

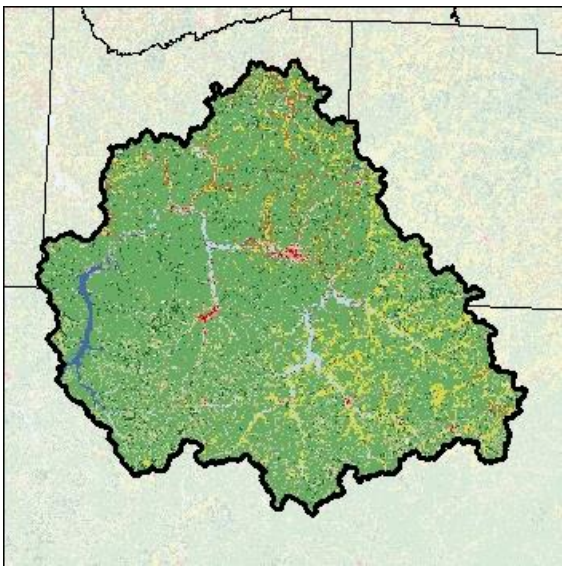

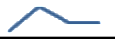
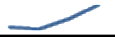






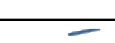





Allegheny Reservoir- Center Channel (Highbanks)		Town of Elko	Cattaraugus County
  	Lake Characteristics	Surface area (ac/ha)	10987 / 4008
		Max depth (ft/m)	132 / 40
		Mean depth (ft/m)	48 / 15
		Retention time (years)	0.2
		Lake Classification	B)
		Dam Classification	In PA
	Watershed Characteristics	Watershed area (ac /ha)	1395981 / 564923
		Watershed / Lake ratio	141
		Lake & wetlands %	3.1%
		Agricultural %	10.1%
Forest, shrub, grasses %		83.3%	
Residential		3.2%	
LCI Participation	Years	2017	
	Samplers	David Newman, Sara Gonzalez, Courtney King, Dan Woltmann, Scott Kishbaugh, Erik Posner, Justin Brewer (R9 DFW)	

Trophic state	HABS Susceptibility	Invasive Vulnerability	PWL Assessment
Eutrophic	Persistent blooms, High susceptibility	Invasives present, High vulnerability	Impaired

Water quality values for Allegheny Reservoir- Center Channel for the 2017 sampling season. “Seasonal change” shows current year variability. Light red color indicates eutrophic conditions in top table and bloom conditions in bottom table.

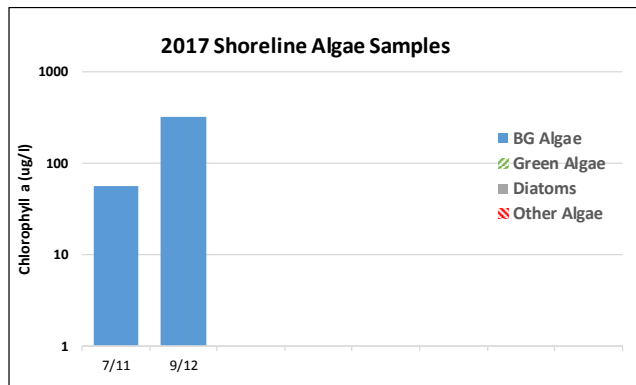
	2016	2017 Sampling Results				Seasonal change	2017 Avg
		6/14	7/11	8/8	9/12		
Open Water Indicators							
Clarity (m)		1.2	0.7	1.1	1.9		1.2
TP (mg/l)		0.024	0.050	0.032	0.032		0.034
Soluble P (mg/l)		0.007	0.006	0.010	0.016		0.009
Deep TP (mg/l)		0.019	0.048	0.040			0.036
Deep Soluble P (mg/l)		0.008	0.019	0.016			0.014
TN (mg/l)		0.350	1.010	0.720	0.420		2.813
Surface N:P Ratio		15	20	23	13		82
Deep to Surface NH4 Ratio			4.6	9.8			7.2
Chl.a (ug/l)		19.9	84.6	34.1	10.2		37.2
pH				8.2	7.6		7.9
Conductivity (umho/cm)		133		192	213		180
Total Organic Carbon (mg/l)		24		23	19		22
True Color (ptu)			23	15	22		20
Deep Manganese (mg/l)							
Deep Iron (mg/l)							
Deep Arsenic (mg/l)							

Shoreline bloom and HABs notifications

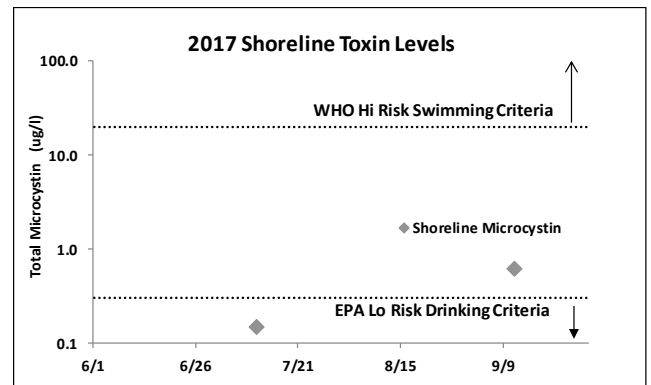
Date of first listing	Date of last listing	# weeks on the DEC notification list	# Weeks with updates
7/7/17	10/20/17	15	11

HAB Indicators	HAB criteria	7/11/2017	9/12/2017
BGA	25 - 30 ug/L	56.5	324.0
microcystin	20 ug/L	<DL	<DL
anatoxin - a		<DL	<DL

HABs Status Shoreline Algae

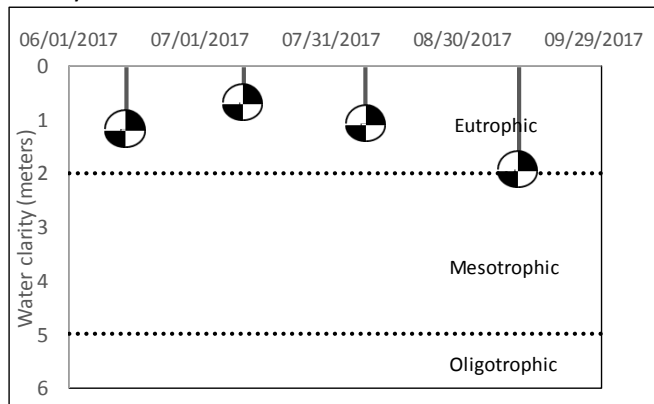


Shoreline Toxins

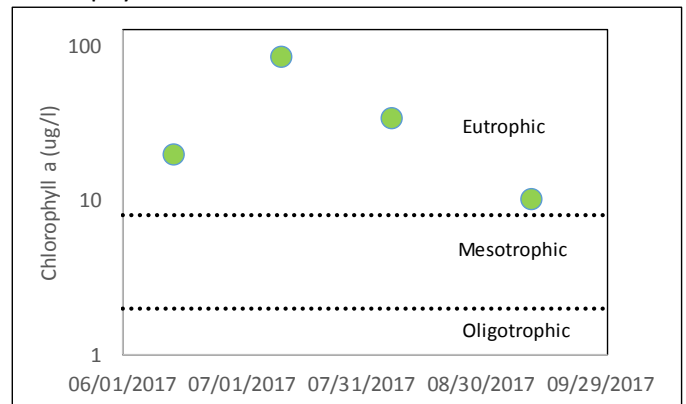


Seasonal Changes- Allegheny Reservoir- Center Channel 2017

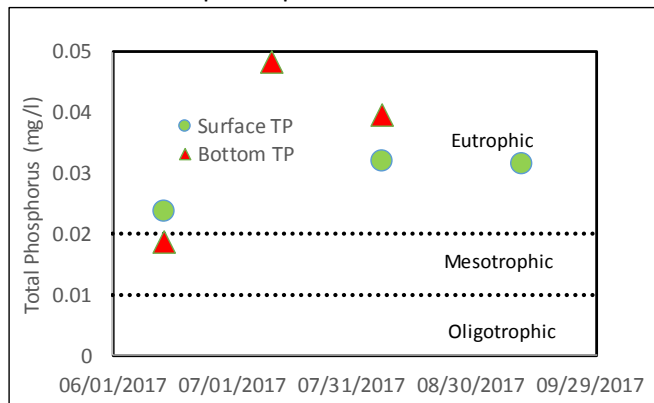
Clarity



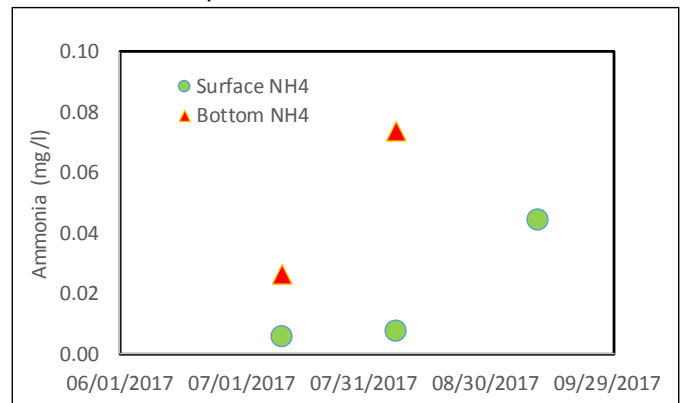
Chlorophyll a



Surface and Deep Phosphorus

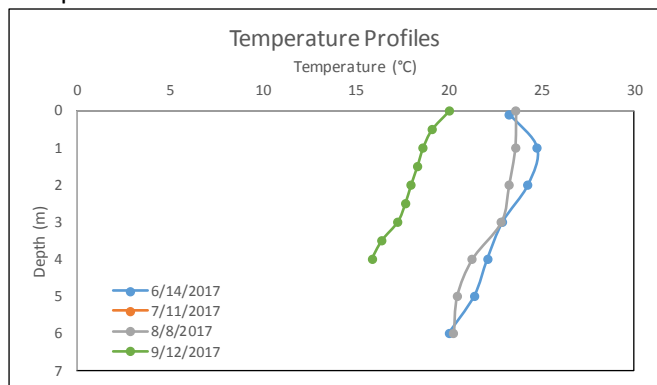


Surface and Deep Ammonia

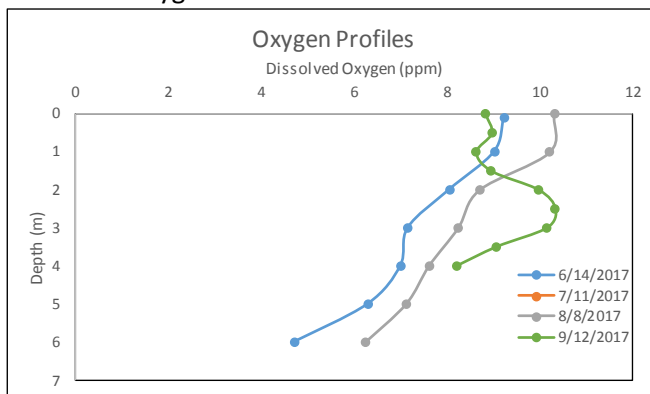


Depth Profiles- Allegheny Reservoir- Center Channel 2017

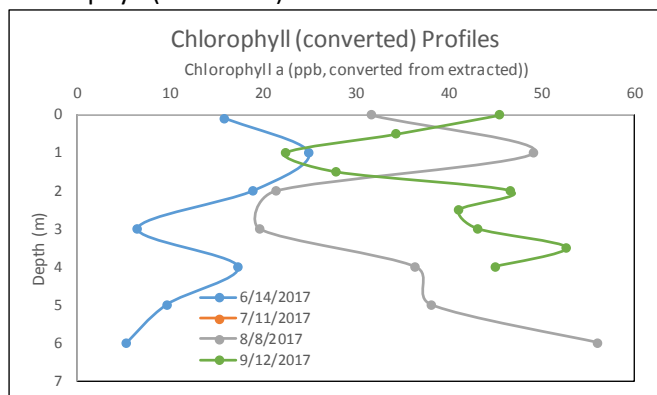
Temperature



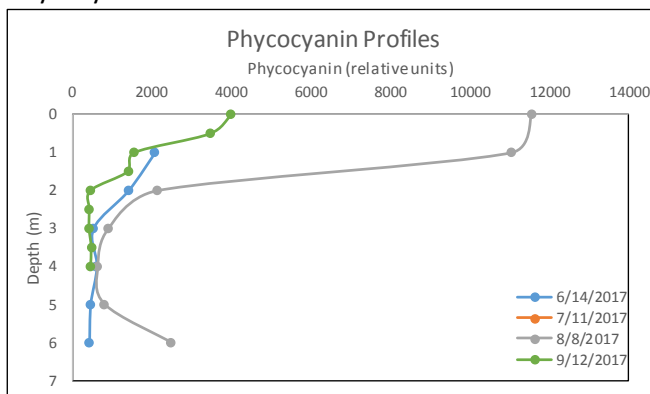
Dissolved Oxygen



Chlorophyll (corrected)



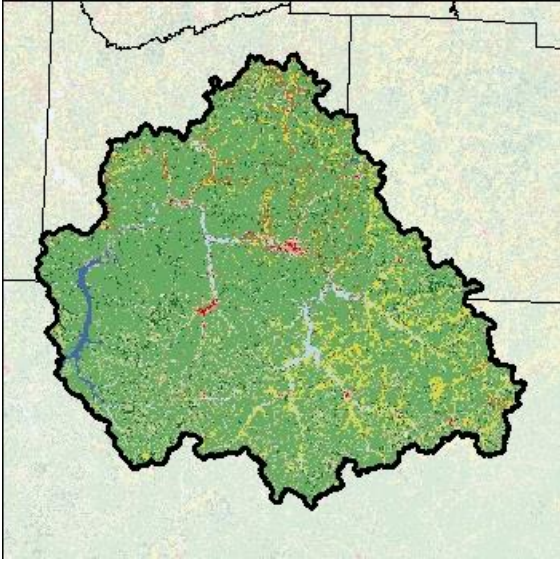


Phycocyanin















Scorecard

	Lake Use			
	PWL	2017	Primary issue	
Potable Water			No impacts	
Swimming			Algae levels	Supported / Good
Recreation			Algae levels	Threatened / Fair
Aquatic Life			Surface Oxygen	Stressed / Poor
Aesthetics			Algae blooms	Impaired
Habitat			Invasive plants	Not Known
Fish Consumption			Not applicable	

Allegheny Reservoir-Friends Landing		Town of Elko	Cattaraugus County
 			
	Lake Characteristics	Surface area (ac/ha)	10987 / 4008
		Max depth (ft/m)	132 / 40
		Mean depth (ft/m)	48 / 15
		Retention time (years)	0.2
		Lake Classification	B)
		Dam Classification	In PA
	Watershed Characteristics	Watershed area (ac /ha)	1395981 / 564923
		Watershed / Lake ratio	141
		Lake & wetlands %	3.1%
		Agricultural %	10.1%
		Forest, shrub, grasses %	83.3%
		Residential	3.2%
LCI Participation	Years	2017	
	Samplers	David Newman, Sara Gonzalez, Courtney King, Dan Woltmann, Scott Kishbaugh, Erik Posner, Justin Brewer (R9 DFW)	

Trophic state	HABS Susceptibility	Invasive Vulnerability	PWL Assessment
Eutrophic	Persistent blooms, High susceptibility	Invasives present, High vulnerability	Impaired

Water quality values for Allegheny Reservoir- Center Channel for the 2017 sampling season. “Seasonal change” shows current year variability. Light red color indicates eutrophic conditions in top table and bloom conditions in bottom table.

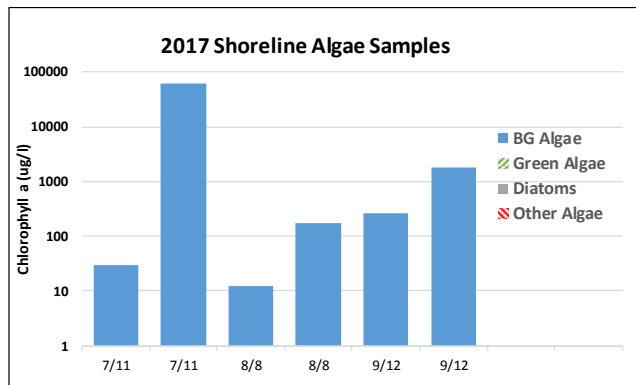
Open Water Indicators	2016	2017 Sampling Results				Seasonal change	2017 Avg
		6/14	7/11	8/8	9/12		
Clarity (m)		1.6	1.0	1.2	0.8		1.1
TP (mg/l)		0.013	0.028	0.021	0.031		0.023
Soluble P (mg/l)		0.003	0.008	0.011	0.010		0.008
Deep TP (mg/l)		0.021	0.034	0.018	0.027		0.025
Deep Soluble P (mg/l)		0.005	0.010	0.010	0.020		0.012
TN (mg/l)		0.350	0.760	0.600	0.700		2.801
Surface N:P Ratio		27	27	29	22		121
Deep to Surface NH4 Ratio		2.7	17.5	2.5	4.3		6.8
Chl.a (ug/l)		8.6	44.2	21.9	45.2		30.0
pH		7.9		7.8	8.5		8.1
Conductivity (umho/cm)		164		172	186		174
Total Organic Carbon (mg/l)							
True Color (ptu)		15	19	11	18		16
Deep Manganese (mg/l)							
Deep Iron (mg/l)							
Deep Arsenic (mg/l)							

Shoreline bloom and HABs notifications

Date of first listing	Date of last listing	# weeks on the DEC notification list	# Weeks with updates
7/7/17	10/20/17	15	11

HAB Indicators	HAB criteria	7/11	7/11	8/8	8/8	9/12	9/12
BGA	25 - 30 ug/L	30.4	62312.5	12.3	172.4	260.3	1789.5
microcystin	20 ug/L	<DL	4.6	<DL	<DL	<DL	<DL
anatoxin - a		<DL	<DL	<DL	<DL	<DL	<DL

HABs Status Shoreline Algae

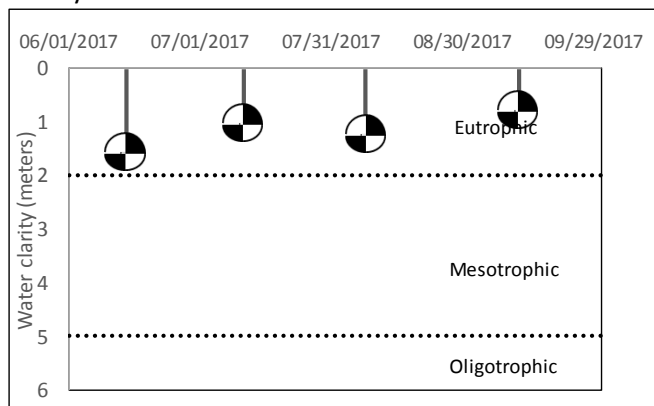


Shoreline Toxins

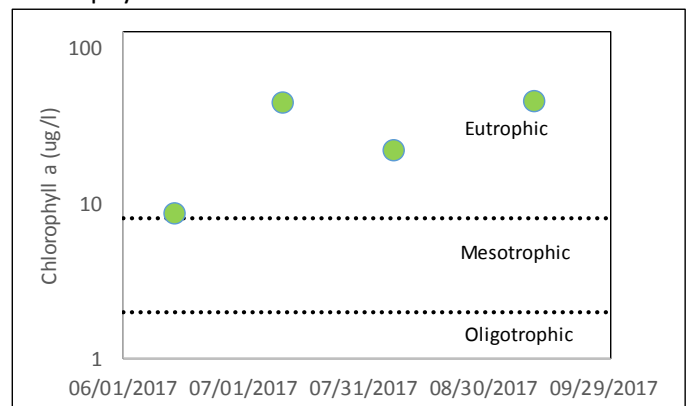


Seasonal Changes- Allegheny Reservoir- Friends Landing 2017

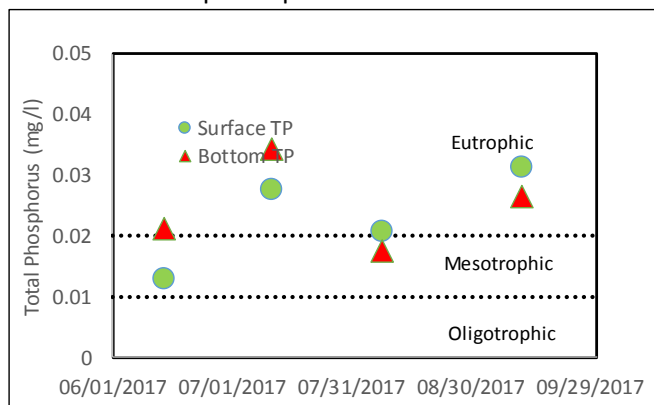
Clarity



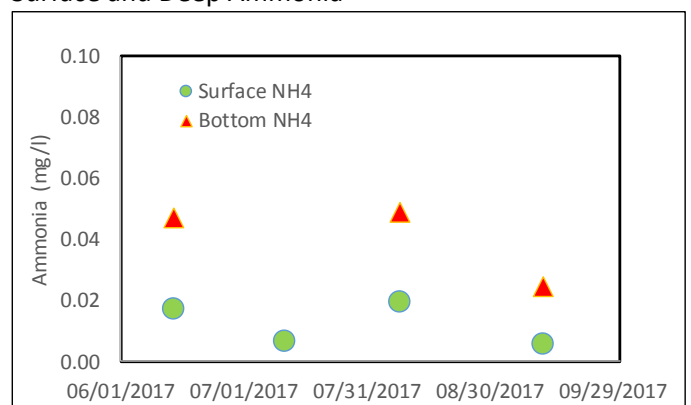
Chlorophyll a



Surface and Deep Phosphorus

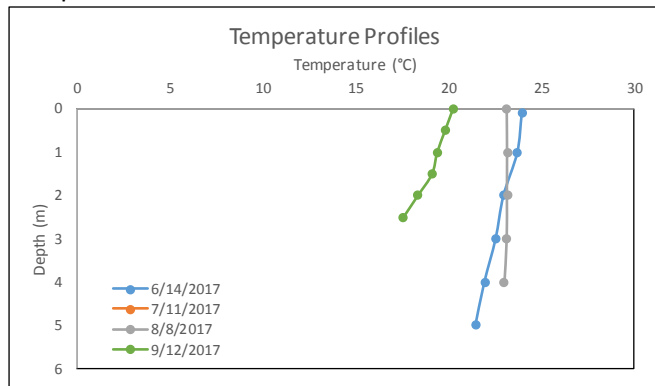


Surface and Deep Ammonia

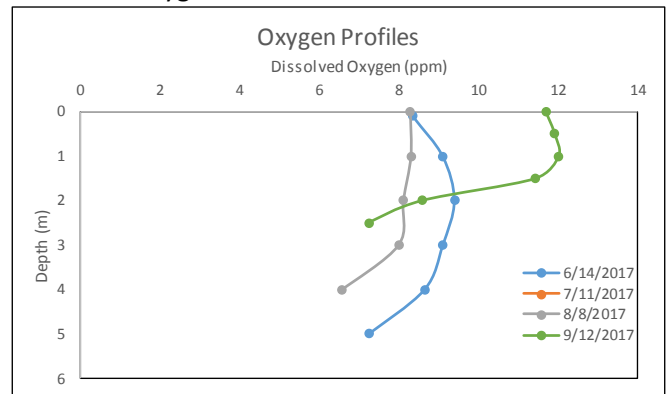


Depth Profiles- Allegheny Reservoir- Friends Landing 2017

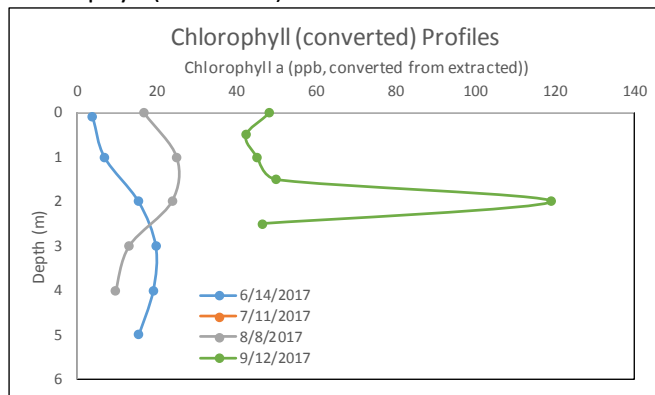
Temperature



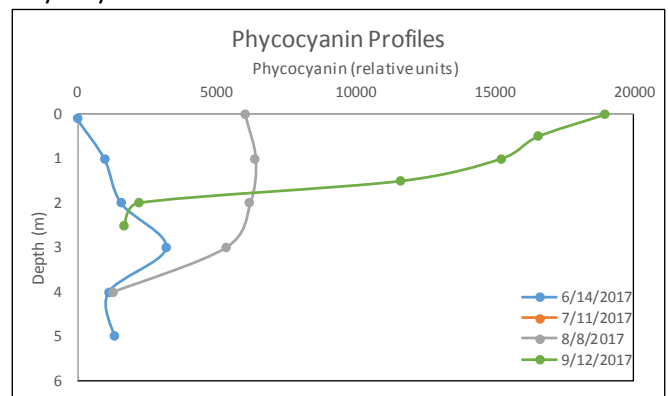
Dissolved Oxygen



Chlorophyll (corrected)


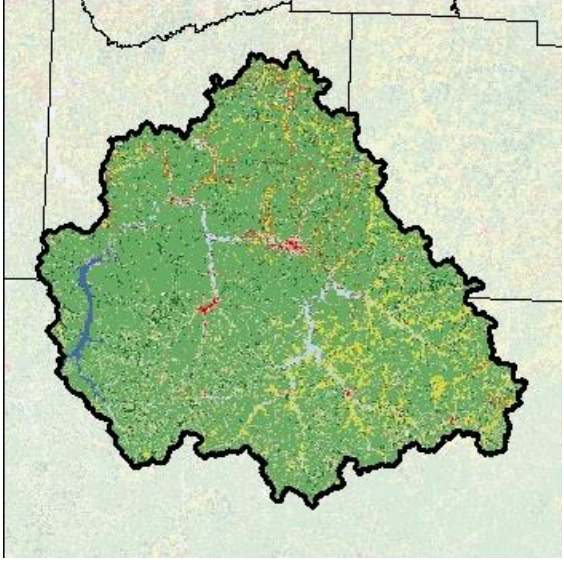


Phycocyanin















Scorecard

	Lake Use			
	PWL	2017	Primary issue	
Potable Water			No impacts	
Swimming			Algae levels	Supported / Good
Recreation			Algae levels	Threatened / Fair
Aquatic Life			Surface Oxygen	Stressed / Poor
Aesthetics			Algae blooms	Impaired
Habitat			Invasive plants	Not Known
Fish Consumption			Not applicable	

Allegheny Reservoir- Oronville		Town of South Valley	Cattaraugus County			
 Department of Environmental Conservation						
		Lake Characteristics		Surface area (ac/ha)	10987 / 4008	
				Max depth (ft/m)	132 / 40	
				Mean depth (ft/m)	48 / 15	
				Retention time (years)	0.2	
				Lake Classification	B)	
				Dam Classification	In PA	
		Watershed Characteristics		Watershed area (ac /ha)		1395981 / 564923
				Watershed / Lake ratio		141
				Lake & wetlands %		3.1%
				Agricultural %		10.1%
Forest, shrub, grasses %				83.3%		
Residential				3.2%		
Urban		0.0%				
LCI Participation		Years	2017			
		Samplers	David Newman, Sara Gonzalez, Courtney King, Dan Woltmann, Scott Kishbaugh, Erik Posner, Justin Brewer (R9 DFW)			

Trophic state	HABS Susceptibility	Invasive Vulnerability	PWL Assessment
Mesoeutrophic	Persistent blooms, High susceptibility	Invasives present, High vulnerability	Impaired

Water quality values for Allegheny Reservoir- Center Channel for the 2017 sampling season. “Seasonal change” shows current year variability. Light red color indicates eutrophic conditions in top table and bloom conditions in bottom table.

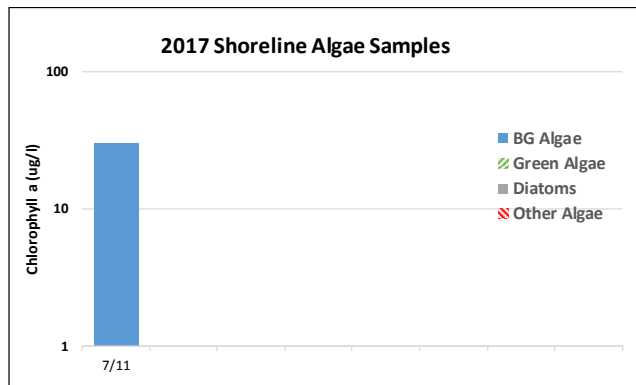
Open Water Indicators	2016	2017 Sampling Results				Seasonal change	2017 Avg
		6/14	7/11	8/8	9/12		
Clarity (m)	2.3	1.9	1.4	1.4		1.7	
TP (mg/l)	0.014	0.023	0.015	0.015		0.017	
Soluble P (mg/l)	0.004	0.003	0.008	0.010		0.006	
Deep TP (mg/l)	0.022	0.044	0.014	0.032		0.028	
Deep Soluble P (mg/l)	0.005	0.009	0.008	0.013		0.009	
TN (mg/l)	0.300	0.370	0.380	0.430		2.685	
Surface N:P Ratio	22	16	26	28		161	
Deep to Surface NH4 Ratio	5.1	15.8	15.6	21.7		14.5	
Chl.a (ug/l)	2.5	14.7	17.9	30.1		16.3	
pH	7.7		7.9	7.9		7.8	
Conductivity (umho/cm)	136		138	136		137	
Total Organic Carbon (mg/l)							
True Color (ptu)	10	16	12	13		13	
Deep Manganese (mg/l)							
Deep Iron (mg/l)							
Deep Arsenic (mg/l)							

Shoreline bloom and HABs notifications

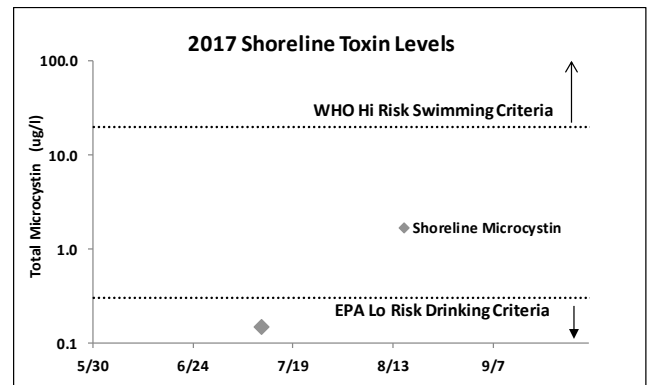
Date of first listing	Date of last listing	# weeks on the DEC notification list	# Weeks with updates
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HAB Indicators	HAB criteria	7/11/2017
BGA	25 - 30 ug/L	30.4
microcystin	20 ug/L	<DL
anatoxin - a		

HABs Status Shoreline Algae

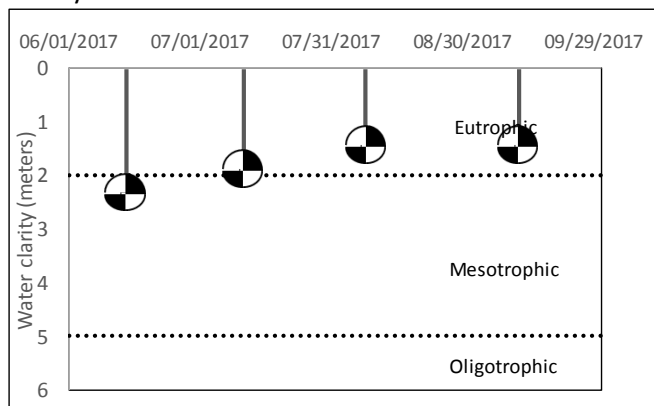


Shoreline Toxins

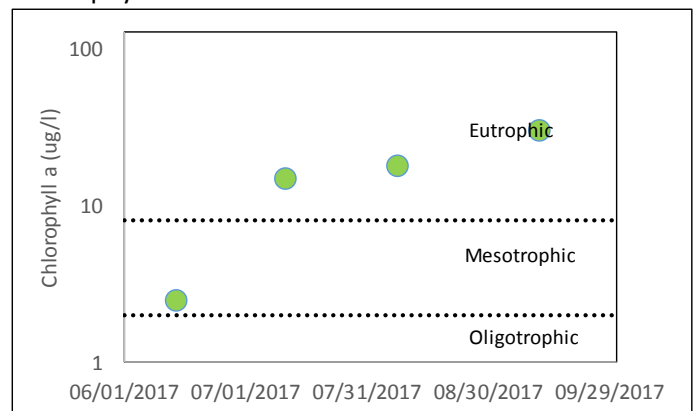


Seasonal Changes- Allegheny Reservoir- Oronville 2017

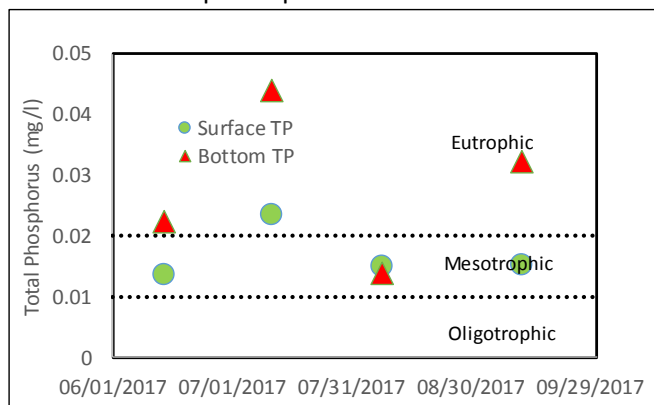
Clarity



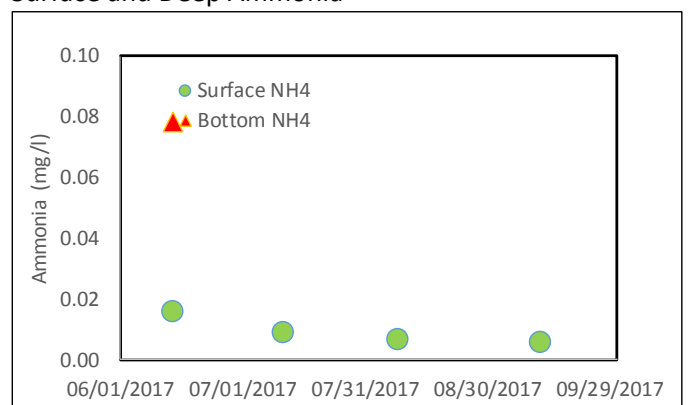
Chlorophyll a



Surface and Deep Phosphorus

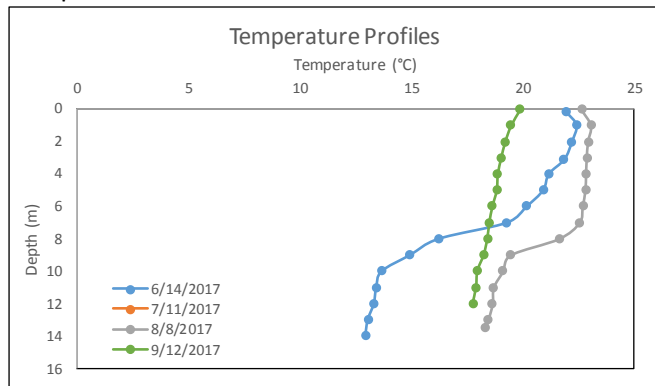


Surface and Deep Ammonia

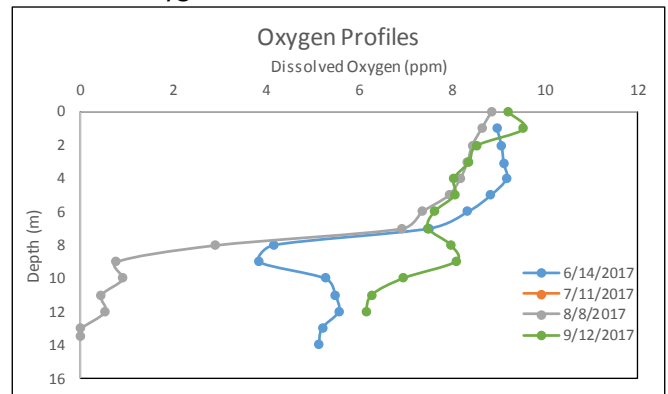


Depth Profiles- Allegheny Reservoir- Oronville 2017

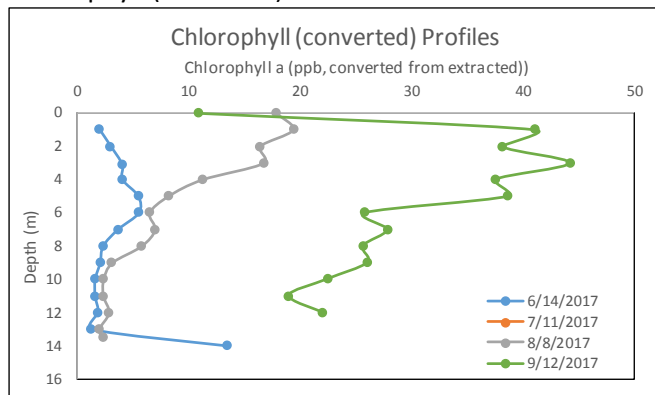
Temperature



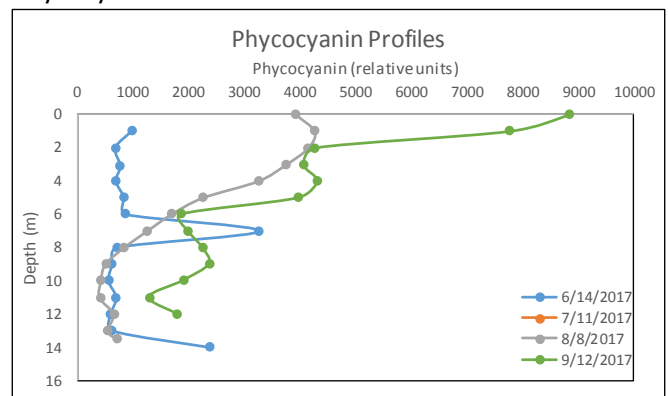
Dissolved Oxygen



Chlorophyll (corrected)



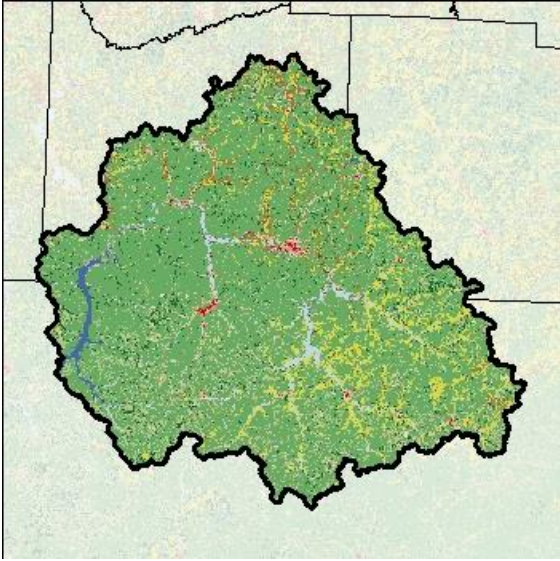


Phycocyanin
















Scorecard

	Lake Use			
	PWL	2017	Primary issue	
Potable Water			No impacts	
Swimming			Algae blooms	Supported / Good
Recreation			Algae levels	Threatened / Fair
Aquatic Life			Surface Oxygen	Stressed / Poor
Aesthetics			Algae blooms	Impaired
Habitat			Invasive plants	Not Known
Fish Consumption			Not applicable	

Allegheny Reservoir- Pennsylvania State Line		Town of South Valley	Cattaraugus County
 			
	Lake Characteristics	Surface area (ac/ha)	10987 / 4008
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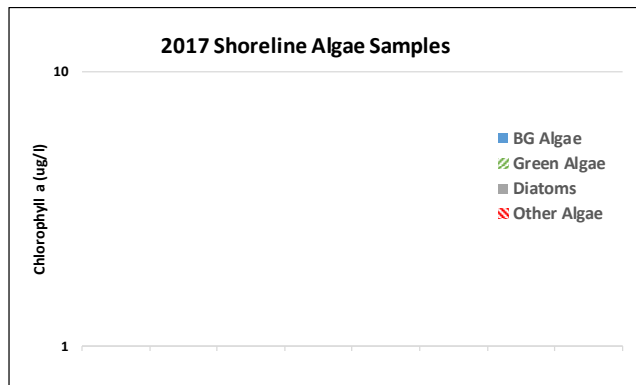
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Clarity (m)		3.2	2.1	1.9	1.8		2.2
TP (mg/l)		0.010	0.016	0.012	0.010		0.012
Soluble P (mg/l)		0.007	0.004	0.004	0.008		0.006
Deep TP (mg/l)		0.011	0.027	0.010	0.009		0.014
Deep Soluble P (mg/l)		0.010	0.009	0.003	0.004		0.007
TN (mg/l)		0.210	0.400	0.410	0.440		2.683
Surface N:P Ratio		20	26	34	44		225
Deep to Surface NH4 Ratio		1.5	12.7	1.8	5.1		5.3
Chl.a (ug/l)		4.3	12.8	11.0	17.4		11.4
pH		7.9		8.0	7.4		7.8
Conductivity (umho/cm)		119		131	140		130
Total Organic Carbon (mg/l)		22		23	19		22
True Color (ptu)		15	15	9	15		14
Deep Manganese (mg/l)							
Deep Iron (mg/l)							
Deep Arsenic (mg/l)							

Shoreline bloom and HABs notifications

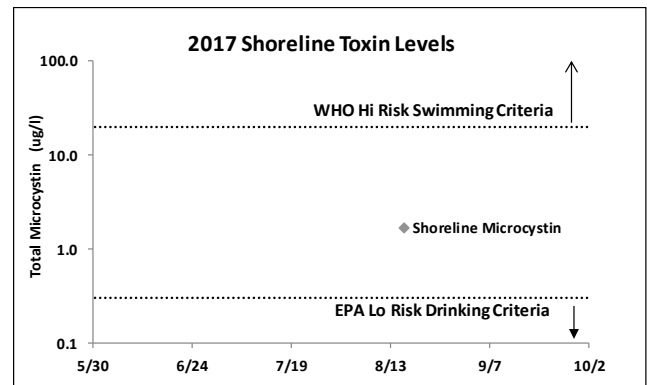
Date of first listing	Date of last listing	# weeks on the DEC notification list	# Weeks with updates
7/7/17	10/20/17	15	11

HAB Indicators	HAB criteria	6/14	7/11	8/8	9/12
BGA	25 - 30 ug/L				
microcystin	20 ug/L				
anatoxin - a					

HABs Status Shoreline Algae

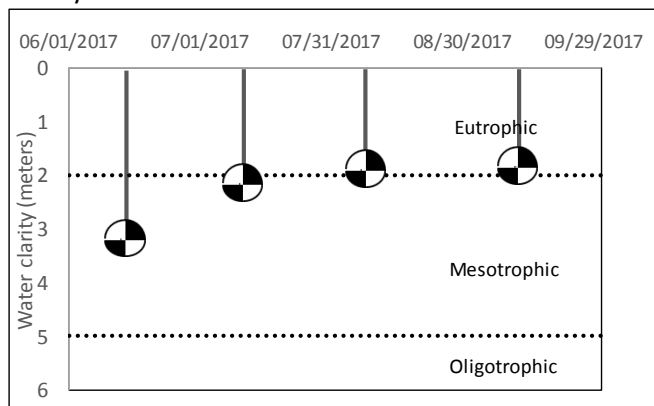


Shoreline Toxins

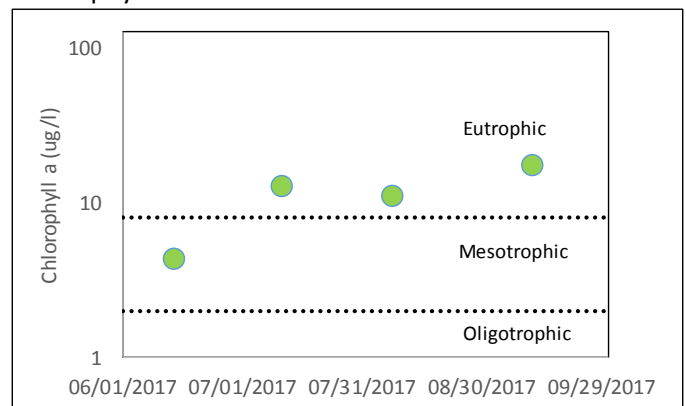


Seasonal Changes- Allegheny Reservoir- PA State Line 2017

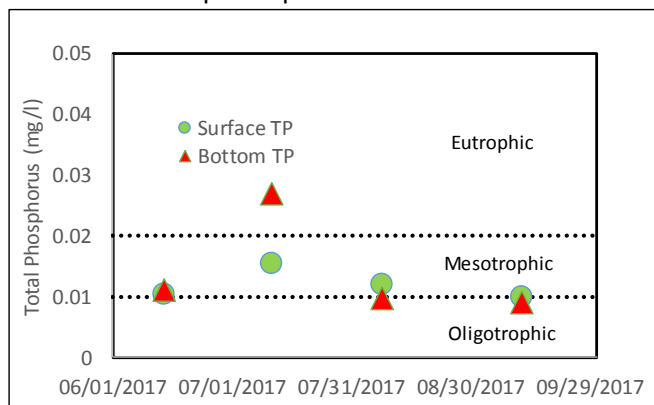
Clarity



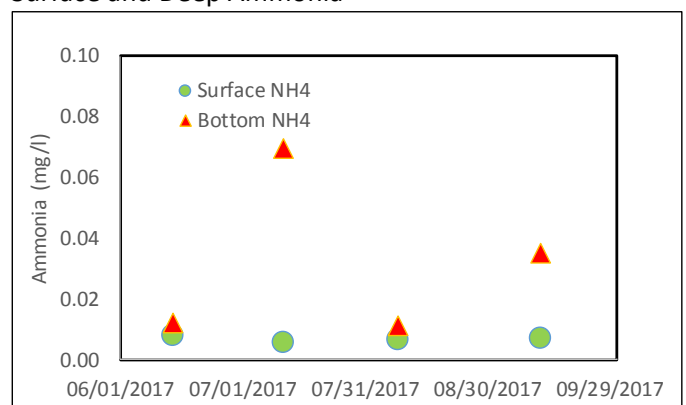
Chlorophyll a



Surface and Deep Phosphorus

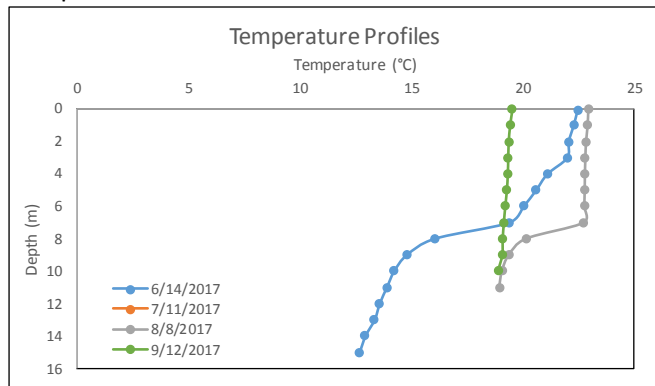


Surface and Deep Ammonia

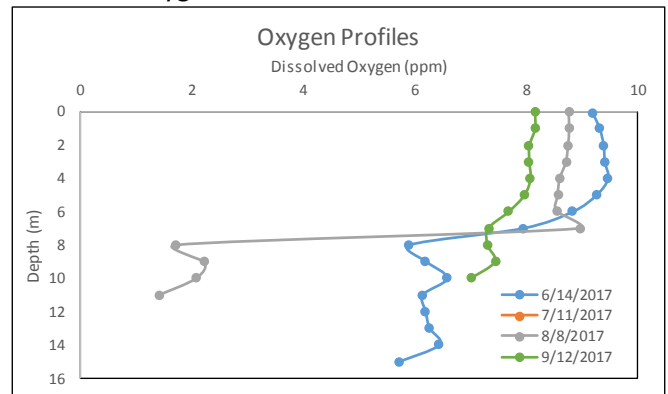


Depth Profiles- Allegheny Reservoir- PA State Line 2017

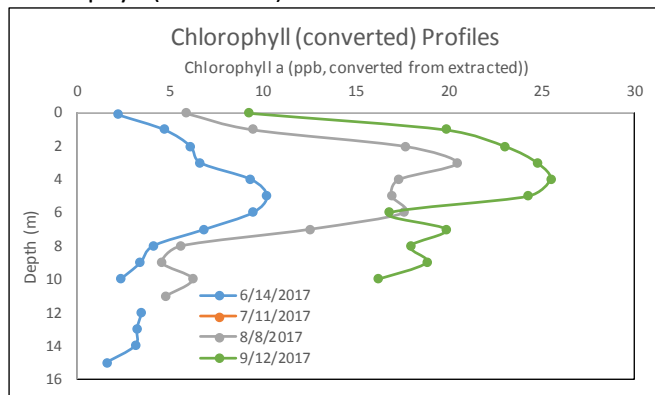
Temperature



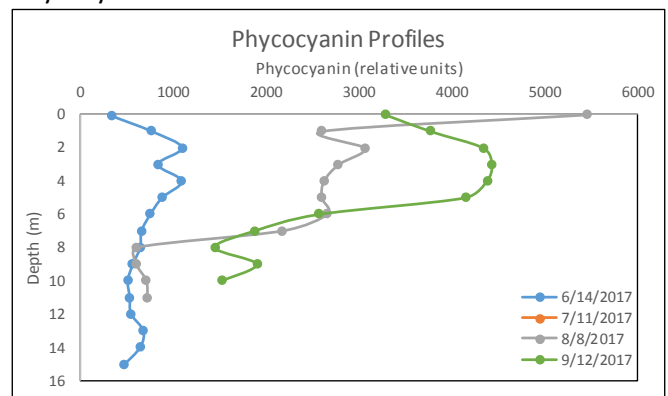
Dissolved Oxygen



Chlorophyll (corrected)



Phycocyanin



Scorecard

	Lake Use			
	PWL	2017	Primary issue	
Potable Water			No impacts	
Swimming			Algae blooms	Supported / Good
Recreation			Algae levels	Threatened / Fair
Aquatic Life			Surface Oxygen	Stressed / Poor
Aesthetics			Algae blooms	Impaired
Habitat			Invasive plants	Not Known
Fish Consumption			Not applicable	

LCI sampling summary- Allegheny Reservoir 2017

What is the condition of the Reservoir?: NYSDEC conducted routine (monthly) sampling of Allegheny Reservoir as part of the DEC Lake Classification and Inventory (LCI) survey of the Allegheny River drainage basin. Allegheny Reservoir was sampled in four locations: from north to south, Center Channel, Friends Launch (mid lake), Oronville (mid lake), and (Pennsylvania) State Line. The two northern sites can best be characterized as *eutrophic* lake, based on elevated nutrient (phosphorus) and algae (chlorophyll *a*) levels, and low water clarity (Secchi disk transparency) readings. The two southern sites can be characterized as *mesoeutrophic*- both have slightly elevated algae levels with intermediate nutrient levels; the State Line site has higher water clarity. All four sites are alkaline (near neutral pH) with intermediate hardness, low to slightly elevated nitrogen (mostly organic) levels, and relatively low water color (brownness).

Do conditions change over the summer?: Algal productivity generally increases during the summer at all sites- water clarity decreases as algae levels increase, although phosphorus levels do not appear to vary seasonally at the Oronville or Center Channel sites. Conductivity increased slightly during the summer at all but the Oronville site.

Do conditions change from surface to bottom?: Allegheny Reservoir is not strongly (thermally) stratified, at least at these sites, with stronger stratification at the deeper (PA line and Oronville) sites. These depth profiles show a steady decrease in temperatures, with thermal stratification occurring in the 6-10 meter depth range. During parts of the summer, dissolved oxygen drops in the hypolimnion, although anoxic conditions were not measured at any site. Deepwater phosphorus and nitrogen (ammonia) levels are only slightly higher than those measured at the surface, and there is no clear seasonal trend in deepwater nutrient levels.

How do these conditions compare to nearby lakes?: Allegheny Reservoir has lower productivity - lower nutrient and algae levels, and slightly higher water clarity- than in many other lakes in the Allegheny River region. However, the conditions vary significantly within sampling sites. The northern sites- Center Channel and Friends Launch- are significantly shallower and more productive, with higher conductivity and higher deepwater nutrient levels. The southern sites are deeper with lower productivity.

Have these conditions changed over time? Allegheny Reservoir (Friends Launch site) was sampled as part of the LCI in 2007. These results suggest that water quality conditions were significantly different in 2007- water clarity was higher, consistent with lower algae levels, but nutrient (phosphorus and nitrogen) levels were much higher in 2007. This suggests that water quality conditions vary from year to year, and additional data would be needed to fully evaluate water quality trends.

Were any algal blooms or HABS observed or reported?: Water quality conditions indicated a high susceptibility to blooms, particularly in the northern sites, and blooms have been regularly observed along the shoreline and periodically in the open water every year since 2012. Many of these blooms have been documented through response-based monitoring by the US Army Corps of Engineers each year after blooms are reported on the Reservoir. None of these blooms has exhibited elevated toxin levels, although all blooms should be avoided even if measured toxin levels are low.

Are there any aquatic invasive species on the lake?: Eurasian watermilfoil and Allegheny crayfish have been documented in the Reservoir. Calcium levels are not high enough to support zebra mussels, and these invasive mussels have not been reported in the Reservoir.

Were there any other observations?: Extensive aquatic plant surveys were not conducted as part of this water quality study, so the extent of the native plant community was not documented. It is likely that many native plants are found in the Reservoir.

Are any designated uses likely impacted by these conditions?: Allegheny Reservoir supports significant recreational use, with access provided through a OPRHP boat launch ramp at the Friends Launch site, a marina in Oronville, and several other locations. Fish species in the Reservoir include smallmouth bass, muskellunge, walleye, northern pike, yellow perch, channel catfish, white bass, crappie, bullhead catfish and brown trout. Excessive growth reduces water clarity in some areas and impairs recreational uses; aesthetics and recreation are also impacted by periodic algae blooms. These problems were previously documented and resulted in the Reservoir being cited on the federal 303d list (https://www.dec.ny.gov/docs/water_pdf/303dlistdraft18.pdf) due to excessive phosphorus. Aquatic life may be threatened by depressed deepwater oxygen levels, and habitat may be threatened by invasive plants.

What actions, if any, are appropriate for consideration?: It is not known what other reservoir management actions have been instituted by the Allegheny Region of the state Office of Parks, Recreation and Historic Preservation, the US Army Corps of Engineers, or other partners. A buffer of native plants next to the shoreline may help reduce nutrient and sediment loading to the Reservoir. In other nearshore areas and in the rest of the watershed, stewardship activities such as pumping septic systems, reducing fertilization, shoreline erosion and channelized stormwater runoff, and other best management practices can also help to maintain or improve water quality. More information about in-lake algae control measures and watershed nutrient control measures to improve Reservoir condition can be found in Diet for a Small Lake (<https://www.dec.ny.gov/chemical/82123.html>).

How to Read the Report

In order to make this lake report as easy to digest as possible for the typical reader, only the most critical information collected in the LCI is presented. We hope that presenting the data in a more succinct manner will draw in more readers and hold their attention. Unfortunately, this new format leaves little room for definitions of terms, so we are including this section primarily as a glossary of terms for which the typical reader may not know the definition.

The report begins with the lake name, town, and county. The next section contains some physical characteristics of the lake. The surface area is the two dimensional area of the lakes surface and is given in units of acres and hectares. The max depth is the water depth measured at the deepest part of the lake and is given in units of feet and meters. The mean depth is either known from a rigorous study of the bathymetry of the lake or is calculated as 0.46 times the maximum depth and is given in units of feet and meters. The retention time is the time it takes for a drop of water to pass through a lake, given in units of years. The lake classification is a letter defining the “best uses” for this particular lake, based on the legal classification assigned by New York state. 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. The dam classification is a letter defining the hazard class of a dam if one exists. Class A, B, C, and D dams are defined as low, intermediate, high, or negligible/no hazard dams in that order. A "0" or blank indicates that no class has been assigned to a particular dam, or that no dam exists.

The next section contains some watershed characteristics including the watershed area in acres and hectares and the land use composition of the watershed. A watershed is the entire area that will drain to a particular lake and is constrained by the topology and hydrology of the land. The watershed area was calculated by the US Geological Survey "StreamStats" program. This area map was then used to calculate land uses from the most recent (2011) National Land Use Cover data on the NYSDEC ArcGIS mapping program. The map itself is shown on the left side of the front page. In general, blue colors show water, green and light brown show forested or shrub land, yellow and dark brown are agriculture, and pink to red is developed land. The program participation section lists the years the lake has been sampled through LCI over a two year period, and the names of the DEC samplers conducting the work.

The next section includes four boxes. The trophic state of a lake refers to its nutrient loading and productivity- in other words, how much algae is produced, and the cause (nutrients) and outcome (changes in clarity) of this algae growth. 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 somewhere in the middle. For most lakes, the nutrient of concern is phosphorus. A more productive lake will support more plant life, which may be good for warmwater fish, but may lower the quality of the lake if growth becomes excessive.

The harmful algal bloom susceptibility section contains a summary of the available historical HAB data. Although the factors that lead to the formation of HAB's is not yet well-understood, a history of HAB occurrences and high nutrient levels may indicate a susceptibility in the lake that could result in more HAB events in the future.

The invasive vulnerability section indicates if aquatic invasive species (AIS) are found in this lake or in nearby lakes. Invasive species are non-native and tend to rapidly colonize a waterbody once introduced, leaving little space for native species. Lakes with invasives or near other lakes with invasives are vulnerable to introductions of new AIS.

The next section is the priority waterbody list (PWL) assessment section. The PWL is a statewide inventory of the waters of New York State that DEC uses to track support (or impairment) of water uses, overall assessment water quality, causes and sources of water quality impact/impairment, and the status of restoration, protection and other water quality activities and efforts. A PWL assessment is broken into categories that include the following: potable water, swimming or public bathing, recreation, aquatic life, aesthetics, habitat, and fish consumption. All of the categories except aesthetics and habitat are assessed on a scale to determine if each of the listed uses are supported. The scale goes from best to worst in the following progression: fully supported, threatened, stressed, impaired, and 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 for each

lake can (or will eventually) be found on the DEC website by searching on “PWL” and the lake basin, at <http://www.dec.ny.gov/chemical/36730.html#WIPWL>.

The rest of the report contains a collection of tables and charts. A glossary of all the water quality and HABs indicators used in the plots and tables is included below. Of particular note are the seasonal change and average for the sampling season. There is also a seasonal change sparkline chart, which only shows the last year of summer trends. The average column summarizes the average of the last year of sampling results, with all samples weighted equally in the reported average. Data shown in these plots represent 0-2 meter depth integrated surface samples and grab samples collected one meter from the bottom in the deepest section of thermally stratified lakes.

The next table contains a summary of shoreline (and open water if appropriate) HABs data for the lake, along with the associated HAB notification information. If a HAB is suspected, a sample from the worst part of the bloom (usually along the shoreline) is collected and sent in for laboratory confirmation. A HAB notification is added to the HAB database where entries are updated on a weekly basis. Additional information- samples or visual reports- are used to update these listings. The HABs Status plots show the algal component (total algae and fractions associated with cyanobacteria (blue green algae), green algae, diatoms, and other algae, as measured by chlorophyll *a*, in any collected samples, and the associated levels of total microcystin. The shoreline toxin data graphs include the World Health Organization (WHO) high risk criteria to protect swimmers and the EPA low risk criteria to protect those using *treated* (not raw lake) drinking water.

The next section of the report shows seasonal changes in water clarity, (extracted) chlorophyll *a*, surface and deep phosphorus (if deep samples are collected) and surface and deep ammonia levels. Surface samples are indicated with round markers, while deep samples are shown as triangular markers. If multiple years of samples were collected, results from all samples are shown, with previous years data shown in red.

The depth profile section shows the water temperatures, dissolved oxygen, chlorophyll, and phycocyanin (a measure of blue green pigments) as measured on a profiling electronic meter. Chlorophyll measures are “corrected” to reflect the expected extracted chlorophyll measurement based on the relationship between the surface integrated chlorophyll (extracted) data and the profiler unextracted data. As such, these results should be considered estimated relative values, and should not be compared to water quality criteria developed from extracted measurements only. Phycocyanin data are reported in relative units, although they are characterized as cells per mL.

The next section of the report includes Lake Use Scorecard. The 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 from LCI data and other lake information. The scorecard also includes a column that lists some primary issues that could impact specific use categories. Multiple issues could affect each designated use, but only the primary issue is listed.

The final section of the report is the Lake Summary. This includes a brief summary of the most recent LCI data for the lake, although there is some comparison to previously LCI data when available. It is essentially the same as the Q&A section of reports generated through

the NY Citizens Statewide Lake Assessment Program (CSLAP), and with the Lake Use Scorecard, represents perhaps the most easily understood single page summary of the LCI data for the lake. This was intentionally created as the last page of the report to allow easy copying and distribution to interested parties.

Glossary of water quality and HAB indicators

Clarity: 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: 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. Total phosphorus is a second trophic indicator for each lake.

Soluble P: Dissolved phosphorus, measured in milligrams per liter at the lake surface, measured in water that passes through a 0.45 micron filter. It is an estimate of the amount of phosphorus available for biological uptake or growth, although available phosphorus is more accurately measured by soluble reactive P.

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)

Deep Soluble P: Dissolved phosphorus measured at depth, measured in milligrams per liter

TN: Total nitrogen, measured in milligrams per liter at the lake surface. TN includes all forms of nitrogen, including **NO_x** (nitrite and nitrate) and **NH₄** (ammonia).

Surface N:P Ratio: The ratio of total nitrogen to total phosphorus, unitless (mass ratio), in surface samples analyzed for TP and TN. This ratio helps determine if a lake is phosphorus or nitrogen limited.

Deep to Surface NH₄ Ratio: The ratio of ammonia measured in deep and surface samples; this is a surrogate for lake anoxia when these ratios are > 10

Chl.a (ug/l): Chlorophyll a, measured in micrograms per liter as chlorophyll extracted from surface water samples using reagents and a desktop fluorometer

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 and 9.

Conductivity: Specific conductance is a measure of the conductivity of water, measured as micromhos per centimeter and corrected to 25 degrees centigrade. A higher value indicates the presence of more dissolved ions that help conduct electricity. Conductivity results may indicate hard or softwater conditions with high ion concentrations resulting in hardwater.

Total (or Dissolved) Organic Carbon: Organic carbon measures the carbon (total or dissolved) in living material within the water, measured in milligrams per liter.

True Color is a visual measure of the brownness of the water, based on water passing through a 0.45 micron filter and compared to a visual series of standards developed from a platinum-cobalt standard (and thus measured as platinum units)

Deep Manganese, Iron or Arsenic measure total manganese, iron or arsenic levels in milligrams per liter in samples collected near the lake bottom. Elevated levels indicate anoxic conditions.

BG Chl.a (ug/L): Chlorophyll a from blue-green algae, measured in micrograms per liter. Readings above 25 ug/L are indicative of bloom conditions.

HABs Reported?: Were any algal blooms reported within a week of the dates listed, and, if so, were they located along the shoreline, in open water, or both?

BGA: Blue-green algae, as measured with a desktop or field fluorometer and reported as micrograms per liter of unextracted chlorophyll a

Microcystin: 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: Another type of toxin that may be produced in a HAB and may be more dangerous as it 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.