Teaching Ecology and Indicators of Wetlands at a Small Liberal Arts College

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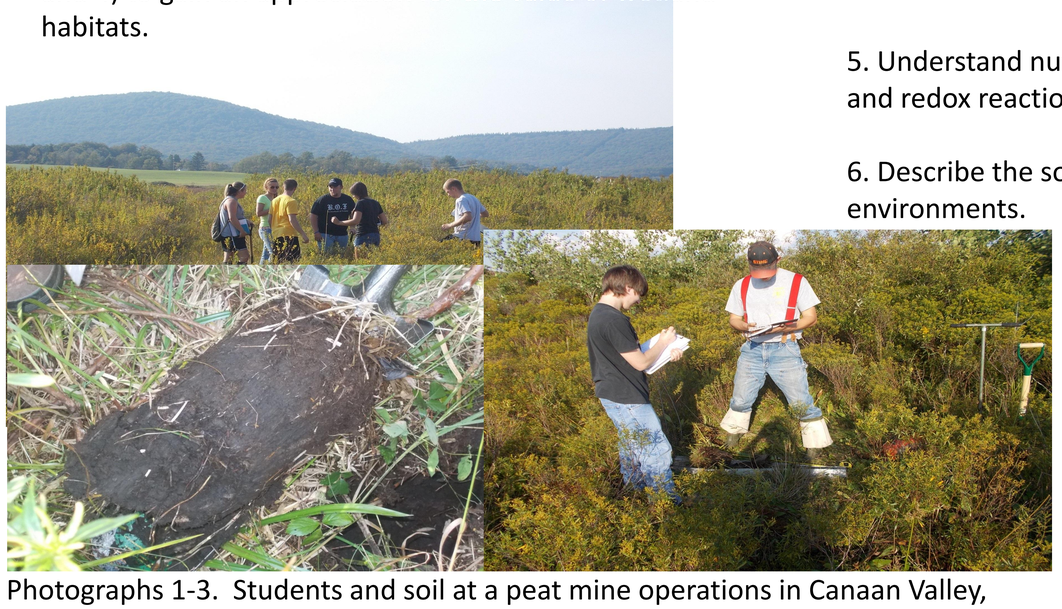
Abstract

Glenville State College contains a diverse body of students; while some students are from rural areas many others are from the suburbs or urban areas with little experience in being outdoors. Many of the students have little experience or confidence in interpreting information and making decisions based upon those interpretations. Most courses are taught within labs or on the campus property with perhaps a few trips during the semester. To effectively teach wetlands ecology in this setting, advance planning to arrange for transportation, site access, and trips that go past the allotted time for lab is absolutely necessary. A required overnight camping trip that allows the class to see wetlands types not available to them otherwise was a component of the course requirements. Another aspect to teaching this course is that many of the available wetlands (those within driving distance for lab) are due to anthropogenic activities and are not naturally occurring, necessitating an increased emphasis from naturally occurring to manmade wetlands. None of the students taking this course have ever taken a soils or plant taxonomy course. Expectations of student outcomes are to 1) develop the ability to describe and recognized hydric soil indicators, 2) create a digital herbarium, learn to use keys to determine plant species, and to recognize the most common wetland plants, 3) understand how hydrology influences wetland type, and 4) to gain an appreciation for the value of wetland habitats.



Photographs 1-3. Students and soil at a peat mine operations in Canaan Valley, West Virginia

Photograph 4. Students at the Ohio River Island National Wildlife Refuge in West Virginia.

Course Learning Objectives

1. Discuss the major wetland communities and be able to define them legally.

2. Realize how hydrologic conditions are one of the major determiners of wetlands type.

3. Recognize the importance of the microbial community in the biogeochemistry of wetlands.

4. Explain aerobic and anaerobic reactions at the soil/water interface.

5. Understand nutrient cycling including nitrogen, phosphorous, and redox reactions.

6. Describe the soils and the properties of soils in wetland environments.

7. Understand the physiological adaptation of plants to aquatic conditions.

8. Examine different types of environmental stress present in wetland and explain how these factors influence plant distribution and community.

9. Examine the fauna especially adapted to aquatic environments.

Resources

James G. Harris and Melinda Woolf Harris. 2001. Plant Identification Terminology: An Illustrated Glossary 2nd Edition. Spring Lake Publishing. Spring Lake , Utah.

W. J. Mitsch , J.G. Gosselink, C.J. Anderson, and L. Zhang. 2009. Wetlands Ecosystems. Wiley and Sons. Hoboken, New Jersey.

P.D. Strausbaugh and Earl L. Core. 1982. Flora of West Virginia. 2nd Edition. Seneca Books, Inc. Grantsville, West Virginia.

U.S. Army Corps of Engineers. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (version 2.0).

USDA. NRCS. 2010. Field Indicators of Hydric Soils in the United States:. A Guide for Identifying and Delineating Hydric Soils. Version 7.0.

Norma Jean Venable. Cooperative Extension Service. West Virginia University. Guide to Aquatic and Wetland plants of West Virginia. www.wvu.edu/~agexten/wildlife/803.pdf

Strengths & Weaknesses of Course

Weakness

- plants-digital library needed that the students can use for comparison (plants should be grouped by season and habitat).

Strengths

-examples of hydric soils and hydric indicators were readily available.

-field trips met goals of exploring a variety of wetlands.

Photograph 5. Cranberry Glades, West Virginia.