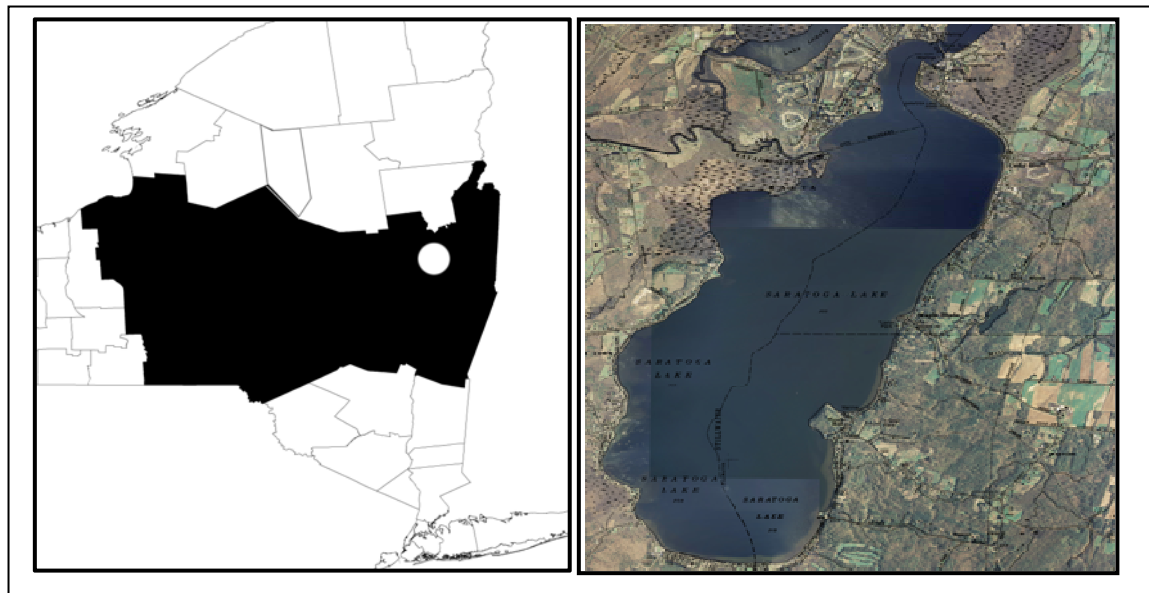


CSLAP 2013 Lake Water Quality Summary: Saratoga Lake

General Lake Information

Location	Town of Saratoga Springs
County	Saratoga
Basin	Upper Hudson River
Size	1,632 hectares (4,030 acres)
Lake Origins	Natural
Watershed Area	63,200 hectares (156,104 acres)
Retention Time	0.4 years
Mean Depth	7.7 meters
Sounding Depth	28.9 meters
Public Access?	DEC/private launches
Major Tributaries	Drummond Creek, Kayaderosseras Creek
Lake Tributary To...	Fish Creek to Hudson River
WQ Classification	A (potable water)
Lake Outlet Latitude	43.103
Lake Outlet Longitude	-73.637
Sampling Years	1993-1997, 2005-2011, 2013
2013 Samplers	Ed Dweck and Tom Whalen
Main Contact	Ed Dweck

Lake Map



Background

Saratoga Lake is a 4030 acre, class A lake found in the Towns of Malta, Saratoga, and Stillwater in Saratoga County, just north of the Capital District region of New York State. It was first sampled as part of CSLAP in 1988.

It is one of seven CSLAP lakes among the more than 50 lakes found in Saratoga County, and one of 25 CSLAP lakes among the more than 470 lakes and ponds in the Upper Hudson River drainage basin.

Lake Uses

Saratoga 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 aesthetics, aquatic life, and aesthetics. The lake is used by lake residents and visitors for power boating and swimming; the lake has multiple public access locations. The lake does not presently serve as a municipal water supply.

8.7 million ½ inch walleye are stocked by the state each year in Saratoga Lake. Fish species on the lake include black crappie, bluegill, brown bullhead, chain pickerel, largemouth bass, northern pike, pumpkinseed sunfish, redbreast sunfish, rock bass, smallmouth bass, walleye, and yellow perch.

General statewide fishing regulations are applicable in Saratoga Lake. In addition, open season for chain pickerel lasts from 1st Saturday May-March 15th, with no size limit, with a daily take limit of five fish. Open season for sunfish lasts all year, with no size limit, but a daily take limit of 15. Ice fishing is permitted.

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

Historical Water Quality Data

CSLAP sampling was conducted on Saratoga Lake from 1993 to 1997, 2005 to 2011, and 2013. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at <http://nysfola.mylaketown.com>. The most recent CSLAP reports for Saratoga Lake can also be found on the NYSDEC web page at <http://www.dec.ny.gov/lands/77843.html>.

Saratoga Lake was sampled through a variety of other programs, including several conducted as part of the US EPA Clean Lakes program and grants awarded in the 1970s and 1980s. The results from these survey efforts have been reported elsewhere.

Saratoga Lake was sampled by the Conservation Department (the predecessor to the NYSDEC) as part of the Biological Survey of the Upper Hudson River basin in 1932. This program was intended to evaluate water quality conditions as they relate to fisheries management, so much of the information collected cannot be easily compared to the CSLAP dataset. The overall summary for Saratoga Lake was as follows:

“Temperature and oxygen relationships suitable for lake trout and whitefish obtain everywhere below the 40 foot contour.... The many weed beds furnish shelter and food for the minnows and young”

"It has very regular, and for the most part, sandy shores, which are quite free from vegetation except in a few protected bays. The principal weed areas... were observed in the northeast corner and along both sides of the outlet for about 3 miles. In some places, the vegetation extends almost to the middle of the outlet.

The limited monitoring did show that pH readings (= 8.2) were mostly comparable to those measured in contemporary monitoring programs, higher water clarity than in most contemporary sampling seasons (at least prior to the introduction of zebra mussels). These data also showed that the lake was both thermally stratified and fully oxygenated in all but the extreme bottom waters.

Kayaderosseras Creek (in Ballston Spa) and Fish Creek in Saratoga have been monitored through the NYSDEC Rotating Intensive Basins (RIBS). These data are summarized at http://www.dec.ny.gov/docs/water_pdf/pwluhud07.pdf. The Kayaderosseras has been sampled through the state biomonitoring program; the sampling results were summarized as follows:

"Current water quality in Kayaderosseras Creek is mostly assessed as non-impacted, with a small reach of slight impact. A 1997 sampling of 4 sites from Porter Corners to Ballston Spa found possible slight impacts near the headwaters and near the mouth. The headwater location at Porter Corners was determined to be due to headwater effect, and the assessment was upgraded to non-impacted. The site near the mouth at Ballston Spa was re-sampled in 2001, and was assessed as non-impacted. All four sites show some indications of nutrient enrichment, and the stream was described as being potentially vulnerable to additional nonpoint sources, as these would likely to result in substantial changes in the stream ecosystem. Sampling in 2002 at a site in Ballston Spa showed slight impact from nutrient enrichment."

Lake Association and Management History

Saratoga Lake is served by the Saratoga Lake Association and the Saratoga Lake Protection and Improvement District. Both organizations work together to conduct a wide variety of lake management activities, including aquatic plant management on the lake, using mechanical harvesting and aquatic herbicides (and experimental herbivorous insect stocking). The management of the lake is summarized in the Saratoga Lake Watershed Management Plan, which can be viewed at <http://www.sara-lake.org/>.

The lake association maintains a web site at <http://www.saratogalake.org/>.

Summary of 2013 CSLAP Sampling Results

Evaluation of 2013 Annual and Monthly Results Relative to 2006-2012

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 – Saratoga Lake" section in Appendix D.

Evaluation of Eutrophication Indicators

Total phosphorus, chlorophyll *a* and Secchi disk transparency readings were close to normal in 2013, despite the extensive shoreline bloom in the fall. Chlorophyll *a* readings have decreased

significantly since the mid 1990s, although it is not known if actual algae levels in the lake have exhibited similar changes. Lake productivity typically increases during the summer, as manifested in decreasing water clarity and increasing nutrient and algae levels; this seasonal trend was also apparent in 2011 and 2013, resulting in a bloom in mid September.

The lake can be characterized as *mesoeutrophic*, or moderately to highly productive, based on water clarity, total phosphorus (both indicative of *mesotrophic* lakes) and chlorophyll *a* readings (typical of *eutrophic* lakes). This overall assessment was also accurate in 2013. The trophic state index (TSI) evaluation suggests that each of these trophic indicators is “internally consistent”—that is, each of these trophic indicators can be accurately predicted from any of the other indicators. 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, but the lake is not presently used for drinking water. Deepwater phosphorus, ammonia, iron, manganese and arsenic readings are not significantly elevated, so deepwater intakes may support “unofficial” potable water use. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

pH readings have decreased slightly since the mid 1990s, although the lake can still be identified as alkaline. Color readings have been higher since the 2002 change in laboratories, but these higher readings may not be “real”. None of the other limnological indicators (NO_x, ammonia, total nitrogen, and conductivity) has exhibited any clear long-term trends, and each of these indicators was close to normal in 2013. It is likely that the small changes in each of these indicators have been within the normal range of variability in the lake. Overall limnological conditions are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Biological Condition

Macrophyte surveys have been conducted through CSLAP and the LCI study of Saratoga Lake. At least 14 aquatic plant species have been found, including at least two exotic plant species (*Myriophyllum spicatum*, Eurasian watermilfoil, and *Potamogeton crispus*, curly-leaved pondweed). The modified floristic quality index (FQI) for the lake indicates that the quality of the aquatic plant community is “fair”.

The composition of the fish community is comprised of at least eight warmwater fish species, and at least five coolwater fish species. This suggests that the lake can most likely be characterized as a coolwater fishery.

Zooplankton, and macroinvertebrates have not been evaluated through CSLAP in Saratoga Lake. The fluoroprobe analyses conducted by SUNY ESF on raw water samples in 2013 showed slightly elevated overall and blue green algae levels in early fall, with samples dominated by *Microcystis*, *Anabaena* (two blue green algae species capable of producing algal toxins) and green algae. The shoreline scum samples from mid fall showed much higher blue green algae levels dominated by *Lyngbya*, *Microcystis*, *Anabaena*, *Woronichinia*, and *Aphanizomenon* (all

blue green algae species). Shoreline samples collected earlier in the summer were also comprised of *Lyngbya*, although both total and blue green algae densities were much lower.

Evaluation of Lake Perception

Water quality assessments, aquatic plant coverage, and recreational conditions were close to normal in 2013, despite the fall algae bloom, and none of these assessments has exhibited any clear long-term trends. This might reflect both stable conditions and active management of aquatic plants. These assessments degrade slightly during the typical summer, consistent with a seasonal increase in lake productivity, but no clear trends were apparent in 2013. Aquatic plant coverage was highly variable in 2013, perhaps due to seasonal changes in active management (harvesting and/or herbicides). 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 2011 and 2013, but both air and water temperature readings has increased since first evaluated in 1993. It is not known if this is an indication of local climate change or if these changes can 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. Phycocyanin readings at times exceed levels indicating susceptibility for harmful algal blooms (HABs), especially in shoreline blooms. This is consistent with the fluoroprobe results from 2013. An analysis of algae samples indicates microcystin readings below the levels needed to support safe swimming in the open water, but much higher readings in fall bloom samples in 2013 exceed the recreational criteria established by the World Health Organization. Regardless of whether elevated algal toxin levels are detected, lake residents and recreational users are advised to avoid direct contact with shoreline blooms.

Lake Condition Summary

Category	Indicator	Min	94-13 Avg	Max	2013 Avg	Classification	2013 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	1.20	3.18	7.05	2.61	Mesotrophic	Within Normal Range	No Change
	Chlorophyll <i>a</i>	1.43	8.91	34.40	8.44	Eutrophic	Within Normal Range	Decreasing Slightly
	Total Phosphorus	0.006	0.019	0.041	0.019	Mesotrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.01	0.04	0.18	0.02	Close to Surface NH ₄ Readings	Lower Than Normal	Not known
	Hypolimnetic Arsenic	0.34	0.48	0.90		Low Deepwater Arsenic Levels		Not known
	Hypolimnetic Iron	0.01	0.10	0.47		Low Iron Levels		Not known
	Hypolimnetic Manganese	0.01	0.21	0.38		Low Manganese Levels		Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.000	0.019	0.040	0.021	Close to Surface TP Readings	Within Normal Range	Not known
	Nitrate + Nitrite	0.00	0.04	0.36	0.02	Low NO _x	Within Normal Range	No Change
	Ammonia	0.01	0.03	0.12	0.02	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.10	0.38	0.89	0.46	Low Total Nitrogen	Within Normal Range	No Change
	pH	6.14	7.91	8.82	7.65	Alkaline	Within Normal Range	Decreasing Significantly
	Specific Conductance	101	267	373	250	Hardwater	Within Normal Range	No Change
	True Color	4	17	36	22	Intermediate Color	Within Normal Range	Increasing Significantly
	Calcium	25.4	28.0	32.4		Highly Susceptible to Zebra Mussels		No Change
Lake Perception	WQ Assessment	1	2.0	4	2.0	Not Quite Crystal Clear	Within Normal Range	No Change
	Aquatic Plant Coverage	1	1.4	4	1.8	Plants Not Visible	Within Normal Range	No Change
	Recreational Assessment	1	1.8	4	1.9	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Fair quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not measured through CSLAP	Not known	Not known
	Macroinvertebrates					Not measured through CSLAP	Not known	Not known
	Fish					Coolwater fishery?	Not known	Not known
	Invasive Species					Zebra mussels, common carp, goldfish, alewife, Eurasian watermilfoil, Curly-leaved pondweed, Water chestnut	Not known	Not known
Local Climate Change	Air Temperature	11	24.2	39	24.2		Within Normal Range	Increasing Significantly
	Water Temperature	14	23.3	29	24.1		Within Normal Range	Increasing Significantly

Category	Indicator	Min	94-13 Avg	Max	2013 Avg	Classification	2013 Change?	Long-term Change?
Harmful Algal Blooms	Open Water Phycocyanin	5	49	380	18	Most readings indicate low risk of BGA	Not known	Not known
	Open Water FP Chl.a	2	5	12	5	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	1	3	10	3	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	0.4	2.7	0.4	Mostly undetectable open water MC-LR	Not known	Not known
	Open Water Anatoxin a	<DL	<DL	<DL	<DL	Open water Anatoxin-a not detectable	Not known	Not known
	Shoreline Phycocyanin	583.0	1364.5	2146.0		All readings indicate high risk of BGA	Not known	Not known
	Shoreline FP Chl.a	5.4	486.1	1425.8	486.1	Most readings indicate high algae levels	Not known	Not known
	Shoreline FP BG Chl.a	3.2	410.0	1213.0	410.0	Most readings indicate high BGA levels	Not known	Not known
	Shoreline Microcystis	0.3	39.8	220.4	74.1	Occasionally very high shoreline bloom MC-LR	Not known	Not known
	Shoreline Anatoxin a	<DL	<DL	<DL	<DL	Shoreline bloom Anatoxin-a not detectable	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Saratoga Lake is presently among the lakes listed on the 2007 Upper Hudson River Basin PWL, with recreation and habitat listed as *stressed* due to excessive algae and weeds. The PWL listing for Saratoga Lake is listed in Appendix C.

Potable Water (Drinking Water)

The CSLAP dataset at Saratoga 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. These data suggest that any "unofficial" potable water use from the surface waters of the lake may be impacted by excessive algae, particularly in association with shoreline or more extensive algae blooms.

Contact Recreation (Swimming)

The CSLAP dataset at Saratoga Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that swimming and contact recreation may be *stressed* by shoreline algae blooms and elevated algal toxins, although additional information about bacterial levels is needed to evaluate the safety of the water for swimming.

Non-Contact Recreation (Boating and Fishing)

The CSLAP dataset on Saratoga Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that non-contact recreation should be fully supported, although this use may ultimately be *threatened* by excessive weeds, particularly Eurasian watermilfoil. This use may be sustained (and threats minimized) by the active management of surface growth of weeds, native and exotic.

Aquatic Life

The CSLAP dataset on Saratoga Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *threatened* by hypolimnetic hypoxia (slightly depressed deepwater oxygen readings) and *stressed* by zebra mussels and exotic plants, although additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics

The CSLAP dataset on Saratoga Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *stressed* by excessive weeds and shoreline algal blooms, although this threat may have been minimized by the aquatic plant control activities conducted at the lake.

Fish Consumption

There are no fish consumption advisories posted for Saratoga Lake.

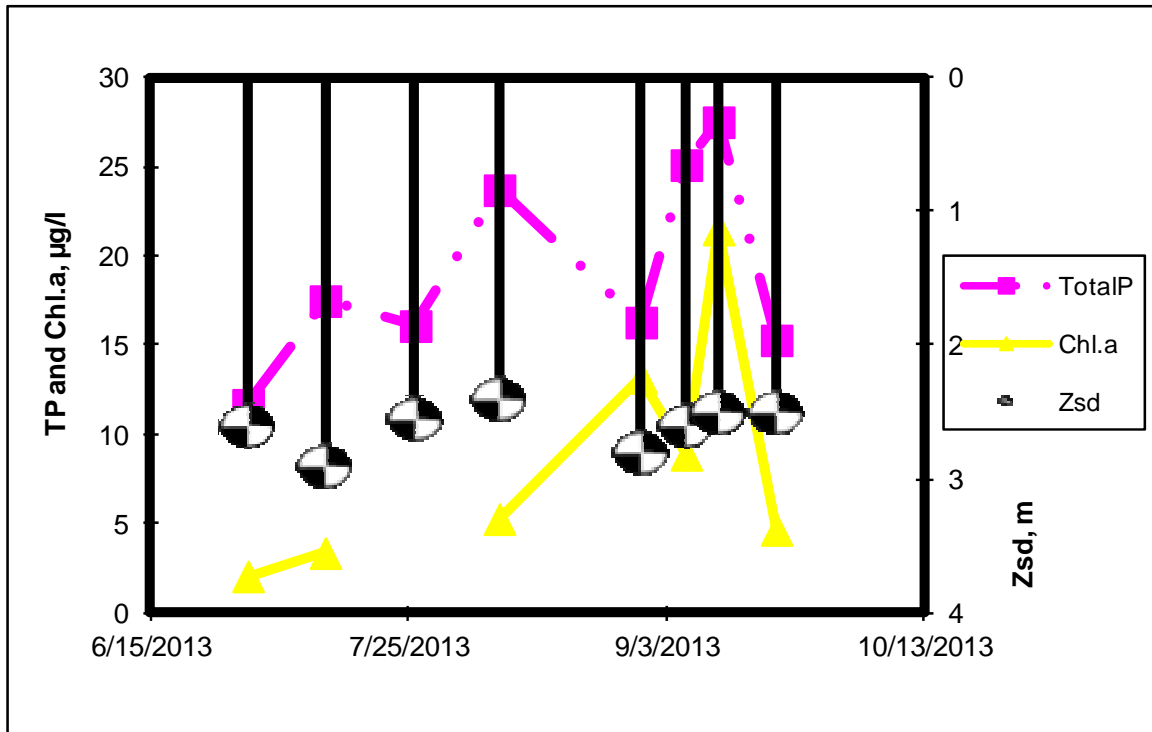
Additional Comments and Recommendations

Additional aquatic plant survey data (or a detailed evaluation of the Darrin Freshwater Institute data) may help to determine if the aquatic plant community is dominated by exotic plants, or if the occasional management of the nuisance weed problems in the lake has resulted in a shift to dominance by native plant species. Lake residents should continue to report and avoid direct exposure to any surface scums or heavily discolored water.

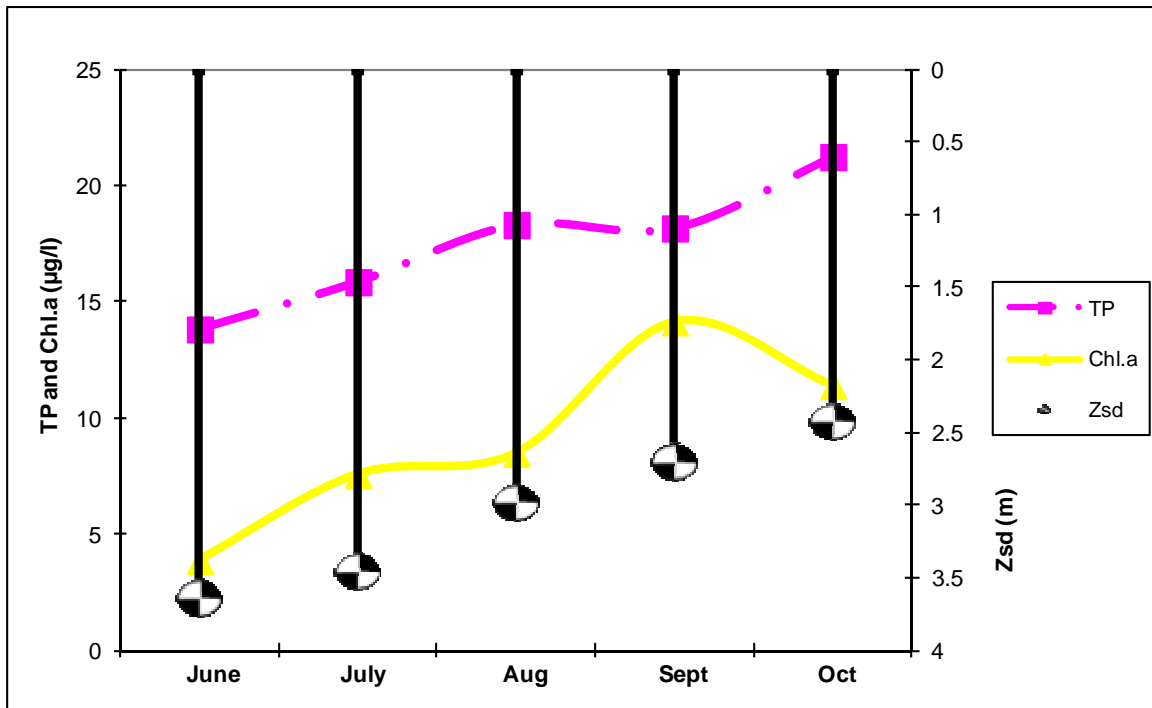
Aquatic Plant IDs-2013

None submitted for identification in 2013.

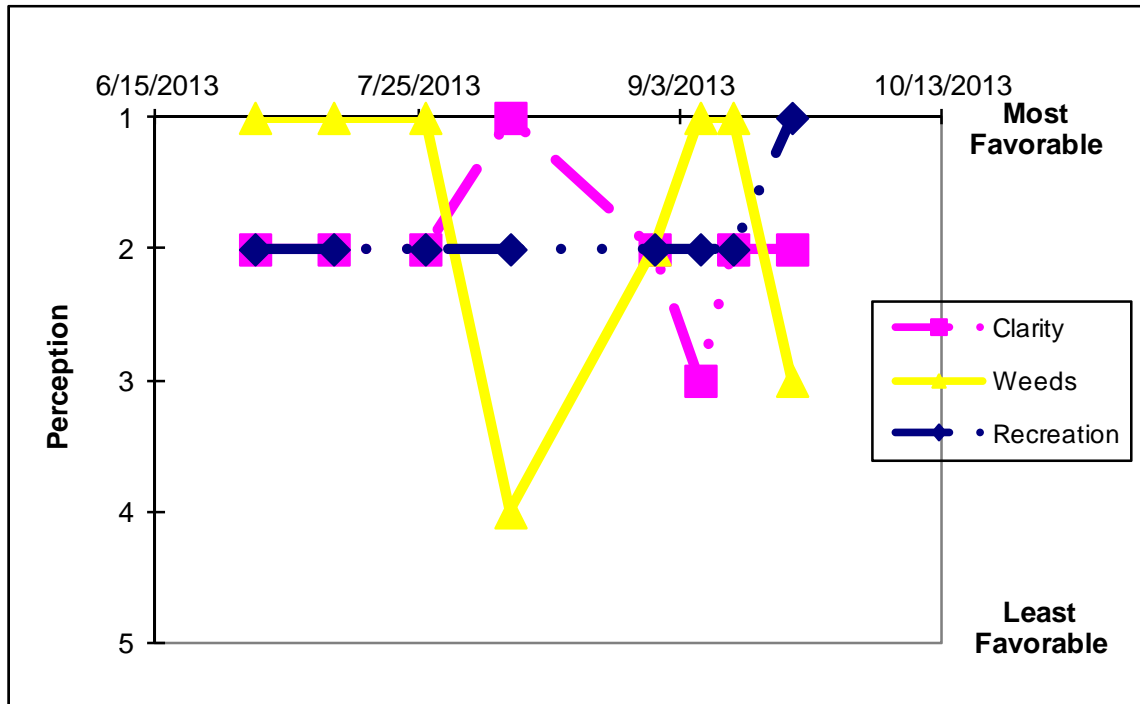
Time Series: Trophic Indicators, 2013



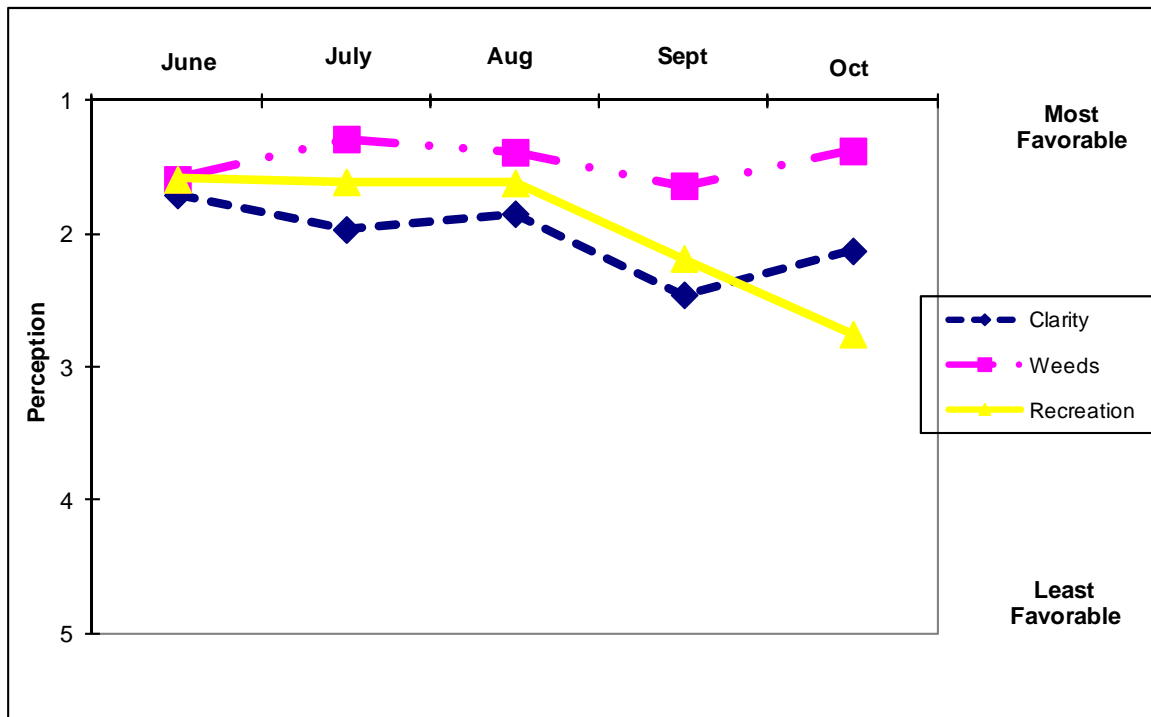
Time Series: Trophic Indicators, Typical Year (1994-2013)



Time Series: Lake Perception Indicators, 2013



Time Series: Lake Perception Indicators, Typical Year (1994-2013)



Appendix A- CSLAP Water Quality Sampling Results for Saratoga Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a
104	Saratoga L	6/26/1993	27.7	2.58	1.5	0.019	0.10				13	8.12	273		5.27
104	Saratoga L	7/10/1993	27.7	3.01	1.5	0.013	0.01				8	7.58	279		3.90
104	Saratoga L	7/25/1993	29.6	5.28	1.5	0.013	0.01				7	8.30	274		23.80
104	Saratoga L	8/7/1993	27.0	3.55	1.5	0.014	0.01				7	8.30	285		8.30
104	Saratoga L	8/21/1993	28.0	2.55	1.5	0.014	0.01				4	8.29	286		10.40
104	Saratoga L	9/5/1993	28.0	1.75	1.5	0.020	0.01				9	8.19	293		29.30
104	Saratoga L	9/20/1993	28.0	1.20	1.5	0.023	0.01				9	8.34	292		34.40
104	Saratoga L	10/2/1993	28.0	1.65	1.5	0.019	0.01				6	8.33	297		27.60
104	Saratoga L	6/5/1994	28.9	2.61	1.5	0.008	0.14				8	7.77	272		7.74
104	Saratoga L	6/18/1994	27.4	2.74	1.5	0.015	0.10				13	8.18	286		4.09
104	Saratoga L	7/5/1994	28.9	2.60	1.5	0.011					7	8.38	282		10.50
104	Saratoga L	7/18/1994	28.9	2.50	1.5	0.010	0.01				7	8.46	289		11.20
104	Saratoga L	7/30/1994	28.9	2.89	1.5	0.017					4	8.27	279		5.44
104	Saratoga L	8/15/1994	27.4	2.23	1.5	0.019	0.01				18	8.24	292		15.80
104	Saratoga L	8/29/1994	29.0	1.69	1.5	0.022	0.01				15	8.19	291		27.00
104	Saratoga L	9/10/1994	28.0	1.63	1.5	0.018	0.01				14	8.24	299		20.90
104	Saratoga L	6/25/1995	27.4	4.77	1.5	0.008	0.01				10	8.28	313		3.94
104	Saratoga L	7/9/1995	27.4	3.33	1.5	0.013	0.01				5	8.15	322		6.02
104	Saratoga L	7/22/1995	27.4	3.35	1.5	0.010	0.01				5	8.36	323		12.20
104	Saratoga L	8/5/1995	27.4	3.05	1.5	0.025	0.01				5	8.23	325		10.70
104	Saratoga L	8/19/1995	28.9				0.01				5	8.46	322		15.10
104	Saratoga L	9/5/1995	28.9	1.91	1.5	0.016	0.01					8.23	331		25.50
104	Saratoga L	9/16/1995	28.9	1.84	1.5	0.020	0.01				5	8.26	333		22.90
104	Saratoga L	10/14/1995	28.9	2.01	1.5	0.019	0.01				7	8.56	332		24.40
104	Saratoga L	6/16/1996	29.0	2.75	1.5	0.010	0.13				15	8.20	288		8.20
104	Saratoga L	7/7/1996	29.0	2.60	1.5	0.038	0.05				10	8.16	296		16.20
104	Saratoga L	7/20/1996	29.0	2.15	1.5	0.015	0.01				15	8.31	293		15.00
104	Saratoga L	8/2/1996	29.0	2.60	1.5	0.007	0.02				15	8.18	296		5.60
104	Saratoga L	8/17/1996	29.0	1.80	1.5	0.019	0.01				15	8.18	296		15.10
104	Saratoga L	9/2/1996	29.0	1.80	1.5	0.020	0.01				15	8.46	303		18.80
104	Saratoga L	9/15/1996	29.0	1.80	1.5	0.023	0.01				10	8.35	302		21.00
104	Saratoga L	10/1/1996	29.0	2.07	1.5	0.024	0.01				15	6.14	309		13.00
104	Saratoga L	6/20/1997	28.9	3.15	1.5	0.008	0.17				15	8.20	288		1.43
104	Saratoga L	6/28/1997	28.9	6.45	1.5	0.008	0.12				10	8.23	291		2.54
104	Saratoga L	7/12/1997	28.9	7.05	1.5	0.007	0.07				10	8.17	295		2.37
104	Saratoga L	7/26/1997	28.9	6.28	1.5	0.013	0.06				10	8.36	301		3.81
104	Saratoga L	8/9/1997	28.9	6.11	1.5	0.006	0.01				8	8.34	301		3.43
104	Saratoga L	8/30/1997	28.9	4.26	1.5	0.012					8	8.28	300		7.14
104	Saratoga L	9/30/1997	28.9	5.84	1.5	0.017					6	8.07	297		5.50
104	Saratoga L	06/25/05		3.60	2.5	0.010	0.01	0.03	0.10	21.54	15	7.69	208	28.2	3.12
104	Saratoga L	07/11/05	29.0	2.70	1.5	0.034	0.01	0.02	0.20	13.03	36	8.30			9.06
104	Saratoga L	07/18/05	25.0	2.90	1.5	0.026	0.01	0.02	0.32	26.56	13	7.30	273		5.47
104	Saratoga L	07/31/05	29.0	2.85		0.019	0.01	0.02	0.19	22.32	14	7.60	275		8.36
104	Saratoga L	08/07/05	29.0	4.30		0.025	0.01	0.01	0.14	12.30	27	7.85	201	26.7	6.26
104	Saratoga L	08/23/05		3.35		0.032	0.01	0.01	0.10	6.90	13	7.62	231		9.34
104	Saratoga L	09/12/05	25.0	3.50		0.030	0.01	0.01	0.16	12.01	17	7.94	256		7.65
104	Saratoga L	09/24/05	27.8	2.55		0.011	0.01	0.01	0.16	31.23	10	7.58	237		12.04
104	Saratoga L	6/15/2006		3.20		0.019	0.16	0.06	0.64	74.45	22	8.31	218	26.4	2.99
104	Saratoga L	7/4/2006	25.9	2.25	1.5	0.024	0.04	0.03	0.49	44.35	25	7.57	210		15.51
104	Saratoga L	7/17/2006	26.0	2.30		0.037	0.01	0.02	0.58	34.22	19	8.82	271		10.56
104	Saratoga L	7/31/2006	24.5	3.40		0.035	0.01	0.01	0.41	26.03	8	8.27	164		7.24
104	Saratoga L	8/16/2006	26.6	2.40		0.037	0.00	0.01	0.61	36.03	23	8.00	253	29.1	8.15
104	Saratoga L	9/6/2006	27.3	2.75		0.026	0.01	0.01	0.41	34.33	17	7.99	179		10.54
104	Saratoga L	9/18/2006	27.7	3.20		0.023			0.37	36.47	15	7.86	101		6.81
104	Saratoga L	10/4/2006	27.0	3.50		0.018	0.02	0.01	0.29	35.53	28	7.79	296		6.49
104	Saratoga L	6/27/2007	25.6	4.38		0.016	0.08	0.02	0.34	46.97	22	8.01	176	25.4	2.95
104	Saratoga L	7/16/2007		3.75	1.5	0.025	0.03	0.02	0.27	23.84	23	7.56	255		6.75
104	Saratoga L	7/21/2007	27.6	3.60	1.5	0.020	0.04	0.02	0.31	34.94	24	8.35	130		7.54
104	Saratoga L	8/1/2007	27.1	3.85	1.5	0.016	0.00	0.01	0.50	69.54	20	7.93	289		2.28
104	Saratoga L	8/12/2007	29.1	3.35	1.5	0.021	0.01	0.01	0.57	60.96	18	7.47	249	27.4	2.58
104	Saratoga L	8/24/2007	27.4	2.75	1.5	0.018	0.36	0.03	0.89	110.95	14	7.70	192		4.69
104	Saratoga L	9/8/2007	28.7	2.65	1.5	0.018	0.02	0.02	0.47	57.48	15	7.83	195		13.90
104	Saratoga L	9/17/2007	29.0	3.35	1.5	0.019	0.01	0.01	0.37	43.98	15	7.76	304		6.82

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a
104	Saratoga L	6/12/2008	26.5	3.15		0.027	0.07	0.02	0.50	39.91	16	7.70	299	27.7	3.88
104	Saratoga L	6/21/2008	22.5	3.15		0.026	0.08	0.02	0.35	29.61	15	7.67	175		4.40
104	Saratoga L	7/7/2008	27.6	2.95		0.018	0.01	0.02	0.29	35.00	16	7.71	309		1.59
104	Saratoga L	7/21/2008	28.9	3.50	1.5	0.018	0.01	0.12	0.23	27.87	21	7.76	248		4.02
104	Saratoga L	8/6/2008	26.3	2.70	1.5	0.034	0.01	0.01	0.26	16.73	20	8.03	182	26.1	12.37
104	Saratoga L	8/20/2008	25.0	2.35	1.5	0.018	0.00	0.02	0.25	29.35	31	7.95	218		11.45
104	Saratoga L	9/11/2008	28.5	2.95	1.5	0.021	0.01	0.01	0.24	25.53	25	7.94	204		9.96
104	Saratoga L	9/17/2008	28.4	3.05	1.5	0.016	0.01	0.03	0.24	33.35	22	7.67	254		10.89
104	Saratoga L	06/29/2009	25.0	5.35		0.026	0.15	0.03	0.43	37.21	16	7.74	212	27.0	3.77
104	Saratoga L	07/06/2009	22.7	3.90		0.019	0.19	0.03	0.43	50.67	22	7.38	314		2.93
104	Saratoga L	07/17/2009	25.0	5.50		0.018	0.10	0.02	0.36	44.74	30	7.37	226		3.61
104	Saratoga L	07/27/2009	24.0	3.55		0.016	0.06	0.03	0.36	48.59	30	6.87	233		4.41
104	Saratoga L	08/09/2009	19.9	3.15	2	0.015	0.02	0.02	0.25	35.89	21	8.07	193	31.4	4.30
104	Saratoga L	08/24/2009	25.2	3.60	2	0.013	0.03	0.01	0.28	47.22	35	7.57	248		3.80
104	Saratoga L	09/14/2009	28.5	4.20	2	0.017	0.01	0.01	0.30	38.44	25	7.45	218		5.20
104	Saratoga L	09/21/2009													
104	Saratoga L	10/03/2009	25.7	4.00	2	0.015	0.03	0.02	0.24	33.71	31	7.08	211		2.14
104	Saratoga L	6/14/2010	27.5	3.90	1.5	0.015	0.16	0.05	0.35	50.00	11	7.94	258	32.4	2.60
104	Saratoga L	7/5/2010	27.4	4.15	1.5	0.013	0.02	0.05	0.74	#####	31	8.48	241		3.00
104	Saratoga L	7/30/2010	17.5	3.85	1.5	0.011	0.02	0.04	0.28	56.80	23	8.39	217		4.40
104	Saratoga L	8/9/2010	22.5	3.45	1.5	0.017	0.06	0.02	0.33	43.60	33	7.71	284		4.00
104	Saratoga L	8/19/2010	22.9	3.85	1.5	0.015	0.03	0.03	0.50	76.47	10	7.77	373	27.8	3.00
104	Saratoga L	8/29/2010	2.0	3.00	1.5	0.014	0.03	0.02	0.41	65.21	7	8.16	345		5.60
104	Saratoga L	9/10/2010	21.2	2.70	1.5	0.018	0.02	0.08	0.35	41.60	11	7.67	286		8.10
104	Saratoga L	10/11/2010	28.0	3.85	1.5	0.023	0.11	0.07	0.34	32.10	15	7.55	313		3.40
104	Saratoga L	10/13/2010	grab	bloom											
104	Saratoga L	6/7/2011	24.3	3.60	1.5	0.010	0.09	0.03	0.45	101.69	21	7.51	315	28.4	3.50
104	Saratoga L	6/21/2011	23.1	3.90	1.5	0.015	0.02	0.04	0.35	51.97	27	7.43	320		3.20
104	Saratoga L	7/15/2011	24.7	2.60	1.5	0.020	0.01	0.02	0.34	37.70	17	7.30	347		3.50
104	Saratoga L	8/2/2011			1.5	0.021	0.02	0.02	0.49	52.08	33	7.57	291		3.60
104	Saratoga L	8/23/2011	24.9	2.35	1.5	0.016	0.03	0.02	0.54	71.77	19	7.30	268	27.9	10.40
104	Saratoga L	8/23/2011													
104	Saratoga L	9/23/2011		3.20		0.021	0.03	0.03	0.46	47.98	27	7.51	299		5.50
104	Saratoga L	10/4/2011	23.9	2.30	1.5	0.027	0.10	0.04	0.55	44.08	27	7.53	265		5.70
104	Saratoga L	6/30/2013	24.1	2.60	1.5	0.012	0.05	0.03	0.34	63.18	20	7.72	310		2.10
104	Saratoga L	7/12/2013	20.3	2.90	1.5	0.018			0.42	53.30	23	8.07	222		3.40
104	Saratoga L	7/26/2013	21.3	2.55	1.5	0.016	0.01	0.02	0.36	49.47	21	7.41	228		
104	Saratoga L	8/8/2013	23.9	2.40	1.5	0.024			0.64	59.36	23	7.30	262		5.30
104	Saratoga L	8/30/2013	23.7	2.80	1.5	0.016	0.01	0.03	0.46	61.66	23	7.64	245		13.20
104	Saratoga L	9/6/2013	22.0	2.60	1.5	0.025			0.57	49.97	23	7.38	257		8.90
104	Saratoga L	7/27/2013													
104	Saratoga L	9/6/2013													
104	Saratoga L	9/11/2013													
104	Saratoga L	9/11/2013	22.9	2.50	1.5	0.028	0.01	0.02	0.44	35.51	18	8.36	162		21.50
104	Saratoga L	9/20/2013	22.8	2.50	1.5	0.015			0.43	61.47	23	7.35	315		4.70
104	Saratoga L	07/11/05	29.0		27.5	0.035									
104	Saratoga L	07/18/05	25.0		25.0	0.029									
104	Saratoga L	07/31/05	29.0		29.0	0.021									
104	Saratoga L	08/07/05	29.0		29.0	0.027									
104	Saratoga L	08/23/05				0.035									
104	Saratoga L	09/12/05	25.0		15.0	0.028									
104	Saratoga L	09/24/05	27.8		25.0	0.011									
104	Saratoga L	6/15/2006			26.5	0.019									
104	Saratoga L	7/4/2006	25.9		24.0	0.025									
104	Saratoga L	7/17/2006	26.0		22.0	0.015									
104	Saratoga L	7/31/2006	24.5		22.0	0.020									
104	Saratoga L	8/16/2006	26.6		25.0	0.007									
104	Saratoga L	9/6/2006	27.3		26.0	0.010									
104	Saratoga L	9/18/2006	27.7		26.0	0.009									
104	Saratoga L	10/4/2006	27.0		25.0	0.024									
104	Saratoga L	6/27/2007	25.6			0.016									
104	Saratoga L	7/16/2007			26.0	0.015									
104	Saratoga L	7/21/2007	27.6		26.0	0.017									
104	Saratoga L	8/1/2007	27.1		26.0	0.020									
104	Saratoga L	8/12/2007	29.1		27.0	0.009									
104	Saratoga L	8/24/2007	27.4		26.0	0.040									

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP		NO2	Fe	Mn	As
104	Saratoga L	9/8/2007	28.7		27.0	0.007									
104	Saratoga L	9/17/2007	29.0		27.0	0.000									
104	Saratoga L	6/12/2008	26.5		26.0	0.003									
104	Saratoga L	6/21/2008	22.5		20.0	0.015									
104	Saratoga L	7/7/2008	27.6		26.0	0.012									
104	Saratoga L	7/21/2008	28.9		27.0	0.013									
104	Saratoga L	8/6/2008	26.3		24.0	0.015									
104	Saratoga L	8/20/2008	25.0		23.0	0.028									
104	Saratoga L	9/11/2008	28.5		27.0	0.018									
104	Saratoga L	9/17/2008	28.4		28.4	0.029									
104	Saratoga L	06/29/2009	25.0		18	0.017		0.05							
104	Saratoga L	07/06/2009	22.7		21	0.013		0.01							
104	Saratoga L	07/17/2009	25.0		23	0.019		0.04							
104	Saratoga L	07/27/2009	24.0			0.034		0.01							
104	Saratoga L	08/09/2009	19.9		18	0.019		0.01					0.12	0.32	0.34
104	Saratoga L	08/24/2009	25.2		23	0.013		0.02							
104	Saratoga L	09/14/2009	28.5		20	0.021	0.36	0.02					0.47	0.16	0.34
104	Saratoga L	10/03/2009	25.7		24	0.018		0.01							
104	Saratoga L	6/14/2010	27.5			0.018		0.18					0.03	0.19	
104	Saratoga L	7/30/2010	17.5		16.0	0.018		0.06					0.09	0.38	
104	Saratoga L	8/9/2010	22.5												0.34
104	Saratoga L	8/19/2010	22.9		21.0	0.015		0.04					0.03	0.24	0.90
104	Saratoga L	9/10/2010	21.2		20.0	0.014		0.07					0.14	0.18	
104	Saratoga L	6/7/2011	24.3	3.60	23.0	0.012		0.04					0.01	0.01	
104	Saratoga L	7/15/2011	24.7	2.60	23.0	0.021		0.02							
104	Saratoga L	8/23/2011	24.9	2.35	23.0	0.024		0.03					0.01	0.37	0.50
104	Saratoga L	10/4/2011	23.9	2.30	22.0	0.029		0.05					0.01	0.04	
104	Saratoga L	6/30/2013			21.0	0.017		0.03							
104	Saratoga L	7/12/2013			19.0										
104	Saratoga L	7/26/2013			18.0	0.026		0.01							
104	Saratoga L	8/8/2013			22.0										
104	Saratoga L	8/30/2013			22.0	0.016		0.01							
104	Saratoga L	9/6/2013			20.0										
104	Saratoga L	9/11/2013			21.0	0.027		0.01							
104	Saratoga L	9/20/2013			21.0										
104.1	Saratoga L-Kaya.Creek	10/30/1994				0.007									
104.1	Saratoga L-Kaya.Creek	10/31/1994				0.160									
104.1	Saratoga L-Kaya.Creek	10/22/1995				0.170									
104.1	Saratoga L-Kaya.Creek	10/22/1995				0.042									
104.1	Saratoga L-Kaya.Creek	10/27/1995				0.035									
104.1	Saratoga L-Kaya.Creek	10/28/1995				0.038									
104.1	Saratoga L-Kaya.Creek	10/29/1995				0.036									
104.1	Saratoga L-Kaya.Creek	11/2/1995				0.021									
104.1	Saratoga L-Kaya.Creek	11/11/1995				0.017									
104.1	Saratoga L-Kaya.Creek	11/12/1995				0.120									

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB-form	Shore HAB
104	Saratoga L	6/26/1993	epi	26	22	2	3	2	6											
104	Saratoga L	7/10/1993	epi	24	21	1	1	1												
104	Saratoga L	7/25/1993	epi	28	23	3	2	2	123											
104	Saratoga L	8/7/1993	epi	15	22	2	1	1	56											
104	Saratoga L	8/21/1993	epi	14	20	2	1	1	5											
104	Saratoga L	9/5/1993	epi	21	23	3	2	3	13											
104	Saratoga L	9/20/1993	epi	13	20	3	2	3	5											
104	Saratoga L	10/2/1993	epi	12	14	1	1	2	5											
104	Saratoga L	6/5/1994	epi	23	19	2	2	1	6											
104	Saratoga L	6/18/1994	epi	23	25	1	1	1												
104	Saratoga L	7/5/1994	epi	22	24	2	1	1	6											
104	Saratoga L	7/18/1994	epi			2	1	3	5											
104	Saratoga L	7/30/1994	epi	19	25	2	1	2												
104	Saratoga L	8/15/1994	epi	17	21	2	1	2	5											
104	Saratoga L	8/29/1994	epi	18	22	3	2	4	15											
104	Saratoga L	9/10/1994	epi	11	17	3	2	2	1											

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB-form	Shore HAB
104	Saratoga L	6/25/1995	epi	29	25	2	1	1	6											
104	Saratoga L	7/9/1995	epi	20	22	2	2	1	6											
104	Saratoga L	7/22/1995	epi	20	24	1	1	1												
104	Saratoga L	8/5/1995	epi	28	24	1	1	2												
104	Saratoga L	8/19/1995	epi	25	25	3	2	1	6											
104	Saratoga L	9/5/1995	epi	23	25	3	3	4	12											
104	Saratoga L	9/16/1995	epi	15	20	4	2	1	136											
104	Saratoga L	10/14/1995	epi	12	17	3	2	1	13											
104	Saratoga L	6/16/1996	epi	22		1	2	1	6											
104	Saratoga L	7/7/1996	epi	29	25	3	2	1	6											
104	Saratoga L	7/20/1996	epi	20		2	1	1	5											
104	Saratoga L	8/2/1996	epi	26		2	1	2												
104	Saratoga L	8/17/1996	epi	17		2	1	1												
104	Saratoga L	9/2/1996	epi	25	22	2	3	2	2											
104	Saratoga L	9/15/1996	epi	22	20	2	1	2	5											
104	Saratoga L	10/1/1996	epi	15	16	3	2	4	5											
104	Saratoga L	6/20/1997	epi	21	19	1	4	2	2											
104	Saratoga L	6/28/1997	epi	20	23	1	2	1	6											
104	Saratoga L	7/12/1997	epi	23	23	1	2	1	6											
104	Saratoga L	7/26/1997	epi	22	23	1	2	1	6											
104	Saratoga L	8/9/1997	epi	30	25	3	2	1	6											
104	Saratoga L	8/30/1997	epi	25	28	1	2	1	6											
104	Saratoga L	9/30/1997	epi	22	28	2	2	1	6											
104	Saratoga L	06/25/05	epi	39	24	1	1	1	0											
104	Saratoga L	07/11/05	epi	32	26	2	1	1	0											
104	Saratoga L	07/18/05	epi	30	26	2	1	2	1											
104	Saratoga L	07/31/05	epi	26	27	2	1	2	8											
104	Saratoga L	08/07/05	epi	24	27	2	1	1	0											
104	Saratoga L	08/23/05	epi	23		1	2	2	6											
104	Saratoga L	09/12/05	epi	30	23	3	1	3	13											
104	Saratoga L	09/24/05	epi	27		3	1	2	13											
104	Saratoga L	6/15/2006	epi	27	19	1	1	2	5											
104	Saratoga L	7/4/2006	epi	25	24															
104	Saratoga L	7/17/2006	epi	33	28	2	1	2	5											
104	Saratoga L	7/31/2006	epi	32	28	2	1	1	0											
104	Saratoga L	8/16/2006	epi	31	25	2	1	1	0											
104	Saratoga L	9/6/2006	epi	20	22	3	1	2	3											
104	Saratoga L	9/18/2006	epi	23	21	2	1	2	0											
104	Saratoga L	10/4/2006	epi	22	19	2	1	2	0											
104	Saratoga L	6/27/2007	epi	35	26	2	1	2	25											
104	Saratoga L	7/16/2007	epi	29	25	2	1	2	8											
104	Saratoga L	7/21/2007	epi	26	25	2	1	1	8											
104	Saratoga L	8/1/2007	epi	30	29	2	1	1	8											
104	Saratoga L	8/12/2007	epi	32	26	2	1	1	5											
104	Saratoga L	8/24/2007	epi	27	23	2	1	2	5											
104	Saratoga L	9/8/2007	epi	28	24	2	1	3	5											
104	Saratoga L	9/17/2007	epi	20	21	2	1	2	5											
104	Saratoga L	6/12/2008	epi	25	27	2	3	1	2											
104	Saratoga L	6/21/2008	epi	25	23	2	1	1	5											
104	Saratoga L	7/7/2008	epi	34	28	2	1	1	0											
104	Saratoga L	7/21/2008	epi	24	26	2	1	4	5											
104	Saratoga L	8/6/2008	epi	26	25	2	1	2	5											
104	Saratoga L	8/20/2008	epi	23	25	2	1	1	0											
104	Saratoga L	9/11/2008	epi	23	24	2	1	1	0											
104	Saratoga L	9/17/2008	epi	18	28	2	1	3	5											
104	Saratoga L	06/29/2009	epi	25	24	1	1	2	5											
104	Saratoga L	07/06/2009	epi	26	24	2	3	2	0											
104	Saratoga L	07/17/2009	epi	26	23	2	1	2	0											
104	Saratoga L	07/27/2009	epi	29	25	2	2	2	5											
104	Saratoga L	08/09/2009	epi	22	24	2	1	4	5											
104	Saratoga L	08/24/2009	epi	30	27	1	1	1	0					0.22						

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB form	Shore HAB
104	Saratoga L	09/14/2009	epi	25	22	2	3	2	0			40.51								
104	Saratoga L	09/21/2009	epi			2	1	3	5					0.07						
104	Saratoga L	10/03/2009	epi	20	17	2	1	4	5			21.4		0.05						
104	Saratoga L	6/14/2010	epi	25	21	1	1	2	5											
104	Saratoga L	7/5/2010	epi	32	26	2	3	2	0											
104	Saratoga L	7/30/2010	epi	22		2	1	2	0			40.00		0.20						
104	Saratoga L	8/9/2010	epi	31	26	2	2	2	5											
104	Saratoga L	8/19/2010	epi	26	26	2	1	4	5											
104	Saratoga L	8/29/2010	epi	26	24	1	1	1	0											
104	Saratoga L	9/10/2010	epi	22	22	2	3	2	0			380.00		0.49						
104	Saratoga L	10/11/2010	epi	20	16							27.00		0.26						
104	Saratoga L	10/13/2010	epi			2	1	3	5			583.00		3.74						
104	Saratoga L	6/7/2011	epi	32	25	2	1	4	5	5	5	7.00	2.40							
104	Saratoga L	6/21/2011	epi	32	25	3	1	1	0	5	5	16.40	3.90							
104	Saratoga L	7/15/2011	epi	30	27	2	1	2	5	5	5	7.40	3.40							
104	Saratoga L	8/2/2011	epi	30	29					5	4	156.70	2.80							
104	Saratoga L	8/23/2011	epi	27	24	2	1	1	0	45	5	91.20	4.00							
104	Saratoga L	8/23/2011	epi			1	1	1	0	5	5									
104	Saratoga L	9/23/2011	epi	23	21	2	1	2	0	0	0	34.50	4.80							
104	Saratoga L	10/4/2011	epi	18	18	2	1	2	5	0	0	57.40	4.40							
104	Saratoga L	10/18/2011	epi	19	17							30.30	4.50							
104	Saratoga L	6/30/2013	epi	22	24	2	1	2	0	0	0	5.10	1.10	<0.30	<0.650		1.50	1.00	I	
104	Saratoga L	7/12/2013	epi	25	25	2	1	2	0	0	0	9.00	1.60	<0.30	<0.380		1.70	0.60	I	
104	Saratoga L	7/26/2013	epi	21	25	2	1	2	0	0	5	10.80	1.90	<0.30	<0.380		4.40	3.20	I	
104	Saratoga L	8/8/2013	epi	27	25	1	4	2	2	0	0	10.50	2.10	<0.30	<0.390		3.20	0.60		
104	Saratoga L	8/30/2013	epi	29	26	2	2	2	0	0	5			<0.30	<1.100		2.70	0.90		
104	Saratoga L	9/6/2013	epi	21	24	3	1	2	0	0	0	20.30	1.90	0.62	<19.130		9.20	7.30	F	
104	Saratoga L	7/27/2013	epi											<0.60	<0.760		27.10	13.90		
104	Saratoga L	9/6/2013	epi											1.63	<38.260		5.40	3.20		
104	Saratoga L	9/11/2013	epi											220.39	<38.260		1426	1213		
104	Saratoga L	9/11/2013	epi	30	24	2	1	2	3	4	0	50.90	2.30	2.06	<19.130		12.40	9.50	B	D
104	Saratoga L	9/20/2013	epi	19	21	2	3	1	0	0	0			<0.30	<0.100		1.90	0.50	D	I
104	Saratoga L	06/25/05	hypo		11															
104	Saratoga L	07/11/05	hypo		7															
104	Saratoga L	07/18/05	hypo		7															
104	Saratoga L	08/23/05	hypo		7															
104	Saratoga L	6/30/2013	hypo		8															
104	Saratoga L	7/12/2013	hypo		9															
104	Saratoga L	7/26/2013	hypo		9															
104	Saratoga L	8/8/2013	hypo		8															
104	Saratoga L	8/30/2013	hypo		8															
104	Saratoga L	9/6/2013	hypo		9															
104	Saratoga L	9/11/2013	hypo		8															
104	Saratoga L	9/20/2013	hypo		8															

Legend Information

<i>Indicator</i>	<i>Description</i>	<i>Detection Limit</i>	<i>Standard (S) / Criteria (C)</i>
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	calcium (mg/l)	1 mg/l	none
Chl.a	chlorophyll a (ug/l)	0.01 ug/l	none
Fe	iron (mg/l)	0.1 mg/l	1.0 mg/l (S)
Mn	manganese (mg/l)	0.01 mg/l	0.3 mg/l (S)
As	arsenic (ug/l)	1 ug/l	10 ug/l (S)
AQ-PC	Phycocyanin (aquafior) (unitless)	1 unit	none
AQ-Chl	Chlorophyll a (aquafior) (ug/l)	1 ug/l	none
MC-LR	Microcystis-LR (ug/l)	0.01 ug/l	1 ug/l potable (C) 20 ug/l swimming (C)
Ana	Anatoxin-a (ug/l)	variable	none
Cyl	Cylindrospermopsin (ug/l)	0.1 ug/l	none
FP-Chl, FP-BG	Fluoroprobe total chlorophyll, fluoroprobe blue-green chlorophyll (ug/l)	0.1 ug/l	none
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- Monthly Evaluation of Saratoga Lake Data, 2006-2013

June Data

	2006	2007	2008	2009	2010	2011	2012	2013
<i>Zsd</i>	NORMAL	HIGH	NORMAL	HIGH	NORMAL	NORMAL		NORMAL
<i>TP</i>	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	LOW		LOW
<i>Chl.a</i>	NORMAL	NORMAL	NORMAL	NORMAL	LOW	NORMAL		LOW
<i>NOx</i>	HIGH	NORMAL	NORMAL	HIGH	HIGH	NORMAL		NORMAL
<i>NH4</i>	HIGH	NORMAL	NORMAL	NORMAL	HIGH	NORMAL		NORMAL
<i>TN</i>	HIGH	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
<i>pH</i>	HIGH	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
<i>SpCond</i>	NORMAL	LOW	NORMAL	NORMAL	NORMAL	HIGH		NORMAL
<i>Color</i>	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
<i>Ca</i>	NORMAL	LOW	NORMAL	NORMAL	HIGH	NORMAL		
<i>QA</i>	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	HIGH		NORMAL
<i>QB</i>	NORMAL	NORMAL	HIGH	NORMAL	NORMAL	NORMAL		NORMAL
<i>QC</i>	NORMAL	NORMAL	NORMAL	NORMAL	HIGH	NORMAL		NORMAL
<i>TH20</i>	LOW	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL

High = average monthly reading > 90th percentile reading for lake, 2000-2010

Low = average monthly reading < 10th percentile reading for lake, 2000-2010

Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

July Data

	2006	2007	2008	2009	2010	2011	2012	2013
<i>Zsd</i>	NORMAL	NORMAL	NORMAL	HIGH	NORMAL	LOW		NORMAL
<i>TP</i>	NORMAL	NORMAL	NORMAL	NORMAL	LOW	NORMAL		NORMAL
<i>Chl.a</i>	HIGH	NORMAL	LOW	NORMAL	NORMAL	NORMAL		NORMAL
<i>NOx</i>	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		
<i>NH4</i>	NORMAL	NORMAL	HIGH	NORMAL	NORMAL	NORMAL		NORMAL
<i>TN</i>	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
<i>pH</i>	NORMAL	NORMAL	NORMAL	LOW	HIGH	LOW		NORMAL
<i>SpCond</i>	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	HIGH		NORMAL
<i>Color</i>	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
<i>Ca</i>								
<i>QA</i>	NORMAL	NORMAL	NORMAL	NORMAL	HIGH	NORMAL		NORMAL
<i>QB</i>	NORMAL	NORMAL	NORMAL	HIGH	NORMAL	NORMAL		NORMAL
<i>QC</i>	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
<i>TH20</i>	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL

High = average monthly reading > 90th percentile reading for lake, 2000-2010

Low = average monthly reading < 10th percentile reading for lake, 2000-2010

Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

August Data

	2006	2007	2008	2009	2010	2011	2012	2013
Zsd	LOW	NORMAL	LOW	NORMAL	NORMAL	LOW		NORMAL
TP	HIGH	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
Chl.a	NORMAL	NORMAL	HIGH	NORMAL	NORMAL	NORMAL		NORMAL
NOx	LOW	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		
NH4	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
TN	HIGH	HIGH	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
pH	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
SpCond	NORMAL	NORMAL	NORMAL	NORMAL	HIGH	NORMAL		NORMAL
Color	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
Ca	NORMAL	NORMAL	LOW	HIGH	NORMAL	NORMAL		
QA	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
QB	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		HIGH
QC	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
TH20	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL

High = average monthly reading > 90th percentile reading for lake, 2000-2010

Low = average monthly reading < 10th percentile reading for lake, 2000-2010

Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

September Data

	2006	2007	2008	2009	2010	2011	2012	2013
Zsd	NORMAL	NORMAL	NORMAL	HIGH	NORMAL	NORMAL		NORMAL
TP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
Chl.a	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		HIGH
NOx	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		
NH4	NORMAL	NORMAL	NORMAL	LOW	HIGH	NORMAL		NORMAL
TN	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
pH	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
SpCond	LOW	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
Color	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
Ca								
QA	HIGH	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		HIGH
QB	NORMAL	NORMAL	NORMAL	HIGH	NORMAL	HIGH		NORMAL
QC	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL		NORMAL
TH20	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	LOW		NORMAL

High = average monthly reading > 90th percentile reading for lake, 2000-2010

Low = average monthly reading < 10th percentile reading for lake, 2000-2010

Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

Appendix C- Priority Waterbody Listing for Saratoga Lake

Saratoga Lake (1101-0012)

Minor Impacts

Waterbody Location Information

Revised: 12/06/2006

Water Index No:	H-299-P27	Drain Basin:	Upper Hudson River	
Hydro Unit Code:	02020003/090	Str Class:	A	Upper Hudson-Hoosic
Waterbody Type:	Lake	Reg/County:	5/Saratoga Co. (46)	
Waterbody Size:	4031.9 Acres	Quad Map:	QUAKER SPRINGS (I-26-4)	
Seg Description:	entire lake			

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

Use(s) Impacted	Severity	Problem Documentation
Recreation	Stressed	Known
Habitat/Hydrology	Stressed	Known

Type of Pollutant(s)

Known: ALGAL/WEED GROWTH, PROBLEM SPECIES (Eurasian milfoil)
Suspected: Nutrients (phosphorus)
Possible: ---

Source(s) of Pollutant(s)

Known: HABITAT MODIFICATION
Suspected: Urban Runoff
Possible: Agriculture

Resolution/Management Information

Issue Resolvability:	3 (Strategy Being Implemented)	
Verification Status:	5 (Management Strategy has been Developed)	
Lead Agency/Office:	ext/WQCC	Resolution Potential: Medium
TMDL/303d Status:	n/a ()	

Further Details

Recreational uses (swimming, fishing, boating) in Saratoga Lake are known to experience minor impacts to water quality due to aquatic weed growth, including invasives (Eurasian milfoil). Slightly elevated nutrient (phosphorus) levels and algal readings have also be noted in this mesoeutrophic lake. The primary source of these impacts are habitat modification (related to the invasive species) and nonpoint runoff of nutrients and sediment from the lake watershed. The current assessment is that uses continue to be fully supported in the lake, in spite of minor impacts.

Saratoga Lake has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1988 and has continued 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 meso-eutrophic, or moderately to highly productive. Phosphorus levels in the lake suggest a highly productive lake, while clarity and algae measurements indicate moderate productivity. Levels of total phosphorus in the shallow water zones of the lake have decreased ove the last 20 years, and internal recycling of phosphorus has become a more significant factor in the annual phosphorus cycle. More recent (and future) water transparency and algae levels be be influenced by zebra mussels, which have been documented in the lake. (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 show the lake to be supportive of recreational uses, with the lake most often described as "could not be nicer" to "excellent" for most uses. Algae is cited more often than nuisance weed growth as having an impact on recreational uses, but this is likely due to an aggressive aquatic plant management program in the lake. (DEC/DOW, BWAM/CSLAP, February 2006)

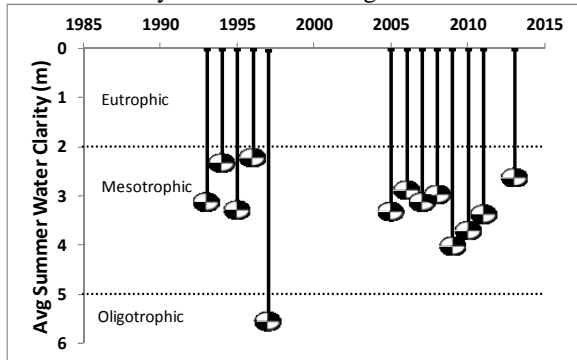
Higher aquatic plant populations in some areas of the lake are managed by mechanical harvesting. Experimental projects associated with the use of aquatic herbicides (Fluridone) and herbivorous aquatic insects have been conducted in recent years. A Long-Term Aquatic Vegetation Management Plan was prepared for the lake in 2004 by the Saratoga Lake Protection and Improvement District. The plan characterizes the scope of the impacts and proposes that a program integrating lake drawdown, mechanical harvesting of weeds and herbicide treatments is needed in order to achieve significant improvements in the management of nuisance weed growth in the lake. Winter drawdowns and harvesting are currently being conducted; a proposal to treat the entire lake with an herbicide is currently under consideration. (Saratoga Lake Long-Term Aquatic Vegetation Management Plan, Saratoga Lake Protection and Improvement District, 2004)

There is currently a proposal by the City of Saratoga Springs to use the lake as a public water supply. An initial Environmental Impact Statement was prepared. A number of issues were identified through the SEQR process and those are being addressed in the EIS. As of now, the permit application for this proposal is incomplete. (DEC/DOW, Reg 5, December 2006)

Appendix D- Long Term Trends: Sacandaga Lake

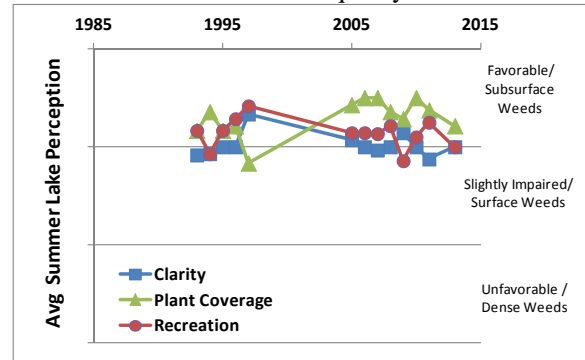
Long Term Trends: Water Clarity

- No trends apparent, but recently decreasing
- Most readings typical of *mesotrophic* lakes, mostly consistent with algae and TP levels



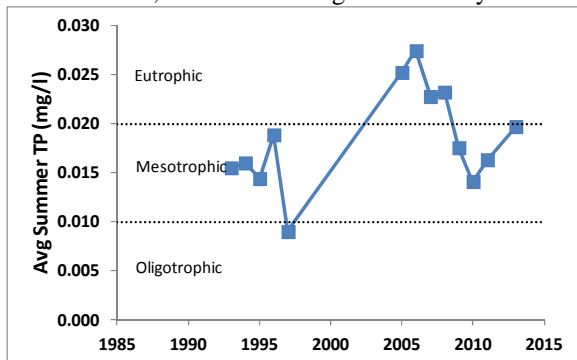
Long Term Trends: Lake Perception

- Recreational assessments mostly favorable
- Small changes in recreational perception more linked to water quality than weeds



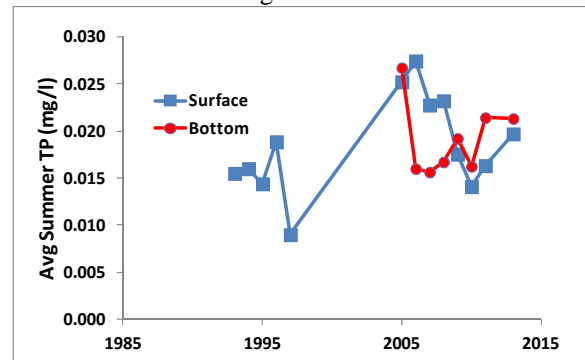
Long Term Trends: Phosphorus

- Significant variability; recent increase
- Most readings typical of *mesoeutrophic* lakes, consistent w/ algae and clarity levels



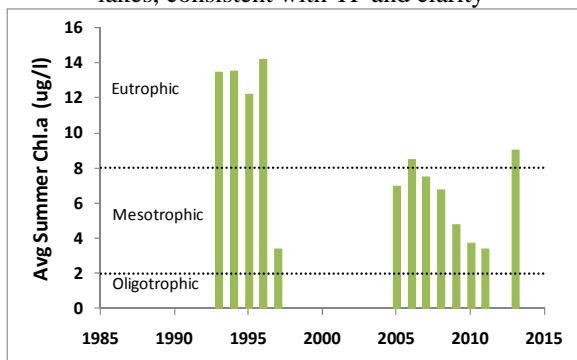
Long Term Trends: Bottom Phosphorus

- Deepwater and surface TP levels similar
- Deepwater TP data suggests little internal nutrient loading from bottom sediments



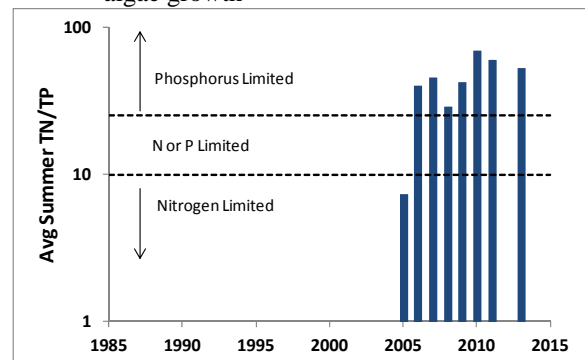
Long Term Trends: Chlorophyll a

- Algae levels decreased -06-'11, but rose '13
- Most readings typical of *mesoeutrophic* lakes, consistent with TP and clarity



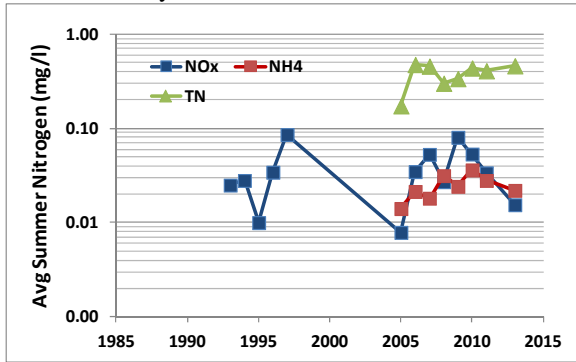
Long Term Trends: N:P Ratio

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



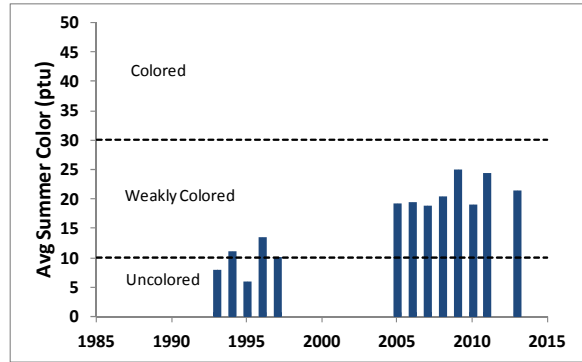
Long Term Trends: Nitrogen

- No significant change in any nitrogen indicators
- Mostly low NOx, ammonia and TN



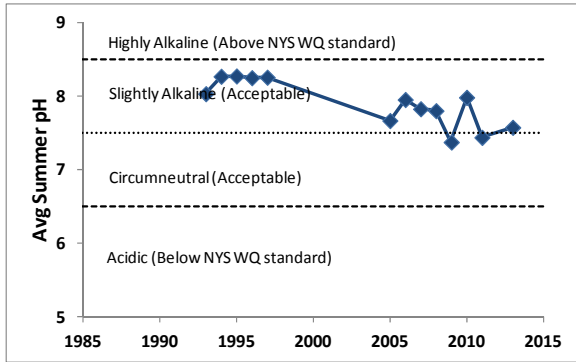
Long Term Trends: Color

- No trends apparent; higher > '02 lab change
- Most readings typical of *weakly colored* lakes



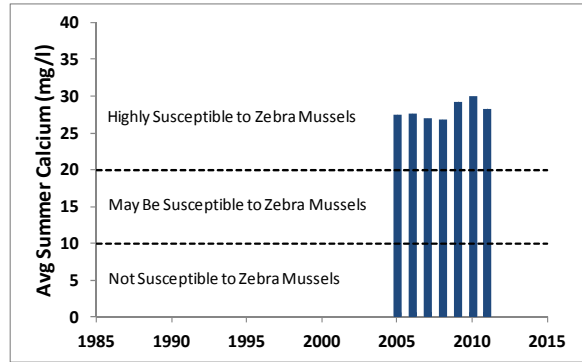
Long Term Trends: pH

- Decreasing since mid 1990s
- Most readings typical of *slightly alkaline* to *circumneutral* lakes



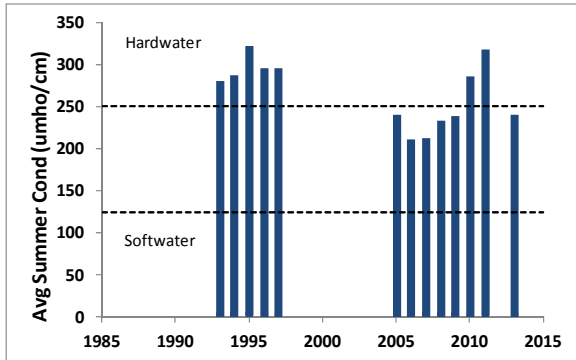
Long Term Trends: Calcium

- No trends yet apparent
- Data indicates high susceptibility to zebra mussels, which are found in lake



Long Term Trends: Conductivity

- Recently lower, but no clear trends
- Most readings typical of *moderate* to *hardwater* lakes



Long Term Trends: Water Temperature

- Water temperatures increasing slightly
- Deepwater temperatures demonstrate that thermal stratification is strong

