Otter Lake Questions and Answers, 2015 CSLAP

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

A1. The condition of Otter Lake was probably similar in 2015 to previous years. Water clarity was slightly lower than usual, although phosphorus readings and algae levels were close to normal. No shoreline blooms were reported in the lake.

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

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

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

A3. Otter Lake had slightly lower water clarity, but similar nutrient and algae levels, compared to most other nearby lakes. Aquatic plant coverage was slightly higher than the plant coverage in many other nearby lakes.

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

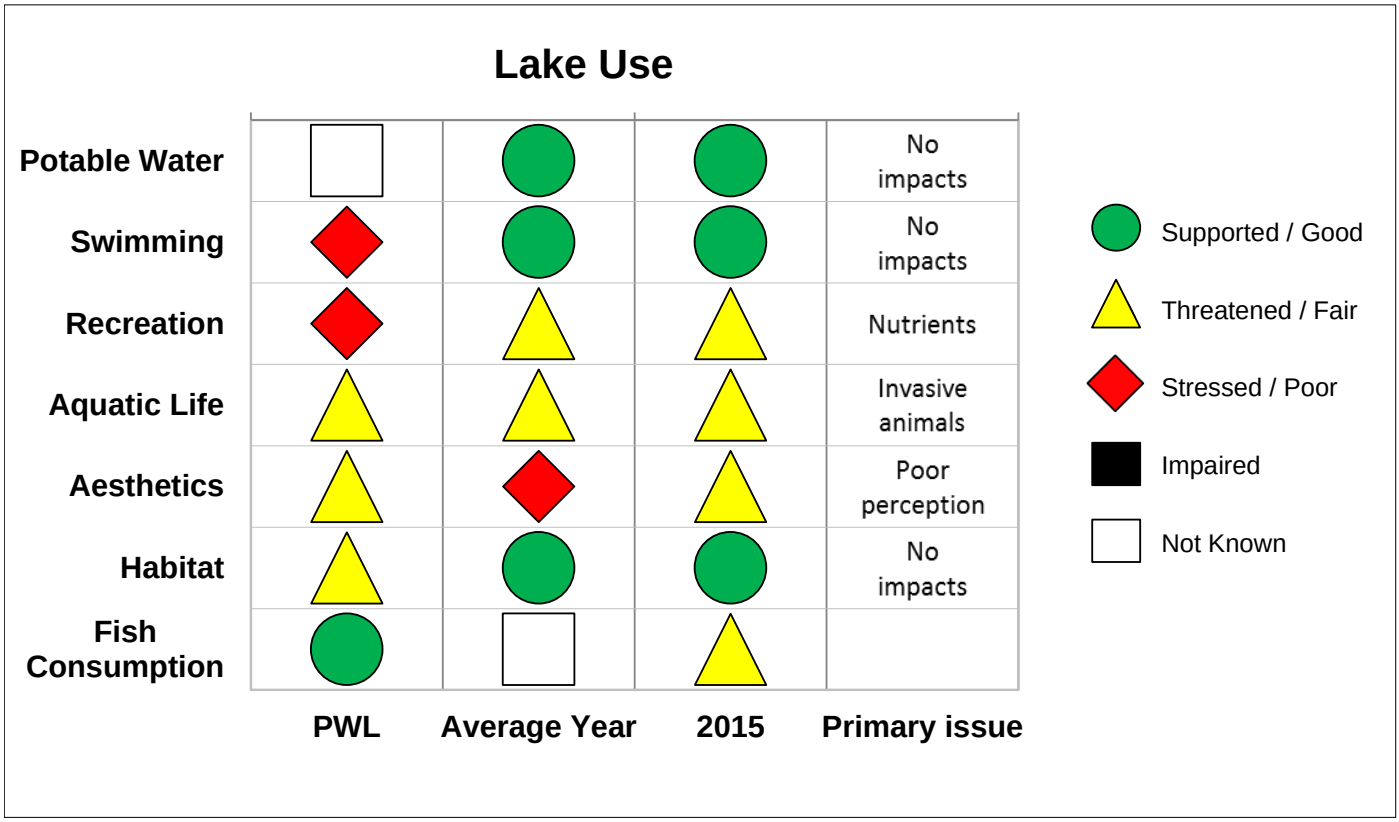
A4. Water clarity has decreased significantly over the last two decades, probably due to changes in dissolved organic matter (color) or turbidity. NOx readings have increased slightly.

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

A5. Otter Lake has shown a low susceptible to shoreline blue green algae blooms, although the lake association should evaluate manageable shoreline and watershed sources of nutrients to keep this susceptibility low.

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 improve lake health by reducing nutrient and sediment loading to the lake. Visiting boats should be inspected to reduce the risk of new invasive species, since nearby lakes harbor several invasive plants not presently found in the lake.



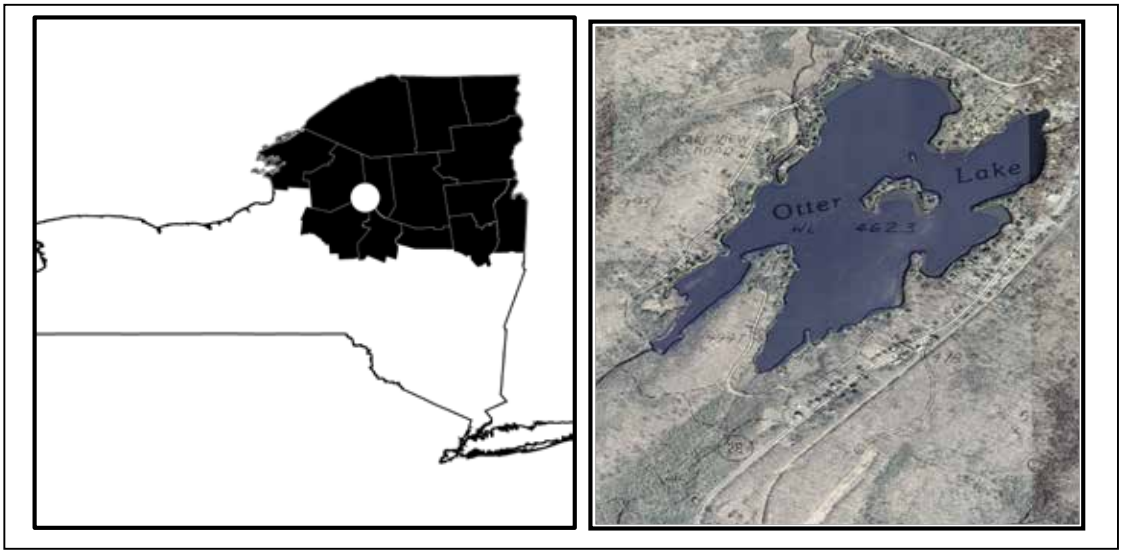
CSLAP 2015 Lake Water Quality Summary:
Otter Lake

General Lake Information

Location	Town of Forestport
County	Oneida
Basin	Black River
Size	114 hectares (281.6 acres)
Lake Origins	Natural
Watershed Area	598 hectares (1477 acres)
Retention Time	0.35 years
Mean Depth	1.4 meters
Sounding Depth	3 meters
Public Access?	no
Major Tributaries	Otter Lake inlet
Lake Tributary To…	Otter Lake outlet to Long Lake outlet to Cummings Creek to Black River to Lake Ontario
WQ Classification	A (potable water)
Lake Outlet Latitude	43.556
Lake Outlet Longitude	-74.742
Sampling Years	1992-1996, 2002-2009, 2011, 2013, 2015
2015 Samplers	Scott Lincoln
Main Contact	Scott Lincoln

Lake Map

(sampling location marked with a circle)



Background

Otter Lake is a 282 acre, class A lake found in the Town of Forestport in Oneida County, in the southwestern Adirondack region of New York State. It was first sampled as part of CSLAP in 1992.

It is one of 3 CSLAP lakes among the more than 250 lakes and ponds found in Oneida County, and one of 8 CSLAP lakes among the 950 lakes and ponds in the Black River drainage basin.

Lake Uses

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

Otter Lake is not stocked by the state of New York. It is not known by the report authors if private stocking occurs in Otter Lake.

General statewide fishing regulations are applicable in Otter Lake.

Historical Water Quality Data

CSLAP sampling was conducted on Otter Lake from 1992-1996, 2002-2009, 2011, 2013 and 2015. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at http://nysfola.mylaketown.com. The most recent CSLAP report for Otter Lake can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77821.html.

Otter Lake was sampled on August 28th, 1931 by New York State Conservation Department (the predecessor of the NYSDEC) as part of the Biological Survey of the Black River basin. The majority of the water quality parameters measured through CSLAP were not measured in this biological survey, although pH readings were similar. The field notes from this survey included the following:

"Otter Lake is a small, shallow body of water with an irregular shoreline. Originally a speckled trout lake it is now the home of bass and perch, and an attempt has been made to establish the pike-perch. In spite of the haphazard stocking an abundance of fish is still present, due to the excellent weed beds and the high oxygen content of all parts of the water. The shallowness of the lake and the variety of habitats which it affords favor the production of large numbers of fish. It would seem wise to confine the efforts of all interested parties to the production of small mouth bass..."

The lake was also sampled in 1984 as part of the Eastern Lakes Survey (conducted by the US EPA), as part of the Adirondack Lake Survey Corporation (ALSC) study of 1500 Adirondack lakes in 1986, and as part of the NYSDEC Lake Classification and Inventory (LCI) survey in 1987. The results from these studies indicated water quality conditions that appeared to be comparable to those measured through CSLAP starting in 1992.

The Otter Lake inlet/outlet has not been monitored through the NYSDEC Rotating Intensive Basins (RIBS). The outlet was sampled 2 km downstream, near the confluence with Purgatory

Creek, as part of the DEC biological screening program. No biological impacts were reported. The lake has also not been sampled through any of the state fisheries monitoring programs

Lake Association and Management History

Otter Lake is represented by the Otter Lake Association. In addition to CSLAP, the lake association is involved in other watershed management projects, including:

- Black Fly Project
- Maintaining a web site
- Education about ongoing local and state projects

The lake association was also engaged in a proposal to stock grass carp in Otter Lake to control problems with excessive weeds, primarily bladderwort. More information about the Otter Lake Association can be found on their website http://www.otterlk.com/.

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual and Monthly Results Relative to 1992-2013

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

Evaluation of Eutrophication Indicators

Water clarity was lower than usual in 2015, despite nutrient and algae levels that were mostly close to normal. The lower water clarity has been part of a long-term decrease, coincident with a slight increase in phosphorus readings over the same period. However, algae levels also generally decreased over the same period, suggesting that the drop in clarity may have been due to higher (non-algal) turbidity.

Phosphorus readings typically increase in early summer, but decrease in late summer. This trend was generally apparent in 2015, particularly in late summer.

The lake continues to be characterized as *mesoeutrophic*, or moderately to highly productive, based on chlorophyll *a* and total phosphorus readings (indicative of *mesotrophic* lakes) and water clarity readings (more typical of *eutrophic* lakes). The TSI evaluation suggests that water clarity is slightly lower than expected given the algae levels in the lake. This suggests that water clarity is influenced by water color (or turbidity or lake depth). Overall trophic conditions are summarized on the Lake Scorecard.

Evaluation of Potable Water Indicators

Algae levels may at times be sufficiently high 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 excessive treatment of the lake water is needed. Otter Lake is not thermally stratified, at least on a consistent basis, so deepwater samples have not been collected in the lake (and deepwater intakes to avoid surface algae-enriched waters are not possible).

Evaluation of Limnological Indicators

Water color was slightly lower than usual in 2015, although these were similar to those measured prior to 2002 (before the lab change). NOx and ammonia readings have increased slightly over the last decade, although these readings were close to usual in 2015. Each of the other water quality indicators was close to normal in 2015. It is likely that the small changes in these other indicators from year to year represent normal variability.

Chloride levels in the 2015 samples, conducted for the first time through CSLAP and cited in Appendix A, ranged from 28 to 30 mg/l. These values are within the range of "moderate road salt" runoff levels cited by the New Hampshire DES, well below the state potable water quality standard of 250 mg/l but within the range of values found in a number of NYS lakes.

Overall limnological conditions are summarized in the Lake Scorecard.

Evaluation of Biological Condition

The fluoroprobe data analyzed by SUNY ESF in the last several years showed low overall algae levels and very low blue green algae levels in the open water, although blue green algae levels were slightly elevated in early August of 2015. No shoreline blooms have been reported, at least in recent years.

The macrophyte data collected through CSLAP show high plant diversity, and no exotic plants were found in the lake (although some native plants may continue to grow to nuisance levels). The modified FQI indicates that the quality of the aquatic plant community is "excellent."

The fish community in the lake is comprised of a mix of coolwater (at least three species) and warmwater (at least three species) fish. It is not known if the diversity of fish species in the lake is greater than apparent through the ALSC study. An analysis of the fish community evaluated through the ALSC, using the Minnesota fish biotic index, suggests that the quality of the fish community is "fair".

Zooplankton and macroinvertebrates have not been monitored through CSLAP in Otter Lake. Zebra mussels are not found in the lake.

Evaluation of Lake Perception

Recreational assessments were slightly more favorable than normal in 2015, despite lower than normal water clarity. However, water quality and recreational assessments improved slightly over the last decade, coincident with a decrease in aquatic plant coverage over the same period. These indicators do not change significantly during the typical summer, and no clear seasonal trends were apparent in 2013 or 2015. Overall lake perception is summarized on the Lake Scorecard.

Evaluation of Local Climate Change

Air and water temperatures were higher than normal in 2015, but neither measure of local climate change has exhibited significant long-term change. It is not known if this is an indication of no local climate change or if these measures are adequate to evaluate climate change.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Fluoroprobe readings have been well below the thresholds for harmful algal blooms (HABs) in the open water, and no shoreline blooms have been apparent. Algal toxin analysis showed low to undetectable results in all samples.

Lake Condition Summary

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	1.05	1.97	3.30	1.51	Eutrophic	Lower Than Normal	Decreasing Significantly
	Chlorophyll *a*	0.10	5.31	25.65	4.49	Mesotrophic	Within Normal Range	No Change
	Total Phosphorus	0.004	0.013	0.031	0.016	Mesotrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia							Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus							Not known
	Nitrate + Nitrite	0.00	0.02	0.44	0.03	Low NOx	Within Normal Range	Increasing Slightly
	Ammonia	0.01	0.05	0.29	0.05	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.10	0.50	0.99	0.43	Low Total Nitrogen	Within Normal Range	No Change
	pH	6.19	7.25	8.58	7.26	Circumneutral	Within Normal Range	No Change
	Specific Conductance	45	107	171	100	Softwater	Within Normal Range	No Change
	True Color	1	51	145	38	Colored	Within Normal Range	No Change
	Calcium	3.2	6.4	8.8	5.6	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.6	4	2.4	Definite Algal Greenness	Within Normal Range	No Change
	Aquatic Plant Coverage	1	2.9	4	3.0	Surface Plant Growth	Within Normal Range	No Change
	Recreational Assessment	1	2.7	4	2.0	Slightly Impaired	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Fair quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not measured through CSLAP	Not known	Not known
	Macroinvertebrates					Not measured through CSLAP	Not known	Not known
	Fish					Warmwater fishery; "fair" fish IBI	Not known	Not known
	Invasive Species					Brook trout	Not known	Not known
Local Climate Change	Air Temperature	2	21.3	34	23.5		Within Normal Range	No Change
	Water Temperature	10	21.1	27	24.8		Higher Than Normal	No Change

Category	Indicator	Min	92-13 Avg	Max	2013 Avg	Classification	2013 Change?	Long-term Change?
Harmful Algal Blooms	Open Water Phycocyanin	2	7	27	9	No readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	4	23	5	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	1	12	2	Few readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	<DL	0.3	<DL	Low to undetectable open water microcystins	Not known	Not known
	Open Water Anatoxin a	<DL	<DL	<DL	<DL	Open water Anatoxin-a consistently not detectable	Not known	Not known
	Shoreline Phycocyanin					No shoreline blooms sampled for PC	Not known	Not known
	Shoreline FP Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline FP BG Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline Microcystis					No shoreline bloom MC-LR data	Not known	Not known
	Shoreline Anatoxin a					No shoreline bloom anatoxin data	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Otter Lake is presently among the lakes cited on the Black River Basin PWL, with no known impacts to lake uses. The 2007 PWL listing for the lake is shown in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Otter Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water. The limited CSLAP data suggest that potable water use in the lake may be supported.

Public Bathing

The CSLAP dataset at Otter Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public swimming beaches, should be supported. Bacterial data are needed to evaluate the safety of the lake for swimming.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Otter Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation should be supported, although this use may be *threatened* by excessive nutrients.

Aquatic Life

The CSLAP dataset on Otter 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 invasive animals (brook trout). Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics and Habitat

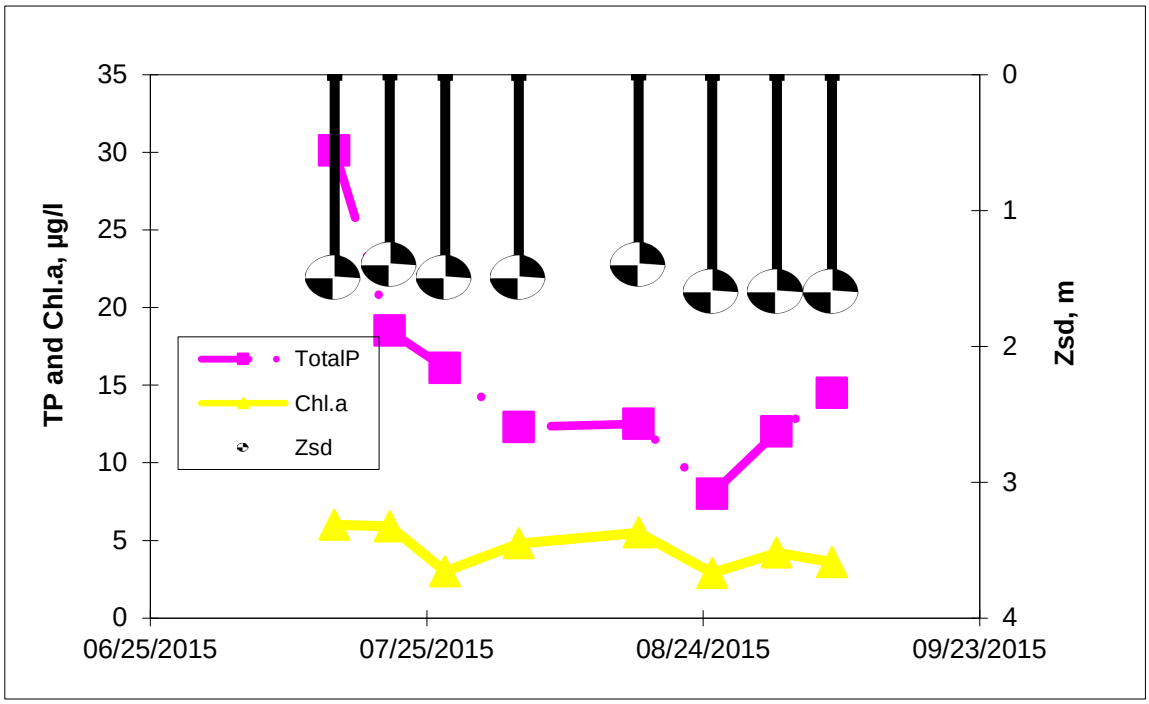
The CSLAP dataset on Otter Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may at times be only *fair* due to poor perception (from poor clarity or excessive weeds). Habitat should be *good.* .

Fish Consumption
There is no fish consumption advisories posted for Otter Lake.

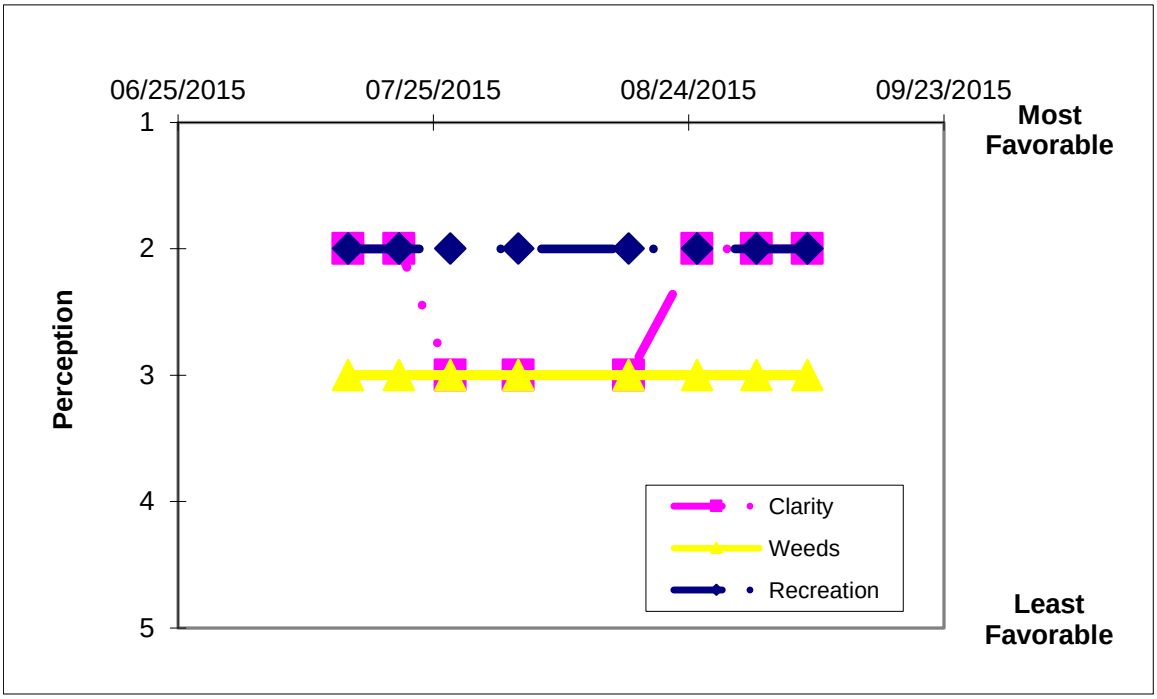
Additional Comments and Recommendations
It is not known if nuisance weeds (bladderwort or an exotic plant) is creating recreational use impacts and is undergoing active management. Lake residents are advised to report (and avoid exposure to) any shoreline blooms.

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

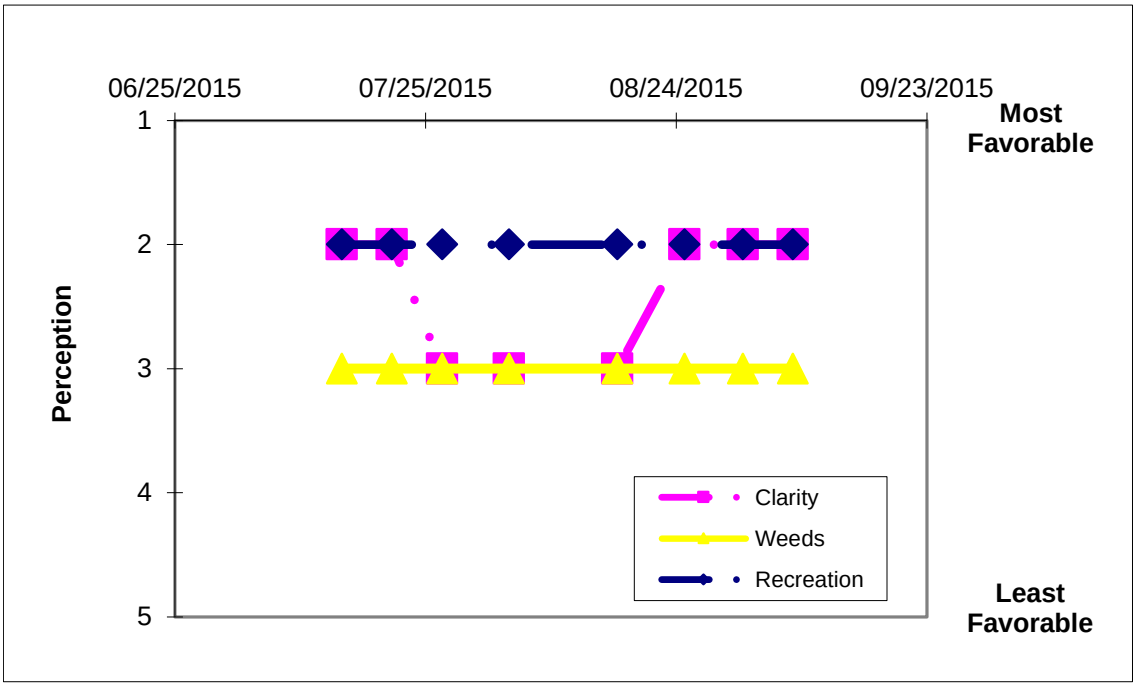
Time Series: Trophic Indicators, 2015



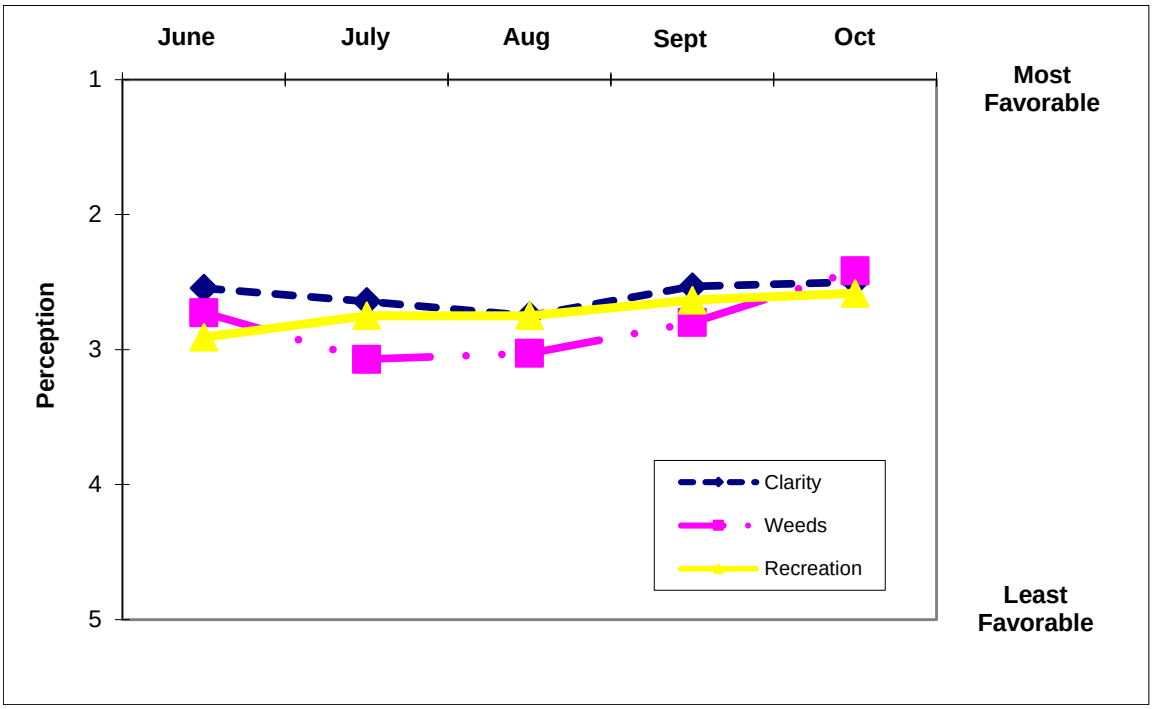
Time Series: Trophic Indicators, Typical Year (1992-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (1992-2015)



Appendix B- CSLAP Water Quality Sampling Results for Otter Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
99	Otter L	6/14/1992	2.8	2.38	1.5	0.011	0.01				29	7.23	93		2.74	
99	Otter L	7/1/1992		2.42	1.5	0.012	0.01				26	7.43	99			
99	Otter L	7/12/1992	3.0	2.60	1.5	0.012	0.01				25	7.70	98		4.94	
99	Otter L	8/1/1992	3.0	2.13	1.5	0.012	0.06				32	7.61	95		5.70	
99	Otter L	8/9/1992	2.9	2.13	1.5	0.012	0.01				30	7.04	93		4.07	
99	Otter L	8/23/1992	2.5	1.83	1.5	0.008	0.01				30	6.83	96		4.73	
99	Otter L	9/6/1992	2.8	2.38	1.5	0.009	0.01				30	7.42	94		8.24	
99	Otter L	9/20/1992	2.0	2.25	1.5	0.009	0.01				35	7.41	96		3.55	
99	Otter L	7/5/1993	3.1	2.28	1.5	0.013	0.01				27	7.64	92		3.10	
99	Otter L	7/18/1993	2.7	2.35	1.5	0.011					27	6.79	94		5.82	
99	Otter L	8/1/1993	3.1	2.73	1.5	0.012	0.01				18	7.16	96		2.23	
99	Otter L	8/15/1993	3.3	3.00	1.5	0.008					22	7.62	95		1.88	
99	Otter L	8/29/1993	3.3	3.05	1.5	0.010	0.01				22	7.59	98		2.05	
99	Otter L	9/12/1993	3.2	2.40	1.5	0.014					31	7.22	94		4.01	
99	Otter L	9/26/1993	2.8	2.60	1.5	0.008	0.01				24	7.74	95		1.92	
99	Otter L	10/11/1993	3.2	3.20	1.5	0.008					29	7.31	96		1.31	
99	Otter L	6/12/1994	3.3	2.65	1.5	0.013	0.01				32	7.20	90		3.62	
99	Otter L	6/19/1994	3.3	2.20	1.5	0.008					27	7.17	92		6.77	
99	Otter L	7/10/1994	3.3	1.40	1.5	0.015	0.01				53	7.35	82		11.60	
99	Otter L	7/24/1994	3.0	1.40	1.5	0.013	0.01				53	7.03	86		16.60	
99	Otter L	8/13/1994	3.0	1.60	1.5	0.012	0.01				55	7.35	90		6.35	
99	Otter L	8/28/1994	3.0	2.25	1.5	0.010					55	7.25	88		5.47	
99	Otter L	9/5/1994	3.0	2.50	1.5	0.009	0.01				45	7.25	89		4.85	
99	Otter L	10/2/1994	3.3	2.20	1.5	0.010					55	7.36	85		2.52	
99	Otter L	7/8/1995	3.3	2.30	1.5	0.014	0.01				30	7.20	96		8.27	
99	Otter L	7/22/1995	3.4	2.40	1.5	0.008	0.01				25	7.01	96		3.73	
99	Otter L	8/1/1995	3.2	2.40		0.010	0.01				30				4.25	
99	Otter L	8/14/1995	3.1	3.10	1.5	0.010	0.01				35	7.51	98		3.89	
99	Otter L	8/27/1995	3.1	2.10	1.5	0.006	0.01				30	7.28	102		7.19	
99	Otter L	9/12/1995	3.3	3.00	1.5	0.008	0.01				30	7.29	98		2.55	
99	Otter L	9/24/1995	3.3	3.30	1.5	0.007	0.01				25	7.19	99		2.13	
99	Otter L	10/8/1995	3.3	3.30	1.5	0.004	0.01				25	7.22	99		1.97	
99	Otter L	6/9/1996	3.0	3.00	1.5	0.009	0.01				30	7.06	99		2.90	
99	Otter L	7/7/1996	3.0	1.50	1.5	0.010	0.02				50	7.07	92		8.50	
99	Otter L	7/24/1996	3.0	2.00	1.5	0.009	0.01				60	7.27	94		24.00	
99	Otter L	8/7/1996			1.5	0.011	0.01				60	7.31	97		9.30	
99	Otter L	8/21/1996	3.0	2.00	1.5	0.009	0.01				55	7.44	98		11.20	
99	Otter L	9/2/1996	3.0	3.00	1.5	0.008	0.01				45	7.25	99		3.70	
99	Otter L	9/23/1996	3.0	3.00	1.5	0.015	0.01				30	7.28	106		3.72	
99	Otter L	7/22/2002	2.3	2.25	1.5	0.006	0.00	0.10	0.63	225.21	42	7.04	136			
99	Otter L	8/6/2002	2.0	2.10	1.5	0.007	0.00	0.04	0.60	176.56	43	7.33	139		15.50	
99	Otter L	8/20/2002	1.8	1.90	1.5	0.011	0.00	0.05	0.54	107.57	23	7.29	142			
99	Otter L	9/3/2002	2.1	2.10	1.5	0.012	0.00	0.03	0.49	91.20	37				14.00	
99	Otter L	9/15/2002	2.1	2.00	1.5		0.06	0.04	0.57							
99	Otter L	10/1/2002	2.1	2.10	1.5	0.010	0.00	0.01	0.57	125.19	28	7.40	141		11.32	
99	Otter L	10/29/2002	1.9	2.00			0.04	0.05	0.52							
99	Otter L	6/10/2003		2.00	1.5	0.007	0.01	0.03	0.37	117.73	42	6.87	139	6.4		
99	Otter L	6/24/2003		1.90	1.5	0.010	0.00	0.03	0.32	70.02	51	6.88	139		14.27	
99	Otter L	7/8/2003		1.85	1.5	0.013	0.03	0.05	0.45	74.73	40	7.23	148		25.45	
99	Otter L	7/23/2003		2.00	1.5	0.011	0.01	0.03	0.40	80.39	44	7.04	144		4.13	
99	Otter L	8/5/2003		2.00	1.5	0.010	0.00	0.01	0.54	118.89	39	7.04	148	7.8	14.20	
99	Otter L	8/19/2003		2.00	1.5	0.008	0.00	0.02	0.38	104.62	48	6.99	143		9.26	
99	Otter L	9/2/2003		1.85	1.5	0.005	0.02	0.01	0.42	174.01	38	6.93	142		10.79	
99	Otter L	9/15/2003		1.85	1.5	0.011	0.00	0.01	0.31	63.02	39	7.16	149		25.65	
99	Otter L	6/23/2004		2.00	1.5	0.015	0.02	0.01	0.72	108.80	51	6.19	133		1.94	
99	Otter L	9/7/2004		2.15	1.5	0.011	0.02	0.03	0.34	68.22	52	7.32	117		10.90	
99	Otter L	9/15/2004		2.00	1.5		0.02	0.01	0.53		49	6.90	88			
99	Otter L	9/22/2004		1.95	1.5	0.009	0.01	0.01			53	7.46	117		6.10	
99	Otter L	9/29/2004		1.90	1.5	0.009	0.44	0.07	0.99	255.79	75	6.67	118			
99	Otter L	10/6/2004		2.05	1.5	0.009	0.01	0.02	0.20	48.27	47	7.28	117			
99	Otter L	6/2/2005		1.90	1.5	0.009	0.01	0.01	0.22	55.38	80	3.74	228		1.26	
99	Otter L	6/28/2005		1.95		0.013	0.04	0.01	0.19	32.46	43	6.37	131	5.5	2.19	
99	Otter L	7/12/2005		1.80	1.5	0.015	0.05	0.03	0.20	27.98	43	7.60	130			
99	Otter L	7/19/2005		1.95	1.5	0.009	0.01	0.02	0.47	120.25	37	8.58	114		1.13	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
99	Otter L	8/8/2005		1.80	1.5	0.014	0.07	0.01	0.21	32.96	42	7.14	127	7.8	1.00	
99	Otter L	8/16/2005		1.95	1.5	0.016	0.08	0.01	0.28	37.76	64	7.38	118		1.32	
99	Otter L	8/23/2005		2.05	1.5	0.012	0.01	0.01	0.10	18.58	52	7.25	69		1.23	
99	Otter L	8/29/2005		1.85	1.5	0.008	0.01	0.01	0.25	67.97	36	7.12	70		2.45	
99	Otter L	6/5/2006		2.05	1.5	0.012	0.03	0.05	0.52	93.85			46	5.0	1.05	
99	Otter L	6/18/2006	5.6	2.05	1.5	0.010	0.02	0.02	0.47	102.26	64	7.02	126		1.82	
99	Otter L	7/11/2006	4.1	1.75	1.5	0.013	0.04	0.08	0.68	117.92	54	7.16	171		1.37	
99	Otter L	7/18/2006	5.9	1.95	1.5	0.012			0.76	134.76	66	6.61	76		2.80	
99	Otter L	7/25/2006	5.5	1.80	1.5	0.016	0.03	0.10	0.85	120.44	109	7.22	92	3.2	2.96	
99	Otter L	7/31/2006	5.7	1.85	1.5	0.019	0.01	0.14	0.69	79.22	62	6.72	117		8.92	
99	Otter L	8/7/2006	5.9	1.85	1.5	0.014	0.02	0.13	0.59	90.94	93	7.20	121		7.45	
99	Otter L	8/14/2006	5.3	1.70	1.5	0.015	0.02	0.06	0.79	114.99	72	7.60	66		6.06	
99	Otter L	8/13/2007		2.20	1.5	0.022	0.01	0.03	0.70	71.07	67	7.58	140	7.8	0.24	
99	Otter L	8/21/2007		2.25	1.5	0.022	0.04	0.04	0.78	79.66	81	7.50	133		0.64	
99	Otter L	8/27/2007		1.85	1.5	0.031		0.04			93	8.33	74		0.29	
99	Otter L	9/3/2007		1.75	1.5	0.027	0.01	0.02	0.70	58.45	104	7.88	120		8.79	
99	Otter L	9/10/2007		1.85	1.5	0.022	0.03	0.05	0.68	66.98	145	7.47	111	8.6	7.16	
99	Otter L	9/16/2007		1.85	1.5	0.021	0.04	0.05	0.78	82.81	67	7.68	128		3.77	
99	Otter L	9/24/2007		1.78	1.5	0.018	0.01	0.01	0.62	74.00	53	7.37	138		0.29	
99	Otter L	10/1/2007		1.78	1.5	0.017	0.02	0.11	0.46	59.60	1	7.64	163		3.76	
99	Otter L	7/21/2008		2.30	1.5	0.012	0.04	0.06	0.42	73.95	48	7.79	115	8.8	3.58	
99	Otter L	7/28/2008		1.65	1.5	0.017	0.04	0.05	0.32	41.19	65	7.78	85		10.02	
99	Otter L	8/19/2008		1.55	1.5	0.031	0.01	0.05	0.34	24.51	59	7.26	143		5.52	
99	Otter L	8/25/2008		1.65	1.5	0.021	0.02	0.06	0.36	38.99	75	6.91	119		4.80	
99	Otter L	9/2/2008	1.5	1.23	1.5	0.024	0.00	0.01	0.44	40.13	80	7.90	115	7.0	8.18	
99	Otter L	9/8/2008		1.43	1.5	0.017	0.01	0.03	0.58	74.03	62	7.41	108		6.65	
99	Otter L	9/15/2008		1.20	1.5	0.017	0.01	0.06	0.53	68.47	63	7.27	104		8.52	
99	Otter L	9/22/2008		1.28	1.5	0.013	0.03	0.05	0.42	72.22	52	7.48	124		2.81	
99	Otter L	07/06/2009		1.60	2	0.015	0.00	0.03			79	7.03	102	5.1	1.71	
99	Otter L	07/13/2009		1.20	2	0.012	0.03	0.08			44	6.69	45		2.95	
99	Otter L	07/18/2009		1.10	2	0.012	0.01	0.02			54	7.46	141		4.79	
99	Otter L	07/29/2009		1.35		0.014	0.01	0.04			80	6.34	93		0.10	
99	Otter L	08/04/2009		1.05	2	0.017	0.01	0.07			78	7.65	88	6.7	3.25	
99	Otter L	08/10/2009		1.15	2	0.013	0.02	0.04			68	7.25	88		1.70	
99	Otter L	08/18/2009		1.20	2	0.014	0.02	0.03			79	7.17	59		0.80	
99	Otter L	09/01/2009		1.25	2	0.010	0.02	0.03			75	7.14	116		0.10	
99	Otter L	09/26/2011	5.50	2.05	2	0.026	0.04	0.05	0.54	46.30	71	7.58	105	5.7	3.30	
99	Otter L	10/03/2011	5.50	2.00	2	0.016	0.01	0.07	0.53	74.83	56	7.98	97		4.50	
99	Otter L	10/10/2011	4.00		2	0.013	0.02	0.05	0.63	107.12	70	7.41	100		1.20	
99	Otter L	10/17/2011	5.00	2.15	2	0.012	0.04	0.07	0.44	80.36	60	6.31	59		4.90	
99	Otter L	10/25/2011				0.011	0.05	0.07	0.50	100.83	98	6.43	89	5.6	4.50	
99	Otter L	07/23/2013	6.00	1.75	2	0.014	0.02	0.09	0.40	62.28	70	6.96	127			
99	Otter L	08/01/2013	6.50	1.55	2	0.010			0.68	147.23	69	7.21	123		3.80	
99	Otter L	08/20/2013	6.00	1.50	2	0.016	0.02	0.02	0.51	72.39	65	7.66	133		8.90	
99	Otter L	08/27/2013	6.00	1.30	2	0.014					70	7.31	128		2.60	
99	Otter L	09/16/2013	6.25	1.45	2	0.012	0.03	0.29	0.94	174.00	65	7.30	132		2.30	
99	Otter L	09/23/2013	6.10	1.35	2	0.012			0.46	85.95	55	7.25	112		1.10	
99	Otter L	10/01/2013	5.50	1.35	2	0.010	0.03	0.09	0.58	132.70	59	6.74	74		1.50	
99	Otter L	10/17/2013	6.40	1.50	2	0.009					58	6.87	84		1.50	
99	Otter L	07/15/2015	6.70	1.50	2	0.030	0.04	0.05	0.45	32.74	43	7.64	111	5.5	6.00	
99	Otter L	07/21/2015	5.80	1.40	2	0.019			0.56	67.07	41	7.35	66		5.90	
99	Otter L	07/27/2015	6.10	1.50	2	0.016	0.02	0.05	0.39	53.02	32	7.45	74		3.00	29.9
99	Otter L	08/04/2015	5.50	1.50	2	0.012			0.39	70.11	55	6.87	71		4.80	
99	Otter L	08/17/2015	5.40	1.40	2	0.013	0.02	0.04	0.49	85.89	36	7.12	127	5.7	5.50	
99	Otter L	08/25/2015	5.50	1.60	2	0.008			0.35	96.25	34	7.35	112		2.90	
99	Otter L	09/01/2015	5.50	1.60	2	0.012	0.04	0.06	0.40	74.07	35	7.13	117		4.20	28.6
99	Otter L	09/07/2015	6.10	1.60	2	0.015			0.37	56.29	28	7.18	125		3.60	

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HABform	ShoreHAB
99	Otter L	6/14/1992	epi	24	21	2	3	3	23											
99	Otter L	7/1/1992	epi	18	21															
99	Otter L	7/12/1992	epi	25	21	2	4	3	25											
99	Otter L	8/1/1992	epi	16	19	2	3	2	1											
99	Otter L	8/9/1992	epi	26	21	2	4	3	2											
99	Otter L	8/23/1992	epi	24	21	3	4	1	23											
99	Otter L	9/6/1992	epi	19	19	3	3	4	2											
99	Otter L	9/20/1992	epi	17	18	2	4	2	2											
99	Otter L	7/5/1993	epi	30	23	2	3	2	21											
99	Otter L	7/18/1993	epi	24	23	2	3	2	12											
99	Otter L	8/1/1993	epi	27	25	3	3	3	23											
99	Otter L	8/15/1993	epi	33	24	2	4	3	126											
99	Otter L	8/29/1993	epi	34	23	3	3	3	12											
99	Otter L	9/12/1993	epi	24	20	2	1	1												
99	Otter L	9/26/1993	epi	18	16	3	3	2	25											
99	Otter L	10/11/1993	epi	14	11	3	3	3	2											
99	Otter L	6/12/1994	epi	26	19	3	4	3	123											
99	Otter L	6/19/1994	epi	30	26	3	3	2	12											
99	Otter L	7/10/1994	epi	22	23	3	3	2	1											
99	Otter L	7/24/1994	epi	24	24	3	3	2												
99	Otter L	8/13/1994	epi	23	22	2	3	2												
99	Otter L	8/28/1994	epi	21	20	2	3	2	5											
99	Otter L	9/5/1994	epi	25	17	1	3	2												
99	Otter L	10/2/1994	epi	10	14															
99	Otter L	7/8/1995	epi	18	23	2	3	2												
99	Otter L	7/22/1995	epi	24	27	2	3	2												
99	Otter L	8/1/1995	epi			2	3	2												
99	Otter L	8/14/1995	epi	23	26	2	3	2												
99	Otter L	8/27/1995	epi	16	22	2	3	2												
99	Otter L	9/12/1995	epi	21	19	1	3	1												
99	Otter L	9/24/1995	epi			1	3	1												
99	Otter L	10/8/1995	epi	10	10	1	3	1												
99	Otter L	6/9/1996	epi	23	21	1	2	1												
99	Otter L	7/7/1996	epi	24	24	3	4	3	23											
99	Otter L	7/24/1996	epi	22	24	3	3	3	123											
99	Otter L	8/7/1996	epi			2	3	3												
99	Otter L	8/21/1996	epi	20	25	3	3	2												
99	Otter L	9/2/1996	epi	22	25	2	3	2												
99	Otter L	9/23/1996	epi	17	18	1	3	2												
99	Otter L	7/22/2002	epi	23		3	3	3	23											
99	Otter L	8/6/2002	epi	20		3	3	3	237											
99	Otter L	8/20/2002	epi	22																
99	Otter L	9/3/2002	epi	24		3	3	3	235											
99	Otter L	9/15/2002	epi	20																
99	Otter L	10/1/2002	epi	20		3	3	3	23											
99	Otter L	10/29/2002	epi	2		3	3	3	123											
99	Otter L	6/10/2003	epi	20		2	2	3	12											
99	Otter L	6/24/2003	epi	28		2	2	3	23											
99	Otter L	7/8/2003	epi	23		2	3	3	1234											
99	Otter L	7/23/2003	epi	23		3	3	3	1237											
99	Otter L	8/5/2003	epi	23		4	3	3	235											
99	Otter L	8/19/2003	epi	23		3	3	4	237											
99	Otter L	9/2/2003	epi	19		4	4	4	12347											
99	Otter L	9/15/2003	epi	18		4	3	4	12345											
99	Otter L	6/23/2004	epi	21		3	3	4	1234											
99	Otter L	9/7/2004	epi	23		4	3	4	1234											
99	Otter L	9/15/2004	epi	22		3	3	4	1234											
99	Otter L	9/22/2004	epi	21		3	3	4	12346											
99	Otter L	9/29/2004	epi	20		3	3	4	234											
99	Otter L	10/6/2004	epi	14		4	3	4	1234											
99	Otter L	10/12/2004	epi	12		3	3	4	1234											
99	Otter L	6/2/2005	epi	24		3	3	4	1234											

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HABform	ShoreHAB
99	Otter L	6/28/2005	epi	27		3	3	3	1234											
99	Otter L	7/12/2005	epi	29		3	3	4	1234											
99	Otter L	7/19/2005	epi	28		3	3	4	1234											
99	Otter L	8/8/2005	epi	27		4	3	4	1234											
99	Otter L	8/16/2005	epi	21		3	3	4	1234											
99	Otter L	8/23/2005	epi	21		4	3	4	1234											
99	Otter L	8/29/2005	epi	23		3	3	4	1234											
99	Otter L	6/5/2006	epi	22	22	3	2	3	1234											
99	Otter L	6/18/2006	epi	30		3	3	3	1234											
99	Otter L	7/11/2006	epi	22		3	3	4	12346											
99	Otter L	7/18/2006	epi	23		3	3	4	12346											
99	Otter L	7/25/2006	epi	26		4	4	4	12346											
99	Otter L	7/31/2006	epi	26		4	3	4	123467											
99	Otter L	8/7/2006	epi	25		4	4	4	12346											
99	Otter L	8/14/2006	epi	20		4	4	4	123467											
99	Otter L	8/13/2007	epi	21		3	3	4	12346											
99	Otter L	8/21/2007	epi	19		3	2	3	1234											
99	Otter L	8/27/2007	epi	21		3	2	3	148											
99	Otter L	9/3/2007	epi	23		3	2	3	1347											
99	Otter L	9/10/2007	epi	18		3	2	3	134											
99	Otter L	9/16/2007	epi	18		3	2	3	123											
99	Otter L	9/24/2007	epi	22		3	2	3	134											
99	Otter L	10/1/2007	epi	18		3	1	3	14											
99	Otter L	7/21/2008	epi	25	21	2	3	3	136											
99	Otter L	7/28/2008	epi	20	24	3	3	3	136											
99	Otter L	8/19/2008	epi	16	22	3	3	3	135											
99	Otter L	8/25/2008	epi	17	23	3	3	3	13456											
99	Otter L	9/2/2008	epi	25	23	3	3	3	1											
99	Otter L	9/8/2008	epi	19	22	3	3	3	4											
99	Otter L	9/15/2008	epi	13	19	3	3	3	135											
99	Otter L	9/22/2008	epi	16	19	3	3	3	13											
99	Otter L	07/06/2009	epi	17	21	3	2	2	15											
99	Otter L	07/13/2009	epi	21	23	3	3	3	1											
99	Otter L	07/18/2009	epi	23	23	2	3	2	1											
99	Otter L	07/29/2009	epi	25	24	2	3	2	123											
99	Otter L	08/04/2009	epi	26	23	2	3	3	125											
99	Otter L	08/10/2009	epi	23	23	3	3	2	135											
99	Otter L	08/18/2009	epi	27	25	2	3	2	1											
99	Otter L	09/01/2009	epi	18	22	2	3	2	1											
99	Otter L	09/26/2011	epi			2	1	1	1	4		12.60	6.30							
99	Otter L	10/03/2011	epi	12	15	2	2	2	1	0	0	14.20	6.60							
99	Otter L	10/10/2011	epi	21	17	2	1	1	19	0	0	7.20	5.20							
99	Otter L	10/17/2011	epi	9	11	2	1	2	0	0	0	7.90	4.10							
99	Otter L	10/25/2011	epi									8.90	6.70							
99	Otter L	07/18/2009	epi	23	23	2	3	2	1											
99	Otter L	07/29/2009	epi	25	24	2	3	2	123											
99	Otter L	08/04/2009	epi	26	23	2	3	3	125											
99	Otter L	08/10/2009	epi	23	23	3	3	2	135											
99	Otter L	08/18/2009	epi	27	25	2	3	2	1											
99	Otter L	09/01/2009	epi	18	22	2	3	2	1											
99	Otter L	09/26/2011	epi			2	1	1	1	4		12.60	6.30							
99	Otter L	10/03/2011	epi	12	15	2	2	2	1	0	0	14.20	6.60							
99	Otter L	10/10/2011	epi	21	17	2	1	1	19	0	0	7.20	5.20							
99	Otter L	10/17/2011	epi	9	11	2	1	2	0	0	0	7.90	4.10							
99	Otter L	10/25/2011	epi									8.90	6.70							
99	Otter L	07/23/2013	epi	21	23	2	3	2	0	0	0			<0.30	<0.380					
99	Otter L	08/01/2013	epi	20	22	3	2	2	1	0	0	1.60	2.30	<0.30	<0.340		2.00	0.00		
99	Otter L	08/20/2013	epi	21	23	2	3	2	1	0	0	10.70	7.60	<0.30	<0.510		7.60	0.00		
99	Otter L	08/27/2013	epi	23	23	2	2	2	1	0	0	4.70	2.60	<0.30	<1.100		1.70	0.00		
99	Otter L	09/16/2013	epi	10	14	2	3	2	0	0	0	1.90	1.80	0.30	<19.130		0.60	0.00		
99	Otter L	09/23/2013	epi	7	14	2	3	2	1	0	0	3.20	2.50	<0.30	<19.130		1.50	0.00		
99	Otter L	10/01/2013	epi	21	14	2	3	2	0	0	0	2.60	1.60	<0.30	<0.100		0.90	0.00		

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HABform	ShoreHAB
99	Otter L	10/17/2013	epi	16	14	2	3	3	1	0	0	2.30	1.70	<0.30	<0.090		0.40	0.00	F	I
99	Otter L	07/15/2015	epi	23	23	2	3	2	17	0	0	2.80	1.70	<0.36	<0.003	<0.018	4.62	0.00	I	I
99	Otter L	07/21/2015	epi	21	26	2	3	2	0	0	0	6.80	1.60	<0.36	<0.003	<0.018	6.47	0.00	I	I
99	Otter L	07/27/2015	epi	27	24	3	3	2	0	0	0	2.40	0.60	<0.19	<0.002	<0.014	1.88	0.00	I	I
99	Otter L	08/04/2015	epi	21	24	3	3	2	1	0	0			<0.18	<0.002	<0.009	23.48	12.00	I	I
99	Otter L	08/17/2015	epi	23	27	3	3	2	1	0	0	4.30	0.90	<0.65	<0.005	<0.015	1.39	0.00	I	I
99	Otter L	08/25/2015	epi	21	24	2	3	2	1	0	0	27.30	0.70	<0.21	<0.003	<0.010	1.49	0.00	I	I
99	Otter L	09/01/2015	epi	24	24	2	3	2	0	0	0			<0.39	<0.012	<0.031	1.63	0.00	I	I
99	Otter L	09/07/2015	epi	28	26	2	3	2	1	0	0			<0.39	<0.004	<0.012	2.27	0.00	I	I

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- PWL Listing for Otter Lake

Otter Lake (0801-0205) — MinorImpacts

Waterbody Location Information

Revised: 03/12/2007

Water Index No: Ont 19- 94- 1-P922- 4-P926
Hydro Unit Code: 04150101/030 **Str Class:** A
Waterbody Type: Lake (Mesotrophic)
Waterbody Size: 134.4 Acres
Seg Description: entire lake

Drain Basin: Black River
Black River
Reg/County: 6/Oneida Co. (33)
Quad Map: MCKEEVER (G-20-0)

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
Recreation	Stressed	Known

Type of Pollutant(s)
Known: ALGAL/WEED GROWTH (aquatic weeds)
Suspected: - - -
Possible: - - -

Source(s) of Pollutant(s)
Known: HYDRO 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 Otter Lake are known to experience minor impacts due to excessive weed growth. High weed densities and associated impacts have been reported through the CSLAP program and verified by DEC staff.

Otter Lake has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1992 thru 1996 and in 2002 and continuing through the present. An Interpretive Summary report of the findings of this sampling was published in 2006. These data indicate that the lake continues to be best characterized as mesotrophic, or moderately productive. Phosphorus levels in the lake fall well below the state guidance values indicating impacted/stressed recreational uses. Corresponding transparency measurements also meet what is recommended for swimming beaches. Measurements of pH typically fall within the state water quality range of 6.5 to 8.5. The lake water is moderately to highly colored, which is also typical of northwestern Adirondack Lakes, and likely reflects natural conditions. Oxygen levels do not appear to be significantly reduced at lower lake depths and internal nutrient cycling is not significant. (DEC/DOW, BWAM/CSLAP, June 2006)

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. These assessment indicate recreational suitability of the lake to be unfavorable. The recreational suitability of the lake is described most frequently

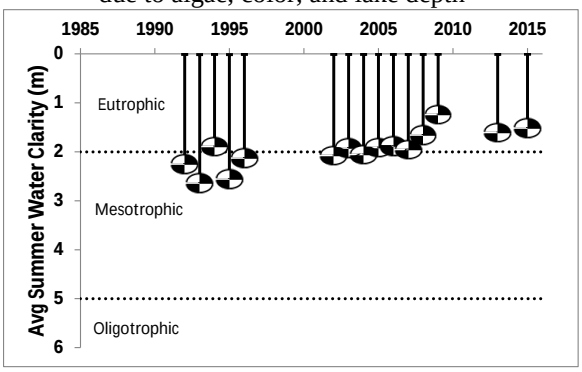
as "slightly" to "substantially" impacted. The lake itself is most often described as having "definite algal greenness." Assessments have noted that aquatic plants regularly grow to the lake surface. Recreational impacts stem from excessive weed growth, and poor water clarity, as a result of occasionally elevated algae levels and naturally high water color, and despite nutrient levels that remain low. It is likely that these impacts are associated with excessive growth of bladderwort (a weakly rooted plant) in the lake. (DEC/DOW, BWAM/CSLAP, June 2006)

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

Appendix C- Long Term Trends: Otter Lake

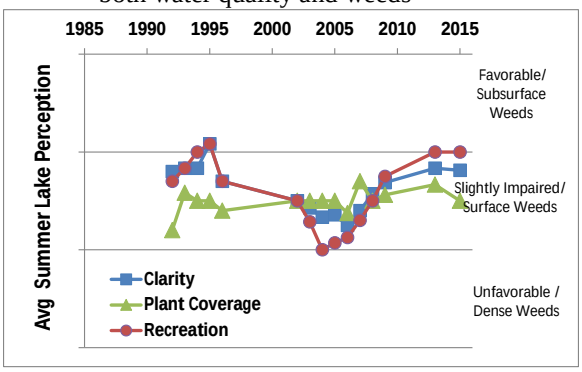
Long Term Trends: Water Clarity

- Clarity decreasing?
- Most readings now typical of *eutrophic* lakes, due to algae, color, and lake depth



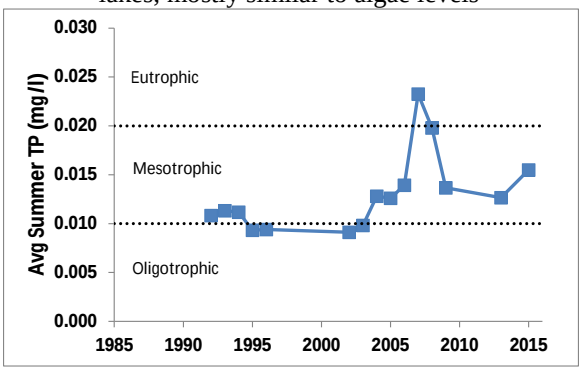
Long Term Trends: Lake Perception

- No trends, but improving assessments?
- Recreational perception linked to changes in both water quality and weeds



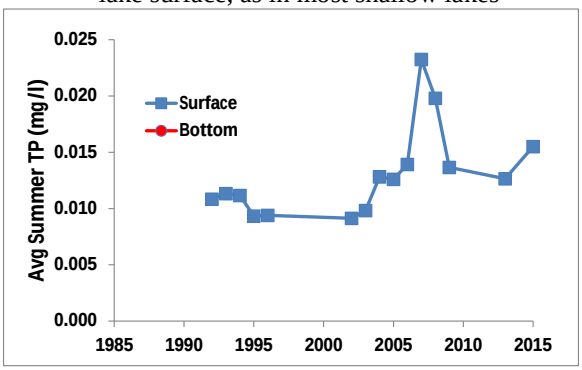
Long Term Trends: Phosphorus

- Not trends; phosphorus increasing slightly?
- Nearly all readings typical of *mesotrophic* lakes, mostly similar to algae levels



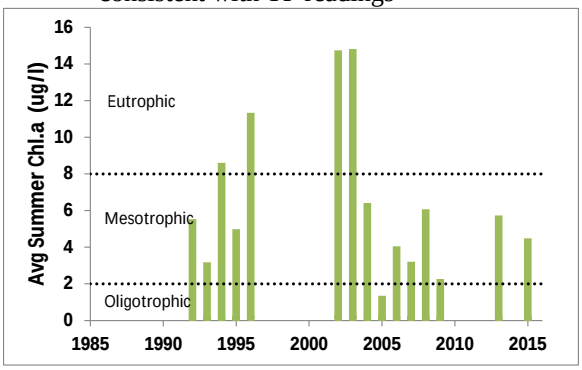
Long Term Trends: Bottom Phosphorus

- No deepwater TP data
- Bottom TP readings likely similar to those at lake surface, as in most shallow lakes



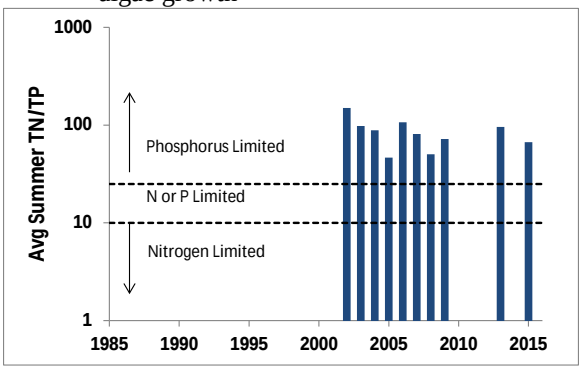
Long Term Trends: Chlorophyll a

- No trends apparent; highly variable readings
- Most readings typical of *eutrophic* lakes, consistent with TP readings



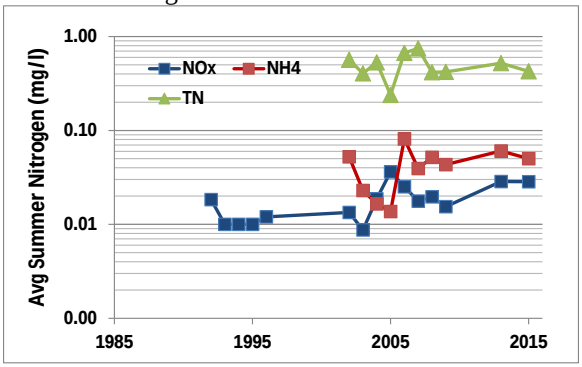
Long Term Trends: N:P Ratio

- No trends apparent- perhaps slight decrease
- Most readings indicate phosphorus limits algae growth



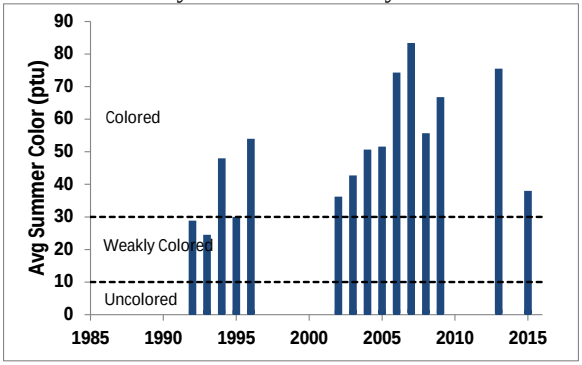
Long Term Trends: Nitrogen

- No trends apparent
- Most nitrogen readings typical of lakes with low algae levels



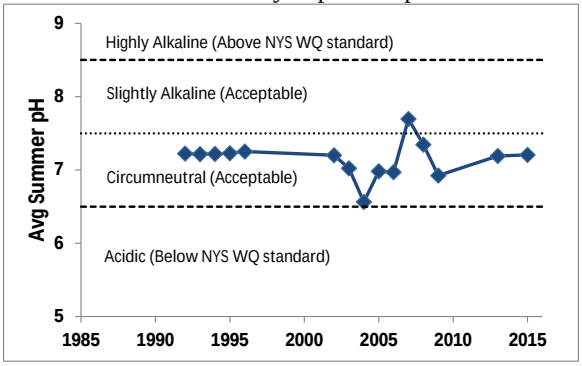
Long Term Trends: Color

- Slightly higher after lab change in 2002
- Most readings typical of *highly colored* lakes, and may affect water clarity



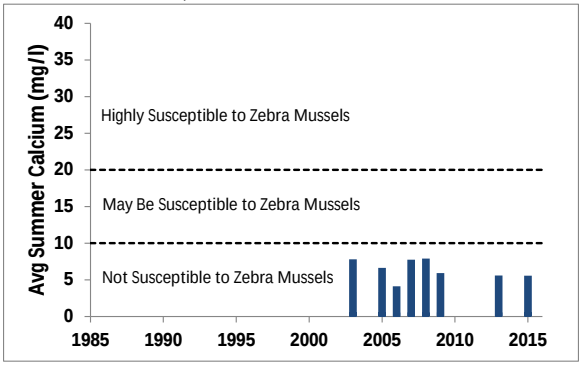
Long Term Trends: pH

- No trends apparent; recently less stable
- Most readings typical of *circumneutral* lakes, with occasionally depressed pH



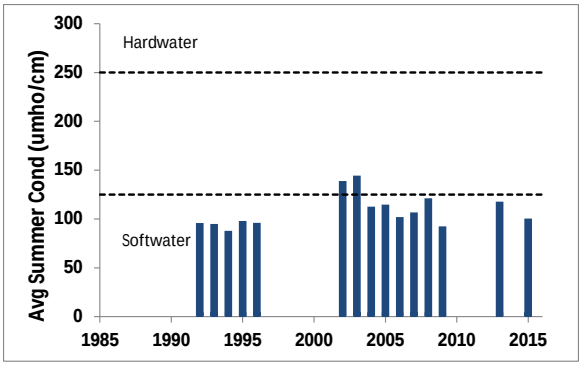
Long Term Trends: Calcium

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



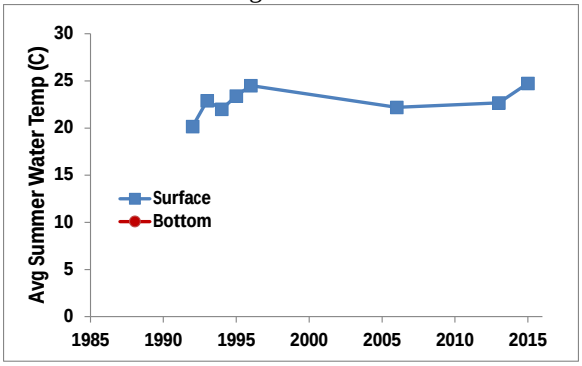
Long Term Trends: Conductivity

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



Long Term Trends: Water Temperature

- No trends apparent
- Deepwater temperatures probably similar to surface readings as in most shallow lakes



Appendix D:
Algae Testing Results from SUNY ESF Study

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

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

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

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

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

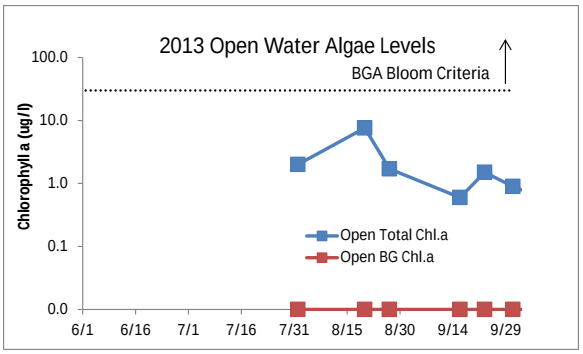


Figure D1:
2013 Open Water Total and BGA Chl.a

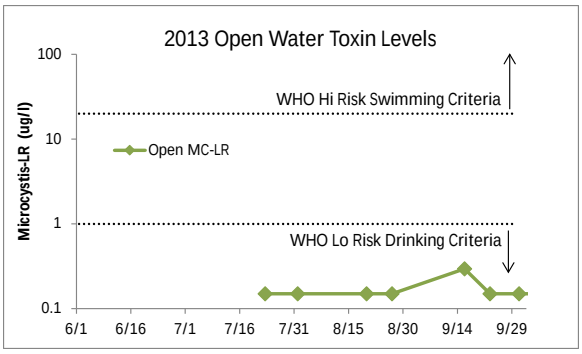


Figure D2:
2013 Open Water Microcystin-LR

Figure D3:
2013 Shoreline Total and BGA Chl.a

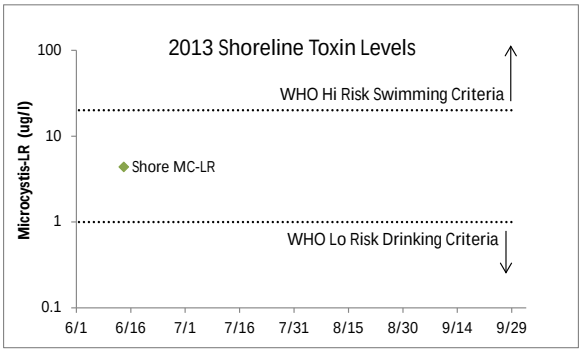


Figure D4:
2013 Shoreline Microcystin-LR

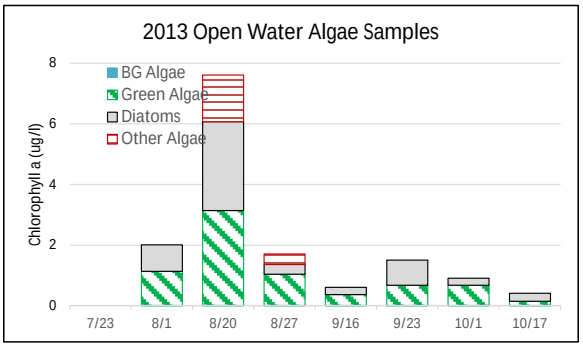


Figure D5:
2013 Open Water Algae Types

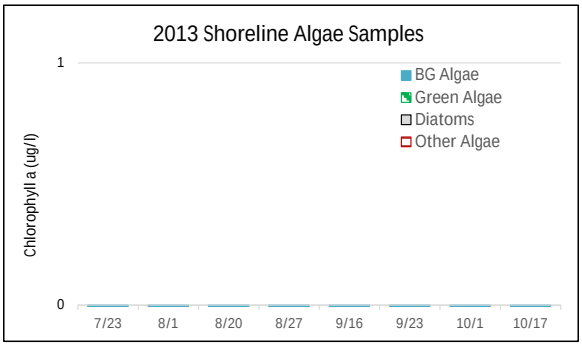


Figure D6:
2013 Shoreline Algae Types

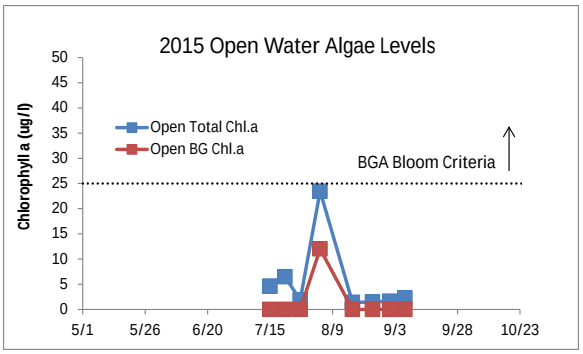


Figure D7:
2015 Open Water Total and BGA Chl.a

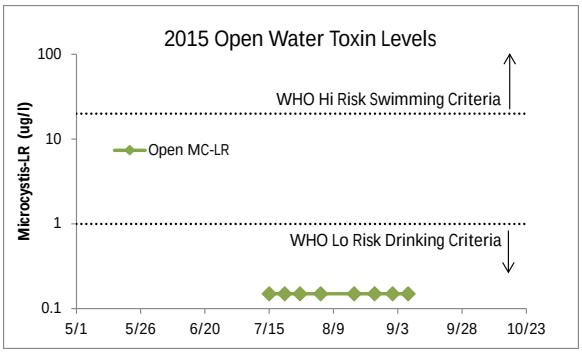


Figure D8:
2015 Open Water Microcystin-LR

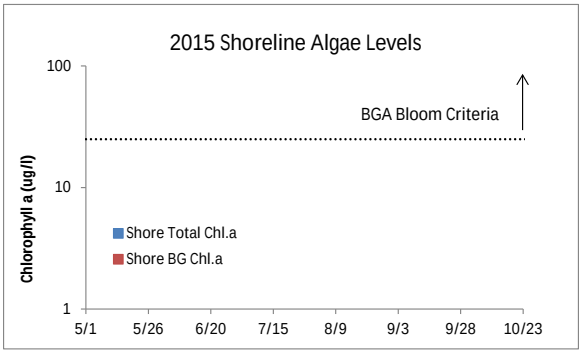


Figure D9:
2015 Shoreline Total and BGA Chl.a

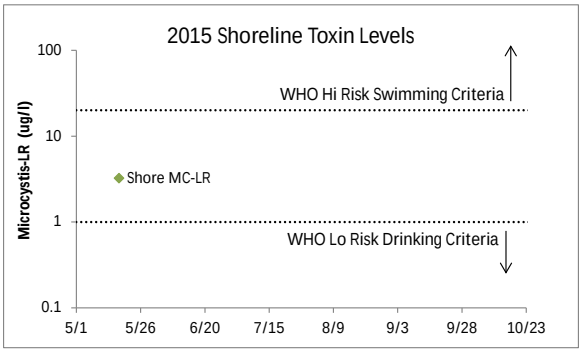


Figure D10:
2015 Shoreline Microcystin-LR

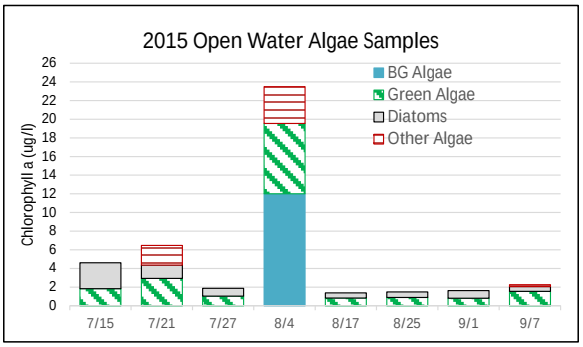


Figure D11:
2015 Open Water Algae Types

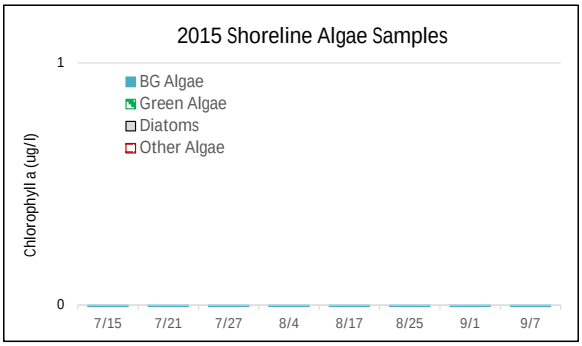


Figure D12:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Oneida County

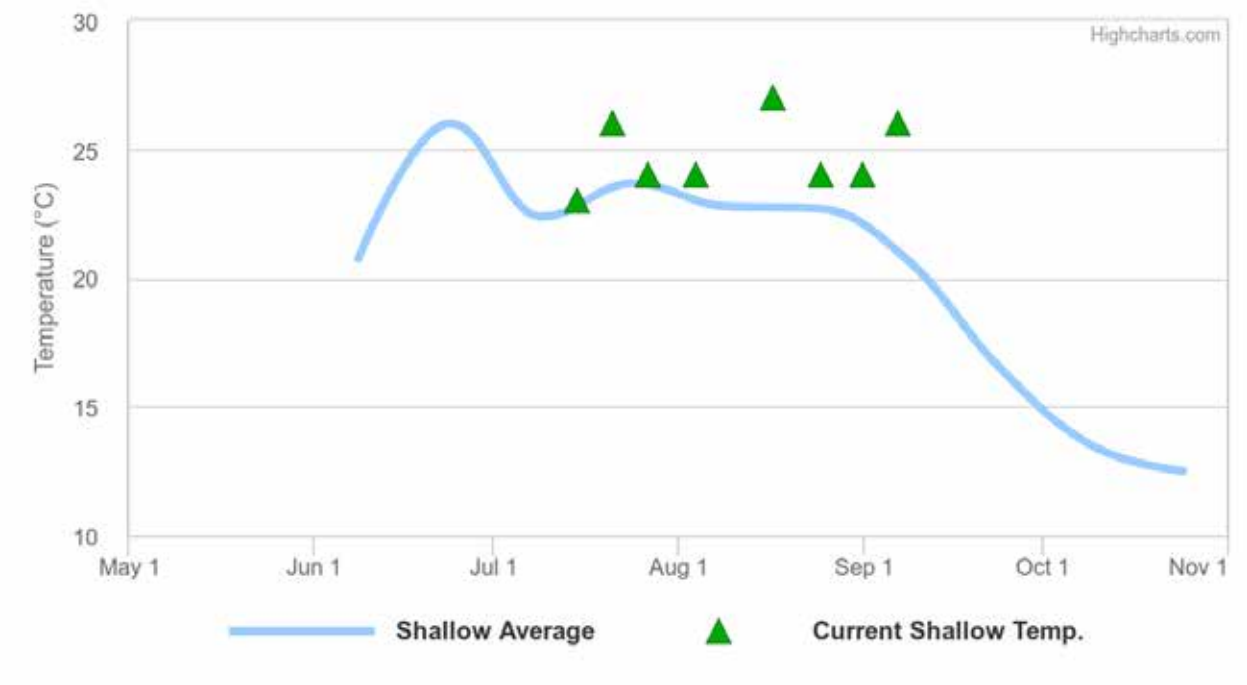
The table below shows the invasive aquatic plants and animals that have been documented in Oneida County, as cited in either the iMapInvasives database (http://www.imapinvasives.org/) or in the NYSDEC Division of Water database. These databases may include some, but not all, non-native plants or animals 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 - Oneida County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Chittning Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Chittning Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Delta Reservoir	Animal	Common carp	*Cyprinus carpio*
Delta Reservoir	Animal	Allegheny crayfish	*Orconectes obscurus*
Delta Reservoir	**Plant**	**Eurasian watermilfoil**	***Myriophyllum spicatum***
Erie Canal in Utica	Animal	Asian Clam	*Corbicula fluminea*
Forestport Reservoir	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Forestport Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Hinckley Reservoir	Animal	Zebra mussel	*Dreissena polymorpha*
Kernan Pond	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*
Kernan Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Oneida Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Oneida Lake	Animal	Bloody-red shrimp	*Hemimysis anomala*
Oneida Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*

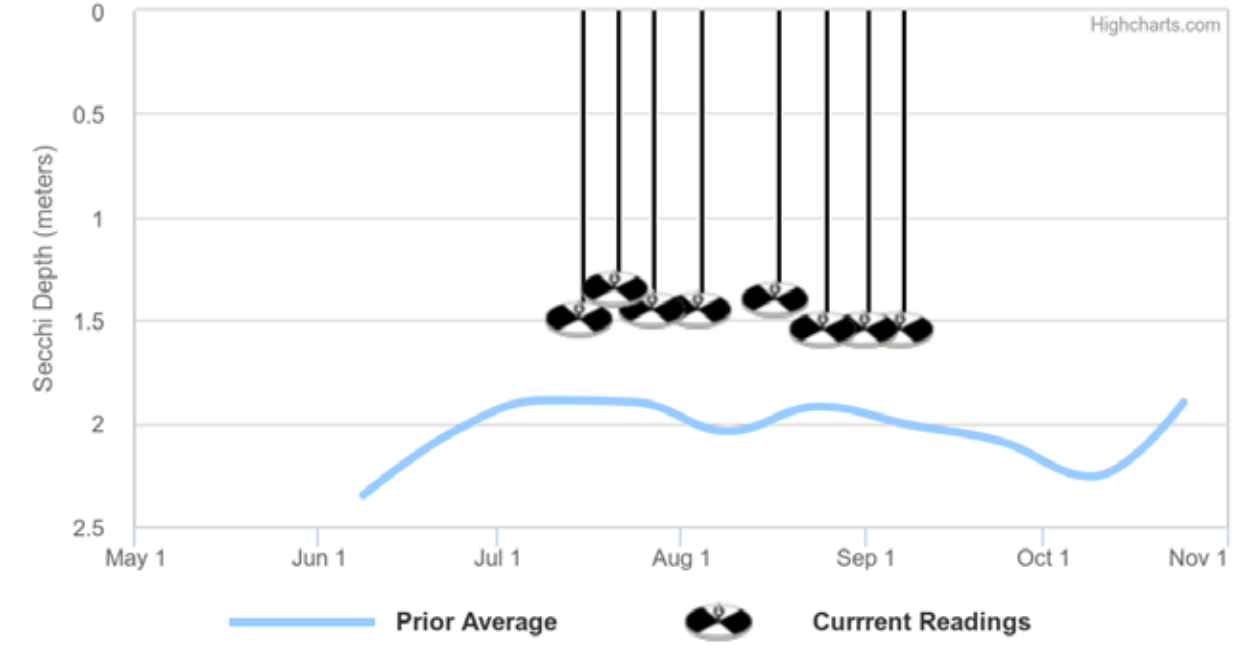
Appendix F: Current Year vs. Prior Averages for Otter Lake

Current Year Water Temperatures vs. Prior Average



This year's shallow water sample temperatures are tending to be higher than normal when compared to the average of readings collected from 1992 to 2013.

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 1992 to 2013

Appendix G: Watershed and Land Use Map for Otter 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.