

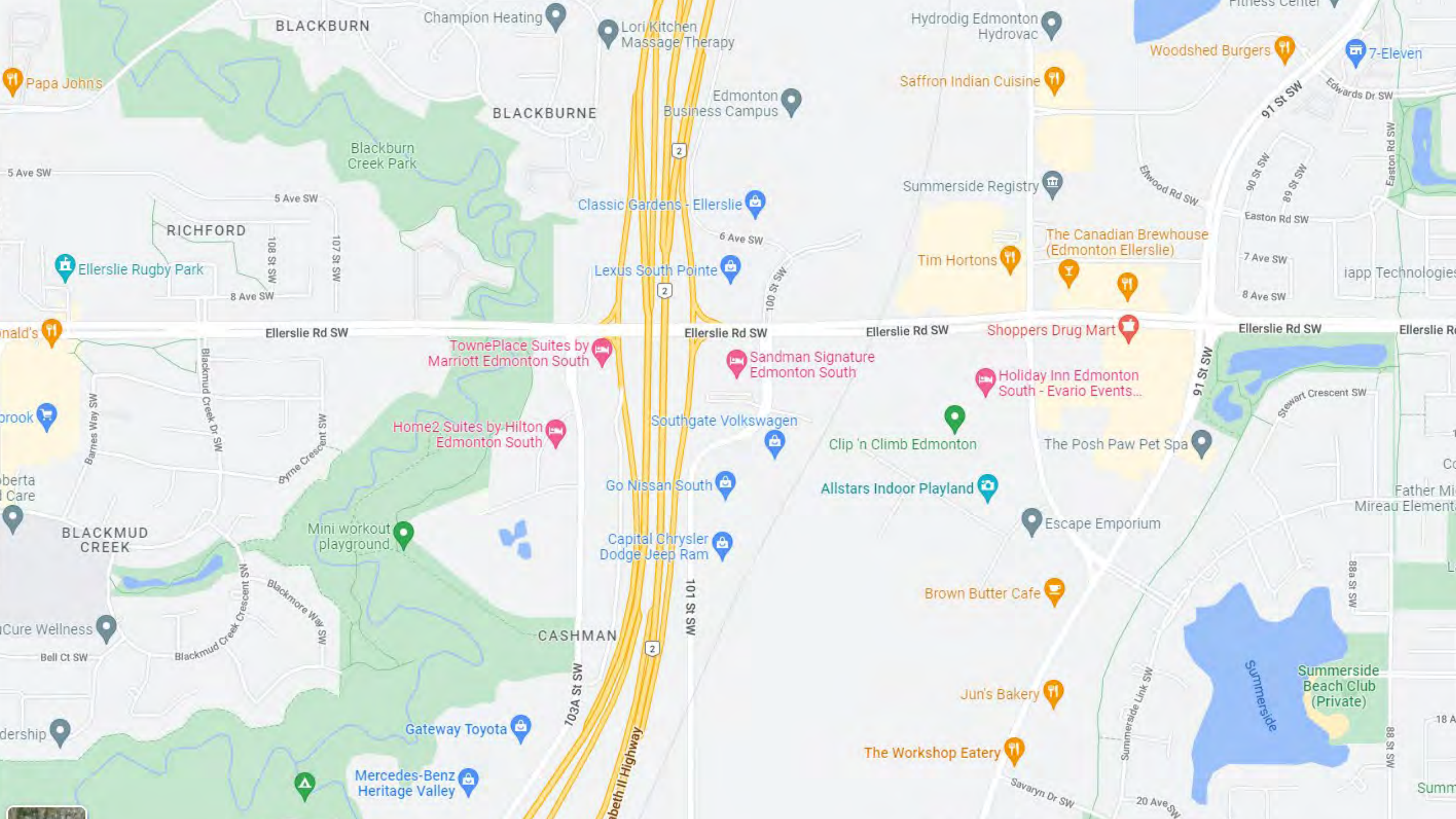
Water Quality Management of Lake Summerside



Jay White, M.Sc., P.Biol., QAES, AP
Aquality Environmental Consulting Ltd.



In 2020, Aquality Environmental Consulting Ltd. was selected to advise Summerside Resident's Association with the management of their lake



BLACKBURN

Champion Heating

Lori Kitchen
Massage Therapy

Hydrodig Edmonton
Hydrovac

Woodshed Burgers

7-Eleven

Papa John's

BLACKBURNE

Edmonton
Business Campus

Blackburn
Creek Park

Saffron Indian Cuisine

5 Ave SW

5 Ave SW

RICHFORD

Ellerslie Rugby Park

Classic Gardens - Ellerslie

6 Ave SW

Lexus South Pointe

Summerside Registry

The Canadian Brewhouse
(Edmonton Ellerslie)

Tim Hortons

Easton Rd SW

iapp Technologies

8 Ave SW

Ellerslie Rd SW

Ellerslie Rd SW

Ellerslie Rd SW

Shoppers Drug Mart

Ellerslie Rd SW

Ellerslie Rd SW

TownePlace Suites by
Marriott Edmonton South

Sandman Signature
Edmonton South

Holiday Inn Edmonton
South - Evario Events...

Home2 Suites by Hilton
Edmonton South

Southgate Volkswagen

Clip 'n Climb Edmonton

The Posh Paw Pet Spa

brook

berta
Care

BLACKMUD
CREEK

Mini workout
playground

Go Nissan South

Allstars Indoor Playland

Father Mi
Mireau Element

Cure Wellness

Bell Ct SW

Blackmud Creek Crescent SW

Blackmore Way SW

CASHMAN

Capital Chrysler
Dodge Jeep Ram

101 St SW

Escape Emporium

Brown Butter Cafe

88a St SW

dership

Gateway Toyota

703A St SW

Elizabeth II Highway

Mercedes-Benz
Heritage Valley

The Workshop Eatery

Jun's Bakery

Summerside Link SW

Summerside
Beach Club
(Private)

18 A

Summ

Savaryn Dr SW

20 Ave SW

MS 15 88

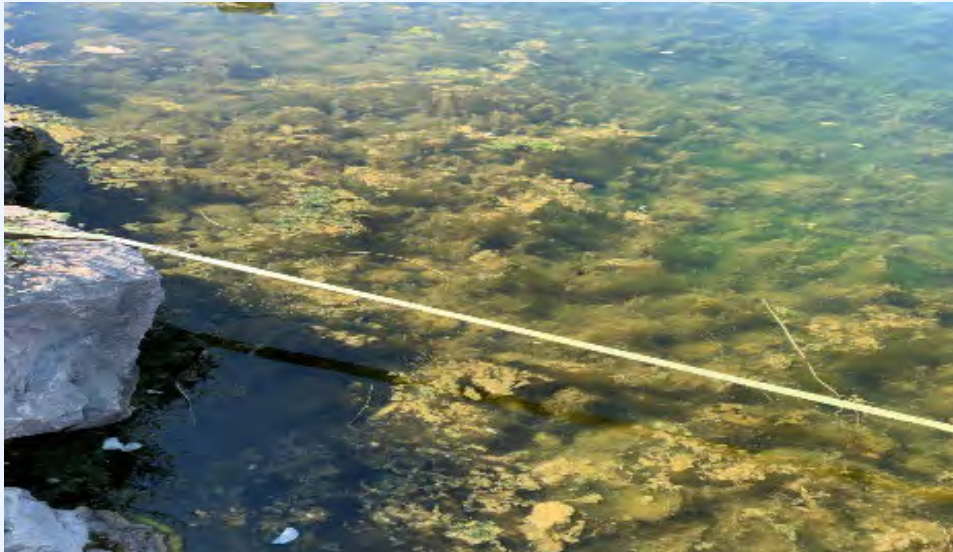


What Are the Lake Management Issues?



- **Green algae and Cyanobacteria (Blue-green Algae) show up!**
- **Blue-green algae produce toxins that can make people, pets, and wildlife sick**

Green Algae



Green algae growing near the shoreline at Summerside Lake. (Aquality, 2020).

Cyanobacteria (Blue-green Algae)



Cyanobacterial bloom at Summerside Lake June 4, 2020. Photo by EnviroMak Inc.



What is Blue-Green Algae (Cyanobacteria)?

- Green algae and Blue-green Algae (Cyanobacteria) are two very different things. Blue-green algae is actually bacteria that can photosynthesize. They produce toxins that can make people, pets, and wildlife sick.

Green Algae



Green algae growing near the shoreline at Summerside Lake. (Aquality, 2020).

Blue-green Algae (Cyanobacteria)



Cyanobacterial bloom at Summerside Lake June 4, 2020. Photo by EnviroMak Inc.





In the summer of 2021, *Aquality* applied Sodium Percarbonate to manage cyanobacteria

- Powerful oxidizer, rapid acting, sunlight intensifies





Peroxide Treatment for Blue-Green Algae

- Effective for rapidly killing off a blue-green algae (cyanobacteria) bloom
- Applied only to targeted bloom areas as required
- No harmful effects for people or organisms as H_2O_2 rapidly degrades into water and oxygen





Lake Managers Happy! Residents Happy!



Does the story end here?



So What...?

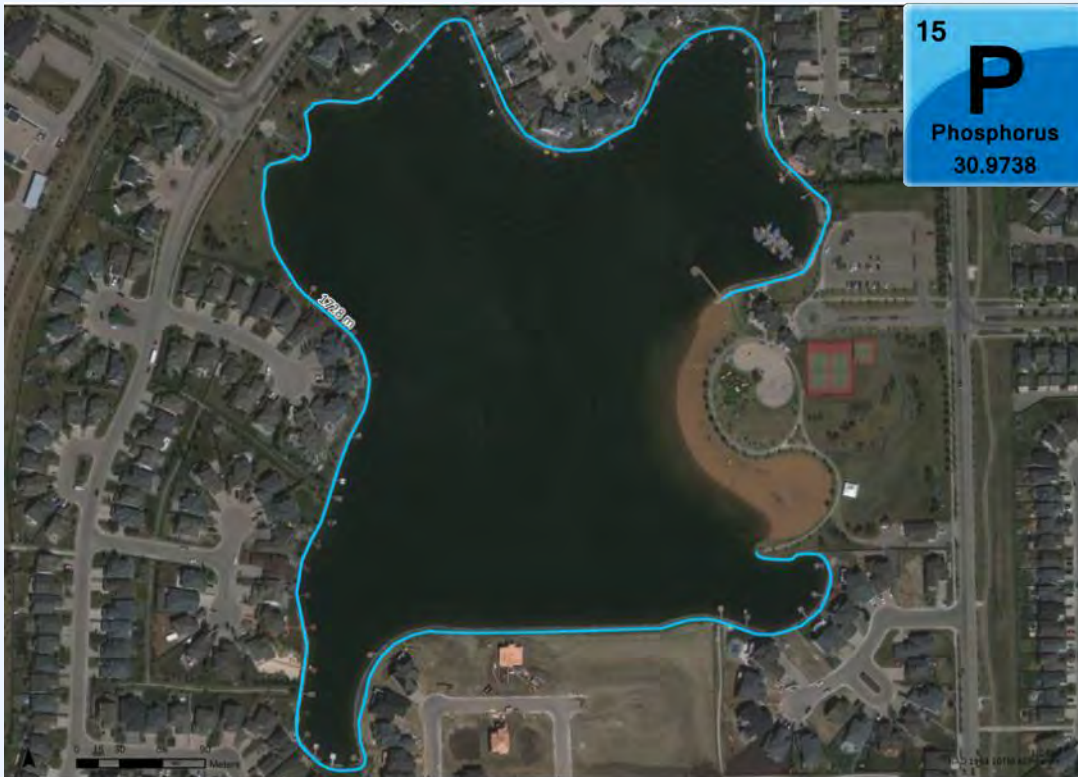


...we showed we could treat the symptoms. But what about the cause?

Is there an effective P-binder that we could use?



What is Floc N'Lock?



Floc N'Lock is aluminum chloride:

- Safer for fish bearing waters compared to alum (aluminum sulfate)

How Does It Work?

- Adds phosphate binding capacity to the top of the sediment layer (removes available phosphate from system)



Nutrient Management in Lakes



Floc N Lock (aluminum chloride) Application:

- Application of Floc N Lock in select areas (all shoreline excluding swimming area)
- Recommended application for first year of treatment is 10 L per 100 m of shoreline twice per season.
- Maintenance treatment 5 L per 100 m of shoreline twice per season



Flock N'Lock Application System



Application system included:

- The ability to pump lake water into the drum for dilution of Floc N'Lock solution to an appropriate concentration
- Tubing and pump system connected to a pipe with several holes drilled into it to evenly disperse the solution on the surface of the lake



Wind Helped To Disperse the Liquid





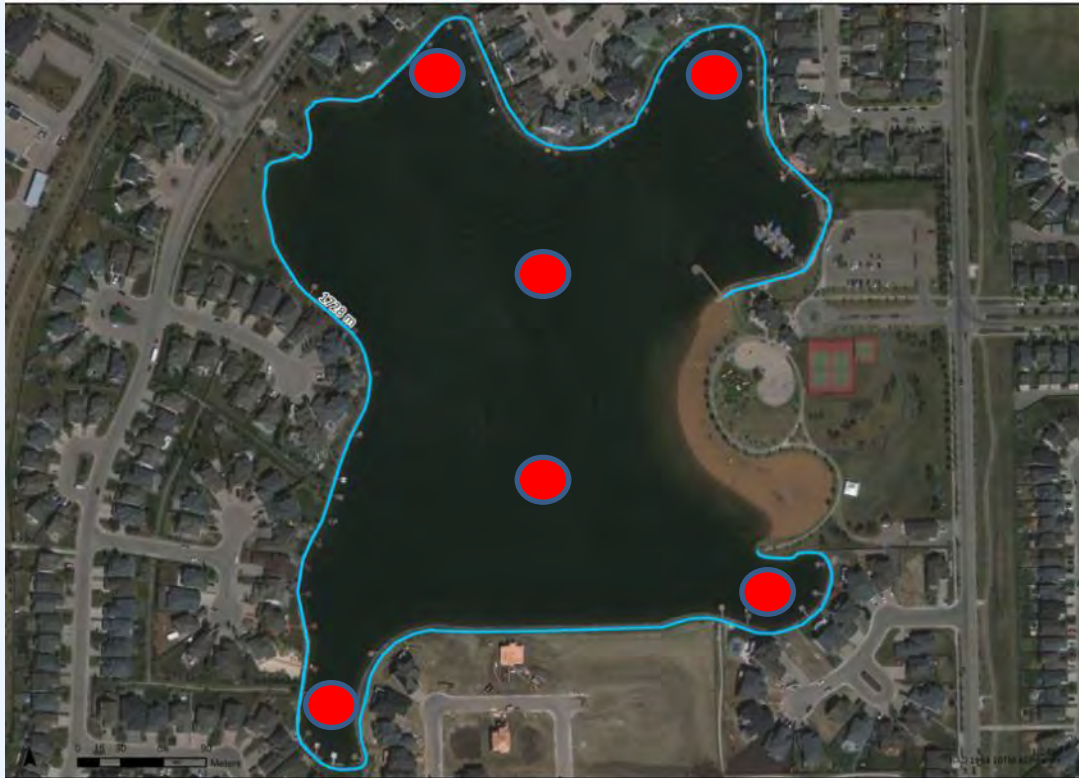
Water Quality Measurements



So.... How do we know it worked?



Water Quality Measurements



Water Quality Sampling Locations:

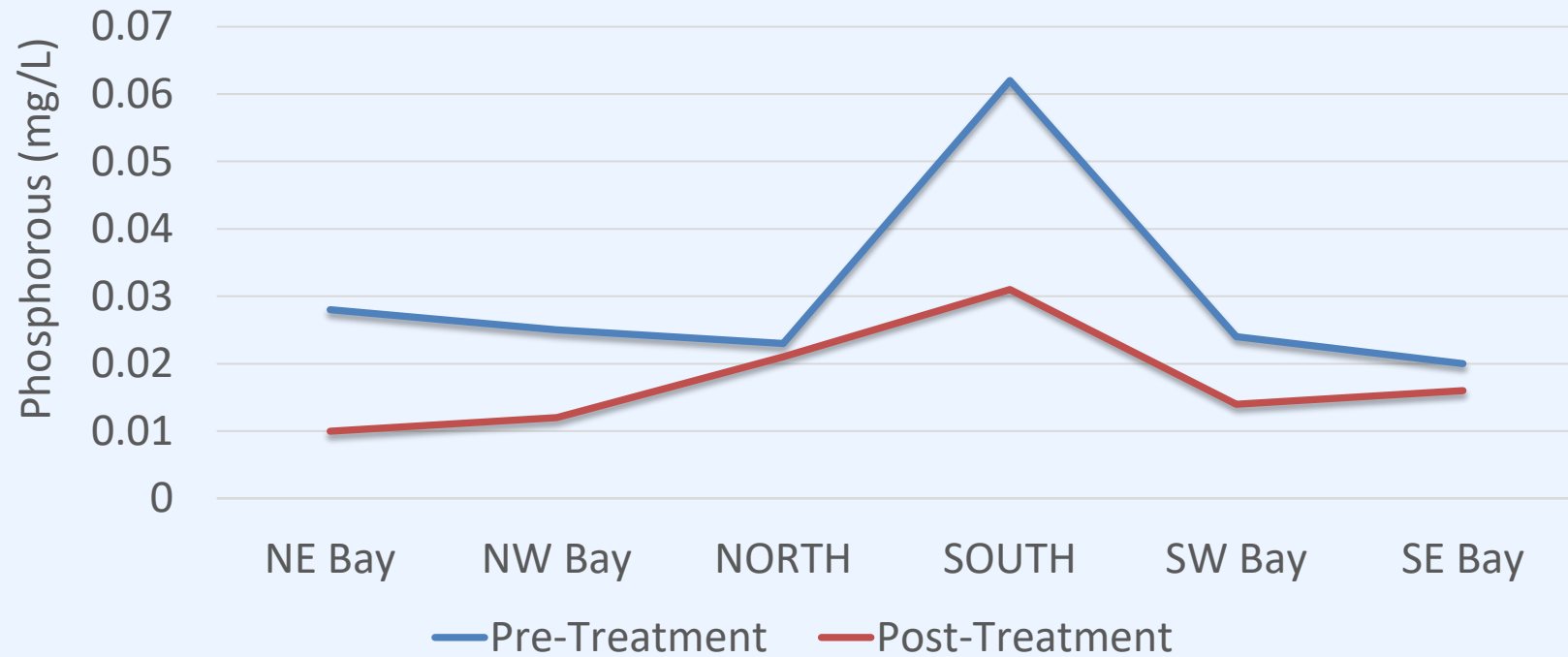
- 6 locations around Lake Summerside were selected including one in each of the four bays and 2 in the central basin
- Pre-treatment sampling conducted on May 25, 2022
- Post-Treatment sampling conducted on June 2, 2022



Water Quality Measurements



Pre and Post Treatment Measurements of the Total Phosphorus Concentration

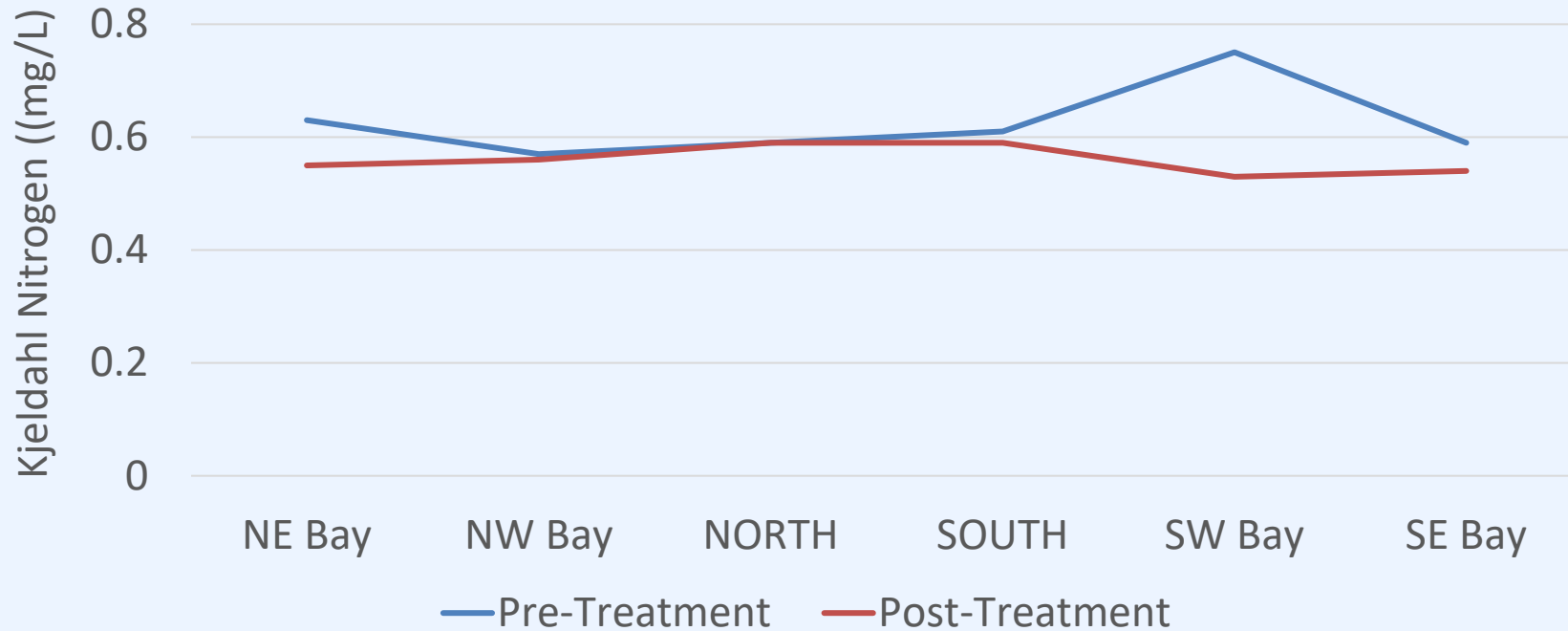




Water Quality Measurements



Pre and Post Treatment Measurement of Kjeldahl Nitrogen





Water Quality Measurements



Secchi disk measurements were conducted to assess the clarity of water

Date	NE Bay	NW Bay	North	South	SW Bay	SE Bay
May 25, 2022	Bottom	Bottom	2.50m	2.50m	Bottom	2.50m
June 2, 2022	Bottom	Bottom	2.95m	2.70m	2.90m	2.70m





Questions? Comments? Contact Us!



Phone: (780) 757-5530

Email: Info@aquality.ca



<http://www.facebook.com/AqualityEnv>

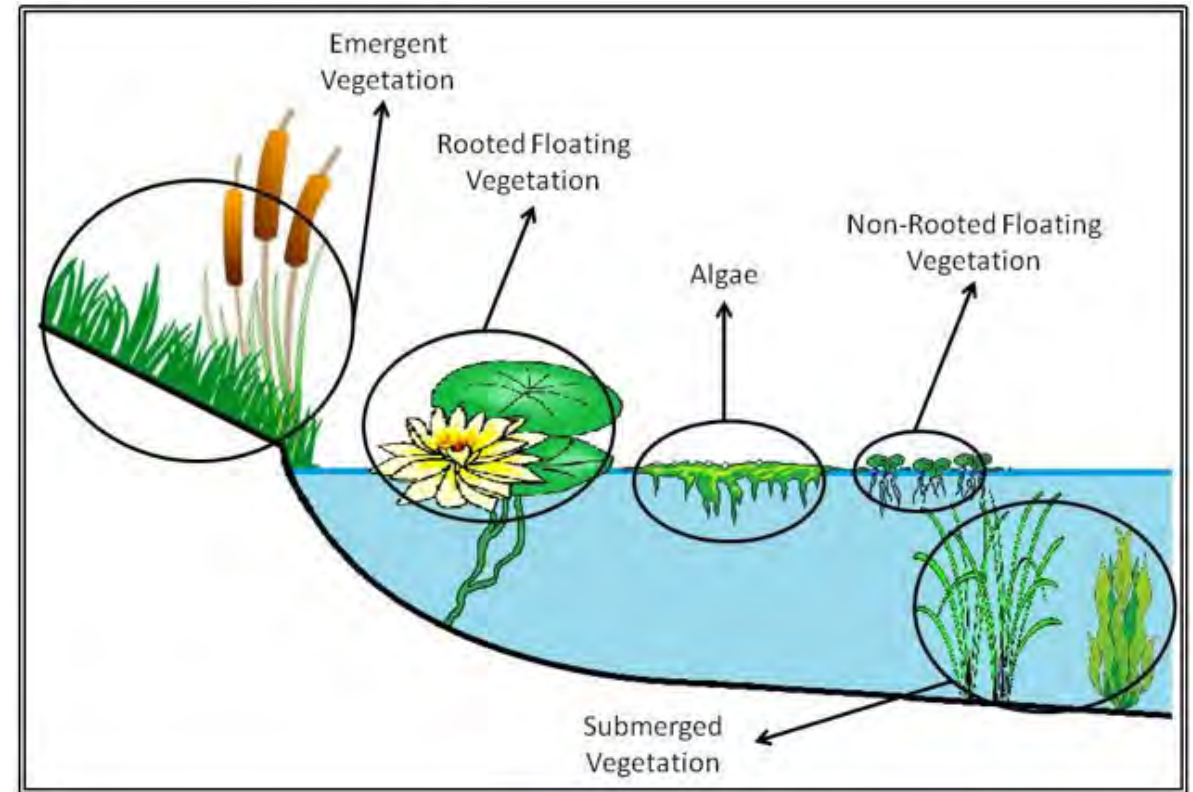


<https://twitter.com/AqualityEnv>



Types of Aquatic Vegetation

- Emergent
 - Grow along the shoreline with roots under water and leaves above water
- Rooted Floating
 - Found in deeper water where roots are under water and leaves on the surface.
- Submergent
 - Entire plant is found under water
- Non-rooted Floating
 - Tiny floating plants with fine roots
- Algae
 - May be floating mats, attached to plants, or attached to rocks and the substrate

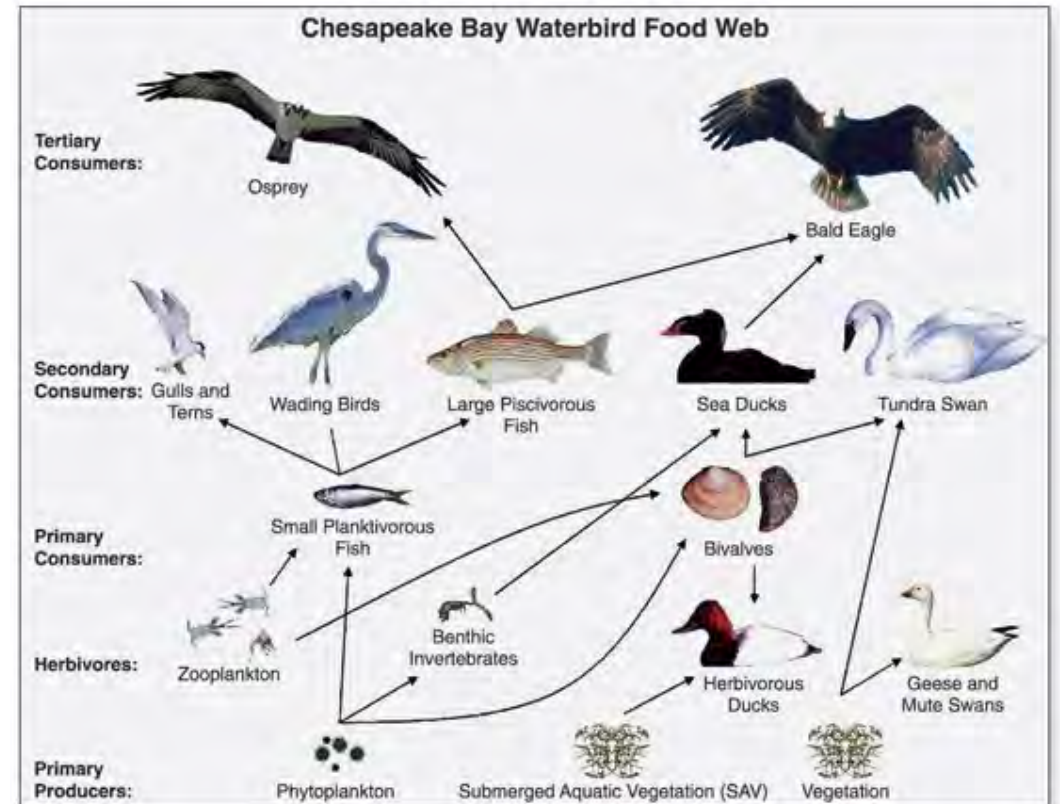


[5 Techniques To ID Aquatic Plants | Ausable River Association](#)



Importance of Aquatic Vegetation

- Plants feed the plankton and macroinvertebrates that feed the fish.
- Plants provide oxygen to the aquatic environment.
- Aquatic plants uptake excess phosphorus and nitrogen. Compete with algae and blue-green algae (cyanobacteria).
- Emergent plants protect the shoreline from wave erosion and reduce turbidity (murkiness) during stormy weather.



[Food Webs - Freshwater biome facts \(weebly.com\)](http://weebly.com)

