

Brantingham Lake Questions and Answers, 2014 CSLAP

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

A1. Brantingham Lake continues to exhibit good water quality, but higher algae levels in the last two years may indicate a problem for potable water use. No shoreline algae blooms have been observed in at least the last few years.

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

A2. The HABs testing includes information about the types of algae found in the water samples. These results showed low algae levels and algae communities that are comprised of a variety of algae types, with little evidence of blue green algae when overall algae levels rise. This suggests a lower risk for at least swimming use.

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

A3. Brantingham Lake has slightly lower water clarity, but also slightly lower algae and nutrient levels, than other nearby lakes. This suggests that overall water quality conditions in the lake are probably similar to other lakes.

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

A4. Phosphorus readings have increased slightly in the last decade, but it is not known if this has resulted in the recent increase in algae levels. This does not appear to have affected any other measured water quality indicators.

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

A5. It is not known if the rise in phosphorus levels (and recent increase in algae levels) will result in more significant future problems in the lake. No shoreline blooms have been apparent, and higher algae levels appear to be dominated by green algae.

Q6. Are any actions indicated, based on the trends and this year's results?

A6. Individual stewardship activities such as pumping your septic system, growing a buffer of native plants next to the water bodies, and reducing erosion from shoreline properties will help to restore highly favorable lake conditions by reducing nutrient and sediment loading to the lake. Additional sources of nutrients should be evaluated by continuing shoreline and watershed evaluations. Visiting boats should be inspected to reduce the risk of new invasive species, since nearby lakes harbor several invasive plants not found in the lake.

Lake Use				
Potable Water				Algae levels
Swimming				No impacts
Boating / Fishing				No impacts
Aquatic Life				No impacts
Aesthetics				No impacts
Fish Consumption				Not applicable
	PWL	Average Year	2014	Primary issue

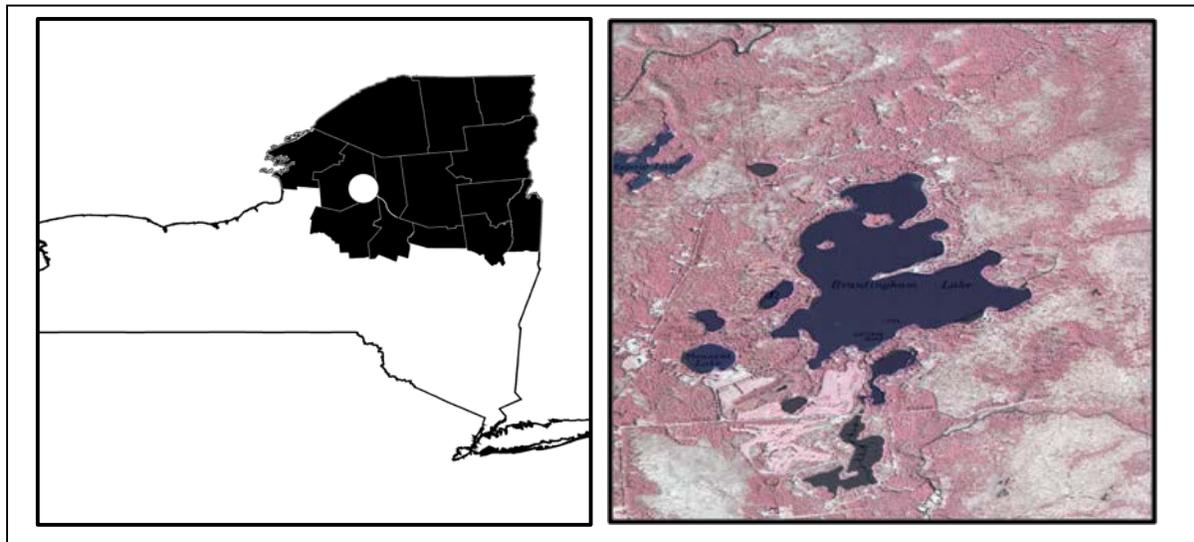
 Supported
 Threatened
 Stressed
 Impaired
 Not Known

CSLAP 2014 Lake Water Quality Summary: Brantingham Lake

General Lake Information

Location	Town of Greig
County	Lewis
Basin	Black River
Size	132.2 hectares (326.5 acres)
Lake Origins	Augmented by dam- owned and operated by town of Greig?
Watershed Area	657.8 hectares (1,624.8 acres)
Retention Time	2.2 years
Mean Depth	8.6 meters
Sounding Depth	18.3 meters
Public Access?	Town of Greig launch for residents and guests
Major Tributaries	no named tribs
Lake Tributary To...	unnamed outlet to Black River to Lake Ontario
WQ Classification	A (potable water)
Lake Outlet Latitude	43.690
Lake Outlet Longitude	-75.276
Sampling Years	2001-2010, 2012-2014
2014 Samplers	Al Predmore and Donald Schneider
Main Contact	Donald Schneider

Lake Map



Background

Brantingham Lake is a 327 acre, class A lake found in the Town of Greig in Lewis County, in the far western Adirondack region of New York State. It was sampled as part of CSLAP for the first time in 2001.

It is one of four CSLAP lakes among the more than 75 lakes found in Lewis County, and one of 8 CSLAP lakes among the more than 465 lakes and ponds in the Black River drainage basin.

Lake Uses

Brantingham Lake is a Class A lake; this means that the best intended use for the lake is for potable water intake, although the lake also supports contact recreation—swimming and bathing—as well as non-contact recreation—boating, aquatic life, and aesthetics. The lake is used by lake residents and visitors (via a town of Greig launch- there is no public parking) for a variety of recreational purposes.

Brantingham Lake is not stocked by the state; the Brantingham Community Association stocks trout every year from funds collected from members.

General statewide fishing regulations are applicable in Brantingham Lake.

Historical Water Quality Data

CSLAP sampling was conducted on Brantingham Lake each year from 2001 to 2010, and in 2012 to 2014. 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 Brantingham Lake can also be found on the NYSDEC web page at <http://www.dec.ny.gov/lands/77863.html>.

Brantingham Lake has not been sampled by New York State as part of any of the major regional or statewide monitoring programs. The lake may have been sampled as part of a local monitoring effort and/or in support of fisheries management activities on the lake—bacteria sampling has been conducted by lake residents.

Neither the unnamed tributaries to nor the outlet of the lake has been monitored through the NYSDEC Rotating Intensive Basins (RIBS) or stream biomonitoring programs.

Lake Association and Management History

Brantingham Lake is served by the Brantingham Community Association. Some of the activities conducted by or encouraged by the lake association are identified in the 2001 lake management plan and include the following:

- Stock brook and rainbow trout
- Signage at boat launch
- APIPP (Adirondack Park Invasive Plant Program) participation
- Bacteria testing/sanitary surveys/dye testing (septic committee, town of Greig septic legislation)
- Boater safety education
- Water level management (Brantingham Water District, town of Greig)
- Water supply advice regarding water testing services

- Contract for insect control

In addition, BCA contracted with the Darrin Freshwater Institute (DFWI) of the Rensselaer Polytechnic Institute in Troy in 1994 to conduct a septic and aquatic plant survey of the lake.

The Brantingham Community Association maintains a website, at www.brantingham.org.

Summary of 2014 CSLAP Sampling Results

Evaluation of 2014 Annual Results Relative to 2001-2013

The summer (mid-June through mid-September) average readings are compared to historical averages for all CSLAP sampling seasons in the “Lake Condition Summary” table, and are compared to individual historical CSLAP sampling seasons in the “Long Term Data Plots – Brantingham Lake” section in Appendix C.

Evaluation of Eutrophication Indicators

Algae levels were higher than normal in 2014 (and 2013), despite phosphorus readings that were close to normal. The higher algae levels did not result in lower than normal water clarity readings, although algae levels are typically higher than expected given the phosphorus readings in the lake. There has been a slight long-term increase in phosphorus readings, despite an apparent long-term decrease in deepwater phosphorus levels. Water clarity readings do not appear to have responded to these small changes in either phosphorus or algae levels.

Lake productivity usually does not change much during the summer during most years. Algae levels did rise slightly during the summer of 2014, due to a slight seasonal increase in phosphorus readings. However, water clarity did not change during the summer, and typically does not vary during the summer in most years.

The lake can be characterized as *mesoligotrophic*, or moderately unproductive, based on chlorophyll *a*, water clarity (both indicative of *mesotrophic* lakes) and total phosphorus readings (typical of *oligotrophic* lakes). The trophic state indices (TSI) evaluation suggests algae levels were higher than expected in 2013 and 2014. This may indicate a susceptibility to small changes in phosphorus readings. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are usually too low 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, although higher algae levels in 2014 may have resulted in higher DBP levels. Deepwater phosphorus, ammonia, manganese and arsenic readings are low and similar to those measured at the lake surface. This suggests no impacts for deepwater potable intakes. Deepwater iron readings are elevated, indicating a potential *threat* to this use. Algal toxin sampling found undetectable microcystin and anatoxin levels well below the levels needed to protect potable water. 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 limnological indicators (NO_x, NH₄, total nitrogen, pH, conductivity, color and calcium) was close to normal in 2014, and none of these indicators has exhibited any apparent historical trends. 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 found low total algae and low blue green algae levels, despite higher overall chlorophyll levels measured in 2013 and 2014. The algae community is comprised of a mix of algae species- mostly blue greens when overall algae levels are low, and green algae when algae levels are high. No shoreline blooms have been reported.

Macrophyte surveys have been conducted at Brantingham Lake through the Adirondack Lake Survey Corporation (ALSC) and by Darrin Freshwater Institute. The plant survey data indicate at least 20 different aquatic plant species, none of which are exotic or protected. The modified floristic quality index (FQI) for the lake indicates that the quality of the aquatic plant community is “excellent”.

The fish community is comprised of at least eight fish species, one of which is a coldwater species and three of which are coolwater fish species. The ALSC fish survey data would be evaluated as “favorable” using the Minnesota fish index for biotic integrity.

The macroinvertebrate community, as evaluated through the ALSC, was dominated by tolerant organisms, indicating a susceptibility to pollution.

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

Evaluation of Lake Perception

Recreational assessments were slightly more favorable than normal in 2014 (and generally over the last five years), despite slightly higher algae levels and water quality and aquatic plant assessments that were close to normal. None of these indicators of lake perception has exhibited any clear long-term trends. Recreational assessments are stable during most of the summer, with less favorable assessments associated with poor weather or other factors unrelated to water quality, usually late in the fall. This seasonal stability was also apparent in 2013 and 2014, despite higher algae levels. Overall lake perception is summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Air and water temperature readings were close to normal in 2014, and have not exhibited any clear long-term trends. However, bottom water temperatures have increased slightly in recent years; it is not known if this is the result of a long-term 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 levels

are consistently below the levels indicating susceptibility for harmful algal blooms (HABs), consistent with fluoroprobe screening data in the last three years indicating low levels of blue green algae in the open water (and no reported shoreline blooms). These data also suggest that the higher chlorophyll a readings measured in mid summer in 2013 and 2014 have not increased the lake's susceptibility to harmful algae blooms. Open water algal toxin levels have been below readings associated with threats to contact recreational use.

Lake Condition Summary

Category	Indicator	Min	Overall Avg	Max	2014 Avg	Classification	2014 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	2.03	3.74	5.38	3.49	Mesotrophic	Within Normal Range	No Change
	Chlorophyll <i>a</i>	0.35	4.22	14.40	7.51	Mesotrophic	Higher than Normal	No Change
Potable Water Indicators	Total Phosphorus	0.000	0.009	0.027	0.009	Oligotrophic	Within Normal Range	Increasing Slightly
	Hypolimnetic Ammonia	0.01	0.06	0.50	0.04	Close to Surface NH4 Readings	Within Normal Range	Not known
	Hypolimnetic Arsenic	0.90	1.30	1.90		Low Deepwater Arsenic Levels		Not known
	Hypolimnetic Iron	0.56	1.42	4.39		Highly Elevated Deepwater Fe		Not known
Limnological Indicators	Hypolimnetic Manganese	0.08	0.26	0.66		Low Manganese Levels		Not known
	Hypolimnetic Phosphorus	0.003	0.018	0.068	0.012	Close to Surface TP Readings	Lower Than Normal	Not known
	Nitrate + Nitrite	0.00	0.02	0.14	0.01	Low NOx	Within Normal Range	No Change
	Ammonia	0.01	0.03	0.41	0.03	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.00	0.35	0.83	0.32	Low Total Nitrogen	Within Normal Range	No Change
	pH	5.74	7.24	8.38	7.38	Circumneutral	Within Normal Range	No Change
	Specific Conductance	20	31	63	28	Softwater	Within Normal Range	No Change
	True Color	7	34	73	37	Intermediate Color	Within Normal Range	No Change
Lake Perception	Calcium	1.8	3.8	11.7	3.1	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
	WQ Assessment	1	1.8	2	2.0	Not Quite Crystal Clear	Within Normal Range	No Change
	Aquatic Plant Coverage	1	1.0	2	1.0	Plants Not Visible	Within Normal Range	No Change
	Recreational Assessment	1	1.8	4	1.3	Excellent	More Favorable Than Normal	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Excellent 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					Coldwater (two stage) fishery	Not known	Not known
	Invasive Species					None observed	Not known	Not known
Local Climate Change	Air Temperature	7	18.6	30	21.6		Higher Than Normal	Increasing Significantly
	Water Temperature	13	21.0	27	22.1		Within Normal Range	No Change

Category	Indicator	Min	Overall Avg	Max	2014 Avg	Classification	2014 Change?	Long-term Change?
Harmful Algal Blooms	Open Water Phycocyanin	-1	10	50	2	No readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	1	3	10	2	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	1	6	0	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	0.0	0.2	0.4	<0.30	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					No shoreline blooms sampled for PC	Not known	Not known
	Shoreline FP Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline FP BG Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline Microcystis					No shoreline bloom MC-LR data	Not known	Not known
	Shoreline Anatoxin a					No shoreline bloom anatoxin data	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Brantingham Lake is presently among the lakes listed on the Black River Basin PWL, with water supply and public bathing threatened by excessive pathogens. The PWL listing for the lake is in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Brantingham Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of Brantingham Lake for potable water. Bacteria data collected by the BCA indicate that intake water must be treated before use as drinking water, but this is inherent in the classification of the lake. The limited CSLAP data, which do not include the bacterial dataset, otherwise indicate that this use may be compromised in the surface waters due to higher than expected algae levels, and hypolimnetic iron levels may *threaten* deepwater intakes.

Contact Recreation (Swimming)

The CSLAP dataset at Brantingham Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that swimming and contact recreation should be fully supported, although these uses may be threatened by bacteria.

Non-Contact Recreation (Boating and Fishing)

The CSLAP dataset on Brantingham 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 Brantingham Lake, including water chemistry data and physical measurements, suggest that aquatic life should be fully supported. Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics

The CSLAP dataset on Brantingham Lake, including volunteer samplers' perception data, suggest that aesthetics should be fully supported.

Fish Consumption

Fish consumption advisories are not posted for Brantingham Lake.

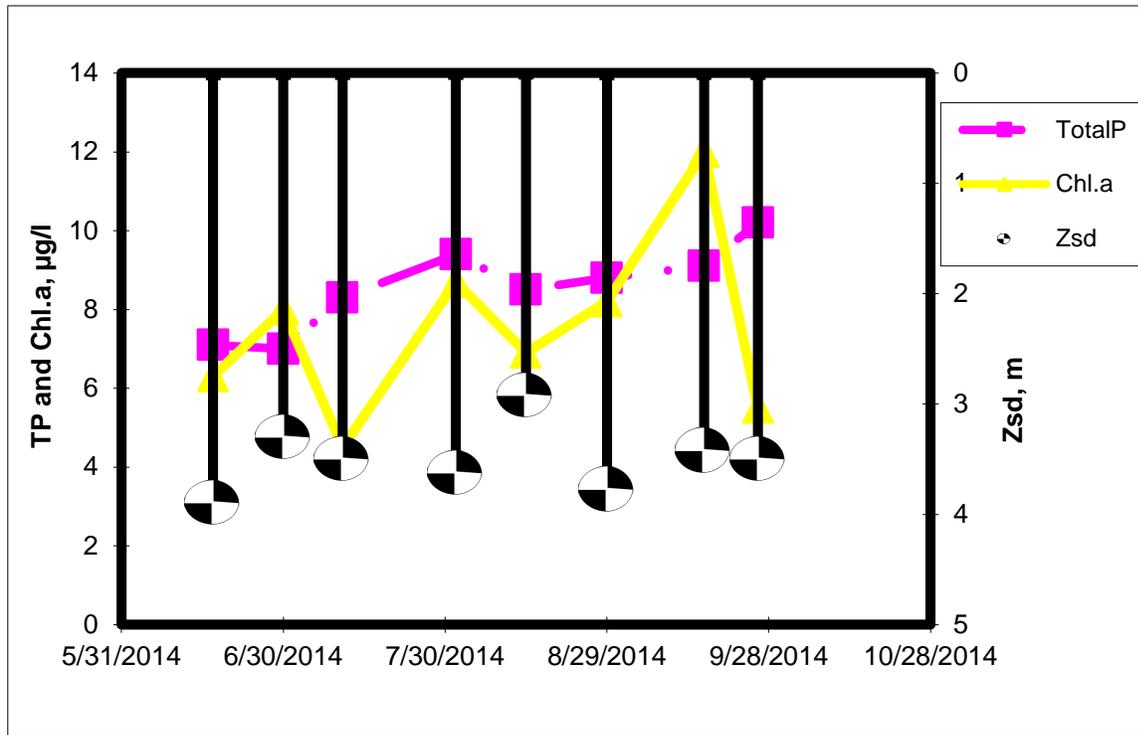
Additional Comments and Recommendations

The residents of Brantingham Lake should continue to look for invasive exotic plants and shoreline algal blooms. The higher algae levels in the open water may create a risk for potable water use, so any algae levels near any water intakes should be evaluated.

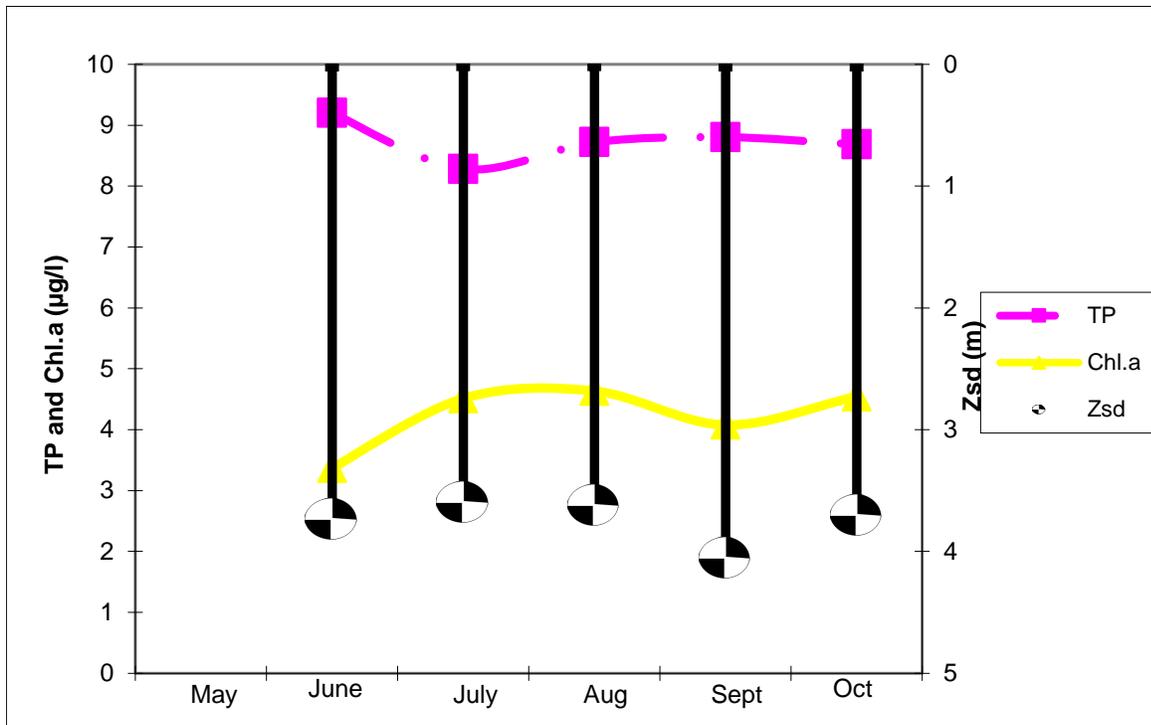
Aquatic Plant IDs-2014

None submitted for identification in 2014.

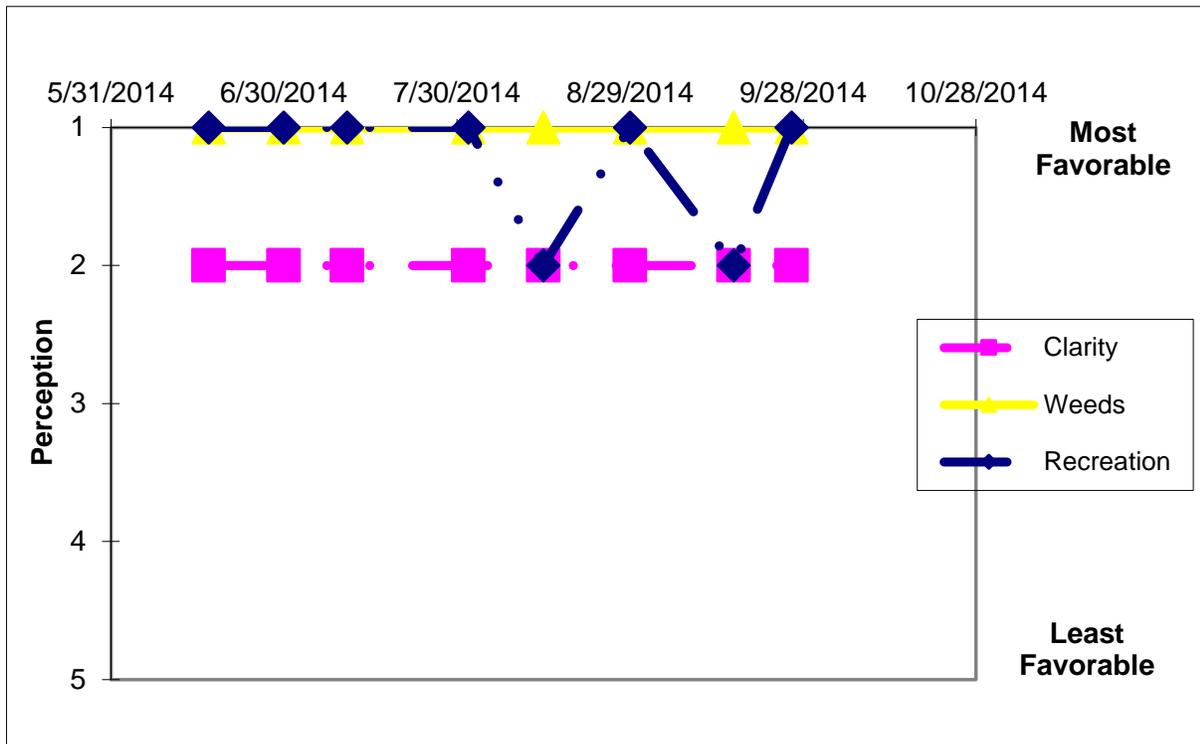
Time Series: Trophic Indicators, 2014



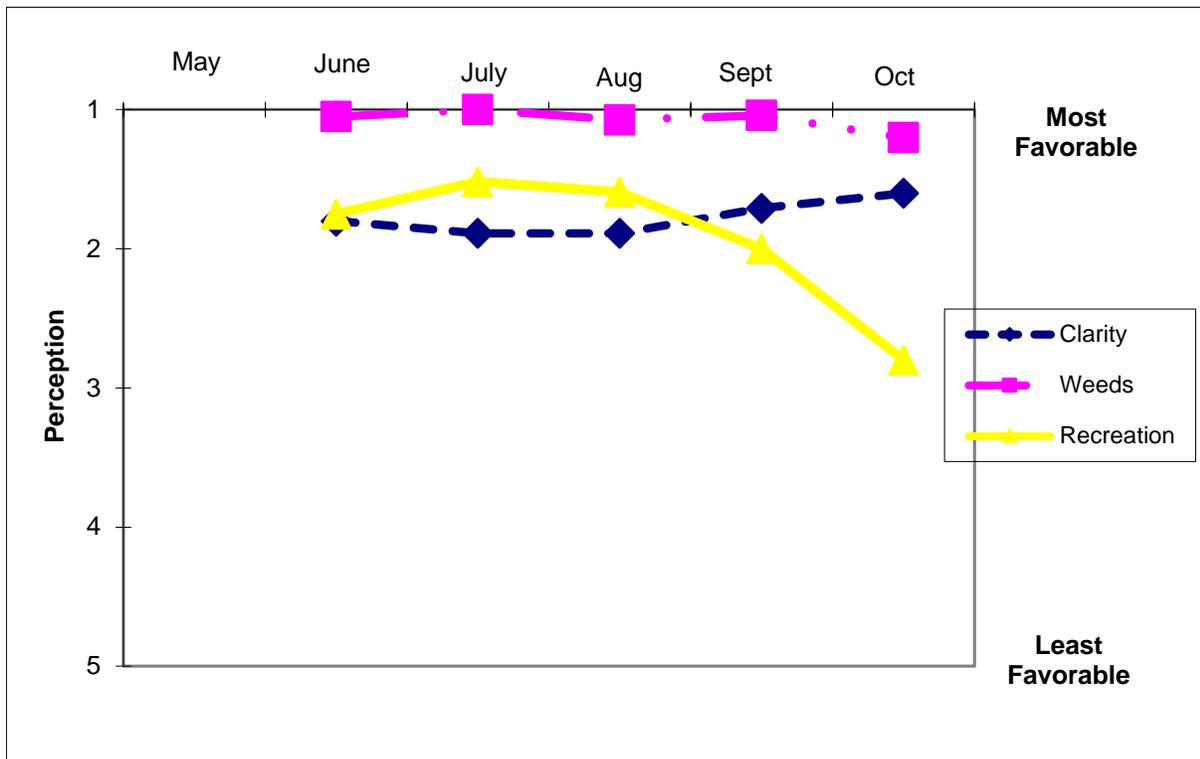
Time Series: Trophic Indicators, Typical Year (2001-2014)



Time Series: Lake Perception Indicators, 2014



Time Series: Lake Perception Indicators, Typical Year (2001-2014)



Appendix A- CSLAP Water Quality Sampling Results for Brantingham Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a
175	Brantingham L	6/1/2001		3.73	1.5	0.007	0.06				30	7.25	33		7.80
175	Brantingham L	6/15/2001		3.90	1.5	0.000	0.04				28	6.74	31		3.16
175	Brantingham L	6/30/2001		4.00	1.5	0.006	0.02				24	6.25	31		1.36
175	Brantingham L	7/13/2001		3.50	1.5	0.009	0.01				47	7.19	31		13.80
175	Brantingham L	7/27/2001		3.65	1.5	0.011	0.01				36	7.45	32		
175	Brantingham L	8/11/2001		3.00	1.5	0.007	0.01				25	7.74	33		5.76
175	Brantingham L	8/28/2001		3.15	1.5	0.007	0.01				21	7.06	33		3.30
175	Brantingham L	9/10/2001		3.10	1.5	0.004	0.01				24	8.00	33		
175	Brantingham L	06/08/02		3.50	1.5	0.010	0.06	0.04	0.54	55.91	32	6.89	29		3.29
175	Brantingham L	06/20/02		2.95	1.5	0.009	0.04	0.03	0.41	44.07	43	7.02	29		5.96
175	Brantingham L	07/06/02		3.10	1.5	0.007	0.01	0.05			30	7.06	30		3.63
175	Brantingham L	07/24/02		3.30	1.5	0.003	0.00	0.05	0.40	120.48	34	7.11	30		6.13
175	Brantingham L	08/05/02		3.70	1.5	0.000	0.00	0.03	0.39	1184.79	30	7.25	32	1.8	4.81
175	Brantingham L	08/19/02		3.60	1.5	0.007	0.00	0.04	0.50	68.00	26	7.23	30		6.88
175	Brantingham L	09/03/02		3.75	1.5	0.006	0.01	0.01	0.32	53.36	65	7.44	31		3.85
175	Brantingham L	09/30/02		4.60	1.5	0.006	0.01	0.05	0.41	65.24	30	7.07	32		3.42
175	Brantingham L	10/18/02		3.40	1.5	0.008	0.00	0.10	0.58	70.41	62	6.76	34		4.19
175	Brantingham L	6/12/2003		3.90	1.5		0.06	0.01	0.25		42	6.82	30	3.4	2.03
175	Brantingham L	6/30/2003		3.65	1.5	0.013	0.00				40	7.26	31		2.93
175	Brantingham L	7/19/2003		4.05	1.5	0.006	0.02	0.01	0.61	97.44	73	7.18	32		1.68
175	Brantingham L	7/31/2003		4.05	1.5	0.006	0.00	0.09	0.15	26.74	31	6.85	31		2.47
175	Brantingham L	8/15/2003		4.00	1.5	0.006	0.00	0.06	0.40	71.30	30	6.79	30	3.6	1.53
175	Brantingham L	9/8/2003		4.70	1.5	0.006	0.03	0.02	0.80	127.80	34	7.02	33		
175	Brantingham L	9/18/2003		4.80	1.5	0.005	0.02	0.02	0.38	71.97	27	6.72	33		1.07
175	Brantingham L	10/11/2003		4.60		0.009	0.02	0.02	0.11	12.88	29	6.91	32		3.18
175	Brantingham L	6/12/2004		3.00	1.5	0.013	0.08	0.02	0.42	33.17	45	7.62	34	3.9	0.50
175	Brantingham L	7/2/2004		3.75	1.5	0.003	0.04	0.02	0.17	59.61	35	6.19	35		0.90
175	Brantingham L	7/14/2004		3.75	1.5	0.003	0.05	0.02	0.38	116.39	39	6.59			1.60
175	Brantingham L	8/2/2004		3.95	1.5	0.006	0.02	0.02	0.07	11.69	45	6.50	32		2.20
175	Brantingham L	8/16/2004		3.95	1.5	0.006	0.04	0.02	0.00	0.00	31	7.64	30	5.6	4.00
175	Brantingham L	8/24/2004		3.80	1.5	0.007	0.02	0.02	0.83	123.83	39	7.51	32		6.60
175	Brantingham L	9/15/2004		3.95	1.5	0.005	0.01	0.01	0.33	63.49	44	7.79	25		
175	Brantingham L	9/27/2004		3.75	1.5	0.006	0.01	0.01	0.73	125.27	33	8.38	27		4.40
175	Brantingham L	6/2/2005		3.60	1.5	0.009	0.02	0.01	0.32	35.09	13	7.25		11.7	1.25
175	Brantingham L	6/15/2005		4.35	1.5	0.010	0.02	0.02	0.18	16.84	23	7.30	29		2.19
175	Brantingham L	7/9/2005		3.45	1.5		0.01	0.01	0.18	5.06	15	8.23	28		4.30
175	Brantingham L	7/21/2005		3.60	1.5	0.009	0.01	0.01	0.31	33.05	22	6.55	32		3.78
175	Brantingham L	8/1/2005		3.70	1.5	0.008	0.03	0.10	0.35	45.27	22	7.21	32	3.8	3.75
175	Brantingham L	8/22/2005		3.95	1.5	0.007	0.01	0.01	0.19	26.86	7	7.81	30		4.95
175	Brantingham L	9/7/2005		3.80	1.5	0.006	0.01	0.01	0.20	33.69	42	6.57	27		1.62
175	Brantingham L	9/22/2005		4.50		0.006	0.02	0.01	0.08	13.12	36	7.32	33		1.39
175	Brantingham L	6/16/2006		3.60	1.5	0.007	0.14	0.01			20	7.55	33	3.3	4.91
175	Brantingham L	7/6/2006		3.50	1.5	0.006	0.06	0.04			66	7.27	25		2.10
175	Brantingham L	7/26/2006		3.50	1.5	0.007	0.05	0.03			50	7.93	28		0.35
175	Brantingham L	8/14/2006		3.00	1.5	0.007	0.01	0.01			40	6.62	29		4.36
175	Brantingham L	8/25/2006		3.60	1.5	0.006	0.02	0.03			50	7.06	31	3.6	4.20
175	Brantingham L	9/7/2006		3.80	1.5	0.006	0.01	0.01			21	7.77	22		4.18
175	Brantingham L	9/15/2006		3.45	1.5	0.002					42	8.32	22		5.35
175	Brantingham L	10/3/2006		3.80	1.5	0.006	0.01	0.11			26	6.67	23		4.46
175	Brantingham L	6/13/2007		4.15	1.5	0.001	0.11	0.04	0.42	706.59	24	6.59	34	3.1	1.57
175	Brantingham L	7/3/2007		3.90	1.0	0.008	0.05	0.02	0.38	109.08	33	7.24	32		2.32
175	Brantingham L	7/12/2007		3.80	1.0	0.013	0.04	0.05	0.47	82.90	24	7.34	27		2.39
175	Brantingham L	8/3/2007		4.00	1.0	0.021	0.01	0.01	0.61	63.79	26	7.80	36		2.23
175	Brantingham L	8/11/2007		3.85	1.0	0.009	0.01	0.02	0.50	126.85	32	8.20	29	3.7	2.52
175	Brantingham L	8/23/2007		3.65	1.0	0.027	0.01	0.01	0.57	47.58	29	8.11	29		4.26
175	Brantingham L	9/17/2007		4.65	1.0	0.006	0.02	0.01	0.48	189.73	26	7.20	35		0.78
175	Brantingham L	9/28/2007	18.5	4.90	1.0	0.021	0.04	0.03	0.49	51.15	19	7.73	25		2.80
175	Brantingham L	6/4/2008	~18	3.70	0.9	0.022	0.04	0.02	0.23	23.05	27	6.78	23	3.6	2.62
175	Brantingham L	6/25/2008	~18	3.60	0.9	0.014	0.00	0.01	0.26	41.83	46	7.45	32		0.63
175	Brantingham L	7/9/2008	18.0	3.65	0.9	0.003	0.01	0.03	0.16	112.44	27	6.81	25		2.26
175	Brantingham L	7/24/2008	18.3	4.00	1.5	0.020	0.03	0.01	0.22	25.21	34	7.71	20		4.80

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a
175	Brantingham L	8/15/2008	18.3	3.60	1.5	0.004	0.01	0.01	0.22	125.72	30	7.22	26	3.5	4.89
175	Brantingham L	9/3/2008	18.3	3.80	1.5	0.018	0.01	0.02	0.24	29.92	41	7.42	36		3.42
175	Brantingham L	9/20/2008	18.3	3.60	1.5	0.015	0.02	0.02	0.25	37.75	28	7.69	27		2.12
175	Brantingham L	9/30/2008	18.3	4.50	1.5	0.017	0.02	0.01	0.21	26.93	10	6.36	30		2.38
175	Brantingham L	07/15/2009		3.00		0.013	0.03	0.01			57	6.99	21	3.2	5.86
175	Brantingham L	07/30/2009			3.0	0.008	0.01	0.02			42	7.11	22		2.77
175	Brantingham L	08/12/2009	18.2	3.75		0.002	0.04	0.01			42	7.85	20		4.10
175	Brantingham L	08/27/2009	21.0	4.05		0.008	0.01	0.01			55	7.58	25		4.00
175	Brantingham L	09/17/2009	19.0	4.15		0.008	0.01	0.01			42	7.00	21	2.7	4.20
175	Brantingham L	09/28/2009	20.0	3.25		0.008	0.02	0.02			36	5.74	29		5.01
175	Brantingham L	10/10/2009	20.5	4.05		0.006	0.01	0.01			47	6.10	25		6.50
175	Brantingham L	6/15/2010	19.0	4.38		0.003	0.03	0.02	0.25	182.60	32	7.62	32	3.3	0.90
175	Brantingham L	7/5/2010	19.0	3.08	1.5	0.003	0.01	0.13	0.30	242.81	30	7.23	32		5.30
175	Brantingham L	7/26/2010	19.0	5.38	1.5	0.010	0.01	0.01	0.27	56.60	29	7.80	34		1.70
175	Brantingham L	8/11/2010	19.0	3.85	1.5	0.009	0.02	0.02	0.07	16.50	32	7.46	37		1.40
175	Brantingham L	8/27/2010	19.0	3.58		0.013	0.04	0.02	0.28	47.72	29	7.71	34	3.6	1.40
175	Brantingham L	9/15/2010	19.0	3.73		0.010	0.01	0.02	0.32	69.30	30	6.55	40		5.40
175	Brantingham L	9/29/2010	19.0	3.78		0.013	0.02	0.03	0.23	39.09	25	6.96	45		6.20
175	Brantingham L	10/11/2010		2.68	1.5	0.014	0.04	0.03	0.03	4.43	48	7.37	58		4.40
175	Brantingham L	6/6/2012	19.0	3.73	1.5	0.013	0.01	0.01	0.30	50.65	30	6.81	41	2.9	2.80
175	Brantingham L	6/21/2012	19.0	4.05	1.5	0.013	0.01	0.03	0.21	34.74	34	7.51	33		3.20
175	Brantingham L	7/5/2012	19.0	4.33	1.5	0.007	0.01	0.41	0.22	66.90	29	6.20	30		3.00
175	Brantingham L	7/17/2012	19.0	4.28	1.5	0.009	0.01	0.08	0.32	82.37	29	8.32	30		3.40
175	Brantingham L	7/31/2012	19.0	4.58	1.5	0.008	0.01	0.02	0.30	81.13	24	7.94	30	3.4	2.30
175	Brantingham L	8/14/2012	19.0	4.28	1.5	0.012	0.01	0.02	0.34	61.68	22	7.45	31		3.30
175	Brantingham L	8/28/2012	19.0	4.63	1.5	0.008	0.01	0.03	0.31	84.47	21	6.60	32		2.30
175	Brantingham L	9/17/2012	19.5	4.78	1.5	0.010	0.01	0.03	0.25	55.66	20	7.95	31		3.40
175	Brantingham L	6/19/2013	19.0	3.83	1.5	0.010	0.02	0.02	0.36	76.78	29	7.25	63		5.90
175	Brantingham L	7/4/2013	19.0	2.65	1.5	0.015			0.37	54.11	29	7.81	31		11.10
175	Brantingham L	7/15/2013	19.0	2.03	1.5	0.011	0.02	0.03	0.28	54.04	38	7.28	29		10.50
175	Brantingham L	7/31/2013	19.0	2.25	1.5	0.011			0.56	116.16	33	6.88	30		14.40
175	Brantingham L	8/12/2013	19.0	2.08	1.5	0.012	0.01	0.03	0.52	91.90	35	7.61	30		10.00
175	Brantingham L	8/28/2013	19.0	2.70	1.5	0.011			0.45	93.61	31	7.51	30		8.60
175	Brantingham L	9/11/2013	19.0	3.63	1.5	0.008	0.01	0.01	0.35	100.44	27	6.88	31		6.70
175	Brantingham L	9/24/2013	19.0	4.68	1.5	0.009			0.40	96.22	28	6.95	31		4.50
175	Brantingham L	6/17/2014	19.0	3.90	1.5	0.007	0.01	0.02	0.34	104.42	32	7.47	27	2.94	6.30
175	Brantingham L	6/30/2014	19.0	3.30	1.5	0.007			0.38	119.11	38	7.74	28		8.00
175	Brantingham L	7/11/2014	19.0	3.50	1.5	0.008	0.01	0.04	0.39	103.90	43	7.00	27		4.50
175	Brantingham L	8/1/2014	19.0	3.63	1.5	0.009			0.33	76.30	31	7.83	27		8.70
175	Brantingham L	8/14/2014	19.0	2.93	1.5	0.009	0.02	0.02	0.32	81.79	43	6.92	29	3.34	6.90
175	Brantingham L	8/29/2014	19.0	3.78	1.5	0.009			0.24	58.75	37	7.45	29		8.20
175	Brantingham L	9/16/2014	19.0	3.43	1.5	0.009	0.01	0.02	0.30	72.77	37	7.31	28		12.00
175	Brantingham L	9/26/2014	19.0	3.50	1.5	0.010			0.24	52.20	36	7.33	31		5.50
175	Brantingham L	06/08/02		3.50	18.6	0.010	0.12	0.08	0.50	51.24					
175	Brantingham L	06/20/02		2.95	18.3	0.012	0.07	0.07	0.46	39.90					
175	Brantingham L	07/06/02		3.10	18.3	0.013	0.11	0.11	0.55	42.26					
175	Brantingham L	07/24/02			18.3	0.019	0.12	0.22	0.66	34.29					
175	Brantingham L	08/05/02				0.047	0.13	0.06	0.80	16.96					
175	Brantingham L	08/19/02				0.016	0.12	0.09	0.89	54.64					
175	Brantingham L	09/03/02				0.026	0.11	0.06	0.53	20.15					
175	Brantingham L	09/30/02			1.5?	0.028	0.00	0.50	1.83	66.34					
175	Brantingham L	6/12/2003					0.12	0.03	0.27						
175	Brantingham L	6/30/2003				0.009	0.16	0.03	0.24	25.37					
175	Brantingham L	7/19/2003				0.013	0.02	0.02	0.41	30.53					
175	Brantingham L	7/31/2003				0.014	0.16	0.01	0.42	29.83					
175	Brantingham L	8/15/2003				0.013	0.21	0.01	1.44	109.84					
175	Brantingham L	9/8/2003				0.012	0.24	0.02	1.26	101.20					
175	Brantingham L	9/18/2003				0.011	0.02	0.03	0.27	23.52					
175	Brantingham L	10/11/2003			1.1	0.021	0.06	0.15	0.13	6.21					
175	Brantingham L	6/12/2004				0.029	0.00	0.05	0.23	7.68					
175	Brantingham L	7/2/2004				0.015	0.16	0.02	0.46	31.01					
175	Brantingham L	7/14/2004				0.011	0.22	0.02	0.38	34.32					
175	Brantingham L	8/2/2004				0.022	0.26	0.02	0.43	20.08					
175	Brantingham L	8/16/2004				0.015	0.20	0.05							
175	Brantingham L	8/24/2004				0.015	0.25	0.07	0.73	47.67					
175	Brantingham L	9/15/2004				0.013	0.19	0.02	0.49	39.24					

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP			Fe	Mn	As
175	Brantingham L	9/27/2004				0.011	0.05	0.12	0.49	45.04					
175	Brantingham L	6/2/2005			14.0	0.012									
175	Brantingham L	6/15/2005				0.022									
175	Brantingham L	7/9/2005			18.3	0.020									
175	Brantingham L	7/21/2005			18.3	0.068									
175	Brantingham L	8/1/2005			18.3	0.019									
175	Brantingham L	8/22/2005			18.3	0.024									
175	Brantingham L	9/7/2005			18.3	0.016									
175	Brantingham L	9/22/2005				0.018									
175	Brantingham L	6/16/2006			18.3	0.018									
175	Brantingham L	7/6/2006			18.3	0.013									
175	Brantingham L	7/26/2006			18.6	0.016									
175	Brantingham L	8/14/2006			18.3	0.023									
175	Brantingham L	8/25/2006			18.3	0.026									
175	Brantingham L	9/7/2006			18.6	0.017									
175	Brantingham L	9/15/2006			18.3	0.021									
175	Brantingham L	10/3/2006			18.3	0.016									
175	Brantingham L	7/3/2007			18.3	0.018									
175	Brantingham L	7/12/2007			18.3	0.018									
175	Brantingham L	8/3/2007			18.3	0.018									
175	Brantingham L	8/11/2007			18.3	0.022									
175	Brantingham L	8/23/2007			18.3	0.019									
175	Brantingham L	9/17/2007			18.3	0.050									
175	Brantingham L	9/28/2007	18.5		18.3	0.025									
175	Brantingham L	6/4/2008	~18		18.0	0.011									
175	Brantingham L	6/25/2008	~18		18.0	0.021									
175	Brantingham L	7/9/2008	18.0		18.0	0.037									
175	Brantingham L	7/24/2008	18.3		18.3	0.012									
175	Brantingham L	8/15/2008	18.3		18.3	0.030									
175	Brantingham L	9/3/2008	18.3		18.3	0.018									
175	Brantingham L	9/20/2008	18.3		18.3	0.021									
175	Brantingham L	9/30/2008	18.3		18.3	0.059									
175	Brantingham L	07/15/2009			18.0	0.015		0.02							
175	Brantingham L	07/30/2009				0.009									
175	Brantingham L	08/12/2009			17.5	0.011		0.01							
175	Brantingham L	08/27/2009			19.0	0.012									
175	Brantingham L	09/17/2009			17.5	0.003		0.02				1.22	0.28	1.90	
175	Brantingham L	09/28/2009			19.0	0.016									
175	Brantingham L	10/10/2009			19.0	0.009		0.10				0.68	0.12	1.80	
175	Brantingham L	6/15/2010	19.0		7.5	0.016		0.02							
175	Brantingham L	7/26/2010	19.0			0.012		0.03							
175	Brantingham L	8/11/2010	19.0		18.0							1.63	0.40		
175	Brantingham L	8/27/2010	19.0		18.0	0.014		0.02				1.07	0.28	0.90	
175	Brantingham L	9/29/2010	19.0		18.0	0.003		0.04				1.73	0.30	1.20	
175	Brantingham L	6/6/2012			17.5	0.017		0.05							
175	Brantingham L	6/21/2012			17.5							0.77	0.14		
175	Brantingham L	7/5/2012			17.5	0.017		0.03							
175	Brantingham L	7/17/2012			17.5							0.56	0.08		
175	Brantingham L	7/31/2012			17.5	0.012		0.02							
175	Brantingham L	8/14/2012			17.5							0.71	0.09	1.00	
175	Brantingham L	8/28/2012			17.5	0.015		0.04							
175	Brantingham L	9/17/2012			17.5							4.39	0.66	1.00	
175	Brantingham L	6/19/2013	17.0		8.0	0.009		0.04							
175	Brantingham L	7/15/2013	17.5		9.5	0.019		0.04							
175	Brantingham L	8/12/2013	17.5		8.0	0.014		0.03							
175	Brantingham L	9/11/2013	17.5		8.5	0.012		0.01							
175	Brantingham L	6/17/2014			17.5	0.009		0.05							
175	Brantingham L	6/30/2014			17.5	0.012									
175	Brantingham L	7/11/2014			17.5	0.015		0.08							
175	Brantingham L	8/1/2014			17.5	0.014									
175	Brantingham L	8/14/2014			17.5	0.011		0.02							
175	Brantingham L	8/29/2014			17.5	0.010									
175	Brantingham L	9/16/2014			17.5	0.008		0.02							
175	Brantingham L	9/26/2014			17.5	0.017									

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QE	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
175	Brantingham L	6/1/2001	epi	14	16	1	1	2	56												
175	Brantingham L	6/15/2001	epi	25	22	2	1	1													
175	Brantingham L	6/30/2001	epi	22	24	1	1	2													
175	Brantingham L	7/13/2001	epi	16	21	2	1	2	6												
175	Brantingham L	7/27/2001	epi	12	23	1	1	1													
175	Brantingham L	8/11/2001	epi	16	26	2	1	1													
175	Brantingham L	8/28/2001	epi	22	24	2	1	2	6												
175	Brantingham L	9/10/2001	epi	21	22	2	1	2	6												
175	Brantingham L	06/08/02	epi	17	18	1	1	1													
175	Brantingham L	06/20/02	epi	18	20	2	1	2													
175	Brantingham L	07/06/02	epi	14	23	2	1	2													
175	Brantingham L	07/24/02	epi	13	23	1	1	2	8												
175	Brantingham L	08/05/02	epi	21	25	2	1	1													
175	Brantingham L	08/19/02	epi	17	23	1	1	2													
175	Brantingham L	09/03/02	epi	14	21	1	1	1													
175	Brantingham L	09/30/02	epi	14	17	1	1	2													
175	Brantingham L	10/18/02	epi	12	13	2	1	4	8												
175	Brantingham L	6/12/2003	epi	21	18	2	1	2	5												
175	Brantingham L	6/30/2003	epi	20	23	2	1	2	8												
175	Brantingham L	7/19/2003	epi	18	23	2	1	1	0												
175	Brantingham L	7/31/2003	epi	22	23	2	1	2	0												
175	Brantingham L	8/15/2003	epi	20	25	2	2	1	8												
175	Brantingham L	9/8/2003	epi	13	18	1	1	2	0												
175	Brantingham L	9/18/2003	epi	12	19	2	1	2	0												
175	Brantingham L	10/11/2003	epi	14	14	2	1	2	5												
175	Brantingham L	6/12/2004	epi	11	19	2	1	3	6												
175	Brantingham L	7/2/2004	epi	18	20	2	1	1	0												
175	Brantingham L	7/14/2004	epi	17	22	2	1	2	5												
175	Brantingham L	8/2/2004	epi	17	23	2	1	1	0												
175	Brantingham L	8/16/2004	epi	16	21	2	1	2	5												
175	Brantingham L	8/24/2004	epi	16	19	2	1	2	5												
175	Brantingham L	9/15/2004	epi	16	19	2	1	2	8												
175	Brantingham L	9/27/2004	epi	9	17	2	1	2	8												
175	Brantingham L	6/2/2005	epi	17	18	2	1	2	0												
175	Brantingham L	6/15/2005	epi	21	23	2	1	2	0												
175	Brantingham L	7/9/2005	epi	21	23	2	1	2	0												
175	Brantingham L	7/21/2005	epi	19	26	2	1	1	7												
175	Brantingham L	8/1/2005	epi	18	24	2	1	2	0												
175	Brantingham L	8/22/2005	epi	16	23	2	1	2	0												
175	Brantingham L	9/7/2005	epi	12	21	2	1	2	0												
175	Brantingham L	9/22/2005	epi	16	20	2	1	1													
175	Brantingham L	6/16/2006	epi	17	18	2	1	2	0												
175	Brantingham L	7/6/2006	epi	16	22	2	1	1	7												
175	Brantingham L	7/26/2006	epi	21	24	2	1	1	0												
175	Brantingham L	8/14/2006	epi	13	22	2	1	2	7												
175	Brantingham L	8/25/2006	epi	14	21	2	1	2	8												
175	Brantingham L	9/7/2006	epi	13	19	2	1	3	5												
175	Brantingham L	9/15/2006	epi	18	18	2	2	2	5												
175	Brantingham L	10/3/2006	epi	10	14	2	2	2	5												
175	Brantingham L	6/13/2007	epi	18	23	2	1	2	68												
175	Brantingham L	7/3/2007	epi	12	21	2	1	2	8												
175	Brantingham L	7/12/2007	epi	16	22	2	1	2	0												
175	Brantingham L	8/3/2007	epi	24	26	2	1	2	7												
175	Brantingham L	8/11/2007	epi	26	25	2	1	2	7												
175	Brantingham L	8/23/2007	epi	16	20	2	1	2	8												
175	Brantingham L	9/17/2007	epi	7	16	2	1	2	8												
175	Brantingham L	9/28/2007	epi	11	19	2	1	2	8												
175	Brantingham L	6/4/2008	epi	16	16	2	1	2	0												
175	Brantingham L	6/25/2008	epi	16	21	2	1	2	0												
175	Brantingham L	7/9/2008	epi	24	25	2	1	2	8												

LNum	PName	Date	Site	TAir	TH2O	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB	
175	Brantingham L	7/24/2008	epi	18	22	2	1	2	0												
175	Brantingham L	8/15/2008	epi	15	20	2	1	2	0												
175	Brantingham L	9/3/2008	epi	28	21	2	1	2	0												
175	Brantingham L	9/20/2008	epi	14	18	2	1	2	0												
175	Brantingham L	9/30/2008	epi	13	16																
175	Brantingham L	07/15/2009	epi		7	2	1	2	0												
175	Brantingham L	07/30/2009	epi	24	8	2	1	1	0												
175	Brantingham L	08/12/2009	epi		7	2	1	1	0					0.00							
175	Brantingham L	08/27/2009	epi	22	8	1	2	1	0												
175	Brantingham L	09/17/2009	epi	19	8	1	1	2	5			13.94		0.00							
175	Brantingham L	09/28/2009	epi	16	7	1	1	4	5			13.10									
175	Brantingham L	10/10/2009	epi	13	7	1	1	3	5			7.53		0.00							
175	Brantingham L	6/15/2010	epi	23		1	1	1	0	0	0										
175	Brantingham L	7/5/2010	epi	26	23	2	1	1	0	0	0										
175	Brantingham L	7/26/2010	epi	24	24	1	1	1	0	0	0										
175	Brantingham L	8/11/2010	epi	28	24	2	1	1	0	0	0	24.00		<0.001							
175	Brantingham L	8/27/2010	epi	20	21	1	1	1	0	0	0										
175	Brantingham L	9/15/2010	epi	15	18	1	1	2	5	0	0	50.00		<0.001							
175	Brantingham L	9/29/2010	epi	15	17	1	1	4	5	0	0										
175	Brantingham L	10/11/2010	epi	20	14	1	1	3	5	0	0	40.00		<0.001							
175	Brantingham L	6/6/2012	epi	23	19	2	2	2	5	0	0	1.20	0.60	<0.30	<0.417						
175	Brantingham L	6/21/2012	epi	30	24	2	1	1	0	0	0	2.50	0.50	<0.30	<0.428	0.93	0.38	i			
175	Brantingham L	7/5/2012	epi	25	24	2	1	1	0	0	0	-0.50	0.50	0.38	<0.392	1.26	0.46	i			
175	Brantingham L	7/17/2012	epi	25	26	2	1	1	0	0	0	2.40	0.70	<0.30	<0.328	1.40	0.00	i			
175	Brantingham L	7/31/2012	epi	24	25	2	1	1	0	0	0	4.10	0.70	<0.30	<0.292	1.50	0.00	i			
175	Brantingham L	8/14/2012	epi	23	24	2	1	2	5	0	0	1.00	0.60	0.37	<0.552	2.50	1.73	i			
175	Brantingham L	8/28/2012	epi	22	23	2	1	2	5	0	0	2.50	0.50	<0.30	<0.551	1.43	0.61	i			
175	Brantingham L	9/17/2012	epi	22	20	2	1	1	0	0	0	3.10	0.50	0.41	<3.299	1.25	0.85	i			
175	Brantingham L	6/19/2013	epi	16	18	2	1	2	5	0	0	7.20	2.00	<0.30	<0.370	2.80	0.80	i	i		
175	Brantingham L	7/4/2013	epi	27	25	2	1	2	15	0	0	19.40	2.80	<0.30	<0.510	6.10	2.70	i	i		
175	Brantingham L	7/15/2013	epi	29	27	2	1	2	1	0	0	20.00	3.40	<0.30	<0.910	6.50	3.20	i	i		
175	Brantingham L	7/31/2013	epi	24	24	2	1	2	1	0	0	31.40	3.00	<0.30	<0.390	8.60	5.60	i	i		
175	Brantingham L	8/12/2013	epi	24	23	2	1	2	1	0	0	34.80	3.50	<0.30	<0.380	7.60	3.90	i	i		
175	Brantingham L	8/28/2013	epi	23	22	2	1	1	1	0	0	5.10	2.30	<0.30	<1.100	10.10	0.00	i	i		
175	Brantingham L	9/11/2013	epi	27	21	2	1	1	0	0	0	3.10	3.80	<0.30	<19.130	2.60	0.10				
175	Brantingham L	9/24/2013	epi	11	16	2	1	2	5	0	0	3.00	2.00	<0.30	<19.130	1.80	0.00	i	i		
175	Brantingham L	6/17/2014	epi	28	27	2	1	1	0	0	0	1.40	0.40	<0.53	<0.08	<0.002	1.50	0.00	i	i	
175	Brantingham L	6/30/2014	epi	27	25	2	1	1	0	0	0	2.40	0.50	<0.62	<0.03	<0.002	1.70	0.00	i	i	
175	Brantingham L	7/11/2014	epi	21	24	2	1	1	0	0	0	2.70	0.50	<0.40	<0.21	<0.003	1.50	0.00	i	i	
175	Brantingham L	8/1/2014	epi	21	21	2	1	1	0	0	0	2.90	0.70	<0.33	<0.01	<0.002	2.20	0.00	i	i	
175	Brantingham L	8/14/2014	epi	17	22	2	1	2	5	0	0	1.80	0.60	<0.35	<0.03	<0.001	2.10	0.10	i	i	
175	Brantingham L	8/29/2014	epi	21	22	2	1	1	0	0	0	1.80	0.30	<0.64	<0.03	<0.001	0.80	0.00	i	i	
175	Brantingham L	9/16/2014	epi	17	19	2	1	2	5	0	0	3.10	0.50	<0.48	<0.04	<0.001	2.50	0.00	i	i	
175	Brantingham L	9/26/2014	epi	23	18	2	1	1	0	0	0	1.60	0.40	<0.59	<0.12	<0.001	1.60	0.00	i	i	
175	Brantingham L	06/08/02	hypo	17	7	1	1	1													
175	Brantingham L	06/20/02	hypo	18	7	2	1	2													
175	Brantingham L	07/06/02	hypo	14	7	2	1	2													
175	Brantingham L	07/24/02	hypo	13	7	1	1	2	8												
175	Brantingham L	09/30/02	hypo	14	7	1	1	2													
175	Brantingham L	6/12/2003	hypo		7																
175	Brantingham L	6/30/2003	hypo		7																
175	Brantingham L	7/19/2003	hypo		7																
175	Brantingham L	7/31/2003	hypo		7																
175	Brantingham L	8/15/2003	hypo		7																
175	Brantingham L	9/8/2003	hypo		7																
175	Brantingham L	9/18/2003	hypo		7																
175	Brantingham L	10/11/2003	hypo		7																
175	Brantingham L	6/12/2004	hypo		7																
175	Brantingham L	7/2/2004	hypo		7																
175	Brantingham L	7/14/2004	hypo		7																
175	Brantingham L	8/2/2004	hypo		7																

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QE	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
175	Brantingham L	8/16/2004	hypo		7																
175	Brantingham L	8/24/2004	hypo		7																
175	Brantingham L	9/15/2004	hypo		7																
175	Brantingham L	9/27/2004	hypo		7																
175	Brantingham L	6/2/2005	hypo		7																
175	Brantingham L	6/15/2005	hypo		7																
175	Brantingham L	7/9/2005	hypo		7																
175	Brantingham L	7/21/2005	hypo		7																
175	Brantingham L	8/1/2005	hypo		7																
175	Brantingham L	8/22/2005	hypo		7																
175	Brantingham L	9/7/2005	hypo		7																
175	Brantingham L	9/22/2005	hypo		7																
175	Brantingham L	6/16/2006	hypo		7																
175	Brantingham L	7/6/2006	hypo		7																
175	Brantingham L	7/26/2006	hypo		7																
175	Brantingham L	8/14/2006	hypo		7																
175	Brantingham L	8/25/2006	hypo		7																
175	Brantingham L	9/7/2006	hypo		7																
175	Brantingham L	9/15/2006	hypo		7																
175	Brantingham L	10/3/2006	hypo		7																
175	Brantingham L	7/3/2007	hypo		6																
175	Brantingham L	7/12/2007	hypo		7																
175	Brantingham L	8/3/2007	hypo		7																
175	Brantingham L	8/11/2007	hypo		7																
175	Brantingham L	8/23/2007	hypo		7																
175	Brantingham L	9/17/2007	hypo		7																
175	Brantingham L	9/28/2007	hypo		7																
175	Brantingham L	07/15/2009	hypo		7																
175	Brantingham L	07/30/2009	hypo		8																
175	Brantingham L	08/12/2009	hypo		7																
175	Brantingham L	08/27/2009	hypo		8																
175	Brantingham L	09/17/2009	hypo		8																
175	Brantingham L	09/28/2009	hypo		7																
175	Brantingham L	10/10/2009	hypo		7																
175	Brantingham L	6/15/2010	hypo		8																
175	Brantingham L	8/11/2010	hypo		8																
175	Brantingham L	8/27/2010	hypo		7																
175	Brantingham L	9/29/2010	hypo		8																
175	Brantingham L	6/6/2012	hypo		9																
175	Brantingham L	6/21/2012	hypo		10																
175	Brantingham L	7/5/2012	hypo		9																
175	Brantingham L	7/17/2012	hypo		9																
175	Brantingham L	7/31/2012	hypo		9																
175	Brantingham L	8/14/2012	hypo		8																
175	Brantingham L	8/28/2012	hypo		10																
175	Brantingham L	9/17/2012	hypo		10																
175	Brantingham L	6/19/2013	hypo		8																
175	Brantingham L	7/4/2013	hypo		12																
175	Brantingham L	7/15/2013	hypo		10																
175	Brantingham L	7/31/2013	hypo		8																
175	Brantingham L	8/12/2013	hypo		8																
175	Brantingham L	8/28/2013	hypo		8																
175	Brantingham L	9/11/2013	hypo		9																
175	Brantingham L	9/24/2013	hypo		7																
175	Brantingham L	6/17/2014	hypo		10																
175	Brantingham L	6/30/2014	hypo		8																
175	Brantingham L	7/11/2014	hypo		8																
175	Brantingham L	8/1/2014	hypo		9																
175	Brantingham L	8/14/2014	hypo		8																
175	Brantingham L	8/29/2014	hypo		8																
175	Brantingham L	9/16/2014	hypo		8																

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QE	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
175	Brantingham L	9/26/2014	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, hypo = hypolimnion)	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)	0.3 ug/l	none
Cyl	Cylindrospermopsis (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 Brantingham Lake

Brantingham Lake (0801-0176)

Need Verific

Waterbody Location Information

Revised: 09/29/2006

Water Index No:	Ont 19- 70- 4-P689	Drain Basin:	Black River
Hydro Unit Code:	04150101/080	Str Class:	A
Waterbody Type:	Lake (Mesotrophic)	Reg/County:	6/Lewis Co. (25)
Waterbody Size:	326.7 Acres	Quad Map:	BRANTINGHAM (G-19-2)
Seg Description:	entire lake		

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

Use(s) Impacted	Severity	Problem Documentation
Water Supply	Threatened	Suspected
Public Bathing	Threatened	Suspected

Type of Pollutant(s)

Known: ---
 Suspected: PATHOGENS, Nutrients
 Possible: ---

Source(s) of Pollutant(s)

Known: ---
 Suspected: FAILING ON-SITE SYST
 Possible: ---

Resolution/Management Information

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

Further Details

Drinking water supply and recreational uses (swimming) of Brantingham Lake may be considered to be threatened by pathogens. The suspected source of possible impacts is from failing and/or inadequate on-site septic systems serving older lake front camps and residences.

Brantingham Lake has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 2001 and continuing through the present. 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 mesoligotrophic, or moderately unproductive. Phosphorus levels in the lake do not exceed the state guidance values indicating impacted/stressed recreational uses. Corresponding transparency measurements easily meet what is recommended for swimming beaches. Measurements of pH typically fall within the state water quality range of 6.5 to 8.5. The lake water is slightly colored, which is also typical of northwestern Adirondack Lakes. Oxygen levels do not appear to be significantly reduced at lower lake depths and internal nutrient cycling is not significant. (DEC/DOW, BWAM/CSLAP, March 2006)

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. These assessment indicate recreational suitability of the lake to continue to be very favorable. The recreational suitability of the lake is described most frequently as "excellent." The lake itself is most often described as "not quite crystal clear," an assessment that is consistent with the perceived water quality conditions in the lake and its measured water quality characteristics. Assessments have noted that aquatic plants rarely grows to the lake surface. (DEC/DOW, BWAM/CSLAP, March 2006)

This lake waterbody is designated class A, suitable for use as a water supply, public bathing beach, general recreation and aquatic life support. 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. Although CSLAP sampling does not include pathogen sampling and cannot be used to evaluate for bacterial impairment, other CSLAP parameters suggest that no other listings appear to be warranted.

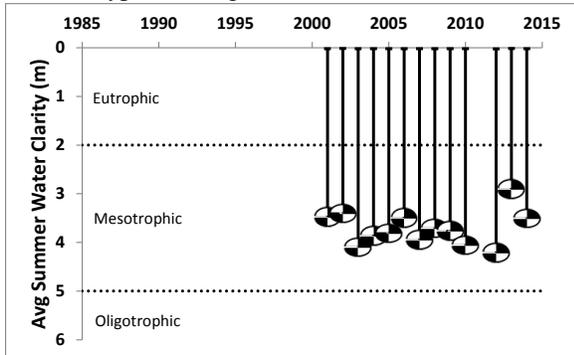
The Brantingham Cottage Association (BCA) has provided coliform data that has been reviewed by DEC. Although the BCA has characterized a large percentage of these samples as "failing" to meet criteria, the criteria used for this evaluation is much more stringent than DEC water quality standards and assessment criteria. Sampling procedures and other associated metadata (to determine if the sampling data is representative of the lake as a whole) were also not available to review. Nonetheless, the apparent frequent occurrence of detectable fecal coliform suggests that an assessment of threatened is appropriate for this waterbody. (DEC/DOW, Region 6, August 2006)

In addition to continued monitoring, the lake would benefit from a strong septic management plan. Such a plan should include detailed sanitary surveys with dye testing of septic systems, site inspections and regular system maintenance requirements. (DEC/DOW, BWAM, August 2006)

Appendix C – Long Term Trends: Brantingham Lake

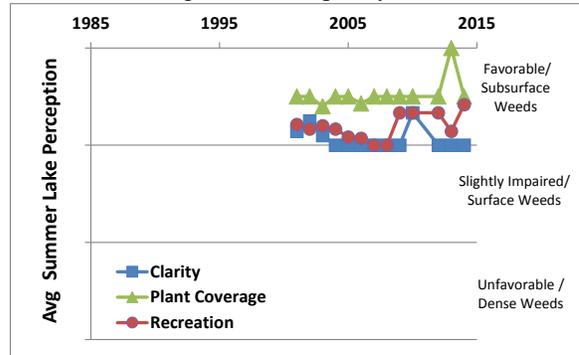
Long Term Trends: Water Clarity

- No long term trend; slight annual variations
- Most readings typical of *mesotrophic* lakes, typical of algae and TP levels in lake



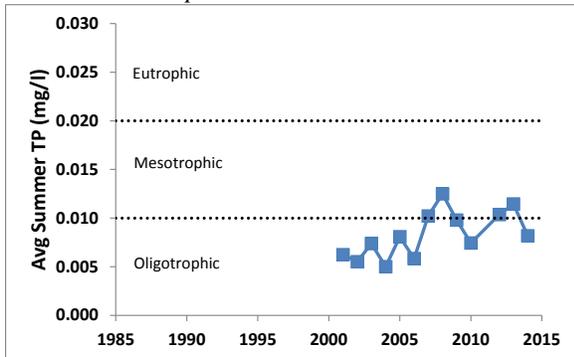
Long Term Trends: Lake Perception

- No long term trends
- Recreational perception only weakly linked to changes in water quality



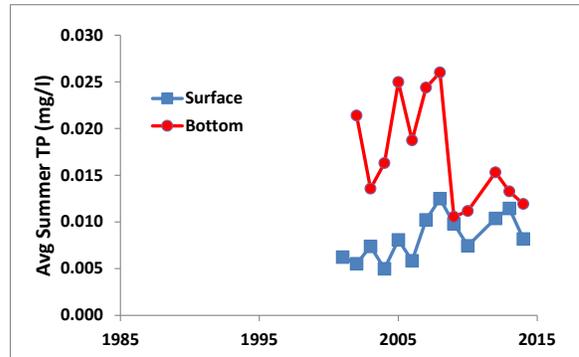
Long Term Trends: Phosphorus

- Slight rise since '00, triggering algae rise?
- Most readings typical of *oligotrophic* to *mesotrophic* lakes



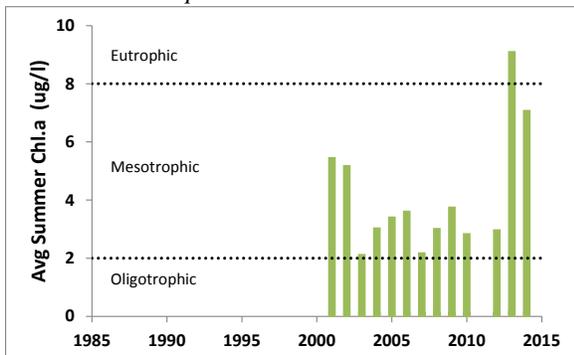
Long Term Trends: Bottom Phosphorus

- Variable, but bottom TP decreasing?
- Low bottom TP does not appear to have resulted in increase in surface TP levels



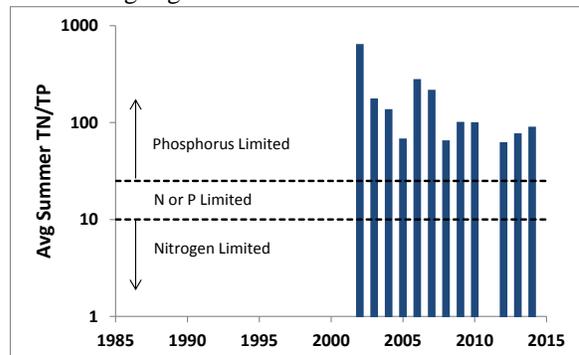
Long Term Trends: Chlorophyll a

- Much higher 13-14; may be part of trend
- Most readings typical of *oligotrophic* to *mesotrophic* lakes



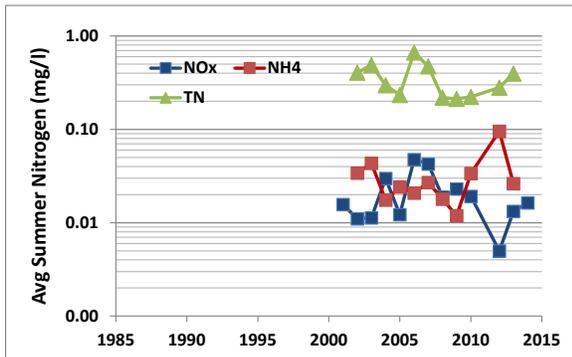
Long Term Trends: N:P Ratio

- Decreasing N:P ratios consistent w/ TP rise?
- Most readings indicate phosphorus still limits algae growth



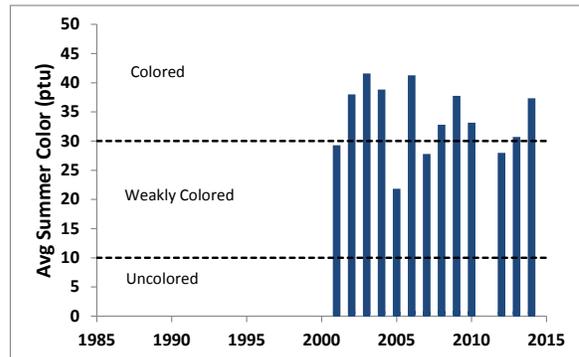
Long Term Trends: Nitrogen

- No long term trend
- Low nitrate, ammonia and total nitrogen



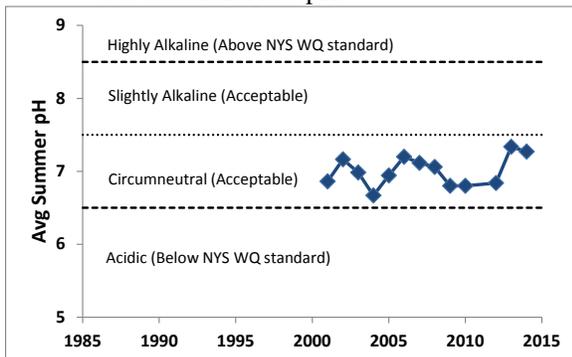
Long Term Trends: Color

- No long term trend
- Most readings typical of *weakly colored* lakes



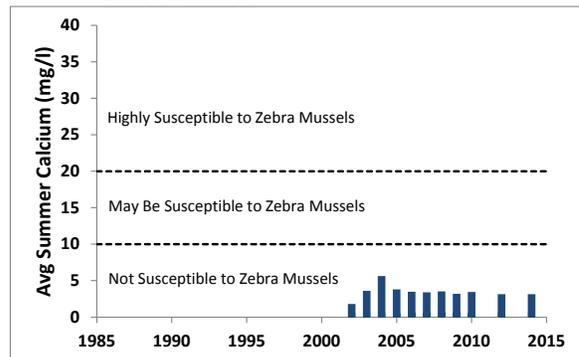
Long Term Trends: pH

- No trends apparent
- Most readings typical of *circumneutral* lakes, but occasional low pH



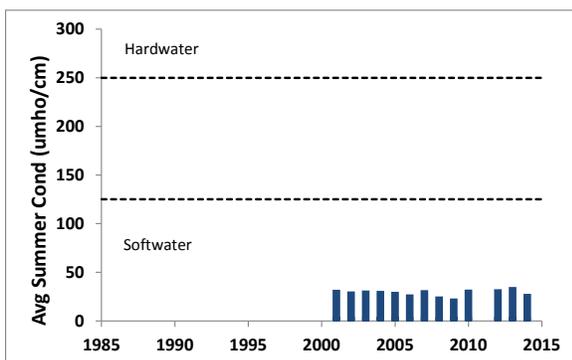
Long Term Trends: Calcium

- No long term trend
- Most readings indicate low susceptibility to zebra mussels



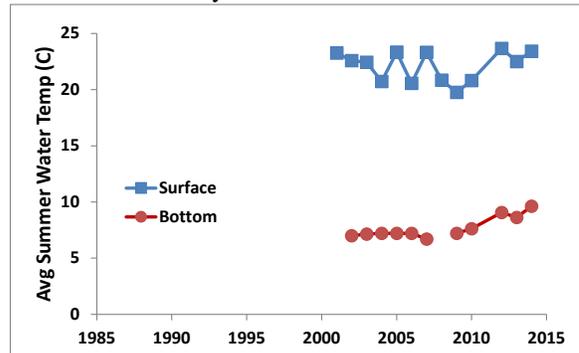
Long Term Trends: Conductivity

- No long term trend
- Most readings typical of *softwater* lakes



Long Term Trends: Water Temperature

- No long term trend, but deep temps rising
- Low deepwater temperature indicates strong thermal layer



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 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.

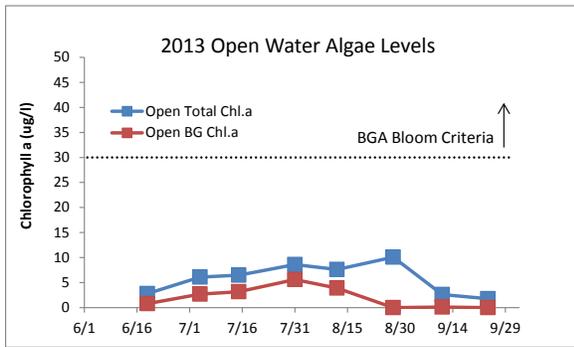


Figure D1:
2013 Open Water Total and BGA Chl.a

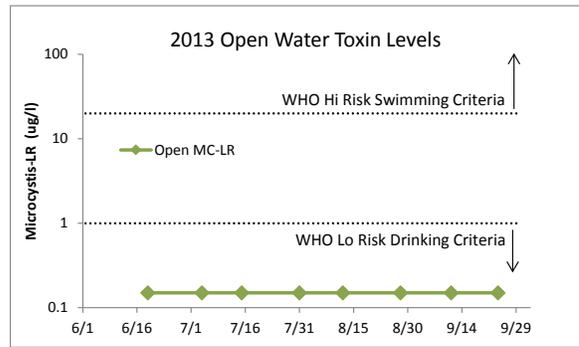


Figure D2:
2013 Open Water Microcystin-LR

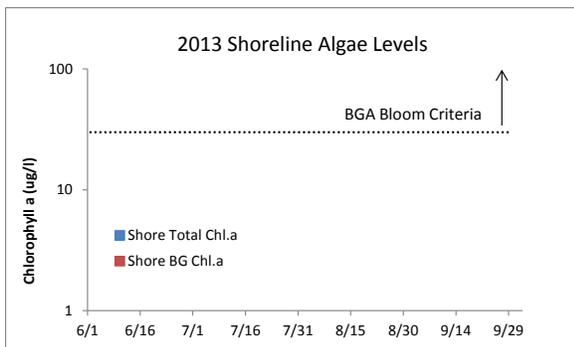


Figure D3:
2013 Shoreline Total and BGA Chl.a

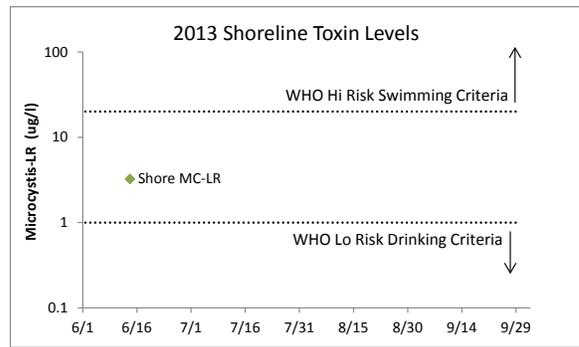


Figure D4:
2013 Shoreline Microcystin-LR

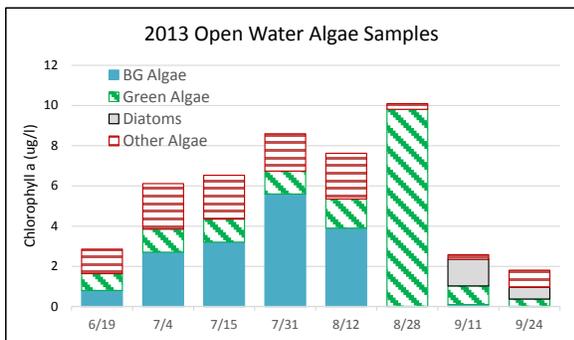


Figure D5:
2013 Open Water Algae Types

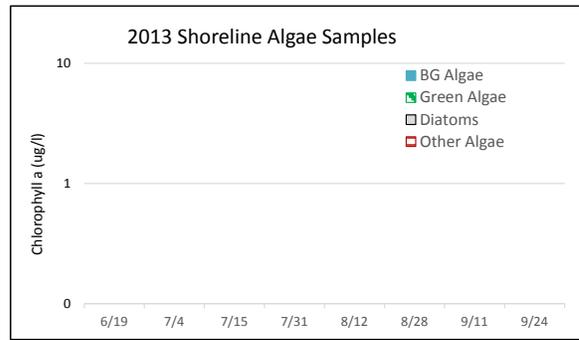


Figure D6:
2013 Shoreline Algae Types

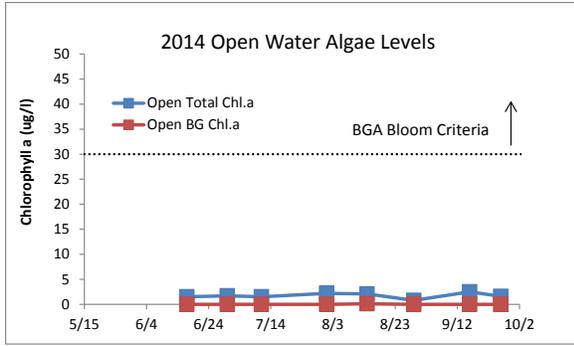


Figure D7:
2014 Open Water Total and BGA Chl.a

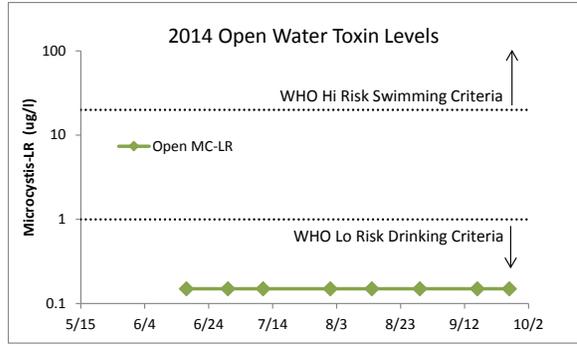


Figure D8:
2014 Open Water Microcystin-LR

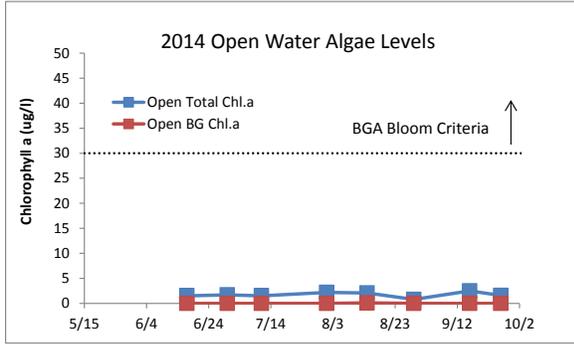


Figure D9:
2014 Shoreline Total and BGA Chl.a

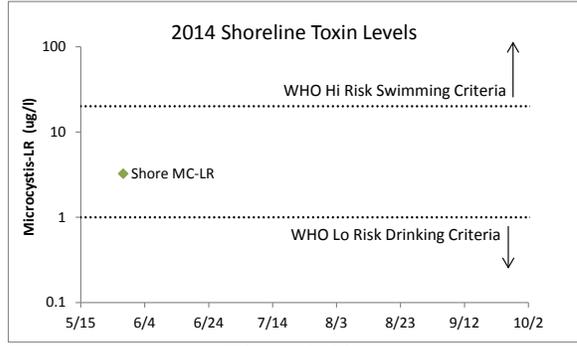


Figure D10:
2014 Shoreline Microcystin-LR

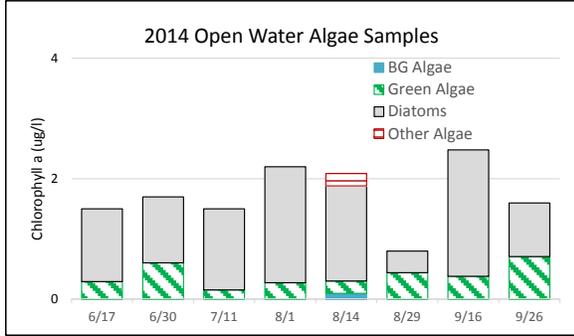


Figure D11:
2013 Open Water Algae Types

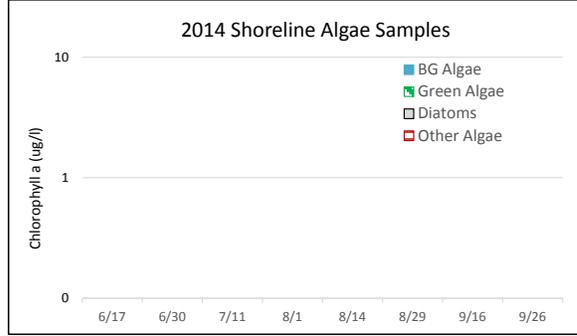


Figure D12:
2014 Shoreline Algae Types

Appendix E: AIS Species in Lewis County

The table below shows the invasive aquatic plants and animals that have been documented in Lewis 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 – Lewis County			
Waterbody	Kingdom	Common name	Scientific name
Effley Falls Pond	Animal	Mud bithynia snail	<i>Bithynia tentaculata</i>
Lake Bonaparte	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Soft Maple Reservoir	Plant	Variable watermilfoil	<i>Myriophyllum heterophyllum</i>

Appendix F: Watershed and Land Use Map for Brantingham 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.

