

EREN-NEON Flexible Learning Project Assessment Test for Students: Lichen

There are 23 questions in this survey.

Consent

Project Title: EREN-NEON Flexible Learning Projects - Lichen Student Assessment

Investigator: Laurel Anderson

Department: Ohio Wesleyan University Department of Botany/Microbiology

Date: August 19, 2020

Introduction

Ohio Wesleyan University supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you do agree that you will participate in this study, you are free to withdraw from this study at any time. If you do withdraw yourself from this study, it will not affect your relationship with Ohio Wesleyan University or any other academic institution, nor will it impact your academic standing in any class.

Purpose of the Study

The Ecological Research as Education Network (EREN) and the National Ecological Observatory Network (NEON) have been funded by the National Science Foundation to create Flexible Learning Projects for teaching ecology and data science to undergraduates. This study is designed to assess how student learning outcomes are impacted by faculty members' use of these projects in their courses.

Procedures

Students who are currently enrolled in courses that are using Flexible Learning Projects will complete a survey before and after project activities with a small number of closed-ended and open-ended questions related to the learning goals of Flexible Learning Projects. All questions will be administered through an online survey platform.

Risks

There are no more than minimal risks anticipated with participation in this project, as participation in this project is unlikely to cause any more distress than what is experienced in a typical academic day.

Benefits

Participation in this project is likely to aid students in their understanding of ecological

principals. Additionally, participation will contribute to the larger knowledge base related to how this particular pedagogical approach does or does not impact student learning.

Payments

Participants will not be financially compensated. Some professors may choose, at their discretion, to offer some type of credit within the context of their class for completing the test.

Participant Confidentiality

Participant information will be kept confidential, with consent forms stored in separate electronic files from survey response data, and individuals identified by number, not by name. Names will not be associated with individual student responses if these are used as explanatory examples in publication.

Data Storage and Security

The only persons who will have access to the raw data which will identify students by name are Dr. Laurel J. Anderson and Dr. Tim McCay, the project administrators, and the faculty members in whose classes students were enrolled at the time they took the test.

Refusal to Sign Consent and Authorization

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your relationship with Ohio Wesleyan University or any other academic institution, or your academic standing. If you refuse to sign, your data will not be used in this study. If your participation in the study is linked to your grade in any class, your professor will provide an appropriate substitute assignment.

Cancelling this Consent and Authorization

You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use information collected about you in writing, at any time, by sending your written request to: Dr. Laurel J. Anderson. If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

Questions about Participation

Questions about procedures should be directed to the researcher listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form.

I agree to take part in this study as a research participant. By providing the information below, I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

Researcher Contact Information:

Dr. Laurel J. Anderson, Professor
Department of Botany and Microbiology
Ohio Wesleyan University
Delaware, OH 43015
(740) 368-3501
ljanders@owu.edu

The Ohio Wesleyan University Institutional Review Board has reviewed this research. Protocol Number: 2008.012. This protocol is not subject to continuing review.

*

Other

Please select your class standing. *

Please choose **only one** of the following:

- Freshman
- Sophomore
- Junior
- Senior
- Non-traditional student

All Modules

How would you rate your understanding of the concept of ecology? *

Please choose **only one** of the following:

- No understanding
- Limited understanding
- Some understanding
- Good understanding
- Thorough understanding

List as many variables as you can that change over large spatial scales and as many as you can that change over small spatial scales. *

Imagine that you are part of a team of scientists who collect data in different locations and wish to integrate them into a comprehensive dataset that future scientists can use. There are two datasets given below: yours from Site 1 and that of one of your colleagues from Site 2. However, there are one or more problems with these datasets that will make integration in the same dataset and use by future scientists difficult. How many of these kinds of problems do you see with these data?

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Site 1 Acorn Data			Site 2 Acorn Data		
Tree Species	Tree ID	Number of acorns/m ²		Spe	#
<i>Quercus alba</i>	Qa1	31		Oak	1
<i>Quercus alba</i>	Qa2	26		Oak	2
<i>Quercus alba</i>	Qa3	17		Oak	3
<i>Quercus alba</i>	Qa4	40		Oak	4
<i>Quercus alba</i>	Qa5	15		Oak	5

*

Please choose **only one** of the following:

- 1
- 2
- 3
- 4
- 5
- 6
- 7

If humans build a housing development on a site that contains an endangered salamander (a small, lizard-like amphibian), what aspects of the environment will change for this species? List as many aspects as you can in the provided space. *

Please write your answer here:

What is the National Ecological Observatory Network (NEON)? Check all that apply. *

Please choose **all** that apply:

- An observatory that collects and provides scientific data
- An observatory that performs scientific research
- A long-term ecological research center
- An ecology training center

NEON collects data on which of the following? Check all that apply. *

Please choose **all** that apply:

- The atmosphere
- Terrestrial organisms
- Aquatic organisms
- Soil characteristics and microbes

NEON is funded by the government, philanthropists, and private businesses. *

Please choose **only one** of the following:

- True
- False
- Unsure

The data collected by NEON is free for public use. *

Please choose **only one** of the following:

- True
- False
- Unsure

Please rank your knowledge of NEON at this time. *

Please choose **only one** of the following:

- Not at all knowledgeable
- Slightly knowledgeable
- Moderately knowledgeable
- Very knowledgeable

Lichens in Diverse Landscapes

Lichens are: *

Please choose **only one** of the following:

- A kind of fungus
- A kind of algae
- A kind of plant
- A kind of cyanobacteria
- A symbiosis between an algae and a plant or fungus
- A symbiosis between a fungus and an algae or cyanobacteria
- I have no idea what lichens are

List as many places as you can where you can find lichens. Please separate places with a comma. *

Please write your answer here:

List as many environmental factors (variables) as you can that you predict will be associated with decreased abundance or decreased numbers of different kinds of lichens. Please separate factors with a comma. *

Please write your answer here:

Based on your current understanding of lichen ecology, which of the following statements are TRUE? Choose all that apply. *

Please choose **all** that apply:

- Finding fewer lichens in an environment that has more air pollution relative to other environments means that air pollution is harmful to lichens and we should enact laws to reduce air pollution for lichen conservation.
- Finding fewer lichens in an environment that has more air pollution suggests air pollution may be harmful to lichens and suggests the need for experiments on how lichens respond to air pollution.
- Finding fewer lichens in an environment that has more air pollution relative to other environments means that air pollution is harmful to lichens and is the only cause of lichen mortality in this environment.
- Previous studies have shown that lichens are sensitive to air pollution and that different species have different levels of sensitivity.
- If lichens are not present in a particular environment, it is certain that this environment has high levels of air pollution.
- If lichens are present in a particular environment, it is certain that this environment has relatively clean air.

Which of the following sets of data, organizations, software programs, and/or phone apps are you personally familiar with at this time? Choose all that apply. *

Please choose **all** that apply:

- iNaturalist
- Canopeo
- National Ecological Observatory Network (NEON)
- Ecological Research as Education Network (EREN)
- Arc-GIS
- AirNow
- Global Forest Watch

Demographics

This project is supported by the National Science Foundation (NSF) through Grant Number DBI-2037827. The NSF wants to document how its resources are being used and ensure that the benefits of its funding are reaching people from a wide range of backgrounds. Therefore, we respectfully request that you respond to the following questions, although you may choose not to answer if you wish.

Please select your age range.

Please choose **only one** of the following:

- I do not wish to provide
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or over

Please select your gender.

Please choose **only one** of the following:

- I do not wish to provide
- Female
- Male
- Non-binary
- Other

Please select your race/ethnicity. Select all that apply.

Please choose **all** that apply:

- I do not wish to provide
- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic or Latinx
- Native Hawaiian or Pacific Islander

- Middle Eastern
- White

If you did not see your race/ethnicity in the list above, or if you would like to be more specific, please enter your preferred ethnic description here.

Please write your answer here:

Please indicate if you have any of the following disabilities. Select all that apply.

Please choose **all** that apply:

- I do not wish to provide
- Hearing impairment
- Visual impairment
- Mobility/orthopedic impairment
- Other disability
- None

Do you identify as a member of the LGBTQ+ community?

Please choose **only one** of the following:

- I do not wish to provide
- Yes
- No

Are you actively serving in the military or a military veteran?

Please choose **only one** of the following:

- I do not wish to provide
- Yes
- No

Thanks for completing this student assessment. Your responses have been recorded.

Submit your survey.

Thank you for completing this survey.