



Pooled Monitoring Initiative's Restoration Research Award Program

Project Title

Watershed Effects on Success of Stream Restoration for Excess Nitrogen Mitigation

Lead Entity

Virginia Tech

Research question(s)

1. What is the slope and shape of the relationship between percent of stream network restored and percent nitrate load reduction at the watershed outlet (i.e., linear, exponential, levelling off)?
2. How do the answers to Question #1 above vary with watershed conditions such as restoration location and restoration technique?

Issue addressed

While water quality goals in the Chesapeake Bay TMDL are at the watershed scale, most studies on the effect of restoration on nutrients have been at the individual project scale. Here we sought to evaluate how projects scale to watershed outcomes.

Project findings

We found that the incremental benefit of individual restoration projects for nitrate reduction depend upon both where in the watershed the restoration occurs, but also how much restoration has happened already in the watershed.

Recommendations

It is critical to understand the watershed context of any restoration project under consideration, which will generally require watershed-level simulations where proposed projects are simulated together with existing projects.

The Pooled Monitoring Initiative pools resources to support scientists who answer key restoration questions posed by the regulatory and practitioner communities. The research teams then provide the answers back to those who asked the questions for direct application. The goal of the program is to answer these key restoration questions that serve as a barrier to watershed restoration project implementation.

Questions? See cbtrust.org/grants/restoration-research/



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Why does this study matter?

Achievement of watershed-scale water quality targets such as the Chesapeake Bay TMDL in part through stream restoration will not occur unless the watersheds are understood at large scales, as started in this project.

What should we do with this information?

The main message is that watershed-scale simulations are necessary to understand the effects of individual restoration projects.

What will the end-user (regulator/manager and practitioner) do with this information?

Regulators: The need to evaluate projects while taking into account cumulative watershed restoration impacts has implications for what information is needed from project design documents and personnel expertise needed to examine designs.

Practitioners: The design approach should be nested within the watershed context. It is important to pick the best location in addition to picking the best technique. Expectations for outcomes need to be managed.

For more information:

See final report for this project for additional details as well as MS theses listed therein. Project PI can be reached at ehester@vt.edu.

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