

2022 White River Water Quality Report

The White River Partnership (WRP) is a community-based organization working to protect and improve clean water in Vermont's White River.

One of the ways we protect clean water is by gathering data at swimming holes and other recreational access sites along the river. This data helps us understand the river's "water quality"—whether or not the water in the river is clean and safe for swimming, tubing, and more.

This report summarizes water quality data collected by WRP staff and volunteers in summer 2022.

Why Do We Monitor Water Quality?

In 2001 the WRP started monitoring water quality in the White River to answer an important question: are bacteria and other pollution making the White River unsafe for recreation?

To address concerns about the safety of the river for swimming, tubing, and paddling, the WRP Water Quality Monitoring Program goals are:

- To raise awareness about water quality in the White River;
- To identify water quality problems; and
- To promote long-term stewardship.



The White River is a popular recreational destination.

What Do We Monitor?

Every other Wednesday from late-May through early-September, WRP staff and trained volunteers gather data at 22 recreational access sites along the White River (see map on page 2). The 3 types of data gathered include bacteria, conductivity, and turbidity data.

Bacteria

Monitoring bacteria is a practical way to identify potential water quality problems. Bacteria are microscopic, single-celled organisms that can be found in virtually any environment. One type of bacteria, *Escherichia coli* (*E. coli*), is commonly found in water.

E. coli is a rod-shaped bacterium that lives in the intestines of all warm-blooded animals. There are many different strains of *E. coli* and most are harmless to humans. *E. coli* bacteria found in the river come from many sources, including animal droppings, faulty or leaking sewage systems, stormwater runoff, and disturbed soil or stream sediments.

Because *E. coli* is common and easy to detect, our monitoring protocol uses *E. coli* to "indicate" the presence of other disease-causing pathogens. In other words, the presence of *E. coli* in the river means that there is an increased risk of exposure to pathogens.

Conductivity and Turbidity

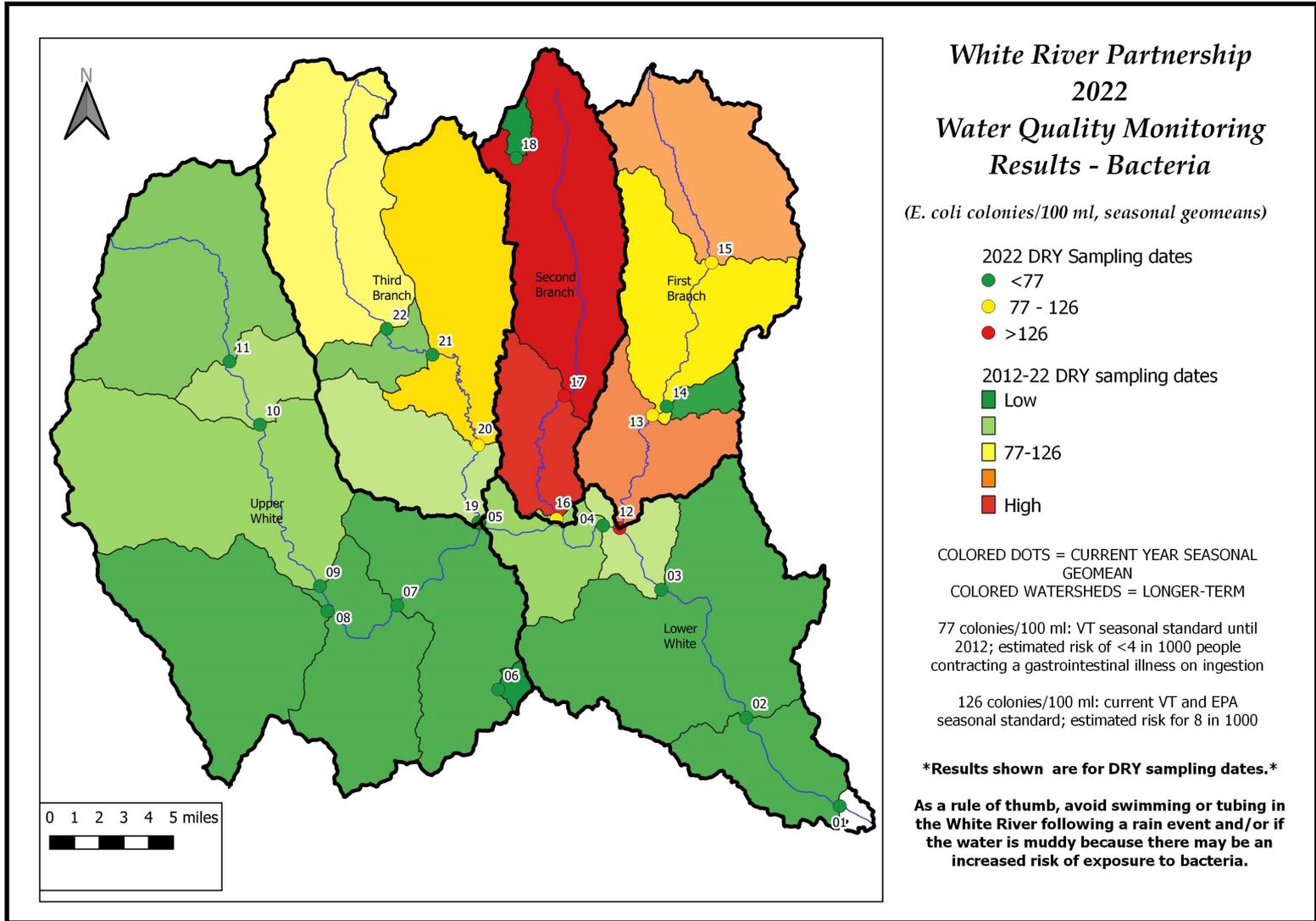
Conductivity and turbidity are also important indicators of water quality. Conductivity indicates the presence of dissolved salts and other compounds in the water. High conductivity readings may indicate increased runoff from roads and other sources. Turbidity indicates how clear or cloudy the water is. A high turbidity reading means that a high number of suspended solids are in the water, likely from erosion.

Where Do We Monitor?

The White River is the longest, undammed tributary to the Connecticut River. The entire watershed covers 711 square miles and is generally divided into five subwatersheds:

1) Lower White River, 2) Upper White River, 3) First Branch, 4) Second Branch, and 5) Third Branch.

In 2022 WRP staff and volunteers collected water quality data at the 22 locations depicted below.



Lower White River	First Branch
1. Old River Rd Ledges–Hartford	12. Mouth of 1st Branch–Royalton
2. West Hartford Bridge–Hartford	13. Tunbridge Fairgrounds
3. The Sharon Academy–Sharon	14. Tunbridge Town Pool Tributary
4. Pinch Rock–Royalton	15. Chelsea Recreation Park
	Second Branch
Upper White River	16. Mouth of 2nd Branch–Royalton
5. Peavine Park–Bethel	17. Dugout Road–Randolph
6. Silver Lake–Barnard	18. Sunset Lake–Brookfield
7. Gaysville Bridge–Stockbridge	Third Branch
8. Mouth of Tweed–Stockbridge	19. Mouth of 3rd Branch–Bethel
9. Peavine Observation Site–Stockbridge	20. Stock Farm Road–Bethel
10. Lion’s Club Park–Rochester	21. Randolph Recreation Park
11. Taylor Meadow Road–Hancock	22. Riford Brook Road–Braintree

How Do We Analyze Our Data?

We analyze water samples for bacteria using the Idexx QuantiTray 2000 system. We then compare our results to two different EPA standards for recreational waters:

1. The “single sample” or “daily” standard looks at one sample from one site on one particular day. The **EPA daily standard is 235 colonies/100 milliliter (mL)** for contact recreation, which means that roughly 8 in every 1,000 people in that water may have an increased risk of getting sick.
2. Because bacteria levels are constantly changing, the EPA “geometric mean” or “seasonal” standard looks at bacteria levels over the course of a whole season for one site. The **EPA seasonal standard is 126 colonies/100 mL**. By calculating the seasonal standard, we can identify trends occurring at each sampling site over time. At the suggestion of state scientists, we also calculate the seasonal standard for each location based on “wet” (recent significant rain) and “dry” weather conditions.

2022 Bacteria Data Findings (view bacteria data online: <http://whiteriverpartnership.org/reports/>)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
# of samples over the daily standard (235 colonies/100mL)	44 of 191 = 23%	45 of 195 = 23%	51 of 197 = 26%	41 of 195 = 21%	34 of 203 = 17%	23 of 202 = 11%	27 of 175 = 15%	37 of 175 = 21%	29 of 175 = 17%	38 of 175 = 22%
# of samples “off the chart” (>2419 colonies/100mL)	4	2	8	5	5	1	1	11	5	0
# of sites over the seasonal standard (126 colonies/100mL)	9 of 22	7 of 22	10 of 22	6 of 22	8 of 23	7 of 23	5 of 22	5 of 22	6 of 22	7 of 22

- **There were more samples over the daily standard in 2022 than in 2021. But only 5 of 38 high readings occurred on dry dates.** During summer 2022, 5 data collection dates were “wet” (significant rain on or before the date) and 3 dates were “dry” (no rain on or before the date). The data show that most of the high readings occurred on wet dates. Typically rainfall means higher bacteria levels.
- **There were no “off-the-chart” readings for the first time since 2008.** Overall summer 2022 was very dry and water levels in the river were very low. In addition, even when it rained, it didn’t rain hard enough to raise water levels in the river significantly. So, even when bacteria readings were higher than the daily standard, they weren’t off-the-chart high.
- **7 sites exceeded the seasonal standard.** The seasonal standard is useful for tracking trends at sites. In 2022, 5 of 8 data collection dates were “wet”. Sites exceeding the seasonal standard had several locally heavy showers with high readings, and three sites (on 1st and 2nd Branches) also had high “dry” date readings. These were the sites that exceeded the seasonal standard.
- **Since 2013, only 7% of seasonal exceedances have occurred on the mainstem.** In general, sites on the main stem have lower bacteria readings, even during “wet” data collection dates.
- **In addition we analyze conductivity and turbidity results, as well as nutrient data collected through a partnership with the state, to identify relationships between these data and bacteria levels.** To learn more, visit <http://whiteriverpartnership.org/reports/>.

What Do The Monitoring Results Mean?

The 2022 findings confirm our understanding of water quality on the White River: rainfall increases bacteria levels on the White River. As a result, the WRP recommends taking precautions when deciding to swim or tube in the White River:

As a rule of thumb, avoid swimming or tubing in the White River following a rain event and/or if the water is muddy because there may be an increased risk of exposure to bacteria.

How Do We Improve Water Quality?

Plant Trees Along the River: Native trees growing along riverbanks provide many benefits, including improving water quality by filtering pollutants out of surface runoff; improving habitat by providing food and cover for fish and wildlife; and reducing flood impacts by stabilizing riverbanks and slowing flood waters. Help us provide these benefits by protecting existing trees on your riverbank or having **FREE TREES** planted along your riverbank through the **WRP's Trees for Streams Program**.

Cleanup the River: Trash in the river can make water quality and recreational access unsafe. Help us keep the White River clean and accessible by removing trash along the river when you see it or by volunteering with the **WRP's River Cleanup Program**.

For more information about WRP Programs, visit www.whiteriverpartnership.org.



WRP staff and partners planted 5,535 trees and removed over 8,000 pounds of trash along the White River in 2022.

Upcoming Events

In 2023 WRP staff and volunteers will monitor water quality on May 31; June 14 and 28; July 12 and 26; August 9 and 23; and September 2. Bacteria data will be posted online at www.whiteriverpartnership.org/water-quality-results and www.facebook.com/WhiteRiverPartnership.

Special Thanks

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For More Information

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