EFFINGHAM WATER QUALITY REPORT 2024

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RIVERS Field Sampling Parameters

Conductivity

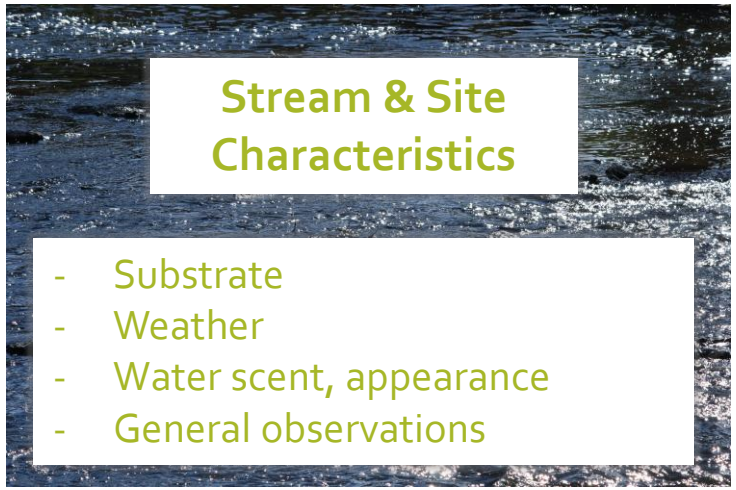
- Ability of water to pass an electrical charge
- Based on amount of charged elements [Mg+, Ca+, Cl-, NO_3-, etc.]
- Can be useful in interpreting salt loads in water bodies

Total Phosphorus

- Critical nutrient for photosynthesis and algae/plant growth
- High levels indicate elevated decomposition (including sewage inputs)

Dissolved Oxygen (DO)

- Measure of how much oxygen is available to aquatic organisms – different species require different amounts

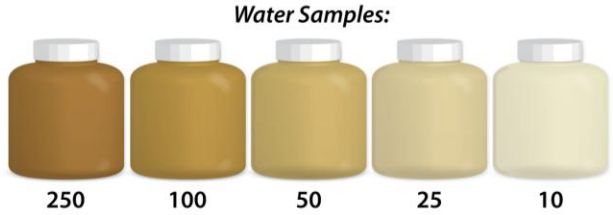


Stream & Site Characteristics

- Substrate
- Weather
- Water scent, appearance
- General observations

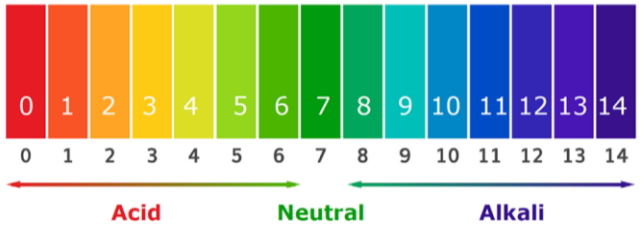
Turbidity

- Water clarity
- Determined by the amount of suspended particles and sediment



pH

- Pure water has a pH of 7, although most water in NH is closer to 6.5 (more acidic)
- The optimal range for aquatic organisms is 6.5 to 8.2



Temperature

- Influences…
  - Amount of dissolved oxygen
  - Rate of chemical reactions in water
  - Plant and algal growth
  - Activity and life cycles of aquatic organisms

Water Quality Standards & Allowable Limits

Parameter	Limit/ Standard
Conductivity	< 100 µS/cm
Total Phosphorus (TP)	< 30 µg/L
Dissolved Oxygen (DO)	6-11 mg/L , 75%-120%
Turbidity	< 10 NTU
pH	6-8, preferably close to 6.5 in NH
Temperature	No standard, but monitored for major changes

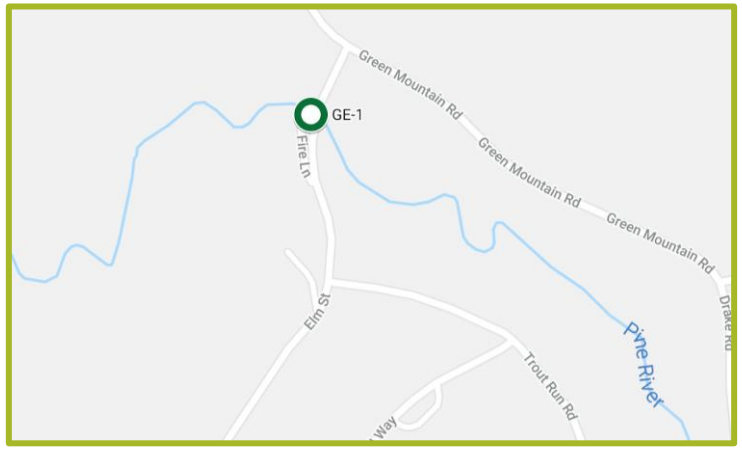
Based on NHDES and EPA Criteria

Anything above is considered "nuisance levels"

****Each site we monitor will vary in these values- a normal occurrence- due to differences in surrounding plant life, land use, infrastructure, geology, etc.**

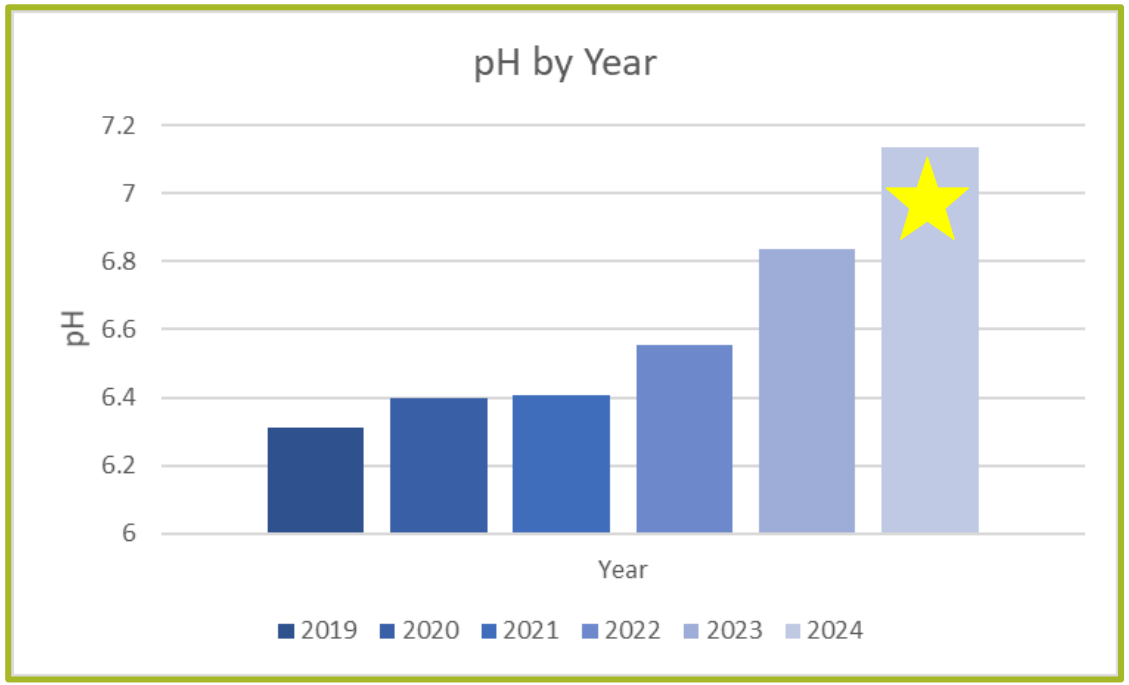
GE-1 Pine River: May 2019-Oct 2024

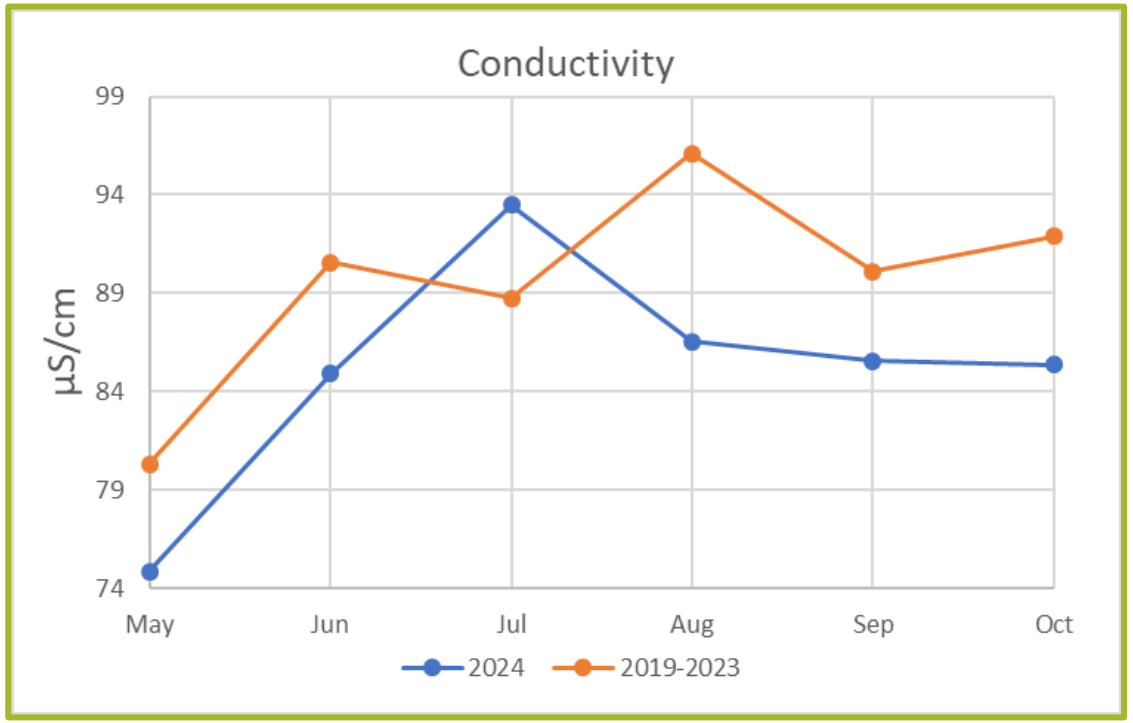
- Monitored since 2002
- Parameters measured: pH, turbidity, temperature, conductivity, DO, TP



Parameter	Status
Temp.	Stable, lowest median value since 2019.
Turbidity	Stable and in range.
TP	Stable. Highest median value since 2019, reached nuisance levels in May.

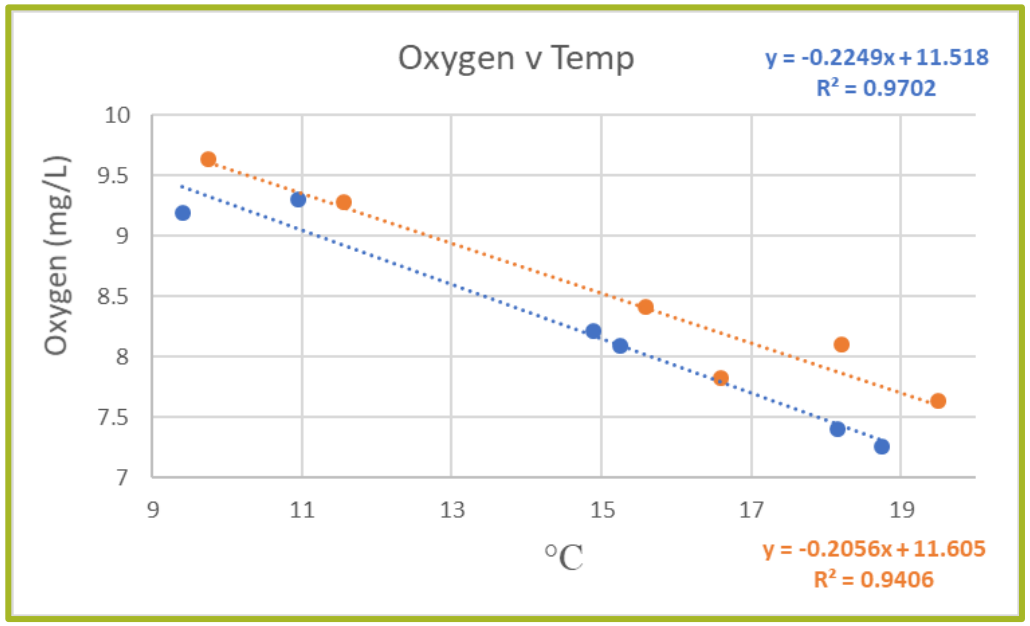
GE-1 Pine River: May 2019-Oct 2024



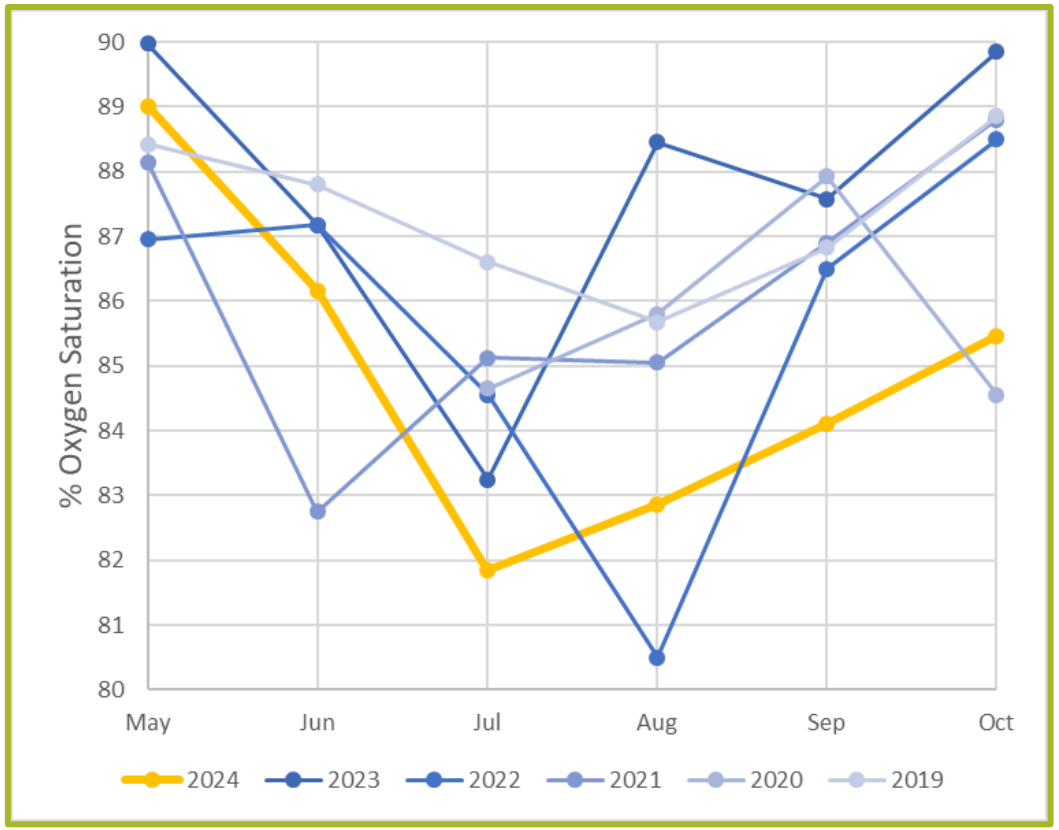


Parameter	Status
pH	pH was higher in 2024 than it had been for the previous 5 years, although all values were within a healthy range.
Conductivity	Conductivity in 2024 was lower than combined values from 2019-2023 in every month except July. All values were within a healthy range.

GE-1 Pine River: May 2019-Oct 2024



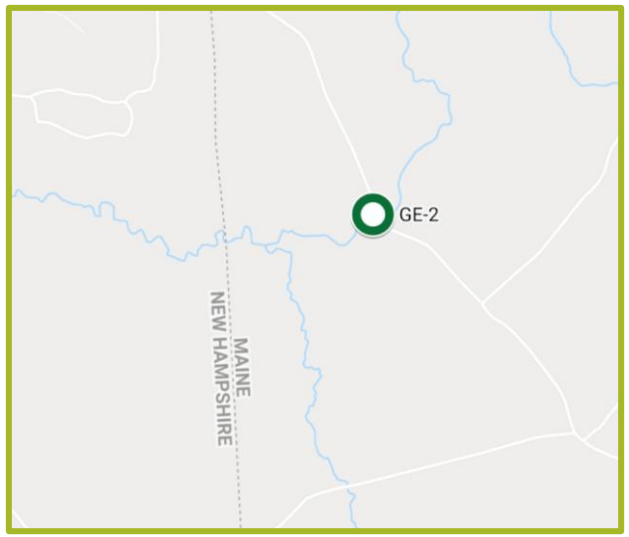
DO should have an inverse relationship with temperature- colder water can dissolve more oxygen.

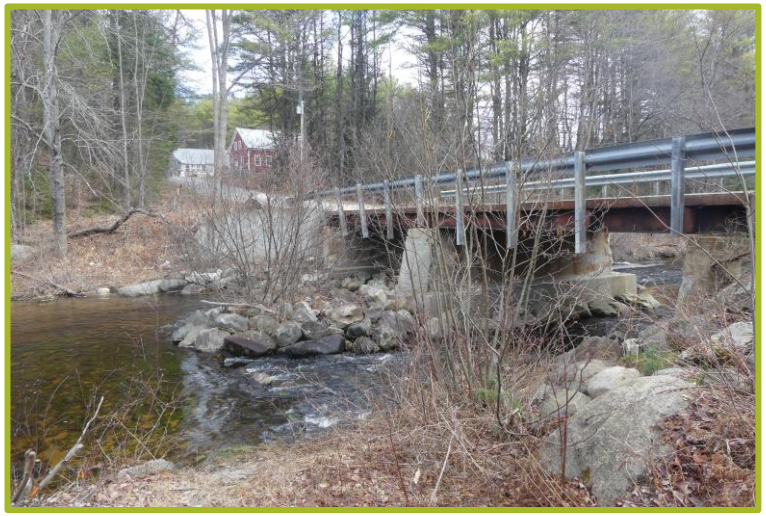


Parameter	Status
DO (mg/L)	The R^2 value from 2024 (blue) was similar to the R^2 value from 2019-2023 (orange) which indicates a consistent relationship between parameters at this site. 2024 DO (mg/L) was lower than the combined values from 2019-2023, although all were within a healthy range.
DO (%)	In 2024, DO % was on the lower end of values from the previous six years, and was the lowest in July and September. All values were within a healthy range.

GE-2 South River: May 2019-Oct 2024

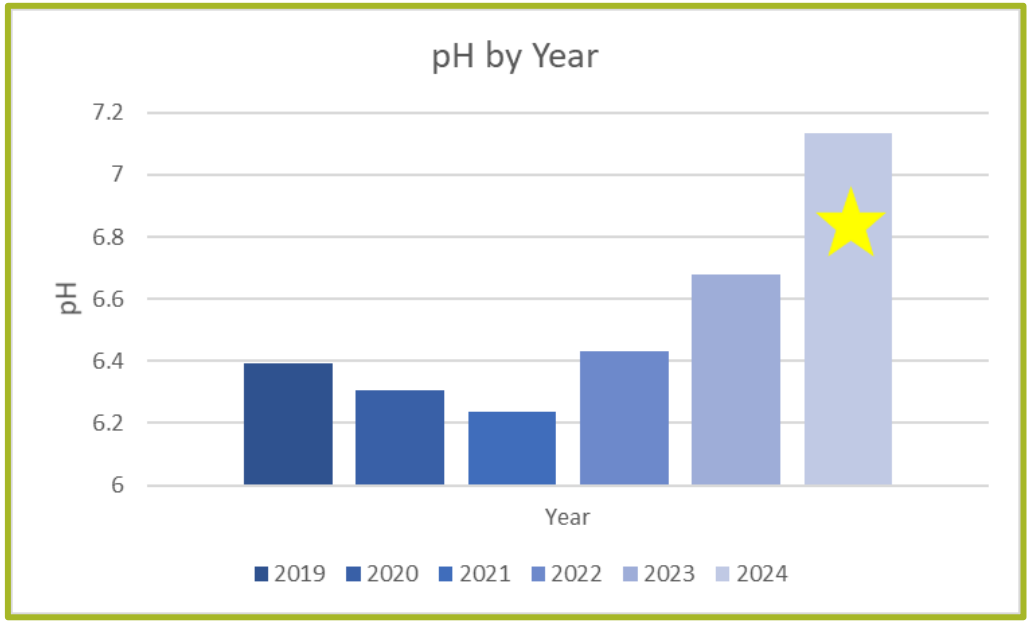
- Monitored since 2002
- Parameters measured: pH, turbidity, temperature, conductivity, DO, TP

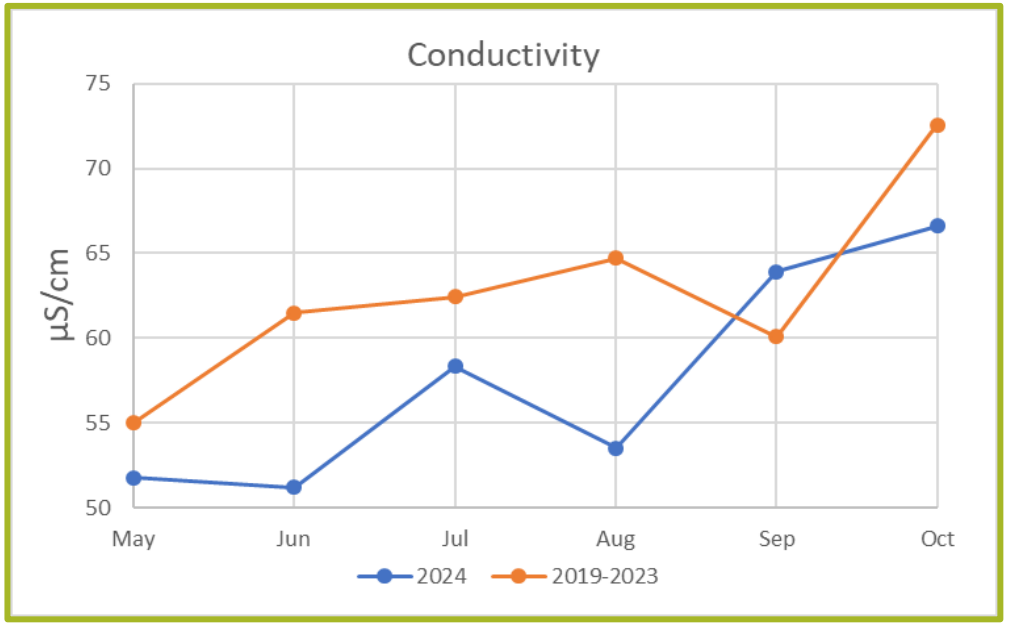




Parameter	Status
Temp.	Stable, lowest median value since 2021.
Turbidity	Stable and in range. Lowest median value in the last six years.
TP	Stable and in range. Lowest median value in the last six years.

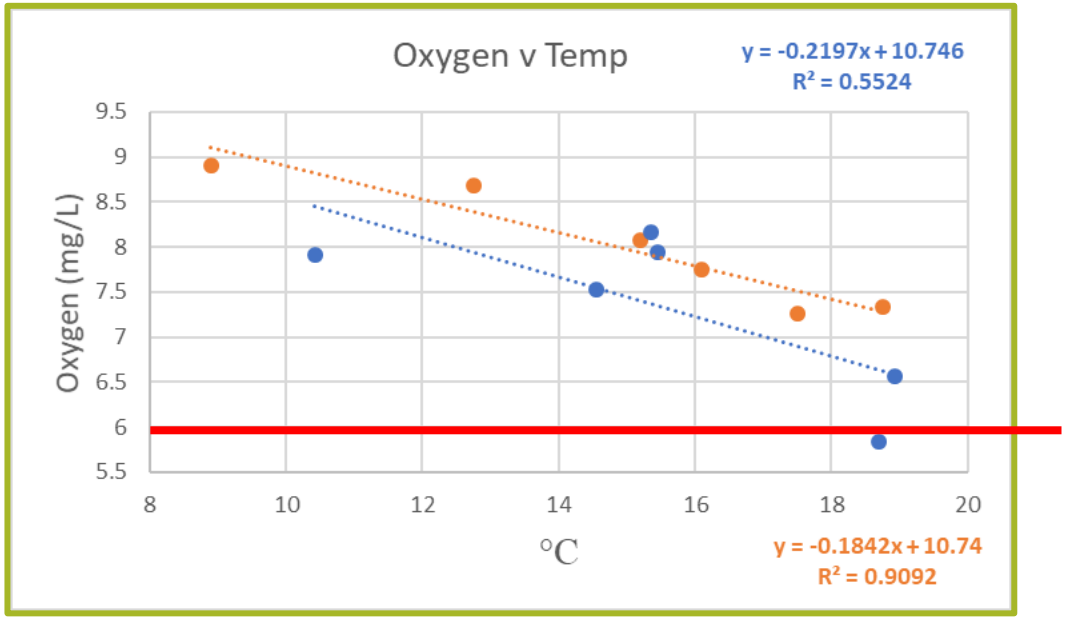
GE-2 South River: May 2019-Oct 2024





Parameter	Status
pH	pH was higher in 2024 than it had been for the previous 5 years, although all values were within a healthy range.
Conductivity	Conductivity in 2024 was lower than combined values from 2019-2023 in every month except September. All values were within a healthy range.

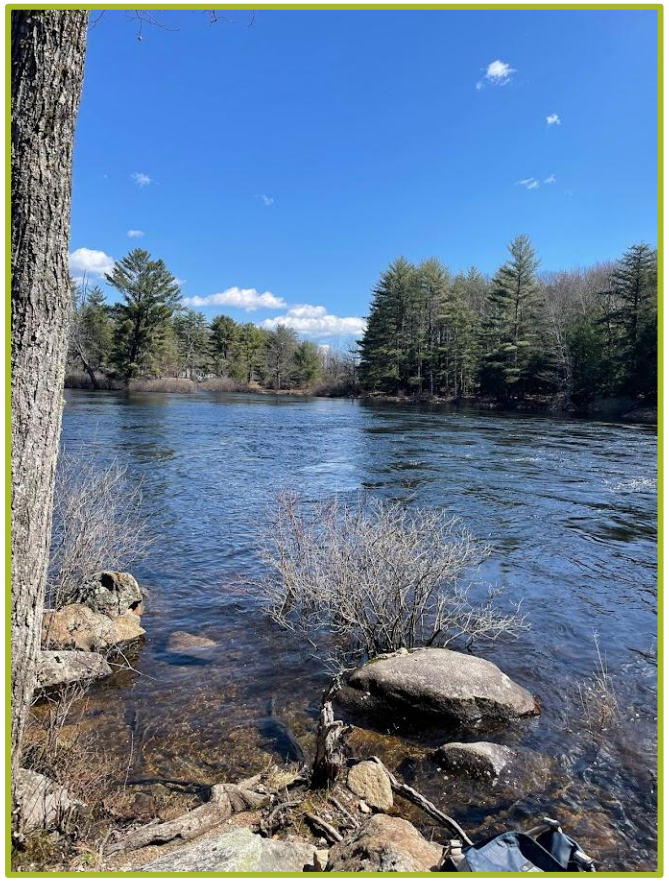
GE-2 South River: May 2019-Oct 2024



Parameter	Status
DO (mg/L)	The R^2 value from 2024 (blue) is lower than the R^2 value from 2019-2023 (orange) which may indicate a weaker relationship between the parameters at this site. In 2024 DO was generally lower than the combined values from 2019-2023, although only in August did it fall below the standard of 6 mg/L.
DO (%)	In 2024, DO % was on the lower end of values from the previous six years, and was the lowest in August. In 2024, DO% values fell below the 75% standard July through October.

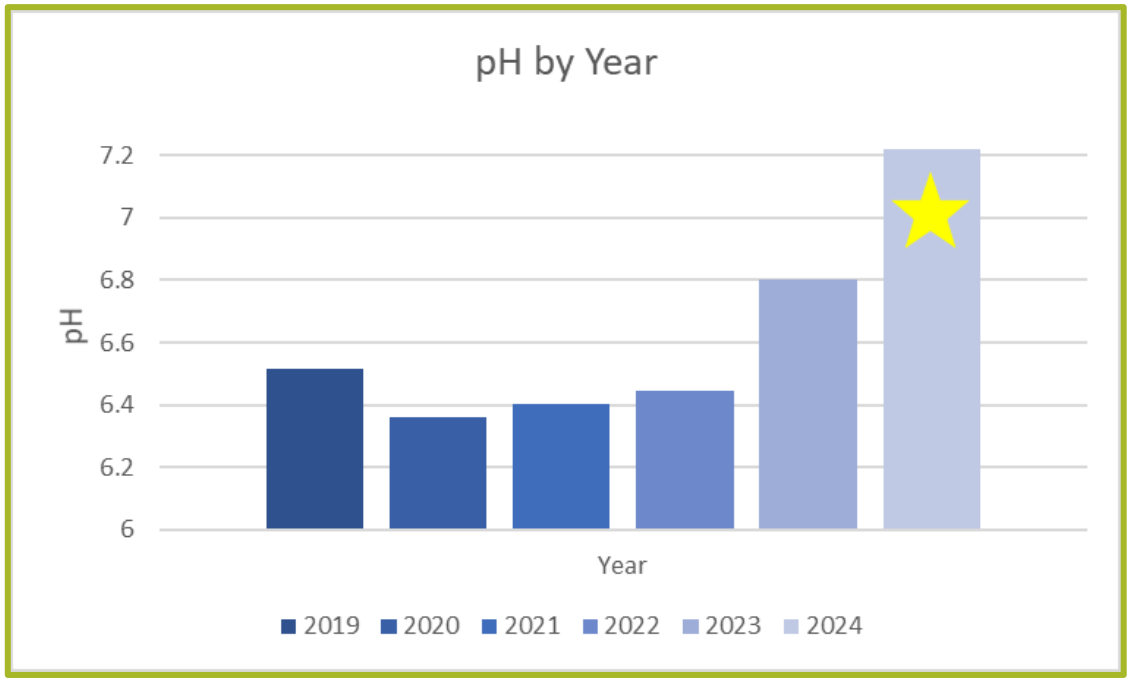
GE-3 Ossipee River: Jan 2019-Dec 2024

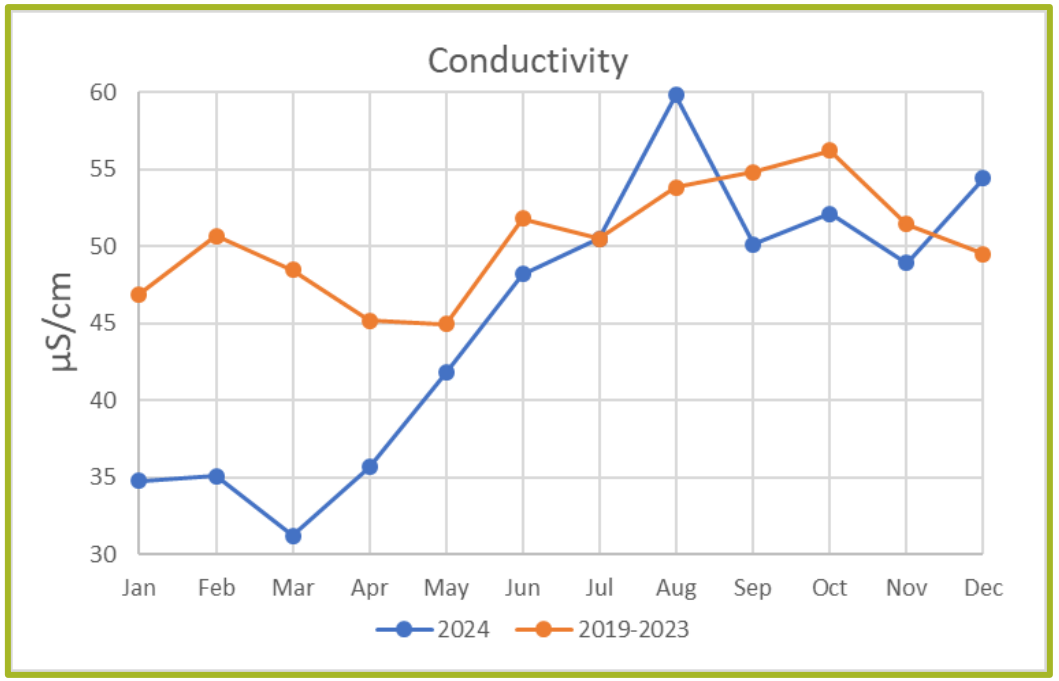
- Monitored since 2003
- Parameters measured: pH, turbidity, temperature, conductivity, DO, TP, LL



Parameter	Status
Temp.	Stable.
Turbidity	Stable and in range. Lowest median value since 2021.
TP	Stable and in range.

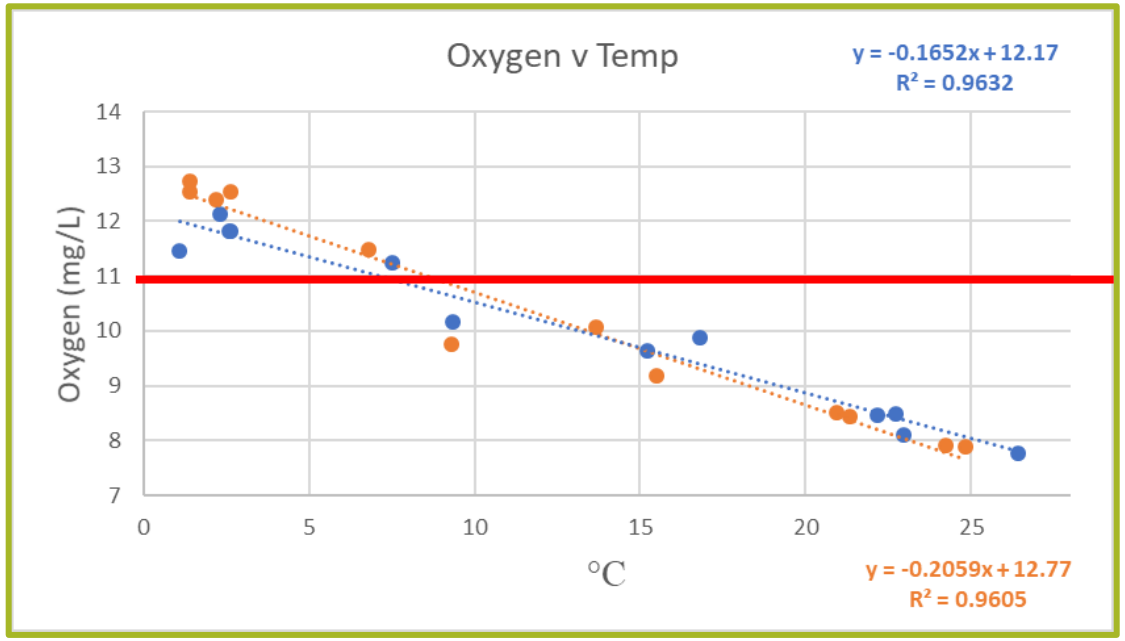
GE-3 Ossipee River: Jan 2019-Dec 2024

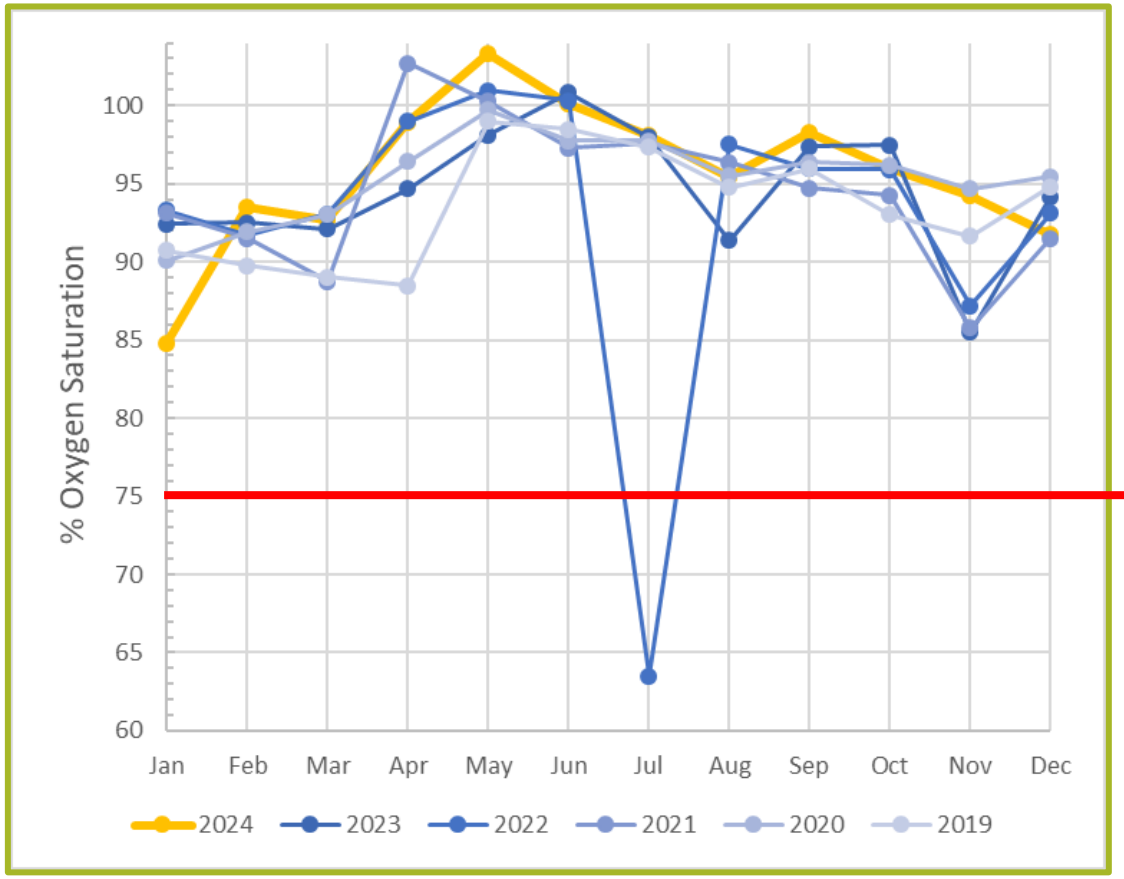




Parameter	Status
pH	pH was higher in 2024 than it had been for the previous 5 years, although all values were within a healthy range.
Conductivity	Conductivity in 2024 was lower than combined values from 2019-2023 in every month except July and December. All values were within a healthy range.

GE-3 Ossipee River: Jan 2019-Dec 2024





Parameter	Status
DO (mg/L)	The R^2 value from 2024 (blue) was similar to the R^2 value from 2019-2023 (orange) which indicates a consistent relationship between parameters at this site. 2024 DO values exceeded the 11 mg/L threshold in January-April and December.
DO (%)	In 2024, DO % values were similar to values from 2019-2023 and all from 2024 were within a healthy range.

GE-3 Ossipee River *2024 Data Only

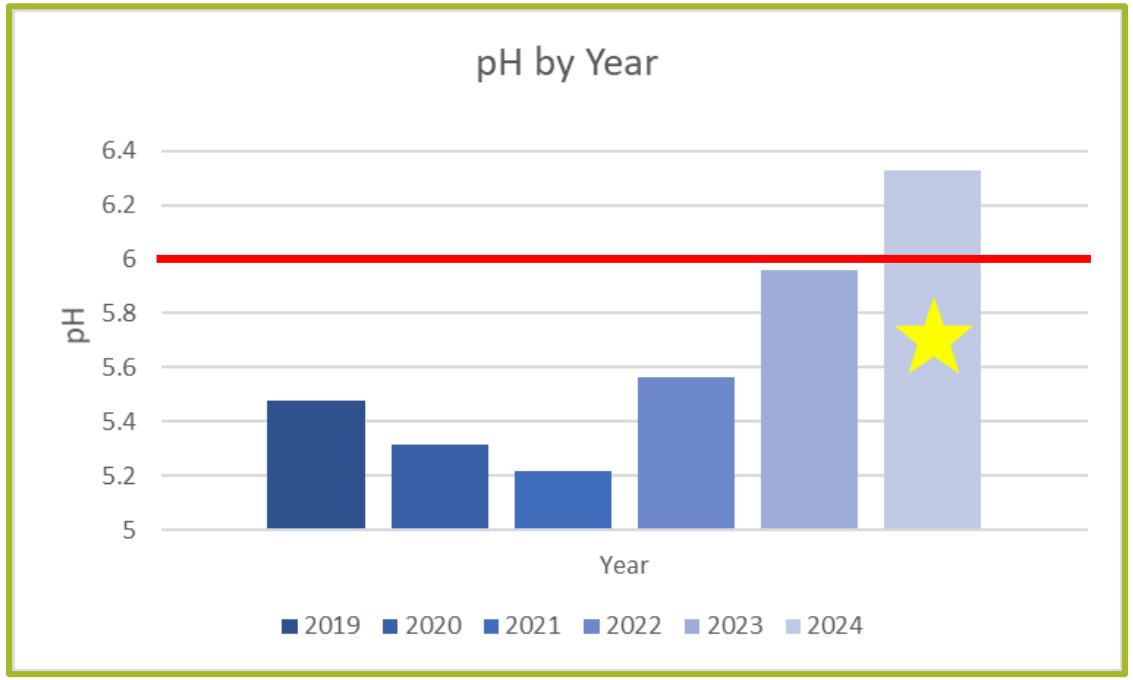
Parameter	Months Sampled	Typical Pristine Surface Water Concentrations	Status
Ammonium	Jan-May, Aug-Oct	< 200 µg/L	In range
Orthophosphate	Jan-Dec	< 10 µg/L	Exceeded standard in Jan, July
Dissolved Organic Carbon	Jan-May, Aug-Oct	1-10 mg/L	In range
Total Dissolved Nitrogen	Jan-May, Aug-Oct	< 0.5 mg/L	Exceeded standard in Jan
Dissolved Organic Nitrogen	Mar-May, Aug-Oct	n/a	In range
Nitrate	Mar-May, Aug-Oct	< 0.05 mg/L	Exceeded in Mar, April
Chloride	Mar-May, Aug-Oct	< 10 mg/L	Neared limit in Oct, in range
Sulfate	Mar-May, Aug-Oct	< 80 mg/L	In range
Sodium	Mar-May, Aug-Oct	< 50 mg/L	In range
Potassium	Mar-May, Aug-Oct	< 10 mg/L	In range
Magnesium	Mar-May, Aug-Oct	1-100 mg/L	Below 1 mg/L every month sampled
Calcium	Mar-May, Aug-Oct	< 15 mg/L	In range

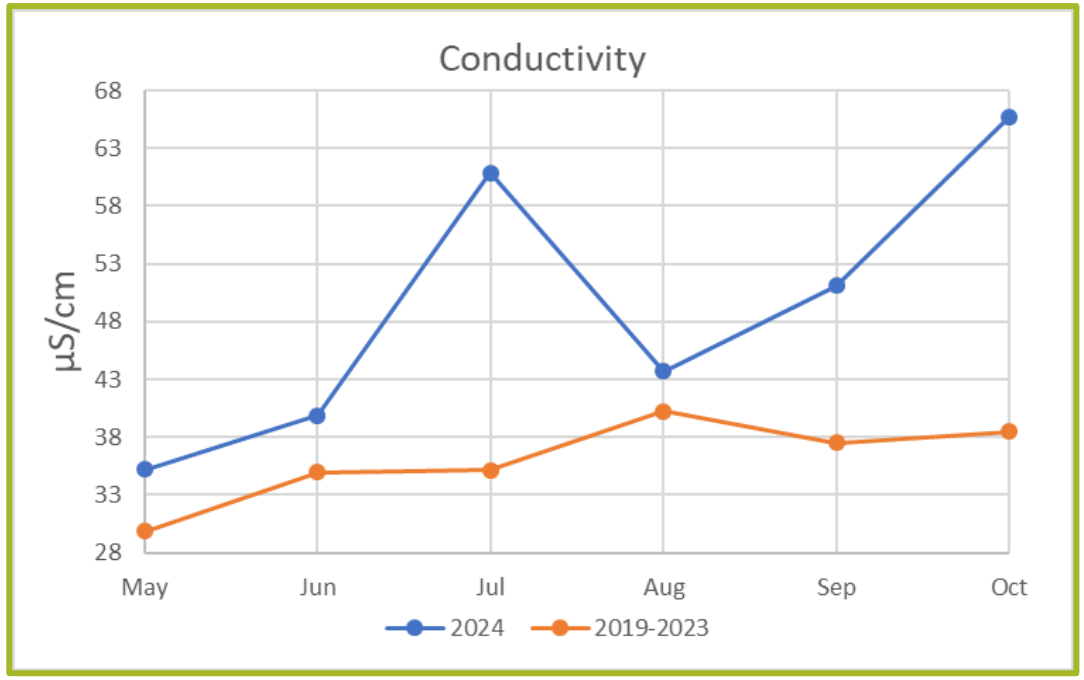
OL-7 Red Brook: May 2019-Oct 2024

- Monitored since 2003
- Parameters measured: pH, turbidity, temperature, conductivity, DO, TP

Parameter	Status
Temp.	Stable.
Turbidity	Stable and in range. Median values from 2022-2024 were higher than those from 2019-2021.
TP	Highest median value in the past six years, reached nuisance levels June-October.

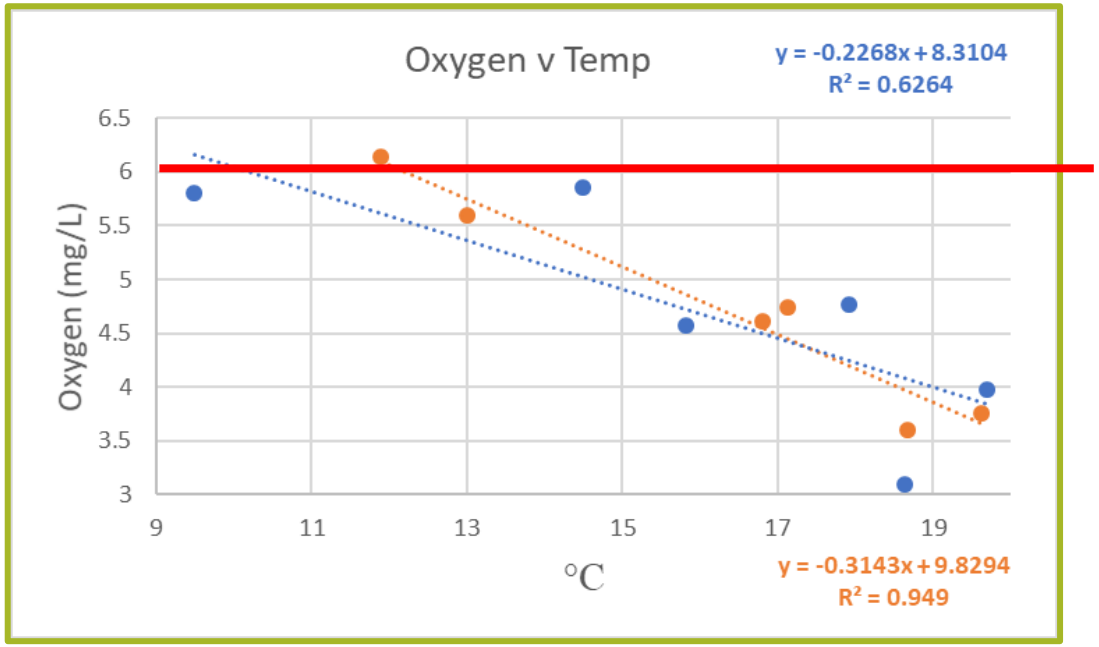
OL-7 Red Brook: May 2019-Oct 2024

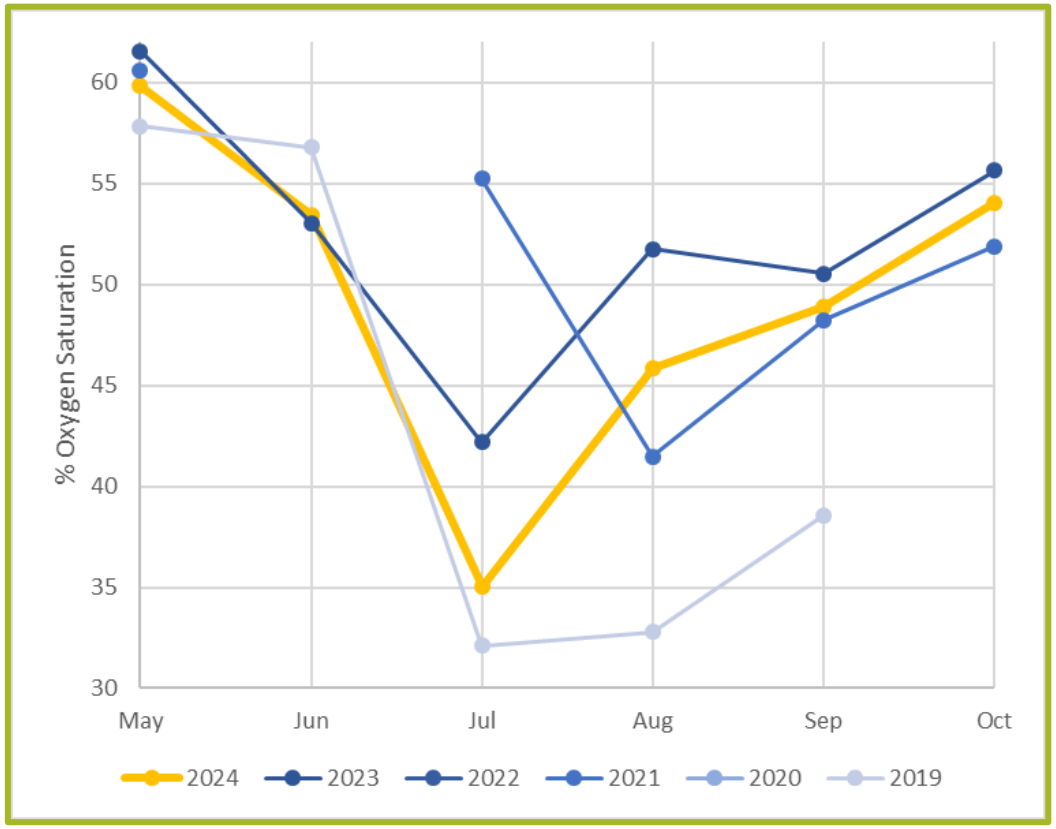




Parameter	Status
pH	pH was higher in 2024 than it had been for the previous 5 years, and is the only year in the past six that is above the minimum threshold of a pH of 6.
Conductivity	Conductivity in 2024 was higher than combined values from 2019-2023 in every month sampled. All values were within a healthy range.

OL-7 Red Brook: May 2019-Oct 2024





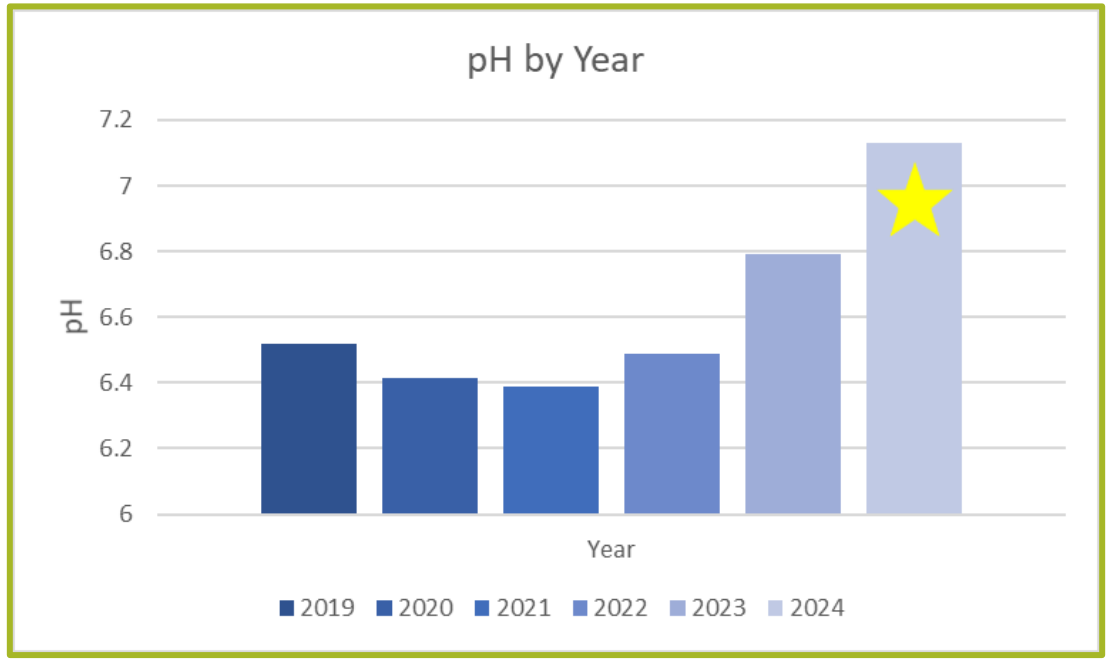
Parameter	Status
DO (mg/L)	The R^2 value from 2024 (blue) is lower than the R^2 value from 2019-2023 (orange) which may indicate a weaker relationship between the parameters at this site. 2024 DO values were lower than the minimum threshold of 6 mg/L at all points. Combined DO values from 2019-2024 were also below this threshold for all months except May.
DO (%)	In 2024, DO % values were similar to values from 2019-2023. All values from 2019-2024 were below the minimum 75% threshold.

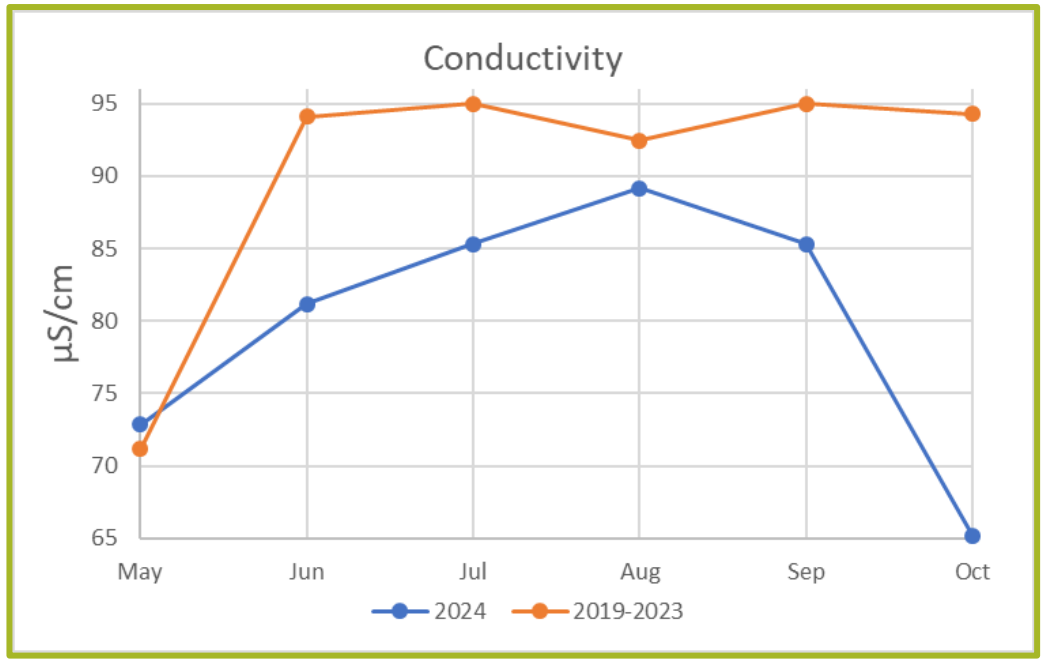
OL-13 Leavitt Brook: May 2019-Oct 2024

- Monitored since 2003
- Parameters measured: pH, turbidity, temperature, conductivity, DO, TP

Parameter	Status
Temp.	Stable, lowest median value in the last six years.
Turbidity	Stable and in range. Median values from 2022-2024 were higher than those from 2019-2021.
TP	In range. Lowest median value in 6 years, and first time in past six years that TP did not reach nuisance levels.

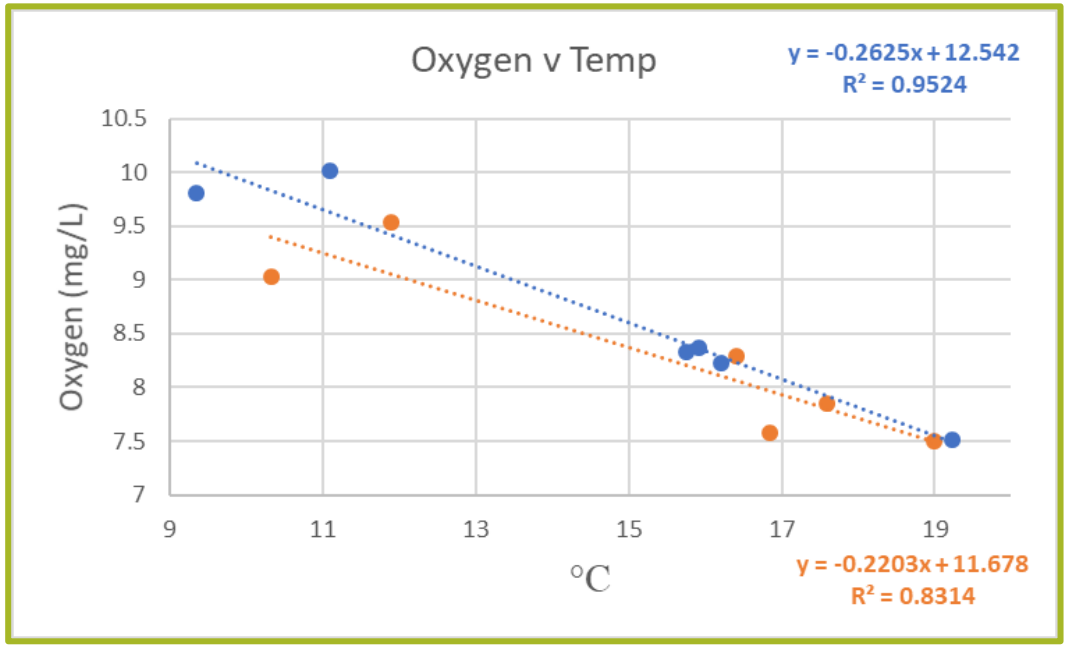
OL-13 Leavitt Brook: May 2019-Oct 2024

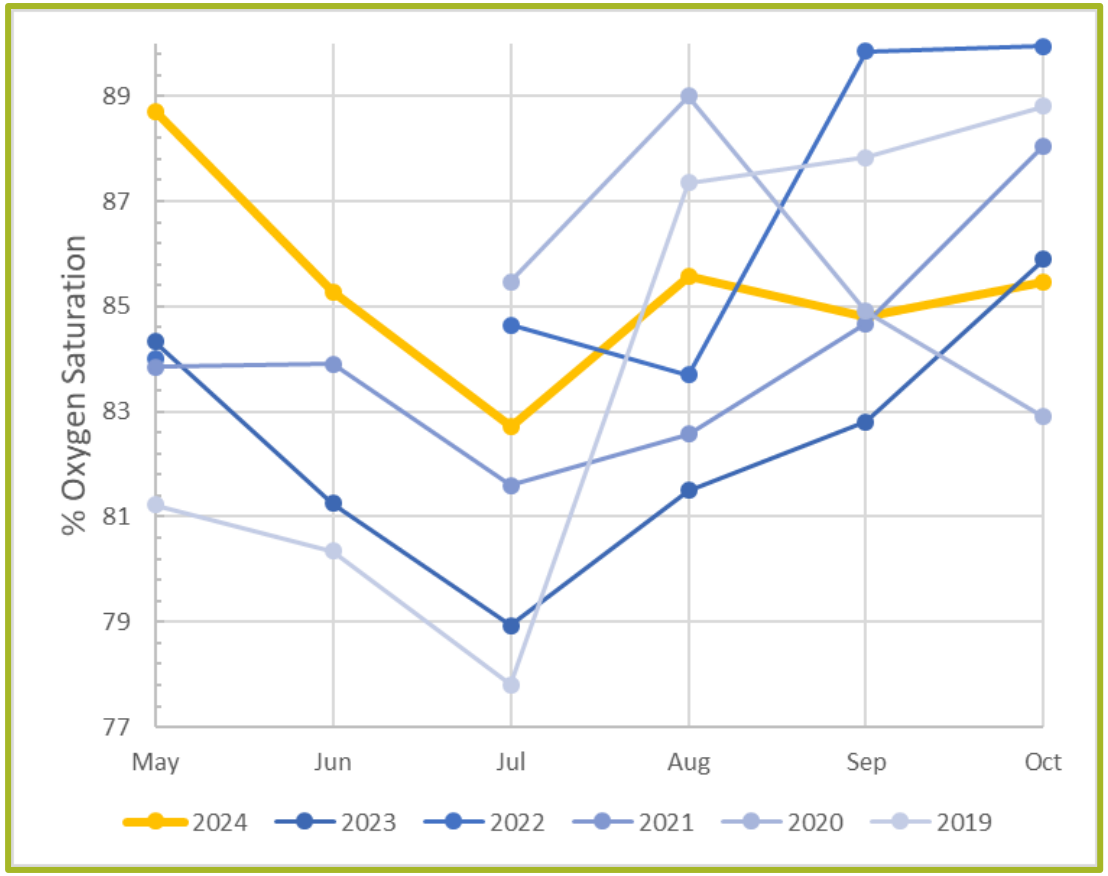




Parameter	Status
pH	pH was higher in 2024 than it had been for the previous 5 years, although all values were within a healthy range.
Conductivity	Conductivity in 2024 was lower than combined values from 2019-2023 in every month except May. All values were within a healthy range.

OL-13 Leavitt Brook: May 2019-Oct 2024





Parameter	Status
DO (mg/L)	The R^2 value from 2024 (blue) was similar to the R^2 value from 2019-2023 (orange) which indicates a consistent relationship between parameters at this site. DO in 2024 was often higher than combined values from 2019-2023, and all were within a healthy range.
DO (%)	In 2024, DO % was on the higher end of values from the past six years, and had the highest values May-July. All values were within a healthy range.

Overview of Findings

The majority of parameters tested fell within the acceptable limits for surface waters set by the New Hampshire Department of Environmental Services (NHDES) and/or the Environmental Protection Agency. Our findings do not indicate any trends or incidences of profound concern.

At **GE-2** and **OL-7,** the relationship between DO (mg/L) and temperature was weaker in 2024 than from 2019-2023, indicating oxygen levels are being increasingly influenced by factors other than temperature.

At **OL-7,** DO% values fell below the minimum 75% for every month sampled, and DO (mg/L) fell below the minimum 6 mg/L in every month sampled except May.

At **GE-2,** DO% values fell below the minimum 75% from July-August, and DO (mg/L) fell below the minimum 6 mg/L in August.

Across **all sites visited,** pH was higher in 2024 than in the previous five years. While there were no instances of pH values exceeding the healthy range, the trend is nonetheless worth paying attention to.

At **GE-1,** TP was at nuisance levels in May, and at **OL-7,** TP was at nuisance levels June-October. More positively, TP at **OL-13** stayed below nuisance levels for the first time in the last six years.

At **GE-3,** there were a small series of chemical parameters exceeding pristine surface water conditions:

- Orthophosphate was over the limit in January and July
- Nitrate was over the limit in March and April
- Total Dissolved Nitrogen was over the limit in January

What steps can Effingham take to protect its waters?

At Home

- Encourage residents to get their septic systems regularly checked and maintained
- Use Best Management practices (BMPs) for proper disposal of chemicals and waste materials

On Roads

- Reduce salt application on roadways, especially near bodies of water and sensitive habitats, like wetlands
  - Consider brining: an equally effective and more environmentally conscious method for keeping roads clear

In Town

- Monitor the effectiveness of culverts, and work to replace those posing as safety and environmental hazards (frequent flooding, erosion of surrounding earth, partial collapse, etc.)
- Maintain riparian areas (aka Streamside Management Zones) and monitor habitats near bodies of water for major changes

THANK YOU FOR YOUR TIME!

AmeriCorps

GREEN MOUNTAIN CONSERVATION GROUP

Report respectfully submitted by:
J. Emerson, *Water Quality Coordinator*
E. Revenaugh, *AmeriCorps Water Quality Resources Assistant*