LRES Graduate Learning Outcomes Assessment – 2022

https://www.montana.edu/provost/assessment/assessment_report_templates.html

Academic Year Assessed: July 1, 2020 – June 30, 2022

College: College of Agriculture

Department: Department of Land Resources and Environmental Sciences (LRES)

Submitted by: Robert K. D. Peterson, Department Head, LRES

Program(s) Assessed:

List all majors (including each option), minors, and certificates that are included in this assessment:

MS, Land Resources & Environmental Sciences

Professional MS, Land Resources & Environmental Sciences

MS, Entomology

MS, Land Rehabilitation

PhD, Ecology & Environmental Sciences

Have you reviewed the most recent Annual Program Assessment Report submitted and Assessment and Outcomes Committee feedback?

The Assessment Report should contain the following elements, which are outlined in this template:

1. Assessment Plan, Schedule, and Sources
2. What was done this assessment cycle – including rubrics, how data was collected, and who analyzed it
3. What was learned – including areas of strength and areas for improvement
4. How we responded
5. Closing the loop

Sample reports and guidance can be found at:
https://www.montana.edu/provost/assessment/program_assessment.html

1. Assessment Plan, Schedule and Data Source.
a) 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).

COMMON OUTCOMES FOR BOTH MS AND PHD DEGREES

ASSESSMENT PLANNING CHART					
PROGRAM LEARNING OUTCOME	2021-2022	2022-2023	2023-2024	2024-2025	*Data Source**
1. The student will successfully demonstrate disciplinary expertise through completion of coursework appropriate to the individual student's master or doctoral program.	X	X			Passing grades in courses as indicated on the student's program of study.
2. The student will successfully demonstrate oral and written communication and presentation skills.	X	X			Successful completion of the required course, Seminar, LRES 594. The course is taken during the student's first year and is where the student's graduate research proposal is presented. It is a milestone event for thesis and dissertation students. Successful defense and completion of the thesis, as indicated by graduate committee assessment and consensus.
3. The student will successfully demonstrate problem-solving skills and critical thinking.	X	X			Successful defense and completion of the thesis, as indicated by graduate committee assessment and consensus.
4. The student will successfully demonstrate data collection abilities, quantitative reasoning, analytical synthesis, and decision making.	X	X			Successful defense and completion of the thesis, as indicated by graduate committee assessment and consensus.

PROGRAM LEARNING OUTCOME	2021-2022	2022-2023	2023-2024	2024-2025	Data Source*
					Publication of the thesis in peer-reviewed scientific/professional journals and/or present professionally, as indicated by major advisor annual productivity measures (Activity Insight)
5. The student will successfully demonstrate teaching experience. This addresses competencies such as leadership, conflict resolution, self-confidence, time management, and mentorship.	X	X			Teaching as a TA for one course is required. Feedback is from the instructor and peer TAs.

OUTCOMES UNIQUE TO MS DEGREES

ASSESSMENT PLANNING CHART					
PROGRAM LEARNING OUTCOME	2021-2022	2022-2023	2023-2024	2024-2025	Data Source*
1. THESIS OPTION: The student will be trained to be a practicing scientist. On completion of the program, the student will be able to plan, conduct, analyze, and communicate their own scientific studies and will be able to assess the scientific merits of other studies.	X	X			Successful defense and completion of the thesis, as indicated by graduate committee assessment and consensus.
2. NON-THESIS OPTION: The student will be trained to critically assess and analyze scientific information. On completion of the program, the student will be able to analyze, assess, synthesize, and communicate scientific information in the environmental sciences.	X	X			Passing grades in courses as indicated on the student's program of study. Successful completion of the professional paper and its oral presentation (LRES 575).

OUTCOMES UNIQUE TO PHD DEGREE

ASSESSMENT PLANNING CHART

PROGRAM LEARNING OUTCOME	2021-2022	2022-2023	2023-2024	2024-2025	Data Source*
1. The student will develop expertise in a scientific discipline or sub-discipline. On completion of the program, the student will be an expert in their disciplinary topic.	X	X			Passing grades in courses as indicated on the student's program of study, including LRES 593. Successful completion of the written comprehensive exam, as indicated by graduate committee assessment and consensus. Successful completion of the oral comprehensive exam, as indicated by graduate committee assessment and consensus. Successful defense and completion of the dissertation, as indicated by graduate committee assessment and consensus.

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.

b) What are the threshold values for which you demonstrate student achievement?

Threshold Values		
PROGRAM LEARNING OUTCOME	**Threshold Value**	**Data Source**
1. The student will successfully demonstrate disciplinary expertise through completion of coursework appropriate to the individual student's master or doctoral program.	Passing grades (≥ B) for courses as indicated on the student's program of study (≥ 85% of all students).	Grading records

2. The student will successfully demonstrate oral and written communication and presentation skills.	Passing grade (≥ B) for Seminar, LRES 594 (≥ 90% of all students). Successful completion and appropriate signatures on thesis or dissertation (≥ 90% of all students).	Grading records Department records
3. The student will successfully demonstrate problem-solving skills and critical thinking.	Passing grades (≥ B) for courses as indicated on the student's program of study (≥ 85% of all students). Successful completion and appropriate signatures on thesis or dissertation (≥ 90% of all students).	Grading records Department records
4. The student will successfully demonstrate data collection abilities, quantitative reasoning, analytical synthesis, and decision making.	Passing grades (≥ B) for courses as indicated on the student's program of study (≥ 85% of all students). Successful completion and appropriate signatures on thesis or dissertation (≥ 90% of all students).	Grading records Department records
5. The student will successfully demonstrate teaching experience. This addresses competencies such as leadership, conflict resolution, self-confidence, time management, and mentorship.	Positive, constructive feedback from the instructor and peer Teaching Assistants. Also, student evaluations.	Department records

2. What Was Done

a) Was the completed assessment consistent with the program's assessment plan?

X

Yes

No

b) If no, please explain.

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

Data were collected by the student coordinators of LRES/LREO and checked for successful completion of all learning outcomes. The data were then forwarded to the Chair of the LRES Graduate Committee for

evaluation and refinement in consultation with the LRES Graduate Curriculum Committee. The data were then shared with the Department Head. Activity Insight data were collected by the Department Head. Data collected were from 1-JUL-2020 to 30-JUN-2022.

d) Please provide a rubric that demonstrates how your data were evaluated.

The data on learning outcomes for graduate students in LRES were evaluated by the LRES Graduate Committee (project led by Tim Seipel and committee chaired by Stephanie Ewing) and the Department Head, Bob Peterson. Given that each graduate student in LRES has a graduate supervisory committee, the committee and especially the primary advisor evaluates the learning outcomes with each student throughout the student's matriculation through the program. This outcomes assessment is done continuously via evaluation and feedback on grades in courses, oral and written presentations, critical thinking and data analysis, graduate committee meetings, annual review of academic progress forms, written drafts of thesis, professional paper, or dissertation, drafts of oral defense of thesis or dissertation, drafts of oral presentation of professional paper, and post-defense examination of thesis and dissertation. Additional data are viewed by the Department Head. Summary statistics were used and compared against threshold values. LRES has greater than 90% retention and graduation rates. Because of the multiple levels of continuous assessment of attainment of learning outcomes for graduate students, we are satisfied with our assessment results.

3. What Was Learned

a) Based on the analysis of the data, and compared to the threshold values established, what was learned from the assessment?

MS, Land Resources & Environmental Sciences: The two-year withdrawal rate was 3% (**97%** retention). Eleven students graduated, for a **100%** graduation rate (i.e., all who completed intent-to-graduate form). In addition, **86%** of students during the period earned a "B" or better in all courses (24 of 28 students). Note that "B-" grades are below our threshold for learning outcomes for our graduate students. All metrics exceeded our high, ambitious threshold values.

MS, Entomology (ENTO): The two-year withdrawal rate was 9% (**91%** retention). Five students graduated, for a **100%** graduation rate (i.e., all who completed intent-to-graduate form). In addition, **82%** of students during the period earned a "B" or better in all courses (9 of 11 students), which is just below our threshold of 85%. Note that "B-" grades are below our threshold for learning outcomes for our graduate students. All metrics, except for grades, exceeded our high, ambitious threshold values.

MS, Land Rehabilitation (LNDA): The two-year withdrawal rate was 0% (**100%** retention). Four students graduated, for a **100%** graduation rate (i.e., all who completed intent-to-graduate form). In addition, **100%** of students during the period earned a "B" or better in all courses. Note that "B-" grades are below our threshold for learning outcomes for our graduate students. All metrics exceeded our high, ambitious threshold values.

Professional MS Program (LREO): The two-year withdrawal rate was 5% (**95%** retention) out of more than 200 students. The withdrawal rate of 5% cannot be extrapolated directly to the graduation rate because of timing and matriculation issues. The program had a **97%** graduation rate over the period (i.e.,

32 of 33 students earned a "B" or better on their professional paper course (LRES 575)). In addition, **94%** of students during the period earned a "B" or better in all courses. Note that "B-" grades are below our threshold for learning outcomes for our graduate students. All metrics exceeded our high, ambitious threshold values.

PhD, Ecology & Environmental Sciences (EES): The two-year withdrawal rate was 10% (**90%** retention). Ten PhD students passed their comprehensive written and oral exams in the review period. The two-year comprehensive exam pass rate was **100%**. The program had a **100%** graduation rate (i.e., all who completed intent-to-graduate form). In addition, **94%** of students during the period earned a "B" or better in all courses. Note that "B-" grades are below our threshold for learning outcomes for our graduate students. All metrics exceeded our high, ambitious threshold values.

In addition to the above, **100%** of LRES graduate students who took the required LRES 594 (Seminar) earned a "B" or better, exceeding our threshold of 90%.

Table. Summary of Assessment Outcomes. Threshold rates are in green parentheses.

Program	2-yr Retention (%)	Graduation Rate (%)	Students with at least "B" grade (%)	Students with at least "B" in LRES 594 (%)	PhD Comprehensive Exams Pass Rate (%)
MS, LRES	97 (90)	100 (90)	86 (85)	100 (90)	NA
MS, ENTO	91 (90)	100 (90)	82 (85)	NA[*]	NA
MS, LNDA	100 (90)	100 (90)	100 (85)	100 (90)	NA
MS, LREO	95 (90)	97 (90)	94 (85)	NA	NA
PhD, EES	90 (90)	100 (90)	94 (85)	100 (90)	100 (90)

[*]NA = not applicable

b) What areas of strength in the program were identified?

LRES has multiple levels of continuous assessment of attainment of learning outcomes. LRES has exceedingly low rates of withdrawal and failure-to-graduate for graduate students. LRES has low percentages of students who earn "B-" or lower grades in graduate courses.

c) What areas were identified that need improvement?

LRES is now strongly encouraging faculty to complete annual reviews of academic program for graduate students, per direction and forms of The Graduate School (https://www.montana.edu/gradschool/forms.html). This annual review will further enhance oversight by the major professor to ensure that the graduate student is achieving learning outcomes. LRES needs a formal mechanism for providing positive, constructive feedback from the instructor and peer teaching assistants to graduate teaching assistants. This can be partially remedied via annual reviews with graduate students.

4. How We Responded
a) Describe how "What Was Learned" was communicated to the department, or program faculty.

The results of the assessment will be presented to the Graduate Committee, which will then present it to the entire LRES faculty before the end of CY22.

b) How are the results of this assessment informing changes to enhance student learning in the program?

We view the current low withdrawal and failure-to-graduate rates in all our programs as acceptable and believe the results indicate that our current multiple levels of review for each graduate student are appropriate. This is especially the case for the graduate student's graduate committee.

c) If information outside of this assessment is informing programmatic change, please describe that.

5. Closing the Loop
a) In reviewing last year's report, what changes proposed were implemented and will be measured in future assessment reports?

We will quantify records of annual reviews of academic program for graduate students. We will attempt to quantify the percentage of theses and dissertations that resulted in published peer-reviewed journal articles. We will also include passing-grade rates for the new course, LRES 593, for PhD students.

b. Have you seen a change in student learning based on other program adjustments made in the past? Please describe the adjustments made and subsequent changes in student learning.

No. It is challenging (and likely unnecessary) to see a change in student learning and make program adjustments when our metrics exceeded our high, ambitious threshold values.