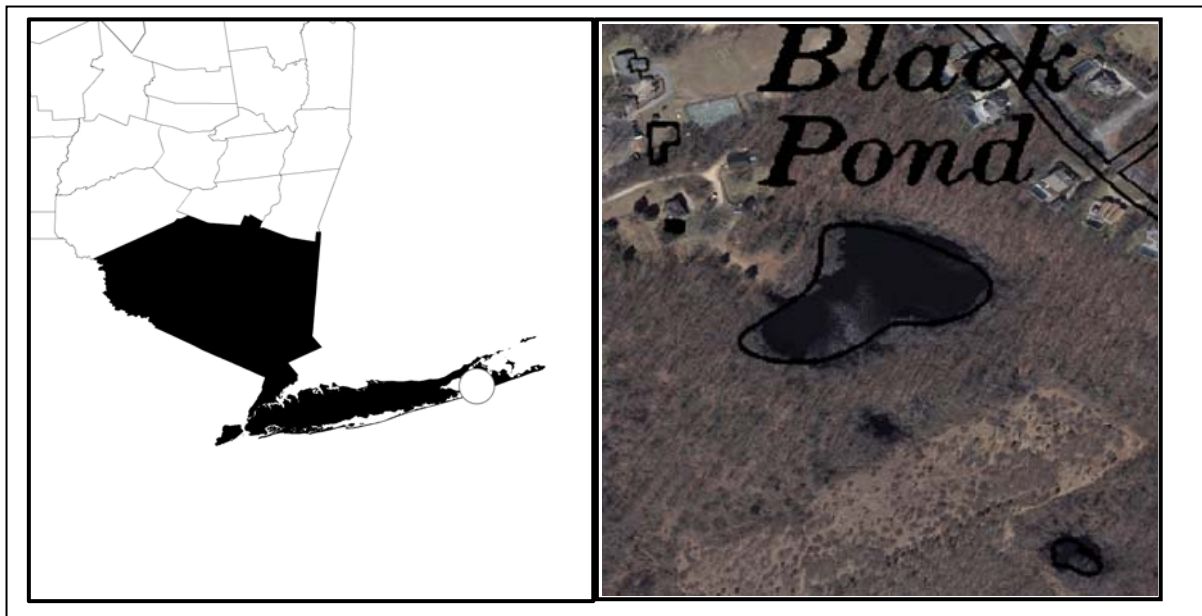


CSLAP 2013 Lake Water Quality Summary: Black Pond

General Lake Information

Location	Town of Southampton
County	Suffolk
Basin	Long Island Sound/Atlantic Ocean
Size	1.1 hectares (2.7 acres)
Lake Origins	Natural
Watershed Area	50 hectares (123.5 acres)
Retention Time	0.04 years
Mean Depth	0.5 meters
Sounding Depth	1 meters
Public Access?	no
Major Tributaries	no named tribs
Lake Tributary To...	no named outlet
WQ Classification	C (non-contact recreation = boating, angling)
Lake Outlet Latitude	40.951
Lake Outlet Longitude	-72.297
Sampling Years	2008-2013
2013 Samplers	Dai Dayton and Jean Dodds
Main Contact	Dai Dayton

Lake Map



Background

Black Pond is a 3 acre, class C lake found in the Town of Southampton in Suffolk County, in the Long Island region of New York State. It was first sampled as part of CSLAP in 2008.

It is one of six CSLAP lakes among the more than 100 lakes found in Suffolk County, and one of eight CSLAP lakes among the more than 200 lakes and ponds in the Atlantic Ocean-Long Island Sound drainage basin.

Lake Uses

Black Pond is a Class C lake; this means that the best intended use for the lake is for non-contact recreation—boating and aesthetics, although the lake may also support contact recreation—swimming and bathing. The lake is not used for swimming or other recreational uses, and there is no public access to the lake.

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

General statewide fishing regulations are applicable in Black Pond. In addition, there is a year-round open season on bluegill, crappie, pumpkinseed sunfish, trout and yellow perch. There is a size limit of nine inches, and a daily take limit of 15 fish for all of these fish except trout, which has a daily take limit of three. Ice fishing of trout is permitted.

There are no lake-specific fish consumption advisories on Black Pond.

Historical Water Quality Data

CSLAP sampling was conducted on Black Pond from 2008 to 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 and scorecard for Black Pond can also be found on the NYSDEC web page at <http://www.dec.ny.gov/lands/77836.html>.

Black Pond has not been sampled through any previous NYSDEC monitoring program. It is not known if the lake has been sampled by any organizations associated with the Long Island Greenbelt.

There are no NYSDEC RIBS monitoring sites near Black Pond, and there are no named tributaries to the lake.

Lake Association and Management History

Black Pond is part of the Long Pond Greenbelt complex, along with (among other CSLAP lakes) Lily Pond and Little Long Pond. The Long Pond Greenbelt is an approximately 11-kilometer (7-mile) north-south corridor of ponds, streams, and adjacent upland areas in the Outer Coastal Plain physiographic province. The preservation of land in the Long Pond Greenbelt has been a goal in the master plan for the town of Southampton since 1970. Long Pond Greenbelt is recognized by the New York State Department of State as a Significant Coastal Fish and Wildlife Habitat, and by the U.S. Fish and Wildlife Service as a priority wetland complex under the federal Emergency Wetlands Resources Act of 1986. The New York State Natural Heritage Program, in conjunction with The Nature Conservancy, recognizes several Priority Sites for Biodiversity within the Long Pond Greenbelt complex. Black Pond is classified as B3 - high

biodiversity significance. Other excellent examples of coastal plain pond shore communities occur at Long Pond and Little Long Pond.

Information about the Long Pond Greenbelt can be found at http://library.fws.gov/pubs5/web_link/text/lpg_form.htm.

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 – Black Pond” section in Appendix D.

Evaluation of Eutrophication Indicators

Each of the trophic indicators (water clarity, chlorophyll *a*, and total phosphorus) was close to normal in 2013, with differences from the long-term average probably within the normal range of variability for the lake. Lake productivity was higher than normal in late summer. Algae levels, as measured by chlorophyll *a*, have increased slightly over the last several years, despite the lack of a long-term trend in water clarity or phosphorus readings. Algae levels increase during the typical summer, a seasonal trend also apparent in 2013, but water clarity is consistently low during the summer and does not appear to change seasonally in response to the rise in algae levels.

The lake can be characterized as *eutrophic*, or highly productive, based on chlorophyll *a*, water clarity and total phosphorus readings (all typical of *eutrophic* lakes). The trophic state indices (TSI) evaluation indicates that phosphorus levels are slightly lower than expected given the algae and water clarity levels. This suggests that any phosphorus inputs to the lake immediately go into algae growth, indicating a high susceptibility to small changes in phosphorus. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are high enough to render the lake susceptible to taste and odor compounds or elevated DBP (disinfection by product) compounds that could affect the potability of the water, although the lake is not classified for use for drinking water and does not sustain any unofficial use for this purpose. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Nitrogen levels, particularly NO_x and total nitrogen, were higher than normal in early summer, although ammonia readings were lower than normal in late summer, the latter part of a decreasing trend in recent years. None of the other limnological indicators (pH, conductivity, color, or calcium) has exhibited any long-term trends, and each of these indicators was close to normal in 2013. It is likely that the small changes in most of these indicators have been within the normal range of variability in the lake. Overall limnological conditions are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Biological Condition

Phytoplankton, macrophyte, zooplankton and macroinvertebrates have not been evaluated through CSLAP in Black Pond, and the composition of the fish community is not known. Fluoroprobe (raw water) samples were not submitted for analysis in 2012, but despite very high algae levels in 2013, the fluoroprobe data indicates very low blue green algae levels (microscopic analysis showed some blue green species, but most samples were dominated by green algae or diatoms). Biological conditions in the lake are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Lake Perception

Water quality, aquatic plant, and recreational assessments were close to normal in 2013, and none of these indicators has exhibited any clear long-term trends. The physical condition of the lake is most often described as having “definite algae greenness, yellowness or brownness”, consistent with the high overall algae levels. Aquatic plants are not visible from the lake surface. Recreational conditions are most often described as “excellent” for most uses. No clear seasonal trends in lake perception have been apparent, and seasonal trends were not apparent in 2013. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Air and water temperature readings in the summer index period were close to normal in 2013, and no long term trends have been apparent. It is not yet known if this indicates the lack of local climate change or if this dataset is inadequate to evaluate these changes.

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 were at times well above the levels indicating susceptibility for harmful algal blooms (HABs), although open water algal toxin levels were below readings associated with threats to contact recreational use. This is consistent with very low blue green algae levels found in both the fluoroprobe results and in the microscopic analyses of most samples. No shoreline blooms have been reported.

Lake Condition Summary

Category	Indicator	Min	08-13 Avg	Max	2013 Avg	Classification	2013 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.15	0.36	0.55	0.32	Eutrophic	Within Normal Range	No Change
	Chlorophyll <i>a</i>	0.27	78.64	532.80	85.51	Eutrophic	Within Normal Range	Increasing Slightly
	Total Phosphorus	0.024	0.088	0.245	0.097	Eutrophic	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	0.01	0.02	0.06	0.02	Low NOx	Within Normal Range	Decreasing Slightly
	Ammonia	0.01	0.06	0.29	0.02	Low Ammonia	Lower Than Normal	Decreasing Slightly
	Total Nitrogen	0.65	1.63	5.67	1.97	High Total Nitrogen	Higher than Normal	No Change
	pH	5.65	6.93	8.85	6.51	Circumneutral	Lower Than Normal	No Change
	Specific Conductance	15	46	84	50	Softwater	Within Normal Range	No Change
	True Color	10	82	247	77	Colored	Within Normal Range	Decreasing Slightly
	Calcium	0.1	1.6	4.7	2.0	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.5	4	3.0	Not Quite Crystal Clear	Within Normal Range	No Change
	Aquatic Plant Coverage	1	1.0	1	1.0	Plants Not Visible	Within Normal Range	No Change
	Recreational Assessment	1	2.2	4	2.0	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Not available through CSLAP	Not known	Not known
	Zooplankton					Not available through CSLAP	Not known	Not known
	Macroinvertebrates					Not available through CSLAP	Not known	Not known
	Fish					Not available through CSLAP	Not known	Not known
	Invasive Species					None observed	Not known	Not known
Local Climate Change	Air Temperature	14	23.0	33	22.4		Within Normal Range	No Change
	Water Temperature	10	23.9	31	23.8		Within Normal Range	No Change
Harmful Algal Blooms	Open Water Phycocyanin	10	113	933	17	Most readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	10	85	176	85	Most 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	0.3	0.2	0.4	<0.30	Mostly undetectable open water MC-LR	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

Black Pond is not presently listed on the Atlantic Ocean / Long Island Sound PWL, last updated in 2002.

Potable Water (Drinking Water)

The CSLAP dataset at Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake is not used for this purpose. The algae levels in the lake suggest that the "unofficial" potable water use would be severely compromised.

Contact Recreation (Swimming)

The CSLAP dataset at Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that swimming and contact recreation may be *impaired* by reduced water clarity, and elevated nutrient and algae levels, although additional information about bacterial levels is needed to evaluate the safety of the water for swimming. It should be noted that the lake presently does not support this use.

Non-Contact Recreation (Boating and Fishing)

The CSLAP dataset on Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that non-contact recreation should be fully supported.

Aquatic Life

The CSLAP dataset on Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *threatened* by either elevated or depressed (highly variable) pH, although additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics

The CSLAP dataset on Black Pond, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *threatened* by excessive algae.

Fish Consumption

There are no fish consumption advisories posted for Black Pond.

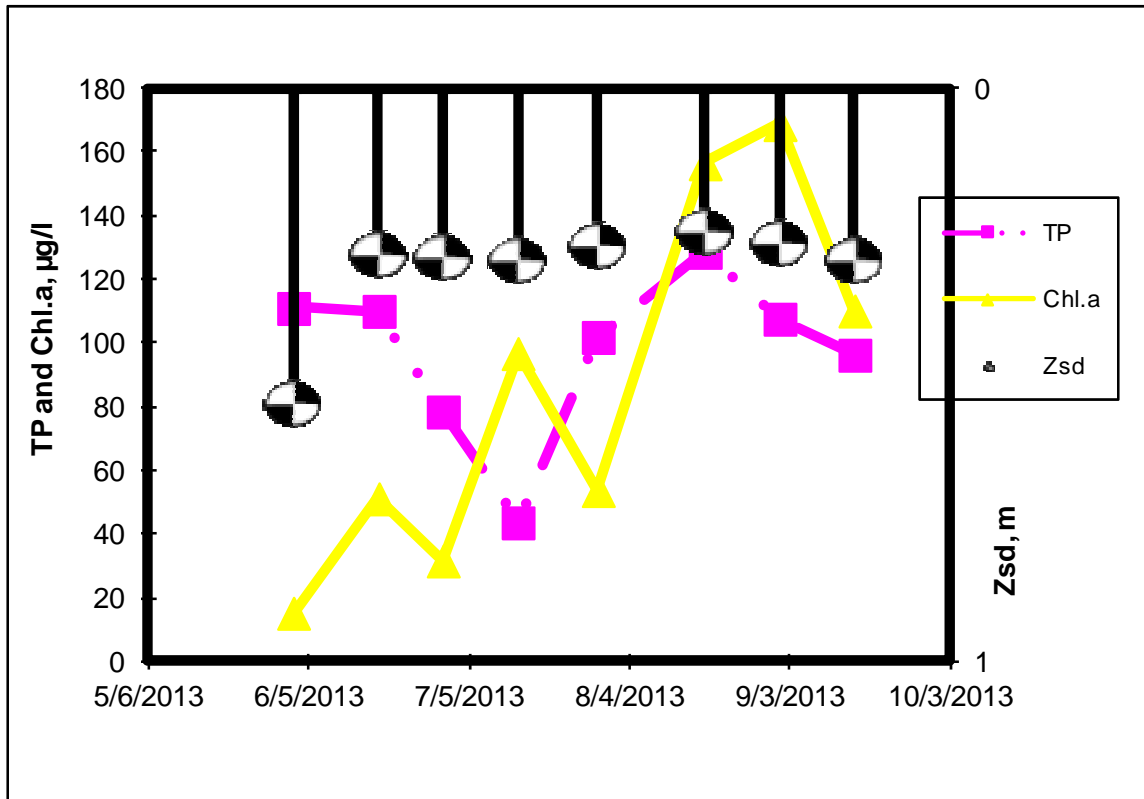
Additional Comments and Recommendations

Aquatic plant monitoring in Black Pond will help to determine if the plant community is more strongly affected by native or invasive plants, particularly fanwort (*Cabomba caroliniana*) and variable watermilfoil (*Myriophyllum heterophyllum*), exotic plant species commonly found in lakes near the Long Pond Greenbelt.

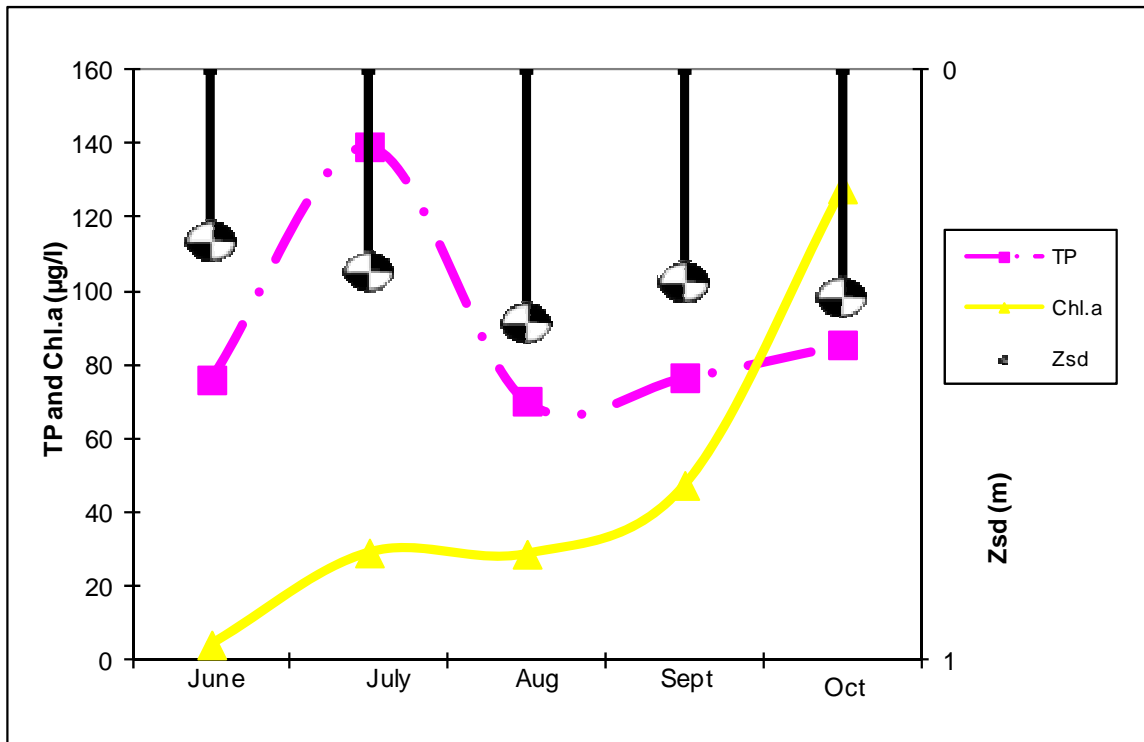
Aquatic Plant IDs-2013

None submitted for identification.

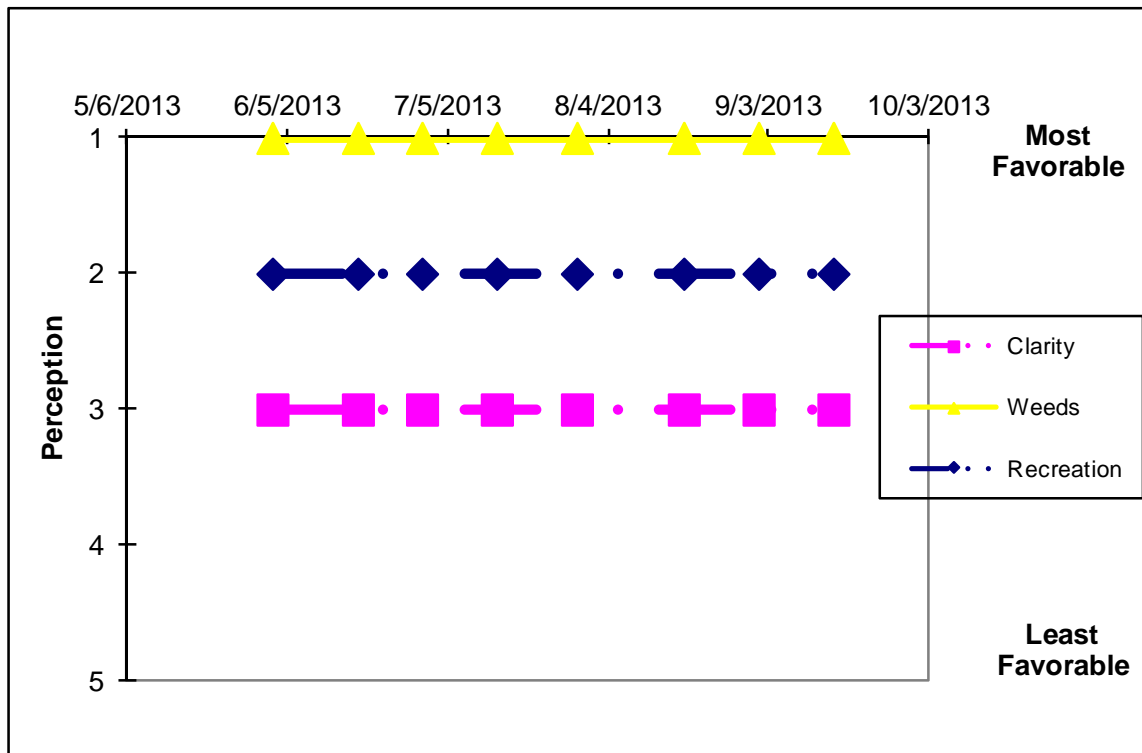
Time Series: Trophic Indicators, 2013



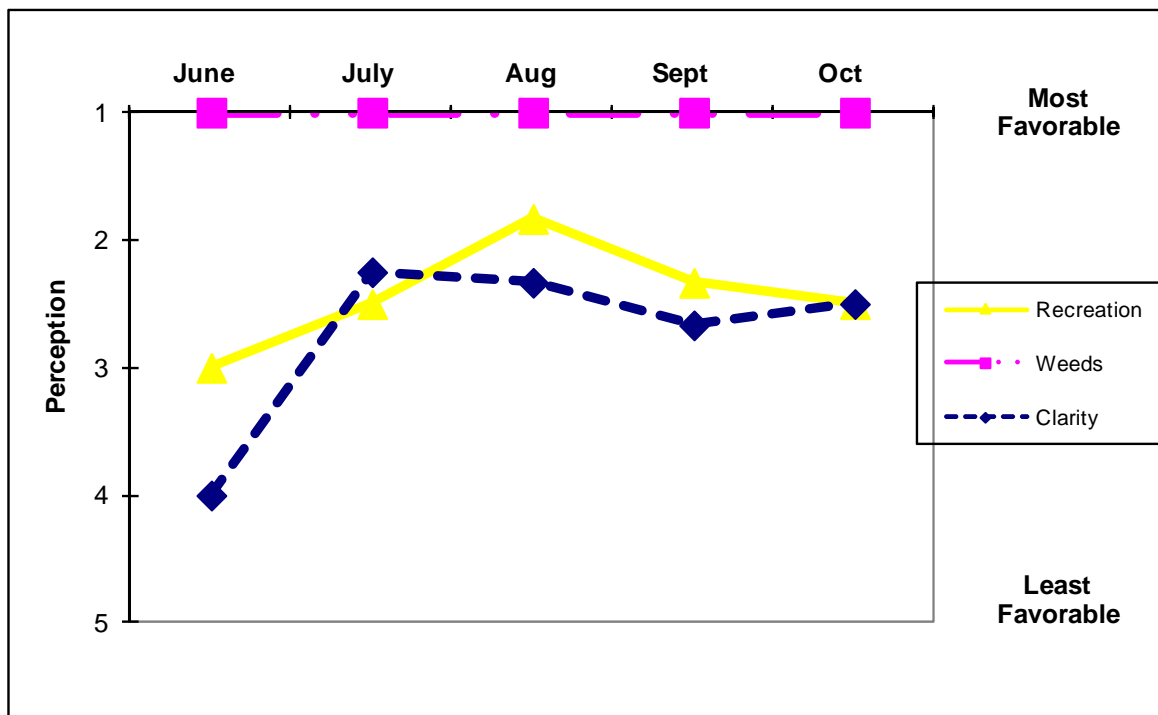
Time Series: Trophic Indicators, Typical Year (2008-2013)



Time Series: Lake Perception Indicators, 2013



Time Series: Lake Perception Indicators, Typical Year (2008-2013)



Appendix A- CSLAP Water Quality Sampling Results for Black Pond

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a
217	Black Pond	7/12/2008		0.35	1.0	0.133	0.04	0.12	1.12	18.43		6.02	35	1.5	6.58
217	Black Pond	7/25/2008		0.35	~1	0.245	0.02	0.10	1.91	17.12	247	6.03	27		4.46
217	Black Pond	8/10/2008	1.00	0.34	0.8	0.100	0.01	0.10	0.95	20.89	37	6.67	38		19.08
217	Black Pond	9/1/2008	1.00	0.35	1.0	0.125	0.01	0.03	2.13	37.52	42	6.15	33		95.58
217	Black Pond	10/11/2008	1.00	0.53	0.5	0.054	0.01	0.23	1.22	49.55	129	7.84	24	0.6	0.27
217	Black Pond	07/11/2009	1.0	0.27	0.9	0.084	0.03	0.03	1.27	33.36	105	6.64	32	0.6	62.00
217	Black Pond	07/26/2009	1.5	0.41	1.0	0.095	0.04	0.07	1.68	38.85	75	6.99	42		43.84
217	Black Pond	08/03/2009	1.5	0.48	1.0	0.078	0.02	0.03	1.23	34.97	78	6.69	30		22.93
217	Black Pond	08/11/2009	1.4	0.48	1.4	0.044	0.01	0.06	1.38	68.80	85	7.21	32		10.80
217	Black Pond	08/23/2009	1.4	0.53		0.063	0.02	0.02	0.97	33.85	76	5.65	35	0.1	39.90
217	Black Pond	09/13/2009	1.0	0.48		0.058	0.01	0.02	1.20	45.83	51	7.02	28		34.90
217	Black Pond	09/20/2009	1.3	0.41		0.082	0.02	0.03	1.54	41.29	91	7.17	30		15.40
217	Black Pond	09/27/2009	1.4	0.34	1.0	0.072	0.01	0.04	1.29	39.45	41	7.79	15		60.50
217	Black Pond	5/31/2010	2.2	0.35	1.5	0.075	0.01	0.05	1.09	32.07	222	5.88	84		196.20
217	Black Pond	6/27/2010	2.0	0.29	1.5	0.076	0.03	0.05	0.98	28.24	166	6.20	60		4.30
217	Black Pond	8/3/2010	0.6	0.40	1.0	0.066	0.02	0.03	0.86	28.72	68	6.36	59		68.70
217	Black Pond	8/15/2010	1.5	0.35	1.0	0.071	0.04	0.05	0.83	25.79	37	8.05	66	1.8	11.80
217	Black Pond	9/6/2010	1.5	0.29	1.0	0.050	0.01	0.02			102	6.03	56	2.3	11.70
217	Black Pond	9/19/2010	1.5	0.29	1.0	0.074	0.05	0.03	0.65	19.32	38	8.07	73		67.00
217	Black Pond	10/2/2010	1.4	0.25		0.117	0.01	0.29	1.16	21.91	42	7.09	57		255.40
217	Black Pond	6/12/2011	1.3	0.50	1.0	0.058	0.05	0.22	0.96	36.55	142	6.66	49.4	4.7	2.20
217	Black Pond	6/25/2011	1.2	0.43	0.9	0.105	0.01	0.02	1.05	21.94	139	6.79	46.6		5.40
217	Black Pond	7/10/2011	1.2	0.48	1.0	0.063	0.01	0.11	1.19	41.42	56	6.31	50.6		21.10
217	Black Pond	7/24/2011	1.0	0.51	0.9	0.072	0.01	0.05	1.18	36.08	72	7.26	59.8		13.50
217	Black Pond	8/7/2011	1.0	0.40	0.9	0.103	0.01	0.06	2.00	42.53	45	8.27	46.2	2.4	82.80
217	Black Pond	8/21/2011	1.1	0.28	0.8	0.082	0.01	0.03	1.75	46.62	54	7.59	44.4		98.60
217	Black Pond	9/5/2011	0.9	0.25	0.8	0.145	0.02	0.03	2.16	32.75	41	8.85	71.8		
217	Black Pond	9/11/2011	0.9	0.34	0.8	0.065	0.03	0.05	2.40	80.86	42	7.39	44.8		22.60
217	Black Pond	6/24/2012	1.0	0.45	0.5	0.059	0.06	0.14	1.53	56.98	70	7.78	52.4	0.6	19.70
217	Black Pond	7/15/2012	0.9	0.46	0.5	0.084	0.01	0.02	1.25	32.74	95	6.38	39.6		4.00
217	Black Pond	7/22/2012	0.7	0.35	0.5	0.101	0.01	0.04	1.51	33.10	94	7.68	37.2		10.80
217	Black Pond	7/31/2012	0.8	0.31	0.3	0.100	0.01	0.03	1.73	38.20	80	6.87	44.9		107.30
217	Black Pond	8/6/2012	0.6	0.27	0.3	0.024	0.01	0.02	1.51	138.54	79	6.36	39.4	0.6	177.10
217	Black Pond	8/19/2012	0.6	0.32	0.3	0.041	0.01	0.04	1.80	96.59	55	8.72	50.1		184.70
217	Black Pond	9/3/2012	0.5	0.21	0.3	0.099	0.01	0.05	3.01	67.03	55	7.5	52.9		532.80
217	Black Pond	9/22/2012	0.4	0.15	0.3	0.125	0.01	0.07	5.67	99.60	43	7.08	53.4		383.60
217	Black Pond	6/2/2013	0.9	0.55	0.7	0.111	0.06	0.03	2.25	44.54	122	6.47	54.6	2.0	15.30
217	Black Pond	6/18/2013	0.9	0.29	0.9	0.110			2.42	48.26	117	6.08	43.6		51.20
217	Black Pond	6/30/2013	1.0	0.30	0.5	0.079	0.01	0.03	2.28	63.79	10	7.16	49.9		31.70
217	Black Pond	7/14/2013	1.0	0.30	0.5	0.044			1.86	93.70	93	7.13	49.4		96.80
217	Black Pond	7/29/2013	0.9	0.28	0.5	0.102	0.01	0.02	2.09	45.01	73	6.93	51.6		53.80
217	Black Pond	8/18/2013	1.0	0.25	0.5	0.129			2.14	36.61	95	6.66	55.2		156.40
217	Black Pond	9/1/2013	0.7	0.27	0.5	0.108	0.01	0.01	1.54	31.58	58	5.72	57.2		168.70
217	Black Pond	9/15/2013	0.7	0.30	0.5	0.096			1.20	27.42	46	5.94	42		110.20

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
217	Black P	7/12/2008	epi	23	28	3	1	3	18											
217	Black P	7/25/2008	epi	27	10	1	1	2	8											
217	Black P	8/10/2008	epi	25	25	2	1	1	8											
217	Black P	9/1/2008	epi	20	23	2	1	1	18											
217	Black P	10/11/2008	epi	16	17	2	1	2	18											
217	Black P	07/11/2009	epi	24	21	2	1	2	1											
217	Black P	07/26/2009	epi	25	21	3	1	3	1											
217	Black P	08/03/2009	epi	26	27	2	1	2	1											
217	Black P	08/11/2009	epi	24	29	2	1	1	0											
217	Black P	08/23/2009	epi	26	30	2	1	2	0											
217	Black P	09/13/2009	epi	21	23	3	1	3	1											
217	Black P	09/20/2009	epi	26	21	3	1	3	1			165.7								
217	Black P	09/27/2009	epi	21	19	2	1	2	0			94.62								
217	Black P	5/31/2010	epi	23	26	4	1	4	13	0	0									
217	Black P	6/27/2010	epi	24	26	4	1	3	13	4	4									
217	Black P	8/3/2010	epi	33	28	3	1	3	16	0	0									
217	Black P	8/15/2010	epi	25	26	3	1	2	1	0	0									
217	Black P	9/6/2010	epi	19	22	3	1	3	1	0	0	932.5								
217	Black P	9/19/2010	epi	19	22	3	1	2	1	0	0									
217	Black P	10/2/2010	epi	16	20	3	1	3	1	0	0									
217	Black P	6/12/2011	epi	17	22	1	1	2	5	0	0	11.90	9.20							
217	Black P	6/25/2011	epi	21	23	1	1	2	0	0	0	32.00	22.00							
217	Black P	7/10/2011	epi	24	30	1	1	2	0	0	0	42.30	14.80							
217	Black P	7/24/2011	epi	28	29	1	1	2	0	0	0	32.80	23.23	0.28	<0.400	<0.1				
217	Black P	8/7/2011	epi	29	29	2	1	2	5	0	0	165.1	208.5	0.57	<0.500	<0.1			i	
217	Black P	8/21/2011	epi	29	27	2	1	1	0	0	0	147.0	190.2	0.15					i	
217	Black P	9/5/2011	epi	27	25	3	1	2	0	0	0	147.5	199.8						i	
217	Black P	9/11/2011	epi	20	22	2	1	2	0	0	0	233.3	325.5						i	
217	Black P	6/24/2012	epi	24	31	3	1	2	1	0	0								i	
217	Black P	7/15/2012	epi	31	29	3	1	4	18	0	0								i	
217	Black P	7/22/2012	epi	23	26	2	1	2	0	0	0								i	
217	Black P	7/31/2012	epi	22	24	2	1	2	0	0	0								F	
217	Black P	8/6/2012	epi	26	29	2	1	2	1	0	0								F	
217	Black P	8/19/2012	epi	21	23	2	1	2	1	0	0								i	
217	Black P	9/3/2012	epi	18	17	3	1	4	1	4	4								F	
217	Black P	9/22/2012	epi	14	16	3	1	2	1	0	0								i	
217	Black P	6/2/2013	epi	27	24	3	1	2	16	0	0	9.50	14.60	<0.30	<0.630		9.90	0.00	i	i
217	Black P	6/18/2013	epi	16	17	3	1	2	1	0	0	16.60	42.80	<0.30	<0.440		43.00	0.00	i	i
217	Black P	6/30/2013	epi	25	25	3	1	2	1	0	0	12.60	46.40	<0.30	<0.650		42.30	0.00	i	i
217	Black P	7/14/2013	epi	29	27	3	1	2	1	0	0	17.00	145.2	<0.30	<0.490		145.4	0.00	F	F
217	Black P	7/29/2013	epi	23	30	3	1	2	1	0	0	12.00	27.90	<0.30	<0.380		51.70	0.00	F	F
217	Black P	8/18/2013	epi	21	25	3	1	2	1	0	0	24.40	154.2	<0.30	<0.510		175.7	0.00	F	F
217	Black P	9/1/2013	epi	24	24	3	1	2	1	0	0	18.90	148.2	<0.30	<1.100		132.6	0.00	F	F
217	Black P	9/15/2013	epi	15	19	3	1	2	1	0	0	22.30	70.40	<0.30	<1.240		76.0	0.00	F	F

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)	0.3 ug/l	none
Cyl	Cylindrospermopsin (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 Black Pond Data, 2006-2013

June Data

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

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

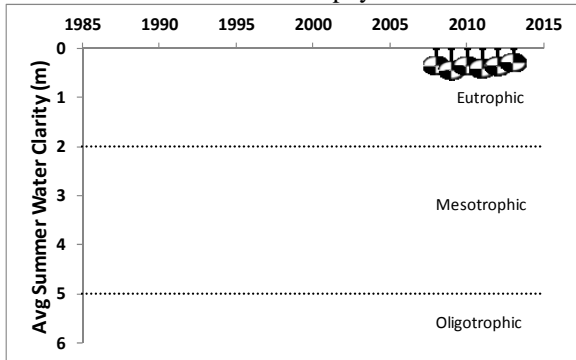
Low = average monthly reading < 10th percentile reading for lake, 2000-2010

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

Appendix D- Long Term Trends: Black Pond

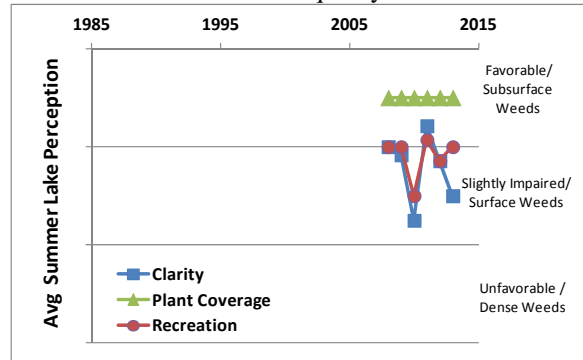
Long Term Trends: Water Clarity

- No long term trends apparent
- Most readings typical of *eutrophic* lakes, consistent with chlorophyll *a* and TP



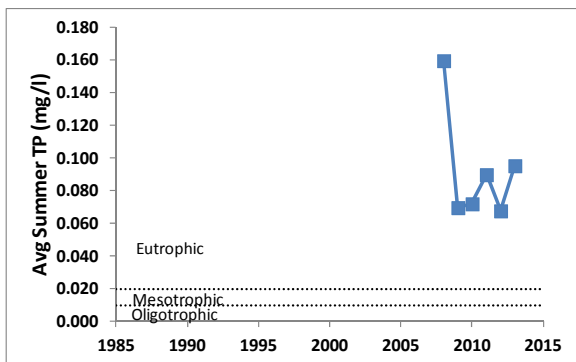
Long Term Trends: Lake Perception

- No long term trends apparent
- Recreational perception more closely connected to water quality than weeds



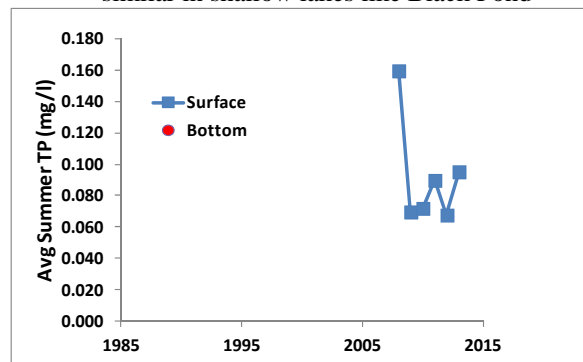
Long Term Trends: Phosphorus

- No long term trend apparent
- Most readings typical of *eutrophic* lakes



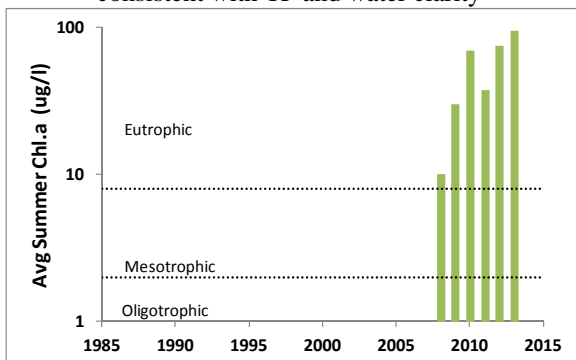
Long Term Trends: Bottom Phosphorus

- No deepwater TP readings
- Likely that surface and TP readings are similar in shallow lakes like Black Pond



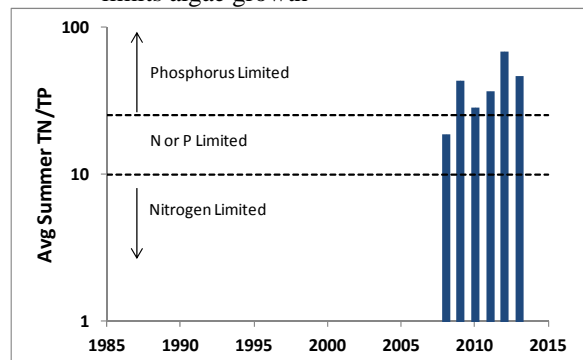
Long Term Trends: Chlorophyll a

- Increasing algae levels?
- Most readings typical of *eutrophic* lakes, consistent with TP and water clarity



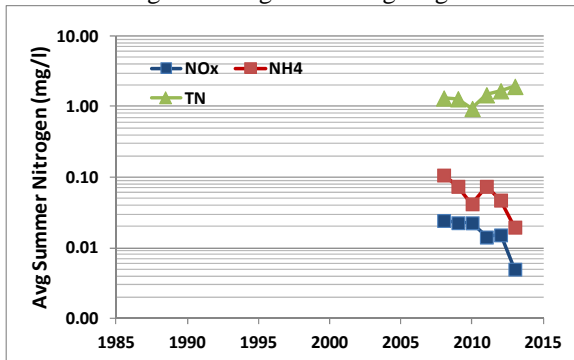
Long Term Trends: N:P Ratio

- Increasing N:P ratios
- Most readings now indicate phosphorus limits algae growth



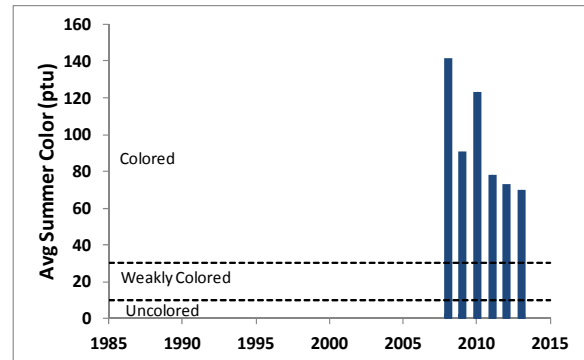
Long Term Trends: Nitrogen

- NOx and ammonia readings decreasing?
- Low NOx and ammonia; higher total nitrogen readings due to high algae levels



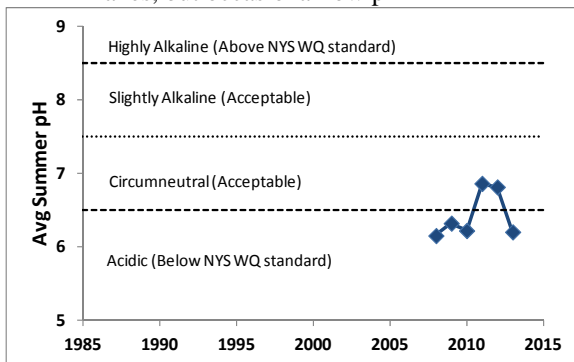
Long Term Trends: Color

- Decreasing color, but no statistical trend
- Most readings typical of *highly colored* lakes



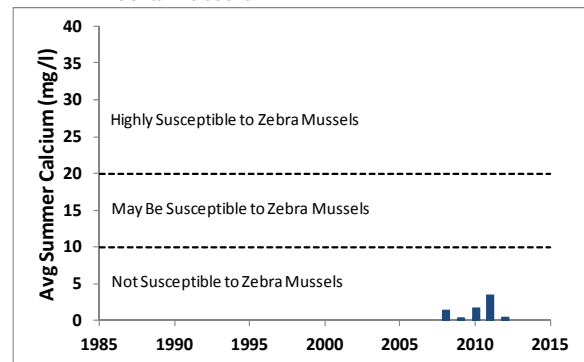
Long Term Trends: pH

- Increasing slightly
- Most readings now typical of *circumneutral* lakes, but occasional low pH



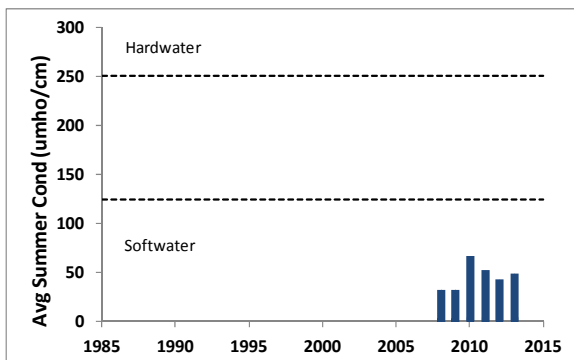
Long Term Trends: Calcium

- No long term trend
- All readings indicate low susceptibility to zebra mussels



Long Term Trends: Conductivity

- No long term trend
- All readings typical of *softwater* lakes



Long Term Trends: Water Temperature

- Increasing temp, but no long term trend
- Surface and bottom temperatures similar in shallow lakes

