WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: NY1141

Title: Nitrogen, Phosphorus, and Sediment Attenuation Capacities of Wetland Plants within the Nanticoke Creek Corridor

Focus Categories: Wetlands, None

Keywords: Nanticoke Creek, Watershed management, Nonpoint pollution, Stormwater treatment, Sediment, Nutrients, Wetlands

Start Date: 03/01/2001

End Date: 02/28/2002

Federal Funds: $11,933

Non-Federal Matching Funds: $15,920

Congressional Districts: 25, 26

Principal Investigator:
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Abstract

Problem: The Nanticoke Creek Watershed (Congressional Districts 25 and 26) located in Broome County, New York has been a priority focus for local and federal government agencies to control non-point sources of pollution. Nanticoke Creek, HUC code: 02050103060, is listed as a priority waterbody (PWL Segment I.D. 0603-0004) by the New York State Department of Environmental Conservation (NYS DEC, 1996), due to agricultural influences in the watershed. Water quality issues within Nanticoke Creek involve impairment to aquatic life, habitat quality, and hydrology.

Objectives: A broad objective for this project is to initiate collaborative research between the State University of New York at Binghamton and local and federal conservation agencies, focusing on water quality issues within the Upper Susquehanna River Watershed. The specific project objective is to quantify wetland species functions in a heavily impacted region within the Nanticoke Creek PWL.

Methods: We hypothesize that: 1) plants growing as highly clumped stems will allow more sediment to flow through compared with species of nearly uniform (i.e. orchard-like) distribution; and 2) plants at the high nutrient site will accumulate greater total N and P (i.e. the product of plant biomass and tissue nutrient concentration) compared with reference site plants.

The project is located on a large dairy operation (350+ Animal Units) in Broome County on Route 26 in the Town of Nanticoke, along the headwaters of Nanticoke Creek in the Nanticoke Watershed. The heavily impacted wetland site is 100 meters south of the dairy operation, receiving direct inputs from farmstead waste and surface runoff from manure-fertilized crop fields. The low-impact reference wetland site is 200 meters southeast of the dairy operation, and receives water flow from upland forested areas, with limited influence from farmstead or field wastes.

Experimental plots will contain species transplants that simulate natural plant densities. Each plot will contain one species, replicated five times at each site. At approximately the time of peak standing crop, a proportion of each plot will be sampled for tissue analysis.

The same plots will be used for the sedimentation experiment. Sediment traps consisting of artificial grass mats, made of long plastic blades fixed to a pliable plastic base, will be placed directly downstream of each plot. Reference traps will be put in locations where plants will not influence sedimentation rates. Depending on season and rainstorm events, traps will be collected and separated in the lab, using jet spraying of water to separate sediments from the turf grass. The sediment will be dried and weighed to ascertain flow-through sedimentation rates for each plot.

For background data, water and sediment samples will be taken above and below the experimental wetland areas at times of high and low flow.