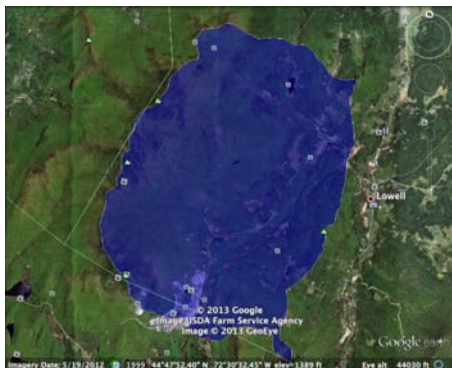




Comparative Study of Riparian Zone Impact on Burgess Branch Macroinvertebrate Communities



STUDY AREA: Burgess Branch, Lowell, VT
Rural, undeveloped, and forested. Occupies an area of 61 square kilometers.



Intact Riparian Zone

PURPOSE: To analyze macroinvertebrate communities between the intact and impacted riparian zones.

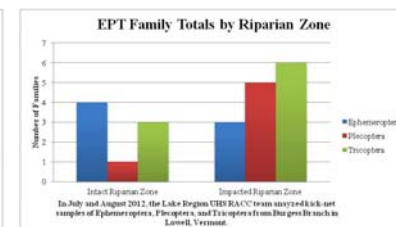
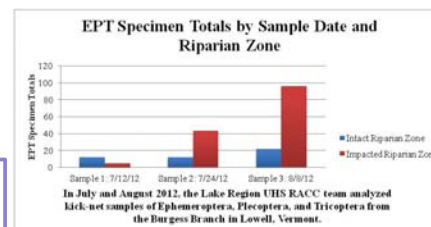
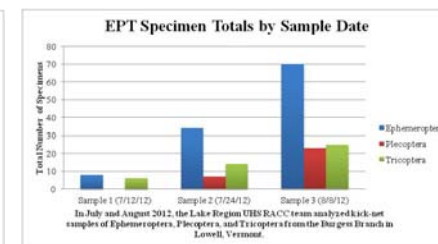
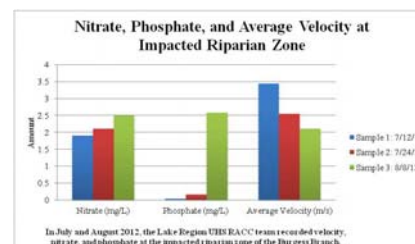
H_a : If the total sample numbers of Burgess Branch Ephemeropterans, Plecopterans, and Trichopterans (EPTs) is measured in both the intact and impacted riparian zones of the Burgess Branch, then the total sample numbers of EPTs will have a statistical difference (of p-value < .05) between the intact and the impacted riparian zones.

METHODS:

- 18"x 9.5" kick-net sample
- Collected on July 12th, July 24th and August 8th, 2012
- All invertebrates counted and identified
- Total EPT data was analyzed
- Used an independent model T-test/5 degrees of freedom
- Phosphate and Nitrate (mg/L) were obtained

RESULTS:

- Low rainfall and flow produced high cyanobacteria growth ("green scum") at the impacted riparian zone.
- From 7/12 to 8/8 impacted PO_4 levels increased by 18.6 times (.14 to 2.6 mg/L)
- Impacted EPT totals increased by 19.2 times (5 to 96 specimens) whereas intact EPT totals had less variation (12, 12, + 22 specimens)
- Impacted Chironomidae totals increased by 72 times (1 to 72 specimens)
- Impacted Heptageniidae increased by 17.5 times (2 to 35 specimens)



CONCLUSION:

- There were only 3 trials and therefore we cannot reject our H_o (5 d.f., $\alpha=.05$). Using a statistical t-test, we discovered $t=1.2$ which was not greater than the critical value of $t=2$ so it is not significant enough to accept H_a .
- Low rainfall and flow influenced the impacted riparian zone by causing the river channel to recede to 1/4 of the original width.
- This reduced channel width may explain the higher concentration of PO_4 and the denser population of EPT. Ostensibly, EPT macroinvertebrates migrated to the narrow main channel.
- Cyanobacteria grow in warm pools and have a high affinity for and store phosphorus, and that may explain PO_4 increase in the impacted.
- The intact riparian zone had a greater level of environmental stability because macroinvertebrate totals and water levels remained consistent, and cyanobacteria blooms were not apparent.

LITERATURE CITED:

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