

White River Partnership 2016 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 22 sites along the White River and its tributaries during summer 2016.

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 22 swimming holes and recreational access sites along the White River (see map on page 2).

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. 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.

Conductivity and Turbidity

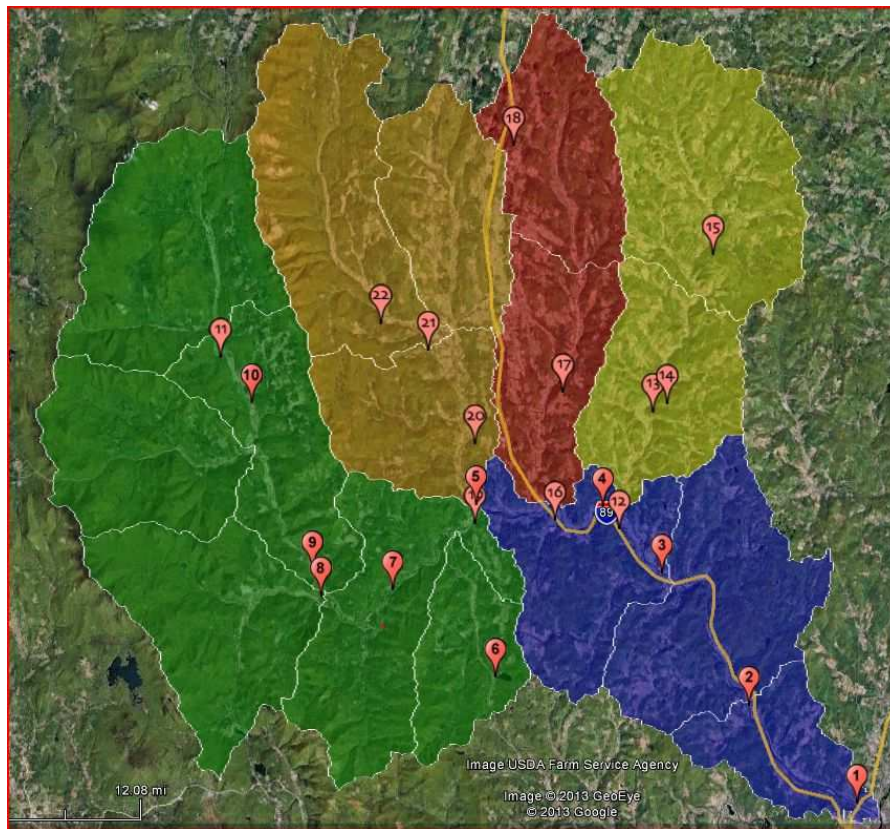
Conductivity and turbidity are also important indicators of water quality. Conductivity indicates the presence of dissolved salts and other compounds in the water. High conductivity readings may indicate increased runoff from roads and other sources. Turbidity indicates how clear or cloudy the water 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** (blue on map below),
2. **Upper White River** (green on map below),
3. **First Branch** (yellow on map below),
4. **Second Branch** (red on map below), and
5. **Third Branch** (orange on map below).

In 2016 WRP staff and volunteers collected water quality samples from the 22 locations depicted below.



Lower White River (blue)	First Branch (yellow)
1. Watson Park–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 (red)
Upper White River (green)	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 (orange)
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

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.

2016 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 195 total samples in 2016, 41 samples (21%) exceeded the EPA daily standard; two-thirds (28) of these exceedances occurred on “wet” sampling days.
- **2016 was dry**—Only two sampling dates were “wet”, and these only had scattered rain—primarily in up-stream portions of the basin. On one of these “wet” dates all sites except the lakes exceeded the EPA daily standard.
- **Overall the White mainstem looked good**—In part due to the dry weather, none of the White mainstem exceeded the EPA seasonal standard.
- **Lakes are clean**—“Silver Lake-Barnard” and “Sunset Lake-Brookfield” never exceeded the EPA daily or seasonal standards.
- **Overall the 2016 bacteria results continued a trend of lower levels since post-Irene 2012 results, but “the Branches” had high readings.** Six sites (two each on the First, Second and Third Branches) had bacteria levels exceeding EPA seasonal standards, both overall and under “dry” conditions. We continue to refine additional “adaptive” monitoring to help understand these trends.

	2012	2013	2014	2015	2016
# of samples exceeding the daily standard	85 of 190 = 45%	44 of 191 = 23%	45 of 195 = 23%	51 of 197 = 26%	41 of 195 = 21%
# of samples exceeding the chart maximum: >2419 colonies <i>E. coli</i> /100mL sample	17	4	2	8	5
# of sites exceeding the seasonal standard	17 of 22	9 of 22	7 of 22	10 of 22	6 of 22

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**.



750 volunteers planted 4,000 trees and removed over 1,000 pounds of trash in 2016.

Upcoming Events

In 2017 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 6 and 20. 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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