MADISON WATER QUALITY REPORT 2025

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RIVERS Parameters

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

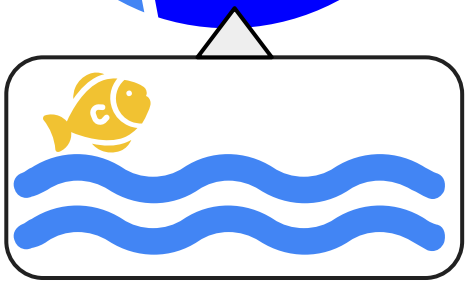
pH
- Pure water has pH 7
- Most NH streams have pH 6.5
- Ideal range for aquatic organisms is 6.5-8.2

Dissolved Oxygen (DO)
- Measure of how much oxygen is available to aquatic species
- Different species need different amounts

Stream & Site Characteristics
- Substrate (i.e. river bottom)
- Weather
- Water scent & appearance
- General observations

Temperature
Influences:
- Plant growth & animal activity
- DO levels
- Rate of chemical reactions

Conductivity
- Ability of water to pass electrical charge
- Based on amount of charged compounds or ions (Na+, Cl-, NO_3-, etc.)
- Can be used to interpret amount of salt in water



Phosphorus & Nitrogen
- Critical nutrient for plant and algae growth growth
- High levels indicate more decomposition (i.e. sewage) or human inputs (e.g. fertilizer runoff)

RIVERS Parameters

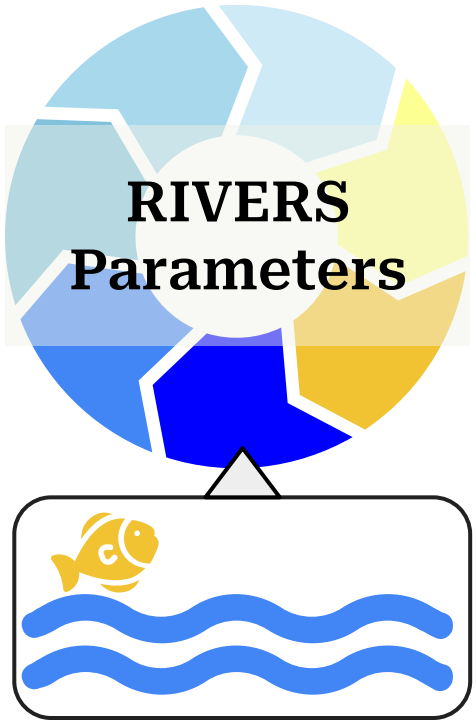
Calcium
- Occurs naturally
- Essential for plants and animals
- Used to measure hardness

Dissolved Organic Carbon
- Occurs naturally from organic decomposition
- Elevated levels from runoff and sewage

Sulfate
- Occurs naturally from weathering
- Elevated levels from mines, smelters, paper mills

Sodium
- Present in water in low concentrations, vary based on geology
- Elevated concentrations from road salt runoff

Magnesium
- Occurs naturally
- Essential nutrition for plants and animals
- Used to measure hardness



Chloride
- Present in water in low concentrations, vary based on geology
- Elevated concentrations from road salt runoff, sewage, or farming

Potassium
- Occurs naturally from weathering or plant decomposition
- Elevated levels from pollution, leaky septic tanks, fertilizer runoff

RIVERS Parameters - Water Quality Standards & Allowable Limits

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

- Based on NHDES & EPA criteria
- Each site will vary in these values due to differences in surrounding plant life, land use, riverbed geology, infrastructure, etc.

Also measure temperature to visualize its relationship with DO, which should be **inverse** in a healthy stream (**as temp. increases, DO decreases**).

Dependent on what form of nitrogen is being tested.

RIVERS Parameters - Water Quality Standards & Allowable Limits

Parameter	Limit/Standard
Chloride	< 10 mg/L
Sodium	< 50 mg/L
Dissolved Organic Carbon	1-10 mg/L
Calcium	< 15 mg/L
Sulfate	< 80 mg/L
Magnesium	1-100 mg/L
Potassium	< 10 mg/L

- Based on NHDES & EPA criteria
- Each site will vary in these values due to differences in surrounding plant life, land use, riverbed geology, infrastructure, etc.

Banfield Brook (GM-1)

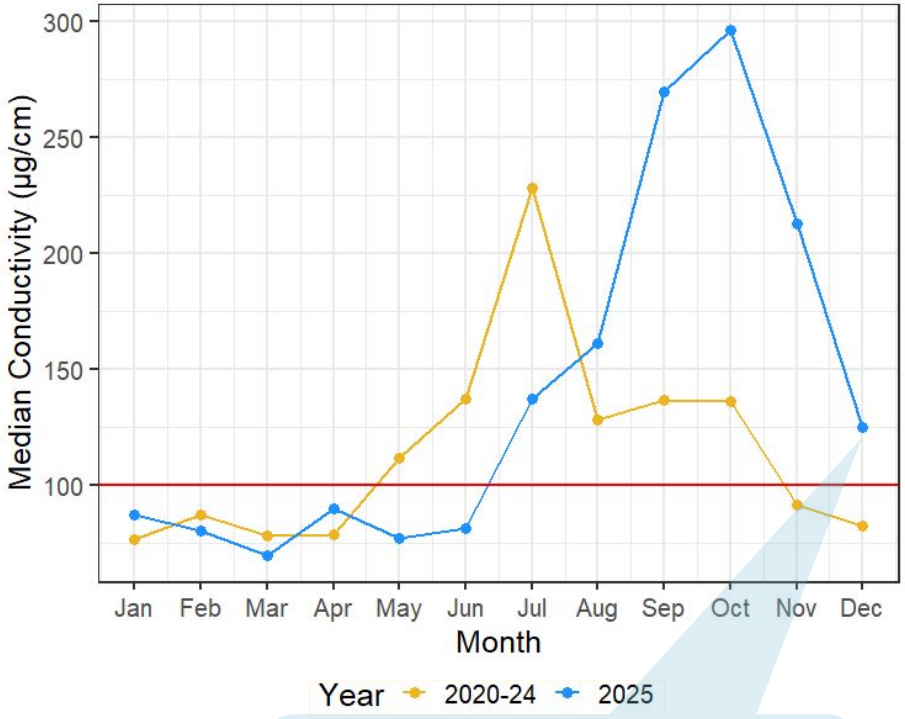
Data analyzed from Jan 2020 - Dec 2025

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

Parameter	Status	Change
pH	Within ideal range	Small decrease from 2024
Turbidity	Within ideal range	No change from 2024
Total Phosphorus*	Within ideal range	Small decrease from 2024

Conductivity

The peak in conductivity is higher in 2025 compared to previous years. Conductivity did not fall back to the ideal range in 2025 unlike 2020-24, although this is likely due to the drought.

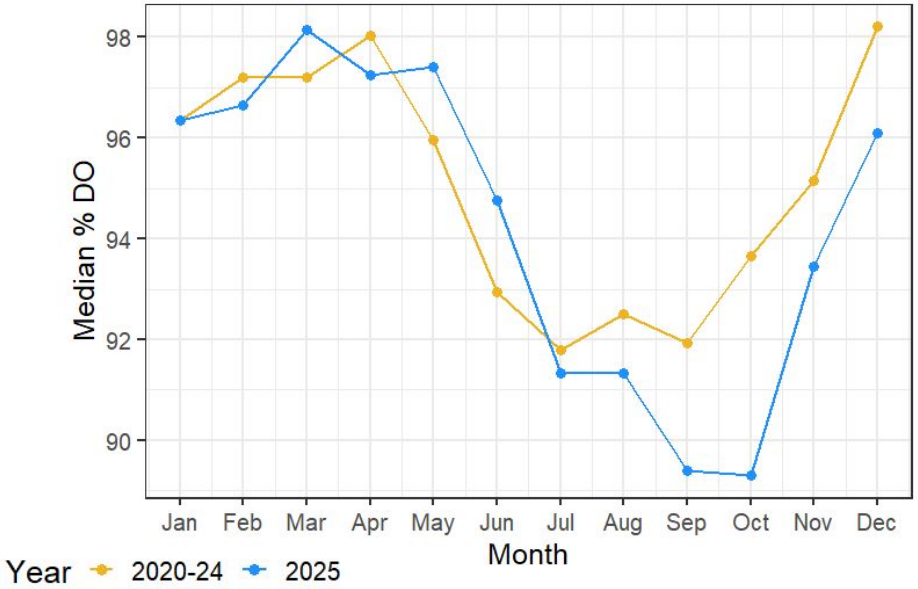


As the amount of water in a river decreases (for example, during a drought) the concentration of salt increases since the water to salt ratio is smaller. This would **increase conductivity** because the water is more saturated!

**values only available up to Nov 2025*

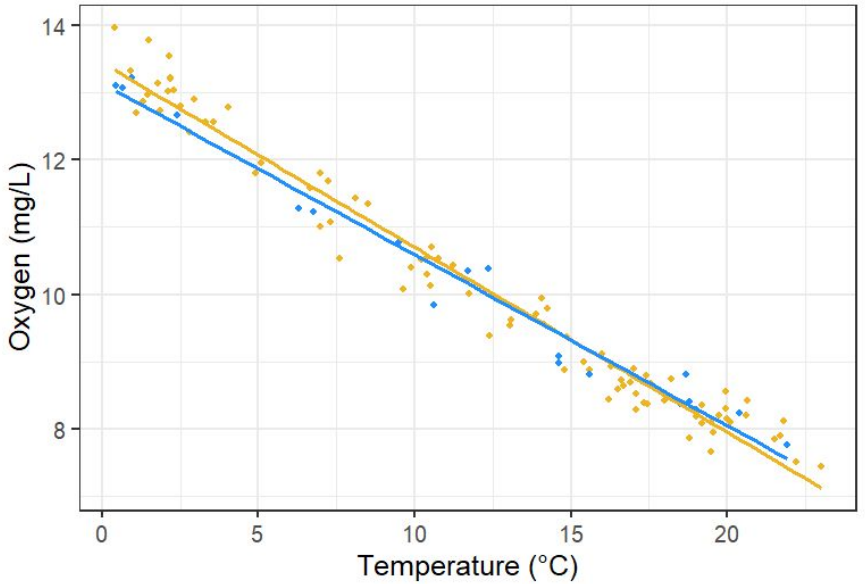
% Dissolved Oxygen

% DO followed the same general trend in 2025 as in previous years, decreasing throughout the summer, although values are slightly lower in the later part of the year. All values fell within the ideal range.



DO & Temperature

There is a consistent, strong inverse relationship between parameters in 2020-24 and 2025. All values stayed within the ideal range.



Banfield Brook (GM-1)

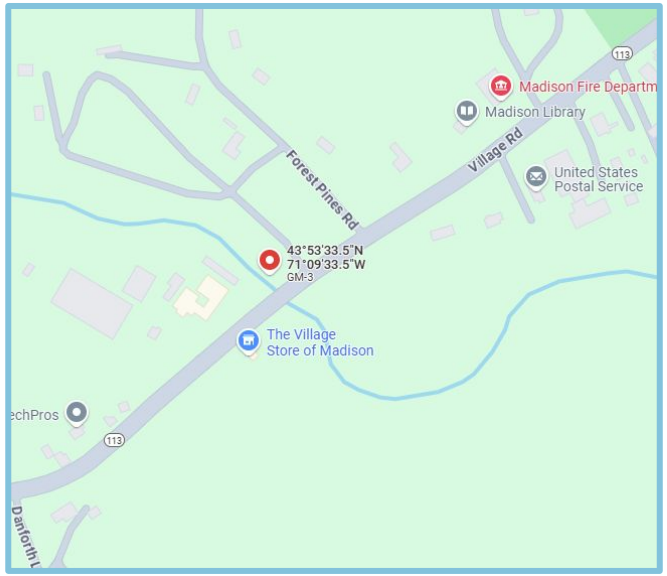
**Data from Aug 2024 - Aug 2025

Parameter	Limit/Standard	Status
Ammonium	< 200 µg/L	In range
Orthophosphate	< 10 µg/L	Exceeded standard in Oct, Feb, Apr, Aug
Dissolved Organic Carbon	1-10 mg/L	In range
Total Dissolved Nitrogen	< 0.5 mg/L	In range
Nitrate	< 0.05 mg/L	Exceeded standard in Sep, Oct, Nov, Jan, Mar
Chloride	< 10 mg/L	Exceeded standard entire year
Sulfate	< 80 mg/L	In range
Sodium	< 50 mg/L	In range
Potassium	< 10 mg/L	In range
Magnesium	1-100 mg/L	Below 1 mg/L Aug, Sep, Dec, Feb-Jul
Calcium	< 15 mg/L	In range

Forrest Brook (GM-3)

Data analyzed from Apr 2020 - Oct 2025

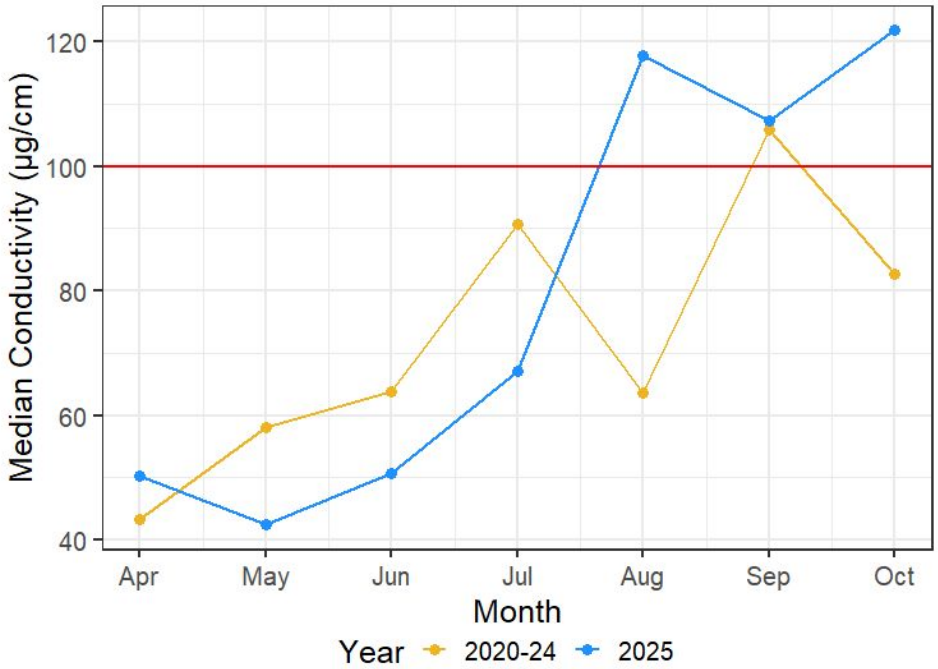
- Monitored since 2003
- Parameters tested: pH, turbidity, temperature, conductivity, DO, TP



Parameter	Status	Change
pH	Within ideal range	Small decrease from 2024
Turbidity	Within ideal range	Small decrease from 2024
Total Phosphorus*	Within ideal range	Small decrease from 2024

Conductivity

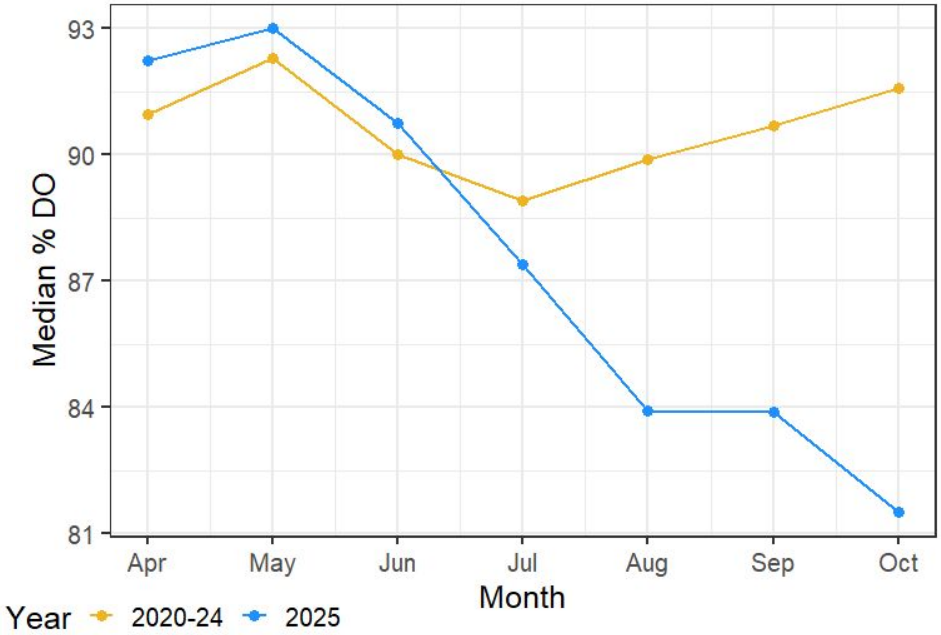
Similar trends in conductivity, with the parameter peaking in Aug and Oct 2025 unlike previous years; this could be due to the drought in 2025



*values only available up to Nov 2025

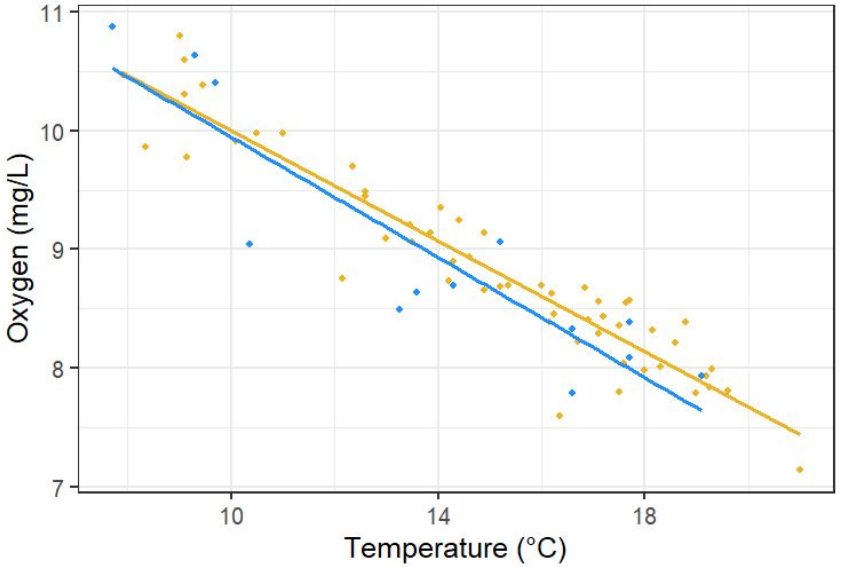
% Dissolved Oxygen

Percent DO has remained in the ideal range since 2020, although there was a greater decrease in percent DO in the later part of 2025.



DO & Temperature

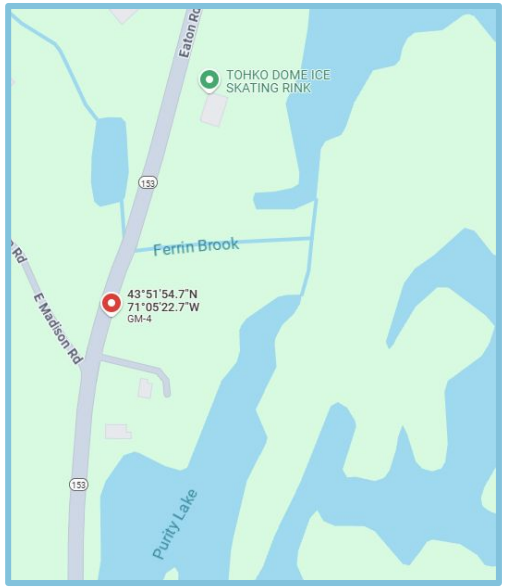
There is a consistent, strong inverse relationship between parameters in 2020-24 and 2025. All values stayed within the ideal range.



Ferrin Brook (GM-4)

Data analyzed from Apr 2020 - Oct 2025

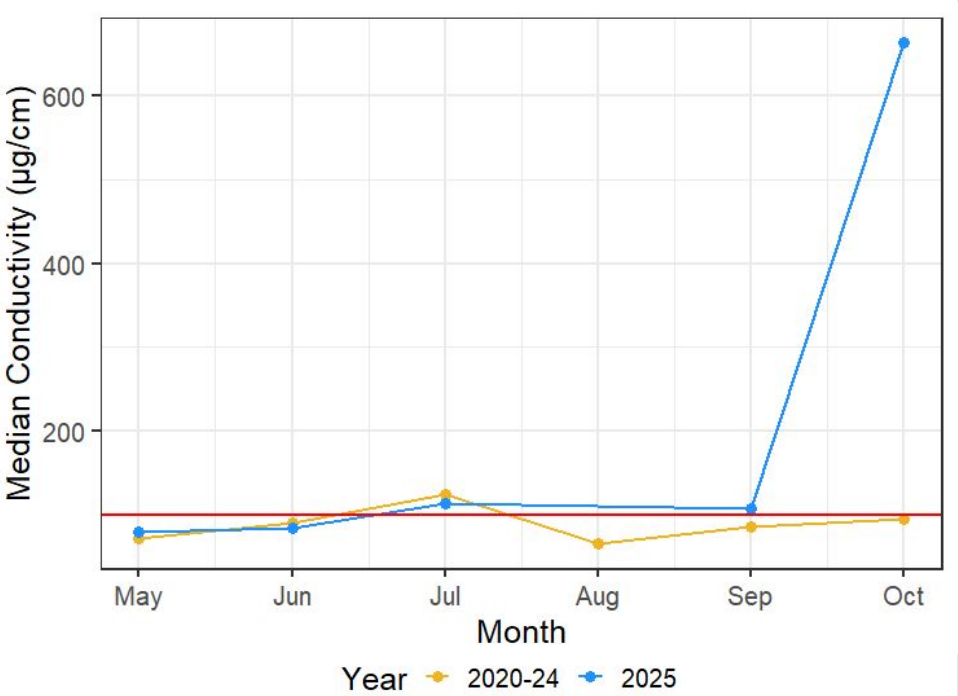
- Monitored since 2013
- Parameters measured: pH, turbidity, temperature, conductivity, DO, TP



Parameter	Status	Change
pH	Within ideal range	Small decrease from 2024
Turbidity	Within ideal range	Small decrease from 2024
Total Phosphorus*	Within ideal range	Small decrease from 2024

Conductivity

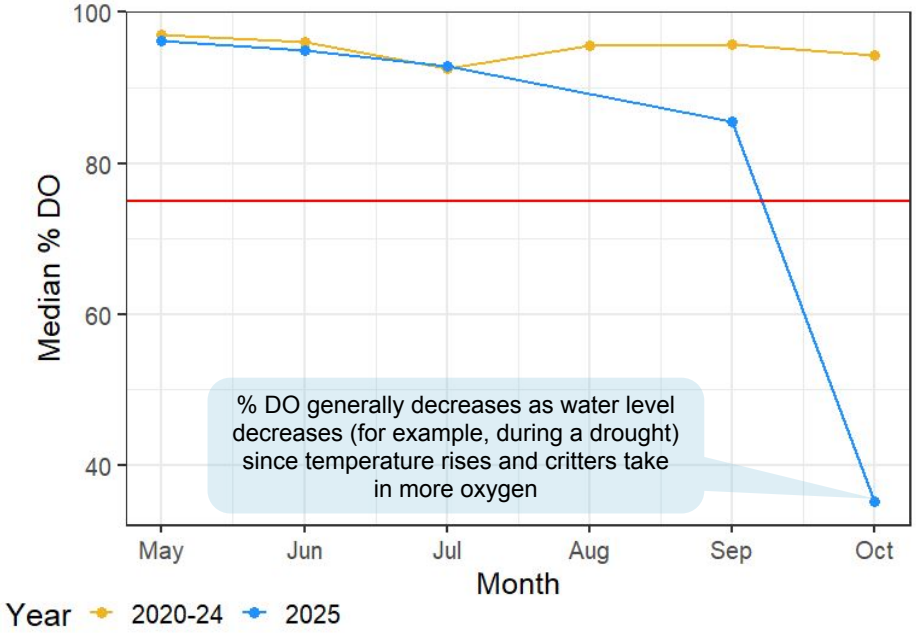
Similar trend in conductivity throughout the 2025 sampling season as previous years, although values remain above the ideal range after Jul and peak in Oct, likely due to the drought.



*values only available up to Nov 2025

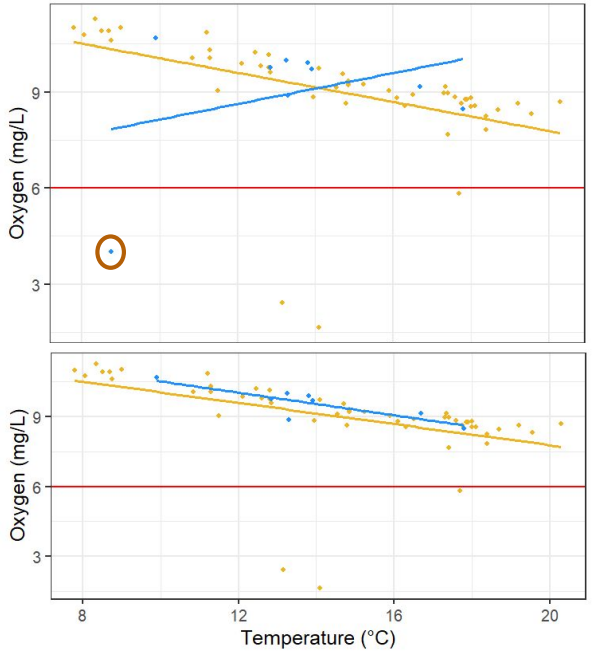
% Dissolved Oxygen

Consistent values from 2020 to 2025, although % DO dips below the ideal range in Oct, likely due to the drought.



DO & Temperature

Stronger inverse relationship in 2025 than 2024 after removing the outlier value which was a result of the drought.



Mill Brook (GM-5)

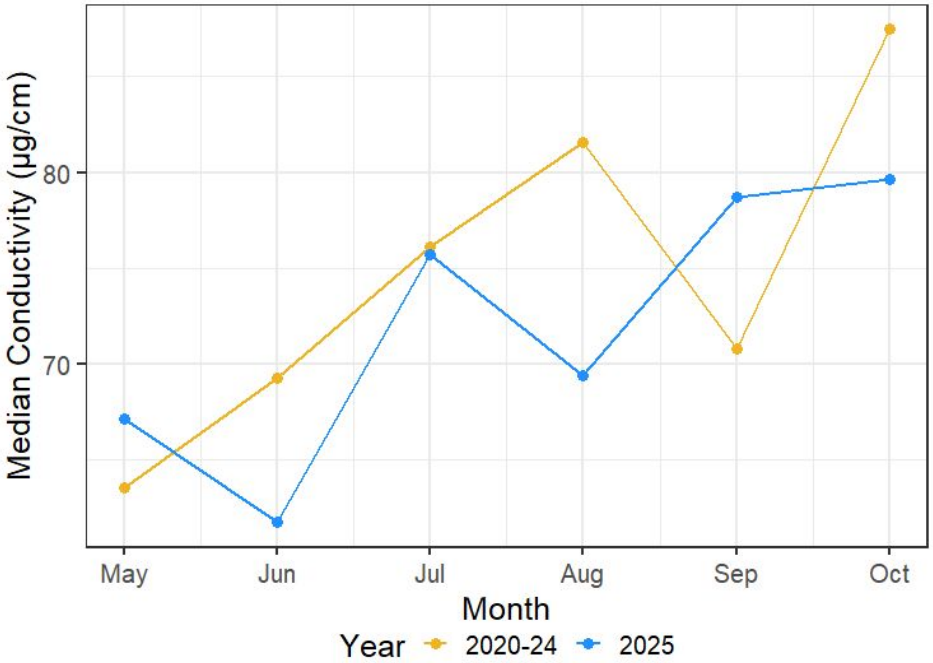
Data analyzed from May 2020 - Oct 2025

- Monitored since 2013
- Parameters measured: pH, turbidity, temperature, conductivity, DO, TP

Parameter	Status	Change
pH	Within ideal range	Small decrease from 2024
Turbidity	Within ideal range	Small decrease from 2024
Total Phosphorus*	Within ideal range	No change from 2024

Conductivity

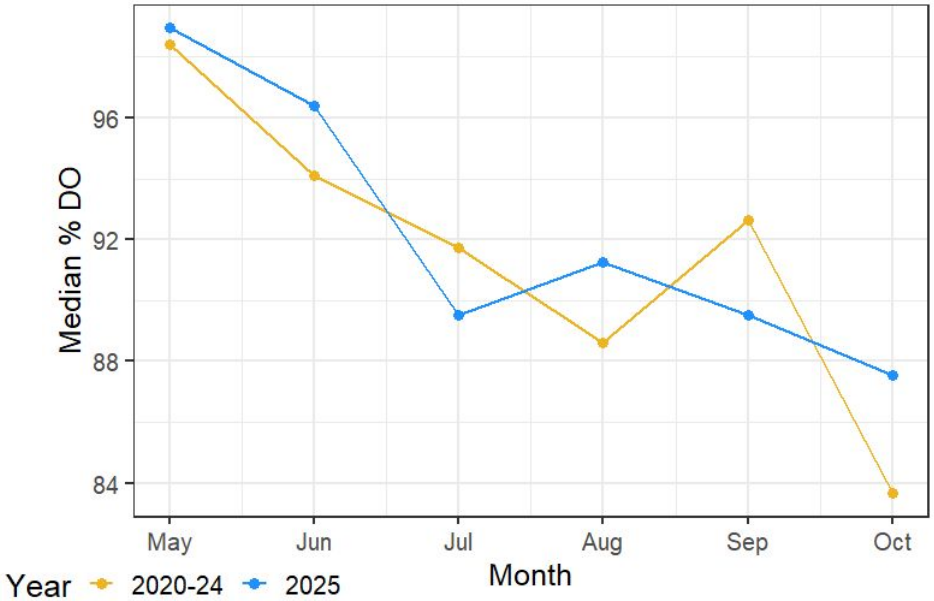
Similar increase over sampling period in 2025 as previous years, with all values in the ideal range.



*values only available up to Nov 2025

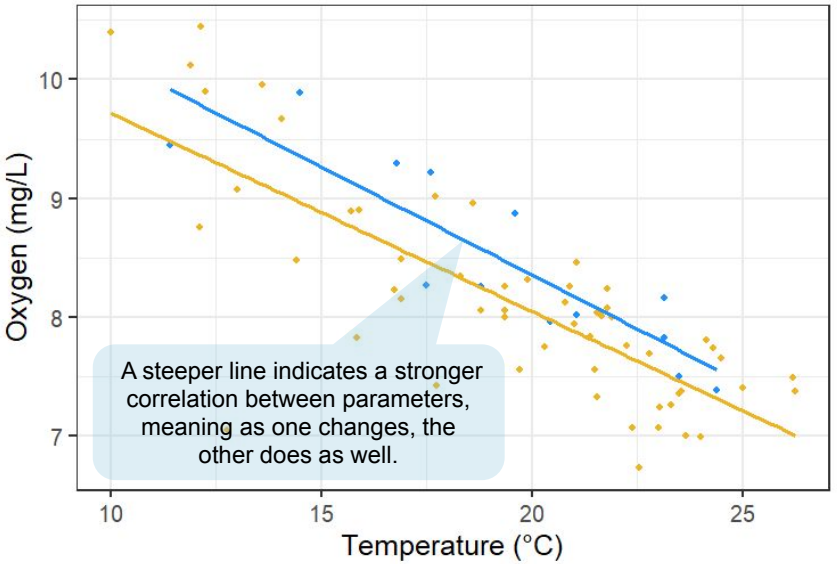
% Dissolved Oxygen

Similar decreasing trend in % DO from May to Oct across the years, with values falling within the ideal range.



DO & Temperature

There is a consistent inverse relationship between parameters in 2020-24 and 2025, although there is a stronger correlation in 2025. All values stayed within the ideal 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 concern.

Parameter	Summary
Conductivity	Similar trend to previous years although with some unique high values outside the ideal range (**sites GM-1, GM-3, GM-4**) likely due to the drought.
Turbidity	Majority slightly lower than 2024, within ideal range.
pH	All sites exhibited small decrease in pH, within ideal range.
% Dissolved Oxygen	Followed similar trends to previous years although with some unique low values (**sites GM-3, GM-4**) likely due to the drought.
DO & Temperature	Consistent inverse relationships.
Total Phosphorus (TP)	Change varied across sites with the majority experiencing a small decrease. All fell within ideal range.

What can Madison do to protect its water?

In Towns

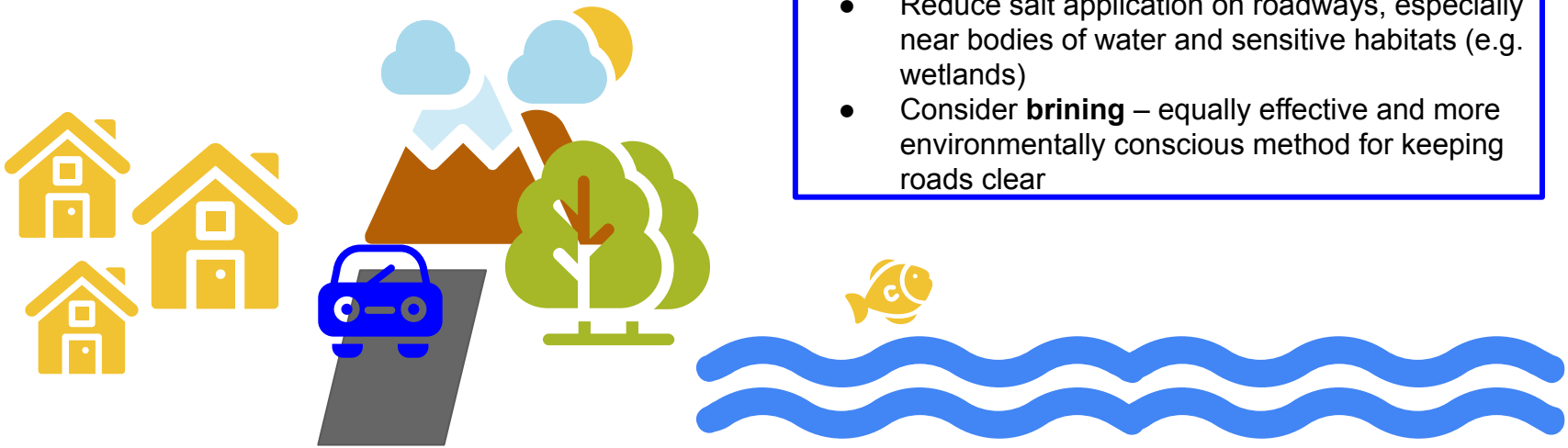
- Monitor the effectiveness of culverts
- Work to replace culverts posing as safety and environmental hazards
- Maintain riparian areas (Streamside Management Zones) and monitor habitats near bodies of water for major changes

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 (e.g. wetlands)
- Consider **brining** – equally effective and more environmentally conscious method for keeping roads clear



THANK YOU FOR YOUR TIME!

Report respectfully submitted by:

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C. Gersten, *Water Quality Resource Assistant*

AmeriCorps

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