Teaching Notes

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Course Information

Course: FW4380 Landscape Ecology
Department: College of Forest Resources and Environmental Science
Level: Upper Undergraduate
Course type: Lecture and Recitation
Students: Mostly majors but non-majors may also take the course
Number of Students: 15

Module Information

Original Module Name:
Investigating Human Impacts on Stream Ecology: Locally and Nationally

Link to Original:
https://qubeshub.org/qubesresources/publications/1095/1

Adapted Module Name:
Landscape Indicators: Nutrients and Macroinvertebrates

Files associated:
Introductory Lectures
Landscape_Indicators_Nutrients_Intro
Landscape_Indicators_Macroinv_Intro

Student Handouts
Stream_Lab_Nutrients
Stream_Lab_Macroinvertebrates

Data
http://knb.ecoinformatics.org/knb/metacat/nuding.9.4/knb. The metadata for this dataset is available from this link as well.

Additional links
http://www.epa.gov/owow/streamsurvey/pdf/WSA_Assessment_May2007.pdf
https://tiee.esa.org/vol/v8/issues/data_sets/nuding/resources/supplement1.pdf
http://tiee.esa.org/vol/v8/issues/data_sets/nuding/resources/supplement2.pdf
http://tiee.esa.org/vol/v8/issues/data_sets/nuding/resources/supplement3.pdf

Modification Learning Goals

- Explain why the EPA developed landscape indicators for wadeable streams
- Conduct an exercise using nutrients as a landscape indicators
- Analyze and compare the nutrient indicators for different regions of the United States
- Explain why macroinvertebrates are useful as bioindicators
- Describe the factors in the Multiple Metrics Index (MMI)
- Graph the relationship between nitrogen and macroinvertebrate metrics
- Explain how nutrients and macroinvertebrates are used as landscape indicators

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Modifications

I split the module into two parts and presented over two class periods. My course is a recitation and we meet for only one hour. Splitting the module gave time to introduce the material and start the students on the exercise. Most finished the remainder of the exercise on their own time.

I added two short introductory lectures to reinforce the material and give students with an auditory learning style another way to learn the material. I uploaded the lectures to YouTube so that the lectures would also have closed-captioning.

For the box plots, I added a link to a tutorial on setting up box plots in Excel. Some of my students are non-majors and do not work with Excel or graphs on a regular basis. It also served as a reminder for those students who needed it.

I redid the Synthesis section also. In the original module, I could not get the WSA data plotter from the Synthesis Section Part B to open and I could not find it on the EPA website. I removed the Part B section. Also I felt that giving the nation a grade (Part A) took away from the quantitative aspect of the module and added some of my own questions to relate it more to my course

The final modification I made was to redo the formatting of the handouts so that they are screen-reader friendly and had more descriptive links.

How it went

I had planned to teach this in person but COVID-19 had other plans and I converted it to an online format. Most students did well and grasped the concepts. There were a few students that did not set-up the graphs correctly and in the future, I would add a brief video tutorial on setting up graphs for any students that did remember how to do it. The students enjoyed working with real data and a couple commented that they could see how it would apply to future careers.

Prep Time
There was considerable prep time this year (~15 hours) since I had not created the student handouts, Powerpoints for the introductory lectures or recordings. Also it took some time to move everything to online and set-up the links in the content-management system. Next year there should be minimal prep.

Future Changes
For the next year, I would like to incorporate some landscape composition and configuration analyses to link with the indicators. I had planned to do it for this year but due to moving online so quickly I did not have time to prepare the additional material. I also felt that the students may need more in-person instruction with the additional analyses.

Teaching Practices
Although moving online was a big change, it brought the important of inclusion to the forefront for me. Students were on different time zones, had different computers, limited access to internet, and new living arrangements. It made it more important to include multiple formats and detailed instructions that I will continue to use in my in-person classes.