

The Effects of Eutrophication on the Structure and Function of Stream Biofilms

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PURPOSE OF STUDY

Recent research has shown that streams are important sites of nutrient processing and retention. The organisms responsible for much of these processes live in biofilms growing on streambed substrates. These biofilms contain microhabitats and communities which efficiently recycle dissolved organic matter, transform and remove nutrients, and trap particulate matter. Anthropogenic eutrophication may significantly impact the structure of biofilm communities and their ability to function well. The researchers will determine how eutrophication affects biofilms.



David VanHorn is a biology graduate student. He is from Lancaster, Pennsylvania and plans to graduate in 2009.

STUDY UNDERWAY

- The researchers will create biofilms in experimental stream channels supplied with river water, and samples will be collected after four weeks.
- Ten channels will be exposed to a balance solution of dissolved organic carbon, nitrate, and phosphate representing a eutrophication gradient ranging from low to high impact.
- One set of samples from each channel will be analyzed using DNA extraction, PCR, and cloning to determine the effects of eutrophication on bacterial community structure.
- Other samples will be incubated in two different bottle experiments. One experiment will determine dissolved organic carbon utilization patterns, and the other will measure the ability of various biofilm communities to process nitrate and ammonium. These experiments will be used to determine how altered biofilm community structures affect function and if eutrophication thresholds exist for stream biofilm communities.



David at the Albuquerque Wastewater Treatment Plant.

BENEFITS

- Knowing how eutrophication affects stream biofilms will help resource managers to keep eutrophication levels low to ensure natural biofilm community structures and their functions are maintained.

