White River Partnership 2017 Water Quality Report

The White River Partnership (WRP) is a grassroots, nonprofit organization bringing people and communities together to improve the long-term health of the White River and its watershed in east-central Vermont. A watershed is an area of land that drains to a common waterway – in our case, the White River.

This report summarizes water quality data collected by WRP staff and volunteers at 23 sites along the White River and its tributaries during summer 2017.

Why Do We Monitor Water Quality?

In 2001 the WRP launched the first citizen-based, water quality monitoring program in the White River watershed in response to concerns that bacteria and other pollution might be making the White River unsafe for recreation. To address these concerns about the safety of the river for swimming, tubing, and paddling, the WRP Water Quality Monitoring Program goals are:

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

The White River is a popular recreational destination.

What Do We Monitor?

Every other Wednesday from June through September, WRP staff and trained volunteers monitor bacteria, conductivity, and turbidity at 23 swimming holes and recreational access sites along the White River (see map on page 2).

<u>Bacteria</u>

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. The presence of *E. coli* in the river does not necessarily mean that the river is unsafe for swimming and tubing, just that there is an increased risk of exposure to pathogens.

<u>Conductivity and Turbidity</u>

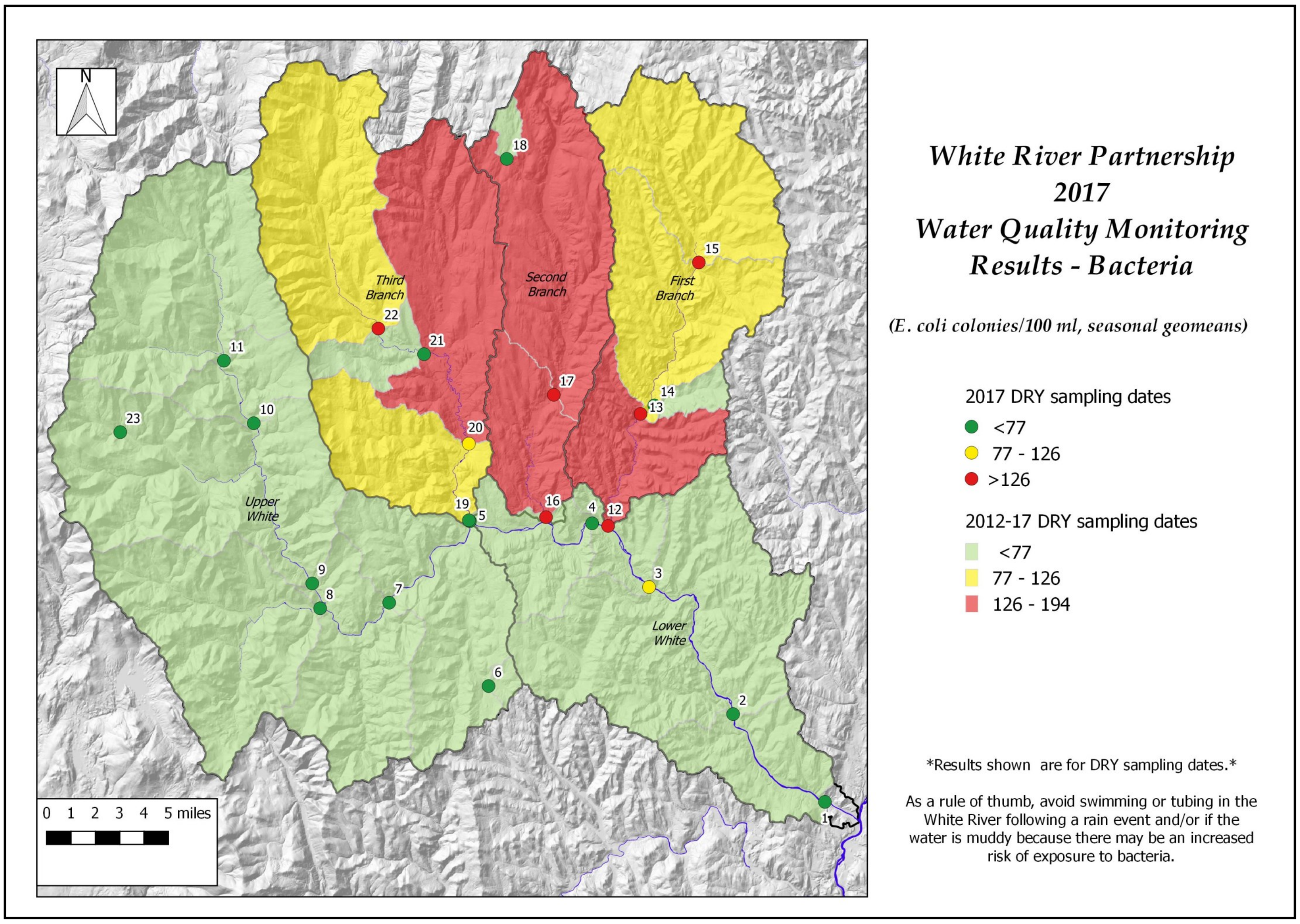
Conductivity and turbidity are also important indicators of water quality. Conductivity indicates the presence of dissolved salts and other compounds in the water. High conductivity readings may indicate increased runoff from roads and other sources. Turbidity indicates how clear or cloudy the water 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; 5.Third Branch

In 2017 WRP staff and volunteers collected water quality samples from the 23 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 Park–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
23. Bingo Brook—Rochester	

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 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 “rainy” and “dry” weather conditions.

Conductivity and turbidity results are recorded and used to identify relationships between these data and bacteria levels.

2017 Bacteria Summary (see complete bacteria data online at www.whiteriverpartnership.org)

- **Bacteria levels are often high immediately after rain and generally low during dry weather**—Out of 203 total samples in 2017, 34 samples (17%) exceeded the EPA daily standard; 29 (85%) of these exceedances occurred on “wet” sampling days.
- **2017 had a mix of weather conditions.** Out of nine sampling dates, 4 were wet and 5 were dry.
- **Exceedances of the “daily” standard were the lowest in 5 years.** This was despite the mixed weather conditions.
- **The number of sites exceeding the “seasonal” standard increased from last year.** The 8 sites exceeding the seasonal mean in 2017 place this result in the middle of the pack for the last five years.
- **Overall the 2017 bacteria results continued a trend of lower levels since post-Irene 2012 results, but “the Branches” still had high readings.** Seven sites (3 on the First, 2 on the Second and 2 on the Third Branch) had bacteria levels exceeding EPA seasonal standards overall, and six of these exceeded seasonal standards under “dry” conditions. We continue additional “adaptive” monitoring to help understand these trends and develop projects toward mitigation.

	2013	2014	2015	2016	2017
# of samples exceeding the daily standard	44 of 191 = 23%	45 of 195 = 23%	51 of 197 = 26%	41 of 195 = 21%	34 of 203 = 17%
# of samples exceeding the chart maximum: >2419 colonies *E. coli*/100mL sample	4	2	8	5	5
# of sites exceeding the seasonal standard	9 of 22	7 of 22	10 of 22	6 of 22	8 of 23

What Do The Monitoring Results Mean?

Because of the relationship between rainfall and bacteria levels, the WRP recommends taking precautions when deciding to swim or tube in the White River and its tributaries.

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 a Tree
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**.

430 volunteers planted 3,400 trees and removed over 1,500 pounds of trash in 2017.

Upcoming Events

In 2018 WRP staff and volunteers will monitor water quality on May 30; June 13 and 27; July 11 and 25; August 8 and 22; and September 5 and 19. Bacteria data will be posted online at www.whiteriverpartnership.org and www.facebook.com/WhiteRiverPartnership.

Special Thanks

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For More Information

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