Can Buffer Strips Reduce the Effects of Nutrient Run-Off from Farms on Water Quality in Vermont?

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Background

For the past two summers, I have been working with Vermont EPSCoR Streams Project. I have attended training with this program where myself and other high school students learned how to take water, soil and macroinvertebrate samples. The teams learned about the different nutrients in the soil as well as the impacts they could have on the streams.

Hypothesis

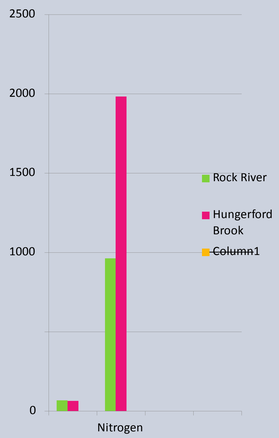
By adding a buffer strip in between farm fields and streams, the streams will be less affected by the run off from the fields.

Buffer strips are strips of grass that are in between a field and a body of water. Usually they are about 30 feet long and serve the purpose to catch any nutrients that may run off the field and into the water.

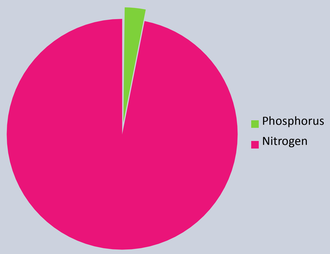
Experimental Design

In order to test the hypothesis about buffer strips reducing the effects of farming on water quality, I collected information from both the Hungerford Brook and Rock River by taking water samples to test nitrogen and phosphorus levels. By comparing these levels, I could see that the buffer strip had in fact, reduced the effects of the chemicals in the streams.

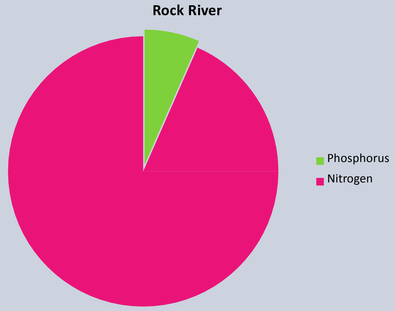
Graphs



Hungerford Brook



Rock River



Discussion of Data Tables

As we can see from the averages, the overall phosphorus level was higher in Hungerford Brook, the stream that didn't have the buffer strip between the water and the field.

Data

Data from Rock River

Date	Phosphorus	Nitrogen
9-11-2013	77.905	877.244
9-11-2013	57.250	1004.200
9-11-2013	68.170	1004.592
Averages	67.775	962.345

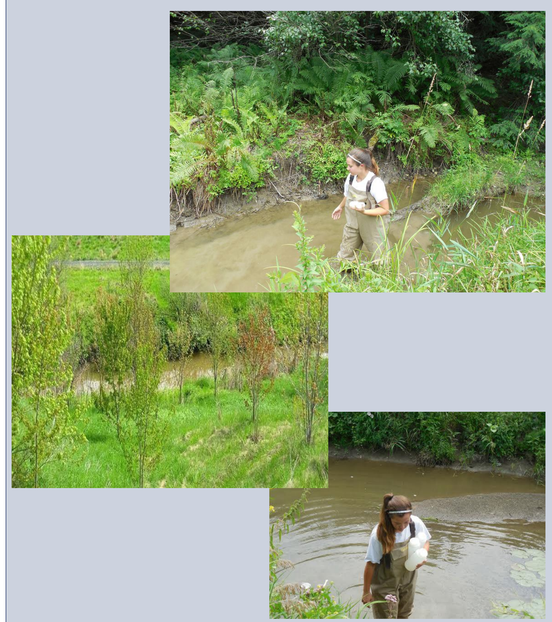
Data from Hungerford Brook

Date	Phosphorus	Nitrogen
08-13-2012	125.882	761.722
08-13-2012	112.536	717.946
08-13-2012	91.986	0.000
09-7-2012	41.516	899.481
09-7-2012	45.806	1170.228
09-7-2012	38.974	792.533
09-19-2012	162.536	3532.950
09-19-2012	157.945	3444.944
09-19-2012	153.353	3496.166
09-24-2012	19.475	3328.496
09-24-2012	16.618	3259.753
09-24-2012	26.312	3489.627
11-07-2012	19.583	3170.511
11-07-2012	16.773	3195.205
11-07-2012	20.586	2578.901
09-11-2013	45.991	638.185
09-11-2013	44.044	593.468
09-11-2013	44.296	614.125
Averages	63.57	1,982.458

*All images taken by Dana Dezotell

Site Description

The two streams that I collected data from are located in St. Albans, Vermont and Highgate, Vermont. The stream located in St. Albans is named Hungerford Brook and the stream located in Highgate is named Rock River. Hungerford Brook travels under a paved side road, surrounded by farm land. Rock River travels under a paved main road and is also surrounded by farm land. Both rivers are part of the Missisquoi River Basin.



Conclusion

Through my experiment, I found my hypothesis to be correct. A buffer strip did reduce the effects of extra nutrients in streams. Buffer strips would be helpful during storms to keep the run-off from running into the rivers.

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