

The Data Is In...

FoRR took to the river with two volunteers on **Wednesday, December 15** to monitor at our three sites along the Reedy River! Our other two sites were monitored by our board member who was accompanied by two additional volunteers on December 8. Thank you to the volunteers who joined to learn more about water quality monitoring! Our sites include the following:

Site #1: Reedy River along the Swamp Rabbit Trail, downstream of Swamp Rabbit Cafe

Site #2: A small tributary of the Reedy River in Falls Park

Site #3: Reedy River behind the ReWa headquarters (near our new office!)

Site #4: A tributary on Greenville Tech's Brashier campus in Simpsonville

Site #5: A tributary in Cedar Falls Park in Simpsonville

The pH results this month were consistent with our findings in November at all five of our reported sites. ReWa and Greenville Tech Brashier's results were exactly the same and the remaining three sites showed slightly higher (less acidic) results.

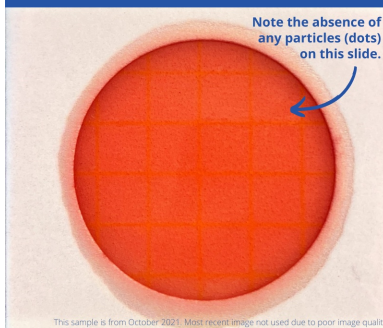
The dissolved oxygen (DO) for nearly all sites increased slightly, sustaining the trend of gradually increasing DO levels as temperatures drop. The only site that did not fit that trend this month was Greenville Tech Brashier which decreased by 0.4 mg/L. This can be explained by rainfall that occurred the night before sampling and a significantly higher than usual water level. The recent precipitation can also explain this site's higher than usual conductivity reading as conductivity increases with the introduction of more dissolved solids to the water- a product of precipitation runoff and higher flow levels. Conductivity readings were relatively consistent from November to December at the other four sites.

The most noticeable results were our bacteria counts. The ReWa and Swamp Rabbit Cafe sites showed a significant decline in bacteria levels, likely due to cooler temperatures, lower rainfall levels, and normal flow levels. Greenville Tech Brashier and Cedar Falls Park showed increases in colony forming units that can be explained by rainfall the night before sampling at both sites, and significantly higher flows at Greenville Tech Brashier. These results were all typical for the conditions under which they were sampled.

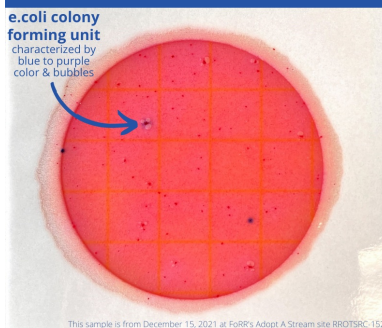
The most unusual bacteria result came from the Falls Park monitoring location. While 0 cfu/100mL would usually be a terrific result for our waterways, **the appearance of these plates after 24 hours of**

incubation was extremely unusual for a natural waterway and prompted further investigation.

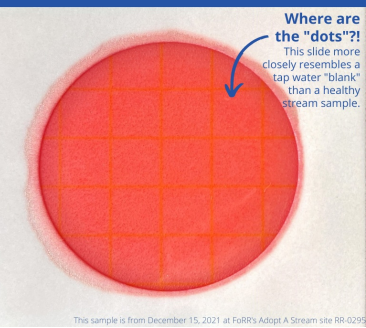
Example of tap water "Blank" slide after 24 hours of incubation



Example of typical bacteria results after 24 hours of incubation



Falls Park December 2021 bacteria results after 24 hours of incubation



The complete lack of evidence of any aerobic bacteria is typically only found in a “blank” plated sample- one that has been plated with fresh water (we use tap water) to serve as a controlled sample for comparison. Finding these entirely blank results in a natural waterway, just feet from its confluence with the Reedy River, led us to look upstream. We sample approximately 15 feet downstream of an outfall pipe that directs flow into the tributary. This pipe’s origin is currently unknown by FoRR as it is embedded in the hillslope, but we suspect that at this time, some type of freshwater source (perhaps a draining fountain, pool, irrigation system, broken water line, etc.) is being redirected to the top of the pipe and then flowing into this small tributary.

Because these results are highly unusual and not suitable to provide habitat to most aquatic organisms that are not acclimated to this type of environment (please note the small scale of this stream: it likely does not provide habitat for a large number of fish, but could potentially support macroinvertebrates), we have alerted local officials of our findings and plan to work with them to discern why our sample produced these results. While finding what we presume to be freshwater is certainly a better alternative to water that is inundated with e.coli colony forming units, it is not a normal result and can still provide its own challenges to an aquatic system. We look forward to providing an update in next month’s “The Data Is In...” newsletter.

Even with the unusual bacteria findings, all results this month were within state standards and typical for this time of year.

We have included the SC State Standards below for comparison to our results.

Location	pH	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	Bacteria (Colony Forming Units/100 mL)
State Standards	6-8.5	No less than 4, average of 5	n/a	>349 is considered "high" Over 1,000 is problematic
Swamp Rabbit	6.5	9.9	50	67
Falls Park	6.5	8.9	100	0
ReWa	6.5	10	80	100
Greenville Tech Brashier	7	9.3	500	500
Cedar Falls Park	7.5	10	200	267



- **pH** is a way of measuring the H⁺ ions in a water sample, or if the sample is acidic or basic. pH is influenced by the concentration of acids in rain, and the types of soils and bedrock present in the watershed. Ideally, rivers will have a neutral pH, or a value of 7.
- The available **dissolved oxygen (DO)** in a water sample is important for fish health and life within a body of water. DO can increase in lower temperatures, turbulence in the water, photosynthesis in the stream, and diffusion from the atmosphere. DO can decrease in higher temperatures, in slow-moving and deep water, and in the presence of decaying organic matter.
- **Conductivity** is the ability of the water to pass an electric charge and shows the presence of ions in the water, such as salt, nitrate, phosphate, and many others. The bedrock in the watershed can also affect conductivity
- **Bacteria** counts are found by incubating a water sample that was placed on a medium, then counting the number of coliform forming units. These values are higher in areas where animals are present so always remember to pick up after your pets and don't feed the geese in the park!

Sign up to join the FoRR monitoring team [HERE!](#)

Find an SC Adopt-a-Stream event near you to become certified [HERE!](#)

The FoRR Monitoring Team uses SC Adopt-a-Stream techniques and has its own monitoring kit,

thanks to Ivy Salon!

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River

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