

Somerset Lake Questions and Answers, 2015 CSLAP

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

A1. Water quality conditions in Somerset Lake were probably more favorable than usual in 2015. Water clarity was higher, consistent with lower overall algae levels, and no shoreline blooms were reported.

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

A2. Chloride testing results are typical of lakes with moderate to high impacts from road salt runoff, although no biological impacts were measured or reported.

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

A3. Somerset Lake had slightly higher water clarity, and lower nutrient and algae levels, than the typical lake in the area. Aquatic plant coverage was higher than in these other lakes.

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

A4. Surface phosphorus levels have increased since the late 1990s, but deepwater phosphorus readings have decreased over this timeframe. Water temperatures have decreased in surface and bottom samples since the late 1990s.

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

A5. Somerset Lake appears to be susceptible to shoreline (and perhaps some open water) blue green algae blooms, although these are not apparent in all years. This may be related to the long-term increase in phosphorus levels, and should prompt the lake association to identify any new or developing sources of nutrients entering the lake.

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 reversing the rise in phosphorus levels in recent years. 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.

Lake Use				
	PWL	Average Year	2015	Primary issue
Potable Water				Not applicable
Swimming				Algae blooms
Recreation				Algae blooms
Aquatic Life				Bottom Oxygen
Aesthetics				Poor perception
Habitat				Invasive plants
Fish Consumption				



CSLAP 2015 Lake Water Quality Summary: Somerset Lake

General Lake Information

Location	Town of Hamden
County	Delaware
Basin	Delaware River
Size	20.7 hectares (51.1 acres)
Lake Origins	Natural
Watershed Area	105.9 hectares (261.6 acres)
Retention Time	2.6 years
Mean Depth	6.1 meters
Sounding Depth	13 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To...	Humphres Brook to Delaware River
WQ Classification	B (contact recreation = swimming)
Lake Outlet Latitude	41.906
Lake Outlet Longitude	-75.231
Sampling Years	1998-2010, 2012-2015
2015 Samplers	Wil Kamp and Cheryl Stockton
Main Contact	Wil Kamp

Lake Map



Background

Somerset Lake is a 51 acre, class B lake found in the Town of Hancock in Delaware County, near the Catskill Mountains portion of New York State. It was first sampled as part of CSLAP in 1998.

It is the only CSLAP lakes among the more than 275 lakes and ponds found in Delaware County, and one of 15 CSLAP lakes among the nearly 1000 lakes and ponds in the Delaware River drainage basin.

Lake Uses

Somerset Lake is a Class B lake; this means that the best intended use for the lake is for contact recreation—swimming and bathing—and non-contact recreation—boating and aesthetics, although the lake is for aesthetics and by aquatic life. The lake is used by lake residents and invited guests for a variety of recreational purposes—the lake has no public access.

It is not known whether Somerset Lake has been stocked through any state fisheries stocking programs, or if any private stocking has occurred.

General statewide fishing regulations are applicable in Somerset Lake.

Historical Water Quality Data

CSLAP sampling was conducted on Somerset Lake from 1998-2010 and 2012 to 2015. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at <http://nysfola.mylaketown.com>. The most recent CSLAP report for Somerset Lake can also be found on the NYSDEC web page at <http://www.dec.ny.gov/lands/77875.html>.

Somerset Lake was not sampled as part of any of the major DEC monitoring programs prior to CSLAP, although the lake was sampled in 2010 by the NYSDEC as part of a lake biomonitoring study. Conductivity readings collected as part of this study found very little variability among the 10 surveyed shoreline sites—all readings were between 150 and 152 $\mu\text{mho/cm}$. The depth profile showed that the thermocline was at 6 meters, and dissolved oxygen levels approached anoxic (no oxygen) levels below 7 meters. Chloride levels (31 mg/l) may be high enough to affect aquatic life. It is not known if local monitoring has been conducted in support of resource management, such as fish stocking.

There are no RIBS monitoring sites on or near Somerset Lake, and the primary outlet (Humphres Brook) has not been sampled through any statewide monitoring programs.

Lake Association and Management History

Somerset Lake is represented by the Somerset Lake Association. It is not known to what extent the lake association is involved in lake management activities, or if the lake association maintains a website.

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual Results Relative to 1998-2014

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 – Somerset Lake” section in Appendix C.

Evaluation of Eutrophication Indicators

Water quality was probably more favorable than usual in 2015. Water clarity readings were higher than usual, most likely due to lower than normal algae levels. Algae levels have decreased slightly over the last fifteen years. Phosphorus readings were close to normal in 2015, although these readings have increased slightly over the last fifteen years.

Lake productivity typically decreases from May through June, as manifested in increasing water clarity and decreasing nutrient and algae levels, and then increases from June into the fall. In 2015, similar seasonal patterns were apparent, although the transition to increasing lake productivity occurred in July. Shoreline algae blooms have been apparent in several locations in the last few years, despite low and stable algae levels in the deep lake site. The distinction between open water and shoreline conditions was not clear at times in 2013, and no shoreline blooms were reported in 2015.

The lake continues to be characterized as *mesoligotrophic*, based on water clarity, chlorophyll *a* (both typical of *mesotrophic* lakes) and total phosphorus readings (typical of *oligotrophic* lakes), although the lake was best characterized as *mesotrophic* in 2014 and *oligotrophic* in 2015. The trophic state indices (TSI) evaluation suggests that the trophic indicators are “internally consistent,” meaning that each of the trophic indicators are in the expected range given the other indicators. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Open water algae levels are not high enough to render the lake susceptible to taste and odor compounds or elevated DBP (disinfection by product) compounds that could affect the potability of the water, although the lake is not classified for this purpose (and shoreline algae levels are at times highly elevated). The deepwater phosphorus and ammonia data indicates that any deeper intakes may be compromised for potable water use, due to depressed oxygen levels, although deepwater phosphorus readings have dropped somewhat over the last decade. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Conductivity was slightly higher than usual in 2015, and these readings (along with pH) have increased slightly in the last 10-15 years. NO_x readings have decreased slightly in recent years. None of the other limnological indicators has exhibited a long-term change. It is likely that the small changes in each of these indicators represent normal variability.

Chloride levels in the 2015 samples, conducted for the first time through CSLAP and cited in Appendix A, ranged from 37 to 39 mg/l. These values are within the range of “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 but within the range of values found in a number of NYS lakes.

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

Evaluation of Biological Condition

Limited macrophyte surveys have been conducted through CSLAP at Somerset Lake. These surveys found at least 12 aquatic plant species, including one exotic plant species (*Potamogeton crispus*, curly-leafed pondweed) and at least one protected plant species (*Stuckenia filiformis*, fineleaf pondweed). The limited dataset and modified floristic quality index (FQI) calculations indicate that the quality of the aquatic plant community is “excellent.”

The composition of the fish community is not known, although it is likely that Somerset Lake supports a coolwater or coldwater fishery. The macroinvertebrate samples collected as part of the NYSDEC biomonitoring study in 2010 have not yet been analyzed, but will likely be analyzed in 2014.

Zooplankton surveys have not been conducted through CSLAP. The fluoroprobe screening samples analyzed by SUNY ESF showed elevated algae levels in some open water and shoreline bloom samples (prior to 2015), but it is likely that only the shoreline bloom data accurately indicates a much high percentage of blue green algae. These shoreline blooms include a mix of blue green algae (*Microcystis* and *Lyngbya*, both capable of producing algal toxins) and non-blue green algae (diatoms and green algae) species. 2014 results showed a mix of algae species in the open water, with low total and blue green algae levels, and the single shoreline bloom sample was comprised primarily of small quantities of mostly green algae. Similar open water results were apparent in 2015, and no shoreline blooms were reported.

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

Evaluation of Lake Perception

Water quality assessments improve slightly in the last several years, although the lake water is frequently described as “brown”. Recreational assessments were slightly more favorable than normal in 2014 and 2015, perhaps due to a reduction in shoreline algae blooms. Aquatic plant coverage was probably close to normal, and neither plant coverage nor recreational assessments have exhibited any clear long-term patterns. None of these indicators of lake perception has exhibited any clear long-term trends.

Recreational assessments are most favorable in early summer and degrade through the rest of the summer, and plant coverage increases into late summer. In 2015, plant coverage peaked in early summer, while recreational assessments degraded in the fall. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Water temperatures in surface and bottom samples have decreased slightly since the late 1990s, although no clear changes were apparent in 2014 or 2015. It is not known if these water temperature results indicate local climate change or are indicative of a long-term 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. Fluoroprobe readings are usually below the thresholds for harmful algal blooms (HABs) in the open water, although it is not clear if the blooms reported in 2003 were in the open water or along the shoreline. Shoreline blooms have been apparent in some years, but not in 2015. An analysis of algae samples indicated microcystin levels below the levels needed to support safe swimming in the open water and shoreline blooms. However, lake residents are advised to avoid contact with surface scums or other discolored water associated with these shoreline blooms.

Lake Condition Summary

Category	Indicator	Min	Overall Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	2.15	4.51	7.90	5.45	Mesotrophic	Higher Than Normal	No Change
	Chlorophyll <i>a</i>	0.10	2.69	11.40	1.41	Mesotrophic	Lower Than Normal	No Change
	Total Phosphorus	0.003	0.010	0.021	0.010	Oligotrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.01	0.29	0.82	0.21	Elevated Deepwater NH4	Lower Than Normal	Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.002	0.115	0.313	0.121	Elevated Deepwater TP	Within Normal Range	Not known
	Nitrate + Nitrite	0.00	0.03	1.27	0.01	Low NOx	Within Normal Range	No Change
	Ammonia	0.00	0.02	0.13	0.03	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.07	0.35	2.13	0.33	Low Total Nitrogen	Within Normal Range	No Change
	pH	4.75	7.32	8.92	7.49	Circumneutral	Within Normal Range	No Change
	Specific Conductance	28	120	167	139	Softwater	Within Normal Range	No Change
	True Color	1	10	57	6	Intermediate Color	Within Normal Range	No Change
	Calcium	4.7	6.6	9.2	7.8	Not Susceptible to Zebra Mussels	Higher than Normal	No Change
Lake Perception	WQ Assessment	1	2.0	5	1.4	Not Quite Crystal Clear	More Favorable Than Normal	No Change
	Aquatic Plant Coverage	1	2.8	4	2.8	Surface Plant Growth	Within Normal Range	No Change
	Recreational Assessment	1	1.7	5	1.3	Excellent	More Favorable Than Normal	No Change
Biological Condition	Phytoplankton					Not measured through CSLAP	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					2010 samples not yet analyzed	Not known	Not known
	Fish					Coolwater or coldwater fishery?	Not known	Not known
	Invasive Species					Curly-leafed pondweed	Not known	Not known

Category	Indicator	Min	Overall Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Local Climate Change	Air Temperature	0	19.2	29	19.3		Within Normal Range	No Change
	Water Temperature	5	18.8	26	16.6		Within Normal Range	Decreasing Significantly
Harmful Algal Blooms	Open Water Phycocyanin	0	67	529	4	Some readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	69	675	1	Most readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	44	579	0	Most readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	<DL	0.5	<DL	Low to undetectable open water microcystins	Not known	Not known
	Open Water Anatoxin a	<DL	<DL	0.0	<DL	Open water Anatoxin-a at times detectable	Not known	Not known
	Shoreline Phycocyanin					No shoreline blooms sampled for PC	Not known	Not known
	Shoreline FP Chl.a	1.0	74.7	296.0		Most readings indicate high algae levels	Not known	Not known
	Shoreline FP BG Chl.a	0.0	28.0	104.3		Most readings indicate high BGA levels	Not known	Not known
	Shoreline Microcystis	<DL	0.5	1.8		Mostly undetectable shoreline bloom MC-LR	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

The 2002 NYSDEC Priority Waterbody Listings (PWL) for the Delaware River drainage basin indicate that *recreation* in Somerset Lake may be *threatened* by nuisance weed growth. The 2002 PWL listing for the lake is shown in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Somerset Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake is not classified for this use. These data suggest that any "unofficial" use of the bottom waters of the lake or within shoreline blooms for potable water may be compromised by deepwater anoxia (verified by strong sulfur smells in bottom samples), although surface waters may support this use.

Public Bathing

The CSLAP dataset at Somerset Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public swimming beach, may be *threatened* by blue green algae blooms, although these impacts are not apparent in some years. Bacterial data are needed to evaluate the safety of the lake for swimming.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Somerset Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation may be *threatened* by shoreline blooms.

Aquatic Life

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

conditions and road salt runoff. Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics and Habitat

The CSLAP dataset on Somerset Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be only *fair* due to poor lake perception associated with blue green algae blooms, particularly along the shoreline. These impacts are not apparent at all times. Habitat may only be *fair* due to invasive exotic plants, although aquatic plant surveys suggest that habitat may not be compromised by curly-leafed pondweed.

Fish Consumption

There is no fish consumption advisories posted for Somerset Lake.

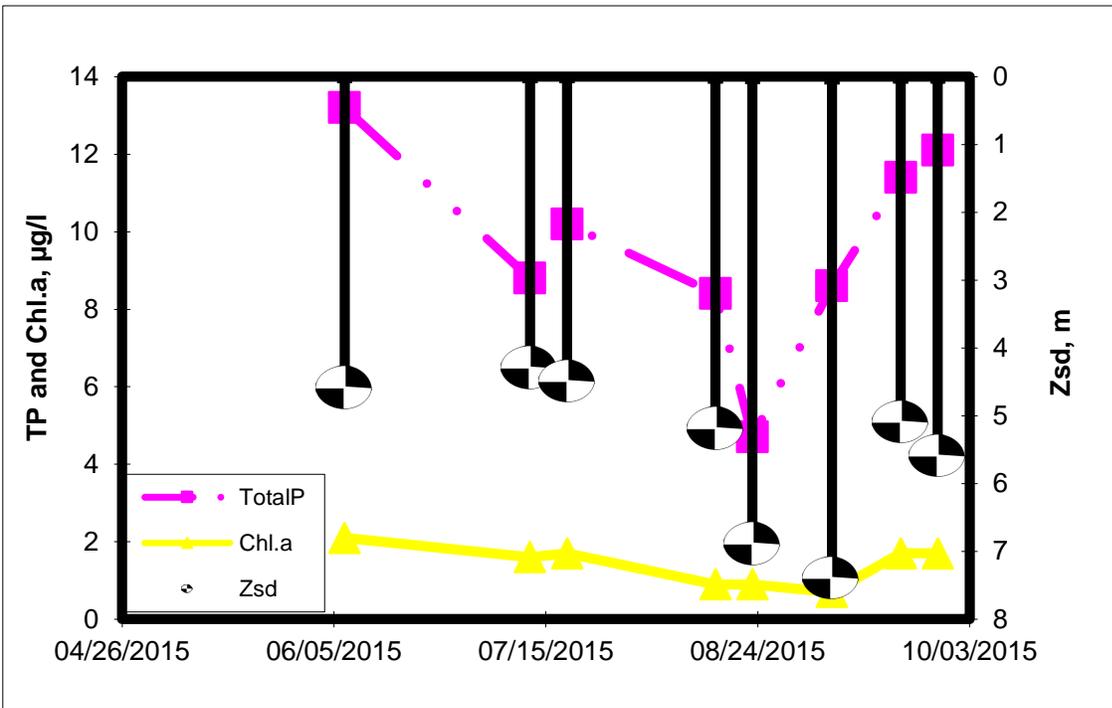
Additional Comments and Recommendations

The evaluation of the macroinvertebrate data will help to improve the evaluation of the biological condition of the lake. Lake residents should continue to report shoreline algae blooms (and distinguish these shoreline blooms from open water conditions away from the shoreline). The lake association should also investigate any sources of phosphorus entering the lake that may have contributed to the rise in surface phosphorus readings over the last 10-15 years.

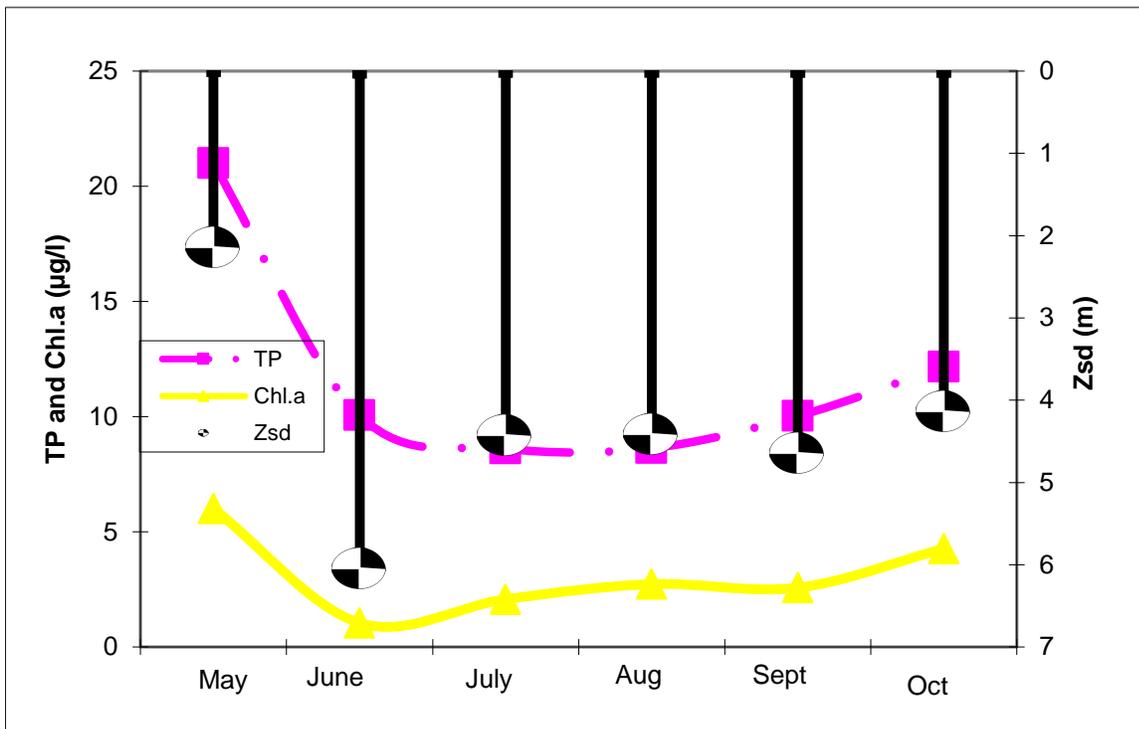
Aquatic Plant IDs-2015

No plants submitted for identification in 2015.

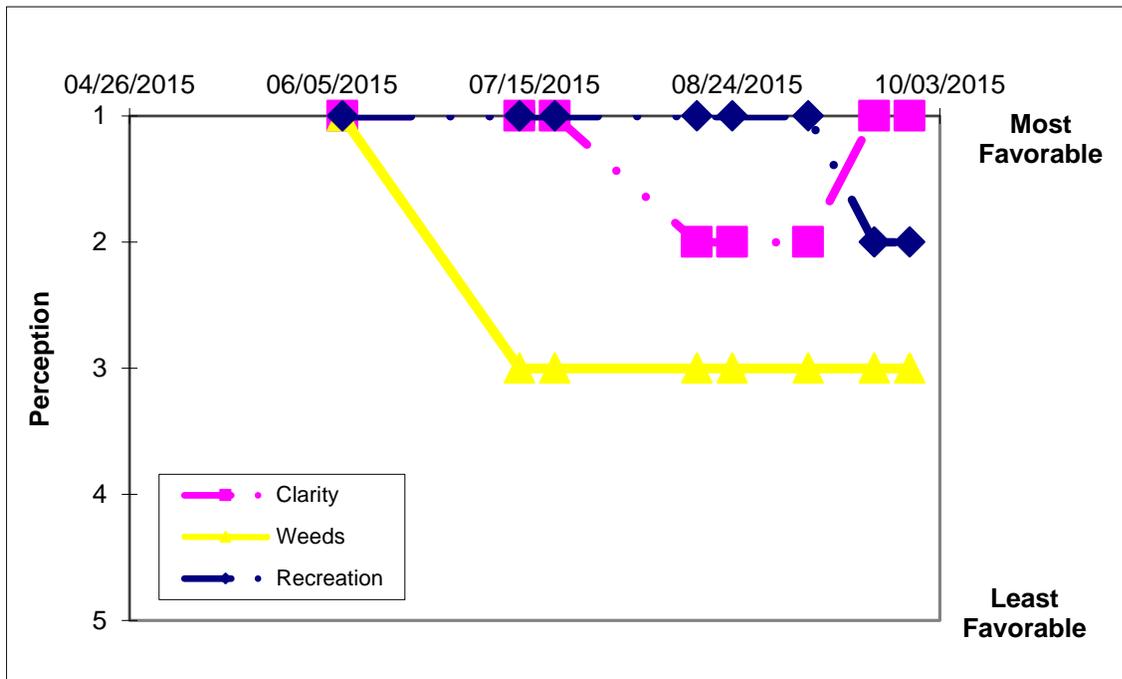
Time Series: Trophic Indicators, 2015



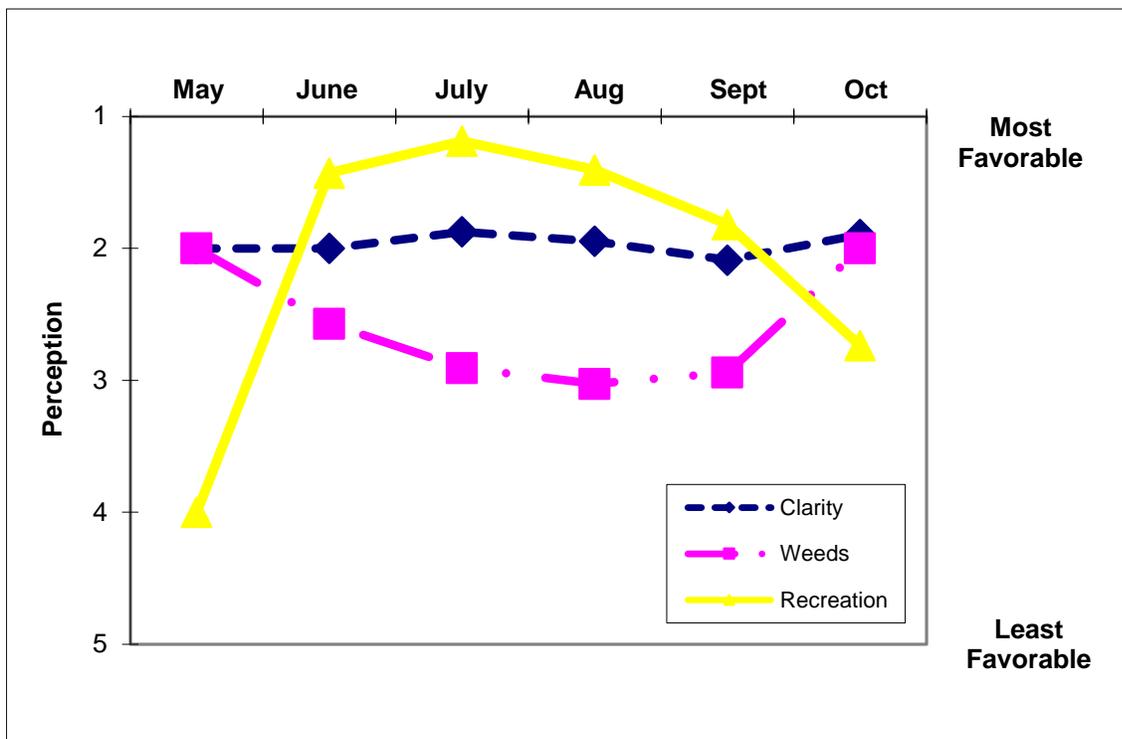
Time Series: Trophic Indicators, Typical Year (1998-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (1998-2015)



Appendix A- CSLAP Water Quality Sampling Results for Somerset Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
153	Somerset L	5/3/1998	15.0	2.15	1.5	0.021	0.01				10	6.46	132		6.01	
153	Somerset L	7/12/1998	13.1	5.30	1.5		0.01				9	7.75	123		1.84	
153	Somerset L	8/3/1998	13.9	4.45	1.5		0.01				9	6.95	126		2.05	
153	Somerset L	8/15/1998	12.4	4.05	1.5		0.01				4	6.90	127		2.31	
153	Somerset L	8/29/1998	13.9	5.55	1.5						8	7.27	129		1.49	
153	Somerset L	9/12/1998	13.6	4.65	1.5						6	6.81	131		1.91	
153	Somerset L	9/19/1998	12.0	5.30	1.5						2	7.34	132		1.54	
153	Somerset L	10/3/1998	12.4	5.40	1.5	0.013					8	6.50	133		2.94	
153	Somerset L	7/10/1999	12.0	3.05	1.5	0.007	0.01				9	6.79	147		5.30	
153	Somerset L	7/24/1999	11.0	3.65	1.5	0.006	0.01				7	6.54	145		2.62	
153	Somerset L	8/16/1999	14.0	5.75	1.5	0.004	0.01				6	7.49	149		2.20	
153	Somerset L	8/28/1999	13.3	5.28	1.5	0.005	0.01				4	6.48	141		3.82	
153	Somerset L	9/26/1999	14.6	4.50	1.5	0.010	0.01				8	7.00	152		3.08	
153	Somerset L	10/2/1999	13.0	4.90	1.5	0.013	0.01				7	6.68	150		3.48	
153	Somerset L	10/9/1999	13.5	4.55	1.5	0.016	0.01				8	6.33	148		5.40	
153	Somerset L	7/9/2000	12.5	3.25	1.5		0.01				11	6.74	139		3.58	
153	Somerset L	8/8/2000	14.0	3.15	1.5	0.007	0.01				8	7.29	140		4.54	
153	Somerset L	8/27/2000	13.9	3.85	1.5	0.009	0.01				8	7.58	141		3.98	
153	Somerset L	9/4/2000	13.7		1.5	0.007	0.01				12	7.77	139		2.74	
153	Somerset L	9/23/2000	14.0	4.00	1.5	0.013	0.01				8	7.30	141		3.57	
153	Somerset L	10/1/2000	14.2	4.15	1.5	0.010	0.01				8	7.43	143		3.10	
153	Somerset L	10/6/2000	13.8	4.10	1.5	0.010	0.01				10	7.15	144		3.98	
153	Somerset L	10/21/2000	13.2	4.30	1.5	0.014	0.01				8	7.53	145		5.05	
153	Somerset L	6/24/2001	12.9	4.85	1.5	0.007	0.01				7	7.63	153		2.72	
153	Somerset L	7/22/2001	12.4	4.50	1.5	0.008	0.01				5	7.31	153		1.35	
153	Somerset L	7/29/2001	12.3	4.90	1.5	0.011	0.01				4	6.89	157			
153	Somerset L	8/19/2001	14.0	3.75	1.5	0.010	0.01				6	7.57	156		5.35	
153	Somerset L	8/27/2001	13.0	3.55	1.5	0.008					7	7.03	154		4.42	
153	Somerset L	9/3/2001	12.8	3.45	1.5	0.012					8	7.92	153		8.45	
153	Somerset L	9/16/2001	14.5	2.85	1.5	0.011					10	6.49	153		4.49	
153	Somerset L	9/23/2001	12.0	3.45	1.5	0.010					7	7.59	153			
153	Somerset L	07/14/02	14.7	2.95	1.5	0.011	0.03	0.10	0.46	94.78	5	4.75	167		3.49	
153	Somerset L	07/28/02	14.6	2.95	1.5	0.011	0.02	0.08	0.51	105.31	26	7.34	149		5.78	
153	Somerset L	08/15/02	15.0	3.75	1.5	0.013					17	7.16	152		2.71	
153	Somerset L	08/25/02	13.0	4.60	1.5	0.011	0.00	0.05	0.55	111.38	4	6.64	152		2.41	
153	Somerset L	09/02/02	11.3	4.20	1.5		0.00	0.01	0.46		5				1.73	
153	Somerset L	09/08/02	14.3	5.35	1.5		0.00	0.02	0.44		12	7.33	153		1.82	
153	Somerset L	09/15/02	13.3	4.40	1.5	0.004	0.02	0.01	0.43	215.56	11	7.37	153		2.89	
153	Somerset L	10/06/02	15.2	4.60	1.5	0.011	0.00	0.03	0.46	91.23	10	7.12	154		6.04	
153	Somerset L	7/6/2003	12.5	4.45	1.5	0.009	1.27	0.05	2.13	518.90	16			9.2	1.12	
153	Somerset L	8/10/2003	11.0	3.45	1.5	0.008	0.04	0.02	0.28	77.64	13	7.15	130		4.39	
153	Somerset L	8/24/2003	11.5	3.85	1.5	0.003	0.00	0.00	0.31	259.07	16	7.10	132		4.09	
153	Somerset L	8/31/2003	12.7	3.50	1.5	0.010	0.00	0.01	0.27	61.31	16	5.80	141		4.98	
153	Somerset L	9/21/2003	11.7	3.10		0.014	0.02	0.01	0.50	80.27	18	7.11	129	6.8	5.05	
153	Somerset L	10/12/03	10.8	4.50	1.5		0.01	0.09	0.26		53				3.54	
153	Somerset L	10/24/03	11.0	3.15	1.5	0.015	0.01	0.04	0.19	29.10	20	7.03	135		8.02	
153	Somerset L	10/25/03	11.0	3.30	1.5	0.013	0.01	0.03	0.18	30.93	20				7.99	
153	Somerset L	7/11/2004	13.0	4.90	1.5	0.005	0.14	0.01	0.07	31.56	7	6.91	135		1.30	
153	Somerset L	7/18/2004	11.0	6.70	1.5	0.004					12	6.30	139		0.70	
153	Somerset L	7/31/2004	14.0	6.30	1.5	0.008	0.01	0.01	0.26	69.70	17	7.51	123		1.60	
153	Somerset L	8/9/2004	11.0	6.05	1.5	0.004	0.01	0.01	0.10	55.42	6	7.29	99		1.10	
153	Somerset L	8/21/2004	11.0	5.90	1.5	0.008	0.02	0.02	0.47	130.97	18	7.52	111	5.9	2.52	
153	Somerset L	8/28/2004	13.0	6.55	1.5	0.007	0.04	0.01	0.34	109.00		7.21			1.90	
153	Somerset L	9/6/2004	14.0	6.00	1.5	0.009	0.03	0.02	0.31	78.92	12	6.37	112		2.00	
153	Somerset L	10/10/2004	12.0	5.55	1.5	0.010	0.02	0.02			12	7.67	122			
153	Somerset L	7/17/2005	15.0	4.95	1.5	0.005	0.02	0.02	0.25	101.95	1	7.60	125	6.3	1.27	
153	Somerset L	8/7/2005	13.7	4.35	1.5	0.007	0.01	0.01	0.22	70.80	8	7.33	123		2.44	
153	Somerset L	8/25/2005	12.0	4.35	1.5	0.008	0.01	0.01	0.13	35.44	6	7.49	122		3.14	
153	Somerset L	9/5/2005	14.5	3.50	1.5	0.010	0.01	0.01	0.24	51.98	10	7.64	115		1.14	
153	Somerset L	9/18/2005	13.4	4.50	1.5	0.008	0.01	0.01	0.09	25.38	6	6.70	81	6.6	2.44	
153	Somerset L	9/25/2005	14.0	3.50	1.5	0.010	0.01	0.13			5	7.00	53		4.07	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
153	Somerset L	10/2/2005	12.0	3.05	1.5	0.011	0.01	0.01	0.13	26.31	6	7.92	59		1.08	
153	Somerset L	10/8/2005	13.9	3.85	1.5	0.010	0.01	0.02	0.17	36.08	3	6.60	108		4.31	
153	Somerset L	7/3/2006	9.0	3.05	1.5	0.010	0.01	0.04	0.71	150.88	28	7.13	74	4.7	0.29	
153	Somerset L	7/23/2006		3.55	1.5	0.011	0.01	0.03	0.58	118.32	57	7.47	104		0.22	
153	Somerset L	8/12/2006	12.0	3.30	1.5	0.011	0.02	0.02	0.41	84.52	9	7.13	88		3.74	
153	Somerset L	9/3/2006	11.0	3.35	1.5	0.008	0.00	0.02	0.56	154.20	17	6.74	109		0.24	
153	Somerset L	9/17/2006	13.0	4.55	1.5	0.008	0.01	0.01	0.46	124.64	6	7.93	99	5.5	1.67	
153	Somerset L	9/30/2006	14.0	2.85	1.5	0.011	0.02	0.12	0.45	87.59	9	7.00	56		2.70	
153	Somerset L	10/22/2006	11.7	5.20	1.5	0.009	0.01	0.03	0.33	82.20	3	7.27	40		1.49	
153	Somerset L	10/27/2006	9.5	3.05	1.5	0.014	0.01	0.04	0.35	52.89	15	6.30	113		1.93	
153	Somerset L	7/8/2007	13.0	4.40	1.5	0.008	0.01	0.01	0.33	92.09	4	7.95	116	6.1	2.42	
153	Somerset L	7/22/2007	9.0	4.55	1.5	0.008	0.01	0.02	0.39	104.61	17	7.84	82		0.34	
153	Somerset L	7/28/2007	15.0	3.65	1.5	0.009	0.01	0.02	0.59	143.44	18	7.08	110		4.02	
153	Somerset L	8/18/2007	11.0	4.95	1.5	0.009	0.03	0.01	0.31	78.11	6	7.80	88		1.12	
153	Somerset L	9/3/2007	10.0	6.85	1.5	0.013	0.01	0.01	0.56	93.00	10	7.69	71	6.4	1.68	
153	Somerset L	9/16/2007	14.6	5.95	1.5	0.007	0.01	0.03	0.64	205.37	7	7.61	105		1.47	
153	Somerset L	9/22/2007	13.0	5.95	1.5	0.008	0.04	0.01	0.52	145.90	9	8.35	60		1.22	
153	Somerset L	10/28/2007	8.5	4.85	1.5	0.012	0.04	0.04	0.31	58.04	13	7.39	95		0.78	
153	Somerset L	6/29/2008	15.3	6.15	1.5	0.006	0.01	0.02	0.23	83.62	9	8.02	143	5.9	0.28	
153	Somerset L	7/7/2008	13.0	6.85	1.5	0.006	0.01	0.05	0.22	81.15	8	8.05	119		1.00	
153	Somerset L	7/20/2008	12.5	6.85	1.5	0.006	0.02	0.02	0.21	78.83	9	6.99	125		1.60	
153	Somerset L	7/27/2008	11.5	4.85	1.5	0.008	0.05	0.00	0.26	71.44	4	7.46	78		3.45	
153	Somerset L	8/2/2008	10.0	4.60	1.5	0.007	0.01	0.01	0.19	65.51	9	7.32	98	6.1	3.60	
153	Somerset L	8/9/2008	13.0	4.05	1.5	0.009	0.01	0.02	0.16	42.47	8	7.66	104		3.93	
153	Somerset L	8/16/2008	10.0	4.85	1.5	0.009	0.00	0.02	0.19	44.16	6	7.81	34		1.43	
153	Somerset L	9/1/2008	10.0	5.80	1.5	0.010	0.01	0.00	0.24	49.91	19	7.82	91		0.28	
153	Somerset L	06/28/2009	11.0	7.00	1.5	0.010	0.02	0.03	0.84	191.72		7.81	113	6.9	0.10	
153	Somerset L	07/12/2009	11.5	6.60	1.5	0.006	0.00	0.01	0.22	82.31	19	7.23	133		0.21	
153	Somerset L	07/19/2009	15.0	4.75	1.5	0.008	0.00	0.01	0.11	30.68		8.03	77		0.29	
153	Somerset L	08/03/2009	14.0	4.95	1.5	0.010	0.02	0.03	0.27	61.83	17	7.80	80	8.9	1.07	
153	Somerset L	08/30/2009	12.5	4.70	1.5	0.010	0.02	0.03	0.16	34.44	19	7.75	108		0.60	
153	Somerset L	09/07/2009	15.0	3.35	1.5	0.011	0.02	0.03	0.40	77.59	17	6.03	114		2.20	
153	Somerset L	09/19/2009	12.0	4.10	1.5	0.011	0.01	0.01	0.08	16.55	14	8.19	79		1.70	
153	Somerset L	10/10/2009	11.0	3.95	1.5	0.008	0.01	0.03	0.26	68.12	5	7.07	57		1.30	
153	Somerset L	06/06/2010	12.0	5.65	1.5	0.013	0.01	0.03			9	7.88	160	4.8	0.80	
153	Somerset L	06/19/2010	11.4	6.25	1.5	0.009	0.01	0.03	0.34	79.48	7	7.47	132		0.30	
153	Somerset L	07/25/2010	12.0	4.10	1.5	0.009	0.01	0.02	0.42	99.83	10	7.88	140		1.80	
153	Somerset L	08/09/2010	11.0	4.25	1.5	0.010	0.01	0.01	0.20	45.16	9	7.62	142		1.40	
153	Somerset L	09/06/2010	11.0	4.75	1.5	0.009	0.04	0.02	0.25	59.89	5	7.36	145	7.1	1.70	
153	Somerset L	09/26/2010	12.0	4.90	1.5	0.012	0.01	0.02	0.44	78.52	5	7.03	107		1.30	
153	Somerset L	10/10/2010	11.0	3.90	1.5	0.018	0.05	0.04	0.51	63.17	14	6.95	134		6.20	
153	Somerset L	10/23/2010	11.0	2.60	1.5	0.014	0.03	0.02	0.33	53.78	16	7.48	143		11.40	
153	Somerset L	07/02/2012				bloom										
153	Somerset L	07/08/2012	12.6	3.53	1.5	0.014	0.01	0.01	0.23	36.20	8	8.25	115	6.6	7.90	
153	Somerset L	07/14/2012		3.28	1.5	0.011	0.01	0.01	0.32	67.04	10	7.49	117		1.80	
153	Somerset L	07/14/2012				bloom										
153	Somerset L	07/22/2012	13.0	3.35	1.5	0.009	0.01	0.02	0.22	51.96	10	8.60	118		0.90	
153	Somerset L	07/22/2012				bloom										
153	Somerset L	08/05/2012	11.0	2.95	1.5	0.015	0.01	0.03	0.26	37.78	9	8.22	115		5.10	
153	Somerset L	08/05/2012				bloom										
153	Somerset L	08/12/2012	14.0	4.25	1.5	0.010	0.02	0.03	0.37	77.63	9	6.64	118	6.8	1.00	
153	Somerset L	08/21/2012	10.0	4.15	1.5	0.010	0.01	0.01	0.22	48.22	10	7.95	59		2.20	
153	Somerset L	08/21/2012				bloom										
153	Somerset L	09/10/2012	13.0	5.35	1.5	0.010	0.01	0.03	0.20	45.83	8	7.44	106		1.60	
153	Somerset L	09/10/2012				bloom										
153	Somerset L	10/08/2012	10.0	3.95	1.5	0.008	0.01	0.01	0.23	59.90	9	6.94	113		3.10	
153	Somerset L	10/08/2012				bloom										
153	Somerset L	07/07/2013	15.0	6.10	1.5	0.009	0.03	0.03	0.20	49.32	10	7.64	110		0.20	
153	Somerset L	07/07/2013				bloom										
153	Somerset L	07/28/2013	15.0	4.20	1.5	0.008			0.36	103.55	15	8.53	98			
153	Somerset L	07/28/2013				bloom										
153	Somerset L	08/05/2013	13.0	4.10	1.5	0.011	0.01	0.02	0.22	45.05	8	8.92	144		0.50	
153	Somerset L	08/05/2013				bloom										
153	Somerset L	08/05/2013				bloom										
153	Somerset L	08/11/2013	10.0	4.25	1.5	0.013			0.39	68.73	11	6.83	114		2.70	
153	Somerset L	08/18/2013	11.0	4.55	1.5	0.011	0.01	0.01	0.56	118.17	11	7.16	118		3.20	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
153	Somerset L	08/18/2013			bloom											
153	Somerset L	08/25/2013	11.0	5.00	1.5	0.003			0.38	251.37	15	7.10	91		1.20	
153	Somerset L	08/25/2013			bloom											
153	Somerset L	09/15/2013	14.0	5.95	1.5	0.010	0.01	0.01	0.33	74.93	10	7.16	119		2.60	
153	Somerset L	09/15/2013			bloom											
153	Somerset L	09/29/2013	11.0	7.00	1.5	0.009			0.94	227.01	5	6.95	28		1.20	
153	Somerset L	6/1/2014	10.7	7.90	1.5	0.012	0.03	0.05	0.34	63.72	13	7.70	130	6.5	1.00	
153	Somerset L	6/1/2014			bloom											
153	Somerset L	7/6/2014	14.0	3.05	1.5	0.013			0.41	71.20	8	7.21	129		2.00	
153	Somerset L	7/20/2014	11.0	2.95	1.5	0.012	0.01	0.01	0.26	48.93	9	7.66	70		2.60	
153	Somerset L	8/3/2014	11.0	2.95	1.5	0.010			0.28	62.37	7	7.59	129		3.70	
153	Somerset L	8/10/2014	12.0	3.05	1.5	0.011	0.01	0.03	0.44	91.56	10	7.76	130	6.3	4.70	
153	Somerset L	8/24/2014	11.7	3.65	1.5	0.012			0.38	68.68	13	7.13	94		3.70	
153	Somerset L	9/1/2014	12.2	3.40	1.5	0.013	0.01	0.01	0.40	69.12	6	7.67	126		5.20	
153	Somerset L	9/14/2014	11.0	3.10	1.5	0.013			0.33	56.02	6	7.26	128		9.70	
153	Somerset L	6/7/2015	11.8	4.60	1.5	0.013	0.01	0.02	0.22	16.82	10	7.34	153	8.0	2.10	
153	Somerset L	7/12/2015	14.0	4.30	1.5	0.009			0.33	37.73	10	7.77	89		1.60	
153	Somerset L	7/19/2015	14.9	4.50	1.5	0.010	0.01	0.04			8	7.20	151		1.70	37.6
153	Somerset L	8/16/2015	13.0	5.20	1.5	0.008			0.46	55.00	4	7.59	118	7.6	0.90	
153	Somerset L	8/23/2015	11.0	6.90	1.5	0.005	0.01	0.03	0.27	57.87	7	8.14	163		0.90	
153	Somerset L	9/7/2015	14.0	7.40	1.5	0.009			0.23	26.86	5	7.25	148		0.70	
153	Somerset L	9/20/2015	11.0	5.10	1.5	0.011	0.00	0.03	0.45	39.04	3	7.34	166		1.70	39.0
153	Somerset L	9/27/2015	12.0	5.60	1.5	0.012			0.36	29.75	2	7.25	121		1.70	
153	Somerset L	8/15/1998	12.4		11.0	0.198										
153	Somerset L	8/29/1998	13.9		11.0	0.164										
153	Somerset L	9/12/1998	13.6		11.0	0.250										
153	Somerset L	9/19/1998	12.0		11.0	0.160										
153	Somerset L	07/14/02	14.7	2.95	13.0	0.098	0.01	0.54								
153	Somerset L	07/28/02	14.6	2.95	13.0	0.078	0.00	0.33	0.78	21.97						
153	Somerset L	08/15/02	15.0	3.75	14.0	0.132										
153	Somerset L	08/25/02	13.0	4.60	12.0	0.140	0.00	0.66	0.96	15.05						
153	Somerset L	09/02/02	11.3	4.20	10.0	0.079	0.00	0.39	0.79	22.04						
153	Somerset L	09/08/02	14.3	5.35	13.0	0.137	0.00	0.63	1.04	16.72						
153	Somerset L	09/15/02	13.3	4.40	12.0	0.123	0.02	0.20	0.99	17.69						
153	Somerset L	10/06/02	15.2	4.60	13.0	0.026	0.00	0.20	0.58	48.30						
153	Somerset L	7/6/2003			10.0	0.083	0.34	0.49	0.97	25.64						
153	Somerset L	8/10/2003			10.0	0.078	0.03	0.33	0.23	6.35						
153	Somerset L	8/24/2003			11.5	0.045	0.00	0.17	0.11	5.28						
153	Somerset L	8/31/2003			11.0	0.127	0.01	0.53	0.45	7.78						
153	Somerset L	9/21/2003				0.146	0.02	0.51	0.47	7.07						
153	Somerset L	10/12/03			9.0	0.086	0.01	0.34	0.15	3.70						
153	Somerset L	10/24/03			10.0	0.146	0.00	0.78	0.70	10.54						
153	Somerset L	10/25/03			10.0	0.151	0.01	0.64	0.55	8.05						
153	Somerset L	7/11/2004				0.150	0.02	0.38	0.43	6.37						
153	Somerset L	7/18/2004			10.0	0.070	0.01	0.19	0.59	18.40						
153	Somerset L	7/31/2004			12.0	0.087	0.02	0.24	0.57	14.40						
153	Somerset L	8/9/2004			10.0	0.083	0.04	0.25								
153	Somerset L	8/21/2004			10.0	0.046	0.01	0.31	0.75	35.89						
153	Somerset L	8/28/2004			12.0	0.239	0.01	0.65								
153	Somerset L	9/6/2004			13.0	0.239	0.01	0.61	0.38	3.45						
153	Somerset L	10/10/2004			11.0	0.279	0.01	0.82								
153	Somerset L	7/17/2005			14.0	0.170										
153	Somerset L	8/7/2005			12.7	0.185										
153	Somerset L	8/25/2005				0.198										
153	Somerset L	9/5/2005			13.5	0.280										
153	Somerset L	9/18/2005			12.0	0.097										
153	Somerset L	9/25/2005			13.0	0.313										
153	Somerset L	10/2/2005			11.0	0.203										
153	Somerset L	10/8/2005			12.0	0.223										
153	Somerset L	7/3/2006	9.0		8.0	0.044										
153	Somerset L	7/23/2006			10.0	0.027										
153	Somerset L	8/12/2006	12.0		11.0	0.137										
153	Somerset L	9/3/2006	11.0		10.0	0.053										
153	Somerset L	9/17/2006	13.0		12.0	0.285										
153	Somerset L	9/30/2006	14.0		13.0	0.308										
153	Somerset L	10/22/2006	11.7		10.7	0.078										

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4							NO2
153	Somerset L	10/27/2006	9.5		8.5	0.016									
153	Somerset L	7/8/2007	13.0		12.0	0.100									
153	Somerset L	7/22/2007	9.0		8.0	0.029									
153	Somerset L	7/28/2007	15.0		14.0	0.214									
153	Somerset L	8/18/2007	11.0		10.0	0.021									
153	Somerset L	9/3/2007	10.0		9.0	0.114									
153	Somerset L	9/16/2007	14.6		13.0	0.288									
153	Somerset L	9/22/2007	13.0		12.0	0.110									
153	Somerset L	6/29/2008	15.3		14.3	0.206									
153	Somerset L	7/7/2008	13.0		12.0	0.165									
153	Somerset L	7/20/2008	12.5		11.5	0.216									
153	Somerset L	7/27/2008	11.5		10.5	0.034									
153	Somerset L	8/2/2008	10.0		9.0	0.030									
153	Somerset L	8/9/2008	13.0		12.0	0.129									
153	Somerset L	8/16/2008	10.0		10.0	0.033									
153	Somerset L	9/1/2008	10.0		9.0	0.050									
153	Somerset L	06/28/2009	11.0		10.0	0.031		0.11							
153	Somerset L	07/12/2009	11.5		10.0	0.041		0.15							
153	Somerset L	07/19/2009	15.0		14.0	0.124		0.39							
153	Somerset L	08/03/2009	14.0		13.0	0.095		0.01							
153	Somerset L	08/30/2009	12.5		11.5	0.154		0.22							
153	Somerset L	09/07/2009	15.0		13.0	0.215		0.46							
153	Somerset L	09/19/2009	12.0		11.0	0.100		0.22							
153	Somerset L	10/10/2009	11.0		10.0	0.039		0.09							
153	Somerset L	6/6/2010	12.0		11.0	0.027		0.08							
153	Somerset L	6/19/2010	11.4		10.0	0.026		0.10							
153	Somerset L	7/25/2010	12.0		11.0	0.034		0.09							
153	Somerset L	8/9/2010	11.0		10.0	0.013		0.02							
153	Somerset L	9/6/2010	11.0		10.0	0.123		0.03							
153	Somerset L	9/26/2010	12.0		11.0	0.117		0.11							
153	Somerset L	10/10/2010	11.0		10.0	0.046		0.07							
153	Somerset L	10/23/2010	11.0		10.0	0.036		0.06							
153	Somerset L	7/8/2012			11.5	0.085		0.20						0.00	
153	Somerset L	7/14/2012			11.0	0.044		0.16						0.00	
153	Somerset L	7/22/2012			12.0	0.121		0.29						0.00	
153	Somerset L	8/5/2012			7.0	0.057		0.09						0.00	
153	Somerset L	8/12/2012			13.0	0.002		0.30						0.00	
153	Somerset L	8/21/2012			9.0	0.036		0.01						0.00	
153	Somerset L	9/10/2012			12.0	0.230		0.48						0.00	
153	Somerset L	10/8/2012			9.0	0.021		0.01						0.00	
153	Somerset L	7/7/2013			14.0	0.071		0.25							
153	Somerset L	7/28/2013			14.0	0.189									
153	Somerset L	8/5/2013			12.0	0.186		0.39							
153	Somerset L	8/11/2013			9.0	0.067									
153	Somerset L	8/18/2013			10.0	0.009		0.02							
153	Somerset L	8/25/2013			10.0	0.023									
153	Somerset L	9/15/2013			13.0	0.215		0.37							
153	Somerset L	9/29/2013			10.0	0.054									
153	Somerset L	6/1/2014			9.7	0.044		0.14							
153	Somerset L	7/6/2014			13.0	0.155									
153	Somerset L	7/20/2014			10.0	0.058		0.11							
153	Somerset L	8/3/2014			10.0	0.042									
153	Somerset L	8/10/2014			11.0	0.141		0.47							
153	Somerset L	8/24/2014			10.7	0.060									
153	Somerset L	9/1/2014			11.0	0.139		0.34							
153	Somerset L	9/14/2014			10.0	0.056									
153	Somerset L	6/7/2015			10.8	0.102		0.27							
153	Somerset L	7/12/2015			13.0	0.134									
153	Somerset L	7/19/2015			14.0	0.018		0.41							
153	Somerset L	8/16/2015			12.0	0.115									
153	Somerset L	8/23/2015			10.0	0.065		0.05							
153	Somerset L	9/7/2015			13.0	0.201									
153	Somerset L	9/20/2015			10.0	0.182		0.11							
153	Somerset L	9/27/2015			11.0	0.150									

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
153	Somerset L	5/3/1998	epi	20	17	2	2	4	56											
153	Somerset L	7/12/1998	epi	27	23	2	3	2	2											
153	Somerset L	8/3/1998	epi	26	26	2	3	2	2											
153	Somerset L	8/15/1998	epi	20	25	2	3	3	25											
153	Somerset L	8/29/1998	epi	17	23	2	3	2	2											
153	Somerset L	9/12/1998	epi	14	21	3	3		25											
153	Somerset L	9/19/1998	epi	16	21	3	3	3	25											
153	Somerset L	10/3/1998	epi	7	17	3	3	4	25											
153	Somerset L	7/10/1999	epi	23	25	2	3	1												
153	Somerset L	7/24/1999	epi	23	26	3	3	1												
153	Somerset L	8/16/1999	epi	19	24	3	3	1												
153	Somerset L	8/28/1999	epi	19	23	2	3	2	5											
153	Somerset L	9/26/1999	epi	17	18	2	3	2												
153	Somerset L	10/2/1999	epi	13	16	2	3	2	5											
153	Somerset L	10/9/1999	epi	13	14	2	3	2	5											
153	Somerset L	7/9/2000	epi	22	23	2	3	2												
153	Somerset L	8/8/2000	epi	27	24	1	3	1												
153	Somerset L	8/27/2000	epi	24	22	2	3	1												
153	Somerset L	9/4/2000	epi	25	24	2	3	2												
153	Somerset L	9/23/2000	epi	11	19	1	3	2	5											
153	Somerset L	10/1/2000	epi	12	17	1	3	2	6											
153	Somerset L	10/6/2000	epi	8	15	2	3	2	5											
153	Somerset L	10/21/2000	epi	9	13	2	3	2	6											
153	Somerset L	6/24/2001	epi	17	22	2	3	2	2											
153	Somerset L	7/22/2001	epi	24	25	2	3	1												
153	Somerset L	7/29/2001	epi	22	24	2	3	1												
153	Somerset L	8/19/2001	epi	25	25	3	3	2												
153	Somerset L	8/27/2001	epi	21	23	2	3	2												
153	Somerset L	9/3/2001	epi	22	24	2	3	1												
153	Somerset L	9/16/2001	epi	13	18	2	3	2	5											
153	Somerset L	9/23/2001	epi	15	19	2	3	2												
153	Somerset L	07/14/02	epi	26	25	2	3	1												
153	Somerset L	07/28/02	epi	24	24	2	3	1												
153	Somerset L	08/15/02	epi	28	25															
153	Somerset L	08/25/02	epi	23	24	2	3	1												
153	Somerset L	09/02/02	epi	22	21	2	4	1												
153	Somerset L	09/08/02	epi	28	22	2	3	1												
153	Somerset L	09/15/02	epi	22	21	2	3	3	5											
153	Somerset L	10/06/02	epi	15	17															
153	Somerset L	7/6/2003	epi	27	25	1	3	1	0											
153	Somerset L	8/10/2003	epi	23	25	2	4	1	0											
153	Somerset L	8/24/2003	epi	20	24	2	4	1	5											
153	Somerset L	8/31/2003	epi	15	23	2	3	1	0											
153	Somerset L	9/21/2003	epi	18	20	2	3	1	5											
153	Somerset L	10/12/03	epi	17	15	2	2	1	8											
153	Somerset L	10/24/03	epi	4	9	2	1	1	5											
153	Somerset L	10/25/03	epi	0	9	1	1	1	5											
153	Somerset L	7/11/2004	epi	24	23	3	3	1	0											
153	Somerset L	7/18/2004	epi	20	22	3	3	2	5											
153	Somerset L	7/31/2004	epi	23	22															
153	Somerset L	8/9/2004	epi	22	22	1	3	1	0											
153	Somerset L	8/21/2004	epi	17	22	1	3	2	5											
153	Somerset L	8/28/2004	epi		23	2	3	1	0											
153	Somerset L	9/6/2004	epi	16	21	2	3	1	0											
153	Somerset L	10/10/2004	epi	12	15	2	3	4	5											
153	Somerset L	7/17/2005	epi	29	23	1	2	2	5											
153	Somerset L	8/7/2005	epi	26	24	1	3	1	0											
153	Somerset L	8/25/2005	epi	22	22	1	3	1												
153	Somerset L	9/5/2005	epi	25	22	3	3	1	0											
153	Somerset L	9/18/2005	epi		22	2	3	1	0											
153	Somerset L	9/25/2005	epi	16	19	2	3	2	0											

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QE	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
153	Somerset L	10/2/2005	epi	18	17	1	1	1	5											
153	Somerset L	10/8/2005	epi	12	16	2	2	4	5											
153	Somerset L	7/3/2006	epi	28	24	2	3	1	0											
153	Somerset L	7/23/2006	epi	23	24	2	3	1	0											
153	Somerset L	8/12/2006	epi	20	19															
153	Somerset L	9/3/2006	epi	15	14	2	3	2	5											
153	Somerset L	9/17/2006	epi	22	15	2	3	1	0											
153	Somerset L	9/30/2006	epi	8	10	2	3	3	5											
153	Somerset L	10/22/2006	epi	8	6	2	2	3	5											
153	Somerset L	10/27/2006	epi	6	5	2	1	5	5											
153	Somerset L	7/8/2007	epi	28	18	2	3	1	0											
153	Somerset L	7/22/2007	epi	24	26	2	4	1	0											
153	Somerset L	7/28/2007	epi	25	20	2	3	1	0											
153	Somerset L	8/18/2007	epi	17	19	3	3	3	5											
153	Somerset L	9/3/2007	epi	24	17	1	3	1	0											
153	Somerset L	9/16/2007	epi	9	15	2	2	3	5											
153	Somerset L	9/22/2007	epi	26	15	3	3	2	5											
153	Somerset L	10/28/2007	epi	4	8	3	2	5	5											
153	Somerset L	7/7/2008	epi	25	18	1	2	1	0											
153	Somerset L	7/20/2008	epi	27	21	1	3	1	0											
153	Somerset L	7/27/2008	epi	27	21	1	2	1	0											
153	Somerset L	8/2/2008	epi	25	20	1	2	1	0											
153	Somerset L	8/9/2008	epi	20	20	1	3	1	0											
153	Somerset L	8/16/2008	epi	20	18	2	3	1	0											
153	Somerset L	9/1/2008	epi	21	18	2	2	1	0											
153	Somerset L	7/7/2008	epi	19	16															
153	Somerset L	06/28/2009	epi	23	19	1	3	1	0											
153	Somerset L	07/12/2009	epi	16	17	1	3	1	0											
153	Somerset L	07/19/2009	epi	21	18	1	3	1	0											
153	Somerset L	08/03/2009	epi	25	19	1	3	1	0											
153	Somerset L	08/30/2009	epi	20	17	1	2	1	0											
153	Somerset L	09/07/2009	epi	16	16	2	3	1	5											
153	Somerset L	09/19/2009	epi	15	14	2	3	2	5											
153	Somerset L	10/10/2009	epi	9	9	2	2	2	5											
153	Somerset L	06/06/2010	epi	17	19	5	3	2	5											
153	Somerset L	06/19/2010	epi	27	17	3	3	1												
153	Somerset L	07/25/2010	epi	22	21	3	3	1												
153	Somerset L	08/09/2010	epi	28	20	2	3	1	0											
153	Somerset L	09/06/2010	epi	19	16	3	2	1	0											
153	Somerset L	09/26/2010	epi	16	15	3	3	3	0											
153	Somerset L	10/10/2010	epi	14	11	2	1	2	5											
153	Somerset L	10/23/2010	epi	11	8	2	1	4	5											
153	Somerset L	07/02/2012	bloom											<0.3	<0.820	106.00	71.00			F
153	Somerset L	07/08/2012	epi	26	21	2	3	2	0	4	4	11.30	1.70	<0.3	<0.392	222.00	107.00	11.30		FG
153	Somerset L	07/14/2012	epi	28	21	3	3	1	0	4	0	14.70	1.70	<0.3	<0.423	280.00	85.00	14.70		FI
153	Somerset L	07/14/2012	bloom											0.66	<0.784	158.70	57.30			F
153	Somerset L	07/22/2012	epi	22	20	3	3	1	0	4	0	79.60	5.70	<0.30	<0.585	47.21	12.20	79.60		I
153	Somerset L	07/22/2012	bloom											<0.60	<0.657	14.90	6.90			E
153	Somerset L	08/05/2012	epi	22	20	2	4	3	5	0	0	8.20	0.90	<0.30	<0.659	11.85	1.11	8.20		F
153	Somerset L	08/05/2012	bloom											0.64	<1.318	8.49	0.41			
153	Somerset L	08/12/2012	epi	25	20	2	3	3	0	234	0	461.30	14.20	<0.30	<0.537			461.30		F
153	Somerset L	08/21/2012	epi	22	18	3	3	2	0	4	0	194.8	17.00	<0.30	<3.163	675.00	578.50			FH
153	Somerset L	08/21/2012	bloom											<0.60	<0.446	2.52	0.62			H
153	Somerset L	09/10/2012	epi	17	15	2	3	2	5	4	0	301.70	13.10	<0.30	<0.725			301.70		F
153	Somerset L	09/10/2012	bloom											0.07	<0.111					
153	Somerset L	10/08/2012	epi	4	10	1	1	5	5	4	4	85.00	4.90	<0.30	<3.205	30.75	8.40	85.00		F
153	Somerset L	10/08/2012	bloom											<0.60	<2.681	53.62	15.06			
153	Somerset L	07/07/2013	epi	28	22	2	3	1	0	0	0		22.20	<0.30	<0.910		306.10	290.00		F
153	Somerset L	07/07/2013	bloom											1.53	<0.239		65.30	27.20	abcdefgh	
153	Somerset L	07/28/2013	epi	20	19	2	3	2	5	0	0			<0.30	<0.400		296.00	104.30		H H
153	Somerset L	07/28/2013	bloom									529.40	33.00	<0.90	<1.150		141.80	67.50		

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QE	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
153	Somerset L	08/05/2013	epi	19	18	2	3	1	0	4	0	307.60	30.10	<0.30	<0.390		251.80	112.30	l	
153	Somerset L	08/05/2013	bloom											<0.60	<0.800		123.00	41.30	h	
153	Somerset L	08/05/2013	bloom											<0.60	<0.770		1.90	0.00		
153	Somerset L	08/11/2013	epi	20	17	2	3	1	0	0	0			<0.30	<0.380		102.50	26.80	H	
153	Somerset L	08/18/2013	epi	16	15	3	3	1	0	0	0	3.60	2.30	<0.30	<0.390		2.30	0.00	ei	
153	Somerset L	08/18/2013	bloom											<0.60	<0.760		1.00	0.00	i	
153	Somerset L	08/25/2013	epi	23	19	3	3	1	0	0	0	1.30	0.60	0.30	<0.570		0.60	0.30	l	
153	Somerset L	08/25/2013	bloom											1.03	<1.940		20.50	6.30	e	
153	Somerset L	09/15/2013	epi	10	15	2	3	3	5	0	0	1.30	1.10	<0.30	<0.100		0.50	0.00	H	H
153	Somerset L	09/15/2013	bloom											0.76	<2.200		205.50	76.80		
153	Somerset L	09/29/2013	epi	11	13	2	2	3	5	0	0	1.40	0.80	<0.30	<10.600		0.40	0.00	l	
153	Somerset L	6/1/2014	epi	20	14	1	3	2	8	4	0	0.10	0.60	<0.53	<0.40	<0.001	0.38	0.00	i	i
153	Somerset L	6/1/2014	epi											<1.07	<0.17	<0.002	4.12	0.00		a
153	Somerset L	7/6/2014	epi		23	2	3	1	0	0	0	1.90	0.50	<0.62	<0.03	<0.002	1.50	0.00	f	f
153	Somerset L	7/20/2014	epi		19	1	2	1	0	0	0	5.10	0.20	<0.39	<0.03	<0.001	1.31	0.22	f	f
153	Somerset L	8/3/2014	epi	22	18	2	3	1	0	0	0	1.60	0.50	<0.33	<0.01	<0.002	2.27	0.00	f	f
153	Somerset L	8/10/2014	epi	20	19	2	3	1	0	0	0	1.80	0.50				0.94	0.00	f	f
153	Somerset L	8/24/2014	epi		17	2	3	1	0	0	0	13.50	0.50	<0.26	<0.10	<0.002	3.38	0.25	f	f
153	Somerset L	9/1/2014	epi	24	17	2	3	1	0	0	0	7.00	0.40	<0.25	<0.14	<0.002	2.50	0.46	f	f
153	Somerset L	9/14/2014	epi	12	14	3	3	2	5	0	0	36.70	0.40	<0.24	<0.03	<0.001	7.69	6.15	f	f
153	Somerset L	6/7/2015	epi	20	15	1	1	1	0	0	0	3.80	0.30	<0.77	<0.126	<1.739	1.11	0.08	l	l
153	Somerset L	7/12/2015	epi	23	18	1	3	1	0	0	0	6.00	0.60	<1.01	<0.003	<0.011	2.09	0.00	H	l
153	Somerset L	7/19/2015	epi	25	18	1	3	1	0	0	0	3.80	0.40	<0.30	<0.009	<0.049	0.67	0.00	l	l
153	Somerset L	8/16/2015	epi	19	17	2	3	1	0	0	0	5.10	0.60	<0.44	<0.002	<0.014	0.40	0.00	F	l
153	Somerset L	8/23/2015	epi	21	18	2	3	1	0	0	0	6.40	0.30	<0.21	<0.003	<0.010	0.45	0.00	l	l
153	Somerset L	9/7/2015	epi	22	18	2	3	1	0	0	0			<0.40	<0.004	<0.012	0.49	0.00	l	l
153	Somerset L	9/20/2015	epi	14	15	1	3	2	5	0	0	1.50	0.20	<0.39	<0.009	<0.022	0.58	0.00	l	l
153	Somerset L	9/27/2015	epi	10	14	1	3	2	5	0	0	3.20	0.40	<0.30	0.01	<0.086	0.46	0.00	l	l
153	Somerset L	8/15/1998	hypo		8															
153	Somerset L	8/29/1998	hypo		10	2	3	2	0	4	4									
153	Somerset L	07/14/02	hypo	26	11	2	3	1												
153	Somerset L	07/28/02	hypo	24	12	2	3	1												
153	Somerset L	08/15/02	hypo	28	10															
153	Somerset L	08/25/02	hypo	23	10	2	3	1												
153	Somerset L	09/02/02	hypo	22	10	2	4	1												
153	Somerset L	09/08/02	hypo	28	11	2	3	1												
153	Somerset L	09/15/02	hypo	22	11	2	3	3	5											
153	Somerset L	10/06/02	hypo	15	10															
153	Somerset L	7/6/2003	hypo		8															
153	Somerset L	8/10/2003	hypo		8															
153	Somerset L	8/24/2003	hypo		9															
153	Somerset L	8/31/2003	hypo		9															
153	Somerset L	9/21/2003	hypo		9															
153	Somerset L	10/12/03	hypo		9															
153	Somerset L	10/24/03	hypo		6															
153	Somerset L	10/25/03	hypo		6															
153	Somerset L	7/18/2004	hypo		9															
153	Somerset L	7/31/2004	hypo		9															
153	Somerset L	8/9/2004	hypo		9															
153	Somerset L	8/21/2004	hypo		9															
153	Somerset L	8/28/2004	hypo		9															
153	Somerset L	9/6/2004	hypo		9															
153	Somerset L	10/10/2004	hypo		7															
153	Somerset L	7/17/2005	hypo		7															
153	Somerset L	8/7/2005	hypo		7															
153	Somerset L	9/5/2005	hypo		8															
153	Somerset L	9/18/2005	hypo		9															
153	Somerset L	9/25/2005	hypo		7															
153	Somerset L	10/2/2005	hypo		9															
153	Somerset L	10/8/2005	hypo		8															
153	Somerset L	7/3/2006	hypo		11															

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153	Somerset L	7/23/2006	hypo		11															
153	Somerset L	8/12/2006	hypo		5															
153	Somerset L	9/3/2006	hypo		5															
153	Somerset L	9/17/2006	hypo		3															
153	Somerset L	9/30/2006	hypo		3															
153	Somerset L	10/22/2006	hypo		4															
153	Somerset L	10/27/2006	hypo		4															
153	Somerset L	7/8/2007	hypo		2															
153	Somerset L	7/22/2007	hypo		4															
153	Somerset L	7/28/2007	hypo		4															
153	Somerset L	8/18/2007	hypo		6															
153	Somerset L	9/3/2007	hypo		4															
153	Somerset L	9/16/2007	hypo		3															
153	Somerset L	9/22/2007	hypo		4															
153	Somerset L	6/29/2008	hypo		2															
153	Somerset L	7/7/2008	hypo		2															
153	Somerset L	7/20/2008	hypo		3															
153	Somerset L	7/27/2008	hypo		5															
153	Somerset L	8/2/2008	hypo		5															
153	Somerset L	8/9/2008	hypo		3															
153	Somerset L	8/16/2008	hypo		5															
153	Somerset L	9/1/2008	hypo		6															
153	Somerset L	06/28/2009	hypo		4															
153	Somerset L	07/12/2009	hypo		4															
153	Somerset L	07/19/2009	hypo		4															
153	Somerset L	08/03/2009	hypo		6															
153	Somerset L	08/30/2009	hypo		4															
153	Somerset L	09/07/2009	hypo		4															
153	Somerset L	09/19/2009	hypo		4															
153	Somerset L	10/10/2009	hypo		4															
153	Somerset L	6/6/2010	hypo		7															
153	Somerset L	6/19/2010	hypo		9															
153	Somerset L	7/25/2010	hypo		7															
153	Somerset L	8/9/2010	hypo		9															
153	Somerset L	9/6/2010	hypo		8															
153	Somerset L	9/26/2010	hypo		8															
153	Somerset L	10/10/2010	hypo		9															
153	Somerset L	10/23/2010	hypo		5															
153	Somerset L	7/8/2012	hypo		5															
153	Somerset L	7/14/2012	hypo		5															
153	Somerset L	7/22/2012	hypo		5															
153	Somerset L	8/5/2012	hypo		7															
153	Somerset L	8/12/2012	hypo		7															
153	Somerset L	8/21/2012	hypo		7															
153	Somerset L	9/10/2012	hypo		5															
153	Somerset L	10/8/2012	hypo		5															
153	Somerset L	7/7/2013	hypo		5															
153	Somerset L	7/28/2013	hypo		5															
153	Somerset L	8/5/2013	hypo		4															
153	Somerset L	8/11/2013	hypo		5															
153	Somerset L	8/18/2013	hypo		5															
153	Somerset L	8/25/2013	hypo		5															
153	Somerset L	9/15/2013	hypo		4															
153	Somerset L	9/29/2013	hypo		5															
153	Somerset L	6/1/2014	hypo		5															
153	Somerset L	7/6/2014	hypo		5															
153	Somerset L	7/20/2014	hypo		6															
153	Somerset L	8/3/2014	hypo		6															
153	Somerset L	8/10/2014	hypo		4															
153	Somerset L	8/24/2014	hypo		6															
153	Somerset L	9/1/2014	hypo		7															

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QE	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
153	Somerset L	9/14/2014	hypo		6															
153	Somerset L	6/7/2015	hypo		4															
153	Somerset L	7/12/2015	hypo																	
153	Somerset L	7/19/2015	hypo		5															
153	Somerset L	8/16/2015	hypo		6															
153	Somerset L	8/23/2015	hypo		4															
153	Somerset L	9/7/2015	hypo		6															
153	Somerset L	9/20/2015	hypo		7															
153	Somerset L	9/27/2015	hypo		5															

Legend Information

<i>Indicator</i>	<i>Description</i>	<i>Detection Limit</i>	<i>Standard (S) / Criteria (C)</i>
General Information			
Lnum	lake number (unique to CSLAP)		
Lname	name of lake (as it appears in the Gazetteer of NYS Lakes)		
Date	sampling date		
Field Parameters			
Zbot	lake depth at sampling point, meters (m)		
Zsd	Secchi disk transparency or clarity	0.1m	1.2m (C)
Zsamp	water sample depth (m) (epi = epilimnion or surface; bot = bottom)	0.1m	none
Tair	air temperature (C)	-10C	none
TH20	water temperature (C)	-10C	none
Laboratory Parameters			
Tot.P	total phosphorus (mg/l)	0.003 mg/l	0.020 mg/l (C)
NOx	nitrate + nitrite (mg/l)	0.01 mg/l	10 mg/l NO3 (S), 2 mg/l NO2 (S)
NH4	total ammonia (mg/l)	0.01 mg/l	2 mg/l NH4 (S)
TN	total nitrogen (mg/l)	0.01 mg/l	none
TN/TP	nitrogen to phosphorus (molar) ratio, = (TKN + NOx)*2.2/TP		none
TCOLOR	true (filtered) color (ptu, platinum color units)	1 ptu	none
pH	powers of hydrogen (S.U., standard pH units)	0.1 S.U.	6.5, 8.5 S.U. (S)
Cond25	specific conductance, corrected to 25C (umho/cm)	1 umho/cm	none
Ca, 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/l	1.0 mg/l (S)
Mn	manganese (mg/l)	0.01 mg/l	0.3 mg/l (S)
As	arsenic (ug/l)	1 ug/l	10 ug/l (S)
AQ-PC	Phycocyanin (aquafior) (unitless)	1 unit	none
AQ-Chl	Chlorophyll a (aquafior) (ug/l)	1 ug/l	none
MC-LR	Microcystis-LR (ug/l)	0.01 ug/l	1 ug/l potable (C) 20 ug/l swimming (C)
Ana	Anatoxin-a (ug/l)	variable	none
Cyl	Cylindrospermopsis (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 Somerset Lake

Somerset Lake (1401-0141)

Threatened

Waterbody Location Information

Revised: 11/04/02

Water Index No: D-66-P268	Drain Basin: Delaware River	
Hydro Unit Code: 02040101/110	Str Class: B	Upper Delaware River
Waterbody Type: Lake	Reg/County: 4/Delaware Co. (13)	
Waterbody Size: 51.1 Acres (Mesotrophic)	Quad Map: FISHS EDDY (N-20-1)	
Seg Description: entire lake		

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

Use(s) Impacted	Severity	Problem Documentation
Recreation	Threatened	Known

Type of Pollutant(s)

Known: ALGAL/WEED GROWTH
Suspected: ---
Possible: Nutrients

Source(s) of Pollutant(s)

Known: ---
Suspected: ---
Possible: UNKNOWN SOURCE, Failing On-Site Syst

Resolution/Management Information

Issue Resolvability: 1 (Needs Verification/Study (see STATUS))	
Verification Status: 4 (Source Identified, Strategy Needed)	
Lead Agency/Office: ext/WQCC	Resolution Potential: Medium
TMDL/303d Status: (TMDL Not Required (No Impairment))	

Further Details

Recreational uses in Somerset Lake are considered threatened based on nuisance weed growth, as reported in a CSLAP study of the lake.

Somerset Lake was the focus of a 1998-2000 CSLAP volunteer monitoring effort. The study found nuisance weed growth occasionally restricted recreational use of the lake. The dominant plant appears to be a common native macrophyte (water weed - *Elodea canadensis*), although non-native species (curly-leaf pondweed) were also found. Nutrient levels were generally low, and excessive weed growth cannot be necessarily attributed to poor water quality. (DEC/DOW, BWM/Lake Services, August 2001)

However there is considerable shoreline development and soil conditions for septic systems are generally poor throughout the county. As a result on-site septic systems/nutrient are listed as possible contributors to water quality threats. (DEC/DOW, Region 4, October 2002)

recreational suitability of the lake to be unfavorable in recent years. The recreational suitability of the lake is described most frequently as "slightly" impacted for recreational use. The lake itself is most often described as having "definite algal greenness." These assessment are consistent with measured water quality characteristics. Assessments have noted that aquatic plants do not typically grow to the lake surface and are not usually cited as impacting recreational uses. (DEC/DOW, BWAM/CSLAP, March 2008)

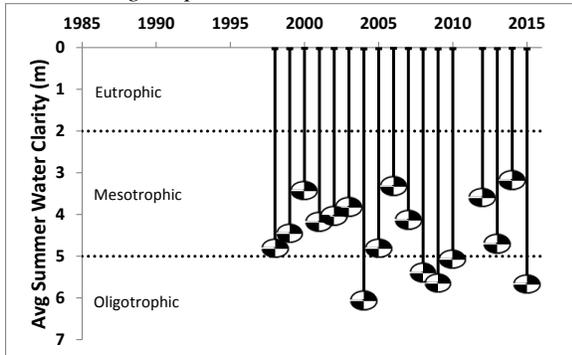
Lake Uses

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

Appendix C- Long Term Trends: Somerset Lake

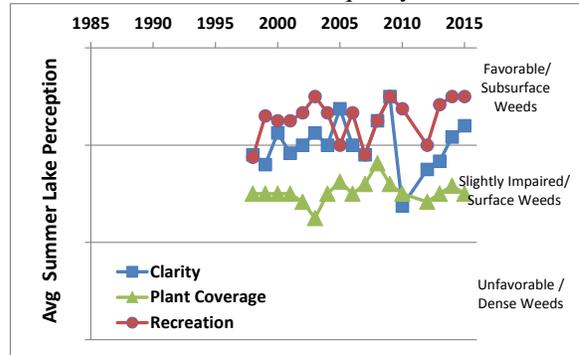
Long Term Trends: Water Clarity

- Slight decrease but variable since '98
- Most readings typical of *mesotrophic* to *oligotrophic* lakes



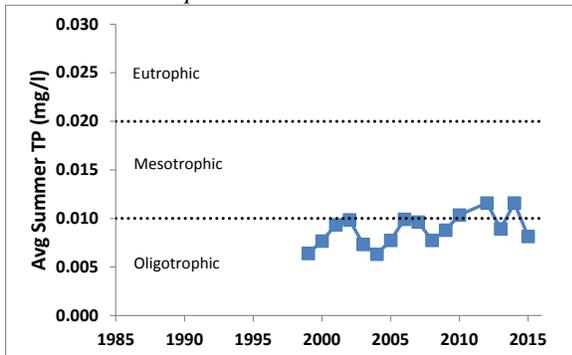
Long Term Trends: Lake Perception

- No clear trends; degrading clarity since '10
- Recreational perception not closely linked to either weeds or water quality



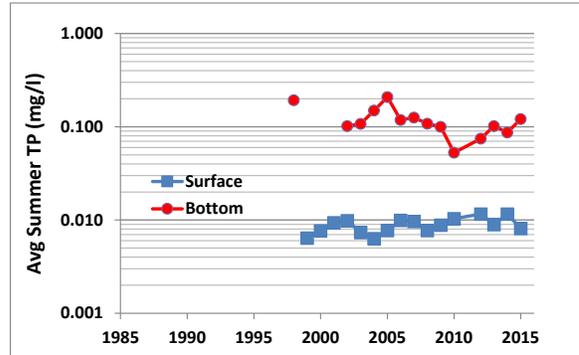
Long Term Trends: Phosphorus

- Slight and steady increase since '98
- Most readings typical of *oligotrophic* to *mesotrophic* lakes



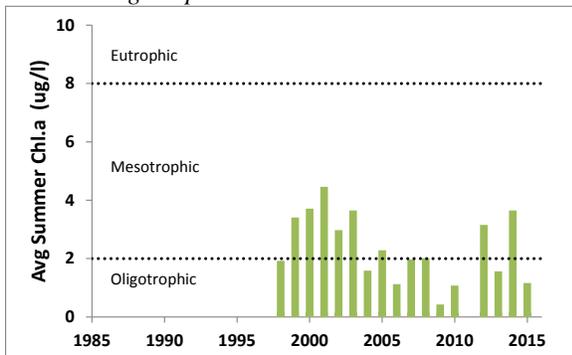
Long Term Trends: Bottom Phosphorus

- Deepwater TP much higher than surface
- Deepwater TP data indicates strong thermal stratification



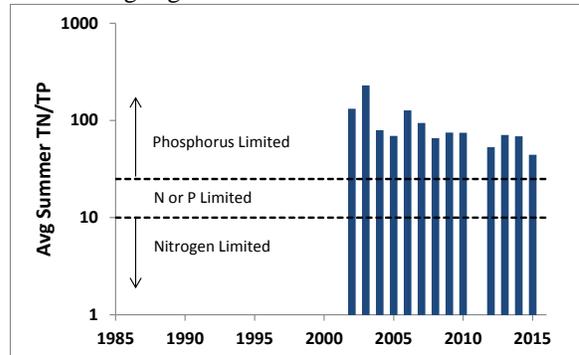
Long Term Trends: Chlorophyll a

- No long term trends; lower than in early 00s
- Most readings typical of *mesotrophic* to *oligotrophic* lakes



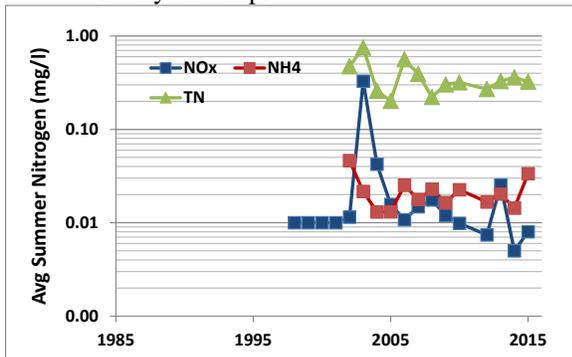
Long Term Trends: N:P Ratio

- Steady decrease; not known if any impact
- Most readings indicate phosphorus limits algae growth



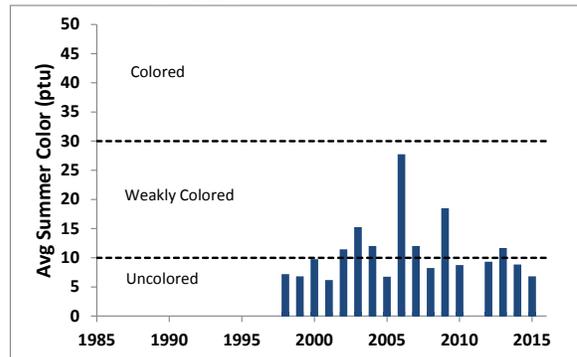
Long Term Trends: Nitrogen

- ↓ NO_x, stable NH₄, TN since early 00s
- Low NO_x, ammonia and total nitrogen in nearly all samples



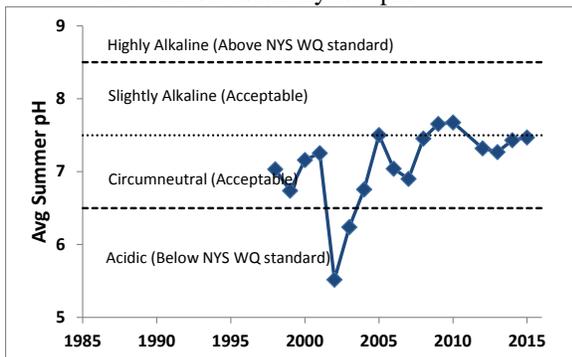
Long Term Trends: Color

- No long term trend; variable year to year
- Most readings typical of *uncolored to weakly colored* lakes



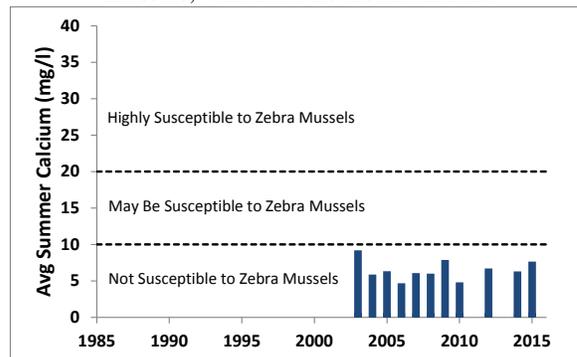
Long Term Trends: pH

- ↑ since early 00s, but now in favorable range
- Most readings typical of *circumneutral* lakes, but with occasionally low pH



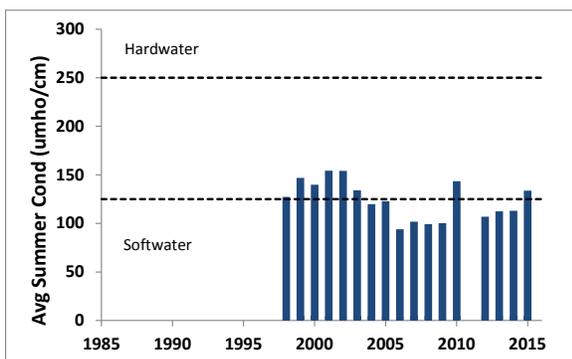
Long Term Trends: Calcium

- No long term trends
- Data indicates low susceptibility to zebra mussels, which are not found in lake



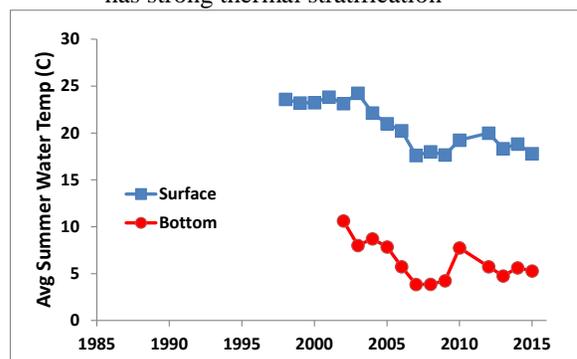
Long Term Trends: Conductivity

- No long term trends; higher since mid-00s
- Most readings typical of *softwater* lakes



Long Term Trends: Water Temperature

- ↓ water temperatures top and bottom
- Deepwater temperature data indicates lake has strong thermal stratification



Appendix D: Algae Testing Results from SUNY ESF Study

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

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

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

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

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

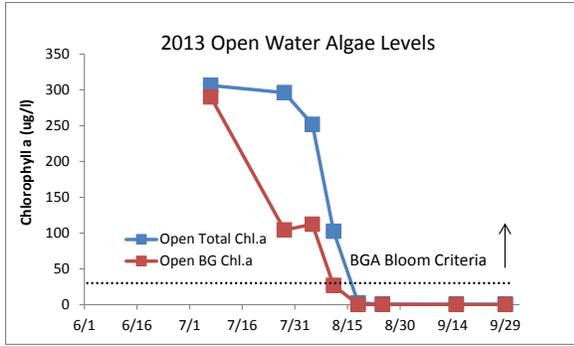


Figure D1:
2013 Open Water Total and BGA Chl.a

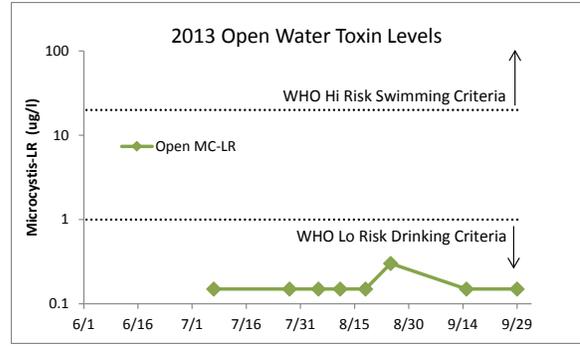


Figure D2:
2013 Open Water Microcystin-LR

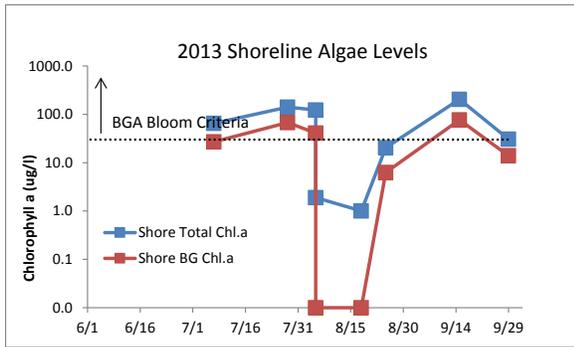


Figure D3:
2013 Shoreline Total and BGA Chl.a

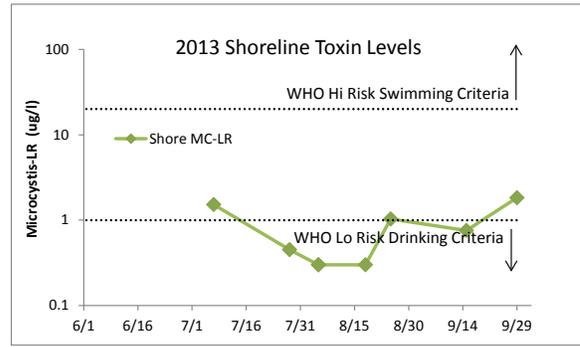


Figure D4:
2013 Shoreline Microcystin-LR

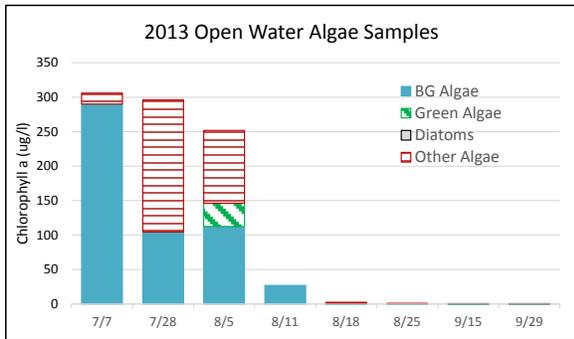


Figure D5:
2013 Open Water Algae Types

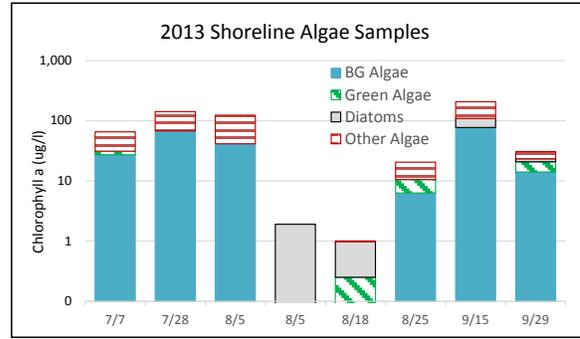


Figure D6:
2013 Shoreline Algae Types

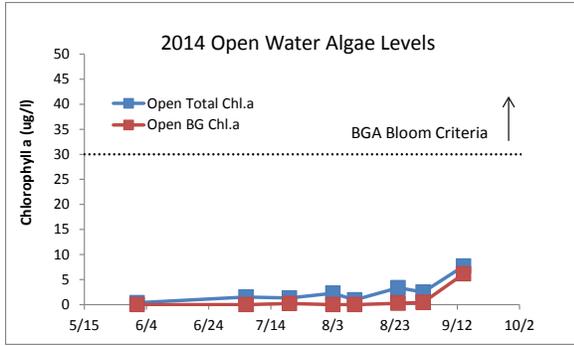


Figure D7:
2014 Open Water Total and BGA Chl.a

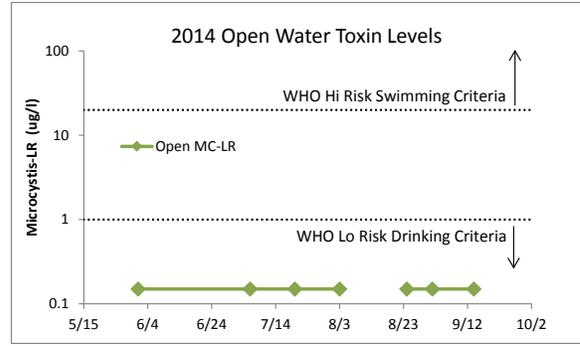


Figure D8:
2014 Open Water Microcystin-LR

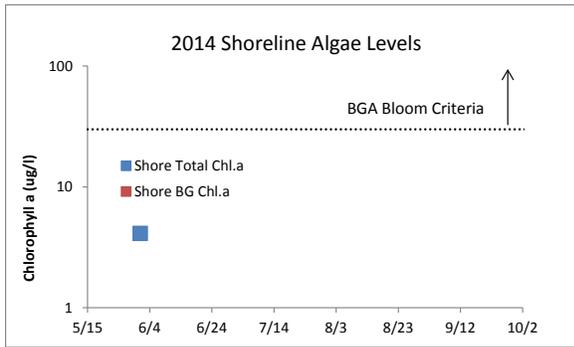


Figure D9:
2014 Shoreline Total and BGA Chl.a

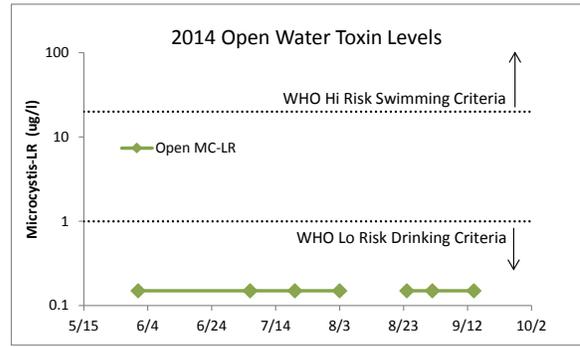


Figure D10:
2014 Shoreline Microcystin-LR

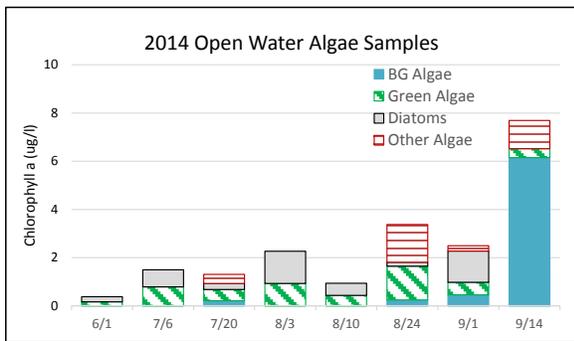


Figure D11:
2014 Open Water Algae Types

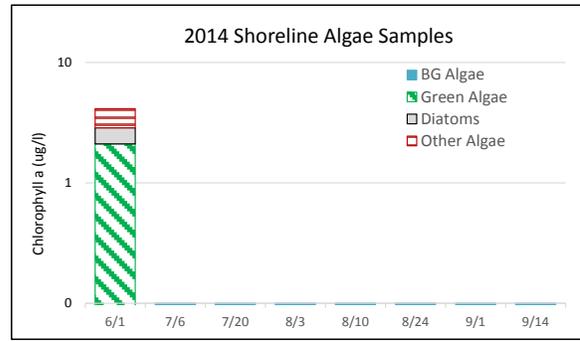


Figure D12:
2014 Shoreline Algae Types

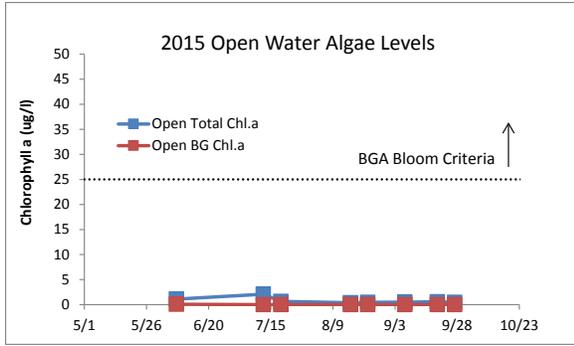


Figure D13:
2015 Open Water Total and BGA Chl.a

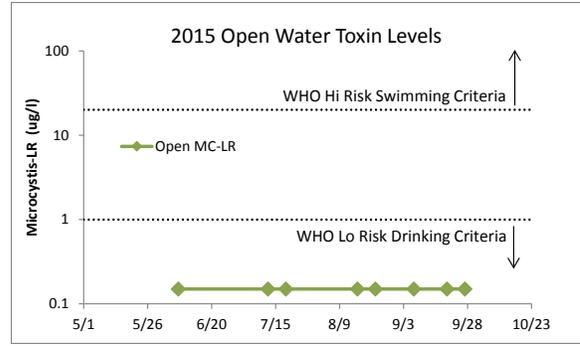


Figure D14:
2015 Open Water Microcystin-LR



Figure D15:
2015 Shoreline Total and BGA Chl.a

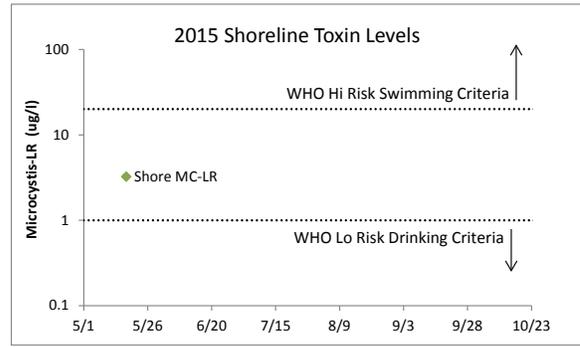


Figure D16:
2015 Shoreline Microcystin-LR

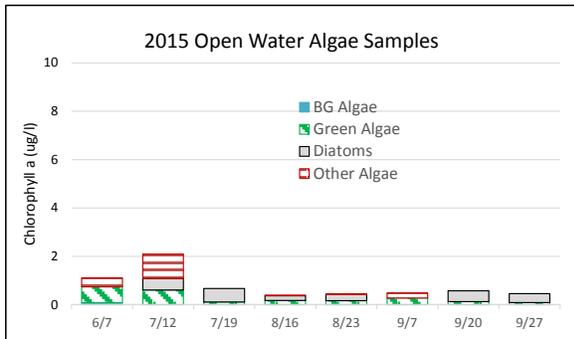


Figure D17:
2015 Open Water Algae Types

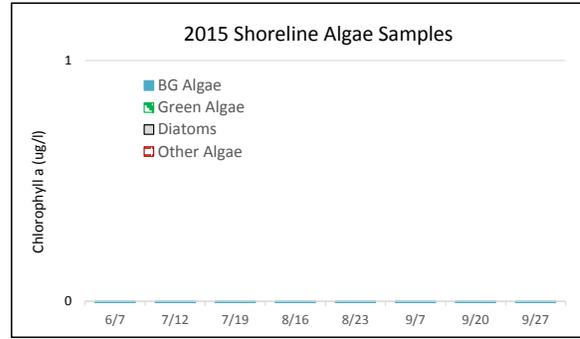


Figure D18:
2015 Shoreline Algae Types

Appendix E: AIS Species in Delaware County

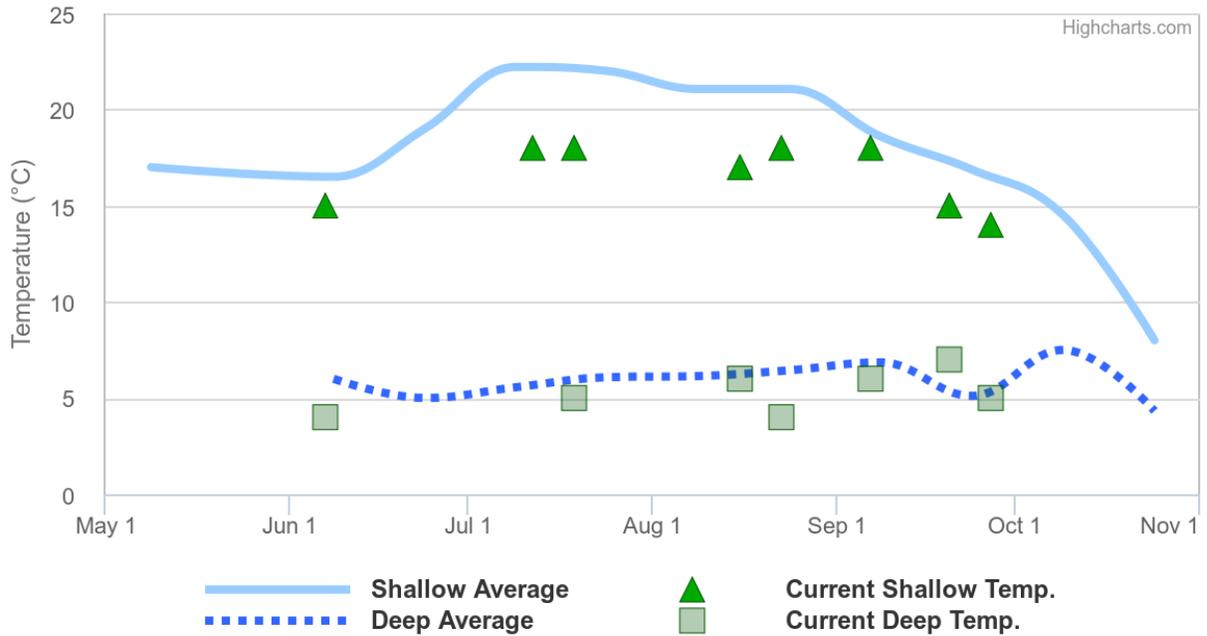
The table below shows the invasive aquatic plants and animals that have been documented in Delaware County, as cited in either the iMapInvasives database (<http://www.imapinvasives.org/>) or in the NYSDEC Division of Water database. These databases may include some, but not all, non-native plants or 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 - Delaware County			
Waterbody	Kingdom	Common name	Scientific name
Big Pond	Animal	Red-eared Slider Turtle	<i>Trachemys scripta elegans</i>
Sand Pond	Plant	Curly leafed pondweed	<i>Potamogeton crispus</i>
Somerset Lake	Plant	Curly leafed pondweed	<i>Potamogeton crispus</i>
Susquehanna River near Nineveh Junction	Animal	Asian clam	<i>Corbicula fluminea</i>

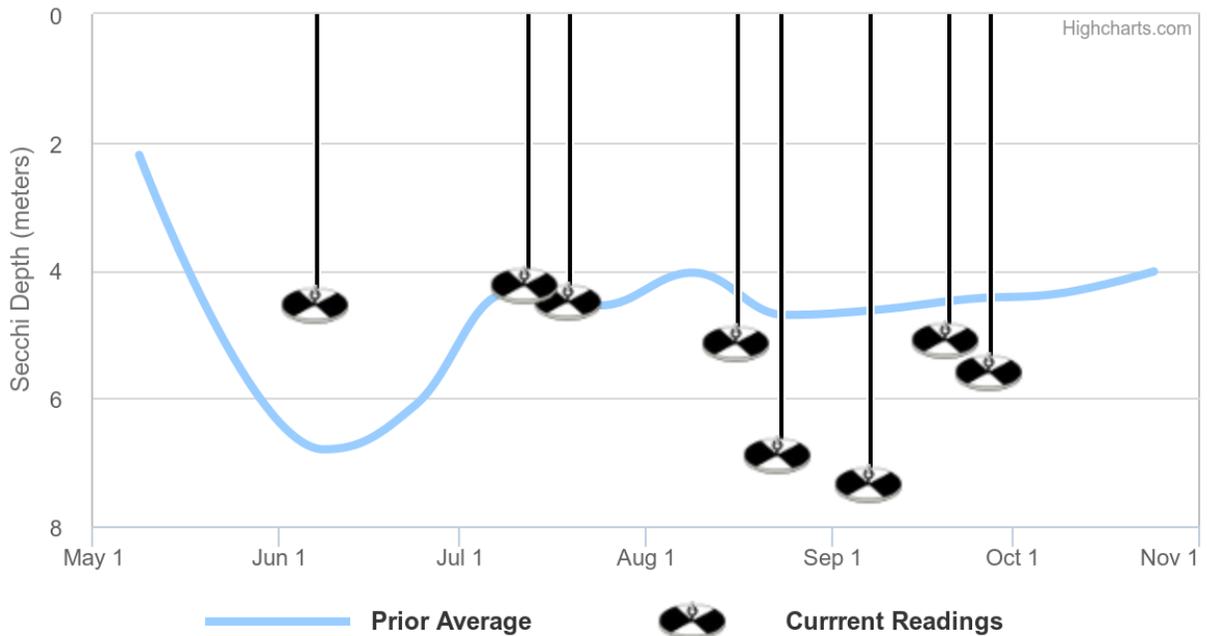
Appendix F: Current Year vs. Prior Averages for Somerset Lake

Current Year Water Temperatures vs. Prior Average



This year's shallow water sample temperatures are tending to be lower than normal when compared to the average of readings collected from 1998 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 1998 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 1998 to 2014

Appendix G: Watershed and Land Use Map for Somerset 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.

