

# Cathance River Project - Water Quality Study 2017

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## Purpose:

How does the Cathance River water quality differ between a point farther upstream where it is slow moving, to downstream where the water is faster and more turbulent, and to a third point downstream, where the water is slow moving?

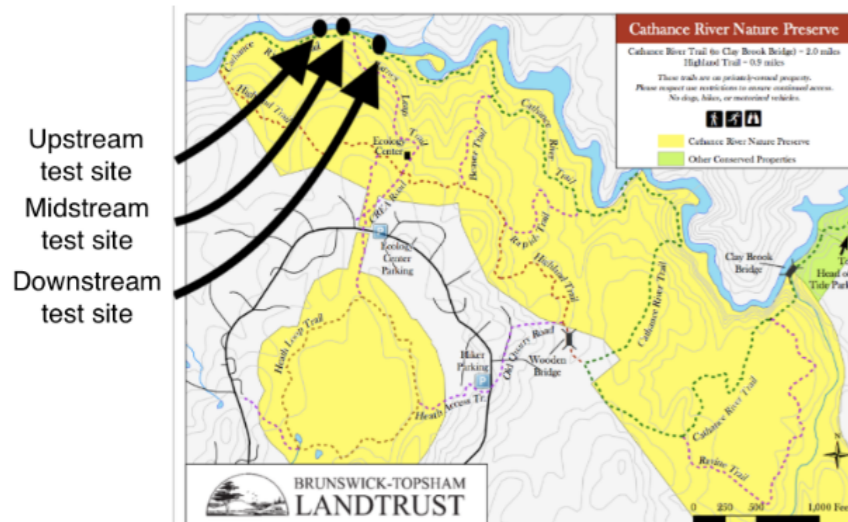
Is the Cathance River water quality acceptable?

## Hypothesis:

The water tests, levels, and qualities will differ in the different river locations, because of the different water speeds. The water quality will be better in a more turbulent area.

## Procedure:

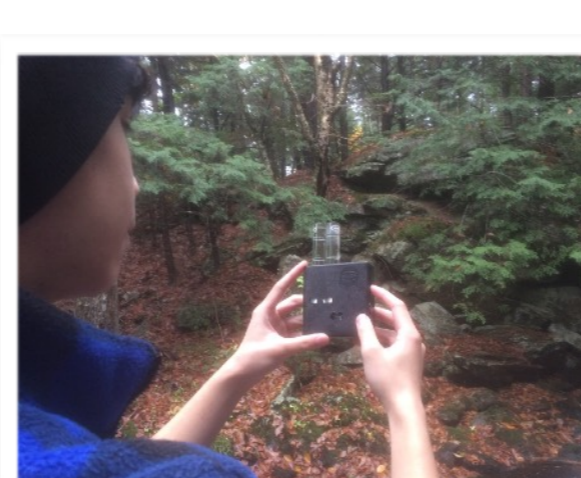
Travel to three sites along the river and run tests for water temperature, speed, depth, color, and conductivity. Also test for pH, Alkalinity, Dissolved Oxygen, Turbidity, Nitrates/Nitrites, and Salinity of the water. Obtain weekly precipitation data from the Cathance River Education Alliance (CREA) website.



Water quality measurement	Healthy range	Upstream Range	Midstream Range	Downstream Range
Conductivity	Greater than 50-1500 $\mu$ S/cm	202 - 291( $\mu$ S/cm)	168 - 331( $\mu$ S/cm)	267-331( $\mu$ S/cm)
Nitrate/Nitrite	Less than 1 ppm	0/0(ppm)	0/0(ppm)	0/0(ppm)
Dissolved oxygen	Greater than 4ppm	4.4 - 6(ppm)	5.5 - 6.4(ppm)	5.4 - 6.8(ppm)
Color	Less than 25 PCU	65 - 100 PCU	10 - 80 PCU	5 - 95 PCU
Salinity	Less than one ppt	2 - 6(ppt)	2 - 6(ppt)	2 - 5(ppt)
Alkalinity	20-200(mEq/L)	82 - 120(mEq/L)	100 - 130(mEq/L)	120 - 130(mEq/L)
pH	Around 6.5-8.5 pH	5 - 6pH	5.5 - 7pH	5.5 - 6pH
Turbidity	Between 0 and 25 JTU	5(JTU)	0 - 5(JTU)	0 - 5(JTU)
Water Temperature	Greater than 0°C, less than 32°C	15 - 20.8°C	12.2 - 20.2°C	12 - 15.9°C
Water speed	N.A	0.01cm/second - 1.25cm/second	33.3cm/second - 66.6cm/second	0.3cm/second - 0.9cm/second
Water Depth	N.A	42 - 66(cm)	6 - 22(cm)	12 - 29(cm)
Weekly Precipitation	N.A	0.02 - 10.5(cm)	0.02 - 10.5(cm)	0.02 - 10.5(cm)

## Conclusions:

- Overall, the health of the river is good. Conductivity, Nitrates/Nitrites, Dissolved Oxygen, Alkalinity, pH, Turbidity, and temp were all at healthy levels.
- The only real problem is the color of the river, being at a high of 100 PCU, 75 more than the accepted amount.
- Mostly, the water quality measurements did not change with the speed of the river, though a few did.
  - Dissolved oxygen levels increased in faster areas.
  - Alkalinity levels increased in faster areas.



Color Test



Temperature Test



Dissolved Oxygen Test

## Thanks:

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