LAKE HOPATCONG – 2025 WATER QUALITY REPORT

MORRIS AND SUSSEX COUNTIES, NEW JERSEY

JANUARY 2026

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1.0 INTRODUCTION

Lake Hopatcong is the largest lake in New Jersey, with a surface area of 2,686 acres and approximately 39 miles of shoreline. With a maximum depth of 16.7 meters and a mean depth of 5.6 meters, the lake is dimictic and stably stratifies during the growing season each year. Lake Hopatcong is a highly valued resource for the state and has a substantial impact on the local economy.

Princeton Hydro, LLC conducted general water quality monitoring of Lake Hopatcong during the 2025 growing season. This monitoring program represents a continuation of the long-term monitoring program of Lake Hopatcong. While the 2010 through 2012 water quality monitoring programs were conducted with funds awarded to the Lake Hopatcong Commission by the New Jersey Department of Environmental Protection (NJDEP) through the Non-Point Source (319(h) of the Clean Water Act) grant program (Project Grant RP10-087), the water quality monitoring program of 2013 was funded through the Lake Hopatcong Foundation as a monetary match toward the grant. Remaining funds in the 319(h) grant were made available for the 2014, 2015, and 2016 water quality monitoring programs. The annual water quality monitoring program has been funded by the Lake Hopatcong Commission from 2018 through 2025.

The current water quality monitoring program is a modified version of the program that was originally initiated in the Phase I Diagnostic / Feasibility Study of Lake Hopatcong and continued through the Phase II Implementation Projects. Both the Phase I and Phase II projects were funded by the US EPA Clean Lakes (314) Program. The modified monitoring program also continued through the development, revision, and approval of the Total Maximum Daily Load (TMDL)-based Restoration Plan, as well as through the installation of a series of watershed projects funded through three NJDEP 319 grants and a US EPA Targeted Watershed grant. Some additional monitoring was conducted during each sampling event in 2020, 2021, and 2022 as part of the HAB grant awarded in 2020 as well as a 319 grant (*WQR-2019-LHC00130)* awarded in 2021.

A 319 grant awarded in 2020 involved modeling efforts to better quantify the internal phosphorus load on a seasonal and monthly basis under varying hydraulic conditions and will also involve the implementation of various in-lake and watershed-based projects to reduce nutrient loading to the waterbody. Finally, additional *in-situ* monitoring was conducted in July and August of the 2022, 2023, and 2024 seasons as part of a Highlands Council funded project to better characterize carryover brown trout (*Salmo trutta*) habitat during the peak summer months. This grant allowed for weekly *in-situ* sampling during the summer months, providing invaluable high-frequency data.

The current water quality monitoring program is valuable in terms of continuing to assess the overall “health” of the lake on an annual basis, identifying long-term trends or changes in water quality, and quantifying and objectively assessing the success and potential impacts of restoration efforts. In addition, the in-lake water quality monitoring program continues to be an important component in the evaluation of the long-term success of the implementation of the phosphorus TMDL-based Restoration Plan, which was approved by NJDEP in April of 2006. The monitoring program also provides the data necessary to support the Foundation’s and Commission’s requests for grant funding to implement both watershed-based and in-lake projects to improve the water quality of Lake Hopatcong. Also, much of the data collected in 2025 will be used to assess the relative effectiveness of in-lake and watershed-based projects, designed to prevent or minimize the impacts of harmful algal blooms (HABs) in Lake Hopatcong. Finally, it should be noted that the 2006 Restoration Plan was recently updated with funds provided by the NJ Highlands Council in 2021 into a Watershed Implementation Plan (WIP) and is being used to select, design and implement additional watershed-based projects.

2.0 MATERIALS AND METHODS

In-lake water quality monitoring was conducted at the following twelve locations in Lake Hopatcong (Appendix I) during the 2025 study period:

Station Number	Location
1	Woodport Bay
2	Mid-Lake
3	Crescent Cove/River Styx
4	Point Pleasant/King Cove
5	Outlet
6	Henderson Cove
7	Inlet from Lake Shawnee
8*	Great Cove
9*	Byram Cove
10	Northern Woodport Bay
11	Jefferson Canals
12	Landing Channel

* *In-situ* monitoring only

During the 2025 season, standard water quality sampling was conducted on 20 May, 26 June, 29 July, 20 August, and 24 September. A YSI EXO3s multi-probe unit was used to monitor the *in-situ* parameters dissolved oxygen (DO), temperature, pH, specific conductance, phycocyanin, phycoerythrin, and chlorophyll *a* during each sampling event. Data were recorded at 1.0 m increments starting at 0.1- 0.2 m below the water's surface and continued to within 0.5 m of the lake sediments at each station. In addition, water clarity was measured at each sampling station with a Secchi disk. A Turner FluoroSense handheld fluorometer was also used to measure *in-situ* phycocyanin and chlorophyll *a* concentrations at the surface of each station.

Discrete water quality samples were collected with a Van Dorn sampling device 0.5 m below the lake surface at each station, with the exception of Stations 8 and 9, as well as mid-depth and 0.5 m above the sediment at the mid-lake sampling site (Station 2). Discrete water samples were appropriately preserved, stored on ice, and transported to a State-certified laboratory for the analysis of the following parameters:

- Total suspended solids
- Total phosphorus-P
- Soluble reactive phosphorus-P
- Nitrate-N
- Ammonia-N
- Chlorophyll *a*

During each sampling event, phytoplankton and zooplankton samples were collected at the surface and mid-depth of the deep sampling station (Station 2). Phytoplankton samples were collected at the surface and mid-depth utilizing a Van Dorn sampling device and quantitatively assessed, while zooplankton samples were collected utilizing a Schindler sampling device and qualitatively assessed. Phytoplankton grab samples were also collected at the surface of Station 3, Station 10, and Station 12 for the quantitative assessment of cyanobacteria.

3.0 RESULTS AND DISCUSSION

All *in-situ* data collected in 2025 is presented Appendix II, discrete data in Appendix III, and plankton data in Appendix IV.

3.1 IN-SITU PARAMETERS

TEMPERATURE

Summer thermal stratification results when increasing solar radiation and air temperatures, aided by a few days of little wind activity, combine to thermally stratify the water column. Thermal stratification consists of a relatively warm upper water layer (epilimnion), a transition zone (metalimnion or thermocline), and a cold, deep water layer (hypolimnion). The density differences imparted through thermal stratification serve to inhibit wind driven mixing of the water column thereby effectively sealing off the hypolimnetic layer from contact with the atmosphere. This phenomenon has important implications in that bottom waters of thermally stratified systems may become devoid of oxygen due to excessive bacterial decomposition of organic matter and a lack of atmospheric replenishment of dissolved oxygen through diffusion. Resultant conditions of hypolimnetic anoxia include internal sediment release of metals and phosphorus, and reduced fish habitat.

In the late summer and early fall, declining air temperatures result in a negative heat income to the lake, and a loss of heat exceeds inputs from solar radiation. Surface waters are thus cooled and induce convection currents which serve to erode the metalimnion of the lake until the water column exhibits a uniform temperature and therefore uniform density. At this point the lake experiences fall turnover. The transition from the final stages of weak summer thermal stratification to fall turnover are often times abrupt, and can occur over a period of a few hours, especially if associated with the high wind velocities of a storm.

Surface water temperatures measured at Station 2 were coolest in May and September, with respective temperatures of 17.73 °C and 21.49 °C. The lake was thermally stratified on 20 May, with an epilimnion present in the upper 8.0 m and a thin thermocline present from approximately 8.0 m to 10.0 m. By late June, surface temperatures at Station 2 had increased by approximately 10.0 °C. This rapid warming at the surface resulted in a very shallow epilimnion, then present in the upper 2.0 m. Surface temperatures at Station 2 remained steady at 27.70 °C in late July, resulting in the expansion of the epilimnion to the upper 5.0 m; water temperatures remained above 26.0 °C in the upper 4.0 m.

The surface temperature at Station 2 cooled to 24.97 °C on 20 August and the thermal stratification pattern remained consistent, with the epilimnion present in the upper 5.0 m. The lake remained stratified in September as temperatures cooled, with an expanded epilimnion present in the upper 8.0 m.

Water temperatures were often higher at the other stations throughout the lake because of the shallower depths. It takes less energy from the sun to heat the other stations since the mixing zone is much shallower. Surface water temperatures exceeded 28.0 °C at Stations 3, 4, 6, 8, 9, 10, 11, and 12 on 29July and exceeded 30.0 °C at Stations 1 and 7.

The long-term surface water temperatures from Station 2 during the month of July have been graphed and are shown below in Figure 1. This analysis was conducted to assess the potential impacts of climate change on Lake Hopatcong. The Station 2, mid-lake data were used because there was no chance of shading from near-shore trees or structures at this location. The July data were used since it is typically the warmest month of the year in the Mid-Atlantic States.

As shown in Figure 1, there has been a statistically significant increase in July surface water temperatures at Lake Hopatcong over the past 35 years. The July 2025 temperature decreased relative to the record high in 2024, but it was still the 4th highest July surface temperature on record. These data provide evidence that climatic change is impacting Lake Hopatcong. In turn, increasing water temperatures makes the lake more favorable for larger and more frequent HABs.

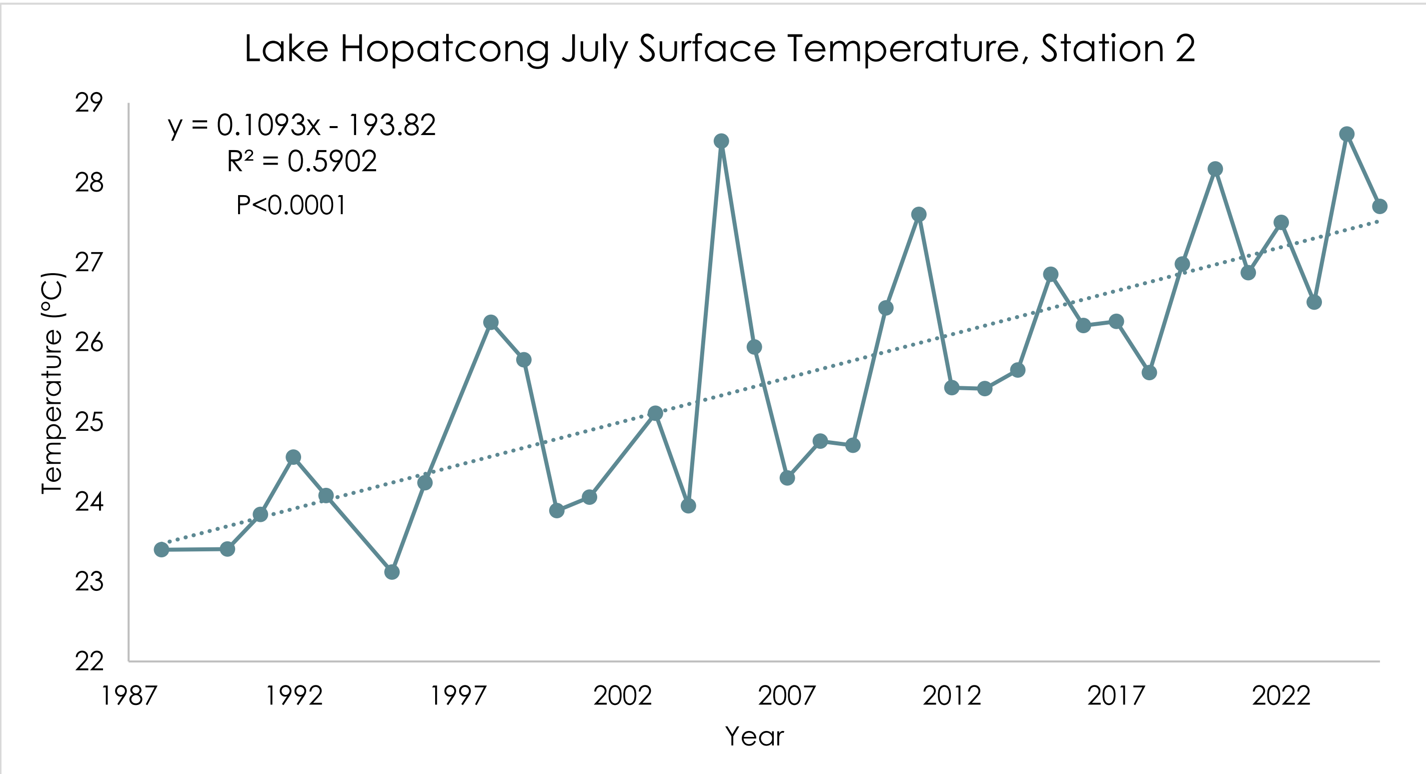


Figure 1: Long-term, July surface water temperatures at the mid-lake sampling station at Lake Hopatcong

DISSOLVED OXYGEN

DO is crucial to almost all biochemical reactions occurring in freshwater ecosystems. The primary sources of DO in a lake are diffusion from the atmosphere and photosynthesis. Biological respiration and bacterial decomposition of organic matter are the primary sources of consumption; these processes are often classified as water oxygen demand (WOD) and sediment oxygen demand (SOD) in limnology. The abundance and distribution of DO in a lake system is predicated on the relative rates of these producers and consumers; producers include aquatic macrophytes and phytoplankton. As the producers photosynthesize, they utilize water, carbon dioxide, and sunlight to create oxygen and glucose. This process increases DO concentrations in the sun-lit zone of a lake; this active area of the lake is known as the photic zone. As such, DO concentrations are generally higher in photic zone and lower in the deeper water, where a lack of photosynthetic activity in conjunction with organism respiration results in a decrease. DO is also influenced by the thermal properties of the water column. This includes both lake stratification and the varying degree of oxygen retention capacity of water at different temperatures; colder water holds more oxygen than warmer water.

When lakes thermally stratify, there is generally a correlated stratification of DO levels. The hypolimnion usually has lower DO concentrations, as this water cannot mix with the epilimnion, whereby DO concentrations would be replenished with atmospheric sources. In highly productive lakes, the hypolimnion may become devoid of oxygen due to bacterial decomposition of excessive inputs of organic material. The source of this material may either be from excessive phytoplankton production in the upper water layers that then sink to the bottom when they die (autochthonous), from excessive watershed derived sediment loading (allochthonous), or more likely a mixture of the two. Also, as DO concentrations are generally measured during the daytime when concentrations are highest, concentrations are lower at night when photosynthesis ceases but respiration continues.

An important consequence of anoxic (DO < 1.0 mg/L) conditions in the hypolimnion includes both reduced fish habitat and the release of metals and phosphorus, a process termed internal loading. Internal loading occurs when tightly bound iron and phosphate sediment complexes are reduced, thereby dissociating phosphorus from iron, and making it available for diffusion into the water column. This process has been documented to contribute to the overall eutrophication of many lakes, as this internal source of phosphorus is pulsed into the photic zone during strong storm events whereby it may serve as fuel for excessive algal growth. A general guideline for DO concentrations in lakes is that a concentration of greater than 1.0 mg/L is needed to preclude internal nutrient and metal release while concentrations of 4.0 mg/L and greater should be kept in order to sustain proper warm-water fisheries habitat.

DO concentrations remained above 5.0 mg/L in the upper 9.0 m at Station 2 on 20 May before slowly declining to anoxic (DO < 1.0 mg/L) conditions at 13.0 m. The anoxic zone increased in size significantly by 26 June as the lake remained stratified, with anoxia present beginning at a depth of 6.0 m. The lake remained anoxic below a depth of 5.0 m at Station 2 in July and August as the lake remained stratified during the summer. The epilimnion began to expand in late September, but the lake remained anoxic below a depth of 6.0 m.

DO concentrations at all remaining stations were above 5.0 mg/L throughout the water column on 20 May, except for the bottom 1.0 m at the deeper (8.0 m) Station 9. On 26 June, the bottom few meters of the deeper Stations 8 and 9 were anoxic, but all other stations had sufficient oxygen concentrations above 5.0 mg/L. DO concentrations at the bottom of the shallower stations declined as temperatures increased in July and August, but all stations had concentrations above 4.0 mg/L except for Stations 8 and 9. Similar conditions were observed on 24 September.

To better illustrate the relationship between thermal stratification and DO concentrations across the growing season, isopleth figures are presented below (Figures 2 and 3).

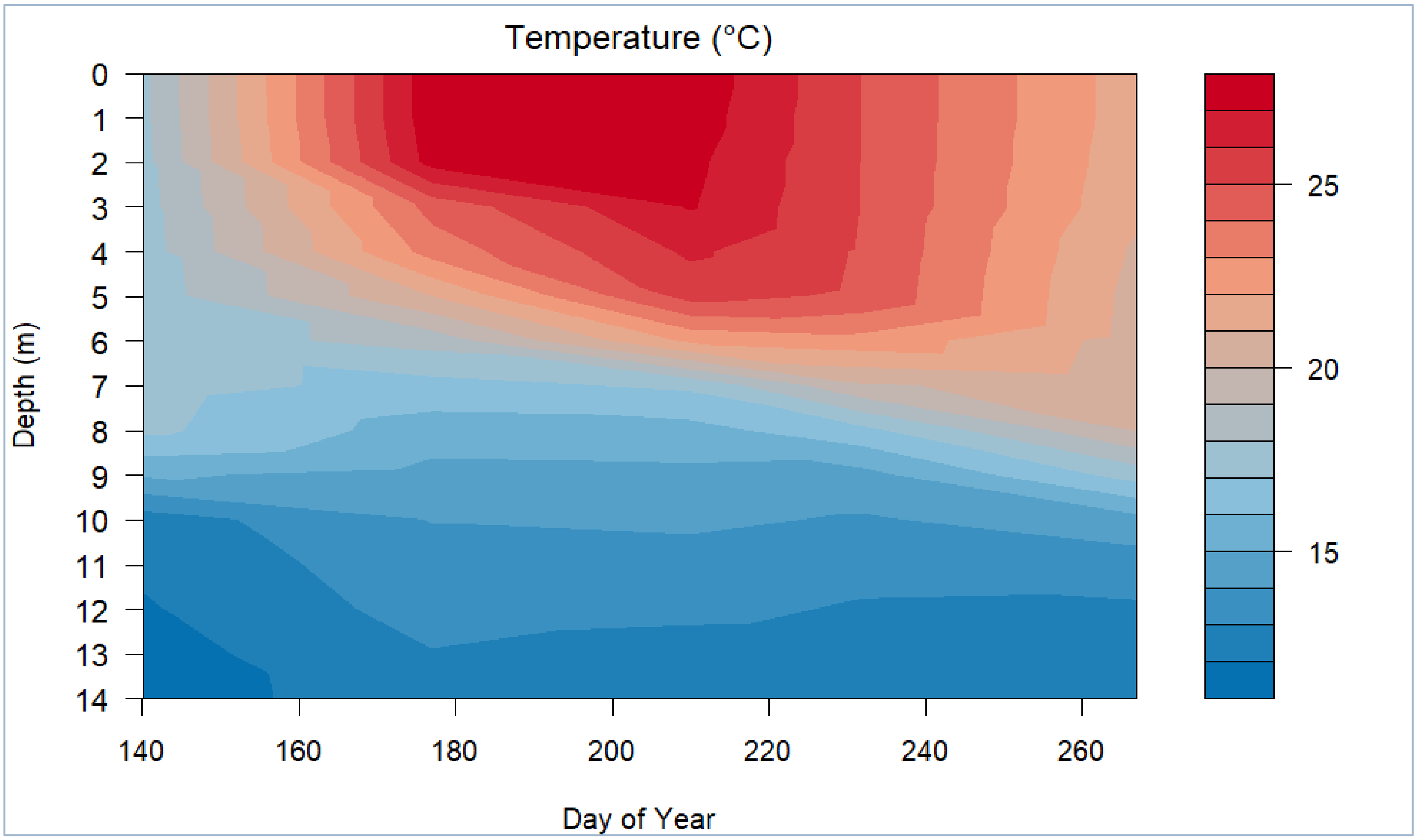


Figure 2: Temperature isopleths at Station 2 throughout the 2025 season

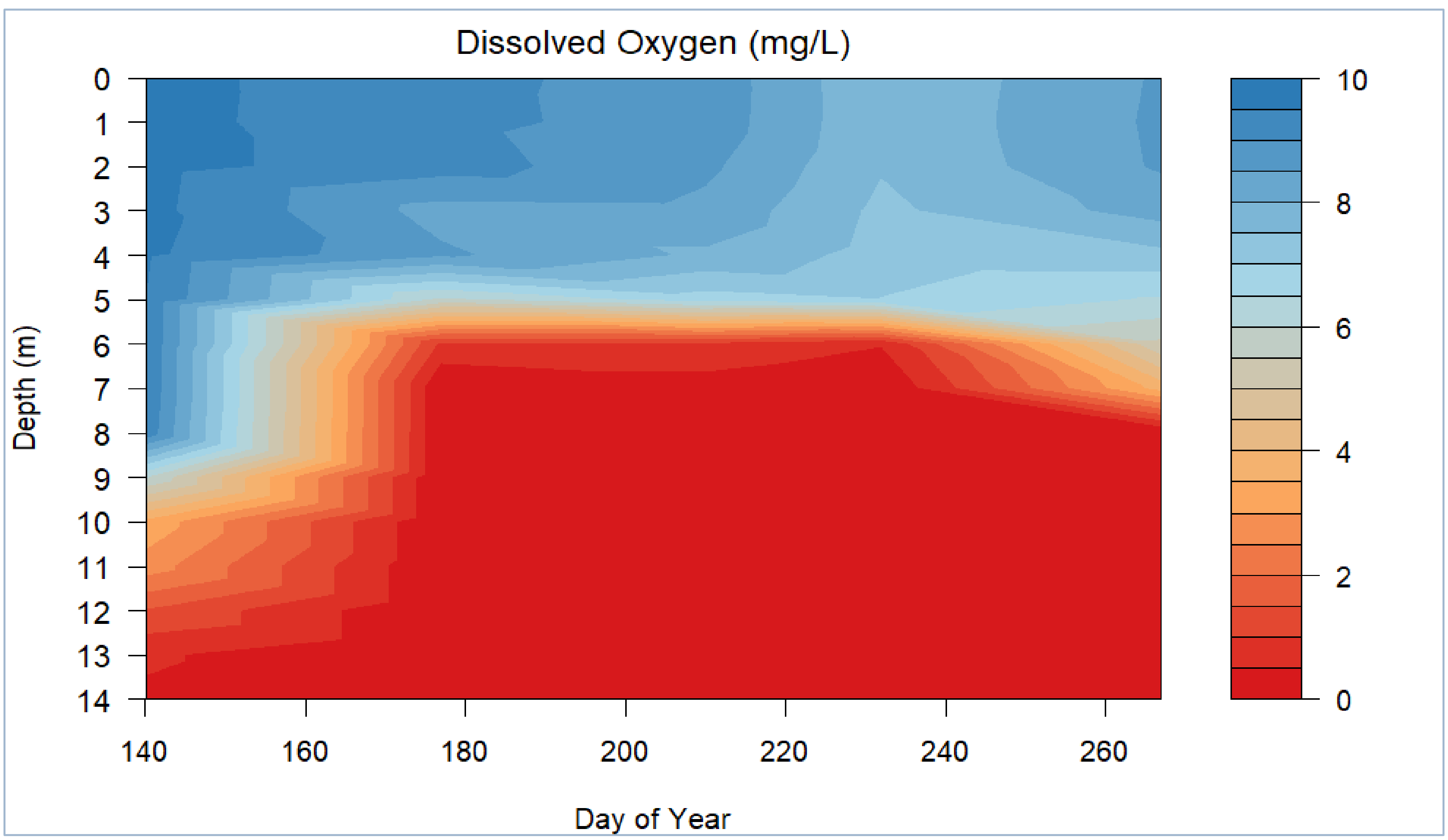


Figure 3: Dissolved oxygen isopleths at Station 2 throughout the 2025 season

PH

pH is a unitless measurement of the hydrogen ion concentration in water. Expressed on a negative logarithmic scale from 0 to 14, every change of 1 pH unit represents a 10-fold change in hydrogen ion concentration. The pH of pure water is 7 and is termed neutral. Any value less than 7 is termed acidic, while any value greater than 7 is termed basic. Baseline pH values in aquatic systems are primarily determined by the ionic constituency of the surrounding geology. Watersheds draining soils of easily erodible anionic constituents are generally well buffered, and as such have runoff waters with basic pH values (pH above 7). Spatial variations in pH throughout the water column are largely due to relative rates of photosynthesis versus respiration. As plants and algae photosynthesize and carbon dioxide is removed from the water, pH values increase. Conversely, respiration releases carbon dioxide into the environment which results in a reduction in pH. Given these relationships, pH values may differ substantially in the epilimnion and hypolimnion. The New Jersey Surface Water Quality Standard for pH is between 6.5 -8.5.

Surface pH values ranged between 6.9 – 9.5 on 20 May, with only the shallow Station 12 exceeding the New Jersey Surface Water Quality Standard. There was abundant curlyleaf pondweed (*Potamogeton crispus*) growth at Station 12 located in Landing Channel at this time causing the elevated pH. On 26 June, surface pH values ranged between 7.3 – 8.5 throughout the lake, remaining within the optimal range. pH values often decrease with depth as a result of decreasing rates of photosynthesis, although pH values at all depths remained above 6.5 during each sampling event. Surface pH values remained similar in July and August, with only two shallow stations exceeding 8.5 in July. Surface values mostly remained within the optimal range of 6.5 – 8.5 in September, with only the shallow Station 10 exceeding the threshold with a pH of 8.6. In summary, pH values exceeded the upper recommended threshold at a few stations but remained at acceptable ecological values.

WATER CLARITY

Transparency in lakes is generally determined through the use of a Secchi disk. The Secchi disk is a contrasting white and black disk that is lowered into the lake until no longer visible then retrieved until visible again. The average of those two lengths is termed the Secchi depth. This depth may be influenced by algal density, suspended inorganic particles, organic acid staining of the water or more commonly a combination of all three. This parameter is often times used to calculate the trophic status (productivity) of a lake and as such is a critical tool in lake evaluation. Secchi depths less than 1.0 m are generally associated with reduced water quality due to high concentrations of algae or suspended inorganic sediments and as such is generally associated with impaired quality.

Water clarity was measured at each in-lake monitoring station throughout the 2025 season. Based on Princeton Hydro's in-house, long-term database of lakes in northern New Jersey, water clarity is considered acceptable for recreational activities when the Secchi depth is equal to or greater than 1.0 m (3.3 ft).

Water clarity typically varies throughout the lake and is often lowest north of Brady Bridge where the lake is shallow and turbid. Figure 4 below depicts water clarity at Station 2 throughout the season. In May, all stations had Secchi depths that met the 1.0 m threshold, ranging from 1.2 m at Station 10 up to 1.9 m at Station 12. In June, clarity increased at many of the deeper stations but decreased at some of the shallow stations, ranging from 0.8 m at Sation 10 to 1.9 m at Stations 2 and 4. Water clarity continued to decrease at the shallow stations on 29 July, with values below 1.0 m at Stations 1, 3, 5, 10, and 12; however, clarity remained at or above1.5 m at Stations 2, 4, 6, 8 and 9. Secchi depth's decreased lakewide on 20 August, varying between 0.7 m at Stations 1, 7, 10, and 12 and 1.1 m at Stations 2, 6, 8, and 9. Water clarity increased at all stations on 24 September with the exception of Stations 1 and 10, both of which are located north of Brady Bridge in the Woodport Bay section of the lake; both stations had poor clarity of 0.6 m.

Water clarity during the 2025 season increased significantly at Stations 2 (mid-lake) and 3 (Crescent Cove) relative to 2024. Station 2 had a seasonal mean Secchi depth of 1.1 m in 2024 and 1.5 m in 2025. Station 3 had a seasonal mean of 0.9 m in 2024 and 1.2 m in 2025. The increase in clarity at Station 2 was likely influenced by the alum treatment that was conducted in the fall of 2024, as data from 2025 shows that the internal dissolved phosphorus load was significantly reduced, resulting in lower cyanobacteria densities.

The increase in clarity at Station 3 was likely influenced by the proactive benthic algaecide application that was conducted in late April 2025. Cyanobacteria densities were significantly lower in 2025 in this section of the lake which has been susceptible to blooms in recent years due to the shallow, secluded nature of the cove.

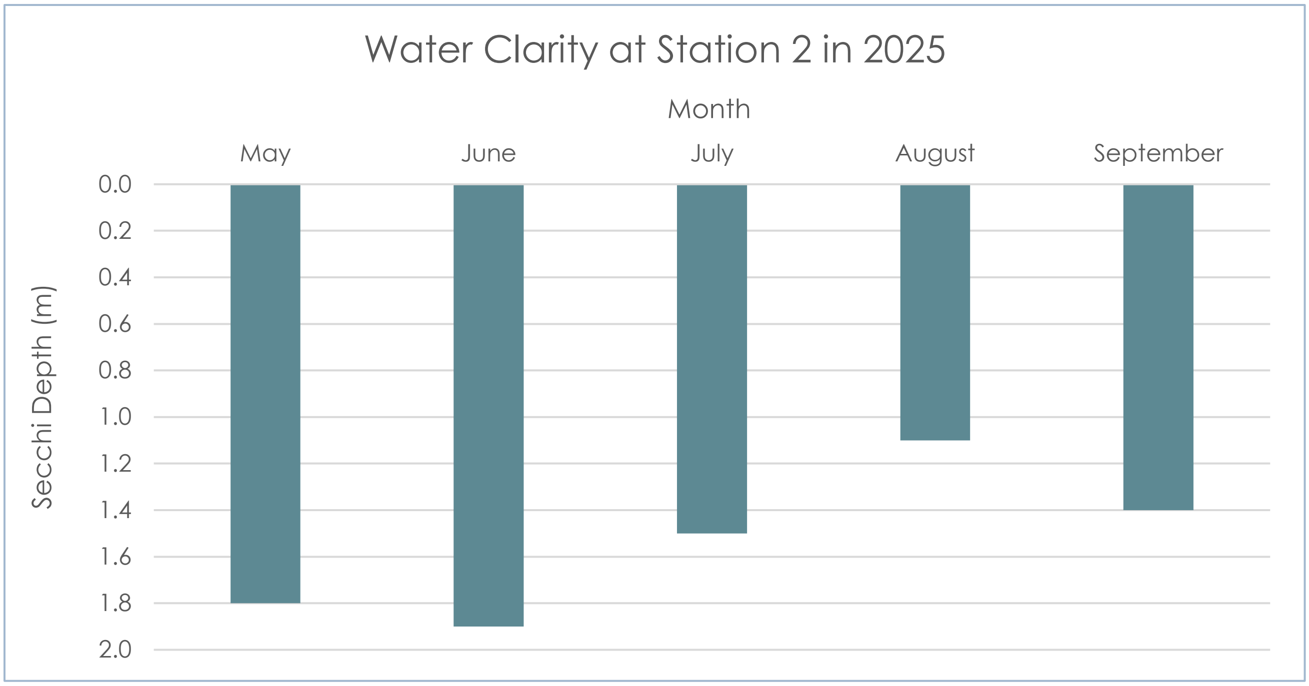


Figure 4: Water clarity at the mid-lake station throughout the 2025 season

3.2 DISCRETE PARAMETERS

AMMONIA-NITROGEN (NH_3-N)

In lakes, ammonia is naturally produced and broken down by bacterial processes while also serving as an important nutrient in plant growth. In a process termed ammonification, bacteria break down organically bound nitrogen to form NH_4^+. In aerobic systems bacteria then break down excess ammonia to nitrate (NO_3^-) in a process termed nitrification. These processes provide fuel for bacteria and are generally kept in balance to prevent accumulation of any one nitrogen compound.

Ammonia is generally present in low concentrations in oxygenated epilimnetic layers of lakes due to the rapid conversion of the ammonium ion to nitrate. In addition, most plants and algae prefer the reduced ammonium ion to the oxidized nitrate ion for growth and therefore further contribute to reduced concentrations of ammonia in the upper water layer. In the anoxic hypolimnion of lakes ammonia tends to accumulate due to increased bacterial decomposition of organic material and lack of oxygen which would otherwise serve to oxidize this molecule to nitrate.

Increased surface water concentrations of ammonia may be indicative of excessive non-point source pollution from the associated watershed. The ammonium ion, unlike that of nitrate, may easily bind to soil particles whereby it may be transported to the lake during storm events. Another likely source of excessive ammonia in suburban watersheds is runoff from lawn fertilizer which is often highly rich in nitrogenous species. Increases in ammonia concentrations in the hypolimnion of lakes are generally associated with thermal stratification and subsequent dissolved oxygen depletion. Once stratification breaks down a pulse of ammonia rich water may be mixed throughout the entire water column whereby it will cause undue stress to aquatic organisms, as well as possible toxicity.

Toxicity of ammonia to aquatic species generally increases with increasing pH (>8.5) and decreasing temperature (<5°C). The general guideline issued by the EPA is that ammonia should not exceed a range of 0.02 mg/L to 2.0 mg/L, dependent upon water temperature and pH, to preclude toxicity to aquatic organisms.

Surface ammonia-N concentrations remained low throughout Lake Hopatcong in 2025, ranging between 0.01 mg/L and 0.08 mg/L; the seasonal mean was 0.02 mg/L.

Mid-depth samples collected at Station 2 were higher than surface concentrations, ranging between 0.01 mg/L in May and 0.19 mg/L in September. The elevated concentrations towards the end of the season were likely a result of migration into the thermocline from the hypolimnion, which typically has elevated concentrations during extended periods of anoxia. Thus, deep samples at Station 2 were elevated throughout the season, ranging between 0.09 mg/L in May and 2.0 mg/L in September. As mentioned above, ammonia often accumulates in the anoxic hypolimnion due to the lack of oxygen which would otherwise oxidize the molecule and convert it to nitrate. These elevated ammonia-N concentrations coincide with an extended period of hypolimnetic anoxia.

NITRATE-NITROGEN (NO_3-N)

Nitrate is the most abundant form of inorganic nitrogen in freshwater ecosystems. Common sources of nitrate in freshwater ecosystems are derived from bacterial facilitated oxidation of ammonia and through groundwater inputs. The molecular structure of nitrate lends it poor ability to bind to soil particles but excellent mobility in groundwater.

Nitrate is often utilized by algae, although to a lesser extent than ammonia, for growth. Nitrate distribution is highly dependent on algal abundance and the spatial distribution of dissolved oxygen concentrations. In many eutrophic lake systems nitrate concentrations show temporal and spatial variability due to algal productivity and relative concentrations of dissolved oxygen.

Excessively high concentrations of nitrate are primarily attributable to either septic wastewater inputs or excessive organic matter decomposition in oxygenated portions of the hypolimnion. Typically, lakes with concentrations above 0.30 mg/L indicates nitrogen-loading; however, concentrations below 0.50 mg/L are still considered acceptable surface water quality.

Surface nitrate-N concentrations were low to moderate throughout most of the lake in May with the exception of Station 3 which yielded a concentration of 0.39 mg/L. Surface nitrate-N concentrations exceeded 0.20 mg/L at Stations 3, 7, and 11. Surface nitrate-N concentrations decreased throughout the lake in June, with concentrations varying between below the lab detection limit of 0.03 mg/L and 0.09 mg/L at Station 11. Surface concentrations remained low for the rest of the season and only exceeded 0.10 mg/L one time at Station 7 in August.

Mid-depth samples collected at Station 2 never exceeded 0.06 mg/L. Deep samples reached a seasonal maximum of 0.21 mg/L in August. Deep nitrate-N concentrations remained relatively low due to the lack of oxygen, resulting in most of the nitrogen accumulating in the form of ammonia.

In summary, surface nitrate-N concentrations remained low throughout the lake for most of the season, with only a few moderately elevated samples at Stations 3, 7, and 10 early in the season. We have historically observed isolated instances of elevated nitrate at these same stations, which may be linked to septic leachate. The Borough of Hopatcong (Station 3) is partially sewered, while the Township of Jefferson (Stations 7 and 10) is not sewered. However, the Borough has been in the process of sewering some of their neighborhoods. In addition, the Township is currently working with a number of stakeholders, including the US Army Corps of Engineers, to design and conduct a sewering project for the residents in this part of the watershed.

TOTAL PHOSPHORUS (TP)

Phosphorus is often the limiting nutrient in lake ecosystems, or the nutrient in which abundance is lowest relative to demand by plants and algae. As a result, phosphorus is often the primary nutrient driving excessive plant and algal growth. Given this nutrient limitation, only relatively small increases in phosphorus concentration can fuel algal blooms and excessive macrophyte production. By monitoring total phosphorus concentrations, the current trophic status of the lake can be determined and future trends in productivity may be predicted. It is important to note that total phosphorus concentrations account for all species of phosphorus, including organic, inorganic, soluble, and insoluble. Therefore, this measure accounts not only for those dissolved, inorganic species of phosphorus that are readily available for algal assimilation, but also for those species of phosphorus either tightly bound to soil particles or contained as cellular constituents of aquatic organisms which are generally unavailable for algal assimilation.

The State's Surface Water Quality Standard (SWQS, N.J.A.C. 7:9B – 1.14(c) 5) for TP in the surface waters of a freshwater lake or impoundment is 0.05 mg/L. This established TP concentration is for any freshwater lake or impoundment in New Jersey that does not have an established TMDL. Lake Hopatcong has established a phosphorus TMDL, which was revised and approved by NJDEP in June 2006. Based on its refined phosphorus TMDL, the long-term management goal is to maintain an <u>average</u> growing season TP concentration of 0.03 mg/L or less within the surface waters of Lake Hopatcong. Based on Princeton Hydro's in-house database on northern New Jersey lakes, TP concentrations equal to or greater than 0.03 mg/L increases the likelihood of nuisance algal growth and/or HABs.

Surface mean TP concentrations during the 2025 season are provided in Figure 5 below.

Surface TP concentrations exceeded the recommended threshold of 0.03 mg/L at Stations 1, 3, 4, 7, 10, and 12 in May, with concentrations of 0.05 and 0.07 mg/L at Stations 1 and 10, respectively; the mean surface concentration on 20 May was 0.04 mg/L. The mean surface TP concentration remained consistent at 0.039 mg/L in June, with an elevated concentration of 0.09 mg/L at Station 11. Surface TP concentrations were lower in July, with a mean concentration of 0.034 mg/L; Station 7 yielded the highest concentration of 0.05 mg/L. Surface TP concentrations remained similar in August and September, with respective mean values of 0.037 mg/L and 0.035 mg/L. Surface concentrations met or exceeded 0.05 mg/L at Stations 1, 3, 10, and 11 in August.

Similar to recent years, mid-depth TP concentrations at Station 2, which were collected from the middle of the thermocline, were low throughout the season and did not exceed 0.04 mg/L. This indicates that little to no TP that was building up in the anoxic hypolimnion throughout the season was mixed with the surface water and likely explains why TP concentrations were generally low at the surface of Station 2 throughout the season. Deep TP concentrations collected from approximately 0.5 m above the sediment increased as the season progressed and anoxic conditions persisted, reaching a maximum TP concentration of 0.17 mg/L on 29 July and 24

September. Although this is still elevated, it's lower than the seasonal maximum of 0.21 mg/L observed in 2024. Additionally, soluble reactive phosphorus (SRP), the form that is both released from the sediments and the most important for limiting algal growth, was significantly lower in 2025 than recent years, which is likely a direct result of the alum treatment.

The mean TP concentration was calculated for each surface water sampling station and compared with the TMDL threshold concentration of 0.03 mg/L (Figure 5). Of the ten long-term water quality monitoring stations, four stations were compliant with this TMDL in 2025. Stations 1, 3, 7, 10, and 12 had seasonal mean concentrations of 0.04 mg/L and Station 11 had a concentration of 0.05 mg/L. In 2023 and 2024, only Stations 3, 10, and 12 exceeded the threshold. Thus, surface TP concentrations did increase slightly at some of the shallow stations in 2025. All of the stations that exceeded the threshold of 0.03 mg/L, with the exception of Station 3, are located north of Brady Bridge and may have been influenced by septic leachate, further supporting the need for sewers in Jefferson Township.

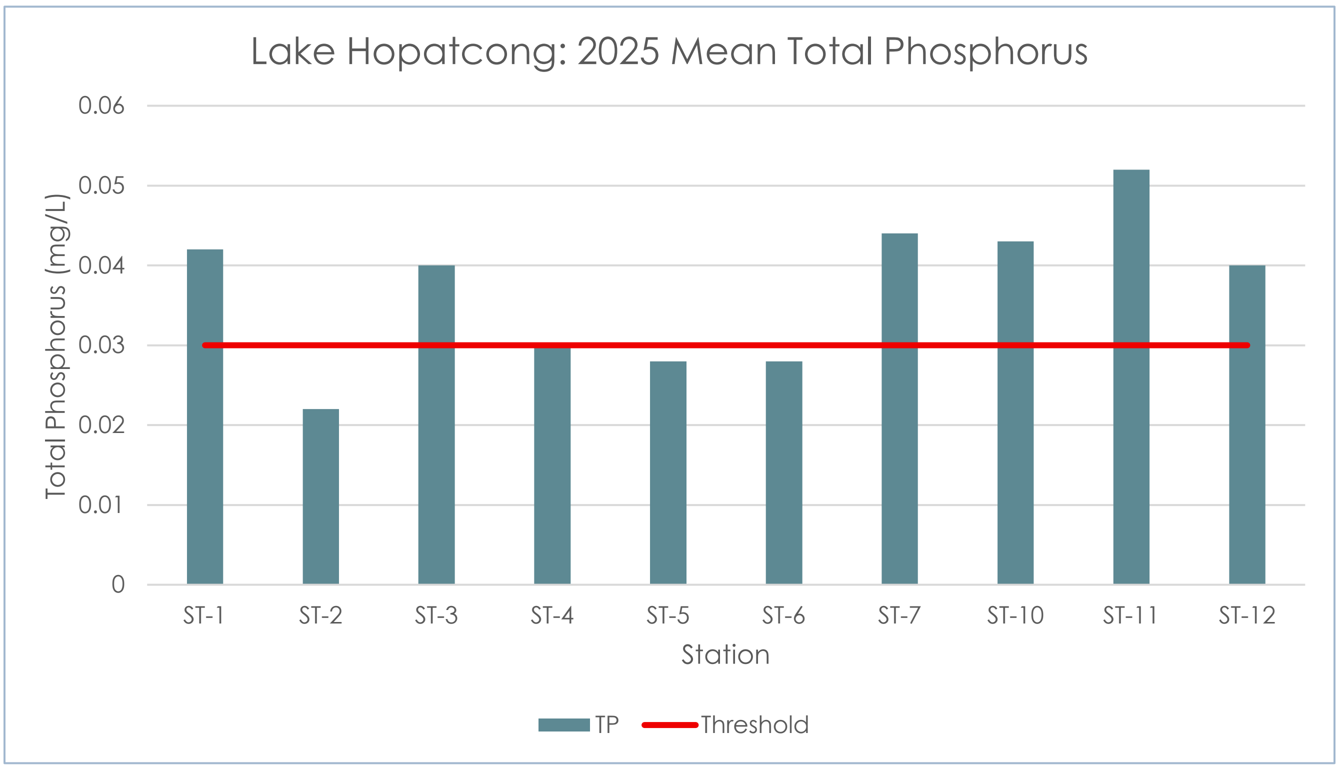


Figure 5: Mean TP concentrations in Lake Hopatcong throughout the 2025 season

SOLUBLE REACTIVE PHOSPHORUS (SRP)

SRP represents the dissolved inorganic portion of the total phosphorus metric. This species of phosphorus is readily available for assimilation by all algal forms for growth and is therefore normally present in limited concentrations except in eutrophic lakes. Princeton Hydro recommends concentrations to not exceed 0.005 mg/L to prevent nuisance algal blooms.

Surface mean SRP concentrations during the 2025 season are provided in Figure 6 below.

Surface SRP concentrations were low throughout the lake for most of the 2025 growing season. Stations 7 and 11 had concentrations of 0.005 mg/L in May and Station 6 had an elevated concentration of 0.01 mg/L. In June, surface concentrations only exceeded 0.003 mg/L at Station 12 with a concentration of 0.004 mg/L. Station 10 had an elevated concentration of 0.01 mg/L in July, and concentrations remained low throughout the lake in August and September.

Mid-depth SRP concentrations at Station 2 remained low, with a seasonal maximum of 0.004 mg/L in June.

Deep SRP concentrations at Station 2 were low in May and June with a concentration below the lab detection limit of 0.001 mg/L in May and 0.005 mg/L in June. Deep concentrations remained low relative to historical concentrations in July and August, with respective concentrations of 0.009 mg/L and 0.005 mg/L. As the hypolimnion began to shrink in September, deep phosphorus concentrations became more concentrated and SRP was elevated at 0.021 mg/L. Overall, deep SRP concentrations at Station 2 remained significantly lower than 2024 which is likely a direct result of the alum treatment. In 2024, deep SRP concentrations were extremely elevated from July – September, with concentrations ranging between 0.049 mg/L in August and 0.085 mg/L in September. It is important to keep deep SRP concentrations low because it can act as a source of fuel for depth-regulating cyanobacteria.

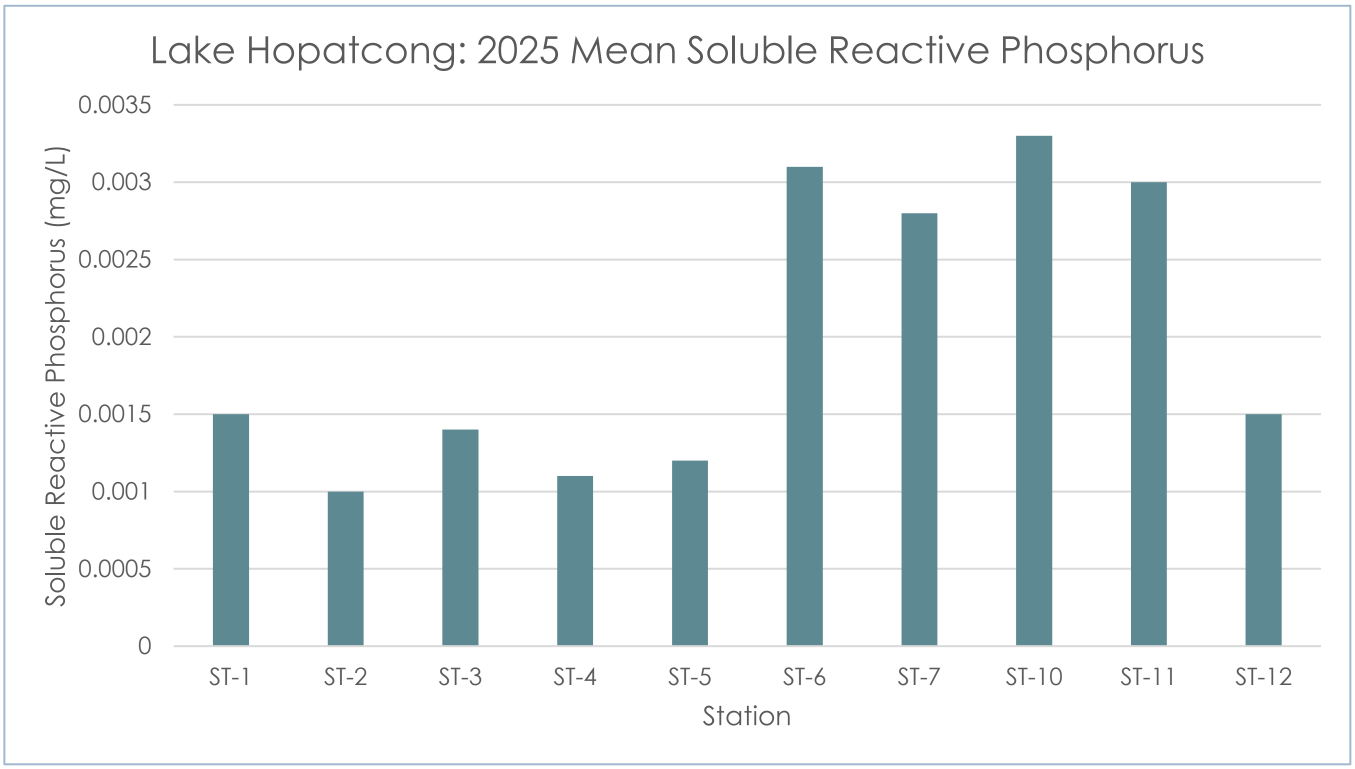


Figure 6: Mean SRP concentrations in Lake Hopatcong throughout the 2025 season

CHLOROPHYLL A

Chlorophyll *a* is a pigment possessed by all algal groups, used in the process of photosynthesis. Its measurement is an excellent means of quantifying algal biomass. In general, an algal bloom is typically perceived as a problem by the layperson when chlorophyll-*a* concentrations are equal to or greater than 25.0 to 30.0 µg/L. In contrast, the <u>targeted</u> average and maximum chlorophyll-*a* concentrations, once Lake Hopatcong is in complete compliance with the TMDL, are predicted to be 8.0 and 14.0 µg/L, respectively.

Mean surface chlorophyll *a* concentrations during the 2025 season are provided in Figure 7 below.

Chlorophyll *a* was variable around the lake on 20 May, with Stations 1, 2, 3, 4, and 10 yielding concentrations between 15.0 and 18.0 µg/L; all other stations had concentrations below 14.0 µg/L. Chlorophyll *a* was below 10.0 µg/L at all stations except for Station 11 in June, which yielded an elevated concentration of 47.0 µg/L; TP was also elevated at this station in June with a concentration of 0.09 mg/L. In July, every station except for Station 2 had chlorophyll *a* concentrations above 14.0 µg/L, ranging from 15.0 µg/L at Station 4 up to 37.0 µg/L at Station 3. Chlorophyll *a* continued to increase around the lake in August as temperatures remained high, ranging between 19.0 µg/L at Station 6 and 38.0 µg/L at Station 12. Only two stations exceeded the 14.0 µg/L threshold in September; Station 7 had a concentration of 17.0 µg/L and Station 10 had a concentration of 20.0 µg/L.

Average lake wide surface chlorophyll *a* concentrations were calculated for each month and compared with the targeted goal of 8.0 µg/L. Average surface chlorophyll *a* concentrations exceeded the targeted goal of 8.0 µg/L during each sampling event in 2025, ranging from 8.8 µg/L in September up to 30.2 µg/L in August. July also had an elevated surface mean of 21.8 µg/L; however, surface mean concentrations remained at or below 11.0 µg/L in May, June, and September.

No individual station had a seasonal mean concentration below the targeted threshold of 8.0 g/L. Stations 1, 10, and 11 had the highest seasonal mean concentrations, with respective values of 18.8, 21.4, and 21.6 µg/L. All three of these stations are located north of Brady Bridge where the lake is shallow and often turbid. This was the first year since before 2022 that Station 3 did not have the highest seasonal average chlorophyll *a* concentration, which is likely a result of the early season proactive algaecide application. Station 3 had a mean concentration of 15.9 µg/L in 2025; the seasonal mean at this station exceeded 20.0 µg/L in 2023 and 2024.

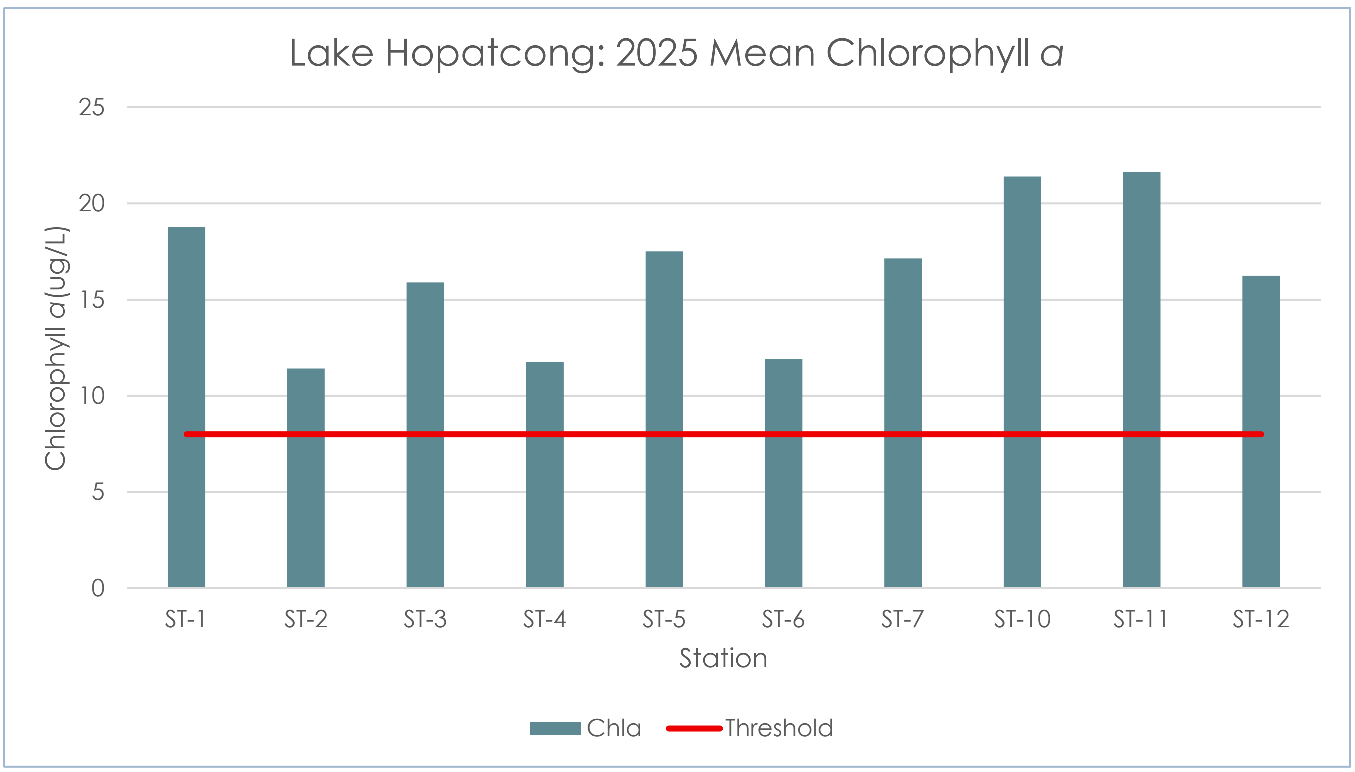


Figure 7: Mean chlorophyll *a* concentrations in Lake Hopatcong throughout the 2025 season

TOTAL SUSPENDED SOLIDS (TSS)

The concentration of suspended particles in a waterbody that will cause turbid or "muddy" conditions, total suspended solids is often a useful indicator of sediment erosion and stormwater inputs into a waterbody. Because suspended solids within the water column reduce light penetration through reflectance and absorbance of light waves and particles, suspended solids tend to reduce the active photic zone of a lake while contributing a "muddy" appearance at values over 25 mg/L. Total suspended solids measures include suspended inorganic sediment, algal particles, and zooplankton particles.

Surface TSS concentrations were low throughout most of the lake in May, ranging from below the lab detection limit of 2 mg/L at Stations 4 and 5 to 9 mg/L at Station 1. TSS concentrations remained relatively low in June, varying between 2 mg/L at Station 2 and 14 mg/L at Station 10. In July, TSS concentrations remained below 8 mg/L at all stations except for Station 10 which yielded a concentration of 13 mg/L. The lake was more turbid in August, and TSS concentrations exceeded 20 mg/L at Stations 7, 10, and 11, with respective concentrations of 23, 21, and 20 mg/L; all three of these stations are located north of Brady Bridge. During the final monitoring event in September, TSS concentrations were low at all stations except for Stations 1 and 10, with respective concentrations of 17 and 19 mg/L; again, both of these stations are located north of Brady Bridge.

TSS concentrations decreased throughout the lake on 24 July, with concentrations ranging between 2 mg/L at Station 11 and 11 mg/L at Station 7. TSS concentrations were variable in August, ranging between 2 mg/L at Station 11 and 19 mg/L at Station 3. TSS concentrations remained relatively low in September, ranging from below the lab detection limit of 2 mg/L at Station 2 and 11 mg/L at Station 10. Mid-depth and deep TSS concentrations at Station 2 never exceeded 10 mg/L.

3.3 BIOLOGICAL PARAMETERS

PHYTOPLANKTON

Phytoplankton are algae that are freely floating in the open waters of a lake or pond. These algae are vital to supporting a healthy ecosystem since they are the base of the aquatic food web. However, high densities of phytoplankton can produce nuisance conditions. The majority of nuisance algal blooms in freshwater ecosystems are the result of cyanobacteria, also known as blue-green algae. Some of the more common water quality problems created by blue-green algae include bright green surface scums, taste and odor problems, and the generation of cyanotoxins. Phytoplankton samples were collected from the surface and mid-depth of Station 2 during the 2025 season and were quantitatively assessed for comparison with the NJDEP HAB Alert Levels. Surface samples were also collected at Stations 3, 10, and 12 for quantitative analysis during each event. New Jersey implemented advanced harmful algal bloom (HAB) screening and response protocols in 2020, and these HAB standards are provided below in Figure 9.

Samples collected at the surface and mid-depth of Station 2 during the 14 May sampling event yielded a diverse green algae and diatom community, with 21 total genera identified at the surface and 19 total genera identified at mid-depth. However, the cyanobacteria community was moderately elevated for early in the season, with total cyanobacteria counts of 53,040 cells/mL and 37,222 cells/mL at the surface and mid-depth, respectively; *Aphanizomenon* was the dominant genera. Phytoplankton genera richness increased by 26 June, with 27 genera identified both at the surface and mid-depth. The green algae community was the most diverse, yielding 13 genera at the surface and 14 genera at mid-depth. The cyanobacteria community increased to seasonal maximums at both the surface and mid-depth, with respective cell counts of 91,893 and 54,372 cells/mL; *Aphanizomenon* and *Planktothrix* were the dominant genera. Cyanobacteria densities were higher early in the season in 2025 but never reached the elevated densities that have been observed in recent years. Cyanobacteria have historically reached a seasonal maximum in July or August when water temperatures increase and there is an abundance of phosphorus in the hypolimnion; however, cyanobacteria densities never exceeded 50,000 cells/mL at Station 2 after June.

Cyanobacteria densities at the surface and mid-depth of Station 2 decreased by 29 July, with respective cell counts of 42,836 and 40,051 cells/mL. The cyanobacteria community was represented by seven genera, and none were particularly dense. It's a positive sign that cyanobacteria densities decreased during the peak of the summer; in July 2024, the surface cyanobacteria cell count exceeded 300,000 cells/mL. Overall phytoplankton richness remained high during this time, with 26 genera observed at the surface and 18 at mid-depth, with good representation from the diatoms and green algae.

Cyanobacteria densities at the surface of Station 2 increased slightly in August, with a cell count of 49,205 cells/mL, but the mid-depth community decreased significantly, with a cell count of 5,896 cells/mL. The surface community experienced a reduction in *Aphanizomenon* but an increase in *Raphidiopsis*, continuing a trend that has been observed in recent years. *Raphidiopsis* is a subtropical cyanobacteria genus that has been blooming in Lake Hopatcong, as well as other temperate waterbodies, in increasing numbers in recent years. Based on the last four years of data, this subtropical cyanobacteria tends to appear at Station 3 at the heigh of the summer season and has increasingly been present at Station 2 and other areas of the lake. Although this genera was observed at both stations in 2025, the densities were significantly reduced, which may be attributed to both the large-scale alum treatment in 2024 and the early season proactive algaecide treatment in Crescent Cove. The green algae community decreased in genera richness in August, which is common during the summer months as cyanobacteria often dominate.

By late September, total phytoplankton richness began to increase, and cyanobacteria densities were reduced. A total of 21 genera were observed at the surface of Station 2 and 19 genera at mid-depth. Surface and mid-depth cyanobacteria densities were 38,892 and 13,813 cells/mL, both dominated by *Raphidiopsis*, representing approximately half of the cyanobacteria community.

Surface grabs were also collected at Stations 3, 10, and 12 during each sampling event. Cyanobacteria densities at these stations remained low in May, ranging between 0 cells/mL at Station 10 and 17,185 cells/mL at Station 12. All three stations had high genera richness, ranging between 18 at Station 12 and 22 at Station 3. Genera richness and cyanobacteria densities increased at all three stations in June, with a minimum of 28 genera observed at each station. Cyanobacteria densities were moderately elevated, ranging between 25,576 cells/mL at Station 3 and 45,208 cells/mL at Station 10.

Cyanobacteria densities reached a seasonal maximum of 118,869 cells/mL at Station 3 in August, dominated by *Raphidiopsis*. Although elevated, this was significantly lower than the July 2024 cyanobacteria densities which reached 287,224 cells/mL. Cyanobacteria densities also increased at Stations 10 and 12 in July, with respective cell counts of 62,444 and 73,856 cells/mL. These increases in cyanobacteria densities coincided with a decrease in total richness.

In August, cyanobacteria densities decreased significantly at Station 3, with a cell count of 69,875 cells/mL. In 2024, cyanobacteria densities at Station 3 remained above 140,000 cells/mL in August and September. However, cyanobacteria densities did increase at Stations 10 and 12, with respective cell counts of 97,864 cells/mL and 95,351 cells/mL. Cyanobacteria densities remained elevated at Station 10 in September, with a cell count of 83,840 cells/mL while Stations 3 and 10 saw significant reductions, with respective cell counts of 17,969 and 9,102 cells/mL.

Cyanobacteria densities in samples collected at Stations 2, 3, 10 and 12, are provided in Figure 8 below.

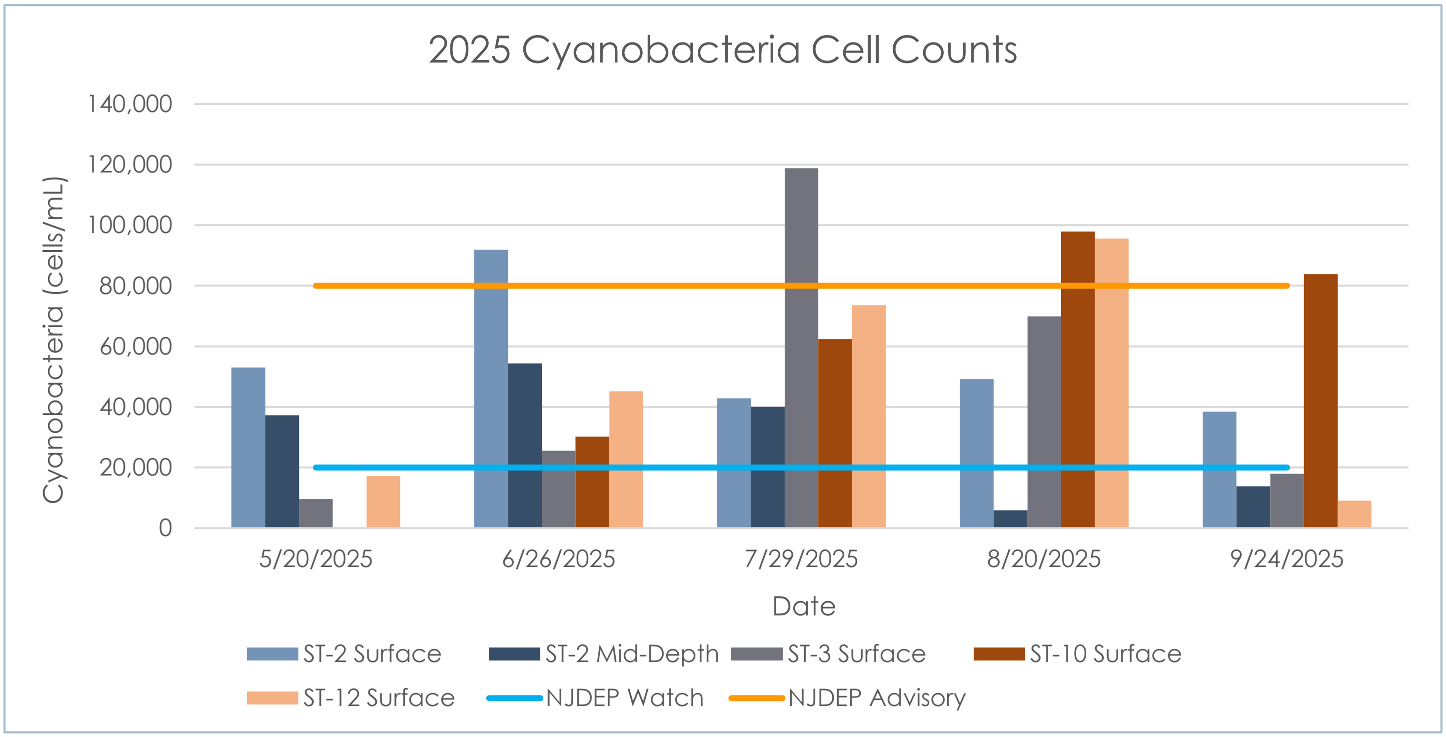


Figure 8: Cyanobacteria cell counts in Lake Hopatcong throughout the 2025 season

In addition to the cyanobacteria cell counts at Station 2, Turner FluoroSense handheld fluorometers were utilized to measure phycocyanin at the surface during these water quality sampling events. Phycocyanin is a pigment that is produced almost exclusively by cyanobacteria and is currently being assessed by NJDEP in terms of monitoring for HABs. It's important to note that the model of meter has different ranges and requires a separate correlation. A correlation was calculated by NJDEP for the Turner handheld meter used by Princeton Hydro, with a value of 12 µg/L correlating with an estimated cyanobacteria cell count of 20,000 cells/mL and a value of 44 µg/L correlating with an estimated cyanobacteria cell count of 80,000 cells/mL.

Phycocyanin measurements were taken at the surface of all stations in 2025. Phycocyanin concentrations were variable by station in May, ranging from 3 µg/L at Station 11 up to 25 µg/L at Station 2; the surface mean concentration was 14 µg/L. Concentrations increased at all stations in June, with a surface mean of 25 µg/L. The highest concentrations were measured at Stations 2, 5, 7, and 11, with respective concentrations of 38, 35, 47, and 54 µg/L. Unlike recent years, phycocyanin concentrations decreased rather significantly throughout the lake in July, with a surface mean of 16 µg/L. This did coincide with a decrease in cyanobacteria densities at Station 2. Phycocyanin concentrations did increase significantly in late August, with a surface mean of 45 µg/L, with concentrations exceeding 50 µg/L at Stations 1, 5, 7, 9, and 10. As water temperatures began to cool in September, the surface mean phycocyanin concentration decreased to 25 µg/L, with the highest concentrations measured north of Brady Bridge at Stations 1 and 10 with respective concentrations of 70 and 56 µg/L.

The NJDEP modified their HAB alert level classifications for 2020 and beyond. Cell counts between 20,000 – 80,000 cells/mL fall under the classification of "Watch." Under this classifications, public health beaches can remain open, depending on local health authority evaluation and assessment, but monitoring under these classifications should increase. As cell counts exceed 80,000 cells/mL, the alert levels progress into "Advisory," "Warning," and "Danger" depending on cyanotoxin concentrations; however, public bathing beaches would be closed under any of these elevated classifications.

HAB Alert Level	Criteria	Recommendations
HAB Not Present	**HAB reported and investigated. No HAB present.**	**None**
WATCH *Suspected or confirmed HAB with potential for allergenic or irritative health effects*	Suspected HAB based on field survey **OR** Confirmed cell counts ≥20K - <80K cells/mL **AND** No known toxins above public health thresholds	**Public Bathing Beaches Open** Waterbody Accessible: Use caution during **primary contact (e.g. swimming) and secondary (e.g. non-contact boating)** activities Do not ingest water (people/pets/livestock) Do not consume fish
ADVISORY *Confirmed HAB with moderate risk of adverse health effects and increased potential for toxins above public health thresholds*	Lab testing for toxins Microcystins: ≥2 µg/L Cylindrospermopsin: ≥5 µg/L Anatoxin-a: ≥15 µg/L Saxitoxin: ≥0.6 µg/L **OR** Confirmed cell counts ≥80K cells/mL	**Public Bathing Beaches Closed** Waterbody Remains Accessible: Avoid primary contact recreation Use caution for secondary contact recreation Do not ingest water (people/pets/livestock) Do not consume fish
WARNING *Confirmed HAB with high risk of adverse health effects due to high toxin levels*	Toxin (microcystins) ≥20 - <2000 µg/L	**Public Bathing Beaches Closed** Cautions as above May recommend against secondary contact recreation.
DANGER *Confirmed HAB with very high risk of adverse health effects due to very high toxin levels*	Toxin (microcystins) ≥2000 µg/L	**Public Bathing Beaches Closed** Cautions as above. Possible closure of all or portions of waterbody and possible restrictions access to shoreline.

Figure 9: NJDEP HAB Response Guidelines

Cyanobacteria cell counts at the surface of Station 2 fell under the "Watch" level in May, July, August and September, and the "Advisory" level in June. Cyanobacteria cell counts at mid-depth of Station 2 fell under the "Watch" level in May, June, and July. Cyanobacteria cell counts at Station 3 fell under the "Watch" level in June and August and the "Advisory" level in July. Cyanobacteria cell counts at Station 10 fell under the "Watch" level in June and July and the "Advisory" level in August and September. Finally, cyanobacteria cell counts at Station 12 fell under the "Watch" level in June and July and the "Advisory" level in August.

ZOOPLANKTON

Zooplankton are the micro-animals that live in the open waters of a lake or pond. Some large-bodied zooplankton are a source of food for forage and/or young gamefish. In addition, many of these large-bodied zooplankton are also herbivorous (i.e. algae eating) and can function as a natural means of controlling excessive algal biomass. Given the important role zooplankton serve in the aquatic food web of lakes and ponds, samples for these organisms were collected at the surface and mid-depths of Station 2 during each monitoring event.

The Cladoceran genera *Bosmina* and *Chydorus* and the copepod genus *Microcyclops* were common at Station 2 in May. In total, there were 5 zooplankton genera identified at the surface and 8 genera identified at mid-depth, with representation from the three major groups: Cladocerans, copepods, and rotifers. Zooplankton richness increased at the surface in June, with a total of 10 genera identified at the surface and 7 genera identified at mid-depth. The Cladoceran genus *Ceriodaphnia* was common at the surface and *Bosmina* was abundant at mid-depth. Rotifer richness also increased at both depths.

Cladoceran abundance began to decrease, and rotifer richness increased by late July, which is typical during the summer months when cyanobacteria begin to dominate the phytoplankton community. However, total richness increased in late August, with 12 genera identified at the surface and 12 at mid-depth, including 3 Cladoceran genera at the surface and 4 at mid-depth. It is a positive sign that Cladocerans remained common throughout the summer, as these organisms provide most of the phytoplankton grazing. The zooplankton community was similar in September, with 13 genera at the surface and 12 at mid-depth.

3.4 RECREATIONAL FISHERY AND POTENTIAL BROWN TROUT HABITAT

Of the recreational gamefish that reside or are stocked in Lake Hopatcong, trout are the most sensitive in terms of water quality. For their sustained management, all species of trout require DO concentrations of at least 4.0 mg/L or greater. However, the State's designated water quality criteria to sustain a healthy, aquatic ecosystem is a DO concentration of at least 5.0 mg/L.

While all trout are designated as cold-water fish, trout species display varying levels of thermal tolerance. Brown trout (*Salmo trutta*) have an <u>optimal</u> summer water temperature range of 18.0 to 24.0 °C (65.0 to 75.0 °F). However, these fish can survive in waters as warm as 26.0 °C (79.0 °F) (Scott and Crossman, 1973), defined here as acceptable habitat. The 2024 temperature and DO data for Lake Hopatcong were examined to identify the presence of optimal and acceptable brown trout habitat. As with previous monitoring reports, this analysis focused primarily on *in-situ* data collected at the mid-lake sampling station (Station 2).

For the sake of this analysis, sections of the lake that had DO concentrations equal to or greater than 5.0 mg/L and water temperatures less than 24.0 °C were considered optimal habitat for brown trout. In contrast, sections of the lake that had DO concentrations equal to or greater than 5.0 mg/L and water temperatures between 24.0 and 26.0 °C were considered acceptable or carry over habitat for brown trout.

Optimal brown trout habitat was present in the upper 9.0 m of the lake on 20 May. By 26 June, optimal brown trout habitat was reduced to a total of 3.0 m at Station 2, present from a depth of 3.0 m through 5.0 m; water temperatures exceeded 26.0 m in the upper 2.0 m, resulting in no carryover habitat at the surface. There was barely any trout habitat present at the shallow stations in June other than a depth of 3.0 m at Station 6.

As temperatures increased and thermal stratification persisted in July, there was no optimal trout habit and barely any carryover habitat. The only carryover habitat in the lake was present at a depth of 5.0 m at Stations 2 and 8 and 4.0 m at Station 9. Water temperatures decreased in August resulting in a significant expansion in trout habitat. Optimal trout habitat was present throughout the entire water column of Stations 5, 7, 10, 11, and 12. Carryover habitat was present throughout the water column at Stations 1, 3, 4, and 6, the upper 5.0 m at Station 2, the upper 4.0 m at Station 8, and the upper 6.0 m at Station 9.

By late September, optimal trout habitat was present throughout the water column of Stations 1, 3, 4, 5, 6, 7, 10, 11, and 12. Optimal habitat was present in the upper 6.0 m at Stations 2 and 8 and the upper 7.0 m at Station 9.

3.5 MECHANICAL WEED HARVESTING PROGRAM

Many of the shallower sections of Lake Hopatcong are susceptible to the proliferation of nuisance densities of rooted aquatic plants. Given the size of Lake Hopatcong, the composition of its aquatic plant community, and its heavy and diverse recreational use, mechanical weed harvesting is the most cost effective and ecologically sound method of controlling nuisance weed densities. Thus, the weed harvesting program has been in operation at Lake Hopatcong since the mid-1980's with varying levels of success. However, one consistent advantage mechanical weed harvesting has over other management techniques, such as the application of aquatic herbicides, is that phosphorus is removed from the lake along with the weed biomass. In fact, based on a plant biomass study conducted at Lake Hopatcong in 2006 and the plant harvesting records from 2006 to 2008, approximately 6-8% of the total phosphorus load targeted for reduction under the established TMDL was removed through the mechanical weed harvesting program.

In sharp contrast to the 2006 – 2008 harvesting years, only 1.2% of the phosphorus load targeted for reduction under the TMDL was removed through mechanical weed harvesting during the 2009 growing season. This substantial reduction in the amount of plant biomass and phosphorus removed in 2009 was due to severe budgetary cuts that resulted in laying off the Commission's full time Operation Staff, as well as initiating the harvesting program later in the growing season. However, the 2010 harvesting season resulted in the estimated removal of approximately 6% of the phosphorus load targeted for reduction under the TMDL, similar to the percentages removed in 2006 – 2008.

In contrast to the 2012 growing season, the mechanical weed harvesting program ran longer from 2013 through 2016. This was primarily due to the fact that the program was initiated earlier in these years relative to 2012. NJDEP has directly overseen the operation of the weed harvesting program for the last seven years and each year displays a higher rate of removal, which was attributed to hired staff becoming more familiar with the operations and lake-specific conditions. In addition, the operations staff has been excellent at maximizing high rates of efficiency during harvesting operations.

Due to an extremely unfortunate accident at the initiation of the 2020 harvesting season, the harvesting of aquatic vegetation at Lake Hopatcong was largely postponed over the 2020 growing season. The removal of only 35 cubic yards (16 tons) of plant biomass from Lake Hopatcong in 2020 resulted in the removal of only 3 kgs (6 lbs) of TP from the lake. This was less than 0.1% of the TP load targeted for removal under the TMDL.

Mechanical weed harvested was not conducted over the 2021 growing season. However, the harvesting program resumed in 2022, resulting in the removal of 1,178 cubic yards (531 tons) of plant biomass. This resulted in the removal of approximately 86 kgs (189 lbs) of TP, which has the potential to produce approximately 208,200 lbs of wet algae biomass. The 189 lbs of TP accounts for 2.6% of the TP targeted for removal under the lake's TMDL.

Approximately 704 cubic yards (317 tons) of plant biomass was removed from Lake Hopatcong in 2024, representing the lowest rate of removal over a full growing season in many years. This resulted in the removal of approximately 51 kgs (113 lbs) of TP, which has the potential to produce approximately 124,426 lbs of wet algae biomass. The 113 lbs of TP accounts for 1.6% of the TP targeted for removal under the lake's TMDL.

Princeton Hydro conducted an updated submerged aquatic vegetation (SAV) survey in 2025 for the first time since 2021. As part of this survey, sub-samples of harvested material from 13 stations were transported to a State-certified laboratory and analyzed for percent solids, TP, and total nitrogen (TN). This updated data will be used to update and expand on the 2006 study that has been used for almost 20 years to quantify how much phosphorus and nitrogen is removed from Lake Hopatcong through mechanical weed harvesting. Table 1 below provides the full results from the study.

Table 1: Biomass and nutrient data for select sites in 2025

Nutrient Analysis Data 2025				
Station	Wet Biomass g/m^2	Total Nitrogen mg/kg	Total Phosphate mg/kg	Percent Solids %
HC-1	436.0	15,000	4,000	9.3
HC-2	3.0	16,000	3,600	9.2
HC-6	116.0	15,000	2,100	10.0
HC-7	249.0	30,000	13,000	7.0
HC-8	219.0	29,000	8,400	6.8
HC-9	526.0	22,000	3,400	8.5
HC-10	126.3	9,100	11,000	6.6
HC-24	357.5	19,000	3,100	7.5
HC-25	279.0	32,000	6,000	7.5
HC-28	146.0	7,000	2,500	19.0
HC-32	597.0	14,000	6,500	8.5
HC-34	1,140.0	20,000	2,600	9.4
HC-35	72.5	21,000	6,900	6.4
Mean	328.3	19,161.5	5,623.1	8.9

The mean TN and TP concentrations for the entire 2025 survey were 19,161.5 mg/kg and 5,623.1 mg/kg, respectively. These high values support the need for smart plant management, with an emphasis on mechanical harvesting that removes the biomass and nutrients from the system. TN concentrations in plant biomass was not measured in the 2006 survey. However, TP was measured during the 2006 survey and overall concentrations were lower relative to the 2025 survey. For example, during the 2006 survey community-based TP concentrations varied between 1,140 and 3,930 mg/kg with a mean value of 2,285 mg/kg (n=8). In contrast, during the 2025 survey community-based TP concentrations varied between 2,100 and 13,000 mg/kg with a mean value of 5,623 mg/kg. Thus, TP concentrations in the plant biomass more than doubled from 2006 to 2025 (n=13).

In 2025, approximately 1,682 cubic yards (758 tons) of plant biomass was removed from the lake, representing a significant increase relative to 2024. Using the updated nutrient data from the 2025 SAV survey, this resulted in the removal of approximately 345 kg (760 lbs) of TP, which has the potential to produce approximately 836,076 lbs of wet algae biomass. The 760 lbs of TP accounts for 10.5% of the TP targeted for removal under the lake's TMDL. The 2025 plant harvesting program resulted in the removal of approximately 7,283 kg (16,057 lbs) of TN. Thus, the continued harvesting of plant biomass in the lake remains a high priority.

3.7 WATER QUALITY IMPAIRMENTS, ESTABLISHED TMDL CRITERIA AND EVALUATION

As identified in N.J.A.C. 7:9B-1.5(g)2, "Except as due to natural condition, nutrients shall not be allowed in concentrations that cause objectionable algal densities, nuisance aquatic vegetation or otherwise render the waters unsuitable for the designated uses." For Lake Hopatcong, these objectionable conditions specifically include both algal blooms and nuisance densities of aquatic vegetation.

As described in detail in the Lake Hopatcong TMDL Restoration Plan, a targeted mean TP concentration, as well as mean and maximum chlorophyll-*a* ecological endpoint, was established to identify compliance with the TMDL. For the sake of this 2024 analysis, the mid-lake (Station 2), Crescent Cove / River Styx (Station 3) and Northern Woodport Bay (Station 10) monitoring stations were reviewed. To provide guidance for this review, the criteria developed under Lake Hopatcong's TMDL are provided below:

TMDL Criteria for Lake Hopatcong

Targeted mean TP concentration	0.03 mg/L
Targeted mean chlorophyll *a* concentration endpoint	8 µg/L
Targeted maximum chlorophyll *a* concentration endpoint	14 µg/L

The 2025 mean TP concentration at Station 2 was 0.022 mg/L, remaining below the targeted threshold of 0.03 mg/L as per the TMDL. Surface TP concentrations at Station 2 ranged between 0.02 mg/L and 0.03 mg/L, representing a decrease relative to 2024. The 2025 seasonal mean chlorophyll *a* concentration at Station 2 was 11.4 µg/L, slightly exceeding the targeted mean chlorophyll *a* concentration of 8.0 µg/L. Chlorophyll concentrations ranged from 3.3 µg/L on 24 September to 20.0 µg/L on 20 August. The May and August sampling events exceeded the targeted maximum chlorophyll *a* concentration endpoint of 14.0 µg/L during the 2025 season, with respective concentrations of 16.0 and 20.0 µg/L.

The mean TP and chlorophyll *a* concentrations at Station 3 did exceed the targeted thresholds with respective concentrations of 0.04 mg/L and 15.9 µg/L in 2025; however, this was the first year since before 2022 that Station 3 did not have the highest seasonal average chlorophyll *a* concentration, which is likely a result of the early season proactive algaecide application. The seasonal mean chlorophyll concentration at this station exceeded 20.0 µg/L in 2023 and 2024. 2025 TP concentrations ranged between 0.03 mg/L and 0.05 mg/. Overall, chlorophyll concentrations ranged from below the lab detection limit of 0.6 µg/L to 37.0 µg/L.

At Station 10, the seasonal TP average was 0.043 mg/L, exceeding the targeted mean and representing the second highest seasonal average behind only Station 11. TP concentrations at Station 10 ranged from 0.01 mg/L in July up to 0.07 mg/L in May. Chlorophyll *a* concentrations ranged between 10.0 µg/L in June and 37.0 µg/L in August. The 2025 seasonal average exceeded the 8.0 µg/L targeted mean, yielding a concentration of 21.4 µg/L, nearly doubling the 2024 seasonal mean of 12.8 µg/L. It should be noted that Stations 1, 7, 10, and 11, all located north of Brady Bridge, had the four highest seasonal mean TP and chlorophyll *a* concentrations in 2025.

4.0 SUMMARY

This section provides a summary of the 2025 water quality conditions, as well as recommendations on how to preserve the highly valued aquatic resources of Lake Hopatcong.

1. The thermal stratification pattern and associated distribution of DO throughout the water column was similar to what has been observed in recent years. The water column was thermally stratified from May through September at Station 2. DO declined with depth, ultimately declining below the 5.0 mg/L threshold below the epilimnion during each event. From June through September, DO concentrations dropped below 5.0 mg/L at the top of the thermocline because of the high oxygen demand during the summer months. The lake was anoxic at a depth of 13.0 m as early as 20 May and remained this way through the last sampling event in September. The extended period of hypolimnetic anoxia has historically resulted in a very large internal phosphorus load; however, a significant reduction in deep SRP concentrations was observed in 2025 following the large-scale alum treatment conducted last fall.

2. The expanded sampling program that was implemented following the HABs experienced in 2019, including the addition of SRP, additional plankton samples, mid-depth samples at Station 2, and the addition of Station 12 in Landing Channel has been extremely valuable and should continue in 2026 and beyond. The expanded sampling plan is vital for building the historical database and monitoring the response following management activities, such as the alum treatment, near-shore HAB treatments, and watershed restoration.

3. It has been well documented that phosphorus is the primary limiting nutrient in Lake Hopatcong. That is, a slight increase in phosphorus will result in a substantial increase in the amount of algal and/or aquatic plant biomass. TP concentrations in the surface water were variable throughout the lake, ranging between 0.01 mg/L and 0.09 mg/L. Elevated TP concentrations at surface stations were observed in some of the shallow, near-shore stations, such as Stations 1, 3, 7, 10, 11, and 12; all of these stations had a seasonal mean concentration of at least 0.04 mg/L. Surface and mid-depth TP concentrations at Station 2 only exceeded 0.03 mg/L during one sampling event, with a concentration of 0.04 mg/L at mid-depth in June.

   Deep TP concentrations increased as the season progressed and anoxic conditions persisted, reaching a maximum TP concentration of 0.17 mg/L on 29 July and 24 September. Although this is still elevated, it's lower than the seasonal maximum of 0.21 mg/L observed in 2024. From 2021 – 2023, the seasonal maximum deep TP concentrations were 0.59, 0.20, and 0.42 mg/L; thus, the deep TP concentration was lower than it has been in many years. Additionally, SRP, the form that is both released from the sediments and the most important for limiting algal growth, was significantly lower in 2025 than recent years, which is likely a direct result of the alum treatment.

4. Other than the late season planktonic bloom that manifested north of Brady Bridge, there were no significant HABs that resulted in the closure of beaches that Princeton Hydro is aware of during the 2025 season. There were instances of elevated cyanobacteria concentrations observed in some near-shore areas during the cyanotoxin monitoring, but none of these posed significant issues and may have been the result of wind-blown accumulations. Cyanobacteria densities during the summer months were significantly lower than recent years at Stations 2 and 3, which may be attributed to both the large-scale alum treatment in 2024 and the early season proactive algaecide treatment in Crescent Cove.

5. Akinetes, which are a type of overwintering cyanobacteria cells or "resting spores," were quantified in the plankton samples in 2024. Elevated akinete densities can reveal the potential for cyanobacteria growth. The akinetes will lie dormant in the sediment during the colder months before forming vegetative cells that will become planktonic cyanobacteria when environmental conditions improve, primarily

through light and temperature. Similar to last year, akinetes did not manifest in Lake Hopatcong until July, increasing as the season progressed. They were observed at all stations, but were more prevalent in the shallow, near-shore stations. Princeton Hydro is in the process of a project funded by the Army Corps of Engineers, Engineer Research and Development Center (ERDC) that is assessing the effectiveness of various strategies to control near-shore HABs and akinete production.

6. Based on the *in-situ* conditions, optimal brown trout habitat was present in the upper 9.0 m of Station 2 in May, 3.0 m in June, and the upper 6.0 m in September. There was no optimal brown trout habitat in the lake in July and a limited amount at the shallow stations in August. At the deeper Station 2, carryover habitat was present at a depth of 5.0 m in July and the upper 5.0 m in August. By late September, optimal trout habitat was present throughout the water column of Stations 1, 3, 4, 5, 6, 7, 10, 11, and 12. Optimal habitat was present in the upper 6.0 m at Stations 2 and 8 and the upper 7.0 m at Station 9.

7. A mechanical weed harvesting program has been in operation at Lake Hopatcong since the early 1980s. As part of the SAV survey that Princeton Hydro conducted in 2025, sub-samples of harvested material from 13 stations were analyzed for TP and TN and the updated data was used to calculate nutrient reductions from harvested plant material. The mean TN and TP concentrations for the entire 2025 survey were 19,161.5 mg/kg and 5,623.1 mg/kg, respectively; the TP values were higher than the values calculated during the 2006 survey, supporting the need for smart plant management with an emphasis on mechanical harvesting.

   In 2025, approximately 1,682 cubic yards (758 tons) of plant biomass was removed from the lake, representing a significant increase relative to 2024. Using the updated nutrient data from the 2025 SAV survey, this resulted in the removal of approximately 345 kg (760 lbs) of TP, which has the potential to produce approximately 836,076 lbs of wet algae biomass. The 760 lbs of TP accounts for 10.5% of the TP targeted for removal under the lake's TMDL. The 2025 plant harvesting program resulted in the removal of approximately 7,283 kg (16,057 lbs) of TN. Thus, the continued harvesting of plant biomass in the lake remains a high priority.

8. While the 2025 mean surface water, mid-lake TP concentration remained in compliance with the targeted concentration under the lake's TMDL, other near-shore stations had higher mean values. Stations 1, 7, 10, and 11, all located north of Brady Bridge, had the four highest seasonal mean TP and chlorophyll *a* concentrations in 2025. These elevated values likely contributed to the late season bloom that manifested in the Woodport Bay section of the lake in late September. The mean 2025 Secchi depth at the mid-lake station was 1.5 m, reversing the trend of declining water clarity that was observed over the past few years (Appendix I). This increase in water clarity may be partly attributed to the alum treatment.

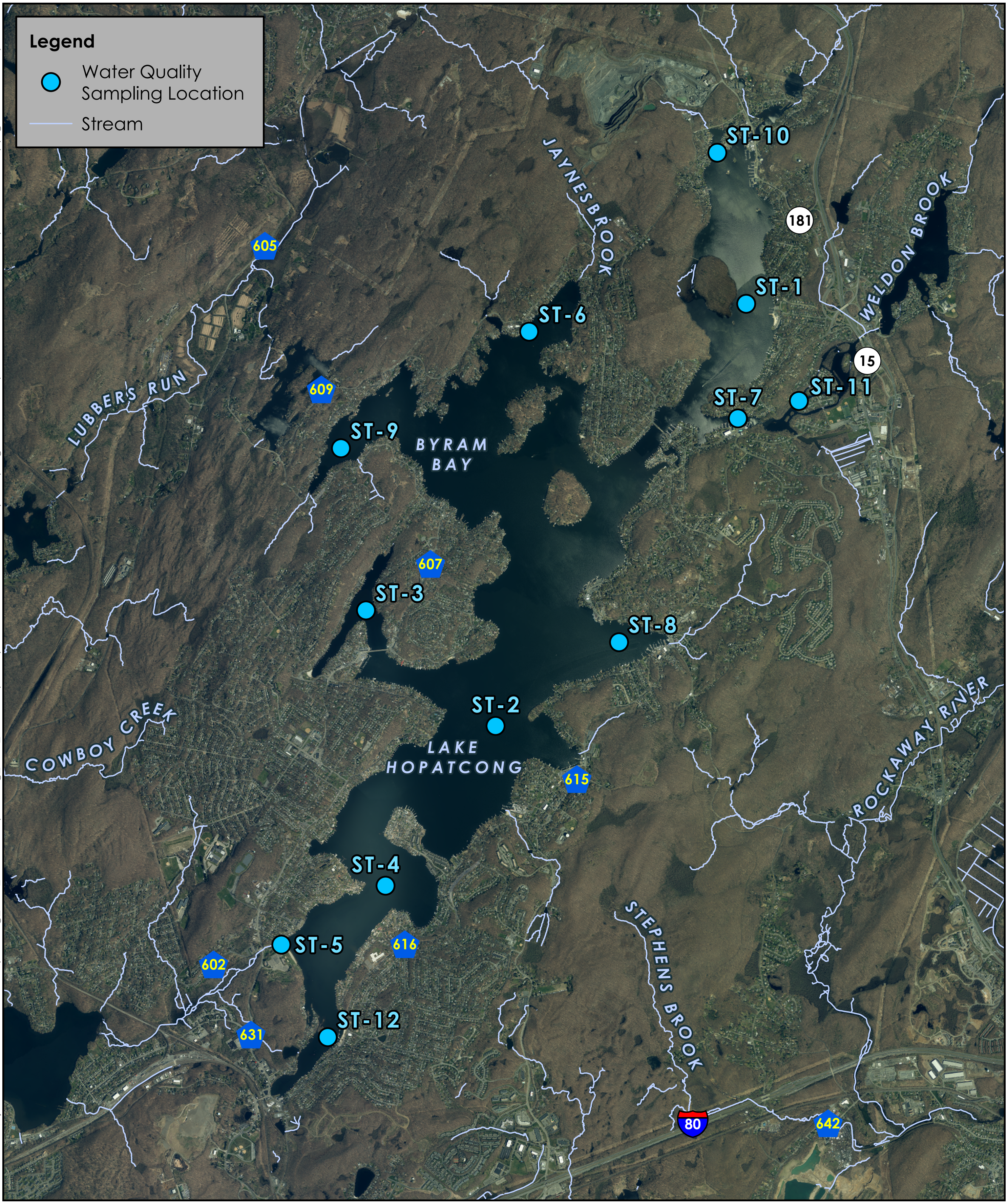
9. *Raphidiopsis raciborskii* (previously named *Cylindrospermopsis raciborskii*) was present in Lake Hopatcong in 2025, but densities were not as elevated as in recent years (Appendix IV). Princeton Hydro has observed that this species typically manifests in Crescent Cove and other shallow areas and spreads out to the deeper portion of the lake. The reduction in *Raphidiopsis raciborskii* densities at Stations 3 and 2 in 2025 may be attributed to the proactive early-season algaecide application that was conducted in Crescent Cove. This species typically produces a lot of akinetes in Lake Hopatcong, indicating that it resides along the sediment / water interface in the shallow sections of the lake where nutrient availability is higher than in the open waters. The USACE ERDC grant focusing on near-shore HAB control is targeting this mode of growth, and post-treatment monitoring will be conducted in 2026.

10. The results from the alum treatment funded by the NJDEP Lake Restoration Grant were positive in 2025, with a significant reduction in hypolimnetic SRP concentrations and cyanobacteria densities at Station 2. A separate report will be submitted focused on the pre- and post-treatment data.

11. Princeton Hydro successfully completed six innovative treatments in near-shore coves and bays during the 2025 season focusing on the control of HABs manifesting from shallow, near-shore sediments. The results from the early-season algaecide treatments in Crescent Cove and Ashley Cove were very positive based on chlorophyll *a*, phycocyanin, and cyanobacteria data collected throughout the season. The other four treatments conducted in Northern Cove, Landing Channel, Great Cove, and Van Every Cove were conducted late in the season and monitoring will continue in 2026.

12. Finally, Princeton Hydro is actively working on two projects in the Lake Hopatcong watershed with the Lake Hopatcong Commission and Foundation in Jefferson Township and Roxbury Township that will result in the further reduction of the external nutrient load, including both nitrogen and phosphorus.

APPENDIX I: FIGURES



NOTES:
1. Sampling locations are approximate
2. Streams obtained from the United States Geological Survey's (USGS) National Hydrography Dataset (NHD).
3. 2020 orthoimagery obtained from the NJ Geographic Information Network (NJGIN) Open Data portal: https://njgin.nj.gov/

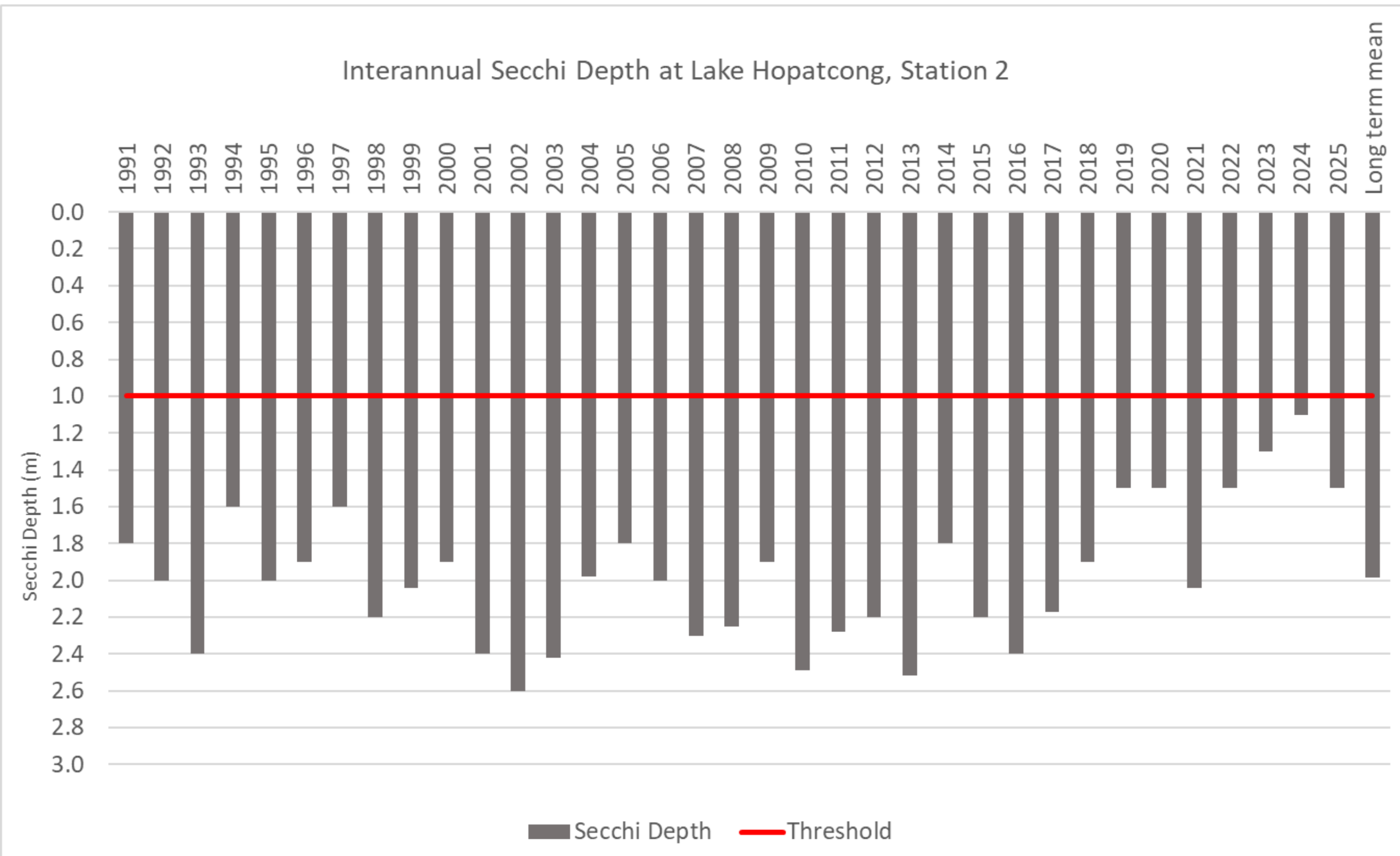
0 2,000 4,000 Feet

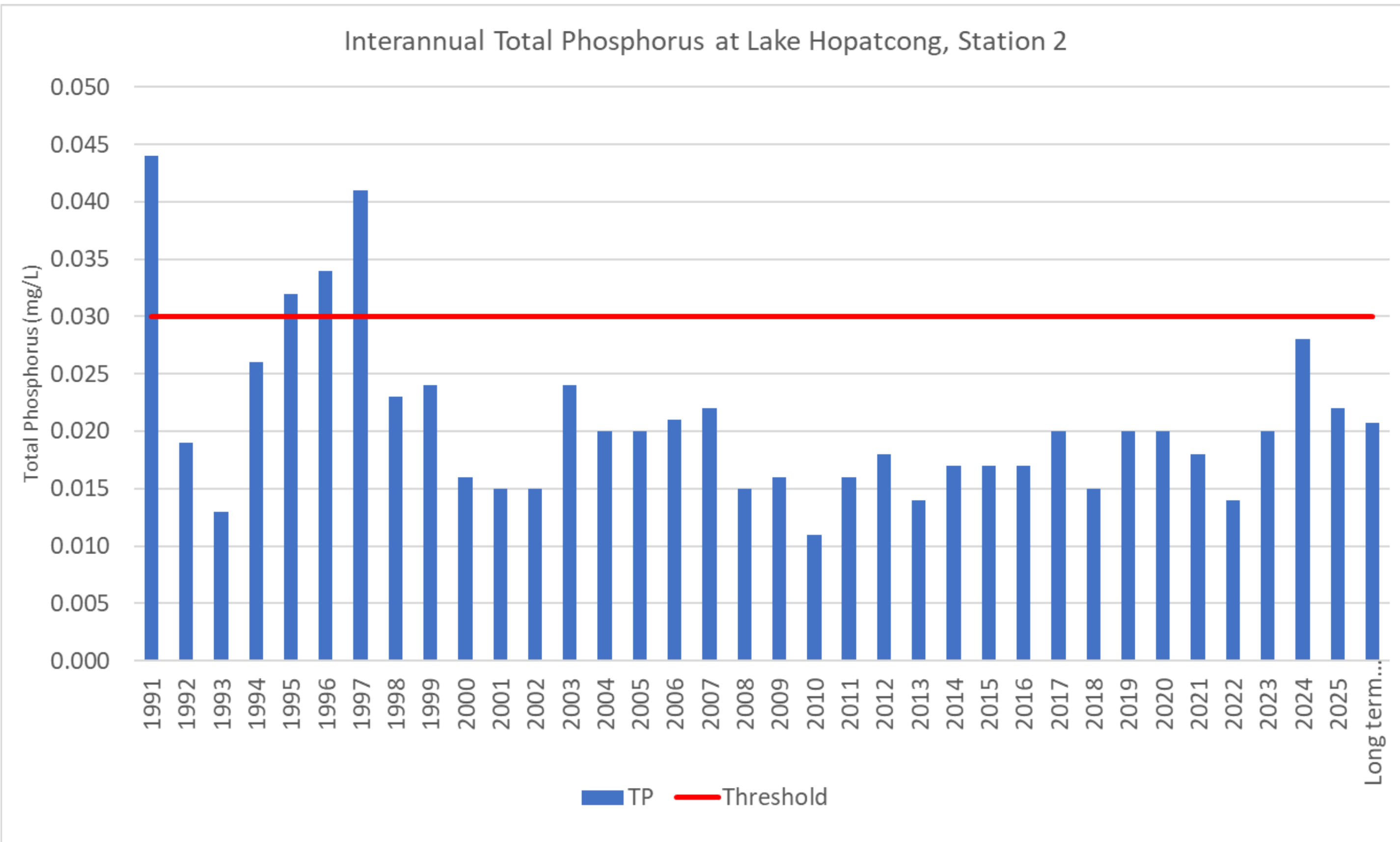
Spatial Reference: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

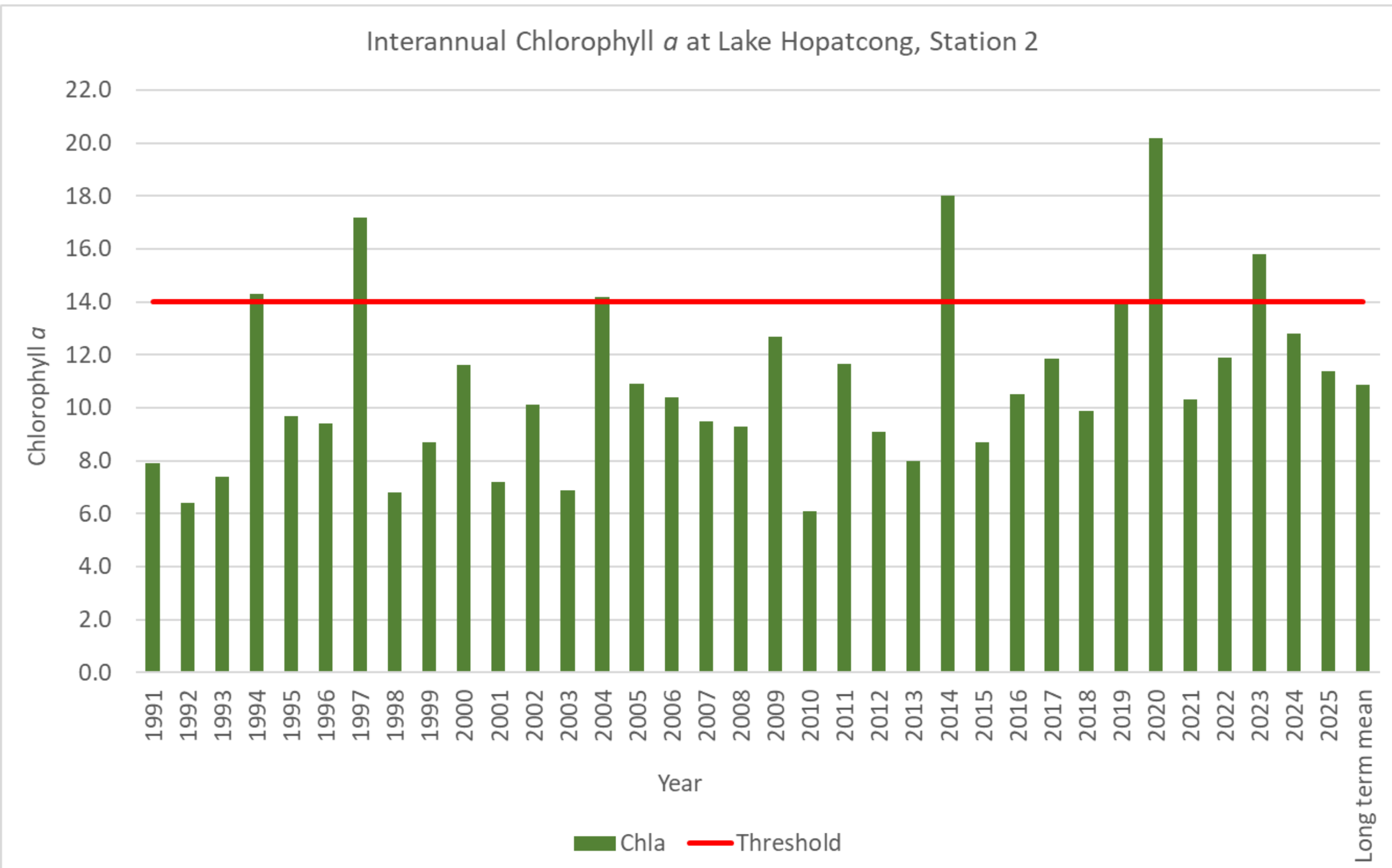
STANDARD WATER QUALITY SAMPLING LOCATIONS

LAKE HOPATCONG
LAKE HOPATCONG COMMISSION
SUSSEX AND MORRIS COUNTIES, NEW JERSEY

PRINCETON HYDRO
SCIENCE DESIGN ENGINEERING
www.PrincetonHydro.com


Interannual Secchi Depth at Lake Hopatcong, Station 2
Secchi Depth (m)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2.8
3.0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Long term mean
Secchi Depth
Threshold


Interannual Total Phosphorus at Lake Hopatcong, Station 2
Total Phosphorus (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Long term...
TP
Threshold


Interannual Chlorophyll *a* at Lake Hopatcong, Station 2
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Chlorophyll *a*
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Long term mean
Year
Chla
Threshold

APPENDIX II: IN-SITU DATA

Lake Hopatcong *In-Situ* Monitoring 2025.05.20								
Station	Depth (meters)			Temperature	SpC	Dissolved Oxygen		pH
	Total	Secchi	Sample	°C	µS/cm	mg/L	% Sat.	S.U.
STA-1	2.20	1.30	0.1	18.76	442.2	9.32	100.1	7.89
			1.0	18.66	441.0	9.31	99.9	7.91
			2.0	18.49	430.7	9.32	99.6	7.92
STA-2	14.30	1.80	0.1	17.73	444.6	9.68	101.8	8.22
			1.0	17.72	444.5	9.67	101.7	8.23
			2.0	17.64	444.3	9.67	101.5	8.22
			3.0	17.57	444.2	9.64	101.1	8.21
			4.0	17.52	443.9	9.58	100.3	8.17
			5.0	17.45	443.8	9.51	99.5	8.13
			6.0	17.44	443.7	9.52	99.5	8.12
			7.0	17.43	443.9	9.52	99.5	8.13
			8.0	17.25	442.8	9.41	98.0	8.02
			9.0	15.13	447.0	6.06	60.4	7.25
			10.0	12.49	447.8	3.40	32.0	6.92
			11.0	12.17	448.3	2.78	25.9	6.86
			12.0	11.89	449.3	1.48	18.1	6.83
			13.0	11.58	452.0	0.58	5.3	6.82
			14.0	11.55	452.3	0.41	3.8	6.81
STA-3	2.20	1.50	0.1	18.49	701.0	9.81	104.8	8.17
			1.0	18.30	689.0	9.87	104.0	8.14
			2.0	17.56	660.0	9.76	102.4	8.05
STA-4	3.00	1.30	0.1	17.12	451.3	9.56	99.3	8.22
			1.0	17.15	451.3	9.53	99.0	8.23
			2.0	16.87	450.4	9.63	99.5	8.23
			2.9	16.80	450.4	9.63	99.3	8.22
STA-5	2.70	1.40	0.1	17.45	449.8	9.07	94.9	7.94
			1.0	17.45	450.1	9.02	94.3	7.98
			2.0	17.20	450.4	9.05	94.1	7.97
			2.5	16.92	453.3	7.52	77.8	7.54
STA-6	2.80	1.80	0.1	18.43	423.4	9.29	99.1	8.30
			1.0	17.73	429.2	9.20	96.8	8.12
			2.0	16.17	440.1	9.05	92.1	7.82
			2.6	16.05	441.6	8.53	86.8	7.60
STA-7	2.10	1.60	0.1	18.53	198.9	7.73	82.5	7.04
			1.0	18.13	199.0	7.60	80.5	6.94
			2.0	17.10	197.6	7.40	76.8	6.96
STA-8	8.30	1.50	0.1	17.32	438.1	9.49	99.0	8.04
			1.0	17.32	437.8	9.49	98.9	8.05
			2.0	17.27	437.7	9.47	98.6	8.06
			3.0	17.24	437.8	9.42	98.1	8.04
			4.0	17.11	438.3	9.27	96.2	7.95
			5.0	17.11	438.4	9.20	95.6	7.92
			6.0	17.10	438.5	9.17	95.1	7.90
			7.0	16.92	438.6	8.85	91.6	7.77
			8.0	16.83	438.5	8.67	89.8	7.68
STA-9	8.30	1.70	0.1	17.51	443.4	9.25	96.9	7.83
			1.0	17.45	443.4	9.29	97.1	7.86
			2.0	16.41	445.2	9.15	93.6	7.79
			3.0	15.59	445.5	8.87	89.8	7.69
			4.0	15.65	446.8	8.45	85.0	7.57
			5.0	15.64	447.0	8.45	85.2	7.55
			6.0	15.50	449.0	8.34	83.7	7.52
			7.0	15.39	454.3	8.11	81.2	7.47
			8.0	13.92	448.6	3.94	30.3	7.04
STA-10	1.30	1.20	0.1	18.15	448.0	10.10	107.1	8.24
			1.0	17.55	450.0	10.39	108.9	8.48
STA-11	1.20	1.20+	0.1	17.70	177.8	7.66	80.4	6.94
			1.0	17.31	177.4	7.45	77.6	6.89
STA-12	1.90	1.90+	0.1	17.56	454.1	11.19	117.2	9.53
			1.0	17.55	454.1	11.24	117.8	9.53
			1.7	17.21	455.3	11.15	116.0	9.50

Lake Hopatcong Phytoplankton Pigment Profiles 2025.05.20 (YSI)				
Station	Depth	PC	PE	Chl *a*
	m	µg/L	µg/L	RFU
STA-1	0.1	0.47	9.23	1.49
	1.0	0.63	16.37	2.41
	2.0	0.67	18.93	2.74
STA-2	0.1	0.83	11.19	0.66
	1.0	0.89	14.89	0.85
	2.0	1.19	28.85	1.68
	3.0	1.49	28.60	1.70
	4.0	1.40	30.15	1.81
	5.0	1.27	30.31	1.87
	6.0	1.39	30.20	1.91
	7.0	1.36	30.18	1.88
	8.0	1.36	27.64	1.62
	9.0	0.74	16.60	0.96
	10.0	0.32	3.35	0.94
	11.0	0.29	1.81	0.37
	12.0	0.27	0.50	0.30
	13.0	0.24	0.00	0.19
	15.0	0.25	0.00	0.24
STA-3	0.1	0.29	3.92	0.59
	1.0	0.34	5.90	0.73
	2.0	0.60	10.73	1.03
STA-4	0.1	0.58	0.15	0.44
	1.0	0.75	0.34	0.73
	2.0	1.23	26.01	1.46
	2.9	1.27	26.05	1.49
STA-5	0.1	0.59	6.87	0.50
	1.0	0.82	13.81	1.23
	2.0	1.21	24.86	1.84
	2.5	1.21	29.79	2.54
STA-6	0.1	0.35	1.82	0.16
	1.0	0.47	5.83	0.50
	2.0	1.02	24.51	1.86
	2.6	1.03	23.55	1.65
STA-7	0.1	0.12	1.24	0.53
	1.0	0.14	3.03	0.61
	2.0	0.08	0.00	0.24
STA-8	0.1	0.73	10.68	0.79
	1.0	1.04	20.98	1.50
	2.0	1.21	24.85	1.70
	3.0	1.23	28.34	1.80
	4.0	1.22	26.83	1.85
	5.0	1.23	27.5	1.90
	6.0	1.28	27.75	1.89
	7.0	1.16	25.12	1.56
	8.0	1.03	24.15	1.45
STA-9	0.1	0.57	6.85	0.36
	1.0	0.61	7.31	0.48
	2.0	1.00	23.52	1.58
	3.0	1.02	23.60	1.73
	4.0	0.85	21.07	1.52
	5.0	0.96	19.59	1.39
	6.0	0.91	19.20	1.30
	7.0	0.80	15.08	1.04
	8.0	0.34	4.04	0.41
STA-10	0.1	0.60	12.82	1.73
	1.0	0.62	9.40	1.48
STA-11	0.1	0.14	2.10	0.59
	1.0	0.15	1.27	0.47
STA-12	0.1	0.15	0.00	0.10
	1.0	0.16	0.00	0.11
	1.7	0.27	1.28	0.35

Lake Hopatcong *In-Situ* Monitoring 2025.06.26

Station	Depth (meters)			Temperature	SpC	Dissolved Oxygen		pH
	Total	Secchi	Sample	°C	µS/cm	mg/L	% Sat.	S.U.
STA-1	2.20	1.00	0.1	28.55	421.9	8.58	110.8	7.90
			1.0	28.58	421.8	8.55	110.5	7.89
			2.0	28.36	422.3	8.17	105.1	7.69
STA-2	14.30	1.90	0.1	27.67	461.6	9.11	115.9	8.37
			1.0	27.67	461.7	9.12	116.0	8.37
			2.0	27.41	461.6	9.21	116.6	8.36
			3.0	24.37	464.4	8.31	99.5	7.63
			4.0	23.42	467.1	8.59	101.0	7.71
			5.0	21.01	457.7	5.90	66.3	7.27
			6.0	18.40	452.2	0.90	9.7	6.88
			7.0	16.65	450.0	0.00	0.0	6.77
			8.0	15.53	451.2	0.00	0.0	6.72
			9.0	14.69	454.4	0.00	0.0	6.69
			10.0	14.04	457.6	0.00	0.0	6.71
			11.0	13.67	460.4	0.00	0.0	6.71
			12.0	13.39	462.6	0.00	0.0	6.73
			13.0	12.95	466.4	0.00	0.0	6.75
			14.0	12.54	470.5	0.00	0.0	6.88
STA-3	2.20	1.50	0.1	27.52	646.0	8.50	107.8	7.88
			1.0	27.53	647.0	8.43	107.0	7.83
			2.0	27.32	607.0	7.61	96.2	7.56
STA-4	3.20	1.90	0.1	27.92	468.9	8.44	107.1	7.99
			1.0	27.92	468.8	8.44	107.8	8.01
			2.0	27.91	468.5	8.40	107.3	7.99
			3.0	26.28	471.2	6.47	80.3	7.49
STA-5	3.20	1.60	0.1	28.17	474.9	8.50	109.1	8.01
			1.0	28.16	474.7	8.50	109.0	8.03
			2.0	28.09	475.1	8.41	107.7	8.00
			3.0	26.39	476.1	5.56	69.1	7.41
STA-6	3.20	1.50	0.1	26.39	452.1	8.74	108.6	7.85
			1.0	26.37	452.3	8.62	107.1	7.80
			2.0	24.62	454.9	9.18	110.5	8.05
			3.0	23.23	455.4	8.40	98.5	7.75
STA-7	2.00	1.00	0.1	28.97	343.9	7.58	98.5	7.27
			1.0	28.95	342.3	7.42	96.4	7.22
			1.8	28.11	321.9	5.23	67.1	7.00
STA-8	11.20	1.70	0.1	26.37	461.7	9.25	114.6	8.37
			1.0	26.02	462.4	9.33	115.2	8.38
			2.0	24.78	467.3	9.00	108.6	8.02
			3.0	23.58	464.4	8.50	100.4	7.83
			4.0	22.38	459.6	7.88	90.9	7.62
			5.0	21.22	456.8	5.63	63.5	7.27
			6.0	17.22	449.5	0.00	0.0	6.89
			7.0	15.97	450.1	0.00	0.0	6.86
			8.0	15.23	451.1	0.00	0.0	6.82
			9.0	14.77	454.7	0.00	0.0	6.81
			10.0	14.28	457.3	0.00	0.0	6.82
			11.0	14.04	458.4	0.00	0.0	6.88
STA-9	8.30	1.70	0.1	26.45	456.6	9.43	117.3	8.45
			1.0	26.42	456.6	9.45	117.5	8.46
			2.0	26.37	456.8	9.46	117.5	8.45
			3.0	26.28	456.8	9.48	117.6	8.45
			4.0	24.02	454.7	9.62	114.4	8.34
			5.0	20.66	450.5	5.02	56.0	7.27
			6.0	16.73	448.1	0.00	0.0	6.91
			7.0	15.74	450.8	0.00	0.0	6.84
			8.0	15.27	454.3	0.00	0.0	6.86
STA-10	1.30	0.80	0.1	27.58	432.4	8.63	109.5	7.81
			1.0	27.57	432.3	8.61	109.3	7.83
STA-11	1.20	1.00	0.1	27.67	247.2	9.02	114.7	7.32
			1.0	27.72	244.6	9.14	116.2	7.33
STA-12	1.90	1.20	0.1	28.70	485.8	8.03	104.0	7.62
			1.0	28.70	486.0	7.99	103.4	7.60
			1.5	28.68	485.8	8.04	104.0	7.59

Lake Hopatcong Phytoplankton Pigment Profiles 2025.06.26 (YSI)				
Station	Depth	PC	PE	Chl *a*
	m	RFU	RFU	RFU
STA-1	0.1	0.98	6.60	3.39
	1.0	0.95	6.29	3.26
	2.0	1.00	7.17	3.66
STA-2	0.1	0.31	2.12	0.58
	1.0	0.38	2.82	0.64
	2.0	0.57	4.71	0.74
	3.0	1.13	9.35	1.06
	4.0	1.14	9.38	1.09
	5.0	1.99	25.00	0.76
	6.0	1.43	17.72	0.55
	7.0	0.60	5.17	0.35
	8.0	0.26	0.73	0.14
	9.0	0.21	0.00	0.12
	10.0	0.22	0.00	0.04
	11.0	0.21	0.00	0.02
	12.0	0.21	0.00	0.04
	13.0	0.25	0.00	0.00
	15.0	0.21	0.00	0.01
STA-3	0.1	0.28	1.83	0.76
	1.0	0.27	2.14	0.85
	2.0	0.39	2.51	0.44
STA-4	0.1	0.25	1.17	0.45
	1.0	0.32	1.72	0.53
	2.0	0.28	2.23	0.52
	2.9	1.05	11.01	1.53
STA-5	0.1	0.39	3.99	1.31
	1.0	0.39	4.16	1.30
	2.0	0.48	4.50	1.31
	3.0	0.84	7.22	1.22
STA-6	0.1	0.53	3.02	1.16
	1.0	0.58	3.81	1.17
	2.0	1.05	9.82	1.35
	3.0	1.22	10.55	0.97
STA-7	0.1	0.66	6.25	2.47
	1.0	0.53	5.30	1.52
	1.8	0.31	3.26	2.01
STA-8	0.1	0.59	3.56	0.73
	1.0	0.09	5.19	0.94
	2.0	0.95	8.45	1.02
	3.0	1.15	9.18	0.87
	4.0	1.44	11.74	0.65
	5.0	2.02	19.31	0.64
	6.0	0.76	8.70	0.44
	7.0	0.31	1.66	0.21
	8.0	0.19	0.00	0.06
	9.0	0.18	0.00	0.10
	10.0	0.21	0.00	0.06
	11.0	0.25	0.00	0.07
STA-9	0.1	0.36	2.28	0.51
	1.0	0.57	4.73	0.80
	2.0	0.71	5.72	0.90
	3.0	0.71	6.20	0.79
	4.0	0.99	7.65	0.68
	5.0	2.30	26.15	0.87
	6.0	0.41	3.56	0.47
	7.0	0.32	1.47	0.46
	8.0	0.29	0.55	0.23
STA-10	0.1	1.13	7.48	3.58
	1.0	1.15	7.69	3.74
STA-11	0.1	1.57	44.99	10.70
	1.0	1.48	36.29	9.26
STA-12	0.1	0.53	4.20	1.73
	1.0	0.43	3.67	1.73
	1.5	0.48	4.92	1.57

Lake Hopatcong *In-Situ* Monitoring 2025.07.29

Station	Depth (meters)			Temperature	SpC	Dissolved Oxygen		pH
	Total	Secchi	Sample	°C	µS/cm	mg/L	% Sat.	S.U.
STA-1	2.20	0.80	0.1	30.25	427.9	9.23	122.7	8.21
			1.0	28.85	427.1	9.19	119.3	8.06
			2.0	28.33	425.5	8.91	114.6	7.85
STA-2	14.50	1.50	0.1	27.70	464.1	8.83	112.3	8.08
			1.0	27.54	464.0	8.81	111.8	8.06
			2.0	27.25	464.4	8.61	108.7	7.98
			3.0	27.09	464.0	8.37	105.3	7.83
			4.0	26.18	462.5	7.92	98.0	7.64
			5.0	25.38	461.8	6.78	83.4	7.35
			6.0	22.22	452.6	0.89	10.2	6.77
			7.0	17.20	456.6	0.27	2.8	6.88
			8.0	15.65	449.4	0.22	2.2	6.74
			9.0	14.77	450.1	0.20	2.0	6.75
			10.0	14.20	452.7	0.00	0.0	6.74
			11.0	13.59	457.1	0.00	0.0	6.74
			12.0	13.24	459.6	0.00	0.0	6.74
			13.0	12.58	467.4	0.00	0.0	6.74
			14.0	12.07	474.8	0.00	0.0	6.71
STA-3	2.30	0.90	0.1	28.59	551.0	10.37	134.0	8.79
			1.0	27.48	522.0	10.02	134.5	8.82
			2.0	26.80	525.0	7.07	88.5	7.73
STA-4	3.20	1.50	0.1	28.34	465.9	8.52	109.7	7.93
			1.0	28.02	465.5	8.65	110.7	7.97
			2.0	27.36	465.3	8.54	108.0	7.90
			3.0	26.00	469.7	4.03	49.7	7.04
STA-5	3.30	0.90	0.1	27.92	469.0	8.92	114.0	8.01
			1.0	27.34	468.5	8.45	106.8	7.79
			2.0	26.95	469.5	6.70	84.1	7.31
			3.0	26.19	470.5	4.15	51.3	6.93
STA-6	3.00	1.50	0.1	28.25	462.0	8.76	112.5	7.97
			1.0	27.99	461.9	8.79	112.4	7.97
			2.0	27.01	460.7	8.45	106.2	7.75
			2.7	26.39	460.4	7.16	89.0	7.45
STA-7	1.20	1.00	0.1	30.12	412.6	9.36	124.2	8.13
			1.0	29.56	416.6	9.47	124.5	8.12
STA-8	10.40	1.60	0.1	28.43	465.2	8.89	114.6	8.25
			1.0	28.33	465.2	0.93	114.9	8.25
			2.0	27.78	465.0	9.07	115.6	8.29
			3.0	27.13	463.0	8.90	112.1	8.18
			4.0	26.32	462.2	8.19	101.6	7.80
			5.0	25.96	462.7	7.38	91.0	7.54
			6.0	23.06	446.9	0.87	10.2	6.74
			7.0	16.23	452.7	0.39	3.9	6.84
			8.0	15.20	449.0	0.36	2.9	6.84
			9.0	14.69	451.0	0.26	2.6	6.84
			10.0	14.14	455.2	0.22	2.2	6.87
STA-9	8.40	1.50	0.1	28.04	461.0	8.97	114.8	8.22
			1.0	27.64	460.8	9.09	115.5	8.24
			2.0	26.56	459.1	8.89	110.8	8.10
			3.0	26.07	458.9	6.74	83.3	7.43
			4.0	25.82	460.2	6.62	81.4	7.34
			5.0	24.93	455.8	3.72	45.1	6.90
			6.0	21.72	452.9	0.50	5.7	6.88
			7.0	17.82	461.2	0.31	3.3	6.96
			8.0	15.57	456.1	0.20	2.6	6.80
STA-10	1.30	0.80	0.1	28.92	432.1	10.52	136.8	8.65
			1.0	27.36	434.8	11.38	143.9	8.79
STA-11	1.10	1.00	0.1	28.05	408.8	6.70	85.7	7.15
			1.0	27.18	413.9	6.14	77.3	7.01
STA-12	1.4/7	0.90	0.1	28.64	473.2	8.91	115.2	7.98
			1.0	28.13	473.4	9.00	115.0	8.09
			1.5	28.01	475.4	8.81	112.7	7.97

Lake Hopatcong Phytoplankton Pigment Profiles 2025.07.29 (YSI)				
Station	Depth m	PC RFU	PE RFU	Chl *a* RFU
STA-1	0.1	0.64	34.27	1.92
	1.0	1.16	84.36	4.25
	2.0	1.38	100.81	5.23
STA-2	0.1	0.48	18.76	0.68
	1.0	0.72	33.24	1.00
	2.0	0.75	35.99	1.12
	3.0	0.78	33.84	1.14
	4.0	0.93	38.86	1.15
	5.0	0.94	38.50	0.90
	6.0	0.30	16.36	0.57
	7.0	0.22	9.20	0.39
	8.0	0.18	4.61	0.21
	9.0	0.15	1.93	0.10
	10.0	0.13	0.67	0.07
	11.0	0.10	0.00	0.03
	12.0	0.13	0.00	0.04
	13.0	0.13	0.00	0.07
	14.0	0.19	1.10	0.07
STA-3	0.1	1.66	84.35	2.99
	1.0	1.50	97.44	3.81
	2.0	1.85	137.60	6.86
STA-4	0.1	0.55	17.92	0.39
	1.0	0.57	25.50	0.76
	2.0	0.87	39.80	1.38
	3.0	1.83	162.70	5.83
STA-5	0.1	1.01	56.80	1.99
	1.0	1.06	66.93	2.53
	2.0	1.36	88.47	3.61
	3.0	1.75	131.80	4.25
STA-6	0.1	0.59	23.74	0.75
	1.0	0.69	32.74	1.10
	2.0	0.99	51.88	1.83
	2.7	1.10	60.74	1.08
STA-7	0.1	0.58	36.88	2.24
	1.0	0.68	45.71	2.72
STA-8	0.1	0.36	13.04	0.30
	1.0	0.52	19.71	0.59
	2.0	0.63	31.05	0.92
	3.0	0.78	35.70	1.10
	4.0	0.95	37.52	1.12
	5.0	0.90	39.23	0.95
	6.0	0.36	19.71	0.72
	7.0	0.11	4.14	0.20
	8.0	0.08	2.30	0.10
	9.0	0.11	1.14	0.12
	10.0	0.21	3.25	0.11
STA-9	0.1	0.40	16.28	0.57
	1.0	0.51	23.36	0.74
	2.0	0.97	48.79	1.51
	3.0	0.96	44.36	1.20
	4.0	0.92	38.15	0.98
	5.0	0.66	26.89	0.76
	6.0	0.23	14.43	0.62
	7.0	0.13	6.36	0.33
	8.0	0.21	5.86	0.24
STA-10	0.1	0.79	64.24	3.26
	1.0	1.35	95.01	4.92
STA-11	0.1	0.16	24.09	2.04
	1.0	0.17	25.10	2.24
STA-12	0.1	0.81	42.90	1.75
	1.0	1.12	62.50	2.22
	1.5	1.11	82.50	2.07

Lake Hopatcong *In-Situ* Monitoring 2025.08.20

Station	Depth (meters)			Temperature	SpC	Dissolved Oxygen		pH
	Total	Secchi	Sample	°C	µS/cm	mg/L	% Sat.	S.U.
STA-1	2.00	0.70	0.1	24.76	451.1	7.27	87.7	7.59
			1.0	24.77	451.3	7.19	86.8	7.52
			1.8	24.44	451.6	7.10	85.6	7.49
STA-2	14.50	1.10	0.1	24.97	477.1	7.57	91.7	7.47
			1.0	24.97	477.2	7.59	91.9	7.47
			2.0	24.97	477.2	7.54	91.3	7.47
			3.0	24.97	477.0	7.39	89.5	7.43
			4.0	24.90	477.0	7.31	88.4	7.41
			5.0	24.82	476.8	6.98	88.3	7.35
			6.0	22.64	462.8	0.54	6.2	6.74
			7.0	19.88	486.4	0.00	0.0	6.91
			8.0	16.73	471.0	0.00	0.0	6.90
			9.0	14.68	464.4	0.00	0.0	6.83
			10.0	13.89	471.0	0.00	0.0	6.77
			11.0	13.29	464.4	0.00	0.0	6.76
			12.0	12.91	471.7	0.00	0.0	6.74
			13.0	12.52	481.6	0.00	0.0	6.71
			14.0	12.21	486.3	0.00	0.0	6.68
STA-3	2.30	0.80	0.1	24.39	520.0	8.15	97.6	8.05
			1.0	24.41	520.0	8.12	97.4	8.08
			2.0	24.38	520.0	7.80	93.4	7.91
STA-4	3.00	1.00	0.1	24.54	481.8	7.95	95.5	7.77
			1.0	24.52	481.8	7.97	95.7	7.79
			2.0	24.48	482.3	8.00	96.0	7.81
			2.8	24.33	483.3	7.89	94.4	7.80
STA-5	3.00	0.90	0.1	23.72	486.6	8.52	100.8	8.05
			1.0	23.72	486.6	8.48	100.4	8.04
			2.0	23.72	486.6	8.45	100.0	8.04
			2.8	23.70	486.5	8.38	99.4	8.01
STA-6	3.20	1.10	0.1	25.05	475.4	7.81	94.7	7.65
			1.0	25.06	475.5	7.76	94.1	7.62
			2.0	25.06	475.5	7.74	93.8	7.60
			3.0	24.73	476.7	7.25	87.4	7.49
STA-7	1.20	0.70	0.1	23.93	473.1	7.70	91.4	7.55
			1.0	23.94	476.2	7.63	90.6	7.53
STA-8	9.90	1.10	0.1	24.81	477.8	7.66	92.5	7.58
			1.0	24.82	477.7	7.61	91.9	7.58
			2.0	24.82	477.7	7.61	91.9	7.58
			3.0	24.82	477.8	7.58	91.6	7.58
			4.0	24.81	477.7	7.51	90.7	7.56
			5.0	23.18	456.3	0.55	6.5	6.75
			6.0	21.48	476.9	0.00	0.0	6.87
			7.0	19.69	487.8	0.00	0.0	7.11
			8.0	16.15	469.0	0.00	0.0	7.01
			9.0	14.88	468.2	0.00	0.0	6.96
			9.5	14.31	468.5	0.00	0.0	6.94
STA-9	8.40	1.10	0.1	25.09	477.3	7.77	94.3	7.68
			1.0	25.12	477.3	7.75	94.1	7.67
			2.0	25.12	477.3	7.71	93.6	7.65
			3.0	25.09	477.3	7.66	93.0	7.63
			4.0	25.07	477.0	7.62	92.4	7.62
			5.0	25.04	477.0	7.52	91.1	7.59
			6.0	25.02	476.6	7.44	90.2	7.55
			7.0	24.77	476.4	6.60	80.4	7.48
			8.0	16.47	480.7	0.67	6.9	7.04
STA-10	1.30	0.70	0.1	23.48	454.8	8.22	96.8	7.97
			1.0	23.40	458.2	8.04	94.5	7.92
STA-11	1.10	0.80	0.1	22.59	549.0	6.71	77.7	7.42
			1.0	22.56	446.0	6.10	70.6	7.31
STA-12	1.70	0.70	0.1	23.69	491.0	7.77	91.8	7.65
			1.0	23.70	491.7	7.71	91.2	7.65
			1.5	23.70	491.8	7.56	89.4	7.62

Lake Hopatcong Phytoplankton Pigment Profiles 2025.08.20 (YSI)

Station	Depth	PC	PE	Chl *a*
	m	RFU	RFU	RFU
STA-1	0.1	2.44	121.40	4.49
	1.0	2.39	132.80	4.90
	1.8	2.34	113.70	4.80
STA-2	0.1	0.96	36.22	1.19
	1.0	0.98	38.16	1.33
	2.0	1.05	40.43	1.43
	3.0	0.99	70.04	1.56
	4.0	0.96	39.47	1.54
	5.0	0.91	44.40	1.62
	6.0	0.27	9.11	0.43
	7.0	0.14	14.18	0.41
	8.0	0.13	3.31	0.21
	9.0	0.16	1.12	0.12
	10.0	0.14	0.72	0.10
	11.0	0.13	0.00	0.06
	12.0	0.17	0.22	0.08
	13.0	0.20	0.00	0.07
	14.0	0.25	1.39	0.10
STA-3	0.1	1.49	126.10	4.60
	1.0	1.30	110.60	4.83
	2.0	1.34	121.90	4.15
STA-4	0.1	1.11	48.93	1.89
	1.0	1.14	50.00	1.85
	2.0	1.11	50.47	2.36
	2.8	1.22	70.59	3.29
STA-5	0.1	1.45	75.30	3.00
	1.0	1.49	81.50	2.96
	2.0	1.33	90.40	3.51
	2.8	1.42	88.00	3.37
STA-6	0.1	0.92	38.80	1.56
	1.0	1.00	42.80	1.76
	2.0	0.95	47.10	1.95
	3.0	1.07	54.60	2.38
STA-7	0.1	1.75	117.18	5.35
	1.0	1.58	132.70	5.15
STA-8	0.1	1.02	40.01	1.43
	1.0	1.02	40.34	1.43
	2.0	1.00	41.12	1.57
	3.0	0.96	40.39	1.42
	4.0	0.97	48.75	1.74
	5.0	0.39	14.90	0.69
	6.0	0.21	15.29	0.41
	7.0	0.20	12.70	0.39
	8.0	0.13	2.78	0.17
	9.0	0.14	0.47	0.08
	9.5	0.34	2.28	0.19
STA-9	0.1	1.01	35.11	1.26
	1.0	1.00	39.22	1.30
	2.0	0.96	39.71	1.47
	3.0	0.95	40.82	1.41
	4.0	0.93	37.52	1.58
	5.0	0.91	39.64	1.60
	6.0	0.93	41.48	1.54
	7.0	0.88	37.24	1.46
	8.0	0.25	7.34	0.88
STA-10	0.1	2.02	97.23	3.75
	1.0	1.93	101.40	4.09
STA-11	0.1	0.64	24.49	5.03
	1.0	0.51	14.97	3.51
STA-12	0.1	1.59	101.40	4.09
	1.0	1.57	92.80	4.82
	1.5	1.72	116.60	4.74

Lake Hopatcong *In-Situ* Monitoring 2025.09.24

Station	Depth (meters) Total	Secchi	Sample	Temperature °C	SpC µS/cm	Dissolved Oxygen mg/L	% Sat.	pH S.U.
STA-1	1.80	0.60	0.1	21.51	479.1	9.89	112.2	8.28
			1.0	21.49	479.1	9.49	111.0	8.20
			1.6	21.24	479.1	8.19	92.4	7.86
STA-2	14.50	1.40	0.1	21.49	485.5	8.56	97.0	7.64
			1.0	21.48	485.6	8.59	94.4	7.66
			2.0	21.38	485.5	8.56	96.9	7.67
			3.0	21.25	485.4	8.21	92.6	7.59
			4.0	20.84	484.7	7.36	82.4	7.44
			5.0	20.66	483.6	6.44	71.9	7.31
			6.0	20.60	482.2	5.40	60.2	7.21
			7.0	20.45	479.7	3.72	41.3	7.07
			8.0	20.06	468.4	0.00	0.0	6.73
			9.0	17.44	561.0	0.00	0.0	7.00
			10.0	14.66	489.3	0.00	0.0	6.93
			11.0	13.54	485.2	0.00	0.0	6.84
			12.0	12.86	491.2	0.00	0.0	6.73
			13.0	12.51	495.5	0.00	0.0	6.68
			14.0	12.22	499.5	0.00	0.0	6.62
STA-3	2.00	1.40	0.1	21.52	509.0	9.08	103.1	8.09
			1.0	21.23	506.0	8.96	101.1	8.11
			1.8	21.01	494.1	7.29	81.9	7.70
STA-4	3.00	1.30	0.1	21.10	487.5	8.06	90.7	7.47
			1.0	21.07	487.4	7.96	89.5	7.46
			2.0	21.85	485.3	7.36	82.5	7.41
			2.9	20.72	485.3	6.18	69.0	7.24
STA-5	3.20	1.20	0.1	21.83	492.7	9.12	104.1	8.08
			1.0	21.67	492.9	9.09	103.4	8.08
			2.0	21.53	492.9	9.01	102.2	8.05
			3.0	21.17	493.7	7.92	89.3	7.80
STA-6	2.80	1.50	0.1	21.77	488.3	9.13	104.1	8.11
			1.0	21.63	488.1	9.18	104.4	8.09
			2.0	21.46	488.5	9.05	102.6	8.05
			2.5	21.16	487.4	8.55	96.3	7.88
STA-7	1.20	0.80	0.1	21.62	546.0	8.96	101.8	7.74
			1.0	20.98	564.0	8.42	94.5	7.72
STA-8	10.70	1.40	0.1	21.61	486.1	8.85	100.6	7.92
			1.0	21.56	486.3	8.85	100.6	7.93
			2.0	21.38	486.0	8.59	97.2	7.86
			3.0	21.10	486.1	8.19	92.2	7.77
			4.0	20.94	485.9	7.97	89.4	7.69
			5.0	20.71	485.3	7.21	80.5	7.54
			6.0	20.59	484.0	6.44	72.3	7.40
			7.0	20.14	475.4	2.58	28.5	7.18
			8.0	19.88	470.7	0.92	10.1	6.97
			9.0	18.74	497.5	0.00	0.0	7.05
			10.0	15.14	494.0	0.00	0.0	7.08
			10.5	14.37	491.2	0.00	0.0	7.04
STA-9	8.20	1.50	0.1	21.52	486.6	8.86	100.6	7.95
			1.0	21.50	486.6	8.86	100.5	7.93
			2.0	21.39	486.4	8.81	99.7	7.91
			3.0	21.15	486.4	8.39	94.5	7.81
			4.0	20.97	486.3	7.87	88.3	7.70
			5.0	20.88	486.3	7.31	81.9	7.60
			6.0	20.83	486.2	7.11	79.5	7.53
			7.0	20.79	486.2	7.18	80.3	7.50
			8.0	20.36	488.3	3.40	37.7	7.30
STA-10	1.30	0.60	0.1	21.96	485.3	10.65	121.9	8.66
			1.0	21.30	520.0	10.14	114.5	8.36
STA-11	1.10	1.10+	0.1	20.44	623.0	8.11	90.1	7.51
			1.0	20.28	623.0	7.98	88.4	7.43
STA-12	1.20	1.00	0.1	21.33	495.0	7.91	89.4	7.54
			1.0	21.12	495.8	7.40	83.3	7.44

Lake Hopatcong Phytoplankton Pigment Profiles 2025.09.24 (YSI)				
Station	Depth	PC	PE	Chl *a*
	m	RFU	RFU	RFU
STA-1	0.1	1.55	60.67	2.28
	1.0	1.76	70.29	2.83
	1.6	1.98	86.00	3.86
STA-2	0.1	0.39	26.40	1.06
	1.0	0.54	36.30	1.53
	2.0	0.51	40.50	1.72
	3.0	0.58	42.00	1.79
	4.0	0.47	30.64	1.24
	5.0	0.39	23.73	1.00
	6.0	0.35	21.00	0.98
	7.0	0.30	17.26	0.95
	8.0	0.26	11.80	0.63
	9.0	0.22	9.17	0.35
	10.0	0.19	4.20	0.28
	11.0	0.19	1.83	0.17
	12.0	0.23	2.61	0.20
	13.0	0.32	3.76	0.22
	14.0	0.51	10.48	0.56
STA-3	0.1	0.20	178.50	0.94
	1.0	0.30	23.71	1.50
	1.8	1.20	225.00	5.13
STA-4	0.1	0.38	31.62	1.33
	1.0	0.49	39.98	1.55
	2.0	0.52	34.20	1.51
	2.9	0.46	30.44	1.31
STA-5	0.1	0.41	21.43	1.33
	1.0	0.42	24.63	1.38
	2.0	0.42	23.77	1.47
	3.0	0.70	31.50	6.50
STA-6	0.1	0.33	25.72	1.40
	1.0	0.41	32.34	1.65
	2.0	0.36	37.22	1.93
	2.5	0.60	40.52	1.88
STA-7	0.1	0.63	35.53	1.81
	1.0	0.48	24.98	1.26
STA-8	0.1	0.49	37.97	1.40
	1.0	0.50	43.90	1.76
	2.0	0.50	37.96	1.64
	3.0	0.50	39.36	1.83
	4.0	0.50	41.27	1.32
	5.0	0.45	30.78	1.10
	6.0	0.40	25.50	0.85
	7.0	0.27	16.61	0.67
	8.0	0.28	14.53	0.50
	9.0	0.28	11.65	0.55
	10.0	0.17	3.23	0.24
	10.5	0.70	19.40	0.92
STA-9	0.1	0.44	33.02	1.37
	1.0	0.47	34.68	1.54
	2.0	0.49	39.26	1.72
	3.0	0.47	34.88	1.65
	4.0	0.45	36.68	1.43
	5.0	0.37	25.27	1.05
	6.0	0.34	20.81	1.04
	7.0	0.38	23.81	1.06
	8.0	0.46	31.70	1.35
STA-10	0.1	1.43	66.76	2.36
	1.0	1.35	65.71	2.41
STA-11	0.1	0.12	10.43	0.94
	1.0	0.08	6.25	0.75
STA-12	0.1	0.25	23.13	1.23
	1.0	0.29	25.20	1.82

APPENDIX III: DISCRETE DATA

Discrete Data 5/20/2025						
STATION	**Chlorophyll a (ug/L)**	**NH3-N (mg/L)**	**NO3-N (mg/L)**	**SRP (mg/L)**	**TP (mg/L)**	**TSS (mg/L)**
ST-1	18.0	0.02	0.07	ND<0.001	0.05	9
ST-2 SURFACE	16.0	0.01	0.04	ND<0.001	0.03	6
ST-2 MID	13.0	0.01	0.06	0.001	0.03	6
ST-2 DEEP		0.09	0.14	ND<0.001	0.04	9
ST-3	6.0	0.04	0.39	0.001	0.04	5
ST-4	16.0	0.02	0.04	ND<0.001	0.04	ND<2
ST-5	15.0	0.02	0.03	0.001	0.03	ND<2
ST-6	9.9	0.01	0.08	0.010	0.03	5
ST-7	5.0	0.01	0.23	0.005	0.04	2
ST-10	15.0	0.01	0.14	ND<0.001	0.07	5
ST-11	5.4	0.02	0.23	0.005	0.03	4
ST-12	4.8	0.01	0.04	ND<0.001	0.04	4
Surface Mean	**11.1**	**0.017**	**0.129**	**0.004**	**0.040**	**5.0**

Discrete Data 6/26/2025						
STATION	**Chlorophyll a (ug/L)**	**NH3-N (mg/L)**	**NO3-N (mg/L)**	**SRP (mg/L)**	**TP (mg/L)**	**TSS (mg/L)**
ST-1	5.9	0.02	0.07	0.001	0.03	12
ST-2 SURFACE	3.8	0.02	ND<0.03	0.001	0.02	2
ST-2 MID	7.3	0.06	0.03	0.004	0.04	7
ST-2 DEEP		1.10	0.03	0.004	0.09	10
ST-3	4.2	0.08	0.06	0.002	0.03	11
ST-4	2.8	0.04	0.03	0.002	0.02	3
ST-5	5.3	0.02	ND<0.03	0.001	0.02	4
ST-6	4.9	0.02	0.03	0.001	0.04	7
ST-7	8.7	0.02	ND<0.03	0.003	0.05	6
ST-10	10.0	0.02	0.04	0.003	0.05	14
ST-11	47.0	0.02	0.09	0.003	0.09	12
ST-12	6.8	0.02	ND<0.03	0.004	0.04	5
Surface Mean	**9.9**	**0.028**	**0.053**	**0.002**	**0.039**	**7.6**

Discrete Data 7/29/2025						
STATION	**Chlorophyll a (ug/L)**	**NH3-N (mg/L)**	**NO3-N (mg/L)**	**SRP (mg/L)**	**TP (mg/L)**	**TSS (mg/L)**
ST-1	22.0	0.02	0.03	0.004	0.04	6
ST-2 SURFACE	14.0	0.02	0.03	0.002	0.02	ND<2
ST-2 MID	11.0	0.02	0.06	0.001	0.02	ND<2
ST-2 DEEP		1.00	0.08	0.009	0.17	ND<2
ST-3	37.0	0.02	0.03	0.001	0.04	5
ST-4	15.0	0.02	0.10	0.001	0.03	ND<2
ST-5	24.0	0.02	0.03	0.002	0.04	ND<2
ST-6	17.0	0.02	0.03	0.001	0.03	ND<2
ST-7	18.0	0.02	ND<0.03	0.003	0.05	7
ST-10	25.0	0.02	0.03	0.010	0.01	13
ST-11	21.0	0.02	0.04	0.003	0.04	3
ST-12	25.0	0.02	0.03	0.001	0.04	5
Surface Mean	**21.8**	**0.020**	**0.039**	**0.003**	**0.034**	**6.5**

Discrete Data 8/20/2025						
STATION	**Chlorophyll a (ug/L)**	**NH3-N (mg/L)**	**NO3-N (mg/L)**	**SRP (mg/L)**	**TP (mg/L)**	**TSS (mg/L)**
ST-1	34.0	0.06	0.11	0.001	0.05	11
ST-2 SURFACE	20.0	0.06	0.05	ND<0.001	0.02	7
ST-2 MID	6.6	0.12	0.06	ND<0.001	0.02	10
ST-2 DEEP		1.20	0.21	0.005	0.12	10
ST-3	32.0	0.02	0.08	0.001	0.05	16
ST-4	22.0	0.02	0.04	0.001	0.02	7
ST-5	35.0	0.03	0.06	0.001	0.03	8
ST-6	19.0	0.03	0.03	ND<0.001	0.01	5
ST-7	37.0	0.04	0.14	0.001	0.04	23
ST-10	37.0	0.04	0.10	0.001	0.05	21
ST-11	28.0	0.03	0.10	0.001	0.06	20
ST-12	38.0	0.03	ND<0.03	0.001	0.04	16
Surface Mean	**30.2**	**0.036**	**0.079**	**0.001**	**0.037**	**13.4**

Discrete Data 9/24/2025						
STATION	**Chlorophyll a (ug/L)**	**NH3-N (mg/L)**	**NO3-N (mg/L)**	**SRP (mg/L)**	**TP (mg/L)**	**TSS (mg/L)**
ST-1	14.0	0.02	0.09	0.001	0.04	17
ST-2 SURFACE	3.3	0.02	ND<0.03	0.001	0.02	2
ST-2 MID	< 1.5	0.19	0.03	0.002	0.03	3
ST-2 DEEP		2.00	0.09	0.021	0.17	9
ST-3	< 0.6	0.04	ND<0.03	0.002	0.04	2
ST-4	3.0	0.02	ND<0.03	0.001	0.04	5
ST-5	8.2	0.02	0.04	0.001	0.02	4
ST-6	8.7	0.01	0.04	0.003	0.03	4
ST-7	17.0	0.02	0.04	0.002	0.04	7
ST-10	20.0	0.02	0.08	0.002	0.04	19
ST-11	6.8	0.01	ND<0.03	0.003	0.04	4
ST-12	6.6	0.02	0.03	0.001	0.04	7
Surface Mean	**9.7**	**0.020**	**0.053**	**0.002**	**0.035**	**7.1**

APPENDIX IV: PLANKTON DATA

Phytoplankton Community Composition Analysis

Sampling Location: Lake Hopatcong | Sampling Date: 2025.05.20 | Examination Date: 2024.05.23

Site A: ST-2 Surface Phyto | Site B: ST-2 Mid- Depth Phyto | Site C: ST-3 Surface Phyto | Site D: ST-10 Surface Phyto | Site E: ST-12 Surface Phyto | Site F: ST-2 Surface Zoop | Site G: ST-2 Deep Zoop

Phytoplankton

Diatoms	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Amphipora							
Asterionella	P		P	C			
Cocconeis			P	P			
Cyclotella	R						
Cymbella							
Eunotia		R		P			
Fragilaria	C	C	C	C	P		
Frustulia							
Gomphonema							
Gyrosigma							
Melosira	P	P	P	P	P		
Navicula				P	R		
Nitzschia	P	P	C		P		
Pinnularia							
Rhoicosphernia							
Stauroneis							
Stephanodiscus							
Synedra	P	P	P	P			
Tabellaria	C	C	P	P	P		
Chrysophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chromulina				P			
Dinobryon							
Mallomonas							
Synura							
Xanthophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Isthmochloron							
Raphids							
Gonyostomum				C			

Chlorophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Actinastrum							
Ankistrodesmus				A			
Brachiomonas			P	P	R		
Chlamydomonas				C	P		
Chlorella							
Closteriopsis		P	P	P			
Coelastrum		C	R	P			
Cosmarium			R	R	R		
Crucigenia							
Dictyosphaerium							
Eudorina							
Franceia							
Gloeomonas							
Gloeotila	P				P		
Golenkinia							
Kirchneriella							
Monoraphidium	P		C				
Nannochloris	P	P	P	C			
Oocystis				R			
Pandorina	P						
Pediastrum	P	P	P	C	P		
Platydorina							
Scenedesmus	P	P	P	A	P		
Selenastrum							
Sphaerocystis							
Spirogyra					P		
Spondylosium							
Staurastrum	P	P	P	P			
Teilingia							
Tetraspora					R		
Treubaria							
Ulothrix							
Zygnema							

Cyanophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Anabaena							
Aphanizomenon	43,239	35,618	7,630		17,185		
Aphanocapsa	4,612						
Chroococcus							
Coelosphaerium							
Cylindrospermopsis							
Dolichospermum							
Eucapsis							
Lyngbya							
Merismopedia							
Microcystis							
Oscillatoria							
Planktothrix							
Pseudanabaena	5,189	1,604	1,978				
Synechococcus							
Woronichinia							
Akinetes							
Euglenoids	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Euglena							
Phacus		R		C			
Trachelomonas	P	P	P	P	P		
Dinoflagellates	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Ceratium				R			
Gymnodinium	P	P			R		
Peridinium							
Cryptophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chroomonas	P	C	C	C			
Cryptomonas	C	C	C	A	A		
Rhodomonas			P		C		

Zooplankton

Cladocera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Bosmina						C	C
Chydorus						C	C
Diaphanosoma							R

Copepoda	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Diaptomus							
Microcyclops						C	C
Nauplii						R	R

Rotifera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Ascomorpha							R
Asplanchna						P	R
Conochilus							
Gastropus							
Keratella							R
Polyartha							
Pompholyx							
Trichocerca							

Sites:	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Cyanobacteria Count (cells/mL)	53,040	37,222	9,609	0	17,185		
Phytoplankton Genera Richness	21	19	22	26	18		
Zooplankton Genera Richness						5	8

Comments: A = Abundant, C = Common, P = Present, R = Rare

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Phytoplankton Community Composition Analysis

Sampling Location: Lake Hopatcong | **Sampling Date: 2025.06.26** | **Examination Date: 2024.06.27**

Site A: ST-2 Surface Phyto | **Site B: ST-2 Mid- Depth Phyto** | **Site C: ST-3 Surface Phyto** | **Site D: ST-10 Surface Phyto** | **Site E: ST-12 Surface Phyto** | **Site F: ST-2 Surface Zoop** | **Site G: ST-2 Deep Zoop**

Phytoplankton

Diatoms	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Amphipora							
Asterionella					R		
Cocconeis	P		P				
Cyclotella							
Cymbella							
Eunotia				R			
Fragilaria	R		P	P			
Frustulia							
Gomphonema							
Gyrosigma			R				
Melosira		P	C	P	C		
Navicula				P			
Nitzschia	P	C	C	P	C		
Pinnularia				R			
Rhoicosphernia							
Stauroneis							
Stephanodiscus							
Synedra							
Tabellaria							
				P			
Chrysophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chromulina	P	P					
Dinobryon			P	P	C		
Mallomonas							
Synura		R					
Xanthophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Isthmochloron							
Raphids							
Gonyostomum							

Chlorophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Actinastrum							
Ankistrodesmus							
Brachiomonas	C	P	C	A	C		
Chlamydomonas		C					
Chlorella	P	P	P	A	P		
Closteriopsis		R		P			
Coelastrum	C		P	A	C		
Cosmarium		R		P	P		
Crucigenia		P	P	P			
Dictyosphaerium							
Eudorina							
Franceia	P				R		
Gloeocystis	P		P				
Gloeomonas	P						
Gloeotila		R	R		R		
Golenkinia				R			
Lagerheimia	P	P		P	P		
Micrasterias					P		
Monoraphidium	P	P	P	P	P		
Nannochloris							
Oocystis			P				
Pandorina							
Pediastrum	P	P	P	P	C		
Quadrigula	P			R			
Scenedesmus	P	P	P	C	P		
Selenastrum							
Sphaerocystis			P	P	P		
Spirogyra							
Spondylosium							
Staurastrum	P	P	P	P			
Tetradesmus		P		R	P		
Tetraspora			P		P		
Treubaria							
Westella	P	P	P	A	P		
Zygnema							

Cyanophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Anabaena							
Aphanizomenon	17,470	6,492	2,096		6,352		
Aphanocapsa	6,988	2,597	1,118	25,646	1,494		
Chroococcus							
Coelosphaerium							
Cylindrospermopsis	699		699				
Dolichospermum	3,843	243	699	916	1,494		
Eucapsis							
Lyngbya							
Merismopedia							
Microcystis							
Oscillatoria							
Planktothrix	34,941	42,605	17,121		12,330		
Pseudanabaena	27,952	2,435	3,843	3,664	23,538		
Synechococcus							
Woronichinia							
Akinetes							
Euglenoids	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Euglena				P			
Phacus			R	R	R		
Trachelomonas	C	P	C	C	C		
Dinoflagellates	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Ceratium	R	R	R				
Gymnodinium		P	P	P			
Peridinium	P						
Cryptophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chroomonas			P		C		
Cryptomonas	C	C	A	P	A		
Rhodomonas							

Zooplankton

Cladocera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Bosmina						P	A
Ceriodaphnia						C	
Chydorus							P
Daphnia						R	

Copepoda	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Diaptomus						R	
Microcyclops						R	P
Nauplii						P	P

Rotifera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Anuraeopsis						R	P
Conochilus						C	C
Keratella						R	R
Polyartha						R	

Sites:	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Cyanobacteria Count (cells/mL)	91,893	54,372	25,576	30,226	45,208		
Phytoplankton Genera Richness	27	27	32	32	28		
Zooplankton Genera Richness						10	7

Comments: A = Abundant, C = Common, P = Present, R = Rare

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Phytoplankton Community Composition Analysis

Sampling Location: Lake Hopatcong | **Sampling Date: 2025.07.29** | **Examination Date: 2024.07.31**

Site A: ST-2 Surface Phyto | **Site B: ST-2 Mid- Depth Phyto** | **Site C: ST-3 Surface Phyto** | **Site D: ST-10 Surface Phyto** | **Site E: ST-12 Surface Phyto** | **Site F: ST-2 Surface Zoop** | **Site G: ST-2 Deep Zoop**

Phytoplankton

Diatoms	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Amphipora							
Asterionella							
Cocconeis	R				R		
Cyclotella			P				
Cymbella							
Eunotia				R			
Fragilaria	P	P	P	P	P		
Frustulia							
Gomphonema							
Gyrosigma							
Melosira		P	C	C	P		
Navicula							
Nitzschia	P	P		P	P		
Pinnularia							
Rhoicosphernia							
Stauroneis							
Stephanodiscus							
Synedra	P			P	P		
Tabellaria	P	P		C	P		

Chrysophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chromulina							
Dinobryon							
Mallomonas							
Synura	P	P					

Xanthophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Isthmochloron							
Raphids							
Gonyostomum							

Chlorophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Actinastrum							
Ankistrodesmus							
Brachiomonas	P	P	C	C			
Chlamydomonas		P					
Chlorella	P	P	P	C			
Closteriopsis				P			
Coelastrum	P		P		P		
Cosmarium							
Crucigenia							
Dictyosphaerium							
Eudorina	R						
Franceia							
Gloeocystis							
Gloeomonas							
Gloeotila	P		C				
Golenkinia			P				
Haematococcus	P						
Micrasterias							
Monoraphidium							
Nannochloris							
Oocystis							
Pandorina							
Pediastrum	R		C	C	P		
Quadrigula	P			P			
Scenedesmus	R	P	C	C	P		
Selenastrum							
Sphaerocystis							
Spirogyra							
Spondylosium							
Staurastrum	P		P	C			
Tetradesmus							
Tetraspora	P			P			
Treubaria							
Westella							
Zygnema							

Cyanophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Anabaena							
Aphanizomenon	24,285	15,130	31,604	7,024	30,252		
Aphanocapsa		5,933		18,965			
Chroococcus				2,388			
Coelosphaerium		3,857					
Cylindrospermopsis							
Dolichospermum	3,373	7,417	9,906	5,971	818		
Eucapsis							
Lyngbya							
Merismopedia				11,239			
Microcystis			4,717	12,643			
Oscillatoria							
Planktothrix	9,782	4,747	6,604				
Pseudanabaena	1,686	2,967	4,717		1,635		
Raphidiopsis	3,710		61,321	4,214	40,881		
Synechococcus							
Woronichinia							
Akinetes	67			70	82		

Euglenoids	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Euglena				P			
Phacus							
Trachelomonas		C	C	C	P		

Dinoflagellates	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Ceratium	R		P	P			
Gymnodinium	P						
Peridinium							

Cryptophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chroomonas		P					
Cryptomonas	P	P	C	C			
Rhodomonas							

Zooplankton

Cladocera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Bosmina						P	C
Ceriodaphnia							R

Copepoda	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Diaptomus							
Microcyclops							P
Nauplii						R	P

Rotifera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Asplanchna							R
Conochilus						P	C
Gastropus						R	P
Keratella						P	P
Polyartha						R	P
Trichocerca						R	P

Sites:	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Cyanobacteria Count (cells/mL)	42,836	40,051	118,869	62,444	73,586		
Phytoplankton Genera Richness	26	18	20	26	15		
Zooplankton Genera Richness						7	10

Comments: A = Abundant, C = Common, P = Present, R = Rare

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Phytoplankton Community Composition Analysis

Sampling Location: Lake Hopatcong | **Sampling Date: 2025.08.20** | **Examination Date: 2024.08.22**

Site A: ST-2 Surface Phyto | **Site B: ST-2 Mid- Depth Phyto** | **Site C: ST-3 Surface Phyto** | **Site D: ST-10 Surface Phyto** | **Site E: ST-12 Surface Phyto** | **Site F: ST-2 Surface Zoop** | **Site G: ST-2 Deep Zoop**

Phytoplankton

Diatoms	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Amphipora							
Asterionella							
Cocconeis			P				
Cyclotella	R			P	P		
Cymbella							
Eunotia							
Fragilaria				P			
Frustulia							
Gomphonema							
Gyrosigma			R	P			
Melosira	P	P	C	C	C		
Navicula			P				
Nitzschia	P	P					
Pinnularia			R	R			
Rhoicosphernia							
Stauroneis							
Stephanodiscus							
Synedra	P	P	P	P	P		
Tabellaria	P	P	C	C	C		

Chrysophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chromulina							
Dinobryon							
Mallomonas							
Synura							

Xanthophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Isthmochloron							

Raphids							
Gonyostomum							

Chlorophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Actinastrum			P				
Ankistrodesmus							
Brachiomonas		P	P	P			
Chlamydomonas			P				
Chlorella	P			P	P		
Closteriopsis							
Coelastrum				P	P		
Cosmarium							
Crucigenia		R	P	P			
Dictyosphaerium							
Eudorina							
Franceia							
Gloeocystis							
Gloeomonas							
Gloeotila	P						
Golenkinia			P				
Haematococcus							
Micrasterias							
Monoraphidium							
Nannochloris							
Oocystis							
Pandorina	P		R				
Pediastrum			P	P	C		
Quadrigula							
Scenedesmus			P	P	P		
Selenastrum							
Sphaerocystis							
Spirogyra							
Spondylosium							
Staurastrum			R	P			
Tetradesmus			R				
Tetraspora				P	P		
Treubaria							
Westella							
Zygnema							

Cyanophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Anabaena							
Aphanizomenon	7,769	1,965	7,674	8,294	8,606		
Aphanocapsa				16,587			
Chroococcus				3,317			
Coelosphaerium							
Cylindrospermopsis							
Dolichospermum	2,590			11,611	2,582		
Eucapsis							
Lyngbya							
Merismopedia							
Microcystis				1,659			
Oscillatoria							
Planktothrix	4,070		1,616		2,582		
Pseudanabaena							
Raphidiopsis	34,776	3,931	60,585	56,396	81,761		
Synechococcus							
Woronichinia							
Akinetes			404	166	344		

Euglenoids	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Euglena				P	P		
Phacus			R	R			
Trachelomonas	P	P	P		P		

Dinoflagellates	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Ceratium	R		P	R	C		
Gymnodinium				P			
Peridinium			P		P		

Cryptophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chroomonas			P				
Cryptomonas	P	P		P	P		
Rhodomonas							

Zooplankton

Cladocera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Bosmina						C	P
Ceriodaphnia						P	P
Chydorus						P	R
Diaphanosoma							R

Other Arthropods	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chaborus						R	

Copepoda	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Diaptomus							
Microcyclops						R	P
Nauplii						P	C

Rotifera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Anuraeopsis							P
Ascomorpha						P	
Asplanchna						R	
Conochilus						P	C
Keratella						C	C
Polyartha						R	P
Trichocerca						P	P

Sites:	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Cyanobacteria Count (cells/mL)	49,205	5,896	69,875	97,864	95,531		
Phytoplankton Genera Richness	15	10	26	27	19		
Zooplankton Genera Richness						13	12

Comments: A = Abundant, C = Common, P = Present, R = Rare

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Phytoplankton Community Composition Analysis

Sampling Location: Lake Hopatcong | **Sampling Date: 2025.09.24** | **Examination Date: 2024.10.03**

Site A: ST-2 Surface Phyto | **Site B: ST-2 Mid- Depth Phyto** | **Site C: ST-3 Surface Phyto** | **Site D: ST-10 Surface Phyto** | **Site E: ST-12 Surface Phyto** | **Site F: ST-2 Surface Zoop** | **Site G: ST-2 Deep Zoop**

Phytoplankton

Diatoms	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Amphipora							
Asterionella							
Cocconeis							
Cyclotella	P			P	P		
Cymbella							
Eunotia							
Fragilaria	P	P		P	P		
Frustulia							
Gomphonema							
Gyrosigma							
Melosira	P	P	P	P	P		
Navicula			P				
Nitzschia		P	P	P			
Pinnularia					R		
Rhoicosphernia							
Stauroneis							
Stephanodiscus							
Synedra	P	P	P				
Tabellaria	P		P	P	P		

Chrysophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chromulina				P			
Dinobryon	P		P	R	P		
Mallomonas	P						
Synura							

Xanthophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Isthmochloron							
Raphids							
Gonyostomum							

Chlorophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Actinastrum							
Ankistrodesmus					P		
Brachiomonas	P	P	P	P			
Chlamydomonas	P						
Chlorella	P		P	P			
Closteriopsis				R			
Coelastrum			P		P		
Cosmarium							
Crucigenia		P	P				
Dictyosphaerium							
Eudorina							
Franceia							
Gloeocystis							
Gloeomonas							
Gloeotila				P			
Golenkinia							
Haematococcus							
Micrasterias				R			
Monoraphidium							
Nannochloris							
Oocystis							
Pandorina							
Pediastrum	P	R	P	P	C		
Quadrigula							
Scenedesmus	P	P	P	P	C		
Selenastrum							
Sphaerocystis							
Spirogyra							
Spondylosium							
Staurastrum	P		P	P	P		
Tetradesmus							
Tetraspora					P		
Treubaria							
Westella							
Zygnema							

Cyanophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Anabaena							
Aphanizomenon	6,842	1,696	2,246	7,939	1,456		
Aphanocapsa							
Chroococcus							
Coelosphaerium							
Cylindrospermopsis							
Dolichospermum	11,404		642	7,093			
Eucapsis							
Lyngbya							
Merismopedia		1,085					
Microcystis				32,816			
Oscillatoria							
Planktothrix	3,801	2,035	5,134				
Pseudanabaena		678					
Raphidiopsis	16,345	7,641	9,947	35,992	7,646		
Synechococcus		678					
Woronichinia							
Akinetes	228	203	193	953			

Euglenoids	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Euglena					R		
Phacus		R		R			
Trachelomonas	P	P		P	C		

Dinoflagellates	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Ceratium							
Gymnodinium		R	P		P		
Peridinium							

Cryptophytes	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chroomonas	P		P	P			
Cryptomonas	C	P	C	C	C		
Rhodomonas							

Zooplankton

Cladocera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Bosmina						R	C
Ceriodaphnia						P	P
Chydorus						R	R
Diaphanosoma							

Other Arthropods	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Chaborus							

Copepoda	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Diaptomus							
Microcyclops						R	P
Nauplii						R	R
Cyclops						R	

Rotifera	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Anuraeopsis							R
Ascomorpha						C	P
Asplanchna							
Conochilus						P	P
Keratella						P	C
Polyartha						P	C
Trichocerca						R	P
Hexartha						R	R
Collotheca							R

Sites:	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Cyanobacteria Count (cells/mL)	38,392	13,813	17,969	83,840	9,102		
Phytoplankton Genera Richness	21	19	21	24	18		
Zooplankton Genera Richness						12	13

Comments: A = Abundant, C = Common, P = Present, R = Rare

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