Community Composition of Benthic Macroinvertebrates and Water Quality Along A Sediment Gradient in Stroubles Creek

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Introduction

- Sedimentation, a natural process along streams, is exacerbated through anthropogenic land-use activities such as agriculture, timber harvesting, mining, and residential and commercial development.
- Sedimentation impacts water quality and aquatic communities and organisms, including benthic macroinvertebrates.
- Benthic macroinvertebrates are common bioindicators of aquatic habitats and water quality.
- The purpose of this study is to investigate the effects of increased sedimentation on benthic macroinvertebrate community composition and water quality.

Methods

- Sites along Stroubles Creek on the Virginia Tech Campus in Blacksburg, Virginia were selected based on their location along a visible sediment gradient. Some of the sites were within the VT StREAM Lab.
- Samples of benthic macroinvertebrates were collected, and embeddedness and water chemistry parameters were measured.

Results

![Abundance of Macroinvertebrates and Embeddedness](image1)

Figure 3. Abundance of macroinvertebrates decreases with embeddedness

![% Chironomidae and Embeddedness](image2)

Figure 4. Chironomidae increases/replaces %EPT as embeddedness increases

![% EPT and Embeddedness](image3)

Figure 5. % EPT increases/replaces Chironomidae as embeddedness decreases

Discussion

Overall, the data suggest that the lower the embeddedness along the sediment gradient, the poorer the water quality and the lower the diversity of benthic macroinvertebrates.

![FBI and Embeddedness](image4)

Figure 6. FBI indicates better water quality with less embeddedness

Educational Modules

The overall research project and experiences through the Research Experience for Teachers (RET) program will be used to enhance the current water quality laboratory project at Lord Botetourt High School.

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