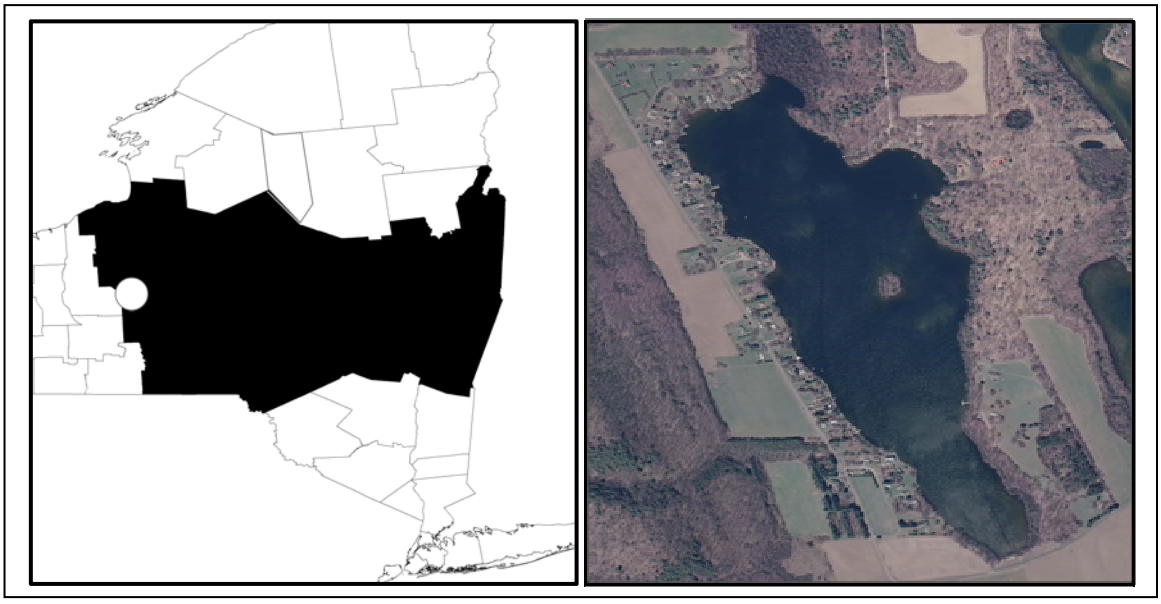
CSLAP 2011 Lake Water Quality Summary:
Song Lake

General Lake Information

Location	Town of Tully
County	Cortland
Basin	Susquehanna River
Size	44 hectares (108.7 acres)
Lake Origins	Natural
Watershed Area	255.4 hectares (630.8 acres)
Retention Time	1.1 years
Mean Depth	4.0 meters
Sounding Depth	8.6 meters
Public Access?	no (some public access prior to 1988)
Major Tributaries	no named tribs
Lake Tributary To…	groundwater feed to West Branch Tioughnioga River to East Branch Tioughnioga River to Tioughnioga River to Chenango River to Susquehanna River
WQ Classification	B (contact recreation = swimming)
Lake Outlet Latitude	42.762
Lake Outlet Longitude	-76.143
Sampling Years	2007-2011
2011 Samplers	Tony George and Carl Grillo
Main Contact	Tony George

Lake Map



Background

Song Lake is a 109 acre, class B lake found in the Town of Tully in Cortland County, in the central region of New York State. Song Lake was first sampled as part of CSLAP in 1988, and again in 2007.

It is one of two CSLAP lakes among the more than 15 lakes found in Cortland County, and one of 24 CSLAP lakes among the more than 120 lakes and ponds in the Susquehanna River drainage basin.

Lake Uses

Song Lake is a Class B lake; this means that the best intended use for the lake is for contact recreation—swimming and bathing, non-contact recreation—boating and fishing, aquatic life, and aesthetics. The lake is used by lake residents and invited guests for boating and swimming. There is no public access to the lake.

Song Lake is not stocked by the state. It is not known by the report authors if private fish stocking occurs in Song Lake. Fish species in the lake include black crappie, brown bullhead, chain pickerel, largemouth bass, pumpkinseed sunfish, rock bass, white sucker, and yellow perch.

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

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

Historical Water Quality Data

CSLAP sampling was conducted on Song Lake from 1998 and 2007 to 2011. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at http://nysfola.mylaketown.com. The 2009 and 2010 CSLAP reports for Song Lake can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77876.html.

Song Lake was sampled in 2001 by the Cortland County SWCD; the report summarizing the results references water quality monitoring conducted in the early 1990s. Water clarity, nutrients, pH, and conductivity readings were comparable to those measured through CSLAP. The report indicated that

"Song Lake appears to be relatively healthy, with no major problems identified. Sampling results from 2011 are consistent with results from 10 years ago as well as being consistent with other lakes in the region"

Song Lake has not been sampled through any of the statewide water quality monitoring programs prior to CSLAP. It is not known if local monitoring has been conducted as a fisheries management tool, or to evaluate swimming conditions in the lake.

The major Song Lake tributaries are not officially named, and have not been monitored through the NYSDEC Rotating Intensive Basins (RIBS) program. No sites have been sampled through

the state stream macroinvertebrate monitoring program. The lake has also not been sampled through any of the state fisheries monitoring programs.

Lake Association and Management History

Song Lake is served by the Song Lake Property Owners Association. It is not known to what extent the lake association is involved in lake management activities or if it maintains a web site.

Summary of 2011 CSLAP Sampling Results

Evaluation of 2011 Annual and Monthly Results Relative to 2006-2010

The Lake Condition Summary Table below and Appendix B compare annual and monthly results from 2011 to those measured in previous CSLAP sampling seasons. The pertinent deviations from normal conditions are discussed below.

Evaluation of Eutrophication Indicators

Each of the trophic indicators were close to normal in 2011, and none of these trophic indicators has exhibited any clear long-term trends. The lake can be characterized as *mesotrophic,* or moderately unproductive, based on water clarity, total phosphorus and chlorophyll *a* readings (all typical of *mesotrophic* lakes). The trophic state indices (TSI) evaluation suggests that each of these trophic indicators is "internally consistent"—each of these indicators is in the expected range given the readings 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 may at times be 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 used for drinking water. Deepwater ammonia and phosphorus readings are only slightly higher than those measured at the lake surface, suggesting that 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

Each of the non-trophic indicators was close to normal. pH readings have decreased since first evaluated in the late 1980s, although the lake is still highly alkaline, and the drop in pH does not appear to have otherwise affected the lake. It is likely that the small changes in each of the other 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

Phytoplankton, macrophyte, zooplankton, and macroinvertebrate surveys have not been conducted through CSLAP at Song Lake. The 2001 study of the lake reported that Eurasian watermilfoil (*Myriophyllum spicatum*) was present in the lake, although it was not the dominant plant. Although this has not been confirmed through CSLAP, given the presence of this plant in most nearby lakes, it is assumed that this exotic plant species is found in the lake. The same study found at least three other native plants, but the survey is not adequate to evaluate plant diversity.

The fish community is comprised of at least five warmwater fish species, and at least three coolwater fish species. This suggests that the lake can most likely be characterized as a coolwater fishery, although the inventory of fish species in the lake may be incomplete. The weight of smallmouth bass, largemouth bass, and yellow perch surveyed by the NYSDEC was lower than expected.

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

Evaluation of Lake Perception

Water quality, aquatic plant and recreational assessments were close to normal in 2011, and none of these measures of lake perception has exhibited any clear long-term trends. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Water temperature readings in the summer index period were higher than normal in 2011, but neither air nor water temperature readings has exhibited any long-term trends. It is not known if this is an indication of the lack of local climate change or if these changes cannot be well evaluated through CSLAP.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Phycocyanin readings have been below the levels indicating susceptibility for harmful algal blooms (HABs) in open water samples; however, cyanobacterial shoreline blooms exhibit microcystin levels well above thresholds associated with safe swimming. Lake residents are strongly advised to stay out of shoreline blooms or discolored water.

Lake Condition Summary

Category	Indicator	Min	88-11 Avg	Max	2011 Avg	Classification	2011 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	1.40	2.94	5.40	3.03	Mesotrophic	Within Normal Range	No Change
	Chlorophyll *a*	0.35	6.47	33.16	4.78	Mesotrophic	Within Normal Range	No Change
	Total Phosphorus	0.004	0.016	0.031	0.016	Mesotrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic NH4	0.00	0.20	0.73	0.32	Elevated Deepwater NH4	Higher than Normal	Not known
	Hypolimnetic As					Not measured through CSLAP		
	Hypolimnetic Iron					Not measured through CSLAP		
	Hypolimnetic Mn					Not measured through CSLAP		
Limnological Indicators	Hypolimnetic TP	0.016	0.053	0.140	0.062	Close to Surface TP Readings	Within Normal Range	Not known
	Nitrate + Nitrite	0.00	0.02	0.07	0.02	Low NOx	Within Normal Range	No Change
	Ammonia	0.01	0.03	0.11	0.03	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.22	0.47	1.02	0.45	Low Total Nitrogen	Within Normal Range	No Change
	pH	7.02	7.82	9.01	7.92	Alkaline	Within Normal Range	Decreasing Significantly
	Specific Conductance	136	191	291	210	Intermediate Hardness	Within Normal Range	No Change
	True Color	5	18	58	17	Intermediate Color	Within Normal Range	No Change
	Calcium	28.9	31.0	34.1	32.2	Highly Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	1.7	4	1.3	Not Quite Crystal Clear	Within Normal Range	No Change
	Plant Coverage	1	2.0	3	1.9	Subsurface Plant Growth	Within Normal Range	No Change
	Rec. Assessment	1	1.9	4	1.7	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Not measured through CSLAP	Not known	Not known
	Macrophytes					Insufficient data to evaluate condition	Not known	Not known
	Zooplankton					Not measured through CSLAP	Not known	Not known
	Macroinvertebrates					Not measured through CSLAP	Not known	Not known
	Fish					Not known	Not known	Not known
	Invasive Species					Eurasian watermilfoil	Not known	Not known
Local Climate Change	Air Temperature	9	22.8	33	23.5		Within Normal Range	No Change
	Water Temperature	15	22.9	29	24.9		Higher Than Normal	No Change
Harmful Algal Blooms	Open Water Phycocyanin	12	38	75	34	All readings indicate low risk of BGA	Not known	Not known
	Open Water Microcystis	0.2	6.3	18.5	6.3	Some readings indicate moderate lakewide toxins	Not known	Not known
	Shoreline Phycocyanin					Some shoreline BGA blooms likely	Not known	Not known
	Shoreline Microcystis	181.3	243.4	305.4	243.4	Shoreline bloom toxins at times well above drinking water and swimming criteria	Not known	Not known
	Other Toxins					Low anatoxin-a and cylindrospermposin	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Song Lake is presently among the lakes listed on the Susquehanna River drainage basin Priority Waterbody List (2009), with public bathing and recreation listed as *stressed* due to excessive weeds. The PWL listing for Song Lake is listed in Appendix C.

Potable Water (Drinking Water)

The CSLAP dataset at Song 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. Any "unofficial" use of the lake for this purpose would be stressed by the occasional production of shoreline algal blooms.

Contact Recreation (Swimming)

The CSLAP dataset at Song Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that swimming and contact recreation may be *stressed* by shoreline algal blooms, 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 Song Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that non-contact recreation should be fully supported.

Aquatic Life

The CSLAP dataset on Song Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *stressed* by deepwater oxygen and *threatened* by invasive species, although additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics

The CSLAP dataset on Song Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *threatened* by occasional algal blooms.

Fish Consumption

There are no fish consumption advisories posted for Song Lake.

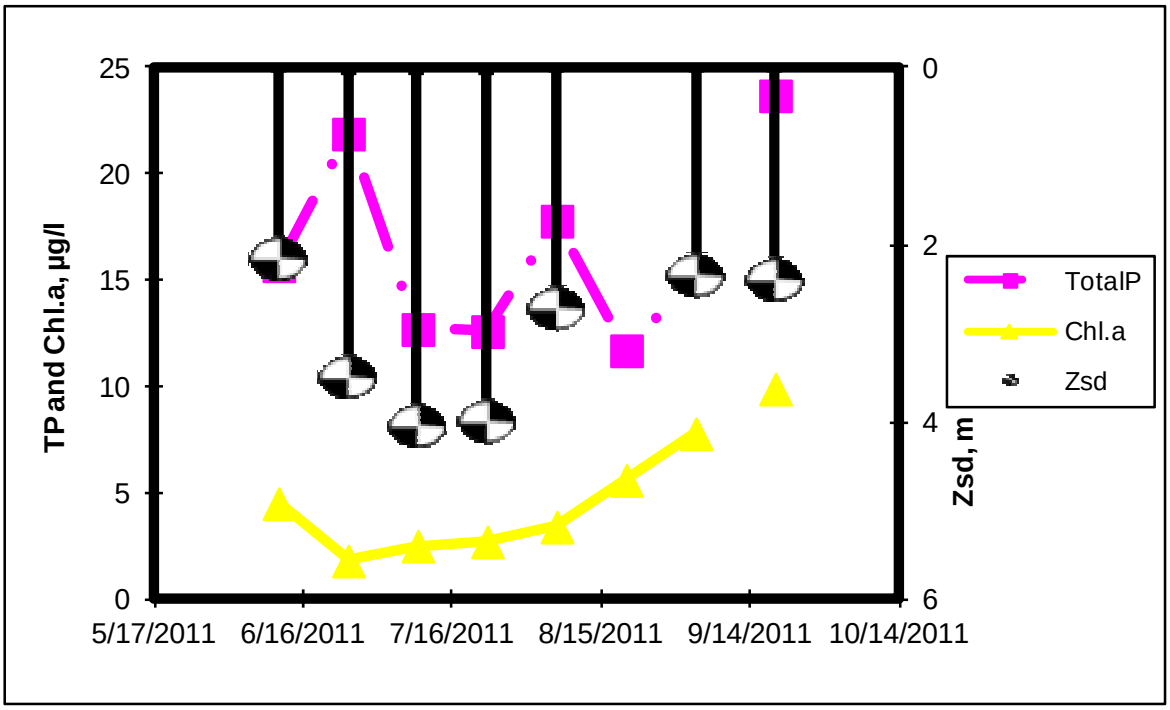
Additional Comments and Recommendations

Aquatic plant survey data will help to determine if the lake is threatened (or presently impacted) by invasive species, such as Eurasian watermilfoil, common to other lakes in the area. Additional water quality monitoring data will help to determine if the existing Priority Waterbody Listings for the lake are warranted, and if harmful algal blooms (HABs) regularly occur at the lake.

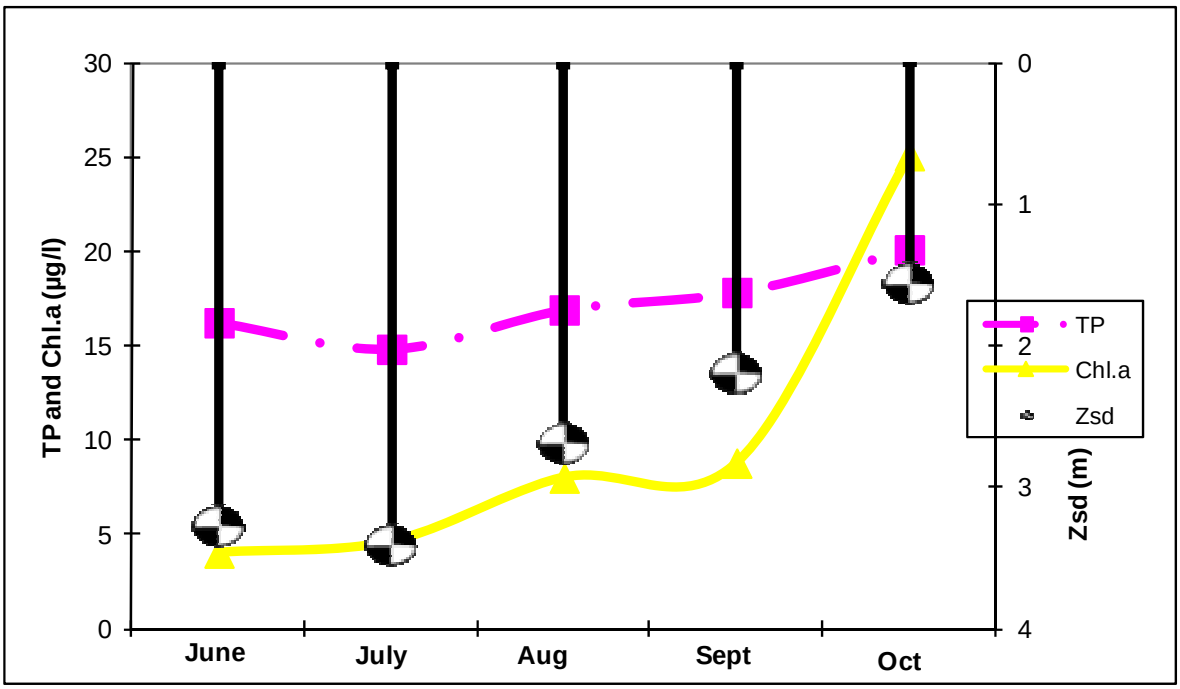
Aquatic Plant IDs-2011

None submitted for identification.

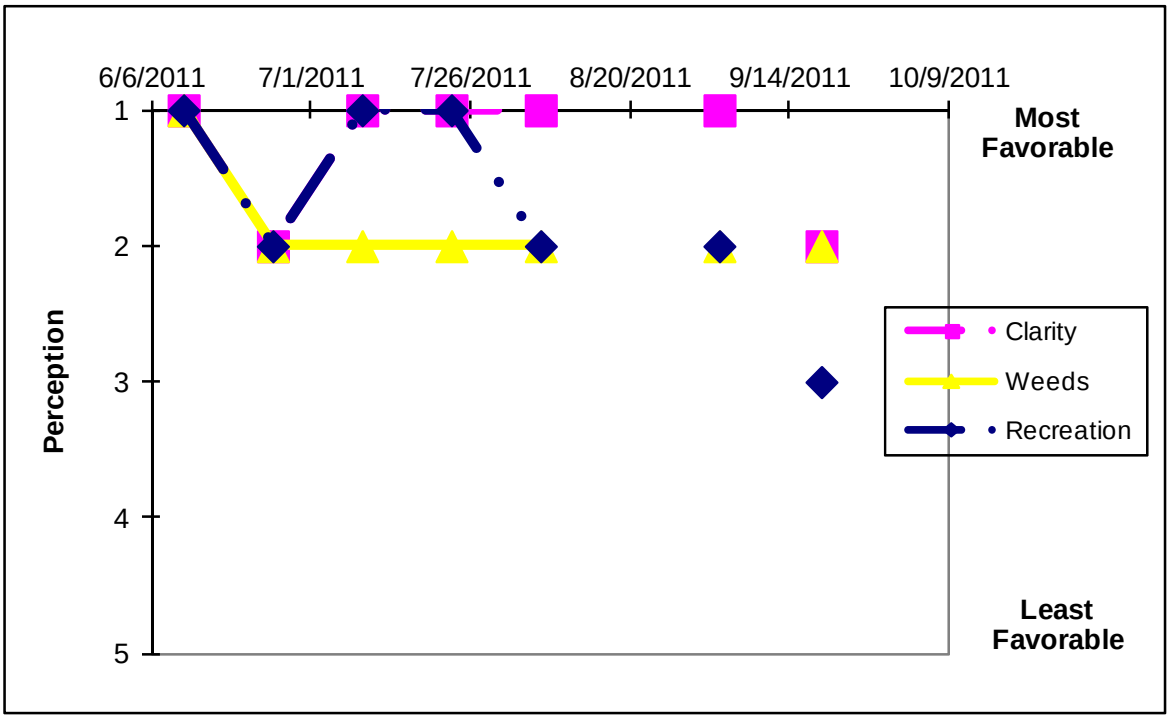
Time Series: Trophic Indicators, 2011



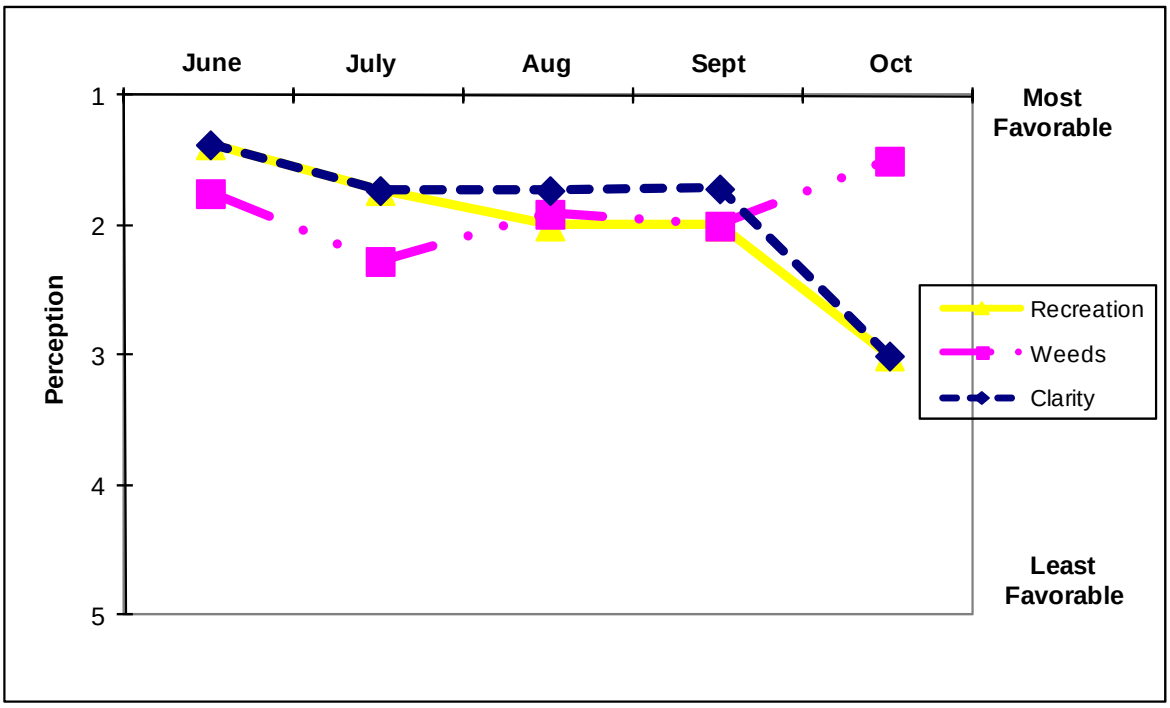
Time Series: Trophic Indicators, Typical Year (1988-2011)



Time Series: Lake Perception Indicators, 2011



Time Series: Lake Perception Indicators, Typical Year (1988-2011)



Appendix A- CSLAP Water Quality Sampling Results for Song Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH3	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a
212	Song L	7/3/1988	7.3	4.04	1.5	0.010	0.01				10	8.39	186		7.18
212	Song L	7/10/1988	7.2	4.05	1.5	0.008	0.01				5	8.31	181		2.52
212	Song L	7/17/1988	7.3	3.20	1.5	0.010	0.01				5	8.32	177		4.74
212	Song L	7/25/1988	8.2	2.71	1.5	0.013	0.01				8	7.98	171		6.96
212	Song L	8/1/1988	7.5	2.96	1.5	0.012	0.01				5	8.72	168		4.88
212	Song L	8/8/1988	7.8	2.64	1.5	0.011	0.01				7	8.39	175		5.33
212	Song L	8/15/1988	7.2	3.14	1.5	0.004	0.01				7	8.61	178		4.81
212	Song L	8/23/1988	7.6	2.56	1.5	0.011	0.07				8	8.04	172		5.33
212	Song L	8/28/1988	7.8	2.29	1.5	0.019	0.01				7	7.96	170		5.03
212	Song L	9/6/1988	7.9	2.82	1.5	0.016	0.01				7	8.14	171		6.36
212	Song L	9/11/1988	7.6	2.96	1.5	0.014	0.01				5	8.25	169		1.42
212	Song L	9/18/1988	8.0	3.77	1.5	0.015	0.01				8	8.08	173		2.96
212	Song L	9/25/1988			1.5	0.012	0.01				13	8.26	181		3.26
212	Song L	9/26/1988			1.5	0.021	0.01				7	8.29	180		2.66
212	Song L	7/17/2007	8.3	3.30	1.5	0.016	0.01	0.02	0.59	80.09	26	7.44	180	30.1	4.88
212	Song L	7/31/2007	8.4	3.38	1.0	0.018	0.01	0.01	0.45	56.50	22	7.87	197		3.01
212	Song L	8/11/2007	8.3	2.90	1.0	0.028	0.01	0.01	0.68	54.51	29	7.47	177		15.97
212	Song L	8/25/2007	8.3	3.40	1.0	0.023	0.02	0.01	0.86	81.17	30	7.48	291		7.18
212	Song L	9/8/2007	8.2	2.80	1.0	0.020	0.00	0.01	0.66	71.99	34	7.62	136	30.0	10.24
212	Song L	9/22/2007	7.6	2.58	1.0	0.019	0.01	0.01	0.65	76.94		7.28	169		8.54
212	Song L	10/6/2007	7.7	1.55	1.0	0.020	0.01	0.02	0.73	81.98	27	7.47	222		17.01
212	Song L	10/20/2007	8.0	1.57	1.0	0.021	0.03	0.08	1.02	110.15	32	7.53	190		33.16
212	Song L	6/14/2008	7.5	3.70	1.0	0.017	0.00	0.01	0.38	50.30	31	8.25	152	30.3	2.88
212	Song L	6/28/2008	8.6	2.70		0.015	0.01	0.05	0.22	31.60	24	7.54	164		5.45
212	Song L	7/12/2008	8.5	2.30	1.0	0.015	0.01	0.01	0.39	56.23	58	7.98	179		4.79
212	Song L	7/26/2008	8.3	1.45	1.0	0.021	0.01	0.08			24	7.96	144		17.74
212	Song L	8/9/2008	8.4	1.40	1.0	0.023	0.01	0.06	0.36	35.14	17	7.27	198	28.9	22.12
212	Song L	8/23/2008	8.4	2.25	1.0	0.024	0.00	0.04	0.49	44.85	21	7.77	201		10.20
212	Song L	9/6/2008	8.2	1.85	1.0	0.019	0.00	0.01	0.47	53.89	24	7.24	162		10.55
212	Song L	9/20/2008	8.2	2.40	1.0	0.019	0.02	0.05	0.51	58.48	17	7.31	190		7.86
212	Song L	06/06/2009	8.7	3.23	1.0	0.016	0.01	0.02	0.43	57.46	18	7.02	201	31.6	3.73
212	Song L	06/20/2009	8.8	3.55	1.0	0.013	0.02	0.02	0.41	69.68	20	8.19	210		9.81
212	Song L	07/05/2009	8.7	4.50	1.0	0.011	0.06	0.05	0.37	71.65	9	7.34	217		0.35
212	Song L	07/19/2009		1.79	1.0	0.031	0.01	0.04	0.35	24.88	20	7.42			5.67
212	Song L	08/01/2009	8.5	3.30	1.0	0.013	0.03	0.02	0.35	59.45	27	7.36	158	32.2	3.98
212	Song L	08/15/2009	8.6	3.00	1.0	0.018	0.01	0.01	0.34	41.92	25	7.82	162		4.40
212	Song L	08/29/2009	8.6	2.50	1.0	0.017	0.03	0.03	0.32	41.31	28	7.69	174		5.30
212	Song L	09/12/2009		2.40	1.0	0.020	0.01	0.01	0.33	36.81	46	7.35	149		6.70
212	Song L	5/22/2010	8.8	2.76	1.0	0.009	0.02	0.02	0.86	202.73	29	7.62	213	32.3	2.80
212	Song L	6/5/2010	8.6	3.90	1.0	0.016	0.01	0.02			26	7.42	219		1.40
212	Song L	6/19/2010	8.4	3.45	1.0	0.015	0.02	0.05	0.47	68.33	12	7.61	220		2.70
212	Song L	7/3/2010	8.6	5.40		0.012	0.02	0.04	0.34	61.49	6	7.72	217		1.30
212	Song L	7/17/2010	8.3	3.45	1.0	0.013	0.02	0.11	0.35	61.07	13	8.09	243	30.2	4.20
212	Song L	7/31/2010	8.2	3.50	1.0	0.019	0.01	0.01	0.36	41.11	11	7.31	215		3.80
212	Song L	8/13/2010	8.2	2.91	1.0	0.018	0.02	0.03	0.29	35.84	7	7.64	219		4.10
212	Song L	8/30/2010	8.2	2.35	1.0	0.020	0.01	0.02	0.42	45.41	11	8.01	221		5.80
212	Song L	6/11/2011	8.6	2.16	1.0	0.016	0.02	0.02	0.26	36.29	9	7.64	210	30.3	4.50
212	Song L	6/25/2011	8.9	3.50	1.0	0.022	0.03	0.04	0.42	41.89	12	7.30	217		1.80
212	Song L	7/9/2011	8.7	4.05	1.0	0.013	0.02	0.03	0.36	62.54	17	7.20	197		2.50
212	Song L	7/23/2011	8.7	4.00	1.0	0.013	0.02	0.02	0.42	73.51	16	8.59	223		2.70
212	Song L	8/6/2011	8.4	2.73	1.0	0.018	0.01	0.02	0.60	74.16	19	8.06	234	34.1	3.40
212	Song L	8/20/2011				0.012	0.02	0.04	0.53	99.66	26	9.01	198		5.60
212	Song L	9/3/2011	8.2	2.35	1.0	0.015	0.01	0.01	0.48	69.59	18	7.93	199		7.80
212	Song L	9/12/2011													
212	Song L	9/19/2011	8.2	2.40	1.0	0.024	0.03	0.05	0.49	45.67	16	7.62	205		9.90
212	Song L	7/17/2007	8.3		7.0	0.051									
212	Song L	7/31/2007	8.4		7.0	0.016									
212	Song L	8/11/2007	8.3		7.0	0.091									
212	Song L	8/25/2007	8.3		7.0	0.073									
212	Song L	9/8/2007	8.2		7.2	0.140									
212	Song L	10/6/2007	7.7		6.7	0.020									
212	Song L	10/20/2007	8.0		7.0	0.030									
212	Song L	6/14/2008			6.5	0.035									

LNum	LName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4							
212	Song L	6/28/2008				0.031									
212	Song L	7/12/2008			7.5	0.045									
212	Song L	7/26/2008			7.3	0.069									
212	Song L	8/9/2008			7.3	0.054									
212	Song L	8/23/2008			7.4	0.092									
212	Song L	9/6/2008			7.3	0.058									
212	Song L	9/20/2008			7.2	0.027									
212	Song L	06/06/2009	8.7		7.7	0.020		0.14							
212	Song L	06/20/2009	8.8		7.8	0.029									
212	Song L	07/05/2009	8.7		7.7	0.063		0.09							
212	Song L	07/19/2009			7.6	0.055									
212	Song L	08/01/2009	8.5		7.5	0.053		0.03							
212	Song L	08/15/2009	8.6		7.6	0.051									
212	Song L	08/29/2009	8.6		7.6	0.140		0.73							
212	Song L	09/12/2009	0.4		7.4	0.021									
212	Song L	5/22/2010	8.8		7.8	0.020		0.03							
212	Song L	6/19/2010	8.4		7.4	0.024		0.00							
212	Song L	7/17/2010	8.3		7.3	0.029		0.05							
212	Song L	8/13/2010	8.2		7.2	0.046		0.04							
212	Song L	6/11/2011	8.6		7.6	0.031		0.24							
212	Song L	7/9/2011				0.053		0.27							
212	Song L	8/6/2011	8.4		7.4	0.097		0.30							
212	Song L	9/3/2011	8.2		7.2	0.067		0.48							

LNum	LName	Date	Zsamp	TAir	TH2O	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Anatoxin-a	Cyclin
212	Song L	7/3/1988	epi	20	18											
212	Song L	7/10/1988	epi	26	25											
212	Song L	7/17/1988	epi	24	23											
212	Song L	7/25/1988	epi	20	23											
212	Song L	8/1/1988	epi	22	24											
212	Song L	8/8/1988	epi	22	23											
212	Song L	8/15/1988	epi	24	26											
212	Song L	8/23/1988	epi	16	20											
212	Song L	8/28/1988	epi	25	21											
212	Song L	9/6/1988	epi	9	16											
212	Song L	9/11/1988	epi	14	18											
212	Song L	9/18/1988	epi	24	17											
212	Song L	7/17/2007	epi	24	23	1	2	1	8							
212	Song L	7/31/2007	epi	23	25	1	2	1	0							
212	Song L	8/11/2007	epi	33	27	3	2	2	6							
212	Song L	8/25/2007	epi	31	24	1	1	1	0							
212	Song L	9/8/2007	epi	27	25	1	2	1	8							
212	Song L	9/22/2007	epi	22	21	1	2	1	8							
212	Song L	10/6/2007	epi		20	3	2	4	368							
212	Song L	10/20/2007	epi	16	15	3	1	2	5							
212	Song L	6/14/2008	epi	29	27	1	2	2	8							
212	Song L	6/28/2008	epi	31	26	1	2	1	0							
212	Song L	7/12/2008	epi	32	27	3	2	3	38							
212	Song L	7/26/2008	epi	23	26	4	2	4	1234							
212	Song L	8/9/2008	epi	22	25	4	2	4	134							
212	Song L	8/23/2008	epi	20	23	2	2	2	8							
212	Song L	9/6/2008	epi	22	22	3	2	3	5							
212	Song L	9/20/2008	epi	16	21	2	2	2	6							
212	Song L	06/06/2009	epi	19	20	2	1	2	0							
212	Song L	06/20/2009	epi	20	22	2	2	1	0							
212	Song L	07/05/2009	epi	24	23	1	2	1	0							
212	Song L	07/19/2009	epi	23	24	2	3	2	0							
212	Song L	08/01/2009	epi	22	24	2	3	3	8							
212	Song L	08/15/2009	epi	25	26	2	2	3	3							
212	Song L	08/29/2009	epi	20	22	2	2	2	0							
212	Song L	09/12/2009	epi	17	22	2	2	2	5			75.29				
212	Song L	5/22/2010	epi	22	19	1	1	1	0	0	4					
212	Song L	6/5/2010	epi	24	24	1	2	1	0	0	0					
212	Song L	6/19/2010	epi	23	22	1	2	1	0	0	0					

LNum	LName	Date	Zsamp	TAir	TH2O	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Anatoxin-a	Cyclin
212	Song L	7/3/2010	epi	21	23	1	2	1	0	0	0					
212	Song L	7/17/2010	epi	27	26	2	3	2	8	**34**	4					
212	Song L	7/31/2010	epi	24	26	2	3	2	0	4	4					
212	Song L	8/13/2010	epi	32	27	1	2	2	0	4	4					
212	Song L	8/30/2010	epi	19	23	1	3	1	0	0	0					
212	Song L	6/11/2011	epi	24	25	1	1	1	0	0	0	28.20	5.70			
212	Song L	6/25/2011	epi	25	25	2	2	2	0	4	4	17.30	4.10			
212	Song L	7/9/2011	epi	24	26	1	2	1	0	0		11.90	2.50			
212	Song L	7/23/2011	epi	30	29	1	2	1	0	0	0	21.70	2.99			
212	Song L	8/6/2011	epi	23	27	1	2	2	0	0		32.50	5.30	0.35		
212	Song L	8/20/2011	grab									49.80	5.10			
212	Song L	9/3/2011	epi	23	23	1	2	2	5	0	4	35.20	3.20			
212	Song L	9/12/2011	grab i											181.27	<2	<0.2
212	Song L	9/19/2011	epi	16	19	2	2	3	15	0	4	72.10	4.00	0.15		
212	Song L	9/19/2011	grab											305.43	<0.8	<0.1
212	Song L	10/8/2011	grab											18.51		
212	Song L	7/17/2007	hypo		16											
212	Song L	7/31/2007	hypo		25											
212	Song L	8/11/2007	hypo		19											
212	Song L	8/25/2007	hypo		21											
212	Song L	9/8/2007	hypo		21											
212	Song L	9/22/2007	hypo		20											
212	Song L	10/6/2007	hypo		19											
212	Song L	10/20/2007	hypo		17											
212	Song L	6/14/2008	hypo		19											
212	Song L	6/28/2008	hypo		18											
212	Song L	7/12/2008	hypo		18											
212	Song L	7/26/2008	hypo		18											
212	Song L	8/9/2008	hypo		20											
212	Song L	8/23/2008	hypo		29											
212	Song L	9/6/2008	hypo		20											
212	Song L	9/20/2008	hypo		20											
212	Song L	06/06/2009	hypo		18											
212	Song L	06/20/2009	hypo		18											
212	Song L	07/05/2009	hypo		18											
212	Song L	07/19/2009	hypo		22											
212	Song L	08/01/2009	hypo		21											
212	Song L	08/15/2009	hypo		22											
212	Song L	08/29/2009	hypo		21											
212	Song L	09/12/2009	hypo		21											
212	Song L	7/17/2010	hypo		18											
212	Song L	8/13/2010	hypo		23											
212	Song L	6/11/2011	hypo		16											
212	Song L	8/6/2011	hypo		17											
212	Song L	9/3/2011	hypo		21											

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)	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/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)	0.3 ug/l	none
Cyl	Cylindrospermposin (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		

Appendix B- Monthly Evaluation of Song Lake Data, 2006-2011

June Data

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

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
Zsd		NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
TP		HIGH	NORMAL	NORMAL	NORMAL	NORMAL
Chl.a		NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
NOx		NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
NH4		NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
TN		HIGH	NORMAL	NORMAL	NORMAL	NORMAL
pH		NORMAL	NORMAL	NORMAL	NORMAL	HIGH
SpCond		HIGH	NORMAL	NORMAL	NORMAL	NORMAL
Color		NORMAL	NORMAL	NORMAL	LOW	NORMAL
Ca			LOW	NORMAL		HIGH
QA		NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
QB		NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
QC		NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
TH20		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
Zsd		NORMAL	NORMAL	NORMAL		NORMAL
TP		NORMAL	NORMAL	NORMAL		HIGH
Chl.a		NORMAL	NORMAL	NORMAL		NORMAL
NOx		NORMAL	NORMAL	NORMAL		NORMAL
NH4		LOW	NORMAL	LOW		HIGH
TN		NORMAL	NORMAL	NORMAL		NORMAL
pH		NORMAL	LOW	NORMAL		NORMAL
SpCond		NORMAL	NORMAL	LOW		NORMAL
Color		HIGH	NORMAL	HIGH		NORMAL
Ca		NORMAL				
QA		NORMAL	NORMAL	NORMAL		NORMAL
QB		NORMAL	NORMAL	NORMAL		NORMAL
QC		NORMAL	NORMAL	NORMAL		NORMAL
TH20		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

Appendix C- Priority Waterbody Listing for Song Lake

Song Lake (0602-0019) — MinorImpacts

Waterbody Location Information

Revised: 07/02/2009

Water Index No: SR- 44-14-60-P68-P72
Hydro Unit Code: 02050102/080 **Str Class:** B
Waterbody Type: Lake (Unknown Trophic)
Waterbody Size: 105.4 Acres
Seg Description: entire lake

Drain Basin: Susquehanna River
Chenango River
Reg/County: 7/Cortland Co. (12)
Quad Map: OTISCO VALLEY (J-16-4)

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
Public Bathing	Stressed	Suspected
Recreation	Stressed	Suspected

Type of Pollutant(s)
Known: - - -
Suspected: ALGAL/WEED GROWTH (aquatic vegetation), NUTRIENTS (phosphorus)
Possible: - - -

Source(s) of Pollutant(s)
Known: - - -
Suspected: AGRICULTURE
Possible: On-Site/Septic Syst

Resolution/Management Information

Issue Resolvability: 1 (Needs Verification/Study (see STATUS))
Verification Status: 4 (Source Identified, Strategy Needed)
Lead Agency/Office: ext/WQCC **Resolution Potential:** Medium
TMDL/303d Status: n/a

Further Details

Overview
Public Bathing and other recreational uses in Song Lake are thought to experience minor impacts due to elevated nutrient levels that contribute to algal and weed growth. Agricultural activities and other nonpoint sources in the watershed are the likely source of the pollutants.

Water Quality Sampling
Song Lake was sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) in 2007. Prior to that, the lake was sampling through CSLAP in 1988. An Interpretive Summary report of the findings of this sampling was published in 2008. These data indicate that the lake continues to be best characterized as mesoeutrophic, or moderately productive. Phosphorus levels in the lake occasionally exceeded the state guidance values indicating impacted/stressed recreational uses. Corresponding transparency measurements typically exceed what is the recommended minimum for swimming beaches. Measurements of pH are somewhat high but typically fall within the state water quality range of 6.5 to 8.5. The lake water is slightly colored, but color does not limit water transparency. (DEC/DOW, BWAM/CSLAP, January 2008)

Recreational Assessment

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. This assessment indicates recreational suitability of the lake to be mostly favorable in 2008. The recreational suitability of the lake is described most frequently as "could not be nicer" or "excellent." The lake itself is most often described as "not quite crystal clear" or having "definite algal greenness," an assessment that somewhat more favorable than occurs in lakes with similar water quality. Assessments have noted that aquatic plants do not grow to the lake surface. (DEC/DOW, BWAM/CSLAP, January 2008)

Lake Uses

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

Previous Assessment

Based on previous CSLAP sampling in 1988, recreational uses in Song Lake were assessed as possibly being stressed. However impacts to the lake were noted as needing verification. The more recent sampling suggests impacts to uses are present but fairly minor. (DEC/DOW, BWM/Lake Services, January 2008).

Segment Description

This segment includes the total area of the lake.