

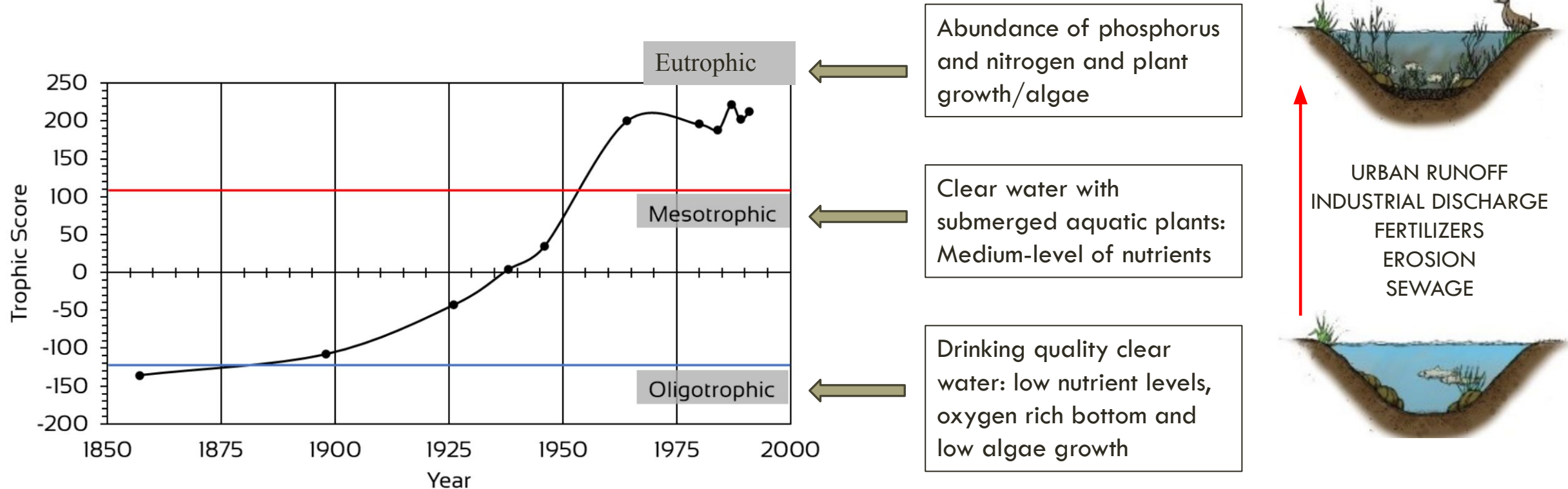
BANTAM LAKE – BLUE GREEN ALGAE

SEPTEMBER 2025



North side of Deer Island 9/1

BANTAM LAKE EVOLUTION TO EUTROPHIC STATE



LOSS OF DISSOLVED OXYGEN AT BOTTOM OF THE LAKE CREATING ABUNDANCE OF NUTRIENTS (PHOSPHOROUS) = ALGAE BLOOMS

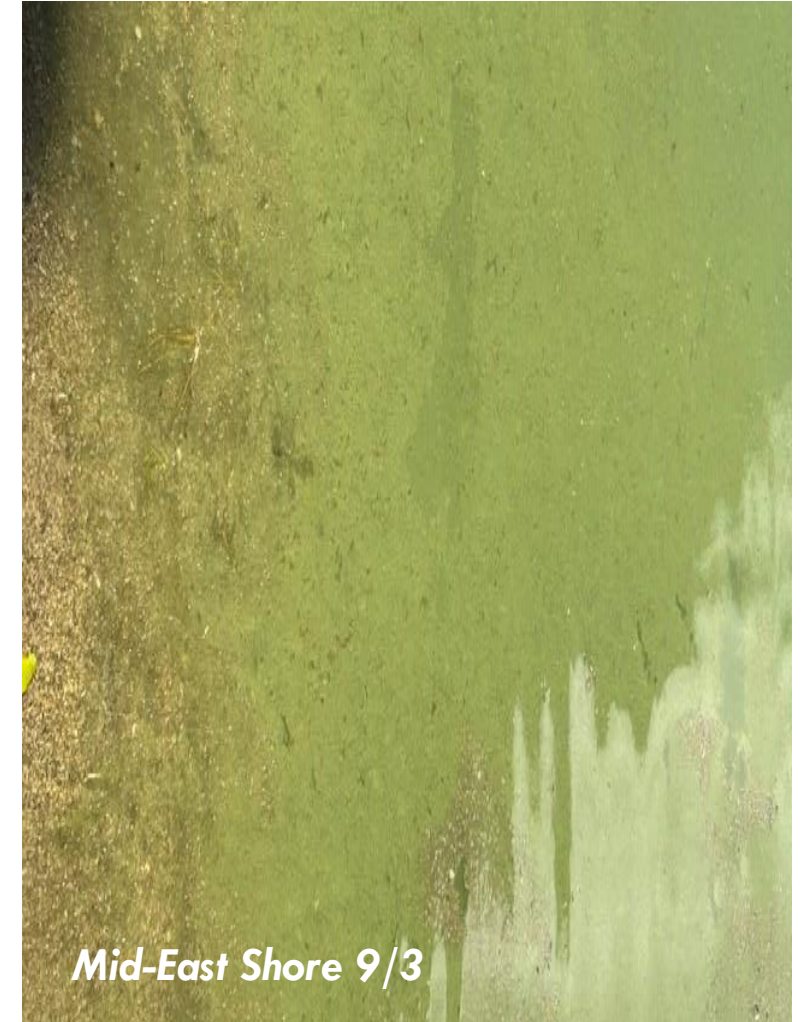
CYANOBACTERIA / BLUE-GREEN ALGAE

- Cyanobacteria are among the oldest life forms on Earth and are the only bacteria capable of making oxygen
- They can convert atmospheric nitrogen (N_2) into a form that plants and other organisms can use, a vital ecological function
- They are primary producers providing food for aquatic ecosystems
- Excessive growth of some cyanobacteria can lead to harmful algae blooms and pose health risks to humans and aquatic life due to the production of potent cyanotoxins



BLUE-GREEN ALGAE BANTAM LAKE

- Occurs most often from July to September
- Caused by a combination of excessive nutrients (phosphorus and nitrogen), warm water temperatures, abundant sunlight and stagnant water
- Fall turnover (de-stratification) can bring nutrient rich bottom water to the surface leading to temporary increases in algae
- Not all cyanobacteria are toxic however; it is impossible to tell if a bloom is harmful just by looking at it, a good rule of thumb is to assume any cyanobacterial bloom is toxic and to avoid contact with the water, especially for pets



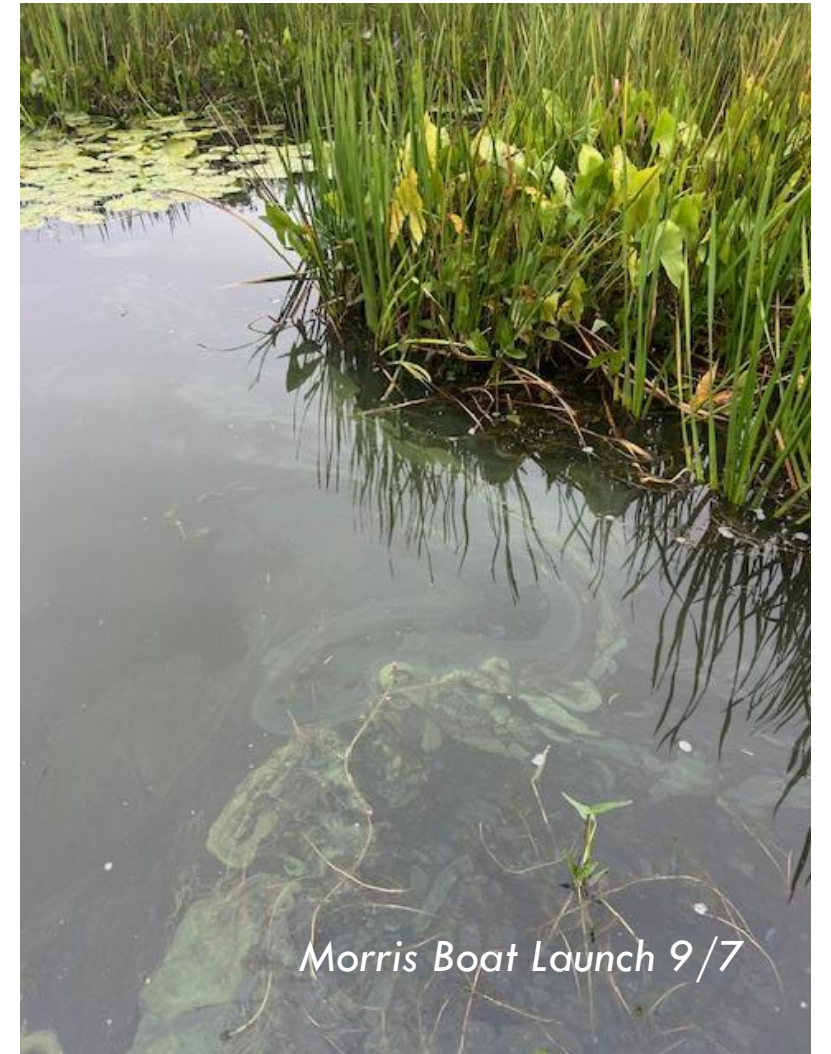
BLUE-GREEN ALGAE CAN CONTAIN A MIX OF TOXINS

Cyanotoxin Type	Toxins Produced	Acute Toxicities
Hepatotoxins	Microcystins, Nodularins, Cylindrospermopsins	Liver injury, lungs, intestine
Neurotoxins	Anatoxin, Saxitoxins	Neuromuscular
Dermatotoxins	Lyngbyatoxin, Aplysiatoxin	Skin irritants
Endotoxins	Lipopolysaccharides	Inflammatory agents, gastrointestinal irritants

Not all Blue-Green Algae Blooms are toxic

HEALTH CONSEQUENCES OF TOXIC CYANOBACTERIA

- **Skin:** Rash, itching, redness, or blisters
- **Eyes:** Irritation or conjunctivitis
- **Respiratory:** Cough, sore throat, or difficulty breathing
- **Gastrointestinal:** Nausea, vomiting, diarrhea, or stomach pain
- **Neurological:** Headache or tingling in fingers and toes



EXPOSURE RISKS

Level of Potential Exposure	Recreational Activity	Primary Exposure Pathway of Concern
High	Swimming/wading	Ingestion
	Diving	Ingestion
	Water skiing/wake boarding	Ingestion/inhalation
	Wind surfing	Ingestion/inhalation
	Jet skiing	Ingestion/inhalation
Moderate	Fish consumption *	Ingestion
	Canoeing	Inhalation/skin
	Rowing	Inhalation/skin
	Sailing	Inhalation/skin
	Kayaking	Inhalation/skin
	Motor boating	Inhalation
Low/none	Catch and Release fishing	Skin

TESTING FOR CYANOBACTERIA BANTAM LAKE

- Cyanobacteria testing is done every two weeks April – October
 - Toxin Testing is done every two weeks from Memorial Day to Labor Day
- Cyanobacteria cell concentrations and risk levels
 - 0 – 20,000 cells/mL lowest risk of toxic algae blooms
 - 20,000 – 100,000 cells/mL moderate risk of toxic algae blooms
 - >100,000 cells/mL highest risk of toxic algae blooms
- 2024 Cyanobacteria cell concentrations results:
Measured in-lake, bi-weekly throughout the season
 - April – July: <5,000 cells/mL* (better than historical comparisons)
 - August – early Sept: 38,000 – 89,000 cells/mL
 - Late Sept – early October: 200,000-400,000 cells/mL

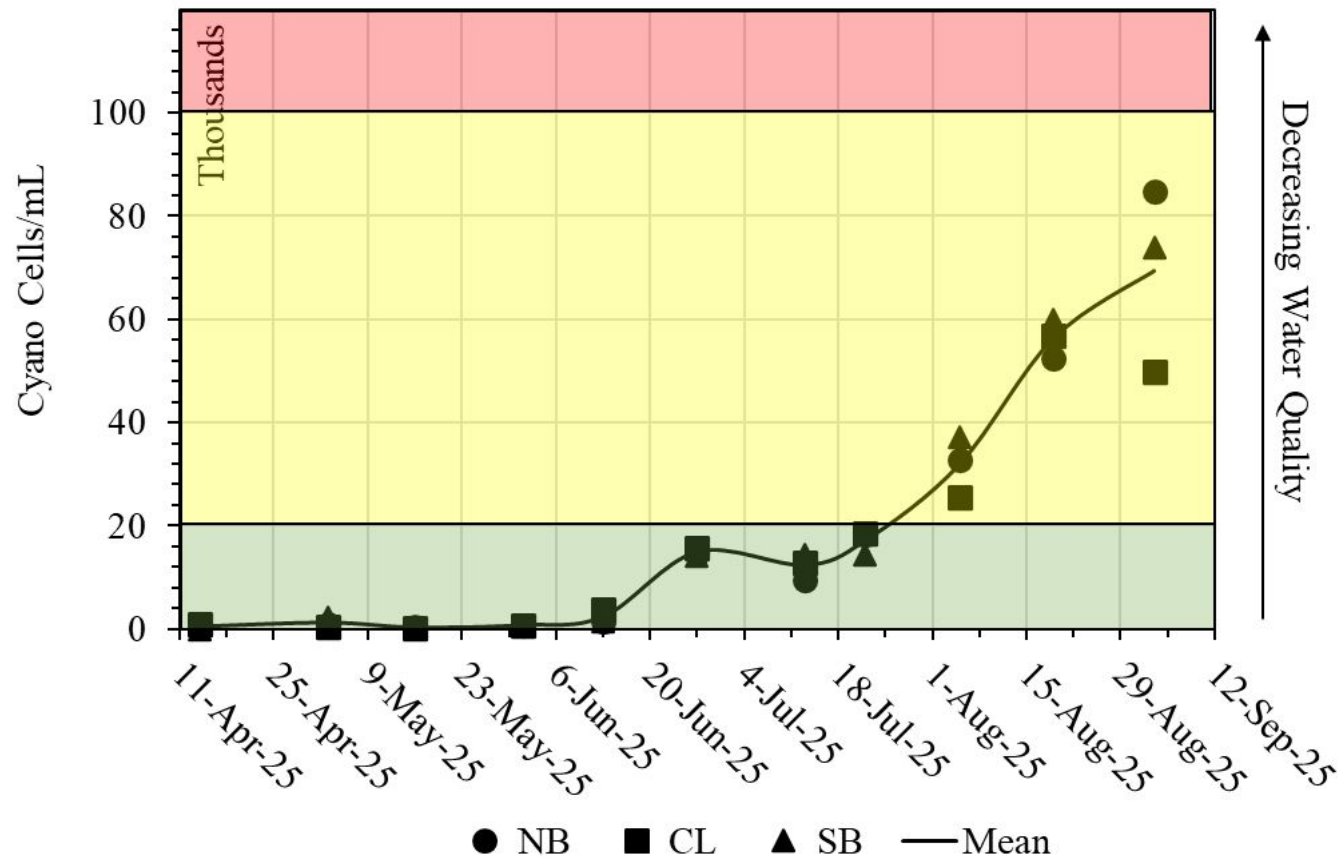
JULY 22ND CYANOBACTERIA CELL COUNTS

Table 1. Site characteristics and cyanobacteria cell concentrations at Bantam Lake on July 22, 2025.

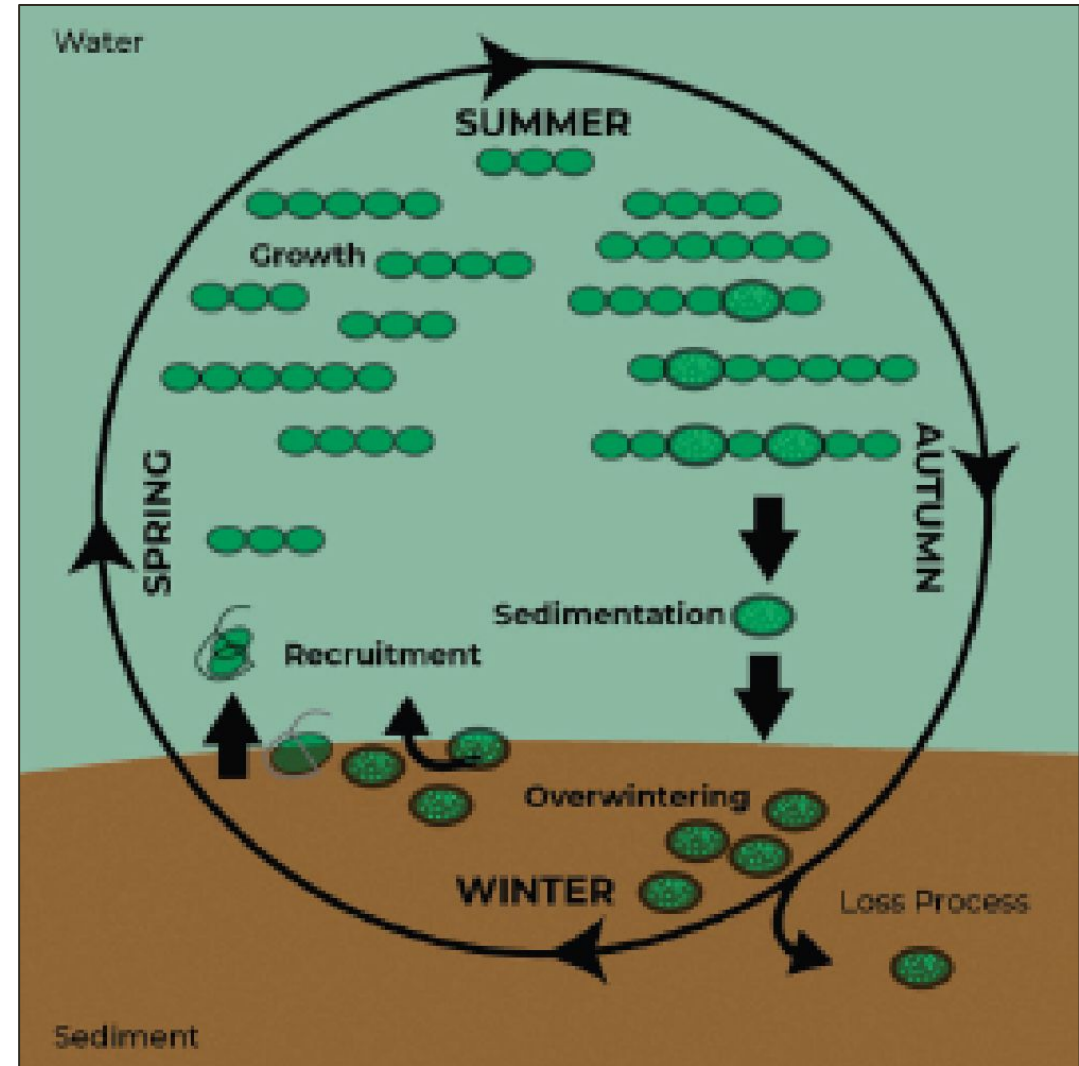
Sites	Cyanobacteria cells (cells/mL)	Total Depth (m)	Secchi Transparency (m)	Temperature Top/Bottom (°C)	Oxygen Top/Bottom (mg/L)
North Bay	84,683	6.23	1.23	21.7 / 20.6	12.8 / 0.1
Center Lake	49,866	7.90	1.08	23.0 / 20.5	12.8 / 1.2
South Bay	73,894	6.60	1.14	22.0 / 20.8	13.3 / 5.2
Folly Point	---	4.69	1.16	21.8 / 20.8	12.3 / 9.3

2025 YTD CYANO CELLS: MONTHLY DATA

EVERY TWO WEEKS APRIL - OCT



REACTIVE VS PROACTIVE TREATMENT



STOP LIGHT CATEGORIES



Category	Description
One	• Water is generally clear • No visible cyanobacteria material • Cell counts are low
Two	• Cyanobacteria present in low numbers • Visible small accumulations • Water is generally clear
Three	• Cyanobacteria present in high numbers • Scums may or may not be present • Water is discolored throughout / Large areas affected • Color assists to rule out sediment and other algae

SOURCES OF PHOSPHORUS

REDUCING PHOSPHORUS: SIGNIFICANT PRIORITY

- Fertilizers and manure (farms, lawns, golf courses, etc)
- Stormwater runoff from roads and lawns
- Wastewater treatment plants
- Soil erosion can transport phosphorus-containing sediments into lakes
- Sediments within the lake; internal phosphorous loading

Many sources of information starting to inform priorities for reducing phosphorus:

- | | |
|---|---|
| - In-Lake Data Collection (Decades of Data) | - Watershed Data Collection (2023-2024) |
| - CT DEEP Bantam Lake TMDL (2021) | - Lake Sediment Analysis (2023) |

**There is no “ONE source” – but there are emerging areas of priority for improvements.
You can help by taking The Pledge!**

TREATMENTS TO ADDRESS ALGAE & PHOSPHORUS

Treatment	Details	Cost
Stormwater mgmt., shoreline stabilization	Implement stormwater best mgmt. practices (BMPs) to reduce the speed and volume of runoff and clean pollutants.	Simple and inexpensive; plant vegetation next to waters edge to protect water quality, rain gardens, etc.
Copper Sulfate	Widely used algaecide for treating algae. Effective in reducing density of algae and improving water quality. Can accumulate in lake sediments and have negative long-term impacts.	\$18K per treatment; typically applied 1-2x per season
Hydrogen Peroxide	Studies have shown it to be effective in reducing algae blooms, works by oxidizing and damaging the cells walls of algae suppressing growth. Does not address the underlying cause of nutrient pollution.	\$150K per treatment, benefit expected to last 3 years
Aluminum sulfate (alum)	Forms a floc that binds with phosphorus, settles to lake bottom and prevents phosphorus from being recycled into the water column (limits internal loading).	\$2.6M – lasts 5-20 years or longer
Dredging	Highly effective for reducing phosphorus levels in lakes by removing sediment containing high concentrations of phosphorus.	\$2M plus