# Annual Program Assessment Report

Undergraduate Assessment reports are to be submitted annually by program/s. The report deadline is October 15th .

Academic Year Assessed: 2020-2021  
College: Agriculture  
Department: LRES  
Submitted by: Catherine Zabinski

Graduate Assessment reports are to be submitted annually by program/s. The report deadline is October 15th .

**Program(s) Assessed:**   
*Indicate all majors, minors, certificates and/or options that are included in this assessment:*

|  |  |
| --- | --- |
| **Majors/Minors/Certificate** | **Options** |
| Environmental Science | Environmental Sciences, Environmental Biology, Geospatial & Environmental Analysis, Land Rehabilitation, Soil and Water Sciences |
|  |  |
|  |  |

1. **Assessment Plan, Schedule and Data Source.**
2. ***Please provide a multi-year assessment schedule that will show when all program learning outcomes will be assessed, and by what criteria (data). (You may use the table provided, or you may delete and use a different format).***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ASSESSMENT PLANNING CHART | | | | | |
| PROGRAM LEARNING OUTCOME | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | ***Data Source\**** |
| 1. An understanding of core theoretical principles and applications in evolutionary, ecological and physical environmental sciences. |  |  | X |  | Embedded exam questions |
| 1. Ability to access, read, and critically assess the quality and source of environmental information. |  |  | X |  | Embedded within assignment in ENSC 210 and ENSC 499 |
| 1. Knowledge of the theory and practice of data analysis in environmental sciences, including statistical analysis, model building, and graphical presentation of data. | X | X |  |  | Embedded in new course, ENSC 391, either assignment or exam question |
| 1. The ability to write and present scientific material effectively. |  | X |  | X | Final paper and presentation for ENSC 499 |
| 1. An understanding of the ethical implications of conducting and applying environmental science. |  | X |  |  | Embedded in final exam for ENSC 499 |

***\*Data sources can be items such as randomly selected student essays or projects, specifically designed exam questions, student presentations or performances, or a final paper. Do not use course evaluations or surveys as primary sources for data collection.***

1. ***What are your threshold values for which you demonstrate student achievement? (Example provided in the table should be deleted before submission)***

|  |  |  |
| --- | --- | --- |
| **Threshold Values** | | |
| **PROGRAM LEARNING OUTCOME** | **Threshold Value** | **Data Source** |
| We have established rubrics for each of the learning outcomes that can be ranked from 1 (low) to 4 (high). | The threshold value for this outcome is for 80% of assessed students to score above 2 on a 1-4 scoring rubric. | The data source varies with the class being used for the assessment, but includes a random selection of papers, presentations, and embedded questions. |

1. **What Was Done**
2. **Was the completed assessment consistent with the plan provided?**

|  |  |  |
| --- | --- | --- |
| **Y** |  | **N** |
|  |  | X |

1. **If no, please explain why the plan was altered.**

This past year we focused on our Learning Outcome 3 (Knowledge of the theory and practice of data analysis in environmental sciences, including statistical analysis, model building, and graphical presentation of data). Based on a previous year’s assessment, we understood that we couldn’t really evaluate students’ understanding, because their work on building models and presenting data was either done in a very guided way (step-by-step instructions of the process), or was done with the help of an engaged teaching assistant, for students who didn’t understand the process. So we spent our assessment time this past year on two things: researching and putting together a draft of rubrics to evaluate this learning outcome, and developing a new course (ENSC 391 Fundamentals of Environmental Data Analysis).

## How were data collected? (Please include method of collection and sample size).

We are scientists, and not specifically trained in pedagogy, so what might take an education professional almost no time, took us more time to research and find rubrics for quantitative methods. That said, the committee presented a detailed set of components related to data analysis, along with a rubric, that generated a lengthy and useful discussion about what skills we want our students to have, particularly in a world where large and complicated data sets are increasingly easy to gather, and not so easy to analyze.

1. **Explain the assessment process, and who participated in the analysis of the data.**

The discussions we had as a department on how to assess quantitative skills has contributed to the development of a new course. We will gather data on students’ progress towards Learning Outcome 3 from the new course this spring, the first time it is being offered.

1. **Please provide a rubric that demonstrates how your data was evaluated.**(Example provided below should be deleted before submission – your rubric may be *very different; it just needs to explain the criteria used for evaluating student achievement).*

We are working on the rubric during this academic year, so I am just including the list of indicators, and not a description of the criteria used to evaluate student performance. Our faculty is in the midst of defining what beginning, developing, competent and accomplished would look like and how we address those criteria across our different courses. Given that most of our courses include a quantitative component, this step requires a degree of coordination from multiple faculty that means that this is a relatively slow process.

Indicators of Quantitative Literacy

1. Ability to explain information presented in equations, graphs and tables
2. Ability to convert information into graphs, diagrams or tables
3. Ability to draw conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis
4. Ability to make and evaluate assumptions in estimation, modeling and data analysis
5. **What Was Learned  
   Based on the analysis of the data, and compared to the threshold values provided, what was learned from the assessment?**

This section is not relevant since we didn’t actually collect data this year, but spent the year using the assessment framework to help us plan curriculum and better define how to design the quantitative literacy component of our undergraduate major in a time of rapid development of large data sets. With increasing capacity to gather a large amount of data relatively quickly, there also exists increasing employer interest in potential employees who are capable of managing, interpreting and applying big data sets. At the same time, our students share an interest in environmental sciences, but not necessarily an interest in ‘big data’. Our discussion as a department has been useful in helping us to develop a new course, and also to understand what kinds of skills and ways of thinking need to be introduced and developed across the curriculum.

**4. How We Responded**

1. **Describe how “What Was Learned” was communicated to the department, or program faculty.**

The committee researched approaches to quantitative literacy and presented what seemed like the most applicable to the department at a faculty meeting. After the discussion there, the committee gathered more focused written feedback from faculty, and that was used to modify the rubrics generated.

|  |  |  |
| --- | --- | --- |
| **Y** |  | **N** |
| X |  |  |

1. **Based on the faculty responses, will there be any curricular or assessment changes?**
2. **If Yes, what changes will be implemented (choose all that apply and describe specifically below under d)**

|  |  |
| --- | --- |
| Gather additional data to verify or refute the result |  |
| Areas where the acceptable performance threshold has not been met are highlighted. |  |
| Change the acceptable performance threshold |  |
| Evaluate the rubric to assure outcomes meet student skill level |  |
| Identify potential curriculum changes to try to address the problem | X |
| Use Bloom’s Taxonomy to consider stronger learning outcomes |  |
| Choose a different assignment to assess the outcome |  |
| Other (please describe):  re-evaluate our approach to thinking about quantitative literacy, and to be sure that our learning outcomes and rubrics reflect what how the department is adapting to the changing face of environmental data streams. | | |

1. **Please include which outcome is targeted, and how changes will be measured for improvement. If other criteria is used to recommend program changes (such as exit surveys, or employer satisfaction surveys) please explain how the responses are driving department, or program decisions.**

Outcome 3, Knowledge of the theory and practice of data analysis in environmental sciences, including statistical analysis, model building, and graphical presentation of data.

We are refining our ways to assess this, and also addressing our approach to teaching quantitative skills in our classes.

1. **When will the changes be next assessed?**We will assess student learning Spring 2022, in the context of the new course, ENSC 391 Fundamentals of Environmental Data Analysis.

## 5. Closing the Loop

## a) Based on assessment from previous years, please describe program level changes that have led to outcome improvements.

## Because we are just offering a new course this spring, I can only describe the changes that we are making (additional course, new rubrics for assessing quantitative literacy, additional quantitative skills added to courses across the curriculum). We will be assessing students during this upcoming spring semester. Since our changes are not made in response to a failed outcome, but to a sense that we weren’t really testing the outcomes, our measurement of success will initially be focused on whether we have improved our assessment tool, and then from there, we will see how students perform, and whether additional changes to curriculum or assessment tools are needed.