

# A Comparison between Total Suspended Solids Levels in 2013 and 2016 in Dothan & Bloody Brook in VT

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## Introduction

The Hartford High School team collected data from two streams in the Upper Valley. We collected samples from Bloody Brook in Norwich, Vermont and Dothan Brook in Wilder, Vermont. Dothan Brook is located by an elementary school and it is a moderately populated area\* with a road above it. It also has two different sets of housing developments on either side of the street so the surrounding roads get more traffic than Bloody Brook. Bloody Brook has an older bridge above it and a swimming hole that is located upstream that is used in the summer by Norwich Residents.

My hypothesis is that if there is a drought one year then the Total Suspended Solids (TSS) will be significantly higher than a year with normal rainfall.

My hypothesis was tested by comparing the data from 2013 and 2016. In the year 2013 we did not have a drought and the TSS data showed that there was a large difference between 2016 when we had a drought. Total suspended solids are particles that can be trapped in a filter. Particles that can get trapped in the filter include silt, dead plant matter, animal matter, sewage and industrial waste. In high amounts Total Suspended Solids can be detrimental to a stream's health. The reason why high levels of TSS can be harmful is because the particles can become lodged in fish gills, harm fish growth, increase disease and prevent the hatching of offspring. In addition macroinvertebrates which are a key part to the food chain cant survive in areas with a high level of TSS.

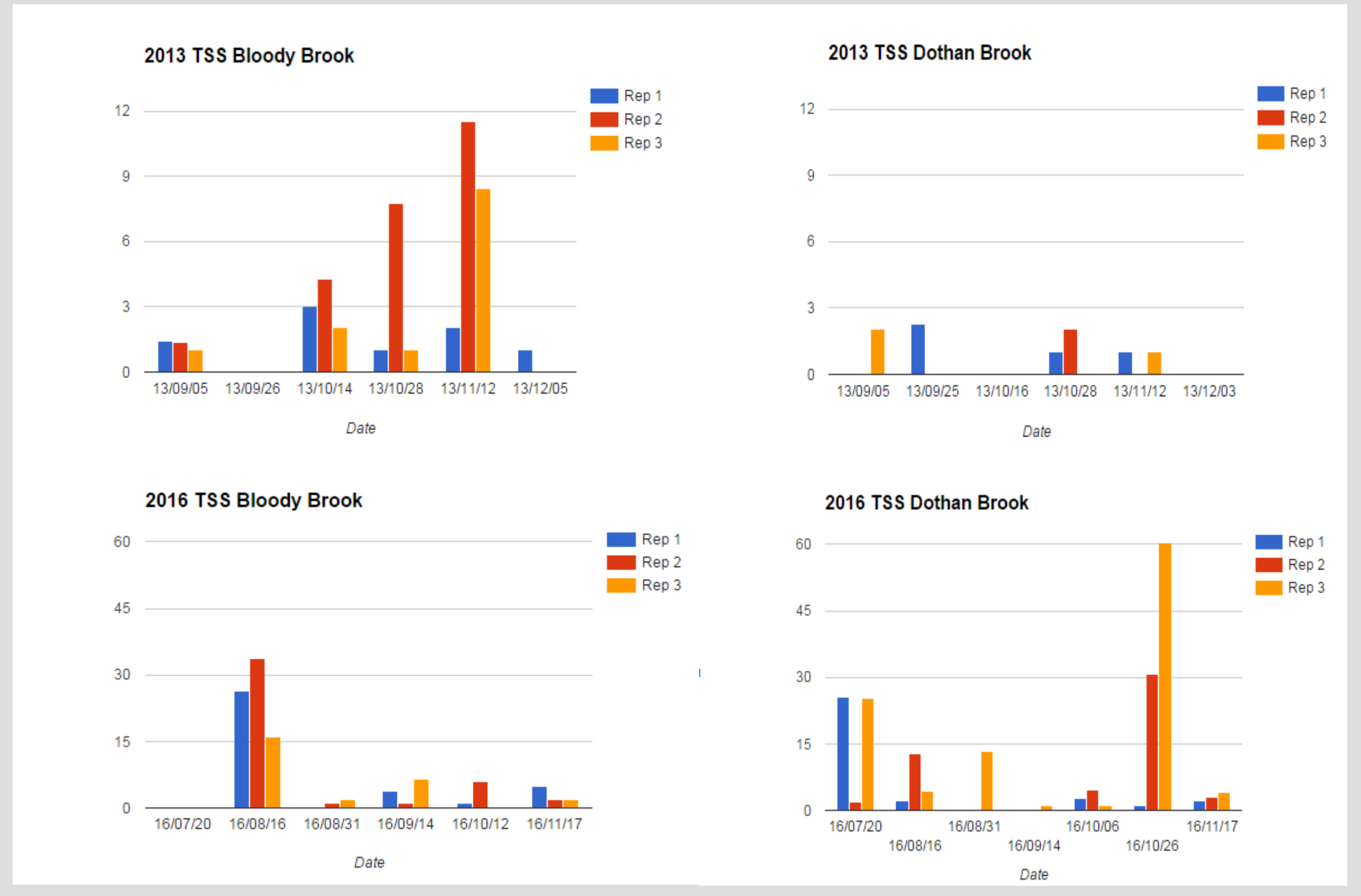
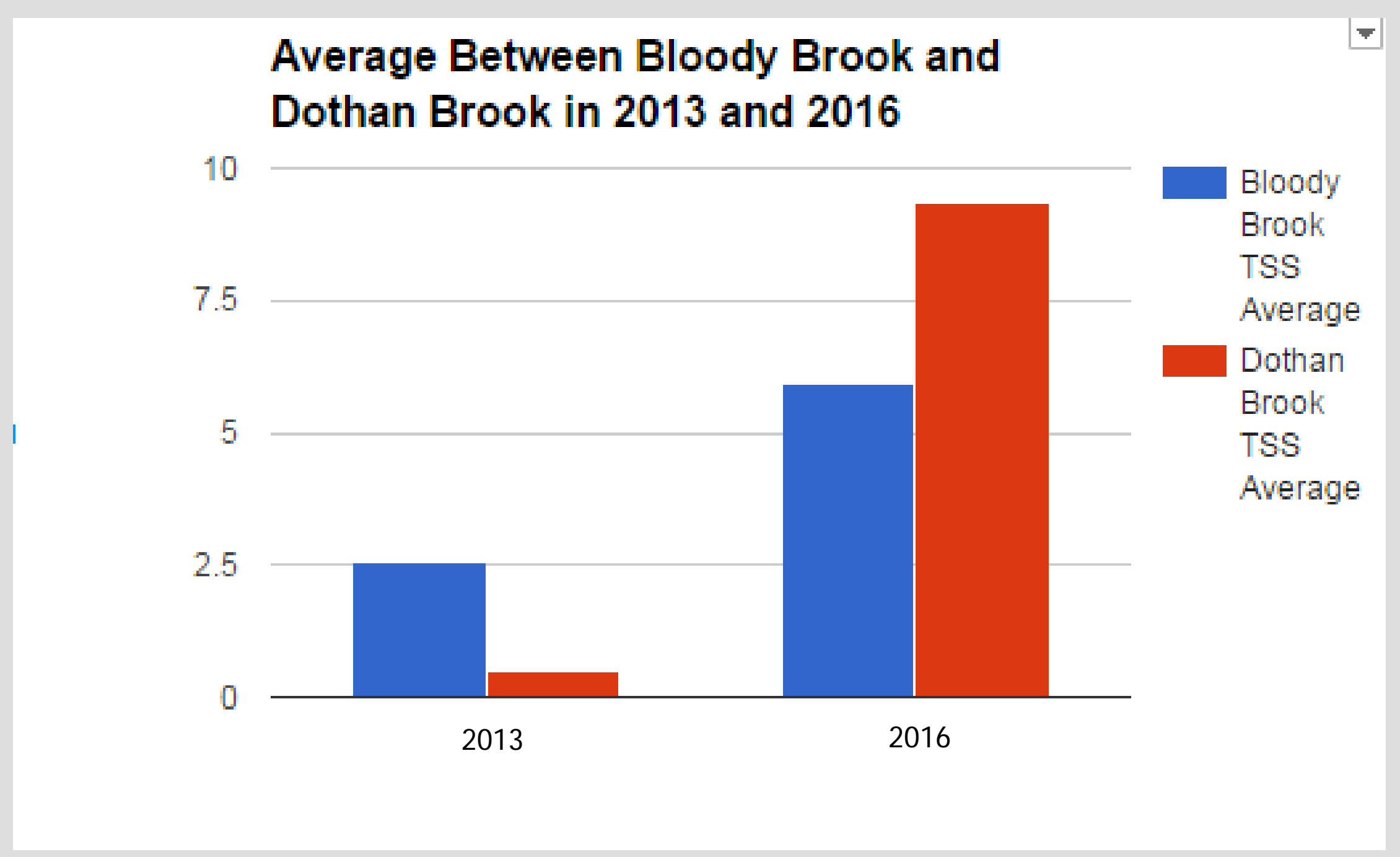
\*Moderately populated for Hartford

## Methods

To collect the data for TSS you collect 3 water samples in the same body of water. When collected it is put into a cooler until it can be placed into a freezer. After all the samples are collected they are shipped to St. Michael's College to be tested. When it gets there it is filtered and then the filter gets placed into an oven until the weight stops changing. The increase measures the total amount of suspended solids.

## Results

Through our data it shows that in 2016 more Total Suspended Solids were collected. In 2013, the average TSS measurement for Bloody Brook was 2.6 and in Dothan Brook it was 0.5. In 2016 the average TSS measurement for Bloody Brook was 5.9 and Dothan Brook was 9.4.



## Conclusion

I found that there is a difference in TSS levels during a drought. We found significantly higher levels in 2016 the year of the drought and 2013. I believe that this is due to less water being in the streams so it is more concentrated in the little water that was there. Due to the drought the surrounding hills had less moisture in the soil and so when it rained the particles got washed into the stream and increased the concentration. Due to the higher levels of TSS in 2016 I conclude that the drought has played a part.

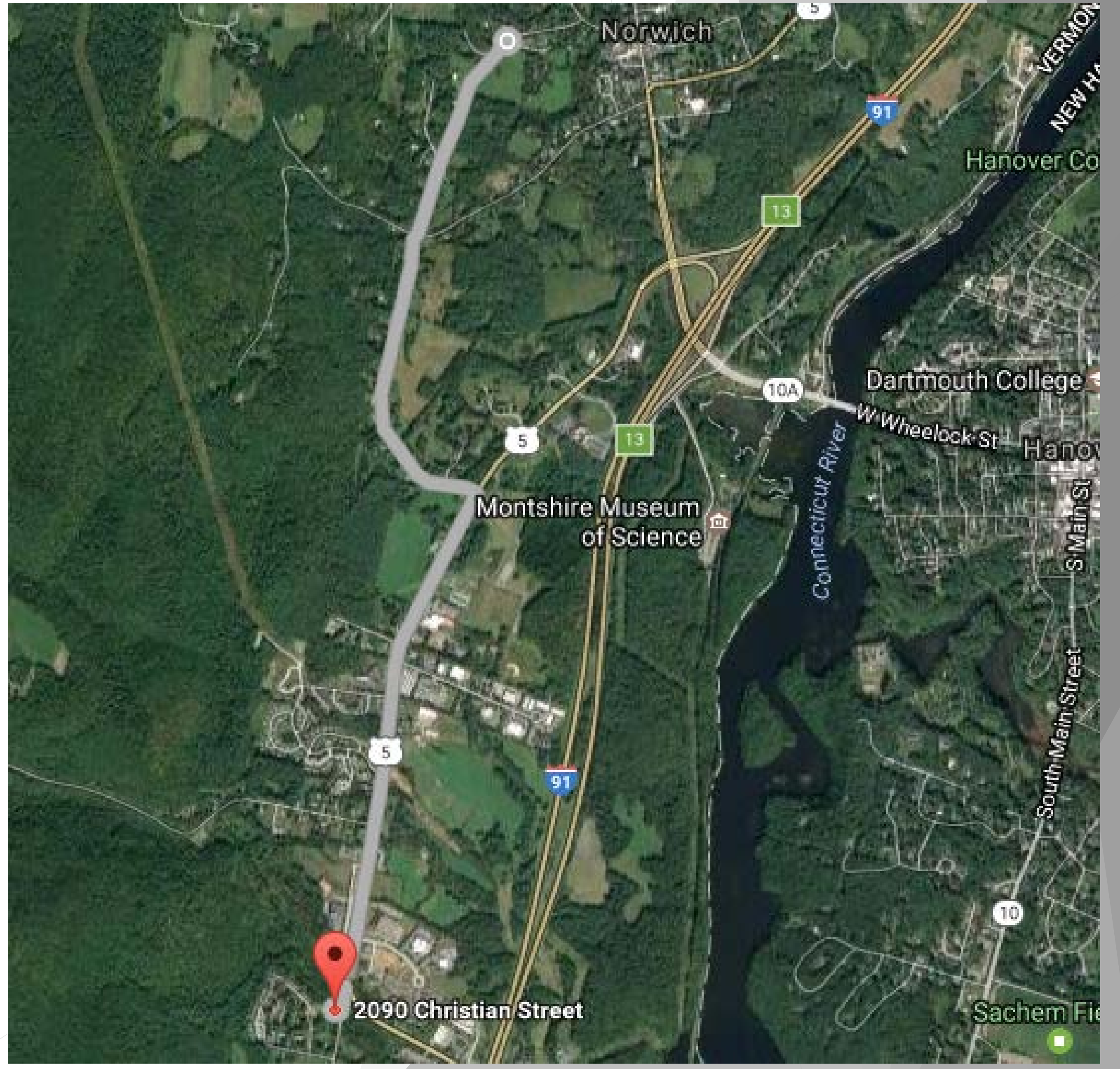
The technique we used to collect the water samples was in the manual since there were a number of people collecting them in slightly different ways the spikes in TSS might have been due to inconsistencies in the way we collected. Some of us took it from the exact same spot and some of us moved around a small amount. Although I didn't put my hands in the bottle I cannot speak for everyone else.

If I were to collect more data I would want to make sure everyone followed the same procedure and continue to compare with the Hartford High School data. If I had more time I would have compared TSS data from other schools with ours the year of the drought and the years prior to see if they also saw an increase in TSS.

## Acknowledgements & References

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"BASIN: General Information on Total Suspended Solids." *BASIN: General Information on Total Suspended Solids*. N.p., n.d. Web. 13 Mar. 2017.



A map showing our two stream locations. The upper one is Bloody Brook which is surrounded by trees unlike Dothan Brook which is surrounded by residential areas.

