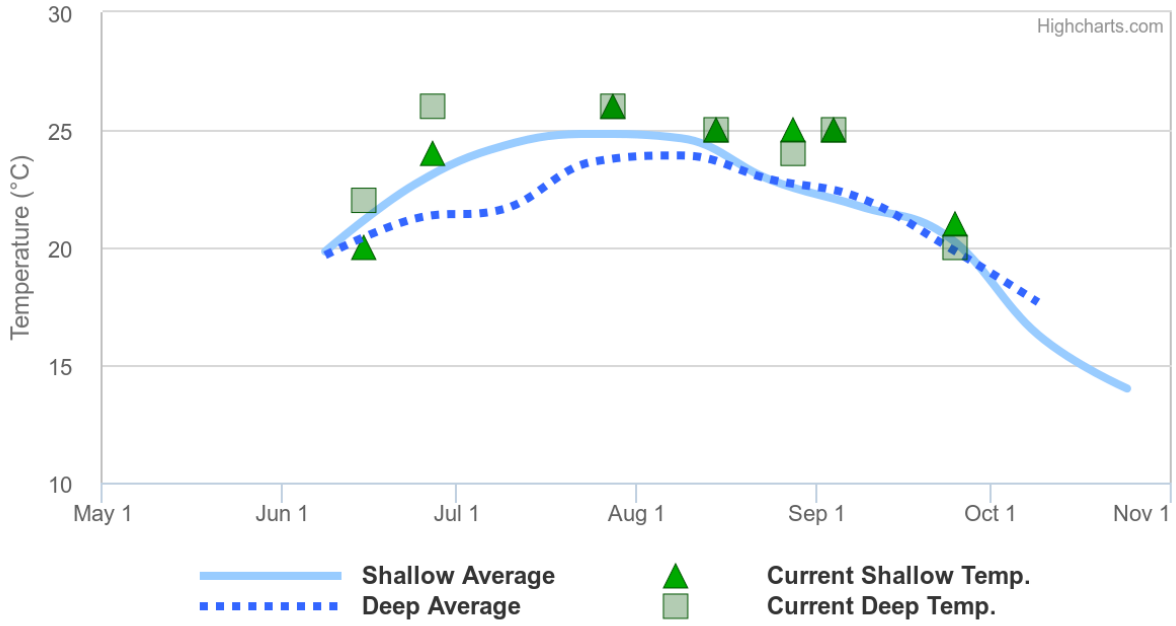
This list is not complete, but instead represents only those species that have been reported and verified within the county. If any additional aquatic invasive species (AIS) are known or suspected in these or other waterbodies in the county, this information should be reported through iMap invasives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

Aquatic Invasive Species – Washington County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Barkley Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Barkley Pond	Plant	Water chestnut	*Trapa natans*
Batten Kill	Animal	Zebra mussel	*Dreissena polymorpha*
Champlain Canal, Clemons	Plant	European frogbit	*Hydrocharis morsus-ranae*
Champlain Canal, Fort Edward	Animal	Asian Clam	*Corbicula fluminea*
Cossayuna Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Cossayuna Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Cossayuna Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Finch Marsh	Plant	Water chestnut	*Trapa natans*
Great South Bay, Lake Champlain	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Great South Bay, Lake Champlain	Plant	Curly leafed pondweed	*Potamogeton crispus*
Hadlock Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Hadlock Pond	Plant	Brittle naiad	*Najas minor*
Hadlock Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Hadlock Pond	Plant	Water chestnut	*Trapa natans*
Hedges Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Hedges Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Hedges Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Hills Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Lake Champlain	Animal	Zebra mussel	*Dreissena polymorpha*
Lake Champlain	Plant	Water chestnut	*Trapa natans*
Lake Champlain, Mill Bay	Plant	European frogbit	*Hydrocharis morsus-ranae*
Lake Lauderdale	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*

Waterbody	Kingdom	Common name	Scientific name
Lock 11, Champlain Barge Canal	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lock 11, Champlain Barge Canal	Plant	Water chestnut	*Trapa natans*
Lock 12, Champlain Barge Canal	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lock 12, Champlain Barge Canal	Plant	Water chestnut	*Trapa natans*
Sheltered Lakes	Plant	European frogbit	*Hydrocharis morsus-ranae*
Sheltered Lakes	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Sheltered Lakes	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Sheltered Lakes	Plant	Curly leafed pondweed	*Potamogeton crispus*
Sheltered Lakes	Plant	Water chestnut	*Trapa natans*
Summit Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Summit Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Whitehall Launch, Champlain Barge Canal	Plant	European frogbit	*Hydrocharis morsus-ranae*
Whitehall Launch, Champlain Barge Canal	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Whitehall Launch, Champlain Barge Canal	Plant	Water chestnut	*Trapa natans*
Wood Creek	Plant	Water chestnut	*Trapa natans*

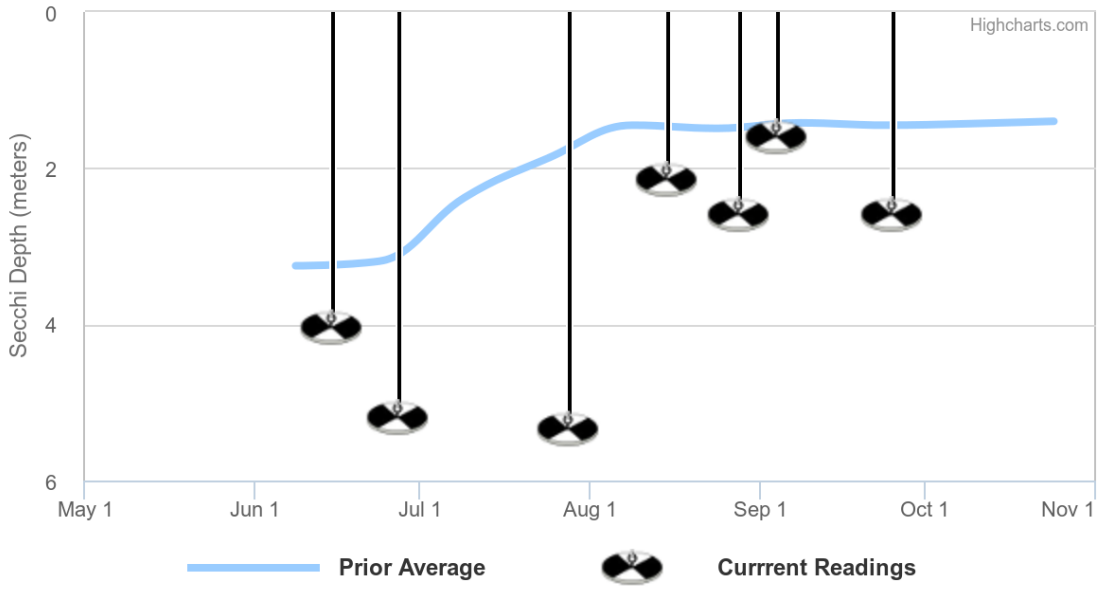
Appendix F: Current Year vs. Prior Averages for Cossayuna Lake

Current Year Water Temperatures vs. Prior Average



This year's shallow water sample temperatures are tending to be higher than normal when compared to the average of readings collected from 1992 to 2014. This year's deep water sample temperatures are tending to be higher than normal when compared to the average of readings collected from 2002 to 2014.

Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are tending to be higher than normal when compared to the average of readings collected from 1992 to 2014

Appendix G: Watershed and Land Use Map for Cossayuna 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.