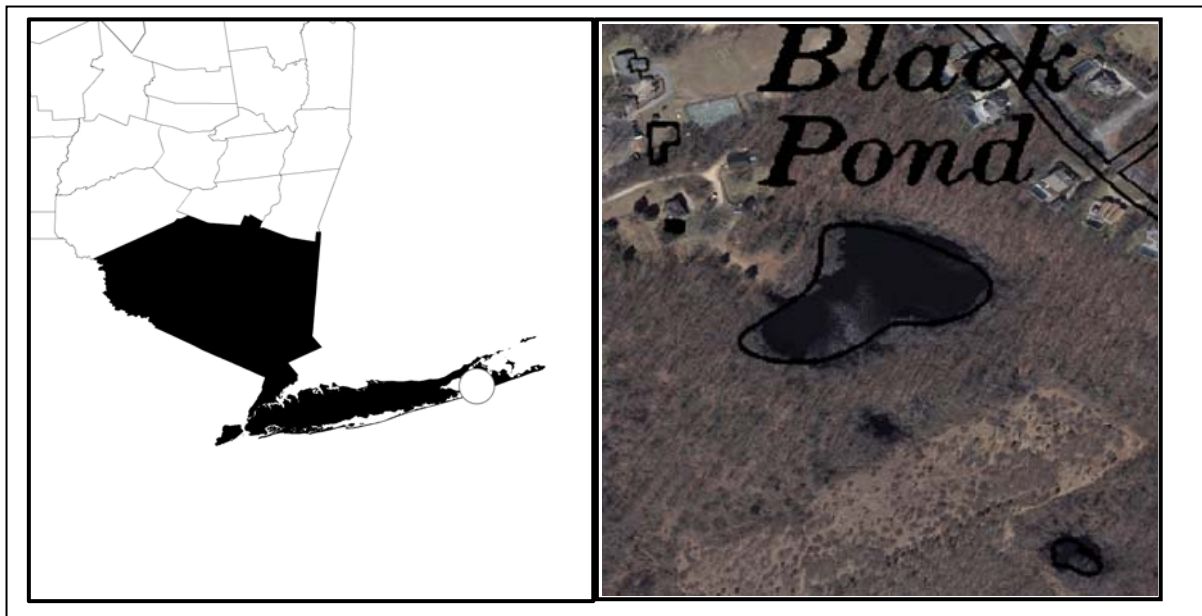


# CSLAP 2012 Lake Water Quality Summary: Black Pond

## General Lake Information

<b>Location</b>	Town of Southampton
<b>County</b>	Suffolk
<b>Basin</b>	Long Island Sound/Atlantic Ocean
<b>Size</b>	1.1 hectares (2.7 acres)
<b>Lake Origins</b>	Natural
<b>Watershed Area</b>	50 hectares (123.5 acres)
<b>Retention Time</b>	0.04 years
<b>Mean Depth</b>	0.5 meters
<b>Sounding Depth</b>	1 meters
<b>Public Access?</b>	no
<b>Major Tributaries</b>	no named tribs
<b>Lake Tributary To...</b>	no named outlet
<b>WQ Classification</b>	C (non-contact recreation = boating, angling)
<b>Lake Outlet Latitude</b>	40.951
<b>Lake Outlet Longitude</b>	-72.297
<b>Sampling Years</b>	2008-2012
<b>2012 Samplers</b>	Dai Dayton and Jean Dodds
<b>Main Contact</b>	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 2012. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at <http://nysfola.mylaketown.com>. The 2011 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](http://library.fws.gov/pubs5/web_link/text/lpg_form.htm).

## **Summary of 2012 CSLAP Sampling Results**

### **Evaluation of 2012 Annual and Monthly Results Relative to 2006-2011**

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**

Chlorophyll *a* readings were higher than normal in 2012, particularly in late summer, resulting in slightly lower than normal water transparency readings. Total phosphorus readings were close to normal in 2012. Algae levels increase during the summer, 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**

Total nitrogen was higher than normal, consistent with highly elevated algae levels, but TN has not exhibited any long-term trends. pH readings have increased slightly in the last several years, and are now typical of *circumneutral* (near neutral pH) lakes. Each of the other limnological indicators (NO<sub>x</sub>, ammonia, conductivity, color and calcium) was close to normal in 2012, and has not shown any trends since CSLAP sampling began in 2008. 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, so it is not known if the very high algae levels in 2012 were associated with blue green algae or other algal species. 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 2012, and none of these indicators has exhibited any clear long-term trends. No clear seasonal trends in lake perception have been apparent, and seasonal trends were not apparent in 2012. 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 2012, 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. No fluoroprobe screening samples or algae toxin samples were submitted for analysis in 2012. No shoreline blooms have been reported.

# Lake Condition Summary

Category	Indicator	Min	08-12 Avg	Max	2012 Avg	Classification	2012 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.15	0.37	0.53	0.31	Eutrophic	Lower Than Normal	No Change
	Chlorophyll <i>a</i>	0.27	77.07	532.80	177.50	Eutrophic	Higher than Normal	Increasing Slightly
	Total Phosphorus	0.024	0.086	0.245	0.079	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	0.01	Low NOx	Lower Than Normal	Decreasing Slightly
	Ammonia	0.02	0.07	0.29	0.05	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.65	1.55	5.67	2.25	High Total Nitrogen	Higher than Normal	No Change
	pH	5.65	7.03	8.85	7.30	Circumneutral	Within Normal Range	Increasing Slightly
	Specific Conductance	15	46	84	46	Softwater	Within Normal Range	No Change
	True Color	37	83	247	71	Colored	Within Normal Range	No Change
	Calcium	0.1	1.5	4.7	0.6	Not Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	1	2.4	4	2.5	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	2.3	4	2.5	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Not available through CSLAP	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	23.2	33	22.4		Within Normal Range	No Change
	Water Temperature	10	24.0	31	24.3		Within Normal Range	No Change
Harmful Algal Blooms	Open Water Phycocyanin	12	182	933		Most readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a							
	Open Water FP BG Chl.a							
	Open Water Microcystis	0.2	0.3	0.6		Mostly undetectable open water MC-LR	Not known	Not known
	Open Water Anatoxin a	<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 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 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.

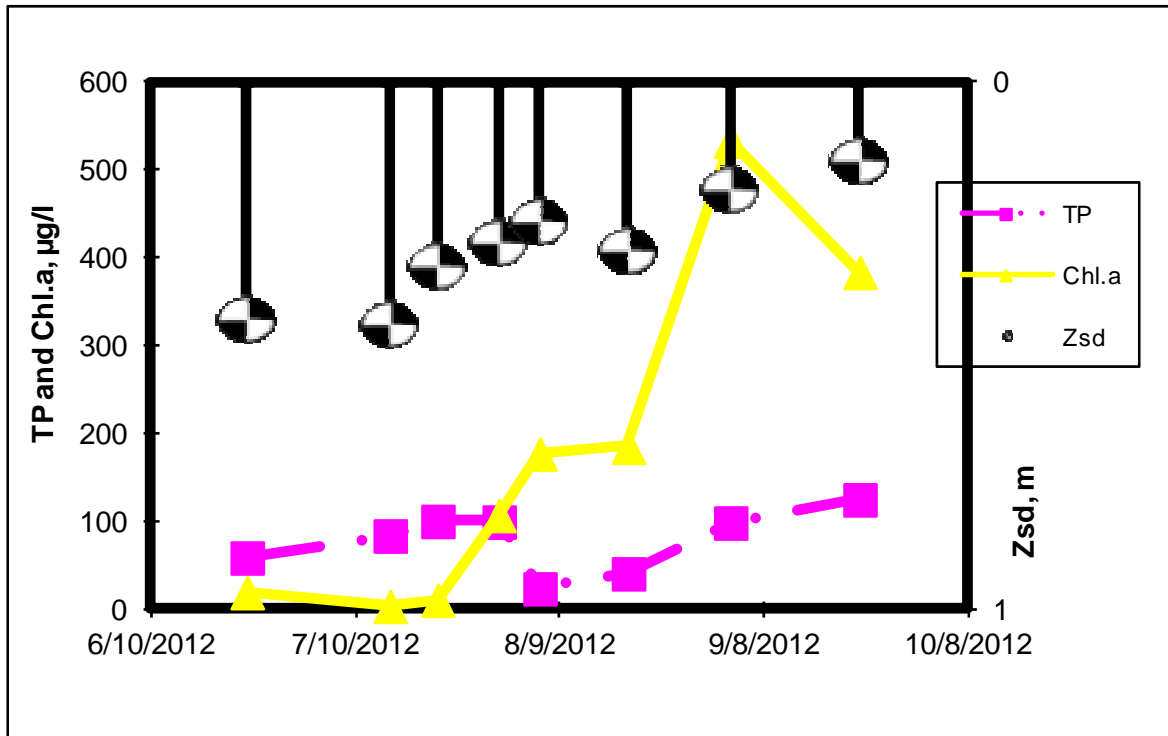
## **Additional Comments and Recommendations**

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. Algae screening (raw water) and algal toxin samples should be collected and submitted through CSLAP.

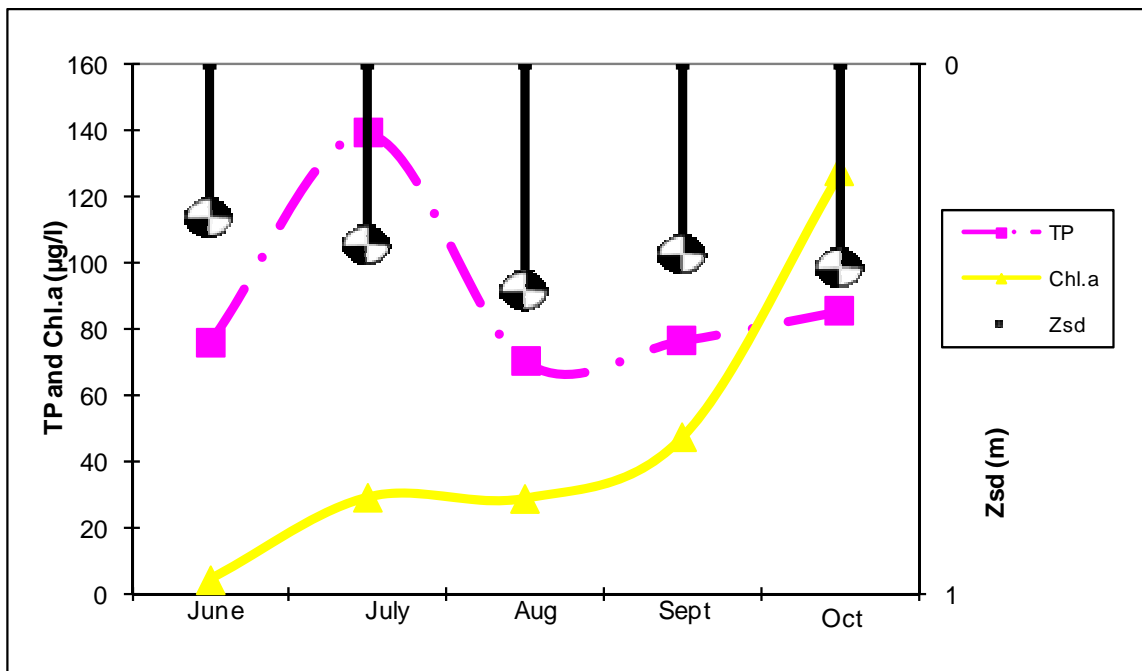
### **Aquatic Plant IDs-2012**

None submitted for identification.

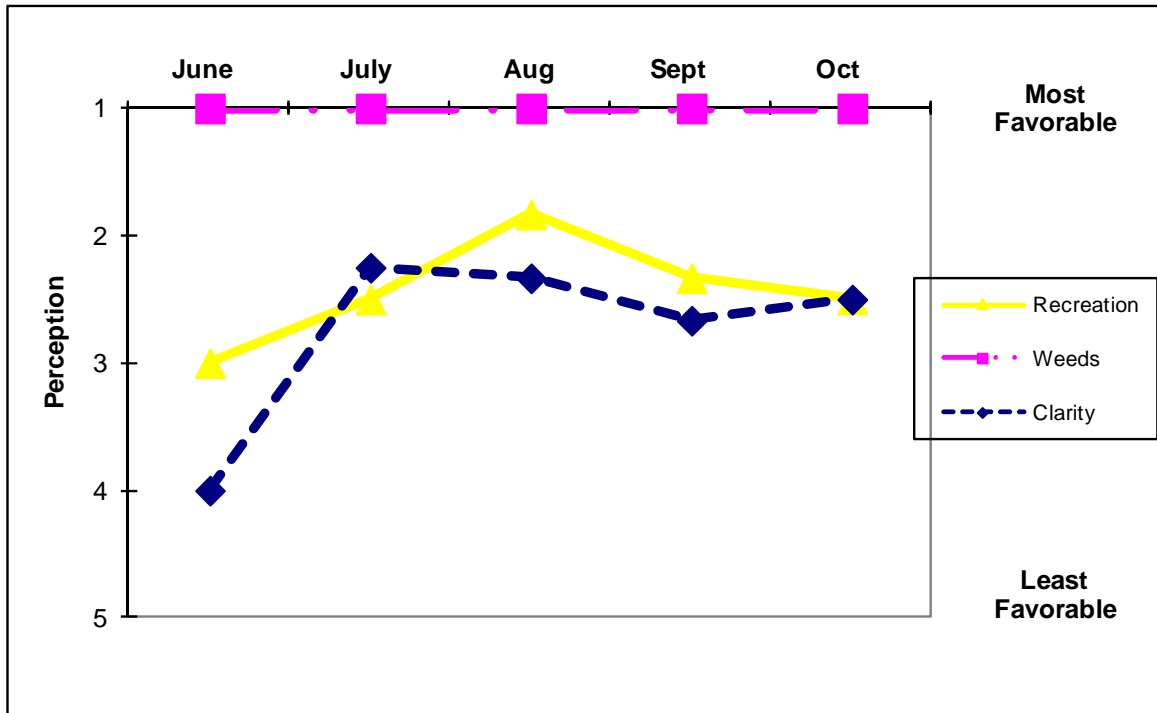
### Time Series: Trophic Indicators, 2012



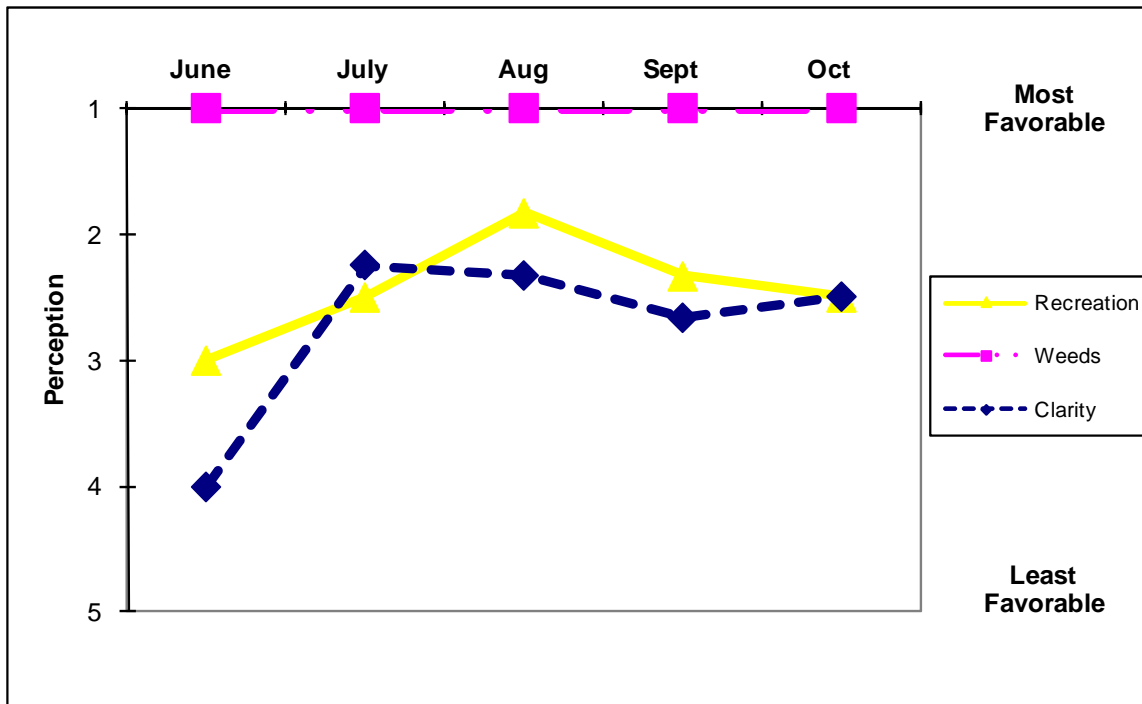
### Time Series: Trophic Indicators, Typical Year (2008-2012)



### Time Series: Lake Perception Indicators, 2012



### Time Series: Lake Perception Indicators, Typical Year (2008-2012)





## 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

LNum	PName	Date	Site	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyc	FP-Chl	FP-BG	HAB form
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								l
217	Black P	7/15/2012	epi	31	29	3	1	4	18	0	0								l
217	Black P	7/22/2012	epi	23	26	2	1	2	0	0	0								l
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								l
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								l

## Legend Information

<i>Indicator</i>	<i>Description</i>	<i>Detection Limit</i>	<i>Standard (S) / Criteria (C)</i>
<b>General Information</b>			
<b>Lnum</b>	lake number (unique to CSLAP)		
<b>Lname</b>	name of lake (as it appears in the Gazetteer of NYS Lakes)		
<b>Date</b>	sampling date		
<b>Field Parameters</b>			
<b>Zbot</b>	lake depth at sampling point, meters (m)		
<b>Zsd</b>	Secchi disk transparency or clarity	0.1m	1.2m ( C)
<b>Zsamp</b>	water sample depth (m) (epi = epilimnion or surface; bot = bottom)	0.1m	none
<b>Tair</b>	air temperature ( C)	-10C	none
<b>TH20</b>	water temperature ( C)	-10C	none
<b>Laboratory Parameters</b>			
<b>Tot.P</b>	total phosphorus (mg/l)	0.003 mg/l	0.020 mg/l ( C)
<b>NOx</b>	nitrate + nitrite (mg/l)	0.01 mg/l	10 mg/l NO3 (S), 2 mg/l NO2 (S)
<b>NH4</b>	total ammonia (mg/l)	0.01 mg/l	2 mg/l NH4 (S)
<b>TN</b>	total nitrogen (mg/l)	0.01 mg/l	none
<b>TN/TP</b>	nitrogen to phosphorus (molar) ratio, = (TKN + NOx)*2.2/TP		none
<b>TCOLOR</b>	true (filtered) color (ptu, platinum color units)	1 ptu	none
<b>pH</b>	powers of hydrogen (S.U., standard pH units)	0.1 S.U.	6.5, 8.5 S.U. (S)
<b>Cond25</b>	specific conductance, corrected to 25C (umho/cm)	1 umho/cm	none
<b>Ca</b>	calcium (mg/l)	1 mg/l	none
<b>Chl.a</b>	chlorophyll a (ug/l)	0.01 ug/l	none
<b>Fe</b>	iron (mg/l)	0.1 mg/l	1.0 mg/l (S)
<b>Mn</b>	manganese (mg/l)	0.01 mg/l	0.3 mg/l (S)
<b>As</b>	arsenic (ug/l)	1 ug/l	10 ug/l (S)
<b>AQ-PC</b>	Phycocyanin (aquafior) (unitless)	1 unit	none
<b>AQ-Chl</b>	Chlorophyll a (aquafior) (ug/l)	1 ug/l	none
<b>MC-LR</b>	Microcystis-LR (ug/l)	0.01 ug/l	1 ug/l potable (C) 20 ug/l swimming (C)
<b>Ana</b>	Anatoxin-a (ug/l)	0.3 ug/l	none
<b>Cyl</b>	Cylindrospermopsin (ug/l)	0.1 ug/l	none
<b>Lake Assessment</b>			
<b>QA</b>	water quality assessment; 1 = crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels		
<b>QB</b>	aquatic plant assessment; 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = surface plant coverage		
<b>QC</b>	recreational assessment; 1 = could not be nicer, 2 = excellent, 3 = slightly impaired, 4 = substantially impaired, 5 = lake not usable		
<b>QD</b>	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		
<b>QF, QG</b>	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		
<b>HAB form</b>	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, 2006-2012

### June Data

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

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

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

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

### July Data

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

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

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

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

## August Data

	2006	2007	2008	2009	2010	2011	2012
Zsd			NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
TP			NORMAL	NORMAL	NORMAL	NORMAL	LOW
Chl.a			NORMAL	NORMAL	NORMAL	NORMAL	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
SpCond			NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Color			LOW	NORMAL	NORMAL	NORMAL	NORMAL
Ca				LOW	NORMAL	NORMAL	NORMAL
QA			NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
QB			NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
QC			NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
TH20			NORMAL	NORMAL	NORMAL	NORMAL	NORMAL

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

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

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

## September Data

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

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

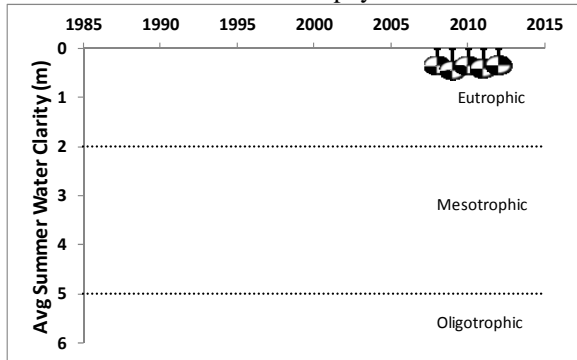
Low = average monthly reading < 10<sup>th</sup> percentile reading for lake, 2000-2010

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

## Appendix D- Long Term Trends: Black Pond

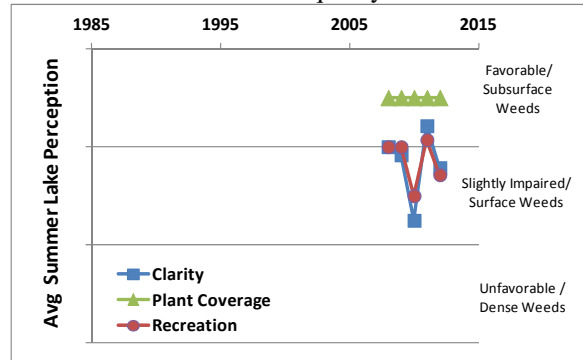
### Long Term Trends: Water Clarity

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



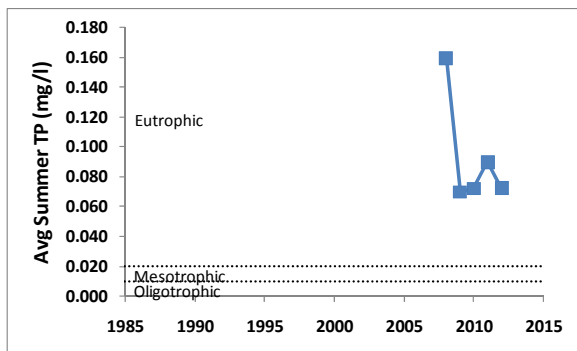
### Long Term Trends: Lake Perception

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



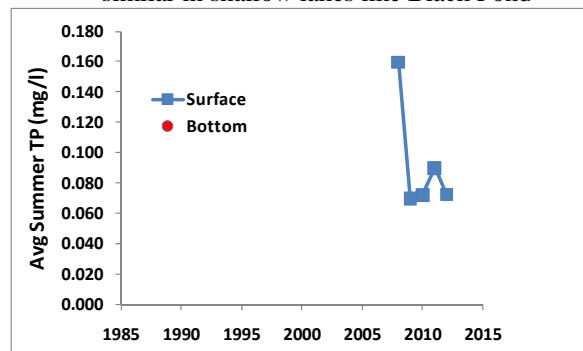
### Long Term Trends: Phosphorus

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



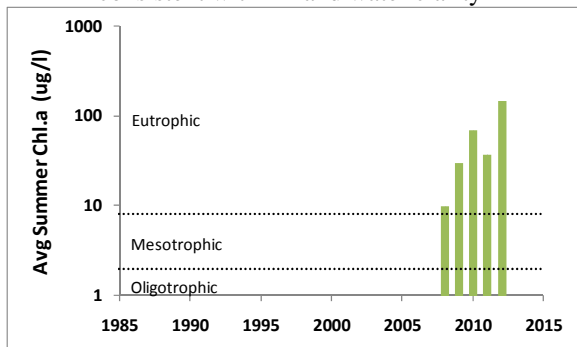
### Long Term Trends: Bottom Phosphorus

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



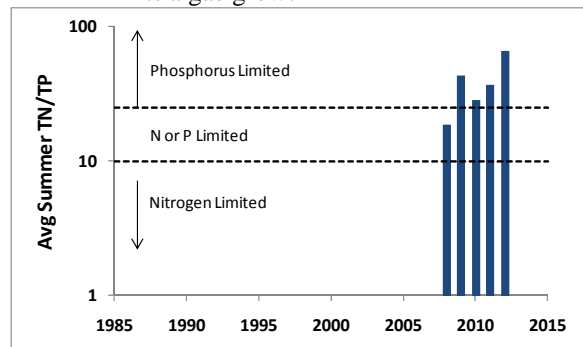
### Long Term Trends: Chlorophyll a

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



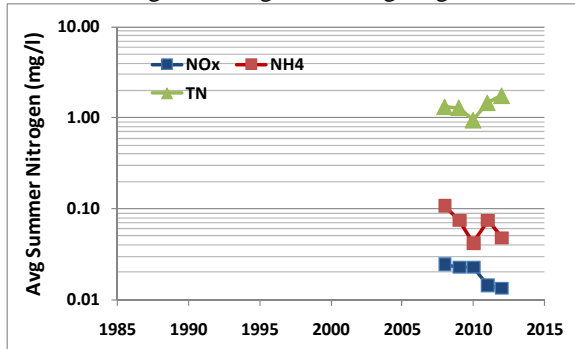
### Long Term Trends: N:P Ratio

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



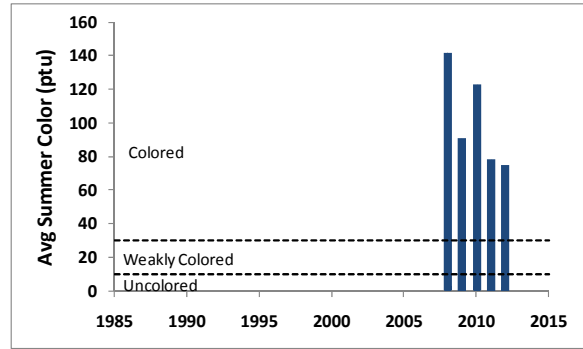
### Long Term Trends: Nitrogen

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



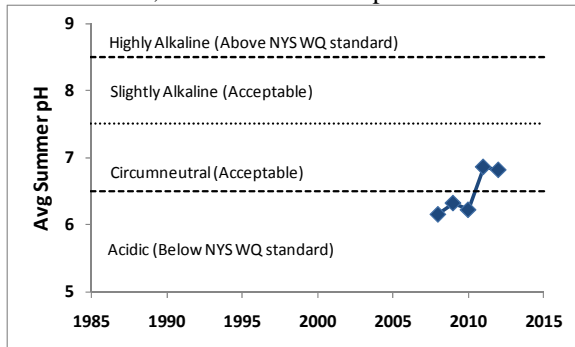
### Long Term Trends: Color

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



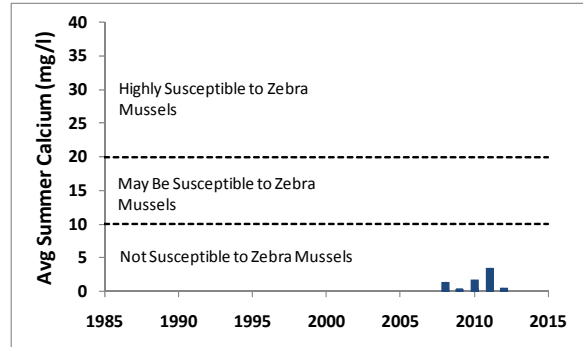
### Long Term Trends: pH

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



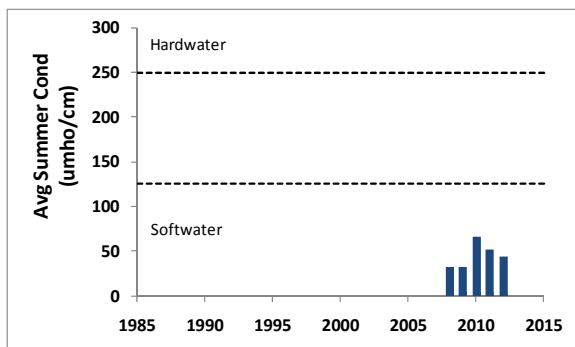
### Long Term Trends: Calcium

- 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

