

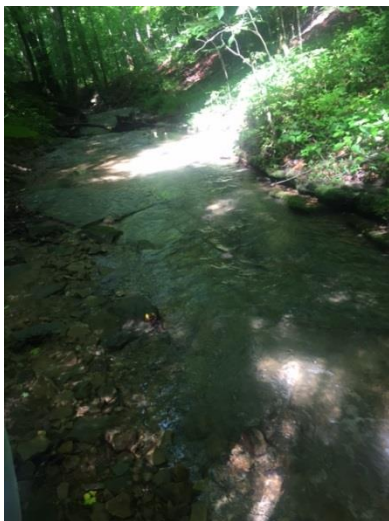
# Leaf litter decomposition in the headwater streams of Lilley Cornett Woods

Myesha James, Union College

Faculty Mentor: Stephen Richter

## Introduction

Leaf litter decomposition in head water streams plays a role of releasing carbon in nutrient cycling. Qualities of the stream have an impact on decomposition of leaf litter.



Many years ago, mountaintop mining of coal changed the quality of streams which could have affected the rate of decomposition.

Salamanders are the top predator in these head water streams. Salamanders possibly could help reduce the rate of leaf litter decomposition. This study was conducted in four different streams. From studying the history and learning about headwater streams, (1) the rate of decomposition can be determined by



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detecting the quality of a stream using indicators such as: pH, conductivity, dissolved oxygen, and temperature.

## Methods



For the field study fresh leaf litter was collected, dried at 125 degrees° C and weighed out 10 grams for 60 leaf litter bags. Sixty leaf litter mesh bag packs. 5 leaf litter packs were placed in 3 riffles in 4 streams. Each week water chemistry was taken and 1 bag from each riffle was pulled. For the salamander project, these same steps were completed except that the bags were only pulled once which was at the end of the project.

## Study Areas

The four streams that were used were: Big Everidge Creek, Pole Branch, Island Branch and Whitaker Branch. They are located in Lilley Cornett Woods, an old growth mixed mesophytic forest located in south eastern Kentucky In the past, part of Island Branch was previously mined, reclamation ended in 2009.

## Results

For the experiment, during the project salamanders escaped the treatment bags but there was a trend in the data that showed the amount of leaf litter in the treatment bags were higher than the in the control bags (Figure 1). For the field study, leaf litter decreased over time and pH and temperature were statistically significant to be indicators of the rate of decomposition of leaf litter in the streams (Figures 2 & 3).

## Conclusions

The salamanders preyed on the plecoptera in the stream which lowered the amount of leaf litter being broken down. The lower the pH the more suitable it was for macro invertebrates to live there and help decompose the leaf litter in the streams. More research would need to be done to see if the streams are more suitable for macro invertebrates. Other research would need to be completed to see if macro invertebrates heavily influence the amount of leaf litter being lost or if there are also any more possible influences.

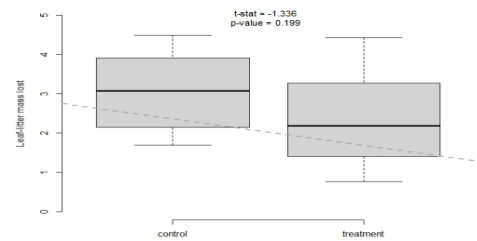


Figure 1 Control and treatment bags for experiment

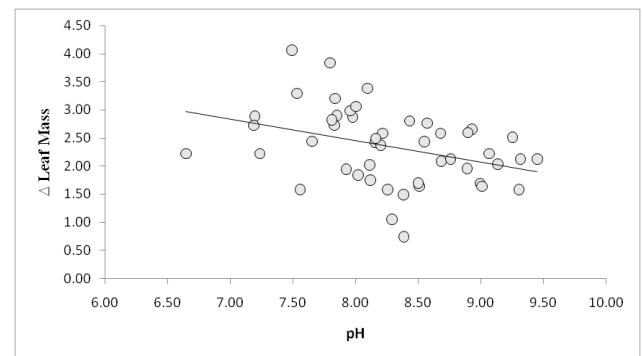


Figure 2 Δ leaf mass correlation to pH

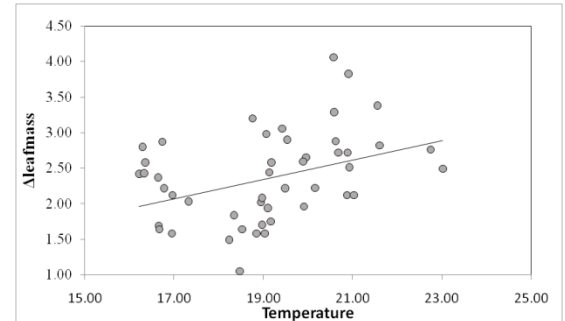


Figure 1 Δ leaf mass correlation to temp.