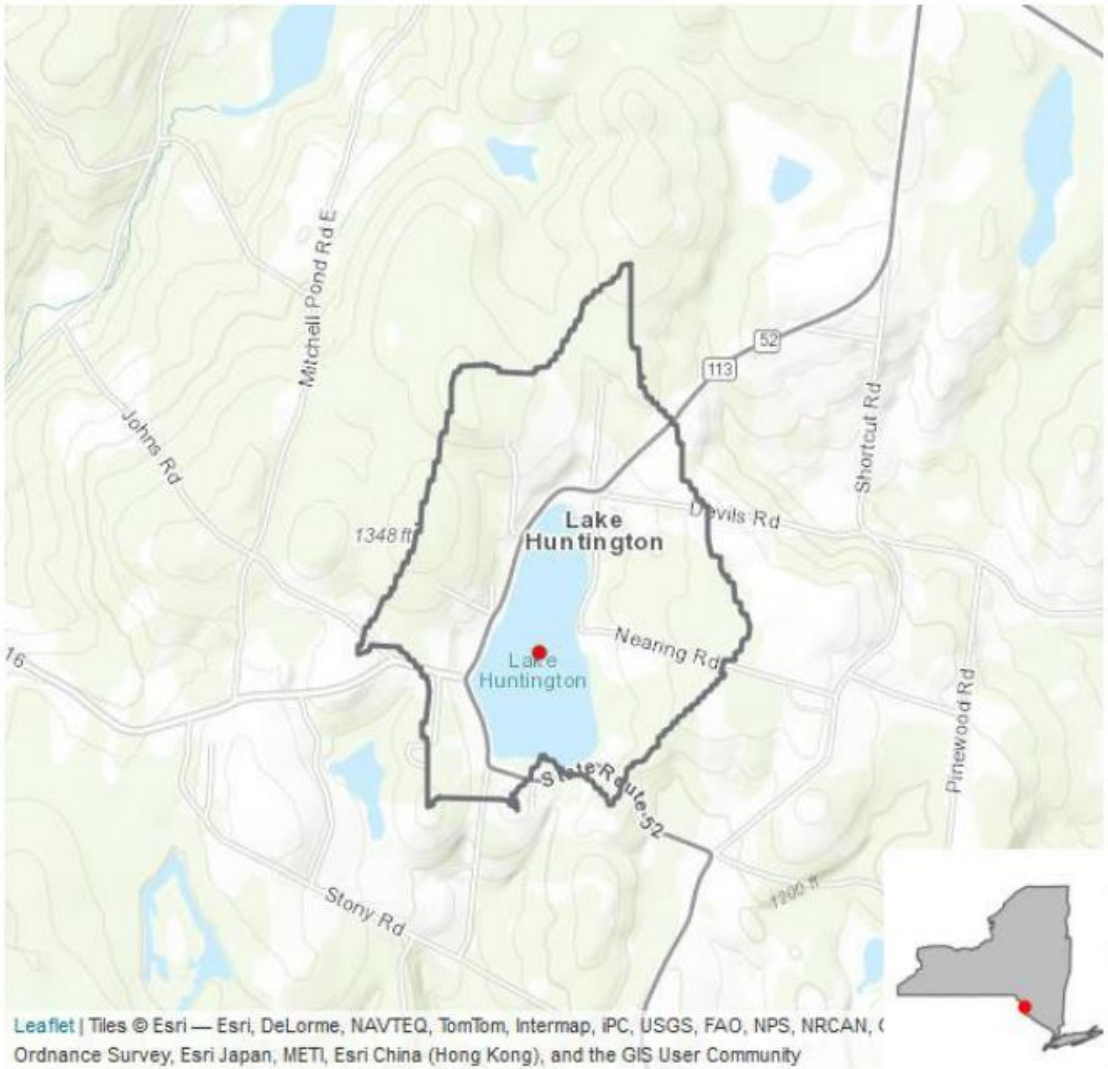
Lake Huntington

Testing assessment

Jack Nearing and Frank Podlaski

2024 **Lake Huntington** Town(s) of Cochecton Sullivan County Delaware River Basin



LAKE CHARACTERISTICS	
Lake Classification	B(T)
Dam Classification	Not available
Public Water Supply	No
Lake Size (AC)	71.9
Maximum Depth (m)	15

WATERSHED CHARACTERISTICS	
Watershed Area (AC)	440
Watershed to Lake Ratio	6
Open Water %	18
Wetlands %	0
Barren Land %	0
Shrub Scrub %	0
Grassland Herbaceous %	0
Forest %	55
Developed %	20
Agriculture %	5

CSLAP Participation	
Years in CSLAP	2023-2024

Waterbody Assessment	Trophic State	HABs Frequency	Invasive Species
Download Assessment Here	Eutrophic	Frequent Blooms	No Invasives Reported

Lake Huntington

Assessment of Best Use

Background

New York State waterbodies are classified to reflect their best use(s), and the assessment of a waterbody is based on the ability of waters to support those uses. This section lists whether this waterbody segment supports its best use(s).

Best Use	Use Assessment	Use Assessment Confirmation	Pollutant(s) Cause(s)	303(d) Year	Integrated Reporting Category
 Fishing	Impaired	Confirmed	Dissolved Oxygen	2018	IR5
			pH	2022	
 Secondary Contact Recreation	Impaired	Unconfirmed	Total Phosphorus	N/A	IR3
 Primary Contact Recreation	Impaired	Unconfirmed	Total Phosphorus	N/A	IR3

Standard CSLAP Sampling Parameters

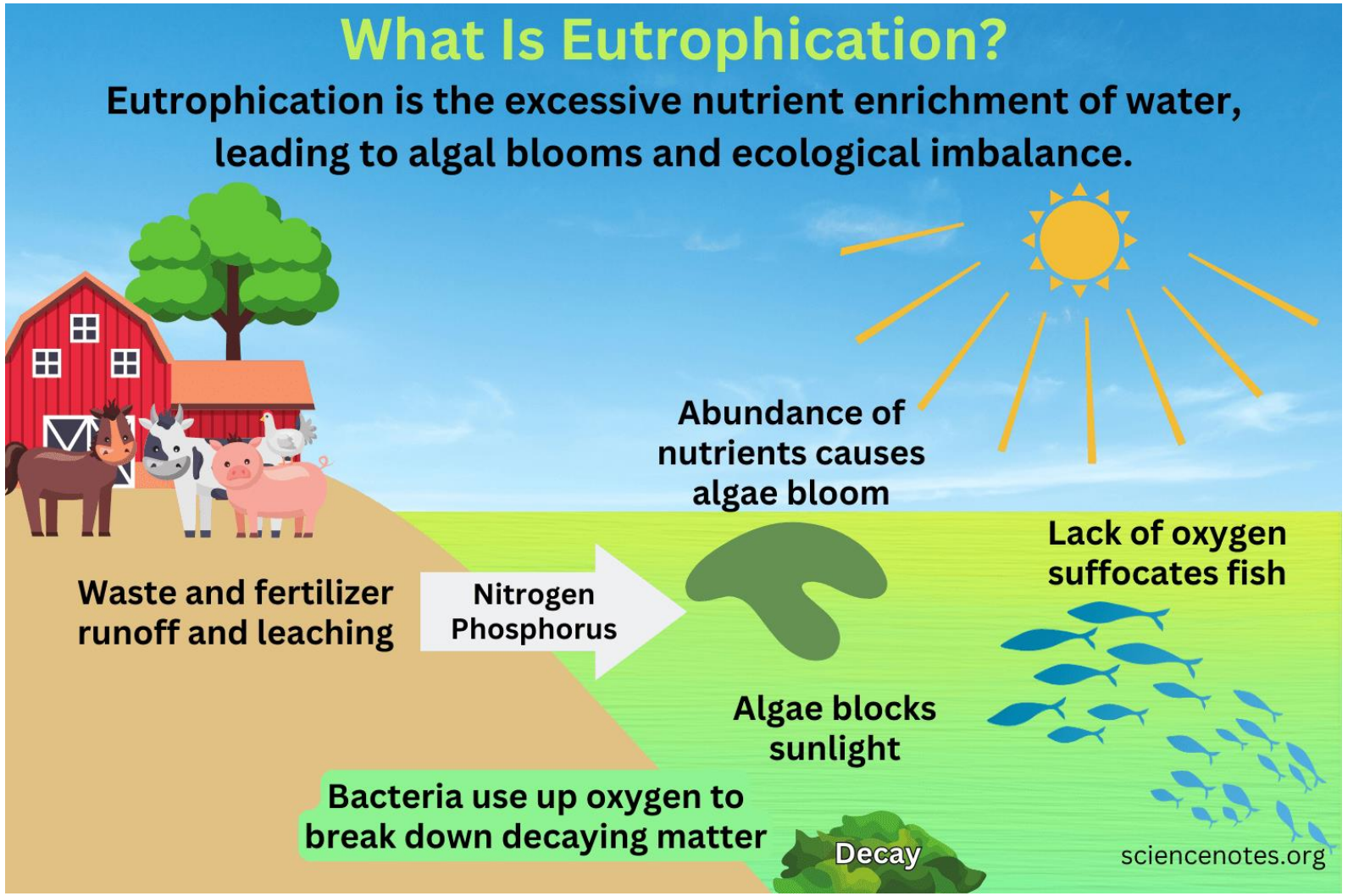
- Water Temperature (°C)
- Conductivity (µmhos/cm
- pH
- Color (true) (platinum color units)
- Phosphorus (total)(mg/l
- Nitrogen (total, ammonia and nitrate)(mg/l)
- Chlorophyll a (µg/l)
- Calcium (mg/l)
- Chloride (mg/l

Lake Huntington measured parameters and stds

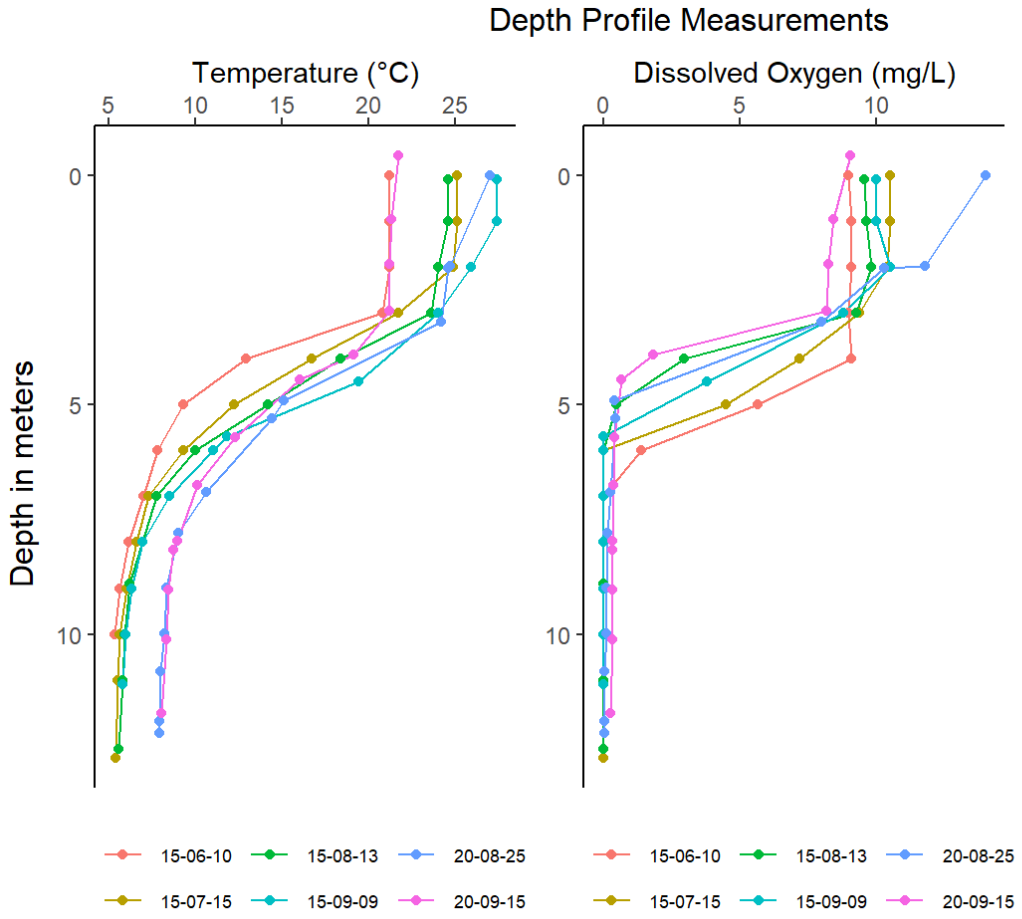
	healthy lake stds (mg/l)	avg (mg/l)	deep
TP (phosphorus)	0.020	**0.024**	**0.234**
ammonia	<0.1	**0.01**	
chlorophyll (eutrophic)	0.008*	**.0126**	
oxygen	8	**1.2**	
pH	6.6-8.5	**6.6**	

Low oxygen and high phosphorus in the deep water

Low oxygen and high phosphate in the deep water can lead to an algae bloom



Oxygen Profile Depth Measurements in Lake Huntington

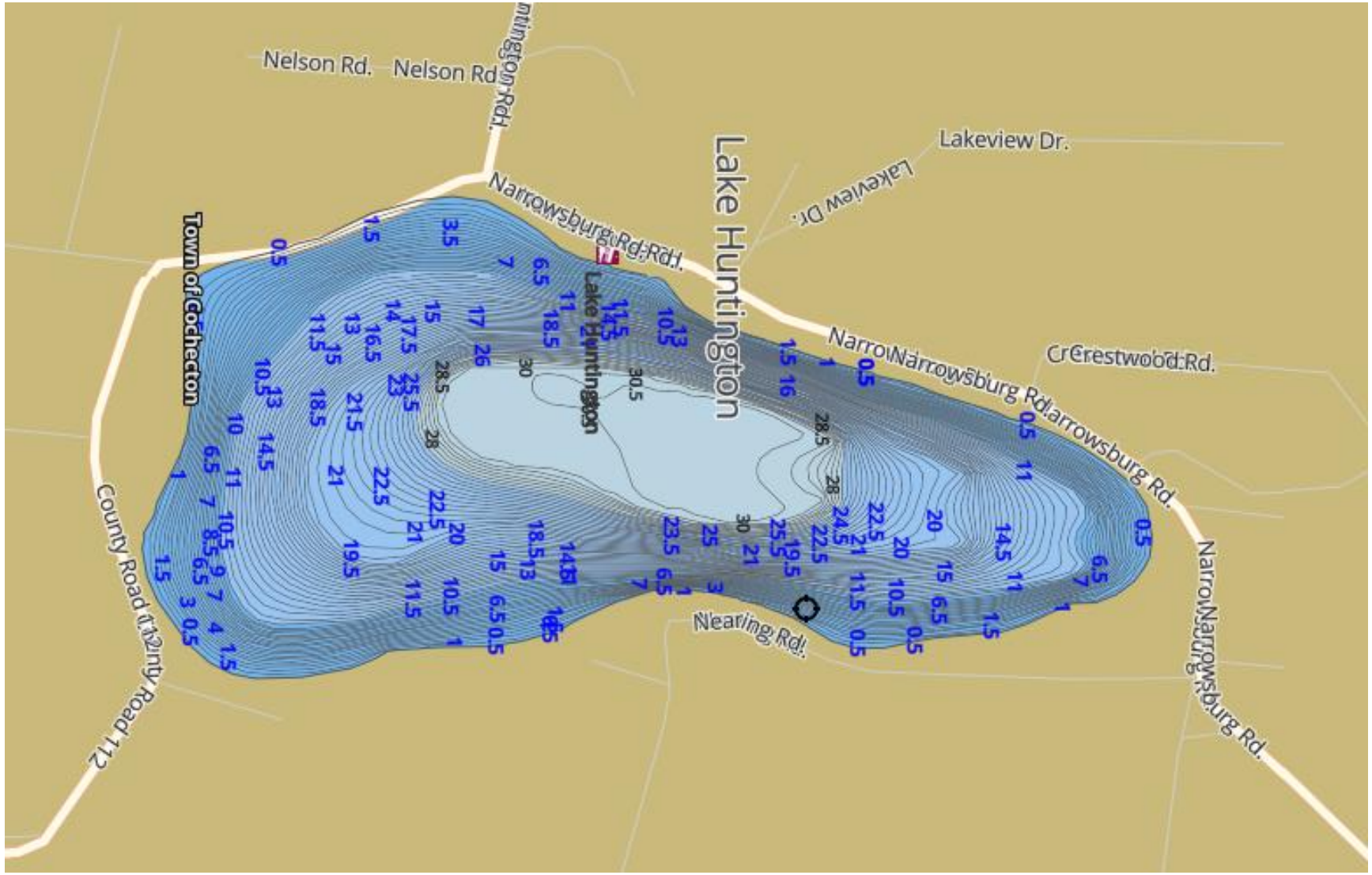


Temperature drives the solubility of gases and solutes and is the primary driver of the density gradient in the water column. Solubility decreases with increasing temperature.

Dissolved Oxygen is the amount of oxygen that is present in water and is a direct indicator of its ability to support aquatic life. Levels may fluctuate but typically, the bottom of the water column has less oxygen than the surface.

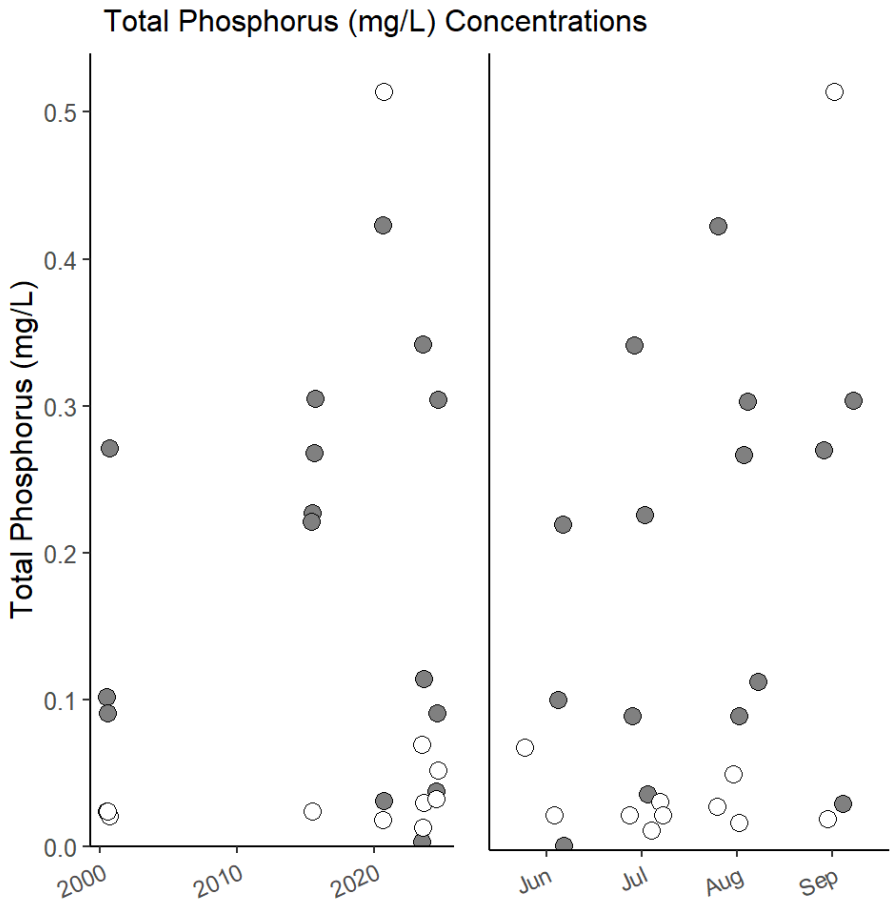
Oxygen level after ~12ft reduces to zero. This is consistent in the testing periods for 2015 and 2020 therefore the low oxygen at the lower depths appears to be the natural state of the lake

Lake Huntington depths



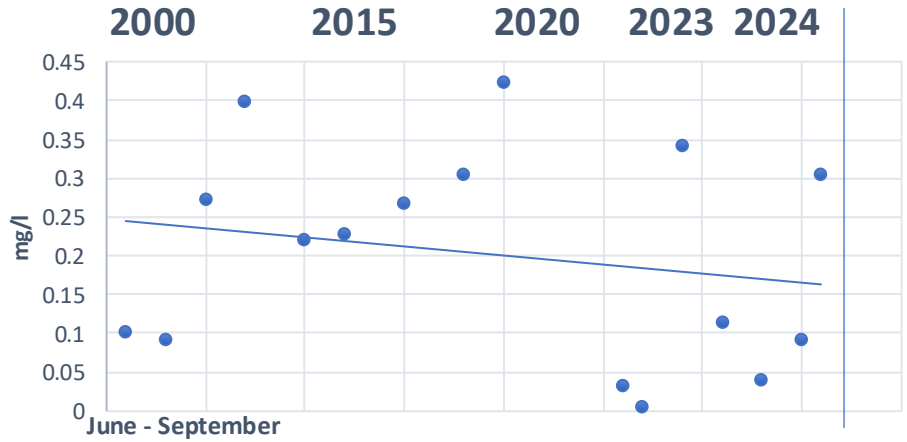
Gps Nautical Charts

Total Phosphorus



Total phosphorus is a limiting nutrient for algal growth and can vary across the vertical water column. Each circle corresponds to Surface Water (white) and Deep Water (gray) total phosphorus measurements.

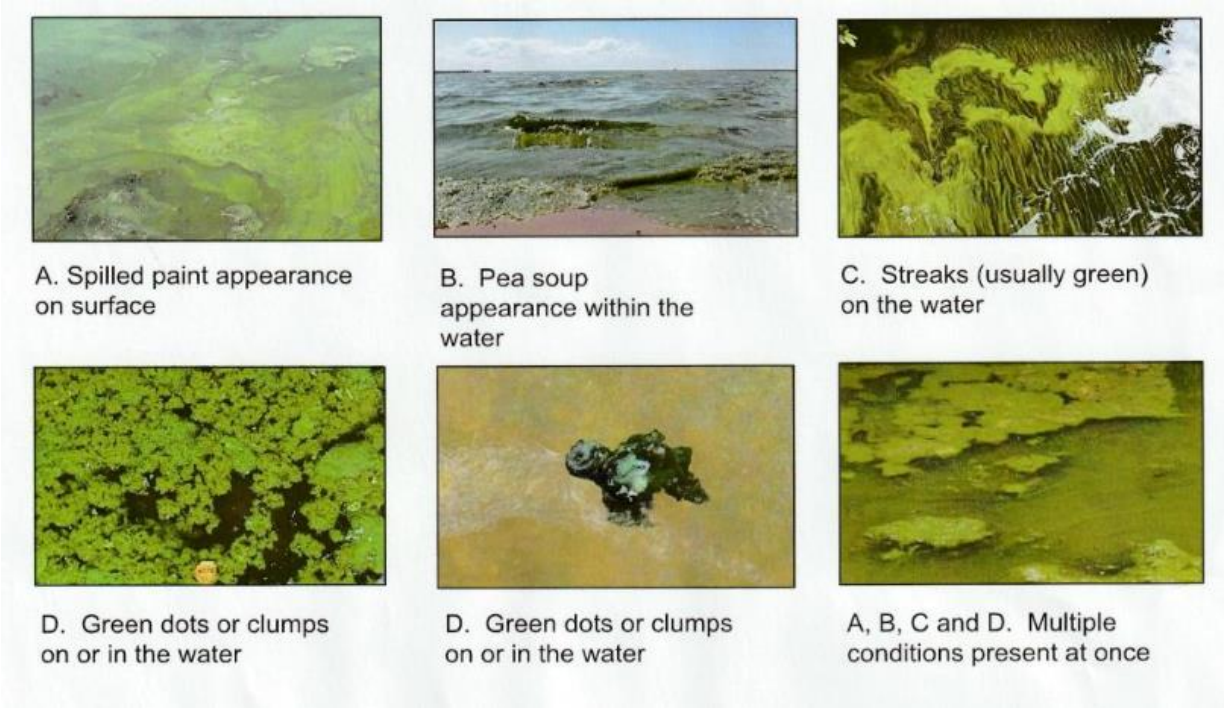
The median surface water concentration of Total Phosphorus is 0.024 mg/L. The median deep water concentration of Total Phosphorus is 0.221 mg/L.



Total phosphorus in the deep water is consistently high but a trendline when including the last two years (right side plot) suggests a decrease although there is not enough data for confirmation

Harmful Algal Blooms

Harmful Algal Bloom



Not Harmful Algal Bloom



It is important to confirm a true algal bloom

Harmful Algal Blooms

Sample Date	Parameter	Water Layer (m) Fraction	Results	Units
3/10/2014	CHLOROPHYLL A (PROBE) CONCENTRATION, CHLOROPHYTE (GREEN ALGAE)	shore bloom	0	ug/L
3/10/2014	CHLOROPHYLL A (PROBE) CONCENTRATION, DINOPHYTA (DIATOMS)	shore bloom	0	ug/L
3/10/2014	CHLOROPHYLL A (PROBE) CONCENTRATION, CYANOBACTERIA (BLUEGREEN)	shore bloom	1860	ug/L
3/10/2014	CHLOROPHYLL A (PROBE) CONCENTRATION, CRYPTOPHYTA (CRYPTOPHYTES)	shore bloom	0	ug/L
6/10/2014	CHLOROPHYLL A (PROBE) CONCENTRATION, CHLOROPHYTE (GREEN ALGAE)	shore bloom	0.1	ug/L
6/10/2014	CHLOROPHYLL A (PROBE) CONCENTRATION, CRYPTOPHYTA (CRYPTOPHYTES)	shore bloom	4.54	ug/L
6/10/2014	CHLOROPHYLL A (PROBE) CONCENTRATION, DINOPHYTA (DIATOMS)	shore bloom	0	ug/L
6/10/2014	CHLOROPHYLL A (PROBE) CONCENTRATION, CYANOBACTERIA (BLUEGREEN)	shore bloom	41.6	ug/L
7/12/2016	CHLOROPHYLL A (PROBE) CONCENTRATION, CHLOROPHYTE (GREEN ALGAE)	shore bloom	0	ug/L
7/12/2016	CHLOROPHYLL A (PROBE) CONCENTRATION, CYANOBACTERIA (BLUEGREEN)	shore bloom	0.8	ug/L
7/12/2016	CHLOROPHYLL A (PROBE) CONCENTRATION, DINOPHYTA (DIATOMS)	shore bloom	0	ug/L

State confirmed a toxic blue green algal bloom in 2014

Rockland Lake





Rockland Lake in Rockland County NY is similar in area to Lake Huntington with a depth of 30 feet but has a good deal more vegetation including water lily, water chestnut, milfoil and duckweed but no observed algae at the time of photo

Congers Lake





Congers Lake in Rockland County NY is a man made, shallow lake with overwhelming vegetation in the summer. Left hand panel shows water chestnut not algae. Right panel shows the north end to be almost completely covered with water lilies and water chestnut and necessitates bringing in harvesters to cut and rake it out. No algae observed at the time of photo

Management Strategies For Low Oxygen and High Phosphorus

Reduce nutrient pollution:

Controlling runoff from farms, lawns, and other sources can help prevent excessive algal growth.

Aeration and oxygenation:

Techniques like diffusers, fountains, or Speece cones can introduce oxygen into the water, either throughout the water column or at specific depths.

Planting aquatic vegetation:

Certain plants can help improve oxygen levels through photosynthesis and uptake of nutrients.

Alum Sulfate - another strategy for phosphorus control

1. Alum Dissolves and Hydrolyzes:

When alum is added to water, it dissolves and releases aluminum ions (Al^{3+}). These aluminum ions then undergo hydrolysis, meaning they react with water molecules to form various aluminum hydroxide species, including the insoluble aluminum hydroxide ($Al(OH)_3$).

2. Formation of Aluminum Phosphate:

The aluminum hydroxide then reacts with dissolved phosphate (PO_4^{3-}) in the water. This reaction forms aluminum phosphate ($AlPO_4$), which is a solid precipitate.

3. Precipitation and Removal:

The newly formed aluminum phosphate is insoluble in water and, therefore, forms a solid precipitate. This precipitate can be removed from the water through settling (in a clarifier) or filtration.

4. Phosphorus Barrier:

In lake or pond restoration, the settled aluminum phosphate forms a layer on the bottom, acting as a barrier to further release of phosphorus from the sediment back into the water column, according to the North American Lake Management Society (NALMS).

Alum for phosphorus control

New England Aquatic Services

Airmax® PRx™ Phosphate Control

For Professional Use Only

- Professional Strength Phosphate Control
- Permanently Bind Free Reactive Phosphorus
- Clarifies Water, without Impacting pH

Airmax PRx is a proprietary blend of naturally occurring phosphate binders designed to permanently bind free reactive phosphorus (FRP). The professional strength of PRx will not affect pH levels and is safe for use in lakes, ponds, and lagoons.

Improves Clarity

PRx proprietary blend of natural phosphate binders works within the water column to clear up cloudy or murky water associated with chemical herbicide or algaecide treatments.



Easy-to-Apply

When mixed with water in a high-volume tank sprayer the PRx slurry can be distributed uniformly to the surface of the waterbody.

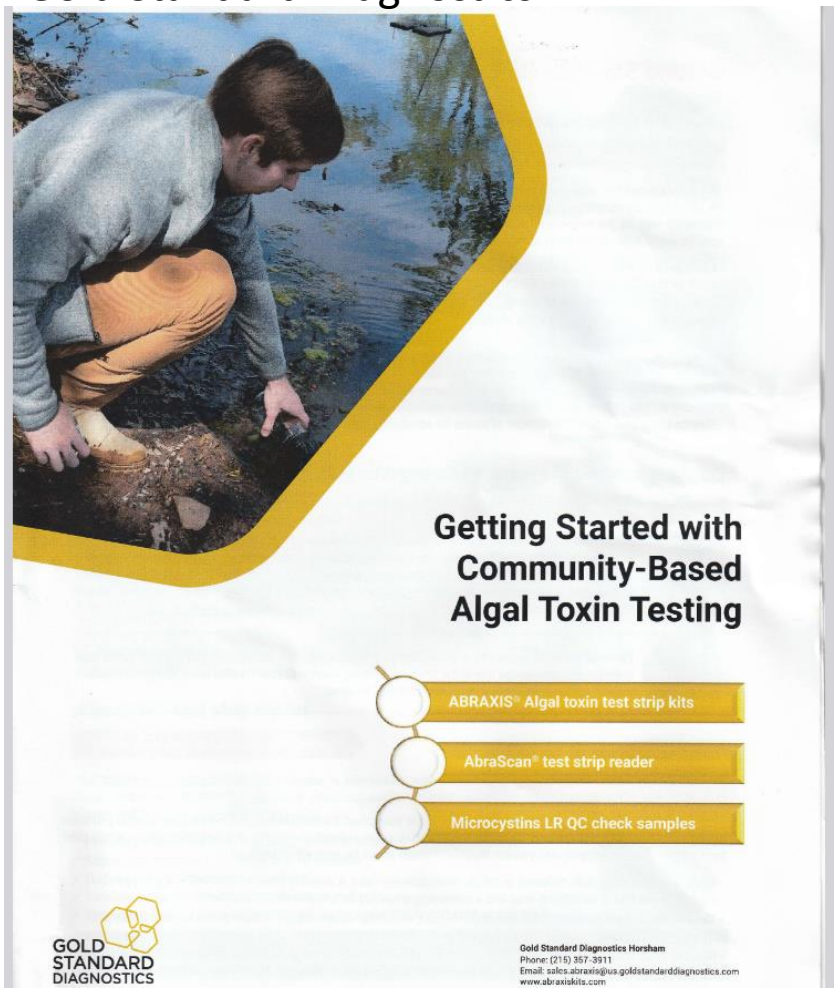
Fish, Plant & Wildlife Friendly

PRx Phosphate Control may be applied to lakes, ponds, and lagoons used for irrigation and/or aquaculture. Water treated with PRx Phosphate Control may be used for recreation, fishing, and other activities immediately after treatment. Safe for recreational ponds, horses, livestock, birds, pets, fish, wildlife, and the environment.

Learn how a 16 week treatment plan using PRx was able to reduce nearly 98% of Free Reactive Phosphorus (FRP) that lead to increased water clarity and a reduction of harmful lake algae blooms in our PRx Phosphate Control Study.

Algal Toxin Testing

Gold Standard Diagnostics



Recommended supplement to the CSLAP testing to identify toxic blue green algae

Plan and Options

- Visual inspection of lake perimeter and accurate identification of algal blooms
- CSLAP monitoring
- Adding beneficial plants, e.g., American Bur Reed
- Testing for green algal toxin
- Chemical treatment if necessary