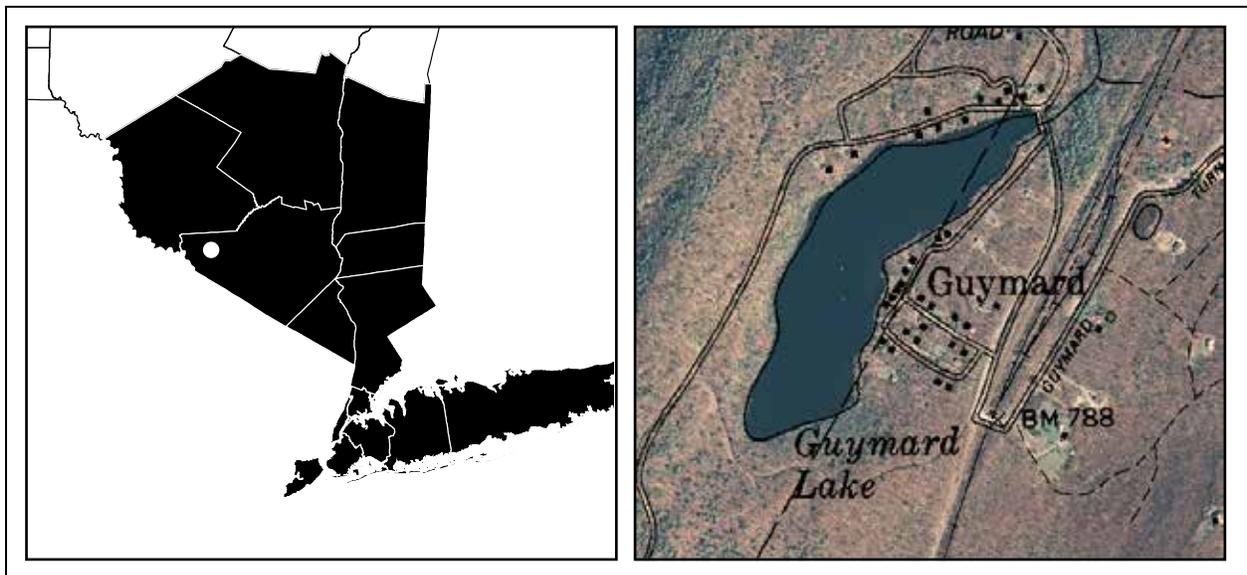


# CSLAP 2013 Lake Water Quality Summary: Lake Guymard

## General Lake Information

<b>Location</b>	Towns of Deerpark and Mount Hope
<b>County</b>	Orange
<b>Basin</b>	Delaware River
<b>Size</b>	13.6 hectares (33.6 acres)
<b>Lake Origins</b>	Natural/Augmented by 35' x 135' earthen dam (1858)
<b>Watershed Area</b>	114.0 hectares (281.6 acres)
<b>Retention Time</b>	0.4 years
<b>Mean Depth</b>	2.0 meters (estimated)
<b>Sounding Depth</b>	4.3 meters
<b>Public Access</b>	No public access
<b>Major Tributaries</b>	None
<b>Lake Tributary To...</b>	Minor Tribs to Hugeunot Creek to Lower Neversink River to Neversink River, Lower, Main Stem
<b>WQ Classification</b>	B
<b>Lake Outlet Latitude</b>	41.431855
<b>Lake Outlet Longitude</b>	-74.595546
<b>Sampling Years</b>	1997-2001, 2003, 2011-2013
<b>2013 Samplers</b>	Joe Bogaty
<b>Main Contact</b>	Joe Bogaty

## Lake Map



## **Background**

Lake Guymard is a 34 acre, class B lake found in the Town of Deerpark and Mount Hope in Orange County, in Catskill region of New York State. It was first sampled as part of CSLAP in 1997.

It is one of nine CSLAP lakes among the more than 145 lakes found in Orange County, and one of 12 CSLAP lakes among the more than 230 lakes and ponds in the Delaware River drainage basin.

## **Lake Uses**

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

It is not known by the report authors if Lake Guymard has been stocked by lake residents or municipal officials.

General statewide fishing regulations are applicable in Lake Guymard.

## **Historical Water Quality Data**

CSLAP sampling was conducted on Lake Guymard each year from 1997 to 2001, 2003, and 2011-2013. 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 Lake Guymard can also be found on the NYSDEC web page at <http://www.dec.ny.gov/lands/77852.html>.

## **Lake Association and Management History**

Lake Guymard is served by the Lake Guymard Association, which conducts a variety of lake management and stewardship activities, including management of the Brazilian elodea infestation.

## **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 –Lake Guymard” section in Appendix C.

### **Evaluation of Eutrophication Indicators**

Total phosphorus readings in Lake Guymard were higher than normal in each of the last three years, particularly in mid summer, leading to lower than normal water clarity, although measured algae levels continued to be low. The lower water clarity is part of a trend since the mid 1990s,

consistent with a long-term increase in algae levels and phosphorus readings. Lake productivity usually increases slightly during the summer, but there was not enough data collected in 2013 to evaluate seasonal trends.

The lake can be characterized as *mesotrophic*, based on water clarity, chlorophyll *a*, and total phosphorus readings (all typical of *mesotrophic* lakes). The trophic state indices (TSI) evaluation suggests that algae levels are lower than expected given the nutrient and water clarity readings. Although consistent with the fluoroprobe data from 2013 (as discussed below), this suggests that chlorophyll *a* levels might not accurately represent algae levels in the lake. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

### **Evaluation of Potable Water Indicators**

Algae levels may be 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, but the lake is not classified for this use. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

### **Evaluation of Limnological Indicators**

True color and pH readings were higher than normal in each of the last three years, and may have increased since first evaluated in the late 1990s. Each of the other limnological indicators (NO<sub>x</sub>, ammonia, total nitrogen, and conductivity) was close to normal in 2013, and it is likely that the small changes in these indicators from year to year represent normal variability. Overall limnological conditions are summarized in the Lake Scorecard and Lake Condition Summary Table.

### **Evaluation of Biological Condition**

There is only limited diversity of aquatic plants in the lake, perhaps due to the extent of Brazilian elodea (*Egeria densa*) in the lake. As a result, the modified floristic quality index (FQI) for the lake would likely indicate “poor” quality of the aquatic plant community.

Zooplankton, macroinvertebrate, and fisheries information has not been collected through CSLAP at Lake Guymard. The fluoroprobe samples analyzed by SUNY ESF in 2013 showed both low overall algae levels and low blue green algae levels. The limited sample analysis showed samples dominated by green algae and a blue green species (*Woronichina*) not associated with toxin production. It is likely that the lake supports a warmwater fishery.

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

### **Evaluation of Lake Perception**

Recreational assessments were close to normal in 2013, perhaps reflecting a balance of both less favorable water quality assessments (coincident with lower water transparency and a longer term degradation in these assessments) and lower coverage of aquatic plants. The latter might reflect active management. Lake perception degrades slightly during the typical summer, consistent with a slight seasonal increase in lake productivity, and perception improves slightly in the fall.

This was not apparent in 2013. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

### **Evaluation of Local Climate Change**

Water and air temperature readings were close to normal during the summer index period in 2013. Neither of these indicators has exhibited a clear long-term change, at least since first evaluated through CSLAP in the late 1990s.

### **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 readings have been below the levels indicating susceptibility for harmful algal blooms (HABs), confirmed by the fluoroprobe screening results from 2013 (showing low blue green algae levels). Algal toxins data indicate levels well below the criteria established to protect swimming. There have been some historical reports of blue green algal blooms, but none reported in recent years.

## Lake Condition Summary

Category	Indicator	Min	97-13 Avg	Max	2013 Avg	Classification	2013 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.80	2.88	4.50	2.10	Mesotrophic	Lower than Normal?	Decreasing Significantly
	Chlorophyll <i>a</i>	0.14	4.32	18.30	3.10	Mesotrophic	Within Normal Range	Increasing Significantly
	Total Phosphorus	0.008	0.023	0.249	0.087	Eutrophic	Higher than Normal	Increasing?
Potable Water Indicators	Hypolimnetic Ammonia							
	Hypolimnetic Arsenic							
	Hypolimnetic Iron							
	Hypolimnetic Manganese							
Limnological Indicators	Hypolimnetic Phosphorus							
	Nitrate + Nitrite	0.00	0.01	0.13	0.01	Low NOx	Lower Than Normal	No Change
	Ammonia	0.00	0.03	0.10	0.03	Low Ammonia	Within Normal Range	No Change
	Total Nitrogen	0.06	0.40	1.09	0.41	Low Total Nitrogen	Within Normal Range	No Change
	pH	6.42	7.38	9.53	7.72	Circumneutral	Higher than Normal	Increasing Slightly
	Specific Conductance	88	139	172	139	Intermediate Hardness	Within Normal Range	No Change
	True Color	4	15	54	36	Intermediate Color	Higher than Normal	Increasing Significantly
	Calcium	5.7	6.6	7.2		Not Susceptible to Zebra Mussels		No Change
Lake Perception	WQ Assessment	1	2.2	3	3.0	Not Quite Crystal Clear	Less Favorable than Normal	Slightly Degrading
	Aquatic Plant Coverage	1	2.2	3	1.0	Subsurface Plant Growth	Less Extensive Than Normal	No Change
	Recreational Assessment	1	2.0	3	2.3	Excellent	Within Normal Range	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Poor 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					Not known	Not known	Not known
	Invasive Species					Brazilian elodea	Not known	Not known
Local Climate Change	Air Temperature	15	25.1	40	26.5		Within Normal Range	No Change
	Water Temperature	8	22.4	29	19.9		Within Normal Range	No Change
Harmful Algal Blooms	Open Water Phycocyanin	1	16	70	4	No readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	4	10	4	No readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	1	4	1	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<0.30	0.3	0.7	0.4	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**

Lake Guymard is presently among the lakes cited on the 2001 Delaware River Basin Priority Waterbody List (PWL) as “unassessed”.

### **Potable Water (Drinking Water)**

The CSLAP dataset at Lake Guymard, 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 classified for this use. The limited CSLAP data suggest that “unofficial” potable water use may be threatened by excessive algae, although this has not been apparent in recent years.

### **Contact Recreation (Swimming)**

The CSLAP dataset at Lake Guymard, including water chemistry data, physical measurements, and volunteer samplers’ perception data, suggests that swimming and contact recreation may be *threatened* by excessive nutrient and algae levels, although these impacts have not been apparent in many years. Bacterial data would need to be collected to evaluate the safety of the water for swimming.

### **Non-Contact Recreation (Boating and Fishing)**

The CSLAP dataset on Lake Guymard, including water chemistry data, physical measurements, and volunteer samplers’ perception data, suggest that non-contact recreation should be fully supported, although this use may be *threatened* by excessive growth of Brazilian elodea.

### **Aquatic Life**

The CSLAP dataset on Lake Guymard, including water chemistry data, physical measurements, and volunteer samplers’ perception data, suggest that aquatic life may be *threatened* by the presence of Brazilian elodea, although actual impacts have not been observed, and additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

### **Aesthetics**

The CSLAP dataset on Lake Guymard, including water chemistry data, physical measurements, and volunteer samplers’ perception data, suggest that aesthetics should be fully supported, although aesthetics may ultimately be *threatened* by Brazilian elodea and shoreline algae blooms.

### **Fish Consumption**

There are no fish consumption advisories posted for Lake Guymard.

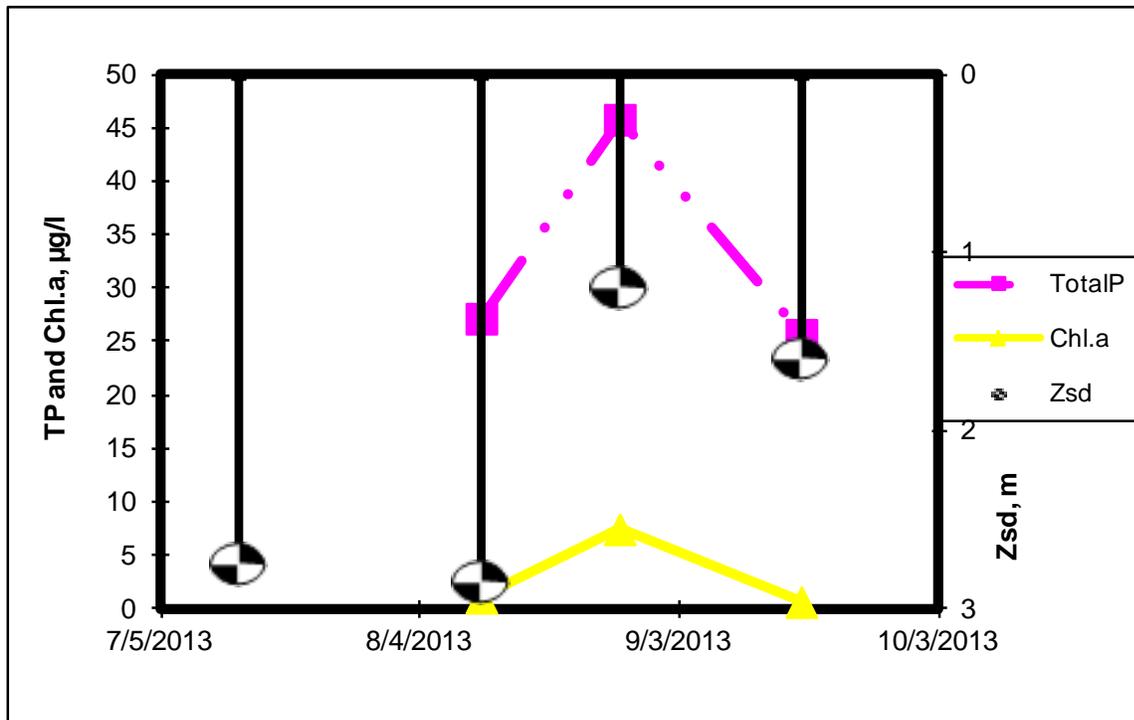
## **Additional Comments and Recommendations**

Continuing plant survey information should be collected to determine if the plant community (and other aquatic life uses) have been affected by Brazilian elodea. Lake residents should report and avoid direct exposure to any shoreline blooms.

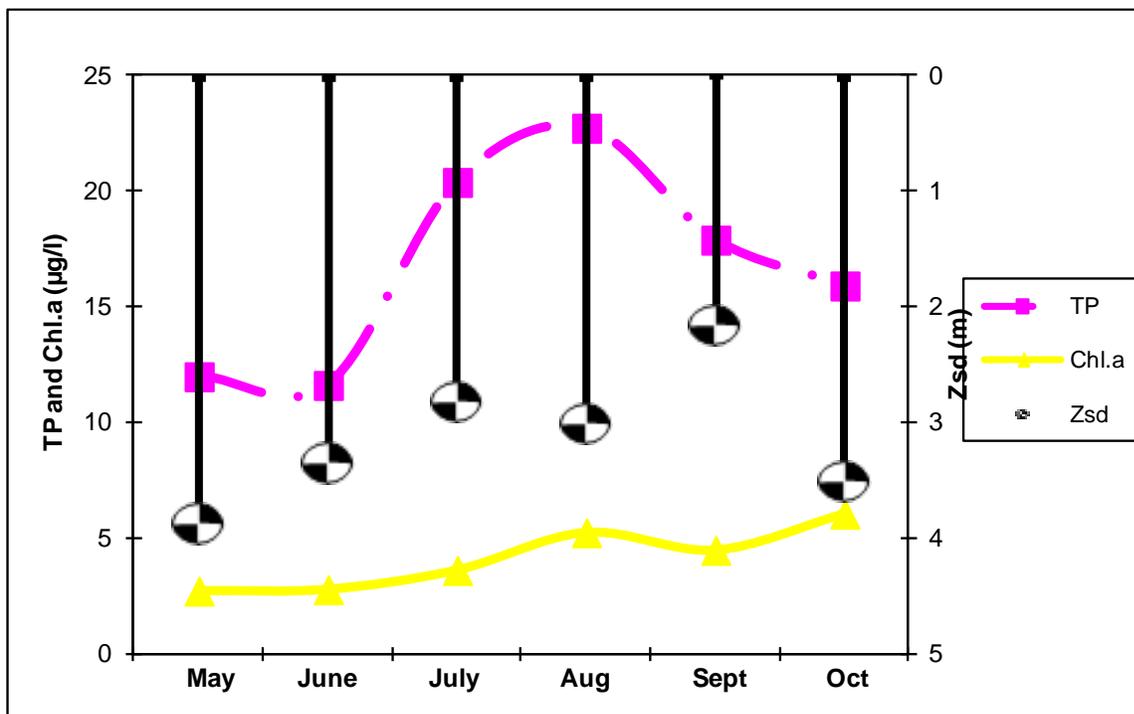
### **Aquatic Plant IDs-2013**

None submitted for identification

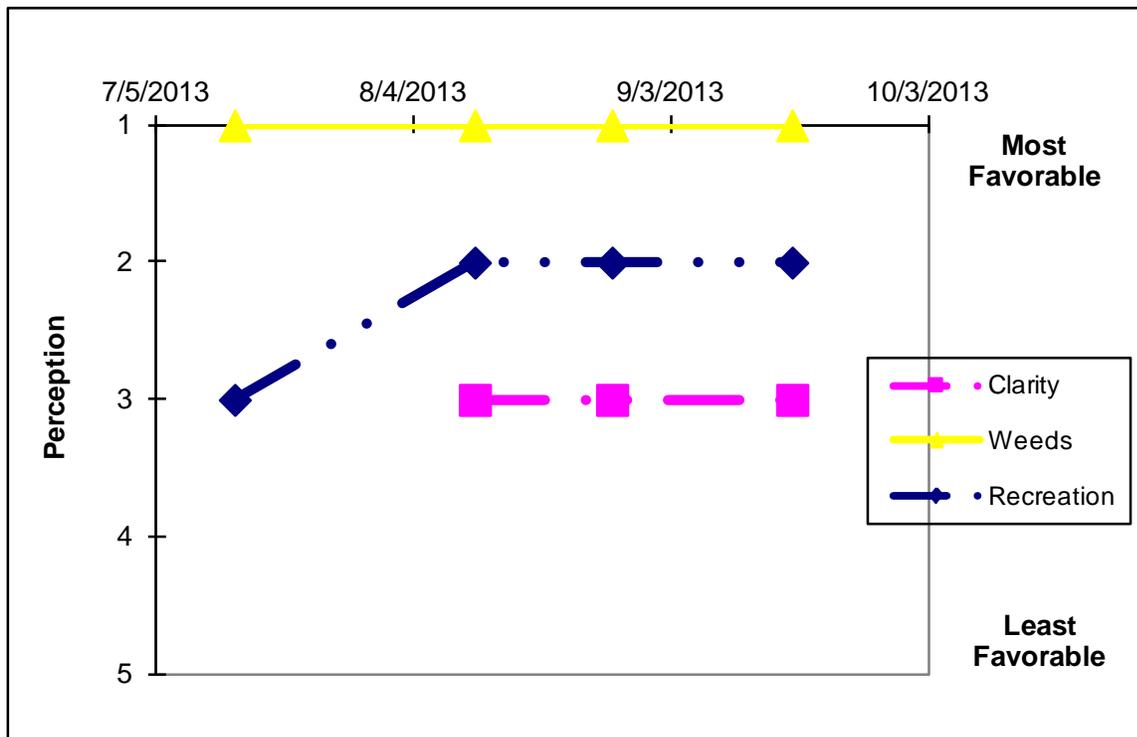
### Time Series: Trophic Indicators, 2013



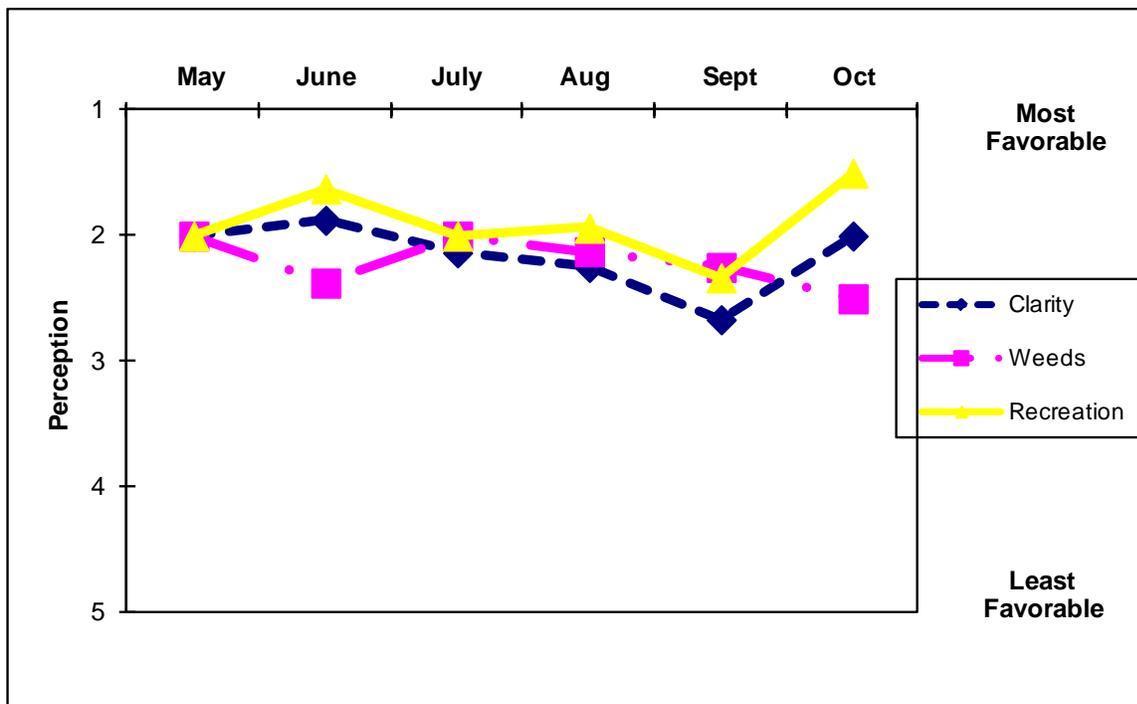
### Time Series: Trophic Indicators, Typical Year (1997-2013)



## Time Series: Lake Perception Indicators, 2013



## Time Series: Lake Perception Indicators, Typical Year (1997-2013)



## Appendix A- CSLAP Water Quality Sampling Results for Lake Guymard

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a
132	L Guymard	5/26/1997	4.6	3.88	1.5	0.012	0.01				7	6.72	147		2.73
132	L Guymard	6/15/1997	4.4	4.40	1.5	0.008	0.01				5	7.55	148		0.80
132	L Guymard	6/29/1997	4.3	3.50		0.009	0.01				5	7.15	151		3.67
132	L Guymard	7/13/1997	4.2	2.85	1.5	0.011	0.01				5	6.46	154		2.59
132	L Guymard	7/27/1997	4.0	2.80		0.016	0.01				5	7.08	155		0.14
132	L Guymard	8/13/1997	4.0	3.55		0.014	0.01				8	7.49	153		1.09
132	L Guymard	8/24/1997	4.0	4.00	1.0	0.013	0.01				7	6.86	150		0.19
132	L Guymard	9/7/1997				0.015	0.01				5	7.79	151		2.16
132	L Guymard	6/29/1998	4.5	4.50		0.016	0.01				4				1.61
132	L Guymard	7/13/1998	4.3	3.60			0.01				13	7.50	123		1.95
132	L Guymard	7/26/1998	4.2	3.50	1.5		0.01				4	7.43	126		5.80
132	L Guymard	8/9/1998		3.50	1.0		0.01				6	7.61	126		0.36
132	L Guymard	8/24/1998	4.1	4.10	4.1						8	6.83	128		0.90
132	L Guymard	9/13/1998	3.5	1.30		0.023					17	7.46	133		4.85
132	L Guymard	9/30/1998	3.5	3.00	1.0	0.023					8	6.96	135		8.10
132	L Guymard	10/12/1998	3.8	2.50	1.0	0.021					6	7.38	133		18.30
132	L Guymard	6/22/1999	4.5	3.00	1.5	0.013	0.01				8	7.48	160		5.50
132	L Guymard	7/6/1999		2.80	1.5	0.016	0.01				18	7.12	161		2.59
132	L Guymard	7/19/1999		3.40	1	0.029	0.01				8	7.56	163		3.16
132	L Guymard	8/2/1999	3.7	3.65	1	0.018	0.01				6	7.60	163		2.15
132	L Guymard	8/18/1999		3.63	1	0.010	0.01				5	7.03	172		2.34
132	L Guymard	9/13/1999	3.0	3.00	1	0.017	0.01				7	7.76	165		4.00
132	L Guymard	9/26/1999	3.5	3.50	1	0.014	0.03				9	6.97	140		8.60
132	L Guymard	10/11/1999	4.5	4.50	1	0.014	0.01				7	6.42	141		2.22
132	L Guymard	6/25/2000	4.5	2.93	1.0	0.012	0.01				14	7.75	135		0.29
132	L Guymard	7/8/2000	4.3	3.60	1.5	0.012	0.01				7	7.68	136		2.66
132	L Guymard	7/23/2000	4.3	3.20	1.5	0.016	0.01				8	6.90	135		4.07
132	L Guymard	8/7/2000	4.4	2.55		0.013	0.01				4	7.62	130		4.78
132	L Guymard	8/20/2000	4.2	3.80	1.5	0.014					8	7.07	126		0.44
132	L Guymard	9/4/2000	4.4	2.45	1.5	0.012					10	6.42	122		2.10
132	L Guymard	9/19/2000	2.6	2.60	1.5	0.021	0.01				7	7.69	125		2.64
132	L Guymard	10/1/2000	2.9	2.90		0.016					8	7.46	124		4.32
132	L Guymard	6/10/2001	4.4	3.00		0.014	0.01				4	7.59	156		1.74
132	L Guymard	6/24/2001	4.4	3.20		0.010	0.02				4	6.95	152		4.10
132	L Guymard	7/8/2001	2.8	2.80		0.019	0.01				8	7.07	151		2.94
132	L Guymard	7/22/2001	2.7	2.35		0.008	0.01				4	7.29	153		1.39
132	L Guymard	8/6/2001	4.0	2.95		0.012	0.01				4	7.31	156		3.43
132	L Guymard	8/19/2001	3.4	2.05		0.012	0.01				15	6.89	155		
132	L Guymard	9/3/2001	3.8	1.55		0.012	0.01				16	7.29	156		
132	L Guymard	9/16/2001	3.2	1.85		0.020	0.01				9	7.66	160		4.15
132	L Guymard	6/23/2003	4.6	2.30	1.5	0.016	0.025	0.010	0.19	12.2	6	7.0	146	7.2	4.60
132	L Guymard	7/8/2003	4.3	4.15	13.4	0.014	0.007	0.003	0.18	12.9	12	7.3	149		1.46
132	L Guymard	7/29/2003	4.5	3.00	1.2	0.016	0.034	0.003	0.06	3.8	24	7.2	144		2.38
132	L Guymard	8/13/2003	4.6	2.81	0.9	0.011	0.003	0.019	0.46	40.9	46	7.2	138		3.00
132	L Guymard	8/26/2003	4.3	1.40	0.9	0.020	0.133	0.095	0.36	17.9	54	8.0	145	7.1	18.19
132	L Guymard	9/22/2003	4.4	1.40	0.9	0.025	0.027	0.080	0.50	20.6	50	7.0	144		6.79
132	L Guymard	10/13/2003	4.5	4.15	1.0	0.015	0.029	0.082	0.31	20.9	15	7.1	137		1.54
132	L Guymard	7/10/2011	3.5	2.15	1.5	0.045	0.005	0.020	0.47	22.9	54	8.7	129	5.9	2.70
132	L Guymard	7/23/2011	3.4	1.43	3.4	0.023	0.039	0.042	0.45	43.8	12	9.5	127		6.70
132	L Guymard	8/8/2011	3.5	2.43	1.5	0.027	0.013	0.028	0.53	43.5	39	7.1	123		16.40
132	L Guymard	9/13/2011	3.3	1.55	1.5	0.010	0.005	0.022	0.34	77.9		7.0	95		
132	L Guymard	9/28/2011	3.4	2.15	1.5	0.016	0.005	0.023	0.31	43.4	15	8.0	90	5.7	5.30
132	L Guymard	10/18/2011				0.014	0.005	0.019	0.34	53.7	13	7.4	88		3.90
132	L Guymard	7/8/2012	3.0	0.80	1.5	0.040	0.005	0.021	0.43	23.5	49	7.4	108	7.2	13.80
132	L Guymard	8/19/2012		3.75	5.0	0.081	0.005	0.051	1.09	29.4	19	8.3	113		16.90
132	L Guymard	7/14/2013		2.75	3.0		0.005	0.021	0.24	2.1	9	7.1	139		
132	L Guymard	8/11/2013		2.85	2.0	0.027			0.42	33.9	45	7.4	130		1.10
132	L Guymard	8/27/2013	3.0	1.20	1.0	0.046	0.005	0.030	0.50	23.9	46	8.8	161		7.50
132	L Guymard	9/17/2013	3.2	1.60		0.026			0.49	41.6	42	7.6	127		0.70

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
132	L Guymard	5/26/1997	epi	18	19	2	2	2												
132	L Guymard	6/15/1997	epi		26	1	2	2												
132	L Guymard	6/29/1997	epi	29	29	2	2	1												
132	L Guymard	7/13/1997	epi	35	29	2	1	1												
132	L Guymard	7/27/1997	epi	27	28	2	2	2	6											
132	L Guymard	8/13/1997	epi	27		2	2	1												
132	L Guymard	8/24/1997	epi	25	23	2	2	2												
132	L Guymard	9/7/1997	epi																	
132	L Guymard	6/29/1998	epi	24	27	2	3	1	5											
132	L Guymard	7/13/1998	epi	40	26	2	2	2												
132	L Guymard	7/26/1998	epi	28	26	2	2	2												
132	L Guymard	8/9/1998	epi	27	28	1	3	1												
132	L Guymard	8/24/1998	epi	34	27	2	3	1												
132	L Guymard	9/13/1998	epi	27	25	3	3	3	1											
132	L Guymard	9/30/1998	epi	15	17	3	3	3	15											
132	L Guymard	10/12/1998	epi	17	14	3	3	2	5											
132	L Guymard	6/22/1999	epi	25	24	3	3	2	16											
132	L Guymard	7/6/1999	epi	33	29	3	3	2												
132	L Guymard	7/19/1999	epi	27	25	2	3	2	15											
132	L Guymard	8/2/1999	epi	22	25	3	3	3	1											
132	L Guymard	8/18/1999	epi	23	23	2	2	2	1											
132	L Guymard	9/13/1999	epi	17	21	3	3	3	6											
132	L Guymard	9/26/1999	epi	21	16	3	3	2	15											
132	L Guymard	10/11/1999	epi	18	14	1	2	1	5											
132	L Guymard	6/25/2000	epi	32	23	2	2	2												
132	L Guymard	7/8/2000	epi	32	24	2	2	1												
132	L Guymard	7/23/2000	epi	25	22	2	2	2												
132	L Guymard	8/7/2000	epi	25	23	2	2	2												
132	L Guymard	8/20/2000	epi	24	22	2	2	2												
132	L Guymard	9/4/2000	epi	26	23	2	2	2												
132	L Guymard	9/19/2000	epi	18	17	2	2	2												
132	L Guymard	10/1/2000	epi	19	15	2	2	2												
132	L Guymard	6/10/2001	epi	29	20	2	2	2	1											
132	L Guymard	6/24/2001	epi	24	22	2	2	2												
132	L Guymard	7/8/2001	epi	19	23	2	2	2	5											
132	L Guymard	7/22/2001	epi	26	24	2	2	2												
132	L Guymard	8/6/2001	epi	32	27	2	2	2												
132	L Guymard	8/19/2001	epi	20	23	3	2	3	1											
132	L Guymard	9/3/2001	epi	20	23	3	2	3	14											
132	L Guymard	9/16/2001	epi	24	19	3	2	3	13											
132	L Guymard	6/23/2003	epi	26	19	1	3	1	0											
132	L Guymard	7/8/2003	epi	26	26	1	3	1	0											
132	L Guymard	7/29/2003	epi	27	27	2	1	1	0											
132	L Guymard	8/13/2003	epi	26	8	1	1	1	0											
132	L Guymard	8/26/2003	epi	27	25	2	3	2	0											
132	L Guymard	9/22/2003	epi	20	19	3	3	2	0											
132	L Guymard	10/13/2003	epi	21	17	2	3	1	0											
132	L Guymard	7/10/2011	epi	27	25	2	3	3	2	0	0	11.30	13.00							
132	L Guymard	7/23/2011	epi	30	28	3	2	3	0	0	0	18.10	7.31							
132	L Guymard	8/8/2011	epi	26	25	3	2	2	8	0	0	18.10	10.80	0.64	<0.5	<0.1				
132	L Guymard	9/13/2011	epi	21	21	2	1	1	0	0	0	6.60	3.60							
132	L Guymard	9/28/2011	epi	23	19	2	2	2	0	0	0	9.70	5.60							
132	L Guymard	10/18/2011	epi									69.60	7.10							
132	L Guymard	7/8/2012	epi	31	25	3	1	3	1	0	0	20.40	1.30	<0.30	<0.423		6.90	3.95	B	
132	L Guymard	8/19/2012	epi	16	20	3	3	3	1	0	0	21.00	1.80	<0.30	<0.551		3.02	1.82		
132	L Guymard	7/14/2013	epi	32	26		1	3	1			0.80	0.40	0.69	<0.390		0.00	0.00		
132	L Guymard	8/11/2013	epi	26	24	3	1	2	1	0	0	3.00	8.60	<0.30	<0.340		9.90	0.30	F	
132	L Guymard	8/27/2013	epi	22	9	3	1	2	0	0	0	9.20	4.00	0.24	<0.570		3.90	2.70		
132	L Guymard	9/17/2013	epi		20	3	1	2	0	0	0	2.40	3.50				2.40	0.00		

## Legend Information

<i>Indicator</i>	<i>Description</i>	<i>Detection Limit</i>	<i>Standard (S) / Criteria (C)</i>
<b>General Information</b>			
Lnum	lake number (unique to CSLAP)		
Lname	name of lake (as it appears in the Gazetteer of NYS Lakes)		
Date	sampling date		
<b>Field Parameters</b>			
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
<b>Laboratory Parameters</b>			
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	Cylindrospermopsis (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
<b>Lake Assessment</b>			
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 Lake Guymard Data, 2006-2013

### June Data

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

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	2013
Zsd						NORMAL	LOW	NORMAL
TP						HIGH	HIGH	HIGH
Chl.a						NORMAL	HIGH	
NOx						NORMAL	NORMAL	
NH4						NORMAL	NORMAL	NORMAL
TN						NORMAL	NORMAL	NORMAL
pH						HIGH	NORMAL	NORMAL
SpCond						NORMAL	LOW	NORMAL
Color						NORMAL	HIGH	NORMAL
Ca						NORMAL	HIGH	
QA						NORMAL	NORMAL	
QB						NORMAL	NORMAL	NORMAL
QC						NORMAL	NORMAL	NORMAL
TH20						HIGH	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

## August Data

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

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

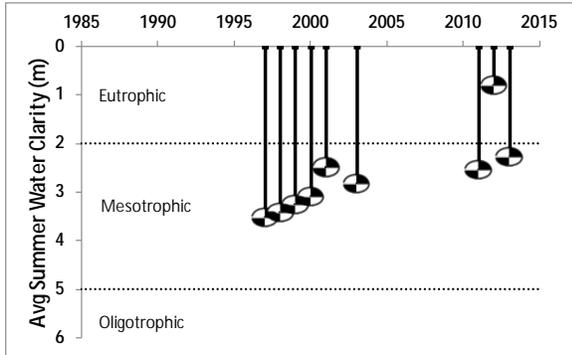
Low = average monthly reading < 10<sup>th</sup> percentile reading for lake, 2000-2010

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

# Appendix D- Long Term Trends: Lake Guymard

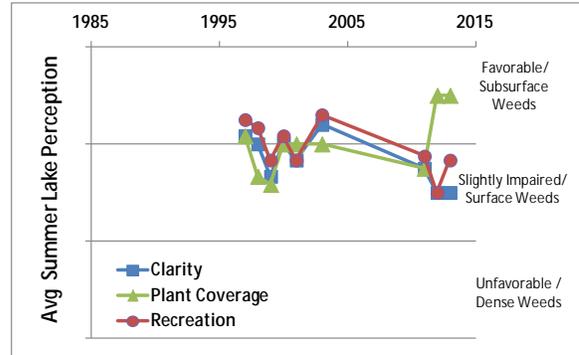
## Long Term Trends: Water Clarity

- Decreasing clarity since late 1990s
- Most readings typical of *mesoeutrophic* lakes, consistent with TP but not algae levels



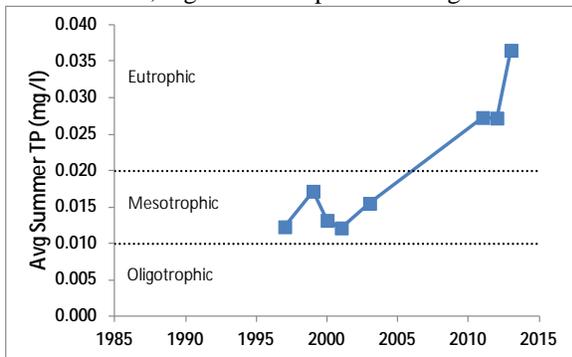
## Long Term Trends: Lake Perception

- Water quality assessments degrading?
- Recreational perception closely linked to changes in both water quality and weeds



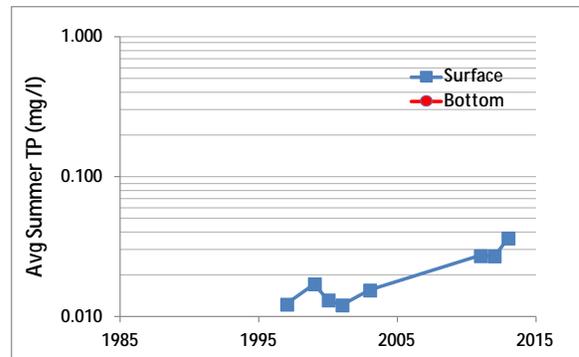
## Long Term Trends: Phosphorus

- TP levels increasing since mid 2000s
- Most readings now typical of *eutrophic* lakes, higher than expected for algae levels



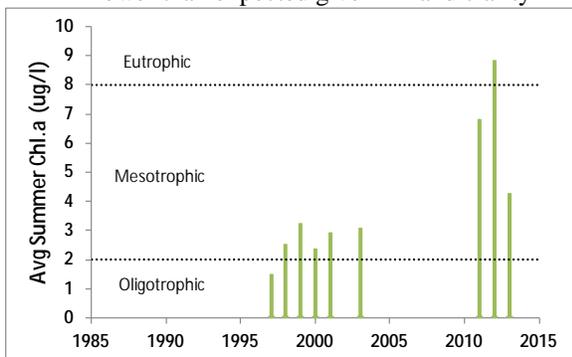
## Long Term Trends: Bottom Phosphorus

- No bottom TP data
- Surface and bottom TP usually similar in shallow lakes



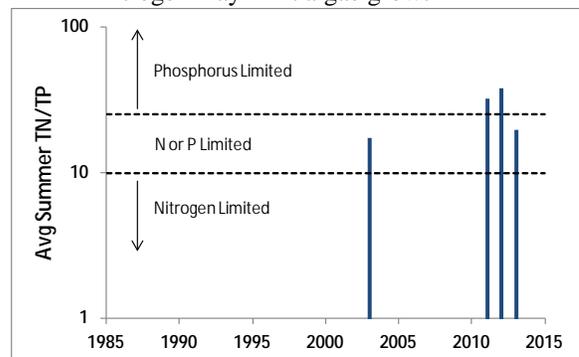
## Long Term Trends: Chlorophyll a

- Algae levels higher in last three years
- Most readings typical of *mesotrophic* lakes, lower than expected given TP and clarity



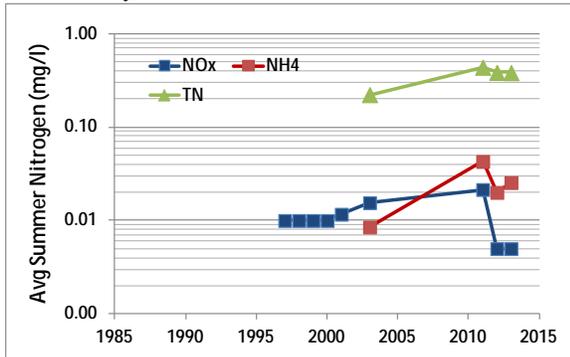
## Long Term Trends: N:P Ratio

- No trends apparent
- Most readings indicate phosphorus or nitrogen may limit algae growth



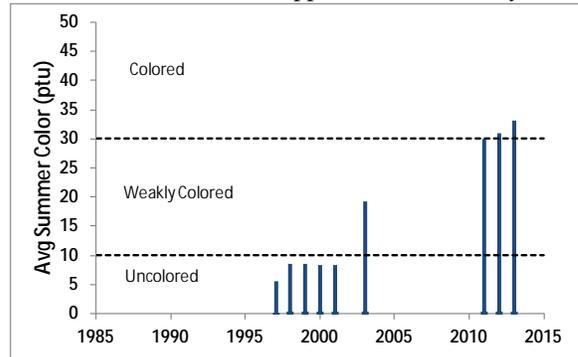
### Long Term Trends: Nitrogen

- No trends apparent in any nitrogen tests
- Some variability in nitrogen levels from year to year



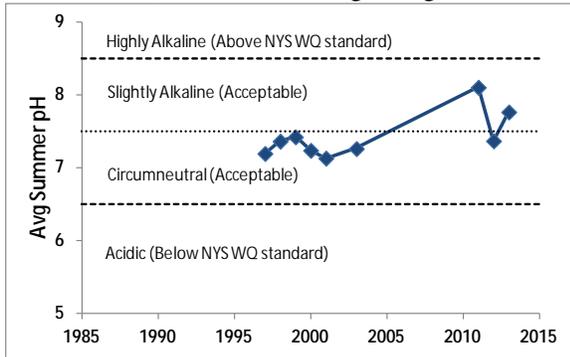
### Long Term Trends: Color

- Much higher color after lab change in 2002
- Most readings typical of *weakly colored* lakes, but do not appear to affect clarity



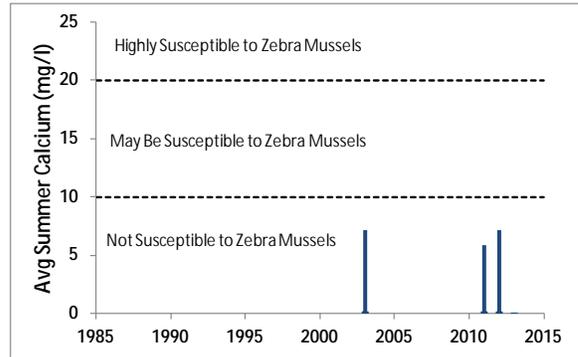
### Long Term Trends: pH

- pH increasing since early 2000s
- Most readings now typical *slightly alkaline* lakes, consistent with higher algae levels



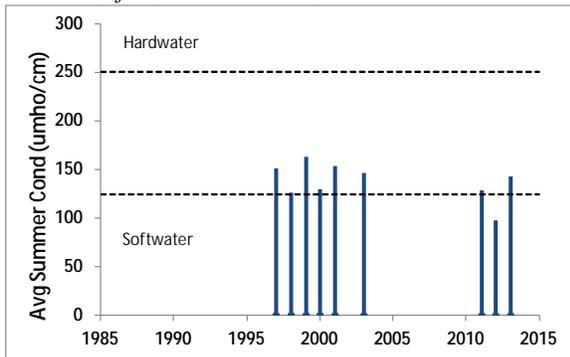
### Long Term Trends: Calcium

- No trends apparent
- Most readings indicate low susceptibility to zebra mussels



### Long Term Trends: Conductivity

- Slight decrease but no clear trends apparent
- Most readings typical of lakes with *softwater to intermediate hardness*



### Long Term Trends: Water Temperature

- Slight decrease but no clear trends apparent
- Surface and bottom temperatures usually similar in shallow lakes

