Executive Summary of the 2024 CSLAP Water Test Results for Big Bowman Pond

Introduction

There is good news to report. Based on the reports from CSLAP, Big Bowman Pond is basically a healthy lake with stable parameters (things we measure). In the few cases where there's been a change over a ten-year period, the change has been positive.

The community of Big Bowman Pond has been participating in CSLAP (Citizens Statewide Lake Assessment Program) since 2013. Water samples have been collected near the white buoy located in the deepest part of the lake located between the Kullman and Schulman docks. In past years, eight samples were collected during the months of June to September.

Part 1 of the report is a table showing the 2024 water test results with a reference to general NYS lake data, changes to the Big Bowman Pond data over a ten-year period, and whether those changes were significant.

Part 2 provides a brief description of the sampling parameters (what is measured) and why we should pay attention to the results.

Part 3 lists several resources you could refer to for more detailed information.

I hope you find this meager attempt at a summary helpful.

Joanne Ingham

PART I: BBP 2024 Test Results in Relation to NYS Lakes, 2024 Results 10 Year Comparison and the Significance of Any Change Over Time

2024 CSLAP Water Testing Results for Big Bowman Pond				
What's Measured?	NYS Lakes Test Guide	2024 BBP Measurement	Change Over Past Decade	Statistically Significant Change?
Phosphorus	.005 - .05 mg/L	.0138 mg/L	Down .0038 mg/L	Sig + change
Nitrogen	.1 – 1.0 mg/L	.309 mg/L	Down .085 mg/L	Sig + change
Ammonia	.01 - .1 mg/L	.014 mg/L	No change	
Nitrogen-Phosphorus Ratio	25	25.7	No change	
Chlorophyll a	2 – 8 µg/L	3.99 µg/L	Down 5.5 µg/L	Sig + change
Water Clarity	2 -5 meters	2.1 meters	No change	
Calcium	Approx 10 mg/L	6.51 mg/L	No change	
Chloride	Less than 100 mg/L	34.8 mg/L		
True Color	5 – 30 color units	23 color units	Down 7 color units	Sig + change
Median Temperature	Top 19°C - 25° C varies seasonally	23°C	No change	
pH	6.0 – 9.0	7.35	No change	
Specific Conductance	26 – 400 µs/cm	119 µs/cm	No Change	

mg = milligram
µg = microgram
µs/cm = microsiemens/cm

Part II: A Brief Description of the Items Measured

1. Phosphorus: Phosphorus is one of the major nutrients needed for plant growth. It is often considered the "limiting" nutrient in NYS lakes. The higher the level of phosphorus, the greater the opportunity for the growth of algae. Since excessive algae growth often leads to reduced water clarity and degraded water quality perception, many lake management plans are centered on phosphorus controls.

   Phosphorus comes from natural phosphate deposits, phosphate rocks and lake bottom sediment. It also comes from sewage, detergents, pharmaceuticals and storm water run-off.

2. Nitrogen, Nitrate and Nitrite: These nutrients are necessary for plant growth and can act as limiting factors for some forms of green algae in some lakes, particularly in the spring and early summer. Nitrate can be an important component of wastewater, stormwater, fertilizers, and soil erosion. Therefore, they can be an indirect measure of lake pollution. Nitrite can be toxic to aquatic life, though it readily converts to nitrate in the presence of oxygen.

   Total Nitrogen is comprised of ammonia, nitrate and organic nitrogen.

3. Nitrogen-Phosphorus Ratio: Nitrogen and Phosphorus are two primary nutrients in aquatic systems. A ratio of 20 or less suggests a nitrogen deficiency. A ratio of 50 or more indicates a phosphorus limitation. This ratio is important for analyzing changes in lake plant growth.

4. Ammonia: Ammonia is a micronutrient and a form of nitrogen. It is produced through the decay of organic matter, found in wastewater, and generated through several biological processes. Ammonia is toxic to aquatic organisms and humans at concentrations occasionally found in lake water, particularly at high pH or in the absence of oxygen. High ammonia readings may also be a sign of other forms of pollution.

5. Chlorophyll *a*: Chlorophyll *a* is a measure of planktonic lake productivity and is closely related to both phosphorus and water transparency. Changes in chlorophyll can be related to changes in phosphorus and to changes in water transparency. This makes it an important lake health indicator.

6. Water Clarity: Clarity is a measure of the transparency of the water, as measured by the depth of disappearance of a 20cm black and white disk (Secchi disc). Water clarity is related to algal productivity and the greenness of water. BBP has a tea color from tannins. Tannins are caused by decaying evergreen and other plant materials leeching into the lake. Tannins are not considered to be harmful to living things. It may affect pH level.

7. Calcium: Lakes with high calcium levels are generally immune to swings in pH due to acid rain or other acidic inputs to lakes. Calcium is also a micronutrient required by freshwater mussels to grow their shells. It may be one of the most significant limiting factors to colonization by zebra mussels.

8. Chloride: The use of chloride compounds in brine, road salt, and water softeners can increase chloride ions in water potentially impacting aquatic life.

9. True Color: True color is a measure of dissolved organic materials in the water. It is not linked to water quality perception. Color is often naturally occurring in high elevation

lakes in the northwestern Adirondacks, Catskills and other regions in the state overlying organic soils. Changes in color can indicate changes in runoff patterns to lakes.

10. Temperature: Water temperature affects many lake activities, including the rate of biological growth and the amount of dissolved oxygen. It also influences the length of the recreational season. Warmer water contains less dissolved oxygen.

11. pH: pH is a measure of the free hydrogen ion concentrations in solutions. Most clearwater lakes must maintain a pH between 6 and 9 to support most types of plant and animal life. Many aquatic organisms do not properly function in water with pH below 6.5 or above 8.5.

12. Specific Conductance: Conductivity measures the electrical current that passes through water, and is used to estimate the number of ions (charged particles). It is an indirect measure of the presence of dissolved solids such as chloride, nitrate, sulfate, phosphate, sodium, magnesium, calcium, and iron. Changes (increases) in conductivity can be an indication of changing runoff to a lake and can also be an indication of pollution problems.

PART III: Resources

1. Big Bowman Pond CSLAP Reports
   https://extapps.dec.ny.gov/data/IF/CSLAP/1301BOW0444/

2. Diet for a Small Lake
   https://www.bowmanlakeny.org/nysdec-diet-for-a-small-lake/

3. Lake Parameters Fact Sheets
   https://extapps.dec.ny.gov/docs/water_pdf/cslaplkpara.pdf

4. CSLAP Sampling Protocol
   https://nysfola.org/wp-content/uploads/2024_CSLAP_SAMPLING_PROTOCOL_REVISED.pdf