Academic Program Assessment Report

Assessment is a term commonly used to encompass the process of gathering and using evidence to guide improvements.

SACSCOC requires that an institution "identifies expected outcomes, assesses the extent to which it achieves these outcomes, and provides evidence of seeking improvement based on analysis of the results".

Be sure to SAVE your progress as you work!

Academic Program
Environmental Science, B.S.

Submission Due Date
2023-2024

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Program Goal

Goal

Goal 1

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
Students will demonstrate an understanding of the scientific basis (chemistry, biology, geology, basic environmental sciences) for environmental challenges and proposed solutions.

Pillar of Success Supported
Graduates Who Are Gainfully Employed or Admitted to Graduate School

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to content knowledge on the presentation, poster or written assignment rubric in ES 301, 302, 310, 407, 490, GEOL 405 or PSCI 499.

Timeframe for this Outcome
Academic year 2022-2023

Performance Target for "Met"
The mean of all student scores are at or above 2.0

Performance Target for "Partially Met"
The mean of all student scores are greater than 1.7 and less than 2.0

Performance Target for "Not Met"
The mean of all student scores are less than or equal to 1.7

Assessment Measure Used
Rubrics for posters, presentations and written assignments in ES 301, and PSCI 499.

Frequency of Assessment
At the end of the semesters in which each of these courses are taught.

Data Collected for this Timeframe (Results)
The data collected were the presentation rubrics for the final reports in ES 301 (n=3) and and the presentation and rubrics for the presentations in PSCI 499 (n=4). The mean scores for the two classes was 2.46.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
The mean scores across all students and the two courses assessed on the item on the rubrics related to content knowledge was 2.46. This goal was met. No improvements are indicated necessary. The instructors of the courses have students hand in several deliverables for evaluation prior to delivery of the final written and verbal reports. These include, at a minimum, an approved topic, outline for the project, draft report, final report, and presentation (in PSCI 499 only) based on the final report. Detailed written comments are provided by the instructor as guidance for improvement. This approach has been shown to be effective and will be continued in all upper level ES courses indicated.

While they still met the goal the mean is down from last year's 2.7. This is due to the fact that there was less available material to use since only one ES class was able to be offered due to lack of full time ES faculty for the 2022-2023 AY. These scores may change along with direction for the program in coming years because the university hired a new ES coordinator starting in Fall 2023. They may change the direction and how the program is assessed in coming years.

Resources Needed to Meet/Sustain Results
No new resources are needed to meet these goals. To be able to sustain the goals we need to continue to have at least one ES faculty so that the classes for the major are offered in a reasonable time frame. As seen in this learning outcome and in a few more in the assessment, the number of assignments and classes being used to assess are smaller then normal since we could not offer ES 302 last spring. That means that for this assessment period it was heavily reliant on the three final project reports from ES 301 along with the four seniors in PSCI 499.

Explanation of How Resources Will Be Used

Outcome 2

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to chemistry content knowledge on a locally designed environmental science exit exam.

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to chemistry.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 35% and less than 50% on specific questions related to chemistry.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to chemistry.

Assessment Measure Used
A locally designed environmental science exit exam.

Frequency of Assessment
Every spring semester, offered in conjunction with PSCI 499 (Senior Seminar in Physical Science).

Data Collected for this Timeframe (Results)
The ES exit exam was given during PSCI 499 during Spring 2023. Four ES students took the exam. The mean score for the chemistry related questions on the exam was 53.5%. There were 14 multiple choice questions on the exam that were specifically related to chemistry.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
We are still including students who were attending Lander during the AY 2020-2021 year and Fall 2021 semester where there were some modifications and changes in the curriculum because of the pandemic. Thus, it is a challenge to put the results of this assessment into the context of the performance of the program at large.

The Exit Exam was unchanged relative to the one given during the Spring of 2022 for the most part. As this exam was written by a faculty member who has since retired some questions have been omitted due to lack of knowing the answers to those questions.

Because the chemistry related content of chemistry courses and ES curriculum have changed from time to time, and are still undergoing modification, a process is in place to review the questions on the exam to ensure that they reflect the major concepts taught in the four (4) to six (6) chemistry courses Environmental Science program students complete, as well as the chemistry related content in ES courses. Going forward, for students who have entered the program after 2018, new students will have to complete Environmental Chemistry (CHEM 420) as a core course, among a total of five chemistry courses (inclusive of CHEM 420) rather than having it be completed by some students as one option of several ES related electives. This is anticipated to improve the mean performance on this learning objective even further.

Moving forward, the content of the Exit Exam will be reviewed against the changing content of the chemistry related material in ES courses and in the Chemistry courses that are part of the ES core curriculum. To help standardize the content for the exit exam, the department has decided to use a standardized Environmental Scientist Exam instead of an exam written by an individual.

Since hiring of a new ES faculty member who is the program coordinator there will be changes in the curriculum coming as she shapes the program for the future.

Resources Needed to Meet/Sustain Results
As of writing this right now the only requirement to meet this goal is to continue having at least one ES faculty. The program has been in flux for the last year though the students who have graduated has still shown knowledge in the categories. Currently we are meeting these goals but continuing to have a strong chemistry component will help make sure students meet this goal.

Explanation of How Resources Will Be Used

Outcome 3

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to biology content knowledge on a locally designed exit exam.

Timeframe for this Outcome

Academic Year 2022-2023

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to biology.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 35% and less than 50% on specific questions related to biology.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to biology.

Assessment Measure Used
A locally designed environmental science exit exam.

Frequency of Assessment
Every spring semester, offered in conjunction with PSCI 499 (Senior Seminar in Physical Science).

Data Collected for this Timeframe (Results)
The ES exit exam was given during PSCI 499 during Spring 2023. Four ES students took the exam. The mean score for the biology related questions on the exam was 61.8%. There were 18 multiple choice questions on the exam that were specifically related to biology, the majority of which were related to ecology.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
We are still including students who were attending Lander during the AY 2020-2021 year where there were some modifications and changes in the curriculum because of the pandemic. Thus, it is a challenge to put the results of this assessment into the context of the performance of the program at large.

The Exit Exam was unchanged relative to the one given during the Spring of 2022 for the most part. As this exam was written by a faculty member who has since retired some questions have been omitted due to lack of knowing the answers to those questions.

Because the biology related content of biology courses and ES curriculum have changed from time to time, and are still undergoing modification, a process is in place to review the questions on the exam to ensure that they reflect the major concepts taught in the three (3) biology courses Environmental Science program students complete, as well as the biology related content in ES courses, particularly ES 301.

Because this learning objective was met for this assessment period no changes are currently anticipated, except to continue to review Exit Exam questions as they reflect the actual course content in biology. To help standardize the content for the exit exam, the department has decided to use a standardized Environmental Scientist Exam instead of an exam written by an individual faculty member.

Some of the Biology related content in this exam was covered in ES 301 and ES 302, as well as the 3 BIOL courses required in the ES curriculum. As we have a new ES program coordinator the content may change in the coming years as they make curriculum changes.

Resources Needed to Meet/Sustain Results
No new resources are needed right now. Currently there is an ES faculty member and program

coordinator which is needed to keep meeting the standards and the ability to teach the requisite major classes.

Explanation of How Resources Will Be Used

Outcome 4

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to geology content knowledge on a locally designed exit exam.

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to geology.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 35% and less than 50% on specific questions related to geology.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to geology.

Assessment Measure Used
A locally designed environmental science exit exam

Frequency of Assessment
Every spring semester, offered in conjunction with PSCI 499 (Senior Seminar in Physical Science)

Data Collected for this Timeframe (Results)
The ES exit exam was given during PSCI 499 during Spring 2023. Four ES students took the exam. The mean score for the geology related questions on the exam was 65%. There were 15 multiple choice questions on the exam that were specifically related to geology.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative

We are still including students who were attending Lander during the AY 2020-2021 year and Fall 2021 semester where there were some modifications and changes in the curriculum because of the pandemic. Thus, it is a challenge to put the results of this assessment into the context of the performance of the program at large.

The Exit Exam was unchanged relative to the one given during the Spring of 2022 for the most part. As this exam was written by a faculty member who has since retired some questions have been omitted due to lack of knowing the answers to those questions.

Because this learning objective was met for this assessment period no changes are currently anticipated, except to continue to review Exit Exam questions as they reflect the actual course content in geology. To help standardize the content for the exit exam, the department has decided to use a standardized Environmental Scientist Exam instead of an exam written by an individual.

It is noted that the faculty member who taught all GEOLOGY (3) courses at Lander retired in Spring 2022. The new ES program coordinator does not have the same background so the geology portion of the major may be changed to another topic area in the future or it may be less of an emphasis compared to the previous direction depending on how the coordinator wants to change the program moving forward.

Resources Needed to Meet/Sustain Results
There is no new resources needed to meet this goal or sustain it as the objective may change as the program changes in the next year or so.

Explanation of How Resources Will Be Used

Outcome 5

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions related to general environmental science content knowledge on a locally designed exit exam.

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to general

environmental science.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 35% and equal to or less that 50% on specific questions related to general environmental science.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to general environmental science.

Assessment Measure Used
A locally designed environmental science exit exam

Frequency of Assessment
Every spring semester, offered in conjunction with PSCI 499 (Senior Seminar in Physical Science)

Data Collected for this Timeframe (Results)
The ES exit exam was given during PSCI 499 during Spring 2023. Four ES students took the exam. The mean score for the general environmental science related questions on the exam was 65.2%. There were 22 multiple choice questions on the exam that were specifically related to general environmental science.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
We are still including students who were attending Lander during the AY 2020-2021 year and Fall 2021 semester where there were some modifications and changes in the curriculum because of the pandemic. Thus, it is a challenge to put the results of this assessment into the context of the performance of the program at large.

The Exit Exam was unchanged relative to the one given during the Spring of 2022 for the most part. As this exam was written by a faculty member who has since retired some questions have been omitted due to lack of knowing the answers to those questions.

Because this learning objective was met for this assessment period (though only for a single student), no changes are currently anticipated, except to continue to review Exit Exam questions as they reflect the actual course content in environmental science courses. To help standardize the content for the exit exam, the department has decided to use a standardized Environmental Scientist Exam instead of an exam written by an individual faculty member.

Since the last program assessment the University has hired a new ES faculty member who will take on the program coordinator position for the major. There will be changes and adaptions coming to the major in the next few years as she modifies the program.

Resources Needed to Meet/Sustain Results
There is no new resources needed to sustain this outcome. The department currently has a program coordinator with the expertise and background to teach the ES courses so will be able to cover the material in this outcome.

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
This goal met the obejctives for all five of the learning outcomes.

It should be noted, that in the last three academic years, there have been changes in the ES curriculum, the Biology curriculum and Chemistry curriculum, and well as the general education curriculum at Lander University. In future assessments, the impacts of these changed curriculum requirements and content will be felt. It is not uncommon for the content of individual courses to change as instructors change and instructors innovate to improve their courses. Not all of these changes are captured by the Exit Exam, one of the key instruments used in evaluating this particular assessment goal (Goal 1).

It should also be noticed that the period from mid Spring (March 14) term 2020 through AY 2020-2021 was a period of many changes in course delivery due to the pandemic. The impacts of these changes will be felt for several more years. Specifically to the ES program, GEOL 111 times 2, GEOL 405, ES 301, ES 302, ES 111, BIOL 306, BIOL 415, CHEM 330, CHEM 220, CHEM 420, CHEM 111, CHEM 112, at a minimum, have been impacted by this. Whether the changes are positive, negative or neutral will be difficult to predict going forward.

The ES curriculum added two core course requirements, ES 111 (Sustainability) and CHEM 420 (Environmental Chemistry) in 2018. These course requirements should lead to improvement in general ES knowledge and knowledge in Chemistry, beginning with the AY 2021-2022, with the first ES students to start graduating with one or both requirements changed. As shown above with the learning objective for the general environmental knowledge did increase with the four students compared to last year's result with one student at 57.6%. This trend should hopefully continue to improve in the next couple of years as more students make it through the program.

In the 2022-2023 AY the program was in flux as a position to replace the two leaving faculty was not approved until after the reporting of the program assessment last year. Starting this fall there is now a new faculty member with the ES background which will lead to more stability in the program again. This will allow for the teaching of courses that were not offered last spring (ES 302) and offer other classes in the major in a timely fashion. The new coordinator has plans to introduce changes and has a different background compared to the prior ES coordinator. That may change some of the learning outcomes (in particular geology) in the years to come.

Changes Made/Proposed Related to Goal
The Exit Exam will undergo review based on changes that may have occurred in the content and emphases of the courses covered in the exam. The Exit Exam was taken by only 4 ES majors this Spring (2023) term. Statistical analysis of such a low population is suspect. After much discussion at the department level last May it was discussed to move to a standardized exam instead of a localized exam. This way the exam is consistent no matter who is the one proctoring or what faculty members are teaching the classes. This exam will be offered moving forward starting in Spring 2024 which may change the learning outcomes as well.

Upload Rubrics/Other Files

Goal 2

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
Students will demonstrate the ability to use the scientific method and associated critical thinking skills to formulate questions, design experiments and interpret and evaluate data to answer them.

Pillar of Success Supported
Graduates Who Are Gainfully Employed or Admitted to Graduate School

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
Mean scores of the portions of a written research report, presentation or poster rubric that ask reviewers to assess critical thinking skills and use of the scientific method in semester assignments in ES 310/302, 310, 407, 490, GEOL 405 or PSCI 499.

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean of all student scores are at or above 2.0

Performance Target for "Partially Met"
The mean of all student scores are above 1.7 and less than 2.0.

Performance Target for "Not Met"
The mean of all student scores are less than 1.7

Assessment Measure Used
Mean score of the portions of a written research report and rubric that ask reviewers to assess critical thinking skills and use of the scientific method in semester assignments in ES 301, ES 302, ES 310, GEOL 405 or PSCI 499

Frequency of Assessment
ES 301, ES 302 are offered every other year. PSCI 499 is offered every Spring term.

Data Collected for this Timeframe (Results)
Mean score of the portions of a written research report and rubric that ask reviewers to assess critical thinking skills and use of the scientific method in semester assignments in ES 301(n=3), and PSCI 499. (N=4). The mean score was 2.58.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
The goal was met, according to this student learning outcome, on average. It did increase from last year's 2.4 which used three classes. The average for both classes were both above the overall average from last year as well. This shows improvement in the students ability to assess critical thinking skills has increased compared to prior year students.

While the overall average for the outcome has increased, the number of classes and students used in the assessment period has decreased because of the lack of full-time ES faculty for the 2022-2023 AY so ES 302 was not offered last spring. There will be changes coming to how the program is assess and possible changes in the ES program as a whole in future years with the hiring of a new ES coordinator.

Resources Needed to Meet/Sustain Results
No new resources are needed to meet this result. The resources needed to sustain is to make sure that there is at least one ES faculty qualified to teach the classes in a timely manner.

Explanation of How Resources Will Be Used

Outcome 2

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores on specific questions requiring students to demonstrate critical thinking and/or use the scientific method on a locally written environmental science exit exam

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean score of all student scores is greater than 50% on specific questions related to this indicator of success.

Performance Target for "Partially Met"
The mean score of all student scores is greater than 35% and equal to or less than 50% on specific questions related to this indicator of success.

Performance Target for "Not Met"
The mean score of all student scores is equal to or less than 35% on specific questions related to this indicator of success.

Assessment Measure Used
A locally written environmental science exit exam.

Frequency of Assessment
This assessment instrument is administered every spring term in conjunction with PSCI 499.

Data Collected for this Timeframe (Results)
The first essay question in the Exit Exam was used in the current assessment cycle. The score for three studentss was 72.3%. This in a relatively high score for this portion of the Exit Exam

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
Although only based on three students, the score on the first essay question, used to assess this learning outcome, was 72.3%, which met the goal for this learning outcome. The question required each student to pick an environmental challenge from a list of six (6) specific environmental challenges. In the essay, students were to describe the challenge, identify the proximate and ultimate causes of the challenge and describe potential solutions to the challenge, as well as impacts of the solutions themselves. This question requires a high degree of critical thinking in order for students to make appropriate responses.

The student made effective responses, performing quite well.

Three courses in the ES curriculum are essential for success in this learning outcome, ES 111, ES 301 and ES 302. All 6 of the environmental challenges, plus others, that may be selected in completing this essay portion of the Exit Exam are detailed in ES 301 and ES 302. Consideration of the different perspectives needed to adequately respond to this portion of the Exit Exam is first covered in ES 111 in the program.

The tools used to assess this may change in coming years since there is a new ES faculty member who will be coordinator of the program. The exit exam may be changed in the future to something that the new ES faculty member creates or move to a more standardized exam.

Resources Needed to Meet/Sustain Results
There is no new resources needed for this goal since there is now a ES faculty member qualified to teach the classes going forward.

Explanation of How Resources Will Be Used

Outcome 3

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?

Student Learning Outcome

Enter Outcome
The mean scores of the portion of the supervisor completed rubric for internships (ES 490) related to critical thinking and/or the use of the scientific method

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean score of all student scores is greater than 3.6 on the relevant section of the supervisor completed rubric for internships in environmental science (A. Problem Solving/Inquiry) .

Performance Target for "Partially Met"
The mean score of all student scores is greater than 3.0 and less than 3.6 on the relevant section of the supervisor completed rubric for internships in environmental science (A. Problem Solving/Inquiry) .

Performance Target for "Not Met"
The mean score of all student scores is less than 3.0 on the relevant section of the supervisor completed rubric for internships in environmental science (A. Problem Solving/Inquiry) .

Assessment Measure Used
A supervisor completed rubric for environmental science internships (ES 490). This is the rubric used in the Lander University EYE Program

Frequency of Assessment
Completed at the end of each environmental science internship, which is offered on demand in the program.

Data Collected for this Timeframe (Results)
Two students completed an internship during the current assessment period. The employer evaluation rubric (EYE Program) was used. That score was 4.86/5.0 for the three (3) items related to critical thinking/the scientific method. On the rubric, those items were found under the subtitle, Problem Solving.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
Two student completed an environmental internship over the current assessment period. Both student supervisors rated the students highly in the internship. Last year's student also was rated highly by their supervisor. This trend should hopefully continue forward for future internships.

The outcomes for this goal may change in future assessment with changes to the program and assessment from the new ES coordinator.

Resources Needed to Meet/Sustain Results
No new resources are needed to meet this goal as it has been sustained. The way to keep this goal sustained is to make sure that there continues to be an ES faculty member to supervise internships.

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments

The goal was met, according to all three of the learning outcomes identified for the goal. This is a strength of the ES program, considering the results in the current assessment period.

Changes Made/Proposed Related to Goal
Students have met this goal. Every upper level course in ES requires a research project with multiple deliverables, and critical thinking is front and center of each of those research projects. All research projects of this sort require a paper and a presentation. The paper is first turned in as a draft, allowing students to make improvements, including the collection of additional data/information, if necessary. All projects go through an initial problem definition stage, which requires high levels of critical thinking and framing consistent with the scientific method. These strengths will continue and be built upon in the future.

The curriculum and content in the ES classes may change in coming years as the person who taught the classes prior retired and a new faculty member will reshape the classes for the future. This may change the outcomes slightly along with the overall goals of the ES program itself. Not only will classes possibly change the overall assessment goals and outcomes may change in the future with a new coordinator for the program.

Upload Rubrics/Other Files

Goal 3

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
Students will demonstrate the development of writing and presentation skills appropriate for students and practitioners in the discipline of environmental science.

Pillar of Success Supported
Graduates Who Are Gainfully Employed or Admitted to Graduate School

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
Mean scores on questions related to the demonstration of writing or presentation skills on assignment

rubrics from ES 301/302, ES 310, ES 407, GEOL 405 or PSCI 499.

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean or all students scores is at or above 2.0

Performance Target for "Partially Met"
The mean or all students scores is above 1.7 and below 2.0

Performance Target for "Not Met"
The mean or all students scores is less than or equal to 1.7.

Assessment Measure Used
Presentation rubrics in PSCI 499 and presentation and written report rubrics in ES 301.

Frequency of Assessment
Each of these courses is offered every other year (except PSCI 499, which is offered every Spring semester). Assessments are completed in at least two courses each academic year, with specific courses alternating.

Data Collected for this Timeframe (Results)
Report and presentation rubrics in ES 301 (N=3) and presentation rubrics in PSCI 499 (N=4). For written communication (reports), the mean was 2.53 (N=7). For presentations, the mean was 2.53 (N=7)

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
The goal was met according to this learning outcome. Both the written and the oral rubrics received an mean overall score of 2.53. This is lower than last year's outcome of 2.6 range but the amount of presentations and students was decreased by half compared to last assessment period. There was also only two classes instead of the normal three that is used in the assessment because ES 302 was not offered in Spring 2023.

These scores suggest that course embedded communications assignments, written and presentation, are working quite well in the Environmental Science program.

While the standards have been met this outcome may change in future years as the program changes because of a new coordinator.

Resources Needed to Meet/Sustain Results
No new resources are needed to meet this goal as it has continually been met the last couple of years. The goal will continue to be meet as long as there is at least one ES faculty to be able to teach the required ES courses in a timely fashion.

Explanation of How Resources Will Be Used

Outcome 2

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
Mean scores on questions related to the demonstration of presentation skills on a presentation rubric from ES 490 (Internship) or ES 407 (Research).

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean or all students scores is at or above 2.0

Performance Target for "Partially Met"
The mean or all students scores is above 1.7 and below 2.0

Performance Target for "Not Met"
The mean or all students scores is less than or equal to 1.7.

Assessment Measure Used
Mean scores on questions related to the demonstration of presentation skills on a presentation rubric from ES 490 (Internship)

Frequency of Assessment
Both ES 490 and ES 407 are available on demand for juniors or seniors. Seniors most frequently pursue ES 490 (internship).

Data Collected for this Timeframe (Results)
No presentations were made for research (ES 407) or internship (ES 490) were completed for this assessment period.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
No internships or research project presentations were completed for this assessment period. While there was two students who completed internships in the last academic year neither one of them gave a presentation.

Resources Needed to Meet/Sustain Results
None at this time, this is dependent on whether or not the students who are completing internships complete a presentation with a rubric. Increasing the number of students who complete research or internships in the major will increase the amount of resources for this objective.

Along with the fact that there was only two internships completed during this assessment period as there was no ES faculty for the AY 2022-2023 year to be able to supervise internships in the Spring 2023 semester.

As of this writing this assessment there is a new ES coordinator that may change how this works for future assessment years as they modify the program.

Explanation of How Resources Will Be Used

Outcome 3

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
The mean scores of the portion of the supervisor completed rubric for internships (ES 490) related to written or verbal communication.

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean score of all student scores is greater than 3.6 on the relevant section of the supervisor completed rubric for internships in environmental science (B. Communications) .

Performance Target for "Partially Met"
The mean score of all student scores is greater than 3.0 and less than 3.6 on the relevant section of the supervisor completed rubric for internships in environmental science (B. Communications) .

Performance Target for "Not Met"
The mean score of all student scores is less than 3.0 on the relevant section of the supervisor completed rubric for internships in environmental science (B.Communications)

Assessment Measure Used
A supervisor completed rubric for environmental science internships (ES 490). This is the rubric used in the Lander University EYE Program

Frequency of Assessment
Completed at the end of each environmental science internship, which is offered on demand in the program.

Data Collected for this Timeframe (Results)
Two internship was completed during the assessment period. The mean score of the five (5) communication items included on the supervisor rubric was 4.2/5.0.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative

The learning outcome was met, although it was for two student. It is anticipated that more students will be successful in obtaining internships during the next assessment period.

Resources Needed to Meet/Sustain Results
None new resources needed to sustain this goal. There are a few majors who do internships in any given year. On top of that there was no ES faculty to mentor students for internships in the Spring 2023 semester. Which may have influenced the number of internships completed.

This objective may change in coming assessment years with the new ES coordinator making changes to the program and how it gets assessed.

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
All students met the learning outcome for this goal. This is not surprising given the effort and focus of program and department faculty on written and verbal communications skills in many of the classes, plus internships, research and PSCI 499 presentations. Research reports and presentations are required for ES 111, ES 301, ES 302, ES 310, ES 314 as well as selected courses in Chemistry and Biology within the ES curriculum. Students have had opportunity for much practice and feedback by the time they become seniors. This is an area of strength to keep and develop for this program.

Changes Made/Proposed Related to Goal
As seen in prior year assessments the program does an excellent job of making sure that students are able to communicate in a professional setting both orally and written. Continuing to include assignments that allow students to practice in the major classes will make sure that the program continues to meet these goals as stated now.

The program goals may change or how they are assessed may change in the next assessment cycle as there is a new coordinator for the program. As they shape and change the program these goals may be modified in the future.

Presentations to outside conferences, such as the Upstate Research Symposium, as well as presentations to the Academic Symposium at Lander, are encouraged at several points in the environmental science program. This will continue.

Upload Rubrics/Other Files

Goal 4

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
Students will develop an ability to develop and articulate well informed and reasoned views on environmental issues, based on an understanding of legal, ethical, social, political and economic ramifications of environmental problems, policies and decisions.

Pillar of Success Supported
Graduates Who Are Gainfully Employed or Admitted to Graduate School

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Student Learning Outcome

Enter Outcome
Mean score on portions of a locally written environmental science exit exam assessing student demonstration of developing and articulating well informed and reasoned views on legal, ethical, social and political ramifications of environmental problems, policies and decisions.

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
The mean score of all student scores for the sum of the selected questions is greater than 50%.

Performance Target for "Partially Met"
The mean score of all student scores for the sum of the selected questions is greater than 35% and equal to or less than 50%.

Performance Target for "Not Met"
The mean score of all student scores for the sum of the selected questions is less than 35%.

Assessment Measure Used
Selected questions on a locally written environmental science exit exam.

Frequency of Assessment
The exam is given each spring semester in conjunction with PSCI 499, the senior seminar for the Department of Physical Sciences, a class which includes graduating seniors in both the Environmental Science and Chemistry programs..

Data Collected for this Timeframe (Results)
Two essay questions were selected on the Exit Exam were assessed for this learning outcome. Three students completed the exam. The average on the first essay for the three students was a 72.3% and the average on the second exam was a 62%. Both of these are above the met criteria.

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative

The students who completed the Exit Exam met the learning outcome. This section of the Exit Exam required students to select an environmental challenge, describe it, determine its proximal and ultimate causes and determine solutions for it. The second question asks the students to reflect on what environmental science's role is in the world today and is related to policy.

This goal has been the one that has been most difficult to assess within the ES program. Opportunity for improvement can be found in ES 301/ES 302, perhaps through the mechanism of case studies of environmental challenges. A challenge is that ES 301/ES 302 are currently offered every other year. The next opportunity for improvement of the course along these lines would be in AY 2022-2023. However, it might be worthwhile to consider teaching both courses every year, given recent increase in major numbers, the increase in numbers of students seeking minors in ES, and the increased interest in environmental issues among students across campus. Enrollment in these two courses has increased over the last few years, a trend that is anticipated to continue.

Another opportunity relates to ES 314, which is a general education course that meets the requirement for Global Cultures. In fact, this course does focus on the multidisciplinary and cross-cultural ramifications of climate change, including significant attention to climate change economics, national policy, international agreements, and law. The course is not currently included in the assessment because it is popular with students across campus, such that ES students make up a minority of the enrollment. This course is offered every Fall term going forward. Perhaps means can be found to assess the ES majors among the students for this goal without risking putting in a bias in instruction or student evaluation, overall. This will be studied in the next assessment period, and perhaps implemented, as well.

As of completing this assessment there is a new ES coordinator that may shift the program to including more topics on policy for the major. That may change how this goal is assessed and the program as a whole in future assessments.

Resources Needed to Meet/Sustain Results
There is no new resources needed to meet this result as the program is meeting it currently as is. As long as there is a faculty member with the background to teach the ES classes and take the ES program into the future.

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
The students who completed the Exit Exam met the learning outcome. In fact, the students did well on this particular essay question, overall, which required students to select an environmental challenge, describe it, determine its proximal and ultimate causes and determine solutions for it. The selected questions within that essay had to do with broad aspects of the environmental challenge such as economics, politics, etc.

This goal has been the one that has been most difficult to assess within the ES program. Opportunity for improvement can be found in ES 301/ES 302, perhaps through the mechanism of case studies of environmental challenges. This avenue could not be pursued readily in the current assessment cycle because all of the courses had to be transferred to online delivery during the academic year. There was little available opportunity to expand the use of case studies and develop appropriate assignments. Another challenge is that ES 301/ES 302 are currently offered every other year. The next opportunity for improvement of the course along these lines would be in AY 2022-2023. However, it might be worthwhile to consider teaching both courses every year, given recent increase in major numbers, the increase in

numbers of students seeking minors in ES, and the increased interest in environmental issues among students across campus. Enrollment in these two courses has increased over the last few years, a trend that is anticipated to continue.

Another opportunity relates to ES 314, which is a general education course that meets the requirement for Global Cultures. In fact, this course does focus on the multidisciplinary and cross-cultural ramifications of climate change, including significant attention to climate change economics, national policy, international agreements, and law. The course is not currently included in the assessment because it is popular with students across campus, such that ES students make up a minority of the enrollment. ES 314 was offered for the first time during Spring 2021. This course is offered every Fall term going forward. Perhaps means can be found to assess the ES majors among the students for this goal without risking putting in a bias in instruction or student evaluation, overall. This will be studied in the next assessment period, and perhaps implemented, as well.

Beginning in Fall 2019, new students in the Environmental Science program were required to take ES 111, a course in sustainability that introduces students to the evaluation of environmental challenges by separately considering the environmental, social and economic aspects of the challenges. This presents an opportunity for ES 301/ES 302 to build from this background, perhaps as early as 2023-2023, when many of those students would have taken ES 111 prior to ES 301/ES 302, though there is no current intention of making ES 111 a prerequisite for either course, due to the significant number of non-ES majors who take the course at this time. ES 111 occurs too early in the program to be used for program assessment, being a freshman level course.

Changes Made/Proposed Related to Goal
Instead of using just one essay question and finding multiple choice questions related to the outcome I used both essay questions this time around. This goal does not have as many outcomes compared to the other goals used in the assessment. That may change in the future.

In Fall 2023 the University hired a new ES faculty who will serve as coordinator for the program. They may make changes to content covered and direction of the program for future years. This will cause changes to be made in what tools are used to assess the program in the next few years.

Upload Rubrics/Other Files

Goal 5

Program Goals are broad and overarching statements about the skills, knowledge, and dispositions students are expected to gain by the end of their course of study (big picture). They support the Institution's Mission/Goals.

Program Goal
To comply with Program Productivity standards as defined by the South Carolina Commission on Higher Education

Pillar of Success Supported
High-Demand, Market-Driven Programs

Outcomes

Outcome 1

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Operational Outcome

Enter Outcome
Major Enrollment

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
Using a five-year rolling average, the number of students enrolled in the major for Baccalaureate programs is greater than or equal to 12.5.

Performance Target for "Partially Met"
Not Applicable

Performance Target for "Not Met"
Using a five-year rolling average, the number of students enrolled in the major for Baccalaureate programs is less than 12.5.

Assessment Measure Used
Enrollment and Graduation data extracted from Banner

Frequency of Assessment
Annually

Data Collected for this Timeframe (Results)
The five-year rolling mean for student enrollment was 22.4

Score (Met=3, Partially Met=2, Not Met=1)
3

Comments/Narrative
The goal was met according to this operational outcome. No changes are indicated. There does seem to be some progress, however. The enrollment in 2018-2019 was 20. The Fall 2020 enrollment in the Environmental Science program was a record high of 31 students, quite a surprise jump in the number. Fall 2021 had a small decrease but still had the second highest freshman class of 21. The enrollment increased slightly in Fall 2022 to 24. This increase in enrollment numbers in the Environmental Science program seems to reflect the total increase in enrollment at Lander University.

There does appear to be evidence that environmental concerns are growing among Lander students, as is also supported by the rise in the number of students pursuing Environmental Science minors, most of whom are Biology and Chemistry majors. With issues such as Global Climate Change so often in the public awareness, and messaging around those issues in our culture and public media increasing in both frequency and severity, it would not be unreasonable to expect this trend to continue on its upward path.

A few minor changes to the program may also have impacted the rise in enrollment numbers. The first is that, for the first time in spring 2019-2020, ES 111, a freshman level course in environmental sustainability, was added to the curriculum. This course meets the general education science requirement for a non-lab science course. It attracts students from across campus. The reason this might be an effective recruitment opportunity is that most students at Lander are unaware of the major, and very few are even aware of environmental science as an educational or career opportunity, given the short shrift this discipline has been given on South Carolina's career cluster scheme that is used by guidance counselors in public schools. Further, there has been a trend of high schools discontinuing environmental science courses in South Carolina due to low enrollment. Recruiting for this vital field has always been a challenge for these reasons. The Coordinator of the ES program has been responsible for most recruiting efforts to the program.
The second recent change is the approval of an addition of an area of concentration in Environmental Forensics, which takes advantage of new courses offered in forensic science at Lander University. This area of concentration was approved by CHE during the summer of 2019. This should broaden the interest of students in ES, and indeed has, given the consistent increase in the number of students in the Environmental Forensic Science concentration each year since it was introduced.

A third factor is that the student group, Environmental Science Student Organization (ESSO) has expanded in membership over the last two years. This will put more students in touch with the program and should lead to more interest in the major. However, given that ESSO and other student groups have not been able to meet in person during 2020-2021 because of the pandemic, the academic year 2021-2022, will be a rebuilding year for that organization.

A fourth item is, that in the last four years or so, there has been an increase in Biology students earning minors in ES, with two recently graduating with double majors in Biology and ES. This trend is expected to continue, given that it has support among faculty in Biology as well as the department and college. All of these factors, taken together, should lead to continued growth of the Environmental Science program.

As of this year we have a new Coordinator for the ES program which will shape the program in the next few years. This will help to hold on to the majors that the program has, there has been a lot of uncertainty in the last year or so about the future of the program after the prior ES coordinator's announced retirement. Having a new coordinator to be able to recruit students in the nearby areas will help keep enrollment numbers in the major increasing.

Resources Needed to Meet/Sustain Results
Recruitment into the program and advising are essential for maintaining productivity. The Coordinator has generally been responsible for all ES recruitment efforts, including serving as faculty mentor to the student organization, ESSO, and all outreach activities. The Coordinator has also served as the academic advisor for essentially all ES students beyond the freshman year, though informally advising freshmen from time to time. Since the program has a new coordinator there is no new resources required to sustain results.

Explanation of How Resources Will Be Used

Outcome 2

Outcomes are specific, **measurable** statements that reflect the broader goals.

Academic Programs are required to develop **Student Learning Outcomes**, which describe knowledge, skills, and values that students are expected to gain as a result of their educational experiences.

Academic Programs may also develop **Operational Outcomes**, which describe the level of performance of an operational aspect of a program or office (ex. graduation rates, retention, employment data).

Most goals have at least two outcomes measured.

What type of Outcome would you like to add?
Operational Outcome

Enter Outcome
Completions (Degrees Awarded

Timeframe for this Outcome
Academic Year 2022-2023

Performance Target for "Met"
Using a five-year rolling average, the number of degrees awarded for Baccalaureate programs is greater than or equal to 8.

Performance Target for "Partially Met"
Not Applicable

Performance Target for "Not Met"
Using a five-year rolling average, the number of degrees awarded for Baccalaureate programs is less than 8.

Assessment Measure Used
Enrollment and Graduation data extracted from Banner

Frequency of Assessment
Annually

Data Collected for this Timeframe (Results)
The five-year rolling average for degrees earned was 3.2 for this assessment period.

Score (Met=3, Partially Met=2, Not Met=1)
1

Comments/Narrative
This goal was not met for this operational outcome, at 3.2 versus a requirement of 8 degrees awarded, based on a five-year rolling average. There are two possible explanations for this result, 1) low total enrollment, although they met the requirement, are still not sufficiently high to lead to an expectation that the program would graduate the minimum of 8 students, and b) graduation rates for the program are low (though apparently higher, as a proportion of total enrollment, than many other academic programs at Lander University). In analyzing the data, the first alternative seems most likely to be responsible for the program not meeting this goal. For example, a program that just meets the 8 degrees awarded requirement, in a four year program, would have no fewer than 32 students, with a graduation rate of 100% of incoming students. The Environmental Science program had a total of 22.4 students in the five-year rolling average. Assuming equal numbers in all four grades and a 100% degree award rate, we would expect a five-year rolling average of 4.5 degrees awarded. This is higher than the result obtained, but not unexpected, because the enrollment in the last few years have been greater compared to prior years, and most of these students have not graduated yet. It is expected that the program graduation numbers will continue to rise as this large cohort of students moves through the program, especially if the program enrollment numbers remain steady or grow. The takeaway from that is that the Environmental Science Program is doing a satisfactory job graduating students in the program, but that the total numbers have not been high enough to guarantee success against this requirement for 8 degrees awarded, at least not for another two years, as the largest cohort on record

moves through and reaches graduation.

The other factor that may lend to a decrease in number of graduates in the next year or so is the uncertainty in the program for the last year and half, including not having any full-time ES faculty for the 2022-2023 Academic School year. Two freshman students left the university and program at the end of Spring 2023 partially due to the fact that no one knew for certain the direction of the program. Other upperclassman changed majors as well because of the uncertainty. ES 302 was pushed back a year because there was no one qualified to teach that course last Spring. Since then program now has a full-time faculty member and Coordinator again that should fix that problem.

With the replacement of one faculty member, we anticipate total student numbers in the program, and consequently total degrees awarded, to increase over the next few years based on improved total student enrollment numbers at Lander University and other factors and recent changes to the Environmental science program, as summarized for the previous operational outcome.

Resources Needed to Meet/Sustain Results
No new resources are needed to sustain this result. As the enrollment has continued to exceed the required amount in the last few years the biggest issue is keeping the students in the program itself. The last year and a half of uncertainty in the program did drop the enrollment but over time that will right itself again.

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
This goal was not met. Although the goal of student enrollment in the program was met, the number of degrees awarded is below the requirement. Based on a more detailed analysis of the enrollment and degrees awarded data, it is apparent that the challenge is more one of recruiting students to the program than a lack of success in having students reach graduation. In fact, the Environmental Science program is above average among baccalaureate programs at Lander University in terms of awarding degrees as a proportion of the students enrolled in the program.

The most critical factor relating to the future potential to meet this goal is the fact that both fulltime faculty in ES, including the Program Coordinator, have left Lander University prior to Fall 2022. This has led to concerns among students about the long-term sustainability of the program and the ability of Lander to offer the courses needed for them to meet all program requirements, and thus graduate on time. This caused at least two majors to transfer to another university along with other students changing their major. Since the university has now hired a new ES faculty that should ease the concerns that students had about the classes being offered and the future for the program. It may take a few years to increase the graduation rate since some of the classes have had to be shifted due to loss of faculty.

Recent changes in the ES program are expected to increase enrollment numbers, assuming the replacement of the faculty members in ES. These include the addition of a freshman, general education science course (ES 111) that will provide students who may not have firmly decided which major to pursue an opportunity to 'taste' what environmental science has to offer. This course was offered at Lander University for the first time during spring of 2019.

A recently approved concentration in environmental science, Environmental Forensics, was placed in the 2020-2021 academic catalog, which is expected to attract students with an interest in forensic science and environmental issues. Several students are currently enrolled in this new concentration, providing early support of this idea.

There has also been a recent trend of Biology majors pursuing environmental science minors, and the first Biology and Environmental science double majors have graduated recently. Biology faculty appear to approve and support ES minors and the double major for interested and qualified students. This is an example of an effective, cross-discipline relationship. Environmental Science minors are also occasionally pursued by Chemistry majors, but none have yet considered the double major as a possibility in recent memory, though it is feasible.

As a last comment, the ES program is one that appears to be doing quite well in terms of awarding degrees and in placing graduates in positions related to the discipline. It addresses a need in the state. Yet, recruitment has been a long challenge with this program, at least until 2020-2021, when the program jumped to 31 total students. The challenges seem to be more related to the lack of awareness of environmental science as a potential area of study and a good career option. This challenge goes to the K-12 school system in the state and public lack of understanding of what environmental science is and does. This implies that a significant and sustained outreach effort will be needed over the longer term to effect sustained increase in this and other environmental science related programs in the state.

Changes Made/Proposed Related to Goal

With the replacement of ES faculty members, we anticipate total student numbers in the program, and consequently total degrees awarded, to increase over the next few years based on improved total student enrollment numbers at Lander University and other factors and recent changes to the Environmental science program, as summarized for the previous operational outcome.

Recent changes in the ES program are expected to increase enrollment numbers, and consequently total number of students graduating, assuming that the open faculty positions in ES are replaced. These include the addition of a freshman, general education science course (ES 111) that provides students who may not have firmly decided which major to pursue an opportunity to 'taste' what environmental science has to offer. This course was offered at Lander University for the first time during spring of 2019. A recently approved concentration in environmental science, Environmental Forensics, was placed in the 2020-2021 academic catalog, which has attracted students with an interest in forensic science and environmental issues. The fact that several students are enrolled in the Environmental Forensics concentration provides early confirmation of this idea.

In addition to academic changes to the program and course offerings, the Environmental Science Student Organization has been growing in membership. This provides an opportunity for recruitment into the major.

There has also been a recent trend of Biology majors pursuing environmental science minors, and the first Biology and Environmental science double majors have graduated recently. Biology faculty appear to approve and support ES minors and the double major for interested and qualified students. This is an example of an effective, cross-discipline relationship. Environmental Science minors are also occasionally pursued by Chemistry majors, but none have yet considered the double major as a possibility in recent memory, though it is feasible.

A sustained outreach and recruiting program would likely need to be initiated for longer term success. This will involve working with the appropriate areas of administration to effect. Opportunities may include magazine or newspaper articles, a blog or other web site dedicated to the major, public outreach such as events celebrating the 25th anniversary of the ES program at Lander University, Earth Day activities, active presence of the program on high school college and/or career days, communications with high school science teachers and guidance councilors, and other opportunities.

Upload Rubrics/Other Files

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Approved by Dean?

Signature of Dean

Comments from Dean's Review