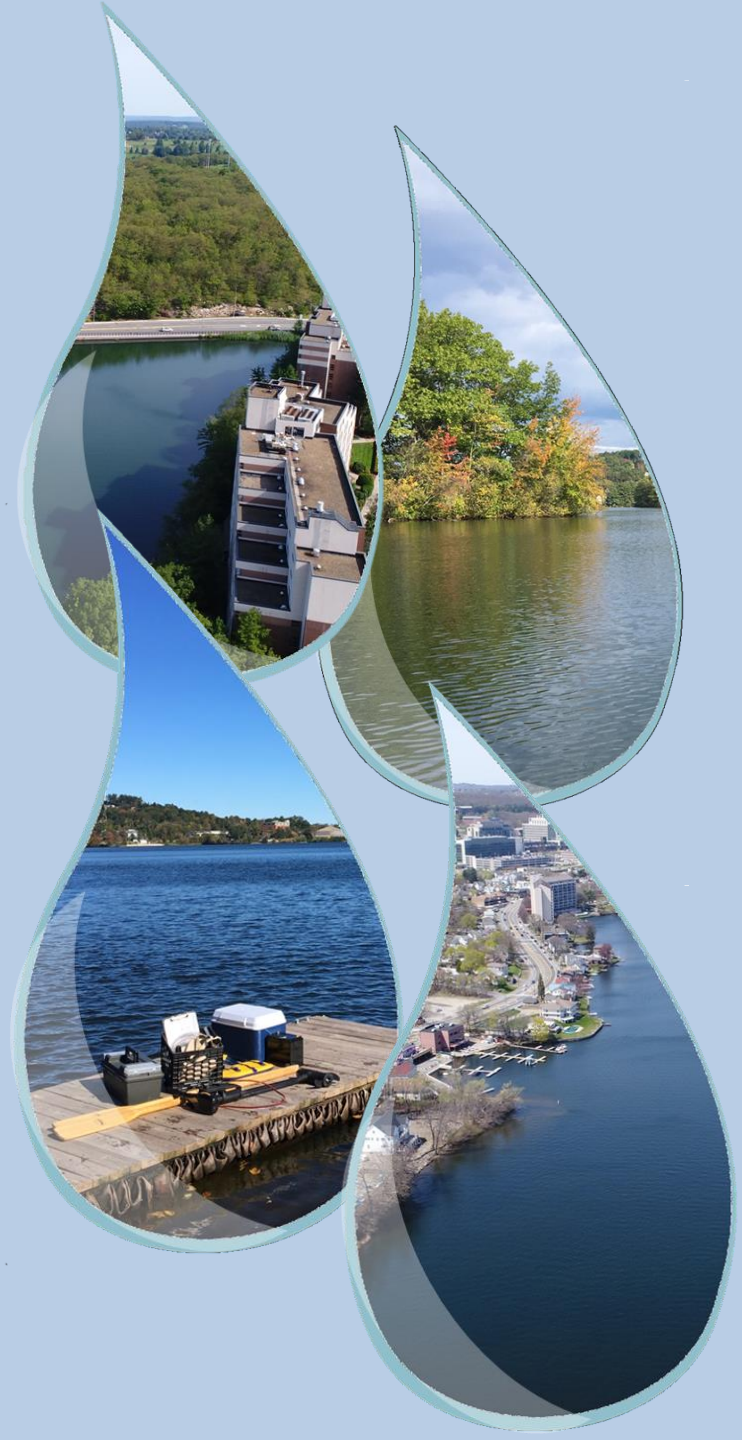
The Department of Public Works and Parks presents

State of the Lakes:

Water Quality and Initiatives in Worcester's Blue Spaces

Thursday, March 7th
Blackstone Heritage Corridor Visitor Center



City of Worcester Lakes and Ponds Program



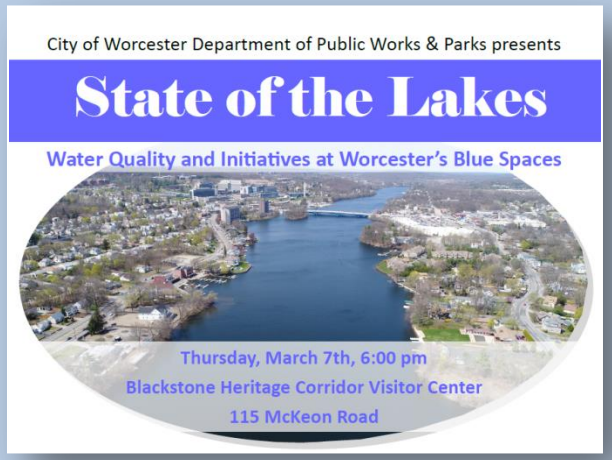
Monitor



Educate



Manage



Promote

Urban Water Quality Threats

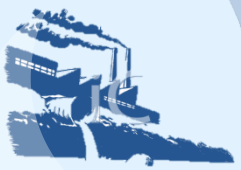
Sediments



Litter



Industrial Contaminants



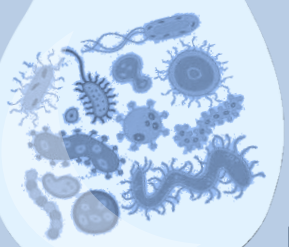
Invasives



Nutrients



Bacteria



Parameters measured

***In situ* measurements**

- Temperature
- Dissolved Oxygen
- pH
- Secchi transparency

Water samples

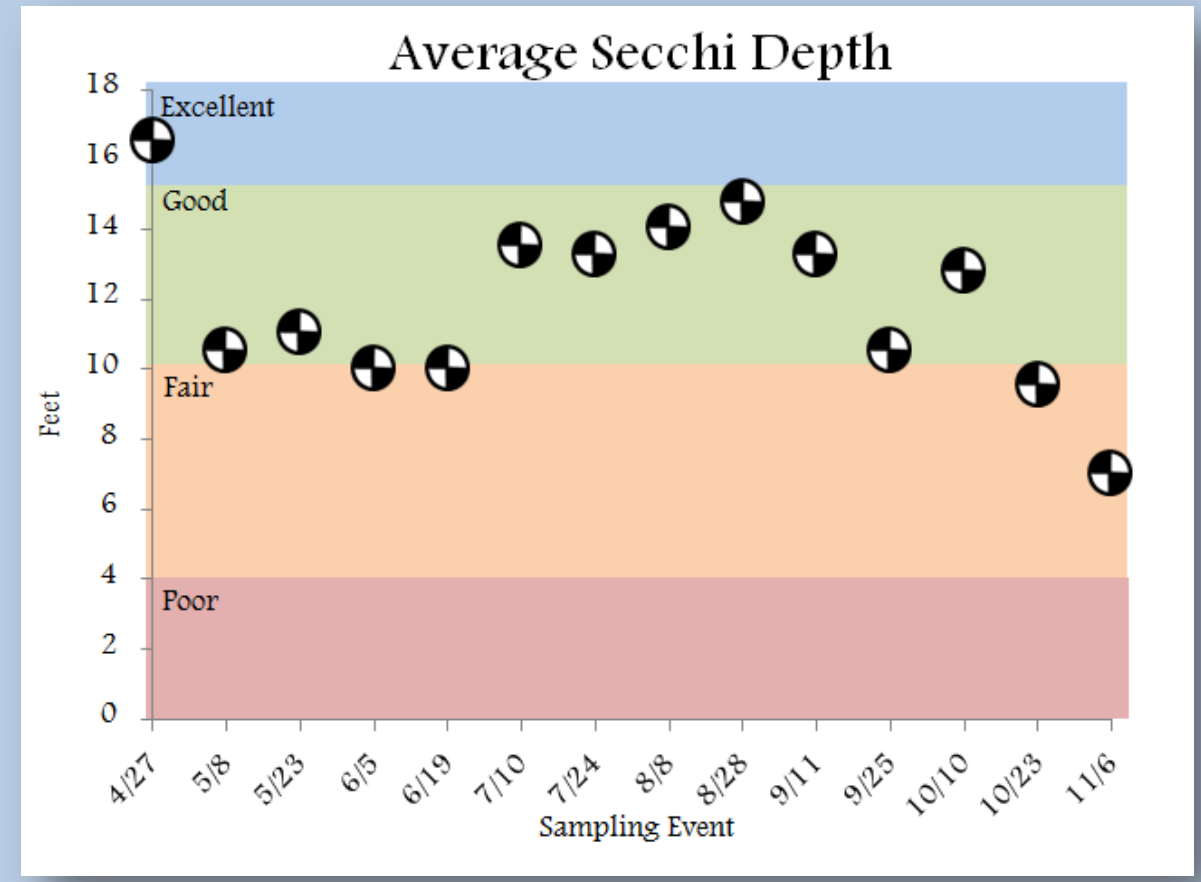
- Total suspended solids
- Total phosphorus
- Total dissolved phosphorus
- Ammonia nitrogen
- Nitrate nitrogen
- Chlorophyll
- Phycocyanin

Observations

- Wildlife
- Trash/Litter/Debris
- Odor, water color
- Invasive plants and animals



SMART Analysis



Results

★ I WANT TO·· $ MAKE A PAYMENT CUSTOMER SERVICE DEPARTMENTS TRANSLATE

Home / Departments / DPW&P / Water & Sewer / Recreational Waters

RECREATIONAL WATERS (BLUE SPACE)



In Worcester, you can find over 20 lakes and ponds that support a variety of recreational activities, including bird watching, walking, swimming, fishing and boating. The City recognizes these "blue spaces" as valuable resources, and strives to maintain the quality of these waters for recreational use and the promotion of economic development. Worcester DPW&P works with the Commonwealth, watershed groups and other local organization so identify and remediate threats to the quality of our lakes and ponds. We monitor water quality parameters in four of our biggest lakes, work with local scientists and universities to understand the data, create management plans, and host educational workshops to help residents better understand the threats to our water quality, and learn how they can improve it.

CONTACT INFORMATION

Customer Service
76 East Worcester Street
Worcester, MA 01604

Accessible via WRTA Bus Line.
View Schedules

Phone: 508-929-1300
Fax: 508-799-1448
Email Us

Office Hours:
Monday - Friday
7:30 a.m. - 5 p.m.

Live Help is Closed. Leave a message

Stay Connected:

2017 LAKES & PONDS WATER QUALITY MONITORING PROGRAM RESULTS

- Bell Pond Water Quality Report
- Coes Reservoir Water Quality Report
- Indian Lake Water Quality Report
- Lake Quinsigamond Water Quality Report

http://www.worcesterma.gov/water-sewer/recreational-waters



Indian Lake

Indian Lake

Location and Physical Characteristics

- Northern Worcester in the Mill Brook Watershed
- 190 acres in surface area
- ~17 feet deep

Attractions

- 2 City-run beaches
- Public boat ramp

Known Impairments

- Non-native plants
- Harmful Algal Blooms
- Low dissolved oxygen
- High Phosphorus

Current Management

- Harmful algal bloom prevention and treatment
- Annual drawdown for weed control
- Herbicide treatment



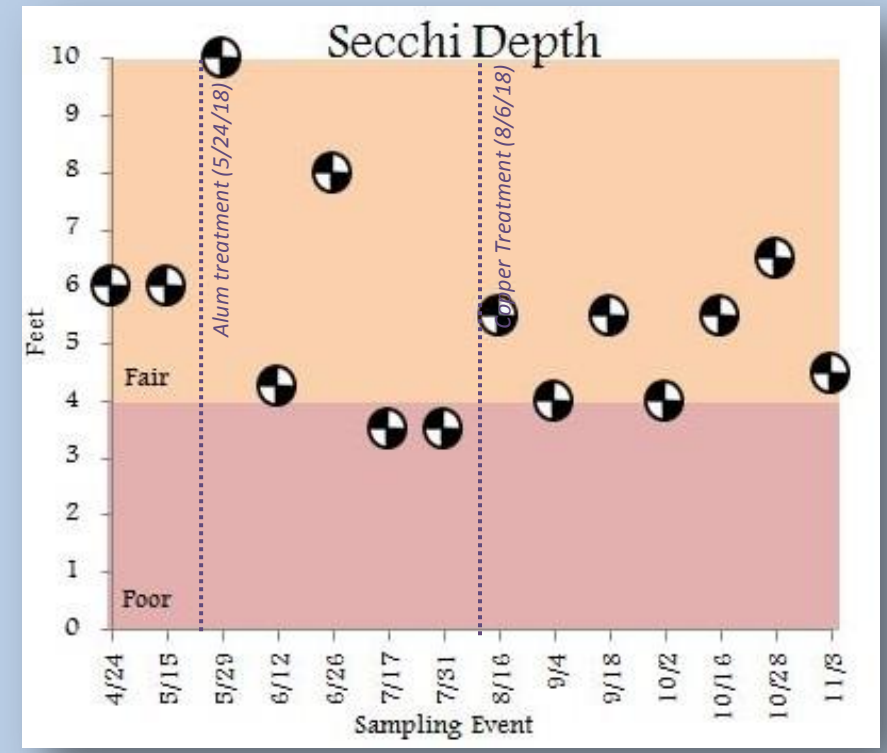
Indian Lake

Daily Reading (E.coli/100ml)		
Date	Shore Park	Clason Beach
6/26/2018	148	92
7/2/2018	60	32
7/9/2018	8	28
7/16/2018	32	16
7/23/2018	56	54
7/30/2018	20	8
8/7/2018	<4	4
8/13/2018	52	24

Blue = “excellent”, Green = “good”

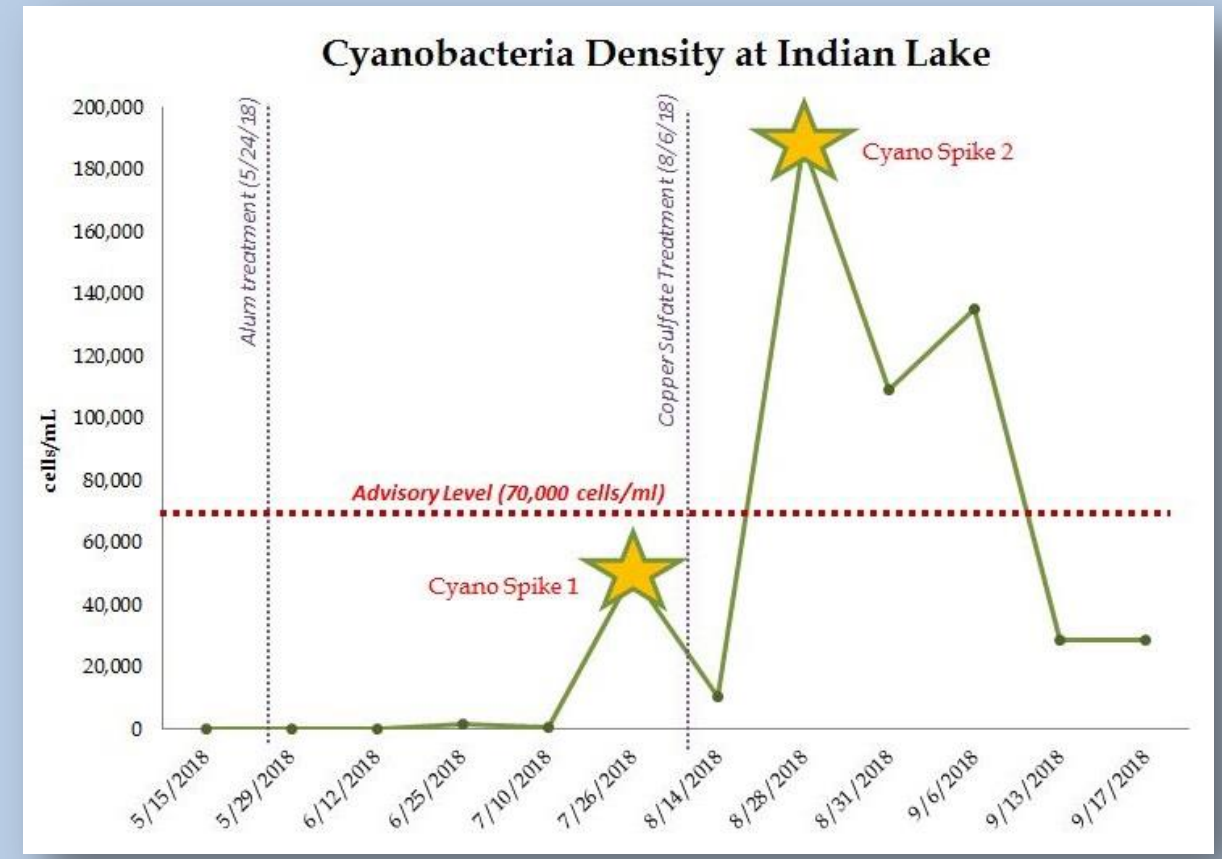


Indian Lake


Secchi Depth
Feet
10
9
8
7
6
5
4
3
2
1
0
Fair
Poor
Alum treatment (5/24/18)
Copper Treatment (8/6/18)
4/24
5/15
5/29
6/12
6/26
7/17
7/31
8/16
9/4
9/18
10/2
10/16
10/28
11/3
Sampling Event

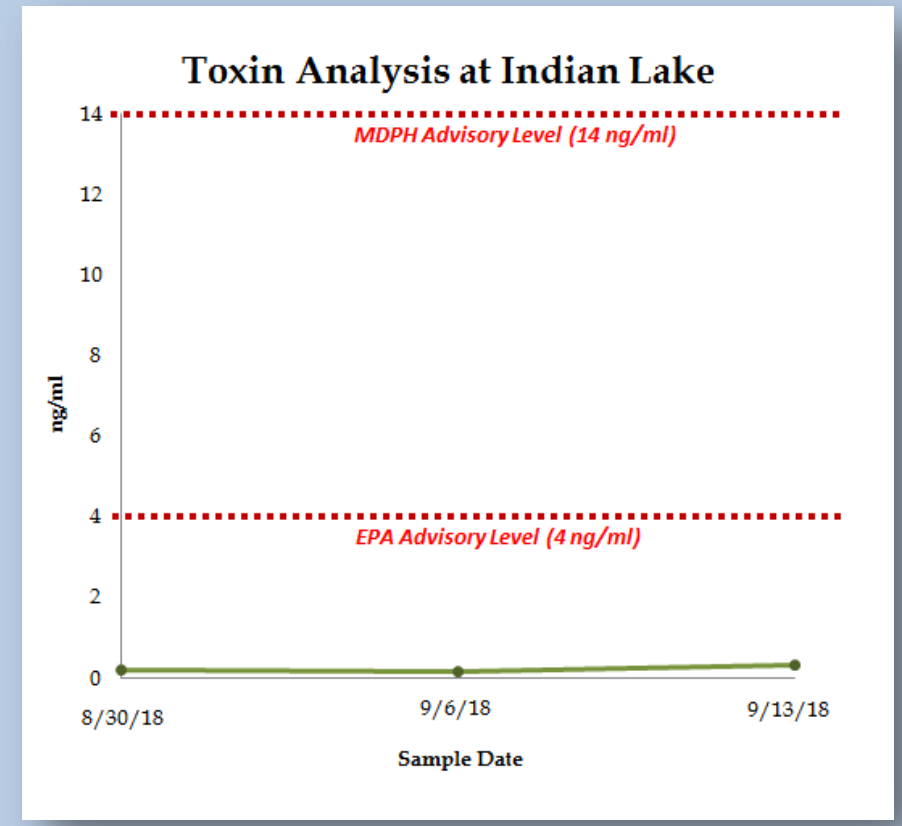


Indian Lake


Cyanobacteria Density at Indian Lake
cells/mL
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
Alum treatment (5/24/18)
Copper Sulfate Treatment (8/6/18)
Advisory Level (70,000 cells/ml)
Cyano Spike 1
Cyano Spike 2
5/15/2018
5/29/2018
6/12/2018
6/25/2018
7/10/2018
7/26/2018
8/14/2018
8/28/2018
8/31/2018
9/6/2018
9/13/2018
9/17/2018

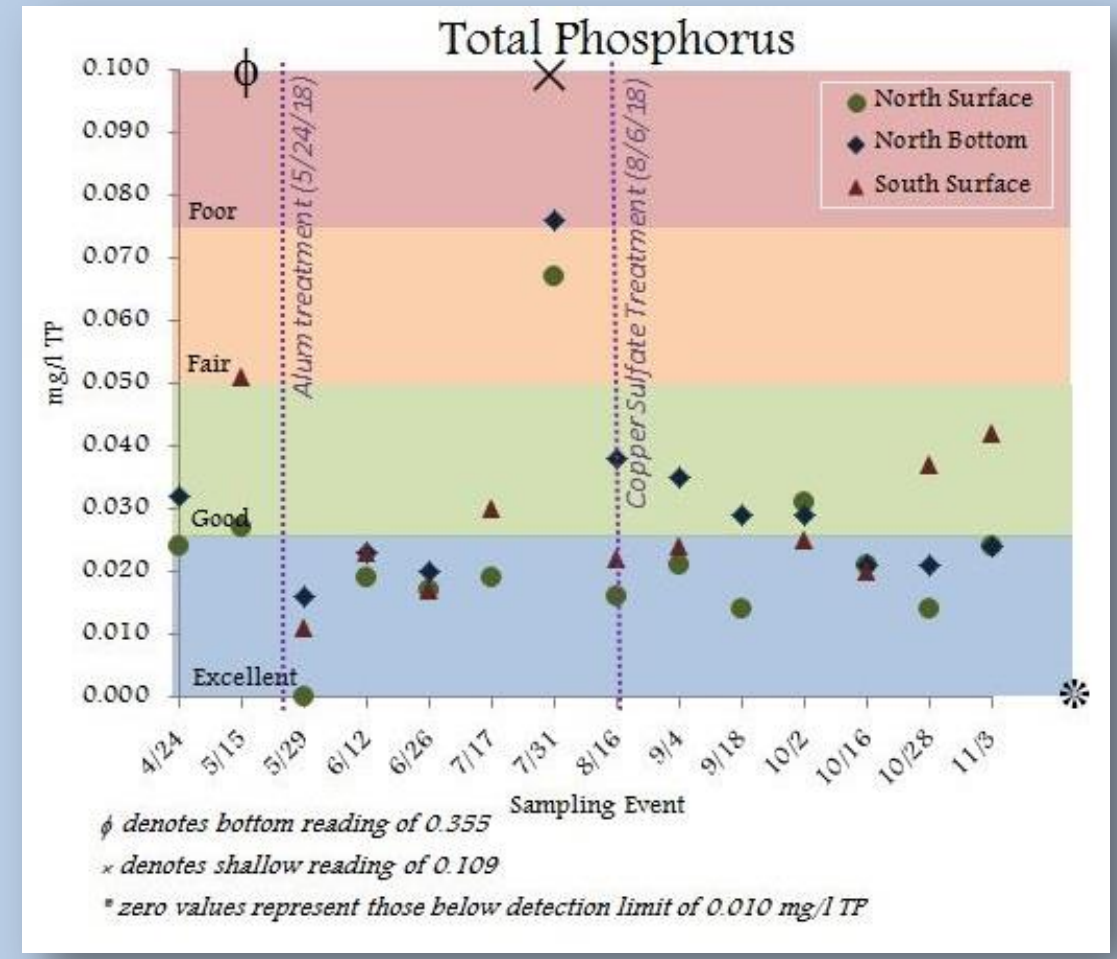


Indian Lake


Toxin Analysis at Indian Lake
14
12
10
8
6
4
2
0
ng/ml
MDPH Advisory Level (14 ng/ml)
EPA Advisory Level (4 ng/ml)
8/30/18
9/6/18
9/13/18
Sample Date

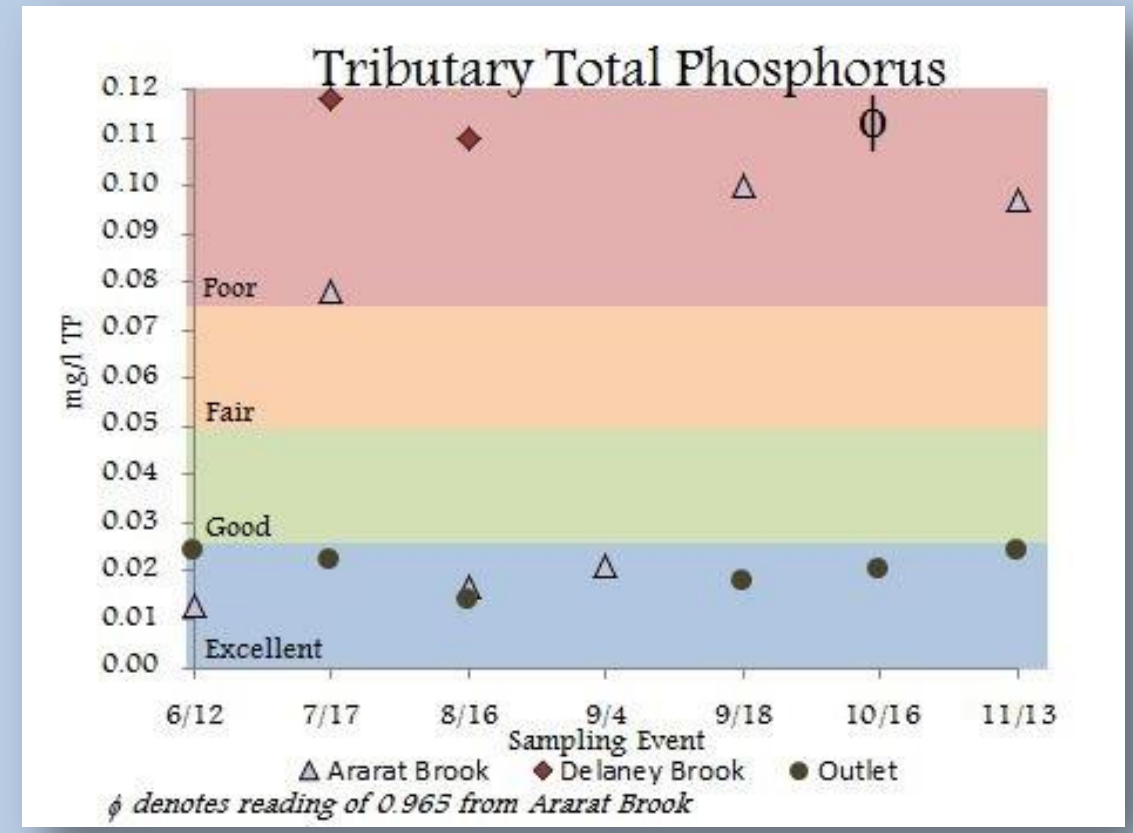


Indian Lake


Total Phosphorus
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
mg/l TP
Poor
Fair
Good
Excellent
Alum treatment (5/24/18)
Copper Sulfate Treatment (8/6/18)
North Surface
North Bottom
South Surface
4/24
5/15
5/29
6/12
6/26
7/17
7/31
8/16
9/4
9/18
10/2
10/16
10/28
11/3
Sampling Event
ϕ denotes bottom reading of 0.355
× denotes shallow reading of 0.109
* zero values represent those below detection limit of 0.010 mg/l TP



Indian Lake

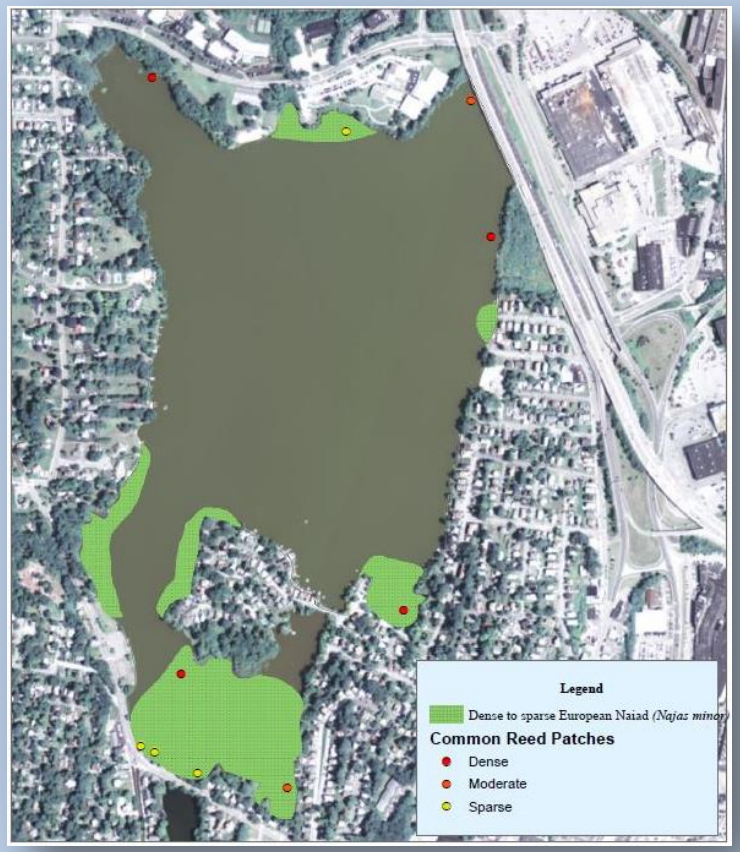

Tributary Total Phosphorus
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
mg/l TP
Poor
Fair
Good
Excellent
6/12
7/17
8/16
9/4
9/18
10/16
11/13
Sampling Event
Ararat Brook
Delaney Brook
Outlet
ϕ denotes reading of 0.965 from Ararat Brook



Indian Lake



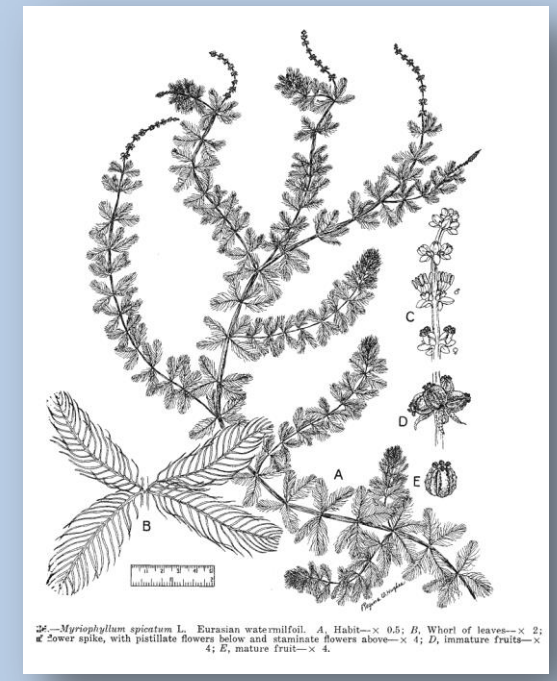
Common Reed
Phragmites australis



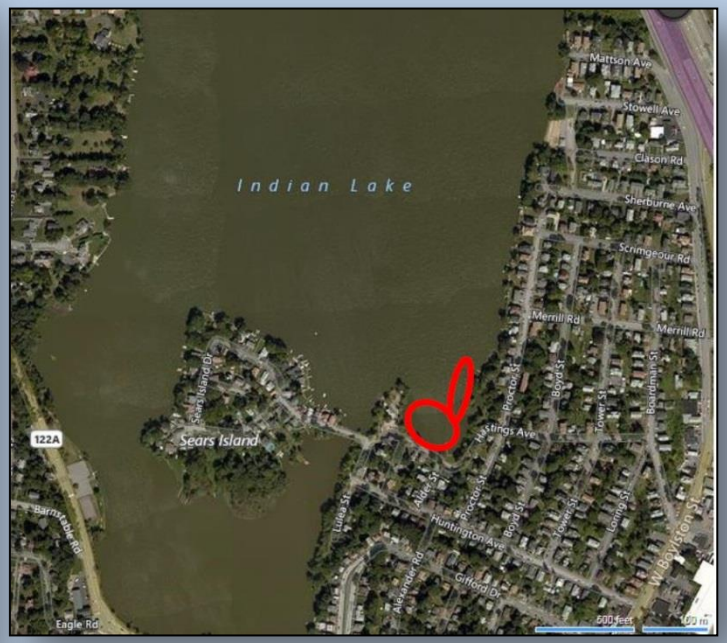
Common Reed Stands 2016



Indian Lake



Eurasian Milfoil
Myrophyllum spicatum



Eurasian Milfoil Patches 2018



Indian Lake

2018

State of the Lake

- Recreational uses and ecology are threatened.
- Major Challenges: cyanobacteria, invasive species



Indian Lake

Monitoring in 2019

- Continued semi-monthly monitoring for water quality parameters
- Greater focus on water temperature
- Increased monitoring for cyanobacteria density
- Study of TP loading during rain events

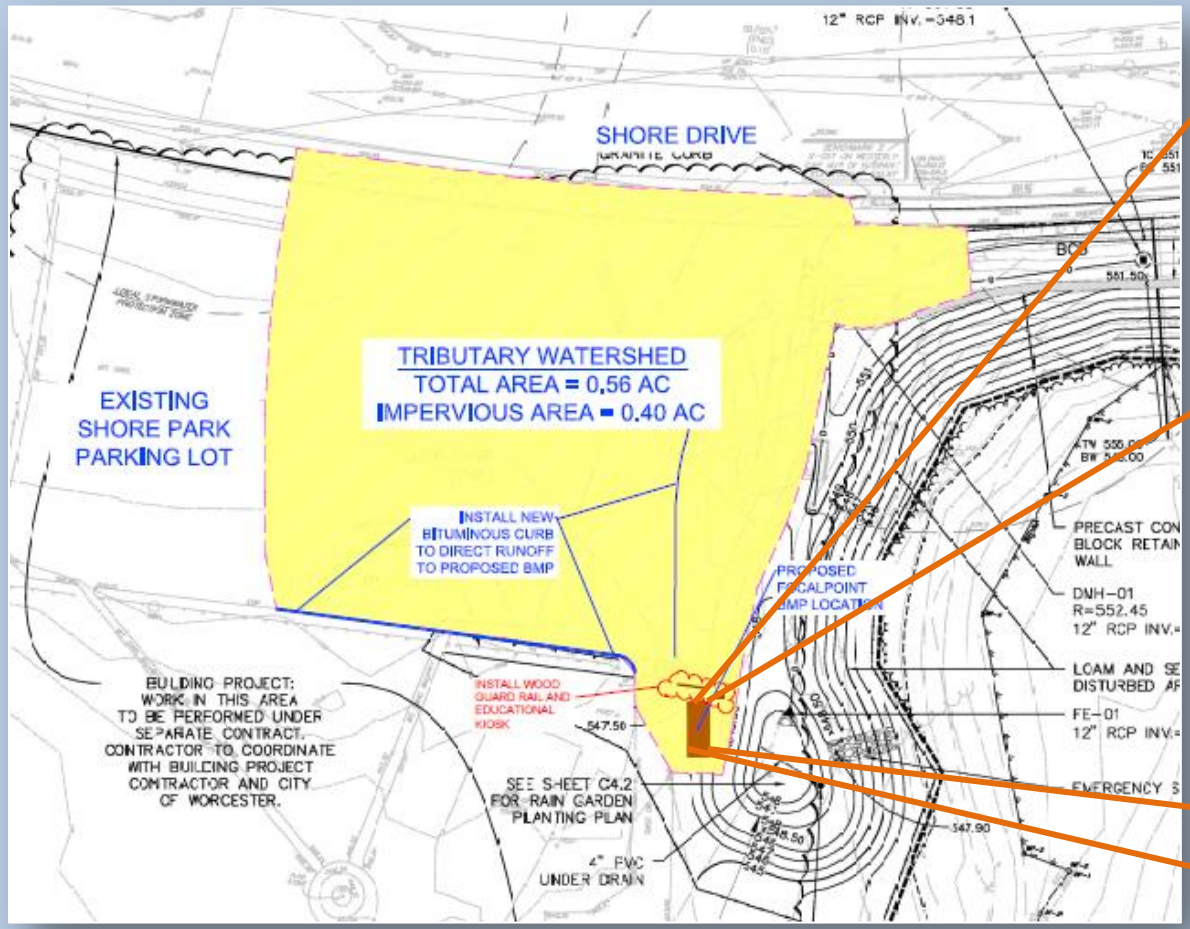
Priorities for 2019

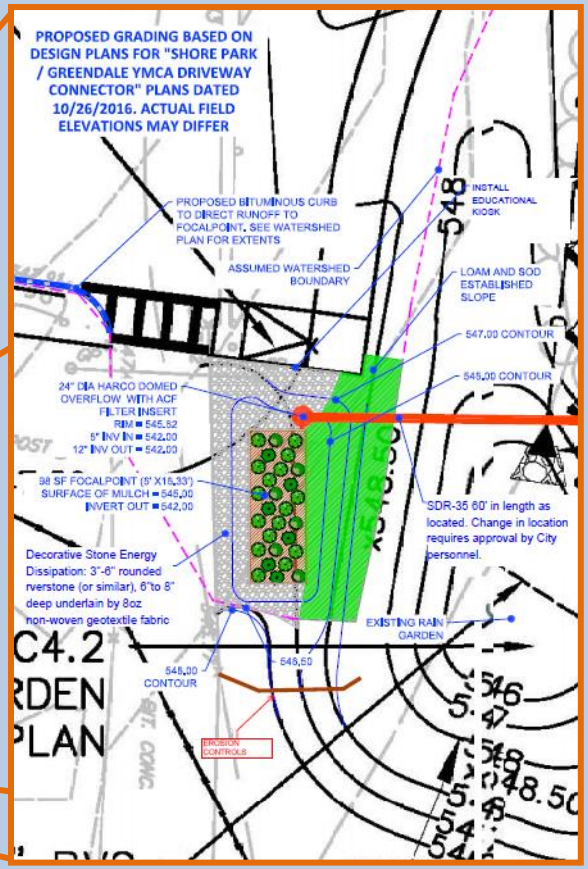
- Aquatic plant survey
- Removal of Eurasian milfoil patches via DASH method
- Construction of a rain garden at Shore Park
- Evaluation of alternative methods of phosphorus control



Indian Lake

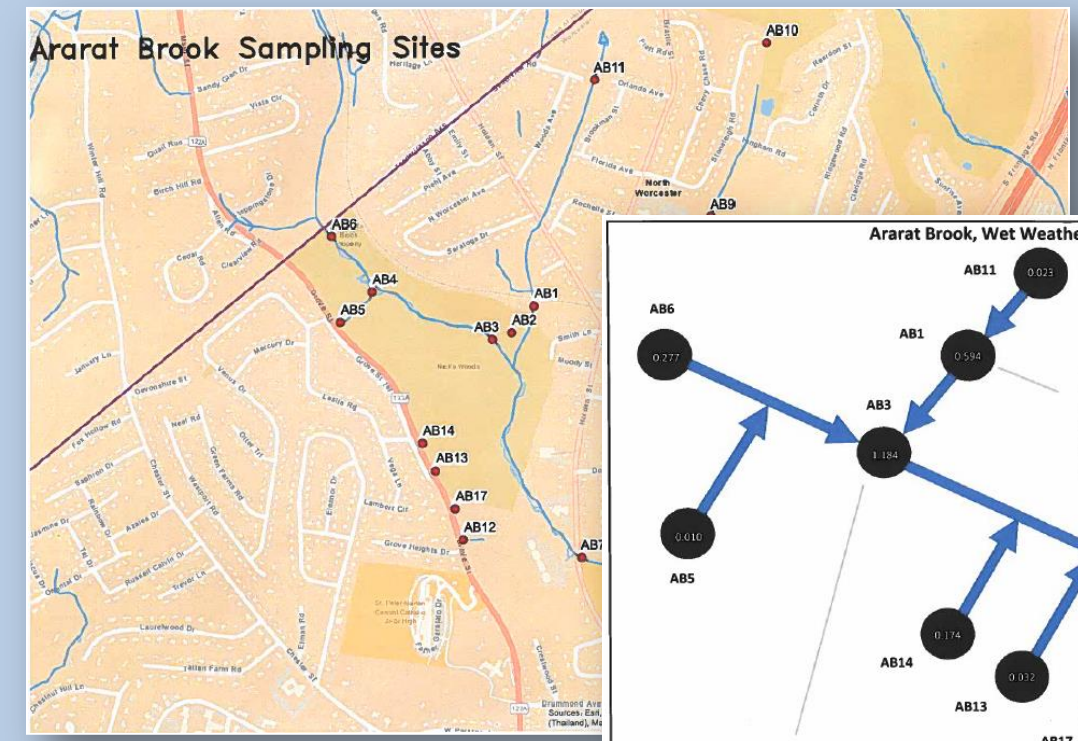
Biofiltratation Unit at Shore Park

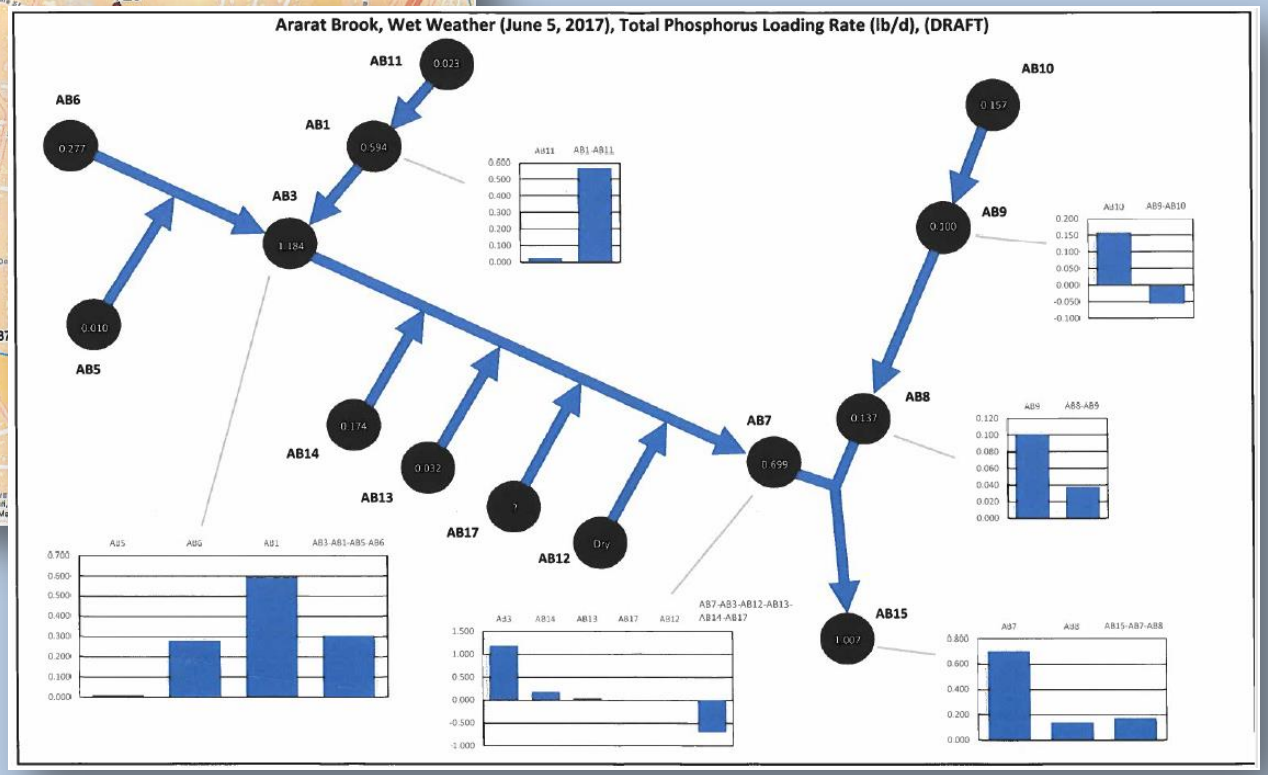




Indian Lake

Phosphorus Source Tracking





Indian Lake

An Alum Dosing Station





Indian Lake

DASH: Diver Assisted Suction Harvesting

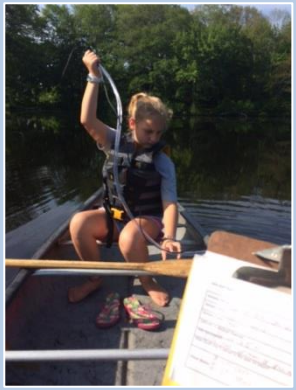


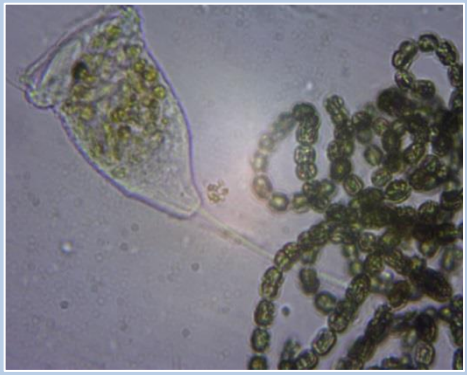


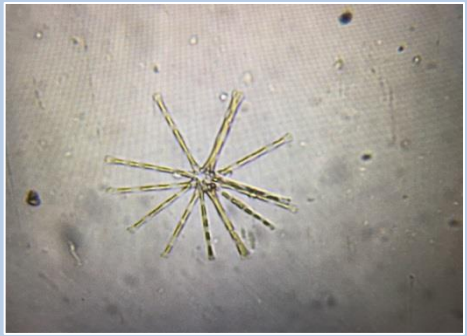


Photo credit: Solitude Lake Management

Citizen Science





Training on Tuesday, April 23rd, 6:00pm
@ Bancroft School Field House