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 Year
2021-2022

Assessment Coordinator Name
Daniel Pardieck

Enter Assessment Coordinator Email
dpardieck@lander.edu

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 2020-2021

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, ES 302 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=16) and ES 302 (n= 17) and the presentation rubrics for the presentations in PSCI 499 (n=3).

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

Comments/Narrative
The mean scores across all students and the three courses assessed on the item on the rubrics related to content knowledge was 2.32. This goal was met. No improvements are indicated necessary. The instructors of the courses has 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.

ES 301 and ES 302 were online, only, due to the pandemic. PSCI 499 was conducted face-to-face, except for those students with accommodations due to the pandemic. Required changes in delivery and assessment format need be kept in mind when interpreting these results. Given the challenges, the students did very well. Face-to-face instruction is anticipated for all courses beginning in Fall 2021.

Resources Needed to Meet/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?
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 2020-2021

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 2021. Three ES students took the exam. The mean score for the chemistry related questions on the exam was 40%. There were 15 multiple choice questions on the exam that were specifically related to chemistry.

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

Comments/Narrative
Since March 14, 2020, instruction at Lander has been modified as a result of the pandemic. This resulted in change of delivery method in all courses. These rapid and persistent changes may very well have affected content delivered and retention of content. 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 did have a few changes made to remove some questions that did not reflect current curriculum and several questions were added in their place to reflect CHEM 420, a requirement in the ES core since 2018. Two of the three students who took the Exit Exam were not required to take CHEM 420.

Five (5) of the 15 questions in the Exit Exam were incorrectly answered by all three students. One of these, question 20, requires a partial solution to a rather complex biodegradation problem involving dissolved oxygen content. It is not clear whether a similar problem is worked out in the appropriate course, CHEM 420. It will be reviewed with the instructor. The other four (4) questions were a bit more fundamental, and ES students would be expected to be able to handle those.

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. Topics of particular focus will be the chemistry of disinfection of water with chlorine, dissolved oxygen equilibria, stoichiometry of reactions with dissolved organics and dissolved oxygen, and calculations among units.

Resources Needed to Meet/Sustain Results
None requested or necessary at this time.

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 2020-2021

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 2021. Three ES students took the exam. The mean score for the biology related questions on the exam was 53%. There were 22 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
Since March 14, 2020, instruction at Lander has been modified as a result of the pandemic. This resulted in change of delivery method in all courses. These rapid and persistent changes may very well have affected content delivered and retention of content. Thus, it is a challenge to put the results of this assessment into the context of the performance of the program at large.

Four (4) of the 22 questions in the Exit Exam were incorrectly answered by all three students. One question related to Ecology, two related to Limnology and the fourth related to ES 301. The ecology related question could have been a confusion due to the wording of the question. It was answered as if the students interpreted it to mean the exact opposite of its actual meaning. The ecology related questions refer to definitions (oligotrophy and compensation depth). Both of these would have been taught in Limnology, and are somewhat fundamental. One student had not taken the course. The last question referred to the identity of the vector for schistosomiasis. Schistosomiasis is one of several vector borne diseases discussed, but is treated in much less detail than others, such as malaria.

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.

Resources Needed to Meet/Sustain Results
No additional resources required.

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 2020-2021

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 2021. Three ES students took the exam. The mean score for the geology related questions on the exam was 33%. There were 22 multiple choice questions on the exam that were specifically related to geology.

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

Comments/Narrative
Since March 14, 2020, instruction at Lander has been modified as a result of the pandemic. This resulted in change of delivery method in all courses. These rapid and persistent changes may very well have affected content delivered and retention of content. Thus, it is a challenge to put the results of this assessment into the context of the performance of the program at large.

This is the first time in recent memory that this learning outcome has not been met for Geology, although 'partially met' has not been uncommon in the past. Six (6) of the 22 questions on the Exit Exam were incorrectly answered by all three students. Each of those six (6) questions dealt specifically with material in GEOL 111, ES 310 and/or GEOL 405.

None of the three students (3) who have taken the Exit Exam this Spring term has had a geology course since the Spring 2020 term, when GEOL 405 was last offered. It is possible that this low score is due to the fact that it has been so long since students took a geology course, the detailed knowledge in this exam was not recalled efficiently. It is also possible that this could be attributed, in part, to the fact that these three students were much more interested in the biology content of the ES program than in geology, all three indicating a specific interest in conservation at one point or another in their academic careers. Yet another possibility is due to the fact that certain questions related to aquatic chemistry were removed from the evaluation of the exam with respect to geology, and included with questions evaluated with respect to chemistry.

Although the content of GEOL 405 has changed recently to reflect more surface water hydrology and geochemistry than it has in the past, at the expense of aquifer mechanics, the material with respect to the questions missed has not changed. The material in GEOL 111 related to structural geology, a specific topic concerning which students have performed poorly in the past on this exam, has been expanded and covered in both GEOL 111 (including a lab on faults and folds) and ES 310. One of the questions missed by all three students was a structural geology question, but the students took both courses prior to the expansion of this material in GEOL 111, though the lab was still assigned.

The students took these courses prior to the pandemic, except for the last two months of last Spring term, when GEOL 405 was being taught, and thus were delivered in face-to-face mode. Thus, this low score is more than a little difficult to understand. Review of the exit exam will be conducted to determine whether each of the questions related to geology reflects those things most essential for ES students to know. Other changes to geology courses and the ES curriculum with respect to geology will be considered, along with the normal process of curriculum review.

Resources Needed to Meet/Sustain Results
No resources requested at this time.

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 2020-2021

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 2021. Three ES students took the exam. The mean score for the general environmental science related questions on the exam was 55%. There were 38 multiple choice questions on the exam that were specifically related to geology.

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

Comments/Narrative
Since March 14, 2020, instruction at Lander has been modified as a result of the pandemic. This resulted in change of delivery method in all courses. These rapid and persistent changes may very well have affected content delivered and retention of content. Thus, it is a challenge to put the results of this assessment into the context of the performance of the program at large.

Four (9) of the 34 questions in the Exit Exam related to general environmentalscience were incorrectly answered by all three students. Two of the missed questions related to enviromental regulation. Material related to both questions were covered in ES 310, which was last offered in Fall 2019. RCRA, one of the items, is also mentioned in ES 301 and GEOL 405. Environmental regulation is a relatively small part of the durriculum, which is science based, but could be expanded as the curriculum is being revised. Two questions relate to waste and waste treatment, a topic in ES 302, primarily, but also in ES 310. One question may have been missed because it refers to a particular piece of research that was not covered in the Spring 2021 edition of ES 302, though it was covered in prior editions. The research needs updating, anyway. The other questions were also related to biology and chemistry, and were discussd previously in this program assessment.

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 general environmental science.

Resources Needed to Meet/Sustain Results

None needed at this time.

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
This goal met the goal for three of the learning outcomes, partially met for one (chemistry), and did not meet for one (geology).

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.

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. Several of these were identified in the sections of this assessment above. Particular attention will be paid to the chemistry and geology material. That said, the Exit Exam was taken by only 3 ES majors this Spring term. Statistical analysis of such a low population is suspect, especially with the very wide distribution of grades across these three candidates, 86%, 70% and 56% respectively for the multiple choice sections of the exam. The 86% score is among the highest on record. A single student could significantly skew the data, in such a situation, with such a variance in individual performance

A possibilty to improving retention of material that was poorly retained might be addition of homework assignments in courses within the ES curriculum that are under the control of the program leadership. Homework assignments are used in all courses, but could be added or expanded in the geology courses

It should be noted that, due to continuation of response to the pandemic, many Fall term 2020 and Spring term 2021 courses were brought online for the first time. In that process, for many courses, significant improvements have been made in the detail and amount of content available to students in Blackboard. Lecture slides were improved. All lectures narrated (for the first time) or recorded. Additional assessments were added to E related courses, most notably more than 1 quiz per week on average and several, short, written and online discussion assignments (ES 301, ES 302, GEOL 111, especially). Students have already provided positive feedback regarding these modifications. Depending how the

next two assessment cycles work out, some of these changes may be saved or expanded upon once courses return to regular delivery (face-to-face).

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 2020-2021

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	Frequency of Assessment

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

ES 301, ES 302, ES 310 and GEOL 405 are offered every other year. ES 310 and GEOL 405 were offered in Academic Year 2019-2030. 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=16), ES 302 (n=17), and PSCI 499. (N=3). The mean score was 2.23.

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

Comments/Narrative
The goal was met, according to this student learning outcome, on average. Firther, this learning outcome was met for each of the three classes. This is a strength to be retained by the ES program.

Resources Needed to Meet/Sustain Results
None needed at this time.

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 2020-2021

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 average score for the three students was 86%, which was among the highest scores recorded on this question .

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

Comments/Narrative
Although only based on three students, the average score on the first essay question, used to assess this learning outcome, was 86%, which met the goal for this learning outcome. The question required each student to pick an environmental challenge from a list of six (6) specfic environmental challenges. In the essay, students were to describe the challenge, identify the proximate and ultimate causes of the challenge and describe potentia 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.

Each of the three students made effective responses, and one of the students did exceptionally well.

Resources Needed to Meet/Sustain Results
None needed at this time.

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 2020-2021

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)
One student completed an internship during the current assessment period. The employer evaluation rubric (EYE Program) was used. That score was 4.2/5.0 for the five (5) 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
One student completed an environmental internship over the current assessment period. Two other students had plnned to pursue internships during that period, but were unable to locate appropriate opportunities due to the COVID 19 pandemic. Many internship opportunities were discontinued for that period.

The student who completed an internship at the Clemson genetics laboratory and field site did quite well. In fact, the supervisor indicated a willingness, even enthusiasm, to place other students from the Lander ES program into such internships in the future.

Resources Needed to Meet/Sustain Results
None needed.

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.

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 2020-2021

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 ES 301, ES 302, ES 310 and GEOL 405, plus PSCI 499. And written report rubrics in ES 310, ES 301, ES 302 and GEOL 405.

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 rubrics in ES 301 (N=16) and ES 302 (N=17), and presentation rubrics in PSCI 499 (N=3). For written communication (reports), the mean was 2.5 (N=33). For presentations, the mean was 2.6 (N=3)

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

Comments/Narrative
The goal was met according to this learning outcome. Presentation skills had a mean score of 2.6 while written communications skills had a mean of 2.5, both similar in number. It should be noted that there were fewer presentations than would have been typical due to the pandemic. In ES 301 and ES 302, emphasis was placed on written communication.

These scores suggest that course embedded communications assignments, written and presentation, are working quite well in the Environmental Science program. No additional improvement is indicated by the results of this learning outcome.

Resources Needed to Meet/Sustain Results
None needed at present.

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 2020-2021

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 internships (ES 490) or research project (ES 407) presentations were 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. The pandemic impacted the opportunity for face to face presentations in the current assessment period. It is anticipated that face-to-face presentations will return in the next assessment period.

Resources Needed to Meet/Sustain Results
None requested at this time.

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 2020-2021

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)
A single internship was completed during the assessment period. The mean score of the five (5) communication items included on the supervisor rubric was 4.6/5.0.

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

Comments/Narrative
The learning outcome was met, although it was for a single student. The pandemic made it quite challenging for students to find suitable internships during this assessment period. It is anticipated that more students will be successful in obtaining internships during the next assessment period.

Resources Needed to Meet/Sustain Results
None needed at this time.

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 301, ES 302, ES 310 and GEOL 405, 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
No specific changes will be made to the program based on this goal. 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 2020-2021

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)
Three (3) selected questions on the Exit Exam, in the first essay, were assessd for this learning outcome. Three students completed the exam. The mean percent score of the respones to the three questions was 90%.

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

Comments/Narrative
All three (3) students who completed the Exit Exam met the learning outcome. In fact, the students did especially 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 economice, 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. 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.

Resources Needed to Meet/Sustain Results
None requested at this time.

Explanation of How Resources Will Be Used

Goal Summary

Goal Summary/Comments
All three (3) students who completed the Exit Exam met the learning outcome. In fact, the students did

especially 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.

First, a second learning outcome will be added to the assessment of this Goal 4, though its first implementation is not likely until the academic year 2022-2023. This assessment would be based on a new, course embedded project or projects, most likely in ES 302 (possibly ES 301). ES 301/ES 302 are the only courses in the Environmental Science curriculum in which such an assignment would be instructive. The goal calls for integration of content, thinking and approaches across several disciplines to address a major environmental challenge. These two courses do cover aspects of these other disciplines (economics, social science, political and legal systems) related to environmental challenges (economy, social systems, political systems).

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

A proposed change to the assessment is to add a second student outcome, to reflect a new, course embedded project in ES 301 or ES 302, which will next be offered in academic year 2022-2023. This will build upon the learning that takes place in ES 111, a new course that is required of ES students beginning with the Fall 2019 entering class.

The rubric used to assess ES 314 projects will be updated to reflect this Goal, and instructional modifications will be made to facilitate integration of the disciplines in the later semester projects that are

focused on adaptation and mitigation of climate change. The learning outcome associated with these assignments will be included in the next assessment period.

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 2020-2021

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 **Frequency of Assessment**

Enrollment and Graduation data extracted from Banner	Annually

Data Collected for this Timeframe (Results)	**Score (Met=3, Partially Met=2, Not Met=1)**
The five-year rolling mean for student enrollment was 18.2	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 2019-2020 was 16 students, while that in 2018-2019 was 20, with the previous three years below 15. The Fall 2020 enrollment in the Environmental Science program was a record high of 31 students, quite a surprise jump in the number. 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 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. This is supported by the observation that several students in the ES program have selected the Forensics Concentration, though the data is still not sufficient to evaluate this hypothesis.

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.

Resources Needed to Meet/Sustain Results

None needed at this time.

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 2020-2021

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 3.0 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 3.0 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. 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 an award rate of 100% of incoming students. The Environmental Science program had a total of 18.2 students in the five-yeal 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 there was a sharp rise in program enrollment in the last academic year (31), and most of these students are Freshmen or Sophomores. 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 three more years, as the largest cohort on record moves through and reaches graduation.

The implication of this for Environmental Science is that the program has actually been doing quite well to help students complete their degrees. As a caution, however, several Environmental Science students have had challenges during the pandemic year of 2020-2021, and at least two have withdrawn from the university or been put on academic suspension. This will impact the graduation numbers in the next two to three years. A further bottle neck in graduates rates would not be unexpected under these conditions, especially considering the several students who withdrew from core ES courses (ES 301 and ES 302), which are taught only every other year.

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 operatonal outcome.

Resources Needed to Meet/Sustain Results
None needed at this time. 2021-2022 will be a pandemic recovery year for this and essentially all programs at Lander University.

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.

Recent changes in the ES program are expected to increase enrollment numbers. 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.

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. However, due to the pandemic, the organization was not able to meet face-to-face or conduct activities in 2020-2021. AY 202102022 will be a rebuilding year for ESSO, as well as many other student organizations.

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

Recent changes in the ES program are expected to increase enrollment numbers. 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. 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. It is not currently anticipated that significant, new resources would be required to do these things.

Upload Rubrics/Other Files

Dean's Email Address
dslimmer@lander.edu

Approved by Dean?
Yes

Signature of Dean
David A. Slimmer

Comments from Dean's Review
Statistically, it is difficult to have confidence when the sample size is only 3. But I am pleased to see that the ES curriculum is constantly being reviewed and modified, and I applaud the work by Dr. Pardieck in putting together this report.

Thank you for reviewing and approving this report. The approval and a copy of the report will be emailed to you and the Assessment Coordinator.