CSLAP 2015 Lake Water Quality Summary:
Loon Lake

General Lake Information

Location	Town of Wayland
County	Steuben
Basin	Chemung River
Size	67.3 hectares (166.2 acres)
Lake Origins	Natural
Watershed Area	602.1 hectares (1,487 acres)
Retention Time	1.8 years
Mean Depth	6.1 meters
Sounding Depth	13 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To…	Moon Hollow Creek to Mill Creek to Canaseraga Creek to Genesee River to Lake Ontario
WQ Classification	B (contact recreation = swimming)
Lake Outlet Latitude	42.486
Lake Outlet Longitude	-77.563
Sampling Years	1994-2015
2015 Samplers	Roderick Lindsey and Helen Sick
Main Contact	Helen Sick

Lake Map

Background

Loon Lake is a 166 acre, class B lake found in the Town of Wayland in Steuben County, in central New York State. It was first sampled as part of CSLAP in 1994.

It is one of four CSLAP lakes among the more than 280 lakes and ponds found in Steuben County, and one of five CSLAP lakes among the nearly 350 lakes and ponds in the Chemung Rivers drainage basin.

Lake Uses

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

It is not known whether Loon Lake has been stocked through any state fisheries stocking programs, or if any private stocking has occurred. Fish netting at the lake has identified brown bullhead, bullhead, carp, cisco, large- and small-mouthed bass, pickerel, pumpkinseed sunfish, rock bass, and yellow perch.

General statewide fishing regulations are applicable in Loon Lake. In addition, open season on trout is April 1-October 15, with no minimum size. There is a daily limit of five trout, with no more than two greater than 12 inches.

Historical Water Quality Data

CSLAP sampling was conducted on Loon Lake from 1994 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 Loon Lake will also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77838.html.

Loon Lake was sampled as part of the Conservation Department (predecessor to the NYSDEC) Biological Survey of the Chemung River basin in 1937. This monitoring program focused primarily on the relationship between water quality and fisheries management, and none of the water quality indicators evaluated through CSLAP were monitored in 1937 (except water temperature).

There was also a summary of the history of Loon Lake provided at the NYSFOLA regional conference in 1995:

"Loon Lake in Steuben County was formed by glaciers and is clam-shaped, 1,700 feet above sea level, a half-mile wide and encompasses 141 acres. Depths range from five-to-ten on down to forty-feet. It has a muck bottom & 1 gravel shore.

In the 1930-40s, Loon Lake was popular for its summertime dance hall and skating rink, the largest in NYS. The hall burnt down in 1936, was rebuilt, and burned down again several years later. The rink deteriorated until it was razed and now there is no public access to Loon Lake.

Loon Lake Association formed in the 1940s, was active for a time and then dormant for 10 years. In the 1950's Matthew Myers published a brochure that garnered interest and re-activated LLA. He was one of the LLA's conference reps.

In the 1950's, the biggest issue on Loon Lake was weeds. Through the town of Wayland, an Aquatic District was formed with taxing authority. Currently, District taxes are $2.15 per $1,000 assessed valuation. Funds were used to purchase, operate, and maintain a weed harvester. There is a big demand for harvested weeds for fertilizer on lake area gardens and farms. Disposal is not a problem.

The Association's 162 members represent 75-80% of the lake community. Dues are $10. The group recently assumed responsibility for the Independence Day fireworks. Since Rte. 390 was constructed, the Loon Lake population has had an influx of city of Rochester property buyers. The community is less close-knit but properly upgrading and maintenance is a common goal".

None of the unnamed ephemeral tributaries, nor the outlet of the lake (Moon Hollow) have 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

Loon Lake is served by the Loon Lake Association. It is not known to what extent the Association is involved in a lake management activities, nor if the Association maintains a website. However, in the mid-1990s, a taxing district raised funds for aquatic plant management

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual Results Relative to 1994-2014

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 –Loon Lake" section in Appendix C.

Evaluation of Eutrophication Indicators

Each of the trophic indicators (Secchi disk transparency, chlorophyll *a*, and total phosphorus) was slightly lower than normal in 2015, although the drop in water clarity was very slight. It is not known if the heavy rains in early June contributed to the change in these conditions. Water clarity readings have been fairly stable over the last decade, after a steady rise from the mid-1990s to the mid-2000s, and then a one year drop in 2006. Phosphorus readings have dropped slightly over the last two decades. Algae levels have not exhibited any clear long-term trends; these readings tend to vary significantly from year to year.

Water clarity and nutrient levels in Loon Lake do not exhibit clear seasonal trends, although both indicators increase slightly in late summer or early fall. Algae levels typically increase through early fall, and then decrease in October. Water clarity increased during the summer of 2015, but neither algae nor nutrient levels exhibited clear seasonal changes in 2015. Shoreline algal blooms have been reported and sampled most years, including 2015 (which exhibited very short term

blue green algae blooms). However, open water algae levels have been consistently much lower than those reported in the shoreline blooms.

The lake can be characterized as *mesotrophic,* or moderately productive, based on total phosphorus, water clarity, and chlorophyll *a* readings (all typical of *mesotrophic* lakes). The trophic state index (TSI) evaluation suggests that each of the trophic indicators are "internally" consistent—each of these trophic indicators are usually in the expected range given the measurements of these other indicators. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are usually 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. Shoreline blooms have shown higher total algae levels and blue green algae levels in some years, including a small shoreline bloom in 2015. However, Loon Lake is not classified for potable water use. Hypolimnetic phosphorus and ammonia readings are slightly higher than those measured at the lake surface, and deepwater ammonia levels were slightly higher than normal in 2014 and 2015. However, these readings are usually below levels of concern, so any "unofficial" deep intake potable water use may not be impacted. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Each of the other water quality indicators (NOx, ammonia, total nitrogen, pH, conductivity, color, calcium) were close to normal in the last three years. pH and conductivity readings have increased slightly over the last two decades. It is likely that the small changes in each of the other limnological indicators have been within the normal range of variability in the lake.

Chloride levels in the 2015 samples, collected for the first time through CSLAP and cited in Appendix A, ranged from 19 to 22 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

Only limited macrophyte surveys have been conducted through CSLAP at Loon Lake. These surveys found at least two exotic plant species—*Myriophyllum spicatum,* Eurasian watermilfoil, and *Potamogeton crispus,* curly-leafed pondweed. SUNY Geneseo students found 12 different aquatic plant species in 2014, but the plant community may have been suppressed by the mechanical weed harvesting.

The composition of the fish community is comprised of at least seven warmwater fish species, two coolwater fish species, and one coldwater fish species. It is likely that the lake fisheries is typical of a warmwater fishery community.

Macroinvertebrate surveys have not been conducted through CSLAP at Loon Lake. The fluoroprobe screening samples analyzed by SUNY ESF found that blue green algae represents a very high percentage of the algal community in blooms and when overall (open water) algae levels are elevated, later in the summer. There is a low percentage of blue green algae when overall algae levels are low, usually early in the summer. 2012 shoreline blooms were dominated by *Woronichina*, a blue green algae species not usually associated with toxin production, while the early June bloom in 2015 was associated with *Anabaena*. The latter can produce toxins, although toxin levels were low in 2015. Shoreline blooms were not reported in 2013 or 2014.

SUNY Geneseo zooplankton surveys in 2014 found dominance by rotifers and crustaceans, particularly *Daphnia galeata*.

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

Evaluation of Lake Perception

Lake perception was close to normal in 2015, and none of these measures of lake perception has changed significantly since lake conditions were first assessed in 1994. Water quality and recreational assessments degrade slightly during a typical summer, but these assessments are often slightly (water quality assessments) to substantially (recreational assessments) worse in late summer. No seasonal changes were apparent in 2015. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Water temperature readings in the summer index period were close to normal in 2015, and have not exhibited any clear long-term trends. It is not known if this is an indication of the lack of local climate change or if these changes cannot be well evaluated through CSLAP.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Fluoroprobe readings at times exceed the levels associated with harmful algal blooms (HABs) in open water and especially within shoreline blooms. An analysis of algae samples indicate microcystin readings well below the levels needed to support safe swimming in both open water and shoreline blooms, and open water toxin levels have been consistently low or undetectable. Shoreline blooms in 2012 and 2015 indicated high blue green algae levels. However, lake residents are advised to report potential blooms and to avoid exposure to shoreline blooms.

Lake Condition Summary

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	1.15	4.22	8.35	4.04	Mesotrophic	Within Normal Range	No Change
	Chlorophyll *a*	0.05	6.20	48.60	1.99	Mesotrophic	Lower Than Normal	No Change
	Total Phosphorus	0.002	0.013	0.027	0.011	Mesotrophic	Lower Than Normal	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.00	0.05	0.45	0.06	Close to Surface NH4 Readings	Higher than Normal	Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.008	0.028	0.290	0.025	Close to Surface TP Readings	Within Normal Range	Not known
	Nitrate + Nitrite	0.00	0.01	0.16	0.01	Low NOx	Lower Than Normal	No Change
	Ammonia	0.00	0.03	0.20	0.04	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.10	0.42	1.13	0.39	Low Total Nitrogen	Within Normal Range	No Change
	pH	6.39	7.62	9.18	7.75	Alkaline	Within Normal Range	No Change
	Specific Conductance	76	125	259	128	Intermediate Hardness	Within Normal Range	No Change
	True Color	1	11	57	9	Intermediate Color	Within Normal Range	No Change
	Calcium	2.5	11.0	14.0	9.6	May be Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.1	3	2.0	Not Quite Crystal Clear	Within Normal Range	No Change
	Aquatic Plant Coverage	1	2.2	4	2.0	Subsurface Plant Growth	Within Normal Range	No Change
	Recreational Assessment	1	2.1	4	1.9	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass; Shoreline-high blue green algae in bloom	Not known	Not known
	Macrophytes					Fair quality of the aquatic plant community	Not known	Not known
	Zooplankton					Rotifers and crustaceans dominate (SUNY Geneseo)	Not known	Not known
	Macroinvertebrates					Not evaluated through CSLAP	Not known	Not known
	Fish					Warmwater fishery?	Not known	Not known
	Invasive Species					Eurasian watermilfoil, curly leafed pondweed	Not known	Not known
Local Climate Change	Air Temperature	6	21.8	31	20.4		Within Normal Range	No Change
	Water Temperature	4	21.0	28	20.5		Within Normal Range	No Change

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Harmful Algal Blooms	Open Water Phycocyanin	0	55	961	9	Some readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	3	10	1	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	2	9	0	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	<DL	0.8	<DL	Very high open water MC-LR	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	129.0	129.0	129.0		All readings indicate high risk of BGA	Not known	Not known
	Shoreline FP Chl.a	2	3104	11630	1941	Most readings indicate high algae levels	Not known	Not known
	Shoreline FP BG Chl.a	0	3103	11630	1941	Most readings indicate high BGA levels	Not known	Not known
	Shoreline Microcystis	<DL	<DL	0.6	<DL	Very high shoreline bloom MC-LR	Not known	Not known
	Shoreline Anatoxin a	<DL	<DL	<DL	<DL	Shoreline bloom Anatoxin-a consistently not detectable	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Loon Lake is presently among the lakes cited on the 2007 Chemung River Basin PWL, with recreation listed as *threatened* due to excessive weeds and algae. The PWL listing for Loon Lake is listed in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Loon Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake is not used for this purpose. Any "unofficial" use of the lake for potable water may be impacted by shoreline algal blooms.

Public Bathing

The CSLAP dataset at Loon Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public swimming beach, should be fully supported, although this use may be *threatened* by shoreline blue green algae blooms. Additional information about bacterial levels is needed to evaluate the safety of the water for swimming.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Loon Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation should be fully supported, although this use may be *threatened* by periodic shoreline blooms and by the presence of Eurasian watermilfoil and curly leafed pondweed. No impacts have been apparent in many years.

Aquatic Life

The CSLAP dataset on Loon 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 the presence of Eurasian watermilfoil and curly leafed pondweed. Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

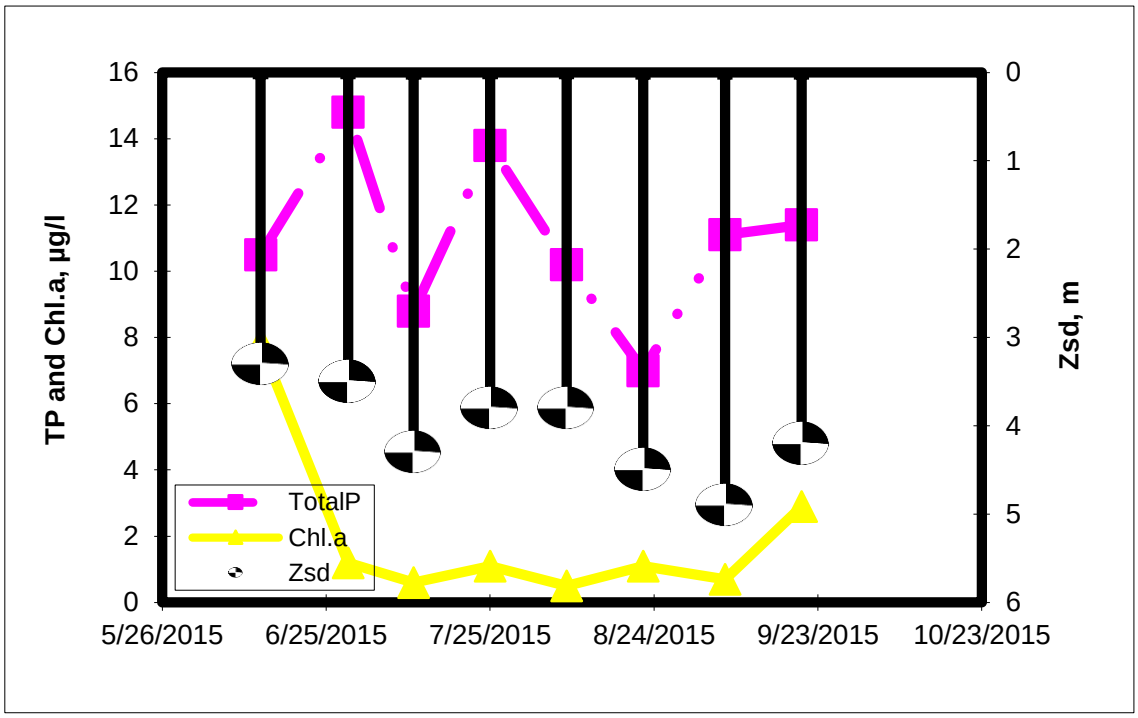
Aesthetics and Habitat
The CSLAP dataset on Loon Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *threatened* by shoreline blue green algae blooms. Habitat may be *threatened* by invasive species.

Fish Consumption
There are no fish consumption advisories posted for Loon Lake.

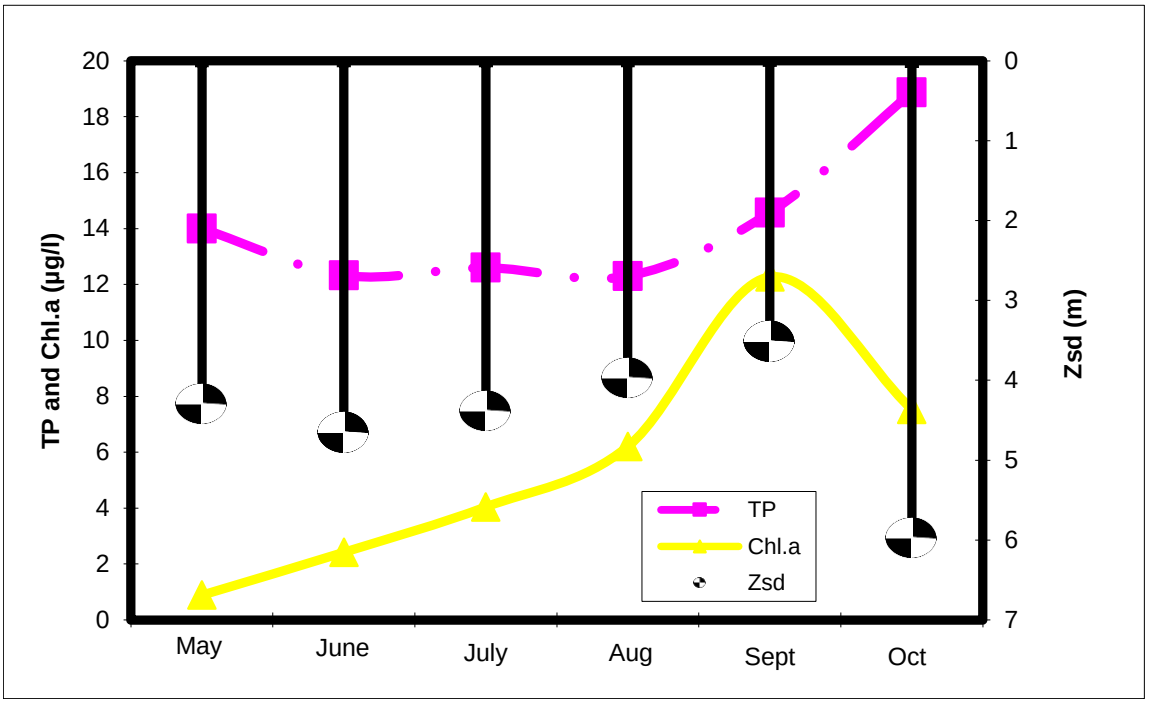
Additional Comments and Recommendations
Aquatic plant surveys should be conducted on Loon Lake to determine whether the aquatic plant community has been compromised by the presence of Eurasian watermilfoil and curly leafed pondweed. Lake residents should continue to report (and avoid exposure to) shoreline blooms.

Aquatic Plant IDs-2015
None submitted for identification in 2015.

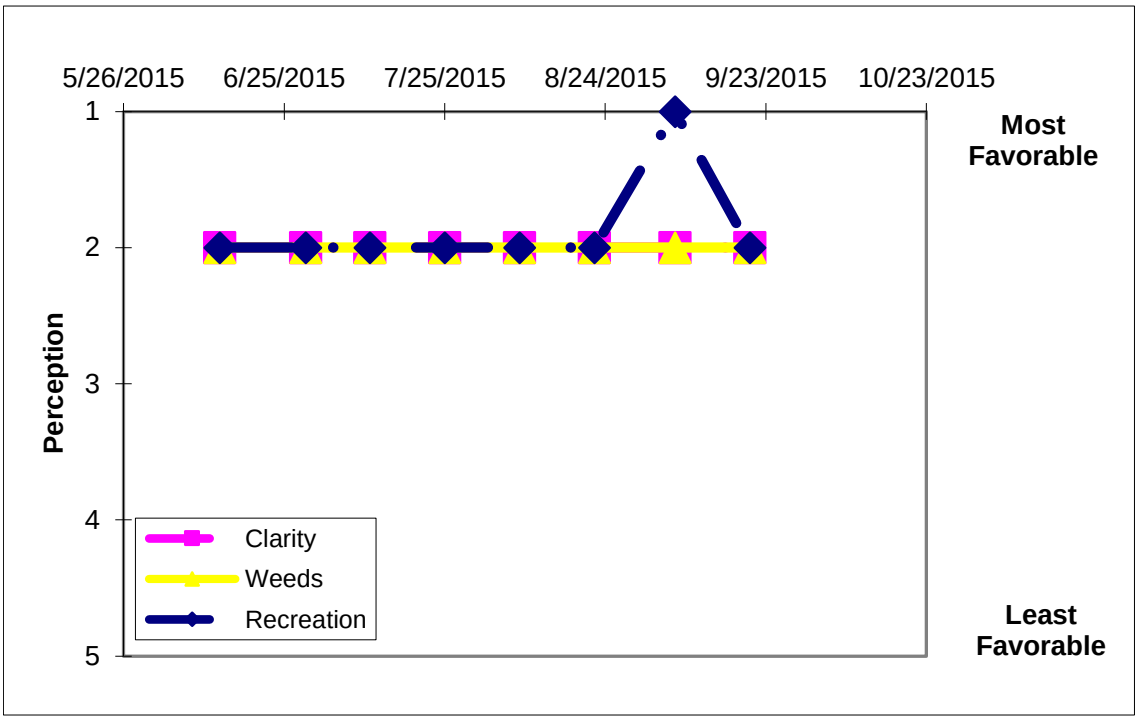
Time Series: Trophic Indicators, 2015



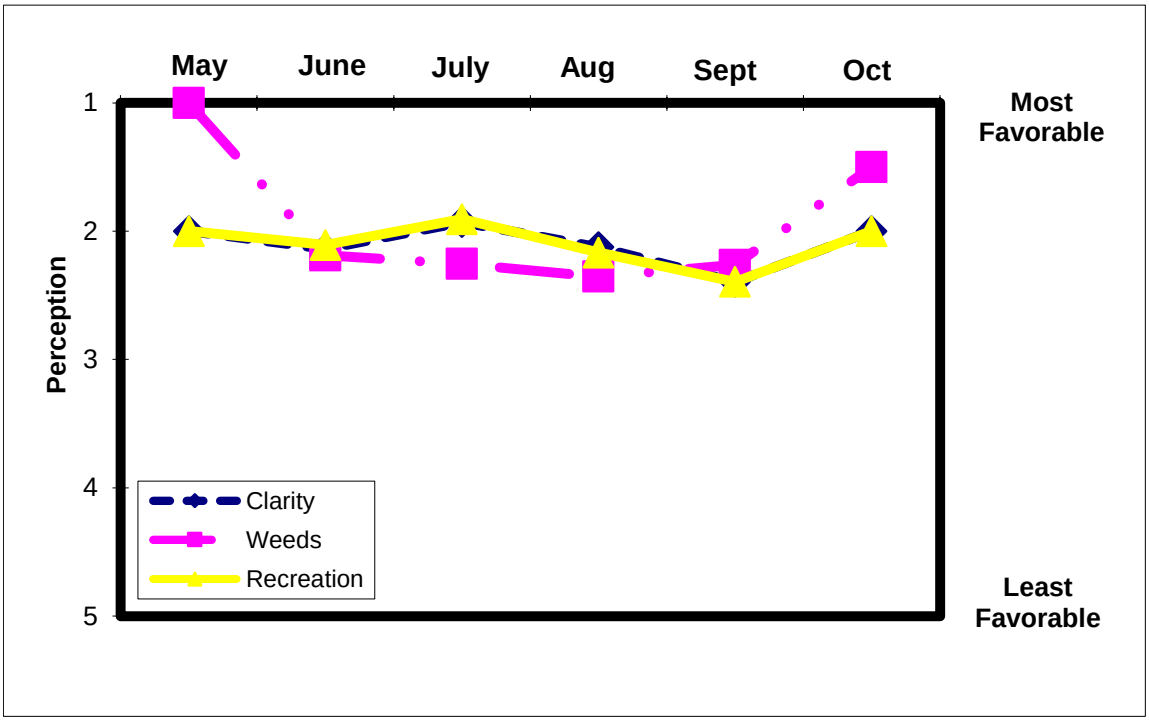
Time Series: Trophic Indicators, Typical Year (1994-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (1994-2015)



Appendix A- CSLAP Water Quality Sampling Results for Loon Lake

LNum	LName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
136	Loon L-S	6/15/1994	8.0	4.50												
136	Loon L-S	6/22/1994	8.0	4.55												
136	Loon L-S	6/29/1994	8.0	5.10												
136	Loon L-S	7/11/1994	8.0	4.45												
136	Loon L-S	7/19/1994	8.0	4.33												
136	Loon L-S	8/3/1994	8.0	2.75												
136	Loon L-S	8/16/1994	8.0	2.95												
136	Loon L-S	8/30/1994	8.0	4.05												
136	Loon L-S	9/13/1994	8.0	4.25												
136	Loon L-S	10/4/1994	8.0	4.55												
136	Loon L-S	6/7/1995	11.0	5.00												
136	Loon L-S	6/21/1995	11.0	4.60												
136	Loon L-S	7/4/1995	11.0	4.45												
136	Loon L-S	7/19/1995	11.0	3.45												
136	Loon L-S	8/1/1995	11.0	2.95												
136	Loon L-S	8/15/1995	11.0	2.50												
136	Loon L-S	8/29/1995	11.0	2.15												
136	Loon L-S	9/2/1995	11.0	3.58												
136	Loon L-S	9/26/1995	11.0	3.68												
136	Loon L-S	6/24/1996	19.0	5.65												
136	Loon L-S	7/2/1996	19.0	6.28												
136	Loon L-S	7/12/1996	19.0	4.68												
136	Loon L-S	8/2/1996	19.0	4.28												
136	Loon L-S	8/14/1996	19.0	4.50												
136	Loon L-S	8/28/1996	19.0	4.00												
136	Loon L-S	9/13/1996	19.0	3.70												
136	Loon L-S	9/20/1996	19.0	3.70												
136	Loon L-S	10/15/1996	19.0	5.20												
136	Loon L-S	5/31/1997	13.0	2.75	1.5	0.016	0.01				5	7.85	112		0.17	
136	Loon L-S	6/14/1997	13.0	4.40	1.5	0.012	0.01				5	6.57	116		1.66	
136	Loon L-S	6/27/1997	13.0	3.50	1.5	0.019	0.01				10	7.52	115			
136	Loon L-S	7/11/1997	13.4	5.05	1.5	0.014	0.01				10	7.68	113		3.71	
136	Loon L-S	7/25/1997	13.4	5.98		0.013	0.01				10	7.19	111		0.37	
136	Loon L-S	8/8/1997	13.4	5.95	1.5	0.012	0.01				8	7.72	113		0.58	
136	Loon L-S	8/25/1997	13.0	5.00	1.5	0.011	0.01				9	6.99	114		4.84	
136	Loon L-S	9/19/1997	13.8	2.00	1.5	0.013	0.01				8	7.23	111		16.90	
136	Loon L-S	5/30/1998	13.4	5.85	1.5	0.012	0.01				5	8.02	113		1.6	
136	Loon L-S	6/12/1998	13.4	4.55	1.5	0.012	0.01				4	7.71	109		4.36	
136	Loon L-S	6/28/1998	13.4	5.40	1.5		0.01				1	6.69	109		3.2	
136	Loon L-S	7/13/1998	12.2	3.40	1.5		0.01				10	7.83	106		6.9	
136	Loon L-S	7/27/1998	13.0	2.50	1.5						5	7.73	108		12.7	
136	Loon L-S	8/7/1998	13.0	2.75	1.5						1	8.04	107		9.72	
136	Loon L-S	8/21/1998	12.0	2.88	1.5						7	7.68	109		6.16	
136	Loon L-S	9/11/1998	13.5	3.55	1.5	0.017	0.01				4	6.39	116		6.27	
136	Loon L-S	6/5/1999	14.6	5.08	1.5	0.011	0.01				11	7.35	120		1.46	
136	Loon L-S	6/19/1999	13.5	6.85	1.5	0.012	0.01				6	7.54	120		1.80	
136	Loon L-S	7/3/1999	14.0	4.85	1.5	0.012	0.01				3	7.60	118		3.36	
136	Loon L-S	7/17/1999	12.0	2.35	1.5	0.012	0.01				7	8.13	117		7.90	
136	Loon L-S	7/31/1999	13.5	2.25	1.5	0.015	0.01				8	7.59	117		11.20	
136	Loon L-S	8/15/1999	12.5	2.65		0.014	0.01				12	7.61	124		10.10	
136	Loon L-S	8/29/1999	13.5	2.85	1.5	0.013	0.01				8	7.72	120		10.80	
136	Loon L-S	10/11/1999	13.0	5.00	1.5	0.016	0.02				10	7.34	124		1.34	
136	Loon L-S	6/5/2000	13.0	3.00	1.5	0.010	0.01				6	7.65	125		2.02	
136	Loon L-S	6/20/2000	13.5	4.70	1.5	0.011	0.01				12	6.44	121		2.56	
136	Loon L-S	7/10/2000	13.0	4.75	1.5	0.016	0.01				6	7.66	124		5.40	
136	Loon L-S	7/23/2000	13.5	5.25	1.5	0.012	0.01				6	7.13	124		4.78	
136	Loon L-S	8/5/2000	13.0	4.95	1.5		0.01				4	7.82	123		2.84	
136	Loon L-S	8/26/2000	12.5	6.00	1.5	0.027					8	7.80	133		3.28	
136	Loon L-S	9/18/2000	13.5	4.75	1.5	0.018					8	7.16	126		5.05	
136	Loon L-S	6/16/2001	13.5	5.00	1.5	0.010	0.01				5	7.27	139		1.62	
136	Loon L-S	6/30/2001	13.0	5.65	1.5		0.01				8	7.42	132		1.90	
136	Loon L-S	7/21/2001	12.0	2.50	1.5	0.008	0.01				4	7.54	128		1.44	
136	Loon L-S	7/29/2001	12.5	8.35	1.5	0.009	0.01				3	7.65	130			

LNum	LName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
136	Loon L-S	8/11/2001	13.0	5.00	1.5	0.011	0.01				8	7.76	259		2.74	
136	Loon L-S	8/25/2001	12.5	5.60	1.5	0.011	0.01				6	7.38	137		0.67	
136	Loon L-S	9/8/2001		7.93	1.5	0.011	0.01				8	7.80	131			
136	Loon L-S	6/22/2002	13.9	7.55	1.5	0.016	0.01	0.03	0.98	135.95	6	8.21	128	2.53	0.19	
136	Loon L-S	7/8/2002	14.0	8.30	1.5	0.009	0.00	0.02	0.44	102.39	17	7.79	127		0.31	
136	Loon L-S	7/18/2002	14.0	4.70	1.5	0.012	0.01	0.10	0.63	113.76		7.26	129		0.79	
136	Loon L-S	8/4/2002	13.4	5.35	1.5	0.009	0.01	0.02	0.49	114.53	8	7.79	126		0.07	
136	Loon L-S	9/8/2002	12.5	5.70	1.5											
136	Loon L-S	6/15/2003			1.5	0.013	0.00	0.01	0.22	37.57	18	8.1	138.5	12.0	0.35	
136	Loon L-S	7/10/2003		6.00	1.5	0.019	0.00	0.00	0.39	44.34	16	7.8	136		0.22	
136	Loon L-S	8/1/2003	14.0	3.95	1.5	0.014	0.01	0.01	0.27	41.87	20	7.8	132.1		0.86	
136	Loon L-S	8/9/2003	14.2	4.45	1.5		0.00	0.02	0.34		8	7.2	132.3			
136	Loon L-S	8/16/2003	14.4	4.55	1.5	0.012	0.00	0.15	0.46	82.56	7	8.1	128	11.0	2.85	
136	Loon L-S	9/2/2003	14.2	3.80	1.5	0.024	0.00	0.01	0.23	21.13	10	6.6	138		3.34	
136	Loon L-S	9/7/2003	14.2	6.00	1.5	0.009	0.03	0.02			10	7.7	134.7		2.91	
136	Loon L-S	9/21/2003	14.5	4.10		0.015	0.00	0.01	0.31	45.13	21	7.5	136.2		3.55	
136	Loon L-S	7/18/2004	15.5	8.00	1.5	0.008	0.02	0.01	0.50	132.72	22	6.7	80.7			
136	Loon L-S	8/1/2004	14.5	7.70	1.5	0.010	0.03	0.02	0.22	49.26	14	7.44	121		0.1	
136	Loon L-S	8/15/2004	14.5	7.35	1.5	0.010	0.01	0.01	0.31	65.06	8	8.01	125		10.4	
136	Loon L-S	8/29/2004	14.5	7.40	1.5	0.009	0.02	0.20	0.38	89.76	10	7.48	147		1.4	
136	Loon L-S	9/12/2004	15.0	7.10	1.5	0.014	0.02	0.02	0.45	69.35	19	8.01	122	12.196	1.5	
136	Loon L-S	9/26/2004	14.5	6.90	1.5	0.013	0.14	0.05			19	8.22	86.5		12.7	
136	Loon L-S	10/10/2004	14.0	7.00	1.3	0.016	0.01	0.03	0.38	51.54	19	6.78	95.6			
136	Loon L-S	10/24/2004	14.5	7.50	1.5	0.025	0.05	0.06	0.67	58.24	19	7.02	92.6			
136	Loon L-S	6/19/2005	14.0	7.25	1.3	0.012	0.04	0.01	0.18	31.29	8	7.00	117	11.5	0.7	
136	Loon L-S	7/10/2005	14.0	7.45	1.4	0.009	0.02	0.01	0.13	29.98	5	7.40	132		1.1	
136	Loon L-S	7/24/2005	14.0	7.45	1.4	0.012	0.01	0.01	0.10	18.96	11	7.90	128		0.1	
136	Loon L-S	8/7/2005	14.0	7.45	1.4		0.01	0.01	0.47		16	7.55	119	0.0	3.2	
136	Loon L-S	8/21/2005	14.0	6.85	1.4	0.012	0.03	0.01	0.27	47.59	55	7.40		10.9	13.4	
136	Loon L-S	9/4/2005	14.0	7.00	0.6	0.013	0.01	0.01	0.28	48.36	12	7.48	122		7.8	
136	Loon L-S	9/18/2005	14.0	6.60	1.2	0.014	0.01	0.01	0.29	45.17	12	7.43	137		5.8	
136	Loon L-S	10/2/2005	14.0	6.60		0.018	0.01	0.01	0.25	30.17	25	7.86	127		13.7	
136	Loon L-S	6/13/2006	14.0	3.10	1.3	0.011	0.03	0.05	0.51	99.43	12	7.04	102	10.4	1.49	
136	Loon L-S	6/25/2006	14.3	4.35	1.0	0.009	0.02	0.01	0.69	174.49	3	8.38	131		1.97	
136	Loon L-S	7/9/2006	14.0	4.30	0.6	0.009	0.01	0.01	0.42	101.68	17	7.84	116		2.01	
136	Loon L-S	7/23/2006	14.3	3.85	1.0	0.012	0.01	0.02	0.56	101.38	18	7.61	124		4.43	
136	Loon L-S	8/6/2006	14.0	3.25	1.3	0.012	0.03	0.01	0.62	110.00	8	7.7	119	10.6	5.58	
136	Loon L-S	8/20/2006	14.0	2.60	1.3	0.012	0.01	0.02	0.76	136.18	14	8.26	126		7.58	
136	Loon L-S	9/4/2006	14.4	1.95		0.016			0.44	61.82	21	7.65	113		0.72	
136	Loon L-S	9/17/2006	14.3	2.35	1.3	0.014	0.02	0.02	1.13	183.99	32	7.92	110		8.59	
136	Loon L-S	6/24/2007	14.0	5.20	1.3	0.012	0.02	0.02	0.49	87.74	11	7.24	137	11.4	2.76	
136	Loon L-S	7/8/2007	14.0	5.10	1.3	0.011	0.02	0.02	0.50	105.13	8	7.72	130		2.26	
136	Loon L-S	7/22/2007				0.012	0.01	0.02	0.42	80.11	16	7.77	97		5.05	
136	Loon L-S	8/5/2007	12.5	4.90	1.3	0.013	0.00	0.01	0.71	119.11	13	8.01	130		7.46	
136	Loon L-S	8/19/2007	12.5	2.30	1.3	0.012	0.01	0.01	0.56	101.45	23	7.85	99	11.2	10.32	
136	Loon L-S	9/2/2007	12.5	1.50	1.3	0.015	0.03	0.01	0.96	139.25	34	8.67	120		47.40	
136	Loon L-S	9/16/2007	12.5	1.15	1.3	0.017	0.07	0.03	0.71	89.99	31	8.14	117		28.00	
136	Loon L-S	9/30/2007	13.0	2.20	1.3	0.013	0.03	0.10	0.76	128.66	21	7.71	121		6.98	
136	Loon L-S	6/15/2008	13.0	5.25	1.3	0.009	0.01	0.02	0.53	125.87	10	8.18	161	11.9	0.95	
136	Loon L-S	6/29/2008	13.0	4.15	1.3	0.009	0.00	0.03	0.37	89.50	5	7.79	140		2.20	
136	Loon L-S	7/13/2008	10.0	3.25	1.3	0.011	0.04	0.04	0.37	73.64	14	8.08	117		3.49	
136	Loon L-S	7/27/2008	13.0	3.80	1.3	0.011	0.03	0.00	0.47	98.08	10	8.00	82		0.10	
136	Loon L-S	8/9/2008	13.0	3.25	1.3	0.011	0.01	0.01	0.39	79.66	9	7.67	110	10.9	6.63	
136	Loon L-S	8/24/2008	13.0	4.10	1.3	0.012	0.01	0.01	0.32	61.54	10	7.75	86		4.32	
136	Loon L-S	9/8/2008		2.90	1.3	0.013	0.00	0.03	0.36	60.01	6	7.89	107		8.75	
136	Loon L-S	9/21/2008	13.0	3.45	1.3	0.012	0.01	0.05	0.28	53.21	5	7.20	116		1.17	
136	Loon L-S	06/14/2009	13.0	4.40	1.3	0.009	0.00	0.02	0.27	65.12	7	7.64	124	9.6	4.91	
136	Loon L-S	06/29/2009	13.0	3.85	1.3	0.011	0.01	0.02	0.27	52.03	7	6.89	128		3.53	
136	Loon L-S	07/12/2009	13.0	3.25	1.3	0.012	0.00	0.01	0.26	46.89	5	7.28	127		6.12	
136	Loon L-S	07/26/2009	13.0	2.90	1.3	0.012	0.02	0.02	0.27	51.15	20	7.95	94		7.39	
136	Loon L-S	08/09/2009	13.0	2.70	1.3	0.002	0.01	0.02	0.29	332.32	57	7.77	109	12.2	18.48	
136	Loon L-S	08/23/2009	13.0	2.33	1.3	0.011	0.01	0.03	0.35	72.29	14	7.60	108		16.90	
136	Loon L-S	09/05/2009	13.0	1.95	1.3	0.012	0.01	0.02	0.43	79.50	12	7.49	117		30.30	
136	Loon L-S	09/20/2009		1.70	1.3	0.014	0.01	0.02	0.45	69.21	15	7.34	92		23.50	
136	Loon L-S	6/11/2010		6.00	1.3	0.012	0.08	0.03			1	8.87	145	12.3	0.10	
136	Loon L-S	6/26/2010		4.15	1.3	0.010	0.01	0.02	0.43	92.27	1	7.90	143		4.50	

LNum	LName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
136	Loon L-S	7/10/2010		4.35	1.3	0.011	0.01	0.02	0.30	58.02	8	7.89	119		5.60	
136	Loon L-S	7/24/2010		3.50	1.3	0.015	0.01	0.02	0.43	64.36	7	7.07	136		13.90	
136	Loon L-S	8/7/2010		3.10	1.3	0.014	0.02	0.02	0.28	43.07	4	7.99	142	13.1	14.50	
136	Loon L-S	8/23/2010		2.05	1.3	0.017	0.02	0.04	0.44	56.55	15	7.41	140		2.30	
136	Loon L-S	9/4/2010		2.15	1.3	0.013	0.01	0.01	0.65	111.38	9	7.66	143		3.00	
136	Loon L-S	9/4/2010	grab		bloom											
136	Loon L-S	9/18/2010	13.0	1.75	1.3	0.016	0.16	0.01	0.42	58.20	20	7.20	150		12.90	
136	Loon L-S	6/11/2011	13.0	4.40	1.3	0.013	0.04	0.04	0.21	35.77	1	7.30	152	12.4	4.60	
136	Loon L-S	6/25/2011	13.0	3.70	1.3	0.012	0.02	0.03	0.26	47.07	14	7.55	143		2.30	
136	Loon L-S	7/9/2011	13.0	4.15	1.3	0.015	0.01	0.02	0.31	44.72	3	7.09	151		5.50	
136	Loon L-S	7/23/2011	13.0	4.15	1.3	0.014	0.02	0.02	0.32	50.33	14	8.11	149		4.80	
136	Loon L-S	7/23/2011	grab		bloom											
136	Loon L-S	8/7/2011	13.0	4.15	1.3	0.010	0.01	0.03	0.30	64.29	9	7.68	145	12.2	10.00	
136	Loon L-S	8/7/2011			bloom											
136	Loon L-S	8/21/2011	13.0	3.45	1.3	0.011	0.01	0.01	0.61	122.00	6	7.51	146			
136	Loon L-S	9/3/2011	13.0	2.45	1.3	0.015	0.01	0.03	0.48	72.18	7	7.77	127		13.60	
136	Loon L-S	9/3/2011	grab		bloom											
136	Loon L-S	9/17/2011	grab		bloom											
136	Loon L-S	9/17/2011	13.0	1.95	1.3	0.017	0.01	0.04	0.52	68.23	11	7.00	143		29.20	
136	Loon L-S	6/7/2012	13.0	3.95	1.5	0.012	0.01	0.02	0.28	51.33	9	7.43	76	14.0	1.10	
136	Loon L-S	6/16/2012	13.0	4.05	1.5	0.012	0.01	0.03	0.27	49.45	8	7.92	131			
136	Loon L-S	6/16/2012			bloom											
136	Loon L-S	7/7/2012	13.0	4.30	1.5	0.009	0.01	0.03	0.21	50.70	8	7.96	131		2.10	
136	Loon L-S	7/7/2012			bloom											
136	Loon L-S	7/21/2012	13.0	3.25	1.5	0.015	0.01	0.02	0.39	58.97	9	7.67	134		5.00	
136	Loon L-S	8/4/2012	13.0	3.35	1.5	0.012	0.01	0.02	0.28	51.32	9	9.18	135	12.0	7.80	
136	Loon L-S	8/18/2012	13.0	2.80	1.5	0.012	0.01	0.04	0.44	79.24	9	8.09	133		12.40	
136	Loon L-S	9/2/2012	13.0	2.25	1.5	0.014	0.01	0.04	0.36	57.59	9	7.42	135		9.70	
136	Loon L-S	9/16/2012	13.0	3.10	1.5	0.017	0.01	0.03	0.43	54.30	6	6.71	138		9.00	
136	Loon L-S	6/17/2013	13.0	4.15	1.5	0.016	0.03	0.03	0.36	50.41	9	7.88	128		3.90	
136	Loon L-S	6/30/2013	13.0	4.85	1.5	0.014			0.28	45.15	10	7.63	130		1.70	
136	Loon L-S	7/13/2013	13.0	3.10	1.5	0.014	0.01	0.01	0.26	39.11	9	8.03	134		3.40	
136	Loon L-S	7/27/2013		2.85	1.5	0.012			0.45	79.04	7	8.34	139			
136	Loon L-S	8/13/2013	13.5	2.20	1.5	0.007	0.01	0.03	0.46	141.47	9	7.45	128		9.20	
136	Loon L-S	8/24/2013	13.0	2.40	1.5	0.014			0.58	89.28	7	7.96	134		5.90	
136	Loon L-S	9/7/2013	13.5	1.90	1.5	0.018	0.01	0.03	0.57	71.36	13	7.69	135		10.10	
136	Loon L-S	9/22/2013	13.5	1.85	1.5	0.015			0.46	65.71	8	7.34	135		48.60	
136	Loon L-S	6/15/2014	13.5	3.75	1.5	0.020	0.00	0.02	0.35	38.83	6	7.47	137	10.1	1.70	
136	Loon L-S	6/28/2014	13.5	3.80	1.5	0.011			0.32	65.80	7	7.55	145		4.00	
136	Loon L-S	6/28/2014														
136	Loon L-S	7/12/2014	13.5	3.90	1.5	0.012	0.02	0.04	0.44	77.98	9	6.85	131		1.40	
136	Loon L-S	7/27/2014	13.5	3.60	1.5	0.016			0.37	49.70	8	8.65	144		2.90	
136	Loon L-S	8/9/2014	13.5	2.60	1.5	0.013	0.03	0.03	0.59	100.35	10	7.27	124	10.3	6.20	
136	Loon L-S	8/23/2014	13.5	1.90	1.5	0.014			0.49	75.01	13	7.56	130		4.50	
136	Loon L-S	9/6/2014	13.5	1.85	1.5	0.014	0.02	0.06	0.46	71.27	10	7.80	125		10.50	
136	Loon L-S	9/20/2014	13.5	1.80	1.5	0.019			0.41	48.47	10	6.97	125		8.90	
136	Loon L-S	6/13/2015	12.7	3.30	1.5	0.011	0.00	0.02	0.36	34.67	8	7.28	112	11.1	7.80	
136	Loon L-S	6/13/2015			Bloom											
136	Loon L-S	6/13/2015			bloom											
136	Loon L-S	6/29/2015	12.3	3.50	1.5	0.015			0.48	32.16	8	7.79	136		1.20	
136	Loon L-S	7/11/2015	13.0	4.30	1.5	0.009	0.00	0.05	0.39	44.09	11	7.26	122		0.60	19.5
136	Loon L-S	7/25/2015	12.9	3.80	1.5	0.014			0.37	26.67	13	7.59	128		1.10	
136	Loon L-S	8/8/2015	13.1	3.80	1.5	0.010	0.01	0.04	0.50	48.63	12	8.14	139	8.1	0.50	
136	Loon L-S	8/22/2015	12.9	4.50	1.5	0.007			0.39	55.86	9	7.83	132		1.10	
136	Loon L-S	9/6/2015	13.5	4.90	1.5	0.011	0.01	0.04	0.25	22.16	7	8.40	123		0.70	21.6
136	Loon L-S	9/20/2015	12.8	4.20	1.5	0.011			0.38	33.60	5	7.70	133		2.90	
136	Loon L-S	6/12/1998				0.015										
136	Loon L-S	7/27/1998				0.148										
136	Loon L-S	8/21/1998				0.229										
136	Loon L-S	9/11/1998				0.290										
136	Loon L-S	5/30/1998													1.97	
136	Loon L-S	6/22/2002				0.015	0.00	0.03	1.52	229.41						
136	Loon L-S	7/8/2002					0.02	0.04	0.56							
136	Loon L-S	6/15/2003				0.014	0.00	0.01	0.26	40.84						
136	Loon L-S	7/10/2003				0.020	0.00	0.00	0.25	27.51						
136	Loon L-S	8/1/2003				0.016	0.01	0.01	0.20	27.02						

LNum	LName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4				NO2	Fe	Mn	As	
136	Loon L-S	8/9/2003					0.00	0.01	0.42							
136	Loon L-S	8/16/2003				0.011	0.01	0.02	0.42	81.47						
136	Loon L-S	9/2/2003				0.015	0.00	0.00	0.23	34.51						
136	Loon L-S	9/7/2003				0.014	0.03	0.02								
136	Loon L-S	9/21/2003				0.015	0.00	0.01	0.26	38.69						
136	Loon L-S	7/18/2004				0.010	0.01	0.01	0.44	100.46						
136	Loon L-S	8/1/2004				0.010	0.03	0.01	0.37	80.30						
136	Loon L-S	8/15/2004				0.013	0.01	0.01	0.30	51.24						
136	Loon L-S	8/29/2004				0.011	0.03	0.16	0.81	159.44						
136	Loon L-S	9/12/2004				0.016	0.01	0.01	0.28	40.18						
136	Loon L-S	9/26/2004				0.014	0.04	0.06	0.73	114.90						
136	Loon L-S	10/10/2004				0.016	0.01	0.01	0.36	48.88						
136	Loon L-S	10/24/2004				0.025	0.08	0.04	0.55	48.92						
136	Loon L-S	6/19/2005				0.010										
136	Loon L-S	7/10/2005				0.010										
136	Loon L-S	7/24/2005				0.009										
136	Loon L-S	8/7/2005				0.010										
136	Loon L-S	8/21/2005				0.010										
136	Loon L-S	9/4/2005				0.014										
136	Loon L-S	9/18/2005				0.015										
136	Loon L-S	10/2/2005				0.017										
136	Loon L-S	6/13/2006	14.0		0.0	0.011										
136	Loon L-S	6/25/2006	14.3		0.0	0.008										
136	Loon L-S	7/9/2006	14.0		0.0	0.013										
136	Loon L-S	7/23/2006	14.3		0.0	0.012										
136	Loon L-S	8/6/2006	14.0		0.0	0.011										
136	Loon L-S	8/20/2006	14.0		0.0	0.012										
136	Loon L-S	9/4/2006	14.4		0.0	0.018										
136	Loon L-S	9/17/2006	14.3		0.0	0.018										
136	Loon L-S	6/24/2007	14.0			0.011										
136	Loon L-S	7/8/2007	14.0			0.015										
136	Loon L-S	7/22/2007				0.015										
136	Loon L-S	8/5/2007	12.5			0.012										
136	Loon L-S	8/19/2007	12.5			0.017										
136	Loon L-S	9/2/2007	12.5			0.016										
136	Loon L-S	9/16/2007	12.5			0.018										
136	Loon L-S	9/30/2007	13.0			0.014										
136	Loon L-S	6/15/2008	13.0			0.010										
136	Loon L-S	6/29/2008	13.0			0.010										
136	Loon L-S	7/13/2008	10.0			0.010										
136	Loon L-S	7/27/2008	13.0			0.013										
136	Loon L-S	8/9/2008	13.0			0.010										
136	Loon L-S	8/24/2008	13.0			0.011										
136	Loon L-S	9/8/2008				0.012										
136	Loon L-S	9/21/2008	13.0			0.014										
136	Loon L-S	06/14/2009	13.0			0.009		0.03								
136	Loon L-S	06/29/2009	13.0			0.011										
136	Loon L-S	07/12/2009	13.0			0.009		0.01								
136	Loon L-S	08/09/2009	13.0			0.014		0.02								
136	Loon L-S	08/23/2009	13.0			0.010										
136	Loon L-S	09/05/2009	13.0			0.014										
136	Loon L-S	09/20/2009				0.016										
136	Loon L-S	6/11/2010			0.0	0.011		0.03								
136	Loon L-S	7/10/2010			0.0	0.012		0.02								
136	Loon L-S	8/7/2010			0.0	0.013		0.02								
136	Loon L-S	9/4/2010			0.0	0.016		0.14								
136	Loon L-S	6/11/2011				0.017		0.04								
136	Loon L-S	7/9/2011				0.019		0.03								
136	Loon L-S	8/7/2011				0.028		0.03								
136	Loon L-S	9/3/2011				0.018		0.01								
136	Loon L-S	6/4/2012			13.0	0.017		0.02								
136	Loon L-S	7/7/2012			13.0	0.022		0.04								
136	Loon L-S	8/4/2012			13.0	0.014		0.03								
136	Loon L-S	9/2/2012			13.0	0.124		0.23								
136	Loon L-S	6/17/2013			13.0	0.014		0.03								
136	Loon L-S	6/30/2013			13.4	0.021										

LNum	LName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4				NO2	Fe	Mn	As	
136	Loon L-S	7/13/2013			12.6	0.031		0.01								
136	Loon L-S	7/27/2013			13.0	0.024										
136	Loon L-S	8/13/2013			13.0	0.016		0.02								
136	Loon L-S	8/24/2013			12.6	0.147										
136	Loon L-S	9/7/2013			13.0	0.204		0.45								
136	Loon L-S	9/22/2013			12.9	0.021										
136	Loon L-S	6/15/2014			13.0	0.023		0.04								
136	Loon L-S	6/28/2014			13.0	0.066										
136	Loon L-S	7/12/2014			13.0	0.051		0.06								
136	Loon L-S	7/27/2014			13.0	0.074										
136	Loon L-S	8/9/2014			13.0	0.066		0.16								
136	Loon L-S	8/23/2014			13.0	0.075										
136	Loon L-S	9/6/2014			13.0	0.026		0.04								
136	Loon L-S	9/20/2014			13.0	0.021										
136	Loon L-S	6/13/2015			12.0	0.014		0.04								
136	Loon L-S	6/29/2015			10.0	0.019										
136	Loon L-S	7/11/2015			11.0	0.008		0.05								
136	Loon L-S	7/25/2015			10.0	0.019										
136	Loon L-S	8/8/2015			11.5	0.014		0.04								
136	Loon L-S	8/22/2015			11.0	0.011										
136	Loon L-S	9/6/2015			12.0	0.087		0.12								
136	Loon L-S	9/20/2015			11.0	0.079										

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
136	Loon L-S	6/15/1994				3	3	2	2											
136	Loon L-S	6/22/1994				3	1	1	2											
136	Loon L-S	6/29/1994				1	1	1												
136	Loon L-S	7/11/1994				2	2	2	2											
136	Loon L-S	7/19/1994				2	2	2	2											
136	Loon L-S	8/3/1994				3	2	3	12											
136	Loon L-S	8/16/1994				3	2	2	1											
136	Loon L-S	8/30/1994				2	2	2												
136	Loon L-S	9/13/1994				2	2	2												
136	Loon L-S	10/4/1994				2	2	4	5											
136	Loon L-S	6/7/1995				3	2	3	35											
136	Loon L-S	6/21/1995				3	3	3	23											
136	Loon L-S	7/4/1995				2	3	2	2											
136	Loon L-S	7/19/1995				2	3	2	12											
136	Loon L-S	8/1/1995				2	3	3	12											
136	Loon L-S	8/15/1995				2	3	3	12											
136	Loon L-S	8/29/1995				2	3	3	12											
136	Loon L-S	9/2/1995				2	2	2	12											
136	Loon L-S	9/26/1995				2	2	2	12											
136	Loon L-S	6/24/1996				2	2	2	2											
136	Loon L-S	7/2/1996				2	2	2	2											
136	Loon L-S	7/12/1996				2	2	2	2											
136	Loon L-S	8/2/1996				2	2	2	2											
136	Loon L-S	8/14/1996				3	3	2	12											
136	Loon L-S	8/28/1996				2	2	2	12											
136	Loon L-S	9/13/1996				2	2	2	12											
136	Loon L-S	9/20/1996				2	2	2	12											
136	Loon L-S	10/15/1996				2	2	1	1											
136	Loon L-S	5/31/1997	epi	20	16	2	1	3	5											
136	Loon L-S	6/14/1997	epi	15	21	2	2	2	5											
136	Loon L-S	6/27/1997	epi	20	23	2	2	2												
136	Loon L-S	7/11/1997	epi	20	22	2	2	2												
136	Loon L-S	7/25/1997	epi	23	22	1	2	1												
136	Loon L-S	8/8/1997	epi	20	22	1	2	1	6											
136	Loon L-S	8/25/1997	epi	18	19	1	3	3	5											
136	Loon L-S	9/19/1997	epi	20	19	3	3	4	1235											
136	Loon L-S	5/30/1998	epi	25	20	2	1	1												
136	Loon L-S	6/12/1998	epi	25	18	3	2	4	5											

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	HABform	ShoreHAB
136	Loon L-S	6/28/1998	epi	25	23	3	3	2	2											
136	Loon L-S	7/13/1998	epi	22	22	3	3	2												
136	Loon L-S	7/27/1998	epi	22	23	3	3	2												
136	Loon L-S	8/7/1998	epi	20	22	3	2	2												
136	Loon L-S	8/21/1998	epi	21	22	2	2	2	5											
136	Loon L-S	9/11/1998	epi	18	18	3	3	3	15											
136	Loon L-S	6/5/1999	epi	17	19	1	1	1	6											
136	Loon L-S	6/19/1999	epi	22	20	2	2	1												
136	Loon L-S	7/3/1999	epi	23	23	2	2	1	6											
136	Loon L-S	7/17/1999	epi	27	24	2	2	2												
136	Loon L-S	7/31/1999	epi	24	25	2	3	2	6											
136	Loon L-S	8/15/1999	epi	19	21	2	1	3	5											
136	Loon L-S	8/29/1999	epi	16	21	2	2	2	5											
136	Loon L-S	10/11/1999	epi	18	16	1	1	1												
136	Loon L-S	6/5/2000	epi	17	19	2	2	4	5											
136	Loon L-S	6/20/2000	epi	31	22	2	2	2	5											
136	Loon L-S	7/10/2000	epi	23	23	2	3	3	6											
136	Loon L-S	7/23/2000	epi	23	21	1	2	2												
136	Loon L-S	8/5/2000	epi	23	24	2	3	2												
136	Loon L-S	8/26/2000	epi	23	22	1	3	2												
136	Loon L-S	9/18/2000	epi	20	18	2	1	2												
136	Loon L-S	6/16/2001	epi	25	22	1	2	2												
136	Loon L-S	6/30/2001	epi	24	25	2	3	2	5											
136	Loon L-S	7/21/2001	epi	22	22	1	2	1												
136	Loon L-S	7/29/2001	epi	21	22	2	3	3	5											
136	Loon L-S	8/11/2001	epi	24	25	2	3	3												
136	Loon L-S	8/25/2001	epi	26	22	2	3	3												
136	Loon L-S	9/8/2001	epi	27	22	2	3	2												
136	Loon L-S	6/22/2002	epi	28	22		4	3	2											
136	Loon L-S	7/8/2002	epi	30	25	2	3	3	2											
136	Loon L-S	7/18/2002	epi	30	25	2	3	2	2											
136	Loon L-S	8/4/2002	epi	30	27	2	2	2	8											
136	Loon L-S	9/8/2002	epi	27	23	2	3	1	8											
136	Loon L-S	7/10/2003	epi	26	23	2	3	3	8											
136	Loon L-S	8/1/2003	epi	26	23	2	3	3	28											
136	Loon L-S	8/9/2003	epi	30	25	2	3	2	2											
136	Loon L-S	8/16/2003	epi	28	26	2	3	2	28											
136	Loon L-S	9/2/2003	epi	16	18	3	3	3	25											
136	Loon L-S	9/7/2003	epi	27	21	2	3	2	8											
136	Loon L-S	9/21/2003	epi	18	19	2	3	1	8											
136	Loon L-S	7/18/2004	epi	18	20	2	3	2	8											
136	Loon L-S	8/1/2004	epi	28	22	2	3	2	8											
136	Loon L-S	8/15/2004	epi	22	20	2	3	2	28											
136	Loon L-S	8/29/2004	epi	26	23	2	3	2	28											
136	Loon L-S	9/12/2004	epi	20	20	2	2	2	28											
136	Loon L-S	9/26/2004	epi	20	17	2	1	2	8											
136	Loon L-S	10/10/2004	epi	10	14	2	1	2	8											
136	Loon L-S	10/24/2004	epi	6	4	2	1	2	58											
136	Loon L-S	6/19/2005	epi	14	7	2	1	2	5											
136	Loon L-S	7/10/2005	epi	25	22	2	1	2	8											
136	Loon L-S	7/24/2005	epi	25	24	2	1	2	8											
136	Loon L-S	8/7/2005	epi	30	21	2	1	2	8											
136	Loon L-S	8/21/2005	epi	25	22	2	1	2	5											
136	Loon L-S	9/4/2005	epi	21	20	2	1	2	8											
136	Loon L-S	9/18/2005	epi	23	20	2	2	2	8											
136	Loon L-S	10/2/2005	epi	26	15	3	2	2	8											
136	Loon L-S	6/13/2006	epi	17	18	2	2	2	8											
136	Loon L-S	6/25/2006	epi	22	21	2	2	2	8											
136	Loon L-S	7/9/2006	epi	22	21	2	2	2	8											
136	Loon L-S	7/23/2006	epi	17	22	2	2	2	8											
136	Loon L-S	8/6/2006	epi	24	24	2	2	2	8											

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
136	Loon L-S	8/20/2006	epi	24	24	2	2	2	5											
136	Loon L-S	9/4/2006	epi	18	21	2	2	2	5											
136	Loon L-S	9/17/2006	epi	19	21	2	2	2	8											
136	Loon L-S	6/24/2007	epi	25	21	2	2	2	0											
136	Loon L-S	7/8/2007	epi	23	22	2	2	2	0											
136	Loon L-S	8/5/2007	epi	22	23	2	2	1	0											
136	Loon L-S	8/19/2007	epi	21	21	3	2	2	1											
136	Loon L-S	9/2/2007	epi	13	20	3	2	3	1											
136	Loon L-S	9/16/2007	epi	10	18	2	2	2	5											
136	Loon L-S	9/30/2007	epi	19	18	3	2	4	5											
136	Loon L-S	6/15/2008	epi	18	22	3	2	1	0											
136	Loon L-S	6/29/2008	epi	22	21	1	2	2	5											
136	Loon L-S	7/13/2008	epi	24	23	1	2	2	5											
136	Loon L-S	7/27/2008	epi	26	23	2	2	1	0											
136	Loon L-S	8/9/2008	epi	24	23	2	2	1	0											
136	Loon L-S	8/24/2008	epi	27	25	2	2	2	0											
136	Loon L-S	9/8/2008	epi	25	21	2	2	2	0											
136	Loon L-S	9/21/2008	epi	17	18	2	2	2	5											
136	Loon L-S	06/14/2009	epi	16	19	3	2	2	0											
136	Loon L-S	06/29/2009	epi	19	21	2	2	2	0											
136	Loon L-S	07/12/2009	epi	16	20	2	2	2	0											
136	Loon L-S	07/26/2009	epi	20	22	2	2	2	0											
136	Loon L-S	08/09/2009	epi	22	22	2	2	3	5					0.04						
136	Loon L-S	08/23/2009	epi	23	23	2	2	3	0											
136	Loon L-S	09/05/2009	epi	23	22	3	2	3	12			213.6		0.14						
136	Loon L-S	09/20/2009	epi	16	18	3	2	3	15			224.2								
136	Loon L-S	6/11/2010	epi	23	21	2	2	1	0	0	0									
136	Loon L-S	6/26/2010	epi	24	22	2	2	3	5	0	0									
136	Loon L-S	7/10/2010	epi	23	25	2	2	1	0	0	0									
136	Loon L-S	7/24/2010	epi	25	25	2	2	2	0	0	0									
136	Loon L-S	8/7/2010	epi	22	23	2	2	1	0	0	0	64.00		0.02						
136	Loon L-S	8/23/2010	epi	18	21	3	3	4	15	0	0	961.40								
136	Loon L-S	9/4/2010	epi	16	21	2	3	3	125	0	0	210.00		0.05						
136	Loon L-S	9/4/2010	bloom									129.00		0.18						
136	Loon L-S	9/18/2010	Epi	20	16	3	3	3	125	0	0									
136	Loon L-S	6/11/2011	Epi	21	22	2	3	2	0	0	0	7.70	2.00							
136	Loon L-S	6/25/2011	Epi	19	21	2	3	3	1	0	0	7.70	1.70							
136	Loon L-S	7/9/2011	Epi	24	23	2	3	2	0	0	0	10.40	2.50							
136	Loon L-S	7/23/2011	Epi	27	26	2	3	2	0	0	0	9.60	1.85							
136	Loon L-S	7/23/2011	bloom											0.61	<0.5	<0.1				
136	Loon L-S	8/7/2011	Epi	26	25	2	3	2	0	0	0	40.90	2.30							
136	Loon L-S	8/7/2011	Bloom											0.58	<0.5	<0.1				
136	Loon L-S	8/21/2011	Epi	22	22	2	3	2	5	0	0	30.70	2.30							
136	Loon L-S	9/3/2011	Epi	27	23	3	3	2	1	0	0	75.70	2.60							
136	Loon L-S	9/3/2011	Bloom											0.30	<0.8	<0.1				
136	Loon L-S	9/17/2011	bloom											0.01						
136	Loon L-S	9/17/2011	epi	11	12	3	3	4	15	0	0	61.80	4.50							
136	Loon L-S	6/7/2012	epi	12	17	3	3	4	15	4		0.80	0.30	<0.30	<0.417		0.42	0.03	F	
136	Loon L-S	6/16/2012	epi	22	21	2	3	3	2	4	4	5.60	0.30	<0.30	<0.413		0.89	0.17	H	
136	Loon L-S	6/16/2012	epi											<0.60	<0.715		11630	11630		
136	Loon L-S	7/7/2012	epi	23	26	3	3	3	2	4	4	2.70	0.30	0.34	<0.392		1.62	0.80	DH	
136	Loon L-S	7/7/2012	epi											<1.29	<1.760		7.34	4.55	DH	
136	Loon L-S	7/21/2012	epi	23		2	3	2	2	0	0	10.90	0.40	<0.30	<0.585		2.45	1.29	I	
136	Loon L-S	8/4/2012	epi	30	25	2	3	2	2	0	0	24.50	0.20	<0.30	<0.330		3.57	2.42	I	
136	Loon L-S	8/18/2012	epi	22	21	2	3	2	2	0	0	43.20	0.50	<0.30	<0.223		5.69	3.86	I	
136	Loon L-S	9/2/2012	epi	25	22	3	3	3	12	0	4	42.90	0.70	<0.30	<0.580		7.33	5.79	I	
136	Loon L-S	9/16/2012	epi	16	15	2	3	2	5	0	0	0.00	0.80	0.35	<3.205		4.00	2.18	I	
136	Loon L-S	6/17/2013	epi	30	18	2	2	2	1	0	0	7.40	1.30	<0.30	<0.440		1.90	0.70	I	I
136	Loon L-S	6/30/2013	epi	30	23	2	2	2	0	0	0	10.60	1.10	<0.30	<0.650		2.30	1.00	I	I
136	Loon L-S	7/13/2013	epi	23	23	2	2	2	0	0	0	15.50	0.80	<0.30	<0.490		3.00	2.20	H	I
136	Loon L-S	7/27/2013	epi	23	23	2	2	2	0	0	0	27.60	3.10	<0.30	<0.400		5.20	3.00	I	I

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
136	Loon L-S	8/13/2013	epi	22	20	2	2	2	0	0	0	51.30	3.80	<0.30	<0.340		9.10	4.50	I	I
136	Loon L-S	8/24/2013	epi	20	21	3	2	2	1	0	0	29.30	1.90	<0.30	<0.390		5.00	2.70	F	F
136	Loon L-S	9/7/2013	epi	18	20	3	2	2	1	0	0	60.60	1.80	<0.30	<1.100		10.40	8.80	F	I
136	Loon L-S	9/22/2013	epi	10	15	3	2	2	1	0	0	46.80	3.30	<0.30	<0.050		9.40	6.20	F	F
136	Loon L-S	6/15/2014	epi	16	17	2	3	1	0	0	0	0.90	0.40	<0.61	<0.08	<0.002	1.70	0.57	i	i
136	Loon L-S	6/28/2014	epi	27	28	2	2	1	0	4	4	3.00	0.20	<1.60	<0.48	<0.002	0.74	0.00	d	d
136	Loon L-S	6/28/2014	bloom											<0.81	<0.96	<0.003	1.59	0.44		d
136	Loon L-S	7/12/2014	epi	31	25	2	2	1	0	0	0	3.00	0.20	<0.40	<0.21	<0.003	0.48	0.00	i	i
136	Loon L-S	7/27/2014	epi	26	22	2	2	1	0	0	0	7.20	0.20	<0.63	<0.03	<0.001	2.40	0.99	i	i
136	Loon L-S	8/9/2014	epi	20	21	3	2	1	1	4	0	20.90	0.40	<0.28	<0.05	<0.001	3.30	2.01	i	i
136	Loon L-S	8/23/2014	epi	21	22	3	2	2	1	0	0	22.00	0.50	<1.06	<0.16	<0.002	5.66	2.66	f	f
136	Loon L-S	9/6/2014	epi	22	22	3	2	4	5	0	0	34.40	0.90	<0.29	<0.14	<0.002	8.43	3.81	i	i
136	Loon L-S	6/13/2015	epi	21	20	2	2	2	0	4	4	16.60	0.40	<0.86	<0.027	<0.318	2.10	1.00	I	B
136	Loon L-S	6/13/2015	bloom											<1.72	<0.053	<0.635	1177.25	1177.25		bc
136	Loon L-S	6/13/2015	bloom											<1.72	<0.053	<0.635	2704.75	2704.75		bc
136	Loon L-S	6/29/2015	epi	20	17	2	2	2	0	0	0	19.40	0.50	<0.63	<0.007	<0.040	1.00	0.00	I	I
136	Loon L-S	7/11/2015	epi	21	21	2	2	2	0	0	0	10.40	0.30	<1.01	<0.003	<0.011	1.10	0.00	I	I
136	Loon L-S	7/25/2015	epi	22	21	2	2	2	0	0	0	6.50	0.30	<0.19	<0.005	<0.020	0.60	0.00	I	I
136	Loon L-S	8/8/2015	epi	20	21	2	2	2	0	0	0	0.90	0.40	<0.44	<0.002	<0.009	0.70	0.00	I	I
136	Loon L-S	8/22/2015	epi	19	21	2	2	2	0	0	0	0.05	0.30	<0.28	0.00	<0.010	1.00	0.60	I	I
136	Loon L-S	9/6/2015	epi	27	24	2	2	1	0	0	0			<0.37	<0.012	<0.031	0.50	0.00	I	I
136	Loon L-S	9/20/2015	epi	13	19	2	2	2	0	0	0			<0.39	<0.009	<0.022	0.90	0.00	I	I
136	Loon L-S	6/17/2013	hypo		22															
136	Loon L-S	6/30/2013	hypo		22															
136	Loon L-S	7/13/2013	hypo		24															
136	Loon L-S	7/27/2013	hypo		23															
136	Loon L-S	8/13/2013	hypo		16															
136	Loon L-S	8/24/2013	hypo		19															
136	Loon L-S	9/7/2013	hypo		19															
136	Loon L-S	9/22/2013	hypo		16															
136	Loon L-S	6/15/2014	hypo		18															
136	Loon L-S	6/28/2014	hypo		28															
136	Loon L-S	7/12/2014	hypo		24															
136	Loon L-S	7/27/2014	hypo		23															
136	Loon L-S	8/9/2014	hypo		20															
136	Loon L-S	8/23/2014	hypo		21															
136	Loon L-S	9/6/2014	hypo		22															
136	Loon L-S	9/20/2014	hypo		16															
136	Loon L-S	6/13/2015	hypo		20															
136	Loon L-S	6/29/2015	hypo		16															
136	Loon L-S	7/11/2015	hypo		21															
136	Loon L-S	7/25/2015	hypo		21															
136	Loon L-S	8/8/2015	hypo		20															
136	Loon L-S	8/22/2015	hypo		21															
136	Loon L-S	9/6/2015	hypo		24															
136	Loon L-S	9/20/2015	hypo		18															

Legend Information

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

Appendix B: Priority Waterbody Listing for Loon Lake

Loon Lake (0502-0039) — Threatened

Waterbody Location Information

Revised: 02/07/2007

Water Index No:	Pa 3-58-38..P79			**Drain Basin:**	Chemung River
Hydro Unit Code:	02050105/030	**Str Class:**	B		Chemung River
Waterbody Type:	Lake			**Reg/County:**	8/Steuben Co. (51)
Waterbody Size:	166.3 Acres			**Quad Map:**	HASKINVILLE (L-10-2)
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:	PROBLEM SPECIES (Eurasian milfoil)
Suspected:	Algal/Weed Growth
Possible:	- - -

Source(s) of Pollutant(s)

Known:	HABITAT MODIFICATION
Suspected:	- - -
Possible:	- - -

Resolution/Management Information

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

Further Details

Recreational uses in Loon Lake are known to experience minor threats due to excessive aquatic weed growth, primarily non-native Eurasian milfoil. Other indicators suggest non-impacted water quality.

Loon Lake has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1994 and continuing through the present. An Interpretive Summary report of the findings of this sampling was published in 2005. These data indicate that the lake continues to be best characterized as mesotrophic, with very high water clarity reading in recent years. Phosphorus levels in the lake rarely exceed the state guidance values indicating impacted/stressed recreational uses. However there appears to be a weak trend toward increasing lake productivity during the summer, perhaps due to deepwater nutrient levels that are somewhat elevated and may enrich surface waters during the summer after the lake turns over. Elevated phosphorus levels were recorded in about 20% of all hypolimnetic samples. Transparency measurements are typically greater the 4 feet, meeting what is recommended for swimming beaches. Measurements of pH were within the 6.5 to 8.5 range in greater than 95% of the samples collected. (DEC/DOW, BWAM/CSLAP, November 2005)

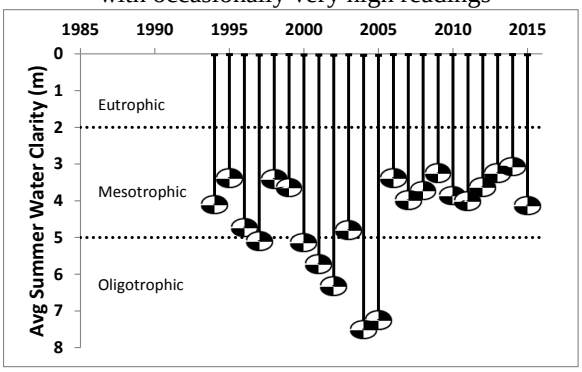
Public perception of the lake and its uses is also evaluated as part of the CSLAP program. These assessment also indicate

recreational suitability of the lake to be "excellent." The lake is described as "slightly" impacted for most recreational uses about 25% of the time; and "substantially" impacted at a frequency of 5%. The lake is described as having "definite Algal greenness" at a frequency of 20%, but has at no time been described as having "severely high algae levels." The limited incidences of recreational use impacts appear to be more closely related to excessive weed growth or poor weather than to water quality problems. Assessments have noted that aquatic plants often (45% of the time) grow to the lake surface. Aquatic plant communities appear to be dominated by non-native species (Eurasian water milfoil). Aquatic vegetation is controlled by mechanical weed harvesting in order to facilitate recreational use of the lake. 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. (DEC/DOW, BWAM/CSLAP, November 2005)

Appendix C- Long Term Trends: Loon Lake

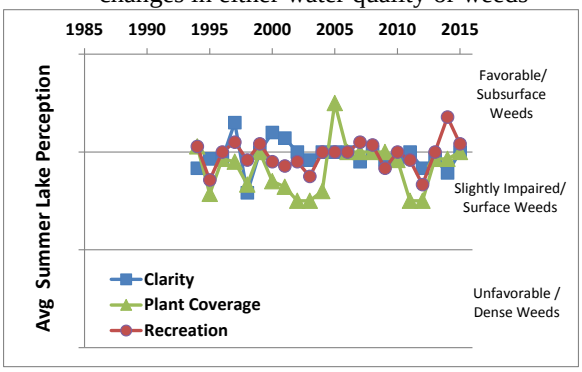
Long Term Trends: Water Clarity

- ↑ 95-04; ↓ 05-14; close to long term avg '15
- Most readings typical of *mesotrophic* lakes, with occasionally very high readings



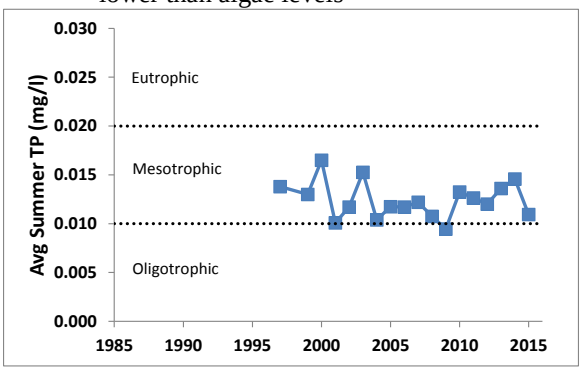
Long Term Trends: Lake Perception

- Varied slightly year to year since early 90s
- Recreational perception at times linked to changes in either water quality or weeds



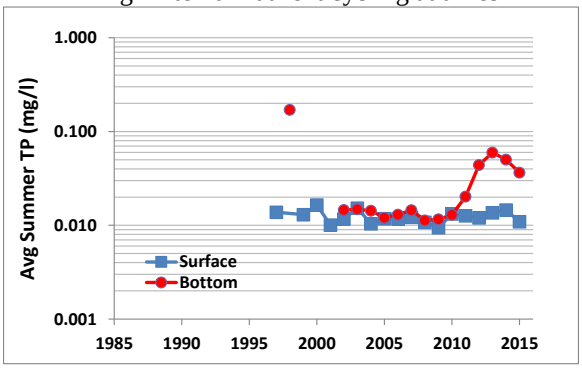
Long Term Trends: Phosphorus

- Slight drop mid-1990s to 2015
- Most readings typical of *mesotrophic* lakes, lower than algae levels



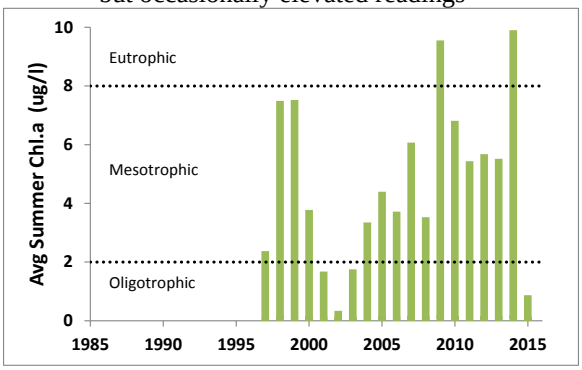
Long Term Trends: Bottom Phosphorus

- Deep TP rising and much higher than surf.
- Occasionally elevated bottom TP indicates high internal nutrient cycling at times



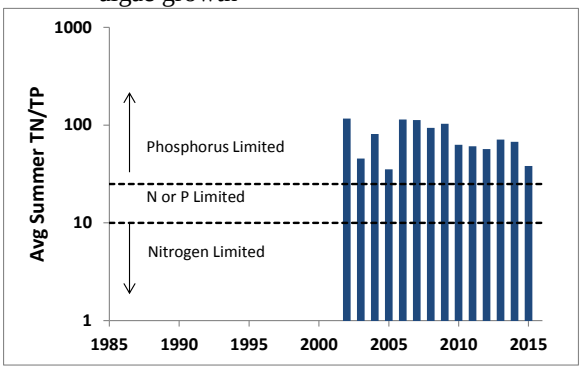
Long Term Trends: Chlorophyll a

- Highly variable w/no clear long term trends
- Most readings typical of *mesotrophic* lakes, but occasionally elevated readings



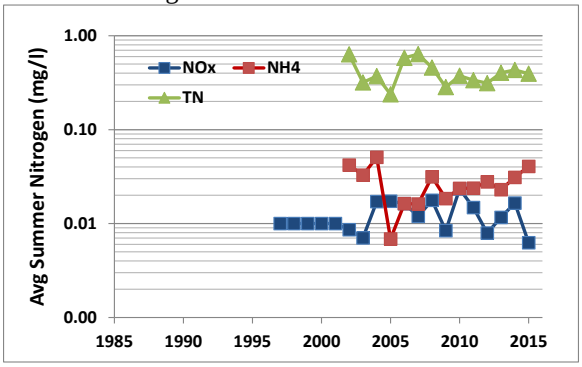
Long Term Trends: N:P Ratio

- Recent slight decrease
- Most readings indicate phosphorus limits algae growth



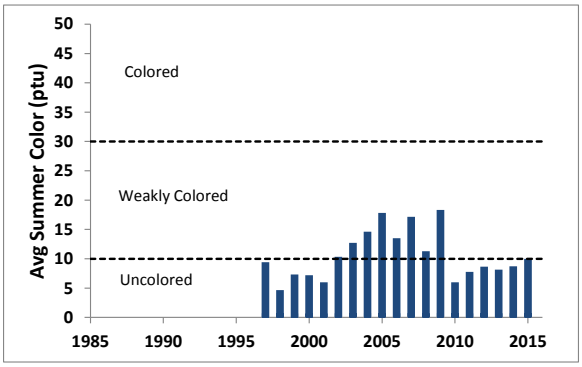
Long Term Trends: Nitrogen

- Slight ↑ TN, NH4 last decade; variable NOx
- Most NOx, ammonia, and total nitrogen readings moderate to low



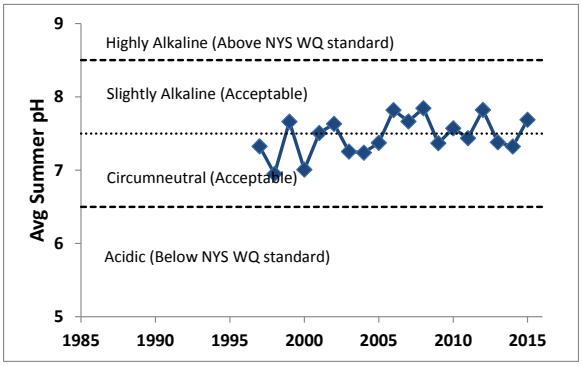
Long Term Trends: Color

- No trends apparent; slightly higher after '02
- Most readings typical of *uncolored* to *slightly colored* lakes



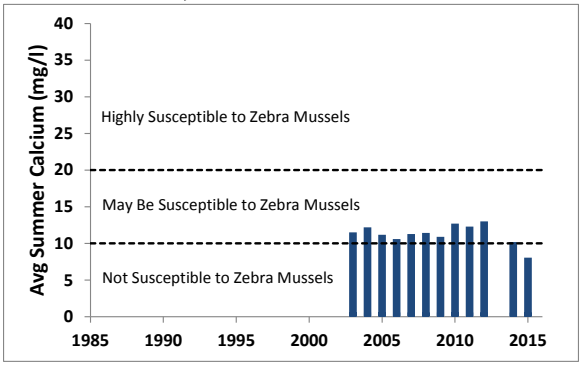
Long Term Trends: pH

- Slight increase since mid-1990s
- Most readings typical of *slightly alkaline* to *circumneutral* lakes



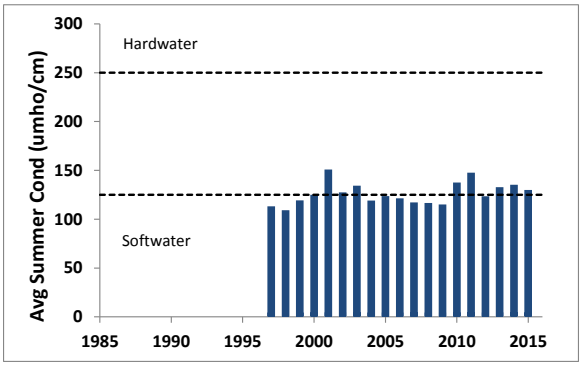
Long Term Trends: Calcium

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



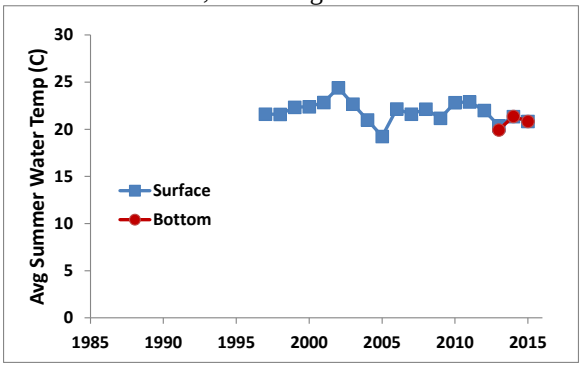
Long Term Trends: Conductivity

- No trends apparent; perhaps slight ↑
- Most readings typical of *softwater* lakes



Long Term Trends: Water Temperature

- No trends apparent
- Limited deepwater temperatures data similar to surface, indicating weak 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.

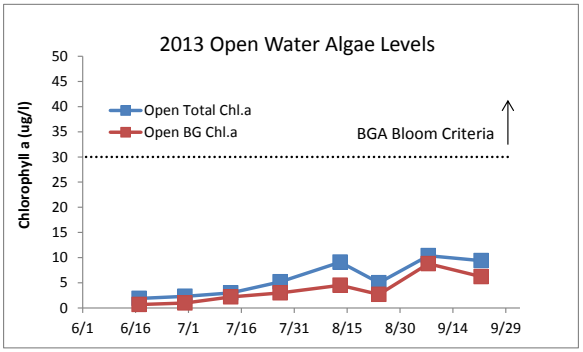


Figure D1:
2013 Open Water Total and BGA Chl.a

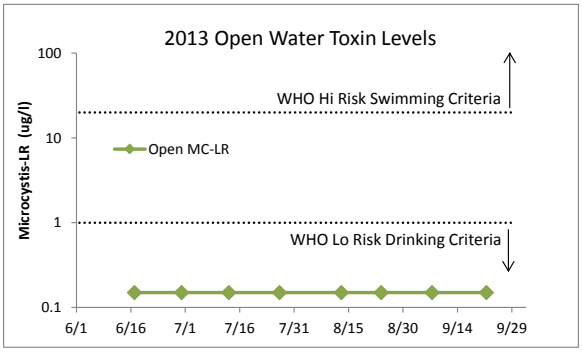


Figure D2:
2013 Open Water Microcystin-LR

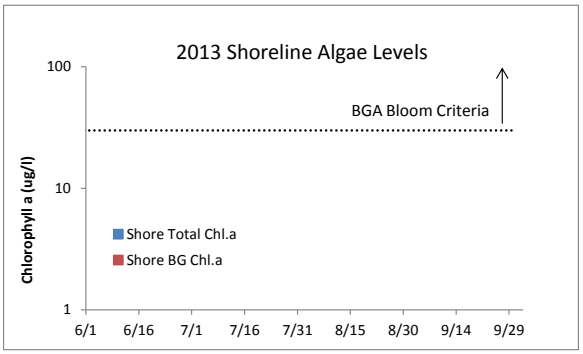


Figure D3:
2013 Shoreline Total and BGA Chl.a

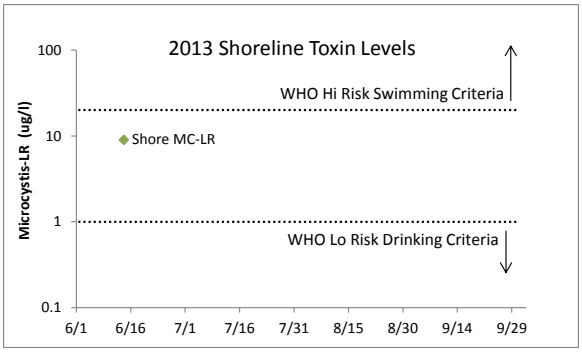


Figure D4:
2013 Shoreline Microcystin-LR

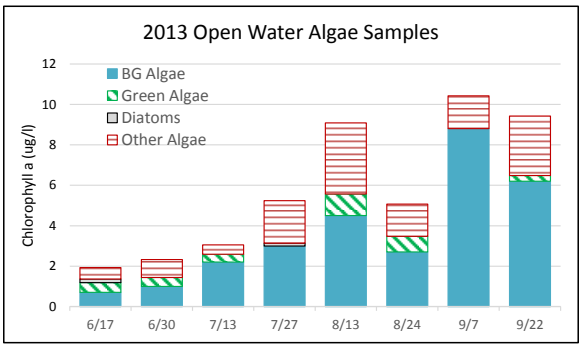


Figure D5:
2013 Open Water Algae Types

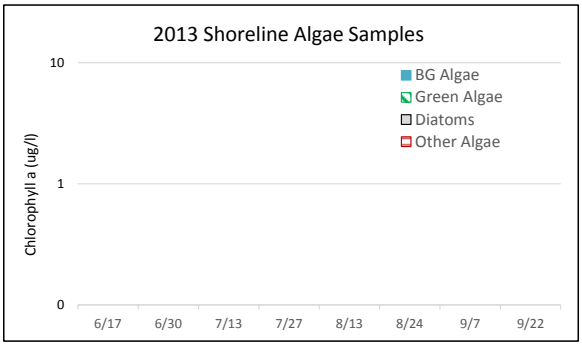


Figure D6:
2013 Shoreline Algae Types

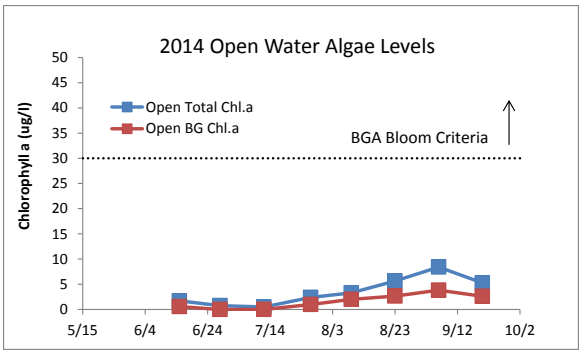


Figure D7:
2014 Open Water Total and BGA Chl.a

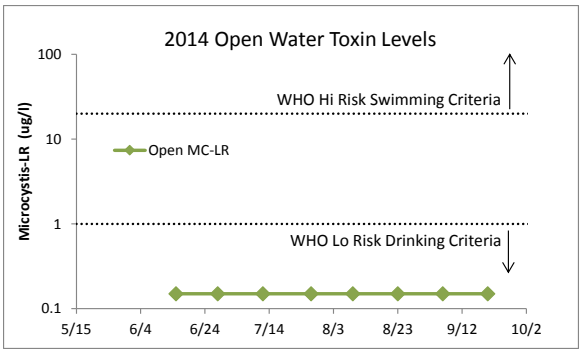


Figure D8:
2014 Open Water Microcystin-LR

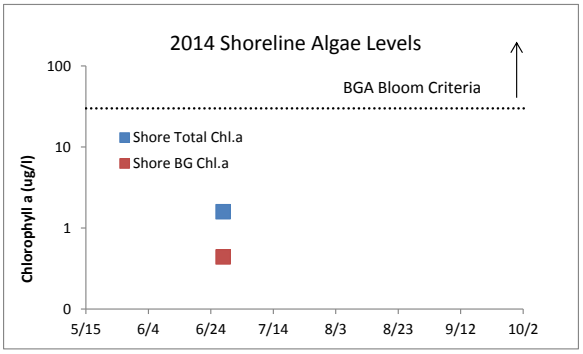


Figure D9:
2014 Shoreline Total and BGA Chl.a

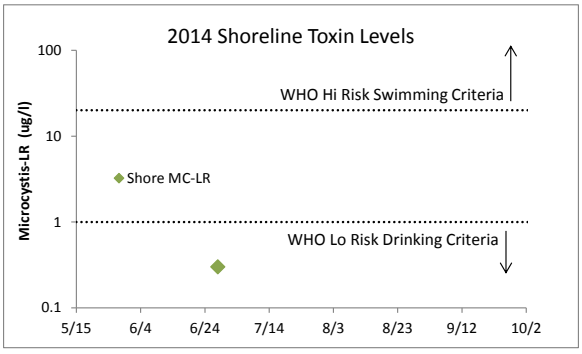


Figure D10:
2014 Shoreline Microcystin-LR

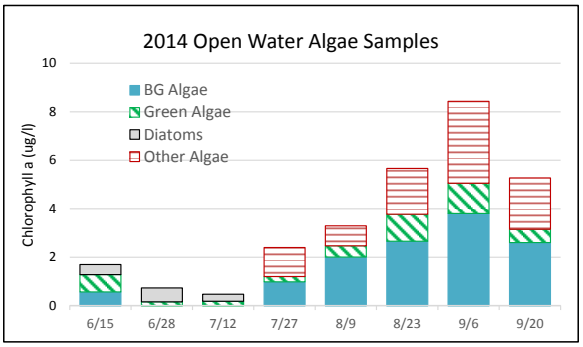


Figure D11:
2014 Open Water Algae Types

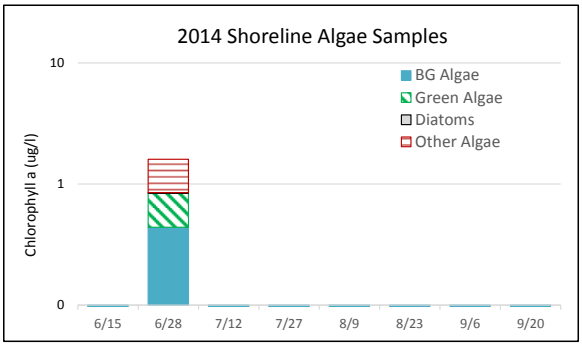


Figure D12:
2014 Shoreline Algae Types

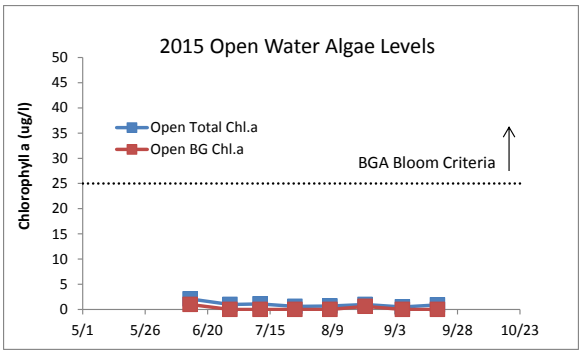


Figure D13:
2015 Open Water Total and BGA Chl.a

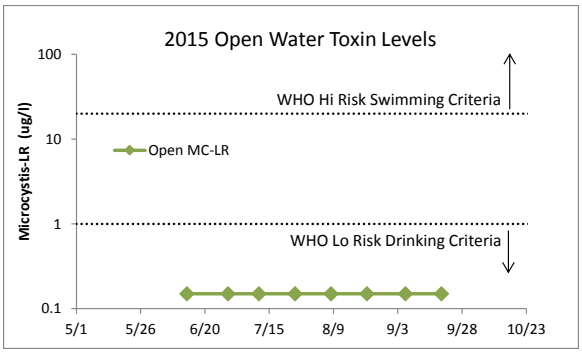


Figure D14:
2015 Open Water Microcystin-LR

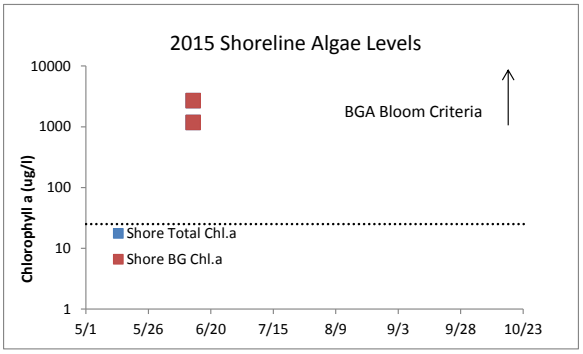


Figure D15:
2015 Shoreline Total and BGA Chl.a

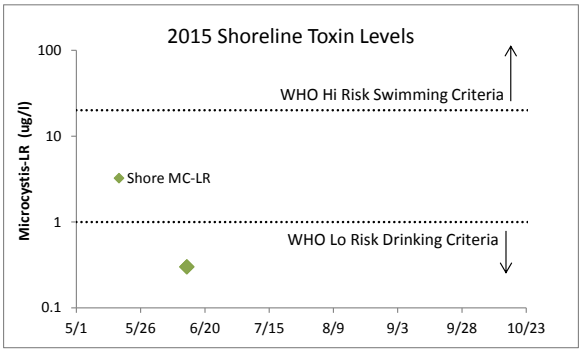


Figure D16:
2015 Shoreline Microcystin-LR

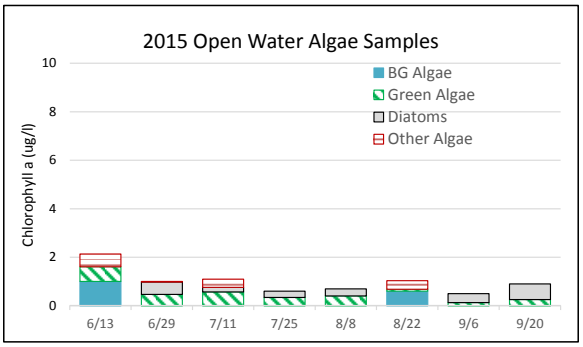


Figure D17:
2015 Open Water Algae Types

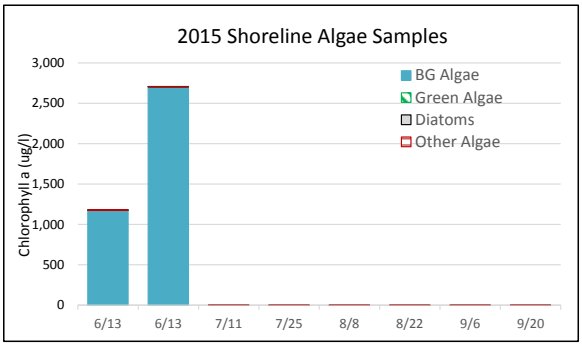


Figure D18:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Steuben County

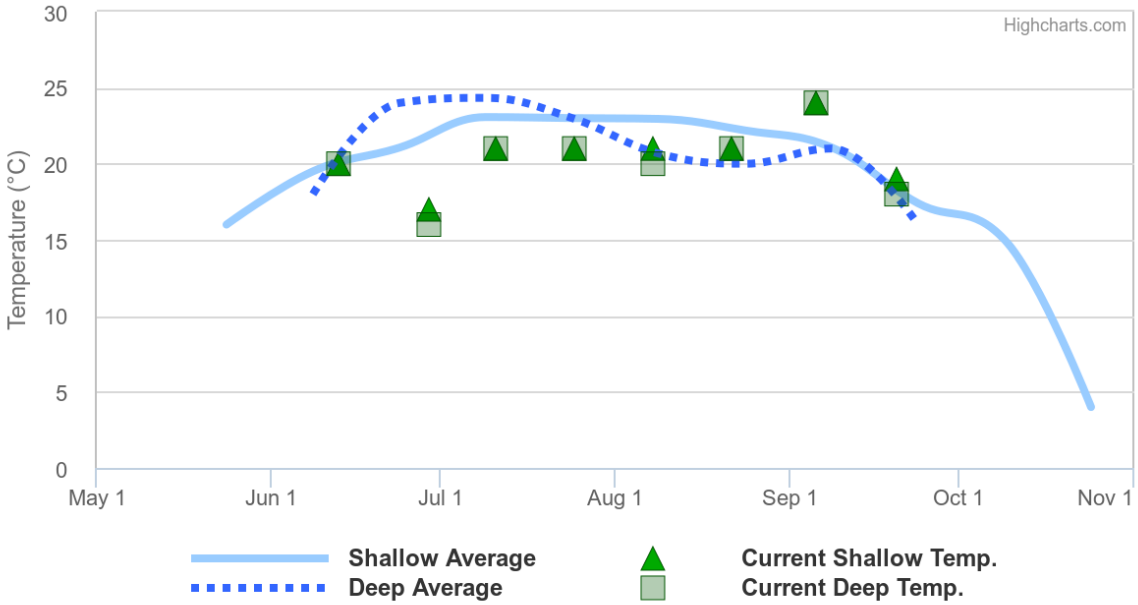
The table below shows the invasive aquatic plants and animals that have been documented in Steuben County, as cited in either the iMapInvasives database (http://www.imapinvasives.org/) or in the NYSDEC Division of Water database. These databases may include some, but not all, non-native plants or animals 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 - Steuben County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Almond Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Almond Reservoir	Plant	Curly leafed pondweed	*Potamogeton crispus*
Cranberry Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Goodhue Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Keuka Lake	Animal	Quagga mussel	*Dreissena bugensis*
Keuka Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Keuka Lake	Animal	Scud	*Echinogammarus ischnus*
Keuka Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lake Salubria	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lime Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Loon Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Loon Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Loucks Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Sanford Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Sanford Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Smith Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Smith Pond	Plant	Curly leafed pondweed	*Potamogeton crispus*
Thurston Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Van Keuren Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Waneta Lake	**Plant**	**Eurasian watermilfoil**	***Myriophyllum spicatum***
Waneta Lake	**Plant**	**Brittle naiad**	***Najas minor***
Waneta Lake	**Plant**	**Curly leafed pondweed**	***Potamogeton crispus***

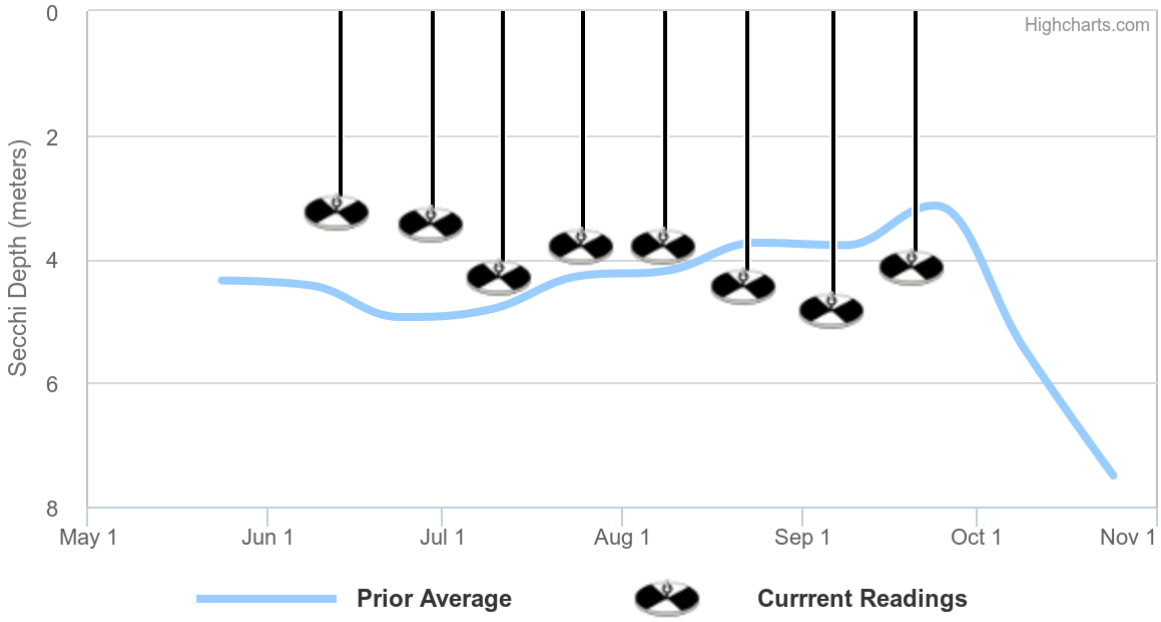
Appendix F: Current Year vs. Prior Averages for Loon Lake

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 1997 to 2014. There are not enough deep water sample temperatures to determine a trend for the current year when compared to the average of readings collected from 2012 to 2014.

Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are tending to be lower than normal when compared to the average of readings collected from 1994 to 2014

Appendix G: Watershed and Land Use Map for Loon 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.