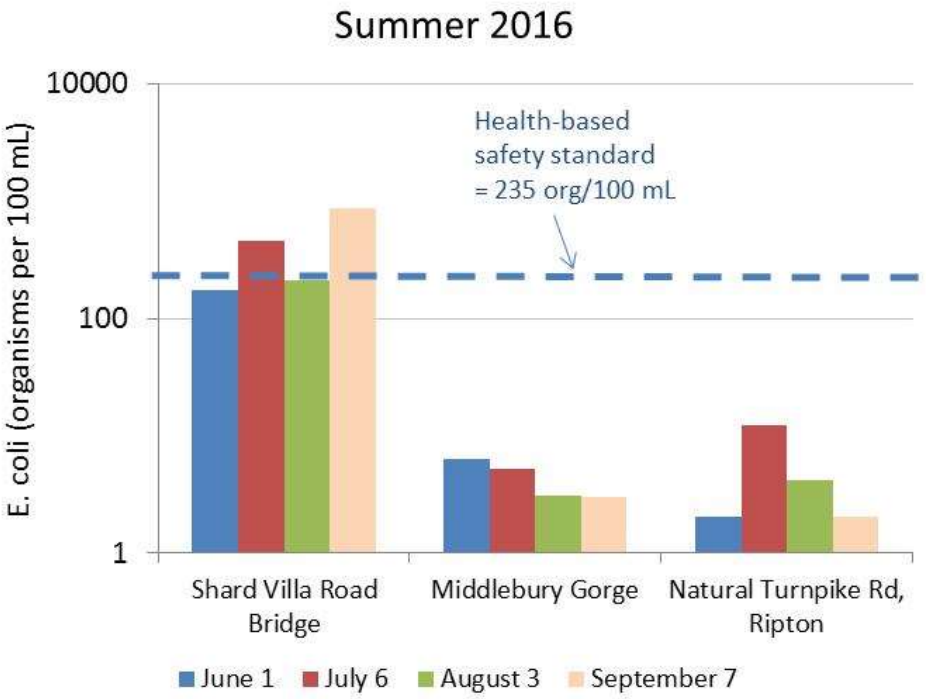
Middlebury River – 2016 Water Quality Summary
Addison County River Watch Collaborative

Site	Location	Town
MIR1.5	Shard Villa Rd. Bridge	Middlebury
MIR5.7	Midd. Gorge @ Rte 125 Bridge	Middlebury
MIR10.6	Natural Turnpike Road	Ripton

The Addison County River Watch Collaborative has been monitoring water quality in the Middlebury River since 1993. For years 2016 through 2019, the number of sampling locations in this watershed has been reduced to three sentinel stations monitored for longterm trends: MIR1.5, MIR5.7, and MIR10.6.

During 2016, sampling occurred on two spring dates (April 6 and May 4) and four summer dates (June 1, July 6, August 3, and September 7). Following a February thaw and final ice-out and snowmelt in early March, the April and May sampling events took place during relatively low flows, characterized as baseflow conditions on the river, based on streamflow gaging records from the nearby USGS streamflow gage on the New Haven River. Given below-normal rainfall, the June, July, August and September events occurred during low to very-low flows also representative of baseflow conditions (i.e., relatively stable flow stage, not significantly rising or falling in response to a rainfall or snowmelt event). On an average annual basis, flows in 2016 were below normal in the six Addison County watersheds monitored by the Collaborative.

Samples were tested for *E.coli*, total phosphorus, and turbidity; *E.coli* was tested only on the summer dates.



E.coli counts at Middlebury River sites ranged from 2.0 to 866 organisms/ 100 mL. Vermont Water Quality Criteria (October 2014) state that *E.coli* is not to exceed a geometric mean of 126 organisms /100mL obtained over a representative period of 60 days, and no more than 10% of samples should be above 235 organisms/100 mL. Samples obtained from the Shard Villa Road Bridge site contained *E. coli* in excess of the 235 org/100 mL health-based standard on two dates in 2016. The geometric mean of values from this site exceeded the geometric mean standard of 126 org/100 mL. At the popular Middlebury Gorge swimming site (MIR5.7), *E.coli* values were far below the health-based standard on all sample dates.

Based on previous years' monitoring results that include additional sites, *E.coli* counts show an increasing trend with distance downstream from the Middlebury Gorge. Developed and agricultural land uses dominate the river corridor in this lower end of the Middlebury River.

Turbidity levels in the Middlebury River during 2016 were relatively low, ranging from <0.2 to 9.6 NTUs, with an average level of 2.3 NTUs for all samples collected. The Vermont state standard of 10 NTUs (for Class B cold-water fisheries) is applicable during dry-weather, baseflow conditions which were relevant to all six sample dates. Detected concentrations were below the standard at all three sentinel sites on all six sample dates.

Based on past years' sampling results, turbidity can become elevated at times of increased flow – during a summer thunderstorm, or during spring runoff conditions – especially in the lower reaches of the river below the Route 7 bridge. A slight increasing trend in turbidity with distance downstream is generally observed during all flow conditions. Turbidity can occur as a result of high suspended sediments in the water (during moderate to high flows) and as a result of algae during low-flow conditions.

Phosphorus was detected at low levels during the six spring and summer sampling dates of 2016. Concentrations ranged from 5.8 to 21.9 µg/L. The instream phosphorus criterion of 27 µg/L for warm-water medium gradient (WWMG) wadeable stream ecotypes in Class B waters is applicable at low median monthly flow during June through October . Based on gaging records from the nearby New Haven River, flows in the Middlebury River were below the low median monthly flow on the July, August, and September sample dates. The mean of the results available for these three summer sampling dates was calculated as 21.2, 7.2 and 12.9 ug/L at MIR1.5, MIR5.7 and MIR10.6, respectively, each below the instream phosphorus criterion. Past years' sampling results, which include additional sites, show an increasing trend in phosphorus concentrations with distance downstream from the Middlebury Gorge.

2017: The Addison County River Watch Collaborative will continue to monitor for *E.coli*, total phosphorus and turbidity at these three sentinel sites on the Middlebury River in 2017. An increased number of parameters and additional monitoring sites will be evaluated when a more intensive monitoring focus rotates back to the Middlebury River for a two-year period beginning in the year 2020. Look for regular postings of *E.coli* results at new signposts installed at the Middlebury Gorge and at the parking area off Three Mile Bridge Road.

For more information, contact the Middlebury River sampling coordinator:
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