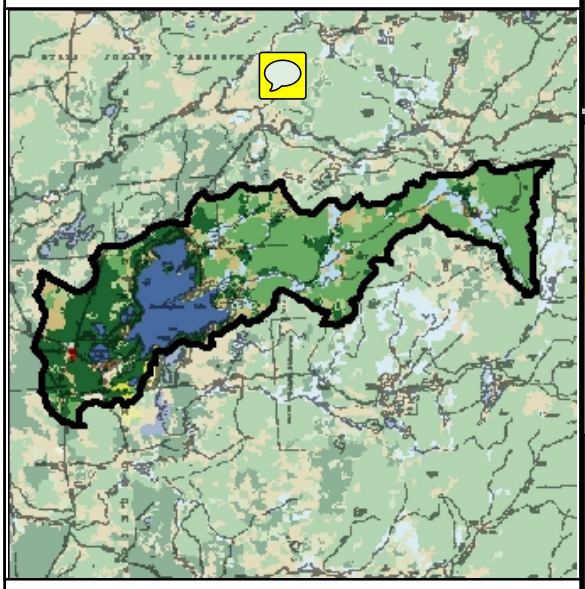
Brantingham Lake, Lewis Co., Brantingham Community Association

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation



Lake Characteristics

Surface Area (ac/ha)	327	132
Max Depth (ft/m)	60	18
Mean Depth (ft/m)	28	9
Retention Time (years)	2.25	
Water Class	A	
Dam Class	A	

Watershed Characteristics

Watershed Area(ac/ha)	2914	1179
Watershed/Lake Ratio	9	
Lake and Wetlands	18.6%	
Agricultural	0.8%	
Forests, shrubs, grasses	80.2%	
Residential	0.4%	
Urban	0.0%	

CSLAP Participation

Years	2001-2010, 2012-2017
Volunteers	Chris Murphy, Karen Murphy

Trophic State	HABs Susceptibility	Invasive Vulnerability	PWL Assessment
Mesoligotrophic	Low	Low	Threatened

Open Water Indicators	2017 Sampling Results								Seasonal Change	Long Term Avg.
	6/11	7/3	7/8	7/16	7/26	8/13	9/2	9/18		
Chl.a (µg/L)	5.4	3.4	4.8	7	6.7	8.8	4.5	6.9		4.2
BG Chl.a (µg/L)	0.6	1.3	0.4	1.0	0.7	1.1	1.4	0.4		0.8
Clarity (m)	2.4	1.7	2	2.6	2	2.3	2.4	3.4		3.6
pH	7.9	7.8	7.6	7.2	8.8	7.6	7.1	7.6		7.3
Cond (µmho/cm)	27.5	22.8	24.4	24.8	32.2	25.7	30.4	26		33
Surf Temp (°C)	22	22	24	25	23	24	23	21		21
Bott Temp (°C)	19	7	8	8	7	9	10	8		8
TN (mg/L)	.307	.376	.488	.415	.27	.238	.312	.174		0.339
TP (mg/L)	.01	.009	.011	.01	.009	.007	.009	.008		0.009
Deep TP (mg/L)	.008	.035	.012	.011	.018	.013	.013	.033		0.018
N:P Ratio	31	42	44	42	30	34	35	22		

Shoreline bloom and HABs notifications

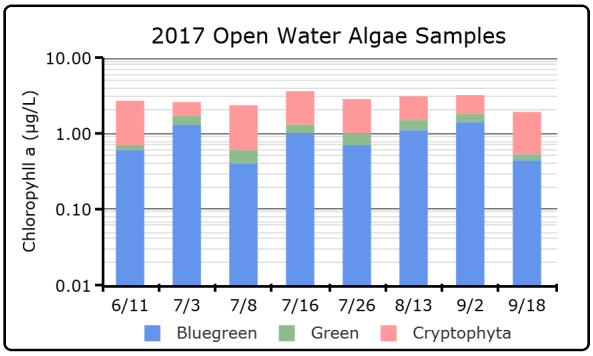
Date of first listing	Date of last listing	# of weeks on DEC notification list	# of weeks with updates

Shoreline HAB Sample Dates 2017

HAB Indicators	HAB Criteria										
BGA	25 µg/L	NA									
Microcystin	20 µg/L	NA									
Anatoxin-a		NA									

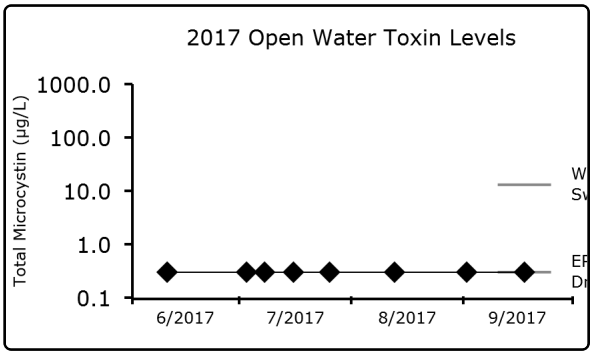
HAB Status

2017 Open Water Algae Samples



2017 Shoreline Algae Samples

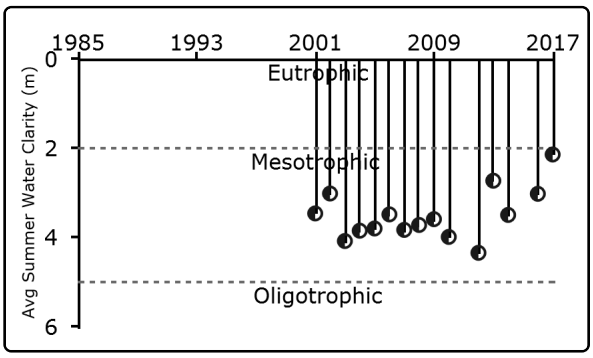
2017 Open Water Toxin Levels



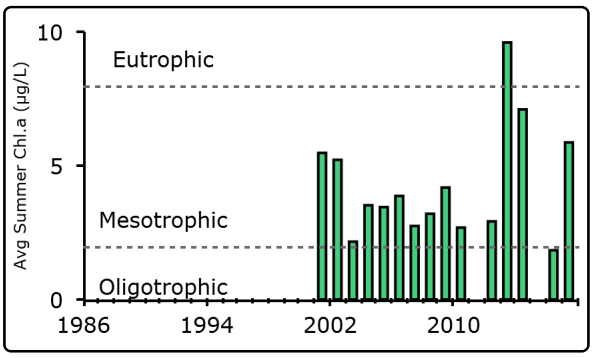
2017 Shoreline Toxin Levels

Brantingham Lake Long Term Trend Analysis

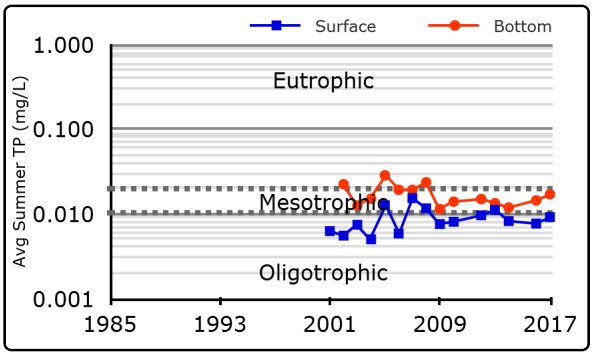
Clarity



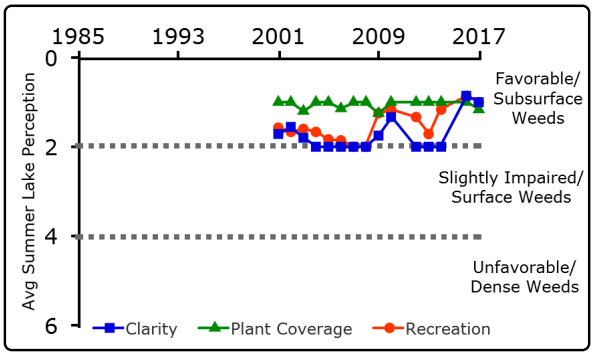
Chlorophyll a



Surface and Deep Phosphorus

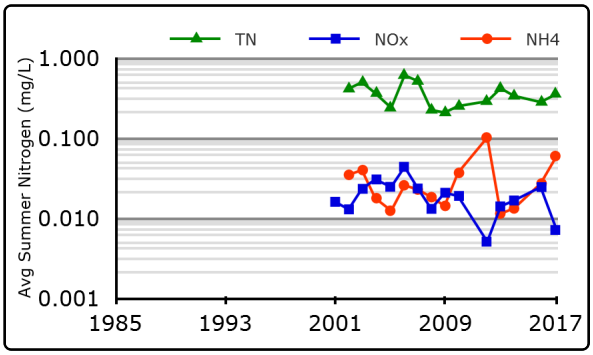


Lake Perception

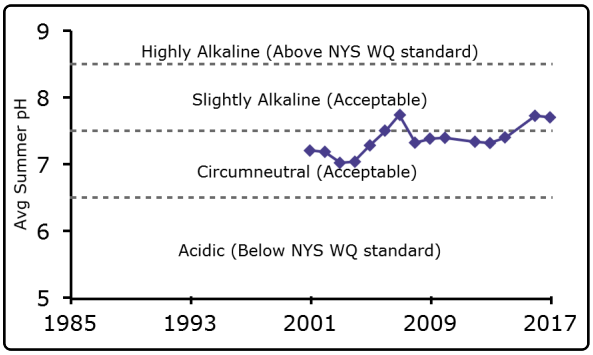


Brantingham Lake Long Term Trend Analysis

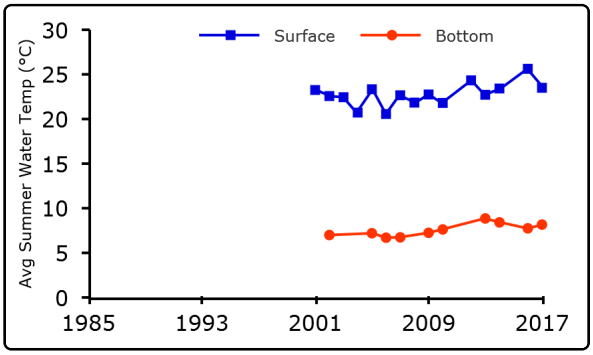
Nitrogen



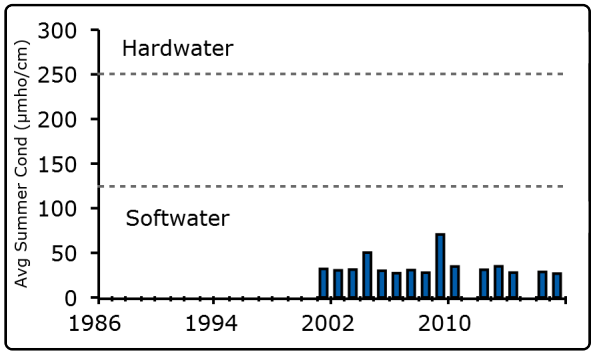
pH



Temperature

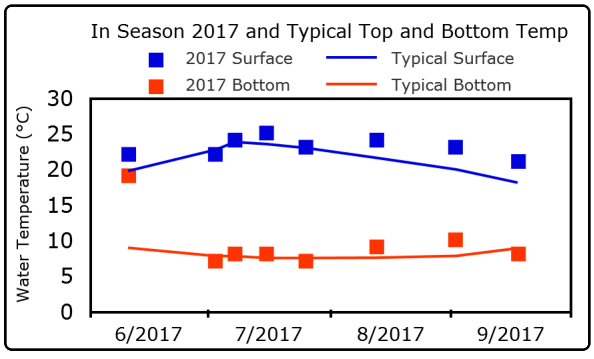


Specific Conductance

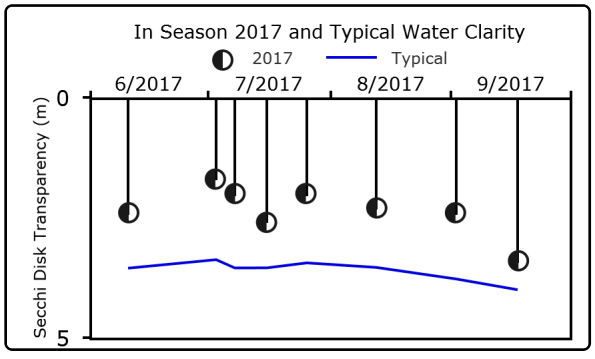


Brantingham Lake In-Season Analysis

In Season Temperature



In Season Water Clarity



Scorecard

Lake Use

	PWL	Average Year	2017	Primary Issue
Potable Water	▲	◆	◆	**Algae levels**
Swimming	▲	●	●	**No impacts**
Recreation	●	●	●	**No impacts**
Aquatic Life	□	●	●	**No impacts**
Aesthetics	□	●	●	**No impacts**
Habitat	□	●	●	**No impacts**
Fish Consumption	□	□	□	**Not applicable**

- ● Supported/Good
- ▲ Threatened/Fair
- ◆ Stressed/Poor
- ■ Impaired
- □ Not Known

Summary

2017 compared to prior years: Brantingham Lake continues to be mesoligotrophic, although water clarity was substantially lower than usual in 2017, coincident with consistently higher algae levels. (Overall) nutrient levels were close to normal, suggesting either higher than usual dissolved nutrients or a change in the biological community.

Compared to nearby lakes: Brantingham Lake usually has similar water clarity, nutrient and algae levels to other western Adirondack lakes, although water clarity was lower and algae levels higher in 2017 than in other nearby lakes. Aquatic plant coverage is slightly lower than in many of these other lakes, consistent with the lack of aquatic invasive species. Chloride levels continue to be in the range of background levels in New York state lakes, indicating little potential for aquatic life impacts from road salt.

Trends: Deepwater phosphorus readings have decreased over the last decade, while pH and deepwater temperatures have increased. Recreational perception has improved slightly in recent years, despite periodic low water clarity, suggesting that these assessments are not closely aligned with changes in water quality.

Algal blooms and HABS: Water quality conditions indicated a low susceptibility to blooms, and none have been reported on the lake. The algae community in the open water samples is comprised of several different taxa, and overall algae levels are low.

Aquatic invasive species: Brantingham Lake has no known invasive species, and no AIS have been reported in any lakes within 15 miles. Overall vulnerability to AIS appears to be fairly low, despite a town boat launch.

Indicated Actions: Individual stewardship activities such as pumping your septic system, growing a buffer of native plants next to the water bodies, and reducing erosion from shoreline properties and runoff into the lake will help to improve lake health by reducing nutrient and sediment loading to the lake. Visiting boats should be inspected to reduce the risk of new invasive species, although no nearby lakes have documented any AIS. Continued monitoring for invasive species is warranted. Continued algae bloom education and monitoring for HABs is recommended, given an apparent (if short-term) increase in algae levels.

How to Read the Report

This guide provides a description of the CSLAP report by section and a glossary. The sampling site is indicated in the header for lakes with more than one routine sampling site.

Physical Characteristics influence lake quality:

- Surface area is the lake's surface in acres and hectares.
- Max depth is the water depth measured at the deepest part of the lake in feet and meters.
- Mean depth is either known from lake bathymetry or is 0.46 of the maximum depth.
- Retention time is the time it takes for water to pass through a lake in years. This indicates the influence of the watershed on lake conditions.
- Lake classification describes the "best uses" for this lake. Class AA, AAspec, and A lakes may be used as sources of potable water. Class B lakes are suitable for contact recreational activities, like swimming. Class C lakes are suitable for non-contact recreational activities, including fishing, although they may still support swimming. The addition of a T or TS to any of these classes indicates the ability of a lake to support trout populations and/or trout spawning.
- Dam classification defines the hazard class of a dam. Class A, B, C, and D dams are defined as low, intermediate, high, or negligible/no hazard dams in that order. "0" indicates that no class has been assigned to a particular dam, or that no dam exists.

Watershed characteristics influence lake water quality:

- Watershed area in acres and hectares
- Land use data come from the most recent (2011) US Geological Survey National Land Use Cover dataset

CSLAP Participation lists the sampling years and the current year volunteers.

Key lake status indicators summarize lake conditions:

- Trophic state of a lake refers to its nutrient loading and productivity, measured by phosphorus, algae, and clarity. An oligotrophic lake has low nutrient and algae levels (low productivity) and high clarity while a eutrophic lake has high nutrient and algae levels (high productivity) and low clarity. Mesotrophic lakes fall in the middle.
- Harmful algal bloom susceptibility summarizes the available historical HAB data and indicates the potential for future HAB events.
- Invasive vulnerability indicates whether aquatic invasive species are found in this lake or in nearby lakes, indicating the potential for further introductions.
- Priority waterbody list (PWL) assessment is based on the assessment of use categories and summarized as fully supported, threatened, stressed,

impaired, or precluded. Aesthetics and habitat are evaluated as good, fair, or poor. The cited PWL assessment reflects the "worst" assessment for the lake. The full PWL assessment can be found at http://www.dec.ny.gov/chemical/36730.html#WIPWL.

Current year sampling results

- Results for each of the sampling sessions in the year are in tabular form. The seasonal change graphically shows the current year results. Red shading indicates eutrophic readings.
- HAB notification periods on the DEC website, updated weekly http://www.dec.ny.gov/chemical/83310.html
- Shoreline HAB sample dates and results. Samples are collected from the area that appears to have the worst bloom. Red shading indicates a confirmed HAB.
- HAB sample algae analysis. Algae types typically change during the season. These charts show the amount of the different types of algae found in each mid-lake or shoreline sample. Samples with high levels of BGA are HABs. The second set of charts show the level of toxins found in open water and shoreline samples compared to the World Health Organization (WHO) guidelines.
- If there are more than ten shoreline bloom samples collected in a year, bloom sample information is instead summarized by month (May-Oct.) as minimum, average, and maximum values for blue-green algae and microcystin.

Long Term Trend Analysis puts the current year findings in context. Summer averages (mid-June thru mid-September) for each of the CSLAP years show trends in key water quality indicators. The graphs include relevant criteria (trophic categories, water quality standards, etc.) and boundaries separating these criteria.

In-Season Analysis shows water temperature and water clarity during the sampling season. These indicate seasonal changes and show the sample year results compared to the typical historical readings for those dates.

The Lake Use Scorecard presents the results of the existing Priority Waterbody List assessment for this lake in a graphical form and compares it to information from the current year and average values from CSLAP data and other lake information. Primary issues that could impact specific use categories are identified, although more issues could also affect each designated use.

The Lake Summary reviews and encapsulates the data in the lake report, and provides suggested actions for lake management.

Glossary of water quality and HAB indicators

Clarity (m): The depth to which a Secchi disk lowered into the water is visible, measured in meters. Water clarity is one of the trophic indicators for each lake.

TP (mg/L): Total phosphorus, measured in milligrams per liter at the lake surface (1.5 meters below the surface). TP includes all dissolved and particulate forms of phosphorus.

Deep TP: Total phosphorus measured in milligrams per liter at depth (1-2 meters above the lake bottom at the deepest part of the lake)

TN: Total nitrogen, measured in milligrams per liter at the lake surface. TN includes all forms of nitrogen, including **NOx** (nitrite and nitrate) and **NH_4** (ammonia).

N:P Ratio: The ratio of total nitrogen to total phosphorus, unitless (mass ratio). This ratio helps determine if a lake is phosphorous or nitrogen limited.

Chl.a (µg/L): Chlorophyll a, measured in micrograms per liter. Indicates the amount of algae in the water column.

pH: A range from 0 to 14, with 0 being the most acidic and 14 being the most basic or alkaline. A healthy lake generally ranges between 6.5 and 8.5.

Cond (µmho/cm): Specific conductance is a measure of the conductivity of water. A higher value indicates the presence of more dissolved ions. High ion concentrations indicate hardwater, and low show softwater.

Upper Temp (°C): Surface temperature, measured in degrees Celsius

Deep Temp (°C): Bottom temperature, measured in degrees Celsius

BG Chl.a (µg/L): Chlorophyll a from blue-green algae, measured in micrograms per liter

HABs: Harmful Algal Blooms. Algal blooms that have the appearance of cyanobacteria (BGA)

BGA: Blue-green algae, also known as cyanobacteria

Microcystin (µg/L): The most common HAB liver toxin; total microcystin above 20 micrograms per liter indicates a “high toxin” bloom. However, ALL BGA blooms should be avoided, even if toxin levels are low.

Anatoxin-a (µg/L): A toxin that may be produced in a HAB which targets the central nervous system. Neither EPA nor NYS has developed a risk threshold for anatoxin-a, although readings above 4 micrograms per liter are believed to represent an elevated risk.