

ASSESSMENT REPORT 2018 - 2019

Forestry
(Instructional Degree Program)

B.S.
(Degree Level)

Program Mission:

Forestry is the application of scientific principles to the management of forest resources, including non-wood products. The mission of the Forestry Program at NMHU is to provide students the skills needed to excel in a natural resources management field of study by:

- Providing a broad-based undergraduate education in the Liberal Arts and Sciences;
- Promoting study and quality research in forestry and natural resource management and conservation sciences;
- Providing an understanding of the ethical and professional sustainable management of land systems;
- Providing a superior learning experience for students through dedicated teaching, hands-on learning, research, and commitment to the individual student; and
- Providing a combination of state of the art computer and science facilities and close access to a diversity of ecosystems for student experiential learning.

Student Learning Outcome 1:

Effectively describe and implement the process of scientific inquiry.

NMHU Traits Specifically Linked to Student Learning Outcome 1:

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Communication Skills

First Means of Assessment for Outcome 1 (SLO1a):

Design an experiment to examine an ecological question in FOR 231 (Terrestrial Ecology) and present this proposal to the class. Students must receive a grade of 70% or higher to be considered passing in this outcome.

Summary of Data:

Number of Students Meeting Criterion:	16	Number of Students Not Meeting Criterion:	3
Total Number of Students Assessed:	19	Percentage of Students Meeting Criterion:	84%

Second Means of Assessment for Outcome 1 (SLO1b):

Successfully design and describe the application of experimental design to a natural resource management problem. This design will be developed and presented in FOR 492 (Applied Forestry Research). Students must receive a grade of 70% or higher to be considered passing in this outcome.

Summary of Data:

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	5	Percentage of Students Meeting Criterion:	100%

Third Means of Assessment for Outcome 1 (SLO1c):

Final grade of B or better in FOR 310 (Biometrics and Mensuration)

Summary of Data:

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	6
Total Number of Students Assessed:	10	Percentage of Students Meeting Criterion:	40%

Interpretation of Results for Outcome 1:

The program saw no significant change in outcomes for SLO1a and SLO1b relative to 2017-18 outcomes. Although SLO1a could improve, 84-85% success on this metric is acceptable and shows that improvements made in SLO1a from 2016-17 to 2017-18 are likely durable and evidence in improved delivery methods and/or the quality of students recruited. Although SLO1b has maintained a 100% rate, this could be considered misleading because this is one grade for one group of five in the class. The five students received the same group grade; it is possible that individuals within the group would not have made the grade if working individually. SLO1c represents a potential source of concern in that the percentage of students meeting this metric fell from 100% in 2017-18 (6 students) to 40% in 2018-19 (10 students). The 2018-2019 cohort in FOR 310 included several students that put forth little to no effort in the class and performed poorly as a result, whereas the students in the 2017-2018 cohort were primarily highly motivated transfer students. Last year, it was noted that SLO1c should be removed as a means of assessment for SLO1 because it does not focus on the content of SLO1, but it was not reviewed across the forestry faculty and, therefore, not removed for this report. Overall, the results from 2018-19 suggest that students are meeting Student Learning Objective 1 at an acceptable level, but there is a need to revise the assessment methods associated with SLO1c.

Student Learning Outcome 2:

Effectively communicate scientific and resource management ideas, information, and results, as well as standards of professional ethics, both verbally and in writing, in a way that (1) demonstrates consistent logic; (2) is well organized; (3) states and defends a thesis; and (4) demonstrates

competent use of language.

NMHU Traits Specifically Linked to Student Learning Outcome 2:

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Communication Skills

First Means of Assessment for Outcome 2 (SLO2a):

Present the results of the capstone project to the FOR 492 Senior Research Project class. A passing grade for this measure is >70%.

Summary of Data:

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	5	Percentage of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 2 (SLO2b):

Grade on final exam in Natural Resource Economics (FOR 305) which requires a comprehensive analysis and presentation of a complicated natural resource valuation and decision problem involving forestry resources. A passing grade for this measure is >70%.

Summary of Data:

Number of Students Meeting Criterion:	11	Number of Students Not Meeting Criterion:	5
Total Number of Students Assessed:	16	Percentage of Students Meeting Criterion:	69%

Third Means of Assessment for Outcome 2 (SLO2c):

Final grade of B or better in Professional Ethics (FOR 426).

Summary of Data:

Number of Students Meeting Criterion:	7	Number of Students Not Meeting Criterion:	4
Total Number of Students Assessed:	11	Percentage of Students Meeting Criterion:	64%

Interpretation of Results for Outcome 2:

As with last year, learning outcomes associated with SLO2b and SLO2c suggest that we are not meeting our objectives, but changes from year to year are expected, outcomes for SLO2b improved this year, and course instructors were different this year for SLO2c relative to last year. It has been noted in the past that forestry students struggle with critical thinking, quantitative reasoning, and mathematical calculations, which has consistently led to lower than desired learning outcomes associated with SLO2b and FORS 3050. This is still the case in 2018-19. We have been working

on curriculum revisions for more than a year; outcomes in SLO2b for this year suggest that our intention to move FORS 3050 to later in the curriculum is well-founded and should be acted upon as soon as possible. In reference to SLO2c, unfortunately, we saw a large decrease in the percentage of students meeting the criterion relative to last year (92% to 64%). However, the faculty member giving the course changed this year relative to last year. The course material was not the same as the previous year and the grading styles likely differed between the professors. Additionally, this result was likely because three students failed to turn any assignments in and there was one major academic integrity infraction. Because of this, the course had four students receive a failing grade or incomplete. For this reason, we do not evaluate the large decrease in students meeting the criterion as cause for much concern. All students passed the metric for SLO2a, but the interpretation is the same as with SLO1b. Overall, students are meeting the expectations of Student Learning Outcome 2.

Student Learning Outcome 3:

Effective use of technology by competently using appropriate tools from forestry and its various sub-disciplines.

NMHU Traits Specifically Linked to Student Learning Outcome 3:

- Critical and Reflective Thinking Skills
- Effective Use of Technology

First Means of Assessment for Outcome 3 (SLO3a):

Demonstrated competence in using basic measuring instruments in an introductory field-based course (FOR 200, Field Practices). Final grade in course of C or better.

Summary of Data:

Number of Students Meeting Criterion:	14	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	14	Percentage of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 3 (SLO3b):

Demonstrated competence in using forest measuring instruments in an intermediate field-based course (FOR 310, Mensuration and Biometrics). Grade in a hands-on practicum exercise of B or better and a final grade in the course of C or better.

Summary of Data:

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	10	Percentage of Students Meeting Criterion:	40%

Interpretation of Results for Outcome 3:

Improvements in results for SLO3a for the 2017-18 year were maintained this year. Outcomes for SLO3b dropped significantly from last year to this year (100% to 40%). As described in relation to SLO1c, the 2018-2019 cohort in FOR 310 contained several exceptionally unmotivated students that put forth minimal effort in the course and performed poorly as a result.. Overall, students are meeting the Forestry Program’s expectations for Student Learning Outcome 3.

Student Learning Outcome 4:

Mastery of Forestry knowledge and skills.

NMHU Traits Specifically Linked to Student Learning Outcome 4:

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Communication Skills

First Means of Assessment for Outcome 4 (SLO4a):

Take a final comprehensive Forestry Exit Exam that includes questions from the four SAF core competency areas. A passing grade will be 70%. This exam will not impact student graduation but will be used for assessment purposes and will provide students the opportunity to provide feedback on the Forestry Program to Faculty. This Exit Exam will be accompanied by a debriefing with graduating students.

Summary of Data:

Number of Students Meeting Criterion:	3	Number of Students Not Meeting Criterion:	2
Total Number of Students Assessed:	5	Percentage of Students Meeting Criterion:	60%

Second Means of Assessment for Outcome 4 (SLO4b):

Final grade of B or better in Forest Management (FOR 410).

Summary of Data:

Number of Students Meeting Criterion:	7	Number of Students Not Meeting Criterion:	6
Total Number of Students Assessed:	13	Percentage of Students Meeting Criterion:	54%

Third Means of Assessment for Outcome 4 (SLO4c):

Final grade of B or better in Applied Forestry Research (FOR 492).

Summary of Data:

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	1
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Total Number of Students Assessed:	5	Percentage of Students Meeting Criterion:	80%
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Fourth Means of Assessment for Outcome 4 (SLO4d):

Final grade of B or better in Natural Resource Law and Policy (FOR 330) or Geologic Resources, Law, and Environmental Policy (GEOL 412).

Summary of Data:

Number of Students Meeting Criterion:	14	Number of Students Not Meeting Criterion:	8
Total Number of Students Assessed:	22	Percentage of Students Meeting Criterion:	64%

Fifth Means of Assessment for Outcome 4 (SLO4e):

Final grade of B or better in Dendrology (FOR 313).

Summary of Data:

Number of Students Meeting Criterion:	5	Number of Students Not Meeting Criterion:	8
Total Number of Students Assessed:	13	Percentage of Students Meeting Criterion:	38%

Interpretation of Results for Outcome 4:

This is the first assessment year with the same faculty member associated with SLO4a, SLO4b, and SLO4c (Dr. Rose). The percentage of students meeting the criteria for SLO4a and SLO4b increased this year relative to last year, while the number meeting the criterion for SLO4c decreased slightly (100% to 80%). The Exit Exam associated with SLO4a assesses knowledge that students acquire throughout the entire program. An increase in that metric (50% to 60%) could be because of improved delivery of material, but could also be a result of improved recruiting or ability of students. Additionally, the number of students assessed each year in this metric is usually low (four in 2017-18 and five in 2018-19) and, consequently, susceptible to small changes in performance. In 2017-18, SLO4b only assessed three students and therefore was of little value. Although the Forestry Program would like to revise assessment methods and move away from grade-based assessment criteria, the “B” grade needed to meet the SLO4b criterion is high; 54% of students meeting this criterion is acceptable, if slightly lower than desired. For SLO4c, a small number of students are assessed and variation in the 80-100% range is acceptable. Outcomes for SLO4d and SLO4e, however, in the 2018-19 year could indicate falling performance. Outcomes for both dropped significantly (100% to 64% for SLO4d and 67% to 38%, for SLO4e). In regards to SLO4d, this is less worrisome when we consider that only one student was assessed in 2017-18, whereas 22 were in 2018-19. When this is considered, 64% of students achieving a B or better in FORS 3300 is acceptable. It does suggest that we need to work to improve the the problem solving and writing abilities and knowledge in natural resources law and policy in our Forestry students. As with the last two years, the results for SLO4e suggest room for improvement in

students' knowledge of taxonomy and plant identification. The percentage of students meeting this criterion dropped from 67% in 2017-18 to 38% in 2018-19. Skills and knowledge intended to be gleaned from this class are consistently a difficulty of Forestry students, but they are essential for foresters and this shortcoming must be addressed. Outcomes for SLO4e need to improve. Overall, students are meeting the Forestry Program's expectations for Student Learning Outcome 4.

Utilization of Results:

These outcome results suggest the program is generally meeting its goals. Although some of the assessment methods in the final capstone course are based on group work and might be coarser measures than they should be, the strong outcomes from that course are evidence that the program is meeting its mission goals and providing a high quality forestry education that meets SAF standards. We continue to be challenged to improve outcomes for knowledge areas and skills associated with applied math, communications, and critical thinking skills. These weaknesses are particularly evident in courses such as FOR 3050, FORS 3100, and FORS 3130. This was the third year Forestry implemented an exit exam and a student debriefing session as part of the capstone course. This was again a valuable tool for understanding what students perceived as the strongest and weakest aspects of the program. We continue to get feedback that hands-on field experiences are highly valued by the students, and we continue to work toward incorporating more of these into the overall curriculum. However, attempts to provide these experiences are sometimes hindered by both logistical and budgetary challenges that must be addressed through improved planning and curriculum mapping.

Changes to Program Based on Results:

The Forestry students do not appear to be primarily content- or concept-limited, with regards to core forestry topics. Nevertheless, struggles in Forest Management (SLO4b), compared to last year, suggest that students are underprepared entering their penultimate forestry class. This has been a known issue related to the lack of effective prerequisites. Because of this, the Forestry program has begun the process of revising the prerequisites for its courses during the upcoming year. Paperwork for this has been submitted to Academic Affairs.

The other SLOs where students struggled more than in the past or far below acceptable levels were related to SLO1c, SLO3b, and SLO4e. For SLOS 1c and 3b, interpretation is difficult because although more rigor was introduced this assessment period, more students than usual did not complete their assignments and there were disciplinary issues that resulted in failing grades or incompletes for the class. It could easily be seen as a one-year aberration. For SLO4e and its associated, very important skill of woody species identification, work is needed to ensure that students are leaving the class with the necessary tools to complete their other field-based work in subsequent years.

Overall, we have found it difficult to interpret many of these outcomes because the assessment criteria have proven themselves to be weak, in many cases, and missing the target, in others. During the visit from Forestry's accrediting body (Society of American Foresters) last spring, it

was noted by the visiting team that Forestry's outcomes assessment framework needed to be revised to better assess skills in an unbiased manner. For example, SLO1c is both grade-based (which we want to avoid in the future) and not targeted towards assessing student's ability to use the scientific method. This metric should be eliminated and another should be chosen that limits faculty bias (e.g. in grading) and targets the skill directly. This type of revision is needed throughout the Outcomes Assessment Plan. This revision is needed for the program to effectively evaluate itself and will be done for the next assessment period.

Retention Strategies:

The Forestry Program has begun to revisit and revise course scheduling, curriculum changes (e.g., course numbering and offerings) and curriculum advising to create a more efficient and clear path for new and transfer students to complete the forestry curriculum in a timely manner. We will be proposing a second set of revisions this year that are aimed at creating a more coherent progression of knowledge and skills, provide clearer guidance on prerequisites, and encourage student cohorts in multiple classes. Additionally, more frequent communications and consultation between students and academic advisors is being encouraged; faculty are talking more frequently about the best advice that can be given to students so that they graduate on time and are prepared for difficult, upper-division courses when they arrive in class for those courses.