Tamworth Water Quality Overview

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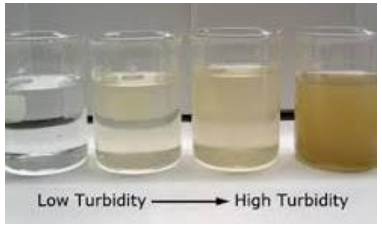
RIVERS parameters

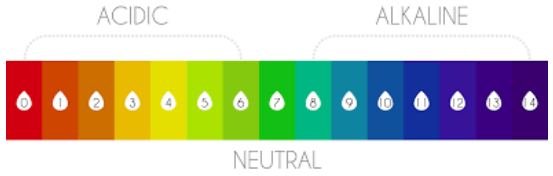
GMCG volunteers tested parameters

- Turbidity
  - Clarity of the fluid
  - Higher level of suspended particles = higher temperature

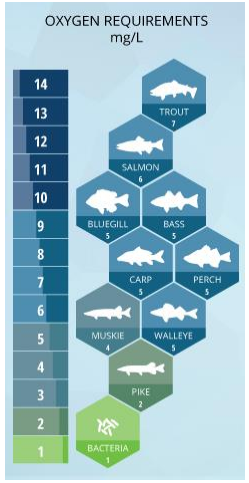


- Temperature
  - Metabolism increases with higher temperatures, which can result in lower DO readings
  - Different organisms prefer different temperatures

- pH
  - Pure water is 7.0
  - Most natural water in NH is slightly acidic
  - Aquatic life prefers pH between 6.5 and 8.2



- Dissolved Oxygen
  - Measures ability to support life
  - VBAP school program looks for various macroinvertebrates which are intolerant to low DO readings



- Conductivity
  - Ability of water to pass an electrical charge
  - Based on other elements in the water that have positive (Mg^+, Ca^+) or negative (Cl^-, NO_3^-) charges
  - Proxy for road salt (NaCl or CaCl2)

- Total Phosphorus (TP)
  - With nitrogen, the two most important nutrients for plant and microbe life
  - Environmental increases indicate decomposition (i.e. sewage)

- General changes to their site
  - Road work
  - New construction/demolition

Water Quality Standards – Acceptable limits

Either from NHDES or EPA*

- Dissolved O2: between 6-11mg/L and between 75% and 120%
- Conductivity: below 500uS/cm
- pH: between 6-8, preferably close to 6.5, unless naturally occurring as less, then no more than 1 pH shift
- Turbidity: less than 10 NTU, unless baseline data indicates naturally occurring turbidity, then standard is less than 10 NTU above background levels (in our cases, there are no sites with naturally occurring turbidity above 10 NTU
- Temperature: No standard, but monitored for changes
- Total P: under 30ug/L, over this is considered “nuisance levels”

Each site we monitor will have naturally occurring differences due to geology, plant life, etc.

*The EPA and NHDES have slight differences between their acceptable limits

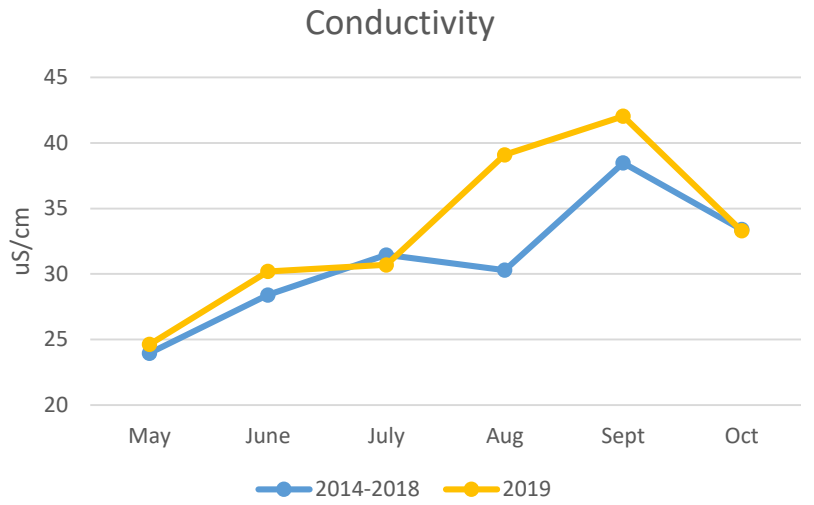
GT-1 Bearcamp River 2014-2019 snapshot

Monitored since 2002

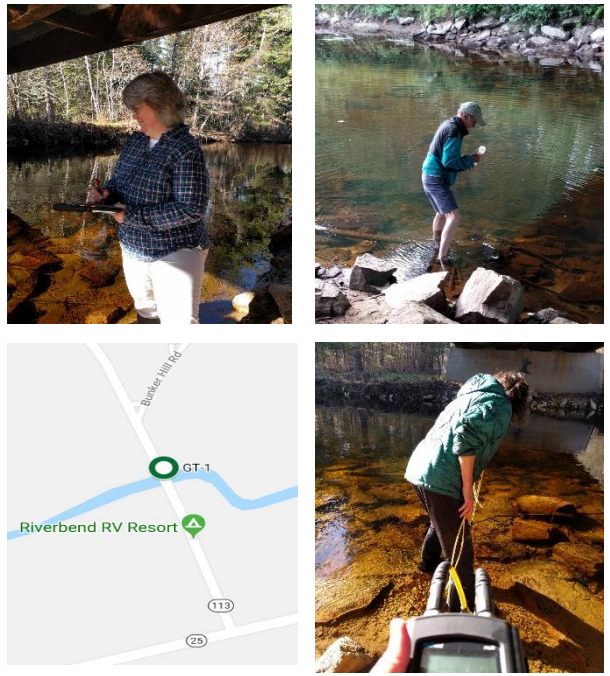
Collecting for: pH, turbidity, TP, temperature, conductivity, dissolved O2
Tamworth, Sandwich, and Wonalancet volunteers sample this site

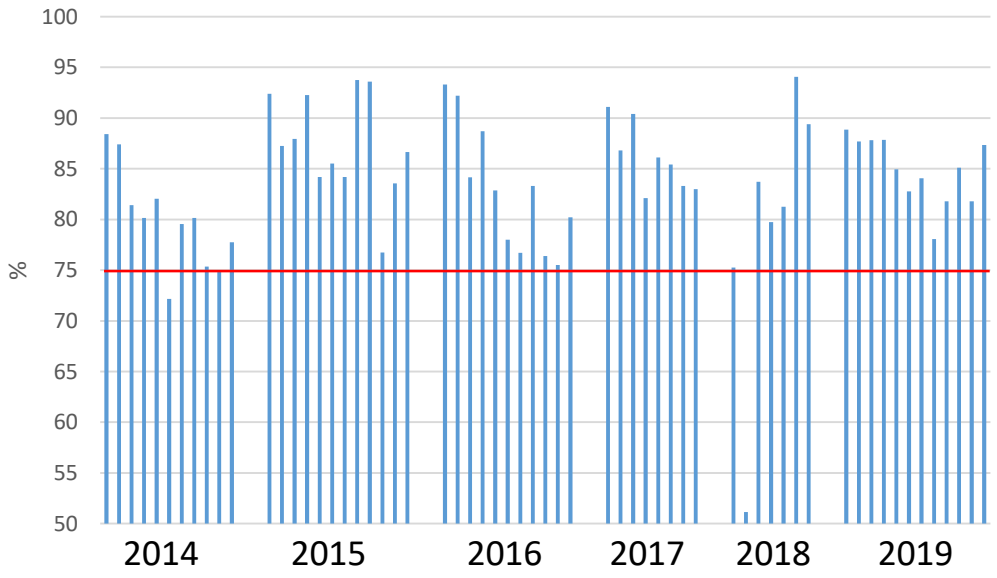
Parameter	Explanation
pH	Stable
Turbidity	Stable
Total P*	Slightly worsening but still well within acceptable limits

*Data available through 2018

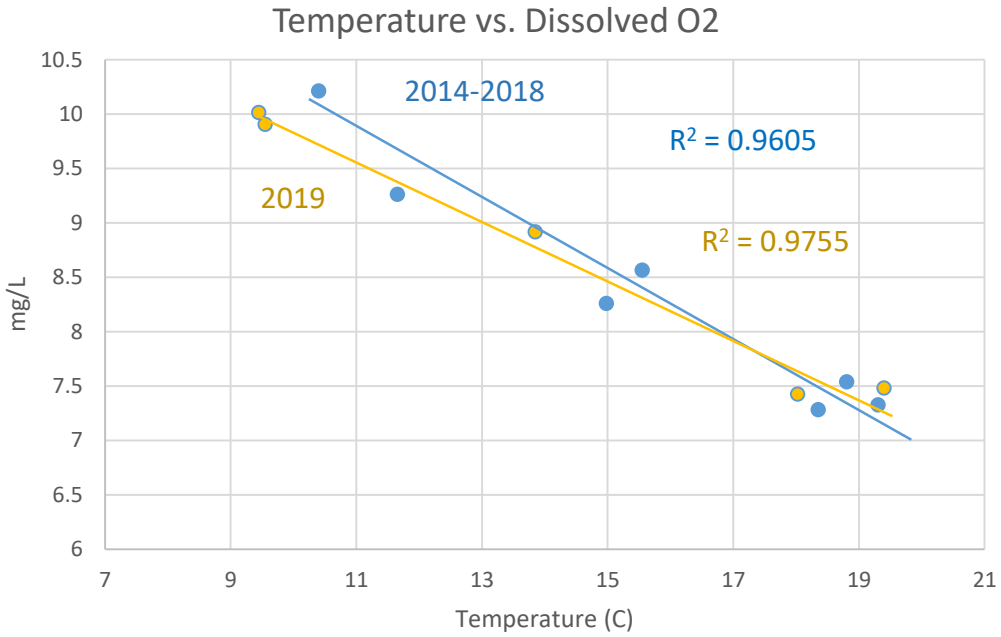


Site location





Above 75% is ideal for life



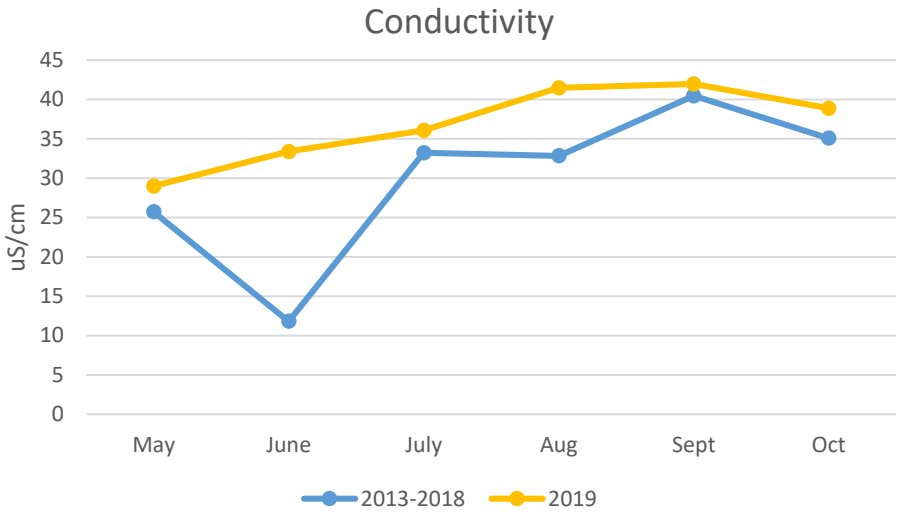
GT-5 Swift River 2014-2019 snapshot

Monitored since 2005

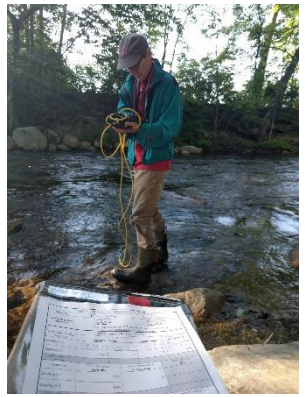
Collecting for: pH, turbidity, TP, temperature, conductivity, dissolved O2
Tamworth and Wonalancet volunteers sample this site

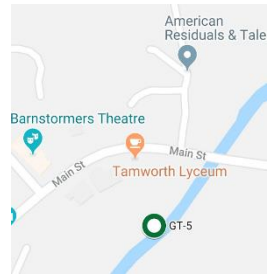
Parameter	Explanation
pH	Stable
Turbidity	Stable
Total P*	Stable

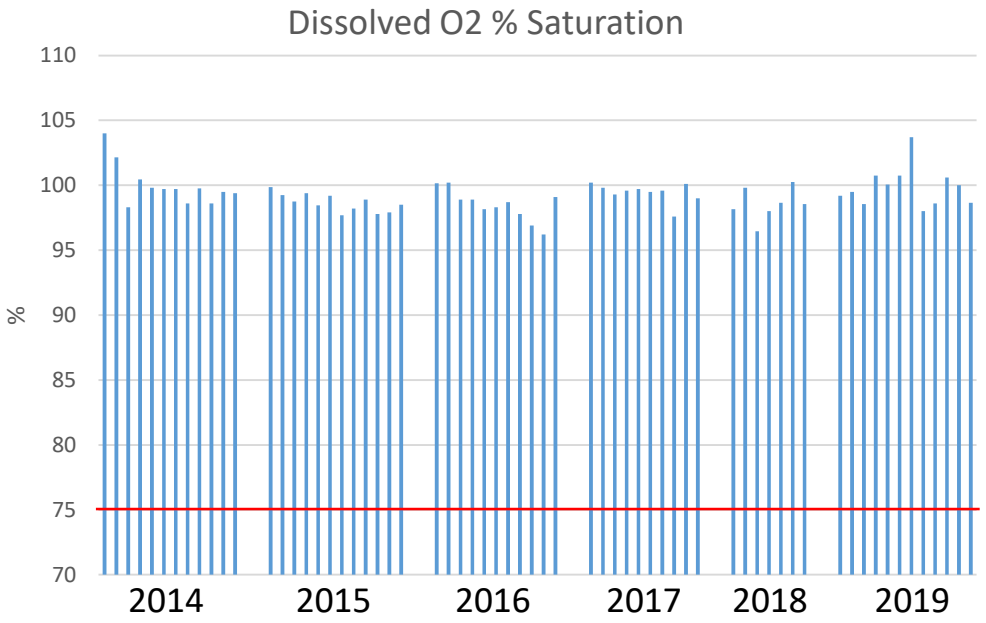
*Data available through 2018



Site Location







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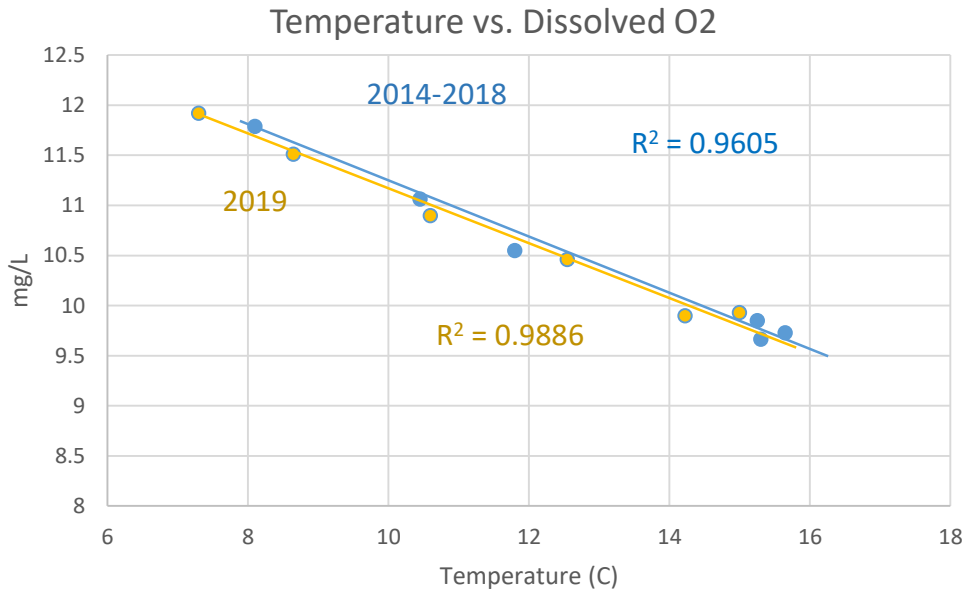


GT-4 Chocorua River 2014-2019 snapshot

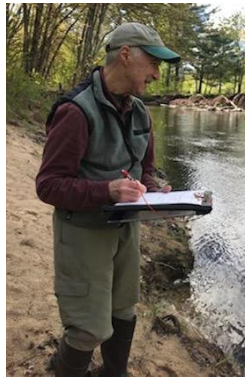
Monitored since 2004

Collecting for: pH, turbidity, TP, temperature, conductivity, dissolved O2, TN, cations, anions, silica, DOC

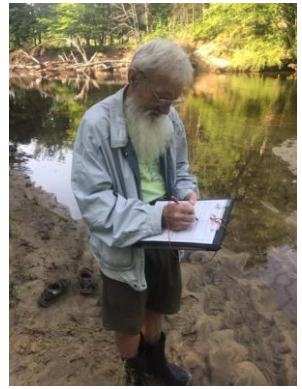
Tamworth volunteers sample this site

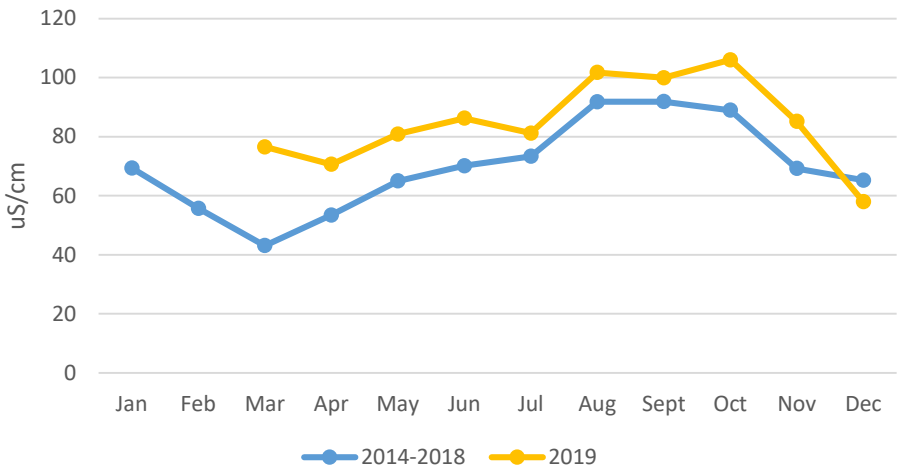
Parameter	Explanation
pH	Stable
Turbidity	Stable
Total P*	Improving but has been under acceptable limits

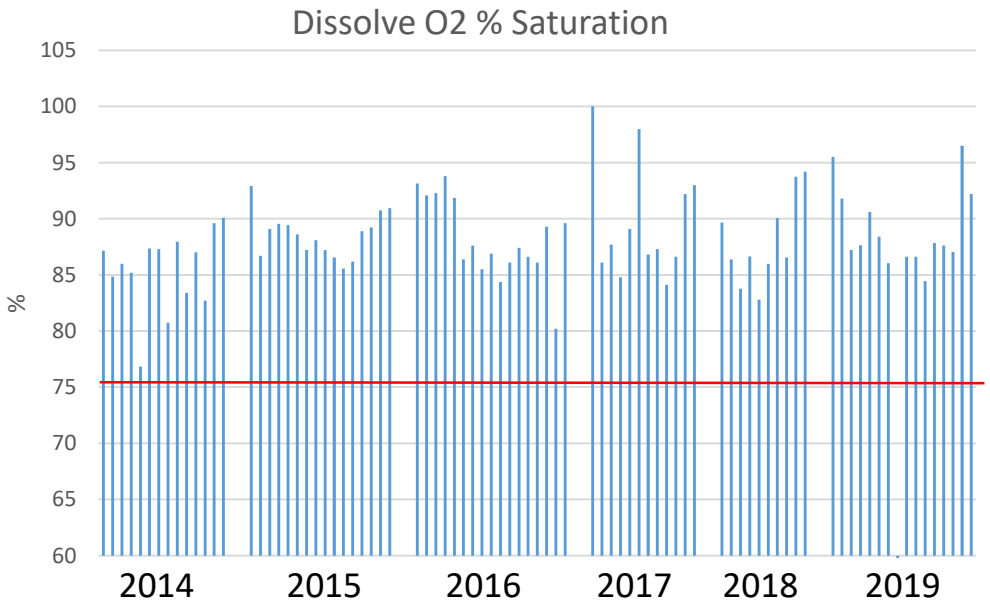
*Data available through 2018



Site location







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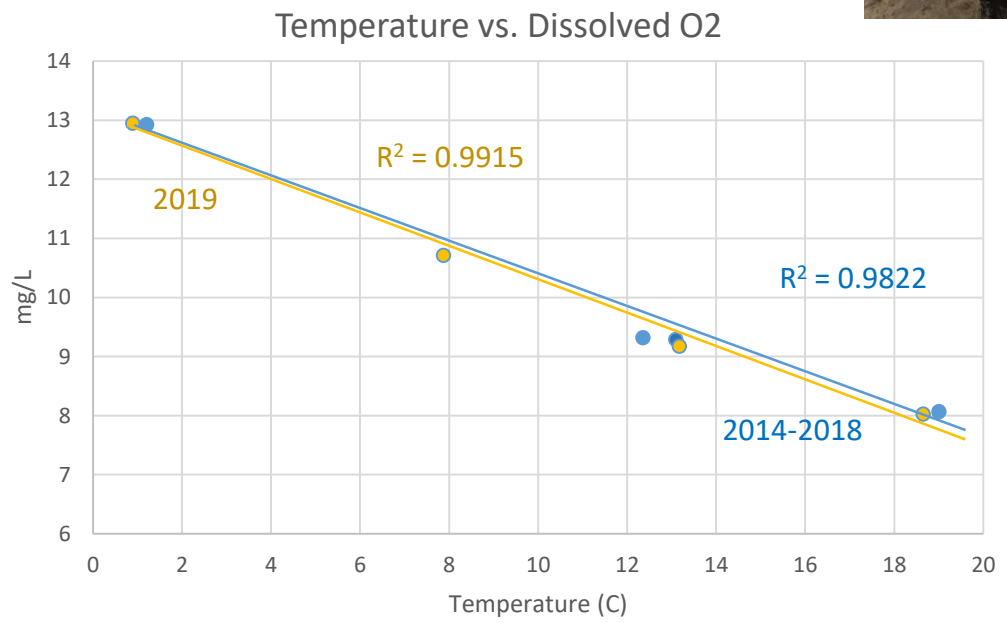

GT-4 Chocorua River 2014-2018 snapshot

Monitored since 2004

Parameter	2014-2018 Evaluation*
Ammonium	Improving - with exception to 2017
Nitrate	Stable
Total dissolved nitrogen	Stable
Dissolved organic nitrogen	Stable
Chloride	Increasing
Sodium	Increasing
DOC	Stable
Sulfate	Stable
Magnesium	Stable
Orthophosphate	Stable

*Data currently available only through 2018

Higher levels of sodium and chloride indicate an increase in road salt (rock salt) in the 2018 season. As 2019 levels of conductivity are much higher than previous years, I suspect the sodium and chloride levels of 2019 will be higher than what was seen in 2018 (data not currently available to verify).

Projected school programs for 2020

GET WET: Drinking water education program. Students screen their drinking water for a variety of parameters

VBAP (fall 2020): Volunteer Biological Assessment Program. Students learn about macroinvertebrates and what they tell us about water quality. They become citizen scientist for a day following a collection protocol and then after they've processed their data, present it at a town presentation.

GMCG programs for 2020

- Bird club (every other week – next is Jan. 21 & 22, 9-10am): Part of Cornell's Project: FeederWatch program
- Ossipee Aquifer Advisory Committee (Jan. 29th 5pm): working to protect the Ossipee Aquifer
- Animal Tracking (Feb. 1 10am): Learn about NH's winter wildlife and try your hand at identifying fresh tracks!
- GET WET (Madison Town Library, Feb. 14 4-6pm): Bring a sample of your drinking water to be screened for a variety of parameters
- Annual Meeting (March 14th at the Preserve in Chocorua, 1-4pm): Naturalist David Carroll is the keynote speaker