

Petonia Lake Questions and Answers, 2015 CSLAP

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

A1. Water quality conditions in Petonia Lake in 2015 were slightly more favorable than in previous years. Water clarity was again slightly higher than in the previous year, although not as high as the historical readings, and nutrient and algae levels were slightly lower. No shoreline blooms were reported in 2015.

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

A2. Chloride sampling results were typical of lakes with low to moderate impacts from road salt runoff, although no impacts have been measured or reported.

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

A3. Petonia Lake had higher water clarity, and lower nutrient and algae levels, than the typical lake in the area. Aquatic plant coverage is similar to the plant coverage in these other lakes, but it is not known if the longer-term increase in plant coverage is comprised of native or invasive plants.

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

A4. Water clarity appears to have stabilized after a decrease from the late 1980s to the early 2000s; this drop in clarity may have contributed to a long-term degradation in water quality and recreational assessments. Most of the other water quality indicators indicate relatively stable conditions.

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

A5. Petonia Lake may be susceptible to shoreline blue green algae blooms, despite relatively low nutrient levels. The trigger for these blooms is not understood. It is also not known if this susceptibility will be reduced by reducing nutrient levels in the lake, but lake residents should continue to be on the lookout for and avoid exposure to blooms.

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.

Lake Use				
	PWL	Average Year	2015	Primary issue
Potable Water				No impacts
Swimming				No impacts
Recreation				No impacts
Aquatic Life				Road salt
Aesthetics				Poor perception
Habitat				No impacts
Fish Consumption				

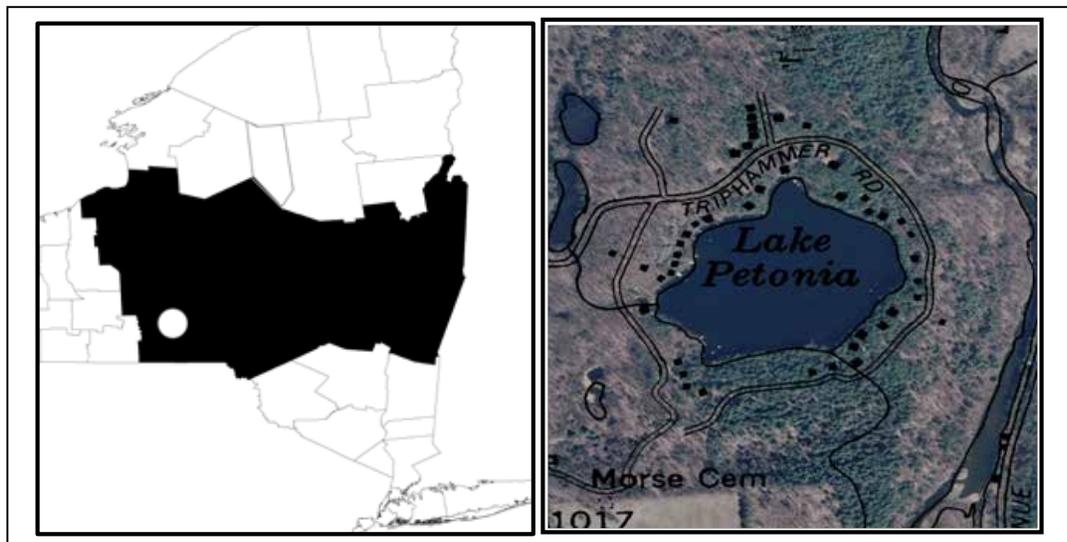
 Supported / Good
 Threatened / Fair
 Stressed / Poor
 Impaired
 Not Known

CSLAP 2015 Lake Water Quality Summary: Petonia Lake

General Lake Information

Location	Town of Greene
County	Chenango
Basin	Susquehanna River
Size	10.4 hectares (25.7 acres)
Lake Origins	Natural
Watershed Area	179 hectares (442.1 acres)
Retention Time	0.6 years
Mean Depth	4.5 meters
Sounding Depth	9.2 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To...	Petonia Lake outlet to Geneganstlet Creek to Chenango River to Susquehanna River
WQ Classification	A (potable water)
Lake Outlet Latitude	42.330
Lake Outlet Longitude	-75.798
Sampling Years	1986-1990, 2001-2015
2015 Samplers	Jim Kozak and Ed Murray
Main Contact	Jim Kozak

Lake Map



Background

Petonia Lake is a 25 acre, class A lake found in the Town of Greene in Chenango County, in central New York State. It was sampled through CSLAP for the first time in 1986.

It is one of eight CSLAP lakes among the more than 150 lakes and ponds found in Chenango County, and one of 25 CSLAP lakes among the nearly 800 lakes and ponds in the Susquehanna River drainage basin.

Lake Uses

Petonia Lake is a Class A lake—this means that the best intended use for the lake is for potable water—drinking, contact recreation—bathing and swimming, non-contact recreation—boating and fishing, aquatic life, and aesthetics. The lake is used by lake residents and invited guests for swimming and non-power boating—there is no public access to the lake.

It is not known by the report authors if Petonia Lake has been stocked by lake residents or municipal officials.

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

Historical Water Quality Data

CSLAP sampling was conducted on Petonia Lake from 1986 to 1990, and 2001 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 Petonia Lake can also be found on the NYSDEC web page at <http://www.dec.ny.gov/lands/77879.html>.

Petonia Lake has not been sampled by the NYSDEC as part of any of the larger regional or statewide monitoring programs prior to CSLAP. It is not known if local monitoring has been conducted as a fisheries management tool, or to evaluate swimming conditions in the lake.

Petonia Lake was sampled as part of the DEC Lake Biomonitoring project in 2008. These data showed water quality conditions comparable to those measured through CSLAP. The other data collected through the program indicate that road salt runoff is minimal and that regular algal blooms are unlikely. The depth profiles indicate very high dissolved oxygen levels throughout the lake to the lake bottom, even in areas where the lake is thermally stratified (warm water on top, cold water on bottom). The biological samples of the lake benthic communities are summarized below.

Petonia Lake was one of four CSLAP lakes sampled in 2013 as part of a joint Cornell-DEC study of pesticides movement into surface waters. The results from this study will be summarized when available in a separate report.

None of the ephemeral inlets or outlet of the lake has been monitored through the NYSDEC Rotating Intensive Basins (RIBS) program or the state stream macroinvertebrate monitoring

program. The lake has not been sampled by DEC fisheries staff in support of fish stocking activities.

Lake Association and Management History

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

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual and Monthly Results Relative to 1986-2014

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 – Petonia Lake” section in Appendix C.

Evaluation of Eutrophication Indicators

Secchi disk transparency readings have been stable over the last few years, after a long-term decrease since the late 1980s. Although neither algae levels nor nutrient readings have exhibited similar trends, both indicators were lower than normal in 2015.

Lake productivity typically decreases through mid-summer, as manifested by increasing water clarity and especially decreasing nutrient levels from May through August. These trends reverse from August through October, and algae levels are sometimes higher in October. This may be due to the effects of lake turnover. There was a slight seasonal decrease in water clarity and increase in algae levels in 2015, although nutrient readings varied more significantly during the summer.

The lake can usually be characterized as *mesoligotrophic*, based on water clarity and phosphorus readings (typical of *oligotrophic* lakes) and chlorophyll *a* readings (both typical of *mesotrophic* lakes). However, each of these indicators were typical of *oligotrophic* lakes in 2015. The trophic state indices (TSI) evaluation suggests that each of the trophic indicators is “internally consistent.” In other words, water clarity, chlorophyll *a* and total phosphorus readings were each in the expected range given the readings for the other trophic indicators. Overall trophic conditions are summarized on the Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

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 it is not known if the lake is used for potable water (drinking). The deepwater phosphorus and ammonia readings are similar to those measured at the lake surface (and the former were slightly lower than usual in 2014), and deepwater iron and manganese levels are low, suggesting that deeper intakes may support potability. Potable water conditions, at least as

measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

pH and conductivity readings were slightly higher than normal in 2015, although neither indicator has exhibited any clear long-term trends. Water color readings have been higher since 2002, corresponding to the change in laboratories- it is not expected that this represents an actual change in the “brownness” of the water. None of the other limnological indicators has exhibited any clear long-term changes, and it is likely that the small changes in most of these indicators from year to year represent normal (or weather-induced) variability.

Chloride levels in the 2015 samples, collected for the first time through CSLAP and cited in Appendix A, ranged from 16 to 17 mg/l. These values fall within the “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 to moderate 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

Macrophyte surveys conducted through the biomonitoring study identified at least eight aquatic plant species, all of which are native plants. The modified floristic quality index (FQI) for the lake indicates that the quality of the aquatic plant community is “excellent.”

The macroinvertebrate survey of the lake (through the DEC biomonitoring program) in 2008 indicated a moderately high diversity of organisms in the lake, with no single taxa comprising more than 17% of the organisms. The number of COTE (*Coleoptera*, *Odonate*, *Tricoptera*, and *Ephemeroptera*, a measure of sensitive macroinvertebrates, and therefore one measure of community health) organisms was higher in Petonia Lake than all but three of the other sampled lakes. However, the other community measures indicated water quality conditions typical of slightly higher lake productivity. These data will continue to be evaluated as data from a larger cross-section of lakes becomes available.

Information about the composition of the fish community is not available, but it is likely that Petonia Lake supports a coolwater fishery. Zooplankton surveys have not been conducted through CSLAP at Petonia Lake. The fluoroprobe screening samples analyzed by SUNY ESF in the last several years indicated both low levels of algae and low levels of blue green algae. The open water algae community appears to be comprised of mix of algae species, with green algae more common in early summer and diatoms more common in late summer. A small shoreline blue green algae bloom was reported in 2014 (and some small blooms have also been reported in previous years), but no shoreline or open water blooms were reported or sampled in 2015.

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

Evaluation of Lake Perception

Water quality assessments were slightly more favorable than normal, consistent with slightly lower than normal algae levels. This was consistent with an improvement in recreational assessments. Aquatic plant coverage was slightly higher than usual in 2015. Despite more favorable assessments in 2015, recreational assessments have degraded significantly in recent years, consistent with a small long-term increase in aquatic plant coverage (and more reports of “excessive weeds”), and despite relatively stable water clarity readings over the last decade. These assessments degrade slightly during the summer, are usually less favorable in June and at the end of the sampling season. This was also apparent in the late summer of 2015, although June conditions were more favorable. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Air temperature and water temperature readings were close to normal in each of the last three years, and neither air nor water temperatures has exhibited any clear long-term trends during the June-September index period. Deepwater temperatures have increased slightly over the last decade; it is not known if this reflects actual warming or slight changes in sampling depth. It is not known if the lack of change in surface temperatures is an indication of the lack of local climate change or if these changes cannot be well evaluated through CSLAP.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Fluoroprobe readings were below the levels indicating harmful algal bloom (HAB) conditions in all open water samples. An analysis of algae samples indicate microcystin readings well below the levels needed to support safe swimming in the open water, although there may be some risk of exposure to these toxins (or irritants) for swimmers within shoreline blooms. Lake residents should report (and avoid exposure to) any surface scums or heavily discolored water that might be associated with blue green algae blooms.

Lake Condition Summary

Category	Indicator	Min	Overall Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	1.45	5.42	8.38	5.94	Oligotrophic	Within Normal Range	Decreasing Slightly
	Chlorophyll <i>a</i>	0.40	2.61	21.96	1.26	Mesotrophic	Lower Than Normal	No Change
	Total Phosphorus	0.001	0.010	0.028	0.008	Oligotrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.00	0.03	0.13	0.04	Close to Surface NH4 Readings	Within Normal Range	Not known
	Hypolimnetic Arsenic	0.34	1.03	1.90		Elevated Deepwater As		Not known
	Hypolimnetic Iron	0.01	0.04	0.14		Low Iron Levels		Not known
	Hypolimnetic Manganese	0.01	0.03	0.10		Low Manganese Levels		Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.002	0.014	0.057	0.011	Close to Surface TP Readings	Lower Than Normal	Not known
	Nitrate + Nitrite	0.00	0.02	0.09	0.01	Low NOx	Within Normal Range	No Change
	Ammonia	0.00	0.03	0.16	0.03	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.06	0.34	1.49	0.31	Low Total Nitrogen	Within Normal Range	No Change
	pH	5.70	7.42	8.67	7.73	Circumneutral	Higher than Normal	No Change
	Specific Conductance	48	70	107	81	Softwater	Higher than Normal	No Change
	True Color	0	6	27	4	Uncolored	Within Normal Range	No Change
	Calcium	1.7	5.5	15.4	5.4	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.0	4	1.7	Not Quite Crystal Clear	More Favorable Than Normal	No Change
	Aquatic Plant Coverage	1	2.4	4	2.4	Subsurface Plant Growth	Greater Coverage than Normal	No Change
	Recreational Assessment	1	2.2	4	1.9	Excellent	More Favorable Than Normal	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass; Shoreline-high blue green algae in bloom	Not known	Not known
	Macrophytes					Excellent quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not evaluated through CSLAP	Not known	Not known
	Macroinvertebrates					High diversity and typical of good water quality conditions	Not known	Not known
	Fish					Coolwater fishery?	Not known	Not known
	Invasive Species					None observed	Not known	Not known
Local Climate Change	Air Temperature	6	22.7	35	24.7		Higher Than Normal	No Change
	Water Temperature	12	22.3	27	22.0		Within Normal Range	No Change
Harmful Algal Blooms	Open Water Phycocyanin	0	9	67	3	No readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	1	4	1	No readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	0	2	0	No 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	2553	2553	2553		All readings indicate very high algae levels	Not known	Not known
	Shoreline FP BG Chl.a	967	967	967		All readings indicate very high BGA levels	Not known	Not known
	Shoreline Microcystis	<DL	7.9	19.3		At times elevated 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

Petonia Lake is presently among the lakes listed on the Susquehanna River Basin Priority Waterbody List (PWL) as having *no use impairment*. The 2009 PWL listing for the lake is shown in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Petonia 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 classified for this use. These data suggest that any use of the lake for potable water may be threatened by shoreline blooms.

Public Bathing

The CSLAP dataset at Petonia 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 supported, although this use may be *threatened* by periodic shoreline blooms and weeds, particularly in late summer. Bacterial data are needed to evaluate the safety of the lake for swimming.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Petonia Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that contact recreation should be fully supported, at least in most locations.

Aquatic Life

The CSLAP dataset on Petonia Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life should be fully supported, although this use may be *threatened* by 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 Petonia Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *threatened*, due to occasional shoreline blue green algae blooms and reports in recent years that the lake at times "looks bad".

Fish Consumption

There is no fish consumption advisories posted for Petonia Lake.

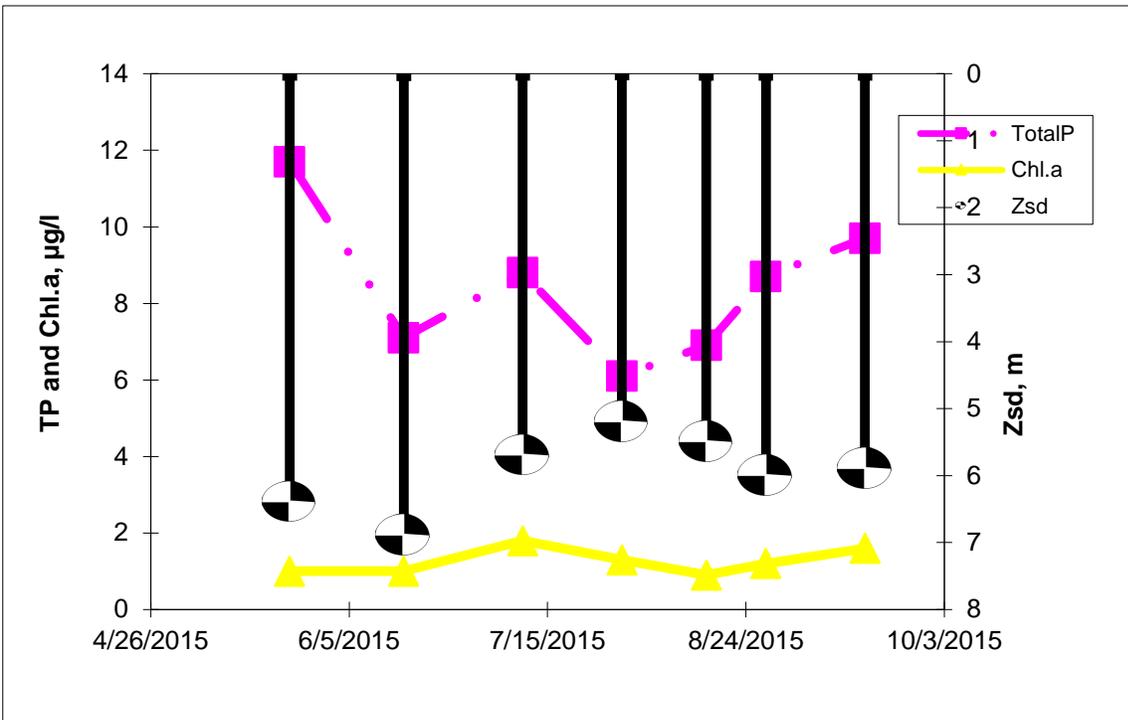
Additional Comments and Recommendations

Lake residents are advised to identify factors leading to the recent (but not present) drop in water clarity, particularly from sediment and nutrient loading to the lake. Residents are also advised to avoid exposure to any shoreline algae blooms. Aquatic plant surveys may be appropriate to provide some assurances that increasing plant growth is associated with native, not invasive, aquatic plants.

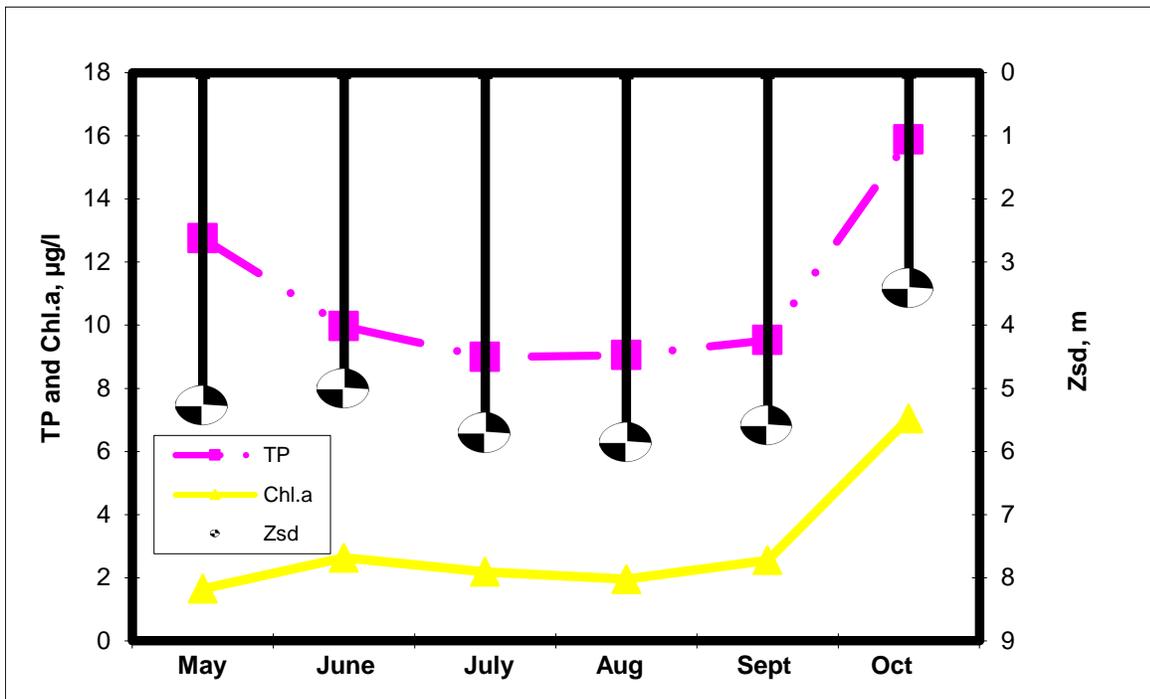
Aquatic Plant IDs-2015

None submitted for identification in 2015.

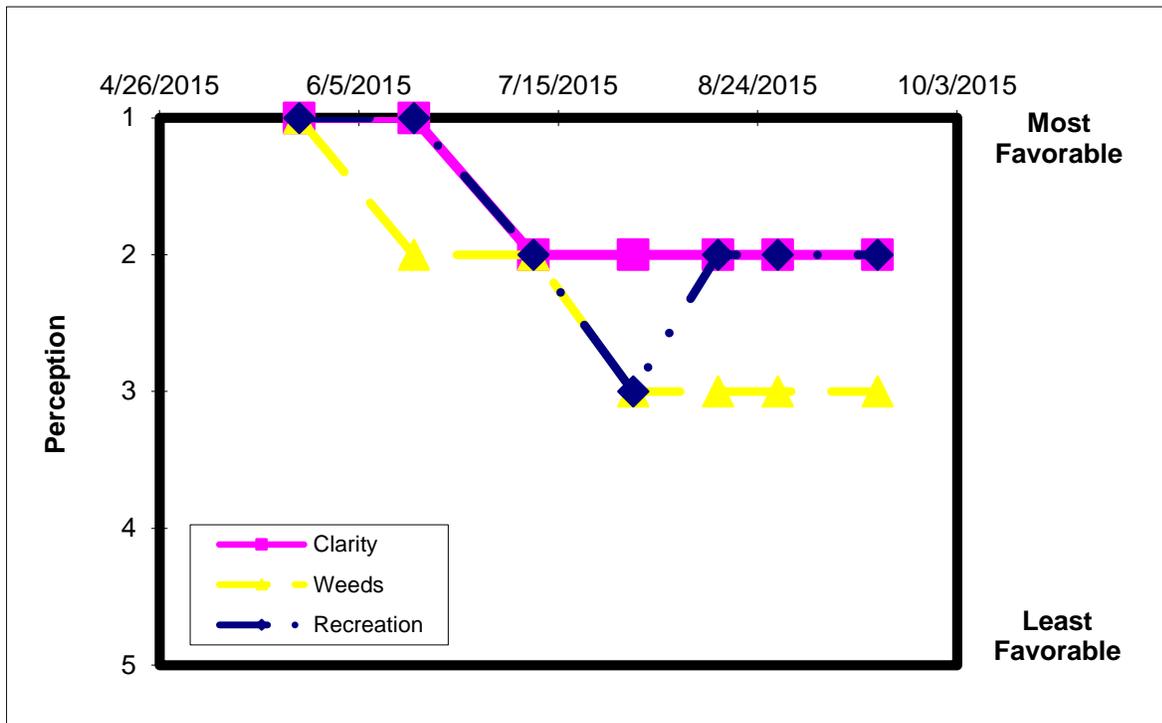
Time Series: Trophic Indicators, 2015



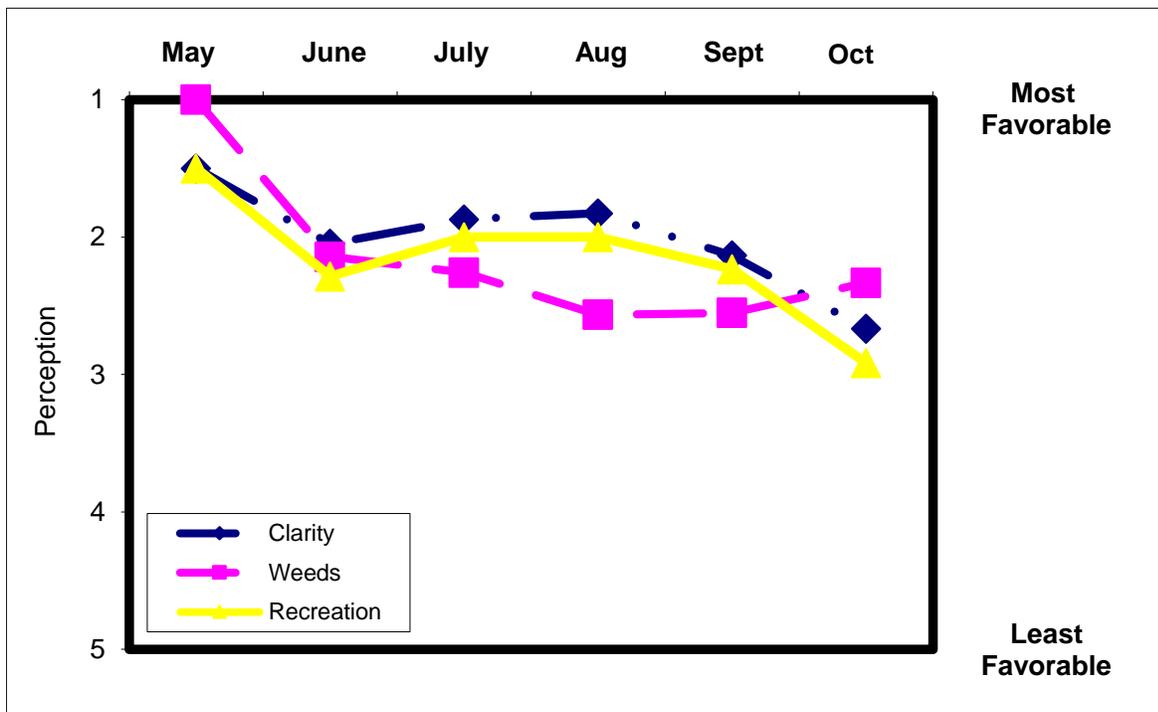
Time Series: Trophic Indicators, Typical Year (1986-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (1986-2015)



Appendix A- CSLAP Water Quality Sampling Results for Petonia Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
20	Petonia L	6/21/1986	10.0	4.88	1.5	0.009	0.03				1	7.64	65		1.85	
20	Petonia L	6/28/1986	10.0	4.63	1.5	0.009	0.03				2	7.32	61		1.55	
20	Petonia L	7/4/1986	10.0	4.75	1.5	0.010	0.03				2	7.52	63		1.63	
20	Petonia L	7/11/1986	10.0	5.00	1.5	0.010	0.03				5	7.55	65			
20	Petonia L	7/16/1986	10.0	6.50	1.5	0.015	0.03					6.56	62			
20	Petonia L	7/23/1986	10.0	6.50	1.5	0.017	0.03								0.57	
20	Petonia L	7/30/1986	10.0	6.50	1.5	0.012	0.03					7.48	62			
20	Petonia L	8/6/1986	10.0	6.13	1.5	0.007	0.03				2	7.97	62		0.76	
20	Petonia L	8/13/1986	10.0	6.25	1.5	0.011	0.03				3	8.07	62		1.42	
20	Petonia L	8/20/1986	10.0	6.00	1.5	0.011	0.03				3	7.23	62		1.84	
20	Petonia L	8/27/1986	10.0	5.75	1.5	0.008	0.03				3	7.30	64		0.94	
20	Petonia L	9/3/1986	10.0	6.00	1.5	0.010	0.03				2	7.85	62		0.97	
20	Petonia L	9/10/1986	10.0	6.13	1.5	0.008	0.03				2	7.85	64		1.48	
20	Petonia L	9/17/1986	10.0	5.50	1.5	0.010	0.03				7	7.02	62		1.85	
20	Petonia L	9/24/1986	10.0	4.88												
20	Petonia L	6/14/1987	9.5	4.13	1.5	0.006	0.01				5	6.80	62		6.50	
20	Petonia L	6/28/1987	10.0	4.90	1.5	0.008	0.01				5	7.10	62			
20	Petonia L	7/12/1987	10.0	8.25	1.5	0.005	0.01				5	7.36	63		2.70	
20	Petonia L	7/26/1987	10.0	8.25	1.5	0.011					1	6.74	64		11.60	
20	Petonia L	8/4/1987	10.0	7.13	1.5	0.008	0.01				6	6.83	63		3.00	
20	Petonia L	8/9/1987	10.0	6.75	1.5	0.013	0.01				6	7.16	64			
20	Petonia L	8/23/1987	10.0	6.88	1.5	0.010					4	6.77	63			
20	Petonia L	9/6/1987	10.0	6.63	1.5	0.009	0.01				3	7.13	62		6.10	
20	Petonia L	9/20/1987	10.0	7.88	1.5	0.012	0.01				4	7.29	65		4.80	
20	Petonia L	6/17/1988	9.3	6.88	1.5	0.006	0.01				5	7.37	76		3.92	
20	Petonia L	7/5/1988	10.0	8.38	1.5	0.008					5	6.58	72		0.94	
20	Petonia L	7/17/1988	10.0	8.38	1.5	0.006	0.01				5	7.47	66		1.92	
20	Petonia L	7/29/1988	9.8	8.13	1.5	0.009					1	7.43	66		1.92	
20	Petonia L	8/15/1988	9.8	6.38	1.5	0.004	0.01				2	7.64	69		2.22	
20	Petonia L	8/28/1988	9.5	7.38	1.5	0.007					9	7.56	66		1.63	
20	Petonia L	9/11/1988	9.5	8.13	1.5	0.007	0.01				4	7.56	65		3.33	
20	Petonia L	9/25/1988	9.3	7.75	1.5	0.011					2	7.84	73		1.60	
20	Petonia L	6/25/1989	10.0	5.25	1.5	0.011	0.01				3	7.60	68		3.91	
20	Petonia L	7/9/1989	10.0	3.88	1.5	0.009					3	7.37	71		2.58	
20	Petonia L	7/26/1989	9.5	6.25	1.5	0.009	0.01				6	7.26	72		2.15	
20	Petonia L	8/6/1989	9.5	6.63	1.5	0.006					4	7.69	68		1.60	
20	Petonia L	8/21/1989	9.5	7.63	1.5	0.008	0.01				2	7.83	69		1.56	
20	Petonia L	9/4/1989	9.5	7.63	1.5	0.008					5	7.52	69		2.75	
20	Petonia L	9/17/1989	9.5	7.81	1.5	0.010	0.01				4	7.53	67		2.07	
20	Petonia L	9/30/1989	9.5	7.38	1.5	0.007					5	7.42	68		1.86	
20	Petonia L	7/8/1990	9.5	7.13	1.5	0.011	0.01				3	7.14	72		3.60	
20	Petonia L	7/22/1990	9.8	7.25	1.5	0.007					3	7.58	71		1.42	
20	Petonia L	8/5/1990	9.8	7.38	1.5	0.007	0.01					7.54	69		2.62	
20	Petonia L	8/19/1990	9.5	6.63	1.5	0.027					2	5.70	87		3.84	
20	Petonia L	9/2/1990	9.8	5.38	1.5	0.005	0.01				2	7.82	69		2.43	
20	Petonia L	9/16/1990	9.8	5.38	1.5	0.010	0.01				8	7.35	69		3.30	
20	Petonia L	9/30/1990	9.8	5.38	1.5	0.009					7	7.16	69		3.81	
20	Petonia L	10/14/1990	9.8	5.63	1.5	0.008					6	7.34	67		3.59	
20	Petonia L	7/9/2001		6.00	1.5		0.05				1	7.52	73		1.30	
20	Petonia L	7/23/2001	9.8	3.50	1.5	0.010	0.01				1	7.23	73		2.29	
20	Petonia L	8/6/2001		5.45	1.5	0.006	0.01				7	7.97	76		1.85	
20	Petonia L	8/20/2001	9.8	5.60	1.5	0.005	0.01				4	7.79	74			
20	Petonia L	9/4/2001	9.8	5.80	9.8	0.007	0.01				2	7.38	74		3.57	
20	Petonia L	9/18/2001				0.008	0.01				4	7.49	74		2.62	
20	Petonia L	10/2/2001	9.6	3.30	1.5	0.016	0.01				2	6.81	77			
20	Petonia L	10/15/2001	9.8	3.00	1.5	0.016					2	7.33	75			
20	Petonia L	06/18/02	9.7	5.95	1.5		0.02	0.02	0.44		8	7.09	72	4.1	2.28	
20	Petonia L	07/02/02	9.7	5.75	1.5	0.007	0.01	0.04	0.45	137.91	10	7.06	74		2.33	
20	Petonia L	07/16/02	9.7	5.85	1.5	0.002	0.00	0.04	0.37	485.05	1	7.31	76		1.28	
20	Petonia L	07/30/02	9.8	4.40	1.5	0.001	0.02	0.08	1.49	3119.50	7	7.48	74		1.64	
20	Petonia L	08/12/02	9.7	5.40	1.0	0.007	0.02	0.03	0.63	201.36	6	7.54	75	1.7	1.95	
20	Petonia L	08/26/02	9.7	4.30	1.5	0.007			0.44	147.62	7	7.24	75		2.12	
20	Petonia L	09/10/02	9.7	4.65	1.5	0.009	0.00	0.02	0.36	84.97	1	7.21	76		2.03	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
20	Petonia L	09/30/02	10.0	3.80	1.5	0.009	0.00	0.03	0.51	130.88	6	7.29	74		6.82	
20	Petonia L	6/18/2003	9.8	5.10		0.010	0.02	0.01	0.22	49.06	8	7.43	76	5.7	0.79	
20	Petonia L	6/30/2003	9.8	4.90		0.011	0.01	0.01	0.32	65.51	1	7.16	75		2.02	
20	Petonia L	7/16/2003	9.8	6.20		0.006	0.00	0.01	0.18	61.86	3	7.22	73		1.58	
20	Petonia L	7/28/2003	9.8	5.50		0.007	0.01	0.00	0.13	42.56	8	7.19	73		1.82	
20	Petonia L	8/19/2003	9.7	5.20		0.011	0.06	0.06	0.31	61.71				5.7	2.77	
20	Petonia L	9/8/2003	9.7	5.30		0.010	0.02	0.01			6	7.38	72		2.45	
20	Petonia L	9/22/2003	9.7	5.45		0.014	0.00	0.02	0.36	57.07	5	7.01	73		2.10	
20	Petonia L	10/20/2003	9.7	2.20		0.028	0.04	0.03	0.09	6.72	6	6.90	74		8.75	
20	Petonia L	6/15/2004	9.8	5.50		0.025	0.06	0.02	0.12	10.48	1	7.06	69		1.36	
20	Petonia L	6/28/2004	9.8	5.50		0.015	0.02	0.01	0.25	36.31	9	7.07	77		0.60	
20	Petonia L	7/13/2004	9.8	6.00		0.009	0.01	0.01	0.24	57.51	3	6.96	69		0.87	
20	Petonia L	7/26/2004	9.7	5.10		0.008	0.01	0.01	0.14	36.98	5	7.39	80		2.30	
20	Petonia L	8/23/2004	9.5	6.60		0.012	0.01	0.02	0.70	132.34	9	7.81	76	6.2	2.15	
20	Petonia L	9/7/2004	9.5	7.00		0.009	0.01	0.02	0.27	67.72	2	7.06	69		2.20	
20	Petonia L	9/22/2004	9.7	6.50		0.013	0.04	0.01	0.34	56.94	5	7.95	61		3.00	
20	Petonia L	10/5/2004	9.7	5.10		0.012	0.01	0.02	0.28	51.44	0	6.92	67			
20	Petonia L	6/17/2005	9.0	5.50		0.010	0.07	0.02	0.33	74.46	2	6.60	67	5.3	2.34	
20	Petonia L	6/28/2005	9.7	7.00		0.007	0.01	0.02	0.06	17.96	0	7.73	73		1.08	
20	Petonia L	7/11/2005	9.3	5.85	1.5	0.013	0.08	0.01	0.68	117.90	27	7.40	74		1.60	
20	Petonia L	7/25/2005	9.0	5.40	1.2	0.008	0.03	0.02	0.10	28.66	0	6.68	71		1.01	
20	Petonia L	8/8/2005	9.4	6.20	1.2	0.017	0.01	0.01	0.15	19.50	4	7.14	72	5.2	1.39	
20	Petonia L	8/22/2005	9.3	5.15	1.2	0.009	0.03	0.01	0.41	97.09	14	7.59	72		1.18	
20	Petonia L	9/5/2005	9.8	3.90	1.2	0.013	0.01	0.01	0.16	26.93	11	7.33	66		2.53	
20	Petonia L	9/21/2005	9.2	6.20	1.2	0.007	0.01	0.01	0.20	58.83	5	7.53	76		1.06	
20	Petonia L	6/27/2006	9.4	6.95	4.0	0.007	0.00	0.02	0.29	97.48	12	7.23	64	4.7	0.96	
20	Petonia L	7/15/2006	9.3	7.00	1.7	0.017	0.01	0.06	0.56	73.70		7.24	60		4.83	
20	Petonia L	7/28/2006	8.8	5.45	1.7	0.007	0.00	0.01	0.40	124.25	11	6.49	59		1.54	
20	Petonia L	8/18/2006	8.9	5.40	1.7	0.008	0.01	0.01	0.58	158.79	14	7.27	65		0.40	
20	Petonia L	9/1/2006	9.4	5.30	1.7	0.008			0.31	88.04		6.60	48	5.2	2.08	
20	Petonia L	9/15/2006	9.2	5.00	1.7	0.007	0.02	0.03	0.55	172.99	4	7.45	59		2.61	
20	Petonia L	10/11/2006	9.1	3.15	1.7	0.010	0.03	0.04	0.31	67.72	11	8.27	63		5.43	
20	Petonia L	10/19/2006	9.6	2.75	1.7	0.015	0.00	0.01	0.37	54.55	4	6.55	71		7.63	
20	Petonia L	6/29/2007	9.2	6.70		0.009	0.01	0.02	0.75	185.31	11	7.44	72	5.9	1.39	
20	Petonia L	7/24/2007	9.3	4.80	1.5	0.010	0.01	0.01	0.45	97.93	21	8.03	65		2.92	
20	Petonia L	8/12/2007	9.0	6.70	1.7	0.008	0.01	0.08	0.44	121.22	16	7.59	59		2.33	
20	Petonia L	8/27/2007	9.1	6.60	1.7	0.008	0.07	0.01	0.63	167.82	3	8.00	64		1.82	
20	Petonia L	9/3/2007	9.0	6.60	1.7	0.007	0.01	0.02	0.63	188.85	9	8.01	64	5.7	1.21	
20	Petonia L	9/19/2007	9.1	5.20	1.7	0.009	0.01	0.01	0.57	144.49	5	7.44	59		2.24	
20	Petonia L	10/3/2007	9.2	4.90	1.7	0.010	0.01	0.02	0.58	128.06	5	7.60	79		1.95	
20	Petonia L	10/21/2007	9.3	5.00	1.7	0.016	0.01	0.11	0.56	78.85	6	6.79	66		2.51	
20	Petonia L	6/9/2008	9.2	4.95	1.5	0.010	0.01	0.02	0.32	74.25	5	7.24	79	5.6	1.22	
20	Petonia L	7/6/2008	8.9	6.60	1.5	0.007	0.01	0.03	0.29	88.09	6	7.93	62		1.22	
20	Petonia L	7/12/2008	8.9	7.15	1.5	0.006	0.01	0.01	0.25	85.81	8	8.67	76		1.10	
20	Petonia L	7/29/2008	9.1	6.05	1.5	0.012	0.01	0.02	0.23	42.45	5	7.76	58		1.10	
20	Petonia L	8/16/2008	9.0	6.25	1.5	0.006	0.02	0.03	0.22	84.67	3	6.94	61	4.7	1.38	
20	Petonia L	9/7/2008	9.0	6.30	1.5	0.001	0.00	0.00	0.19	344.38	4	7.76	69		1.67	
20	Petonia L	9/19/2008	8.9	4.50	1.5	0.012	0.01	0.03	0.20	38.82	5	7.81	60		4.45	
20	Petonia L	10/12/2008	9.2	1.45	1.5	0.021	0.02	0.02	0.35	38.07	7	7.35	85		21.96	
20	Petonia L	06/13/2009	9.0	4.15	1.5	0.009	0.01	0.01	0.20	49.52	7	7.85	71	5.4	2.34	
20	Petonia L	06/21/2009	9.0	5.65	1.5	0.007	0.01	0.02	0.16	55.72	8	7.28	64		3.94	
20	Petonia L	07/13/2009	9.0	5.50	1.5	0.007	0.00	0.00	0.14	46.00	12	7.58	58		1.43	
20	Petonia L	08/02/2009	8.8	6.55	1.5	0.006	0.01	0.02	0.14	51.33	9	7.62	50		1.38	
20	Petonia L	08/12/2009	9.0	4.50	1.5	0.005	0.05	0.02	0.21	95.33	12	8.22	58	4.5	1.50	
20	Petonia L	09/04/2009	9.4	4.80	1.5	0.010	0.01	0.01	0.19	42.63	12	8.05	68		1.60	
20	Petonia L	09/24/2009	8.9	4.50	1.5	0.007	0.01	0.01	0.22	66.90	5	6.16	53		1.70	
20	Petonia L	10/04/2009	8.9	3.60	1.5	0.024	0.01	0.04	0.39	35.81	8	7.57	62		4.17	
20	Petonia L	2009	grab	HAB												
20	Petonia L	2009	grab	HAB												
20	Petonia L	2009	grab	HAB												
20	Petonia L	5/23/2010	9.3	4.15	1.5	0.014	0.02	0.06			4	7.72	80	5.0	2.30	
20	Petonia L	6/7/2010	9.4	4.35	1.5	0.009	0.02	0.03			4	7.54	77		3.90	
20	Petonia L	7/6/2010	9.1	5.15	1.5	0.003	0.01	0.02	0.23	155.33	4	7.10	82		2.10	
20	Petonia L	7/27/2010	9.2	6.45	1.5	0.009	0.02	0.03			8	7.73	80		1.60	
20	Petonia L	8/20/2010	8.9	5.10	1.5	0.008	0.03	0.02	0.23	66.29	5	7.66	81	5.4	1.40	
20	Petonia L	9/11/2010	9.0	3.60	1.5	0.015	0.02	0.05	0.23	34.74	1	6.97	83		3.20	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
20	Petonia L	9/26/2010	9.0	4.25		0.014	0.04	0.15	0.36	56.57	5	6.77	81		2.90	
20	Petonia L	10/10/2010	9.1	2.45	1.5	0.016	0.06	0.04	0.25	35.63	15	6.80	83		3.40	
20	Petonia L	6/6/2011	9.2	3.45	1.5	0.011	0.02	0.04	0.20	40.04	10	8.42	92	15.4	1.60	
20	Petonia L	6/20/2011	9.3	3.40	1.5		0.01	0.03	0.20	11.08	6	6.24	107		1.70	
20	Petonia L	7/5/2011	9.4	2.15	1.5	0.015	0.02	0.02	0.26	38.16	8	7.57	75		3.50	
20	Petonia L	7/26/2011	9.1	3.35	1.5	0.010	0.09	0.03	0.34	76.22	8	7.94	72		3.90	
20	Petonia L	8/8/2011	9.1	3.15	1.5	0.013	0.01	0.03	0.36	62.54	7	7.96	87	5.0	3.40	
20	Petonia L	8/29/2011	9.4	2.55	1.5	0.011	0.02	0.03	0.39	76.51	9	7.89	75		7.40	
20	Petonia L	9/23/2011	9.3	2.45	1.5	0.016	0.02	0.03	0.34	48.26	13	7.44	67		6.40	
20	Petonia L	10/3/2011	9.2	2.05	1.5	0.016	0.01	0.03	0.39	54.93	16	7.71	64		11.10	
20	Petonia L	6/5/2012	9.4	2.40	1.5	0.020	0.05	0.02	0.43	47.32	7	7.81	65	4.7	8.40	
20	Petonia L	6/21/2012	9.5	2.15	1.5	0.013	0.07	0.05	0.29	49.08	6	8.08	66		5.30	
20	Petonia L	7/12/2012	9.1	2.40	1.5	0.012	0.01	0.03	0.44	84.21	6	7.49	68		3.90	
20	Petonia L	7/26/2012	9.2	4.15		0.010	0.01	0.02	0.43	90.75	5	7.10	67		1.50	
20	Petonia L	8/12/2012	9.2	5.30	1.5	0.008	0.02	0.05	0.27	70.98	7	6.84	71	4.7	1.40	
20	Petonia L	9/1/2012	9.2	6.35	1.5	0.015	0.01	0.05	0.17	26.22	6	7.40	68		1.40	
20	Petonia L	9/13/2012	9.4	6.35	1.5	0.011	0.04	0.05	0.45	92.98	5	8.00	65		1.30	
20	Petonia L	9/30/2012	9.3	3.55	1.5	0.013	0.01	0.16	0.22	37.91	10	7.64	67		2.90	
20	Petonia L	6/8/2013	9.1	4.58	1.5	0.012	0.01	0.011	0.24	44	6	7.67	67		3.60	
20	Petonia L	6/25/2013	9.1	4.25	1.5	0.010			0.28	58.66	6	7.41	68		3.30	
20	Petonia L	7/8/2013	9.4	4.35		0.015	0.01	0.023	0.11	16.39	7	8.07	81		1.40	
20	Petonia L	7/26/2013	9.1	5.45	1.5	0.007			0.35	114.8	7	7.87	66			
20	Petonia L	8/9/2013	9.1	6.35	1.5	0.015	0.02	0.026	0.23	34.59	10	7.18	67		1.10	
20	Petonia L	9/2/2013	9.2	6.20	1.5	0.008			0.37	107.3	12	7.66	70		0.60	
20	Petonia L	9/15/2013	9.0	6.30	1.5	0.008	0.01	0.005	0.3	83.59	10	7.33	68		1.10	
20	Petonia L	9/27/2013	9.0	5.05	1.5	0.007			0.37	113.4	7	7.50	69		2.30	
20	Petonia L	6/20/2014	9.7	5.40	1.5	0.008	0.01	0.04	0.30	79.62	2	7.29	73	4.9	1.50	
20	Petonia L	7/3/2014	8.9	4.85	1.5	0.008			0.35	99.14	4	7.15	78		1.70	
20	Petonia L	7/14/2014	9.6	4.70	1.5	0.009	0.01	0.04	0.33	80.91	6	7.28	74		1.50	
20	Petonia L	7/24/2014	9.2	6.10	1.5	0.008			0.30	80.94	5	7.83	79		1.30	
20	Petonia L	8/20/2014	9.1	5.75	1.5	0.006	0.01	0.02	0.40	147.66	2	7.33	74	4.7	1.60	
20	Petonia L	8/29/2014	9.3	4.80	1.5	0.009			0.36	85.16	6	7.34	74		2.40	
20	Petonia L	9/9/2014	9.1	4.10	1.5	0.010	0.03	0.04	0.31	69.82	6	7.36	72		2.30	
20	Petonia L	9/26/2014		bloom												
20	Petonia L	9/26/2014	9.1	3.85	1.5	0.010			0.35	77.66	5	8.41	84		1.60	
20	Petonia L	5/24/2015	9.4	6.40	1.5	0.012	0.02	0.02	0.23	19.74	4	7.95	82	5.5	1.00	
20	Petonia L	6/16/2015	9.6	6.90	1.5	0.007			0.28	39.72	2	7.32	87		1.00	
20	Petonia L	7/10/2015	9.2	5.70	1.5	0.009	0.01	0.03	0.30	33.86	6	6.81	71		1.80	16.1
20	Petonia L	7/30/2015	9.3	5.20	1.5	0.006			0.26	42.62	6	8.47	81		1.30	
20	Petonia L	8/16/2015	9.8	5.50	1.5	0.007	0.02	0.04	0.43	61.74	2	7.67	79	5.3	0.90	
20	Petonia L	8/28/2015	9.5	6.00	1.5	0.009			0.48	55.63	7	7.75	74		1.20	
20	Petonia L	9/17/2015	9.2	5.90	1.5	0.010	0.00	0.02	0.20	20.21	2	8.14	95		1.60	17.0
LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP			Fe	Mn	As	
20	Petonia L	06/18/02	9.7			0.011	0.01	0.02	0.46	91.28						
20	Petonia L	07/02/02	9.7	5.75	9.7	0.015	0.00	0.06	0.41	59.98						
20	Petonia L	07/16/02	9.7	5.85	9.7	0.013	0.00	0.04	0.44	76.90						
20	Petonia L	07/30/02	9.8	4.40	9.8	0.007	0.02	0.13	0.52	152.95						
20	Petonia L	08/12/02	9.7	5.40	9.7	0.022	0.02	0.05	0.54	52.99						
20	Petonia L	08/26/02	9.7	4.30	9.7	0.012			0.43	79.49						
20	Petonia L	09/10/02	9.7	4.65	9.7	0.018	0.00	0.01								
20	Petonia L	09/30/02	10.0	3.80	10.0	0.029	0.00	0.09	0.64	47.98						
20	Petonia L	6/18/2003			9.8	0.020	0.02	0.03	0.20	22.81						
20	Petonia L	6/30/2003			9.8	0.020	0.00	0.02	0.25	28.00						
20	Petonia L	7/16/2003			9.8	0.022	0.00	0.03	0.33	33.74						
20	Petonia L	8/19/2003			9.7	0.039	0.05	0.12	0.42	23.73						
20	Petonia L	9/8/2003			9.7	0.022	0.02	0.01								
20	Petonia L	9/22/2003			9.7	0.007	0.00	0.02	0.19	58.79						
20	Petonia L	10/20/2003			9.7	0.024	0.00	0.00	0.07	6.70						
20	Petonia L	6/15/2004			9.8	0.014	0.02	0.01	0.52	79.63						
20	Petonia L	6/28/2004			9.8	0.026	0.01	0.01	0.33	27.96						
20	Petonia L	7/13/2004			9.8	0.019	0.02	0.03	0.51	60.15						
20	Petonia L	7/26/2004			9.7	0.014	0.01	0.01	0.15	22.72						
20	Petonia L	8/23/2004			9.5	0.026	0.03	0.02	0.41	34.22						
20	Petonia L	9/7/2004			9.5	0.018	0.01	0.01	0.31	38.62						
20	Petonia L	9/22/2004			9.7	0.020	0.01	0.01	0.44	48.07						
20	Petonia L	10/5/2004			9.7	0.012	0.01	0.01	0.18	33.38						

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP			Fe	Mn	As	
20	Petonia L	6/9/2008	9.2		9.2	0.011										
20	Petonia L	7/6/2008	8.9		8.9	0.008										
20	Petonia L	7/12/2008	8.9		8.9	0.007										
20	Petonia L	7/29/2008	9.1		7.0	0.014										
20	Petonia L	8/16/2008	9.0		7.0	0.007										
20	Petonia L	9/7/2008	9.0		7.0	0.002										
20	Petonia L	9/19/2008	8.9		7.0	0.004										
20	Petonia L	10/12/2008	9.2		7.0	0.019										
20	Petonia L	06/13/2009				0.010		0.04								
20	Petonia L	06/21/2009				0.013										
20	Petonia L	07/13/2009				0.007		0.01								
20	Petonia L	08/02/2009				0.006										
20	Petonia L	08/12/2009				0.006		0.01					0.10	0.10	1.00	
20	Petonia L	09/04/2009				0.008										
20	Petonia L	09/24/2009				0.009		0.01					0.10	0.10	0.34	
20	Petonia L	10/04/2009				0.015										
20	Petonia L	5/23/2010	9.3		7.0	0.012		0.03					0.03			
20	Petonia L	7/6/2010	9.1		7.0	0.057		0.01					0.03			
20	Petonia L	8/20/2010	8.9		7.0	0.009		0.05					0.03			
20	Petonia L	9/26/2010	9.0			0.014		0.02					0.14		1.90	
20	Petonia L	6/6/2011	9.2		7.0	0.014		0.04						0.01		
20	Petonia L	7/5/2011	9.4		7.0	0.015		0.03					0.01	0.01		
20	Petonia L	8/8/2011	9.1		7.0	0.013		0.04					0.01	0.01	1.00	
20	Petonia L	9/23/2011	9.3		7.0	0.025		0.06					0.01	0.01	1.00	
20	Petonia L	6/5/2012			7.0	0.017		0.02								
20	Petonia L	6/21/2012			7.0								0.03	0.02		
20	Petonia L	7/12/2012			7.0	0.019		0.02								
20	Petonia L	7/26/2012											0.03	0.02		
20	Petonia L	8/12/2012			7.0	0.015		0.07								
20	Petonia L	9/1/2012			7.0								0.03	0.02	1.00	
20	Petonia L	9/13/2012			7.0	0.010		0.06								
20	Petonia L	9/30/2012			7.0								0.03	0.02	1.00	
20	Petonia L	6/8/2013			7.0	0.010		0.01								
20	Petonia L	6/25/2013			7.0											
20	Petonia L	7/8/2013				0.012		0.03								
20	Petonia L	7/26/2013			7.0											
20	Petonia L	8/9/2013			7.0	0.012		0.03								
20	Petonia L	9/2/2013			7.0											
20	Petonia L	9/15/2013			7.0	0.007		0.01								
20	Petonia L	9/27/2013			7.0											
20	Petonia L	6/20/2014			7.0	0.011		0.05								
20	Petonia L	7/3/2014			7.0	0.013										
20	Petonia L	7/14/2014			7.0	0.020		0.05								
20	Petonia L	7/24/2014			7.0	0.011										
20	Petonia L	8/20/2014			7.0	0.007		0.02								
20	Petonia L	8/29/2014			7.0	0.015										
20	Petonia L	9/9/2014			7.0	0.010		0.04								
20	Petonia L	9/26/2014			7.0	0.008										
20	Petonia L	5/24/2015			7.0	0.012		0.04								
20	Petonia L	6/16/2015			7.0	0.010										
20	Petonia L	7/10/2015			7.0	0.008		0.05								
20	Petonia L	7/30/2015			7.0	0.012										
20	Petonia L	8/16/2015			7.0	0.010		0.04								
20	Petonia L	8/28/2015			7.0	0.011										
20	Petonia L	9/17/2015			7.0	0.011		0.02								
20	Petonia L-A	6/17/2005					0.01	0.01	0.34							
20	Petonia L-B	6/17/2005					0.01	0.01	0.22							
20	Petonia L-C	6/17/2005					0.06	0.01	0.39							
20	Petonia L-A	7/11/2005					0.01	0.01	0.20							
20	Petonia L-B	7/11/2005					0.01	0.01	0.13							
20	Petonia L-C	7/11/2005					0.01	0.01	0.30							

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
20	Petonia L	6/21/1986	epi	23	20															
20	Petonia L	6/28/1986	epi	25	21															
20	Petonia L	7/4/1986	epi	23	21															
20	Petonia L	7/11/1986	epi	19	23															
20	Petonia L	7/16/1986	epi	22	22															
20	Petonia L	7/23/1986	epi	27	23															
20	Petonia L	7/30/1986	epi	20	23															
20	Petonia L	8/6/1986	epi	25	24															
20	Petonia L	8/13/1986	epi	20	23															
20	Petonia L	8/20/1986	epi	25	24															
20	Petonia L	8/27/1986	epi	18	22															
20	Petonia L	9/3/1986	epi	23	20															
20	Petonia L	9/10/1986	epi	24	19															
20	Petonia L	9/17/1986	epi	15	17															
20	Petonia L	9/24/1986	epi	25	18															
20	Petonia L	6/14/1987	epi	19	21															
20	Petonia L	6/28/1987	epi	18	23															
20	Petonia L	7/12/1987	epi	35	26															
20	Petonia L	7/26/1987	epi	20	26															
20	Petonia L	8/4/1987	epi	27	19															
20	Petonia L	8/9/1987	epi	20	25															
20	Petonia L	8/23/1987	epi	17	22															
20	Petonia L	9/6/1987	epi	19	18															
20	Petonia L	9/20/1987	epi	17	17															
20	Petonia L	6/17/1988	epi	20	21															
20	Petonia L	7/5/1988	epi	30	20															
20	Petonia L	7/17/1988	epi	25	23															
20	Petonia L	7/29/1988	epi	27	23															
20	Petonia L	8/15/1988	epi	21	24															
20	Petonia L	8/28/1988	epi	25	22															
20	Petonia L	9/11/1988	epi	23	18															
20	Petonia L	9/25/1988	epi	23	17															
20	Petonia L	6/25/1989	epi	20	19															
20	Petonia L	7/9/1989	epi	20	20															
20	Petonia L	7/26/1989	epi	32	27															
20	Petonia L	8/6/1989	epi	28	26															
20	Petonia L	8/21/1989	epi	27	24															
20	Petonia L	9/4/1989	epi	20	22															
20	Petonia L	9/17/1989	epi	21	20															
20	Petonia L	9/30/1989	epi	19	18															
20	Petonia L	7/8/1990	epi	25	23															
20	Petonia L	7/22/1990	epi	34	26															
20	Petonia L	8/5/1990	epi	20	23															
20	Petonia L	8/19/1990	epi	20	24															
20	Petonia L	9/2/1990	epi	25	23															
20	Petonia L	9/16/1990	epi	13	20															
20	Petonia L	9/30/1990	epi	23	19															
20	Petonia L	10/14/1990	epi	22	19															
20	Petonia L	7/9/2001	epi	24	25	1	1	1												
20	Petonia L	7/23/2001	epi	32	24	2	3	1												
20	Petonia L	8/6/2001	epi	29	26	1	1	1												
20	Petonia L	8/20/2001	epi	29	27	2	1	1												
20	Petonia L	9/4/2001	epi	21	23	2		1												
20	Petonia L	9/18/2001	epi			1	1	1												
20	Petonia L	10/2/2001	epi	22	20	1	1	1												
20	Petonia L	10/15/2001	epi	16	18	2	1	2												
20	Petonia L	06/18/02	epi			2	1	2	8											
20	Petonia L	07/02/02	epi	29	24	1	1	1												
20	Petonia L	07/16/02	epi	27	24	1	1	1												
20	Petonia L	07/30/02	epi	32	25	2	2	1												
20	Petonia L	08/12/02	epi	32	27	1	2	1												

LNum	PName	Date	Site	TAir	TH2O	QA	QB	QC	QD	QE	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
20	Petonia L	08/26/02	epi	21	23	2	2	1													
20	Petonia L	09/10/02	epi	29	24	2	1	1													
20	Petonia L	09/30/02	epi	21	20	2	1	1													
20	Petonia L	6/18/2003	epi	27	20	2	1	2	5												
20	Petonia L	6/30/2003	epi	26	22	2	2	1	5												
20	Petonia L	7/16/2003	epi	28	23	1	1	1													
20	Petonia L	7/28/2003	epi	27	26	2	1	1													
20	Petonia L	8/19/2003	epi	29	24	2	1	1													
20	Petonia L	9/8/2003	epi	22	22	2	1	1													
20	Petonia L	9/22/2003	epi	20	21	2	1	2	5												
20	Petonia L	10/20/2003	epi	8	12	3	1	4	135												
20	Petonia L	6/15/2004	epi	22	21	2	1	2	0												
20	Petonia L	6/28/2004	epi	20	21	2	1	2	0												
20	Petonia L	7/13/2004	epi	22	22	2	1	2	0												
20	Petonia L	7/26/2004	epi	21	24	2	1	2	5												
20	Petonia L	8/23/2004	epi	20	22	1	1	1	0												
20	Petonia L	9/7/2004	epi	23	24	2	1	1	0												
20	Petonia L	9/22/2004	epi	21	22	2	1	1	0												
20	Petonia L	10/5/2004	epi	6	19	3	1	1	0												
20	Petonia L	6/17/2005	epi	21	24	1	2	3	23												
20	Petonia L	6/28/2005	epi	27	27	1	2	2	5												
20	Petonia L	7/11/2005	epi	30		2	3	2	2												
20	Petonia L	7/25/2005	epi	25	21	2	3	2	2												
20	Petonia L	8/8/2005	epi	23	27	1	3	2	2												
20	Petonia L	8/22/2005	epi	17	26	2	3	2	2												
20	Petonia L	9/5/2005	epi	12	23	2	3	2	2												
20	Petonia L	9/21/2005	epi	16	21	1	3	2	2												
20	Petonia L	6/27/2006	epi	25	22	2	3	2	5												
20	Petonia L	7/15/2006	epi	22	25	1	3	2	8												
20	Petonia L	7/28/2006	epi	25	27	2	3	2	2												
20	Petonia L	8/18/2006	epi	19	24	3	4	3	28												
20	Petonia L	9/1/2006	epi	17	23	2	3	3	2												
20	Petonia L	9/15/2006	epi	23	22	2	3	3	25												
20	Petonia L	10/11/2006	epi	18	18	3	3	3	123												
20	Petonia L	10/19/2006	epi	18	16	3	3	3	12568												
20	Petonia L	6/29/2007	epi	20	24	2	3	3	2												
20	Petonia L	7/24/2007	epi	24	24	2	3	3	2												
20	Petonia L	8/12/2007	epi	27	26	2	3	3	2												
20	Petonia L	8/27/2007	epi	21	25	2	3	3	2												
20	Petonia L	9/3/2007	epi	22	22	2	3	3	2												
20	Petonia L	9/19/2007	epi	24	19	2	3	3	2												
20	Petonia L	10/3/2007	epi	22	20	2	3	3	2												
20	Petonia L	10/21/2007	epi	20	18	2	3	3	28												
20	Petonia L	6/9/2008	epi	34	25	2	2	3	1456												
20	Petonia L	7/6/2008	epi	30	27	2	2	2	8												
20	Petonia L	7/12/2008	epi	20	23	2	2	2	2												
20	Petonia L	7/29/2008	epi	27	25	1	3	2	2												
20	Petonia L	8/16/2008	epi	20	24	1	3	2	2												
20	Petonia L	9/7/2008	epi	20	22	1	3	2	2												
20	Petonia L	9/19/2008	epi	21	20	3	3	3	12												
20	Petonia L	10/12/2008	epi	23	17	4	3	4	12348												
20	Petonia L	06/13/2009	epi	22	20	2	3	2	68												
20	Petonia L	06/21/2009	epi	24	18	2	3	2	25												
20	Petonia L	07/13/2009	epi	23	21	2	2	2	25												
20	Petonia L	08/02/2009	epi	24	24	1	3	1	25												
20	Petonia L	08/12/2009	epi	22	23	3	3	3	125												
20	Petonia L	09/04/2009	epi	23	24	3	3	3	124				23.7								
20	Petonia L	09/24/2009	epi	21	21	3	3	3	12358				23.9	0.00							
20	Petonia L	10/04/2009	epi	16	17	3	3	3	1234				41.8								
20	Petonia L		bloom												1.07						
20	Petonia L		bloom												9.78						

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
20	Petonia L		bloom											19.30						
20	Petonia L	5/23/2010	epi	21	21	2	1	2	36	0	0									
20	Petonia L	6/7/2010	epi	20	22	2	2	2	35	0	0									
20	Petonia L	7/6/2010	epi	30	27	2	2	2	2	0	0									
20	Petonia L	7/27/2010	epi	18	26	2	3	2	2	0	0									
20	Petonia L	8/20/2010	epi	23	26	2	3	3	28	6	0	20.00		0.00						
20	Petonia L	9/11/2010	epi	23	21	2	4	2	128	4	0									
20	Petonia L	9/26/2010	epi			3	4	3	23	4	0	25.00		0.00						
20	Petonia L	6/6/2011	epi	21	21	2	2	2	1256	0	0									
20	Petonia L	6/20/2011	epi	24	23	3	3	3	124	0		4.50	1.30							
20	Petonia L	7/5/2011	epi	28	24	3	3	3	1248	0		3.90	1.50							
20	Petonia L	7/26/2011	epi	27	27	3	3	4	124	4		4.60	4.63	<0.30					f	
20	Petonia L	8/8/2011	epi	23	25	3	4	4	1245	0		9.50	2.80							
20	Petonia L	8/8/2011	DOH											0.00						
20	Petonia L	8/29/2011	epi	24	23	3	3	3	1245	0	0	25.30	3.30							
20	Petonia L	9/23/2011	epi	16	17	3	3	4	12345	0	0	15.80	6.40							
20	Petonia L	9/23/2011	DOH											0.00						
20	Petonia L	10/3/2011	epi	8	17	3	3	4	1245	0	0			0.00						
20	Petonia L	10/3/2011	DOH									26.60	5.90							
20	Petonia L	6/5/2012	epi	11	18	3	3	4	156	0		15.80	2.10	<0.30	<0.417		2.38	1.37	F	
20	Petonia L	6/21/2012	epi	21	21	3	3	4	1234	0		3.40	1.40	<0.30	<0.413		4.44	0.26	F	
20	Petonia L	7/12/2012	epi	26	27	3	4	3	12	0	0	8.90	0.70	<0.30	<0.423		3.45	1.54	FI	
20	Petonia L	7/26/2012	epi	28	26	3	3	3	124	0		4.40	0.40	<0.30	<0.292		2.04	0.92	FI	
20	Petonia L	8/12/2012	epi	28	26	2	3	2	2	0	0	1.40	0.40	<0.30	<0.537		1.80	0.64	I	
20	Petonia L	9/1/2012	epi	19	23	2	3	2	2	0		1.80	0.20	<0.30	<0.580		1.21	0.91	FHI	
20	Petonia L	9/13/2012	epi	22	21	2	3	2	2	0	0	0.90	0.10	0.42	<3.299		0.69	0.53	FHI	
20	Petonia L	9/30/2012	epi	12	16	3	3	3	2	4	0	1.80	0.70	<0.30	<3.205		1.78	0.00	H	
20	Petonia L	6/8/2013	epi	12	16	3	3	3	2	4	0	1.80	0.70	<0.30	<3.205		1.78	0.00	hi	I
20	Petonia L	6/25/2013	epi	15	18	2	2	2	6	0		2.40	2.10	<0.30	<0.420		2.70	0.50	F	F
20	Petonia L	7/8/2013	epi	24	24	3	2	2	123	0		1.60	2.40	<0.30	<0.410		1.90	0.00	fi	I
20	Petonia L	7/26/2013	epi			2	2	2	2	0		2.00	1.30	<0.30	<0.510		0.70	0.00	I	I
20	Petonia L	8/9/2013	epi	27	26	1	3	2	2	0		0.90	1.20	<0.30	<0.400		0.30	0.10	I	I
20	Petonia L	9/2/2013	epi	23	23	1	3	2	25	0		5.00	2.30	<0.30	<0.380		0.80	0.00	I	I
20	Petonia L	9/15/2013	epi	27	25	1	3	2	25	0		2.90	1.10	<0.30	<0.570		1.00	0.10	I	I
20	Petonia L	9/27/2013	epi	15	20	2	3	2	25	0	0	2.00	0.90	<0.30	<19.130		0.50	0.00	I	I
20	Petonia L	6/20/2014	epi	32	21	2	2	2	8	0	0	1.30	0.20	<0.47	<0.44	<0.002	0.77	0.30	i	i
20	Petonia L	7/3/2014	epi	27	27	2	2	2	2	0	0	1.40	0.20	<0.62	<0.03	<0.002	0.21	0.00	i	i
20	Petonia L	7/14/2014	epi	24	26	2	2	2	2	0	0	3.60	0.50	<0.40	<0.48	<0.001	1.27	0.00	i	i
20	Petonia L	7/24/2014	epi	22	26	1	2	2	0	0	0	1.60	0.30	<0.63	<0.03	<0.001	0.90	0.00	i	i
20	Petonia L	8/20/2014	epi	22	24	1	3	1	5	0	0	2.40	0.30	<1.06	<0.16	<0.002	1.02	0.01	i	i
20	Petonia L	8/29/2014	epi	21	24	2	1	2	13	0	0	3.80	0.40	<0.64	<0.16	<0.002	1.72	0.00	i	i
20	Petonia L	9/9/2014	epi	23	23	3	3	3	12	0	0	2.90	0.30	<0.24	<0.03	<0.001	1.33	0.00	i	i
20	Petonia L	9/26/2014	bloom											1.38	<0.50	<0.003	2553	967		h
20	Petonia L	9/26/2014	epi	23	20	3	2	4	12	0	0	2.90	0.30	<0.19	<0.12	<0.001	1.34	0.10	i	h
20	Petonia L	5/24/2015	epi	25	18	1	1	1	5	0	0	3.20	0.20	<1.34	<0.032	<0.080	0.23	0.00	I	I
20	Petonia L	6/16/2015	epi	25	19	1	2	1	0	0	0	2.10	0.20	<0.55	<0.004	<0.024	0.15	0.00	I	I
20	Petonia L	7/10/2015	epi	21	22	2	2	2	0	0	0	8.40	0.20	<1.01	<0.003	<0.011	0.73	0.00	I	I
20	Petonia L	7/30/2015	epi	25	25	2	3	3	2	0	0	0.96	0.20	<0.19	<0.004	<0.013	0.45	0.00	I	I
20	Petonia L	8/16/2015	epi	27	25	2	3	2	2	0	0	2.40	0.20	<0.44	0.01	<0.014	0.46	0.00	I	I
20	Petonia L	8/28/2015	epi	26	22	2	3	2	28	0	0			<0.27	<0.004	<0.012	0.51	0.00	I	I
20	Petonia L	9/17/2015	epi	24	23	2	3	2	28	0	0	0.05	0.40	<0.74	<0.010	<0.075	1.05	0.00	H	H
20	Petonia L	07/02/02	hypo	29	17	1	1	1												
20	Petonia L	07/16/02	hypo	27	14	1	1	1												
20	Petonia L	07/30/02	hypo	32	14	2	2	1												
20	Petonia L	08/12/02	hypo	32	16	1	2	1												
20	Petonia L	08/26/02	hypo	21	17	2	2	1												
20	Petonia L	09/10/02	hypo	29	17	2	1	1												
20	Petonia L	09/30/02	hypo	21	17	2	1	1												
20	Petonia L	6/18/2003	hypo		14															
20	Petonia L	6/30/2003	hypo		14															
20	Petonia L	7/16/2003	hypo		14															

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
20	Petonia L	8/19/2003	hypo		17															
20	Petonia L	9/8/2003	hypo		20															
20	Petonia L	9/22/2003	hypo		14															
20	Petonia L	10/20/2003	hypo		9															
20	Petonia L	6/15/2004	hypo		14															
20	Petonia L	6/28/2004	hypo		14															
20	Petonia L	7/13/2004	hypo		14															
20	Petonia L	7/26/2004	hypo		16															
20	Petonia L	8/23/2004	hypo		16															
20	Petonia L	9/7/2004	hypo		20															
20	Petonia L	9/22/2004	hypo		16															
20	Petonia L	10/5/2004	hypo		14															
20	Petonia L	6/17/2005	hypo		14															
20	Petonia L	7/11/2005	hypo		17															
20	Petonia L	7/25/2005	hypo		20															
20	Petonia L	8/8/2005	hypo		23															
20	Petonia L	8/22/2005	hypo		21															
20	Petonia L	9/5/2005	hypo		22															
20	Petonia L	9/21/2005	hypo		21															
20	Petonia L	6/27/2006	hypo		22															
20	Petonia L	7/15/2006	hypo		22															
20	Petonia L	9/1/2006	hypo		22															
20	Petonia L	9/15/2006	hypo		22															
20	Petonia L	10/11/2006	hypo		17															
20	Petonia L	10/19/2006	hypo		14															
20	Petonia L	6/29/2007	hypo		24															
20	Petonia L	7/24/2007	hypo		21															
20	Petonia L	8/12/2007	hypo		26															
20	Petonia L	8/27/2007	hypo		23															
20	Petonia L	9/3/2007	hypo		21															
20	Petonia L	9/19/2007	hypo		19															
20	Petonia L	10/3/2007	hypo		19															
20	Petonia L	10/21/2007	hypo		19															
20	Petonia L	6/9/2008	hypo		18															
20	Petonia L	7/6/2008	hypo		23															
20	Petonia L	7/12/2008	hypo		23															
20	Petonia L	7/29/2008	hypo		17															
20	Petonia L	8/16/2008	hypo		21															
20	Petonia L	9/7/2008	hypo		23															
20	Petonia L	9/19/2008	hypo		20															
20	Petonia L	10/12/2008	hypo		17															
20	Petonia L	06/13/2009	hypo		19							23.7								
20	Petonia L	06/21/2009	hypo		17							23.9	0.00							
20	Petonia L	07/13/2009	hypo		16							41.8								
20	Petonia L	08/02/2009	hypo		23							23.7								
20	Petonia L	08/12/2009	hypo		24															
20	Petonia L	09/04/2009	hypo		22															
20	Petonia L	09/24/2009	hypo		20															
20	Petonia L	10/04/2009	hypo		16															
20	Petonia L	5/23/2010	hypo		16															
20	Petonia L	7/6/2010	hypo		21															
20	Petonia L	8/20/2010	hypo		26															
20	Petonia L	6/6/2011	hypo		11															
20	Petonia L	7/5/2011	hypo		13															
20	Petonia L	8/8/2011	hypo		17															
20	Petonia L	9/23/2011	hypo		10															
20	Petonia L	6/5/2012	hypo		15															
20	Petonia L	6/21/2012	hypo		15															
20	Petonia L	7/12/2012	hypo		17															
20	Petonia L	7/26/2012	hypo		18															
20	Petonia L	8/12/2012	hypo		18															

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QE	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB	
20	Petonia L	9/1/2012	hypo		19																	
20	Petonia L	9/13/2012	hypo		21																	
20	Petonia L	9/30/2012	hypo		18																	
20	Petonia L	6/8/2013	hypo		19																	
20	Petonia L	6/25/2013	hypo		20																	
20	Petonia L	7/26/2013	hypo		23																	
20	Petonia L	8/9/2013	hypo		22																	
20	Petonia L	9/2/2013	hypo		22																	
20	Petonia L	9/15/2013	hypo		13																	
20	Petonia L	9/27/2013	hypo		18																	
20	Petonia L	6/20/2014	hypo		16																	
20	Petonia L	7/3/2014	hypo		14																	
20	Petonia L	7/14/2014	hypo		22																	
20	Petonia L	7/24/2014	hypo		18																	
20	Petonia L	8/20/2014	hypo		20																	
20	Petonia L	8/29/2014	hypo		21																	
20	Petonia L	9/9/2014	hypo		23																	
20	Petonia L	9/26/2014	hypo		20																	
20	Petonia L	5/24/2015	hypo		17																	
20	Petonia L	6/16/2015	hypo		16																	
20	Petonia L	7/10/2015	hypo		17																	
20	Petonia L	7/30/2015	hypo		18																	
20	Petonia L	8/16/2015	hypo		21																	
20	Petonia L	8/28/2015	hypo		22																	
20	Petonia L	9/17/2015	hypo		23																	

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	Cylindrospermopsin (ug/l)	0.1 ug/l	none
FP-Chl, FP-BG	Fluoroprobe total chlorophyll, fluoroprobe blue-green chlorophyll (ug/l)	0.1 ug/l	none
Lake Assessment			
QA	water quality assessment; 1 = crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels		
QB	aquatic plant assessment; 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = surface plant coverage		
QC	recreational assessment; 1 = could not be nicer, 2 = excellent, 3 = slightly impaired, 4 = substantially impaired, 5 = lake not usable		
QD	reasons for recreational assessment; 1 = poor water clarity, 2 = excessive weeds, 3 = too much algae, 4 = lake looks bad, 5 = poor weather, 6 = litter/surface debris, 7 = too many lake users, 8 = other		
QF, QG	Health and safety issues today (QF) and past week (QG); 0 = none, 1 = taste/odor, 2 = GI illness humans/animals, 3 = swimmers itch, 4 = algae blooms, 5 = dead fish, 6 = unusual animals, 7 = other		
HAB form, Shore HAB	HAB evaluation; A = spilled paint, B = pea soup, C = streaks, D = green dots, E = bubbling scum, F = green/brown tint, G = duckweed, H = other, I = no bloom		

Appendix B- Priority Waterbody Listing for Petonia Lake

Lake Petonia (0602-0092)

NoKnownImpct

Waterbody Location Information

Revised: 07/06/2009

Water Index No:	SR- 44-23- 3-P78	Drain Basin:	Susquehanna River
Hydro Unit Code:	02050102/040	Str Class:	A
Waterbody Type:	Lake (Oligotrophic)	Reg/County:	7/Chenango Co. (9)
Waterbody Size:	24.1 Acres	Quad Map:	GREENE (L-17-3)
Seg Description:	entire lake		

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

Use(s) Impacted	Severity	Problem Documentation
NO USE IMPAIRMNT		

Type of Pollutant(s)

Known: ---
 Suspected: ---
 Possible: ---

Source(s) of Pollutant(s)

Known: ---
 Suspected: ---
 Possible: ---

Resolution/Management Information

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

Further Details

Water Quality Sampling

Petonia Lake has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1986 through 1991 and from 2001 through 2006. An Interpretive Summary report of the findings of this sampling was published in 2007. These data indicate that the lake continues to be best characterized as mesoligotrophic, or moderately unproductive. Phosphorus levels in the lake are typically well below the state guidance values indicating impacted/stressed recreational uses. Corresponding transparency measurements consistently exceed the recommended minimum for swimming beaches. Measurements of pH 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, July 2007) 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 very favorable. The recreational suitability of the lake is described most frequently as "could not be nicer" to "excellent." The lake itself is most often described as "crystal clear" to "not quite crystal clear," an assessment that is consistent measured water quality characteristics. Assessments have noted that aquatic plants rarely grow to the lake surface. Aquatic plants are dominated by native and have not typically been cited as impacting recreational uses. (DEC/DOW, BWAM/CSLAP, July 2007)

Lake Uses

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

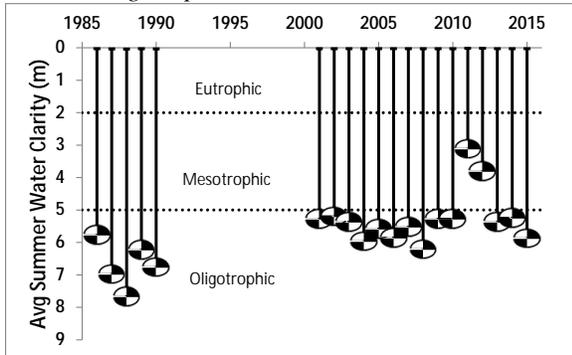
Segment Description

This segment includes the total area of the entire lake.

Appendix C- Long Term Trends: Petonia Lake

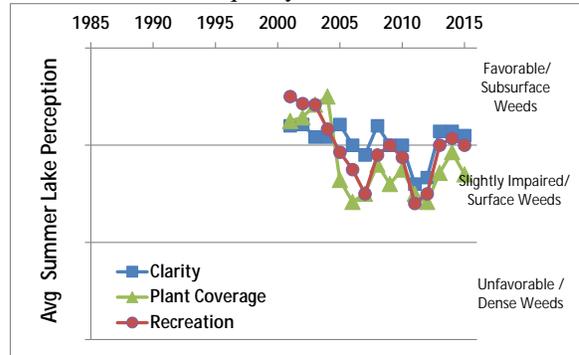
Long Term Trends: Water Clarity

- ↓ since late 80s; mostly stable since early 00s
- Most readings now typical of *mesotrophic* to *oligotrophic* lakes



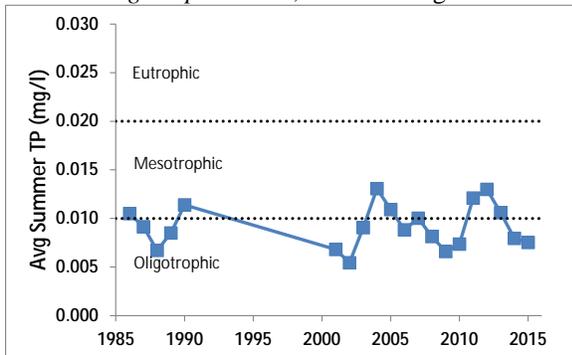
Long Term Trends: Lake Perception

- Degrading early 00s-early 10s; better since
- Recreational perception linked to changes in both water quality and weeds



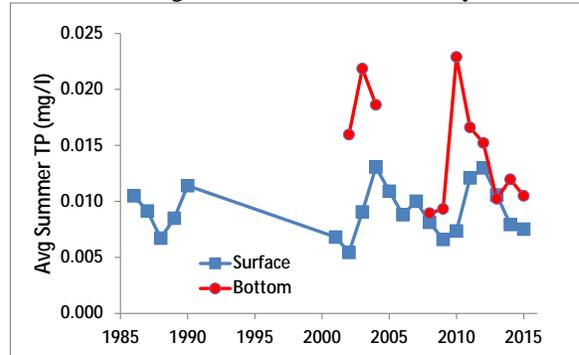
Long Term Trends: Phosphorus

- No trends apparent; varies cyclically
- Most readings typical of *mesotrophic* to *oligotrophic* lakes, similar to algae levels



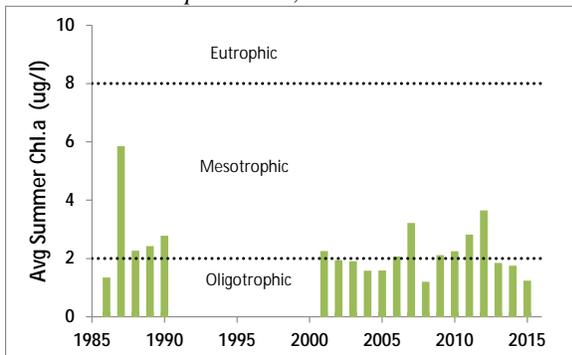
Long Term Trends: Bottom Phosphorus

- Deep TP only slightly elevated some years
- Mostly similar surface and bottom TP readings indicate weak thermal layers



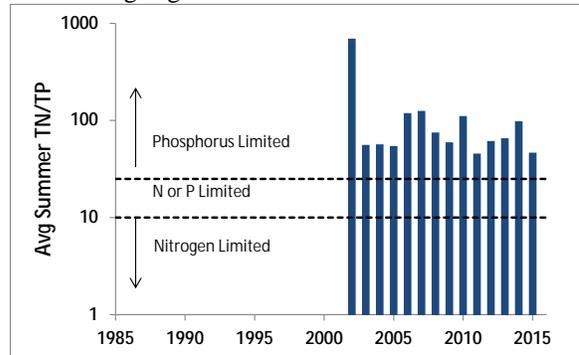
Long Term Trends: Chlorophyll a

- No trends apparent; recent ↓
- Most readings typical of *oligotrophic* to *mesotrophic* lakes, consistent with TP levels



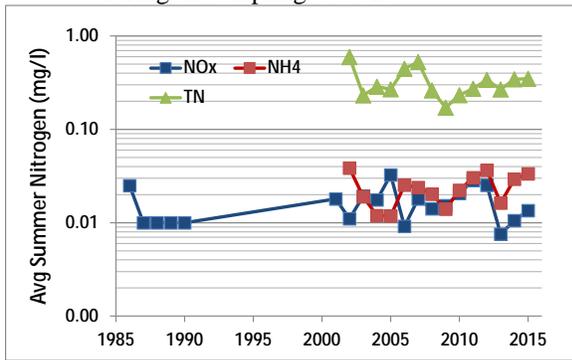
Long Term Trends: N:P Ratio

- No trends apparent; ↑ last few years
- Most readings indicate phosphorus limits algae growth



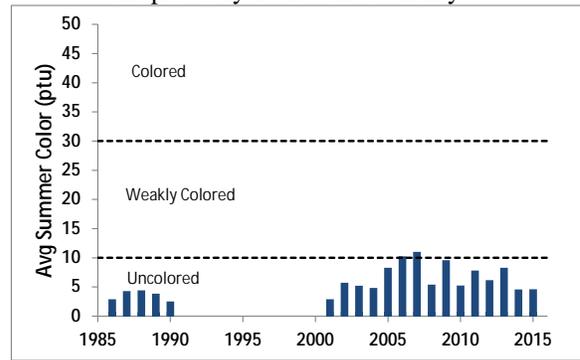
Long Term Trends: Nitrogen

- ↑ N late 00s-2012; variable since
- Low NO_x, ammonia and total nitrogen during all sampling seasons



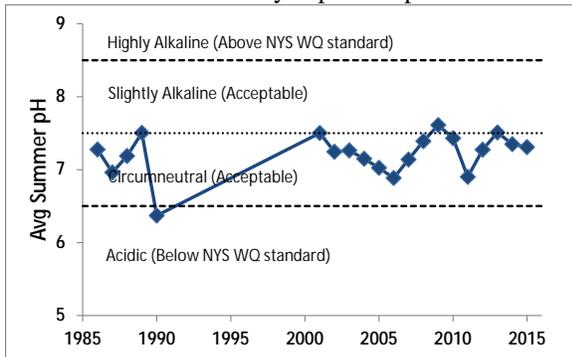
Long Term Trends: Color

- Higher after lab change in 2002; no trends
- Most readings still typical of *uncolored* lakes, and probably do not affect clarity



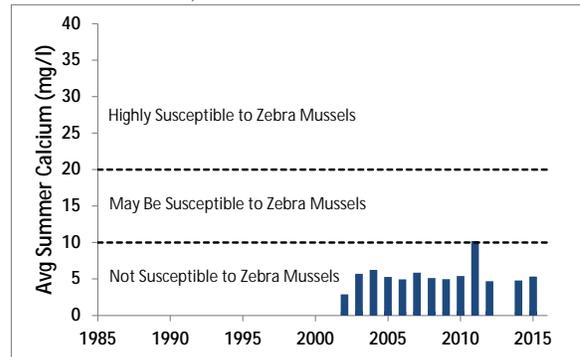
Long Term Trends: pH

- Varies cyclically (similar to P cycle?)
- Most readings typical of *circumneutral* lakes, with occasionally depressed pH



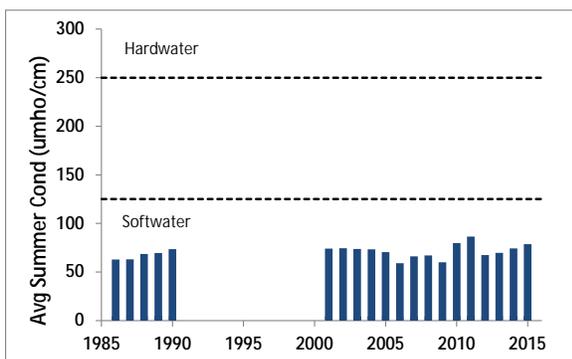
Long Term Trends: Calcium

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



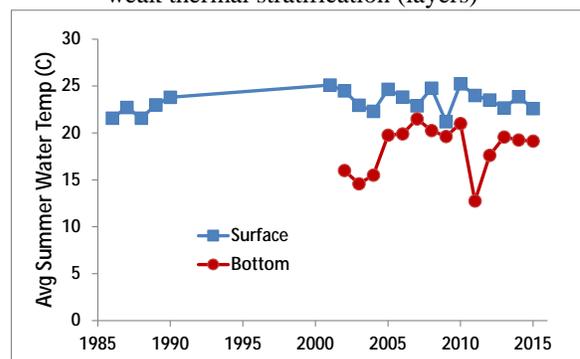
Long Term Trends: Conductivity

- No trends apparent; slight ↑ since early 00s
- Most readings typical of *softwater* lakes



Long Term Trends: Water Temperature

- No trends apparent; recent decrease
- Similar deepwater temperatures indicate weak thermal stratification (layers)



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

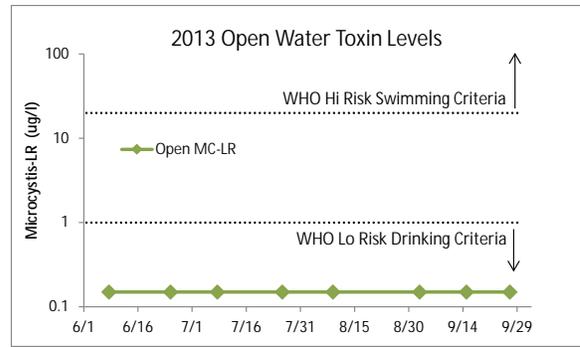


Figure D2:
2013 Open Water Microcystin-LR



Figure D3:
2013 Shoreline Total and BGA Chl.a



Figure D4:
2013 Shoreline Microcystin-LR

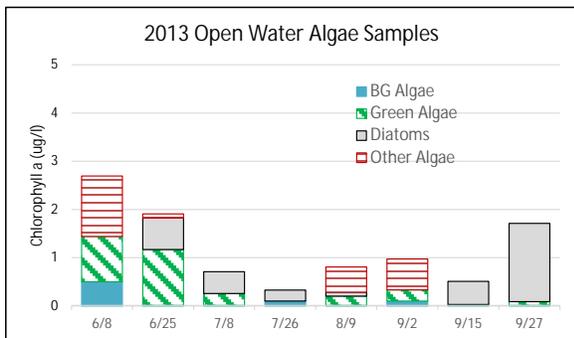


Figure D5:
2013 Open Water Algae Types

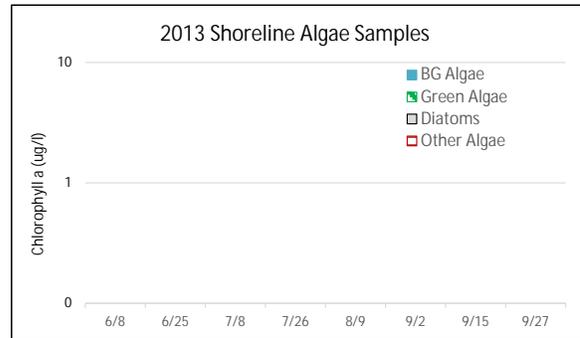


Figure D6:
2013 Shoreline Algae Types

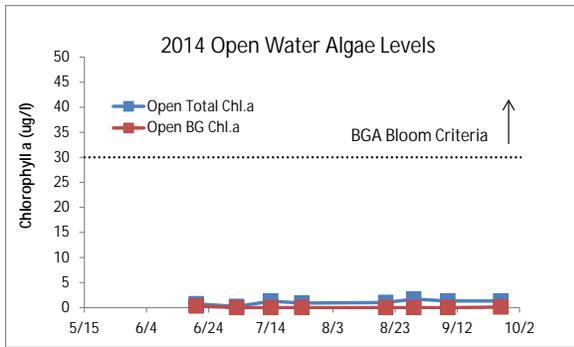


Figure D7:
2014 Open Water Total and BGA Chl.a

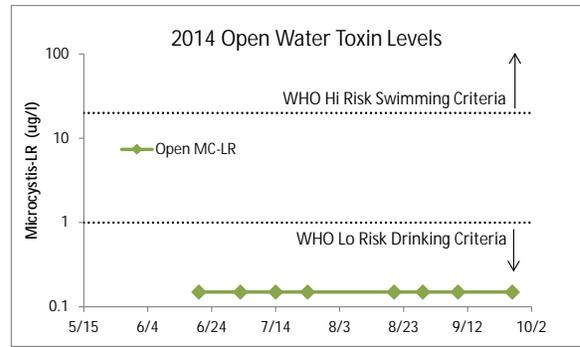


Figure D8:
2014 Open Water Microcystin-LR

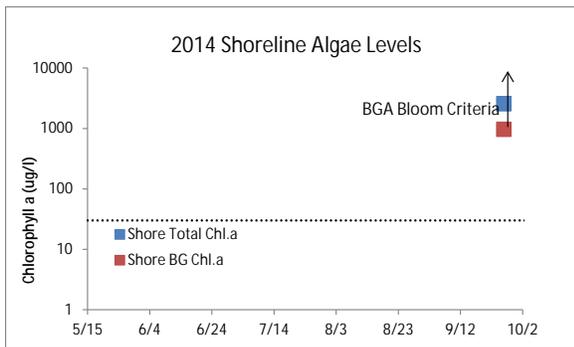


Figure D9:
2014 Shoreline Total and BGA Chl.a

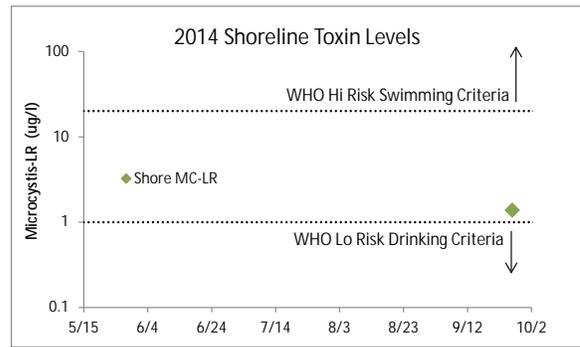


Figure D10:
2014 Shoreline Microcystin-LR

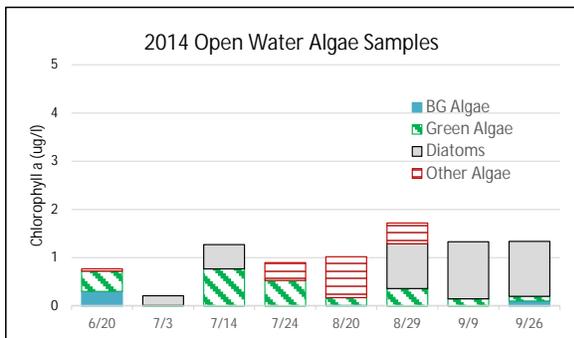


Figure D11:
2014 Open Water Algae Types

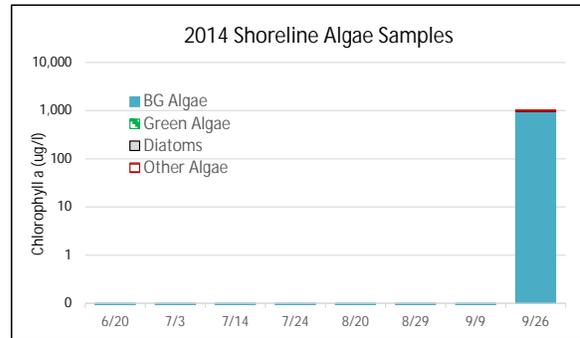


Figure D12:
2014 Shoreline Algae Types

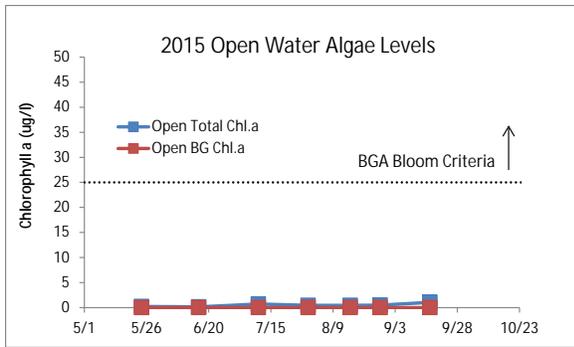


Figure D13:
2015 Open Water Total and BGA Chl.a

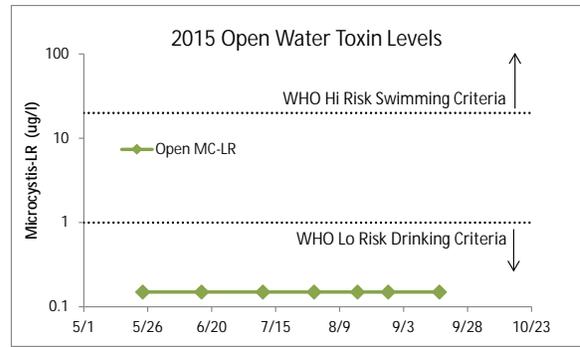


Figure D14:
2015 Open Water Microcystin-LR

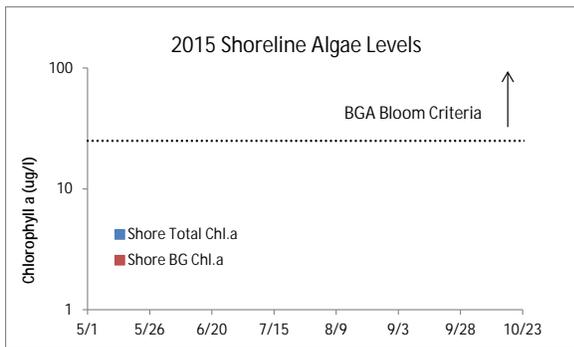


Figure D15:
2015 Shoreline Total and BGA Chl.a

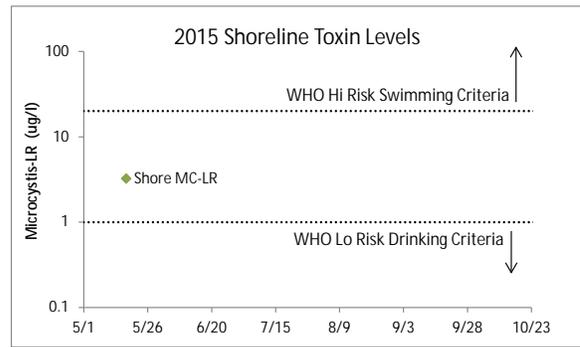


Figure D16:
2015 Shoreline Microcystin-LR

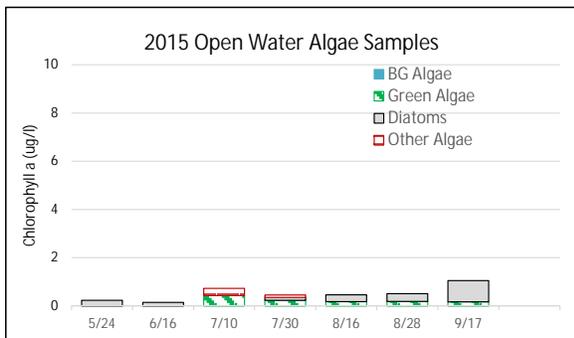


Figure D17:
2015 Open Water Algae Types

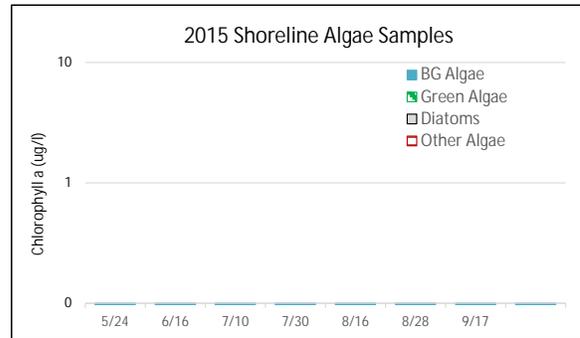


Figure D18:
2015 Shoreline Algae Types

Appendix E: AIS Species in Chenango County

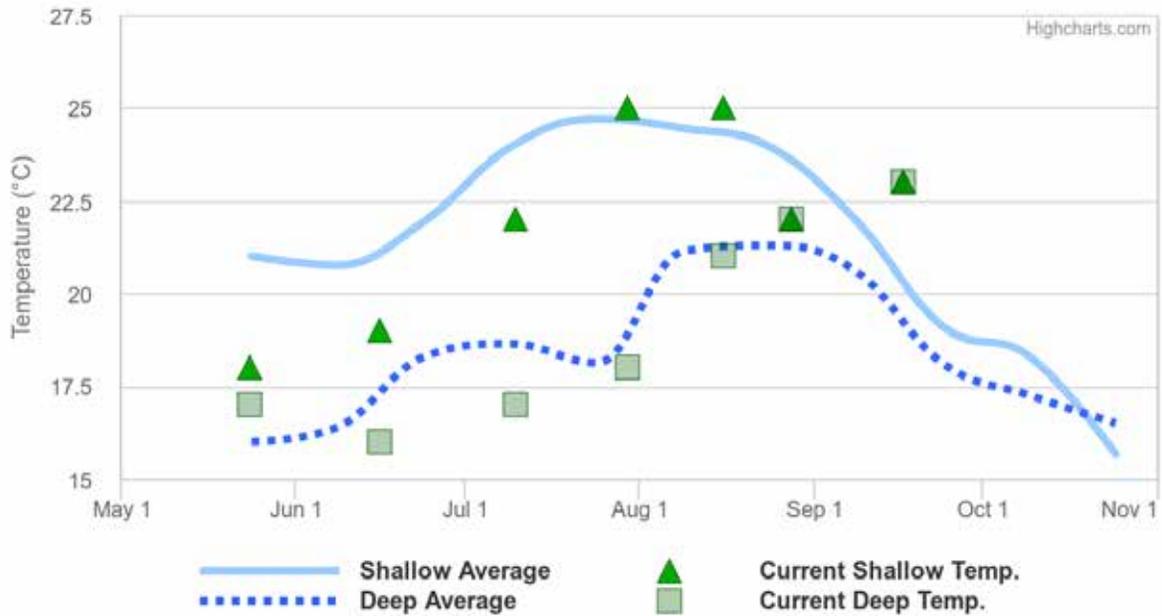
The table below shows the invasive aquatic plants and animals that have been documented in Chenango County, as cited in either the iMapInvasives database (<http://www.imapinvasives.org/>) or in the NYSDEC Division of Water database. These databases may include some, but not all, non-native plants or 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	<i>Myriophyllum heterophyllum</i>
Bowman Lake	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Chenango Lake	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Chenango River near Greene	Animal	Asian clam	<i>Corbicula fluminea</i>
Chenango River near Oxford	Animal	Asian clam	<i>Corbicula fluminea</i>
Guilford Lake	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Hunt Pond	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Jackson Pond	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Long Pond	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Mill Brook Reservoir	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Mud Creek e of Cortland	Animal	Asian clam	<i>Corbicula fluminea</i>
Otselic River near Pitcher	Animal	Asian clam	<i>Corbicula fluminea</i>
Plymouth Reservoir	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Warn Lake	Plant	Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Warn Lake	Plant	Curly leafed pondweed	<i>Potamogeton crispus</i>

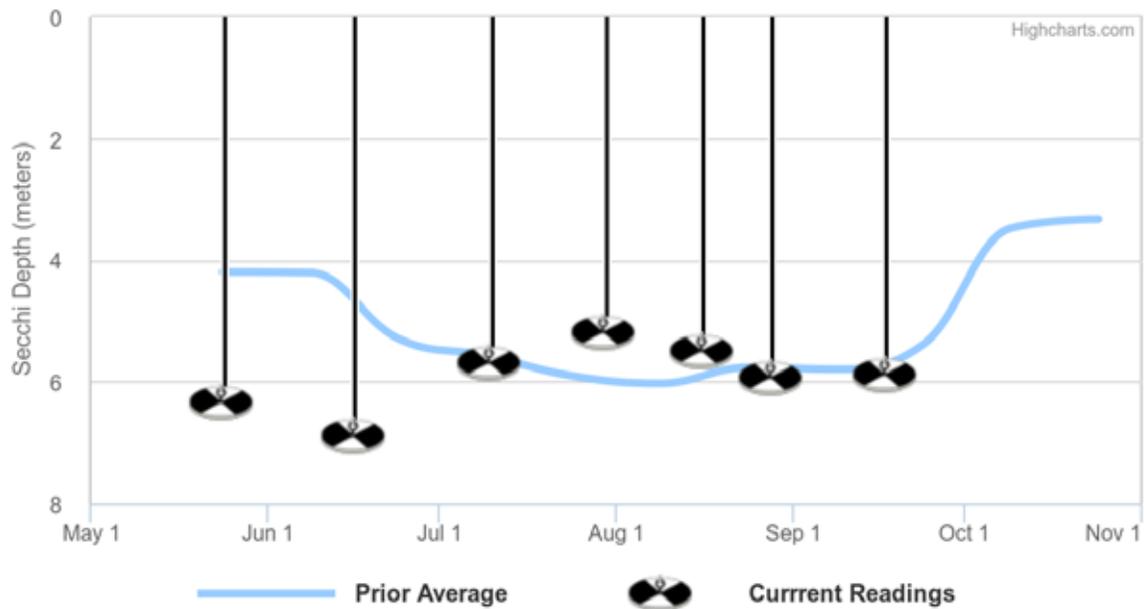
Appendix F: Current Year vs. Prior Averages for Petonia Lake

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 1986 to 2014. This year's deep water sample temperatures are tending to be higher than normal when compared to the average of readings collected from 2002 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 1986 to 2014

Appendix G: Watershed and Land Use Map for Petonia 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.

