Dendrology, Forest Ecology, and Data Analysis in the STEM-Centered Classroom

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Objective

Allow middle school students of Glendale School District to participate in a 2-module curricular STEM (Science Technology Engineering Mathematics) program while also meeting Department of Education academic standards.

Introduction

The students of rural Pennsylvania have a unique opportunity to use Pennsylvania State Parks and public forests to enrich their education(s) in the areas of environmental science and ecology.

Prince Gallitzin State Park

The students of Glendale School District are located directly adjacent to the Prince Gallitzin State Park. Students will also have several experiences working with the DCNR park rangers from the Prince Gallitzin State Park allowing them to further develop their outdoor skills.

I. Field Module

- Will consist of hands-on fieldwork
- Students will develop the following skills:
  - Understory vegetation measurements
  - Tree identification
  - O-Horizon sampling
  - Course woody debris measurements

II. Analysis Module

- Will consist of data entry of field data
- Construction of graphs and data analysis
- Potential to create a long-term monitoring system

Standards Covered

4.1.7.A: Describe the relationships between biotic and abiotic components of an ecosystem, Compare and contrast different biomes and their characteristics.

4.1.7.C: Explain the flow of energy within an ecosystem. Explain the concept of trophic levels.

4.5.7.B: Describe the impact of pests in different geographic locations and techniques used to manage those pests.

The opportunity to conduct this field research and curriculum development was made possible by financial support from NSF EAR 1263212, a project entitled "Collaborative Research: REU/RET site - Introducing Critical Zone Observatory science to students and teachers" (Principal Investigator: Tim White). Mieke Vrijmoet, C. Kim, and Quincey Johnson contributed to design of field protocols. Dr. Margot Kaye (RET advisor).

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