

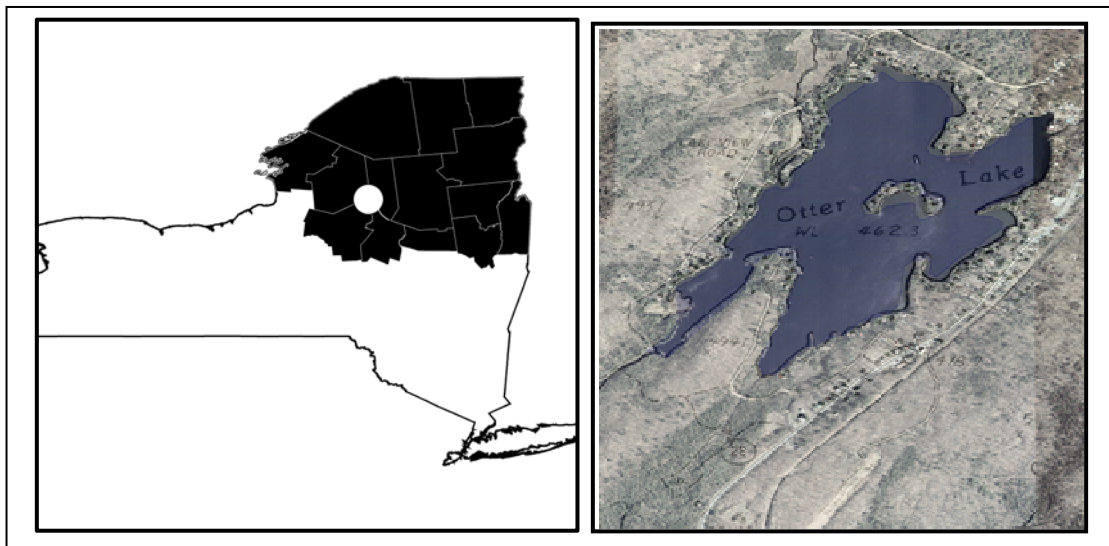
CSLAP 2013 Lake Water Quality Summary: Otter Lake

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
2013 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 >30 lakes found in Oneida County, and one of 16 CSLAP lakes among the >460 lakes and ponds in the Oswegatchie and Black Rivers 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, and 2013. 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 2013 CSLAP Sampling Results

Evaluation of 2013 Annual and Monthly Results Relative to 2006-2012

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 D.

Evaluation of Eutrophication Indicators

Each of the trophic indicators (phosphorus, chlorophyll *a* (an indication of algae), and water clarity) measured in Otter Lake was lower than normal in 2013, although only the change in water clarity may have been statistically significant. Water clarity readings have decreased over the last twenty years, coincident with an increase in water color and a slight increase in phosphorus over the same period. Lake productivity typically increases slightly through early summer, as indicated by increasing nutrient and algae levels and decreasing water clarity, and then decreases into the fall. This trend was not apparent in 2013; although algae levels decreased slightly during the summer, none of the other trophic indicators exhibited any clear seasonal trends.

The lake continues to be characterized as *mesotrophic*, or moderately productive, based on water clarity, chlorophyll *a* and total phosphorus readings, although water clarity readings in 2013 were more typical of *eutrophic*, or highly productive, lakes. The TSI evaluation suggests that both water clarity and phosphorus levels are slightly lower than expected given the algae levels in the lake. This suggests that water clarity is influenced by water color (and perhaps lake depth), and that algae growth may be susceptible to small increases in phosphorus loading to the lake. 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

Ammonia levels were slightly higher than normal in 2013, but these readings have not changed significantly since the early 2000s (when first evaluated). Each of the other water quality indicators (NO_x, total nitrogen, pH, conductivity, and color) was close to normal in 2013. Water color is higher now than prior to 2002, corresponding to the change in CSLAP laboratories, although slightly elevated color may contribute to low water clarity. It is likely that the small changes in these other indicators from year to year represent normal variability. Overall limnological conditions are summarized in the Lake Scorecard.

Evaluation of Biological Condition

A limited phytoplankton survey was conducted in 1992 and showed algae levels similar to those measured in a typical CSLAP sampling session. However, nearly the entire “algae” sample was comprised of bacteria, suggesting active decomposition of organic matter (decayed weeds or algae). The fluoroprobe data analyzed by SUNY ESF in 2013 showed low overall algae levels and very low blue green algae levels.

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 and water quality assessments were more favorable than normal in 2013, consistent with lower than normal algae levels and despite lower than normal water clarity. Aquatic plant coverage was close to normal in 2013, and none of these indicators of lake perception has changed since the early 1990s. These indicators improve only slightly during the typical summer, and no clear seasonal trends were apparent in 2013. Overall lake perception is summarized on the Lake Scorecard.

Evaluation of Local Climate Change

Air and water temperatures were lower than normal in 2011 and 2013, 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. Phycocyanin levels

have been well below the levels indicating susceptibility for harmful algal blooms (HABs), consistent with fluoroprobe samples showing very low blue green algae levels. Algal toxin analysis in 2013 showed low to undetectable results in all samples. No shoreline blooms have been reported or sampled.

Lake Condition Summary

Category	Indicator	Min	92-13 Avg	Max	2013 Avg	Classification	2013 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	1.05	2.00	3.30	1.47	Mesotrophic	Lower Than Normal	Decreasing Significantly
	Chlorophyll <i>a</i>	0.10	5.38	25.65	3.10	Mesotrophic	Within Normal Range	No Change
	Total Phosphorus	0.004	0.013	0.031	0.012	Mesotrophic	Within Normal Range	No Change
Potable Water Indicators	Hypolimnetic Ammonia							
	Hypolimnetic Arsenic							
	Hypolimnetic Iron							
	Hypolimnetic Manganese							
Limnological Indicators	Hypolimnetic Phosphorus							
	Nitrate + Nitrite	0.00	0.02	0.44	0.02	Low NOx	Within Normal Range	No Change
	Ammonia	0.01	0.05	0.29	0.12	Low Ammonia	Higher than Normal	No Change
	Total Nitrogen	0.10	0.51	0.99	0.59	Intermediate Total Nitrogen	Within Normal Range	No Change
	pH	6.19	7.25	8.58	7.16	Circumneutral	Within Normal Range	No Change
	Specific Conductance	45	107	171	114	Softwater	Within Normal Range	No Change
	True Color	1	52	145	64	Colored	Within Normal Range	Increasing Significantly
	Calcium	3.2	6.5	8.8		Not Susceptible to Zebra Mussels		No Change
Lake Perception	WQ Assessment	1	2.6	4	2.1	Definite Algal Greenness	More Favorable Than Normal	No Change
	Aquatic Plant Coverage	1	2.9	4	2.8	Surface Plant Growth	Within Normal Range	No Change
	Recreational Assessment	1	2.8	4	2.1	Slightly Impaired	More Favorable Than Normal?	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	21.1	34	17.3		Lower Than Normal	No Change
	Water Temperature	10	20.6	27	18.4		Lower 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	6	14	4	No readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	2	8	2	No readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	0	0	0	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	0.2	0.3	0.2	Mostly undetectable open water MC-LR	Not known	Not known
	Open Water Anatoxin a	<DL	<DL	<DL	<DL	Open water Anatoxin-a 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 C.

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 might be *threatened* by excessive algae, although these impacts were not apparent in 2013.

Contact Recreation (Swimming)

The CSLAP dataset at Otter Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that swimming and contact recreation may be *threatened* by low water clarity, although bacterial data are needed to evaluate the safety of the lake for swimming.

Non-Contact Recreation (Boating and Fishing)

The CSLAP dataset on Otter Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that non-contact recreation may be *stressed* by excessive weeds, although these impacts were not reported in 2011 or 2013.

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 additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics

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

Fish Consumption

There is no fish consumption advisories posted for Otter Lake.

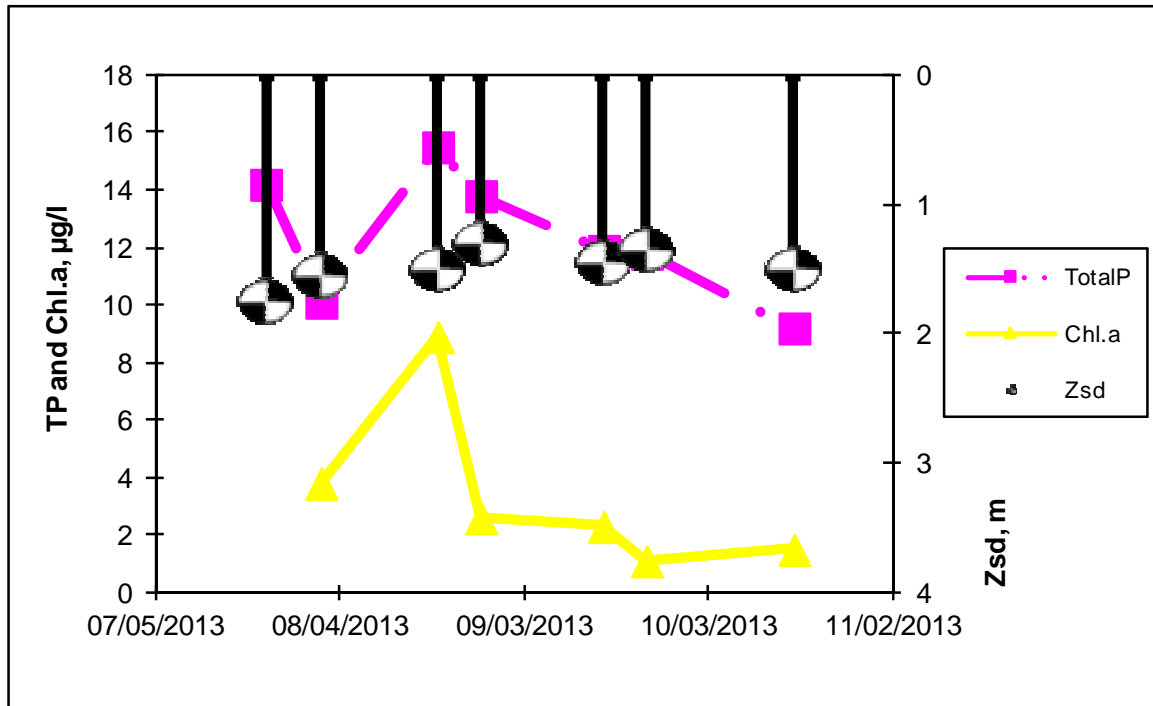
Additional Comments and Recommendations

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 direct exposure to) any shoreline blooms.

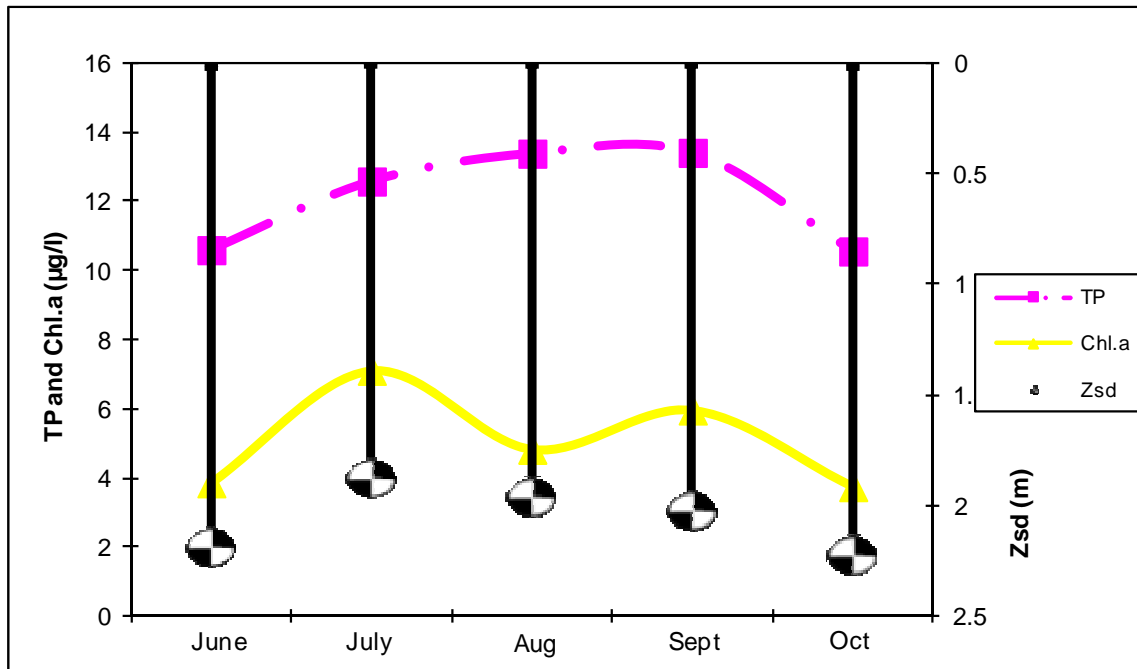
Aquatic Plant IDs-2013

None submitted for identification in 2013.

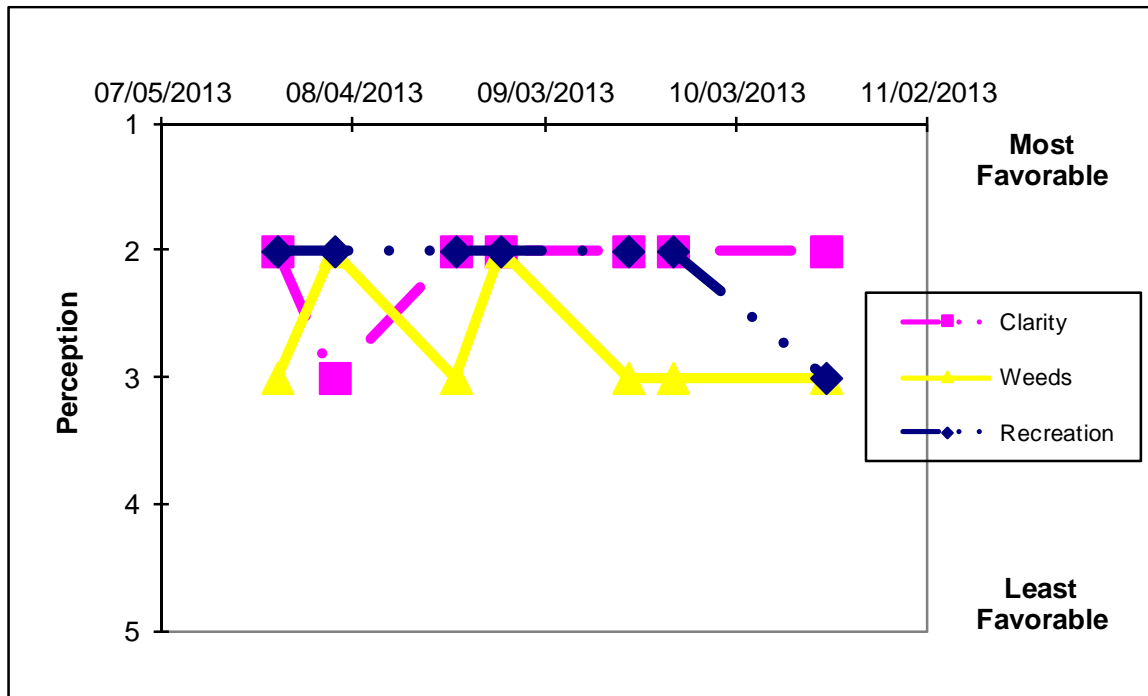
Time Series: Trophic Indicators, 2013



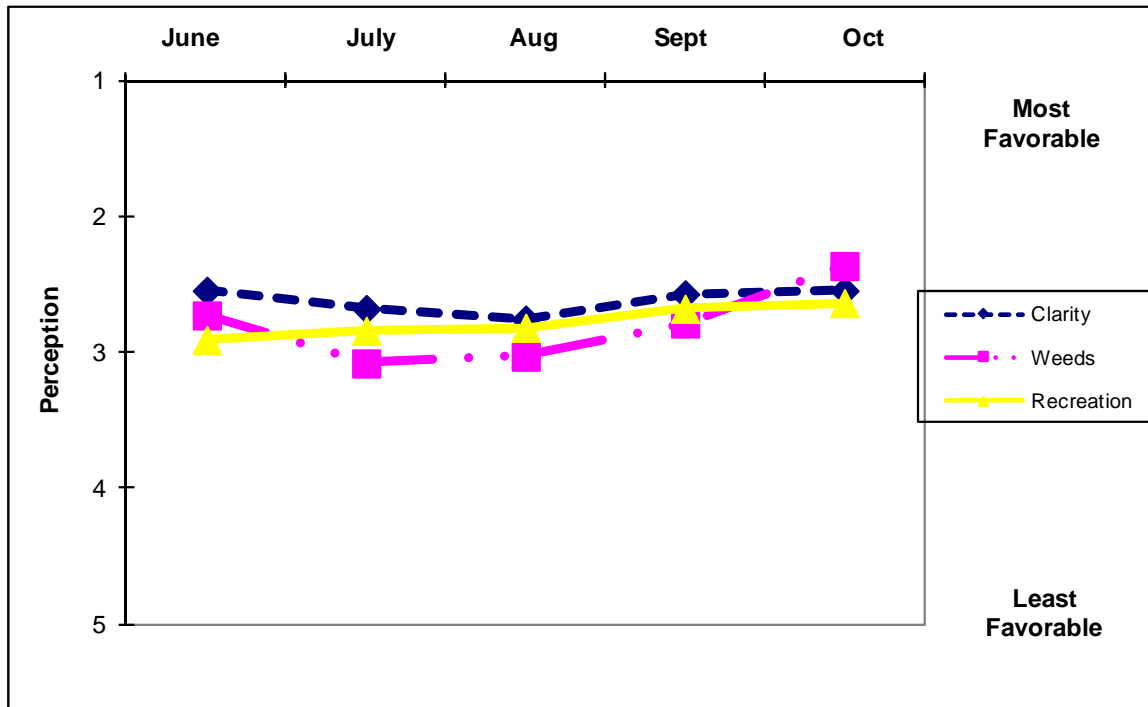
Time Series: Trophic Indicators, Typical Year (1992-2013)



Time Series: Lake Perception Indicators, 2013



Time Series: Lake Perception Indicators, Typical Year (1992-2013)



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
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	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cylin	FP-Chl	FP-BG	HAB form	Shore HAB
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		
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

Legend Information

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

Appendix B- Monthly Evaluation of Otter Lake Data, 2006-2013

June Data

	2006	2007	2008	2009	2010	2011	2012	2013
<i>Zsd</i>	NORMAL							
<i>TP</i>	NORMAL							
<i>Chl.a</i>	NORMAL							
<i>NOx</i>	NORMAL							
<i>NH4</i>	NORMAL							
<i>TN</i>	NORMAL							
<i>pH</i>	NORMAL							
<i>SpCond</i>	NORMAL							
<i>Color</i>	NORMAL							
<i>Ca</i>	NORMAL							
<i>QA</i>	NORMAL							
<i>QB</i>	NORMAL							
<i>QC</i>	NORMAL							
<i>TH20</i>	NORMAL							

High = average monthly reading > 90th percentile reading for lake, 2000-2010

Low = average monthly reading < 10th percentile reading for lake, 2000-2010

Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

July Data

	2006	2007	2008	2009	2010	2011	2012	2013
<i>Zsd</i>	NORMAL		NORMAL	NORMAL				NORMAL
<i>TP</i>	NORMAL		NORMAL	NORMAL				NORMAL
<i>Chl.a</i>	NORMAL		NORMAL	NORMAL				
<i>NOx</i>	NORMAL		NORMAL	NORMAL				NORMAL
<i>NH4</i>	HIGH		NORMAL	NORMAL				HIGH
<i>TN</i>	HIGH		NORMAL	NORMAL				NORMAL
<i>pH</i>	NORMAL		HIGH	NORMAL				NORMAL
<i>SpCond</i>	NORMAL		NORMAL	NORMAL				NORMAL
<i>Color</i>	NORMAL		NORMAL	NORMAL				NORMAL
<i>Ca</i>	LOW		HIGH	NORMAL				
<i>QA</i>	NORMAL		NORMAL	NORMAL				NORMAL
<i>QB</i>	HIGH		NORMAL	NORMAL				NORMAL
<i>QC</i>	NORMAL		NORMAL	LOW				NORMAL
<i>TH20</i>			NORMAL	NORMAL				NORMAL

High = average monthly reading > 90th percentile reading for lake, 2000-2010

Low = average monthly reading < 10th percentile reading for lake, 2000-2010

Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

August Data

	2006	2007	2008	2009	2010	2011	2012	2013
Zsd	NORMAL	NORMAL	NORMAL	LOW				NORMAL
TP	NORMAL	HIGH	HIGH	NORMAL				NORMAL
Chl.a	NORMAL	LOW	NORMAL	NORMAL				NORMAL
NOx	NORMAL	NORMAL	NORMAL	NORMAL				NORMAL
NH4	HIGH	NORMAL	NORMAL	NORMAL				NORMAL
TN	NORMAL	HIGH	NORMAL	NORMAL				NORMAL
pH	NORMAL	HIGH	NORMAL	NORMAL				NORMAL
SpCond	NORMAL	NORMAL	NORMAL	NORMAL				NORMAL
Color	HIGH	HIGH	NORMAL	NORMAL				NORMAL
Ca		NORMAL		NORMAL				
QA	NORMAL	NORMAL	NORMAL	NORMAL				NORMAL
QB	HIGH	NORMAL	NORMAL	NORMAL				NORMAL
QC	NORMAL	NORMAL	NORMAL	LOW				NORMAL
TH20			NORMAL	NORMAL				NORMAL

High = average monthly reading > 90th percentile reading for lake, 2000-2010

Low = average monthly reading < 10th percentile reading for lake, 2000-2010

Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

September Data

	2006	2007	2008	2009	2010	2011	2012	2013
Zsd		NORMAL	NORMAL	NORMAL		NORMAL		NORMAL
TP		HIGH	NORMAL	NORMAL		HIGH		NORMAL
Chl.a		NORMAL	NORMAL	LOW		NORMAL		NORMAL
NOx		NORMAL	NORMAL	NORMAL		HIGH		NORMAL
NH4		NORMAL	NORMAL	NORMAL		NORMAL		HIGH
TN		NORMAL	NORMAL	NORMAL		NORMAL		HIGH
pH		NORMAL	NORMAL	NORMAL		NORMAL		NORMAL
SpCond		NORMAL	NORMAL	NORMAL		NORMAL		NORMAL
Color		HIGH	NORMAL	NORMAL		NORMAL		NORMAL
Ca		HIGH	NORMAL			NORMAL		
QA		NORMAL	NORMAL	NORMAL		NORMAL		NORMAL
QB		NORMAL	NORMAL	NORMAL		LOW		NORMAL
QC		NORMAL	NORMAL	LOW		LOW		NORMAL
TH20			NORMAL	NORMAL				LOW

High = average monthly reading > 90th percentile reading for lake, 2000-2010

Low = average monthly reading < 10th percentile reading for lake, 2000-2010

Normal = average monthly reading between 10th and 90th percentile reading for lake, 2000-2010

Appendix C- 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	Drain Basin:	Black River
Hydro Unit Code:	04150101/030	Str Class:	A
Waterbody Type:	Lake (Mesotrophic)	Reg/County:	6/Oneida Co. (33)
Waterbody Size:	134.4 Acres	Quad Map:	MCKEEVER (G-20-0)
Seg Description:	entire lake		

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

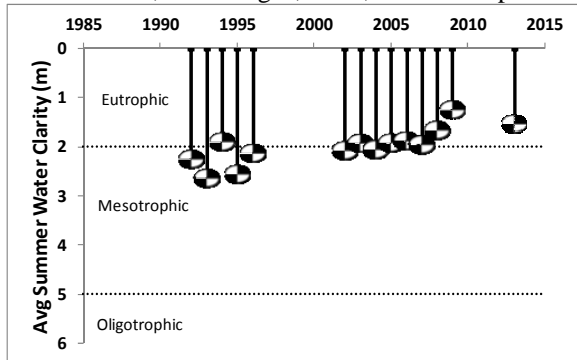
as "slightly" to "substantially" impacted. The lake itself is most often described as having "definite algal greenness." Assessments have noted that aquatic plants regularly grow to the lake surface. Recreational impacts stem from excessive weed growth, and poor water clarity, as a result of occasionally 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 D- Long Term Trends: Otter Lake

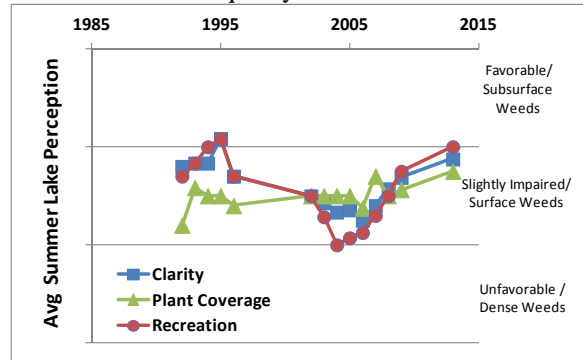
Long Term Trends: Water Clarity

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



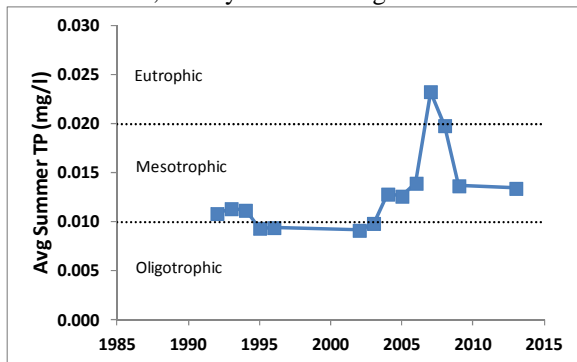
Long Term Trends: Lake Perception

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



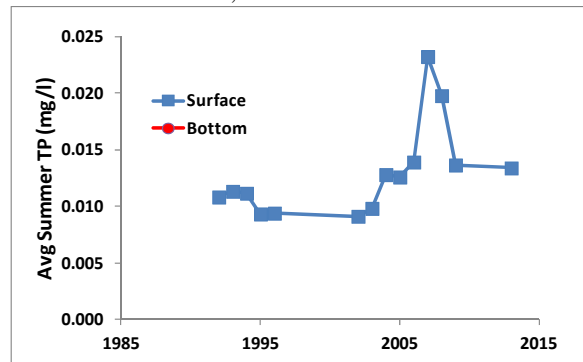
Long Term Trends: Phosphorus

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



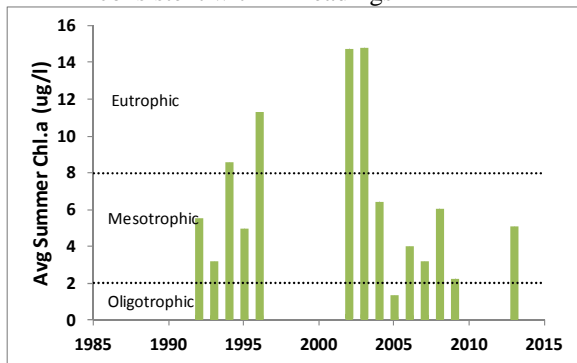
Long Term Trends: Bottom Phosphorus

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



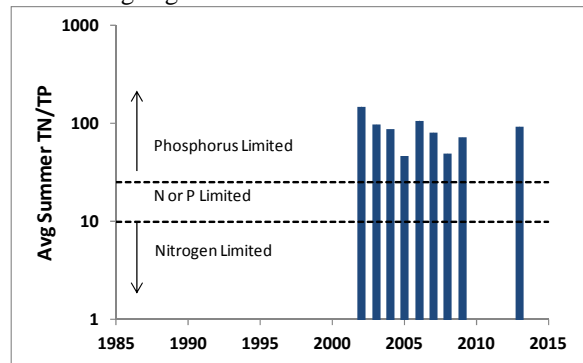
Long Term Trends: Chlorophyll a

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



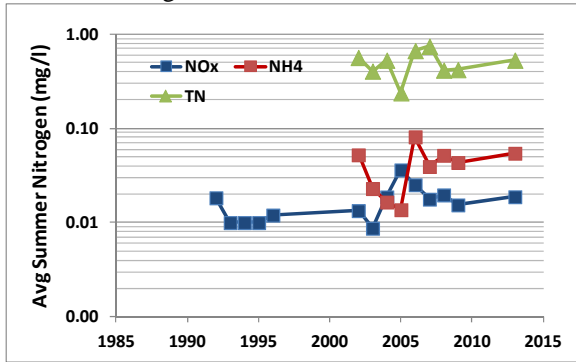
Long Term Trends: N:P Ratio

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



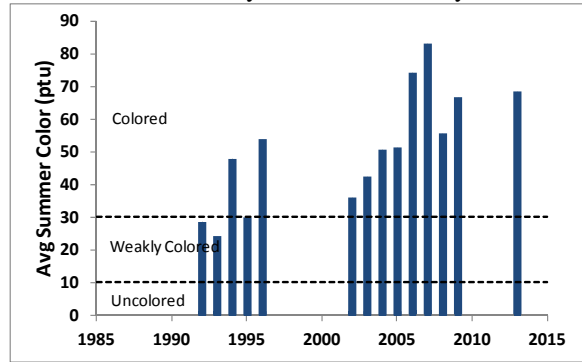
Long Term Trends: Nitrogen

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



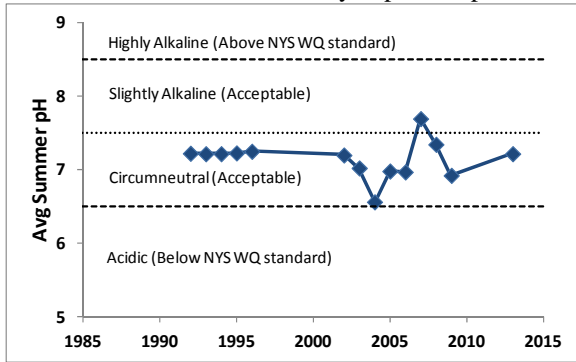
Long Term Trends: Color

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



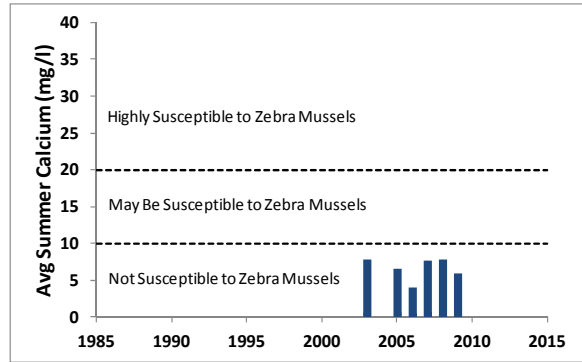
Long Term Trends: pH

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



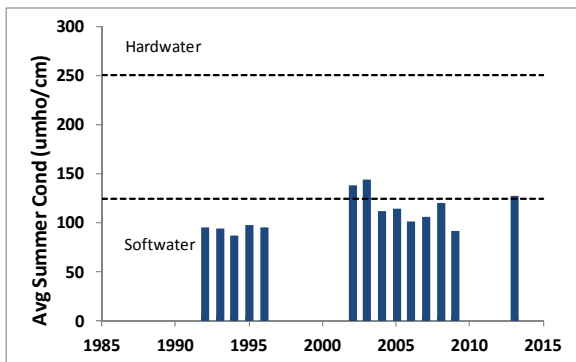
Long Term Trends: Calcium

- 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

