Guilford Lake Questions and Answers, 2015 CSLAP

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

A1. Water clarity was substantially higher in 2015 than in recent years, reverting back to conditions found in the 1990s. This was consistent with much lower algae levels.

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

A2. Chloride sampling results were indicative of lakes with minor to moderate impacts from road salt runoff. Any "baseline" change in the lake that led to the higher water clarity (and lower algae levels) was not apparent in other water quality indicators.

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

A3. Guilford Lake had higher water clarity, slightly lower nutrient levels and much lower algae levels, than other nearby lakes. Aquatic plant coverage is slightly higher than in other lakes.

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

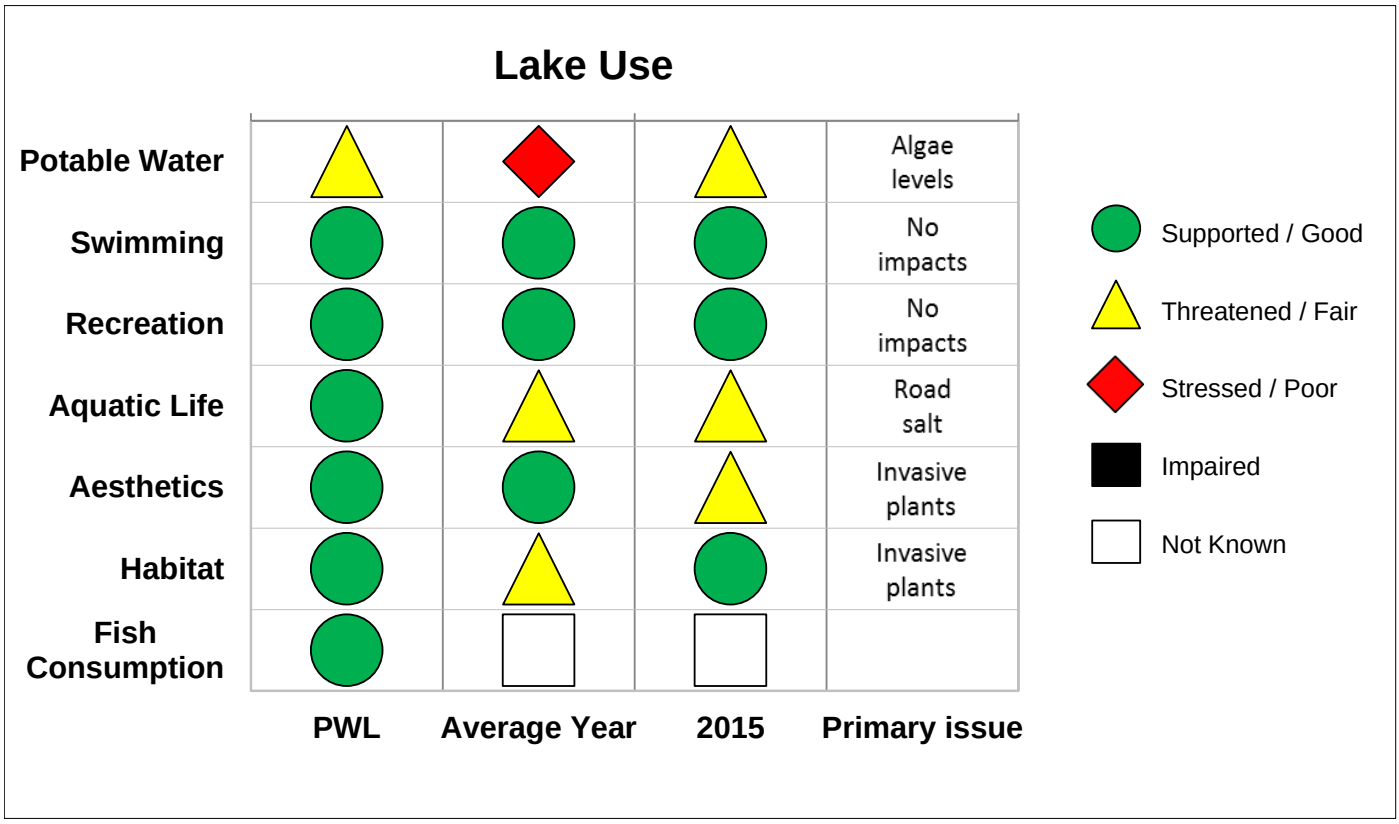
A4. Water temperatures and especially ammonia levels have increased slightly in recent years. It is not yet known if the return of high water clarity and low algae levels was due to temporary circumstances or part of a longer trend.

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

A5. Although water clarity was higher in 2015, the previous drop in water clarity should be further evaluated by lake residents, particularly since algae levels did not increase over the same period. Sources of sediment or other materials contributing to the drop in water transparency should continue to be evaluated.

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

A6. Individual stewardship activities such as pumping your septic system, growing a buffer of native plants next to the water bodies, and reducing erosion from shoreline properties and runoff into the lake will help to maintain lake health by reducing nutrient and sediment loading to the lake. Visiting boats should be inspected to reduce the risk of new invasive species, since nearby lakes harbor several invasive plants not presently found in the lake.



CSLAP 2015 Lake Water Quality Summary:
Guilford Lake

General Lake Information

Location	Town of Guilford
County	Chenango
Basin	Susquehanna River
Size	28.5 hectares (70.4 acres)
Lake Origins	Natural
Watershed Area	213 hectares (526 acres)
Retention Time	2.4 years
Mean Depth	9 meters
Sounding Depth	20 meters
Public Access?	DEC beach launch
Major Tributaries	no named tribs
Lake Tributary To…	no named outlet
WQ Classification	AA (potable water = drinking)
Lake Outlet Latitude	42.409
Lake Outlet Longitude	-75.496
Sampling Years	2004-2008, 2012-2015
2015 Samplers	Tom Shedd
Main Contact	Tom Shedd

Lake Map

Background

Guilford Lake is a 70 acre, class AA lake found in the Town of Guilford in Chenango County in Central New York State (the eastern portion of the Southern Tier). It was first sampled as part of CSLAP in 2004.

It is one of eight CSLAP lakes among the more than 150 lakes found in Chenango County, and one of 25 CSLAP lakes among the nearly 900 lakes and ponds in the Susquehanna River drainage basin.

Lake Uses

Guilford Lake is a Class AA lake; this means that the best intended use for the lake is for potable water—drinking, contact recreation—swimming and bathing—and for non-contact recreation—boating and aesthetics. The lake serves as a potable water supply for the Guilford Water District, and is used by lake residents for a variety of recreational uses, including power- and non-power boating, fishing, and swimming. There is a DEC beach launch near the lake outlet along County Route 35 that supports 12 cars.

Guilford Lake is stocked through the state spring fisheries stocking programs—approximately 200 12” to 15” brown trout and 1800 8.5”-9.5” rainbow trout are stocked annually. At least at one time, the Chenango County Federation of Sportsman raised walleye fingerlings for stocking into Guilford Lake. However, predator numbers were considered to be low. At least 12 fish species are found in the lake, including at least two coldwater fish species, five coolwater fish species, and five warmwater fish species.

General statewide fishing regulations are applicable in Guilford Lake. In addition, the open season for trout lasts all year, with no size limit but a daily take limit of five fish, with no more than two fish longer than 12" in length. Ice fishing is permitted.

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

Historical Water Quality Data

CSLAP sampling was conducted on Guilford Lake from 2004 to 2008 and 2012 to 2015. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at http://nysfola.mylaketown.com. The most recent CSLAP report and scorecard for Guilford Lake will soon be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77879.html.

Guilford Lake was sampled by the NYSDEC as part of several large-scale New York State monitoring programs. The lake was sampled in 1998 as part of the state Lake Classification and Inventory (LCI) survey, the state ambient lake monitoring program during the 1980s and since 1996; as part of the USEPA Eastern Lakes Survey of 1984, and as part of the Biological Survey of the Susquehanna River basin by the Conservation Department (the predecessor to the NYSDEC) in 1935.

These data showed water clarity was higher in the more recent monitoring programs, in part due to lower phosphorus concentrations. pH readings appeared to be essentially unchanged over this period. In the 1935 Biological Survey, deepwater oxygen was substantially reduced starting at a depth of about 30 feet, and essentially depleted at a depth of about 60 feet. In the LCI survey

from 1998, the oxygen deficits began at a depth of about 20 feet, and dropped to near depleted levels by a depth of about 30 feet.

None of the tributaries to the lake, nor the outlet of the lake (Guilford Lake) have been sampled through the NYSDEC RIBS monitoring program nor through the state biomonitoring program. The lake has been sampled as part of fisheries management (stocking) activities by the state in at least 1992

Lake Association and Management History

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

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual and Monthly Results Relative to 2004-2014

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

Evaluation of Eutrophication Indicators

Water clarity readings in 2015 were much higher than in recent years, and close to long-term average for the lake. This was consistent with algae levels that were also close to readings from the mid-2000s and much lower than in recent years. However, phosphorus readings have been fairly consistent since the mid-2000s, suggesting that most of these changes are within the normal range of variability for the lake.

Lake productivity is stable during the early- to mid-summer and then increases significantly in late summer to early fall, as manifested in reduced water clarity due to increasing algae and nutrient levels. This was generally apparent in 2015, although water clarity did steadily increase through mid-summer, despite a lack of change in either nutrient or algae levels.

The lake can be characterized as *mesotrophic*, or moderately productive, based on water clarity, total phosphorus readings, and chlorophyll *a* readings (typical of *mesotrophic* lakes). An evaluation of trophic state indices (TSI) shows that each of these trophic indicators is usually "internally consistent"—each of the trophic indicators can be predicted from the other indicators. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are at times high enough to render the lake susceptible to taste and odor compounds, algal toxins, or elevated DBP (disinfection by product) compounds that could affect the potability of the water, and the lake is used for drinking water. Deepwater phosphorus and ammonia readings are slightly higher than those measured at the lake surface, indicating some deepwater oxygen deficits. Deepwater ammonia levels were lower than usual in 2015, suggesting that deepwater oxygen levels may have been higher in 2015 than in recent years. Potable water

conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Ammonia readings have increased since 2008, although these readings remain low. None of the other limnological indicators (NOx, total nitrogen, pH, conductivity, color, and calcium) has exhibited clear changes since the mid-2000s, although TN and NH4 have increased slightly while NOx had decreased slightly over this period. Conductivity readings were slightly higher than usual in 2015.

Chloride levels in the 2015 samples, collected for the first time through CSLAP and cited in Appendix A, were approximately 10 mg/l. These values fall within the "minor" to "moderate" road salt runoff levels cited by the New Hampshire DES. These readings are well below the state potable water quality standard of 250 mg/l and below the range of values found in most NYS lakes. These readings suggest a low likelihood of biological impacts from road salt. Additional data will help to determine if these represent normal readings for the lake.

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

Evaluation of Biological Condition

Phytoplankton, zooplankton, and macroinvertebrates have not been analyzed through CSLAP at Guilford Lake. The fluoroprobe screening samples analyzed by SUNY ESF over the last several years indicated increasing total and blue green algae levels over the summer in 2013, decreasing readings in 2014, and relatively stable readings in 2015. No shoreline blooms have been reported or sampled in the last few years. Although the algal community is at times comprised primarily of *Aphanizomenon, Anabaena, Lyngbya,* and *Microcystis,* all blue green algae species capable of producing toxins, toxins have not been detectable even when algae levels are elevated.

Only limited macrophyte surveys have been conducted (through the LCI) at Guilford Lake. These limited surveys found two exotic plant species- Eurasian watermilfoil (*Myriophyllum spicatum*) and curly-leafed pondweed (*Potamogeton crispus*)- and only a limited number of native plant species. These limited surveys suggest that the diversity of the plant community is only "fair", although more extensive survey work needs to be conducted to better evaluate the quality of the plant community.

As noted earlier, the fish community is comprised of a mix of coldwater, coolwater, and warmwater fish species. This suggests that the lake can most likely be characterized as a coldwater fishery, although it is not known if this represents a classic two story fishery. Fisheries surveys found that largemouth bass were in the expected weight range, but yellow perch were lighter than expected.

The CSLAP volunteers reported large quantities of snails in 2015, but there is no indication of any water quality issues that might have triggered this occurrence.

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

Evaluation of Lake Perception

Aquatic plant coverage increased slightly in 2015; it is not known if this is due to less active management or normal fluctuations in plant coverage (or if the change affected invasive plants differently than native plants). Recreational assessments were more favorable than usual over the last several years.

Recreational assessments degrade steadily in late summer most years, consistent with a seasonal increase in lake productivity and to a lesser extent seasonally degrading water quality assessments. This seasonal trend was not apparent in 2014 but was apparent in 2015. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Surface water temperature readings in the summer index period have decreased slightly since the mid-2000s, but this trend is not statistically significant. It is not known if this is an indication of local climate change or if these changes can be well evaluated through CSLAP.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Fluoroprobe screening results from the last several years demonstrate a slight seasonal increase in susceptibility for harmful algal blooms (HABs) in early summer some years, in the fall in other years, and not at all in some years, all due to variable blue green algae levels. An analysis of algae samples indicate algal toxin readings well below the levels needed to support safe swimming and potable water use.

Lake Condition Summary

Category	Indicator	Min	Overall Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	1.00	3.66	7.75	4.19	Mesotrophic	Within Normal Range	No Change
	Chlorophyll *a*	0.05	5.91	24.60	3.47	Mesotrophic	Lower Than Normal	No Change
	Total Phosphorus	0.004	0.015	0.040	0.014	Mesotrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.01	0.51	5.00	0.39	Highly Elevated Deepwater NH4	Within Normal Range	Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.001	0.060	0.350	0.059	Close to Surface TP Readings	Within Normal Range	Not known
	Nitrate + Nitrite	0.00	0.02	0.35	0.01	Low NOx	Within Normal Range	No Change
	Ammonia	0.00	0.03	0.50	0.04	Low Ammonia	Within Normal Range	Increasing Significantly
	Total Nitrogen	0.06	0.44	1.07	0.54	Low Total Nitrogen	Within Normal Range	No Change
	pH	6.19	7.71	9.06	7.80	Alkaline	Within Normal Range	No Change
	Specific Conductance	50	72	91	80	Softwater	Higher than Normal	No Change
	True Color	2	11	29	11	Intermediate Color	Within Normal Range	No Change
	Calcium	3.4	7.3	9.8	6.9	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.2	5	2.3	Not Quite Crystal Clear	Within Normal Range	No Change
	Aquatic Plant Coverage	1	2.8	4	3.0	Surface Plant Growth	Less Favorable than Normal	No Change
	Recreational Assessment	1	2.2	4	1.9	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Fair quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not measured through CSLAP	Not known	Not known
	Macroinvertebrates					Not measured through CSLAP	Not known	Not known
	Fish					Incomplete inventory	Not known	Not known
	Invasive Species					Eurasian watermilfoil, curly leafed pondweed	Not known	Not known
Local Climate Change	Air Temperature	6	21.4	30	23.5		Within Normal Range	No Change
	Water Temperature	14	21.4	26	21.8		Within Normal Range	No Change

Category	Indicator	Min	Overall Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Harmful Algal Blooms	Open Water Phycocyanin	0	27	114	12	Most readings indicate low risk of BGA	Not known	Not known
	Open Water FP Chl.a	1	7	57	3	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	4	20	2	Few readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	0.2	0.9	0.2	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	<DL	<DL	<DL		Shoreline bloom MC-LR consistently not detectable	Not known	Not known
	Shoreline Anatoxin a	<DL	<DL	<DL		Shoreline bloom Anatoxin-a consistently not detectable	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Guilford Lake is presently among the lakes listed on the 2008 Susquehanna River Basin Priority Waterbody List (PWL); water supply in Guilford Lake is listed as *threatened* by elevated deepwater nutrient levels and oxygen deficits near the lake bottom. The PWL citation for Guilford Lake is listed in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Guilford Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, although the lake is used for this purpose. The occasionally high algae levels suggest that surface potable water use may be *stressed*, since elevated algae levels can result in the production of disinfection by-products when the water supply is chlorinated.

Public Bathing

The CSLAP dataset at Guilford Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public swimming beach, would be fully supported. This use may be *threatened* by excessive nutrients in some years. Additional information about bacterial levels is needed to evaluate the safety of the water for swimming.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Guilford Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation is fully supported, although nuisance weed growth associated with invasive plants and occasionally elevated algae levels may *threaten* this use.

Aquatic Life

The CSLAP dataset on Guilford Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *threatened* by road salt

runoff and by occasionally elevated pH, invasive plants and depressed deepwater oxygen levels. Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics and Habitat

The CSLAP dataset on Guilford Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics and habitat may be *threatened* by invasive plants, particularly Eurasian watermilfoil.

Fish Consumption

There are no fish consumption advisories posted for Guilford Lake.

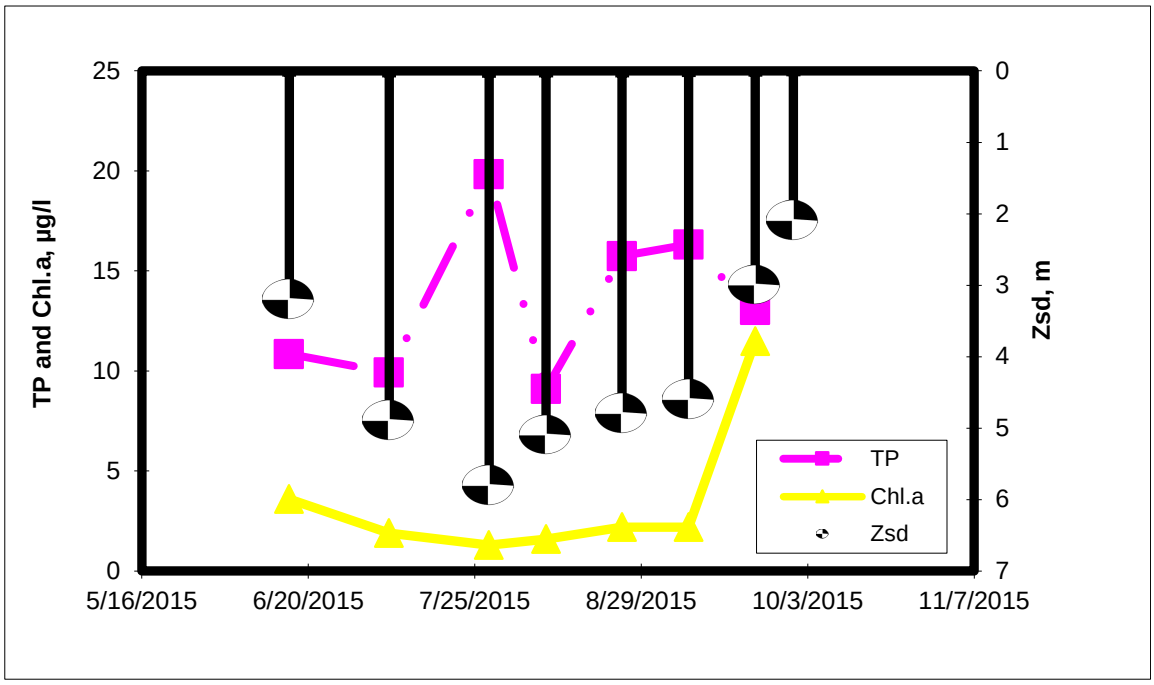
Additional Comments and Recommendations

Additional data will help to determine if water quality conditions in Guilford Lake are stable or have changed, and if invasive plants or shoreline blooms affect any lake uses. Lake residents and pets are advised to avoid contact with surface scums or heavily discolored water.

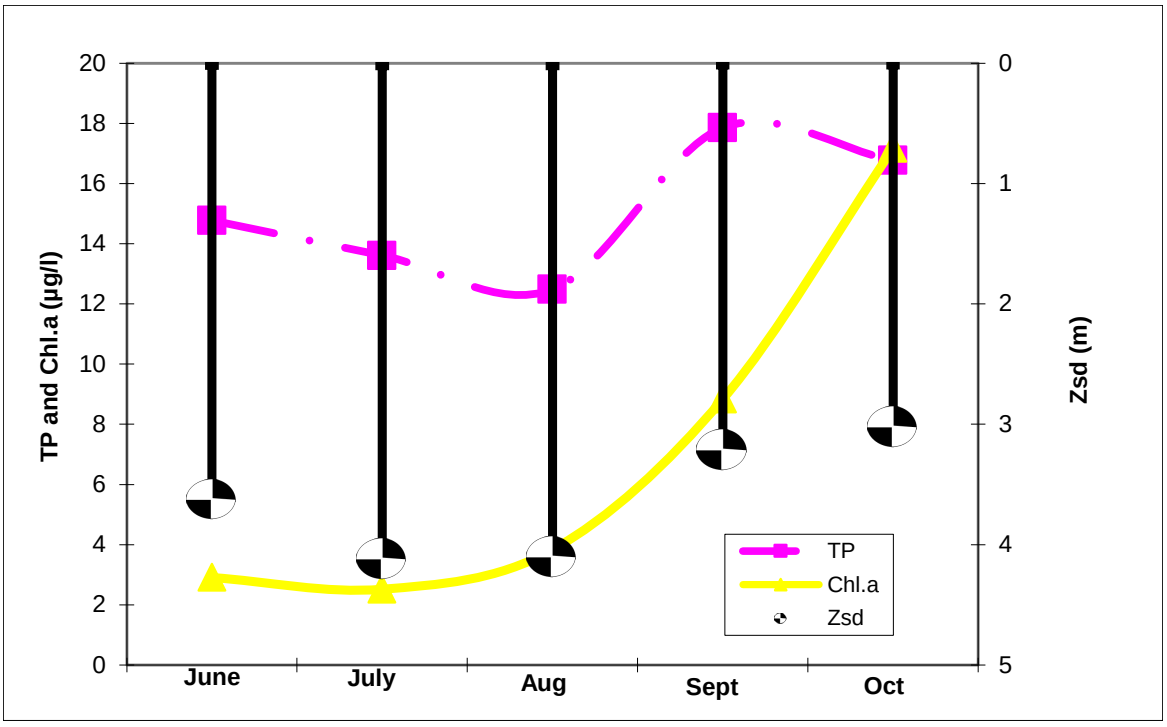
Aquatic Plant IDs-2015

None submitted for identification in 2015.

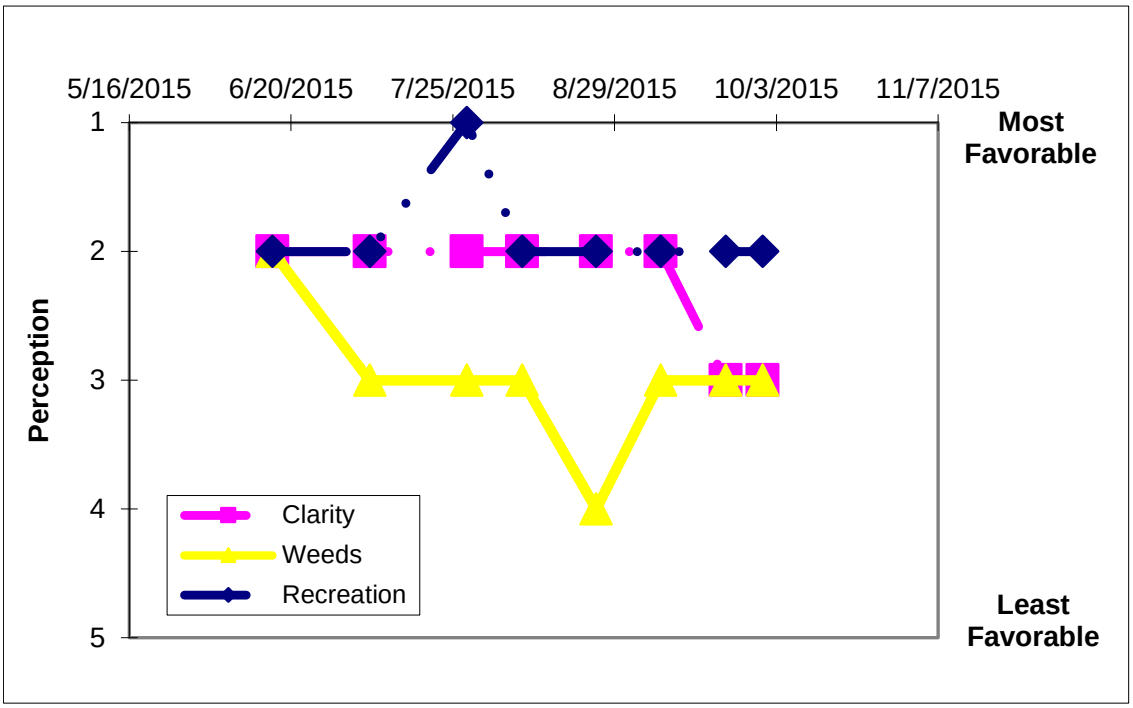
Time Series: Trophic Indicators, 2015



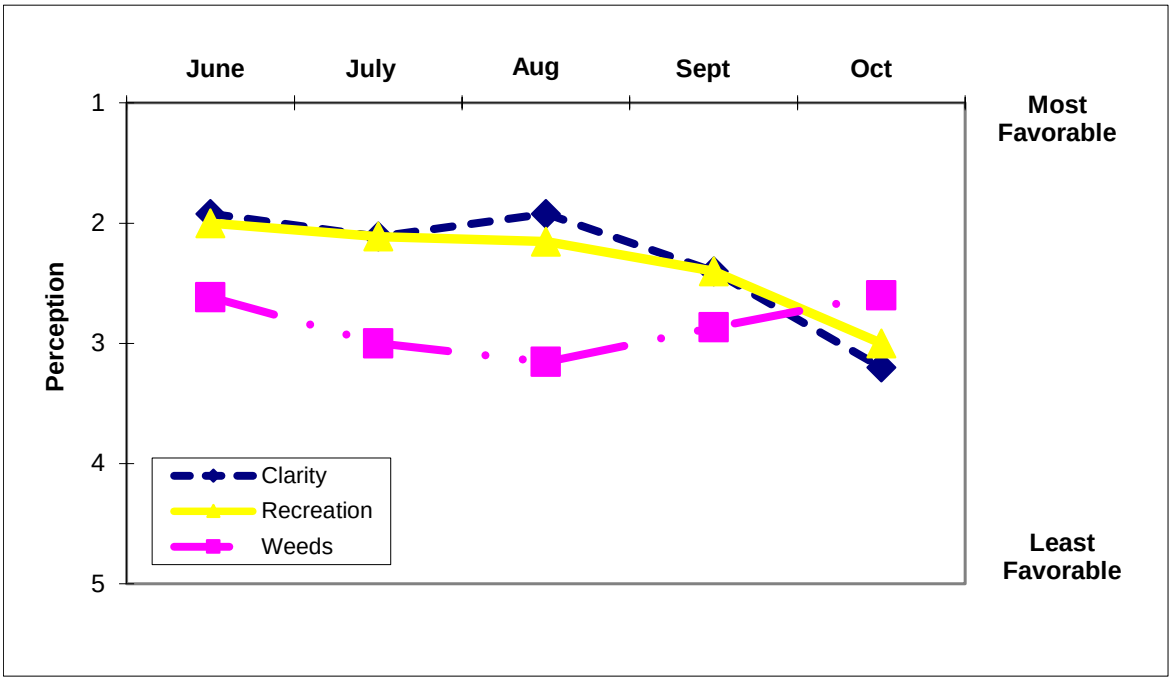
Time Series: Trophic Indicators, Typical Year (2004-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (2004-2015)



Appendix A- CSLAP Water Quality Sampling Results for Guilford Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
194	Guilford L	5/23/2004		3.75	1.0	0.015	0.01	0.01			13	7.90	80		0.67	
194	Guilford L	6/6/2004	19.5	3.00	1.0	0.008	0.01	0.01			19	6.19	84		9.33	
194	Guilford L	6/24/2004	19.5	4.28	1.0	0.015	0.01	0.01	0.29	41.8	12	6.30	89		0.82	
194	Guilford L	7/12/2004		5.25	1.0	0.016	0.01	0.01	0.06	8.5	10	6.94	87		0.38	
194	Guilford L	7/28/2004	20.4	4.95	1.0	0.017	0.13	0.03	0.40	52.5	12	7.19	88	8.2	2.00	
194	Guilford L	8/15/2004		4.63	1.0	0.007	0.07	0.02	0.36	117.0	9	8.27	77		2.60	
194	Guilford L	8/23/2004		4.30	1.0	0.009	0.07	0.04	0.56	138.3	12	8.01	54		0.90	
194	Guilford L	9/14/2004	18.3	3.40		0.020	0.01	0.01	0.17	19.2	15	7.80	70		3.90	
194	Guilford L	6/5/2005	16.8	5.50	1.0	0.015	0.07	0.01	0.39	58.0	7	7.50	76	3.4	0.56	
194	Guilford L	6/22/2005	18.9	5.20	1.0	0.009	0.01	0.02	0.16	39.8		6.59	54		1.48	
194	Guilford L	7/6/2005	30.0	5.25	1.0		0.01	0.01	0.22		11	7.90	69		1.64	
194	Guilford L	7/13/2005	20.0	3.60	1.0	0.011	0.01	0.01	0.14	26.8	14	6.52	66			
194	Guilford L	7/26/2005	20.0	4.20	1.0	0.011	0.02	0.01	0.07	14.1	5	7.28	76	6.9	1.47	
194	Guilford L	8/8/2005	20.0	5.95	1.0	0.012	0.01	0.01	0.64	117.2	5	7.72	78		0.66	
194	Guilford L	8/24/2005	20.0	5.65	1.0	0.016	0.01	0.02	0.21	29.6	9	7.76	66		0.78	
194	Guilford L	9/12/2005	20.0	6.00	1.0	0.012	0.01	0.01	0.11	20.2	5	7.96	72		1.11	
194	Guilford L	5/29/2006		3.85	1.0	0.016		0.50			4		78	7.2	2.06	
194	Guilford L	6/21/2006	19.0	3.40	1.0	0.025	0.02	0.01	0.46	40.0	11	7.58	80		0.51	
194	Guilford L	7/11/2006		3.20	1.0	0.015	0.01	0.02	0.55	83.9	13	8.81	74		3.19	
194	Guilford L	7/17/2006	20.0	2.40	1.0	0.017	0.01	0.03	0.56	73.4	18	7.75	61		5.25	
194	Guilford L	8/1/2006	20.0	3.00	1.0	0.016	0.00	0.02	0.84	119.1	17	9.06	59	6.4	7.28	
194	Guilford L	9/9/2006		2.05	1.0	0.015	0.04	0.02	0.67	100.3	8	8.29	50		17.04	
194	Guilford L	9/25/2006	20.0	1.55	1.0	0.016	0.03	0.02	0.75	102.5	18	7.91	62		19.21	
194	Guilford L	10/7/2006	20.0	1.50		0.017	0.02	0.03	0.63	80.2	16	7.43	59		21.83	
194	Guilford L	7/10/2007	60.0	5.15	1.0	0.017	0.02	0.02	0.44	59.1	4	7.91	67	7.3		
194	Guilford L	7/26/2007	20.0	4.70	1.0	0.010	0.01	0.02	0.52	112.5	9	8.28			1.90	
194	Guilford L	8/15/2007	20.0	4.70	1.0	0.017	0.35	0.02	1.07	137.4	11	7.84	91		1.94	
194	Guilford L	9/11/2007	19.0	6.00	1.0	0.013	0.01	0.03	0.64	110.4	8	7.26	83		5.45	
194	Guilford L	9/23/2007	19.0	6.00	1.0	0.016	0.01	0.01	0.57	77.4	10	8.41	61	7.7	7.80	
194	Guilford L	10/2/2007	19.0	2.55	1.0	0.019	0.01	0.01	0.74	87.8	2	7.86	72		14.84	
194	Guilford L	10/11/2007	19.0	7.75	1.0	0.016	0.01	0.01	0.39	54.5	9	6.81	72		16.28	
194	Guilford L	10/22/2007	19.0	2.40	1.0	0.016	0.02	0.03	0.74	101.5	11	6.93	72		15.43	
194	Guilford L	6/19/2008	19.0	5.00	1.0	0.013	0.01	0.03	0.24	41.50	10	8.28	66	8.0	0.40	
194	Guilford L	7/13/2008	19.0	5.25	1.0	0.008	0.02	0.02	0.39	102.24	10	7.39	77		1.30	
194	Guilford L	7/23/2008	19.0	5.05	1.0	0.011	0.02	0.05	0.30	60.11	10	8.46	51		1.59	
194	Guilford L	8/12/2008	19.0	5.30	1.0	0.005	0.01	0.01	0.19	90.58	13	7.90	75		1.95	
194	Guilford L	9/1/2008	19.0	4.40	1.0	0.010	0.01	0.00	0.19	40.21	4	7.72	80	7.6	2.84	
194	Guilford L	9/10/2008	19.0	3.90	1.0	0.004	0.00	0.01	0.25	146.44	10	7.03	76		4.73	
194	Guilford L	10/12/2008	19.0	2.65	1.0	0.013	0.01	0.01	0.26	43.66	7	7.97	78		9.99	
194	Guilford L	6/18/2012	20.0	4.00	2.0	0.010	0.03	0.10			9	7.89	77	7.9		
194	Guilford L	7/9/2012	17.0	3.90	2.0	0.011	0.01	0.01	0.20	40.86	9	7.30	76		1.60	
194	Guilford L	7/23/2012	17.0	3.00	1.5	0.014	0.02	0.02	0.39	62.95	7	8.73	56		4.60	
194	Guilford L	8/6/2012	20.0	3.90	1.5	0.010	0.01	0.01	0.31	68.69	9	8.30	66		0.20	
194	Guilford L	8/19/2012	19.8	1.65	1.5	0.016	0.01	0.01	0.54	72.48	6	8.14	69	8.4	16.00	
194	Guilford L	9/4/2012	19.8	1.40	1.5	0.038	0.01	0.03	0.51	29.12	7	8.41	62		8.60	
194	Guilford L	9/17/2012	19.8	1.45	1.5	0.020	0.01	0.02	0.49	54.34	6	7.30	78		21.60	
194	Guilford L	10/1/2012	19.8	1.30	1.5	0.020	0.01	0.11	0.42	47.24	6	6.89	78		24.60	
194	Guilford L	6/4/2013	18.9	4.05	2.0	0.011	0.02	0.03	0.25	50.14	13	7.52	84	9.8	1.10	
194	Guilford L	6/18/2013	18.9	2.55	2.0	0.018			0.33	39.22	19	7.67	79		4.70	
194	Guilford L	6/30/2013	18.9	3.40	1.5	0.014	0.01	0.02	0.20	30.40	21	7.10	59		1.40	
194	Guilford L	7/16/2013	18.9	3.70	1.5	0.013			0.43	71.11	13	7.60	69		8.30	
194	Guilford L	7/30/2013	18.9	2.20	1.5	0.016	0.03	0.01	0.41	57.54	10	8.32	61		0.10	
194	Guilford L	8/20/2013	18.9	1.75	1.5	0.016			0.63	88.14	29	8.72	66		12.40	
194	Guilford L	9/3/2013	18.9	1.35	1.5	0.018	0.01	0.01	0.61	74.70	16	8.77	64		19.50	
194	Guilford L	9/16/2013	18.9	1.25	1.5	0.020			0.47	52.47	22	7.72	65		15.60	
194	Guilford L	5/27/2014	18.9	1.00	1.5	0.023	0.02	0.02	0.82	79.47	28	8.61		6.41	21.50	
194	Guilford L	6/10/2014	18.9	1.80	1.5	0.022			0.46	45.99	8	7.17	77		7.90	
194	Guilford L	6/24/2014	18.9	1.75	1.5	0.020	0.02	0.05	0.45	50.44	14	6.84	67		3.10	
194	Guilford L	7/8/2014	18.9	2.35	1.5	0.015			0.50	74.98	14	7.76	65		4.20	
194	Guilford L	7/30/2014	18.9	3.45	1.5	0.015	0.01	0.05	0.38	56.70	6	7.58	75	6.95	2.10	
194	Guilford L	8/17/2014	18.9	2.65	1.5	0.015			0.44	64.53	12	7.30	64		1.30	
194	Guilford L	9/2/2014	18.9	3.15	1.5	0.014	0.01	0.03	0.40	64.06	12	7.74	75		0.20	
194	Guilford L	9/15/2014	18.9	3.05	1.5	0.040			0.39	21.13	10	7.17	55		0.05	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
194	Guilford L	6/16/2015	19.5	3.20	1.5	0.011	0.03	0.04	0.34	31.46	5	7.75	83	7.63	3.60	
194	Guilford L	7/7/2015	19.5	4.90	1.5	0.010			0.33	33.67	13	7.38	80		1.90	
194	Guilford L	7/28/2015	19.5	5.80	1.5	0.020	0.00	0.04	0.81	40.78	16	7.75	64		1.30	10.2
194	Guilford L	8/9/2015	19.5	5.10	1.5	0.009			0.37	40.99	17	7.92	85		1.60	
194	Guilford L	8/25/2015	19.5	4.80	1.5	0.016	0.00	0.05	0.42	26.43	12	7.91	82	6.21	2.20	
194	Guilford L	9/8/2015	19.5	4.60	1.5	0.016			1.03	63.17	7	7.80	78		2.20	
194	Guilford L	9/22/2015	19.5	3.00	1.5	0.013	0.01	0.04	0.47	35.89	8	8.09	84		11.50	10.2
194	Guilford L	9/30/2015	19.5	2.10	1.5											
194	Guilford L	5/23/2004			13.0	0.015										
194	Guilford L	6/6/2004	19.5		0.0	0.027										
194	Guilford L	06/24/2004	19.5		15.0	0.014										
194	Guilford L	07/12/2004			15.0	0.021										
194	Guilford L	07/28/2004	20.4		15.0	0.016										
194	Guilford L	08/15/2004			15.0	0.030										
194	Guilford L	08/23/2004			15.0	0.042										
194	Guilford L	09/14/2004	18.3			0.103										
194	Guilford L	6/5/2005	16.8		20.0	0.022										
194	Guilford L	6/22/2005	18.9		16.0	0.033										
194	Guilford L	7/6/2005	30.0		28.0											
194	Guilford L	7/13/2005	20.0		19.0	0.038										
194	Guilford L	7/26/2005	20.0		19.0	0.055										
194	Guilford L	8/8/2005	20.0		19.0	0.023										
194	Guilford L	8/24/2005	20.0		19.0	0.022										
194	Guilford L	9/12/2005	20.0		19.0	0.013										
194	Guilford L	5/29/2006			19.0	0.014										
194	Guilford L	6/21/2006	19.0		19.0	0.011										
194	Guilford L	7/11/2006			19.0	0.019										
194	Guilford L	7/17/2006	20.0		20.0	0.019										
194	Guilford L	8/1/2006	20.0		19.0	0.012										
194	Guilford L	9/9/2006			19.0	0.032										
194	Guilford L	9/25/2006	20.0		19.0	0.077										
194	Guilford L	10/7/2006	20.0		19.0	0.110										
194	Guilford L	7/10/2007	60.0		20.0	0.027										
194	Guilford L	7/26/2007	20.0		19.0	0.072										
194	Guilford L	8/15/2007	20.0		23.0	0.058										
194	Guilford L	9/11/2007	19.0		19.0	0.026										
194	Guilford L	9/23/2007	19.0		18.0	0.135										
194	Guilford L	10/2/2007	19.0		18.0	0.026										
194	Guilford L	10/11/2007	19.0		18.0	0.160										
194	Guilford L	10/22/2007	19.0		18.0	0.234										
194	Guilford L	6/19/2008	19.0		18.0	0.010										
194	Guilford L	7/13/2008	19.0		19.0	0.016										
194	Guilford L	7/23/2008	19.0		18.0	0.027										
194	Guilford L	8/12/2008	19.0		18.0	0.024										
194	Guilford L	9/1/2008	19.0		17.0	0.055										
194	Guilford L	9/10/2008	19.0		18.0	0.076										
194	Guilford L	10/12/2008	19.0		18.0	0.101										
194	Guilford L	6/18/2012			16.0	0.350		0.27								
194	Guilford L	7/9/2012			17.0	0.087		0.21								
194	Guilford L	7/23/2012			17.0	0.015		0.02								
194	Guilford L	8/6/2012			20.0	0.037		0.04								
194	Guilford L	8/19/2012			19.0	0.256		0.34								
194	Guilford L	9/4/2012			19.0	0.234		0.46								
194	Guilford L	9/17/2012			19.0	0.158		0.28								
194	Guilford L	10/2/2012			19.0	0.224		0.42								
194	Guilford L	6/4/2013			15.0	0.019		0.02								
194	Guilford L	6/18/2013			15.0											
194	Guilford L	6/30/2013			15.0	0.019		0.01								
194	Guilford L	7/16/2013			15.0											
194	Guilford L	7/30/2013			15.0	0.009		0.04								
194	Guilford L	8/20/2013			15.0											
194	Guilford L	9/3/2013			15.0	0.024		0.46								
194	Guilford L	9/16/2013			15.0											
194	Guilford L	5/27/2014			15.0	0.021		0.37								
194	Guilford L	6/10/2014			15.0	0.019										
194	Guilford L	6/24/2014			15.0	0.020		0.21								

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
194	Guilford L	7/8/2014			15.0	0.020										
194	Guilford L	7/30/2014			15.0	0.010		0.43								
194	Guilford L	8/17/2014			15.0	0.001										
194	Guilford L	9/2/2014			15.0	0.053		0.59								
194	Guilford L	9/15/2014			15.0	0.102										
194	Guilford L	6/16/2015			18.0	0.072		0.20								
194	Guilford L	7/7/2015			18.0	0.030										
194	Guilford L	7/28/2015			18.0	0.086		0.27								
194	Guilford L	8/9/2015			18.0	0.014										
194	Guilford L	8/25/2015			18.0	0.037		0.51								
194	Guilford L	9/8/2015			18.0	0.062										
194	Guilford L	9/22/2015			18.0	0.110		0.60								
194	Guilford L	9/30/2015			18.0											

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB form	Shore HAB
194	Guilford L	5/23/2004	epi	27	23	3	2	2	0											
194	Guilford L	6/6/2004	epi	18	18	3	1	2	5											
194	Guilford L	6/24/2004	epi	28	23	1	3	1	0											
194	Guilford L	7/12/2004	epi	24	23	2	3	2	5											
194	Guilford L	7/28/2004	epi	21	23	2	3	2	5											
194	Guilford L	8/15/2004	epi	21	23	2	3	2	5											
194	Guilford L	8/23/2004	epi	28	22	2	3	1	0											
194	Guilford L	9/14/2004	epi	21	21	2	3	2	25											
194	Guilford L	6/5/2005	epi		23	2	2	2	0											
194	Guilford L	6/22/2005	epi	17	21	2	3	3	25											
194	Guilford L	7/6/2005	epi	22	25	1	3	2	28											
194	Guilford L	7/13/2005	epi		25	3	3	3	28											
194	Guilford L	7/26/2005	epi	21	25	2	4	3	2											
194	Guilford L	8/8/2005	epi	21	26	2	3	2	2											
194	Guilford L	8/24/2005	epi	22	23	2	3	2	2											
194	Guilford L	9/12/2005	epi	24	23															
194	Guilford L	5/29/2006	epi	28	21	c	1	1	0											
194	Guilford L	6/21/2006	epi	25	23	2	3	2	2											
194	Guilford L	7/11/2006	epi	30	26	2	2	1	0											
194	Guilford L	7/17/2006	epi	26	24	3	3	3	124											
194	Guilford L	8/1/2006	epi	25	26	3	3	2	125											
194	Guilford L	9/9/2006	epi	24	19	4	3	4	23											
194	Guilford L	9/25/2006	epi	13	16															
194	Guilford L	10/7/2006	epi	16	15	4	3	4	134											
194	Guilford L	7/10/2007	epi	6	23	2	3	2	0											
194	Guilford L	7/26/2007	epi	26	23	1	3	2	0											
194	Guilford L	8/15/2007	epi	22	19	1	3	2	0	0	0									
194	Guilford L	9/11/2007	epi	21	22	1	2	1	0	0	0									
194	Guilford L	9/23/2007	epi	22	21	3	2	2	0	0	0									
194	Guilford L	10/2/2007	epi	20	19	2	2	4	5	0	0									
194	Guilford L	10/11/2007	epi	8	14					0	0									
194	Guilford L	10/22/2007	epi	22	17	3	2	2	1											
194	Guilford L	6/19/2008	epi	14	19	2	3	2	8	0	0									
194	Guilford L	7/13/2008	epi	24	25					0	0									
194	Guilford L	7/23/2008	epi	21	24	5	3	4	35	0	0									
194	Guilford L	8/12/2008	epi	18	22	1	4	4	234	0	0									
194	Guilford L	9/1/2008	epi	22	22	1	3	3	23	0	0									
194	Guilford L	9/10/2008	epi	18	22	2	3	2	23	0	0									
194	Guilford L	10/12/2008	epi	20	16	4	3	3	36	0	0									
194	Guilford L	6/18/2012	epi	18	21	2	3	2	0	0	0	0.70	0.50	<0.30	<0.417		0.84	0.21	I	
194	Guilford L	7/9/2012	epi	19	21	1	3	2	0	0	0	5.70	0.30	<0.30	<0.392		1.37	0.72	I	
194	Guilford L	7/23/2012	epi	23	23	1	3	2	0	0	0	22.50	0.30	<0.30	<0.328		3.68	3.02	I	
194	Guilford L	8/6/2012	epi	22	23	1	3	2	0	0	0	15.10	0.40	<0.30	<0.330		2.09	0.66	I	
194	Guilford L	8/19/2012	epi	17	23	3	3	3	1	4	4	84.50	0.70	<0.30	<0.519		57.04	3.50	F	
194	Guilford L	9/4/2012	epi	21	21	3	3	4	1	4	4	97.40	0.80	<0.30	<0.725		12.00	10.56	F	
194	Guilford L	9/17/2012	epi	22	21	3	3	3	1	4	4	66.00	0.80	0.38	<3.299		9.80	8.83	F	
194	Guilford L	10/1/2012	epi	15	15	3	3	2	15	4	4	46.20	0.60	<0.30	<3.205		9.36	8.42	F	

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB form	Shore HAB
194	Guilford L	6/4/2013	epi	19	19	1	2	1	0	0	0	2.30	1.70	<0.30	<0.630		0.80	0.00	I	I
194	Guilford L	6/18/2013	epi	20	19	1	3	2	0	0	0	5.50	2.30	<0.30	<0.440		3.30	0.70	I	
194	Guilford L	6/30/2013	epi	23	22	1	3	2	0	0	0	8.90	0.90	<0.30	<0.650		2.20	1.40	I	I
194	Guilford L	7/16/2013	epi	27	26	2	3	2	0	0	0	14.90	1.10	<0.30	<0.910		2.50	1.70	F	F
194	Guilford L	7/30/2013	epi	19	21	3	3	2	1	46	6	54.50	1.70	<0.30	<0.380		8.40	7.40	F	F
194	Guilford L	8/20/2013	epi	27	23	3	3	3	124	4	4	69.10	2.50	<0.30	<0.510		11.20	9.90	cf	cf
194	Guilford L	9/3/2013	epi	19	21	3	3	3	12			114.20	4.70	0.61	<0.570		20.50	19.90	F	F
194	Guilford L	9/16/2013	epi	15	16	3	3	3	15	0	0	107.50	32.00	<0.30	<0.100		12.20	10.40	F	F
194	Guilford L	5/27/2014	epi	24	20	3	1	2	1	0	0	12.50	3.40	<1.83	<0.09	<0.001	15.18	13.65	f	f
194	Guilford L	6/10/2014	epi	26	23	3	3	2	1	4	4	0.70	0.80	<1.83	<0.17	<0.001	2.24	0.00	f	f
194	Guilford L	6/24/2014	epi	21	22	3	3	3	1	4	4	2.90	0.60	<1.60	<0.28	<0.002	2.22	0.00	f	f
194	Guilford L	7/8/2014	epi	26	24	3	3	2	1	4	4	4.20	0.40	<0.40	<0.48	<0.001	0.83	0.00	f	f
194	Guilford L	7/30/2014	epi	16	20	1	3	1	0	0	0	7.00	0.30	<0.31	<0.24	<0.002	1.23	0.11	i	i
194	Guilford L	8/17/2014	epi	20	20	1	3	1	0	0	0	5.70	0.40	<0.35	<0.03	<0.001	1.59	0.43	i	i
194	Guilford L	9/2/2014	epi	26	23	2	3	2	0	0	0	6.60	0.30	<0.29	<0.14	<0.002	2.32	0.76	i	i
194	Guilford L	9/15/2014	epi	20	20	1	3	1	0	0	0	7.10	0.40	<0.28	<0.03	<0.001	2.95	1.35	i	i
194	Guilford L	6/16/2015	epi	24	23	2	2	2	568	0	0	3.60	0.50	<0.55	<0.018	<0.139	1.30	0.00	I	I
194	Guilford L	7/7/2015	epi	24	22	2	3	2	5	0	6	6.40	0.20	<0.71	<0.003	<0.011	0.70	0.00	I	I
194	Guilford L	7/28/2015	epi	26	25	2	3	1	8	0	0	1.80	0.20	<0.23	<0.002	<0.014	0.80	0.10	I	I
194	Guilford L	8/9/2015	epi	26	23	2	3	2	8	0	0	3.80	0.40	<0.44	<0.002	<0.014	0.60	0.00	I	I
194	Guilford L	8/25/2015	epi	20	23	2	4	2	0	6	0	0.20	0.60	<0.21	<0.003	<0.010	1.10	0.30	I	H
194	Guilford L	9/8/2015	epi	29	24	2	3	2	0	0	7	8.00	0.30	<0.39	<0.004	<0.012	2.10	1.20	H	H
194	Guilford L	9/22/2015	epi	19	20	3	3	2	1	46	6	58.80	0.60	<0.30	<0.007	<0.035	11.60	9.20	F	F
194	Guilford L	9/30/2015	epi	20	14	3	3	2	15	6	4	3.60	0.50	<0.55	<0.018	<0.139	1.30	0.00	F	F
194	Guilford L	6/18/2012	hypo		6															
194	Guilford L	7/9/2012	hypo		6															
194	Guilford L	7/23/2012	hypo		8															
194	Guilford L	8/6/2012	hypo		19															
194	Guilford L	8/19/2012	hypo		7															
194	Guilford L	9/4/2012	hypo		7															
194	Guilford L	9/17/2012	hypo		13															
194	Guilford L	10/2/2012	hypo		6															
194	Guilford L	6/4/2013	hypo		8															
194	Guilford L	6/18/2013	hypo		9															
194	Guilford L	6/30/2013	hypo		13															
194	Guilford L	7/16/2013	hypo		7															
194	Guilford L	7/30/2013	hypo		8															
194	Guilford L	8/20/2013	hypo		10															
194	Guilford L	9/3/2013	hypo		7															
194	Guilford L	9/16/2013	hypo		21															
194	Guilford L	5/27/2014	hypo		6															
194	Guilford L	6/10/2014	hypo		12															
194	Guilford L	6/24/2014	hypo		8															
194	Guilford L	7/8/2014	hypo		20															
194	Guilford L	7/30/2014	hypo		7															
194	Guilford L	8/17/2014	hypo		9															
194	Guilford L	9/2/2014	hypo		8															
194	Guilford L	9/15/2014	hypo		7															
194	Guilford L	6/16/2015	hypo		6															
194	Guilford L	7/7/2015	hypo		6															
194	Guilford L	7/28/2015	hypo		6															
194	Guilford L	8/9/2015	hypo		6															
194	Guilford L	8/25/2015	hypo		6															
194	Guilford L	9/8/2015	hypo		6															
194	Guilford L	9/22/2015	hypo		6															
194	Guilford L	9/30/2015	hypo		6															

Legend Information

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

Appendix B- Priority Waterbody Listing for Guilford Lake

Guilford Lake (0601-0012) NoKnownImpct

Waterbody Location Information

Revised: 07/02/2009

Water Index No: SR-146- 1-P188
Hydro Unit Code: 02050101/180 **Str Class:** AA
Waterbody Type: Lake (Mesotrophic)
Waterbody Size: 72.9 Acres
Seg Description: entire lake

Drain Basin: Susquehanna River
Upper Susquehanna
Reg/County: 7/Chenango Co. (9)
Quad Map: OXFORD (L-18-2)

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
Water Supply	Threatened	Possible

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

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

Resolution/Management Information

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

Further Details

Water Quality Sampling
Guilford Lake was sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 2004 and continuing through the present. 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 mesotrophic, or moderately productive. Phosphorus levels in the lake do not typically exceed the state guidance values indicating impacted/stressed recreational uses. Corresponding transparency measurements 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 weakly 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 favorable in 2008. 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 water quality measurements. Assessments have noted that aquatic plants grow to the lake surface but not densely enough to impact uses. (DEC/DOW, BWAM/CSLAP, January 2008)

Lake Uses

This lake waterbody is designated class AA, suitable for use as a drinking 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.

Drinking Water Supply

Gilford Lake has been designated a Class AA water, suitable for use as a drinking water supply. Although there are no specific water quality impacts, the waterbody is considered a highly valued water resource due to its drinking water supply classification as an AA water. The particular resource value reflected in this designation and the need to provide additional protection may result in an assessment of threatened (possible) for drinking water use.

Previous Assessment

Regional Fisheries staff indicate that Guilford Lake exhibits no significant water quality impacts and supports all uses. No algal blooms have been noted and the level of weed coverage is not excessive, but reasonable and expected for any lake. A Lake Classification and Inventory study (DEC/DOW, Lake Services) found some elevated nutrients and low dissolved oxygen at the lake bottom. But Fisheries data (from the late 1960s to present) shows that these levels have remained stable, and likely represent the natural condition of the lake. There is adequate cool water habitat all year round and in spite of low hypolimnetic D.O. trout survival is not affected. (DEC/DFWMR, Region 7, June 1998)

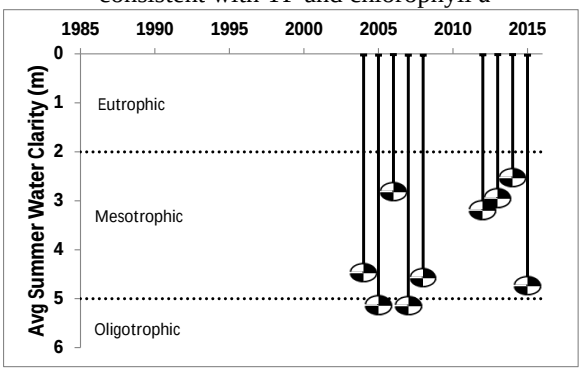
Segment Description

This segment includes the total area of the lake.

Appendix C- Long Term Trends: Guilford Lake

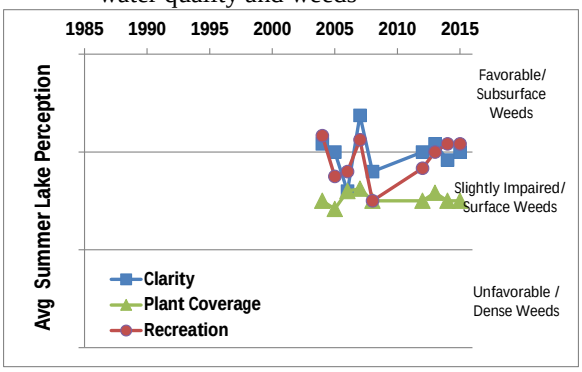
Long Term Trends: Water Clarity

- 2015 rise back to "normal" conditions
- Most readings typical of *mesotrophic* lakes, consistent with TP and chlorophyll *a*



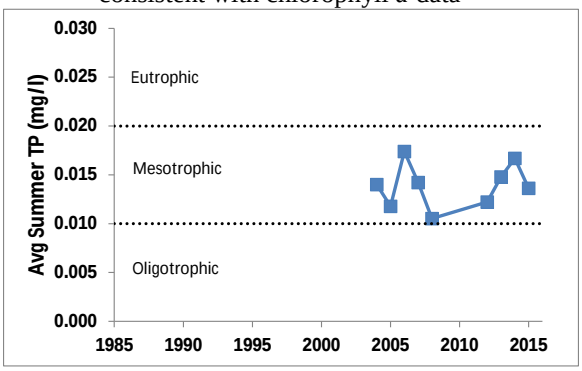
Long Term Trends: Lake Perception

- Improving rec/WQ perception since '08
- Recreational perception linked to changes in water quality and weeds



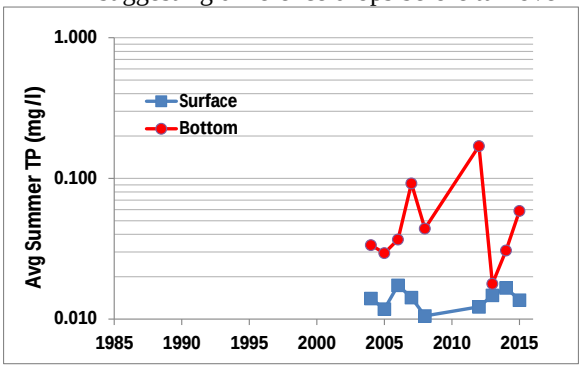
Long Term Trends: Phosphorus

- Variable TP with no clear trends
- Most readings typical of *mesotrophic* lakes, consistent with chlorophyll *a* data



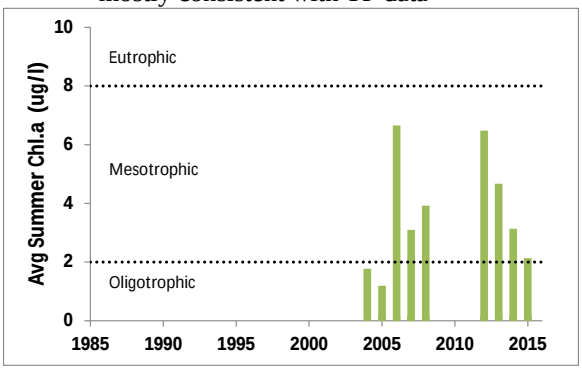
Long Term Trends: Bottom Phosphorus

- Deep P at times much higher than surf P
- Does not appear to have affected surface TP, suggesting difference drops before turnover



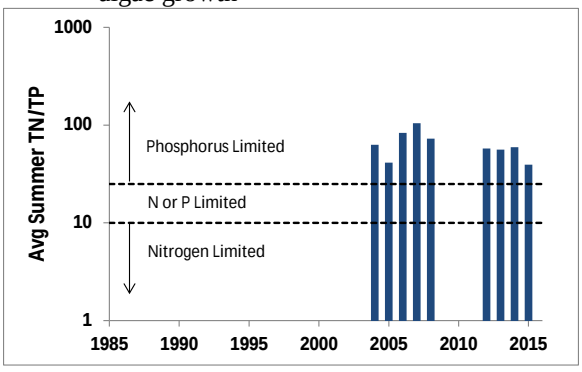
Long Term Trends: Chlorophyll a

- Algae levels dropping last three years
- Most readings typical of *mesotrophic* lakes, mostly consistent with TP data



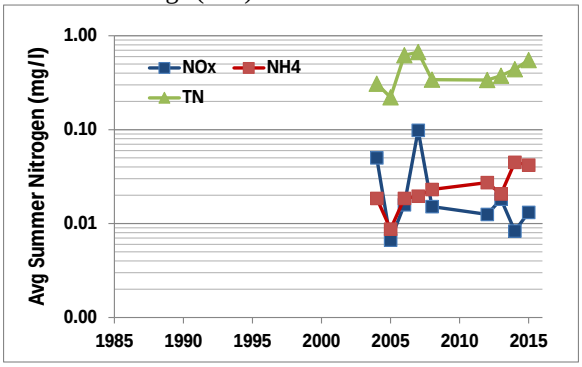
Long Term Trends: N:P Ratio

- No trends apparent, but recently lower
- Most readings indicate phosphorus limits algae growth



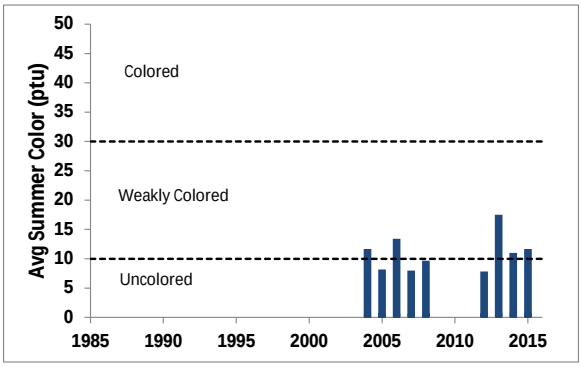
Long Term Trends: Nitrogen

- No clear trends, but NH4, TN ↑; NOx ↓
- Most NOx, ammonia, and total nitrogen readings (still) moderate to low



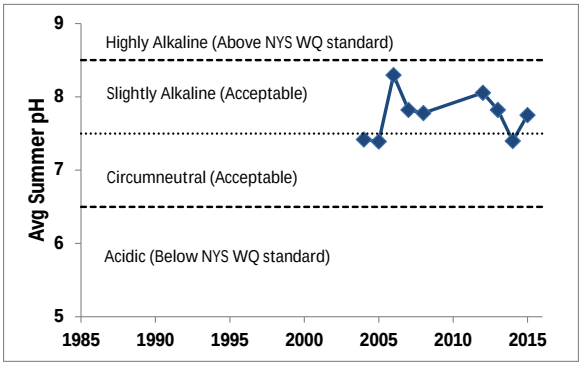
Long Term Trends: Color

- No trends apparent
- Most readings typical of *uncolored* to *weakly colored* lakes



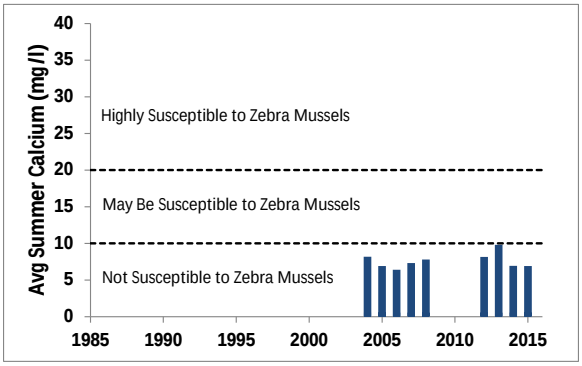
Long Term Trends: pH

- Varies year to year
- Most readings typical of *slightly alkaline* to *circumneutral* lakes



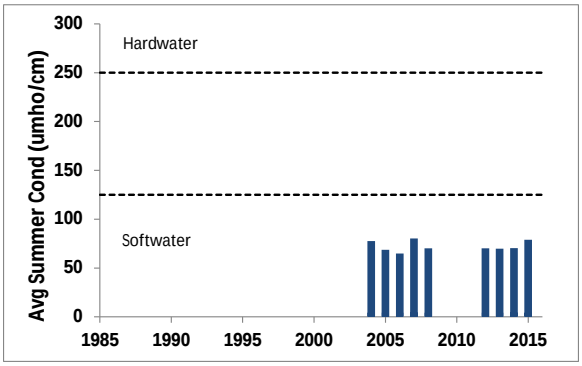
Long Term Trends: Calcium

- No trends apparent
- Data indicates low susceptibility to zebra mussels



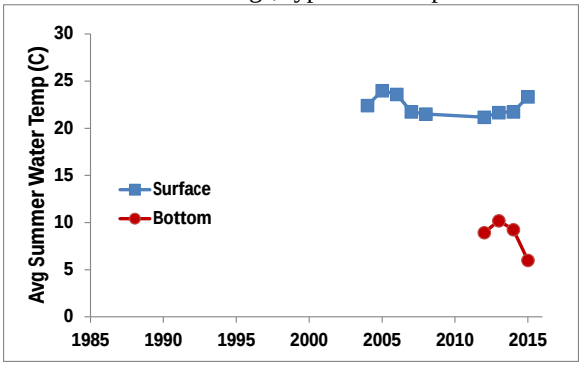
Long Term Trends: Conductivity

- No trends apparent
- Most readings typical of *softwater* lakes



Long Term Trends: Water Temperature

- ↓ surface T last decade, but ↑ 2015
- Bottom temperatures much colder than surface readings, typical of deep lakes



Appendix D:
Algae Testing Results from SUNY ESF Study

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

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

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

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

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

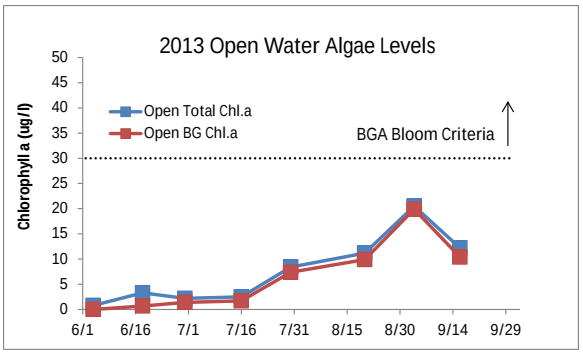


Figure D1:
2013 Open Water Total and BGA Chl.a

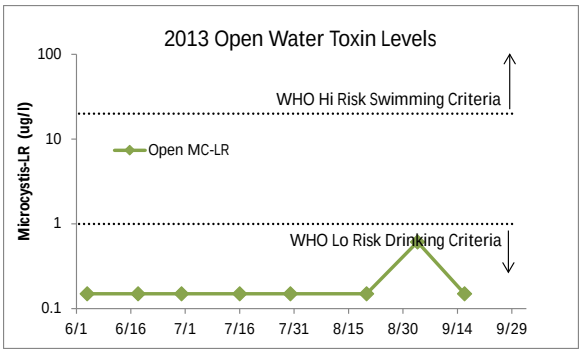


Figure D2:
2013 Open Water Microcystin-LR

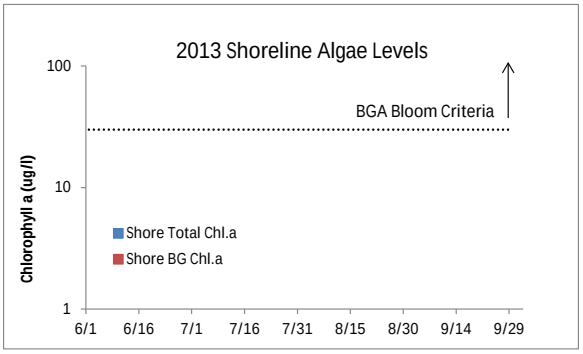


Figure D3:
2013 Shoreline Total and BGA Chl.a

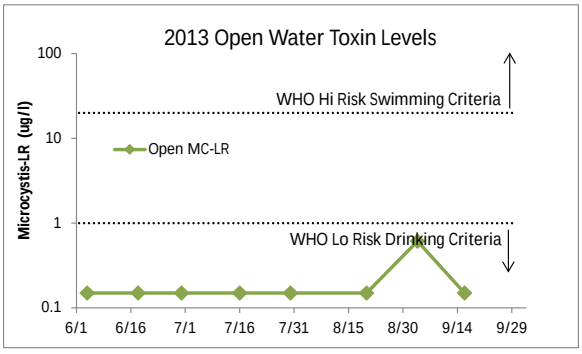


Figure D4:
2013 Shoreline Microcystin-LR

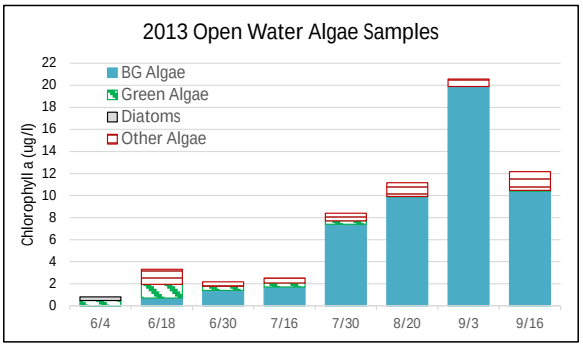


Figure D5:
2013 Open Water Algae Types

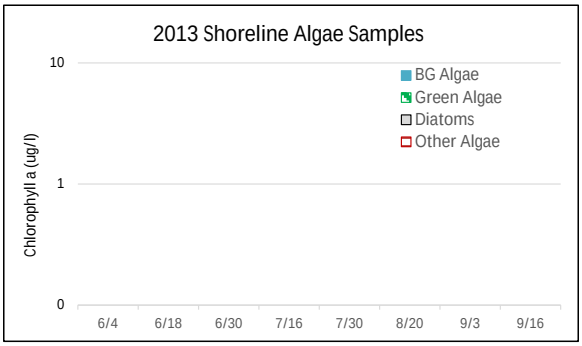


Figure D6:
2013 Shoreline Algae Types

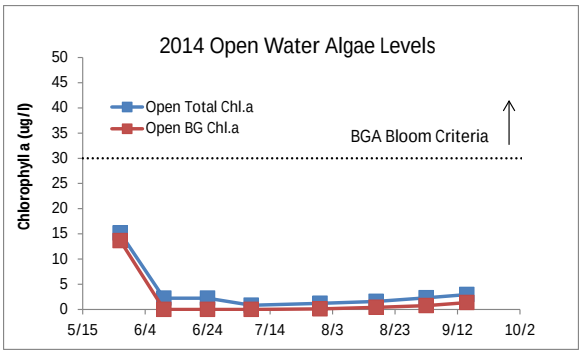


Figure D7:
2014 Open Water Total and BGA Chl.a

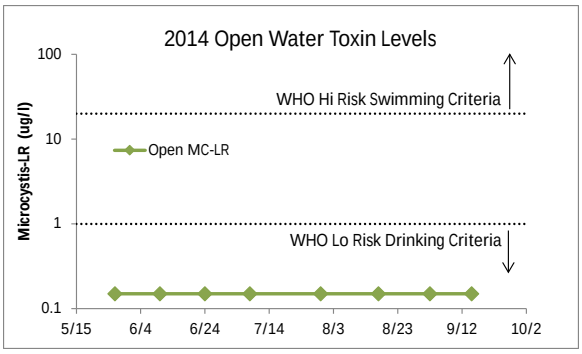


Figure D8:
2014 Open Water Microcystin-LR

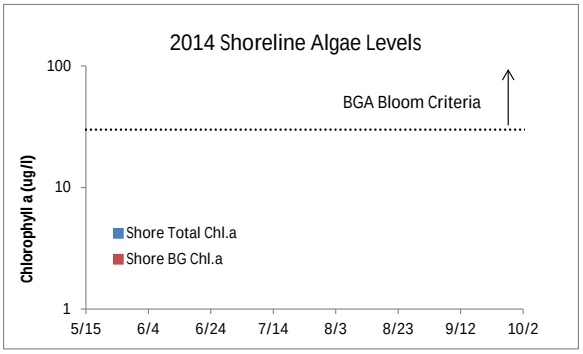


Figure D9:
2014 Shoreline Total and BGA Chl.a

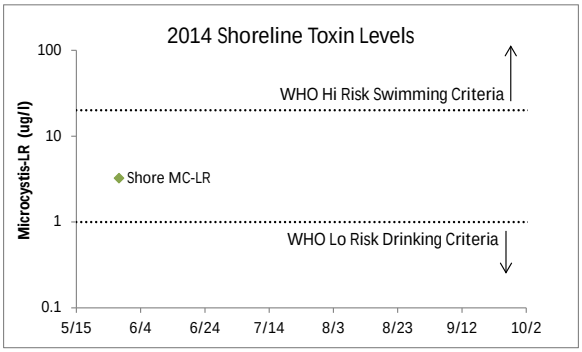


Figure D10:
2014 Shoreline Microcystin-LR

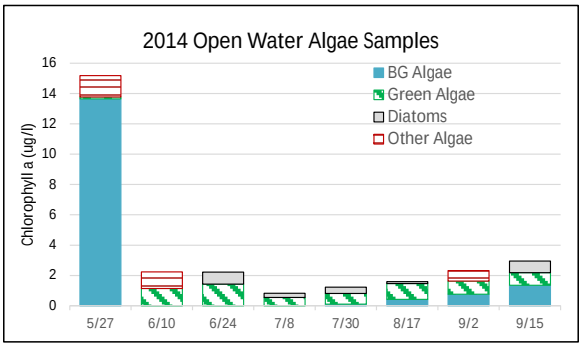


Figure D11:
2014 Open Water Algae Types

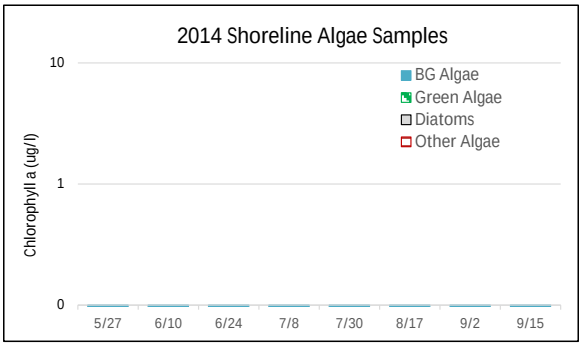


Figure D12:
2014 Shoreline Algae Types

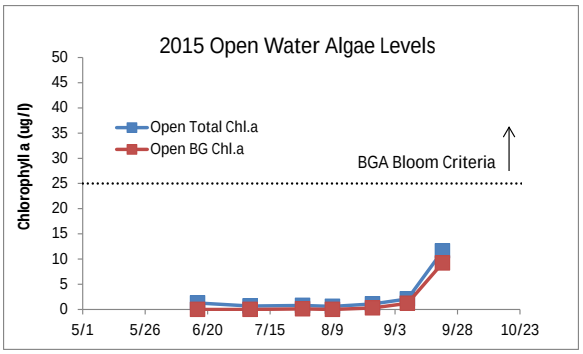


Figure D13:
2015 Open Water Total and BGA Chl.a

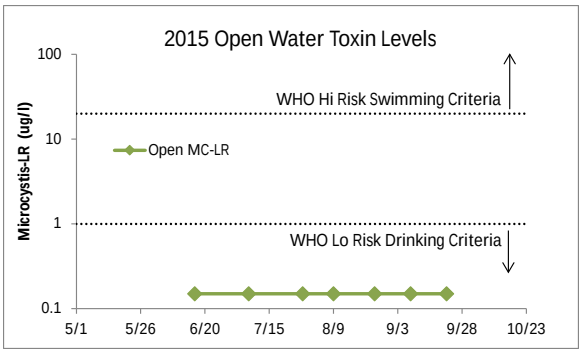


Figure D14:
2015 Open Water Microcystin-LR

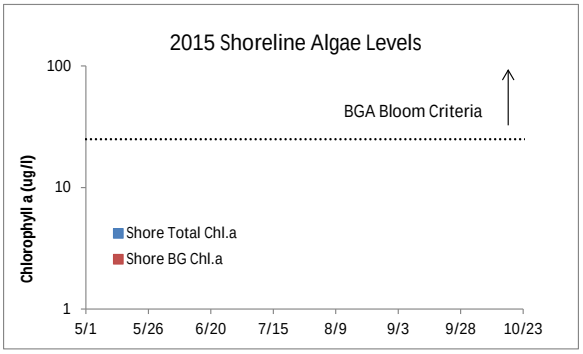


Figure D15:
2015 Shoreline Total and BGA Chl.a

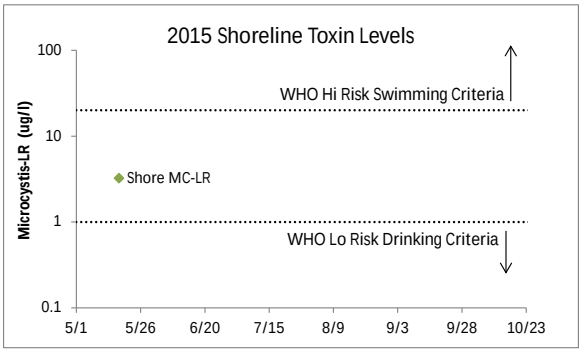


Figure D16:
2015 Shoreline Microcystin-LR

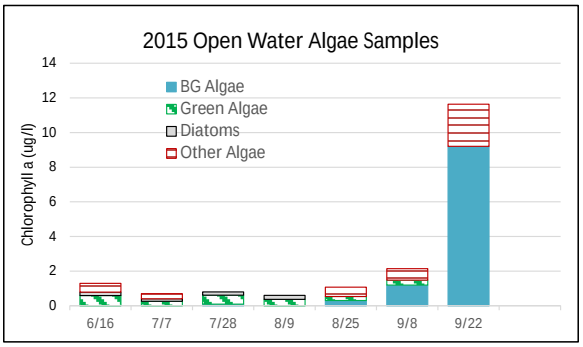


Figure D17:
2015 Open Water Algae Types

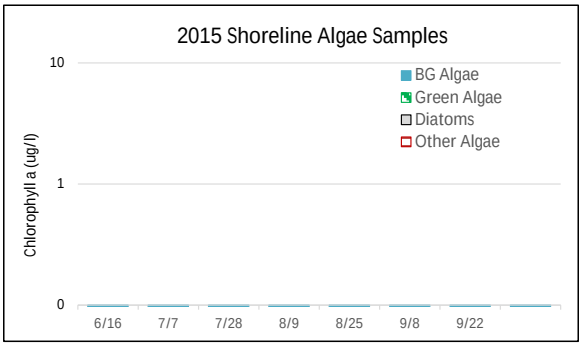


Figure D18:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Chenango County

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

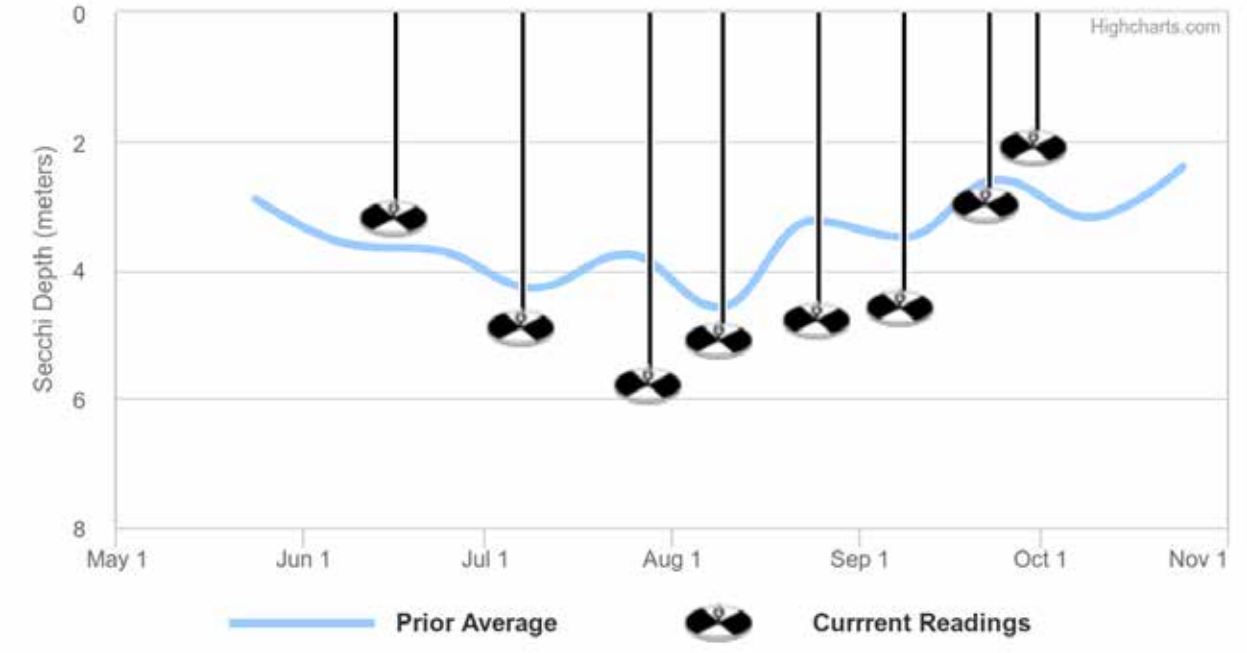
Aquatic Invasive Species – Chenango County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Balsam Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Bowman Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Chenango Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Chenango River near Greene	Animal	Asian clam	*Corbicula fluminea*
Chenango River near Oxford	Animal	Asian clam	*Corbicula fluminea*
Guilford Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Hunt Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Jackson Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Long Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Mill Brook Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Mud Creek e of Cortland	Animal	Asian clam	*Corbicula fluminea*
Otselic River near Pitcher	Animal	Asian clam	*Corbicula fluminea*
Plymouth Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Warn Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Warn Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*

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

Current Year Water Temperatures vs. Prior Average

This year's shallow water sample temperatures are tending to be higher than normal when compared to the average of readings collected from 2004 to 2014. This year's deep water sample temperatures are tending to be lower than normal when compared to the average of readings collected from 2005 to 2014.

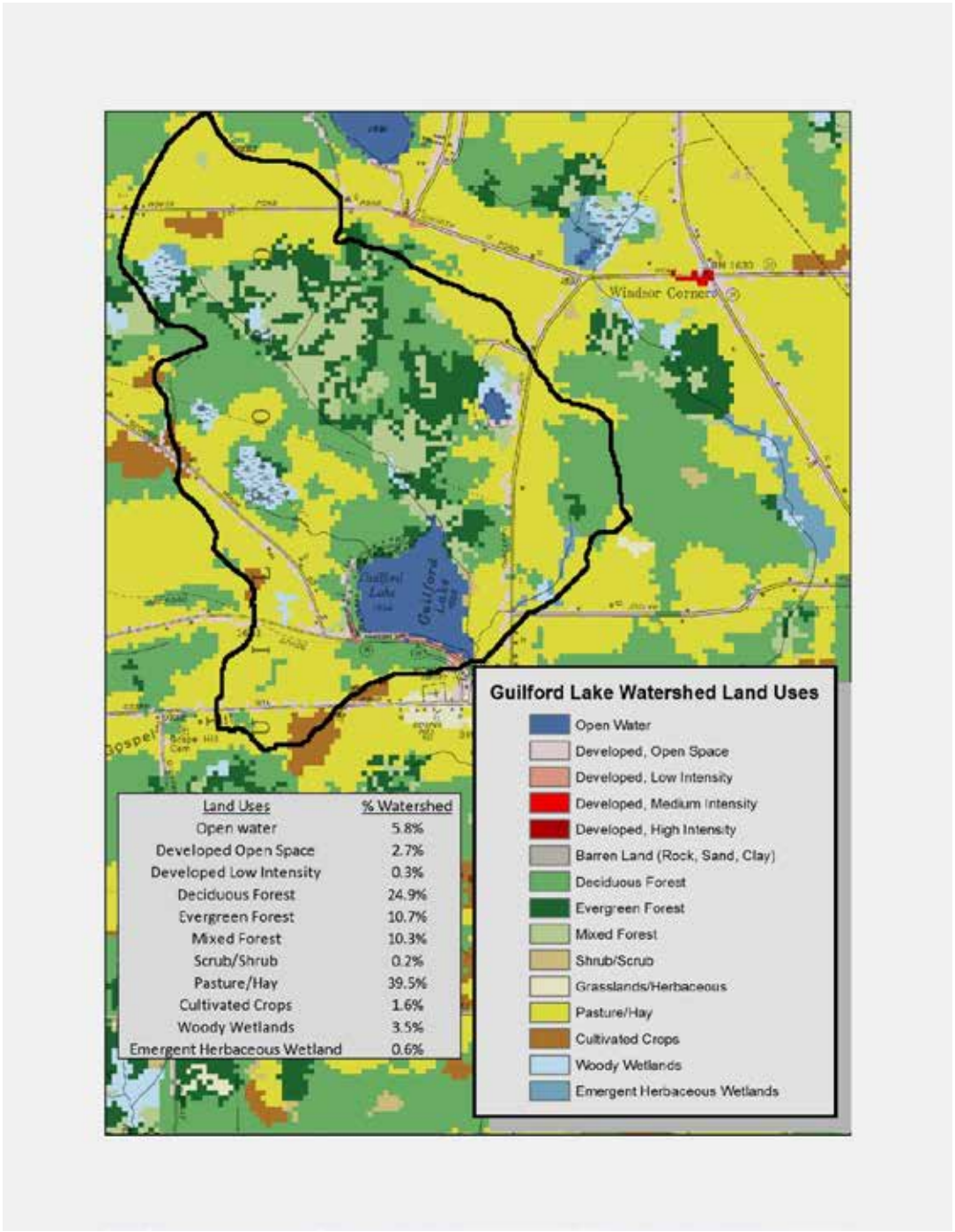
Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are tending to be higher than normal when compared to the average of readings collected from 2004 to 2014

Appendix G: Watershed and Land Use Map for Guilford 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.



Land Uses	% Watershed
Open water	5.8%
Developed Open Space	2.7%
Developed Low Intensity	0.3%
Deciduous Forest	24.9%
Evergreen Forest	10.7%
Mixed Forest	10.3%
Scrub/Shrub	0.2%
Pasture/Hay	39.5%
Cultivated Crops	1.6%
Woody Wetlands	3.5%
Emergent Herbaceous Wetland	0.6%